BORDO

CLIMA

BORDOCLIMA. New calligraphies of moving borders

POLITECNICO DI TORINO
Dipartimento di Architettura e Design
Laurea Magistrale in Architettura Costruzione Città
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BORDOCLIMA
New calligraphies of moving borders

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abstract

Bordoclima investigates the topic of moving borders by constructing possible design methods and scenarios in the "New Climatic Regime" (Bruno Latour, *Down to Earth: Politics in the New Climatic Regime*, 2017). Geopolitical borders are considered paradigmatic places of the relationship between the new dynamic and transcalar ecological processes and the architectural ones, usually defined by static traces and signs on the territory. In a condition of suspension marked by the uncertainty of the current planetary climate crisis, the "rigid" boundary of architectural space conflicts with the ecological one constantly in movement, requiring a new methodological and design model.
The structure of the work, in terms of both methodology and narrative, is divided into four macro parts:

1. Rhizome: the theoretical platform on which the method is structured turns out to be non-hierarchical, heterogeneous, verticalized, and constantly changing in scale from the general to the particular. The tools and methods of Landscape Ecology are used and tested in the research, considering the outcome of an ecological project a probabilistic and non-deterministic scenario.

2. Bordoclima: after a comparative analysis on a global scale between the different figures of conflict on the borders, the research intends to test the relationship between instability and stability, between ecological and architectural processes, through an alternative operational, dialogic, dynamic model that involves the use of a new "calligraphic" language capable of generating new aesthetic and performative forms of the landscape.

3. On fluids: the border refuses the static and linear logic, including in its domain of sovereignty, elements outside the visible geopolitical realm, preferring the taxonomy characteristic of the fluid and moving model. The borders of the Balkan area thus become a territory of experimentation, where interference and disturbance take the form of holograms of conflict. The tools used to map and simulate the complex and conflictual systems of the border are based on complex software and data analysis, as critical tools able to trace global and local phenomena.

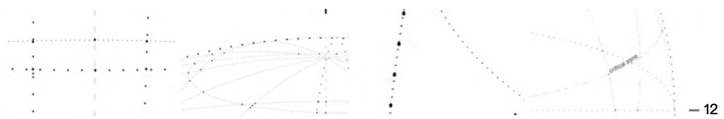
4. Far from equilibrium: in the "Age of Asymmetry" (Timothy Morton, *Hyperobjects. Philosophy and Ecology after the End of the World*, 2013), humans and non-humans become actors in a project that conceives Ecology as a science of possibilities and not as a discipline capable of defining definitive spatial outcomes. Through an abductive process, three points of discontinuity are identified on the unstable border between Croatia and Bosnia and Herzegovina. Emblematic places for the experimentation of a synchronic mapping of the conflict, able to generate a "sieve" useful for the creation of a probabilistic scenario of mutation of the border.
Bordoclima is constructed as a hypertext, an open work, an instant in which we observe a break in the linearity of processes and languages towards the emergence of new calligraphies. In this logic, a non-linear structure of the narrative has been developed, which verticalizes contents and methodologies.
Bordoclima is the first step of a theoretical project, which sees the relationship between science (geodata analysis and computational tools) and art (new aesthetic figures), a possible scenario for the project of contemporaneity.
In relation to the contemporary and transdisciplinary approach, a non-linear structure of the story has been developed, which vertically integrates contents and methodologies.

Bordoclima is a **hypertext**.
An open work, an instant in which we observe a break in the linearity of the language and the emergence of new calligraphies. In this sense it is composed of technical and scientific notes, explanatory of a method, and notes of a specific taxonomy of the language used.

Bordoclima is a **theoretical project**.
It is based on an established infrastructure in the discipline of landscape and architecture, while also introducing the possibility of contamination with other disciplines , in a relationship of constant dialogue on the fracture between art and science.

The narrative is further divided into theoretical apparatus and inserts of conversation, art, and science that stretch the boundaries of the profession.

hypertext



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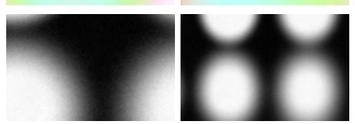

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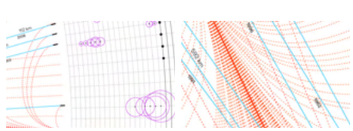

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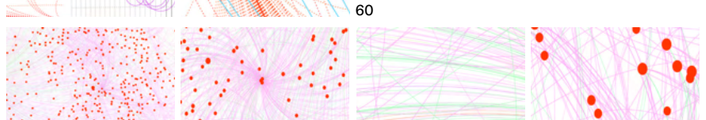

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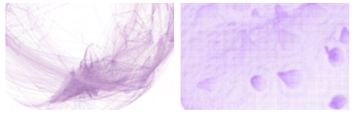

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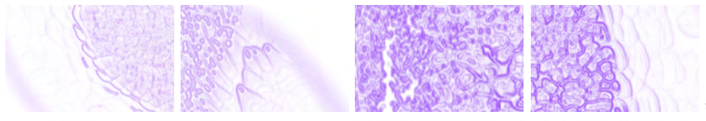

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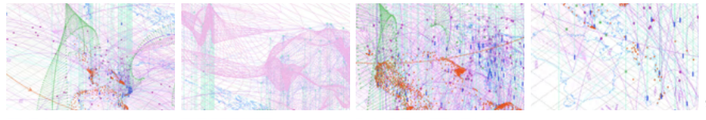

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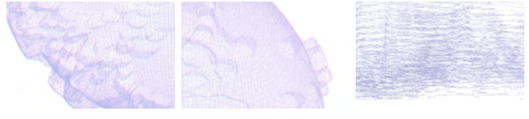

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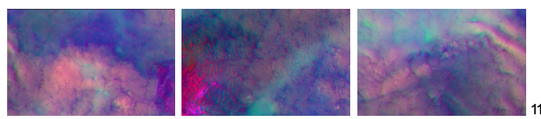

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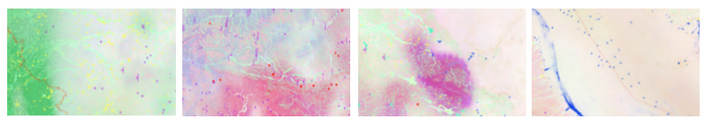

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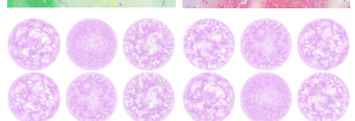

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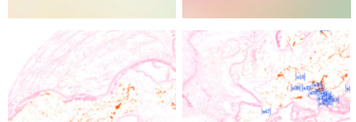

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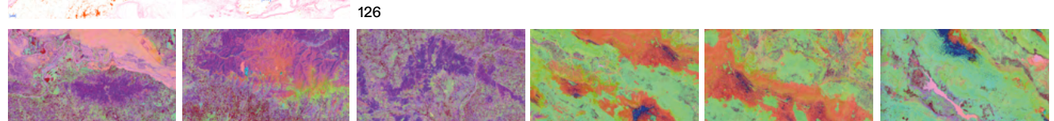

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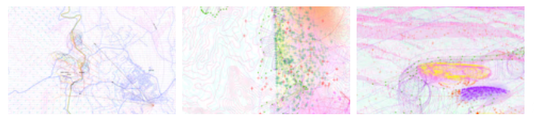

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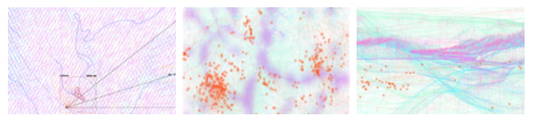

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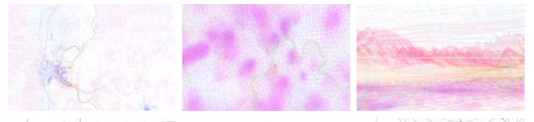

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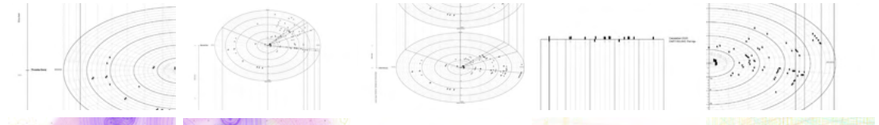

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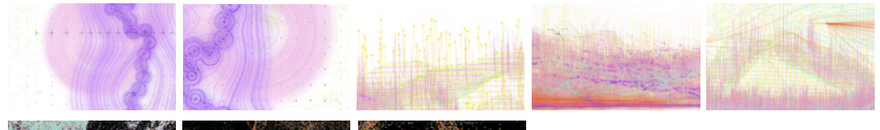

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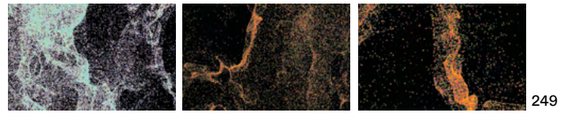

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index

SOSPENSIONE APERTA

BORDO CLIMA

SOSPENSIONE FLUIDA

SOSPENSIONE CHIUSA

ti con zero

t_0

the initial instant of
observation of a phenomenon.

“ In *Ti con zero*
I try to see time
with the same concreteness
with which one sees space”.

Italo Calvino

ti con zero.

is the decisive minimum unit for composing and understanding the sequence with which the formal structure of the narrative is structured.

In relation to the contemporary and transdisciplinary approach, a non-linear structure of the story has been developed, which vertically integrates contents and methodologies.

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Bordoclima is a laboratory of experimentation and crumbling of conventions.
The research is deliberately constructed without following a classic traditional logic in which the attempt is to shatter the codes and reasons deposited over time in order to pose new questions according to a vertical taxonomy of continuous discontinuity. The attempt is to work through epistemological ruptures and continuous rotations in relation to a point of innovation, using the force of aesthetic thought in which form becomes a way of leading the separate technical objects back to a unity.
Experimentation is nourished by triggers that have to do with the aesthetic order, machines that through the manipulation of forms visualise data and maps. In this sense the process, which is typical of the contemporary era, is not consequential and systemic, but it is built up through points of criticism and rupture.
The desire to work by criticities is also reflected in the objectives of the research, both at a methodological and design level: in fact the openness of questions is suspended in an apparent closing.

SOSPENSIONE APERTA

0

declaration of intents

This research declares the will to experiment with a new method and new calligraphy on the theme of the moving border, treated in its geopolitical consistency, in a contemporary context. This process is supported by the tools and methods of Landscape Ecology. This discipline was born not for cultural and aesthetic reasons but for the very birth of a problem and the need to approach it with an alternative method that is operational, dialogic, dynamic, which involves the use of a new language capable of generating the new aesthetic forms of the landscape. It was decided to territorialise the theoretical system and thus experiment operationally with the method on the border, with a probabilistic project that relies on ecology as the science of possibilities. The drawings play the role of Hypertexts, a machine that multiplies narratives characterised by being an open work in relation to space and time. The research question is how we can work as architects with a multidisciplinary approach on places of political and ecological conflict with a non-resolutive logic, aiming at redefining new pathways for this practice.

SPERIMENTAZIONE LIQUIDA

1

rizoma

SISTEMI
RELAZIONALI

1.1

PROBLEMATIC NUCLEUS

1.1.1

Questioning the conflict

The problematic nucleus to which the research refers concerns the constant conflict between the rigid architectural boundary and the ecological boundary, inserted in the contemporary world, in a condition of space-time suspension marked by uncertainty and climatic crisis.
The characteristic rigidity of the architectural boundary, represented by the fence, the perimeter, contrasts with the instability and dynamism of the ecological issues.
The two elements appear to be in constant conflict not only from the spatial point of view but also in the temporal dimension.
This is why it was decided to work on the border, as an emblematic point of fragility, conflict and discontinuity.
Ecological time is characterized by units of measures that are different from those of architecture: a rigid element such as a fence, a wall, an administrative boundary drawn on a map, derives from human decisions taken at a precise instant of space-time. For this reason, the problematic core of the research aims to investigate the disturbance and interference generated by this space-time displacement, in an attempt to represent it.
The approach used is to work on the conflict in a non-resolutive way, to experiment with the methods and tools of the probabilistic discipline of Landscape Ecology in a given spatiotemporal framework, where disturbances and interferences are identified and re-proposed in the form of performative calligraphies, where the overlap between human and non-human becomes the generator of new forms.

To place oneself in the contemporary context means pushing research towards further issues and interrogatives inherent to the ecological question: the transition of ecology from a natural science to a projective lens generating forms in the practice of design, remains the source of some confusion and limits in communication at the intersection of the disciplines of landscape architecture, urban design and urban planning (Waldheim 2000).

In the last few years, we have seen a resurgence of ecological thinking and ideas in discussions of urbanism, society, culture and design. In science, the field of ecology has moved away from classical determinism and a Newtonian reductionism with stability, certainty and order in favour of a more contemporary understanding of dynamic systemic change and the related phenomena of adaptability and flexibility. This places landscape architecture in a unique disciplinary and practical space, equally informed by ecological knowledge as an applied science, as a tool for managing change. However, ecology is not simply a project of the natural sciences.

Many researchers and theorists have used ecology as a general idea or metaphor for a range of conditions and relationships with social and political implications - or even redefined the term ecology to include these fields in a broader context. Félix Guattari, in *The Three Ecologies*, argued that ecology is as much about social and economic power, demography, and political struggles and commitments as it operates with environmental forces. A concise manifestation of a holistic and relational approach to understanding eoclogical issues. According to him, the most appropriate way to address the ecological crisis is to deal with the global scale "provided that it brings about an authentic political, social and cultural revolution, reshaping the objectives of the production of both material and immaterial assets" (Mostafavi 2009).

The contemporary concept of ecology is therefore dragged into the experimental method of research where theories are open, "far from a modernist strategy"(Allen 1997). Time and space become indivisible, asymmetrical and dynamic, so that the field cannot be separated from the object

The space of conflict, as defined by Ilia Prigogine's[1] research, can be defined as the space of possibility, the space in which the largest number of elements hybridize and can assume different forms and alternative configurations. The edge is the space of Non- equilibrium and Non-linearity of processes. It includes the chaos in its dimension of maximum order and maximum disorder. The political laws are powerless in front of the instability of the spatial construction of the edge. A complex system built on probabilistic scenarios. The research therefore moves in this direction: the most interesting scenario for the project becomes that of new interferences and new problematizations, where the consolidated specificities become unstable and in movement and are projected towards a relative time in which new possible transformations can be determined.

Space becomes dynamic. There are new epistemological conditions, new formal and trans-discipline frameworks.
Dynamic processes are part of the city, constantly evolving as ecological processes changing its tools methods and scale (Allen 1997).
In relation to this overlapping of human and non-human issues, which is characteristic of ecological thinking, the research focuses on borders as places where the conflict between the two parts is open.
The projectual space is defined by forces, or intensity of relations between felds and conflicts. These forces interact in an active way to specify the space of the project.

1. Ilya Romanovich Prigogine (1917-2003)was a physical chemist and Nobel laureate noted for his work on dissipative structures, complex systems, and irreversibility.

1.2

THEORETICAL STRUCTURE

1.2.1

Genealogy of terms

The theoretical sphere on which the research is based refers to two disciplines, architecture and landscape ecology.
Considering the need to be part of the contemporary context, the theory takes shape through the construction of a structure made up of two fundamental centers, Stuart Elden with *The Instability of Terrain* concerning the concept of **borders**, and *Down to Earth. Politics in the New Climatic Regime* by Bruno Latour about **climate**, thus dividing the sphere into two thematic hemispheres.
Secondary authors revolve around those two on specific meridians and parallels touching the research with different disciplines and theories, carrying within it approaches, principles and methods. The structure aims to verticalize and connect seemingly distant concepts, such as art and science, nature and humans, but which in reality are constantly put into close relation, discussion, and conflict in the current discourse. The calligraphic and design experimentation on the edge in Latour's New Climate Regime is treated from a conflictual and dynamic point of view, evolving by crossing disciplines.
First of all through the support of the theories and methods of Landscape Ecology, including Stan Allen, James Corner and Gyorgy Kepes, who were the first to experiment with new aesthetic forms of landscape, in the transition from the concept of object to that of field, on the development of new images and techniques of conceptualization and in the continuous change of scale from macro to micro.
The theoretical project sees the manipulation of an epigenetic landscape based on the theories of Sanford Kwinter, supported by contemporary computational systems based on matrices, algorithms, and data, underlying Forman's studies in *Network and Matrix*. The instability and conflict on which the research is based are given by the current geopolitical and climatic situation, where Timothy Morton's hyperobject is revealed.

Characteristic of the method and of the theoretical platform is the rhizomatic structure that will result: non-hierarchical, heterogeneous and not centered, in a continuous change of scale from general to particular.

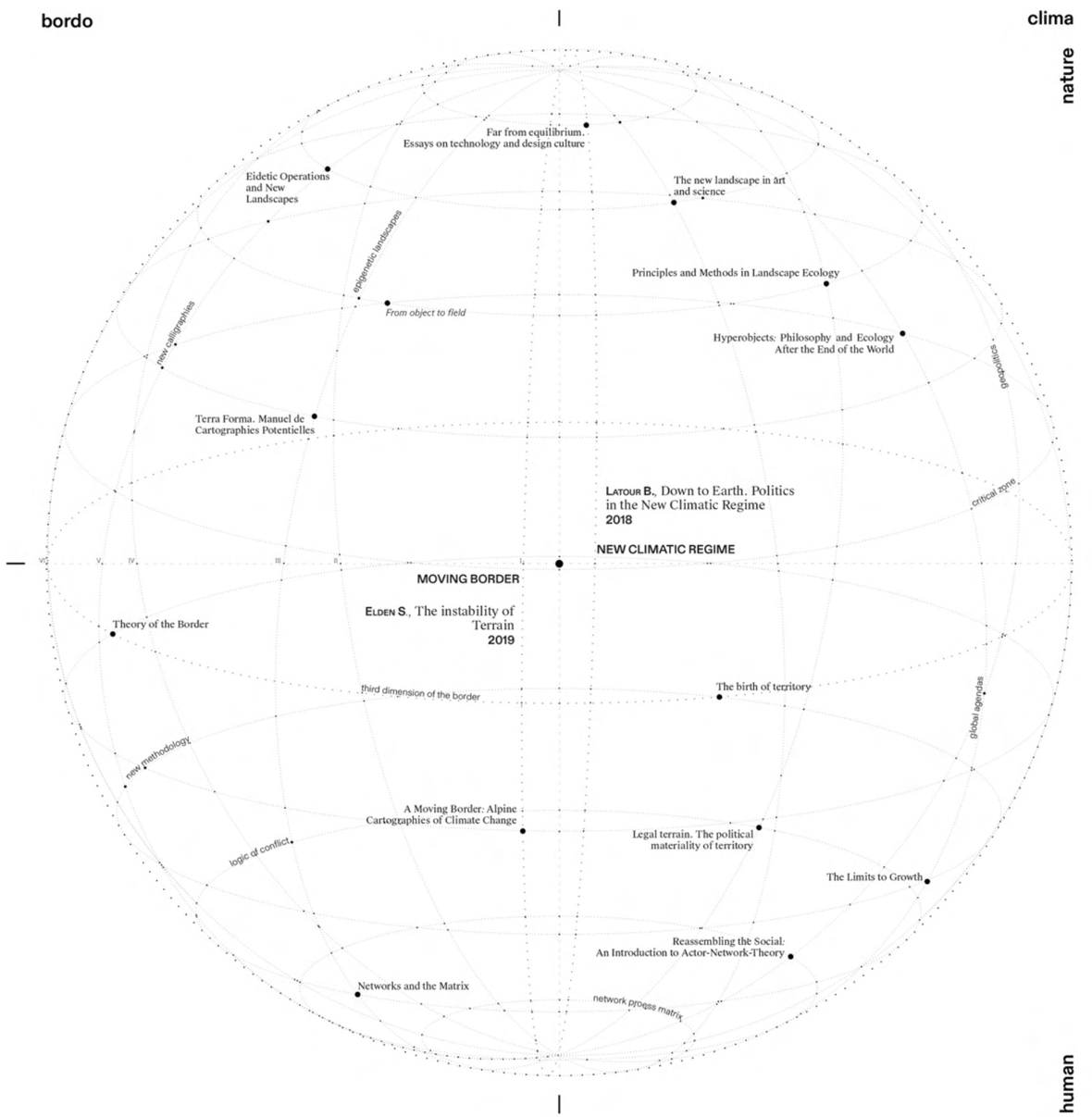


figure n.1
theoric structure of the research

Kepes G., *The new landscape in art and science*
2016

Allen S., *From object to field*
1997

Corner J., *Eidetic Operations and New Landscapes, in Recovering Landscape. Essays in Contemporary Landscape Architecture*
1999

Forman R., Wilson E, *Networks and the Matrix*
1995

Latour B., *Down to Earth. Politics in the New Climatic Regime*
2018

Elden S., *The instability of Terrain*
2019

Elden S., *The birth of territory*
2013

Morton T., *Hyperobjects. Philosophy and Ecology After the End of the World*
2013

Kwinter S., *Far from equilibrium essays on technology and design culture*
2008

Farina A., *Principles and Methods in Landscape Ecology*
1998

Nail T., *Theory of the Border*
2016

Meadows D. H., *The Limits to Growth*
1971

1.2.2

Glossary

The glossary is formulated according to taxonomic data sheets that refer to a different vocabulary of authors who are constantly questioned within the research.
The purpose is to clarify to the reader at an early stage the terminology recurring in the discourse and the reasoning.
The desire to catalog terms derives from the need to make transparent complex concepts that are drawn from disciplines tangential to architectural practice.

n.

> Critical Zone

> Hyperobject

> Hypertext

> Matrix

> Model

> New Climatic Regime

01

Critical Zone

A thin layer on the envelope of the biosphere which extends vertically from the top of the lower atmosphere down to the so-called sterile rocks and horizontally wherever it is possible to obtain reliable data on the various fluxes of ingredients flowing through the chosen site.

a living, breathing, constantly evolving boundary layer where rock, soil, water, air, and living organisms interact

“
-You want me to land on Earth? Why?
- Because you're hanging in midair, headed for a crash.
- How is it down there?
- Pretty tense.
- A war zone?
- Close: a Critical Zone, a few kilometers thick, where everything happens.
- Is it habitable?
- Depends on your chosen science.
- Will I survive down there?
- Depends on your politics. "

2014

Bruno Latour

"Some advantages of the notion of “Critical Zone” for Geopolitics"
vol 10, 2014, ISSN 1878-5220,
doi:10.1016

2020

Bruno Latour

"Critical Zones. The Science and Politics of Landing on Earth"

Landing on Earth,
Science and Politics

02

Hyperobject

It is a term that describes global phenomena which have an enormous impact on our world, yet are of such a scale that they cannot be comprehended in their totality.
Their effects of hyperobjects may be experienced even if they cannot be necessarily touched.
The other examples are nuclear radiation, tectonic plates, nuclear radiation, etc.
Hyperobjects appear in our world as a product of human thinking through the ecological crisis humanity has invented. Ecological crisis is thought to be the time of hyperobjects when massive of non-human, non-sentient beings make decisive contact with humans, ending various human concepts such as world, horizon, nature, or even environment.

Denoting n-dimensional non-local entities - computer science

2013

Timothy Morton

"Hyperobjects. Philosophy and Ecology after the End of the World"
University of Minnesota Press / 2013

1967

Noll, A. Michael

"A Computer Technique for Displaying n-Dimensional Hyperobjects".

Dark Ecology, Objects,
Ontology, Causality

03

Hypertext

1965

Theodor H. Nelson

"Complex information processing: a file structure for the complex, the changing and the indeterminate"
ACM '65: Proceedings of the 1965 20th national conference

It means non-sequential writing - text that branches and allows choices to the reader, best read at an interactive screen. As popularly conceived, this is a series of text chunks connected by links which offer the reader different pathways. Since hyper-text, which links one passage of verbal discourse to images, maps, diagrams, and sound as easily as to another verbal passage, expands the notion of text beyond the solely verbal, there i so diffe-rence between hypertext and hypermedia.

1967

Italo Calvino

"Tcon0"

Hyper as amplification, deviation or neologism.
Calvino coined the term in the last essay tconzero. The concept of "Iperromanzo" is defined in the American Lessons: "infinite contemporaries universes where all the possibilities are realized in all possible combinations", where it may be "an idea of punctual time,almost an absolute present subjective", where its parts "develop in different ways a common core, and act on a frame that determines them and from which is determined"; that acts as a "machine for multiplying narratives".

Information technology,
Hypermedia

04

Matrix

1995

Richard T.T. Forman

"Networks and the matrix" in "The Ecology of Landscapes and Regions", Cambridge 1995

A matrix is the background ecosystem or land-use type in a mosaic, characterized by extensive cover, high connectivity and/or major control over dynamics.
The matrix surrounds and dominates a network and is critical to its function. In rectilinear networks the matrix is subdivided into many sections, the size and shape of which also affect the network.
The topography of the matrix helps determine the actual locations and form of network.

1858

Arthur Cayley

"A memoir on the theory of matrices"

A set of quantities arranged in the form of a square, e. g. (a, b, c) | a', b', c' | | a", b", c" | is said to be a matrix. The notion of such a matrix arises naturally from an abbreviated notation for a set of linear equations, and the consideration of such a system of equations leads to most of the fundamental notions in the theory of matrices. It will be seen that matrices (attending only to those of the same order) comport themselves as single quantities; they may be added, multiplied or compounded together

Matrix, networks
Physics
Mathematics
Landscape

05

Model

A model is simply an ordered set of assumptions about a complex system.
Every person approaches his problems, wherever they occur on the space-time graph, with the help of models.
It is an attempt to understand some aspect of the infinitely varied world by selecting from perceptions and past experience a set of general observations applicable to the problem at hand.

Cambridge Dictionary

"Something that represents another thing, either as a physical object that is usually smaller than the real object, or as a simple description that can be used in calculations."

Models are powerful abstractions that have impacts on the way we think, feel, act and construct our worlds. They are unreal artifacts that mold reality. We rely on models, trusting their superior relevance and immanent ability to produce and reproduce objects, spaces, and above all – knowledge. The model can transform reality as we know it.

1972

Club of Rome

"The Limits to Growth. A REPORT FOR THE CLUB OF ROME'S PROJECT ON THE PREDICAMENT OF MANKIND"
Universe Books, New York
1972

Technology,
Model
Knowledge

06

New Climatic Regime

There used to be an older climatic regime, the rather stable situation since the end of the last glaciation that geologists have defined as the Holocene. By relying so heavily on fossil fuels, humans have shifted, without realizing it, to a New Climatic Regime. Climate has ceased to be a given to which people had to adjust as best as they could, and that was varying inside certain limits, and has become the most urgent and most disputed subject of their politics. At this point, how humans position themselves toward the climate situation defines their core values much better than whether they are on the left or the right. Paradoxically, the most obviously natural phenomenon – the climate – has become the most clearly political object – the State of the climate.

2017

Bruno Latour

Down to Earth: Politics in the New Climatic Regime
Polity Press / 2018

Facing Gaia. Eight Lectures on the New Climatic Regime
Polity Press / 2017

https://zkm.de/en/new-climatic-regime

Nature/Culture, Terrestrial,
Terrestrial Time

< Critical Zone >

1.3 architects after architecture

1.3.1 The concept of contemporaneity

In contemporary times, in the context of human knowledge, humans and non-humans interface in an equal confrontation, thereby defining the Age of Asymmetries (Morton 2013). The sense of human interiority is extended by mirroring itself in the non-human, which in the social space, is no longer simply an object of knowledge (calculable and predictable) but becomes a being in itself of which humans can perceive only a part, a limited section. The push for globalization makes the field of vision and perception very limited. As we move forward, in the New Climatic Regime, humans have less and less perception of the changing and the ecological crisis. Affected by the shifting baseline syndrome[2], humans tend to attach and root themselves to the ground. (Latour 2018).

Acting in the contemporary as architects means being able to move critical attention from architecture as a matter of fact to architecture as a matter of concern (Latour 2004). "As a matter of concern," human action in the space enters into a much larger network of relationships in which the consequences of architecture are far more significant than the object itself. The practice of architecture is characterized by strong normalizing tendencies that are reflected in the city of uniformity indifferent to conflict, disconnected from the political and ecological context. The standardized view of the profession associates the architect with a static practice of limitations and certainties. Architectural culture tends to prioritize aspects associated with static, technical and atemporal properties. Mistakenly, architecture as a profession is based on the need for architecture (as practice and product) to be a protected domain of the architect (Awan 2011).

The contemporary architect must act at a new scale, disassociating himself from the stereotypical figure of the singular hero, like that of the misunderstood genius conceived by Ayn Rand in her novel *The Fountainhead* (1943). Here, Howard Roark, behind the shadow of purposeful ambition, hides a darker essence of individualism and greed. The Randian image of the architect does not include that of an individual capable of acting, of moving in the exchange between space and people, and of looking at wider possibilities of space.

The new figure of the contemporary architect, able to expand his field of vision, moves in Space. Lebfevre's definition of space, as it was written in 1947, now has to interface with factors that have multiplied in scale, since problems such as Climate Change, Globalization, features of the age of Asymmetries, have a direct relationship in the interaction that exists between space and architect (Lefebvre 1991) The contemporary experience in the practice of architecture cannot be seen in a linear way, on the contrary it appears multiform and complex.
For example, aesthetic experience is the strongest, most solid model despite its peripheral positioning in contemporary vision.
However, it does not have a marginal value as much as a paradigmatic one. In fact, in contemporary experience aesthetics has above all the value of a paradigm.
"It is precisely through aesthetics that we recognize the model of our richest, most living, most genuine experiences in relation to a reality whose outline is blurred" (De Sola Morales 1996).
Since science has become routine, it is not at all inexplicable that contemporary culture might want to shift its interests towards reasons previously considered marginal.
Finally, we can say that contemporaneity is characterized by new optical lenses, new climatic regimes, new spaces and aesthetic experiences. But also new materiality, as we live in liquid times: this means that we are constantly subject to act within global networks, ecological networks and virtual networks (Baumann 1999).

2. Coined by Daniel Pauly in 1995, while speaking of increasing tolerance to fish stock declines over generations, SBS also has roots in psychology, where it is referred to as 'environmental generational amnesia'. Simply put, Shifting Baseline Syndrome is 'a gradual change in the accepted norms for the condition of the natural environment due to a lack of experience, memory and/or knowledge of its past condition'.

1.3.2 Transdisciplinay inserts

Transdisciplinarity introduces the possibility of working vertically on different levels of reality, which even if they belong to specific disciplines, can be contaminated and contaminate the disciplines themselves in an exogenous process. (Cattaneo 2015). In order to arrive at an epistemological transdisciplinarity, we must consider the open relationships that exist between disciplines, without making them disappear individually but widening them to such an extent that clean and interdisciplinary relationships are created between them. (UNESCO, 1998)
The transdisciplinary approach is designed on three different postulates theorized by Basarab Nicolesu in the *Manifesto of Transdisciplinarity*:

- The diversity of different levels of reality, perception and knowledge
- The logic of the third included
- Complexity

"A new principle of Relativity emerges from the coexistence of complex plurality and open unity: no level of Reality constitutes a privileged place from which all other levels of Reality can be understood. (Nicolesu 2002)
In transdisciplinary logic, concepts are always in motion and they thicken and stretch at different times according to their proximity in a specific space and time. The crucial method introduced by the discipline of Landscape Urbanism is just that, to feature these experimental levels of hybridization in the practice of conceptualization.

The uncertain future of architectural practice is a fuzzy element— a system of numbers that incorporates the unknown. Myopic about what will happen tomorrow, we stretch our boundaries, redefining what is possible. This is the time we live in. We are microscopic and macroscopic at the intersection of different scales. We are versatile, we adapt, and we transform. Experimenting and using design as a critical tool is the path that, as an architect, we have to follow and pursue. Contemporary challenges in architectural practice call for creative thinkers and designers to reconsider how we interact with data involving both human and non-human beings, both things and people. From our social interactions to how we work, there is no single moment in which we are not generating or manipulating data. We live in a complex algorithm, consisting of 1 and 0, which repeatedly follow each other in a chain of effects in which, as architects, we can place ourselves. What distinguishes an architect from other practices is to confront physical space and imagine new scenarios. To do this, we are enabled to use different tools. Experimenting with scientific and non-rhetorical issues using a spatial approach is what Architect that are stretching their boundaries are trying to do. Investigating the world through the filter of the intangible, and shaping this world with new lenses is the aim of architecture after architecture. With the incorporation of new technologies, architecture has evolved to cross disciplinary boundaries and as a result creativity and information are not two distinct matters. (Stracuzzi 2019).

The research gathers both a fascination with art and science that lets drag theoretical concepts and works into the practice of the project, and the contributions of several people who during their path have gone beyond the conventional view of the practice to redefine what kind of issues they wanted to answer.
Some of these architects continue to work whitin architecture, others apply their skills in other disciplines. By bringing these figures into conversation with bordoclima's research, the goal is to create a broad and inclusive definition of what architecture is and how it stands within the contemporary in a liquid and versatile way.

1.4 LE MODÈLE EN MOUVEMENT

1.4.1 Methodological Figures

The theoretical structure defined within the disciplinary framework of ecology, is tested and formalized in time and space involving specific methodological figures in order to generate design strategies of best practice in a projective perspective, multiplying possibilities and effects.
Matter is made of modifications, perturbations, changes of tension and energy. The complexity and heterogeneity of the systems that make up the world, and the different organizational levels of the forms of life present on our planet are part of even higher levels of complexity, in time and space, invisible to human perception.

Among the many avant-gardes that took place in the early decades of the 20th century, the Futurist movement, declared in the newspaper Le Figaro by Marinetti, was certainly that artistic and cultural movement most profoundly sensitized to the concept of the multiplication of points of view that express, with intense emotionality, constant dynamic spatial interactions. in a constant obsession with the complex systems of reality in search of movement, of the machine, in a period marked by wars and technological progress, Marinetti's manifesto is conceived as an open system, a hypertext far from equilibrium. The Futurist universe is understood in theoretical logic as an aesthetic system exemplifying a point of rupture with the dynamic model.

"Dynamism!" was the catchword for the entire movement: through it was expressed the will to invervent politically, scientifically and aesthetically in an emerging order of space-time that was already revolutionizing the social environment. the social environment. (Kwinter 2002). The necessity of the contemporary scene does not seem to be far removed from Marinetti's movement and Umberto Boccioni's series of three paintings *Stati d'Animo*.

What does it mean, then, when something stable and continuous ceases to be so? What does it mean when the unfolding of a dynamical process suddenly shifts into a new mode, when an ensemble of units and forces breaks up to form two or more independent, more highly organized systems? (Kwinter 2002). From these questions emerges the need for a new language and a new model capable of communicating the complexity of reality and its processes.
These are active, dynamic, and moving processes, each of which tends towards multiple states of heterogeneity and richness of interactions (Corner 2020). Within this discourse, the methodological approach chosen excludes the principle of staticity, in favor of a dynamic model capable of making new spatial forms and conditions visible. The model brings with it methodological figures defined within the processes of which ecology, architecture and science speak. Starting from the concept of field introduced by Stan Allen, in the attempt of opening in architecture to address the dynamics of use, behaviour of crowds and the complex geometries of masses in motion (Allen 1997), the following concepts are introduced:

- the figures of the gradient, as an element of the relation between two or more parts, replacing the defined concept of scale/vector, working on it as a point of discontinuity;

- the concept of pattern, as a surface in constant movement in space and time, an organizational structure of nature, in a generative, non-linear, multiplying field condition;

- by treating the space of the border as a place of intermezzo in its dynamic dimension, the concept of externality is inserted, intended as the parts that interact on the territory considered;

The concept of dynamism carries over to the ongoing investigation of how maps can address the concept of time. The incorporation of the temporal dimension in the representation of contemporary space has generated one of the most active and innovative fronts in the research and practice of cartography, especially when the interest in recognizing the changing nature of reality is combined with the ability to acquire and manage data (computation, modelling and simulation; conceptualization, representation and visualization) provided by new digital technologies.
The complexity and dynamism of phenomena are irreducible to maps' static two-dimensionality. (Paez 2019)

Although at first it might seem that mapping tends to capture a particular moment, very often it is able to incorporate time-related parameters in a precise and accurate manner. Time appears in the map through aspects associated with the idea of transfromation, understood as a change from one state of reality to another, from the concept of evolution to that of metamorphosis.
Movement in the new model therefore appears at new scales and different speeds implying different rhythms directly related to the intrinsic characteristics of the territory. Using mapping operations at the level of coding and semiology graphics (line values, colors), the maps are able to visualize movement and, therefore, allow to work in dynamic terms.

01

gradient

A gradient is an element of a relationship, a relationship between two parts that can be homogeneous and inhomogeneous. It implies the relationship between the parts considered.

In this sense, the concept of gradient becomes a methodological figure for the design approach. It is spatialized and applied on the border, an element that by nature and definition represents the place of intermezzo, discontinuity, and conflict between two or more parts.

Within the dynamic model, introducing the gradient means generating a movement between opposite poles.

Precisely because of the definitions generated by the physical and mathematical sciences, the gradient drags variations, tensions, and continuously variable ratios of pressures, stresses, elasticities into the dynamic model.

02.

scale/vector

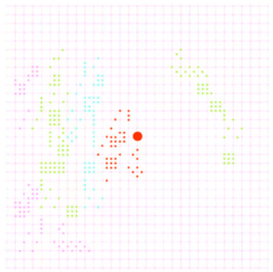
The notion is linked to that of a reference system, as its definition requires specifying an origin, a unit of measurement and a positive direction of travel. In fact, it is closely related to that of vector, an entity characterised not only by an intensity (or modulus), i.e. a numerical or scalar value, but also by a direction or direction. Scale represents the spatial or temporal dimension of a phenomenon and in Landscape Ecology, scale refers to grain size and extent.

Grain is the smallest spatial or temporal unit in a data set, within which homogeneity is assumed, while extent is the total spatial area or temporal duration of a study.
Scale and vector are replaced by that of the gradient, in favour of a methodological figure with intrinsic characteristics of movement, dynamism, and opacity.

-taxonomy of movement-

03.

pattern



Patterns represent organizational structures of nature.
Patterns are surfaces.
"Without bold, regular patterns in nature, ecologists do not have anything very interesting to explain. Patterns can exist at various scales in time and space, ranging from population abundances, through communities, ecosystems, biomes and the entire biosphere (Lawton 1996).
MacArthur in 1972, in his introduction to Geographical Ecology wrote that doing science means search for repeated patterns.
The pattern is inserted as an internal characteristic of the field condition.
In the transition from object to field, Stan Allen introduces into the architectural and urban design scenario the use of dynamic systems, aggregations and complex geometries generated by moving bodies.
The pattern generates the elimination of the concept of the defined figure, the object in question, generating a new non-figurative background.

04.

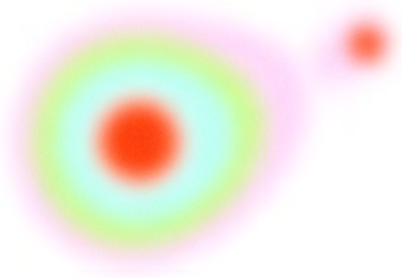
figure

The concept of figure takes on different meanings in the sciences and disciplines that are useful within the methodology.
By definition, in geometry, a figure is represented by points, lines and surfaces that, aggregated in space, generate a well-defined whole.
In the theory of perception, regulated by the figure/background dynamic, the perceptual content grasped as a unit of attention and detached from a more or less undifferentiated background.
The background is what the figure is in relation to so as to emerge; it's the sensory activity condition that enables the figure to dominate, whereas the 'organized', figure is that the unit of measuring perception.
In this sense the figure serves to make a fundamental shift to the concept of pattern, thus in favor of eliminating the figure/background relationship introducing a background/background relationship.
Figure is emergency, a moment of temorary intensity (Cattaneo 2015)

05

externality

The concept of externality refers to all the parts that actively interact with the border of the territory, or more generically represents that methodological figure of the gradient-driven moving model, whereby external entities interact on a specific space or process, opacifying the boundaries and generating disturbances.
An example contextualized in the current ecological and climate crisis is represented by the Hyperobjects, viscous entities that have a spatial and temporal extension beyond human comprehension, but that nevertheless and attach themselves to individuals and places.
This figure allows in the contemporary world to make the transition from a static model, made up of sharp edges, to a fluid dynamic one.



06

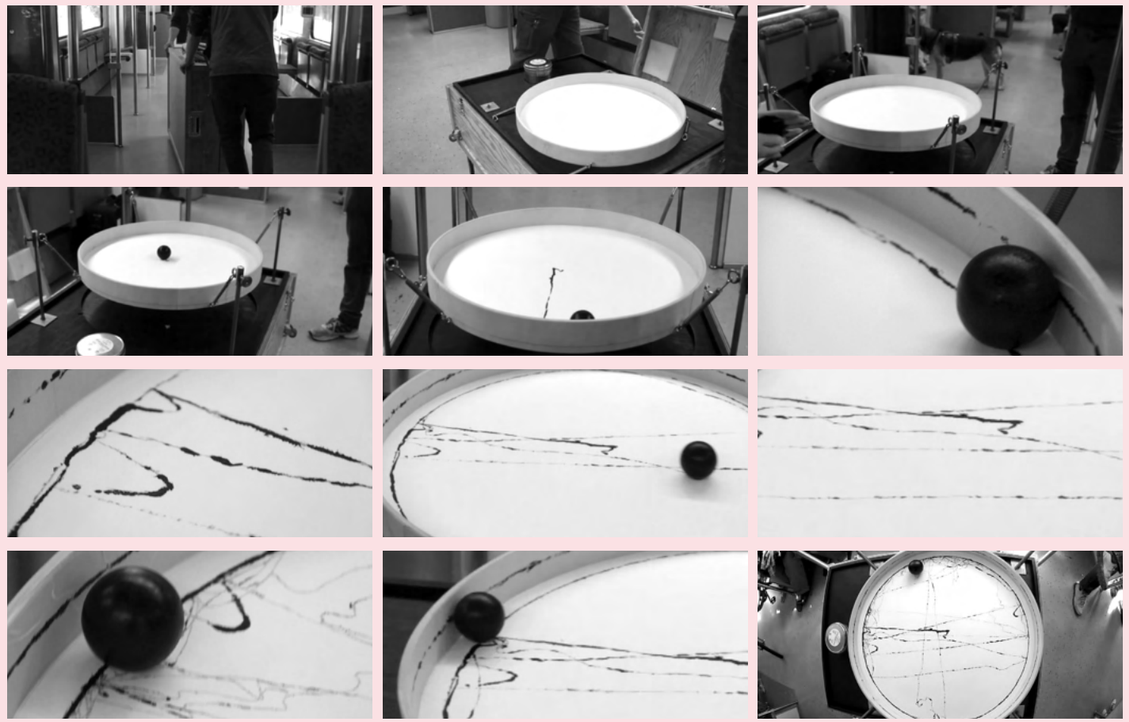
internality

On the border, the figure of internality relates to that of externality when the methodological approach excludes the principle of statics. If we consider the border as a place of intermezzo, discontinuity and conflict in which relations between the parts are generated, the relationship between inside and outside, typical of the figure of the limit, comes into play. The word limit derives from limes, a static barrier, boundary line and separation device that places concepts of interior and exterior in a dichotomous relationship. In this sense, in the transition to a dynamic model, where the border is read as a gradient, the interiority, represented by the architectural fence, the static human and geopolitical construction, is questioned in order to generate new dynamic forms.

Connect cross country with a line
SOE.TV

SOE.TV is a platform for moving images by Studio Olafur Eliasson, Berlin. The site offers glimpses into the experiment-based, research-driven work at the studio and the activities of SOE Kitchen, as well as documentation of Eliasson's artworks, architectural projects, and exhibitions.

https://www.soe.tv/about#connecting-cross-country-with-a-line-a-film-for-station-to-station



“A film for ‘Station to Station’, filmed on the S25 urban railway, Berlin, 2013. ‘Station to Station’ is a living project exploring modern creativity. The project first crossed North America by train, from the Atlantic to the Pacific, over 23 days in September 2013. Over the course of the journey, a constantly changing group of creative contributors joined and took part in ten events in major cities and off-the-grid locations. What began as a train journey has evolved into a platform for non-commercial creativity and cross-collaboration between different mediums”.

-art and science-

a film for 'station to station'

1.4.2

New calligraphies

The research places itself within the contemporary debate between art and science, standing at their fracture point, using drawings as experimental tools to generate new performative calligraphy and new languages.
In this sense, drawing itself becomes an object of scientific investigation and visual communication, which, through the support of scientific tools, such as GIS and computational design software, allows to show new perspectives and new forms of landscape and territory.

Calligraphy mostly shows letters and signs. These signs are used to compose a language, a new cartographic language that, inheriting the history of Western cartography, reworks the common imaginary through an transdisciplinary approach at the intersection of art and science.

The modern cartographic representation of reality is based on the construction of the Cartesian plane and on the principle that Earth is fragmented into equal and infinitely subdividable parts, with the premise that space, and consequently reality itself, is absolute, precise, and rationally explainable. Modernity is defined for this reason by Heidegger as "the age of the world picture", thus reducing the world to an image, in this case to a map. Furthermore, the graphics of cartography and cybernetics is considered from the 60's very modernist, strict, not able to show reality in a proper way. The result is confusion between the cartographic image of reality and reality itself (Farinelli 2003)

"Our limited senses do not allow us to grasp the world in a single glance, and this is why cartographic representation is necessary" (Stracuzzi 2019).
The contemporary representation of nature, of the world, built around complex systems and processes (social, fluid-dynamic, etc.), generates a problem of communication, especially in the light of the theme of Hyperobjects, space and time. In this direction, we abandon modernist thought and representation, which is no longer effective for contemporary dynamics, and introduce new performative calligraphies, understood as new languages and representative methods generating aesthetic forms.

This need to search for a new language has always been part of the practice of architecture and the discipline of landscape, manifesting itself in a more marked way in the contemporary context, in which we observe a constant push towards technological progress and sophistication in representation.

The complexity of the systems that constitute the world generate the constant need to produce new narratives and speculative visualizations of the reality that surrounds us, including all the aspects that characterize it. In this sense, the search for a new cartographic language aims to generate new possibilities for reading and experiencing the world.

Within the contemporary discourse, new technologies and visual arts have evolved in search of new methods of expression by crossing interdisciplinary boundaries with the consequence that we no longer consider creativity and scientific data as two distinct issues. In this way, the architect/designer makes it possible to contribute to the construction of critical knowledge, using aesthetic tools as a means to address new contemporary issues, in this case ecological ones. As part of the project resulting from this research, an aesthetic scientific approach will be realized, linking information and data about boundaries with the aesthetics of maps and new languages.
The new language investigates the boundary that takes on a new dimension, generating the need for a physical, visual, graphic manifestation that can be perceived by humans. It aims to represent movement in space and time, considering reality fluid, dynamic and unstable.

The question of disturbance and its possibility of leaving traces on the territory allows us to look at the landscape and urban places in an "entropic and ecological way, using the instability of ecology and entropy as the foundation of the project" (Cattaneo 2015) . The research places itself in the condition of codifying methods of representation able to deal with the urgent themes of the contemporary from the social/technological to the natural/ecological. The border therefore becomes a place where to experiment new calligraphies, new drawings and new geographies. Its unstable and disturbed condition favors this kind of experimentation, exploring new methodologies of landscape representation at different scales. The discipline of landscape, and in particular that of Landscape Ecology are then used as tools to include the complex nature of hyperobjects, new calligraphies want to build a new multidimensional vision that can understand the complex nature of these elements (Morton 2013).
How can we use hyperobject, manipulate it, and create new forms of space?
In relation to Andrea Branzi's interest in parametric and indexical representation of the city, what are the parameters for creating the new forms of space? Could the availability of data and the new technologies of the contemporary make it possible to shape hyperobjects in space?

Terraforma
Studio SOC

"Terra Forma raconte l'exploration d'une terre inconnue : la nôtre.
A six-handed experimental work, Terra Forma is the result of a collaboration between two architects whose practice lies at the crossroads of landscape and territorial strategy, Alexandra Arènes and Axelle Grégoire, and a scie[illegible] Frédérique Aït-Touati".

Alexandra Arenes is a graduate architect from ENSA of Grenoble. She has worked for several years on territorial projects at *Baseland*, a landscape and landscape and urban planning agency. She then pursued a post-master's degree at Sciences po in political arts (SPEAP). She is pursuing this research through an investigation in the *Critical Zone* since 2016 in collaboration with Bruno Latour. She is involved in collaborative projects between arts and politics.

Axelle Gregoire is an architect and a graduate of ENSA of Versailles. After having been a project manager in the urban planning and large territories of the *Baseland agency*, she is currently working on experimental research projects between artistic works and positions on the city. and positions in the city.

Axelle and Alexandra collaborate regularly within *SOC - Societe d'objets d'art et de la culture* co-founded in 2016 with Soheil Hajmirbaba. This research group conducts surveys, workshops, and from this produces cartographic tools to test new public configurations

http://s-o-c.fr/index.php/object/terraforma/

-conversation-

BORDO CLIMA

. Why the Terra Forma approach, in describing new potential cartography, is a useful tool for architectural design in contemporary practice?

A. Architecture has always invented new tools to describe better the existing world or the projects which are by definition not yet in the world. Architecture is a speculative discipline, shaping realities which are not happened yet, so it needs to imagine tools and images to render spaces and materialities. Each period has its own challenge (see Renaissance, Modernity). Today I think the Anthropocene challenges the shaping of our environments that are changing at rapid pace. We need to follow this pace with our drawing tools, as architects, to adapt to this new reality and shaping projects according to it too. The maps in Terra Forma are designed to adapt the changing state of our environments and suggest giving the central stage to the living beings or phenomena that are actually shaping spaces. We are not alone, humans, to shape the world! So the maps that describe only the space made for humans are not enough. We don't want to replace the traditional maps but instead to add more maps, more layers, with various structure and aiming at showing other things of environment that exist. The aim of terra forma is thus to deploy a multiplicity of viewpoints because we live in a plural world. And don't forget that depending on the lens we look at the world, we take different actions. So the nature of the viewpoints are actually very important.

. The aesthetic form of this new cartographic language can be considered fragile. Do you think that, as a result of the intersection of art, theory and scientific methods, this approach can actually be seen as a strength of a project?

A. Some critics we had is that the maps appear very subjective. However, I would question this kind of subjective/objective dichotomy. Maps become "objectives" when the referential are shared by several people using it. What we did in terra forma is explaining how we changed some mapping referential – the north becoming the soil for example – so that the "procedure" to draw the maps is made explicit. This procedure, which is a scientific requirement, is very important for us, more than the final maps or aesthetic resulting from, let's say, our drawing skills. So the most important parts of the book is what we called "the manual" where we exposed the different steps of the making of the model – the new referential – which then can be applied to a territory to draw its maps. Scientific procedures are thus very robust because as it is explained step by step, you can follow then and check them, or come back if there is an error or a doubt. It is the same with the maps, but it is kind of "hidden" because we don't really question it in the traditional maps we use now (google for example). Terra forma questions it and thus can give this impression of "bricolage" as the doubts or the fragility of the drawings (because it is not 'universal') are made visible.

. The need to represent the intangibility of the climate crisis is growing. How do you think, as architects, we should approach this demand?

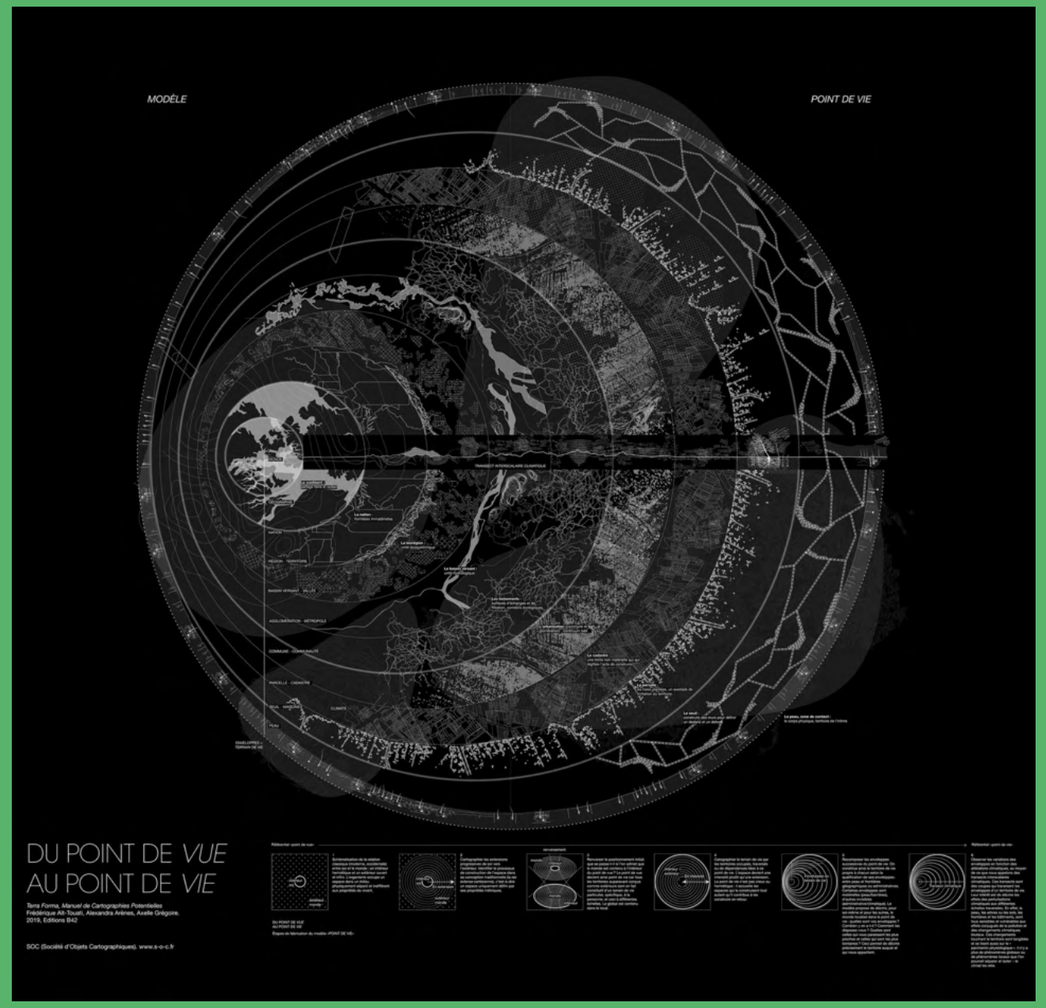
A. I don't know if the climate crisis is intangible: see the flooding, the fires, the heat in the summer, the snow melting, the soil pollution, these events are very concrete. But I understand the question: it is intangible because we can't represent them with the mapping referential we had until now. We used to draw roads, forest, surface of soils in the maps, things until now stable and material. But how now to visualize these events that transform a territory in a very short period of time? I don't have a recipe to deal with it but as architects we can proceed by test, trial and errors, as in a project, to design a suitable manner to render these events. Again, I think there is not one way, and it could be dangerous to say so, but the more there are experiences, documented and explained (as in scientific procedures), the better it can talk to various people to make them sensitive to the crisis.

. What does it mean in your opinion to place ourselves with the project in spaces which are opaque conflictual and unresolved?

A. I think that this is always the case in urban or public projects, only the degrees of conflict vary. Of course it is not the same to design in a war zone or in a small peaceful village, but we can be amazed at which degree of conflict there is, even in rural territories. For example, we worked with Bruno Latour at drawing maps for in rural = conflict about the types of agriculture, the water as a resource, the kind of alimentation, the use of the cars, etc. The territory we live from and the one we live in are not the same: we use for our needs other territories which sustain our daily way of life (see smartphone, coffee for example): if you can see it on a map, you can finally understand the extend and the imbrication, the complexity of your territory. But it needs a drawing exploration, with the possibility that it could not work. I think this point has to be said when positioning ourselves in these unresolved spaces: we don't resolve with project: we raise questions, points out things.

. Do you think there is a need for a new method and a new language to read and represent space?

Yes, but first we need to know in which space we are or we were used to represent, and towards which space we tend to be now too. I will refer here to BLatour and his reading of scientific revolution around Gaia with Lovelock and Margulis. Before, the space was a cartesian one, that is a measurable one with units: a stable, empty space ready to be filled by us, humans. Gaia hypothesis states that the space is already full of organisms which adapt it to be able to live within it, triggering chemical reactions on their own. Let's say, they don't adapt to an environment pre existing but they adapt the environment to their need. This is a radical change of perspective. I worked on it in my thesis: how does it change the way we understand landscapes and represent them?



http://s-o-c.fr/index.php/object/terraforma/

-manuel cartographies potentielles-

"Five centuries after the Renaissance travellers set out to map the terra incognita of the New World, this book proposes to rediscover in a different way the Earth that we think we know so well. By redefining, or rather extending, the traditional cartographic vocabulary, it offers a manifesto for the foundation of a new geographical and, in so doing, political imaginary. If some of the phenomena we are witnessing (soil erosion, resource depletion, acceleration of urban space-time, intensification of polluted areas) escape us by their scale, duration, and scope, it is through the development of our techniques of representation that we can hope to better understand them. By putting into 'maps' certain propositions of the Earth System sciences and contemporary ecological thought, Terra Forma allows us to better grasp their political significance ".

"Les sept chapitres de ce livre sont des points de vue sur la réalité, de possibles visions du monde esquissées par différents prismes, comme autant d'instruments optiques".

Learning to See Data
The New York Times

"Advanced computing produces waves of abstract digital data that in many cases defy interpretation; there's no way to discern a meaningful pattern in any intuitive way. To extract some order from this chaos, analysts need to continually reimagine the ways in which they represent their data. How to train human intuition to perceive patterns in the digital universe?"

" So it is in many fields, whether predicting climate, flagging potential terrorists or making economic forecasts. The information is all there, great expanding mountain ranges of it. What's lacking is the tracker's instinct for picking up a trail, the human gut feeling for where to start looking to find patterns and meaning.
Can such creative instincts really be trained systematically?
What if the data were turned sideways?
Or upside down?
Or what if you could click on a point on the plotted data and see another dimension?"

https://www.nytimes.com/2015/03/29/sunday-review/learning-to-see-data.html

-art and science-

BORDO CLIMA

IDEAS | OPINION | NEWS ANALYSIS

SundayReview
The New York Times

SUNDAY, MARCH 29, 2015

Learning to See Data

How to train human intuition to perceive patterns in the digital universe.

NEWS ANALYSIS
BY BENEDICT CAREY
A science reporter for The New York Times and the author of "How We Learn: The Surprising Truth About When, Where, and Why It Happens."

FOR the past year or so genetic scientists at the Albert Einstein College of Medicine in New York have been collaborating with a specialist from another universe: Daniel Kohn, a Brooklyn-based painter and conceptual artist.

Mr. Kohn has no training in computers or genetics, and he's not there to conduct art therapy classes. His role is to help the scientists with a signature 21st-century problem: Big Data overload.

Advanced computing produces waves of abstract digital data that in many cases defy interpretation; there's no way to discern a meaningful pattern in any intuitive way. To extract some order from this chaos, analysts need to continually reimagine the ways in which they represent their data — which is where Mr. Kohn comes in. He spent 10 years working with scientists and knows how to pose useful questions. He might ask, for instance, What if the data were turned sideways? Or upside down? Or what if you could click on a point on the plotted data and see another dimension?

"A lot of the value of his input is jolting us out of our comfort zone, and making us aware that we can and should be thinking about the representation of data in new ways," said John Greally, director of Einstein's Center for Epigenomics, who brought on Mr. Kohn.

"The problem today is that biological data are often abstracted into the digital domain," Dr. Greally added, "and we need some way to capture the gestalt, to develop an instinct for what's important."

And so it is in many fields, whether predicting climate, flagging potential terrorists or making economic forecasts. The

Continued on Page 4

Why Reconstruction Matters

The post-Civil War era dealt with many of the same issues we grapple with today.

OPINION
BY ERIC FONER
A professor of history at Columbia University and the author of "Reconstruction: America's Unfinished Revolution" and "A Short History of Reconstruction."

THE surrender of Confederate Gen. Robert E. Lee at Appomattox Court House, 150 years ago next month, effectively ended the Civil War. Preoccupied with the challenges of our own time, Americans will probably devote little attention to the sesquicentennial of Reconstruction, the turbulent era that followed the conflict. This is unfortunate, for if any historical period deserves the label "relevant," it is Reconstruction.

Issues that agitate American politics today — access to citizenship and voting rights, the relative powers of the national and state governments, the relationship between political and economic democracy, the proper response to terrorism — all of these are Reconstruction questions. But that era has long been misunderstood.

Reconstruction refers to the period, generally dated from 1865 to 1877, during which the nation's laws and Constitution were rewritten to guarantee the basic rights of the former slaves, and biracial governments came to power throughout the defeated Confederacy. For decades, these years were widely seen as the nadir in the saga of American democracy. According to this view, Radical Republicans in Congress, bent on punishing defeated Confederates, established corrupt Southern governments presided over by carpetbaggers (unscrupulous Northern-

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ABSTRACT

Bordoclima indaga il tema del bordo in movimento costruendo possibili metodi e scenari progettuali nel "Nuovo Regime Climatico" (Bruno Latour, Down to Earth: Politics in the New Climatic Regime, 2017). I confini geopolitici vengono considerati luoghi paradigmatici del rapporto tra i nuovi processi ecologici dinamici e transcalari e quelli architettonici usualmente definiti da tracce e segni statici sul territorio. In una condizione di sospensione segnata dall'incertezza dell'attuale crisi climatica planetaria, il bordo "rigido" dello spazio architettonico entra in conflitto con quello in movimento dell'ecologia, richiedendo la necessità di un nuovo modello metodologico e progettuale. La struttura del lavoro, sia a livello metodologico che narrativo, si articola in quattro macro parti: 1. Rizoma: la piattaforma teorica su cui il metodo si struttura risulta essere non gerarchica, eterogenea, verticalizzata e in continuo cambiamento di scala dal generale al particolare. Gli strumenti e i metodi della Landscape Ecology vengono utilizzati e sperimentati nella ricerca, considerando l'esito di un progetto ecologico uno scenario probabilistico e non deterministico. 2. Bordoclima: dopo un'analisi comparativa a scala globale tra le diverse figure del conflitto sui bordi, la ricerca intende testare il rapporto tra instabilità e stabilità, tra processi ecologici e architettonici, attraverso un modello alternativo operativo, dialogico, dinamico che prevede l'uso di un nuovo linguaggio "calligrafico" capace di generare nuove forme estetiche e performative del paesaggio. 3. On fluids: il bordo rifiuta la logica statica e lineare, includendo nel suo dominio di sovranità, elementi al di fuori del campo visibile geopolitico, prediligendo la tassonomia caratteristica del modello fluido e in movimento. I confini dell'area dei Balcani diventano così territorio di sperimentazione, dove l'interferenza e il disturbo assumono la forma di ologrammi del conflitto. Gli strumenti utilizzati per mappare e simulare i sistemi complessi e conflittuali caratteristici del bordo, si basano su software complessi e data analysis, come strumenti critici in grado di monitorare fenomeni globali e locali. 4. Far from equilibrium: nell'Età dell'Asimmetria (Timothy Morton, Hyperobjects. Philosophy and Ecology after the End of the World, 2018), umani e non umani diventano attori in un progetto che intende l'Ecologia come scienza delle possibilità e non come disciplina in grado di definire esiti spaziali definitivi. Tramite un processo abduttivo vengono individuati sull'instabilità del confine tra Croazia e Bosnia ed Erzegovina, tre punti di discontinuità. Luoghi emblematici per la sperimentazione di una mappatura sincronica del conflitto, in grado di generare un "setaccio" utile alla creazione di uno scenario probabilistico di mutazione del bordo. Bordoclima è costruito come un ipertesto, un'opera aperta, un istante in cui si osserva una rottura della linearità dei processi e dei linguaggi verso l'emergere di nuove calligrafie. In questa logica, è stata sviluppata una struttura non lineare della trama, che verticalizza contenuti e metodologie. Bordoclima è un primo passo di un progetto teorico, che vede nel rapporto tra scienza (geodata analysis e strumenti computazionali) e arte (nuove figure estetiche), un possibile scenario per il progetto della contemporaneità.

SOSPENSIONE APERTA

Bordoclima è un laboratorio di sperimentazione e di sbriciolamento delle convenzioni.
La ricerca è volutamente costruita senza seguire una logica tradizionale classica in cui il tentativo è quello di frantumare i codici e le ragioni depositate nel tempo per porre nuove questioni secondo una tassonomia verticalizzata di continue discontinuità. Il tentativo è quello di lavorare per rotture epistemologiche e continue rotazioni rispetto a un punto di novità, utilizzando la forza del pensiero estetico in cui la forma diventa un modo per ricondurre gli oggetti separati del pensiero tecnico ad una unità. La sperimentazione si nutre di inneschi che hanno a che fare con l'ordine estetico, macchine che tramite la manipoazione delle forme visualizzano dati e mappe. In questo senso il processo, tipico della contemporaneità, non risulta consequenziale e sistemico si costruisce per punti di criticità e rottura. La volontà di lavorare per criticità si riflette anche negli obiettivi della ricerca, sia a livello metodologico che progettuale: infatti la apertura delle questioni, risulterà sospesa in un'apparente chiusura.

TI CON ZERO

L'istante iniziale di osservazione di un fenomeno. È l'unità minima decisiva per comporre e comprendere la sequenza con con cui si struttura la trama formale della narrazione. In relazione all'approccio contemporaneo e transdisciplinare, è stata sviluppata una struttura non lineare della trama, che integra verticalmente contenuti e metodologie. Bordoclima è un ipertesto. Un'opera aperta, un istante in cui si osserva una rottura della linearità del linguaggio e l'emergere di nuove calligrafie. In questo senso è composto da note tecniche e scientifiche, esplicative di un metodo, e note di una tassonomia specifica del linguaggio utilizzato. Bordoclima è un progetto teorico. Si basa su un'infrastruttura consolidata nella disciplina del paesaggio e dell'architettura, ma introduce anche la possibilità di contaminazione con altre discipline. tra arte e scienza.
La narrazione è ulteriormente suddivisa in apparati teorici e inserti di conversazione, arte e scienza che estendono i confini della professione.

0. DECLARATION OF INTENTS

Questa ricerca dichiara la volontà di sperimentare un nuovo metodo e una nuova calligrafia sul tema del confine in movimento, trattato nella sua consistenza geopolitica, in un contesto contemporaneo. Questo processo è supportato dagli strumenti e dai metodi dell'Ecologia del Paesaggio. Questa disciplina è nata non per ragioni culturali ed estetiche ma per la nascita stessa di un problema e la necessità di affrontarlo con un metodo alternativo che sia operativo, dialogico, dinamico, che preveda l'uso di un nuovo linguaggio capace di generare le nuove forme estetiche del paesaggio. Si è deciso di territorializzare l'impianto teorico e quindi di sperimentare operativamente il metodo sul confine, con un progetto probabilistico che si affida all'ecologia sperimentale come scienza delle possibilità. I disegni svolgono il ruolo di Ipertesti, una macchina che moltiplica le narrazioni caratterizzata dall'essere un lavoro aperto in relazione allo spazio e al tempo. La domanda di indagine è come possiamo lavorare come architetti con un approccio multidisciplinare su luoghi di conflitto politico ed ecologico con una logica non risolutiva, con lo scopo di ridefinire nuovi percorsi per questa pratica.

1. RIZOMA

1.1 PROBLEMATIC NUCLEUS

1.1.1 QUESTIONING THE CONFLICT

Il nucleo problematico a cui si riferisce la ricerca riguarda il costante conflitto tra il rigido confine architettonico e il confine ecologico, inserito nel mondo contemporaneo, in una condizione di sospensione spazio-temporale segnata dall'incertezza e dalla crisi climatica.
La caratteristica rigidità del confine architettonico, rappresentato dalla recinzione, dal perimetro, contrasta con l'instabilità e il dinamismo delle questioni ecologiche. I due elementi appaiono in costante conflitto non solo dal punto di vista spaziale ma anche della dimensione temporale. Per questo si è deciso di lavorare sul confine, come punto emblematico di fragilità, conflitto e discontinuità. Il tempo ecologico è caratterizzato da un'unità di misura diversa da quella dell'architettura: un elemento rigido come una recinzione, un muro, un confine amministrativo tracciato su una mappa, deriva da decisioni umane prese in un preciso istante dello spazio-tempo. Per questo motivo il nucleo problematico della ricerca è quello di indagare il disturbo e l'interferenza generati da questo spostamento spazio-temporale, nel tentativo di rappresentarlo.
L'approccio utilizzato è quello di lavorare sul conflitto in modo non risolutivo, di sperimentare i metodi e gli strumenti della disciplina probabilistica dell'Ecologia del Paesaggio in un determinato quadro spazio-temporale, in cui i disturbi e le interferenze vengono individuati e riproposti in forma di calligrafie performative, dove la sovrapposizione tra umano e non umano diventa generatrice di nuove forme.
Collocarsi nel contesto contemporaneo significa spingere la ricerca verso ulteriori questioni e interrogativi inerenti alla questione ecologica: il passaggio dell'ecologia da scienza naturale a lente proiettiva generatrice di forme nella pratica del progetto, rimane la fonte di una certa confusione e di limiti nella comunicazione nell'incrocio delle discipline dell'architettura del paesaggio, del design urbano e della pianificazione urbana (Waldheim 2000). Negli ultimi anni, abbiamo visto una rinascita del pensiero e delle idee ecologiche nelle discussioni sull'urbanistica, la società, la cultura e il design. Nella scienza, il campo dell'ecologia si è spostato dal determinismo classico e da un riduzionismo newtoniano con stabilità, certezza e ordine a favore di una comprensione più contemporanea del cambiamento sistemico dinamico e dei fenomeni correlati di adattabilità e flessibilità. Questo pone l'architettura del paesaggio in uno spazio disciplinare e pratico unico, ugualmente informato dalla conoscenza ecologica come scienza applicata, come strumento di gestione del cambiamento. Tuttavia, l'ecologia non è semplicemente un progetto delle scienze naturali. Molti ricercatori e teorici hanno usato l'ecologia come idea generale o metafora per una serie di condizioni e relazioni con implicazioni sociali e politiche - o addirittura hanno ridefinito il termine ecologia per includere questi campi in un contesto più ampio. Félix Guattari, in Le tre ecologie, ha sostenuto che l'ecologia riguarda tanto il potere sociale ed economico, la demografia, le lotte e gli impegni politici quanto le forze ambientali. Una concisa manifestazione di un approccio olistico e relazionale per comprendere le questioni ecologiche. Secondo lui, il modo più appropriato per affrontare la crisi ecologica è quello di occuparsi della scala globale "a condizione che porti un'autentica rivoluzione politica, sociale e culturale, rimodellando gli obiettivi della produzione di beni sia materiali che immateriali" (Mostafavi 2009). Il concetto contemporaneo di ecologia viene quindi trascinato nel metodo sperimentale di ricerca dove le teorie sono aperte, "lontano da una strategia modernista" (Allen 1997). Tempo e spazio diventano indivisibili, asimmetrici e dinamici, per cui non si può separare il campo dall'oggetto in divenire. Lo spazio del conflitto, come definito dalla ricerca di Ilia Prigogine, può essere definito come lo spazio di possibilità, lo spazio in cui il maggior numero di elementi si ibrida e può assumere forme diverse e configurazioni alternative. Il margine è lo spazio del non equilibrio e della non linearità dei processi. Include il caos nella sua dimensione di massimo ordine e massimo disordine. Le leggi politiche sono impotenti di fronte all'instabilità della costruzione spaziale del margine. Un sistema complesso costruito su scenari probabilistici. La ricerca si muove quindi in questa direzione: lo scenario più interessante per il progetto diventa quello di nuove interferenze e nuove problematizzazioni, dove le specificità consolidate diventano instabili e in movimento e si proiettano verso un tempo relativo in cui si possono determinare nuove possibili trasformazioni. Lo spazio diventa dinamico. Ci sono nuove condizioni epistemologiche, nuovi quadri formali e transdisciplinari. I processi dinamici sono parte della città, in costante evoluzione come processi ecologici che cambiano i suoi strumenti, metodi e scala (Allen 1997). In relazione a questa sovrapposizione di questioni umane e non umane, caratteristica del pensiero ecologico, la ricerca si concentra sui confini come luoghi in cui il conflitto tra le due parti è aperto. Lo spazio progettuale è definito da forze, o intensità di relazioni tra campi e conflitti. Queste forze interagiscono in modo attivo per specificare lo spazio del progetto.

1.2 THEORETICAL STRUCTURE

1.2.1 GENEALOGY OF TERMS

L'ambito teorico su cui si basa la ricerca fa riferimento a due discipline, l'architettura e l'ecologia del paesaggio. Considerando la necessità di inserirsi nel contesto contemporaneo, la teoria prende forma attraverso la costruzione di una struttura composta da due centri fondamentali, Stuart Elden con The Instability of Terrain riguardante il concetto di confine, e Down to Earth. Politics in the New Climatic Regime di Bruno Latour sul clima, dividendo così la sfera in due emisferi tematici. Gli autori secondari ruotano intorno a questi due su meridiani specifici e paralleli che toccano la ricerca con diverse discipline e teorie, portando al suo interno approcci, principi e metodi. La struttura mira a verticalizzare e connettere concetti apparentemente distanti, come arte e scienza, natura e uomo, ma che in realtà sono costantemente messi in stretta relazione, discussione e conflitto nel discorso attuale. La sperimentazione calligrafica e progettuale al limite in New Climate Regime di Latour è trattata da un punto di vista conflittuale e dinamico, che si evolve attraversando le discipline.
Innanzitutto attraverso il supporto delle teorie e dei metodi della Landscape Ecology, tra cui Stan Allen, James Corner e Gyorgy Kepes, che sono stati i primi a sperimentare nuove forme estetiche del paesaggio, nel passaggio dal concetto di oggetto a quello di campo, sullo sviluppo di nuove immagini e tecniche di concettualizzazione e nel continuo cambiamento di scala dal macro al micro. Il progetto teorico vede la manipolazione di un paesaggio epigenetico basato sulle teorie di Sanford Kwinter, supportato da sistemi computazionali contemporanei basati su matrici, algoritmi e dati, alla base degli studi di Forman in Network e Matrix. L'instabilità e il conflitto su cui si basa la ricerca sono dati dall'attuale situazione geopolitica e climatica, dove si rivela l'iperoggetto di Timothy Morton. Caratteristica del metodo e della piattaforma teorica è la struttura rizomatica che ne risulterà: non gerarchica, eterogenea e non centrata, in un continuo cambio di scala dal generale al particolare.

1.2.2 GLOSSARY

Il glossario è formulato secondo schede tassonomiche che fanno riferimento a un vocabolario diverso di autori che si interrogano costantemente all'interno della ricerca.
Lo scopo è quello di chiarire al lettore in una fase iniziale la terminologia ricorrente nel discorso e nel ragionamento.
La volontà di catalogare i termini deriva dalla necessità di rendere trasparenti concetti complessi che sono tratti da discipline tangenziali alla pratica architettonica.

> Zona critica
> Iperoggetto
> Ipertesto
> Matrice
> Modello
> Nuovo regime climatico

1.3 ARCHITECTS AFTER ARCHITECTURE

1.3.1 THE CONCEPT OF CONTEMPORANEITY

Nell'epoca contemporanea, nel contesto della conoscenza umana, umani e non-umani si interfacciano in un confronto paritario, definendo così l'Età delle Asimmetrie (Morton 2013). Il senso dell'interiorità umana si estende specchiandosi nel non umano che, nello spazio sociale, non è più semplicemente un oggetto di conoscenza (calcolabile e prevedibile) ma diventa un essere a sé di cui gli umani possono percepire solo una parte, una sezione limitata. La spinta alla globalizzazione rende il campo visivo e percettivo molto limitato. Man mano che andiamo avanti, nel Nuovo Regime Climatico, gli umani hanno sempre meno percezione del cambiamento e della crisi ecologica. Colpiti dalla "sindrome della linea di base mobile", gli umani tendono ad attaccarsi e radicarsi al suolo. (Latour 2018). Agire nel contemporaneo come architetti significa essere in grado di spostare l'attenzione critica dall'architettura "come questione di fatto" all'architettura "come questione di interesse" (Latour 2004). "Come questione di interesse", l'azione umana nello spazio entra in una rete molto più ampia di relazioni in cui le conseguenze dell'architettura sono molto più significative dell'oggetto stesso. La pratica dell'architettura è caratterizzata da forti tendenze normalizzanti che si riflettono nella città dell'uniformità indifferente al conflitto, scollegata dal contesto politico ed ecologico. La visione standardizzata della professione associa l'architetto a una pratica statica di limiti e certezze. La cultura architettonica tende a privilegiare gli aspetti associati a proprietà statiche, tecniche e atemporali. Erroneamente, l'architettura come professione si basa sulla necessità che l'architettura (come pratica e prodotto) sia un dominio protetto dell'architetto (Awan 2011). L'architetto contemporaneo deve agire a una nuova scala, dissociandosi dalla figura stereotipata dell'eroe singolare, come quella del genio incompreso concepito da Ayn Rand nel suo romanzo The Fountainhead (1943). Qui, Howard Roark, dietro l'ombra dell'ambizione propositiva, nasconde un'essenza più oscura di individualismo e avidità. L'immagine randiana dell'architetto non include quella di un individuo capace di agire, di muoversi nello scambio tra spazio e persone, e di guardare a possibilità più ampie dello spazio. La nuova figura dell'architetto contemporaneo, capace di ampliare il suo campo visivo, si muove nello Spazio. La definizione di spazio di Labfavre, così come fu scritta nel 1947, deve ora interfacciarsi con fattori che si sono moltiplicati in scala, poiché problemi come il Cambiamento Climatico, la Globalizzazione, caratteristiche dell'era delle Asimmetrie, hanno un rapporto diretto nell'interazione che esiste tra spazio e architetto (Lebfevre 1991). L'esperienza estetica è il modello più forte e solido nonostante il suo posizionamento periferico nella visione contemporanea. Tuttavia, non ha un valore marginale quanto paradigmatico. Infatti, nell'esperienza contemporanea l'estetica ha soprattutto il valore di un paradigma. "È proprio attraverso l'estetica che riconosciamo il modello delle nostre esperienze più ricche, più vive, più genuine in relazione a una realtà i cui contorni sono sfumati" (De Sola Morales 1996). Poiché la scienza si è trasformata in routine, non è affatto inspiegabile che la cultura contemporanea possa voler spostare i suoi interessi verso ragioni prima considerate periferiche. Infine, possiamo dire che la contemporaneità è caratterizzata da nuove lenti ottiche, nuovi regimi climatici, nuovi spazi ed esperienze estetiche. Ma anche nuova materialità, infatti viviamo in tempi liquidi: questo significa che siamo costantemente soggetti ad agire all'interno di reti globali, reti ecologiche e reti virtuali (Baumann 1999).

1.3.2 TRANSDISCIPLINARY INSERTS

La transdisciplinarità introduce la possibilità di lavorare verticalmente su diversi livelli di realtà, che pur appartenendo a specifiche discipline, possono essere contaminati e contaminare le discipline stesse in un processo esogeno. (Cattaneo 2015). Per arrivare ad una transdisciplinarità epistemologica, bisogna considerare le relazioni aperte che esistono tra le discipline, senza farle sparire singolarmente ma ampliandole a tal punto da creare rapporti puliti e interdisciplinari tra di esse. (UNESCO, 1998) L'approccio transdisciplinare è progettato su tre diversi postulati teorizzati da Basarab Nicolesu nel Manifesto della Transdisciplinarietà:
- La diversità dei diversi livelli di realtà, percezione e conoscenza
- La logica del terzo incluso
- Complessità
"Un nuovo principio di Relatività emerge dalla coesistenza di pluralità complessa e unità aperta: nessun livello di Realtà costituisce un luogo privilegiato dal quale tutti gli altri livelli di Realtà possono essere compresi. (Nicolesu 2002)
Nella logica transdisciplinare, i concetti sono sempre in movimento e si addensano e si allungano in tempi diversi a seconda della loro vicinanza in uno spazio e in un tempo specifici.
Il metodo cruciale introdotto dalla disciplina del Landscape Urbanism è proprio questo, caratterizzare questi livelli sperimentali di ibridazione nella pratica della concettualizzazione. Il futuro incerto della pratica architettonica è un elemento fuzzy, un sistema di numeri che incorpora l'ignoto.
Miopi su ciò che accadrà domani, allunghiamo i nostri confini, ridefinendo ciò che è possibile.
Questo è il tempo in cui viviamo. Siamo microscopici e macroscopici all'intersezione di diverse scale. Siamo versatili, ci adattiamo e ci trasformiamo. Sperimentare e usare il design come strumento critico è il percorso che, come architetto, dobbiamo seguire e perseguire. Le sfide contemporanee nella pratica architettonica richiedono ai pensatori creativi e ai designer di ri-considerare il modo in cui interagiamo con i dati che coinvolgono esseri umani e non umani, sia cose che persone. Dalle nostre interazioni sociali a come lavoriamo, non c'è un solo momento in cui non stiamo generando o manipolando dati. Viviamo in un algoritmo complesso, costituito da 1 e 0, che si susseguono ripetutamente in una catena di effetti in cui, come architetti, possiamo collocarci. Ciò che distingue un architetto da altre pratiche è confrontarsi con lo spazio fisico e immaginare nuovi scenari. Per farlo, siamo abilitati a usare strumenti diversi.
Sperimentare con questioni scientifiche e non retoriche usando un approccio spaziale è ciò che l'architetto che sta allargando i propri confini sta cercando di fare. Indagare il mondo attraverso il filtro dell'intangibile, e plasmare questo mondo con nuove lenti è lo scopo dell'architettura dopo l'architettura. Con l'incorporazione delle nuove tecnologie, l'architettura si è evoluta per attraversare i confini disciplinari e di conseguenza creatività e informazione non sono due questioni distinte. (Stracuzzi 2019). La ricerca raccoglie sia una fascinazione per l'arte e la scienza che lascia trascinare concetti e opere teoriche nella pratica del progetto, sia i contributi di diverse persone che durante il loro percorso sono andate oltre la visione convenzionale della pratica per ridefinire che tipo di questioni volevano rispondere.
Alcuni di questi architetti continuano a lavorare in architettura, altri applicano le loro competenze in altre discipline. Mettendo in conversazione queste figure con la ricerca di bordoclima, l'obiettivo è quello di creare una definizione ampia e inclusiva di cosa sia l'architettura e di come essa si collochi all'interno della contemporaneità in modo liquido e versatile.

1.4 LE MODELE EN MOUVEMENT

1.4.1 METHODOLOGICAL FIGURES

La struttura teorica definita nell'ambito disciplinare dell'ecologia, viene testata e formalizzata nel tempo e nello spazio coinvolgendo specifiche figure metodologiche al fine di generare strategie progettuali di best practice in una prospettiva proiettiva, moltiplicando possibilità ed effetti. La materia è fatta di modificazioni, perturbazioni, cambiamenti di tensione e di energia. La complessità e l'eterogeneità dei sistemi che compongono il mondo, e i diversi livelli organizzativi delle forme di vita presenti sul nostro pianeta fanno parte di livelli di complessità ancora superiori, nel tempo e nello spazio, invisibili alla percezione umana. Tra le numerose avanguardie portate nei primi decenni del 900, il movimento futurista, dichiarato sul giornale Le Figaro da Marinetti, fu sicuramente quel movimento artistico culturale più profondamente sensibilizzato al concetto di moltiplicazione dei punti di vista che esprimano, con intensa emozionalità, costanti dinamiche interazioni spaziali. in una costante ossessione per i sistemi complessi della realtà alla ricerca del movimento, della macchina, in un periodo segnato da guerre e progresso tecnologico, il manifesto da Marinetti viene concepito come un sistema aperto, un ipertesto lontano dall'equilibrio. L'universo futurista viene inteso nella logica teorica come sistema estetico esemplificativo di un punto di rottura verso il modello dinamico. "Dinamismo!" fu la parola d'ordine di tutto il movimento: attraverso di essa si esprimeva la volontà di intervenire politicamente, scientificamente ed esteticamente in un ordine emergente dello spazio-tempo che stava già rivoluzionando l'ambiente sociale. l'ambiente sociale. (Kwinter 2002). La necessità della scena contemporanea non sembra essere molto lontana dal movimento di Marinetti e dalla serie di tre dipinti Stati d'Animo di Umberto Boccioni. Cosa significa, allora, quando qualcosa di stabile e continuo cessa di esserlo? Cosa significa quando lo svolgimento di un processo dinamico si sposta improvvisamente in una nuova modalità, quando un insieme di unità e forze si rompe per formare due o più sistemi indipendenti e più altamente organizzati? (Kwinter 2002). Da queste domande emerge la necessità di un nuovo linguaggio e di un nuovo modello capace di comunicare la complessità della realtà e dei suoi processi. Si tratta di processi attivi, dinamici e in movimento, ognuno dei quali tende verso molteplici stati di eterogeneità e ricchezza di interazioni (Corner 2020). All'interno di questo discorso, l'approccio metodologico scelto esclude il principio di staticità, a favore di un modello dinamico capace di rendere visibili nuove forme e condizioni spaziali. Il modello porta con sé figure metodologiche definite all'interno dei processi di cui parlano ecologia, architettura e scienza. Partendo dal concetto di campo introdotto da Stan Allen, nel tentativo di apertura in architettura per affrontare le dinamiche d'uso, il comportamento delle folle e le complesse geometrie di masse in movimento (Allen 1997), vengono introdotti i seguenti concetti
- le figure del gradiente, come elemento della relazione tra due parti, sostituendo il concetto definito di scala/vettore, lavorando su di esso come punto di discontinuità.
- il concetto di pattern, come superficie in costante movimento nello spazio e nel tempo, una struttura organizzativa della natura, in una condizione di campo proiettivo, non lineare e moltiplicatore
- trattando lo spazio del confine come luogo di intermezzo nella sua dimensione dinamica, si inserisce il concetto di esternalità, intesa come le parti che interagiscono sul territorio considerato. Il concetto di dinamismo si ripercuote nella continua ricerca di come le mappe possano affrontare il concetto di tempo. L'incorporazione della dimensione temporale nella rappresentazione dello spazio contemporaneo ha generato uno dei fronti più attivi e innovativi nella ricerca e nella pratica della cartografia, specialmente quando l'interesse a riconoscere la natura mutevole della realtà è unito alla capacità di acquisire e gestire dati (calcolo, modellazione e simulazione; concettualizzazione, rappresentazione e visualizzazione) fornite dalle nuove tecnologie digitali. La complessità e il dinamismo dei fenomeni sono irriducibili alla bidimensionalità statica delle mappe. (Paez 2019) Anche se all'inizio potrebbe sembrare che la mappatura tenda a catturare un momento particolare, molto spesso è in grado di incorporare parametri legati al tempo in maniera precisa e accurata. Il tempo appare nella mappa attraverso aspetti associati all'idea di trasformazione, intesa come un cambiamento da uno stato di realtà a un altro, dal concetto di evoluzione a quello di metamorfosi. Il movimento nel nuovo modello appare così a nuove scale e diverse velocità che implicano ritmi diversi direttamente connessi con le caratteristiche intrinseche del territorio. Utilizzando operazioni di mappatura a livello di codifica grafica e semiologia grafica (valori delle linee, colori), le mappe sono in grado di visualizzare movimento e, quindi, permettono di lavorare in termini dinamici.

1.4.2 NEW CALLIGRAPHIES

La ricerca si colloca all'interno del dibattito contemporaneo tra arte e scienza, ponendosi rispetto ad essa sul loro punto di frattura, utilizzando i disegni come strumenti sperimentali per generare nuove calligrafie performative e nuovi linguaggi. In questo senso, il disegno stesso diventa un oggetto di indagine scientifica e di comunicazione visiva che, attraverso il supporto di strumenti scientifici, come GIS e software di progettazione computazionale, permette di mostrare nuove prospettive e nuove forme di paesaggio e territorio. La calligrafia mostra soprattutto lettere e segni.
Questi segni sono utilizzati per comporre un linguaggio, un nuovo linguaggio cartografico che, ereditando la storia della cartografia occidentale, rielabora l'immaginario comune attraverso un approccio transdisciplinare all'intersezione tra arte e scienza. La moderna rappresentazione cartografica della realtà si basa sulla costruzione del piano cartesiano e sul principio che la Terra è frammentata in parti uguali e infinitamente suddivisibili, con la premessa che lo spazio, e di conseguenza la realtà stessa, sia assoluto, preciso e spiegabile razionalmente. La modernità è definita per questo motivo da Heidegger come "l'età dell'immagine del mondo", riducendo così il mondo a un'immagine, in questo caso a una mappa. Inoltre, la grafica della cartografia è considerata dagli anni '60 modernista, rigida, non in grado di mostrare la realtà in modo adeguato. Il risultato è la confusione tra l'immagine cartografica della realtà e la realtà stessa (Farinelli 2003). "I nostri sensi limitati non ci permettono di cogliere il mondo in un solo sguardo, ed è per questo che la rappresentazione cartografica è necessaria" (Stracuzzi 2019). La rappresentazione contemporanea della natura, del mondo, costruita intorno a sistemi e processi complessi (sociali, fluido-dinamici, etc..), genera un problema di comunicazione, soprattutto alla luce della questione degli Iperoggetti, dello spazio e del tempo. In questa direzione, si abbandona il pensiero e la rappresentazione modernista, non più efficace per le dinamiche contemporanee, e si introducono nuove calligrafie performative, intese come nuovi linguaggi e metodi rappresentativi che generano forme estetiche. Questa necessità di ricerca di un nuovo linguaggio ha sempre fatto parte della pratica dell'architettura e della disciplina del paesaggio, manifestandosi in modo più marcato nel contesto contemporaneo, in cui si osserva una costante spinta verso il progresso tecnologico e la sofisticazione della rappresentazione. La complessità dei sistemi che costituiscono il mondo genera la costante necessità di produrre nuove narrazioni e visualizzazioni speculative della realtà che ci circonda, compresi tutti gli aspetti che la caratterizzano. In questo senso, la ricerca di un nuovo linguaggio cartografico mira a generare nuove possibilità di lettura e di esperienza del mondo. All'interno del discorso contemporaneo le nuove tecnologie e le arti visive si sono evolute alla ricerca di nuovi metodi di espressione attraversando i confini interdisciplinari con la conseguenza che non consideriamo più la creatività e i dati scientifici come due questioni distinte. In questo modo, il progettista / artista rende possibile contribuire alla costruzione della conoscenza critica, utilizzando strumenti estetici come mezzi per affrontare nuove tematiche contemporanee, in questo caso ecologiche. Nell'ambito del progetto che deriva da questa ricerca, si realizzerà un approccio scientifico estetico, collegando informazioni e dati sui confini con l'estetica delle mappe e dei nuovi linguaggi.Il nuovo linguaggio indaga il confine che assume una nuova dimensione, generando la necessità di una manifestazione fisica, visiva, grafica percepibile dall'uomo. Mira a rappresentare il movimento nello spazio e nel tempo, considerando la realtà fluida, dinamica e instabile.
La questione del disturbo e della sua possibilità di lasciare tracce sul territorio ci permette di guardare al paesaggio e ai luoghi urbani in "modo entropico ed ecologico, usando l'instabilità dell'ecologia e dell'entropia come fondamento del progetto" (Cattaneo 2015) . La ricerca si pone nelle condizioni di codificare metodi di rappresentazione in grado di trattare gli urgenti temi del contemporaneo dal sociale/tecnologico al naturale/ecologico. Il confine diventa quindi luogo dove sperimentare nuove calligrafie, nuovi disegni e nuove geografie.
La sua condizione instabile e disturbata favorisce questo tipo di sperimentazione, esplorando nuove metodologie di rappresentazione del paesaggio a diverse scale. La disciplina del paesaggio, e in particolare quella della Landscape Ecology sono quindi usate come strumenti per includere la natura complessa degli iperoggetti, le nuove calligrafie vogliono costruire una nuova visione multidimensionale in grado di comprendere la natura complessa di questi elementi (Morton 2013). Come possiamo utilizzare i dati relativi agli Iperoggetti, manipolarli, e creare nuove forme dello spazio? In relazione all'interesse di Andrea Branzi sul tema della rappresentazione parametrica e indicizzata della città, quali sono i parametri per creare le nuove forme dello spazio? La disponibilità di dati e le nuove tecnologie del contemporaneo potrebbero permettere di dare forma agli iperoggetti nello spazio.

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“Ecology and creativity speak not of fixed and rigid realities but of movemen, passage, genesis, and autonomy, of propulsive life unfolding in time”.

James Corner, 1997

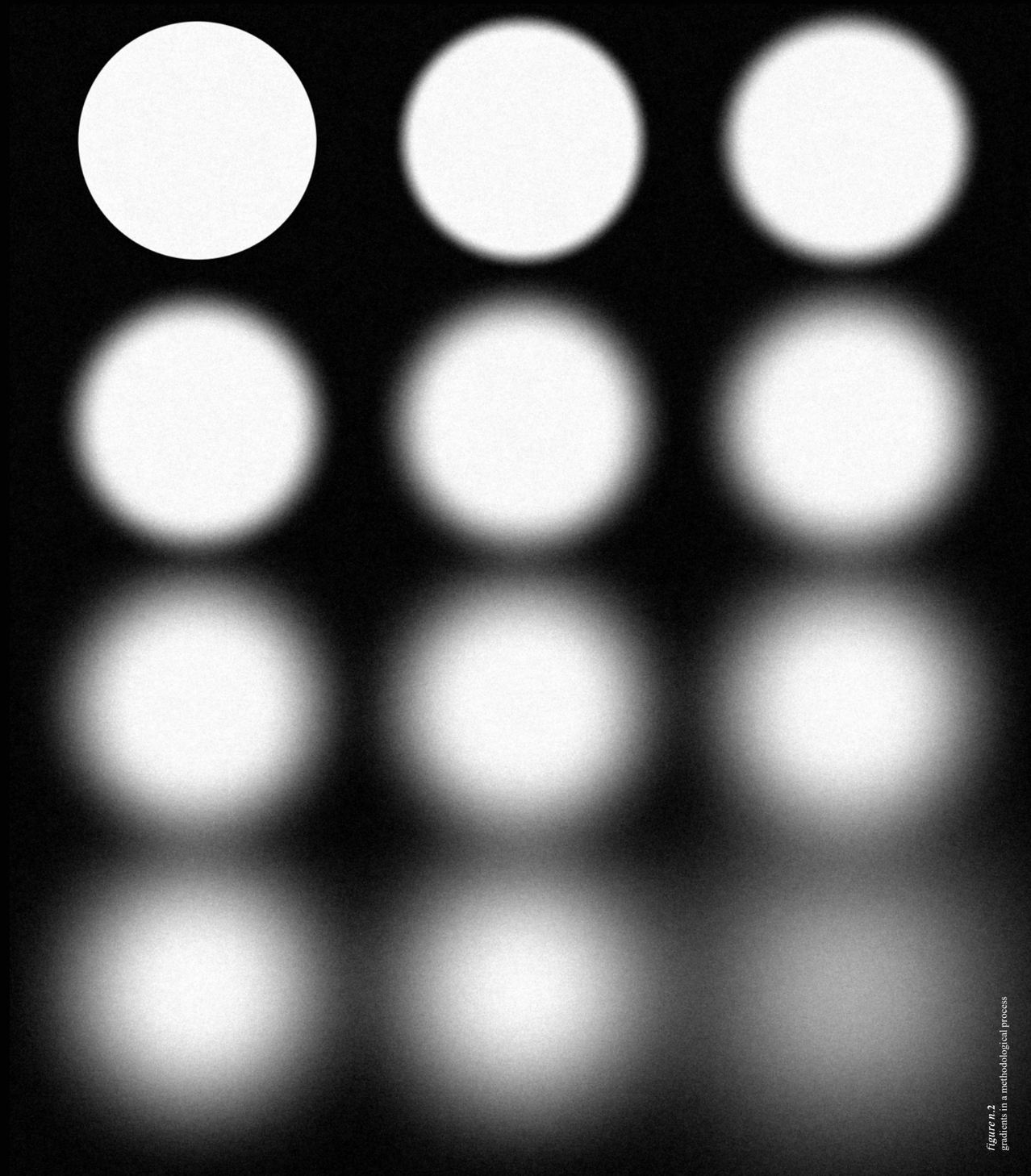


figure n.2
gradients in a methodological process

2

bordoclima

SISTEMI
RELAZIONALI

2.1 bordo

2.1.1 Etymology of the border

Borders are conceptualized as boundaries and visualized two-dimensionally as lines in space that divide space. Places of conflict, places of density, places with a very high level of human decision-making have the ability to enclose territory and generate huge disparities based on arbitrary decisions.

Every Border is an act of power (Popescu 2012). We are continually subjected to institutional facts (Searle 2010), we live confined within constricting institutions that have become so because they are collectively accepted.

From a physical barrier to a symbolic one, borders become a landscape of conflict, a trace full of desnity, political questions, negotiations. Heavy in its trace carries the weight of wars and history, in which over the years it has remarked its deontic power. The genesis of borders from the material to the social, however collectively recognized, needs new conformations. Saturated with complications and conflicts, boundaries explode into new figures, moving out of the static regime and into the dynamic one.
When dealing with complex ontologies, it is impossible to create and maintain in existence without an elaborate set of written rules, which makes visible and understandable by the community the dynamics of evolution of their boundaries.
A system of rules in society can rest on architectural conditions, such as the trace of a boundary capable of exercising a complex deontic power. Maps and atlases have always been political objects par excellence, their top-down view establishing a dominatin representation of political interactions (Farinelli 2009). Maps are characterized by scientism and indexicality, which allow us to experience the tool as a "non-interfering medium between spatial reality and huma perception" (Jacob 2006). But maps are not only political, they are also epistemological devices.

A line in space, when projecting its trace on the ground, takes on two meanings simultaneously, both as a space that divides two parts "between" states, and as a single point of contact between these two parts.
This line can be projected on the space in different ways, it can be made visible on the landscape through man-made elements, fences, walls or ditches, or environmental voids, suspended spaces, fluids, in which the line remains floating in a geometric dimension that is not rooted on the ground.
cccThe conception of the space of the border as a place between states is an important step in the conceptualization of the border because it implies the fact that the social object border cannot be dealt with by divisions of social forces but is a constant of forces between juridical and economics regimes, between states, between territories. The border is not only its parts that touch the two states, it is the thing that stands between the two tangent states. "Borders are complex composites precisely between states. literally and actually in motion in several ways" (Nail 2016).

The first official border recognized in the modern sense was created in 1659 with the Treaty of Piranei, but before the concept of a border was recognized as overlapping with a natural element of the landscape, such as the watershed, we arrive at 1866-68 with the traties of Bayonne, where for the first time the watershed was formally delimited and demarcated. (Kratochwill 1986). A river only functions as an edge if there is some kind of social impact in being one. "Rivers, mountains, sea, glacier, coastline, deserts, swamp, airspace, subterranean, submarine are all conditions where the relationship between geophysical form and geopolitical regime are complicated and fluid" (Shah 2012).

A boundary is, in this definition, a line of nominally zero width (Elden 2019).
According to the theories of Stephen B.Jones, in *Boundary Making: a Handbook for Statesmen* the demarcation in the form of the trace of a boundary on a place occurs after the legal definition and political agreement. This temporal sequesnce is not limited to the materialization. Jones speaks of the problem of maintenance. The landscape, in continuous transformation and mutation can eliminate the previous traces of the line.

Territory is a complicated concept, which includes technical and legal aspects.Territory can be conceived as political technolofy (Foucault 1988) or a boundle of political technologies that regulates the relationship between people places and power (Eleden 2013).
Eyal Weizman intervenes in this definition of territory by first introducing the dimensional issue that is linked to the concept of edge, namely that the political space need to be understood in three dimensions. (Weizmann 2007).
To understand the complexity of an edge we must add the vertical axis, and look at it through the lens of its volume, depth, height, texture and slopes (Elden 2013). The terrain, the materiality of which a border is structured, is materialized in legal and political constructs.

"There is nothing natural - physically or socially - about borders. They are literally impositions on the world. This is not to say that borders are somehow simply metaphorical or textual, without materiality; lines on a map rather than a set of objects and practices in space" (Agnew 2008). The contemporary conception of edge is built on geophysical, dynamic assumptions.
The land is dynamic.
The border as continuous divisions, are dynamic as well. “Border itself as a zone- like or plastic phenomenon shaped by and limiting human flows” (Nail 2016)

Timeline
Dennis A. Oppenheim

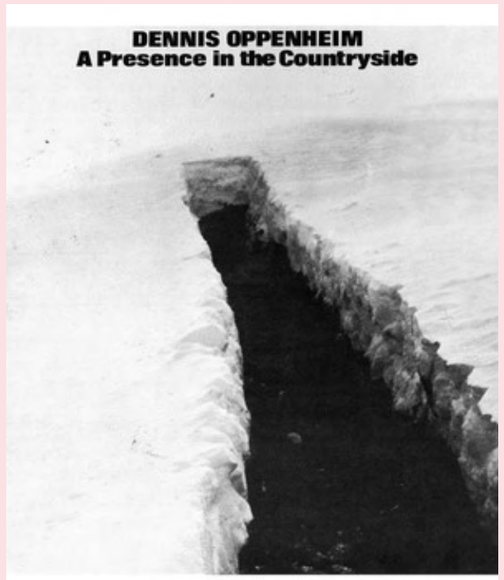
"Idea as force implies it creates shape when it is in contact with a material that can collect around it, or attach itself to it, like metal filings to a magnet. If the attraction is fixed it would then show the shape of the attracting agent (the magnetic current)"

Dennis Oppenheim
Notebook, January 1983

"*Time Line*, consists of the two-mile long pattern of the international date line (which, by convention, runs irregularly from North to South Pole through the Pacific) ploughed into the snow of a frozen river. Like Transference it refers to three scales —map, real country, and globe. But even more economical than Transference, it leaves the first and third of these only implied. Technically, Time Line refers to the longest line in the world. On the globe, visualized by cartographer or astronaut, no other line, real or imaginary, is longer. By so directly alluding to this greatest line on earth, Time Line achieves a monumentality that, if emblematic, is still supreme".

www.artforum.com/print/196908/dennis-oppenheim-36469

USA - Canada, Frozen St. John River, 1968



www.dennisaoppenheim.org/copy-of-arm-wire

vehicle: 10 HP snowmobile.
chill factor: 70 degrees below zero.
execution time:
3:15 USA
4:15 Canada

3 mile cut time zone between Fort Kent and Clair, New Brunswick

-art and science-

2.2 clima

2.2.1 New Climatic Regime

The design and architectural practice collide in the contemporary debate with the concept of climate and the problem of resources, already anticipated in the 1970s by the Club of Rome in *The Limits To Growth* in which it made a prediction of the lack of resources we are witnessing today, focusing on several problems affecting the world and society.
We find ourselves in a time of emergency and ecological crisis, which are a constant backdrop to everyday life. It is no longer time to make meta-strategies as Timothy Morton and Bruno Latour suggest: the contemporary world brings with it a problem between the elements that make up the planet and the way they interact.
It is a time when humanity has assumed the role of ecological agency on a planetary scale through our transformation of the Earth's environment (Graham 2016) by entering a "New Climate Regime" (Latour 2017), in which climate, as a natural phenomenon has ceased to be a given to which humans had to adapt as best they could, and which varied within certain limits, and has become the most urgent and most contested topic of their politics (Latour 2017, 2018).

These days, climate has almost become a political entity, an attractor that actively interacts with humans in geopolitical issues increasingly facing modernity and globalization, and an attitude of climate denialism as a defensive strategy. As Latour denounces in his book *Down To Earth*, the real problem in the New Climatic Regime is that the ruling class - or 'obscurantist elites' - seems to have come to the conclusion that there is no more place on earth for themselves and the rest of the population, and so they react by denying climate change, rejecting the limits imposed by nature, and seeing the planet as an endless store of raw materials.

"How can we deny that we find ourselves facing another power that imposes barriers different from the old so-called 'natural' limits?" (Latour 2018) What is brought to attention is not so much the central role of humanity in the New Climate Regime, but rather its destiny and the possibility of not being the only actor on the planet. Nature in this context is defined as acting actor (Latour ANT) and a continuous process interconnected to human activity. This is why the concept of the Critical Zone (Latour 2021) is introduced: "a volume on the envelope of the biosphere extending vertically from the top of the lower atmosphere to the so-called barren rocks and horizontally to wherever reliable data can be obtained on the various ingredient flows through the chosen site; a living, breathing and evolving boundary layer where rock, soil, water, air, and living organisms interact. Instead of one agent, 'the human', acting 'on nature', heterogeneous entities come into play on the land, mixing in different combinations".
These complex interactions regulate the natural habitat and determine the availability of life-sustaining resources, generating traces on the critical zone every second, hour year and geological time.

The current structure and functioning of the critical zone reflects short-term responses to events such as rainfall and human activities such as land-use changes; long-term responses to climate and tectonic changes over geological time. In this sense, the concept is dragged by Latour into the political sphere of the New Climate Regime: "politics" is not limited to human beings but includes all elements or entities considered to be part of the composition of the common world and the evolution of the local climate become describable for all to see, feel and react to.
Literally, the critical zone involves all its inhabitants in a narrative of history, crises, conflicts and transformations that differs totally from what it once was when someone proudly spoke of having their feet firmly 'on the ground'. If within this vacuous, geopolitical situation man feels landless, 'off shore', it is largely because of the blurring between what we do and how we come to record the consequences of our action.

This requires not only more hydrology, more biology, more geochemistry, but also more regulation as a totally different legal framework is the only way to balance the outflow of water with the inflow - especially at a time of intense and some say enduring drought (Latour 2014).
Whatever the definition of the New Climate Regime, it is clear that it is taking us into dizzying cycles of explication, revision and reflexivity. "Thus, even more than the concept of the Anthropocene, the concept of the critical zone changes the notion of space that had been encapsulated in the notion of Nature as well as in the old divisions between human and physical geographies" . (Latour 2021)

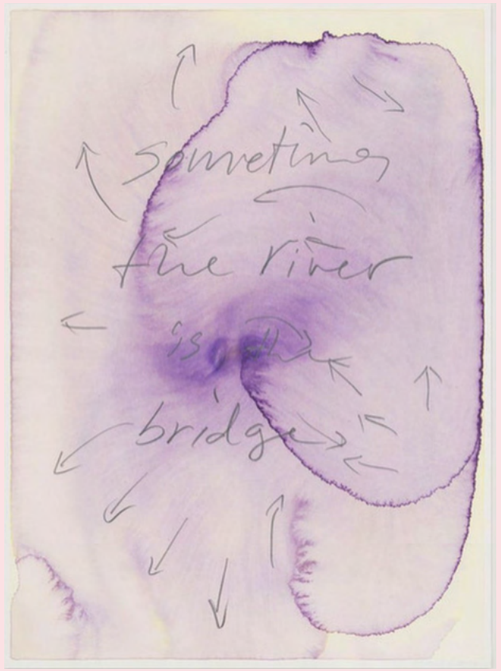
We can no longer afford to discern disciplines: the processes of deregulation and globalisation, the increase in inequality and the denial of climate change are consequences of a world in tension towards modernity and progress. The New Climate Regime requires a geosocial focus, whereby every human activity must be considered together with the impact it will have on the planet, and whereby a socially active understanding of nature is given in constant interaction with anthropological practices: what affects humans is shaped by natural manifestations, and vice versa.

Under this large umbrella called climate, the research not only aims to generate a new methodology for architectural and landscape design, but also to bring new understanding to the attention of policy-makers and the public worldwide, as a moment of discussion, a space made up of drawings to generate ideas and questions to be investigated.

Statement
Olafur Eliasson

"Art does not show people what to do, yet engaging with a good work of art
can connect you to your senses, body, and mind. It can make the world felt.
And this felt feeling may spur thinking, engagement, and even action.
Art can motivate people to turn thinking into doing.
Art encourages us to cherish intuition, uncertainty, and creativity
and to search constantly for new ideas"

Why Art Has the Power to Change the World
2016



sometimes the river is the bridge
2020

www.olafureliasson.net/archive/artwork

-art and science-

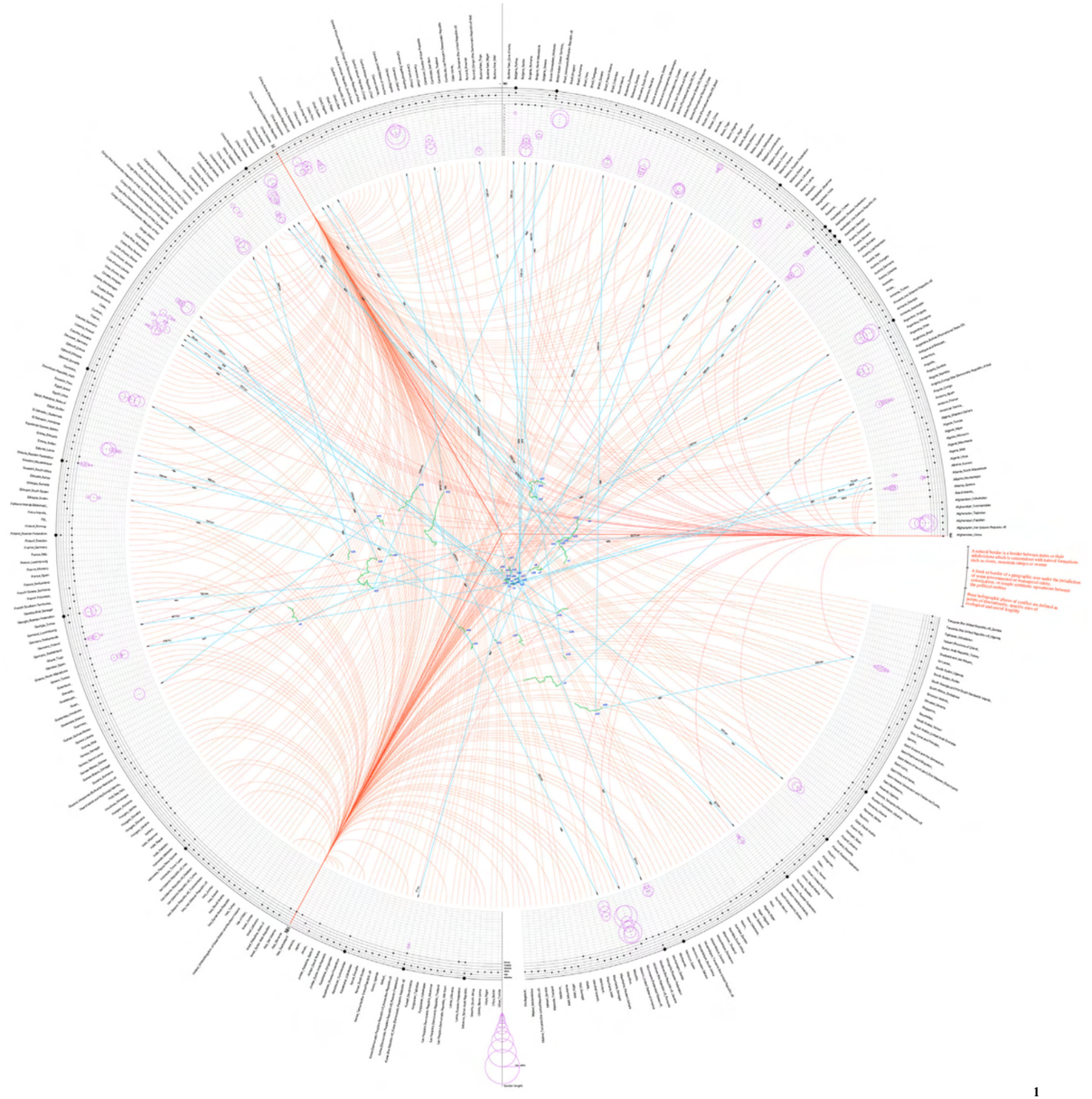
"This is one of a series of watercolours produced using chunks of ancient glacial ice that were fished from the sea off the coast of Greenland. The ice was placed atop thin washes of colour on a sheet of thick paper. As the ice gradually melted, the resulting water displaced the pigment, producing organic swells and fades of colour".

glacial landscape no. 5
2018

2.3 FIGURES OF CONFLICT

2.3.1 Helix

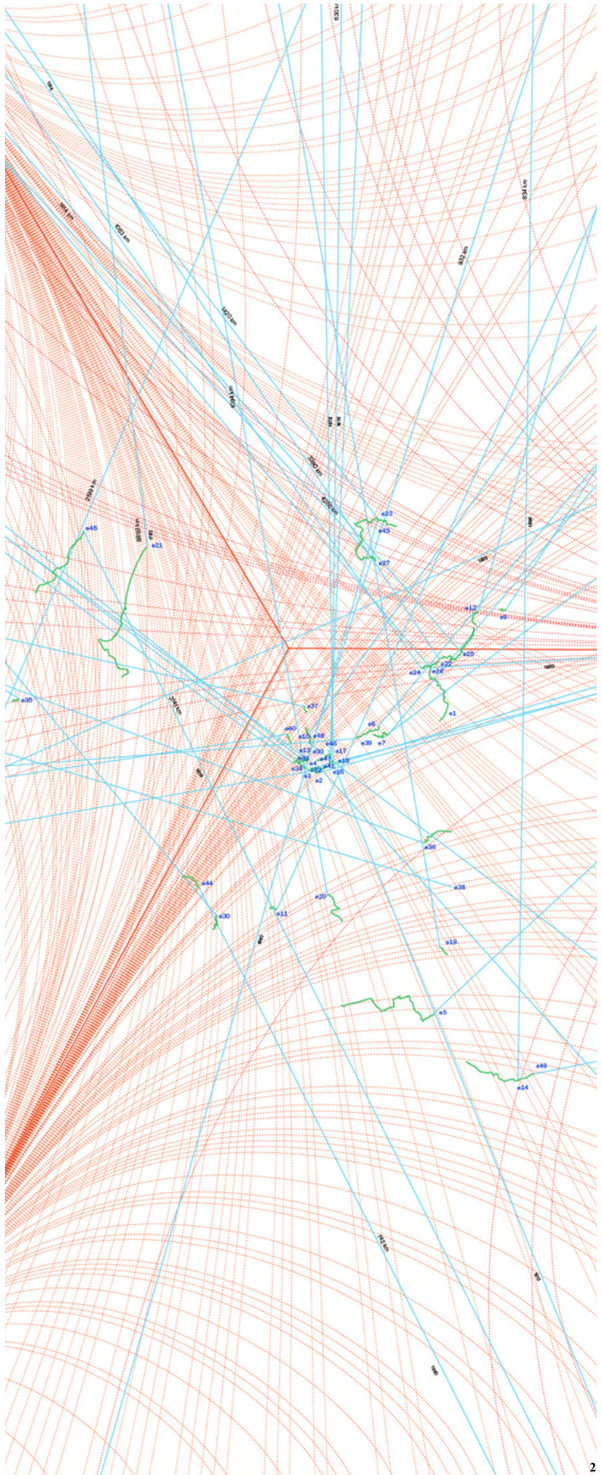
The concept of the helix as a new figure of conflict arises from the intersection of human and non-human tension. Emblematic places of tension are borders: places of conflict and negotiation are placed in a dynamic framework. The transformation produced is considered as a torsion generated by two phenomena and it is figuratively represented by the geometrical helix, which is made up of two superimposed forces that generate the movement and the torsion.nThe structure is based on the principle of complementarity rather than equality (Latour 1987). It was decided to drag this scientific concept into the method used for a new reading of the border: the border acquires a thickness and a third dimension (Elden 2013), where human constructions such as infrastructures, borders, physical barriers or administrative geometric boundaries, collide with natural borders, rivers, mountains, oceans. This helix is generated at specific points, known as points of discontinuity: the pattern changes from territory to territory because it depends on the intensity of the two forces acting in a given space-time. In fact, the oscillatory diagram of this figure that is formed is directly proportional to the dimension of space and time. It records the non-human polarities by trying to measure the timeline that indicates peaks and variations in the intensity of the phenomena. The figure of the helix thus makes possible the ambivalence of the border as a space of separation and at the same time a common space. (Arenes 2019). In order to map this new figure in space, we started from the morphological classification of the types of territorial boundaries on a global scale by dividing them into the two categories, human and non-human, according to which of the two acting forces had greater intensity. Those boundaries where the spatial overlap between these two actors was present are within the model as helices. In fact, both human and non-human forces are actors in the construction of this new figure of conflict (Latour 1999): starting from Bruno Latour's ANT, according to which an actor (actant) is something that acts or to which activity is granted by others, the terms human and non-human have been defined and interpreted. Non-human is defined as everything that concerns natural phenomena and nature itself as an entity that, according to biological and ecological processes, actively acts on the space of the border, generating new forms and new traces. Instead, human is defined as an actor with the power to make decisions, which are directly related to the forms of space and which produce significant traces on it. Agency, in ANT is equally redistributed between human and non-human actors (Spencer 2019). Since the research deals with complex systems, in the new contemporary scenario of continuous interaction between social and ecological issues, it is not possible to separate these concepts: natural phenomena, social phenomena and the discourse about them are not seen as separate objects but as hybrids.

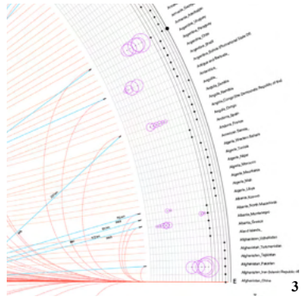


1

helix

code	border	km	year
e1	albania-montenegro	172	- 2003
e2	albania-n.macedonia	151	- 1991
e3	albania - kosovo	112	- 2008
e4	angola - congo	231	- 1975
e5	argentina - bolivia	742	- 1825
e6	armenia - azerbaijan	1007	- 1991
e7	azerbaijan - iran	689	- 1991
e8	azerbaijan - russia	284	- 2011
e9	bangladesh - myanmar	271	- 1937
e10	belaurus - poland	418	- 1945
e11	benin - niger	266	- 1951
e12	bhutan - china	400	- 1951
e13	bosnia - croatia	932	- 1999
e14	botswana - zimbabwe	834	- 1898
e15	brazil - venezuela	20199	- 1929
e16	bulgaria - greece	630	- 1878
e17	bulgaria - turkey	240	- 1878
e18	burundi - congo	236	- 1910
e19	cameroon - chad	11094	-
e20	cameroon - nigeria	8893	- 1783
e21	china - india	1420	- 1914
e22	china - korea	3380	- 1962
e23	china - lao	1063	- 1996
e24	china - nepal	4250	- 1961
e25	china - pakistan	592	- 1963
e26	china - russia	1414	- 1991
e27	colombia - ecuador	586	- 1830
e28	colmbia - venezuela	2219	- 1891
e29	cote d'ivoire- guinea	816	-
e30	croatia - hungary	329	-
e31	croatia - montenegro	25	- 1991
e32	croatia - serbia	217	- 1992
e33	croatia - slovenia	670	- 1991
e34	dominican r. - haiti	376	- 1697
e35	eritrea - ethiopia	682	- 1991
e36	estonia - russia	294	- 1920
e37	ethiopia - s.sudan	744	- 1902
e38	georgia - russia	732	- 1991
e39	germany - poland	467	- 1945
e40	greece - n.macedonia	234	- 1913
e41	guatemala - mexico	871	- 1882
e42	korea - russia	17	- 1860
e43	mauritania - w.sahara	742	- 1960
e44	mexico - usa	3141	- 1819
e45	montenegro - serbia	157	- 1913
e46	n.macedonia - serbia	221	- 1996
e47	portugal - spain	530	- 1951
e48	s.africa - zimbabwe	230	- 1881

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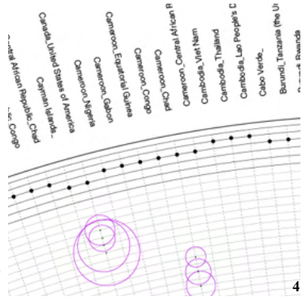

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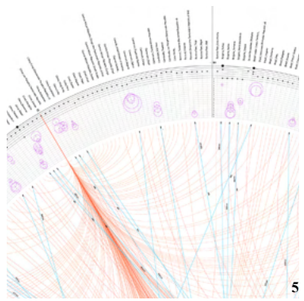
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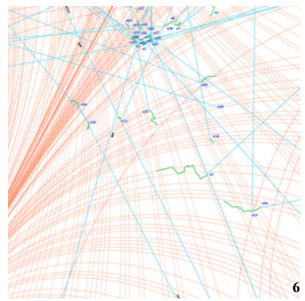
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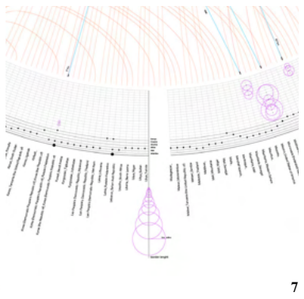

7

figure n.1-7
world borders catalogued according to the human/non human/helix tension between relative nations

To translate the helix concept spatially and territorially, two examples can be given referring to different scales and continents.
The first concerns the border between Mexico and the United States, where the Tijuana River is part of a shared landscape, where political tensions are reinforced both physically by the presence of the wall and by the dual governance and largely opposing agendas between the two nations.
The second concerns the border that delimits the state of Slovenia from that of Croatia: due to the political tensions generated by the phenomenon of human migration, numerous fences have been placed on the border that specifically coincides with the Kolpa River, where in addition to these physical barriers, the Slovenian police act violently, blocking passage and transregional movement.

projection

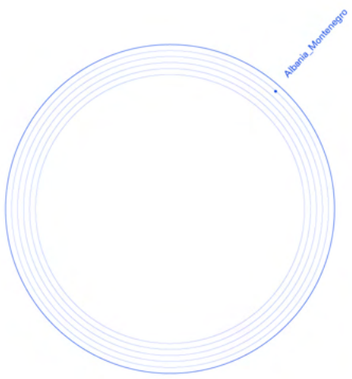
01

	state1	state2
1	Afghanistan	China
2	Afghanistan	Iran
3	Afghanistan	Pakistan
4	Afghanistan	Tajikistan
5	Afghanistan	Turkmenistan
6	Afghanistan	Uzbekistan
n	...	...

a.
starting from the UTM projection of the planisphere, the tabular information in .csv format on all the world's borders (neighbouring states in relation to each border, length) was extracted using GIS.

b.
once the information was extrapolated, it was decided to use a stereographic projection of the world so that it could be easily inscribed in a circle.

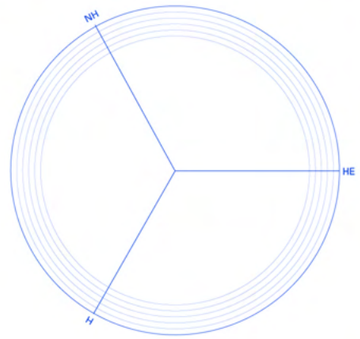
By using an algorithm, the tabular data of the boundaries were reported radially on the circumference.



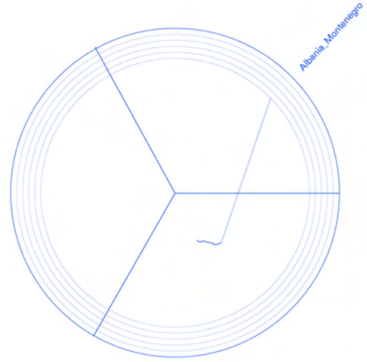
c.
the structure of the algorithm on Grasshpper has been evolved to generate concentric circles in which to list the boundaries on the relevant continents: America, Antarctica, Africa, Europe, Oceania.

parameterisation

02

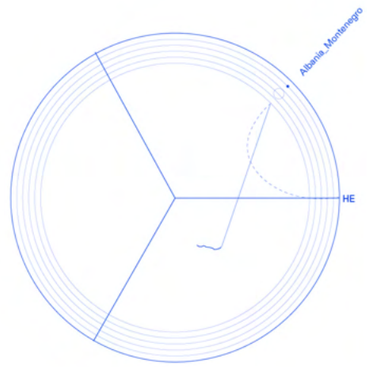


d.
3 geometric attractor axes were created, corresponding to HE (helix), NH (non-human) and H (human) respectively.



e.
each boundary in radial written form is connected by a line with its corresponding geometric shape in space.

on each connecting line there is data on the length and date of institutionalisation of the border



f.
each radial written boundary has been successively connected by a sript linking the list of .csv data with the data from the border conflict survey.

the script also generates, through the input information, concentric shapes on the HE borders related to the size of the border in relation to its conflict between humans and non-humans.

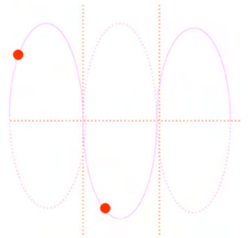
-technical note-

-taxonomy of conflict-

BORDO CLIMA

07

human

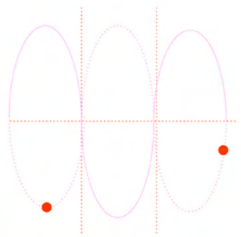


Human, by definition is any entity having the attributes of man, thus belonging to the category *Homo*, as opposed to animals, divine beings, or machines.
To this term, in the context of this research, are also attributed all actions and phenomena related to man. Examples can be physical constructions on the territory, policies, documents, impacts on the environment generated by man's action (production of air pollution, soil metabolism, conflicts and migration).

These human entities are registered on borders and mapped. In the sphere of borders, human refers to those signs of delimitation between territories produced by man himself, such as political, administrative, geometric borders, physical barriers such as walls, frontiers, perimeters.
Based on Latour's Actor-Network Theory, according to which an actor (actant) is something that acts or to which activity is granted by others, human is defined as an actor with the power to make decisions, which are directly related to the forms of space and which produce significant traces on it.

08.

non human



The term non-human refers to any natural phenomenon, or nature itself, understood as any entity that according to biological processes actively acts on the territory, generating forms and traces in space.
It is defined as being other than a human being; not belonging to or produced by or appropriate to human beings.
These entities are closely related to the human ones.

At the level of boundaries, non-human means those signs of delimitation between territories of an ecological, morphological nature (rivers, mountains, oceans...).

09.

helix

The term helix refers to a geometric figure generated by a line wrapped around itself along its own axis at a constant angle.

Starting from this definition belonging to geometry, the concept is drawn into a new figure generated by the intersection of human and non-human tensions.

In this sense, in the methodology adopted, the helix represents the union of phenomena of human origin and phenomena of non-human origin.

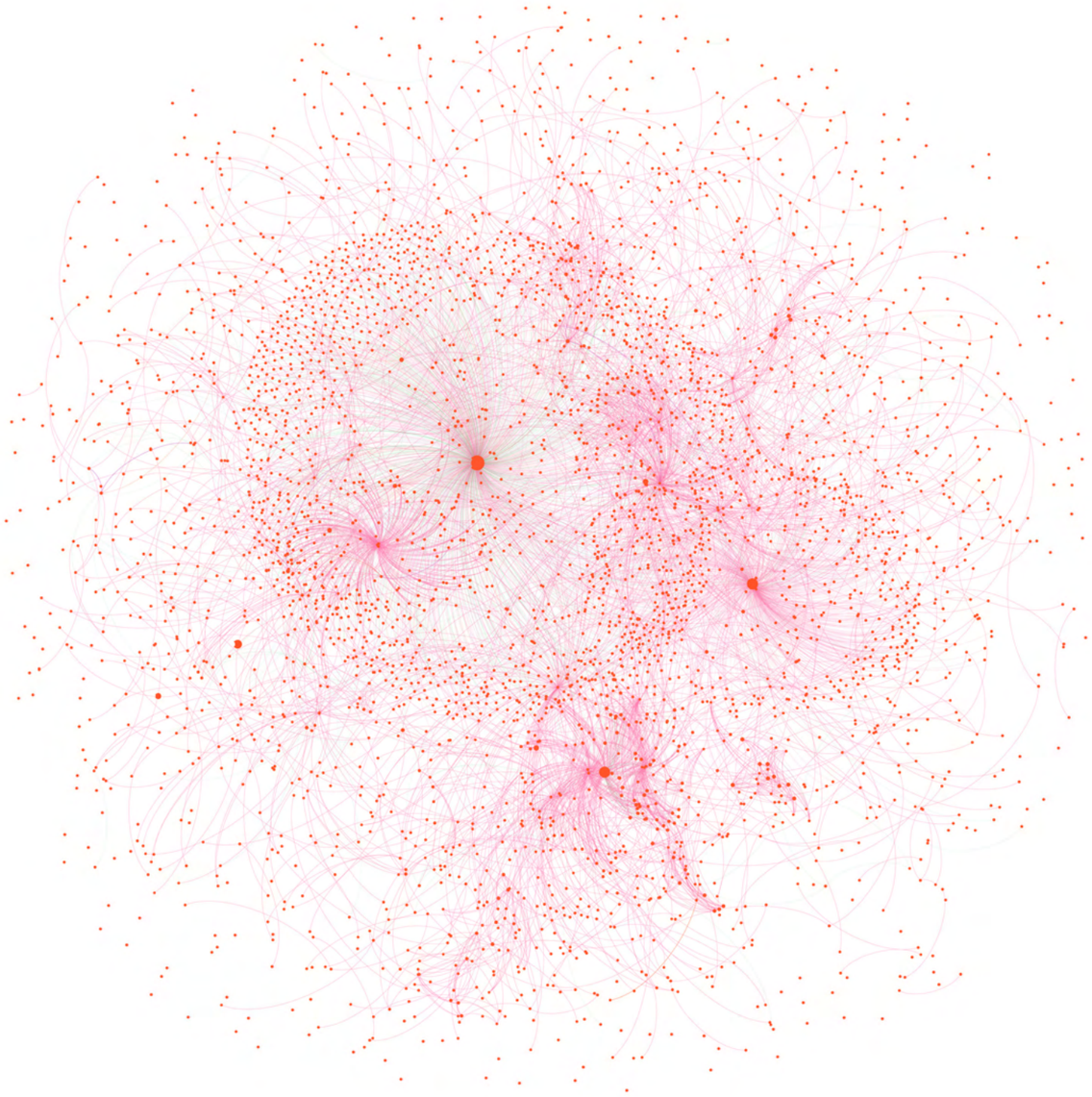
This figure enables to characteri-ze the element of the border as a space of separation between two entities but at the same time a common space in constant movement, a tension between two homogeneous and heterogeneous parts.
It also allows us to see in the context of the research, the border as a place of exchange and transformation, as a phenomenon of torsion in constant change.

2.4 BORDOCLIMA

2.4.1 Moving border

How are we become sensitive to the New Climatic Regime and the reconfiguration of territories it implies? Maps inspire politics settled in the relatively stable frame of natural borders. What happens when the physical boundaries themselves have to be mapped? How to redraw these lines in the midst of ecological mutation? [1]
Bordoclima moves theoretical research on two apparently distant themes. Border, where the two layers of territory, human geography, which looks directly at social interactions and human movements, and physical geography, which investigates patterns in the natural environment, are defined in space. Climate, intended as New Climatic regime, is the current condition in which global warming challenges the notions of territory, in its unstable dimension built on interferences and disturbances. Rethinking this interaction between disciplines means, first of all, finding a new way to represent them. Where natural phenomena define borders, climate may accelerate the rate and degree of boundary movement. Glaciers, oceans, rivers crossed by the divide are shrinking, and consequently, their geometry is changing. In the exemplifying case of the border in the Alps, the border moves so that the natural line does not coincide anymore with the political one defined by the states and shown on the official maps. The gap that exists between these two lines may have different dimensions. This depends on the conformation of the territory and the intensity of the agent moving in a specific direction of flow. A moving border creates political uncertainty in bilateral relations through conflict often reflects overall state relations. Despite the phenomenon of global warming, military cartography is well known and visible continues to represent fluid agents as static, fixed entities and river drainage as one-directional, adimensional lines and vectors. The physical border is seen as a social construct, a paradox between "legal staticity and fluid dynamism" (Donaldson 2011) and the inconsistency between policies that recognize both a rigid border and an inherently flexible boundary marker (ICJ8). The natural geomorphologically moving boundary that can draw political divisions and the effects of the moving boundary is considered negligible to date. For this reason, the research wants to move the solid conceptual and symbolic value of the theme, which questions the possibility of a new collective acceptance (Searle 1995) in which the geographical and morphological characteristics of an unstable border can embody a political demarcation. The notion of Bordoclima can be recognized as socially constructed scientific fact, as the end product of multiple actors whose agendas are often in conflict. In the light of the current planetary crisis, this apparently irrelevant fact seems to condense a series of assumptions on the geophysical terrain (Ferrari 2019). Border movements are accelerating due to climate change, and policies will need to evolve accordingly, and the response will require a set of political and technical rules. (ICJ8)

1.These are the questions Bruno Latour asked during the Reset Modernity exhibition at the KZM Center for Art and Media Karlsruhe in 2016.



9

10

11

12

13

14

figures n. **8-14**
interactions between the words bordo-clima

SNA Social Network Analysis TWITTER

01

	border
1	#border
2	#borderconflict
3	#borderwar
4	#bordermigrant
5	#borderdown
6	#borderup
n	...

	climate
1	#climatecrisis
2	#climate
3	#climatepolicy
4	#climate
5	#climatewar
6	#climateup
n	...

	borderclimate
1	#borderclimate
2	#borderclimate
3	#borderclimate
4	#borderclimate
5	#borderclimate
6	#borderclimate
n	...

a.

using an analysis software it was possible to download a network of interactions regarding specific themes according to a specific space and time criteria

For the calculation was considered Europe with time frame 06/21-07/21

Initially was mapped the hashtag #BOARDER

b.

subsequently the hashtag #CLIMATE was downloaded

c.

and at the end have been identified the sentences within the network that contain in the same phrase the words #BORDER #CLIMATE

d.

with a data visualization and exploration software it was finally possible to work on the information design of the tables to produce visualizations that collect in different clusters the two words + their combination, in a network of interactions and connections.

-technical note-

tweets

Moving border
Studio Folder

From terrestrial surveys to the chambers of parliament. In the 1990s, observations by the Istituto Geografico Militare started to acknowledge the problematic uncertainty of the limits between Italy and its adjacent countries. A new definition of *moving border* was eventually enacted into law, by means of a 2006 agreement between the governments of Italy and Austria, and of a 2009 agreement with with Switzerland.

Studio Folder is a design and research agency founded by Marco Ferrari and Elisa Pasqual, and based in Milan, Italy.
The studio's work spans between the cultural and commercial domains and the investigation of autonomous research paths, while working through a diverse range of outcomes-from data visualisation to the design of exhibitions, editorial products and digital platforms.

Marco Ferrari is architect and co-director of Studio Folder, whose research is based on the relationship between the politics of visual representation and the territory. A former founding member of the Salottobuono collective, he was creative director of Domus magazine between 2011 and 2013. He has been teaching information design at IUAV in Venice and methods of representation at ISIA in Urbino since 2010.
Elisa Pasqual is designer with a PhD in design science from the IUAV University of Venice, and co-director of Studio Folder. Her research maps the evolution of visual communication of states, observing the intersection between design, politics and identity. Since 2008 she has been teaching visual design at the universities of Venice, Milan, Lugano and San Marino.

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-conversation-

.Looking at the current planetary crisis, can the concept of Moving Border be extended to new moving border figures also belonging to the fluid regime, such as rivers, oceans but also atmosphere and air?

M. Concerning the issue of the atmosphere, we published last year, together with the co-tutors with whom I teach at the Royal College of Art, School of Architecture (London), an essay in the Avery Review that touches these aspects, starting with a specific case study: the Sky River project. Sky River is an experimental project that the Chinese government has been conducting for a few years now, on the Tibetan Highlands, to control rainfall on a very large scale; a so vast scale that it affects not only rainfall and its control at a local, regional but also st continental level. Tibet is itself already a disputed area on the border with India and Pakistan, where there is a question of control of water vapour flows in the atmosphere and how these can constitute resources that can be linked to geopolitical dynamics, in terms of expansion and projection of these volumetric and three-dimensional boundaries. The project involves a series of monitoring technologies: in fact, it is a weather engineering project that involves both the use of remote sensing instruments, which in fact monitor real time steam flows, and through the interception and activation of a system of stoves installed on the mountains at very high altitudes. So there is in fact an issue of watershed control. There is not such an accurate projection in the atmosphere as there is for ground components. Therefore, the attempt of Sky River is to project the expansive dimension, the imprint of a state, even in this sense of verticality of the border. There is definitely a dimension of the sovereignty of air. I think there is an intention to control, through territorial categories, what are highly dynamic and fluid processes that take place in the atmosphere. Starting from the canonical conception of the boundary as a two-dimensional line on the ground, it actually projects vertically, from the subsoil to the limit of the atmosphere, deforming itself completely.

.If the movement of borders is directly proportional to the acceleration of climate change, policies will have to evolve accordingly. What methods/techniques of representation can become an active and critical tool to keep up with this continuous ecological mutation?

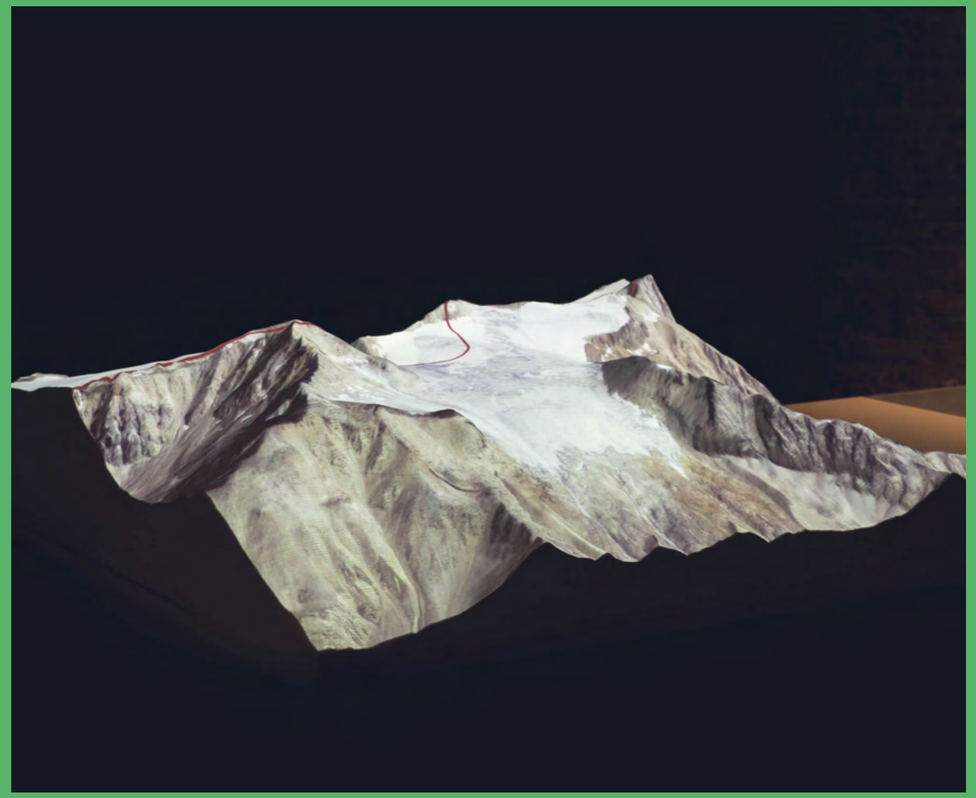
M. The theme is precisely that of finding new ways of representation. I don't think there is a definitive one. One that can replace a classic or traditional form of cartography. I believe that the issue is how to open up this field to more complex, hybrid forms of visualisation that can manage to represent the complexity of these processes and above all the different scales, both spatial and temporal, through which these processes manifest themselves. Today we are able to understand, to map in a more conscious way many of these certainties, with a much higher level of detail than we used to be able to do.
Interesting in this sense is the theme of the border, which in some cases is used as a technological device according to interests, generating unresolved geopolitical questions and conflicts. But since in the canonical conception it remains a two-dimensional linear system, it is clearly insufficient to describe much more complex phenomena, such as those of the present groundwater contamination, because they have not been planned, designed and conceived in that sense.
So we need instruments that are able to represent what happens beyond that line, what happens below and above the surface, according to times, scales and modes, which require a new effort of representation. I believe that the constant search for complexity is one of the fundamental aspects in the work of architectural design. Understanding that what we are observing, especially in the boundaries that are very complex nodes, is not something that can be reduced or simplified, but requires the duty to represent this complexity and ambiguity that is inherent in the territory

.In the New Climate Regime we are dealing with phenomena that are not numerical models that can be calculated and represented mathematically. So, is there a need to intersect data and read them critically through mapping and new methods of representation?

M. I don't think there is a method. In order to represent and map these phenomena, we need to experiment so to understand what the new forms of aesthetics of communication and representation of these dynamic processes might be. Each specific case study can become a sort of methodological design prototype that makes it possible to be precise and to deal with data, with information that can be collected in a precise and accurate way in the specifics, until it can be extrapolated in a global dimension or far from the initial place, and therefore be represented elsewhere.
It is interesting to observe where there are specific nodes and look for new methods to represent them.
This is what was done with Italian Limes: we took a very specific case, to understand how through that lens we could touch themes and dynamic processes on a wider scale.

.Do you believe that the data, even if aestheticised, can take on a critical dimension and become an instrument of contemporary project?

M. There is no gap between a scientific representation and an artistic-aesthetic representation. Even scientific data has its own aesthetics, in which there is only one form of representation for which certain languages, codes and conventions are chosen to constitute an aesthetic form of the data.
Thus, what may seem to be the driest, most banal data visualization, those for example found in scientific texts, is an aesthetic form that corresponds to canons of representation and certain disciplinary conditions, which evolve over time and could represent a scientific objectivity. The data is an object of design just like in any other



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-conversation-

BORDO CLIMA

discipline. It can therefore be analyzed from an aesthetic point of view, from the point of view of its characteristics of graphic interpretation, like any other artifact. The production of new experimental languages has in itself a critical dimension, which consists precisely in the fact of seeking alternative calligraphies as a design tool. The datum in this sense acquires the critical dimension at the moment in which its communication is transparent, and therefore its visualization can be taken up, contested, discussed or supported; but it is something that goes beyond the surface, the interpretation, since the aesthetic-artistic one has equal value to the scientific one.

.If this tension exists today between aesthetic representation and the measurement of physical space, how can the figure of the architect "negotiate" its credibility when the scientific datum is aestheticised?

M. This concerns the issue of truthfulness, scientificity and accuracy of what concerns the visualisation of data. A graphic language can be more or less experimental, cryptic, but it is mainly a question of leaving the manipulation of sources open in a clear and transparent way; documenting the way in which data is observed and transformed. So a work acquires validity in its aesthetic, artistic dimension if there is transparency and a kind of access to the process that has been used.

.What is the " limit " of architecture, and of visual representation, with relation to these scientific and geopolitical issues?

M. I think it hardly makes sense to define the boundaries of a profession except for its legal dimension, which clearly has its own meaning. As far as the more theoretical or critical part is concerned, I repeat, I don't think it makes sense. In certain historical moments, even very recent ones, there is still this idea of architecture as an autonomous profession with an autonomous history. For me this is really the most uninteresting and negative part.
I think that the architect's educational training provides a privileged position to be able to understand everything that has to do with space and the dynamics of the transformation of space. One interpretation that I think is possible is that which gives the figure of the architect a vocation that places him in dialogue with the risk of observing the connections and relationships between very different phenomena that nonetheless have an impact on the territory, on space. So on the one hand it can be considered an extremely generic profession, without its own specificity: it is not a science but it is clearly a humanistic discipline. On the other hand, however, it focuses on the role of technology, of measurement, of a modern observation, if you like, which puts it in dialogue with specific scientific disciplines that study real phenomena much more closely.

.In relation to the transdisciplinary nature of the architect's practice, do you think we are evolving in this sense? What do you think will be the possible future pathways?

M. The figure of the architect is extremely malleable and difficult to define. And this generates the opportunity to collaborate and deal with the heterogeneous emergencies or complexities of the contemporary world. The trajectories that can be taken are all valid and all participate in that critical dimension of architecture. it is a difficult evolution that has been developing a lot in recent years.
Even if there is still a lot of resistance.

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-italian limes-

"Italian Limes is an ongoing research project by Studio Folder that explores the most remote Alpine regions, where national borders drift due to global warming and shrinking glaciers. It focuses on the effects of climate change on shrinking glaciers and the consequent shifts of the watershed that defines the national borders of Italy, Austria, Switzerland and France.

Measuring the Border
A grid of solar-powered sensors at 3,300m above sea level

The measuring units installed on the glacier are solar-powered devices based on an Arduino microcontroller. They have been designed to record precise changes in altitude as wells as a range of other environmental data, useful to understand the weather conditions on the glacier.
The sensors were tested at -30°C inside the facilities of EuroCold Laboratories at the University of Milano-Bicocca.

The data are processed remotely in order to monitor any changes in the glacier surface, detecting in real time the evolution of the watershed geometry.
Data is recorded internally and transmitted every two hours through a GPRS/GSM network provided by TIM. It is then translated into a live, automated representation of the movement of the border by means of a drawing machine".

2.4.2

The borderless atlas

Borgesian cartography does not address the problem of the possible movement of physical boundaries themselves. The need to represent a territory that is parametrically connected with the continuous ecological movement is the challenge that the research wants to answer. The climate crisis forces us to rethink and redefine our conception of space, consequently demanding new geographies. There is a direct relationship between cartographic representation and reality. (Farinelli 2003)

In the modern vision, states and nations are modeled according to the Cartesian principles of fragmentation of the earth into equal and endlessy divisible pieces based on the principle that space is absolute and can be rationally divided.
The advancement in contemporary technological systems of mapping and satellite imagery has caused the perception of the map to be transformed into that of a photograph, making them inseparable from their physical model, hiding the traces of political decisions on the territory. In this sense, technological advancement produces confusion between cartographic representation and reality. From here again arises the problem of representation of complex systems. Our limited senses cannot capture the world in a single glance. To fix an object in a real imageof space , as it happens in photography, means to fix it in a linear space in a specific space and time. To verticalize the concept it comes into question the need to find new calligraphies.

Geographical boundaries are becoming less and less fixed on the territory, assuming multifaceted characteristics.
By studying the performativity of the border essence, it is possible to deduce its intrinsic and ambiguous characters.
Global Flows, migration and information technologies have shaken the logic of nation-state borders, creating transnational networks. As a matter of fact there are no natural borders that separate human beings in space. (Popescu 2012).
The phenomenon of globalization has often been interpreted as the prerequisite for a "borderless" world in which social boundaries lose their importance with respect to social agents. What often happens, however, in these places of conflict, is a "policy vacuum"' in which the area under the metaphorical bridge remains neglected and untouched by both parties (van Houtum 2013).
The willingness to redefine national borders, described as rational entities, replacing it with global flows does not lead to a defined partition of the world (Popescu 2012).
This process, also known as "re-bordering" implies the reorganization of borders that thus acquire new roles and meanings. What would happen if the phenomenon of re-bordering, which by definition transfers national power to different levels (under and above) where there is no longer alignment with fixed territorial boundaries, would instead concern a mobile power structure, reorganized, which anchors to the territory following its flows in space and time, adapting to its new gradient form?

Borders are unstable in time and space. The most significant aspect of this kind of retorritorialization phenomenon concerns precisely the radical transformation of the idea of the border as a fixed topographic line, to a fluid topographic line.
A new multi-layered geography is essential to describe the concept of movement that impacts and reverberates between the states of a nation. In particular, the spatial directions in which the boundary moves are multidimensional.Multiple movements can occur simultaneously in the same geographic context.
The three-dimensionality of the territory and its instability (Elden 2019) allow for the identification of opposing agents between two states that determine the movement of the border, both in an aerial dimension that refers directly to the climatic classification of states, and planetary boundaries, and in a material dimension that refers to topographies and soil thicknesses.

The criticism to the official cartography, apparently slow, not able to capture the acceleration and the scale of the natural phenomena and of the Hyperobjects that define the contemporary has been the presupposition to intervene, as designer with the tools of the profession.
The opportunity to intervene is precisely to make visible the fluctuations and at the same time problematize the conventional representation.
In support of the instability of the land and its continuous geomorphological and social fluctuations in space. In a world where there are more states than borders.
In the vision of a borderless atlas, we imagine how the methodological figure of the gradient can extend into a potential cartography.
According to this imagery, the newly catalogued states are characterised by borders made up of gradients, resulting in the genesis of a single figure on a different scale.
The border is seen as an element of relationship between two heterogeneous parts, which in this sense are unified.
The use of the Koppen Geiger 2 classification in the new generative geographies takes into account the possible intersection of different climate classes and thus a possible entrainment of new biodiversity within an initially alien state.
This movement of biodiversity and climate classes will imply an adaptation of the agendas of each state to this type of incorporation.

2.The Koppen climate classification divides climates into five main climate groups, with each group being divided based on seasonal precipitation and temperature patterns. The five main groups are A (tropical), B (dry), C (temperate), D (continental), and E (polar). Each group and subgroup is represented by a letter.

india
equatorial arid warm boreal
china
equatorial arid warm boreal
myanmar
equatorial warm boreal
bangladesh
equatorial warm boreal
nepal
equatorial warm boreal
butan
equatorial warm boreal
indonesia
equatorial
thailand
cambogia
laos
vietnam
corea nord
corea sud
malaysia
equatorial
spain
equatorial
greece
equatorial warm boreal
portugal
warm boreal
netherlands
warm boreal
italy
warm boreal
slovacchia
equatorial
lussemburgo
warm
croatia
warm
bosnia
warm
czech republic
warm
austria
warm
slovenia
warm
england
warm
germany
warm
montenegro
warm
ireland
warm
switzerland
warm
albania
warm
andorra
warm
belgium
warm
denmark
warm
norway
warm
svezia
warm
finland
warm
polonia
warm
kosovo
boreal
lettonia
boreal
estonia
boreal
lituania
warm boreal
romania
warm boreal
ucraina
warm boreal
bielorussia
warm boreal
serbia
bulgaria
warm boreal
moldavia
warm boreal
north macedonia
malta
warm
islenda
cipro
warm boreal
russia
warm boreal
francia
warm
papua new guinea
arid
philippines
polar
taiwan
warm
japan
arid warm boreal
australia
new zeland
warm
panama
equatorial
guatemala
equatorial
belize
equatorial
el salvador
equatorial
mexico
equatorial arid warm
honduras
equatorial
paraguay
equatorial
bolivia
equatorial arid
equatorial arid
equatorial
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namibia
guinea bessau
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chad
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mauritania
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burkina faso
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etiopia
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gibuti
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ecuador
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peru
polar
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equatorial
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borderless

01

a.

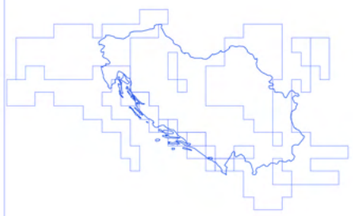
consider and map
global boundaries in their
currently known geometric configu-
ration with WGS 1984 Web Mercator
reference system
(auxiliary sphere)_1

b.

select a state according
to its neighbouring states

c.

redefine cartography/geography
by introducing the concept of
gradient.
consider the border as an element
of relationship between two
homogeneous and heterogeneous
parts (gradient), which in this
way becomes undefined



d.

apply the Köppen Geiger climate
classification to the newly
generated geography, taking into
account that there will be
possible intersections of diffe-
rent climate classes
(the colour codes of the original
classification are changed as
desired)

-technical note-

BORDO CLIMA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the projection covers the Earth from −180° to 180° longitude, and 85.05° north and south.

2.5 particel world

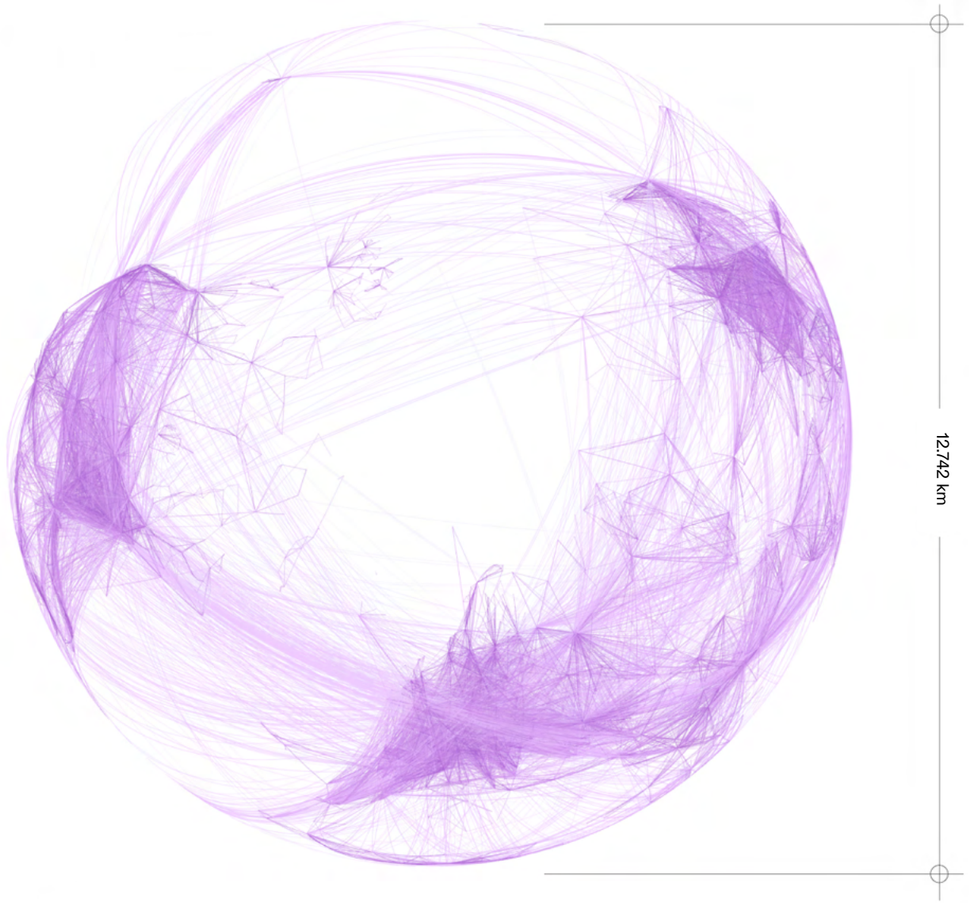
2.5.1 Hyperobjects

The legacy left by postmodernity in our current historical context is the need to find, think or elaborate new forms of interpretation capable of responding to the crisis that postmodernity and that Bauman's liquidity has established even in the cornerstones of the disciplines, cancelling forms and showing the need to generate new concepts and methods to respond to the current problems constantly unresolved by historical, environmental, climatic and political transformations. Therefore, a theoretical need emerges that has practical implications, yet able to interpret the contemporaneity and its metamorphic speed (Marini 2016).
The current ecological and climatic issue places man in a condition of rethinking his relationship with the space that surrounds him, having to do with sudden geopolitical climatic changes. The reading and analysis of the territory and space, in a new key within the disciplines, especially those of architecture and landscape, is proposed to understand and overcome the concept of the world through a profound immersion in a new theoretics of space (Marini 2016). This new key of interpretation has its roots in the theories of OOO (*Object-Oriented-Ontology*) theories applied above all by Timothy Morton in the definition of the concept of *hyperobject* within the contemporary context.

The ecological era in which we find ourselves does not allow us to use "meta-languages" but rather to make it clear from the very beginning, according to Morton, that we are already in the era of hyperobjects, whereby these objects in their own right (Morton 2015) have already had a strong psychic and social impact. With this term Morton defines those global phenomena, constructed by human and non-human beings, that have an enormous impact on our world, but of such a scale that they cannot be understood in their entirety. And it is precisely this opacity of these phenomena that makes people so distressed about the ecological crisis leading to denialism. The ethics that can handle hyperobjects is directed toward the unknown and unknowable future.
Not the future we can predict and manage, but an unknowable future, an absolutely unexpected stranger and unexpectable arrival,thas has a sort of uncanny familiarity (Morton 2015).
Hyperobjects are those externalities that have ousted man from a decidedly privileged position. World is more or less a container in which objectified things float or stand. The world, as the background of events, is an objectification of a hyperobject: the biosphere, climate, evolution, capitalism.
This is why the age of hyperobjects is also defined by Morton as the *Age of Asymmetry*: a new phase of weakness and instability, in which the more knowledge we accumulate about radiation, global warming and other objects, the more we realise how entangled we are in it. Knowledge is no longer able to match the speed of the Earth, what Heidegger called the "impetuous and imposing reality of things" (Morton 2015).
Hyperobjects stimulate thought by posing scalar dilemmas to which it is not possible to respond by establishing ontotheologically what is more real: the ecosystem, the world, the environment or, conversely, the individual.
They make evident things that are already known: human beings are weak, since they agree with entities that crowd around them.
Hyperobjects cause alterations in the territory including many directly related to moving boundaries. It is for this reason that the Intergovernmental Panel of Climate Change (IPCC) has recognised the "risk of territorial integrity" that appear to be closely linked to global warming (Ferrari 2019).

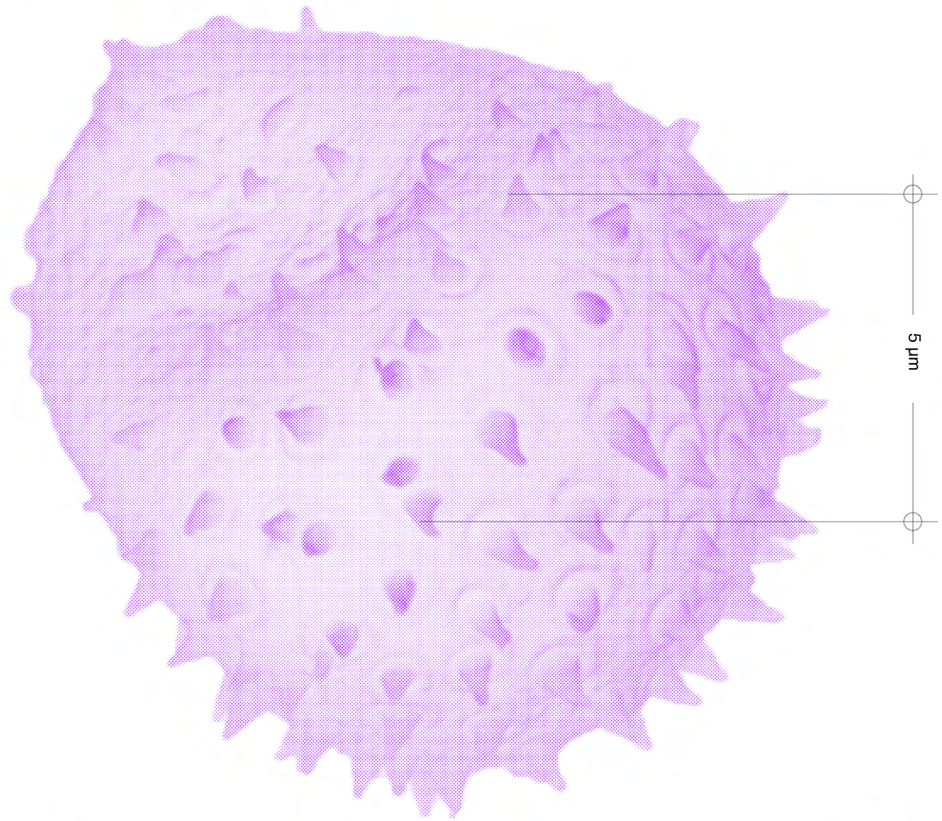
What happens when boundaries are altered not directly by conflict but by geophysical processes? What happens when rivers change direction, coastlines shift and glaciers melt?

AIR ROUTES



2019

PM2.5 - 10



SEI 10kV

figures n.15-16
The comparison of scale using GIS, air pollution data, and the airport database of arrivals and departures in 2019, the number of pollutants emitted in the world's air routes travelled in a month is mapped in comparison to the dimension of the little particle emitted

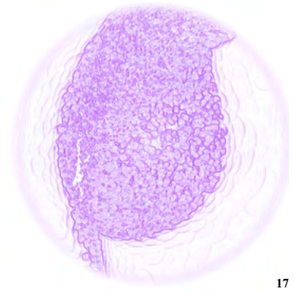
"Hyperobjects occupy a higher dimensional space than other entities can normally perceive. Thus, hyperobjects appear to come and go in three-dimensional space, but would appear differently to an observer with higher multidimensional vision."

Coffield, Kris. "Interview: Timothy Morton". Fractured Politics. Retrieved 15 September 2011

2.5.2

New Topographies

Hyperobjects can change and assume spatial form by being in contact with the ground, or even more precisely with borders. By imagining which phenomena on a planetary scale are asymmetrical and characterize the movement of a boundary, we can distinguish between human and non-human phenomena.
Melting glaciers, floods, droughts and earthquakes are just some of the non-human catastrophes generated by the great Global Warming Hyperobject. The disturbances and catastrophes that generate movement, morphogenesis, something that is out of focus and moving. However, there are also human phenomena that we can identify as Hyperobjects: deforestation and loss of biodiversity, intensive fishing that causes coastal and seabed erosion, human migrations, driven by wars and even more so, today, by climate.
The methodological figure of externality mapped on a global scale thus creates tensions and bulges on the earth's surface, and even more so in dense and disturbed places such as those near borders.
Can the movement of a hyper-object, passing from one state to another across a border, such as that due to the phenomenon of climatemigration, generate new topographies? Can the flow of man across a territory change its shape?



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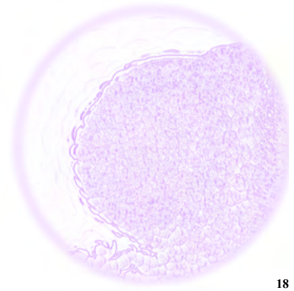

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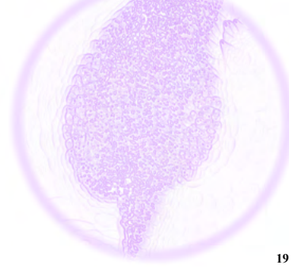

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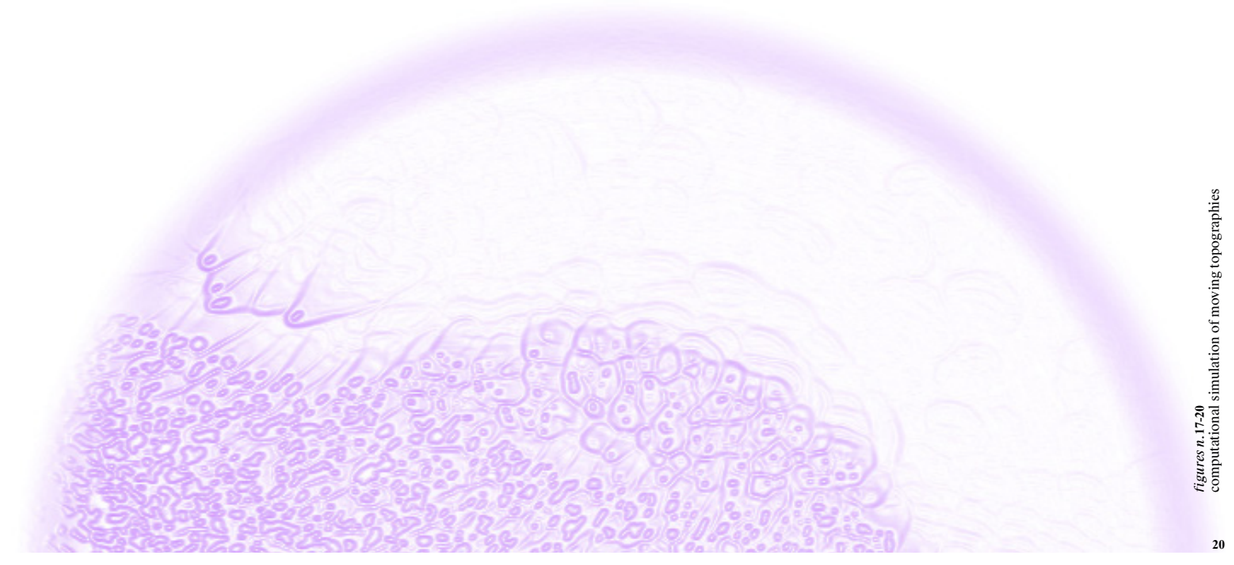
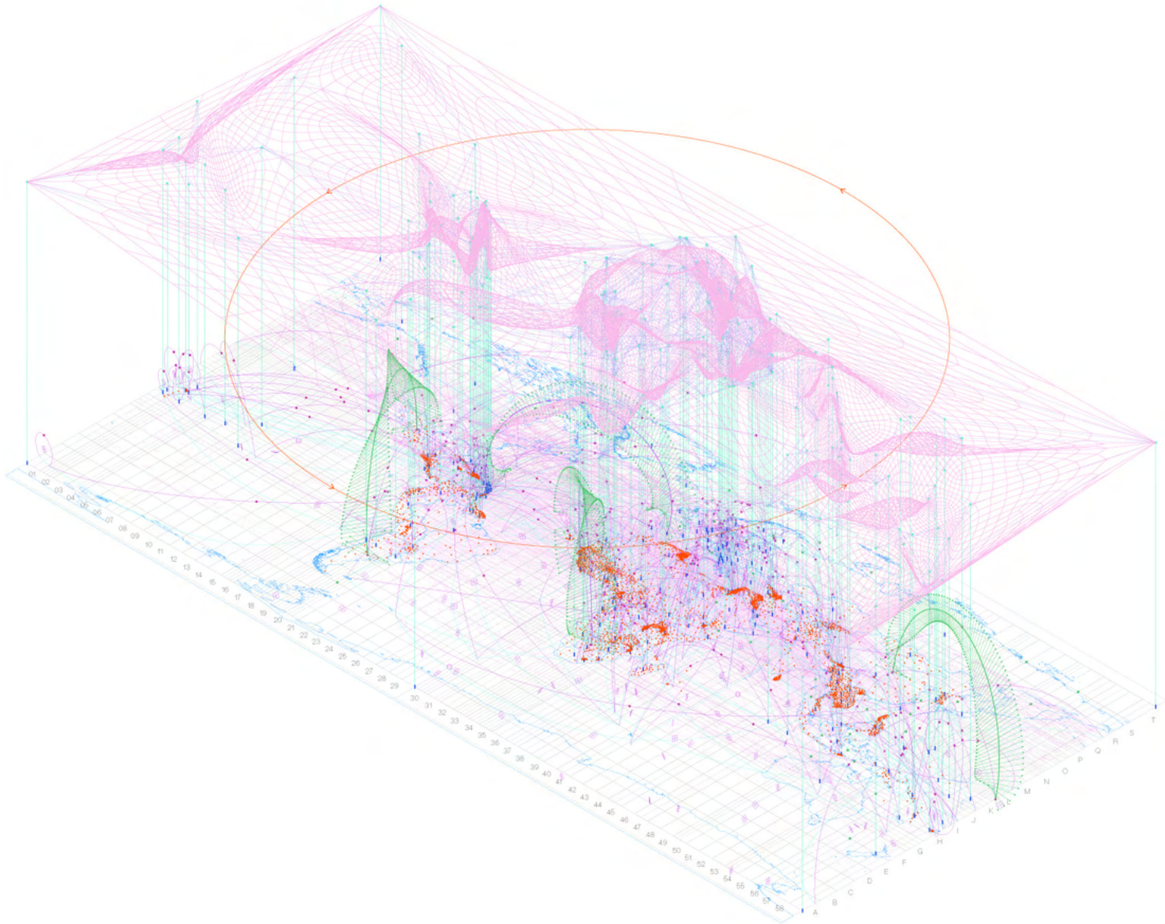


figures n.17-20
computational simulation of moving topographies

20



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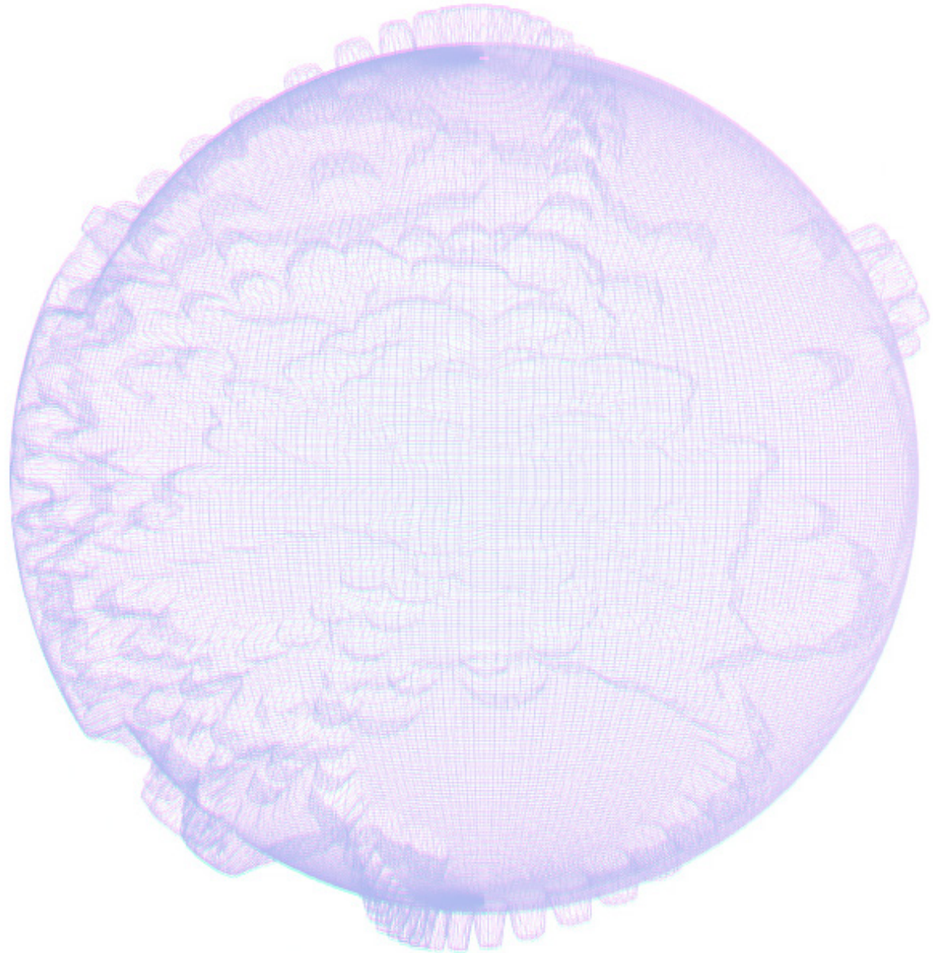
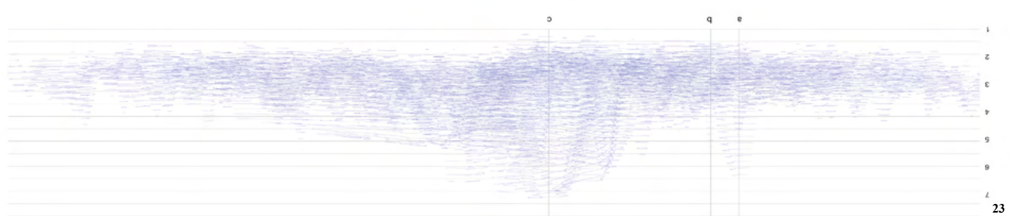


22

The United Nations High Commissioner for Refugees (UNHCR), at the end of 2020, published a report of data regarding forcibly displaced people worldwide: 84.3 million in total, including 4.1 million asylum seekers, 36.4 million refugees, and 48 million internally displaced persons. In 2021, refugees represented 1% of the population on a global scale, fleeing their home countries due to persecution, climate and violent conflict. Using GIS software, data from 1951 to 2020 was examined and mapped to find patterns of the global refugee movement. Border migration is considered in the research to be one of the hyperobjects that can move edges. Therefore, based on the number of people crossing each border (interpolation of point A and point B intersecting a curve/edge),
a "new topography" was extruded directly related to the intensity with which borders are crossed.

(source: spreadsheet of population statistics compiled by the United Nations High Commissioner for Refugees - UNHCR -)

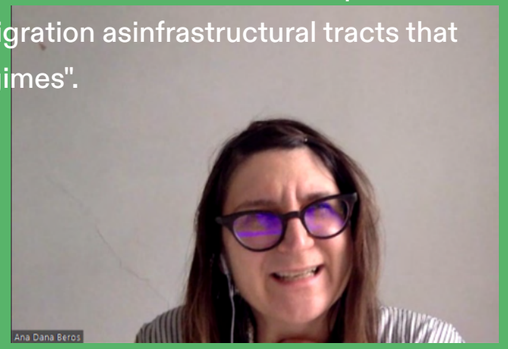


23

figures n.22-23
migration hyperobject creating
new topographies: 3d globe and section

Ana Dana Beros
Geotrauma

"Borders not only define political law, they also constitute geographic realities built of infrastructure, forging politics into the landscape. Architect Ana Dana Beroš and filmmaker Matija Kralj foreground this infrastructural element in a short experimental film and text, depicting the political drama of migration asinfrastructural tracts that increasingly define the geography of border regimes".



Ana Dana Beros is an architect and curator focused on creating uncertain, fragile environments that catalyze social change.

Her research project *Intermundia*, which questions alternating borderscapes of trans-European migration, was selected as the Wheelwright Prize finalist by Harvard Graduate School of Design and received a special mention at the 14th International Architecture Exhibition at the Venice Biennale curated by Rem Koolhaas (2014).
She was the Zagreb curator of ACTOPOLIS, a transnational artistic lab initiated by the Athens Goethe-Institut (2015–17).
Currently, Beros is the guest editor of *Life of Art* magazine on the topic of TRANS/MIGRANCY and Vice President of the Croatian Association of Architects.

-conversation-

.Would you consider the problem of Migration as a Hyperobject of the Contemporary?

A. It is interesting to have this sort of contradiction with the term object. I'm thinking of something some solid rock and in comparison with migration as a phenomenon, as a social, political but also environmental phenomenon.
So in the sense, hyperobjects of migration immediately brings us images of entire continents moving and changing the globe, so in a sense, it's in relation to the theoretical and research models we are making today.
The research that we have been doing, it's close to the centre of the place, so it's very important that places we document and research then always go back to think how to mediate or interpret them. It's crucial that we are placed in that particular situation, in a particular context in time and space. I love this term soil metabolism. So this is actually where we sort of stand, stand strong.

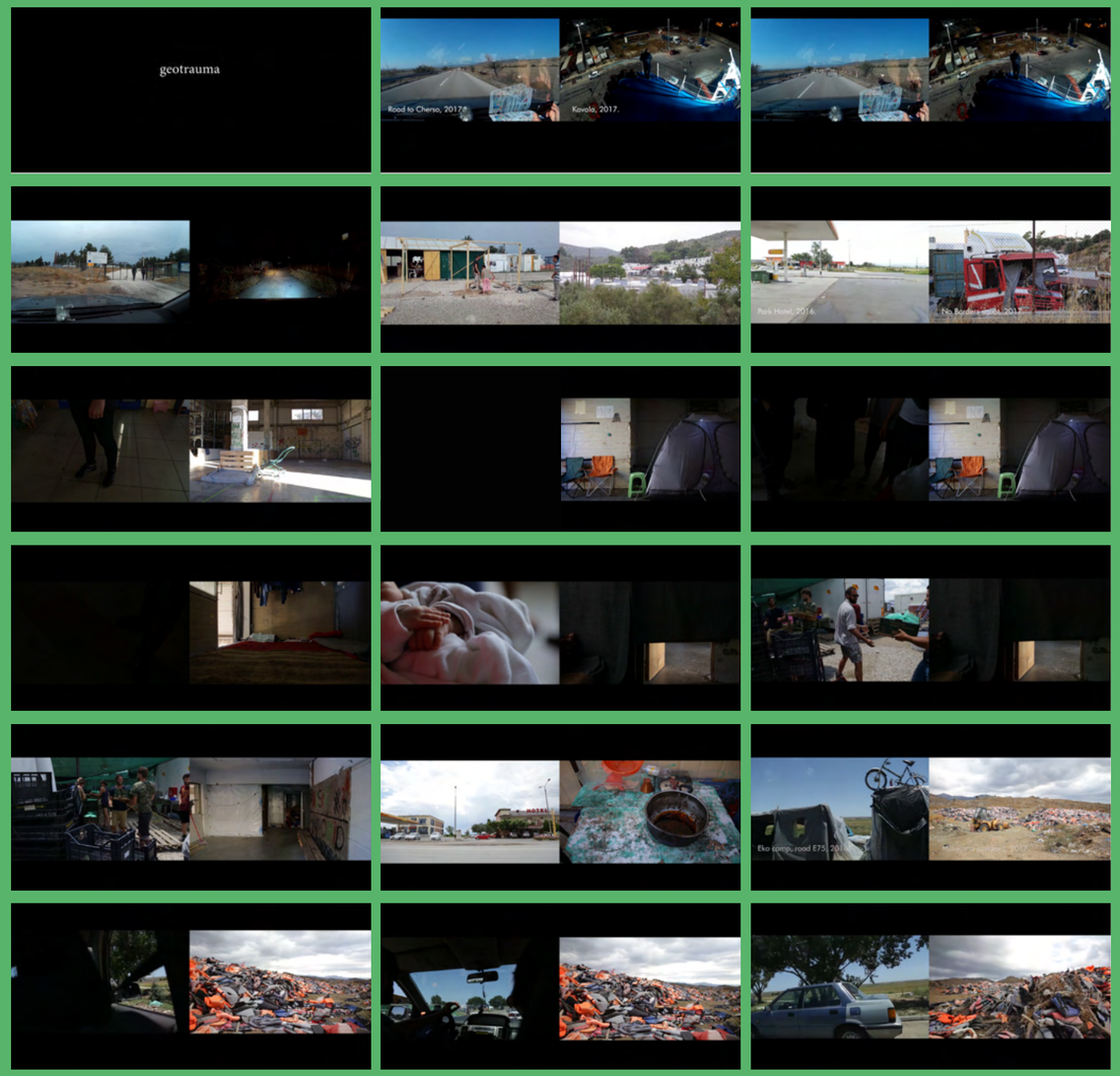
.The movement of humans along the Balkan Route is able to generate political and social tensions on the Balkan borders, do you think that there can be a correlation between human tensions and the generation of new forms of space and landscape?

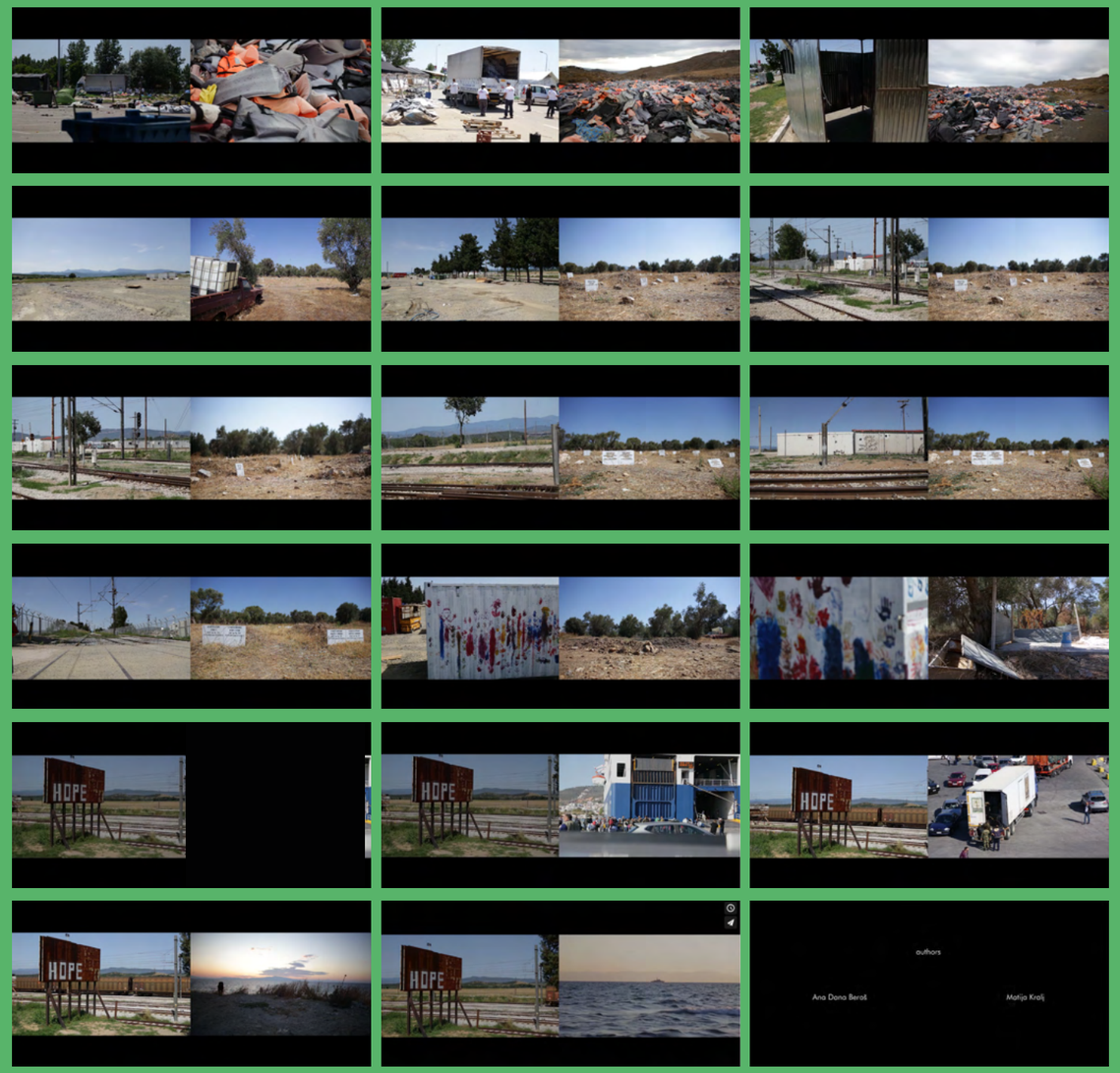
A. The agency of humans in creating, re-creating, transforming borders and the borderscape, so it's important to say that I believe most of us carry the notion of border within ourselves. In that sense, a person crossing a border, being somewhere in the continental part, whether Croatia or Bosnia, is actually stretching out the border in the sense. Regarding tensions in borderscapes, It was always interesting for me in my research to to document and to focus on the marginalised communities on the borderline, talking about how to say locals or individuals, talking about free agents as migrants and people moving.
The thing that is specific or maybe not so specific about the Balkans, and it's hard to say, we are currently reliving the trauma of either of the Yugoslav wars in the 90s.
So for us, the most difficult research trips were actually in the Balkan's borders, in comparison to just researching and documenting other places in the Mediterranean, because we were in the bones of this geotrauma.
Besides documenting it was important to get engaged and involved in transnational movements. It was always important to work to build networks, to work with such horizontal networks. We're all trying to find a person with similar beliefs to work for. We're trying to find collaborators within the border communities, local people or of course with migrants themselves. one of the most pressing issues on the Croatian and Bosnian border is actually the issue of illegal pushbacks. Okay.

If we think about that, in that sense the border tensions is absolutely spread out all the way from Bosnia to Slovenia, having this sort of reborder push backs from Slovenia, sometimes even from from Italy, from Kyrgyzstan, all the way back to Bosnia-Herzegovina.

.Considering your transdisciplinary approach that uses art in the exposition of a problem, do you think that art and the production of new visual methodologies can be considered a Best Practice strategy for architectural practice?

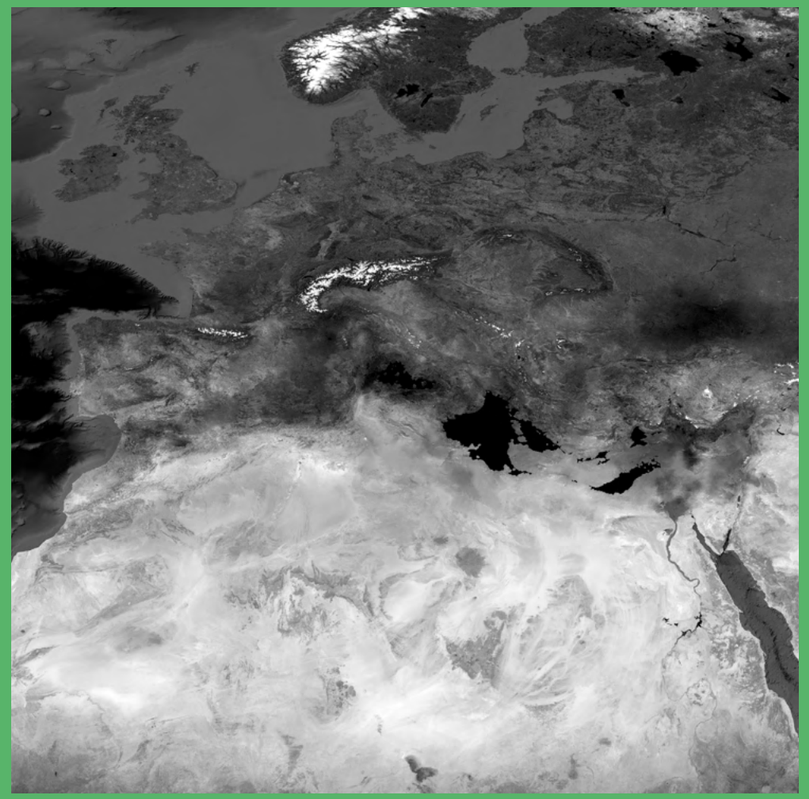
A. I would say Architectural Path have some sort of a natural drift. In a way, it was very difficult for me to accept and call it architect to define my practice an architectural practice. But then again, let's say artists also find it difficult to find in my practice someway artistic, as curators find and it's very difficult actually to comprehend other venues or other definitions. It's really important in time, in perfect timing to define in which way the practice is before them. Nowadays, that of architecture it's quite a general term for a practice that deals with critical spatial issues.
From the early 2000s, I believe it was Jane Rendell, the British theorist, who coined the term and used and used the term because it's a very broad term that actually absorbs, of course, architecture, art and other disciplines with a more scientific scientific approach to research.
For me, there is one anecdote which is very important: some five years ago we have been in northern Greece after the closure of the border passage. It was just after actually the Balkan route has been officially closed in 2000 and 2016, and I have been there with an NGO and with colleagues and with my artistic partner, Martin, actually there not to film, but to start understanding what was actually going on, especially in monitoring camps and all these sorts of sites. And there we were put to a task to help rebuild a cultural centre that was already exhisting for 72000 people in this military camp was organised and maybe had around 3000 at that point inhabitant.
And It was needed to build a school as a very first task, but within a fenced off compound; so they actually asked us to build a fence around this school and the schoolyard.
With my habilities I said I'm not going to reproduce and recreate the boundaries and fences. After working there physically, it was a period of summer, so it was really arid, when you were there on my own, working with all the children around, you see and realise that your beliefs start crumbling. Of course, we should not build a fence around the school.
Life is so much different from what we believe.
That was like a strong proof for me. Architectural outcomes often come too much in a sort of swayed way trying to express political ideas





"Geotrauma is not merely a wound, incised in organic texture by means of a foreign object, or even an individual experience, instead, it is a physical and material reality onto which all of life on Earth is inscribed, with its traces accumulated and entangled within us"

-geotrauma-



https://topalovic.arch.ethz.ch/Libraries/Lectures/Intermundia-Ana-Dana-Beros

"The Intermundia research project questions alternating border-scapes of trans-European and intra-European migration. The project started with depicting the case of Lampedusa as a metonym of contemporary detention conditions at the entry point to the Fortress Europe. Lampedusa serves as a textbook example of an erased space arising at geopolitical crossroads, where socially and institutionally marginalised communities are being formed. Instead of observing the island of Lampedusa as consolidated institution of the ***waiting room***, a jailed zone in the middle of conflict, Intermundia attempts a post-human perspective in order to investigate the ambivalent state of ***in-between-ness*** and the (im)possibilities of cultural translation".

-intermundia-

Powers of ten
Charles and Ray Eames

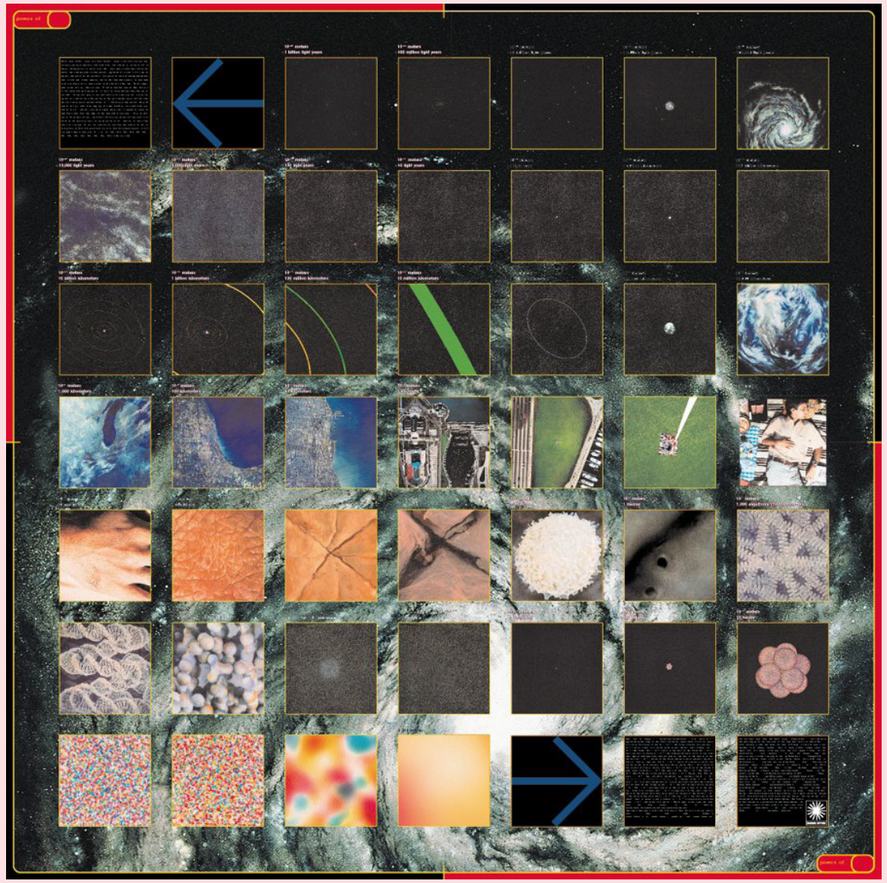
"This lonely scene, with galaxies like dust, is what most of space looks like.
This emptiness is normal. The richness of our own neighborhood is the exception".
Contemporaneous with the first photographs ofthe earth from space, this scientific film essay, narrated by Phil Morrison, plays a similar role in the history of scale aesthetics.

“Based on the 1957 book by Kees Boeke, *Cosmic View. The Universe in Forty Jumps*, the Eameses decided to use its concepts as the basis of a film that investigates the relative size of things and the significance of adding a zero to any number.

Starting with a closeup of a man sleeping near a lake, it makes its way quickly to the edge of the known universe. Then, just as quickly, it reverses course and descends down to the level of a carbon atom.

zooms back by a factor of ten.

-art and science-



Powers of Ten is an aesthetic event comparable to the first image ofthe earth from space. Though much less discussed, the Eameses’ film represents all known scales of the universe in one continuous zoom,expressing a space-age cosmology. Images that many had by then seen intextbooks and magazines seem sutured together in a single, virtual shot.The film locates the human perceptual mesocosm, the world perceptible to our senses, between vast expanses of patterned energy and microscopicdepths of atomic structure”.

Scale in Literature and Culture,
D.Wittenberg, M.T. Clarke
www.eamesoffice.com/the-work/powers-of-ten/

2. BORDOCLIMA
2.1 BORDO
2.1.1 ETYMOLOGY OF BORDER

Le frontiere sono concettualizzate come confini e visualizzate bidimensionalmente come linee nello spazio che dividono lo spazio. Luoghi di conflitto, luoghi di densità, luoghi con un livello di decisione umana molto alto hanno la capacità di racchiudere il territorio e generare enormi disparità basate su decisioni arbitrarie.
Ogni confine è un atto di potere (Popescu 2012). Siamo continuamente sottoposti a fatti istituzionali (Searle 2010), viviamo confinati all'interno di istituzioni costrittive che sono diventate tali perché collettivamente accettate. Da barriera fisica a simbolica, i confini diventano un paesaggio di conflitto, una traccia piena di densità, domande politiche, negoziazioni. La sua traccia porta il peso delle guerre e della storia, in cui nel corso degli anni ha rimarcato il suo potere deontico. La genesi delle frontiere dal materiale al sociale, per quanto collettivamente riconosciuta, ha bisogno di nuove conformazioni. Saturi di complicazioni e conflitti, i confini esplodono in nuove figure, uscendo dal regime statico per entrare in quello dinamico.
Quando si tratta di ontologie complesse, è impossibile crearle e mantenerle in vita senza un elaborato insieme di regole scritte, che renda visibile e comprensibile alla comunità la dinamica di evoluzione dei propri confini. Un sistema di regole nella società può poggiare su condizioni architettoniche, come la traccia di un confine capace di esercitare un potere deontico complesso. Le mappe e gli atlanti sono sempre stati oggetti politici per eccellenza, la loro visione dall'alto stabilisce una rappresentazione dominante delle interazioni politiche (Farinelli 2009). Le mappe sono caratterizzate da scientismo e indicizzazione, che ci permettono di vivere lo strumento come un "mezzo non interferente tra la realtà spaziale e la percezione umana" (Jacob 2006). Ma le mappe non sono solo politiche, sono anche dispositivi epistemologici.
Una linea nello spazio, quando proietta la sua traccia sul terreno, assume due significati contemporaneamente, sia come spazio che divide due parti "tra" stati, sia come unico punto di contatto tra queste due parti.
Questa linea può essere proiettata sullo spazio in diversi modi, può essere resa visibile sul paesaggio attraverso elementi artificiali, recinzioni, muri o fossati, oppure vuoti ambientali, spazi sospesi, fluidi, in cui la linea rimane fluttuante in una dimensione geometrica non radicata sul terreno. La concezione dello spazio del confine come luogo tra stati è un passo importante nella concettualizzazione del confine perché implica il fatto che l'oggetto sociale confine non può essere trattato con divisioni di forze sociali ma è una costante di forze tra regimi giuridici ed economici, tra stati, tra territori. Il confine non è solo le sue parti che toccano i due stati, è la cosa che sta tra i due stati tangenti. "I confini sono complessi elementi compositi proprio tra gli stati. letteralmente ed effettivamente in movimento in diversi modi" (Nail 2016).
Il primo confine ufficiale riconosciuto in senso moderno fu creato nel 1659 con il trattato dei Pirenei, ma prima che il concetto di confine fosse riconosciuto come sovrapponibile ad un elemento naturale del paesaggio, come per esempio lo spartiacque, si arriva al 1866-68 con i trattati di Bayonne, dove per la prima volta lo spartiacque fu formalmente delimitato e demarcato (Kratochwill 1986). Un fiume funziona come un bordo solo se c'è una sorta di impatto sociale nell'esserlo. "Fiumi, montagne, mare, ghiacciaio, costa, deserti, palude, spazio aereo, sotterraneo, sottomarino sono tutte condizioni in cui la relazione tra forma geofisica e regime geopolitico sono complicate e fluide" (Shah 2012).
Un confine è, in questa definizione, una linea di larghezza nominalmente nulla (Elden 2019).
Secondo le teorie di Stephen B.Jones, in Boundary Making: a Handbook for Statesmen la demarcazione nella forma della traccia di un confine su un luogo avviene dopo la definizione giuridica e l'accordo politico. Questa sequenza temporale non si limita alla materializzazione. Jones parla del problema della manutenzione. Il paesaggio, in continua trasformazione e mutazione, può eliminare le tracce precedenti della linea.
Il territorio è un concetto complicato, che include aspetti tecnici e giuridici. Il territorio può essere concepito come una tecnologia politica (Foucault 1988) o un insieme di tecnologie politiche che regolano il rapporto tra persone, luoghi e potere (Elden 2013).
Eyal Weizman interviene in questa definizione di territorio introducendo prima la questione dimensionale che è legata al concetto di margine, cioè che lo spazio politico deve essere compreso in tre dimensioni. (Weizmann 2007). Per comprendere la complessità di un bordo dobbiamo aggiungere l'asse verticale, e guardarlo attraverso la lente del suo volume, profondità, altezza, consistenza e pendenza (Elden 2013). Il terreno, la materialità di cui è strutturato un confine, si concretizza in costrutti giuridici e politici.
"Non c'è nulla di naturale - fisicamente o socialmente - nei confini. Sono letteralmente delle imposizioni sul mondo. Questo non vuol dire che i confini siano in qualche modo semplicemente metaforici o testuali, senza materialità; linee su una mappa piuttosto che un insieme di oggetti e pratiche nello spazio" (Agnew 2008).
La concezione contemporanea del confine è costruita su presupposti geofisici e dinamici.
La terra è dinamica. Anche il confine, come divisioni continue, è dinamico. "Il confine stesso come zona o fenomeno plastico modellato da e limitato dai flussi umani" (Nail 2016)

2.2 CLIMA
2.2.1 NEW CLIMATIC REGIME

La pratica del design e dell'architettura si scontra nel dibattito contemporaneo con il concetto di clima e il problema delle risorse, già anticipato negli anni '70 dal Club di Roma in The Limits To Growth in cui faceva una previsione della mancanza di risorse a cui stiamo assistendo oggi, concentrandosi su diversi problemi che riguardano il mondo e la società.
Ci troviamo in un momento di emergenza e di crisi ecologica, che fanno da sfondo costante alla vita quotidiana. Non è più tempo di fare meta-strategie come suggeriscono Timothy Morton e Bruno Latour: il mondo contemporaneo porta con sé un problema tra gli elementi che compongono il pianeta e il modo in cui interagiscono.
È un momento in cui l'umanità ha assunto il ruolo di agenzia ecologica su scala planetaria attraverso la nostra trasformazione dell'ambiente terrestre (Graham 2016) entrando in un Nuovo Regime Climatico (Latour 2017), in cui il clima, come fenomeno ha cessato di essere un dato di fatto al quale gli uomini dovevano adattarsi come meglio potevano, e che variava entro certi limiti, ed è diventato l'argomento più urgente e più contestato della loro politica (Latour 2017, 2018)
Il clima infatti oggigiorno acquista quasi una valenza di entità politica, di attrattore che interagisce attivamente con l'uomo nelle questioni geopolitiche che vedono sempre di più la modernità e la globalizzazione e un atteggiamento di negazionismo climatico come strategia difensiva. Come viene denunciato da Bruno Latour, nel suo libro Down To Earth, il vero problema del Nuovo Regime Climatico è che la classe dirigente - o "élite oscurantiste" - sembra essere arrivata alla conclusione che non ci sia più posto sulla terra per loro stessi e per il resto della popolazione, e reagisce così negando il cambiamento climatico, rifiutando i limiti imposti dalla natura e considerando il pianeta un deposito infinito di materie prime.
Come negare che ci troviamo di fronte a un altro potere che impone barriere diverse dai vecchi limiti cosiddetti "naturali"? (Latour 2018).
Ciò che viene portato all'attenzione non è tanto il ruolo centrale dell'umanità nel Nuovo Regime Climatico, quanto piuttosto il suo destino e la possibilità di non essere l'unico attore del pianeta. La natura in questo contesto viene definita come attore agente (Latour ANT) e processo continuo interconnesso all'attività umana. Per questo motivo viene introdotto il concetto di Critical Zone (Latour 2021): un volume sull'involucro della biosfera che si estende verticalmente dalla cima della bassa atmosfera fino alle cosiddette rocce sterili e orizzontalmente fino a dove si possono ottenere dati affidabili sui vari flussi di ingredienti attraverso il sito scelto; uno strato limite vivo, respirante e in evoluzione dove interagiscono roccia, suolo, acqua, aria e organismi viventi. Invece di un solo agente, " l'uomo ", che agisce " sulla natura ", entità eterogenee entrano in gioco sul terreno, mescolandosi in diverse combinazioni. Queste complesse interazioni regolano l'habitat naturale e determinano la disponibilità di risorse per la vita, generando tracce sulla Critical Zone ogni secondo, ora, anno e tempo geologico. L'attuale struttura e funzionamento della Critical Zone riflette le risposte a breve termine a eventi come le precipitazioni e le attività umane come i cambiamenti di uso del suolo, e risposte a lungo termine al clima e ai cambiamenti tettonici nel corso del tempo geologico. In questo senso, il concetto viene trascinato da Latour nella sfera politica del Nuovo Regime Climatico: la "politica" non è limitata esclusivamente agli esseri umani, ma include tutti gli elementi o entità considerati come parte della composizione del mondo comune e l'evoluzione del clima diventa per tutti qualcosa di descrivibile che è possibile vedere, sentire e a cui reagire. Letteralmente, la Critical Zone coinvolge tutti i suoi abitanti in una narrazione di storie, crisi, conflitti e trasformazioni che differisce totalmente da quella che era una volta, quando l'uomo sentiva ancora "di avere i piedi ben saldi per terra" (Latour 2017).
Se all'interno di questa situazione vacua e geopolitica l'uomo si sente senza terra, 'al largo', è in gran parte a causa dell'offuscamento tra ciò che facciamo e come veniamo a registrare le conseguenze della nostra azione.
Questo richiede non solo più idrologia, più biologia, più geochimica, ma anche più regolamentazione, poiché un quadro giuridico totalmente diverso è l'unico modo per bilanciare il deflusso dell'acqua con l'afflusso - specialmente in un periodo di intensa, e alcuni dicono duratura, siccità (Latour 2014). Qualunque sia la definizione del Nuovo Regime Climatico, è chiaro che stia portando in cicli vertiginosi di esplicazione, revisione e riflessività. Così, ancor più del concetto di Antropocene, il concetto di Critial Zone cambia la nozione di spazio che apparteneva anche alla nozione di Natura, così come nelle vecchie divisioni tra geografie umane e fisiche. (Latour 2021)
Non possiamo più permetterci di discernere le discipline: i processi di deregolamentazione e globalizzazione, l'aumento della disuguaglianza e la negazione del cambiamento climatico sono conseguenze di un mondo in tensione verso la modernità e il progresso. Il Nuovo Regime Climatico richiede un focus sul geosociale, per cui ogni attività umana deve essere considerata insieme all'impatto che avrà sul pianeta, e per cui una comprensione socialmente attiva della natura è data in costante interazione con le pratiche antropologiche: ciò che colpisce gli umani è modellato dalle manifestazioni naturali, e viceversa.
Sotto questo grande ombrello chiamato clima, la ricerca non solo mira a generare una nuova metodologia per la progettazione architettonica e paesaggistica, ma anche a portare la nuova comprensione all'attenzione dei responsabili politici e del pubblico di tutto il mondo, come un momento di discussione, uno spazio fatto di disegni per generare idee e domande da indagare.

2.3 FIGURES OF CONFLICT
2.3.1 HELIX

Il concetto di elica come nuova figura del conflitto nasce dall'intersezione della tensione umana e non umana. I luoghi emblematici di questa tensione sono i confini: luoghi di conflitto e di negoziazione che si collocano all'interno di un contesto dinamico. La trasformazione che si produce attraverso questa tensione viene considerata come una torsione, generata da due fenomeni e rappresentata figurativamente dall'elica geometrica, che si compone appunto di due forze sovrapposte che generano il movimento. La struttura di questa figura metodologica si basa sul principio di complementarietà piuttosto che su quello di uguaglianza (Latour 1987). Si è deciso di trascinare questo concetto scientifico nel metodo utilizzato per una nuova lettura del confine: il confine acquisisce uno spessore e una terza dimensione (Elden 2013), dove le costruzioni umane come le infrastrutture, le frontiere, le barriere fisiche o i confini geometrici amministrativi, si scontrano con i confini naturali, fiumi, montagne, oceani. Questa elica si genera in punti specifici, noti come punti di discontinuità: il modello varia di territorio in territorio poiché dipende dall'intensità delle due forze (umane e non umane) che agiscono in un dato spazio-tempo. Infatti, il diagramma oscillatorio di questa figura che si forma è direttamente proporzionale alla dimensione dello spazio e del tempo. Essa registra le polarità non umane cercando di misurare la linea del tempo che indica i picchi e le variazioni dell'intensità dei fenomeni. La figura dell'elica rende così possibile l'ambivalenza del confine come spazio di separazione e allo stesso tempo spazio comune (Arenes 2019). Per mappare questa nuova figura nello spazio, si è partiti dalla classificazione morfologica dei tipi di confini territoriali su scala globale dividendoli nelle due categorie, umani e non umani, a seconda di quale delle due forze agenti avesse maggiore intensità. Quei confini in cui era presente la sovrapposizione spaziale tra questi due attori sono all'interno del modello identificati e definiti come eliche. Infatti, sia le forze umane che quelle non umane sono attori nella costruzione di questa nuova figura del conflitto (Latour 1999): partendo dall' Actor-Network-Theory di Bruno Latour, secondo cui un attore (actant) è qualcosa che agisce o a cui l'attività è concessa da altri entità, sono stati definiti e interpretati i termini umano e non umano. Non umano viene definito come tutto ciò che riguarda i fenomeni naturali e la natura stessa come entità che, secondo i processi biologici ed ecologici, agisce attivamente sullo spazio del confine, generando nuove forme e nuove tracce. L'umano viene invece definito come un attore che ha il potere di prendere decisioni, che sono direttamente legate alle forme dello spazio e che producono tracce significative su di esso. L'agency, nella ANT è equamente distribuita tra attori umani e non umani (Spencer 2019). Poiché la ricerca si occupa di sistemi complessi, nel nuovo scenario contemporaneo di continua interazione tra questioni sociali ed ecologiche, non è possibile separare questi concetti: i fenomeni naturali, i fenomeni sociali e il discorso su di essi non sono più visti come oggetti separati bensì come ibridi.
Per tradurre spazialmente e territorialmente il concetto di elica, si possono fare due esempi riferiti a scale e continenti diversi.
Il primo riguarda il confine tra Messico e Stati Uniti, dove il fiume Tijuana fa parte di un paesaggio condiviso, dove le tensioni politiche sono rafforzate sia fisicamente dalla presenza del muro che dalla doppia governance e dalle agende largamente opposte tra le due nazioni.
Il secondo riguarda il confine che delimita lo stato della Slovenia da quello della Croazia: a causa delle tensioni politiche generate dal fenomeno della migrazione umana, numerose recinzioni sono state poste sul confine che coincide specificamente con il fiume Kolpa, dove oltre a queste barriere fisiche, la polizia slovena agisce con violenza, bloccando il passaggio e il movimento transregionale.

2.4 BORDOCLIMA
2.4.1 MOVING BORDER

Come possiamo diventare sensibili al Nuovo Regime Climatico e alla riconfigurazione dei territori che esso implica? Le mappe sono fonte di ispirazione per le politiche che si insediano nella cornice relativamente stabile dei confini naturali. Cosa succede quando i confini fisici stessi devono essere mappati? Come ridisegnare queste linee nel mezzo della mutazione ecologica? 1
Bordoclima muove la ricerca teorica su due temi apparentemente distanti. Confine, dove i due strati del territorio, la geografia umana, che guarda direttamente alle interazioni sociali e ai movimenti umani, e la geografia fisica, che indaga i modelli nell'ambiente naturale, sono definiti nello spazio. Il clima, inteso come Nuovo regime climatico, è la condizione attuale in cui il riscaldamento globale sfida le nozioni di territorio, nella sua dimensione instabile costruita su interferenze e disturbi. Ripensare questa interazione tra discipline significa, prima di tutto, trovare un nuovo modo di rappresentarle. Laddove i fenomeni naturali definiscono i confini, il clima può accelerare la velocità e il grado di spostamento dei confini. I ghiacciai, gli oceani, i fiumi attraversati dal confine si riducono e, di conseguenza, la loro geometria cambia. Nel caso esemplificativo della frontiera nelle Alpi, il confine si sposta in modo tale che la linea naturale non coincide più con quella politica definita dagli stati e riportata sulle carte ufficiali. Il divario che esiste tra queste due linee può avere dimensioni diverse. Questo dipende dalla conformazione del territorio e dall'intensità dell'agente che si muove in una determinata direzione di flusso. Un confine in movimento crea incertezza politica nelle relazioni bilaterali attraverso il conflitto che spesso riflette le relazioni generali degli stati. Nonostante il fenomeno del riscaldamento globale, la cartografia militare ben nota e visibile continua a rappresentare gli agenti fluidi come entità statiche e fisse e il drenaggio fluviale come linee e vettori unidirezionali e adimensionali. Il confine fisico è visto come un costrutto sociale, un paradosso tra "staticità legale e dinamismo fluido" (Donaldson 2011) e l'incoerenza tra politiche che riconoscono sia un confine rigido che un marcatore di confine intrinsecamente flessibile (ICJ8). Il confine naturale geomorfologicamente in movimento che può disegnare divisioni politiche e gli effetti del confine in movimento è considerato ad oggi trascurabile. Per questo motivo, la ricerca vuole spostare il solido valore concettuale e simbolico del tema, che si interroga sulla possibilità di una nuova accettazione collettiva (Searle 1995) in cui le caratteristiche geografiche e morfologiche di un confine instabile possano incarnare una demarcazione politica. La nozione di Bordoclima può essere riconosciuta come un fatto scientifico socialmente costruito, come il prodotto finale di molteplici attori le cui agende sono spesso in conflitto. Alla luce dell'attuale crisi planetaria, questo fatto apparentemente irrilevante sembra condensare una serie di assunzioni sul terreno geofisico (Ferrari 2019). I movimenti di confine stanno accelerando a causa dei cambiamenti climatici e le politiche dovranno evolvere di conseguenza, e la risposta richiederà un insieme di regole politiche e tecniche. (ICJ8)

2.4.2 THE BORDERLESS ATLAS

La cartografia borgesiana non affronta il problema del possibile movimento dei confini fisici stessi. La necessità di rappresentare un territorio parametricamente connesso al continuo movimento ecologico è la sfida a cui la ricerca vuole rispondere. La crisi climatica ci costringe a ripensare e ridefinire la nostra concezione dello spazio, richiedendo di conseguenza nuove geografie. Esiste una relazione diretta tra rappresentazione cartografica e realtà. (Farinelli 2003)
Nella visione moderna gli stati e le nazioni sono modellati secondo i principi cartesiani di frammentazione della terra in pezzi uguali e infinitamente divisibili basati sul principio che lo spazio è assoluto e può essere razionalmente diviso.
L'avanzamento dei sistemi tecnologici contemporanei di mappatura e di immagini satellitari ha fatto sì che la percezione della mappa si trasformasse in quella di una fotografia, rendendole inseparabili dal loro modello fisico, nascondendo le tracce delle decisioni politiche sul territorio. In questo senso, il progresso tecnologico produce confusione tra la rappresentazione cartografica e la realtà. Da qui nasce di nuovo il problema della rappresentazione dei sistemi complessi. I nostri sensi limitati non possono catturare il mondo in un solo sguardo. Fissare un oggetto in un'immagine reale dello spazio, come accade nella fotografia, significa fissarlo in uno spazio lineare in uno spazio e in un tempo specifici. Per verticalizzare il concetto viene in questione la necessità di trovare nuove calligrafie.
I confini geografici stanno diventando sempre meno fissi sul territorio, assumendo caratteristiche multiformi. Studiando la performatività dell'essenza del confine, è possibile dedurre i suoi caratteri intrinseci e ambigui.
I flussi globali, le migrazioni e le tecnologie dell'informazione hanno stravolto la logica dei confini degli stati nazionali, creando reti transnazionali. Di fatto non ci sono confini naturali che separano gli esseri umani nello spazio. (Popescu 2012).
Il fenomeno della globalizzazione è stato spesso interpretato come il presupposto per un mondo "senza confini" in cui i confini sociali perdono la loro importanza rispetto agli agenti sociali. Ciò che spesso accade, tuttavia, in questi luoghi di conflitto, è un "vuoto politico" in cui l'area sotto il ponte metaforico rimane trascurata e non toccata da entrambe le parti (van Houtum 2013).
La volontà di ridefinire i confini nazionali, descritti come entità razionali, sostituendoli con flussi globali non porta a una definita suddivisione del mondo (Popescu 2012). Questo processo, noto anche come "re-bordering" implica la riorganizzazione dei confini che acquisiscono così nuovi ruoli e significati. Cosa accadrebbe se il fenomeno del rebordering, che per definizione trasferisce il potere nazionale a diversi livelli (sotto e sopra) dove non c'è più allineamento con confini territoriali fissi, riguardasse invece una struttura di potere mobile, riorganizzata, che si ancori al territorio seguendone i flussi nello spazio e nel tempo, adattandosi alla sua nuova forma gradiente?
I confini sono instabili nel tempo e nello spazio. L'aspetto più significativo di questo tipo di fenomeno di riterritorializzazione riguarda proprio la trasformazione radicale dell'idea di confine come linea topografica fissa, in una nuova dimensione fluida.
Una nuova geografia multistrato è essenziale per descrivere il concetto di movimento che impatta e si riverbera tra gli stati di una nazione. In particolare, le direzioni spaziali in cui il confine si muove sono multidimensionali e più movimenti possono avvenire simultaneamente nello stesso contesto geografico.
La tridimensionalità del territorio e la sua instabilità (Elden 2019) permettono l'individuazione di agenti contrapposti tra due stati che determinano il movimento del confine, sia in una dimensione aerea che rimanda direttamente alla classificazione climatica degli stati, e ai confini planetari, sia in una dimensione materiale che rimanda alle topografie e agli spessori del suolo.
La critica alla cartografia ufficiale, apparentemente lenta, non in grado di cogliere l'accelerazione e la scala dei fenomeni naturali e degli Iperoggetti che definiscono la contemporaneità è stato il presupposto per intervenire, come architetti e progettisti con gli strumenti della professione.
L'opportunità di intervenire è proprio quella di rendere visibili le fluttuazioni e allo stesso tempo problematizzare la rappresentazione convenzionale.
A sostegno dell'instabilità del territorio e delle sue continue fluttuazioni geomorfologiche e sociali nello spazio. In un mondo dove ci sono più stati che frontiere. Nella visione di un atlante senza confini, immaginiamo come la figura metodologica del gradiente possa estendersi in una potenziale cartografia. Secondo questo immaginario, i nuovi stati catalogati vengono caratterizzati da confini fatti di gradienti, generando così un'unica figura a scala diversa. Il bordo infatti viene considerato come un elemento di relazione tra due parti eterogenee, che in questo senso si unificano. L'uso della classificazione di Koppen Geiger 2 nelle nuove geografie generative, tiene conto della possibile intersezione tra diverse classi climatiche e quindi di un possibile trascinamento di nuova biodiversità all'interno di uno stato inizialmente alieno. Questo movimento di biodiversità e di classi climatiche implicherà l'adattamento delle agende di ogni stato a questo tipo di incorporazione.

2.5 PARTICEL WORLD
2.5.1 HYPEROBJECTS

L'eredità lasciata dalla postmodernità nel nostro attuale contesto storico è la necessità di trovare, pensare o elaborare nuove forme di interpretazione capaci di rispondere alla crisi che la postmodernità e che la liquidità di Bauman ha stabilito anche nei capisaldi delle discipline, annullando le forme e mostrando la necessità di generare nuovi concetti e metodi per rispondere alle problematiche attuali costantemente irrisolte dalle trasformazioni storiche, ambientali, climatiche e politiche. Emerge quindi un'esigenza teorica che abbia risvolti pratici, ma che sia capace di interpretare la contemporaneità e la sua velocità di metamorfosi (Marini 2016).
L'attuale questione ecologica e climatica pone l'uomo in una condizione di ripensamento del suo rapporto con lo spazio che lo circonda, avendo a che fare con improvvisi cambiamenti climatici geopolitici. La lettura e l'analisi del territorio e dello spazio, in una nuova chiave all'interno delle discipline, soprattutto quelle dell'architettura e del paesaggio, si propone di comprendere e superare il concetto assodato di mondo, attraverso una profonda immersione in una nuova teorica dello spazio (Marini 2016).
Questa nuova chiave di lettura ha le sue radici nelle teorie della OOO (Object-Oriented-Ontology) applicate soprattutto da Timothy Morton nella definizione del concetto di iperoggetto all'interno del contesto contemporaneo. L'era ecologica in cui ci troviamo non ci permette più di utilizzare "meta-linguaggi" ma piuttosto di chiarire fin dall'inizio, secondo Morton, che siamo già nell'era degli iperoggetti, per cui questi oggetti, considerati tali a pieno titolo, (Morton 2015) hanno già avuto un forte impatto psichico e sociale sull'umanità. Con questo termine - Iperoggetto - Morton definisce quei fenomeni globali, costruiti da esseri umani e non, che hanno un enorme impatto sul nostro pianeta, che hanno una scala tale per cui non possono essere compresi nella loro interezza.
Ed è proprio questa opacità di questi fenomeni che rende le persone così angosciate per la crisi ecologica portando al negazionismo climatico ambientale. L'etica che può gestire gli iperoggetti è diretta verso il futuro sconosciuto e inconoscibile. Non il futuro che possiamo prevedere e gestire, ma un futuro inconoscibile, un arrivo assolutamente inatteso, estraneo e inaspettato, che ha una sorta di inquietante familiarità (Morton 2015).
Gli iperoggetti sono quelle esternalità che hanno spodestato l'uomo da una posizione decisamente privilegiata. Il mondo è più o meno un contenitore in cui galleggiano o stanno le cose oggettivate. Il mondo, come sfondo degli eventi, è l'oggettivazione di un iperoggetto: la biosfera, il clima, l'evoluzione, il capitalismo (Morton 2015)
Per questo l'era degli iperoggetti è anche definita da Morton come l'Era dell'Asimmetria: una nuova fase di debolezza e instabilità, in cui più conoscenza accumuliamo sulle radiazioni, sul riscaldamento globale e su altri oggetti, più ci rendiamo conto di quanto siamo invischiati in essa. La conoscenza non è più in grado di eguagliare la velocità della Terra, quella che Heidegger chiamava la "realtà impetuosa e imponente delle cose" (Morton 2015). Gli iperoggetti stimolano il pensiero ponendo dilemmi scalari a cui non è possibile rispondere stabilendo ontoteologicamente cosa sia più reale: l'ecosistema, il mondo, l'ambiente o, viceversa, l'individuo.
Rendono evidenti cose già note: gli esseri umani sono deboli, poiché si accordano con entità che si affollano intorno a loro.
Gli iperoggetti provocano alterazioni nel territorio, tra cui molte direttamente legate allo spostamento dei confini. È per questo che l'Intergovernmental Panel of Climate Change (IPCC) ha riconosciuto i "rischi di integrità territoriale" che sembrano essere strettamente legati al riscaldamento globale (Ferrari 2019).
Cosa succede quando i confini vengono alterati non direttamente dai conflitti ma dai processi geofisici? Cosa succede quando i fiumi cambiano direzione, le linee di costa si spostano e i ghiacciai si sciolgono?

2.5.2 NEW TOPOGRAPHIES

Possono gli iperoggetti mutare e assumere forma spaziale entrando in contatto con il suolo, o ancora più precisamente con i confini? Immaginando quali possano essere a scala planetaria, quei fenomeni asimmetrici che caratterizzano il movimento di un confine, possiamo distinguere quelli umani e quelli non umani. Scioglimenti dei ghiacciai, esondazioni, siccità, terremoti sono solo alcuni delle catastrofi non umane generate dal grande Iperoggetto Global Warming. I disturbi e catastrofi che generano il movimento. La morfogenesi, qualcosa che è sfocato e si muove. Esistono però anche fenomeni umani che possiamo identificare come Iperoggetti: la deforestazione e la perdita di biodiversità, la pesca intensiva che causa l'erosione delle coste e dei fondali, le migrazioni dell'uomo, mosse dalle guerre e ancor di più, oggi, dal clima. La figura metodologica dell'esternità mappata a scala globale crea quindi tensioni e rigonfiamenti sulla superficie terrestre, e ancor di più nei luoghi densi e disturbati come quelli in prossimità dei confini. Il movimento di un Iperoggetto, che transita da uno stato all'altro oltrepassando un confine, come per esempio quello dovuto al fenomeno della climate migration, può generare nuove topografie? Il flusso dell'uomo attraverso un territorio, può cambiarne la forma?
l'architettura si è evoluta per attraversare i confini disciplinari e di conseguenza creatività e informazione non sono due questioni distinte. (Stracuzzi 2019).
La ricerca racconglie sia una fascinazione per l'arte e la scienza che lascia trascinare concetti e opere teoriche nella pratica del progetto, sia i contributi di diverse persone che durante il loro percorso sono andate oltre la visione convenzionale della pratica per ridefinire che tipo di questioni volevano rispondere.
Alcuni di questi architetti continuano a lavorare in architettura, altri applicano le loro competenze in altre discipline. Mettendo in conversazione queste figure con la ricerca di bordoclima, l'obiettivo è quello di creare una definizione ampia e inclusiva di cosa sia l'architettura e di come essa si collochi all'interno della contemporaneità in modo liquido e versatile.

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come parlarne
questa cosa che non fa rima
ne vibra in giambi o si muove in modo prevedibile
come lince
o frasi

come trovare la sintassi
di questa cosa
che cavalca le marce
e si muove con loro e sotto di loro
e insieme a loro
e possiede un ventre cosi largo e profondo
che nemmeno le nostre luci piu potenti
sanno illuminarne l'intero corpo

e questa l'ombra della nostra anima
l'oscurita che non possiamo avere
la forma che non possiamo nominare

e ne posso scrivere solo di notte
quando la mia ombra mi risveglia, quando riesco
a sentire la notte che ricopre ogni poro e follicolo,
infiltrandosi
in occhi

e orecchi, entrandoci come Zeus, una notte che non voglio
ne in me ne sopra di me e sogno di dare alla luce
un bimbo informe e rugginoso che striscia fuori di me
e ancora e ancora senza smettere di strisciare, sempre piu
grande e nero,
diffondendosi e pulsando tra le mie gambe
oscurando il mondo.

come dev'essere sentirsi una tartaruga, per esempio,
nuotare nelle sole acque che hai mai conosciuto
nuotare poiche e il solo modo in cui ti muovi per il mondo
e finire su questa nera bile
questa specie di untuoso amante
una cosa che ti guarda
come una medusa, che ti ci tuffi e cerchi di mangiarla
e invece ricopre le tue pinne che non si muovono piu come
prima
e c'e questo peso sul tuo guscio e sulla testa
che prima non c'era, e sei cieco
nelle acque in cui sei nato

Midnight Oil
Sheryl St. Germain, 2010
reaction to the Deepwater Horizon oil spill

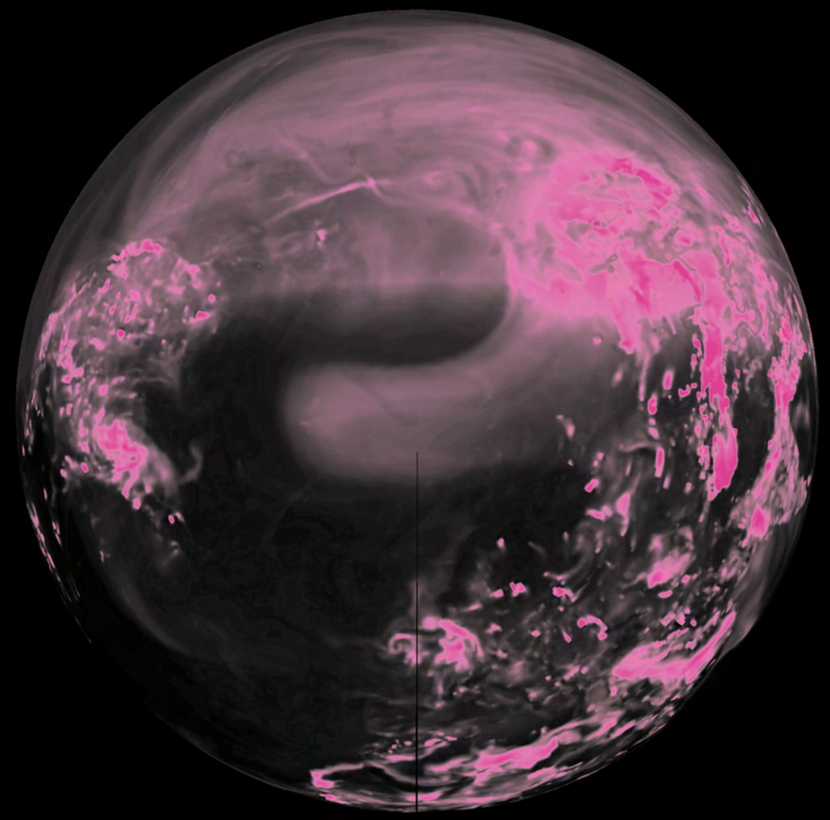


figure n. 24
CO_2 map at planetary scale 2020

3

on fluids

FLUIDODINAMICA DEL BORDO

Water and air also have sovereignty.
In the New Climate Regime, the boundary rejects linear and one-dimensional logic and includes elements outside the visible geo-political realm: water and air boundaries. The concept of fluid borders is introduced into the method from the science of fluid dynamics, which studies the behavior of fluids, defining them as aggregations of matter in the gaseous and liquid states. According to fluid mechanics, the assumption of constant variation of fluid elements is assumed, which are defined in a condition of continuous movement. Based on these theories of the science of physics, the characteristic properties of dynamism, permeability and indivisibility are applied to borders, which are subdivided into liquid, consisting mainly of water, rivers, glaciers, oceans, and gaseous, consisting of air and atmosphere. In this new border fluid dynamics, it acquires the third dimension, dragging the concept of flow, as a methodological starting point. Continuous movement, chance, uncertainty, and events, characterize the border that moves because of its intrinsic fluid properties.

fluids,
so to speak,
neither fix space nor bind time

fluids travel easily.
they flow, spill, run out, splash, pour
over, leak, flood, spray, drip, seep, ooze.

SOSPENSIONE FLUIDA

Baumann, *Liquid Modernity*
2000

3.1 ASSUME TO SUSPEND

3.1.1 The Balkans' Masterplan

Suspension implies a condition of spatial and temporal interruption, in which moments of reflection and observation are generated. It implies within the research the first step towards the relapse of the method and its experimentation in a specific place, which is identified as emblematic. This condition of suspension, in which emerges the need to territorialize theory and methods, identifies in the of the Balkan area those points of discontinuity characterized by conflict and by the previously described figure of the helix. These helical places present a greater coincidence between the administrative border and the ecological border, where the latter is understood to be the hydrogeological infrastructure formed by the Danube and its primary and secondary tributaries. These places are mapped according to their helix characteristics, i.e. according to the interference of human and non-human phenomena that generate the movement of the border, and according to the methodological figures of gradient, pattern and externality. These properties interact with the fluid dimension of the border, opening up questions and interferences in new possible scenarios. These scenarios emerge and are mapped on the territory as holograms of conflict, places of exception that were formed in the past and are in continuous formation, to generate a new Balkan Masterplan as a mapping of ecological and social fragilities. The Masterplan presents within it the points of discontinuity, marked through alphanumeric codes and symbols creating a database of information, traceable in the form of meaning and spatial matrices (chapter 3.2.3 Matrix). They are located at specific points on the border or in their surrounding areas.
The strategy of the method is to use complex software and data analysis as critical design tools. In particular, the use of GIS allows global and local phenomena to be monitored through the lens of the method's critical thinking, in which not only spatial data but also intangible issues and complex conflictual systems characteristic of the edge emerge.
Data relating to the different points of discontinuity and the phenomena connected to them can be traced back to a graphic semiology that makes it possible to construct a system of signs and a language that allows the immediate graphic translation of the information (Bertin 1967): each phenomenon is reworked according to a specific methodological figure starting from local and global geodatabases. Data, within the project, assume a processual and critical dimension, in contrast to its aestheticization, since it makes it possible to visualize the effects, generating a serialization of possibilities
The relationship between ecological and social structure thus emerges, taking us back to that condition of suspension marked by the uncertainty of the current social and climatic crisis.

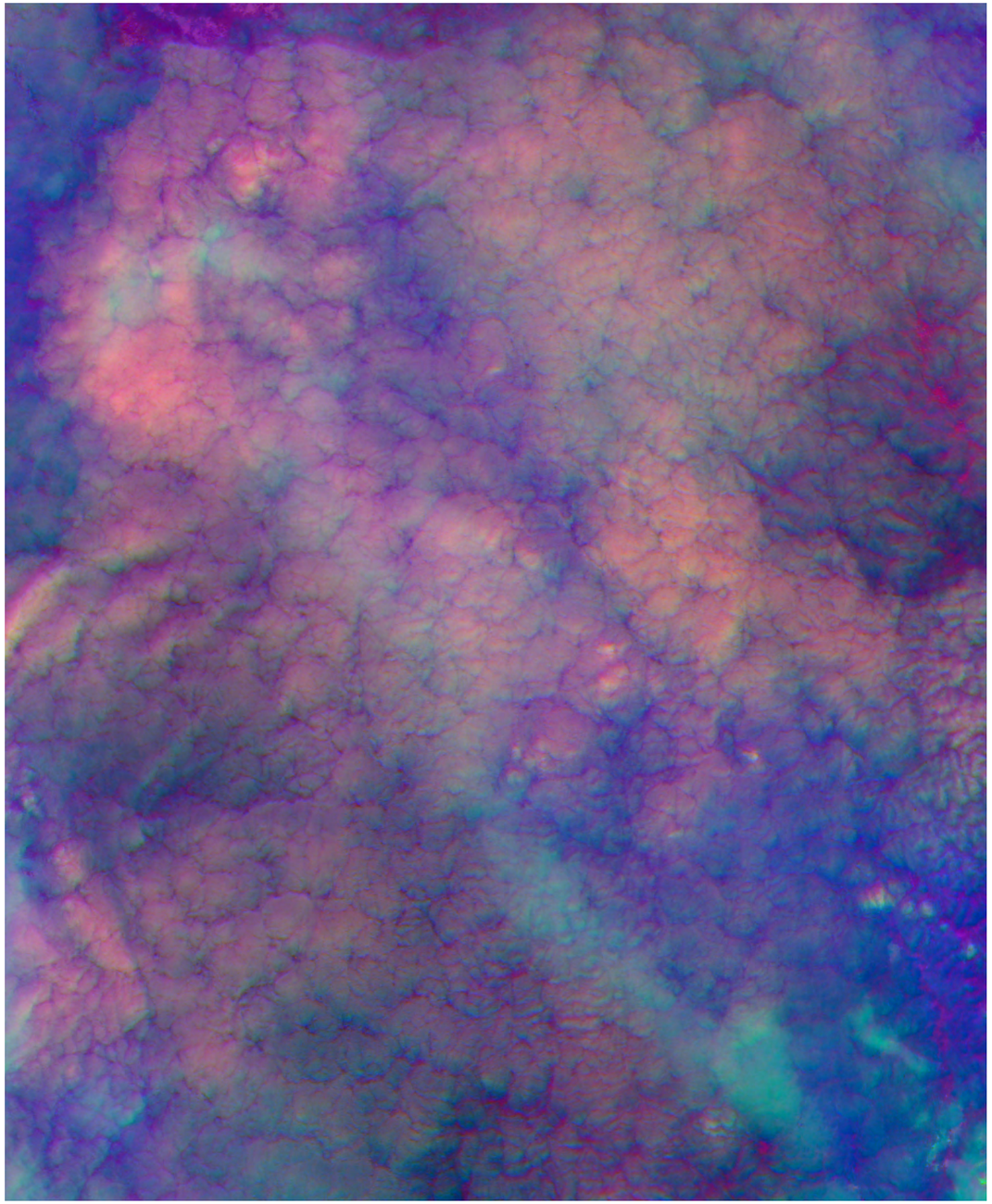
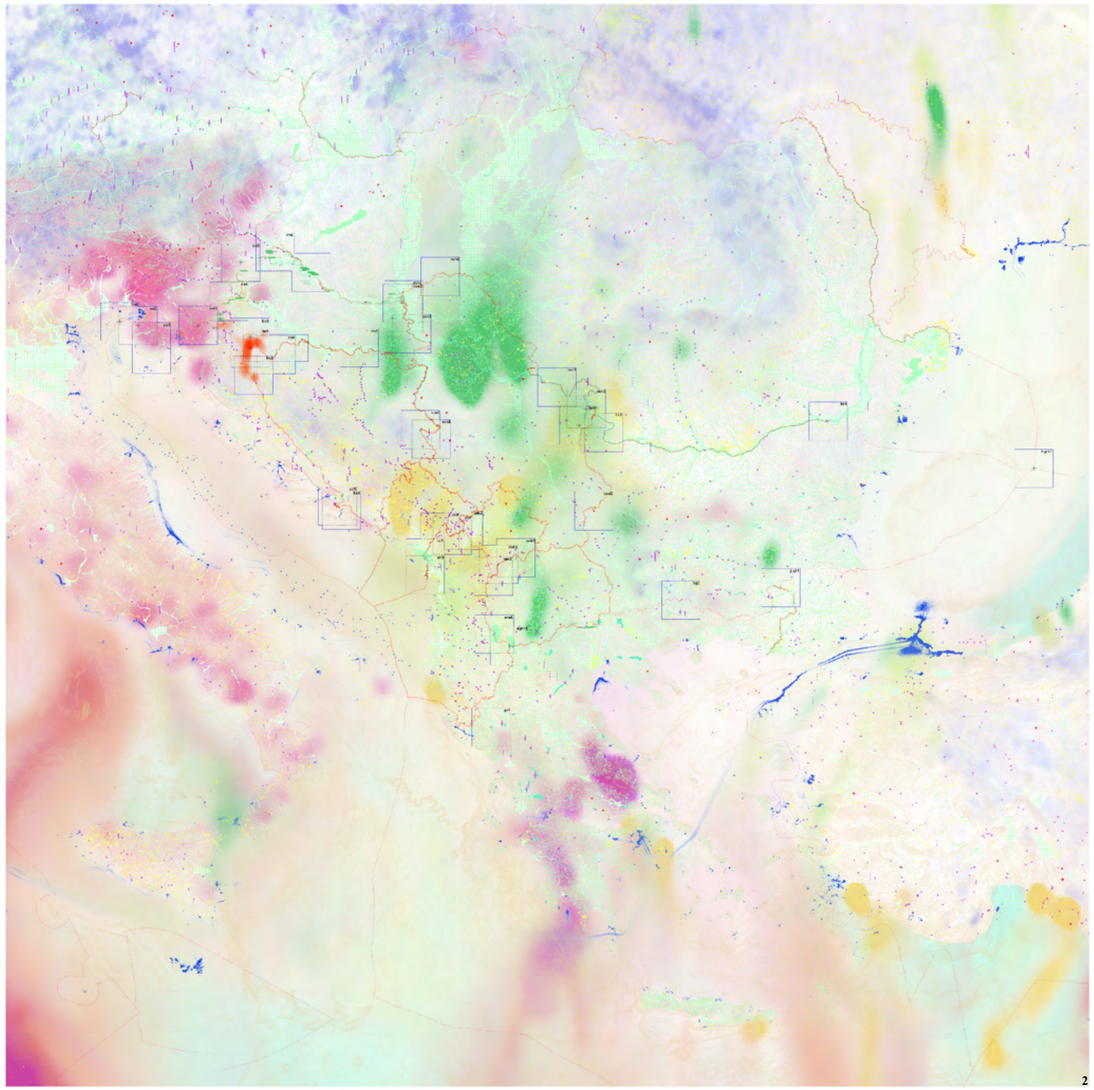


figure n.1
Balkan area fluid dimension



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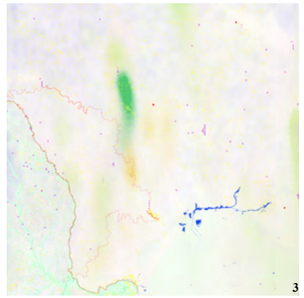

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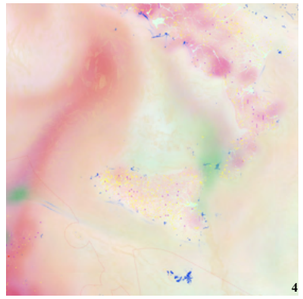

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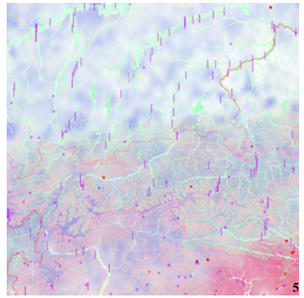

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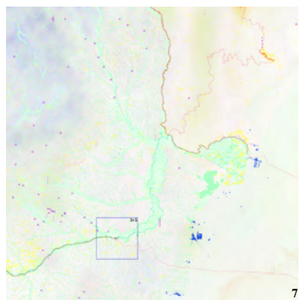

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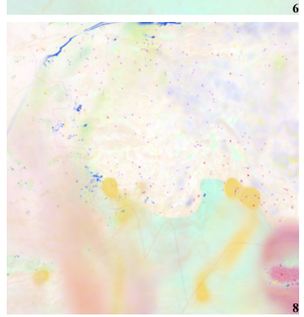

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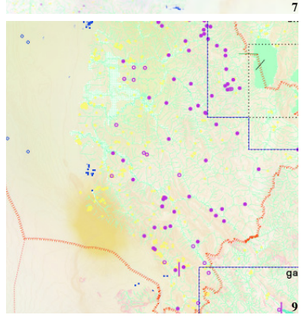

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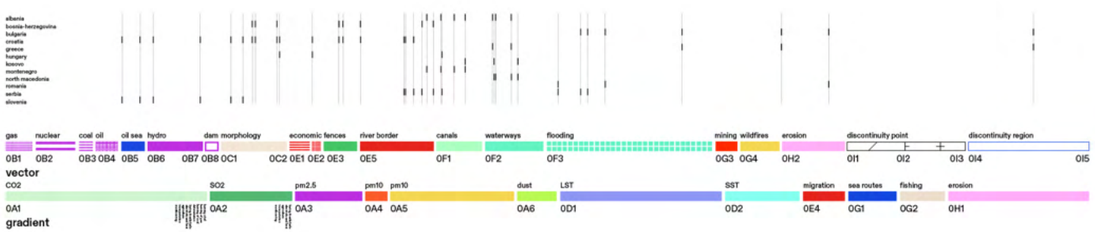

sémiologie graphique

figures n.2-9
the Masterplan f the Balkans

<Bounding Box>
data code /data name
num specificity origin source metadata .

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0A **air pollution**
- 1 CO2 — **greenhouse** https://ads.atmosphere.copernicus.eu/cdsapp#!/dataset/cams-europe-air-quality-forecasts?tab=form/carbon-dioxide — **2021.NetCDF**
  - 2 SO2 — **mining** https://ads.atmosphere.copernicus.eu/cdsapp#!/dataset/cams-europe-air-quality-forecasts?tab=form/sulphur-dioxide — **2021.NetCDF**
    - 3 pm2.5 — **urban traffic** https://ads.atmosphere.copernicus.eu/cdsapp#!/dataset/cams-europe-air-quality-forecasts?tab=form/PM2.5 — **2021.NetCDF**
      - 4 pm10 — **powerplant** https://ads.atmosphere.copernicus.eu/cdsapp#!/dataset/cams-europe-air-quality-forecasts?tab=form/PM10 — **2021.NetCDF**
      - 5 pm10 — **wildfire** https://ads.atmosphere.copernicus.eu/cdsapp#!/dataset/cams-europe-air-quality-forecasts?tab=form/PM10 — **2021.NetCDF**
        - 6 dust — **wind** https://ads.atmosphere.copernicus.eu/cdsapp#!/dataset/cams-europe-air-quality-forecasts?tab=form/PM10 — **2021.NetCDF**

0B **powerplants**
- 1 gas — **in use** http://datasets.wri.org/dataset/globalpowerplantdatabase/gas — **2021.csv**
  - 2 nuclear — **in use** http://datasets.wri.org/dataset/globalpowerplantdatabase/nuclear — **2021.csv**
    - 3 coal — **in use** http://datasets.wri.org/dataset/globalpowerplantdatabase/coal — **2021.csv**
      - 4 oil — **sea extraction** http://datasets.wri.org/dataset/globalpowerplantdatabase/oilsea — **2021.csv**
      - 5 oil — **in use** http://datasets.wri.org/dataset/globalpowerplantdatabase/oil — **2020.csv**
        - 6 hydro — **in use** http://datasets.wri.org/dataset/globalpowerplantdatabase/hydro — **2021.csv**
          - 7 dam — **future** http://globaldamwatch.org/data/future — **2050.csv**
          - 8 dam — **present** http://globaldamwatch.org/data/present — **2021.csv**

0C **morphology**
- 1 topography — **10 m** https://land.copernicus.eu/imagery-in-situ/eu-dem/eu-dem-v1-0-and-derived-products/eu-dem-v1.0 — **2021.DEM**
  - 2 bathymetry — **10 m** https://www.gebco.net/data_and_products/gridded_bathymetry_data/ — **2021.DEM**

0D **temperature**
- 1 LST — **land** https://land.copernicus.eu/global/products/lst — **2021.NetCDF**
- 2 SST — **sea** https://resources.marine.copernicus.eu/product-detail/SST_EUR_PHY_L4_NRT_010_031/INFORMATION — **2021.NetCDF**

0E **borders**
- 1 economic — **administratif** https://www.marineregions.org/ https://doi.org/10.14284/403 — **2021.ShapeFile**
- 2 Shengen — **area** https://www.marineregions.org/ https://doi.org/10.14284/403 — **2021.ShapeFile**
  - 3 fences — **conflict** https://www.fencing-borders.cc/2019.html — **2019.csv**
  - 4 migration — **pushback** https://www.borderviolence.eu/ — **2021.csv**
    - 5 rivers — **overlap** https://earthobservatory.nasa.gov/images/147238/when-rivers-are-borders — **2021.ShapeFile**

0F **rivers**
- 1 canals — **main** https://land.copernicus.eu/imagery-in-situ/eu-hydro/eu-hydro-river-network-database/canals — **2021.ShapeFile**
- 2 waterways — **secondary** https://land.copernicus.eu/imagery-in-situ/eu-hydro/eu-hydro-river-network-database/waterways — **2021.ShapeFile**
- 3 flooding — **0-50 years** https://data.jrc.ec.europa.eu/dataset/1d128b6c-a4ee-4858-9e34-6210707f3c81 — **2050.??**

0G **human action**
- 1 sea routes — **port area** https://emodnet.ec.europa.eu/en/new-insights-european-maritime-traffic-new-emodnet-vessel-density-maps — **2021.csv**
  - 2 fishing — **zone** https://ec.europa.eu/jrc/en/news/new-tool-map-fishing-activities-europe — **2021.csv**
    - 3 mining — **region** https://www.sciencebase.gov/catalog/item/594d3c8ee4b062508e39b332 — **2021.csv**
      - 4 wildfires — **hotspot** https://firms.modaps.eosdis.nasa.gov/active_fire/ — **2021.csv**
        - 5 mine — **hotspot** http://www.see-demining.org/main.htm — **2021.csv**

0H **erosion**
- 1 rainfall — **hotspot** https://www.emodnet-geology.eu/data-products/#wp5 — **2021.NetCDF**
- 2 soil — **crust** https://esdac.jrc.ec.europa.eu/resource-type/soil-data-maps — **2020.geoTIFF**

0I **discontinuity**
- 1 countries — **pt 2** specific point corresponding to a unique location identified by the interference of data on the border between 2 states — **2021.NetCDF**
- 2 countries — **pt 3** specific point corresponding to a unique location identified by the interference of data on the border between 3 states — **2021.NetCDF**
  - 3 region — **srf** specific region corresponding to the reverb of influence of the specific point on the border in relation to the two states — **2021.NetCDF**
    - 4 area — **srf** specific area corresponding to the sum of all the nearest point of influence on the border in relation to the two states — **2021.NetCDF**
      - 5 extension — **srf** specific extension corresponding to the whole area of influence on the border in relation totwo or more states — **2021.NetCDF**

			(00)	(01)	(02)	(03)	(04)	(05)
							0B1	0B2
			(10)	(11)	(12)	(13)	(14)	(15)
							0B6	0B5
			(20)	(21)	(22)	(23)	(24)	(25)
							0B7	0E4
			(30)	(31)	(32)	(33)	(34)	(35)
								0I4
			(40)	(41)	(42)	(43)	(44)	(45)
0C1							0I1	0I2
0C2			(50)	(51)	(52)	(53)	(54)	(55)
								0I5
			(60)	(61)	(62)	(63)	(64)	(65)
0H1	0H2	0G1	0G2	0G3			0E4	0E5
			(70)	(71)	(72)	(73)	(74)	(75)
							0G5	0D1
			(80)	(81)	(82)	(83)	(84)	(85)
0F1	0F2							0F3
			(90)	(91)	(92)	(93)	(94)	(95)

			(06)	(07)	(08)	(09)		
0B3			0E2	0E3				
			(16)	(17)	(18)	(19)		
0B4			0E1					
			(26)	(27)	(28)	(29)		
					0A6			
			(36)	(37)	(38)	(39)		
					0A5			
			(46)	(47)	(48)	(49)		
0I3					0A4			
			(56)	(57)	(58)	(59)		
					0A3			
			(66)	(67)	(68)	(69)		
			0E4	0E5	0A2			
			(76)	(77)	(78)	(79)		
					0A1			
0D2			0G4					
			(86)	(87)	(88)	(89)		
			(96)	(97)	(98)	(99)		

NH S H

			0B1	0B2	0B3		0E2	0E3
			0B6	0B5	0B4		0E1	
			0B7	0E4				0A6
				0I4				0A5
0C1			0I1	0I2	0I3			0A4
0C2				0I5				0A3
0H1	0H2	0G1	0G2	0G3		0E4	0E5	0A2
			0G5	0D1	0D2	0G4		0A1
0F1	0F2			0F3				

d

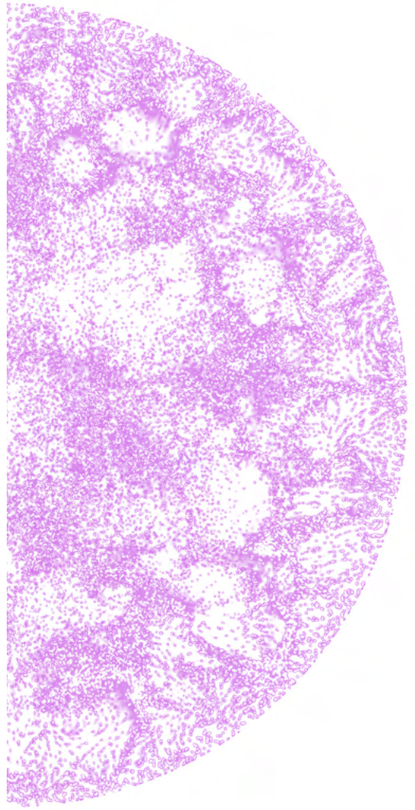
matrix of data source

3.2 DYNAMIC PROTOTYPES

3.2.1 Something in the air

The settled concept of borders in our imagery of the territory is changing. Complex topographical systems allow borders to assume different dimensions, hybridizing the solid political and rigid concept, the idea of something beyond the human lens.
Air borders are virtual limits in space, but they are under state jurisdiction, regulated by international agreements and treaties like territorial ones. According to international law, horizontal airspace corresponds to the territorial limits of a state, including its maritime borders.
How to govern something that cannot be seen? The intangible dimension of airspace subjects them to a greater intensity of international disputes and numerous complications.

The earth's atmosphere is composed of a layer of gases and aerosols, an envelope that maintains its position tangent to the earth only through gravitational attraction. The different weights of the airborne particles cause a thinner layer to be created at the earth's crust, which goes on to create the Critical Zone, the biosphere's interaction layer (Latour 2021), where microscopic particles of smog, dust and chemicals are deposited on the earth's soil and absorbed unfiltered by its inhabitants.
Saturated air exerts a form of colonialism over boundary space.
The areosol increases the complexity in atmospheric modeling of airspace. Contemporary urban political issues see the concept of "haze" as a danger to human health, a "material" capable of both destabilizing the atmosphere and the lives of the living beings who breathe it but even more so of collapsing the planet's current climate systems. With their compression and expansion in the airspace, air pollutants produce new spheres of action, social, economic and political, that generate the unstable and variable dimension of the atmosphere."Something in the air" imposes its dominance, generating places where conflict over the control of different vectors of the climate crisis manifests itself. Alternative cartographies of the air of the atmosphere can allow modelling its dynamics to create future scenarios to produce alternative projects suspended in the biosphere. In order to produce a new imaginary of the airspace, it is necessary, however, to refer to the unstable concept of fluid movement, characteristic of these elements and its very complex dimension to map that requires a high level of critical skill in the data processing. Fueled by the actual instability of the particles, this concept of atmosphere speculates on increasingly dynamic earth. Through its properties of implosion and expansion, the geometry of the atmosphere claims a domain of its own, moving beyond its vision as a background, foregrounding itself as a fundamental agent in the conception of the moving border, both in its vertical and horizontal dimensions of space.



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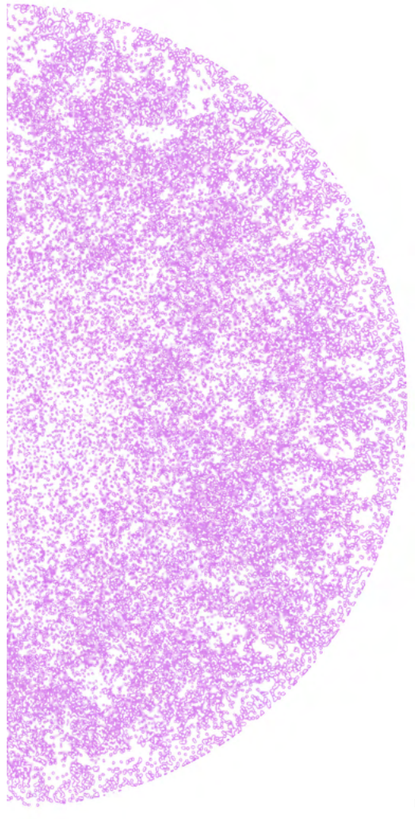

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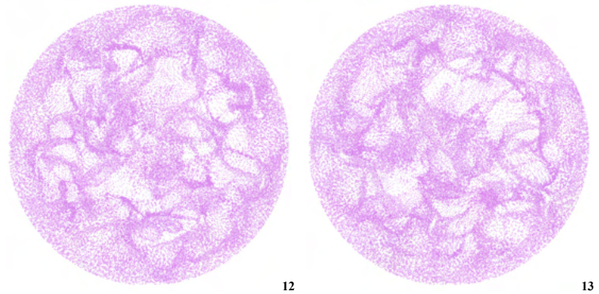
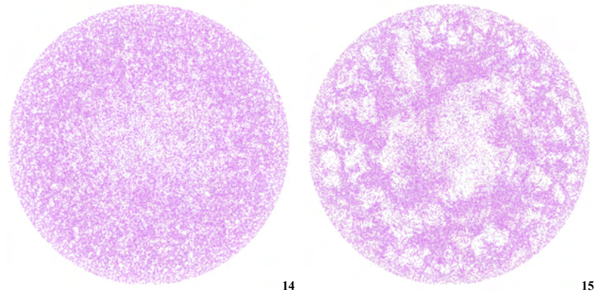


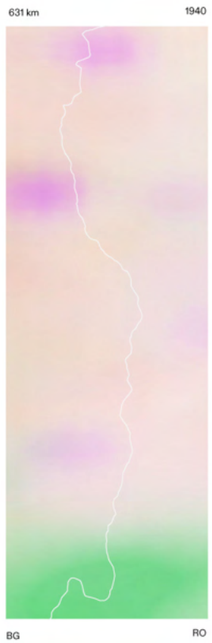
12 13



14 15

figures n. **10-15**
simulating interactions between particels
in the atmosphere

cards from the atmosphere



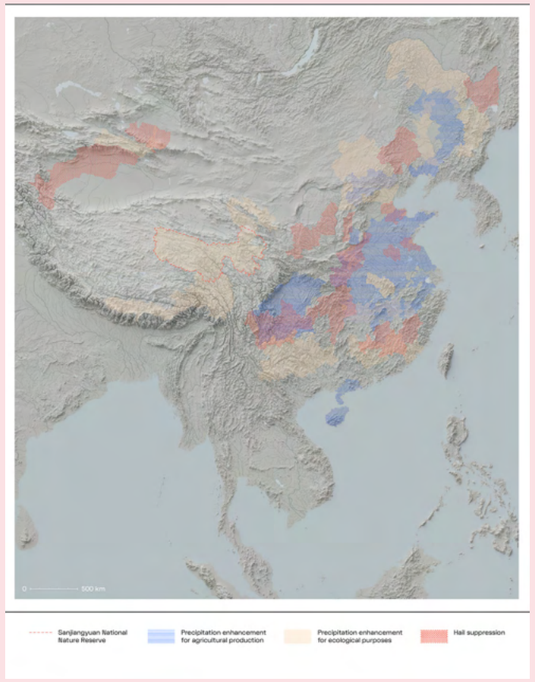
Sky River

Marco Ferrari, Elise Hunchuck

"Do you not see the Yellow River come from the sky?"

poet Li Bai - Tang Dynasty

Articulating a new planetary and atmospheric imaginary, the project positions the water that circulates in the upper atmosphere not as a natural occurrence but as an asset that can be secured through infrastructure.

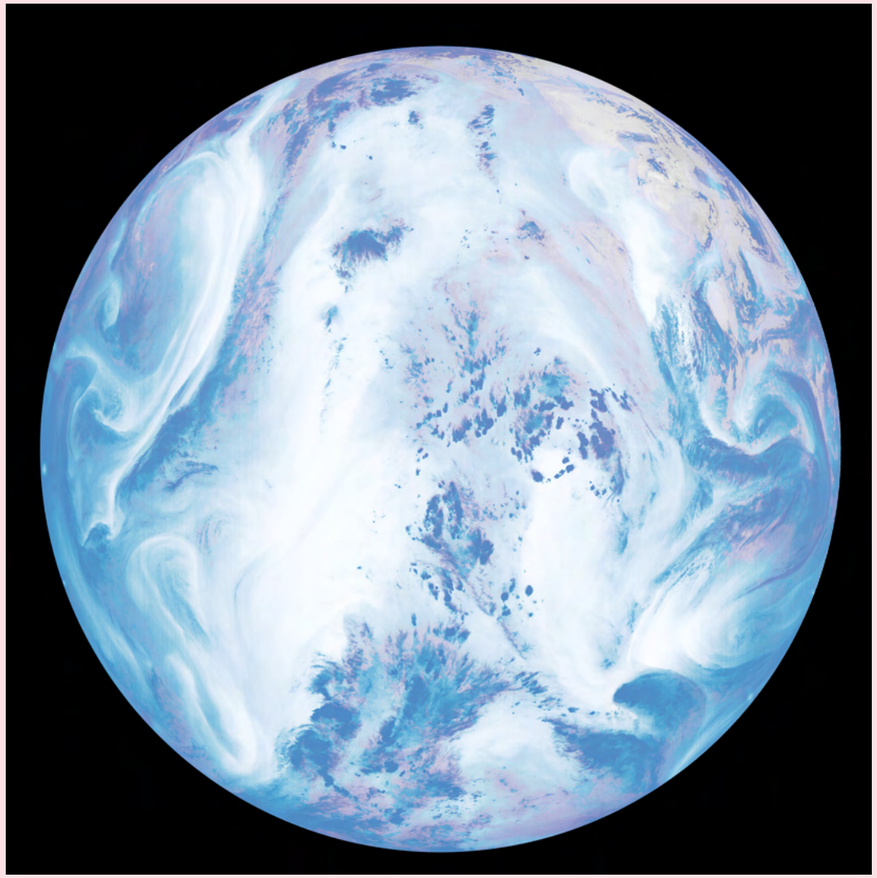


China's National Weather Modification Development Plan

"Sky River is a project by Marco Ferrari , Jingru Cyan Cheng and Elise Hunchuck, supported by the Chinese government to work on the watershed of the Huang He (Yellow River) through weather engineering and aimed at mitigating the territory's increasing drought conditions.

The sound of the border' examines the western edge created by these two adjacent conditions by analysing sound.
The project looks beyond cartography and its visual limitations by researching alternative modes of investigation.

-art and science-



water vapor and aerosols

Precipitation is, in this context, a readily available water source that could be managed through a distributed network of cloud-seeding devices, while the tracking of weather patterns can be done via sophisticated remote-sensing technologies".

www.averyreview.com/issues/53/prologue-to-the-sky-river
www.e-flux.com/podcasts/409144/wet-togetherness-8-discharging-cyan-cheng-marco-ferrari-and-elise-hunchuck-presented-by-shanghai-biennale

3.2.2

Liquid soil

The parts that constitute the border are in motion in different ways. The constant state of erosion and decomposition to which every physical object on earth is subjected is also manifested on the borders, subject to the constant movement of self-decomposition. (Nail 2016) The visible forms of the landscape are distorted under the fluid regime of amorphous floods and overflow events. Flood boundaries remain shifting forms, defined by the quantity and velocity vector of water. The aerial volume given by perturbations breaks down into the planar dimension of the land, spreading wherever gravity leads it and then going on to metabolize into the land. The combination of sea-level rise, increased climate fluctuations and urban expansion accentuated territories' risks near rivers. (Rossano 2021) The human relationship with river fluctuations changes over time, especially when this fluid demarcation coincides with a marked artificial sign on the territory. The territorial palimpsest of human traces decomposes as they break into liquid. Policies and laws must create a space for adaptation to these growing variations, bringing flexibility into landscapes petrified by centuries of hard engineering in favour of a model that supports contemporary ecological times. How can the functional demands of the project be reconciled with the natural dynamics within the water itself? (Prominski 2012). Designing elastic landscapes for uncertain futures means considering uncertainty as an inherent fact of human social action rather than a limitation. The concept of elasticity of the landscape given by its fluid component influences the forms of the landscape, untying them from the concept of function. The fluid conception made of fields of flows, with different chemical concentrations, different volumes and different viscosities and fixities, involves the design of speeds, cycles, synergies and synchronicities of interconnections. (Bélanger 2014)
The patterns of border distribution in superposition to fluid elements such as rivers are not random. Research by Professor Laurence C. Smith1 maps waterways as political borders at the global scale. According to his analysis, rivers make up 23 per cent of international borders, 17 per cent of the world's state and provincial borders, and 12 per cent of all county-level local borders. (Popelka 2020) Accretion and Avulsion are two fundamental concepts for the boundary. "States accept slow, incremental meandering of rivers (accretion) but not rapid, large-scale shifts (avulsion). There are three methods of marking the boundary of a river. The boundary can be indicated by a simple midpoint or median, although this approach tends to distort resource allocations. The second and most recognized method is the "thalweg," or the centre of the main navigation channel. The thalweg distributes river water volumes more equitably and is preferred when navigation points are important. Third, the boundary may be a riverbank, which means jurisdiction over the entire river." (ICJ8)

1. Department of Earth, Environmental, and Planetary Sciences (DEEPS), Institute at Brown for Environment and Society (IBES)

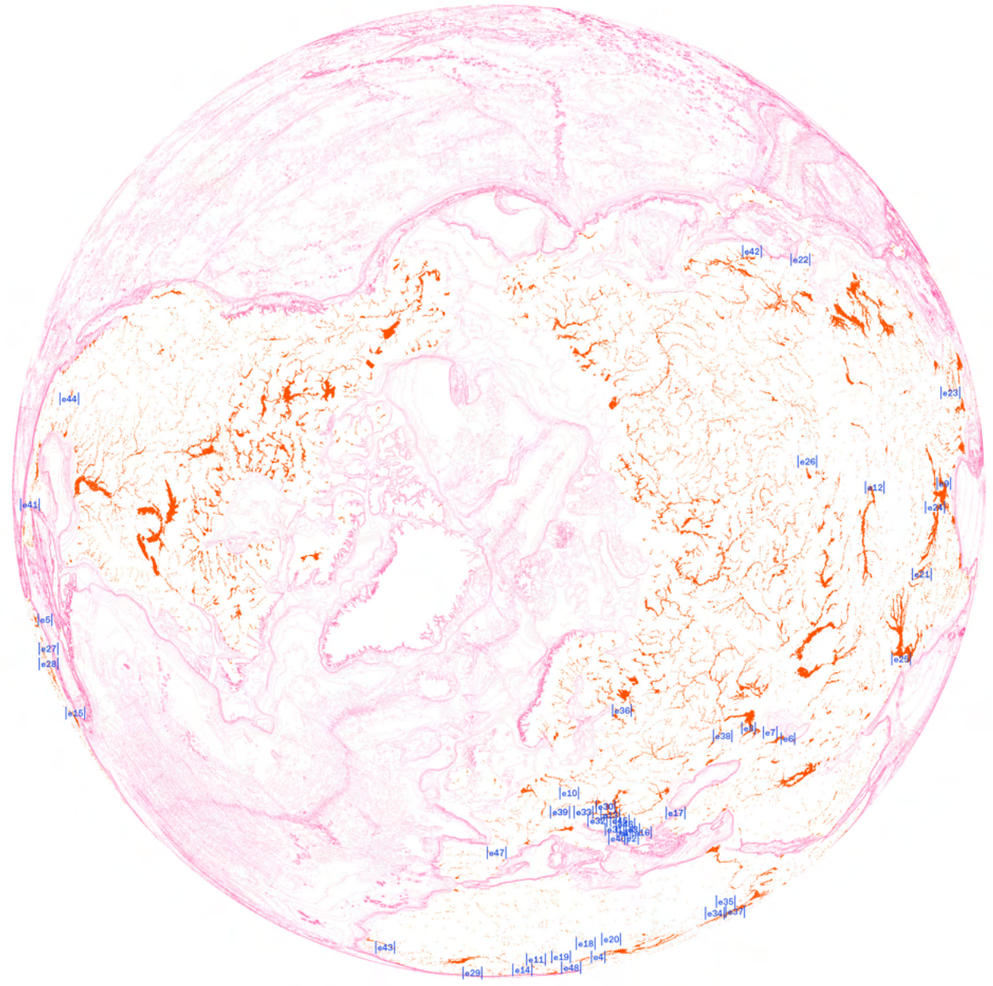
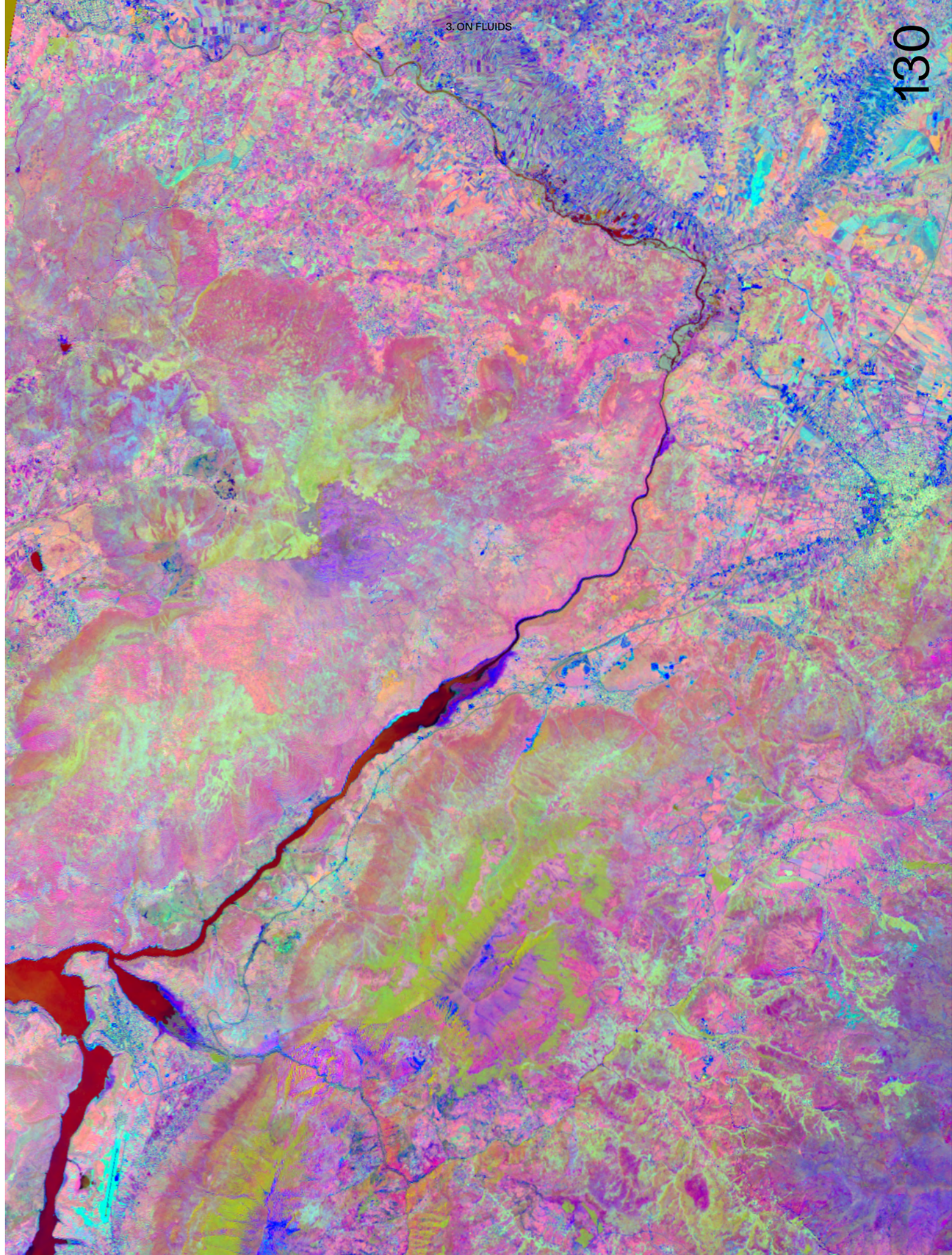


figure n.16
liquid layer of the globe
flooding + bathymetry

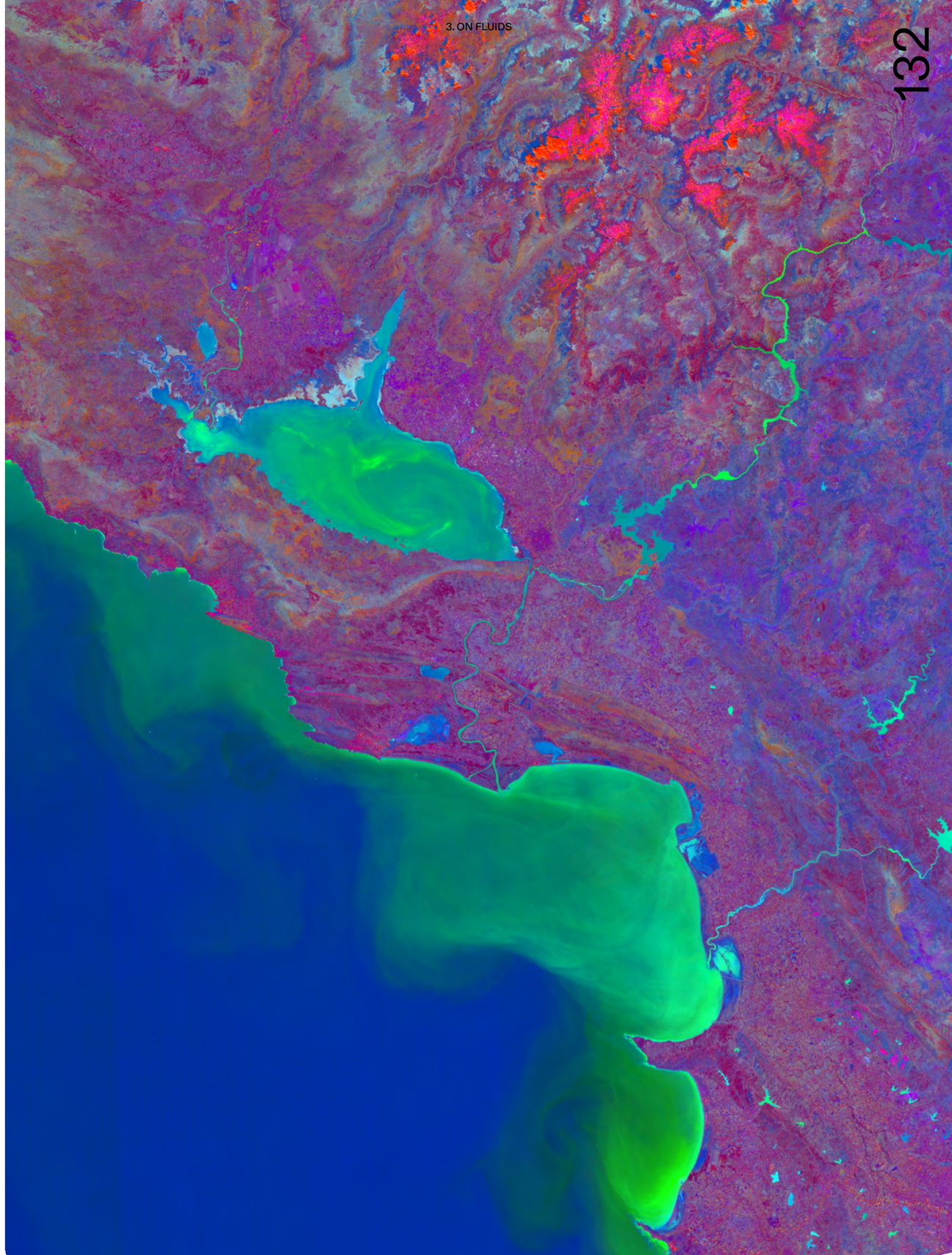
the land that sleeps underwater

Albania - Greece

Albania - Kosovo

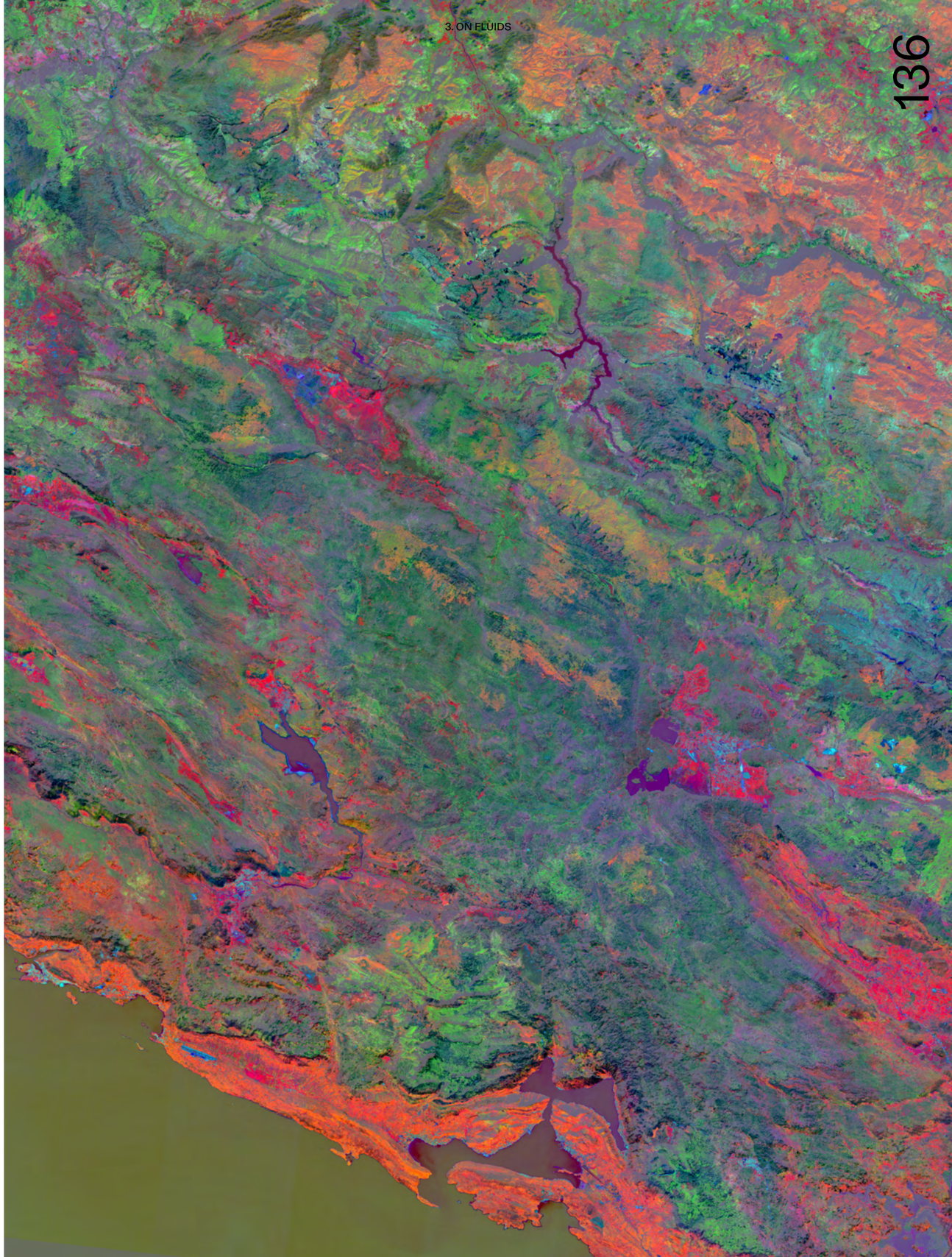


Albania - Montenegro

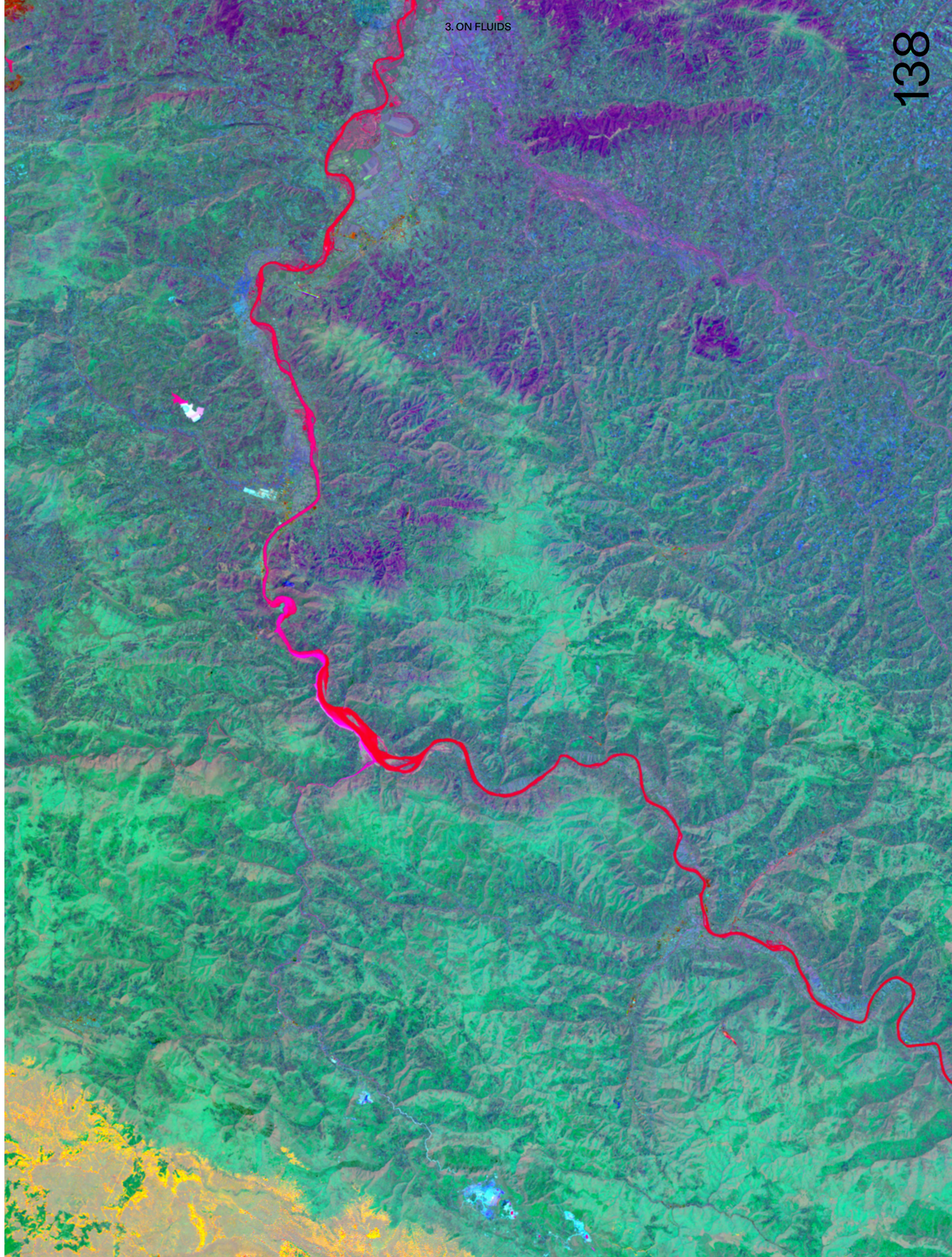


Albania - North Macedonia

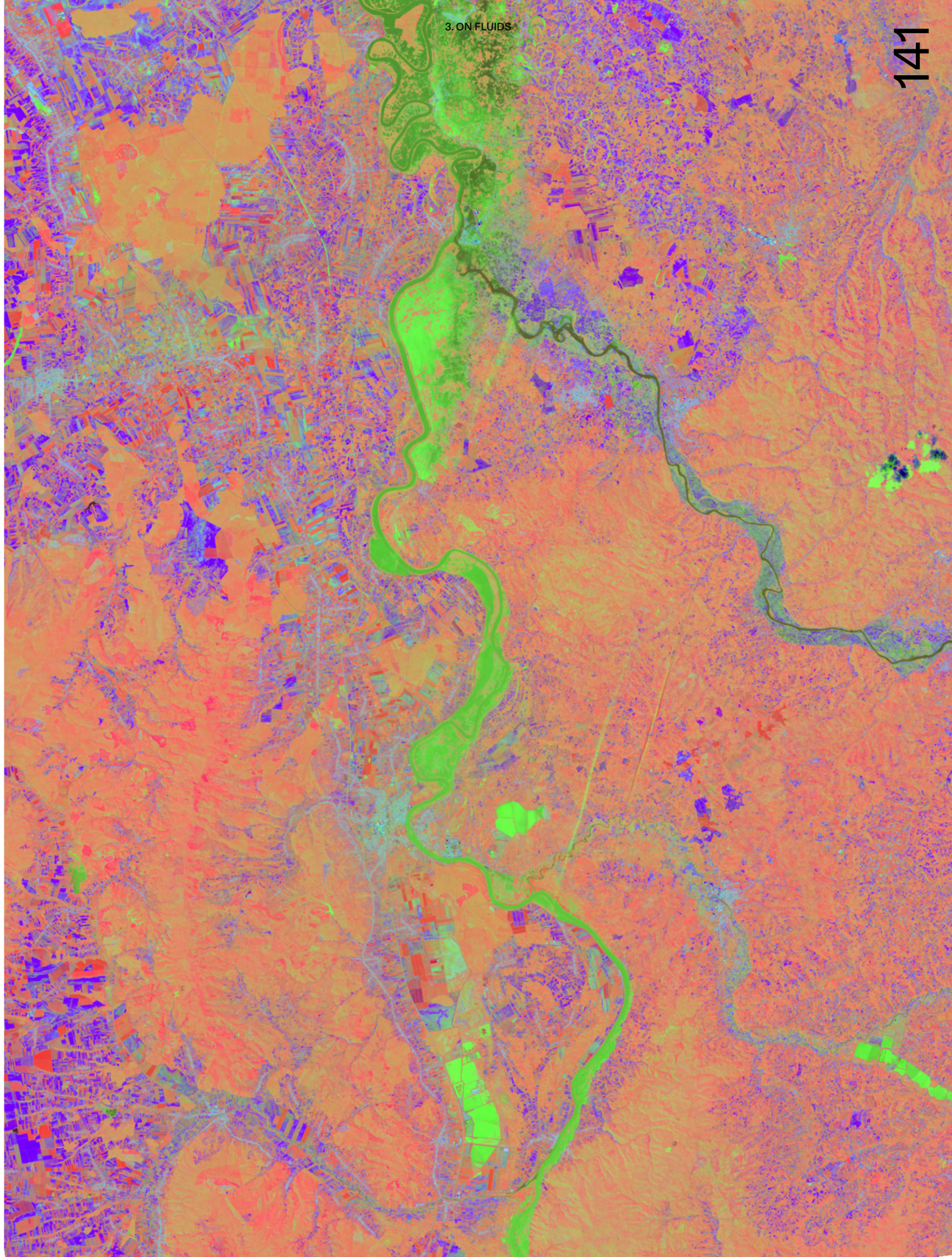
Bosnia Herzegovina - Montenegro



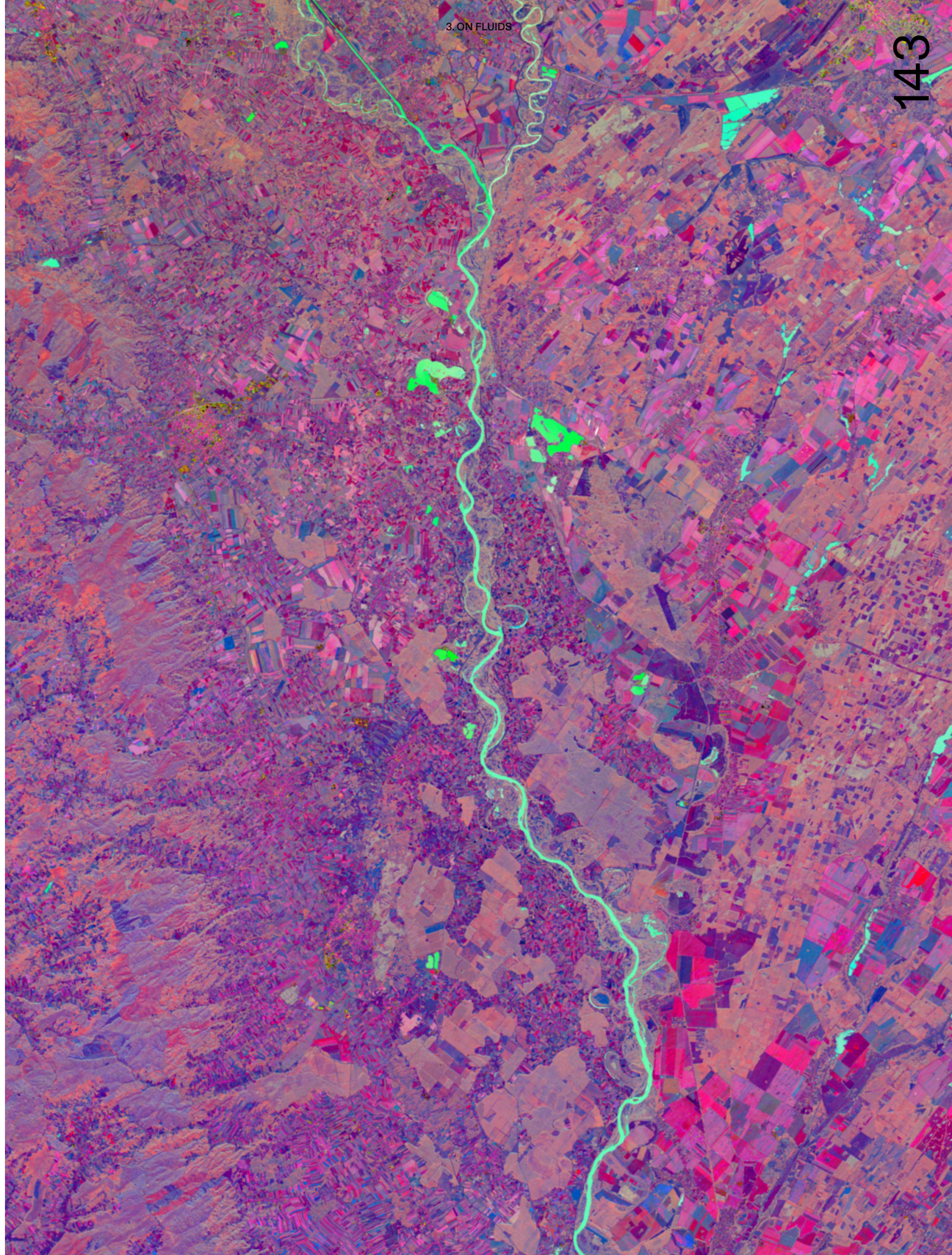
Bosnia Herzegovina - Serbia



Croatia - Bosnia ed Erzegovina

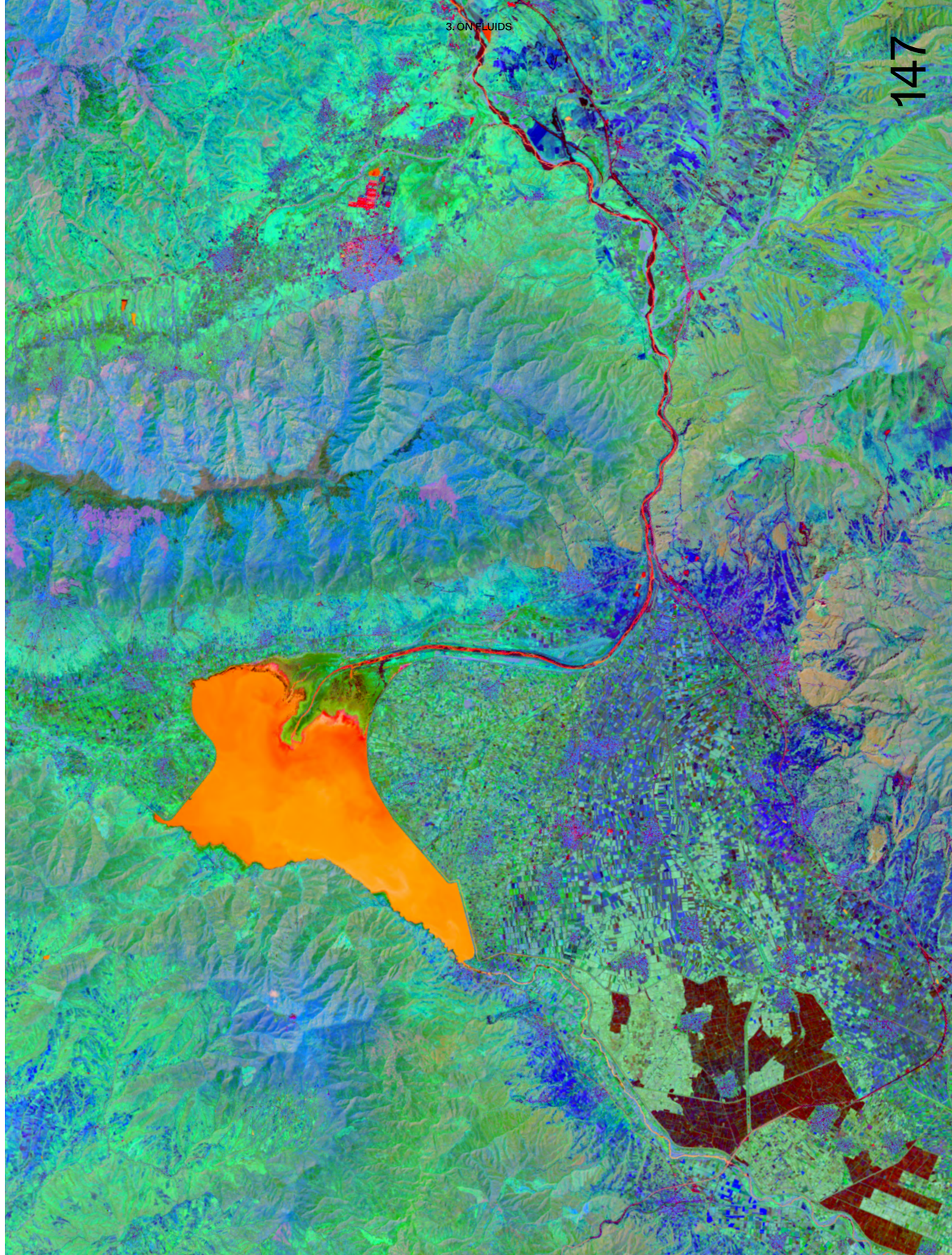


Croatia - Hungary

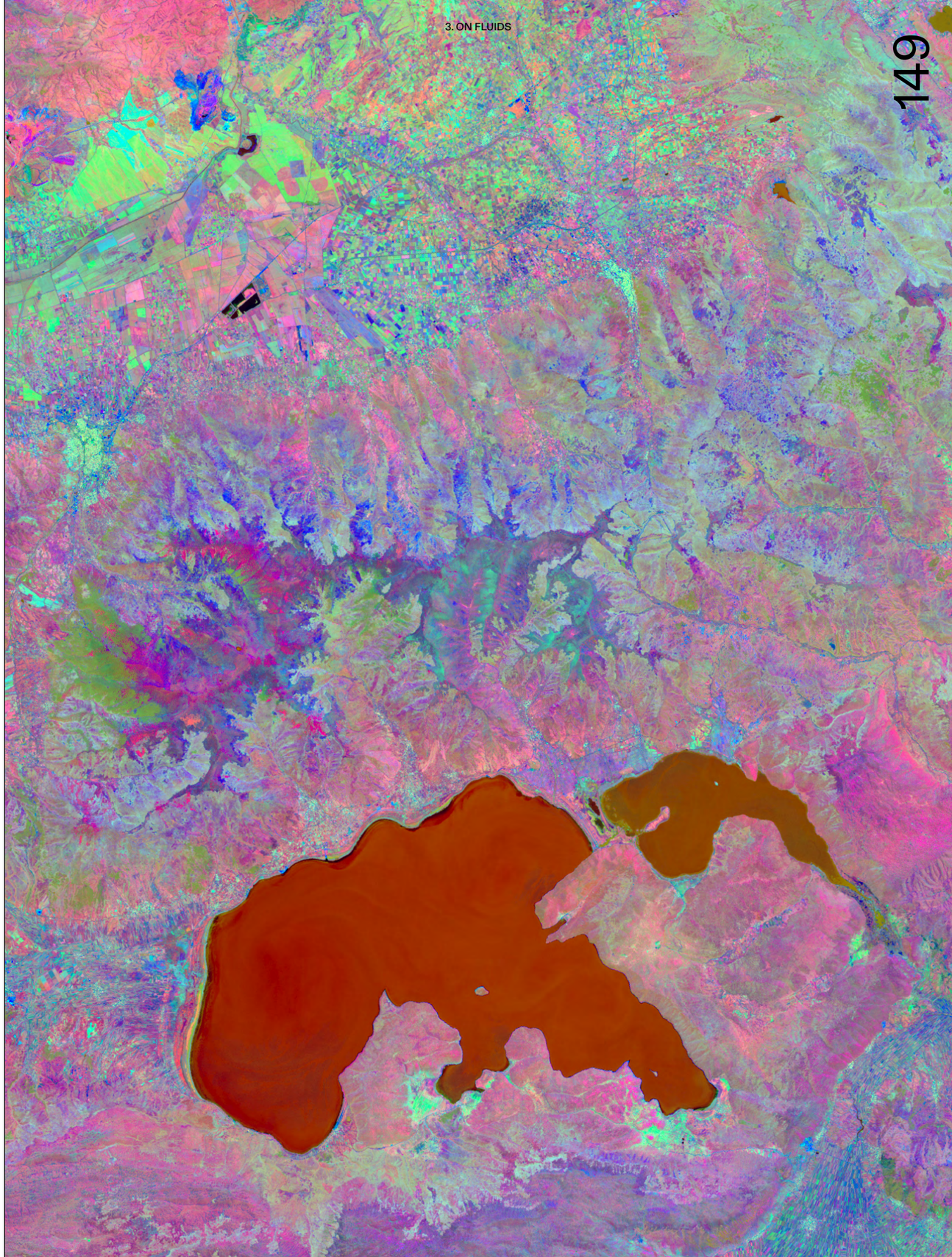


Croatia - Serbia

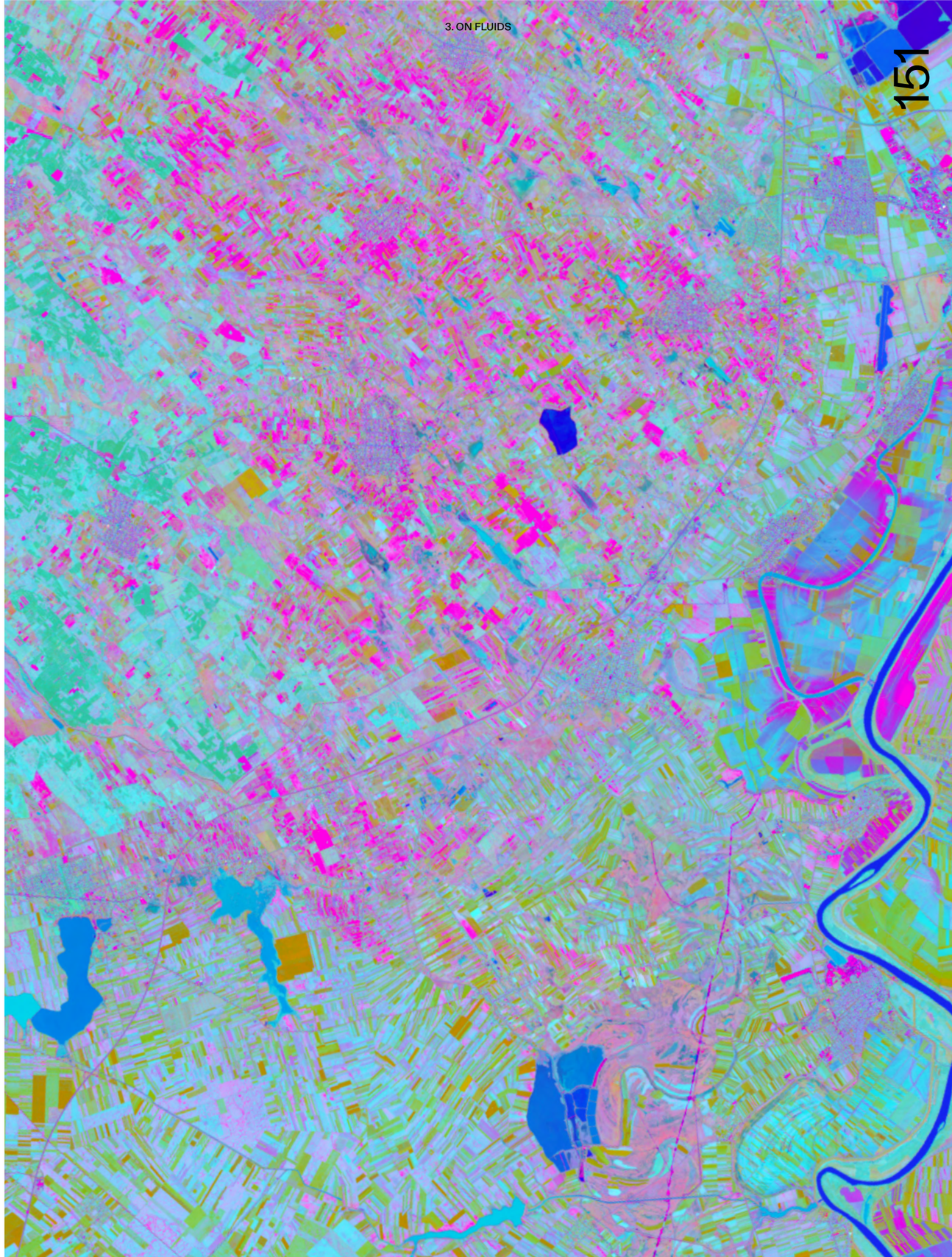
Greece - Bulgary



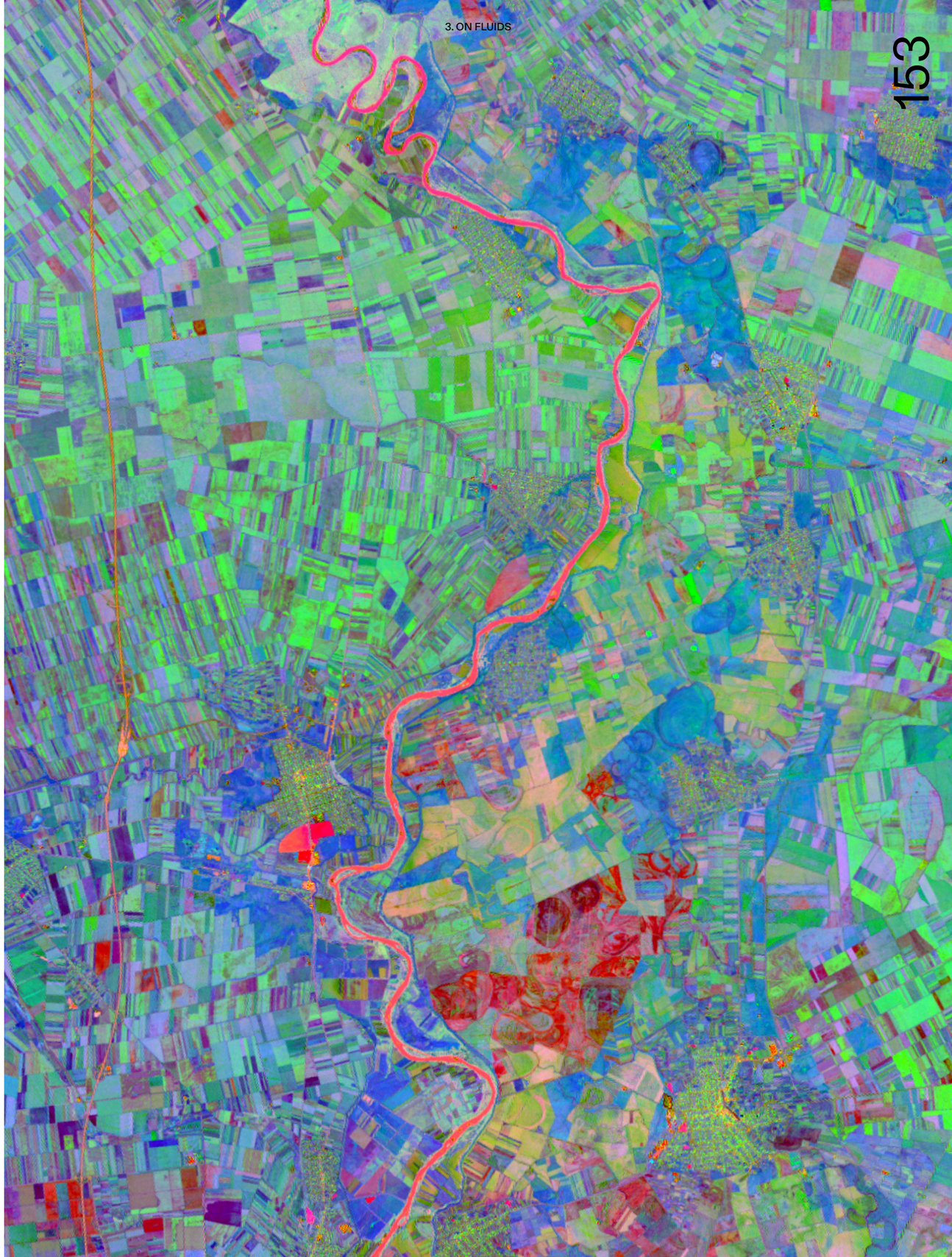
Greece - North Macedonia



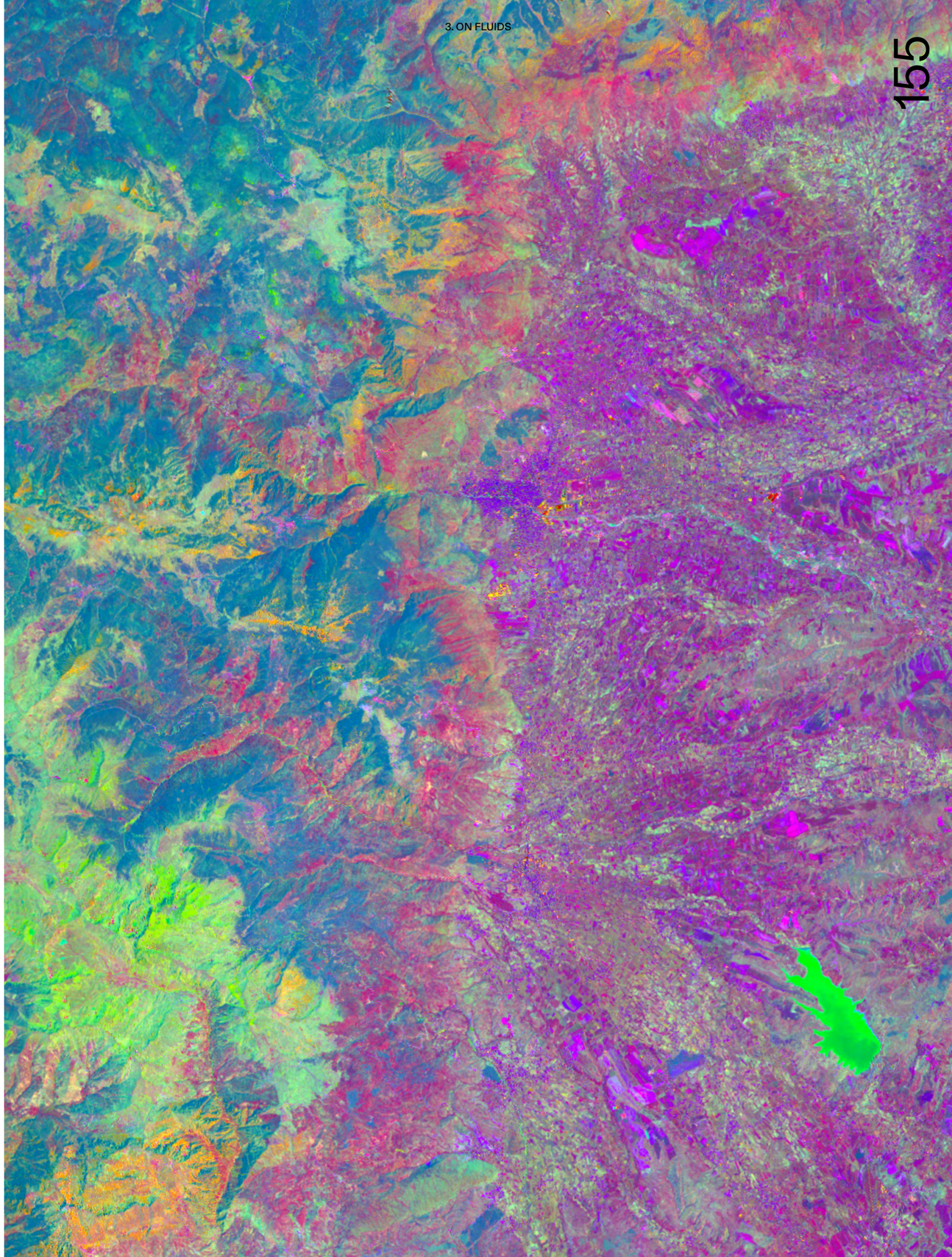
Hungary - Serbia



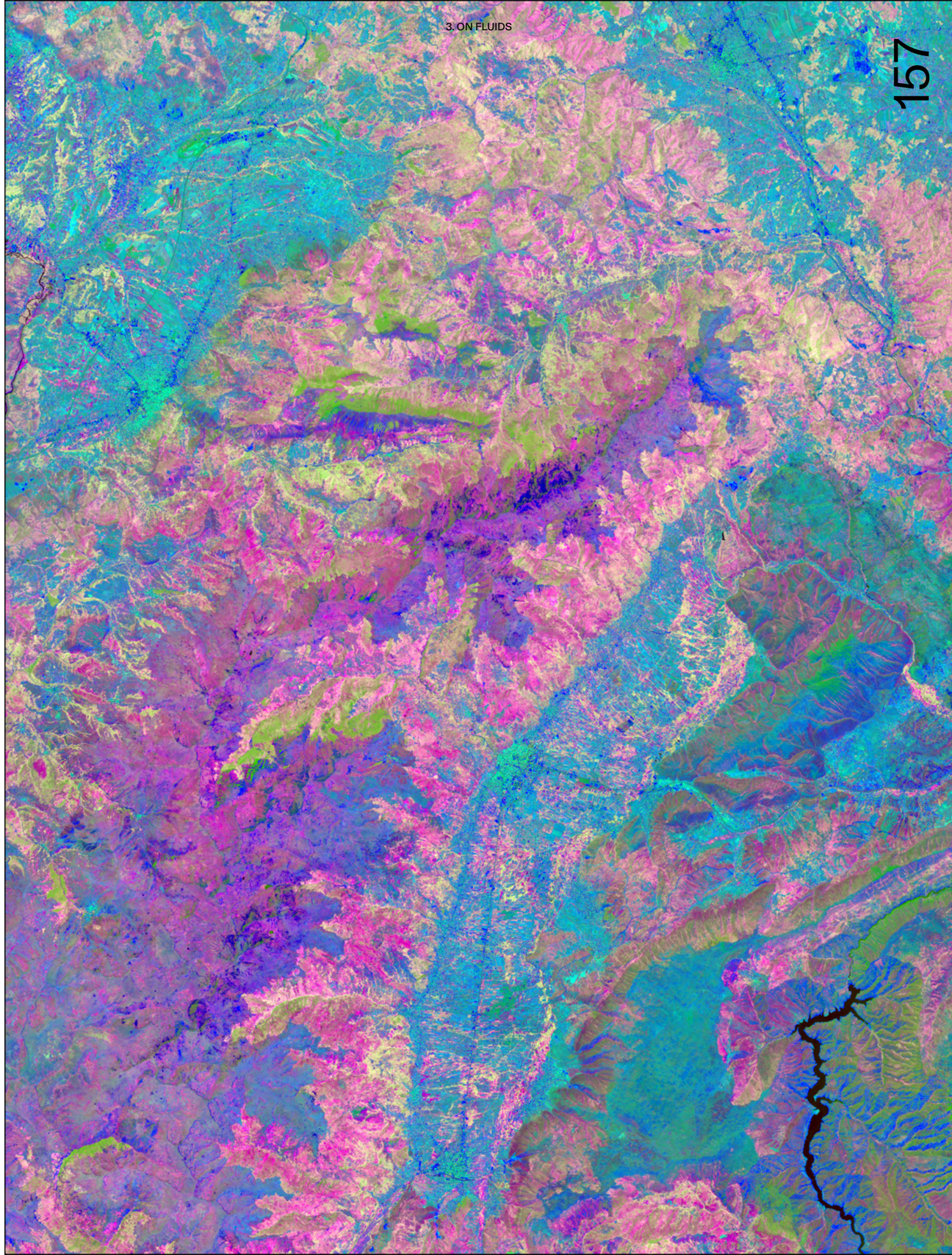
Hungary - Romania



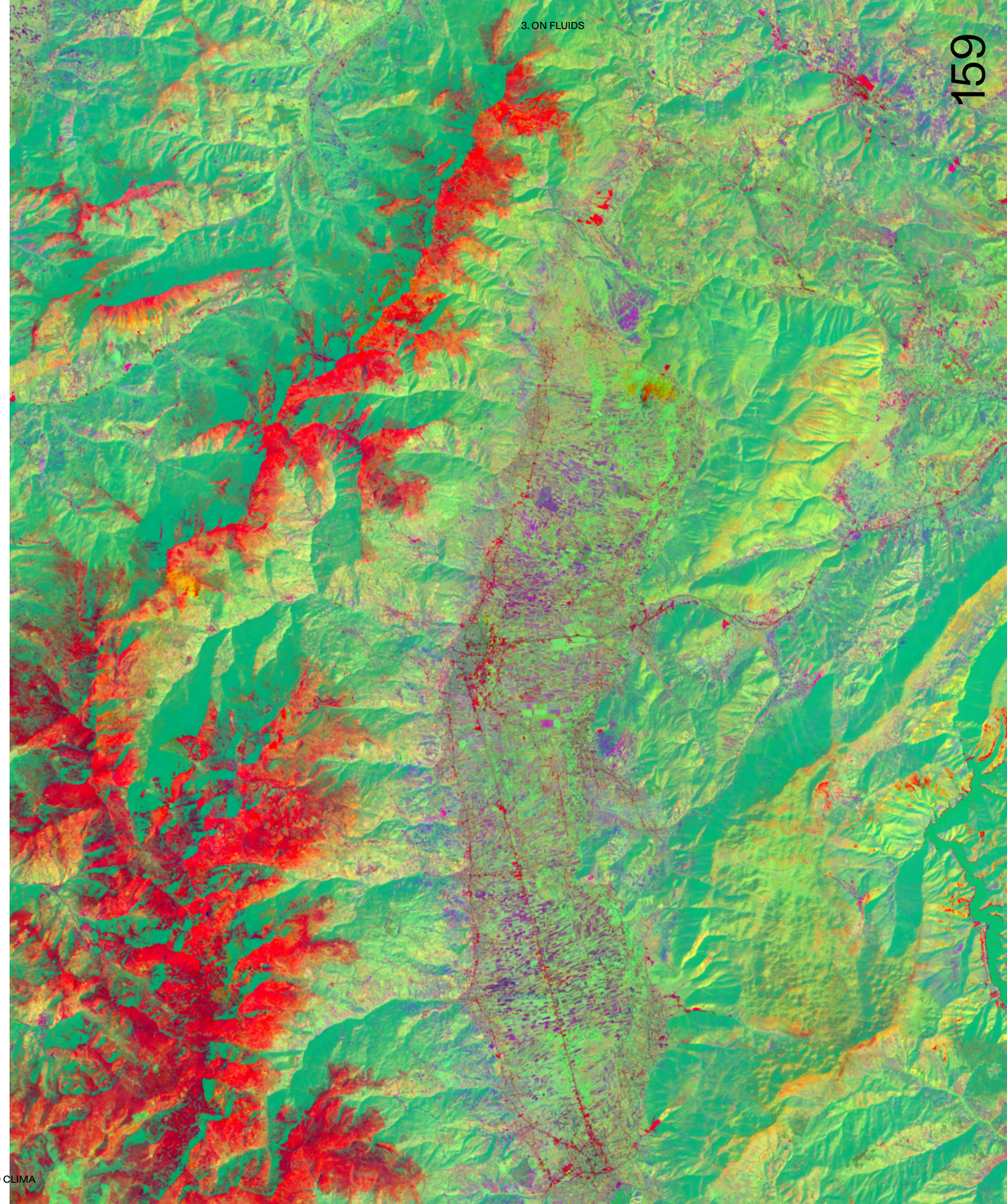
Kosovo - Montenegro



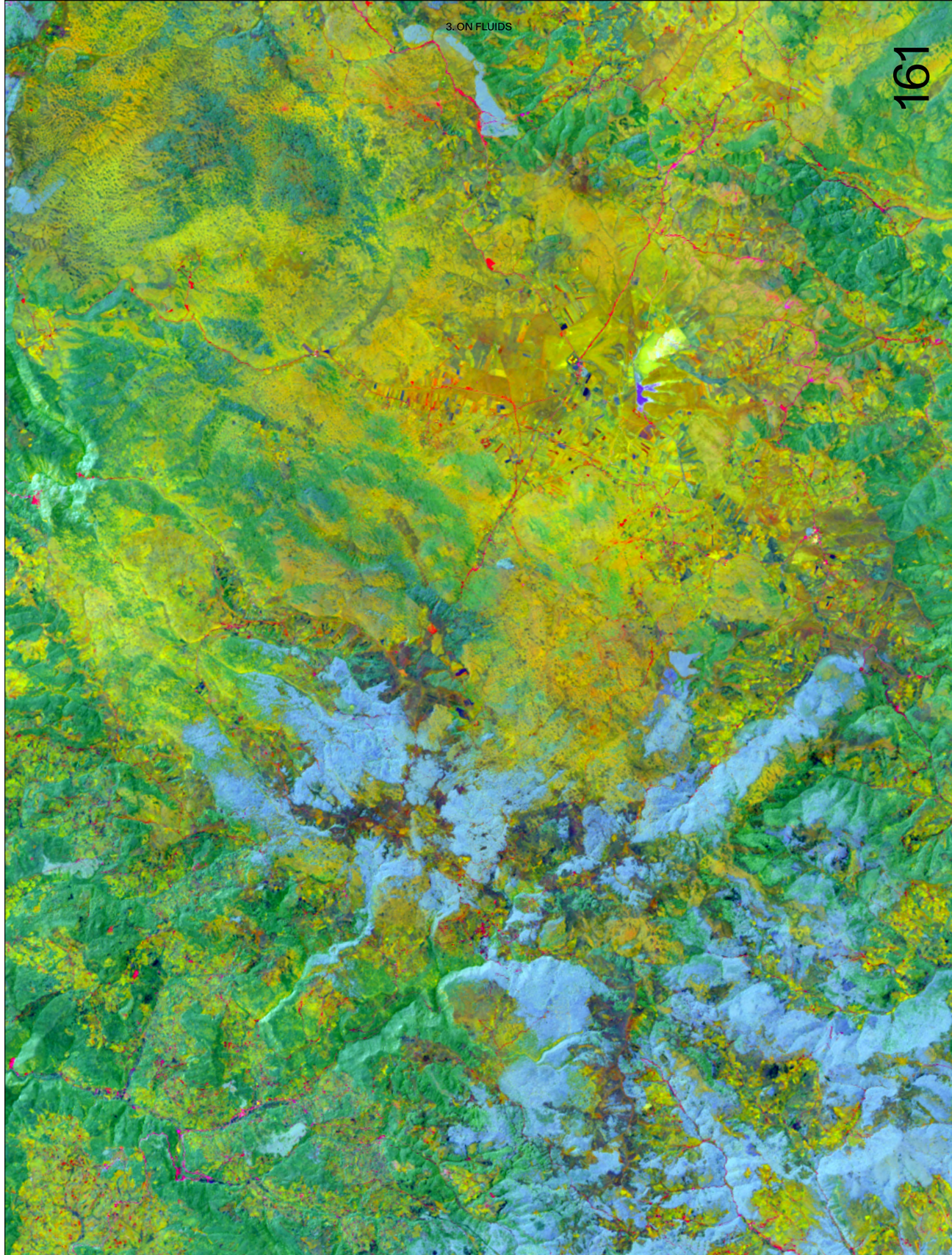
Kosovo - North Macedonia



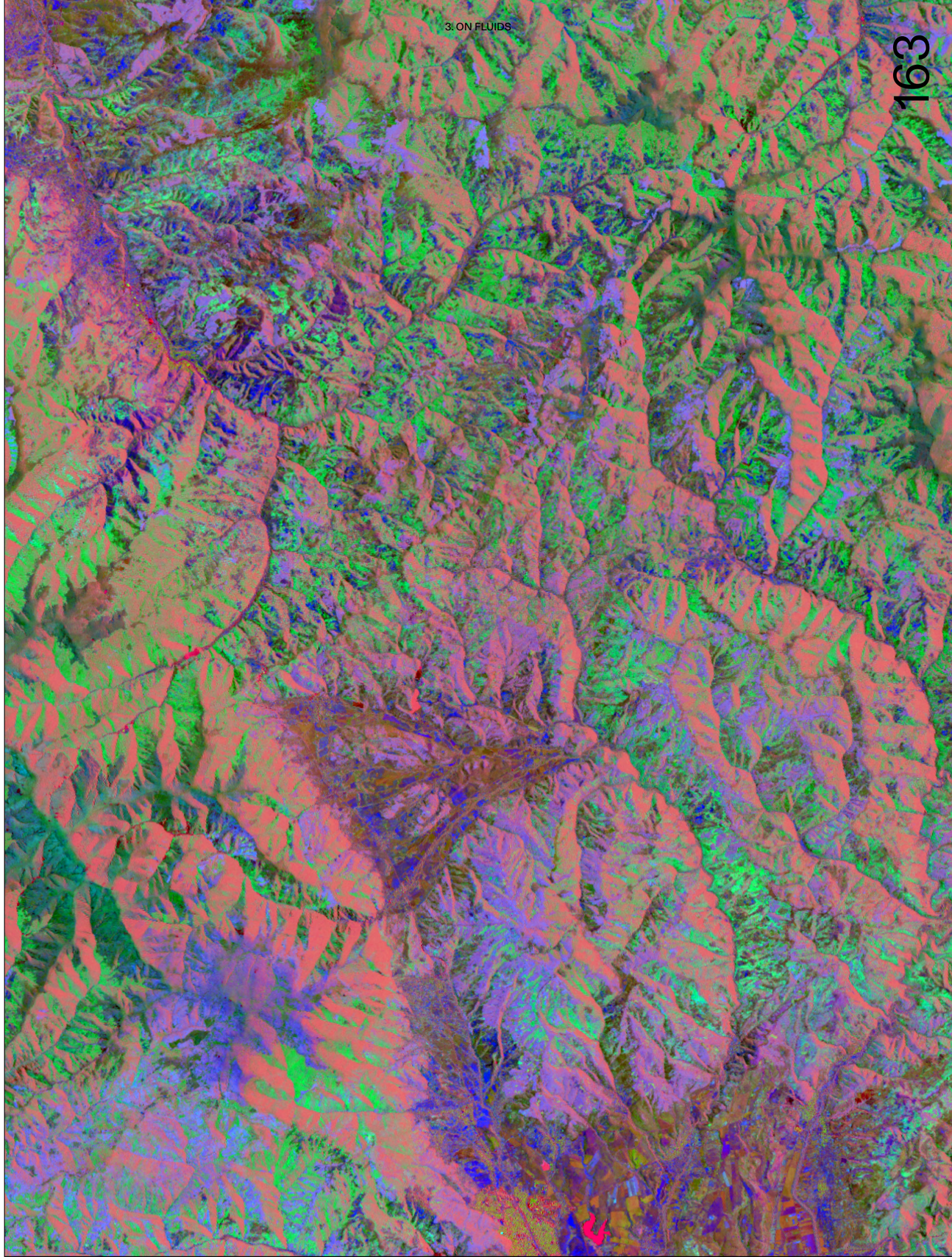
Kosovo - Serbia



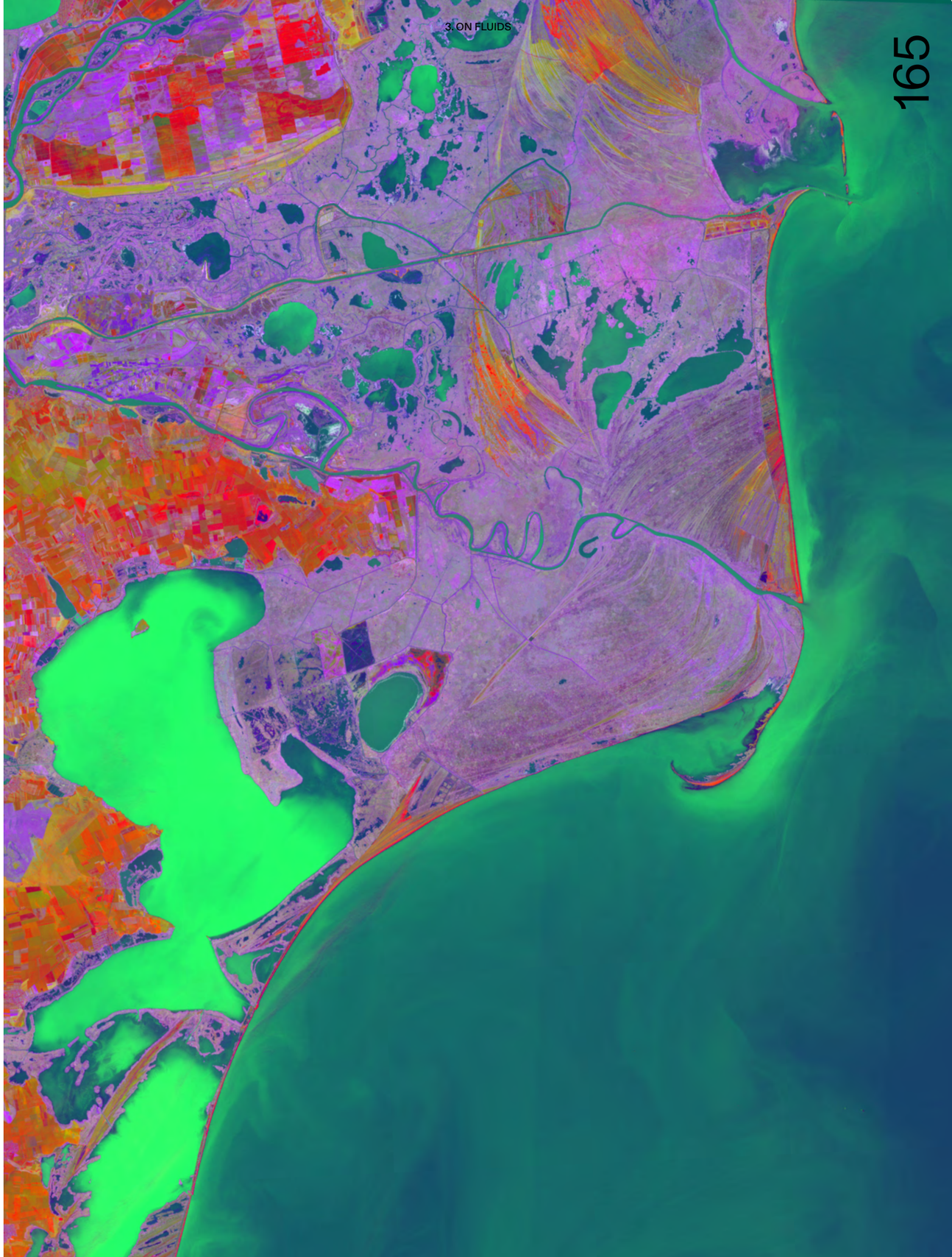
Montenegro - Serbia



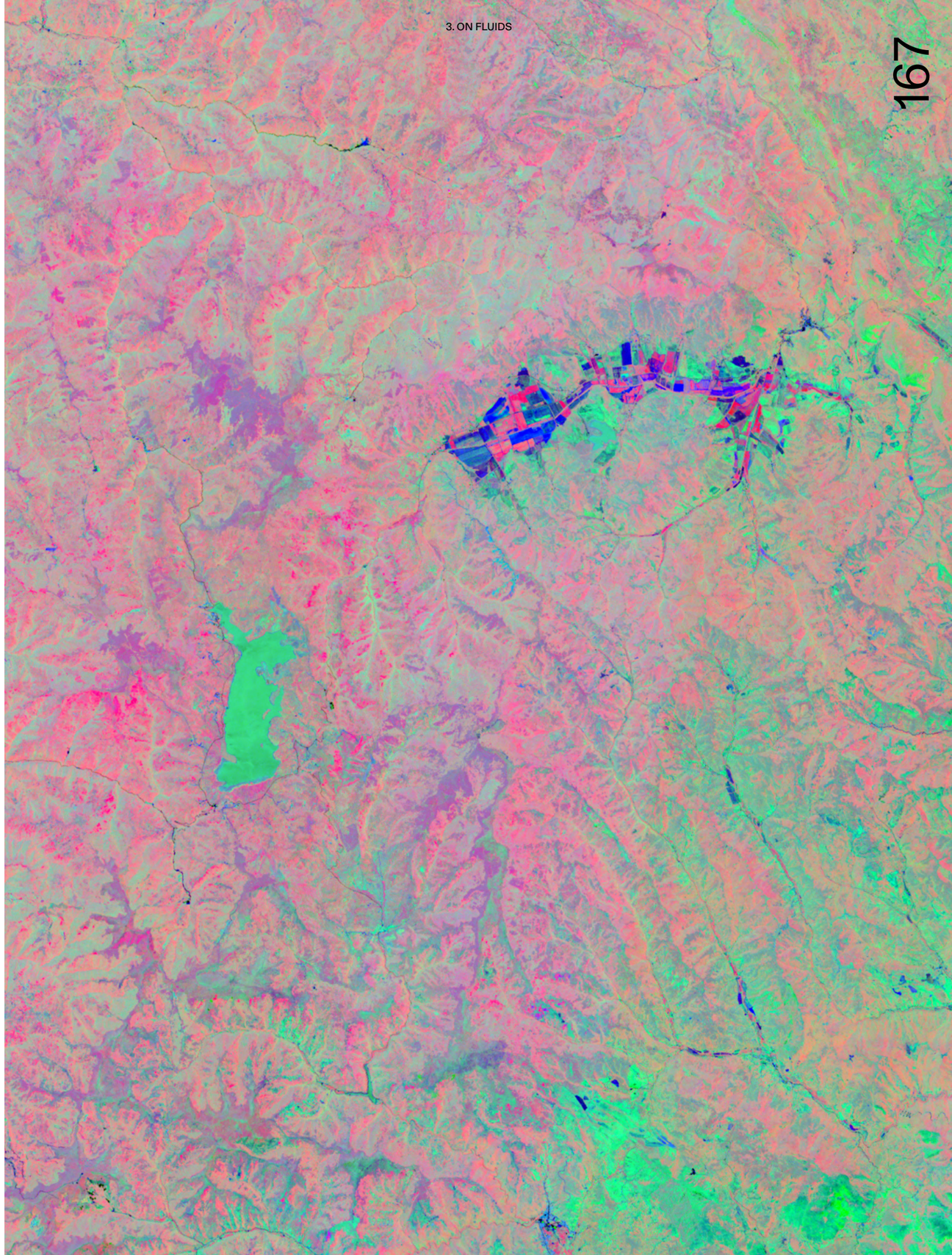
North Macedonia - Bulgaria



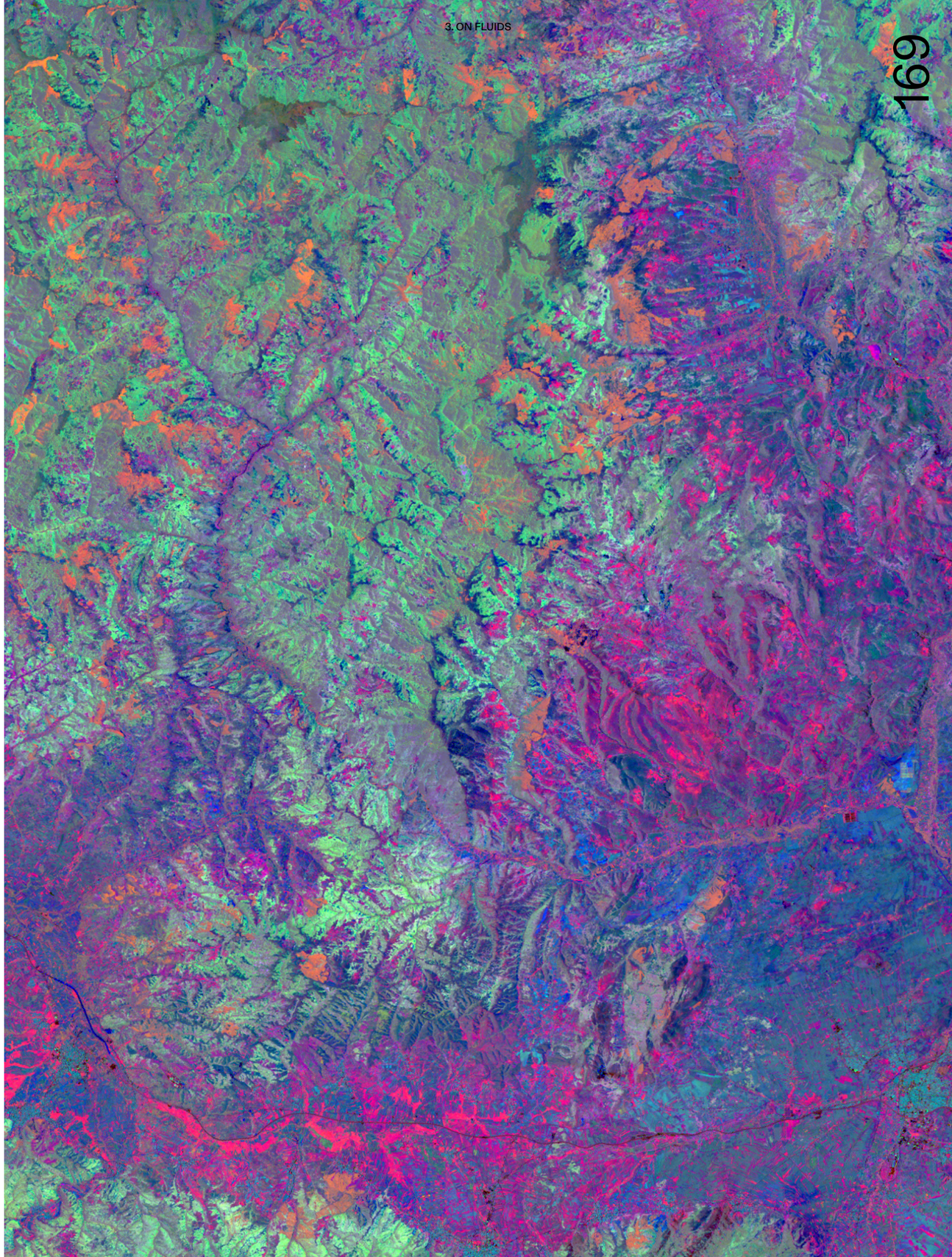
Romania - Bulgary



Serbia - Bulgary

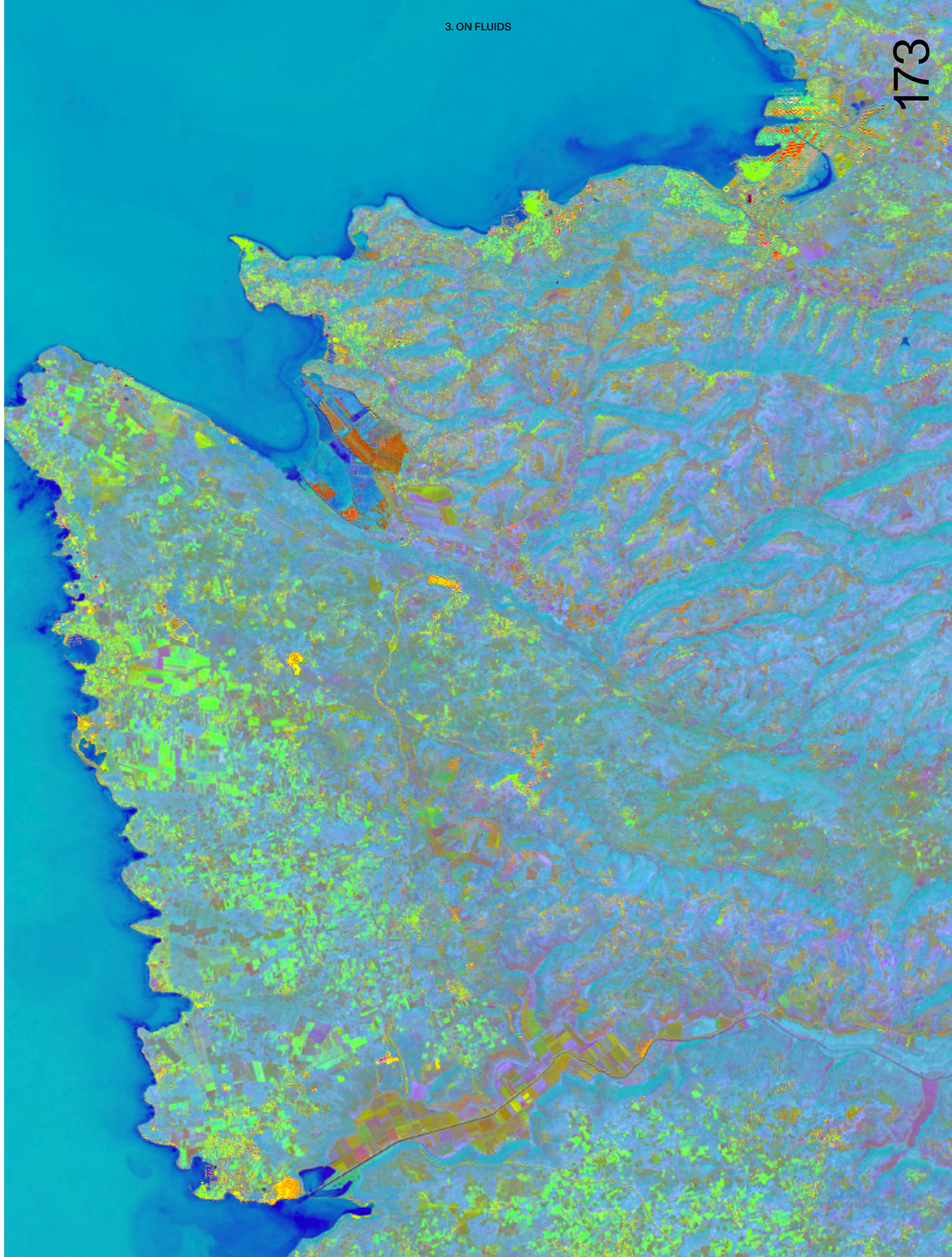


Serbia - North Macedonia



Serbia - Romania

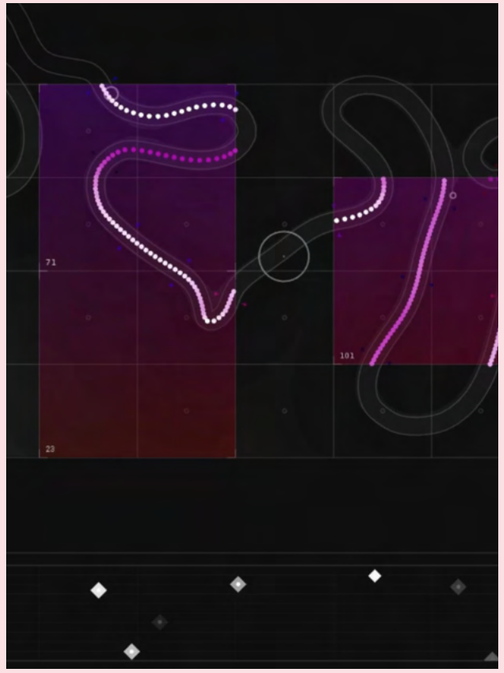
Slovenia - Croatia



Slovenia - Hungary

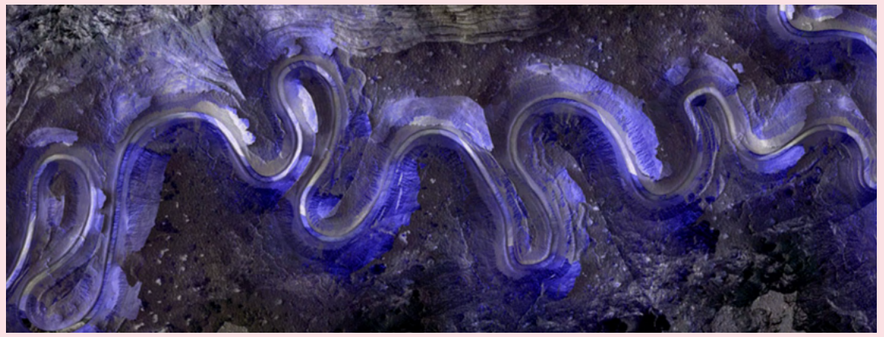
Meandering River
Onformative

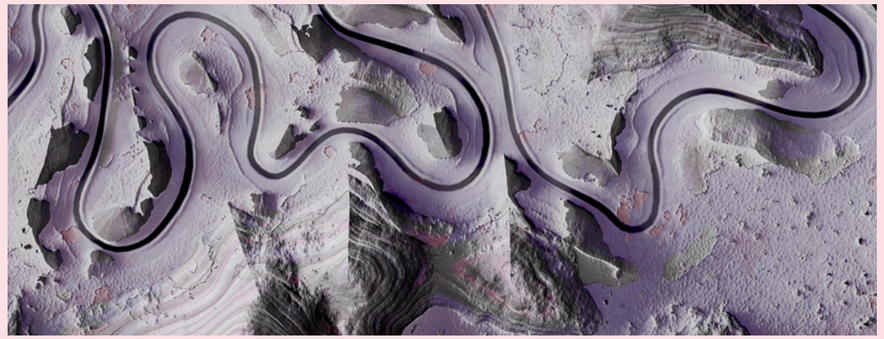
"Over time, landscapes are gradually shaped by natural forces. Indiscernible to the naked eye, we only perceive one moment at a time. The fluctuations and the rhythmic movement of rivers are a glimpse into the past, as traces provide evidence of the constant transformations that surround us".

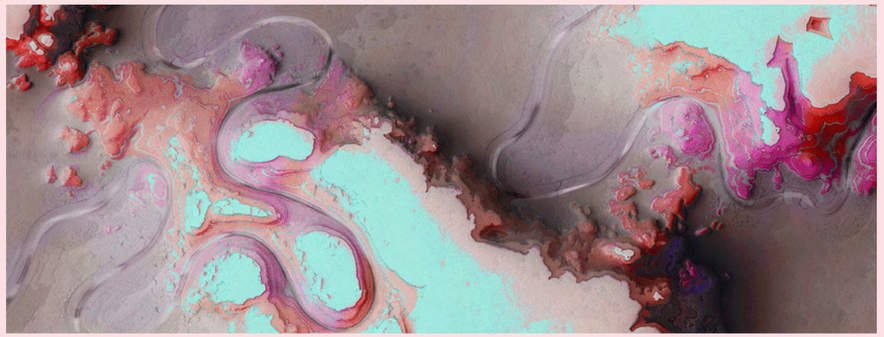


www.onformative.com/work/meandering-river/

“Meandering River is an audiovisual installation comprised of real-time visuals generated by an algorithm and music composed by an A.I. This digital artwork makes change perceivable by creating a unique awareness of time.
Spanning over multiple screens, the piece reinterprets the shifting behaviors of rivers by visualizing and sonifying their impact on the surface of the earth. The audiovisual installation creates a bird’s eye view of a landscape. This orientation conceptualizes a new human perspective on space and time, in an attempt to decipher the unpredictable patterns. By experiencing it from an influential perspective, the real-time visuals demonstrate what is happening on a larger scale. Based on a bespoke algorithm, the rippling and oscillating movement inherent in the generated imagery, provides a vantage point that transforms an understanding of progress, to examine the rhythm of natural forces”.







“As the evolving patterns of *Meandering River* emerge, the viewer is left with a humbling sense of the unpredictability of change and the beauty of nature.

The diverse and painterly aesthetic of real satellite images of abstract landscapes served as visual inspiration for the look development of the final piece”

-art and science-

3.2.3

Matrix

The matrix is one of the basic constituent units of each pattern and model of spatial arrangement (Forman 1995). Matrix classification allows a synoptic view of multiple data and information collected. A point in space is visualized through the critical tool of the matrix in relation to its intrinsic characteristics, from tangible to the most intangible ones, and in relation to the multiplicity of the complex system to which the point belongs. This allows a direct comparison between data, generating multiplication of possibilities (Rovelli 2020).
Starting from its technical definition, as a critical tool for tracing complex phenomena, it was decided to create four different spatial and meaning matrices in which the points of discontinuity identified in the Masterplan (fig. 2) were inserted, reporting for each of them the peculiarities:

The first matrix presents an alphabetical classification of the points, through alphanumeric codes indicating the states involved in the conflict. They are catalogued on the basis of their geographical location, the helix figure, i.e. the codes of the states generating the boundary (nHnNHnE); the code of the fluid regime to which they belong (nLnG); the spatial code indicating whether it is an area near the boundary (+), a point on the boundary between two states (/), a point on the boundary between three states (⊦); the code of the graphic semiology used in the Masterplan.

The second highlights the polarisation of the phenomena acting on the boundary, more human (H) or non-human (NH), and the fluid regime to which they belong (liquid 1L0G, gaseous 0L1G, or polarised 1L1G).

The third takes the spatialized graphic semiology of the Balkan master plan and brings it back into an overall view, in which the phenomena that cause and generate disturbance are shown for each location, starting from the issues specific to the area with the greatest ecological time (topography, bathymetry, etc.) to the categories of agents that are more human/fruit of human intervention (pm2.5, so2, water dams, etc.).

The last data transformation tool takes the form of a pentagram of conflict, in which the intensity with which places have been subject to political conflicts and ecological issues is quantified over time, emphasizing the time lag between the two processes. The diagram summarises on the ordinates the polarisation of the phenomenon (human, polarised, non-human) and on the abscissae the time span considered. The fluid regime to which it belongs is also distinguished by a specific graphic code

albania	0	H	1	NH	3	E	3	H	0	NH	1	E	0	H	4	NH	1	E
angola	0	H	3	NH	1	E	1	H	1	NH	3	E	1	H	0	NH	1	E
argentina	3	H	0	NH	1	E	2	H	1	NH	1	E	1	H	0	NH	1	E
armenia	2	H	1	NH	1	E	**0**	**H**	**2**	**NH**	**1**	**E**	2	H	0	NH	1	E
azerbaijan	1	H	6	NH	1	E	2	H	0	NH	2	E	2	H	0	NH	1	E
bangladesh	3	H	2	NH	1	E	5	H	0	NH	1	E	8	H	2	NH	6	E
belaurus	2	H	1	NH	2	E	3	H	1	NH	1	E	2	H	2	NH	1	E
benin	**0**	**H**	**0**	**NH**	**5**	**E**	1	H	0	NH	1	E	2	H	0	NH	1	E
buthan	1	H	0	NH	1	E	4	H	0	NH	2	E	1	H	3	NH	1	E
bolivia	5	H	3	NH	1	E	0	H	2	NH	2	E	2	H	1	NH	1	E
bosnia ed erzegovina	5	H	0	NH	1	E	0	H	0	NH	1	E	**5**	**H**	**1**	**NH**	**1**	**E**
botswana	6	H	0	NH	1	E	5	H	0	NH	1	E	2	H	0	NH	2	E
brazil	**0**	**H**	**1**	**NH**	**3**	**E**	3	H	1	NH	1	E	3	H	0	NH	1	E
bulgaria	0	H	1	NH	2	E	**0**	**H**	**1**	**NH**	**2**	**E**	3	H	1	NH	1	E
burundi	1	H	0	NH	1	E	6	H	0	NH	1	E	3	H	1	NH	1	E
cameroon	**1**	**H**	**0**	**NH**	**4**	**E**	2	H	0	NH	1	E	3	H	1	NH	3	E
chad	0	H	0	NH	1	E	0	H	0	NH	1	E	8	H	1	NH	5	E
china	**3**	**H**	**1**	**NH**	**3**	**E**	**2**	**H**	**1**	**NH**	**1**	**E**	3	H	2	NH	1	E
colombia	5	H	0	NH	1	E	1	H	1	NH	1	E	5	H	2	NH	1	E
congo	0	H	0	NH	2	E	0	H	1	NH	2	E	2	H	1	NH	3	E
cote d'ivoire																		
croatia																		
ecuador																		
eritrea																		
estonia																		
ethiopia																		
georgia																		
germany																		
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korea																		
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mauritania																		
mexico																		
montenegro																		
myanmar																		
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niger																		
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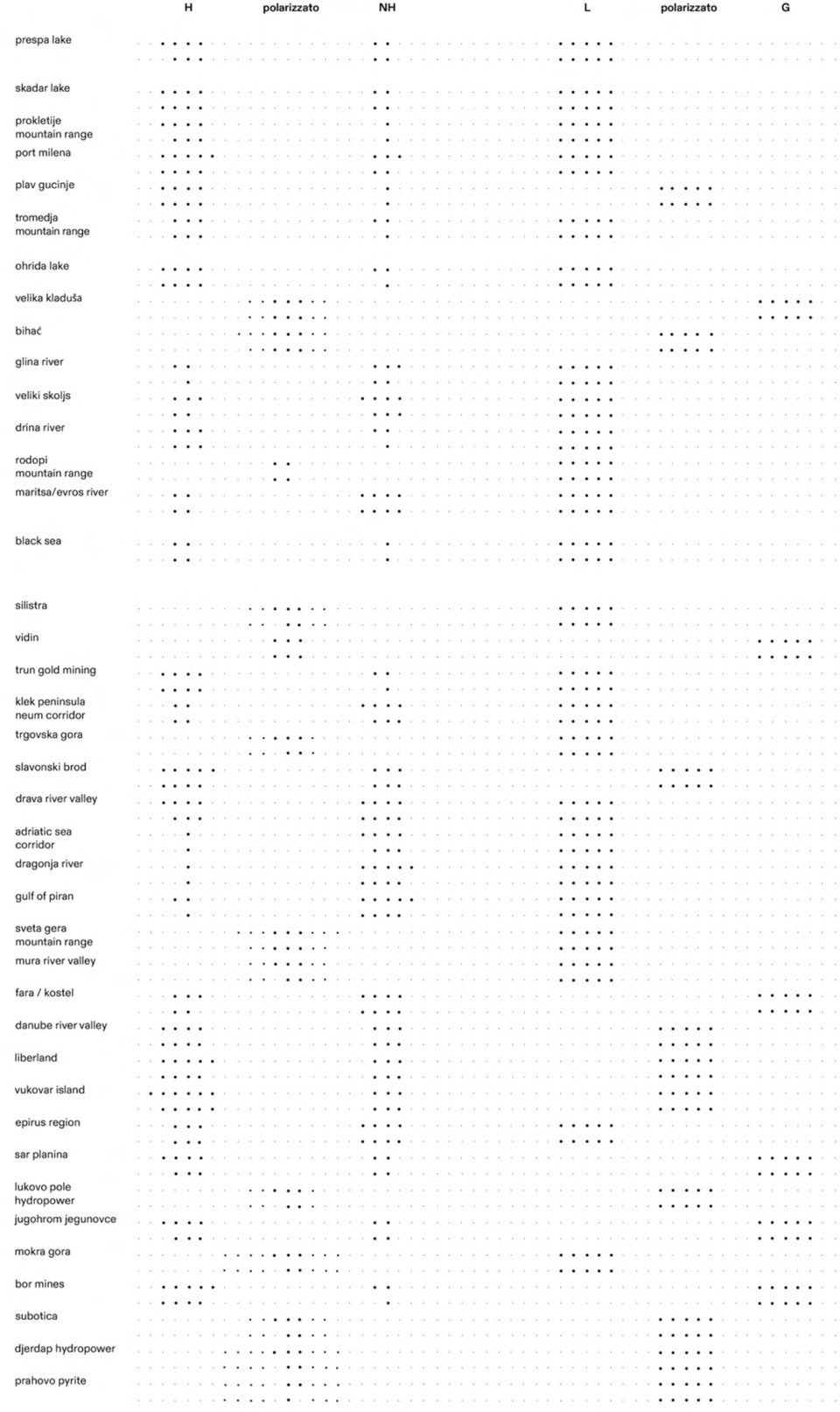
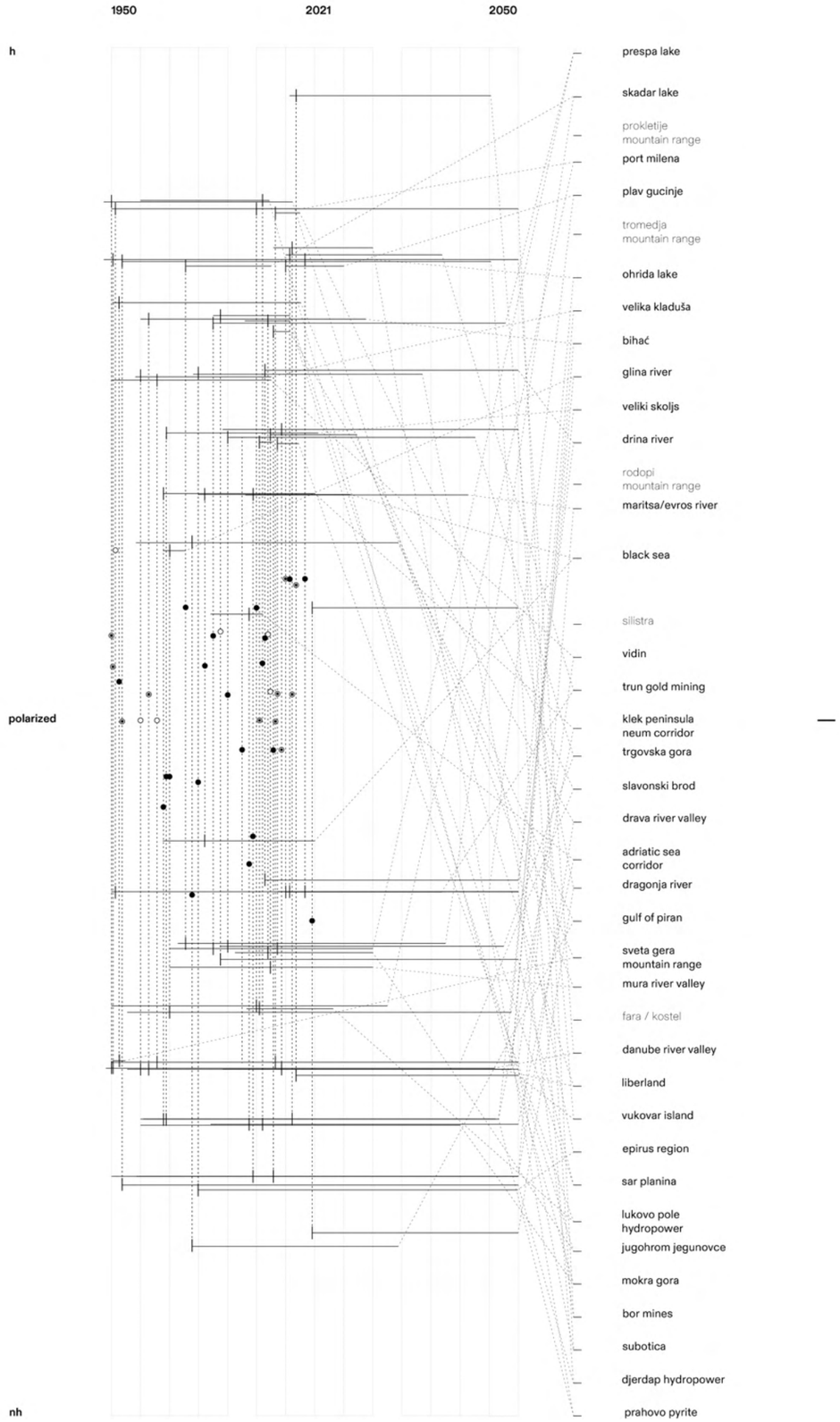
north macedonia																		
pakistan																		
poland																		
portugal																		
republic dominican																		
russia																		
serbia																		
slovenia																		
south africa																		
south sudan																		
spain																		
turkey																		
usa																		
venezuela																		
zimbabwe																		

	code	place	coordinates	states	code states	fluid code	spatial code	code semiologie
a	agnm1	prespa lake	40°53'91'' N 21°02'66'' E	albania greece north macedonia	1H0NH3HE 0H2NH2HE 2H0NH3HE	1L0G	⊢	0F30E30A5
	am1	skadar lake	42°04'52'' N 19°30'43'' E	albania montenegro	1H0NH3HE 0H1NH2HE	1L0G	／	0F30A5
	am2	prokletije mountain range	42°26'24'' N 19°48'43'' E	albania montenegro	1H0NH3HE 0H1NH2HE	1L0G	／	0A30G4
	am3	port milena	42°54'49'' N 19°14'30'' E	albania montenegro	1H0NH3HE 0H1NH2HE	1L0G	／	0A60F30G1
	am4	plav gucinje	42°33'49'' N 19°49'59'' E	albania montenegro	1H0NH3HE 0H1NH2HE	1L1G	／	0A50G4
	amk2	tromedja mountain range	42°49'58'' N 20°21'13'' E	albania montenegro kosovo	1H0NH3HE 0H1NH2HE	1L0G	⊢	0A150G4
	anm1	ohrida lake	41°07'12'' N 20°48'62'' E	albania north macedonia	1H0NH3HE 2H0NH3HE	1L0G	／	0F30E30A5
	bc1	velika kladuša	45°11'35'' N 15°48'24'' E	bosnia herzegovina croatia	0H1NH2HE 0H0NH5HE	0L1G	┼	0F120E40G40A5
	bc2	bihać	44°48'52'' N 15°52'87'' E	bosnia herzegovina croatia	0H1NH2HE 0H0NH5HE	1L1G	┼	0F120E4
	bc3	glina river	45°13'20'' N 15°53'43'' E	bosnia herzegovina croatia	0H1NH2HE 0H0NH5HE	1L0G	┼	0F120E4
b	bc4	veliki skoljs	42°54'58'' N 17°35'57'' E	bosnia herzegovina croatia	0H1NH2HE 0H0NH5HE	1L0G	／	0B50D20C1
	bse2	drina river	44°01'55'' N 19°14'25'' E	bosnia herzegovina serbia	0H1NH2HE 3H1NH4HE	1L0G	／	0F120G3
	bg1	rodopi mountain range	41°28'16'' N 24°28'41'' E	bulgaria greece	2H0NH2HE 0H2NH2HE	1L0G	／	0A1
	bgt1	maritsa/evros river	43°0'00'' N 34°00'00'' E	bulgaria greece turkey	2H0NH2HE 0H2NH2HE	1L0G	／	0F120G4
	bgrt1	black sea	43°52'47'' N 33°31'43'' E	bulgaria greece romania turkey	2H0NH2HE 0H2NH2HE 2H1NH1HE	1L0G	⊢	0A10C1
	br1	silistra	44°07'08'' N 27°14'29'' E	bulgaria romania	2H0NH2HE 2H1NH1HE	1L0G	┼	0F1230B8
	br2	vidin	43°59'31'' N 22°50'56'' E	bulgaria romania	2H0NH2HE 2H1NH1HE	0L1G	／	0F1230B80A2
	bse1	trun gold mining	43°45'15'' N 24°52'28'' E	bulgaria serbia	2H0NH2HE 3H1NH4HE	1L0G	／	0F10G4
	cb5	klek peninsula neum corridor	42°56'43'' N 17°33'46'' E	croatia bosnia herzegovina	0H0NH5HE 0H1NH2HE	1L0G	／	0E120G1
	cb6	trgovska gora	45°03'01'' N 16°22'16'' E	croatia bosnia herzegovina	0H0NH5HE 0H1NH2HE	1L0G	／	0F1230B2
	cb7	slavonski brod	45°09'41'' N 18°00'40'' E	croatia bosnia herzegovina	0H0NH5HE 0H1NH2HE	1L1G	／	0F1230G40A125
	ch1	drava river valley	46°20'37'' N 15°51'22'' E	croatia hungary	0H0NH5HE 5H1NH1HE	1L0G	／	0F1230B6780E3
	cs1	adriatic sea corridor	45°30'52'' N 13°25'15'' E	croatia slovenia	0H0NH5HE 2H1NH1HE	1L0G	┼	0G10H12
	cs2	dragonja river	45°28'01'' N 13°36'10'' E	croatia slovenia	0H0NH5HE 2H1NH1HE	1L0G	┼	0H120F123
	cs3	gulf of piran	45°30'15'' N 13°33'43'' E	croatia slovenia	0H0NH5HE 2H1NH1HE	1L0G	┼	0H120F1230D2
c	cs4	sveta gera mountain range	45°45'38'' N 15°19'02'' E	croatia slovenia	0H0NH5HE 2H1NH1HE	1L0G	┼	0E30F123
	cs5	mura river valley	45°56'42'' N 14°49'25'' E	croatia slovenia	0H0NH5HE 2H1NH1HE	1L0G	／	0E30F123
	cs6	fara / kostel	45°30'29'' N 14°54'31'' E	croatia slovenia	0H0NH5HE 2H1NH1HE	0L1G	／	0H120B6F123
	cse1	danube river valley	45°57'32'' N 18°44'23'' E	croatia serbia	0H0NH5HE 3H1NH4HE	1L1G	／	0E30F1230A20G4
	cse2	liberland	45°47'02'' N 18°51'11'' E	croatia serbia	0H0NH5HE 3H1NH4HE	1L1G	┼	0E30F1230A20G4
	cse3	vukovar island	45°20'35'' N 19°00'11'' E	croatia serbia	0H0NH5HE 3H1NH4HE	1L1G	┼	0E30F1230G3
g	ga1	epirus region	39°33'08'' N 20°46'11'' E	greece albania	0H2NH2HE 1H0NH3HE	1L0G	┼	0F12
n	nmk1	sar planina	45°05'00'' N 20°49'59'' E	north macedonia kosovo	2H0NH3HE 3H1NH4HE	0L1G	┼	0F10A5
	nmk2	lukovo pole hydropower	41°40'02'' N 21°46'52'' E	north macedonia kosovo	2H0NH3HE 3H1NH4HE	1L1G	┼	0F10A50B678
	nmk3	jugohrom jegunovce	42°03'44'' N 21°07'32'' E	north macedonia kosovo	2H0NH3HE 3H1NH4HE	0L1G	┼	0F12
s	seb1	mokra gora	43°47'37'' N 19°30'42'' E	serbia bosnia	3H1NH4HE 0H1NH2HE	1L0G	┼	0F120B60A2
	seb1	bor mines	44°04'17'' N 22°06'01'' E	serbia bulgaria	3H1NH4HE 2H0NH2HE	0L1G	┼	0F10A250H3
	seh1	subotica	46°05'47'' N 19°39'33'' E	serbia hungary	3H1NH4HE 5H1NH1HE	1L1G	┼	0A2
	ser1	djerdap hydropower	44°31'41'' N 21°58'46'' E	serbia romania	3H1NH4HE 2H1NH1HE	1L1G	┼	0F120A25
	ser2	prahovo pyrite	44°17'31'' N 22°35'21'' E	serbia romania	3H1NH4HE 2H1NH1HE	1L1G	┼	0F120B60A2



		topography	bathymetry	erosion rainfall	erosion soil crust	rivers canals	rivers waterways	flooding	LST	SST	migration	sea extractions	sea routes	dust	pm2.5	pm10 traffic	pm10 widfire	SO2	CO2	wildfire points	dam present	dam future	mining	rivers border	hydro powerplant	oil powerplant	coal powerplant	gas powerplant	nuclear powerplant	border fences	war mines	border schengen	border economic
a	prespa lake	—	—	—	—	—	▬	▬	—	—	—	—	—	—	—	—	—	▬	—	▬	▬	▬	—	—	—	—	—	—	—	▬	—	▬	—
	skadar lake	—	—	—	—	—	—	▬	—	—	—	—	▬	—	—	—	▬	—	—	▬	▬	▬	—	▬	—	—	—	—	—	▬	—	▬	—
	prokletije mountain range	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	▬	—	—	▬	▬	▬	—	—	▬	—	—	—	—	—	—	▬	—
	port milena	—	—	—	—	—	—	▬	—	▬	—	—	▬	—	—	—	▬	—	—	▬	▬	▬	—	▬	▬	—	—	—	—	—	▬	—	▬	▬
	plav gucinje	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	▬	—	—	▬	▬	▬	—	▬	▬	—	—	—	—	—	—	▬	—
	tromedja mountain range	—	—	—	▬	—	—	—	—	—	—	—	—	—	—	—	—	▬	—	—	▬	▬	—	▬	—	—	—	—	—	—	—	▬	—
	ohrida lake	—	—	—	—	—	—	▬	—	—	—	—	—	—	—	—	—	▬	—	▬	▬	▬	—	—	▬	—	—	—	—	▬	—	▬	—
	velika kladuša	—	—	—	—	▬	▬	▬	—	—	▬	—	—	—	—	—	—	—	▬	▬	—	▬	—	▬	—	—	—	—	—	—	—	▬	—
	bihać	—	—	—	—	▬	▬	▬	—	—	▬	—	—	—	—	—	—	—	▬	▬	—	▬	—	▬	—	—	—	—	—	▬	—	▬	—
	glina river	—	—	—	—	▬	▬	▬	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	▬	—	—	—	—	—	▬	—	▬	—
b	veliki skoljs	—	—	—	▬	—	—	▬	—	▬	—	▬	▬	—	—	—	—	—	—	▬	—	▬	—	▬	▬	—	—	—	—	—	—	—	—
	drina river	—	—	—	—	—	—	—	▬	—	—	—	—	—	—	—	—	—	—	▬	▬	▬	—	▬	▬	—	—	—	—	—	—	—	—
	rodopi mountain range	—	—	—	—	—	—	—	▬	—	—	—	—	—	▬	—	—	—	—	▬	▬	—	—	—	▬	—	—	—	—	—	—	—	—
	maritsa/evros river	—	—	—	—	▬	▬	—	—	—	—	—	—	—	—	—	—	▬	▬	▬	▬	▬	—	▬	▬	—	—	—	—	—	—	—	—
	black sea	—	—	—	—	—	—	—	—	▬	—	—	▬	—	—	—	—	—	▬	—	—	—	—	—	—	—	—	—	—	—	—	—	▬
	silistra	—	—	—	—	▬	▬	▬	▬	—	—	—	—	—	—	—	—	—	▬	—	▬	▬	—	▬	—	—	—	—	—	—	—	—	▬
	vidin	—	—	—	—	▬	▬	▬	—	—	—	—	—	▬	—	—	▬	▬	—	▬	▬	—	—	▬	—	—	—	—	—	—	—	—	—
	trun gold mining	—	—	—	—	—	—	—	▬	—	—	—	—	—	—	—	—	—	—	▬	▬	▬	▬	▬	▬	—	—	—	—	—	—	▬	—
	klek peninsula neum corridor	—	—	▬	▬	—	—	▬	—	▬	—	—	▬	—	—	—	—	—	▬	▬	—	▬	—	—	—	—	—	—	—	—	—	▬	▬
	trgovska gora	—	—	—	—	▬	—	▬	—	—	—	—	—	—	—	—	—	—	—	▬	—	▬	—	▬	—	—	—	—	—	—	—	▬	—
	slavonski brod	—	—	—	—	▬	▬	▬	—	—	—	—	—	▬	—	▬	—	▬	▬	▬	▬	▬	—	▬	—	—	—	▬	—	—	—	▬	—
	drava river valley	—	—	▬	—	▬	▬	▬	▬	—	—	—	—	—	—	▬	—	—	—	▬	▬	▬	—	▬	▬	—	—	—	—	▬	—	—	—
	adriatic sea corridor	—	—	▬	—	—	—	▬	—	▬	—	▬	▬	—	—	▬	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	▬
	dragonja river	—	—	▬	▬	▬	▬	▬	▬	—	—	—	▬	—	—	▬	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	gulf of piran	—	—	▬	▬	▬	▬	▬	▬	—	—	—	▬	—	—	▬	—	—	—	—	▬	—	—	—	—	—	—	—	—	—	—	—	▬
c	sveta gera mountain range	—	—	▬	—	▬	▬	—	▬	—	—	—	—	▬	—	—	—	▬	—	—	▬	▬	—	—	—	—	▬	—	▬	▬	—	—	—
	mura river valley	—	—	▬	—	▬	▬	—	▬	—	—	—	—	—	—	—	—	—	—	—	▬	▬	—	—	▬	—	—	—	—	▬	—	—	—
	fara / kostel	—	—	▬	▬	▬	▬	—	▬	—	—	—	—	▬	—	—	—	—	—	—	▬	▬	—	—	▬	—	—	—	—	▬	—	—	—
	danube river valley	—	—	—	—	▬	▬	▬	—	—	—	—	—	—	▬	—	▬	▬	—	—	▬	▬	—	▬	—	—	—	—	—	▬	—	▬	—
	liberland	—	—	—	—	▬	▬	▬	—	—	—	—	—	—	▬	—	▬	▬	—	—	▬	▬	—	▬	▬	—	—	—	—	▬	—	▬	—
	vukovar island	—	—	—	—	▬	▬	▬	—	—	—	—	—	—	▬	—	▬	▬	—	—	▬	▬	▬	▬	▬	—	▬	—	—	▬	—	▬	—
g	epirus region	—	—	▬	▬	▬	▬	▬	▬	—	—	—	—	—	—	—	—	—	—	▬	▬	▬	—	—	▬	—	—	—	—	—	—	▬	—
n	sar planina	—	—	—	—	▬	▬	—	—	—	—	—	—	—	—	—	▬	—	—	▬	▬	▬	▬	—	▬	—	—	—	—	—	—	—	—
	lukovo pole hydropower	—	—	—	—	▬	▬	—	—	—	—	—	—	—	—	—	▬	—	—	▬	▬	▬	—	—	—	—	—	—	—	—	—	—	—
	jugohrom jegunovce	—	—	—	—	▬	▬	—	—	—	—	—	—	—	—	—	▬	▬	—	▬	▬	▬	▬	—	—	—	—	—	—	—	—	—	—
s	mokra gora	—	—	—	—	▬	▬	▬	▬	—	—	—	—	▬	▬	▬	▬	—	—	▬	▬	▬	—	▬	▬	—	—	—	—	—	—	▬	—
	bor mines	—	—	—	—	—	—	—	—	—	—	—	—	—	▬	▬	▬	▬	—	▬	▬	▬	▬	—	—	—	—	—	—	—	—	▬	—
	subotica	—	—	—	—	▬	▬	—	▬	—	—	—	—	▬	—	▬	—	—	—	▬	▬	—	—	—	—	—	—	—	—	—	—	▬	—
	djerdap hydropower	—	—	—	—	▬	▬	▬	▬	—	—	—	—	▬	▬	▬	▬	—	▬	▬	▬	▬	▬	▬	—	—	—	—	—	—	—	▬	—
	prahovo pyrite	—	—	—	—	▬	▬	▬	▬	—	—	—	—	—	▬	—	—	▬	▬	▬	▬	▬	—	—	—	—	—	—	—	—	—	▬	—



POLITICHE SOCIALI | POLITICHE ECOLOGICHE

a

Government Macedonia_ Government of Albania Ministry, Macedonia_ Ministry, Albania
Government Greece Ministry, Greece

Montenegro Police_
Government, Montenegro

Public Enterprise National Parks, NPCG, Montenegro
NPCG's National Park Protection Service Department
Fishing and Agriculture Inspectorate

Ramsar Convention
Council of Europe's Bern Convention

Ulcinj Municipality
Directorate for Traffic

Government, Slovenia
Ministry of Sustainable Development and Tourism, Montenegro

Secretariat for Communal Services and Environmental Protection

NGO "Zeleni korak"

Municipality of Plav
Montenegro Police
Ministry of Health, Montenegro

Committee on Tourism, Agriculture and Environment, Montenegro
Ministry of Sustainable Development and Tourism, Montenegro

Ministry for Spatial Planning and Environment, Montenegro
Environmental Protection Agency, Montenegro

Government, Macedonia
Municipality of Ohrid

Society of Wetlands Scientists (European Chapter)
European Center for Nature Conservation
EuroNatur, Germany

Front 21/42, Macedonia
Ekosvest, Macedonia

Government, Bosnia and Herzegovina
European Commission (EC)
Government, Bosnia and Herzegovina
European Commission (EC)
Government, Bosnia and Herzegovina
European Commission (EC)
Government, Bosnia and Herzegovina
European Commission (EC)

Government, Croatia
Croatia Police
Government, Croatia
Croatia Police
Government, Croatia
Croatia Police
Government, Croatia
Croatia Police

European Border Agency
UN Refugee Agency
European Border Agency
UN Refugee Agency
European Border Agency
UN Refugee Agency
European Border Agency

Network for Critical Migration and Border Regime Studies
International Organization for Migration
Network for Critical Migration and Border Regime Studies
International Organization for Migration
Network for Critical Migration and Border Regime Studies
International Organization for Migration
Frontex

b

Municipality of Bogatić/Badovinci, Serbia
Government, Serbia

Government, Bosnia Herzegovina

Eko Put Ecological Association, Bosnia and Herzogovina

Government, Greece
Government, Turkey
European Commission (EC)
Ministry of Environment, Urban Planning and Public Works

Syriza party, Greece
Ministry of Defence, Greece
European Border Agency
Frontex

Turkish coastguard
Network for Critical Migration and Border Regime Studies
International Organization for Migration
Directives of the General Secretariat of Civil Protection

Laws 1739/1987, Greek Flooding Legislation

Xenocrates, 2003 General Plan of Civil Protection of Greece

EU Directives 2000/60/EE and 2007/60/EE

International Court of Justice
United Nations
Government, Bulgaria
European Union

Convention on the Territorial Sea and Contiguous Zone
Government, Turkey
Government, Greece

Government, Romania

Article 15 of the United Nations Convention on the Law of the Sea

OMV (the owner of Romania's largest oil company, Petrom

Directive 2008/50/EC
Council Directive 96/62/EC

Bulgaria's Council of Ministers

Supreme Administrative Court
Town council of Trun

Euromax, Canada
Bulgarian Association of Alternative Tourism

Campaign For Local Nature-Protection Referendum

Neum Agreement
Government, Croatia
Parliament, Bosnia and Herzegovina

European Commission (EC)

Government, Croatia
The National Assembly, Srpska
Parliament, Bosnia and Herzegovina

Ministry of Spatial Planning, Civil Engineering and Ecology, Srpska
Local authorities in the Una River Basin
Nuclear Power Plant "Krško" Slovenia

Political party "Živi zid"

State Office for Nuclear Safety, Croatia
Energy and Environmental Protection Institute (EKONERG) Croatia

"STOP deponiji radioaktivnog otpada na Trgovskoj gori"
Mining, Geology and Civil Engineering Association "Iskra", Novi Grad

Local Action Group LAG-UNA
Faculty of University of Tuzla

Ministry of Justice, Croatia
Government, Croatia

City of Slavonski Brod
Ministry of Industry, Energy and Mines of the Republic of Srpska

Ministry of Environmental and Nature Protection

GRAĐANSKA INICIJATIVA ZA ČISTI ZRAK Slavonski Brod

Ministry of Foreign Trade and Economic Relations, Bosnia Herzegovina

International association "Bikers of Europe"
Association of cyclists from Slavonski Brod

Citizens initiative "Kad ako ne sad. Brodani, ne dajte da nas truju"

Ecological associations "Eko Integral"

European Commission (EC)
Government, Croatia

WWF (World Wide Fund for Nature)
Euronatur

Drava Federation from Hungary

Drava League
Green Action

c

Government, Croatia
Government, Slovenia
European Union

Convention on the Territorial Sea and Contiguous Zone
Drnovšek–Račan agreement
United Nations

Article 15 of the United Nations Convention on the Law of the Sea

Government, Croatia
Government, Slovenia

Ministry of Environment and Energy, Croatia

Zelena Akcija (The Green Action)
Friends of the Earth Croatia

Government, Slovenia
Government, Croatia
European Union

Convention on the Territorial Sea and Contiguous Zone
United Nations

Article 15 of the United Nations Convention on the Law of the Sea

Government, Slovenia
Government, Croatia

Government, Hungary
Government, Croatia

County of Medimurje, Croatia

Schengen border

Government, Croatia
Government, Serbia

Ministry of Foreign Affairs, Serbia
Ministry of Foreign and European Affairs, Croatia

Government, Croatia
Government, Serbia

Ministry of Foreign Affairs, Serbia
Ministry of Foreign and European Affairs, Croatia

Party of Free Citizens

Radio Television of Vojvodina
Dnevni avaz

g

Government, Croatia
Croatian Hydrocarbon Agency (CHA)

Aspect Holding, USA
Vermilion Energy, Canada

INA-Industrija Nafte d.d. (INA)Croatia

Ministry of Environment and Energy, Croatia
Zelena Akcija (The Green Action) Friends of the Earth Croatia

n

Cameria Political Association (CPA)
Government, Greece

Ministry of Foreign Affairs, Albania
Government, Albania

Ministry of Foreign Affairs, Greece

Government, Macedonia
European Union

Government, Kosovo

United Nations Environment Programme
International Union for Conservation of Nature

Environment and Security Initiative
Macedonian ecological society

EuroNatur Foundation

The Ministry of Economy of the Republic of Macedonia
The World Bank, USA

Government, Kosovo

Front 21/42

EkoSvest

s

Government, Macedonia
Ministry of Economy of the Republic of Macedonia
Government, Kosovo

Camelot Group from Hong Kong SAR, China
Jugohrom Ferroalloys DOO Jegunovce, Macedonia

citizens of Tetovo
DOM- The Democratic Renewal of Macedonia

Ministry of Environment and Physical Planning, Macedonia

EcoGuerilla

The portal Portalb.mk

Government of Republic of Serbia
Municipality of Uzice

Municipality of Topola

Dinara Nikl DOO, UK

Ministry of Agriculture and Environmental Protection of Republic of Serbia
Serbian Ministry of Natural Resources, Mining and Spatial Planning

Nature Park "Sargan-Mokra gora"

The World Bank, USA
European Union

Government of ex-Yugoslavia_ Government, Serbia
Municipality of Bor

Ministry of Agriculture and Environmental Protection, Serbia
Inspectorate of Environmental Protection Serbia

Ekoagenda 1935
Mladi istrazivaci Bora
Civil initiative "Ne ćutim jer imam decu"
Klub mladih Nove Srbije

Government, Hungary
Republic of Serbia

Agreement on the Cooperation of Municipalities
Local self-government and educational institutions

Regional waste management plan

Ministry of Environment, Mining and Spatial Planning

local CSOs, local communities,
the public utility company "Čistoca i zelenilo"

Republic of Serbia

Djerdap National Park Public Enterprise (NPPE)

NGO Endemit

Republic of Serbia
Government, Romania

Elixir group DOO

Ministry of Agriculture and Environmental Protection, Serbia
Inspectorate of Environmental Protection Serbia

NGO "Preporod" NGO "Badem"
Vojvodjanska zelena inicijativa

3. ON FLUIDS
SOSPENSIONE FLUIDA

Anche l'acqua e l'aria hanno sovranità. Nel Nuovo Regime Climatico, il bordo rifiuta la logica lineare e unidimensionale e include elementi fuori dal visibile ambito geopolitico: i confini fluidi. Il concetto di confine fluido viene introdotto nel metodo a partire dalla scienza della fluido dinamica, che studia il comportamento dei fluidi, definendo tali come aggregazioni della materia allo stato gassoso e liquido. Secondo la fluidodinamica si assume l'ipotesi di costante variazione degli elementi fluidi che vengono definiti in una condizione di costante movimento. Sulla base di queste teorie della scienza della fisica, ai bordi, suddivisi in liquidi, costituiti prevalentemente da acqua (fiumi, oceani ecc.), e gassosi, costituiti da aria, vengono applicate le proprietà caratteristiche di costante dinamicità, permeabilità e indivisibilità. In questa nuova fluidodinamica del bordo, esso acquisisce la terza dimensione fluida trascinando con se il concetto di flusso, come starting point metodologico. Continuous movement, chance, uncertainty, and events, caratterizzano il bordo che si muove per le sue proprietà intrinseche di fluido

3.1 ASSUME TO SUSPEND
3.1.1 BALKAN'S MASTERPLAN

Sospendere implica una condizione di interruzione spaziale e temporale, in cui si generano istanti di riflessione, di osservazione. Implica all'interno della ricerca il primo passo verso la ricaduta del metodo e la sua sperimentazione in un luogo specifico, che viene individuato come emblematico. Questa sospensione in cui sorge la necessità di territorializzare la teoria e i metodi, identifica nei bordi dell'area dei Balcani quei punti di discontinuità caratterizzati da conflitto e dalla figura precedentemente descritta dell'elica. Questi luoghi elica presentano una maggiore coincidenza tra il bordo amministrativo e il bordo ecologico, intendendo quest'ultimo l'infrastruttura idrogeologica costituita dal Danubio e i suoi affluenti primari e secondari. Questi luoghi vengono mappati secondo le loro caratteristiche di eliche, ovvero secondo l'interferenza dei fenomeni umani e non umani che generano il movimento del bordo, e secondo le figure metodologiche del gradiente, del pattern e dell'esternità. Queste proprietà si intrecciano alla dimensione fluida del bordo aprendo questioni ed interferenze in nuovi scenari possibili. Questi scenari emergono e vengono mappati sul territorio come olo-grammi del conflitto, luoghi di eccezione che si sono formati in un tempo passato e che sono in continua formazione, per generare un nuovo Masterplan dei Balcani come mappatura delle fragilità ecologiche e sociali.
Il Masterplan presenta al suo interno i punti di discontinuità, segnati attraverso codici alfa-numerici e simboli creando un database delle informazioni, rintracciabile sottoforma di matrici di significato e spaziali (capitolo 3.2.3 Matrix). Essi sono collocati in punti sul bordo o in aree immediatamente adiacenti a esso.
La strategia del metodo è stata quella di utilizzare software complessi e data analysis, come strumenti critici utili alla progettazione. In particolare, l'uso del GIS consente di monitorare, attraverso la lente del pensiero critico proprio del metodo, i fenomeni globali e locali, in cui emergono non solo i dati spaziali ma anche le questioni intangibili e i sistemi complessi conflittuali caratteristici del bordo.
I dati relativi ai differenti punti di discontinuità e i fenomeni ad essi collegati sono riconducibili a una semiologia grafica che permette di costruire un sistema di segni e un linguaggio che consente l'immediata traduzione grafica delle informazioni (Bertin 1967): ogni fenomeno viene rielaborato secondo una specifica figura metodologica a partire da geodatabase locali e globali. Il dato, all'interno del progetto, assume una dimensione processuale e critica nonostante la sua estetizzazione, poichè rende possibile la visualizzazione degli effetti, generando una serialità di possibili processi.
La relazione tra la struttura ecologica e quella sociale emerge così riportandoci in quella condizione di sospensione segnata dall'incertezza dell'attuale crisi sociale e climatica.

3.2 DYNAMIC PROTOTYPES
3.2.1 SOMETHING IN THE AIR

La visione definita del nostro immaginario del bordo sul territorio si modifica. I complessi sistemi topografici permettono al bordo di assumere dimensioni diverse, che ibridano alla visione solida politica e rigida, l'idea di qualcosa che va oltre la lente dell'umano.
I bordi aerei sono limiti virtuali nello spazio, ma come quelli territoriali anch'essi sono under state jurisdiction, regolati da international agreements and treaties. Secondo le leggi internazionali infatti lo spazio aereo orizzontale corrisponde con i limiti territoriali di uno stato, inclusi i suoi confini marittimi. Come si può governare qualcosa che non si vede? La loro dimensione intangibile li sottopone però ad una maggiore intensità di dispute internazionali sottoponendoli a innumerevoli complicazioni. L'atmosfera che circonda la terra è composta da uno strato di gas e aerosol, un involucro che mantiene la sua posizione tangente alla terra solo grazie all'attrazione gravitazionale. I pesi diversi delle particelle aeree fanno sì che si crei un sottile strato più denso in corrispondenza della crosta terrestre, che va a creare la Critical Zone, strato di interazione della biosfera (Latour 2021), dove particelle microscopiche di smog, polvere e sostanze chimiche si depositano sul suolo terrestre e vengono respirate e assorbite senza filtri dai suoi abitanti. L'aria satura esercita una forma di colonialismo sullo spazio dei confini.
L'areosol aumenta la complessità nella modellazione atmosferica dello spazio aereo. Le questioni urbane contemporanee politiche vedono il concetto di "foschia" come pericolo per la salute umana, "materiale" in grado sia di destabilizzare l'atmosfera e la vita degli esseri viventi che la respirano ma ancor di più di far collassare gli attuali sistemi climatici del pianeta.
Gli inquinanti aerei, con la loro compressione ed espansione nello spazio aereo, producono nuove sfere d'azione, sociali, economiche e politiche che generano la dimensione instabile e variabile dell'atmosfera.
"Qualcosa nell'aria" impone il suo dominio, generando luoghi in cui si manifesta il conflitto sul controllo dei vettori diversi della crisi climatica. Cartografie alternative dell'aria, dell'atmosfera, possono permettere di modellarne le dina-miche, con l'obiettivo di crearne scenari futuri per produrre progetti alternativi sospesi nella biosfera. Per produrre un nuovo immaginario dello spazio aereo, bisogna però fare riferimento al concetto instabile di movimento fluido, caratteristico di questi elementi e alla sua dimensione molto complessa da mappare che richiede un elevato livello di critical skill in data processing.
Alimentata dall'instabilità effettiva delle parti-celle, questo concetto di atmosfera, specula su una terra sempre più dinamica. La geometria dell'atmosfera, attraverso le sue proprietà di implosione ed espansione, rivendica un proprio dominio, muovendosi oltre la sua visione come sfondo, ponendosi in primo piano come agente fondamentale nella concezione di confine in movimento, sia nella sua dimensione verticale che orizzontale dello spazio.

3.2.2 LIQUID SOIL

Le parti che compongono il confine sono in movimento in diversi modi. Il costante stato di erosione e decomposizione a cui è sottoposto ogni oggetto fisico sulla terra si manifesta anche sui confini, soggetti al costante movimento di autodecomposizione. (Nail 2016) Le forme visibili del paesaggio sono distorte sotto il regime fluido delle inondazioni amorfe e degli eventi di esondazione. I confini delle esondazioni rimangono forme mutevoli, definite dalla quantità e dal vettore di velocità dell'acqua. Il volume aereo dato dalle perturbazioni si scompone nella dimensione planare del terreno, diffondendosi ovunque la gravità lo conduca e andando poi a metabolizzare nel terreno. La combinazione di innalzamento del livello del mare, aumento delle perturbazioni climatiche ed espansione urbana ha accentuato i rischi dei territori in prossimità dei fiumi. (Rossano 2021)
Il rapporto umano con le oscillazioni fluviali cambia nel tempo, soprattutto quando questa fluida demarcazione coincide con un segno marcato e costruito artificialmente sul territorio. Il palinsesto territoriale delle tracce umane si de-compone man mano che si trasforma in liquido. Le politiche e le leggi devono creare uno spazio di adattamento a queste variazioni crescenti, portando flessibilità nei paesaggi pietrificati da secoli di ingegneria dura a favore di un modello che supporti i tempi ecologici contemporanei. Come si possono conciliare le esigenze funzionali del progetto con le dinamiche naturali all'interno dell'acqua stessa? (Prominski 2012). Progettare paesaggi elastici per futuri incerti significa considerare l'incertezza come un fatto inerente all'azione sociale umana piuttosto che una limitazione. Il concetto di elasticità del paesaggio dato dalla sua componente fluida influenza le forme del paesaggio, slegandole dal concetto di funzione. La concezione fluida fatta di campi e di flussi, con diverse concentrazioni chimiche, diversi volumi e diverse viscosità e fissità, comporta la progettazione di velocità, cicli, sinergie e sincronicità di interconnessioni. (Bélanger 2014)
I modelli di distribuzione dei confini in sovrapposizione a elementi fluidi come i fiumi non sono casuali. La ricerca del professore Laurence C. Smith1 mappa i corsi d'acqua in quanto confini politici su scala globale. Secondo la sua analisi, i fiumi costituiscono il 23% dei confini internazionali, il 17% dei confini statali e provinciali del mondo, e il 12% di tutti i confini locali a livello di contea. (Popelka 2020) Accrescimento e avulsione sono due concetti fondamentali per il confine. "Gli stati accettano il lento e incrementale meandro dei fiumi (accrescimento) ma non i rapidi spostamenti su larga scala (avulsione). Ci sono tre metodi per segnare il confine di un fiume. Il confine può essere indicato da un semplice punto medio o mediano, anche se questo approccio tende a distorcere le allocazioni delle risorse. Il secondo e più riconosciuto metodo è il "thalweg", o il centro del canale di navigazione principale. Il thalweg distribuisce i volumi d'acqua del fiume in modo più equo ed è preferito quando i punti di navigazione sono importanti. In terzo luogo, il confine può essere un argine del fiume, il che significa giurisdizione su tutto il fiume". (ICJ8)

3.2.3 MATRIX

La matrice è uno degli elementi base costitutivi di ciascun pattern e modello di arrangement spaziale (Forman 1995). La classificazione matriciale consente una visione sinottica di più dati e informazioni raccolte. Un punto nello spazio attraverso lo strumento critico della matrice viene visualizzato in relazione alle sue caratteristiche intrinseche, da quelle tangibili a quelle più intangibili, e in relazione alla molteplicità del sistema complesso a cui appartiene. Questo permette un confronto diretto tra i dati generando una moltiplicazione delle possibilità (Rovelli 2020).

A partire dalla sua definizione tecnica, di strumento critico di tracciamento dei fenomeni complessi, si è deciso di creare quattro matrici diverse spaziali e di significato in cui sono stati inseriti i punti di discontinuità individuati nel masterplan, riportando per ciascuno di essi le peculiarità:

La prima matrice presenta una catalogazione alfabetica dei punti, attraverso codici alfanumerici che indicano gli stati coinvolti nel conflitto. Essi sono catalogati in base alla loro localizzazione geografica, alla figura dell'elica, ovvero i codici degli stati che generano il confine (nHnNHnE)1; il codice del regime fluido a cui appartengono (nLnG)2; il codice spaziale che indica se è un'area in prossimità del confine (+), un punto sul confine tra due stati (/),un punto sul confine tra tre stati ( ); il codice della semiologia grafica utilizzata nel masterplan (fig. 2).
La seconda evidenzia la polarizzazione dei fenomeni che agiscono sul confine, più umani (H)o non umani (NH) e il regime fluido di appartenenza (liquido 1L0G, gassoso 0L1G o polarizzato 1L1G).
La terza riprende la semiologia grafica spaziali-zzata del masterplan dei balcani e la riporta in una visione d'insieme, in cui vengono mostrati per ogni luogo i fenomeni agenti e generatori di disturbo, a partire dalle questioni proprie del territorio con un tempo ecologico maggiore (topografia, batimetria ecc.) fino alle categorie di agenti più umane/frutto dell'intervento dell'uomo (pm2.5, so2, water dams ecc.)
L'ultimo strumento di trasformazione dei dati assume la forma di un pentagramma del conflitto in cui viene quantificata nel tempo l'intensità con cui i luoghi sono stati soggetti a conflitti politici e questioni ecologiche, sottolineando lo sfasamento temporale tra i due processi. Il diagramma sintetizza sulle ordinate la pola-rizzazione del fenomeno (umano, polarizzato, non umano) e sulle ascisse l'arco temporale considerato. Il regime fluido di appartenenza viene anch'esso distinto da un codice grafico specifico.

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“I try to make the work itself sensitive, not in any deep sense, but just literally make it very sensitive, so you become aware not of the way the work looks or the way it sounds, but you become aware of listening. That’s what I’m investigating now, so I am not investigating in the objective world, I am investigating sensitivity”.

Bernd Schulz, 2001

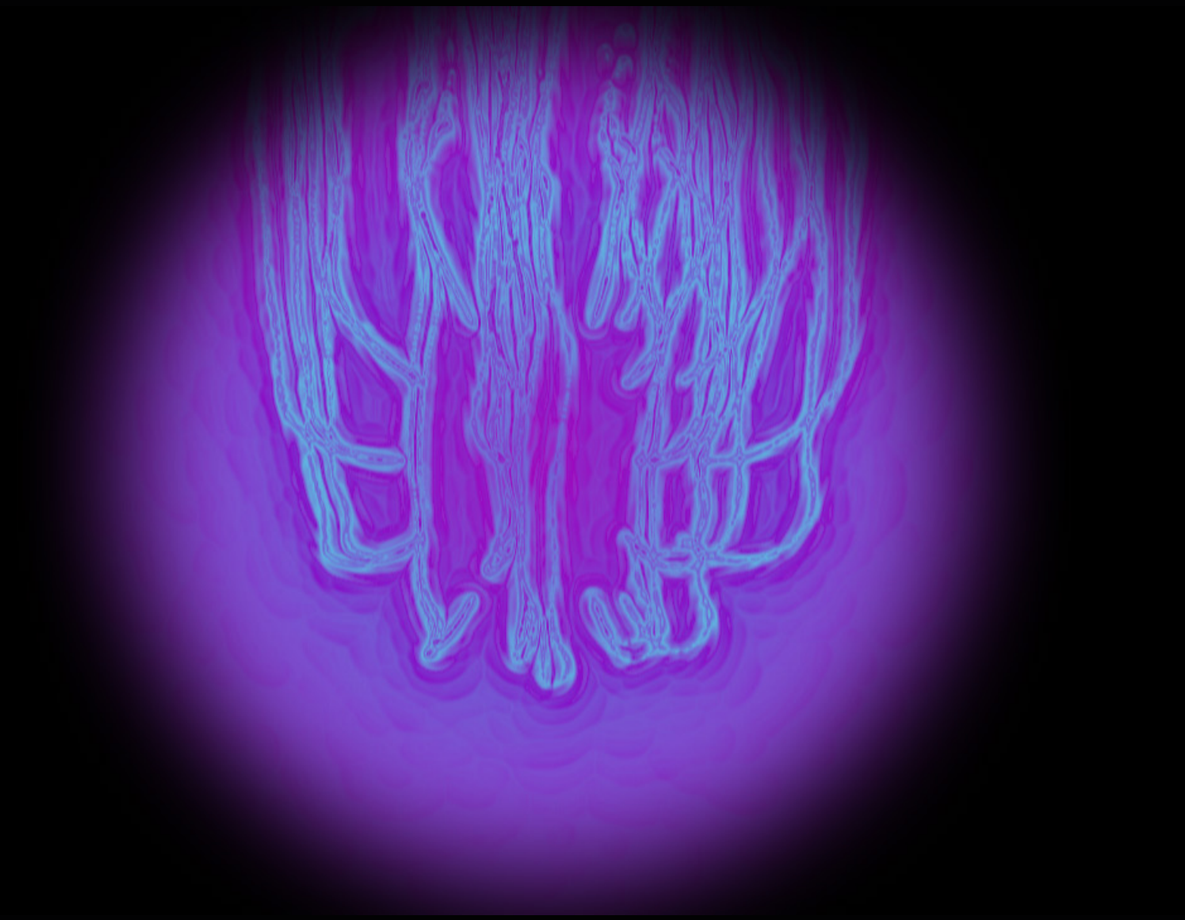


figure n.17
simulation of fluids’ movement

4

far from equilibrium

SEMIOTICA
DEL CONFLITTO

4.1 epigenetic landscape

4.1 Morphogenetic fields

The concept of epigenetic landscapes has its origins in the discipline of genetic biology and was introduced in 1957 as a biological model by Conrad Waddington. The term derives from epigenesis, a process in which forms gradually emerge from homogeneous environments and undifferentiated genes, and manifest their differentiation in subsequent stages of development. This model proposed by Waddington aims to bring out the complexity of systems in a continuous state of evolution: gene differentiation in the epigenetic landscape model is represented by a diagram consisting of a series of reliefs and cavities that a cell may pass through on its way to a specific state of type development. Each of these cavities represents a possible pathway of the evolution of the individual type (Waddington 1940).
The evolving form is represented in Waddington's diagram by the possible trajectories of a sphere, from a higher to a lower point of the generated surface in a continuous search for the state of equilibrium in the different configurations assumed in time.
This spatial and temporal model introduces the possibility that the differentiation of the form considers the intervention of external factors: what results is a relation between phenomenal forms (phenotypes) and morphogenetic fields, generating a topographic undulatory surface whose multiple cavities correspond to the possible trajectories that the form of anybody, considered as a dynamic element, can assume (Kwinter 1992).
The concept is taken up by Sanford Kwinter in his essay "*Landscapes of Change*: *Boccioni's* '*Stati d'animo*" and applied in the discipline of landscape and architecture, as a possible key to reading and drawing the complex non-linear phenomena and processes that constitute the planet. Kwinter compares the theory of classical models with the topological one. In classical theory, form is conceived in an idealized way without considering the influence of matter as a dynamic force on an idealized and isolated form. In this model, matter is reduced to an inert substrate that is unable to intervene in the genesis of form. Kwinter, relying on epigenetics, proposes a dynamic, relational and performative model; a multiple set of connections, events, forces and actions actively playing in the development of time and space. The form exists in continuous evolution and development through different states of equilibrium and possible scenarios in space and time; it is not to be considered fixed or static, precisely because it is located in a space that Kwinter defines as transformational space.This principle of transformational space is identified as a necessity within architectural and landscape design, especially in a historical context in which social and natural urgencies are continuously agents of transformation and modulation. The modulations of the epigenetic landscape, therefore, correspond to trends or scenarios, which are not deterministic. On the contrary, the epigenetic landscape absorbs and makes all contingency creative, as a multiplicity generated by an extremely complex field of forces (Kwinter 1992). This makes it possible to understand in the practice of design at the application level what the new forms of complex systems may be, which will be generated over time, and consequently what design actions may respond to the different evolutions, spatial modulations at a specific time.
Operationally within the research, the theory of the epigenetic landscape is inserted precisely at the methodological level as a design action of best practice. The scientific mappings carried out on the places considered lead to the production of transformations of space that develop over time: the new fluid form of the border is generated in a continuous dynamic space-time process, producing new scenarios and possible topographies characterized by methodological figures of the gradient, the attern and the externality.

4.2 abductive logic

4.2 Non-linear reasoning

The concept of abduction and abductive logic was introduced into the theories of modern logic and formulated by the American philosopher Charles Sanders Peirce, in his work on the logic of scientific disciplines, as one of the three main types of inference alongside deduction and induction. While deductive and inductive logic were able to take their place as pillars in the philosophy of science, abductive logic remained a more hidden concept. According to Peirce, however, abductive logic is to be regarded as the basis of the scientific method, since it is defined as the process of forming explanatory hypotheses, and as the only logical operation for the introduction of any new idea and explanation of 'surprising observations' (CP 5.172, 1903); he also defines abduction as that operation which includes any other kind of process by which theories and concepts are generated. In his lectures at Harvard in 1903, Peirce pronounced the three cotary prepositions of pragmatism, described as aspects of the functioning of the mind:
1.Everything in our minds is based on something generated by our senses.
2. Perceptual judgments include generality, which enables us to generate general statements based on them.
3. The subconscious uses abduction to generate perceptual judgments; the conscious mind does not criticize those perceptual judgments.
If we assume, as the philosopher states, that perceptual judgement, based precisely on observed premises, is essentially abduction, then pragmatism is nothing more than "the logic of abduction", which is why it lies at the foundation of the scientific method. "Abduction comes in a *flash*, like an *illumination*. The pieces were already present in our minds; what is new is their connection. Thus abduction is, at its root, a connection, a relation." (CP 5.189, 1903)
Perception and abduction are thus considered in logical reasoning as both applicable inferences in the method, since, based on observations and perceptions of concatenations of phenomena, they allow us to discover something we do not know. Although abduction states its conclusions only hypothetically, it has a definite logical form.
Peirce presented the standard logical description in the seventh Harvard Lecture, in 1903:

The surprising fact, C, is observed.
But if A were true, C would be an obvious fact,
Therefore, there is reason to suspect that A is true.
(CP 5.189, 1903)

This scheme reveals why abduction is also called *retroduction* it is reasoning that leads from an effect of an admitted consequence to its antecedent.
This process of formulating hypotheses in a continuous transition between sets of elements constituting the phenomenon can be included in the design practice of architecture and landscape. In fact, if we consider the initial phases of the design processes as instants of formulation of experimental hypotheses, speculative proposals, which are based on the observation of concrete phenomena and are tested through mapping, drawings, models, it is evident how abductive logic can become a useful tool for design.
Generating possible scenarios, resulting from the observation of a phenomenon, by continuously changing the scale of the processes and elements that constitute the general and the particular, thus becomes a methodological operation that is well-founded, especially in disciplines such as architecture and landscape, which focus on different scalar problematics.
The abductive method is in fact used in reasoning for the circular logical structure with which hypotheses, phenomena and statements are linked. It moves away from binary logic and allows in research to work through non-linear logic in a scheme of action and feedback as a general approach to the observation and design of a place.

4.3 POINTS OF DISCONTINUITY

4.3.1 Holograms of conflict

The concept of points of discontinuity, presented in chapter 3, those emblematic places, holograms of conflict, that characterise the Balkan area, identified and mapped within the new Master Plan, is taken up again in a projectual dimension. These points are helix places, in which the edge, characterised by a coincidence of administrative and ecological edge, moves in its fluid dimension due to human and non-human phenomena. The properties of these propellers interact with the new fluid nature of the edge, also acquiring a liquid or gaseous regime. Three characteristic points along the same section of the border dividing the states of Croatia and Bosnia and Herzegovina, distinguished by specific properties of fluid regime and by the type of conflictual phenomena manifested, have been chosen as sites for testing the method.
01. bc1 - Velika Kladusa: is the first point, a border town, located in Bosnia, marked by the strong migration crisis that has long involved the Balkan Route. This point is characterised by the gaseous regime (0L1G), as the figure of the gradient acts on it, the latter being understood as the movement on the border of human beings. This emblematic place is also marked by the presence of the river, as an element of conflict and threshold between the two states;
10. cb6 - Trgovska Gora: is the point in Croatia characterised by the liquid regime (1L0G) and the strong presence of a still open conflict. At this border point, whose landscape is characterised by the Una river, Croatia and Slovenia plan to store nuclear waste produced by the Slovenian nuclear power plant Krsko, to the strong disapproval of the Bosnian town of Dvor. The point drags with it the problems of river water and soil pollution, demonstrating through successive mappings the three-dimensionality of the moving edge;
11. cb7 - Slavonski Brod: is the third point, located in Croatia, further east on the border. This fragmented spot is characterised by a hybrid fluid regime between liquid and gas (1L1G) due to the presence of the Sava river, which is particularly prone to overflows, and the presence of strong air pollution due to the old oil refinery in the Bosnian town of Bosanski Brod. The point is chosen as an example of the aerial dimension of the border, which goes beyond the static and tangible dimension of administrative architectural boundaries;
These three points are chosen within the territory because they are united by the presence of the ecological element of the river, and its related flooding processes affecting the area, and the earthquake of 29 December 2020. These phenomena allow the formulation, through the collection of data related to them and the consequent mapping, of hypotheses of future scenarios, i.e. possible landscapes whose morphogenesis is influenced by the specific human and non-human phenomena that characterise them.

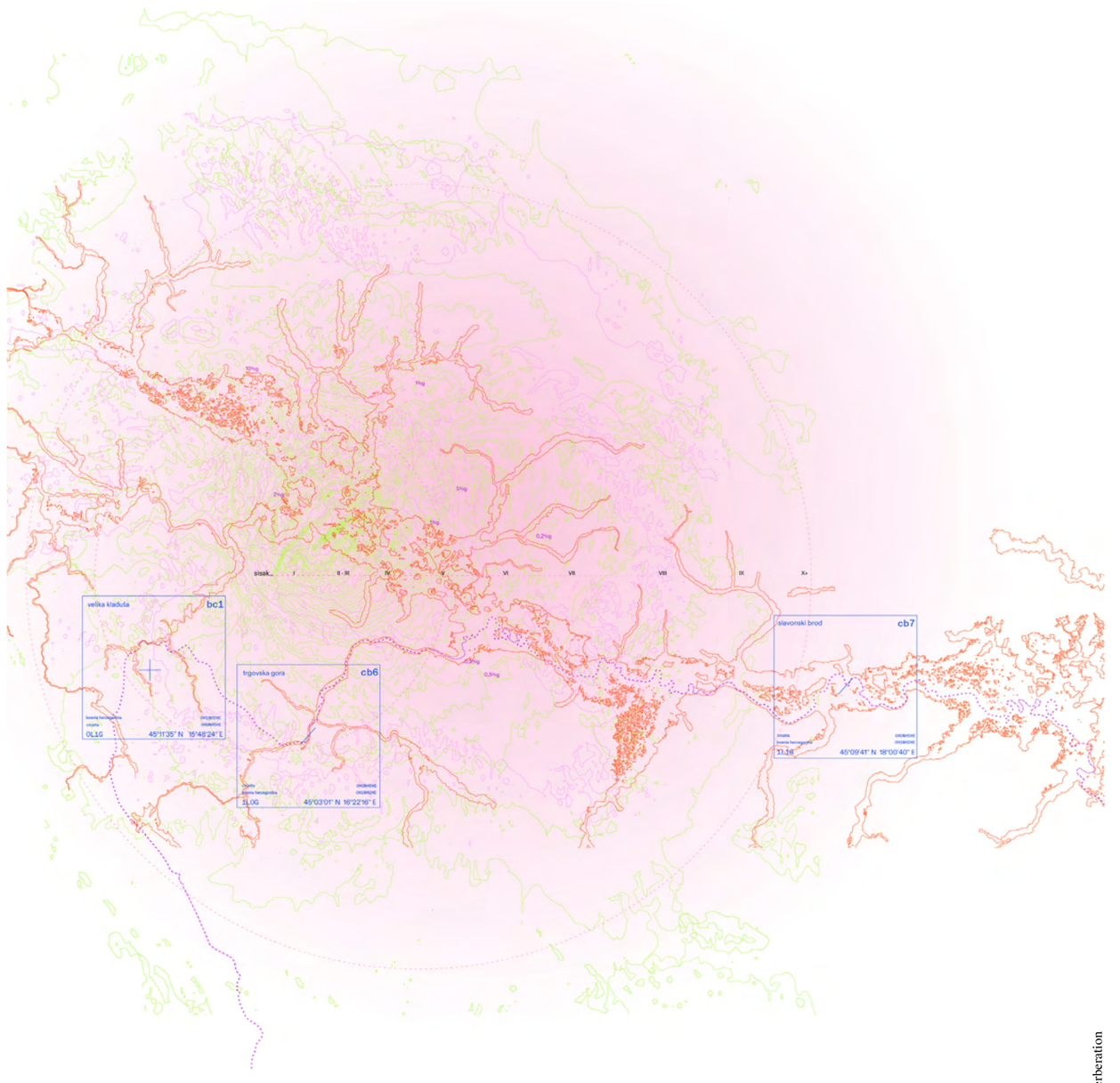


figure n.1
the three points of discontinuity
and the december earthquake's reverberation

01

velika kladusa

45°11'35''N 15°48'24''E

bosnia herzegovina 0H1NH2HE
croatia 0HONH5HE

bc1

Since 2015, Bosnia as a transit country has been subject to numerous waves of migrants seeking to reach European nations, especially neighbouring Croatia. In 2016, the influx increased more when the borders of Greece and the Republic of Macedonia (North) closed and border controls between Serbia, Hungary and Croatia were increased. The closure of the Balkan Route in 2016 resulted in further tightening of border controls and rejections.
The reasons for people to leave Bosnia and move to Croatia refer mainly to the perceived socio-economic situation, corruption and internal political tensions. The legal framework related to migration issues is very fragmented in Bosnia due to the division of the federal state into separate political-administrative entities with a large degree of autonomy and their governing bodies.
The first significant Law of reference is the Law on Immigration and Asylum that entered into force, with UNHCR, OHR and the Council of Europe, in 1999. At the end of 2003, significant progress in improving the legal framework was achieved with the adoption of the Law on "Circulation and Stay of Foreigners and Asylum Seekers".
In 2016, the Council of Ministers of Bosnia and Herzegovina decided to examine and adopt a new migration and asylum strategy for an action plan for 2020. To date, the country is making efforts to undertake several substantial improvements to its legislative and institutional framework required by the European Commission as a condition for its accession to the European Union.

In Bosnia and Herzegovina, as of 2019 were registered 19,266 migrants according to estimates of the IOM (International Organization for Migrants). There are about 3,000-3,500 people in the canton of Una-Sana. Most of the migrants are concentrated precisely in Bihac and Velika Kladusa, near the Glina River in the western part of the country.

Despite the partial lack of interest of the international media, the migratory flow that is concentrated in Velika Kladusa makes the town a critical junction on the route to Europe.
The first arrivals in Velika Kladuša have been recorded since December 2017, when small groups of men began gathering in makeshift camps around the centre and the main mosque. The eviction in May 2018 led to the development of a series of informal encampments in the peripheral area, especially near the border.
To date, the movement of migrants occurs mainly through 2 corridors. The first is an alternative to the traditional Balkan route through Serbia that enters Bosnia and Herzegovina after crossing the Drina River. The second is the Bosnian enclaves of Velika Kladuša, and Bihać comes directly from Greece through Albania and Montenegro.
The latter, precisely through the border section between Velika Kladusa and Bihac, is stimulated by the relative porosity of the borders. This route brings new challenges to local authorities in Bosnia and Herzegovina related to the provision of humanitarian support and the geopolitical implications of becoming a new country part of the European Union.

source: migrants-refugees.va/country-profile/bosnia-and-herzegovina/

Jost Franko, *Keine Chance*,
2019 - ongoing
jostfranko.com

10

trgovska gora

45°03'01''N 16°22'16''E

croatia OHONH5HE
bosnia herzegovina OH1NH2HE

cb6 /

Croatia owns 50□ of the Slovenian nuclear power plant "Krško" and is therefore obliged to dispose of half of the nuclear waste when the plant ceases operation in 2043. Slovenia has built a permanent nuclear waste repository in the vicinity of the Kershko (Vrbina) NPP. However, the Croatian government has found it more economically viable to build repository and storage warehouses within its borders, partly due to the fact that EU funds go directly to the municipality hosting the project.

Since 1999, the former underground military warehouse in Trgovska gora, 2.5 km from the town of Dvor and 850 m from the Una River, has been registered in the spatial planning of the Republic of Croatia as the only potential storage site. Trgovska gora is an area of high natural value with a long mining and agricultural tradition. It is also part of Banya, the poorest and least populated region in Croatia, inhabited mainly by the Serbian minority. From the beginning, the project faced opposition from local authorities, citizens and NGOs.
In 2003, more than 16,000 people signed a petition against the application. However, this was not enough to resolve the conflict and the issue was reopened in 2007 and more recently in 2013, after Croatia joined the European Union and agreed to comply with its regulations on radioactive waste disposal. In February 2015, citizens of Dvor reported a large number of freight trucks carrying unidentified goods to locations of their choosing. In April 2015, the Dvor City Council unanimously decided to say "no" to the application and shared its views on the issue with the Croatian national government.

Since the Una River forms the natural border between Croatia and Bosnia and Herzegovina, more precisely Republika Srpska (RS), the field will also affect the nearest Bosnian town of Novi Grad (2 km from the site) . The Una River has been declared a B□H National Park and protected by the Natura 2000 network and public debate criticized the strategic study for not taking into account the 230,000 people living on the Bosnian side of the Una River. Croatia violated the ESPOO convention, which states that warehouses should be located at least 20 kilometers from international borders. The National Assembly of RS referred to the "Declaration against the construction of the nuclear waste disposal site" receiving the support of the Parliament of the B□H Federation. Bosnian authorities then reported the case to the European Commission and the signatories of the ESPOO Convention.

Over the years, several Croatian and Bosnian opponents have organized joint protests and public hearings in the Croatian capital, Zagreb, and the town of Dvor. Trgovska gora is not an appropriate area for such an object, given the high seismic activity, the risk of flooding, the presence of porous rocks and the fact that it contains important water resources. According to the opponents, the Croatian government should invest in the construction of new reservoirs in the locality of Vrbina, Slovenia, instead of jeopardizing the expense of local development based on agriculture, ecology and tourism.

source: ejatlas.org

www.youtube.com/watch?v=UEV2OaN0UGU
www.balkaninsight.com/2016/03/03/bosnia-and-croatia-spar-over-radioactive-waste-site-03-02-2016/
www. balkaninsight.com/2018/11/29/croatia-still-has-no-solution-for-nuclear-waste-from-npp-krsko-11-28-2018/
Johannes Plenio da Pixabay
www.ejatlas.org/conflict/nuclear-waste-disposal-at-trgovska-gora-croatia
www.tportal.hr/vijesti/clanak/hrvatske-srbe-zavadio-nuklearni-otpad-u-dvoru-20160317
www.express.24sata.hr/galerije/galerija-15321?page=5

11

slavonski brod

45°09'41''N 18°00'40''E

croatia	OHONH5HE
bosnia herzegovina	OH1NH2HE

cb7 /

In 2007, the Russian company Zarubezhneft purchased the oil refinery in the Bosnian town of Bosanski Brod (Republika Srpska). The old processing line was put into operation to process crude oil with a capacity of 1.2 million tons per year to produce motor fuels, diesel fuels, bitumen, liquid diesel, heating oil and sulfur. The industry, over time, has employed hundreds of Bosanski Brod citizens.

Beginning in 2010, air monitoring stations in Slavonski Brod, a Croatian city located on the opposite side of the Sava River Basin, began recording exponentially higher air pollutant emissions over time. The city in 2013 was ranked by the Environmental Protection Agency as the city with the worst air quality in Croatia in 2013 and one of the most polluted cities in Europe.

Over the years, local authorities have organized demonstrations and protests in Zagreb due to air pollution.
In the same year, the authorities of Republika Srpska, claiming that the Refinery complies with all environmental permits, rejected any accusation related to their responsibility for the air pollution of the Croatian city on the border. The Croatian environment minister and the deputy general director of the Russian company then decide to hold a meeting in Zagreb to discuss possible solutions to cross-border air pollution.

Despite the request by the Croatian authorities to modernize the Refinery, the same air quality data continues to be recorded in 2014. Therefore, it is decided to form a "specialized body to monitor the improvement of air quality in Slavonski Brod" and keep citizens and the media regularly informed about the authorities' activities related to this problem.

In 2015, the Croatian government decided to present the case to the European Commission regarding 'transboundary pollution against Bosnia and Herzegovina and the Russian company Zarubezneft. Between 2015 and 2016, the pollution increases to alarming levels involving different types of European interests. Therefore, Croatia and Bosnia decided to sign in 2016 a cooperation agreement for environmental protection and sustainable development. One of the main economic measures applied to counter the Rafineria was to prevent the Refinery's access to the Croatian market and infrastructure. The Croatian oil company JANAF in particular has been one of the leading suppliers of the Refinery.

In 2019, the Refinery officially stopped operating after it reported a net loss of €60 million, compared to a net loss of €7.5 million in 2018.
However, in 2020 pollution values continue to be above the limit, determining that Brod Refinery is not solely responsible for pollution from Slavonski Brod. However, the meteorological and geographical environment also contribute to the accumulation of air pollutants.
In 2020, the Ministry of Energy and Mines of the Republic of Srpska (RS) declared the reopening of the oil refinery in Bosanski Brod, which is committed to completing the gasification project and implementing the facility with new investments by 2022.

source: ejatlas.org














www.otisak.ba/brod-u-eksploziji-u-rafineriji-poginula-jedna-osoba-devetero-povrijedenih/
www.hr.n1info.com/english/news/slavonski-brod-ranks-third-worst-city-in-europe-on-air-quality-index/
www. tvk3.info/
www.rtrs.tv/

www.tportal.hr/vijesti/clanak/ministry-warns-against-misinterpretations-of-benzene-data-in-slavonski-brod-20121104
www.rafinerija.com/Multimedia?lang=en-US

4.4 SETACCIO OF SYNCRHONICITY

4.4.1 Pentragram of the collective

In *Politics of Nature. How to bring the sciences into Democracy* (2004) Latour states that we are bound and situated inside a political machine that produces truth/science and we cannot (ever) look at it from the outside (apart from imagining it as a model). Therefore, from inside this machine, we are forced to 'believe' in the truth/science it continuously produces, in a cycle that changes over time. Latour defines this machine for constructing truth (but not reality) as the 'Collective', a global procedure applicable to many situations. The Collective is defined only by its movement: entities rejected externally by the ordering power come back to the call, to disturb the system. The model of the Collective is a hypothesis of movement that is often accompanied by representations of a reticular type. Latour himself developed the Actor Network Theory, according to which the entities in the network are described on the basis of the action they are performing and which therefore allows us to take them into consideration. The ANT uses networks of relations, which can be declined by considering the different entities that compose it. When we start to speak jointly of movements (cycles, sequences, processes) and networks (relations, systems of actors), we must frame the difference between the diachronic and synchronic dimensions. The cycle of the Collective is a diachronic model that we can apply to architectural and urban design processes, but which allows a network of documents and entities to appear as a synchronic whole. The process in the realization of the Pentagram of the Collective starts from the unrolled structure of the cycle in which the diachronic dimension of time in ordinate is marked by the initial opening of the conflict at a specific point of the boundary and closes with an apparent final closure in which the problem remains unresolved, suspended, which corresponds to the contemporary. The movement of actors and actants through the controversies of the collective is only discretised into segments after observing the cycle in its dimension of circular totality. Here, in fact, the cyclical diagram of the Latouriana collective imposes itself as a "Photographic Gun" to capture distinct frames in movement. From a diachronic process we try to extrapolate synchronic frames. The rays of the circle mark the temporality of the events, and show the irruption of entities, actors and actants in different phases. By "sifting" the cyclical diagram, starting from specific triggering events, the "catastrophes" that have made these points unstable and discontinuous, it is possible to identify new linear grids, in which on the same dimension (time) we find local and European institutions, governments, documents and events that have built a specific synchronic frame. How can the synchronic dimension of a place take on a third dimension linked to space and no longer to time?
How can we put into "spatial" motion a diagram that does not take into account a time variable?

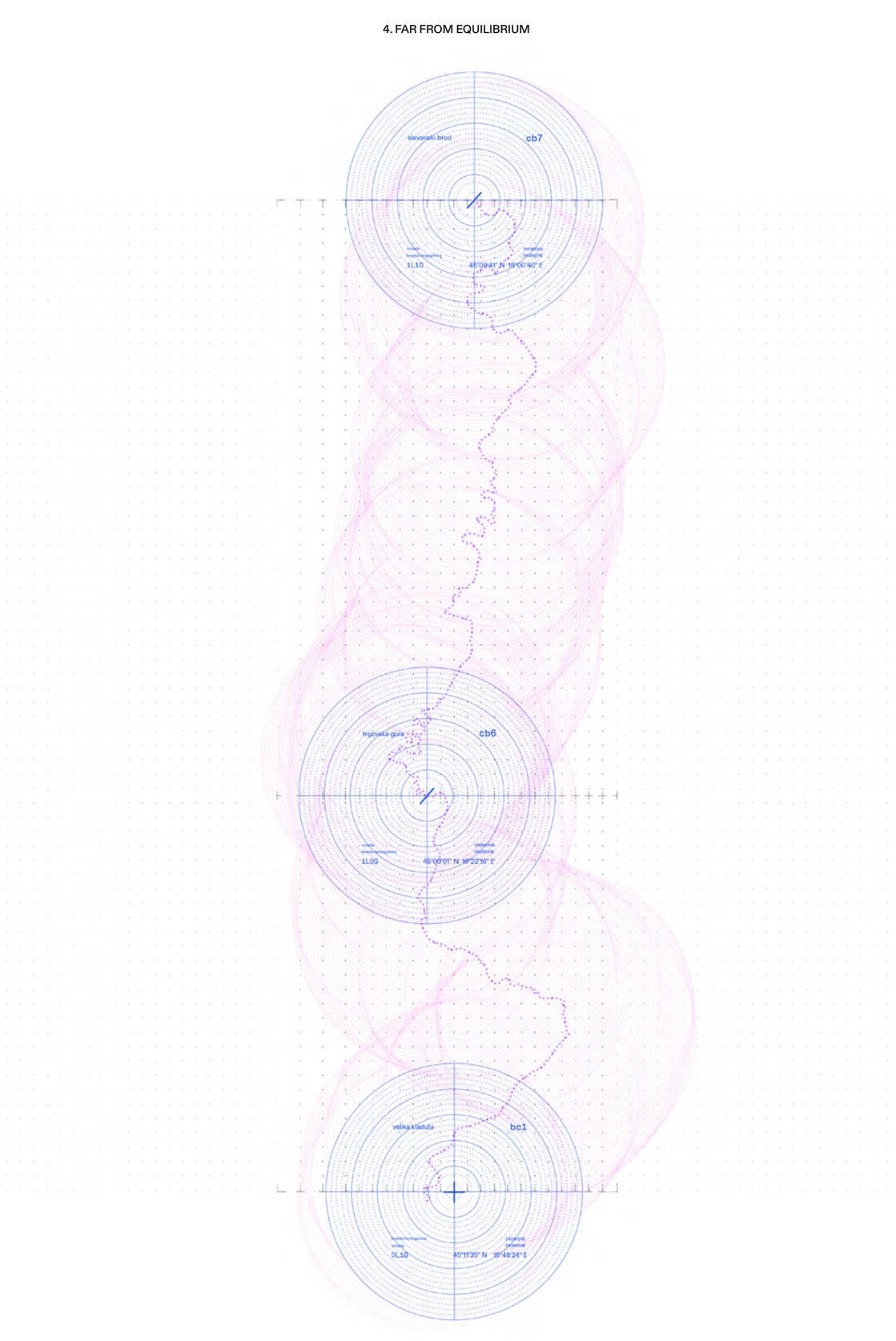
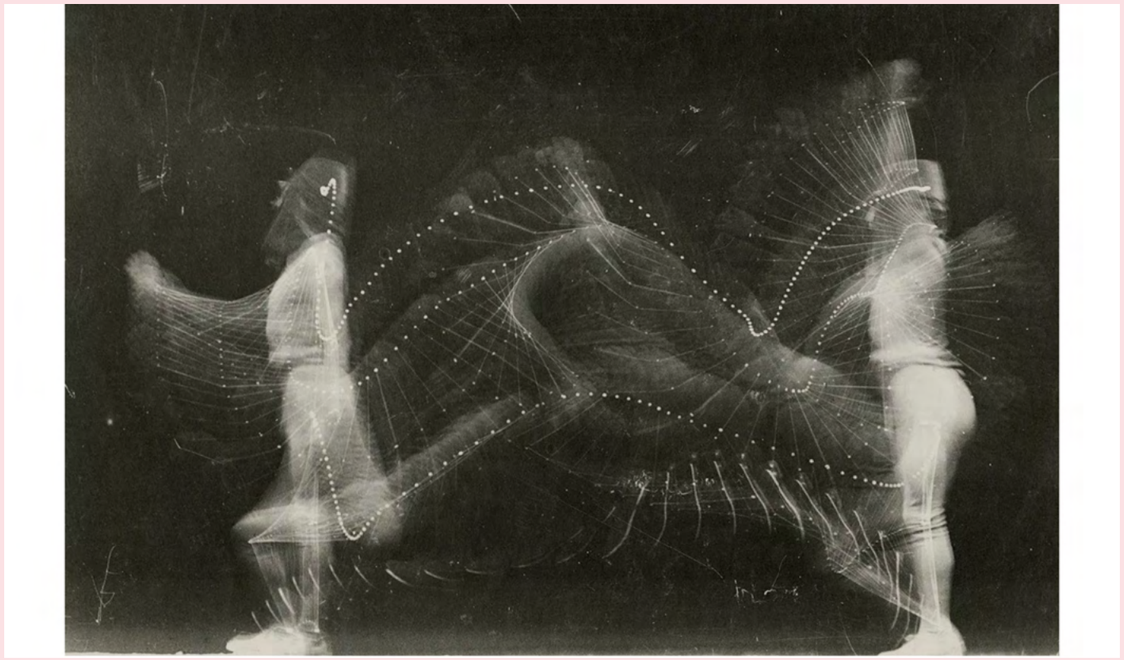


figure n.2
the border acquires its third dimension

Etienne-Jules Marey
Physics and Art

"Over time, landscapes are gradually shaped by natural forces. Indiscernible to the naked eye, we only perceive one moment at a time. The fluctuations and the rhythmic movement of rivers are a glimpse into the past, as traces provide evidence of the constant transformations that surround us".



-art and science-

According to art theorist Rosalind Krauss, “photography [...] becomes a theoretical object, a sort of grid or filter by means of which one can organise the data of another field that is in a second position in relation to it”.

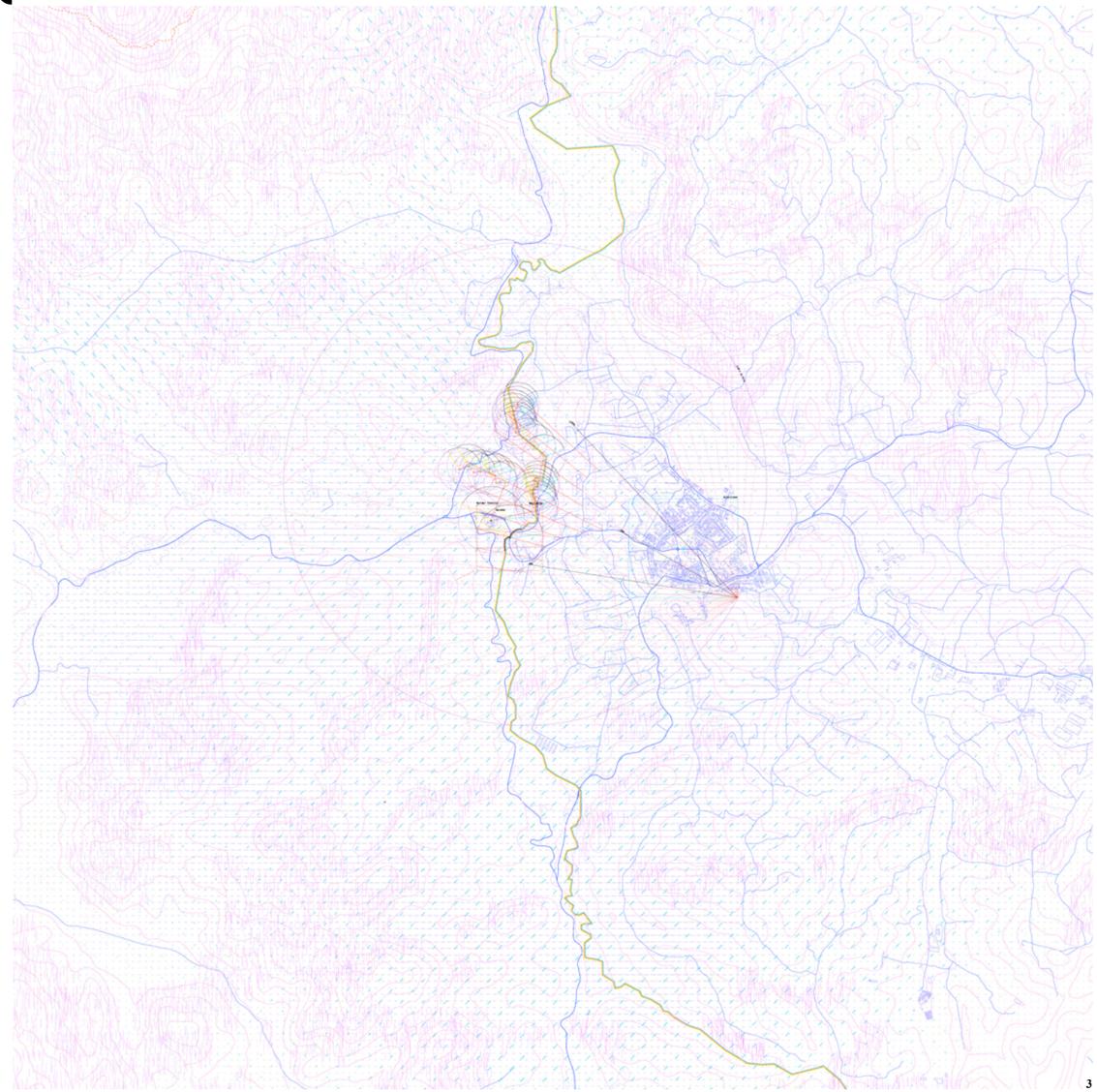
Etienne Jules Mary, wasn’t a photographer but a physiologist and he considered the body an animate machine, whose laws governing movement are the same as those of inanimate machines and can be analysed using the tools of physics and engineering. Through his works he attempts to capture movement in the image by serially dividing each act and gesture produced.
Movement in this sense is intended to capture the moment in time in its dilation.
In 1882, he developed a method with a single camera that he called chronophotography. This precise and objective method allowed Marey to capture images that enabled scientific measurements to be made.

To make these chronophotographs, Marey used dry photographic plates and a normal camera with an open shutter. Behind the lens, Marey placed a rotating metal disc with slits cut in at regular intervals. As the subject moved in front of a black background, the rotating shutter then exposed the glass plate, creating a sequence of images.

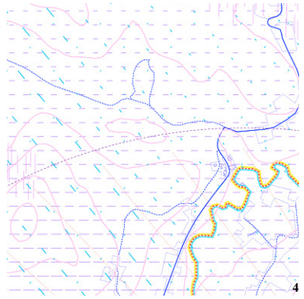
01

bc1

+



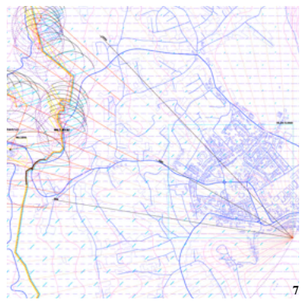
3



4

5

6



7

BORDO CLIMA

MIGRANTS PUSHBACK

Velika Kladusa

bosnia ⟶ croatia

The term pushback is a key component of the situation that unfolded along the EU borders (Hungary and Croatia) with Serbia in 2016, after the closure of the Balkan route.
Push-back describes the informal expulsion (without due process) of an individual or group to another country. This lies in contrast to the term “deportation”, which is conducted in a legal framework. Push-backs have become an important, if unofficial, part of the migration regime of EU countries and elsewhere.
Croatia uses EU funds to finance pushback operations on the border. Documents in the EU tender database show how the officers’ costs are paid by the EU Internal Security Fund (ISF)

https://www.borderviolence.eu/

figure n.3-7 . Velika Kladusa
maps showing the static and rigid nature
of the architectural and political borders

01. pentagram of the collective

CROATIA

|E1|
Croatia'll join Shengen Area

|e1|
Pushback expanded during Covid19

|e2|
first pushback from Croatia

|e3|
Closure of Balkan Route

|e4|
process of (re)borderization Balkan Region

|e5|
Border closure

|d1|
EURODAC-database

|d2|
Lighthouse Reports

|d3|
EU's Internal Security Fund (ISF)

|c1|
Pointer

|c2|
Novosti

|c3|
RTL Croatia

|c4|
Libération

|c5|
ARD Studio Wien

|c6|
ARD Monitor

|c7|
Der Spiegel

|c8|
Croatia Police

|c9|
European Court of Human Rights

|c10|
The Service for Foreigners Affairs (SFA)

|c11|
The Centre for Peace Studies (CPS)

|c12|
"Are You Serious"

|c13|
Service for Foreigners' Affairs

|c14|
"CMS"

|c15|
Frontex, the European Border and Coast Guard Agency

|c16|
Croatian Ministry

|c17|
UNHCR

|a1|
Croatian Minestry of Interiors (MUP)

|a2|
Donald Tusk
president of the European Council

|d4|
Hungary, push-backs were legitimized

|d5|
IOM 2015

|D5|
Croatia 1st request to Join Shengen Area

|c18|
European Parliament

|c19|
Council

|d6|
Article 18 and 19 of the Charter of Fundamental Rights of European Union and in Directive 2013/32/EU

|d7|
Prot. 4, Art. 4, European Convention on Human Rights

|D6|
Croatia joined EU

|d8|
Directive 2008/115/EC of the European Parliament and of the Council "third safe countries"

|d9|
Readmission agreement

|D7|
Agreement on Yugoslavia's Succession issues

|D8|
Border demarcation Treaty

|A6|
Franjo Tuđman
President

|D10|
Agreement between the Governments of Croatia and Bosnia and Herzegovina on Water Management Issues

|D11|
Agreement of mutual co-operation

|D12|
Breakup of the Yugoslav federation

|D13|
Limits between census settlements

2030

2020

2010

2000

1990

BOSNIA ED ERZEGOVINA

|e1|
evicted "helicopter" settlement in Velika Kladusa

|e2|
Miral camp is no longer issuing new identity cards that entitle people to enter the camp.

|E1|
Mandatory for citizens traveling to Europe from Bosnia and Herzegovina (to the Schengen zone) to obtain an ETIAS visa waiver for stays of 90 days

|e3|
transformation of the temporary Lipa site into an official camp

|e4|
TRC Miral Dramatic Covid Situation

|e5|
Fire in Lipa camp

|e6|
Violent protest migrants

|e7|
Borići, Sedra, Miral, Bira and Lipa camps were set up

|e8|
first pushback to Bosnia

|e9|
Closure of Balkan Route

|e10|
process of (re)borderization Balkan Region

|e11|
Major migratory flow

|e12|
Refugee crisis

|c1|
The European Committee for thePrevention of Torture a nd Inhuman or DegradingTreatment or Punishment, (CPT)

|c2|
Border Violence Monitoring Network (BVMN)

|c3|
Una-Sana Canton (USC)

|c4|
"Are You Serious"

|c5|
"CMS"

|c6|
"Aid Brigade" NGOs

|c7|
"No Name Kitchen"

|c8|
Danish Refugee Council

|c9|
International Organisation for Migration

|a1|
Ale Šiljdedić
Ministry of the Interior of Canton Una-Sana

|a2|
Mirolad Dodik
Former President of the Serbian Republic of Bosnia and Herzegovina

|d1|
IOM 2015

|D3|
European Accession Request

|D5|
Council Regulation (EU) No 1053/2013

|D6|
Visa liberalisation negotiations between the EU and the Western Balkans

|D7|
Development of a national environmental monitoring system

|D8|
Development of the Una River Basin Program

|D9|
Agreement on Yugoslavia's Succession issues

|D10|
Border demarcation Treaty

|A10|
Alija Izetbegović
President

|D11|
River Water Law

|D12|
Agreement between the Governments of Croatia and Bosnia and Herzegovina on Water Management Issues

|D13|
Agreement of mutual co-operation

|D14|
Breakup of the Yugoslav federation

|D15|
Limits between census settlements

|X1|
EU Strategy on Adaptation to Climate Change BRUXELLES

|X2|
AR6 Climate Change 2021: The Physical Science Basis

|X3|
European Parliament Mitigating the consequences of earthquakes in Croatia

|X4|
HORIZON 2020 project 'Grow green - Green Cities for Climate and Water Resilience, Sustainable Economic Growth, Healthy Citizens and Environments'

|X5|
Outline of the Climate Adaptation Strategy (ISRBC)

|X6|
The Committee for Inter-Sectoral Coordination for Policies and Measures for Mitigation and Adaptation to Climate Change

|X7|
National Adaptation Strategy development process

|X8|
Pact of Amsterdam

|X9|
Climate change, impacts and vulnerability in Europe 2016 An indicator-based report

|X10|
Pact of Paris

|X11|
Environment and Climate Regional Accession Network (ECRAN)

|X12|
Water and Climate Adaptation Plan for the Sava River Basin (ISRBC)

|X13|
EU Directorate-General (DG) Climate's project "Adaptation strategies for European cities"

|X14|
IPCC 2012

|X15|
The South East European (SEE) Forum for Climate Change Adaptation

|X16|
White Paper Adapting to Climate Change: Towards a European Framework for Action

|X17|
2006 IPCC Guidelines for National Greenhouse Gas Inventories

|X18|
Adriatic-Ionian Programme (ADRION)

|X19|
EU Strategy for the Adriatic and Ionian Region (EUSAIR)

|X20|
TAR Climate Change 2001: Synthesis Report

|X21|
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories

|Y1|
EARTHQUAKE
Petrinja

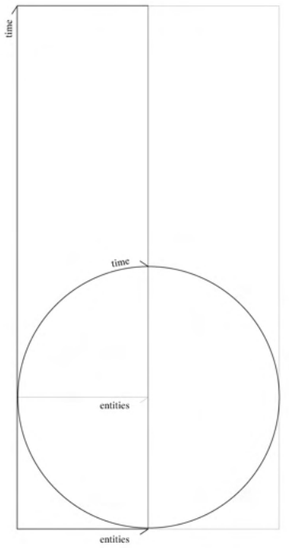
|Y2|
EARTHQUAKE
Zagreb

|Y3|
FLOOD
Una River

|Y4|
DROUGHT
Summer Season

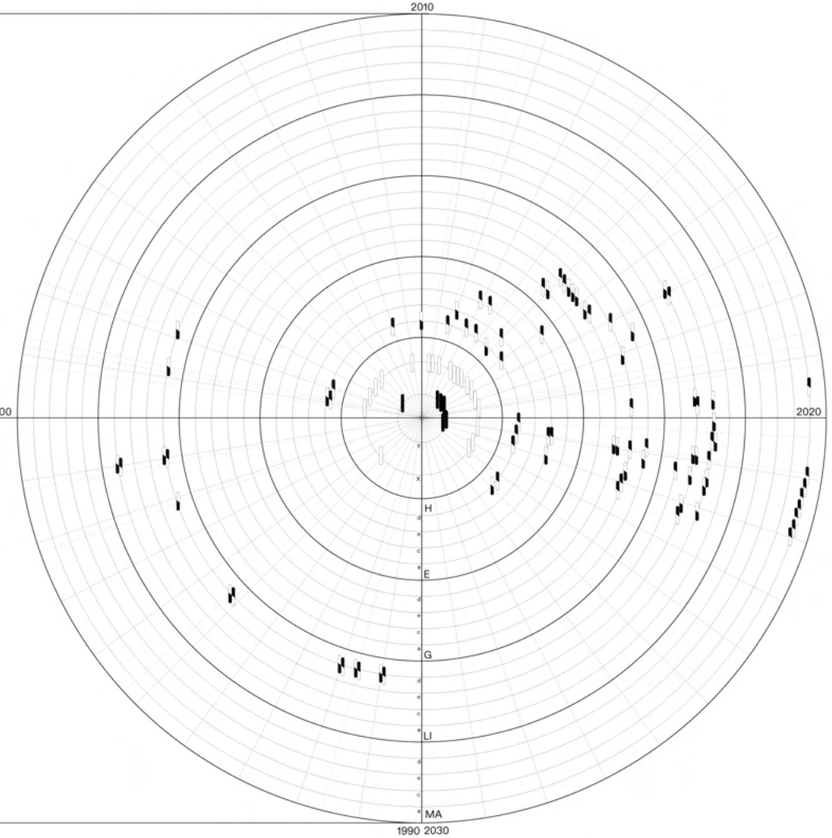
|Y5|
FLOOD
Vrbas, Bosna, Sana, Una, Ulora rivers

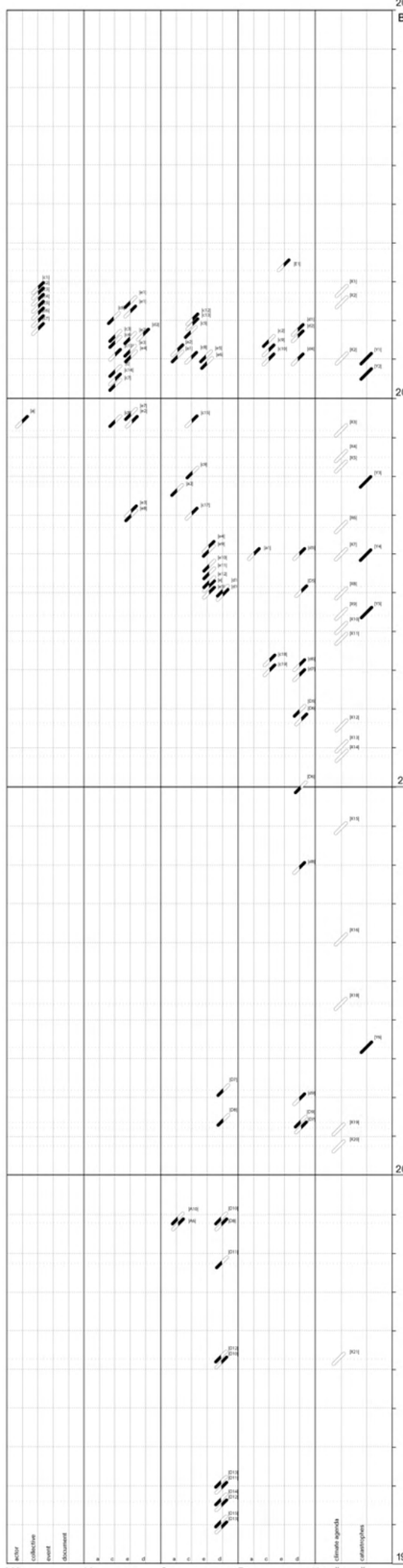
|Y6|
DROUGHT
Hot peak



MA	media activism	CROATIA
LI	local institution	
G	governments	BOSNIA ED ERZEGOVINA
E	europe	
H	hyperobject	
a	actor	
b	collective	AGENDA
c	event	
d	document	
X	climate agenda	CATASTROPHE
Y	catastrophes	

the upper case in the 5 categories refers to the scale of the entire border





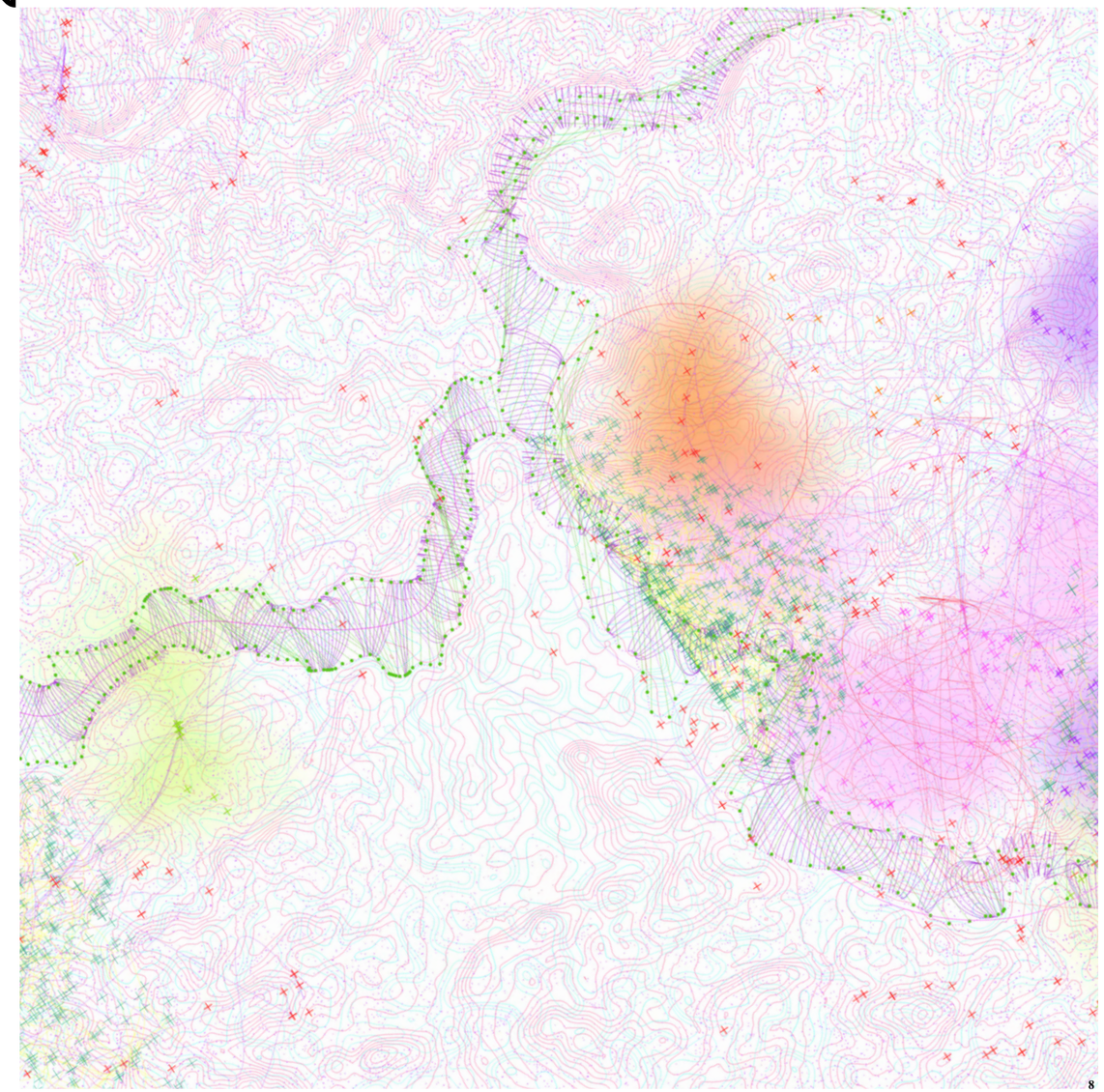
event (e) document (d) collective (c) actor (a) climate agenda (X) catastrophes (Y)

BORDO CLIMA

Glina river

With reference to statistics about the countries of pushbacks of Border Violence Monitoring Network (https://www.borderviolence.eu/), the largest "pushback countries from" the Balkan route is Croatia (63% of testimonies) while the largest "pushback countries to" is Bosnia and Herzegovina (45% of testimonies).
From March 2016, official closure of the Balkan Route, to 2022, 246 migrants are missing in the Balkan area, in particular along the Glina River (Velika Kladusa, Bihac) in the passage between Bosnia and Croatia. (https://missingmigrants.iom.int/)

Glina river therefore takes both the form of a moving corridor that is used by migrants to move along the border, but often becomes a natural, physical barrier that obstructs and repels.



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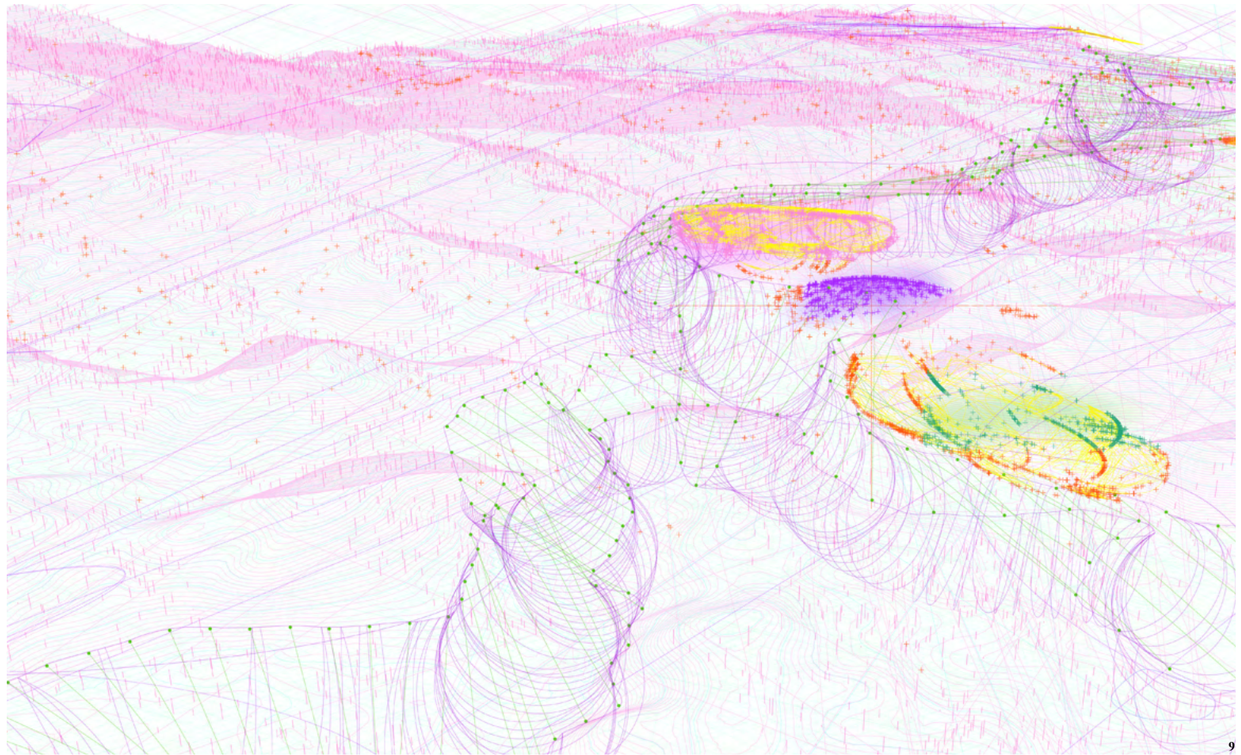

9

figure n.8-9 , Velika Kladusa
maps showing the dynamic nature
of the ecological borders

10

cb6

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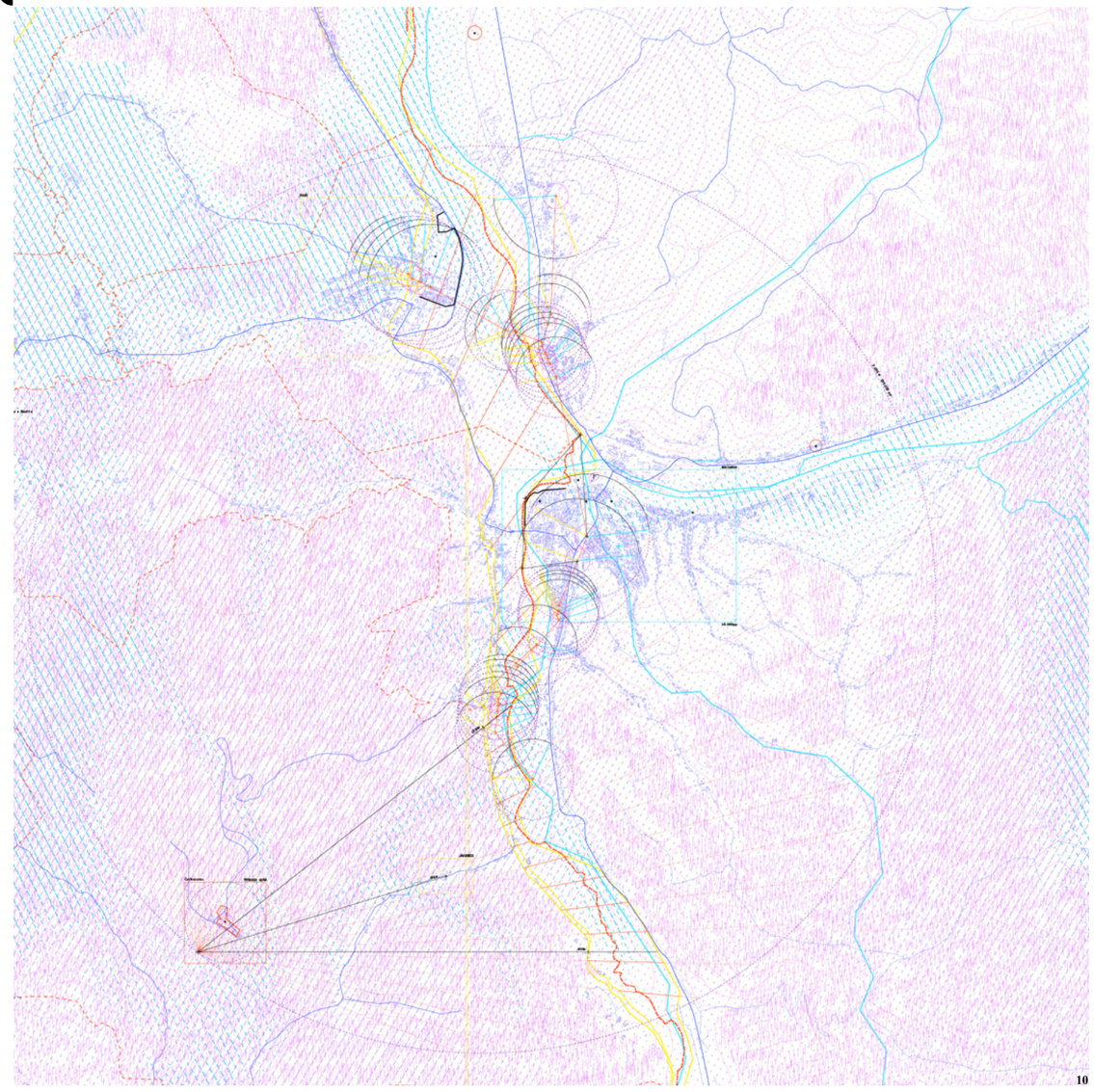

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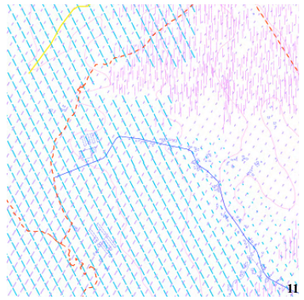
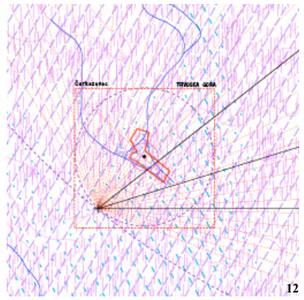
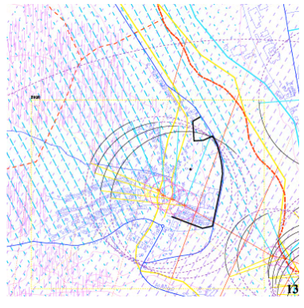


11



12



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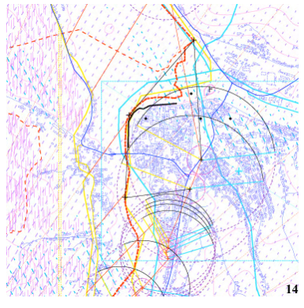


14

NUCLEAR WASTE DISPOSAL

Trgovska Gora

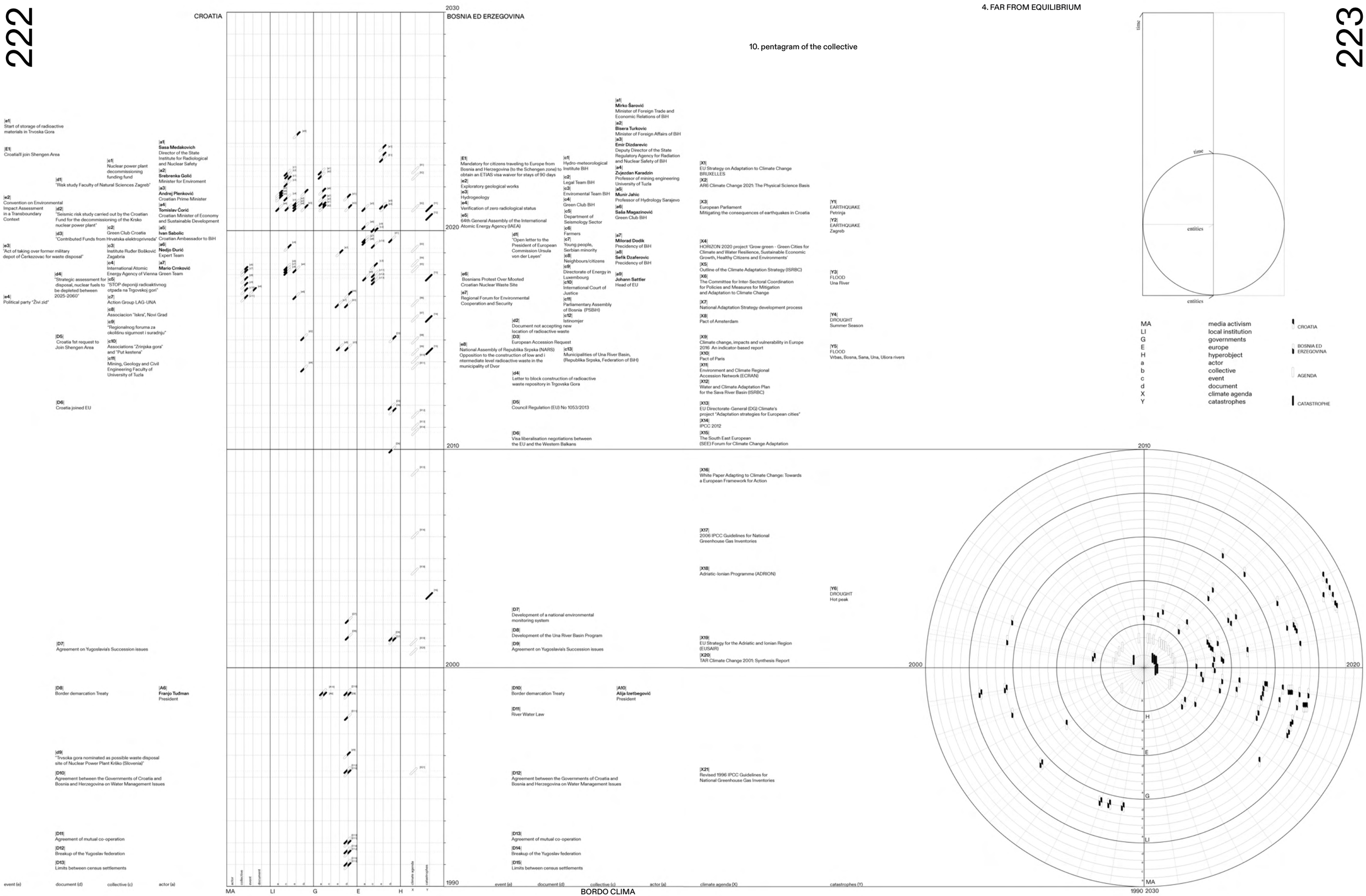
croatia ⟶ bosnia

Croatia has been planning storage since 1997. In 2020 the Fund for "Financing the Decommissioning and Disposal of Radioactive Waste and Spent Nuclear Fuel" from the Krsko Nuclear Power Plant has taken over from the Ministry of Environmental Protection and Energy of the Republic of Croatia for the use of the location of the former military warehouse Cerkezovac in the municipality of Dvor. A member of the geology team, stated that after the Petrinja earthquake in 2021 in Croatia, the seismological situation in this area has changed. And stated that, For every earthquake of magnitude five on the Richter scale, a place 70 or 80 kilometers away cannot be a place for the disposal of such waste near the border, as it would endanger the health of residents in 13 municipalities in the Una river basin in BiH, as well as the environment.

https://storymaps.arcgis.com/stories/11ac35d7d0d3487586e-1e01f6f9fd1d6?header

*figure n.***10-14**. Trgovska Gora
maps showing the static and rigid nature
of the architectural and political borders

10. pentagram of the collective



MA	media activism
LI	local institution
G	governments
E	europe
H	hyperobject
a	actor
b	collective
c	event
d	document
X	climate agenda
Y	catastrophes

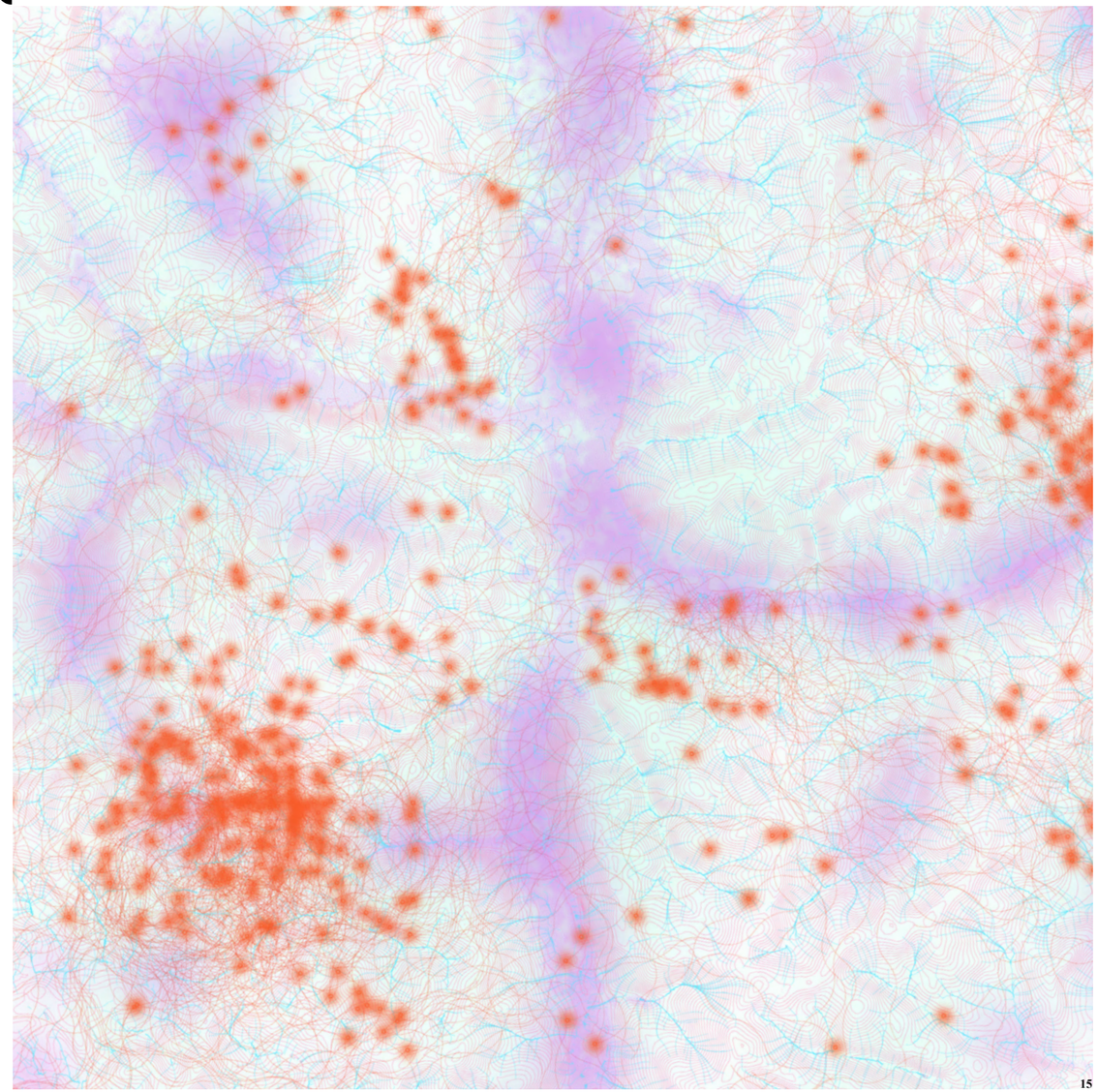
CROATIA

BOSNIA ED ERZEGOVINA

AGENDA

CATASTROPHE

BORDO CLIMA



15

Una river

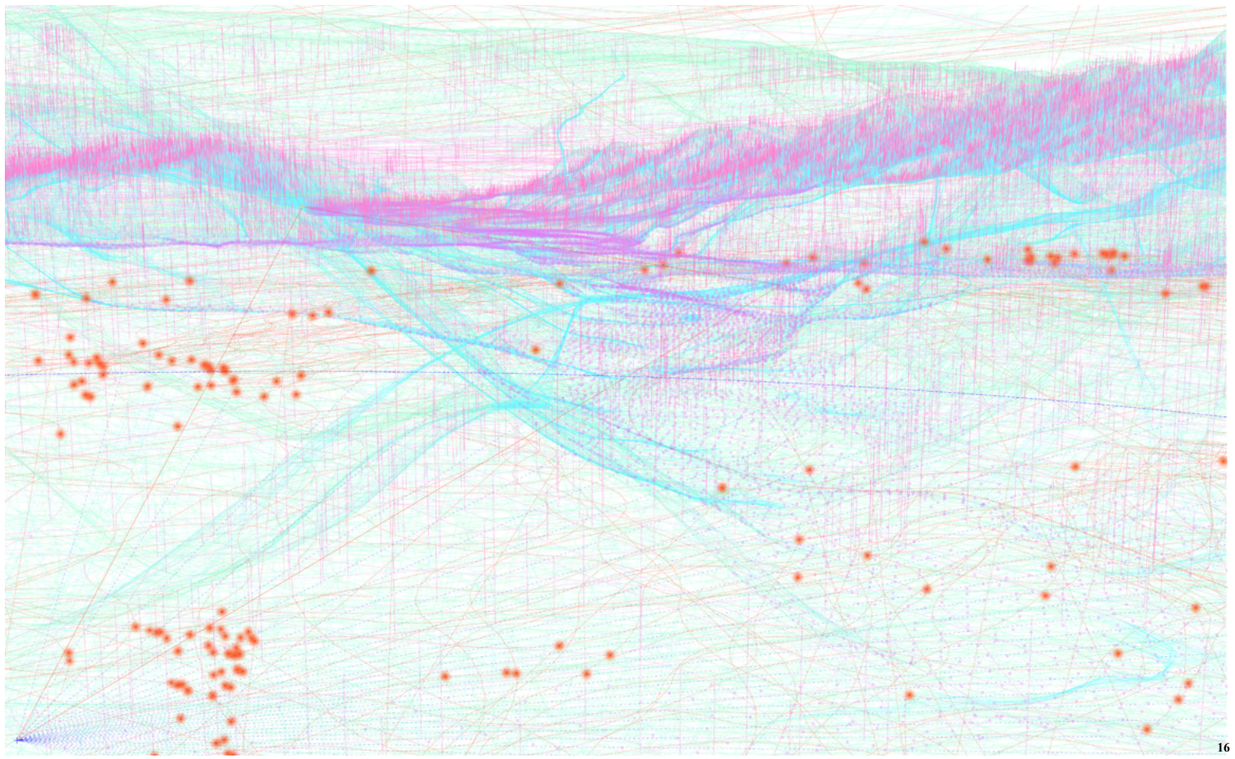
Trgovska gora is located about 200 km from the nuclear power plant "Krsko" (Slovenia). The disposal site power plant is planned to store:

- 60 tons of industrial and medical radioactive waste,

- 8,000 m^3 of radioactive waste of different levels (low/medium)

- 10,000 m^3 of so-called nuclear decommissioning waste.

70% of the impact zone of the repository is located in the territory of B&H, crossing its entire section Una River. Biodiversity loss, soil contamination, groundwater pollution or depletion, surface water pollution / decreasing water (physico-chemical, biological) quality are some of the possible ecological impacts expected.



16

*figure n.***15-16**. Trgovska Gora maps showing the dynamic nature of the ecological borders

11

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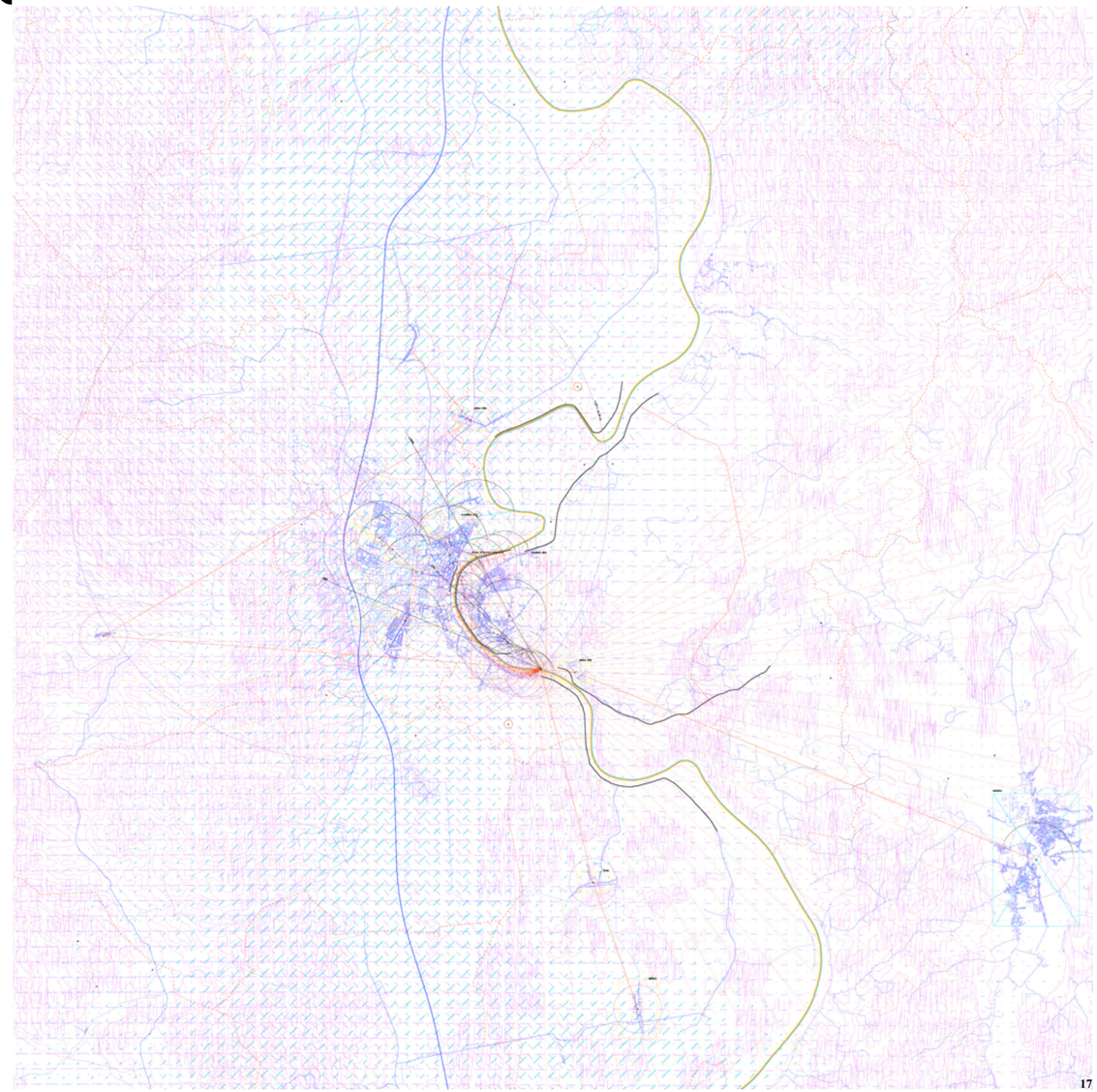
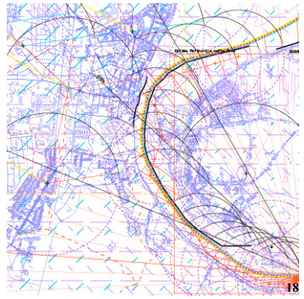
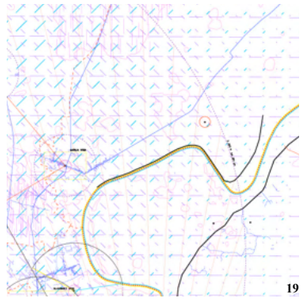
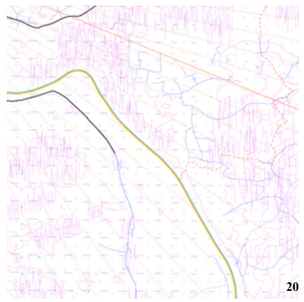
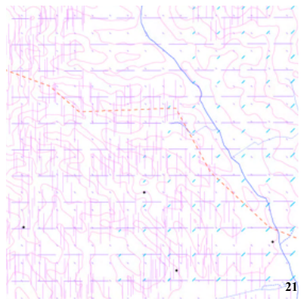
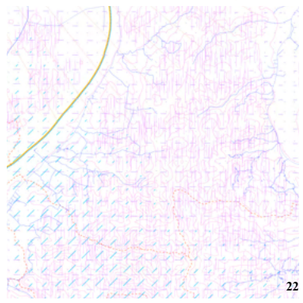












CROSS BORDER AIR POLLUTION

Slavonski Brod

bosnia ⟶ croatia

In 2019 before the refinery stopped being formally operative the Croatian authorities decided to inform the European Commission on the case.

As Bosnia and Herzegovina is not obliged to comply with EU regulations, the Croatian government might apply the economic measures such as preventing the refinery access to the Croatian market and infrastructure, which would further aggravate its difficult financial situation.
In 2021 the persistence of above-limit levels of pollutants in the atmosphere makes Slavoski Brod one of the most polluted cities in Europe.
Specific measurements and studies of scientific centres reveal that the meteorological and geographical features of the city will persist in causing air pollution independently of the temporary closure of the Brod Industry.

figure n.17-22. Slavonski Brod
maps showing the static and rigid nature
of the architectural and political borders

11. pentagram of the collective

CROATIA

BOSNIA ED ERZEGOVINA

2030

2020

2010

2000

1990

|E1|
Croatia'll join Shengen Area

|e1|
Peak pollutants detection station Slavoskibrod

|e2|
Public contract construction embankment flood Sava section Bord

|e3|
Procedure for determining the responsibility of persons at the Bosanski Brod refinery f or air pollution in Slavonski Brod

|e4|
Zagreb: Cooperation agreement in the field of environmental sustainable development

|e5|
"If If Not Now", Protest

|e6|
Croatian government initiates European Commission cross-border pollution case against Republika Srpska and Bosanski Brod oil refinery

|e7|
Croatia sues Brod oil refinery for ecocide

|e8|
Protest Zagreb residents Slavoski Brod

|e9|
Citizens initiative "Kad ako ne sad. Brođani, ne dajte da nas truju".

|d1|
European Environment Agency (EEA) new data

|d2|
Possibility of financing with EU funds

|d3|
Meteorological and Geographical context causes pollution

|d4|
European Commission "Air quality in Slavonski Brod"

|d5|
Slavonski Brod most polluted air in Europe

|d6|
Call for the execution of public works under the program "Rehabilitation as a result of the flood in Slavonski Brod in 2014"

|D5|
Croatia 1st request to Join Shengen Area

|D6|
Croatia joined EU

|c1|
Brod-Posavina County Public Health Institute

|c2|
State Hydrometeorological Institute

|c3|
Eko-Integral environmental group

|c4|
Civic Initiative for Clean Air

|c5|
The Ministry of Environmental and Nature Protection

|c6|
Croatian Consulate General in Banja Luka

|c7|
Croatian Agency for Environment and Nature

|c8|
The Government of the Republic of Croatia

|c9|
"I want clean air in Slavonski Brod." fb group

|c10|
The World Health Organization (WHO)

|a1|
Nirvana Franković Mihelj
Ministry of Economy and Sustainable Development

|a2|
Dunja Mazzocco Drvar
President of the Directorate for Climate Activities

|a3|
Ante Cvitković
Director of the Public Health Teaching Institute of Brod-Posavina County

|a4|
Gordan Grlić Radman
Minister of Foreign and European Affairs

|a5|
Andrej Plenković
Prime Minister

|a6|
Tomislav Ćorić
Croatian Minister of Economy and Sustainable Development

|a7|
Anto Cvitković
Director of the Institute of Public Health in Slavonski Brod

|a8|
Mirko Duspara
Mayor of Slavonski Brod

|a9|
Tomislav Panenić
Minister of Economy

|a10|
Slaven Dobrović
Minister of Nature and Environment

|a11|
Ante Šprlje
Minister of Justice

|a12|
Mihael Zmajlović
Croatian Minister of Environment

|a13|
Zoran Đuroković
head of flood defense for Croatia

|a14|
Ivica Pilšić
General Director of Hrvatske vode

|a15|
Ranko Ostojić
Minister of Interior

|a16|
Minister of Environment

|d7|
Bosanski Brod ad oil refinery resumed its production

|D7|
Agreement on Yugoslavia's Succession issues

|D8|
Border demarcation Treaty

|A6|
Franjo Tuđman
President

|D10|
Agreement between the Governments of Croatia and Bosnia and Herzegovina on Water Management Issues

|D11|
Agreement of mutual co-operation

|D12|
Breakup of the Yugoslav federation

|D13|
Limits between census settlements

|E1|
Mandatory for citizens traveling to Europe from Bosnia and Herzegovina (to the Schengen zone) to obtain an ETIAS visa waiver for stays of 90 days

|e1|
Raffineria stops being officially operational

|e2|
Protest against air pollution

|e3|
SOS - Save Our Ship

|d1|
Letter informs that refinery not working

|d2|
Brod Refinery is not solely responsible for pollution from Slavonski Brod

|d3|
70 million by Russian Society to reduce refinery pollution

|d4|
The refinery environmental permit expires

|d5|
Deadline for filter installation and upgrading

|d6|
Deadline for rebuilding the exhaust gas storage system

|D3|
European Accession Request

|d7|
Refinery's debt is double the Company's capital

|d8|
Letter of support from the Russian Society

|D5|
Council Regulation (EU) No 1053/2013

|d9|
Limits for harmful gases emitted from the Bosanski Brod refinery were not exceeded

|D6|
Visa liberalisation negotiations between the EU and the Western Balkans

|c1|
The Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina

|c2|
The Ministry of Industry, Energy and Mines of the Republic of Srpska

|c3|
Health Center

|c4|
OAO NIK
Russian Federation parent company

|c5|
Commission for monitoring the improvement of air quality in the area of the city of Slavonski Brod

|c6|
"When if not now"

|c7|
citizens of Brod

|c8|
Zarubezhneft
owner of the refinery
Russian company

|a1|
Mario Brezič
Minister of Foreign Trade and Economic Relations of Bosnia and Herzegovina

|a2|
Slavko Sceparović
Representative of the company Optima, operator of Rafinery

|a3|
Dubravka Šuica
Member of the European Parliament

|a4|
Marija Šćulac Domac
Commission President

|a5|
Milorad Dodik
Council President

|a6|
Mayor of Slavonski Brod

|D7|
Development of a national environmental monitoring system

|D8|
Development of the Una River Basin Program

|D9|
Agreement on Yugoslavia's Succession issues

|D10|
Border demarcation Treaty

|A10|
Alija Izetbegović
President

|D11|
River Water Law

|D12|
Agreement between the Governments of Croatia and Bosnia and Herzegovina on Water Management Issues

|D13|
Agreement of mutual co-operation

|D14|
Breakup of the Yugoslav federation

|D15|
Limits between census settlements

|X1|
EU Strategy on Adaptation to Climate Change
BRUXELLES

|X2|
AR6 Climate Change 2021: The Physical Science Basis

|X3|
European Parliament
Mitigating the consequences of earthquakes in Croatia

|X4|
HORIZON 2020 project 'Grow green - Green Cities for Climate and Water Resilience, Sustainable Economic Growth, Healthy Citizens and Environments'

|X5|
Outline of the Climate Adaptation Strategy (ISRBC)

|X6|
The Committee for Inter-Sectoral Coordination for Policies and Measures for Mitigation and Adaptation to Climate Change

|X7|
National Adaptation Strategy development process

|X8|
Pact of Amsterdam

|X9|
Climate change, impacts and vulnerability in Europe 2016 An indicator-based report

|X10|
Pact of Paris

|X11|
Environment and Climate Regional Accession Network (ECRAN)

|X12|
Water and Climate Adaptation Plan for the Sava River Basin (ISRBC)

|X13|
EU Directorate-General (DG) Climate's project "Adaptation strategies for European cities"

|X14|
IPCC 2012

|X15|
The South East European (SEE) Forum for Climate Change Adaptation

|X16|
White Paper Adapting to Climate Change: Towards a European Framework for Action

|X17|
2006 IPCC Guidelines for National Greenhouse Gas Inventories

|X18|
Adriatic-Ionian Programme (ADRION)

|X19|
EU Strategy for the Adriatic and Ionian Region (EUSAIR)

|X20|
TAR Climate Change 2001: Synthesis Report

|X21|
Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories

|Y1|
EARTHQUAKE
Petrinja

|Y2|
EARTHQUAKE
Zagreb

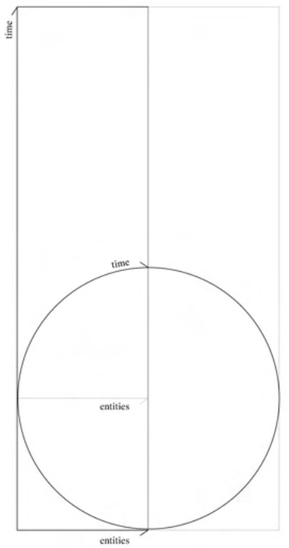
|Y3|
FLOOD
Una River

|Y4|
DROUGHT
Summer Season

|Y5|
FLOOD
Vrbas, Bosna, Sana, Una, Ulora rivers

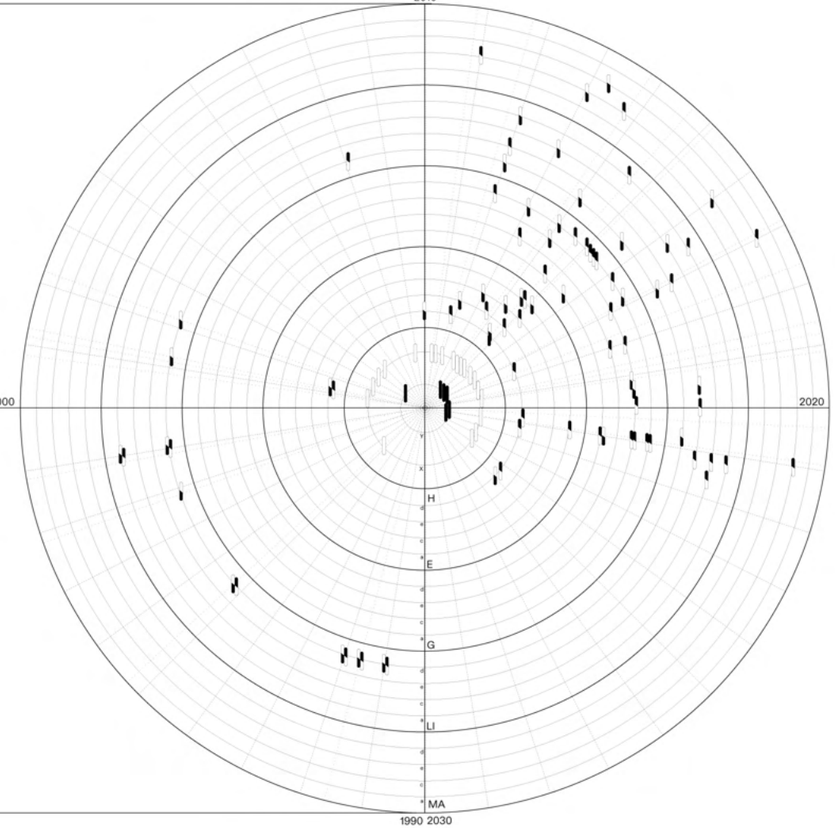
|Y6|
DROUGHT
Hot peak

|Y6|
DROUGHT
Hot peak



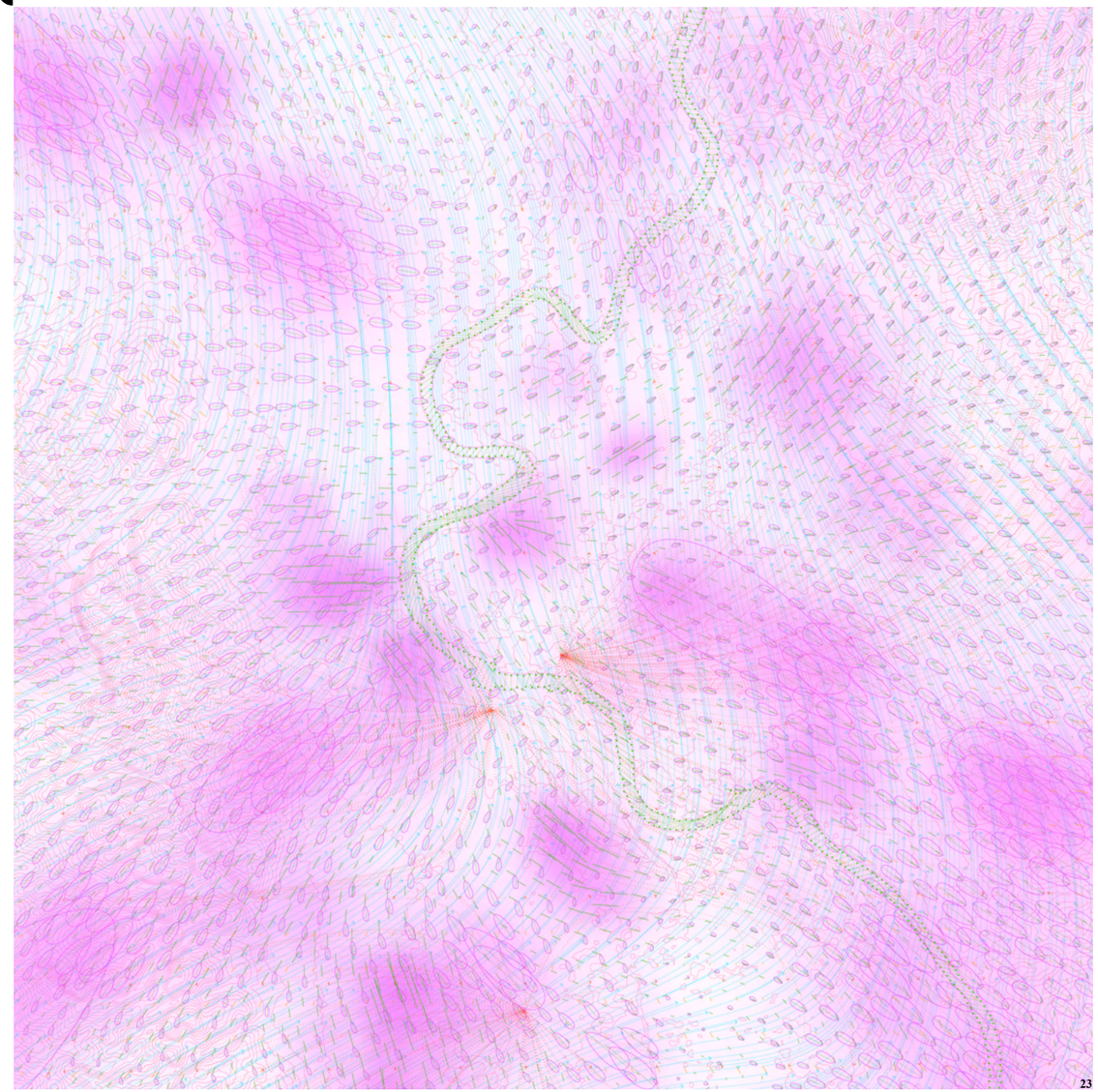
MA	media activism	CROATIA
LI	local institution	BOSNIA ED ERZEGOVINA
G	governments	
E	europe	AGENDA
H	hyperobject	
a	actor	
b	collective	CATASTROPHE
c	event	
d	document	
X	climate agenda	
Y	catastrophes	

the upper case in the 5 categories refers to the scale of the entire border



event (e) document (d) collective (c) actor (a) climate agenda (X) catastrophes (Y)

BORDO CLIMA



23

Sava river

The air pollution from the refinery includes high concentration of pollutants that far exceed the limit values of Croatia.

HYDROGEN SULFIDE

42 µg/m^3 - 7 µg/m^3

SULPHUR DIOXIDE

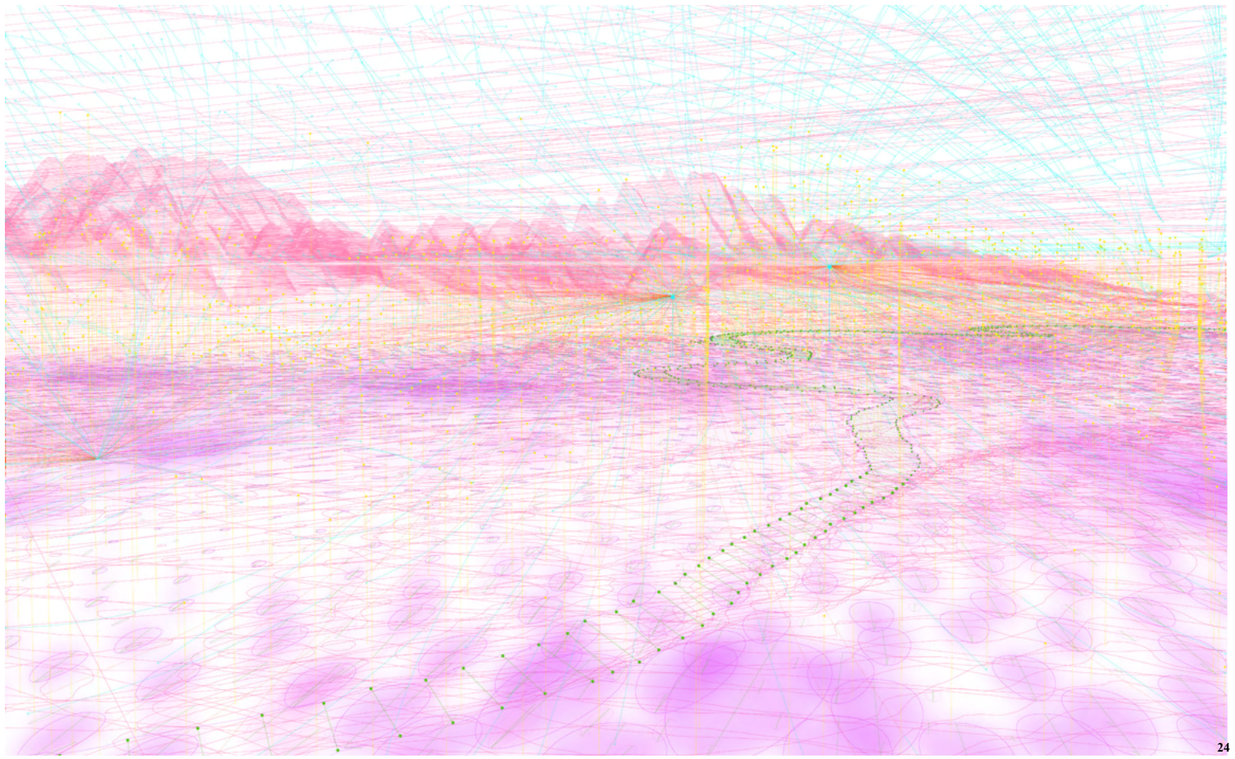
500 µg/m^3 - 350 µg/m^3

BENZENE

16,2 µg/m^3 - 5 µg/m^3

PM 2.5

93,1 µg/m^3 - 25 µg/m^3



24

figure n.23-24 . Slavonski Brod
maps showing the dynamic nature
of the ecological borders

4.4.2

Machine

The instability of the border between Bosnia and Croatia is characterised by numerous catastrophes, ruptures. In socio-technical (and also sociological) terms, a rupture is called a 'dispute'. A dispute is an open, hybrid problem, usually both social and technical nature (Latour 1992).
Facing a controversy, a problem or a rupture (which implies a socio-technical association) two types of action can be performed: to describe or modify (to reassemble it)_to describe or modify the reading. In the first case we carry out investigations on cosmograms that have exploded (posthumous cosmograms). We carry out ethnographic, genealogical, historical work. In the second case, we start from open situations for which we can define a preventive cosmogram, and we try to close them, to implode them, to condense them into a new cosmic thing. In other words, we carry out a projectual work, a socio-technical work of assembly.
Design condensation towards a new cosmic thing is a notion that allows us to see design as an action of mapping and composing heterogeneous parts of the world, rather than as a creation ex nihilo or an isolated and specialised process (only technical, only social, only creative).
Cosmograms and cosmic things (Tresch 2007) are two synchronic definitions, two "still-images", through which we can grasp the divergence/convergence succession with which we proceed in the course of an architectural project. From divergence-opening to convergence-closing, we tend to unfold and fold cyclically and continuously, at all possible scales.
The Collective reveals itself, becomes explicit only in relation to an interruption of the normal (and implicit) course of action, that is, when it runs into a controversy.
Three cosmograms are derived from the discretization of the collective. One for each discontinuity point.
Apparently dimensionless, the three diagrams take the form of a performing machine for the project, when the concept of the third dimension of territory and edge (Elden 2013) is dragged into the logic of the diagram. The new abscissa in fact becomes the spatial dimension of the edge, which verticalizes the frames in a new dimensional vision, where the synchronic frames become planes that allow to identify the internal relations between different places in the space, in which the same controversy has broken through involving different complications and closures.
Disassembling the cycle of the collective into synchronic planes is like explicating (explaining/explaining).
The idea of creating a model for a universal machine, capable of sifting through synchronicities in an open system of relations in multidimensional space, is meant to be the basis for structuring new questions and design scenarios.

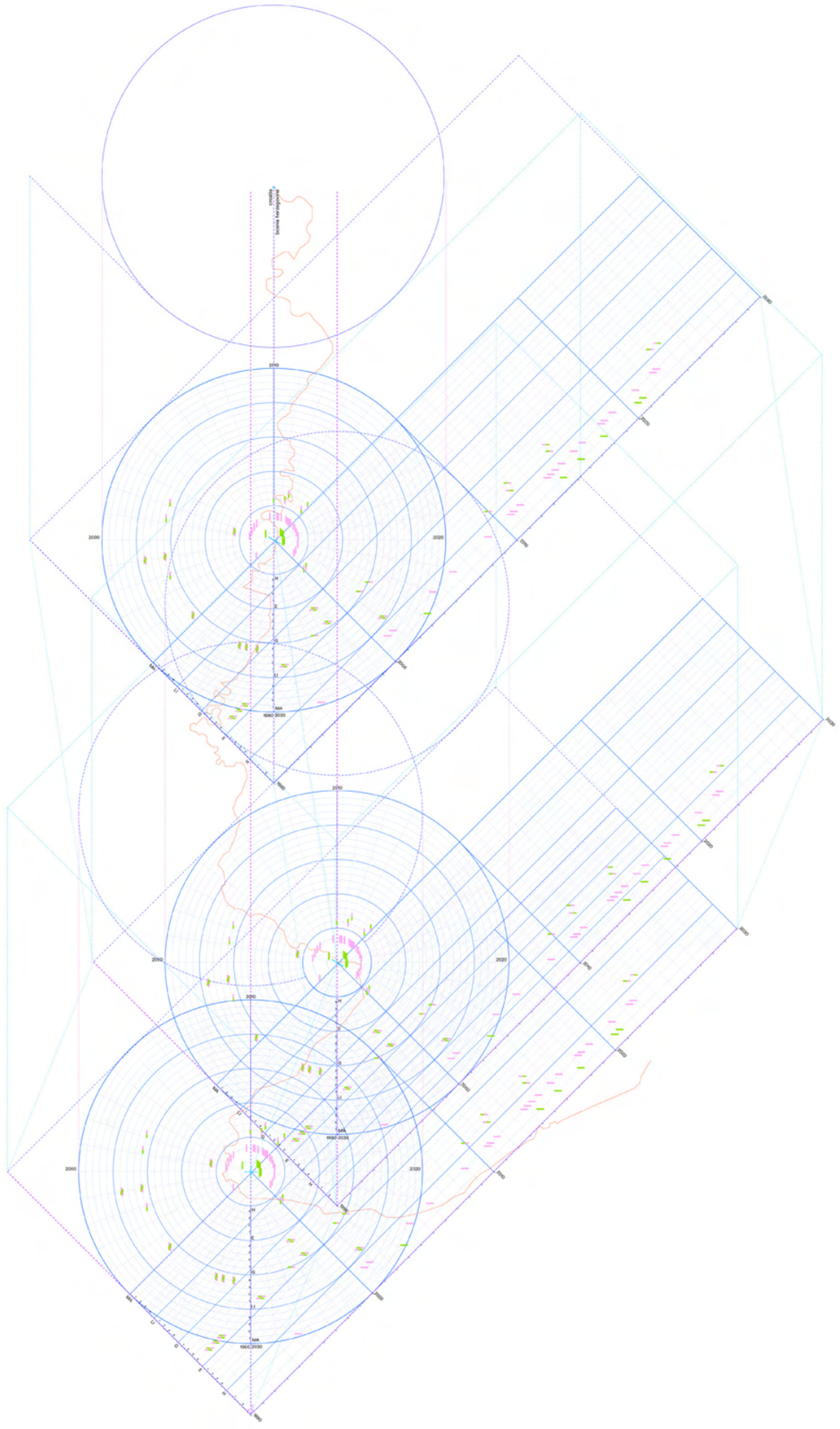
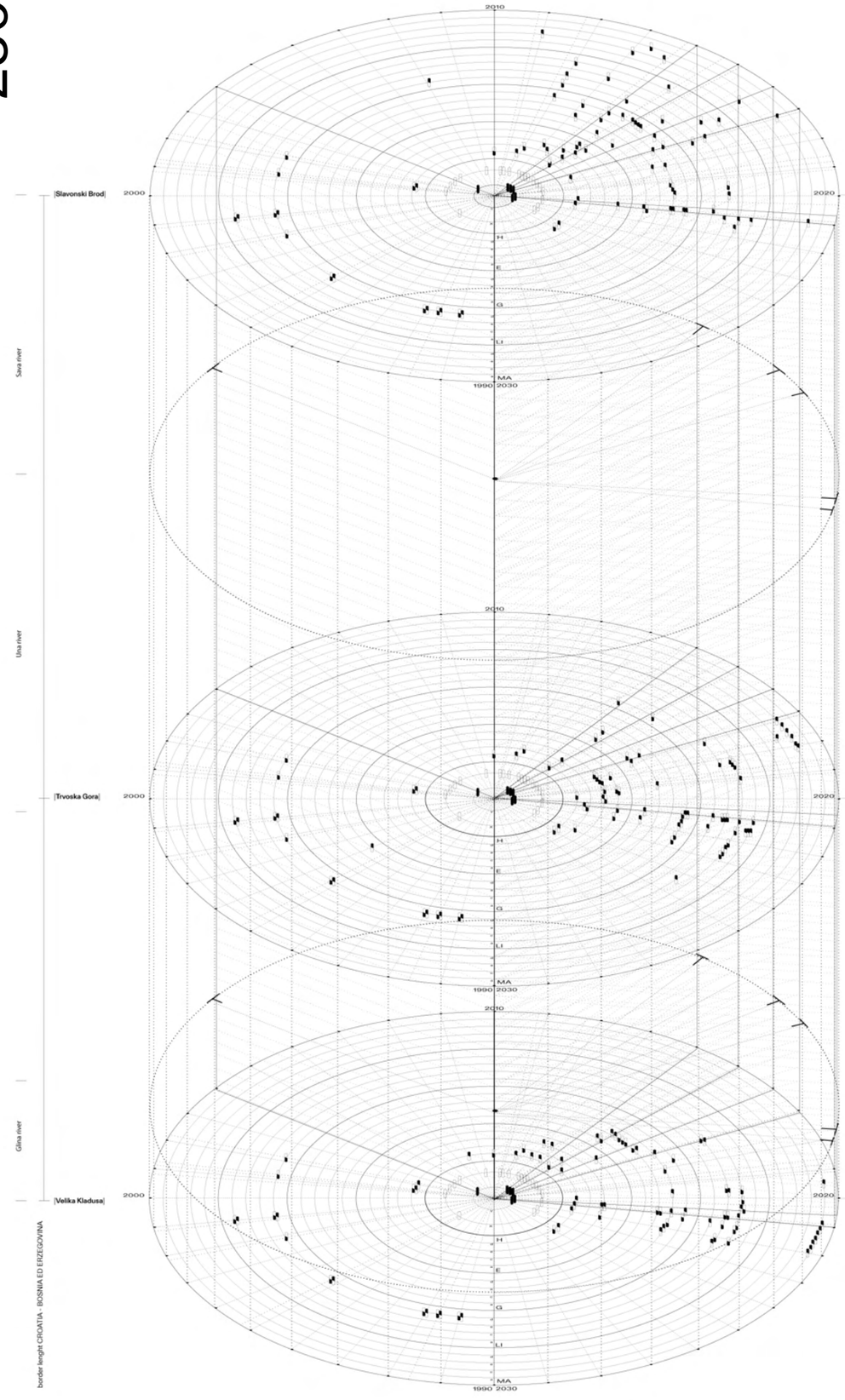
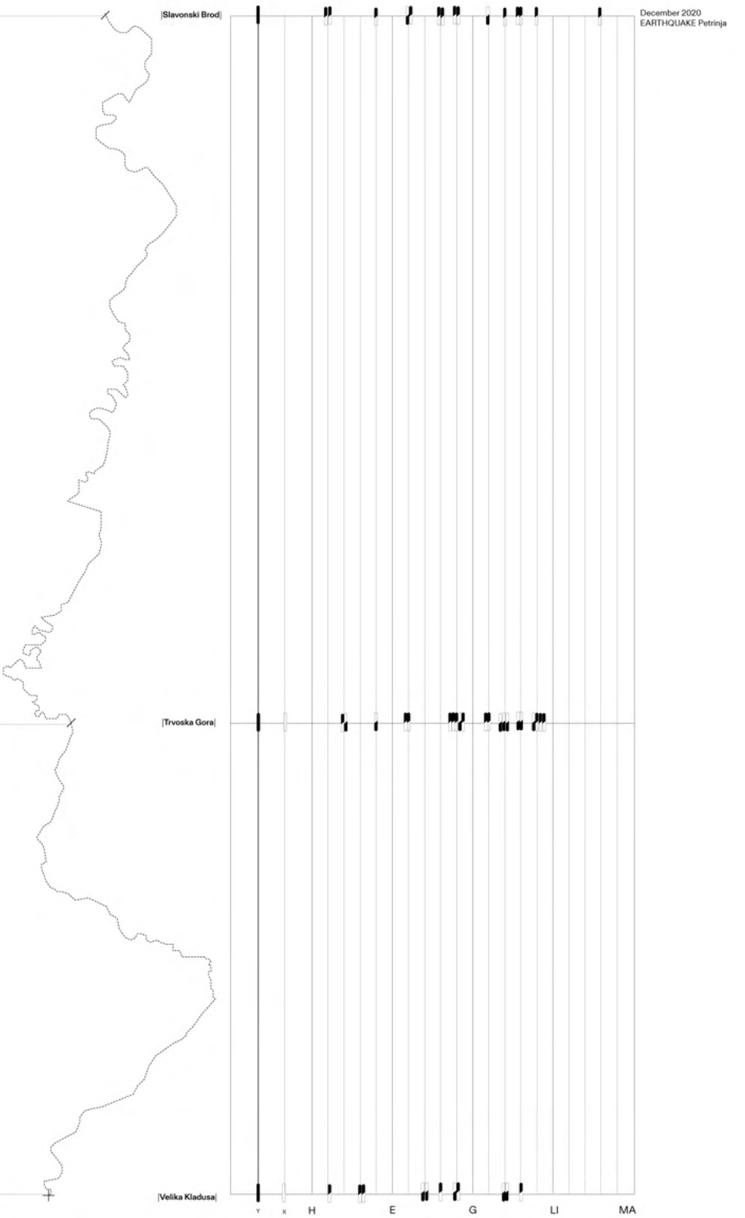


figure n.25
the geometric construction of the machine

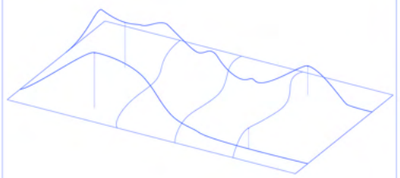


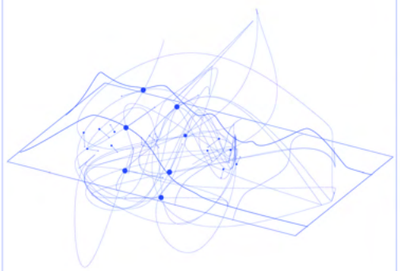


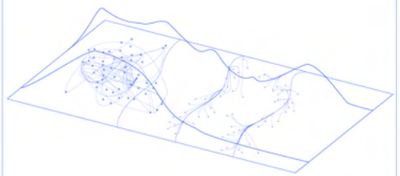
The new geopolitical border, within this machine of the contemporary, is read in its three-dimensionality in the sieve, effectively becoming the third dimension of the diagram. The synchronic plane common to the three diachronic collectives of the places, which is extrapolated from the machine, generates a sieve of synchronicities which becomes is a gradient. The sieve, in this sense, is the instrument that allows seeing the gradient of the border superimposing different entities. It gives a heterogeneous gradient with different specificities.

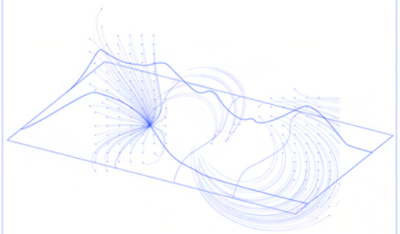
ecological

01









a.

THIRD DIMENSION OF TERRITORY
consider a topographical surface
and extrapolate the contour lines
from a digital elevation model.
all the calculations of the
ecological maps are carried out
from a topographical (territory)
in order to territorialize the
theoretical model.

b.

AGENTS ON A TOPOGRAPHYCAL SURFACE.
this method involves the use of a
topographic surface which is
analysed to find possible movement
corridors and inaccessible areas.
the starting script sends informa-
tion of a storm of agents -
migrants - and how they move
across the landscape

c.

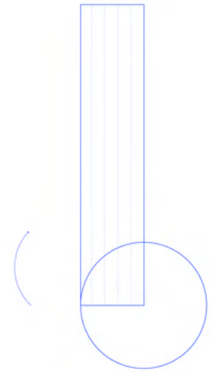
WATER RUNOFF AND SOIL METABOLISM
starting from a grid ona surface
the fastest path on a specific
slope is calculated
to analyze the water flow.
at the points of greatest water
accumulation in relation to soil
type and location, it is assumed
the possible branching
of liquids in the soil

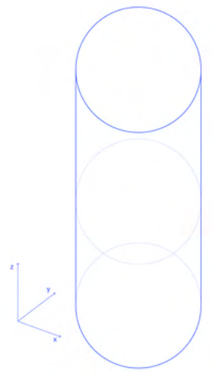
d.

AIR FLOW SIMULATION.
using gis data on pollutant
concentration, the airflow is
analysed and simulated in relation
to the topography, highlighting
points of accumulation
and concentration

machine

02





a.

the pentagram of the collective:
x axis_ entities
y axis_ time axis
refers to actors and actants
involved in a diachronic time in
relation to a specific
dispute in a place

b.

the pentagram is rewound into its
cyclic form in relation to
Latour's theory of opening and
closing a process.

c.

the three sections on the xy-plane
of the cylinder correspond to the
three prototype places on the
border (z-axis, third dimension of
the territory)

d.

the sieve of synchronicities is
obtained by dissecting the
cylinder along a vertical plane:
the result is, therefore, a
synchronic plane in which the
collective referring to a specific
catastrophe/shock factor that sets
the scenario in motion
can be read.

-technical note-

4.5

SCIENCE OF POSSIBILITIES

4.5.1

A probabilistic scenario

Following the relative investigations carried out on the three identified points of discontinuity and the generative mappings of three specific space transformation scenarios, the theoretical project and the diagrammatic machine are dragged into a single probabilistic scenario along the Croatian-Bosnian Herzegovinian border that conntects these three places. The image produced summarises, in a holistic vision, a probable mutation of the border characterised by the tensions and conflicts generated by each point.

The border acquires the third dimension generating a possible performative configuration that uses the methodological figures and the theoretical structure of the model in movement, thus creating new forms of an epigenetic landscape, in which gradients, externals and patterns offer possible new topological and dynamic models.
The theoretical concept of an epigenetic landscape is used on a practical and design level in a literal way, as a performative fluid landscape in continuous evolution of spatial forms, hybridising ecology and architecture.
The new probabilistic scenario of the moving border is thus generated as a result of site-specific ecological processes, and as an outcome of the construction of a conflictual sieve as an operational tool for relating human and non-human elements.
The static elements and traces of architecture and geopolitics intersect with ecological elements in the generation of new forms.

These scenarios emerge on the territory as holograms of conflict, places of exception where morphogenesis takes place in a condition of space-time continuum.
The genesis of these new forms of epigenetic landscapes derives from the observation of global and local phenomena, experimenting with the new language and methodology in an abductive logic, which provides for circularity and fluidity in the direction of the project, making continuous transitions of scale, from the general to the particular and the creation of new contemporary images.
In this sense, the production of a probabilistic scenario assumes a fundamental meaning within the research.

The non-resolutive, conflictual logic with which the methodology is set out, and the dynamic dimension of the model are thus reinforced, and leave open questions typical of the contemporary context: humans and non-humans are actors in a project on fragility, on the instability of the ecological and architectural boundary, which understands Ecology as a science of possibilities and not as a discipline capable of defining definitive spatial outcomes.

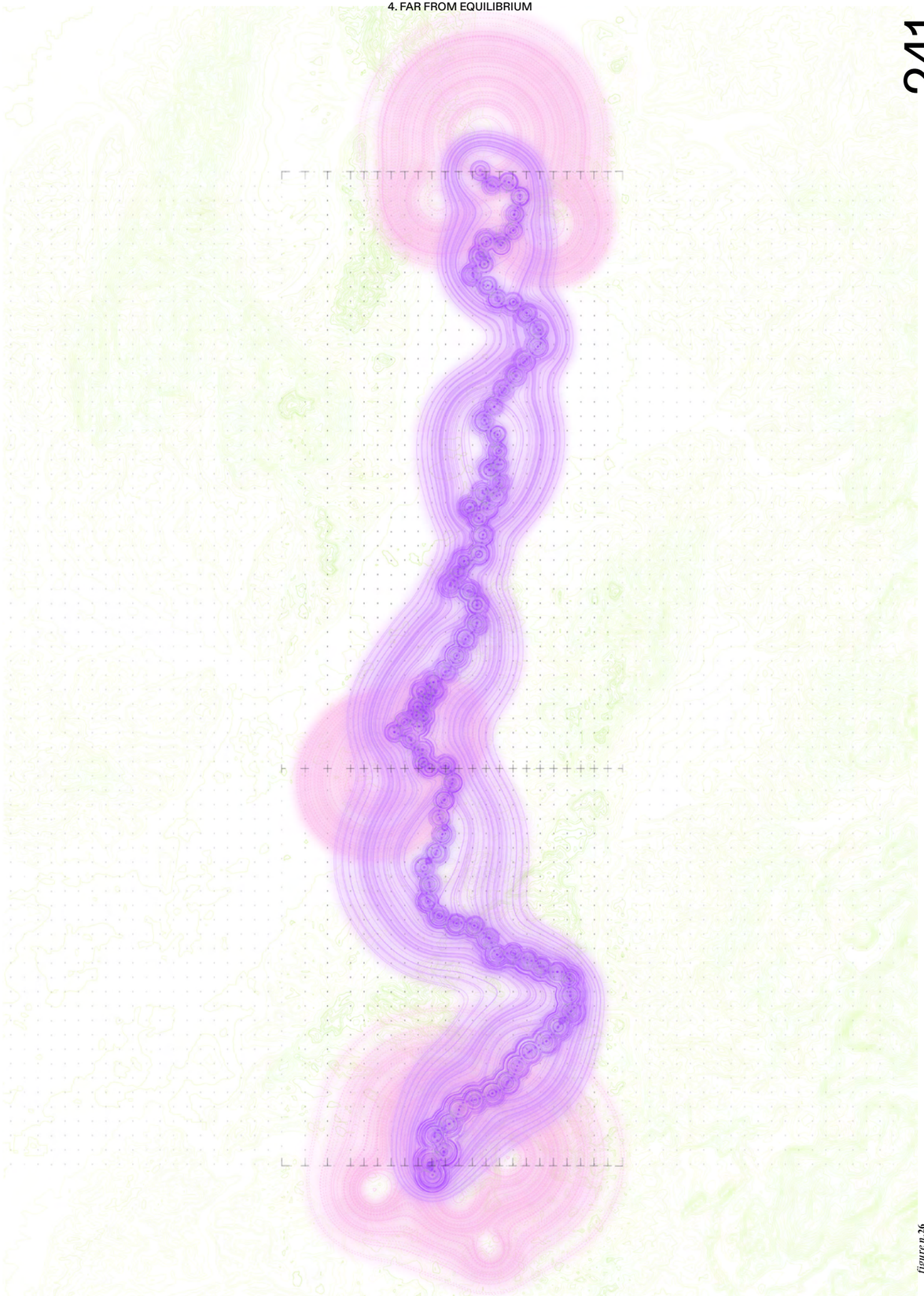


figure n.26
plan view of the probabilistic scenario on the border

new topography of borderscapes

figure n.27
a new topography of the border

Nikola Bojic

"The question of representation, scale, and the relations with the 'real' objects or spaces and reality in general. Does a model represent a specific version of the thing that is already 'out here' or it is used to produce an entirely new thing?
Models are powerful abstractions that have impacts on the way we think, feel, act and construct our worlds".

Nikola Bojic holds a Master degree in Art History and Museology from University of Zagreb and a Master in Design Studies from Harvard University, Graduate School of Design.
He looks into the modes of spatial production across multiple scales and thematic registers.

Engaged with the political, social and technological mechanisms running behind various spatial phenomena, his works range from public art, landscape and media interventions to critical design practice and experimental publications.

Along with his research and design projects, he also works on diverse urban and cultural development initiatives as an international expert in public space or artistic director managing large scale cultural projects such as the candidacy of the City of Pula for European Capital of Culture 2020 (finalist city candidate, Pula+2020 – Demilitarization).
Currently, he is a research fellow at the Institute of Art History in Zagreb (ART NET project) and a doctoral candidate at the University of Split.

www.act.mit.edu/about/people/nikola-bojic/
www.ocw.mit.edu/courses/architecture/4-313-advanced-studio-on-the-production-of-space-fall-2016/syllabus/

-conversation-

. Do you think there is a need for a new method and language to read and represent the conflicting space of the border?

N. I am working a lot with a speculative type of thinking about ecology and technology, and I am working a lot with with diagrams and data. So if we talk about landscape, we talk about data because landscape is a data itself. Basically, if we focus on borders, but at the same time, we try to visualize them and try to create this image of a new landscape and a new scenario of the borderscape, we generate new images, new readings that redefine what the border is or ways of conceiving a border. So the map in this sense becomes a model. A new methodology and a new language of thinking and representing space, in this case that of borders

. Do you think that a model could be a useful instrument for the project and for a research crossing disciplines?

N. The idea of model I think is like an abstract entity in time and space. But it has a real impact on physical reality. Models do have agencies and they can be different: it was initially sketched on a napkin during the lunch, as Joseph Paxton did for the Crystal Palace, but later the model became a computer model, an economic model, the actual Gaia model, and so on.
This is a basic definition of a model.
However, building in the model can potentially lead to an incredible reverse trajectory from the very first action in the project, representing complexity and dynamics, and taking you back to steady figures. Because we humans think in a rational way.
And we connect things as easy and simple as possible. Different geometric shapes, connected with lines. That's the model. A model involves a kind of principle of simulation. There is like ideological agency embedded in simulation.

. The need to represent the intangibility of the climate crisis is growing. How do you think, as architects, we should approach this demand?

N. A model involves a kind of principle of simulation and there is like ideological agency embedded in simulation. First simulations happened with this ecosystemic models exactly in late 60s 70s.
And in contemporary times we are making things by the metadata methodology, with theoretical introductions and simulations that always happens with a goal. Infact, even before thinking about simulation, you have to define what you want to do with simulation and why you're doing simulation.
Simulation is always about predicting different futures and different circumstances or different situations or conditions. It always has different inputs, but at the same time, in order to simulate, you need to build up a model.

. What does it mean in your opinion to place ourselves in spaces which are opaque conflictual and unresolved with a new calligraphy?

N. Calligraphy mostly shows letters, or different signs and the graphics of cartography. And further on the graphics of cybernetics, and ecosystem theories from mid 60s to mid 70s, they have been actually very modern, computer based type of diagrammatics, rationalizations.
Very complex processes and layers, functions and phenomena today are impossible to actually map in the proper way.
That's why we can talk about hyper objects or objects that stretch across different timelines and spaces. So, really finding a new way to represent or finding new calligraphies to show this opacity and complexity, means denying the modernist type of thinking about showing things placing the work in contemporaneity.

4.6

A DIGITAL MODEL

4.6

Digital Atmosphere Model

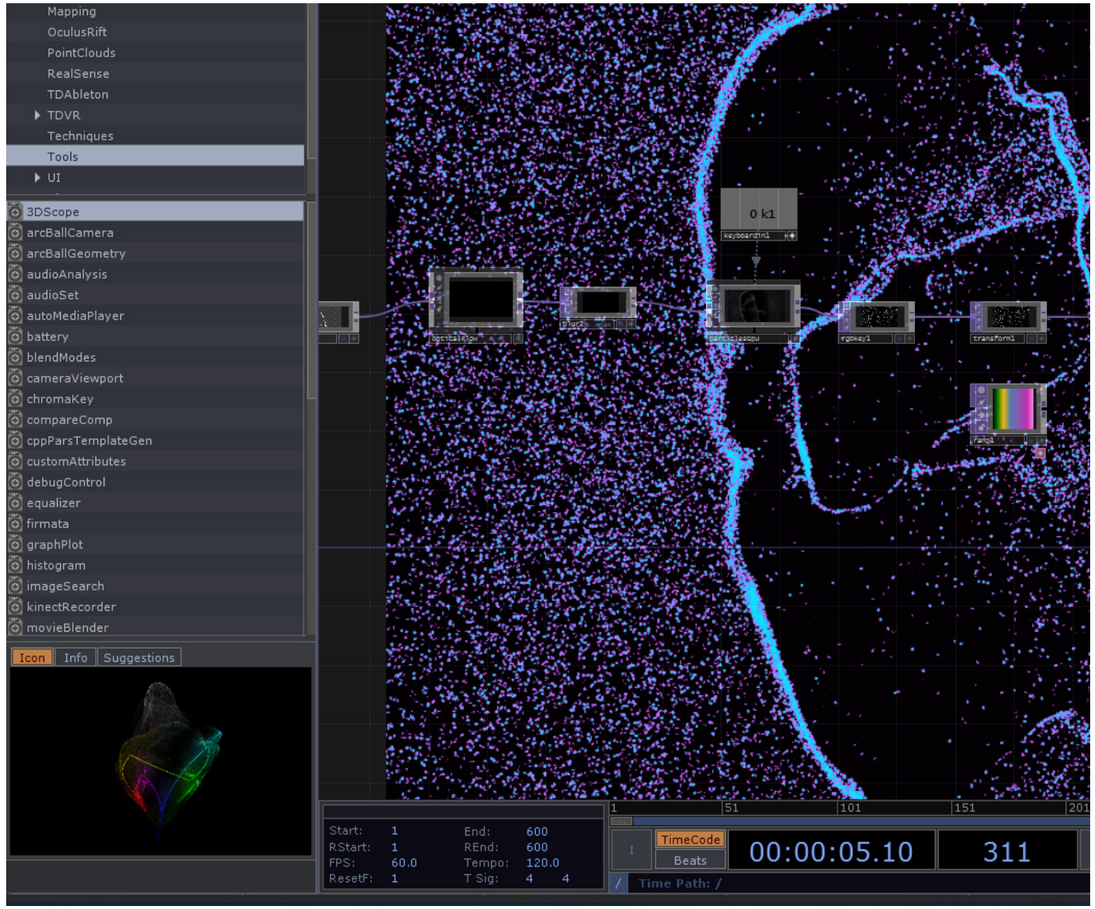
Engaging with political, social, ecological and technological mechanisms, the research experiments and suspends its questions in the creation of a digital and interactive model. In order to provide the basis for possible new methodological intuitions, boundaries of different disciplines are mutated and transgressed to structure an algorithm capable of visualising one of the fluid disturbances on borders.

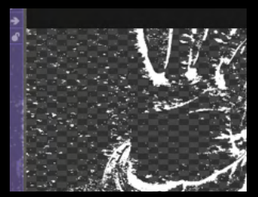
The aim of the digital model in the contemporary context is to create an interactive installation that shows a specific theme/phenomenon through digital and multimedia experiences. The idea originates from the existing "Digital Elevation Model" (DEM), i.e. the representation of the elevations distributed over a territory, or a surface, collected in digital format. Each elevation is attributed to a specific pixel that makes up the raster format of the DEM, where the elevation data are processed and acquired through sensors installed on satellites.

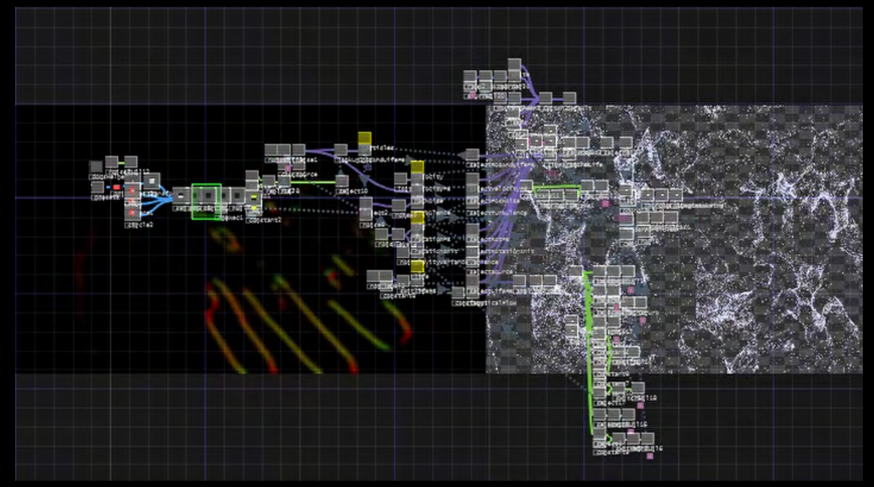
Starting from the satellite, for the realization of the "digital model of the atmosphere", data relative to air pollutants (CO2, PM2.5, PM 10, SO2, NO2) are first acquired in a specific period of time (1 month). The acquired data are manipulated so that the numerical value acquires the form of a gradient, and each image obtained is processed with the others to produce the average of the values in the final image, which will then be superimposed on those of the other pollutants.

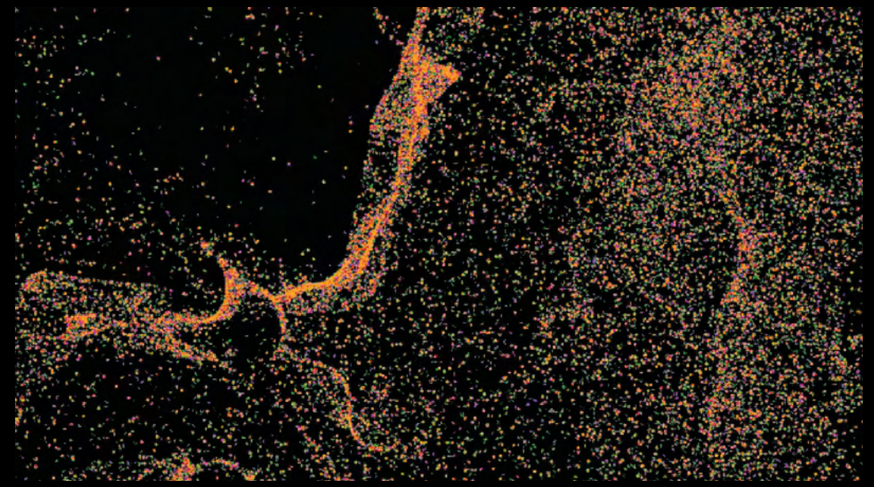
Through this process, it was possible to create "Cards from Atmosphere" (chapter 3.2.1 Something in the Air), i.e. the gradients of pollutants relative to a specific boundary. In this way, it was possible to map the political and sovereignty tensions that exist in the aerial dimension of space. The aim of the installation is to relate in a virtual way and in real time, the intensity of human action on the movement of pollutant particles over a border. For the realisation of the moving model, a visual programming language was used based on nodes that function in relation to interactive multimedia content in real time.
In particular, the movement of gradients and particles on the boundary line is governed by a sensor camera capable of capturing the movements and controlling the behaviour of the particles. In order to speculatively simulate the human interference on the movement of the gradients, the intensity of the Bitmap with which the sensor acquires the image of the movement is related to a table in which the main sources of human pollution (industries, urban/air traffic etc) are listed in relation to the pollution produced.

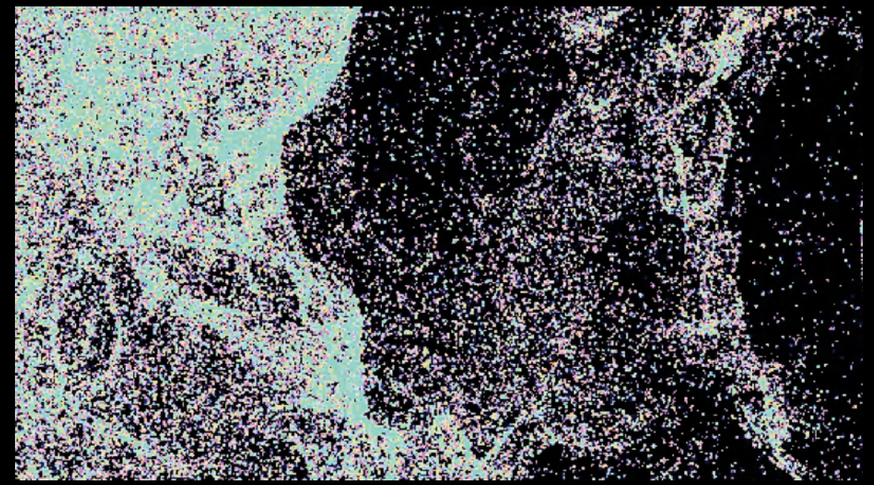
figure n.28
gradients of Balkans pollutants











NO_2 Nitrogen Dioxide

-burning of fossil fuels

coal
oil
gas
petrol
diesel

-road transport

-power generation

-domestic heating

O_3 Ozone

-chemical reactions

emission industries

-vehicle exhaust

-solvents in sunlight

SO_2 Sulphur Dioxide

- combustion process

solid fuel burning

- electricity

coal
oil

CO Carbon Monoxide

- bruning carbon based fuels

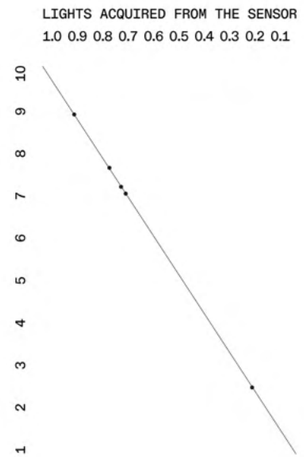
petrol
diesel
gas
oil
wood
coal

PM_{10} $PM_{2.5}$ Particulate Matter

- industrial processes
- solid fuel buring

- vehicles

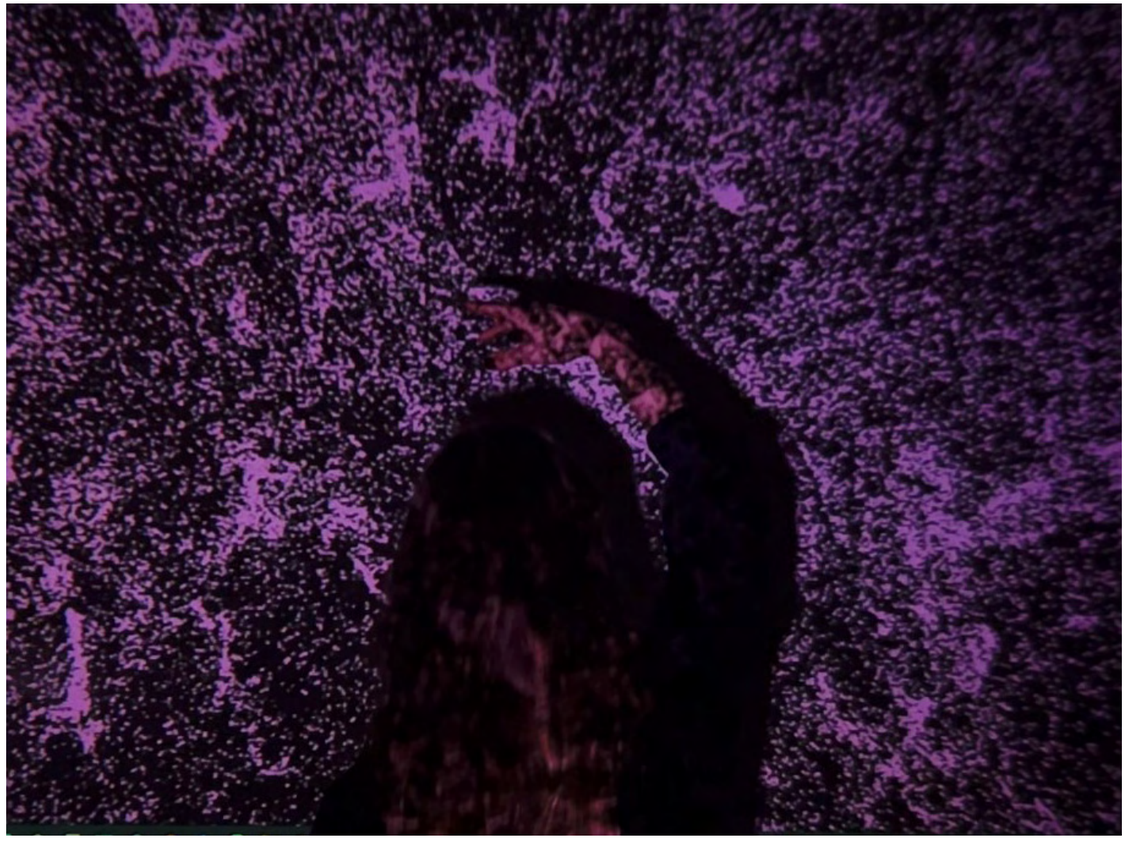
transport
diesel trains
shipping



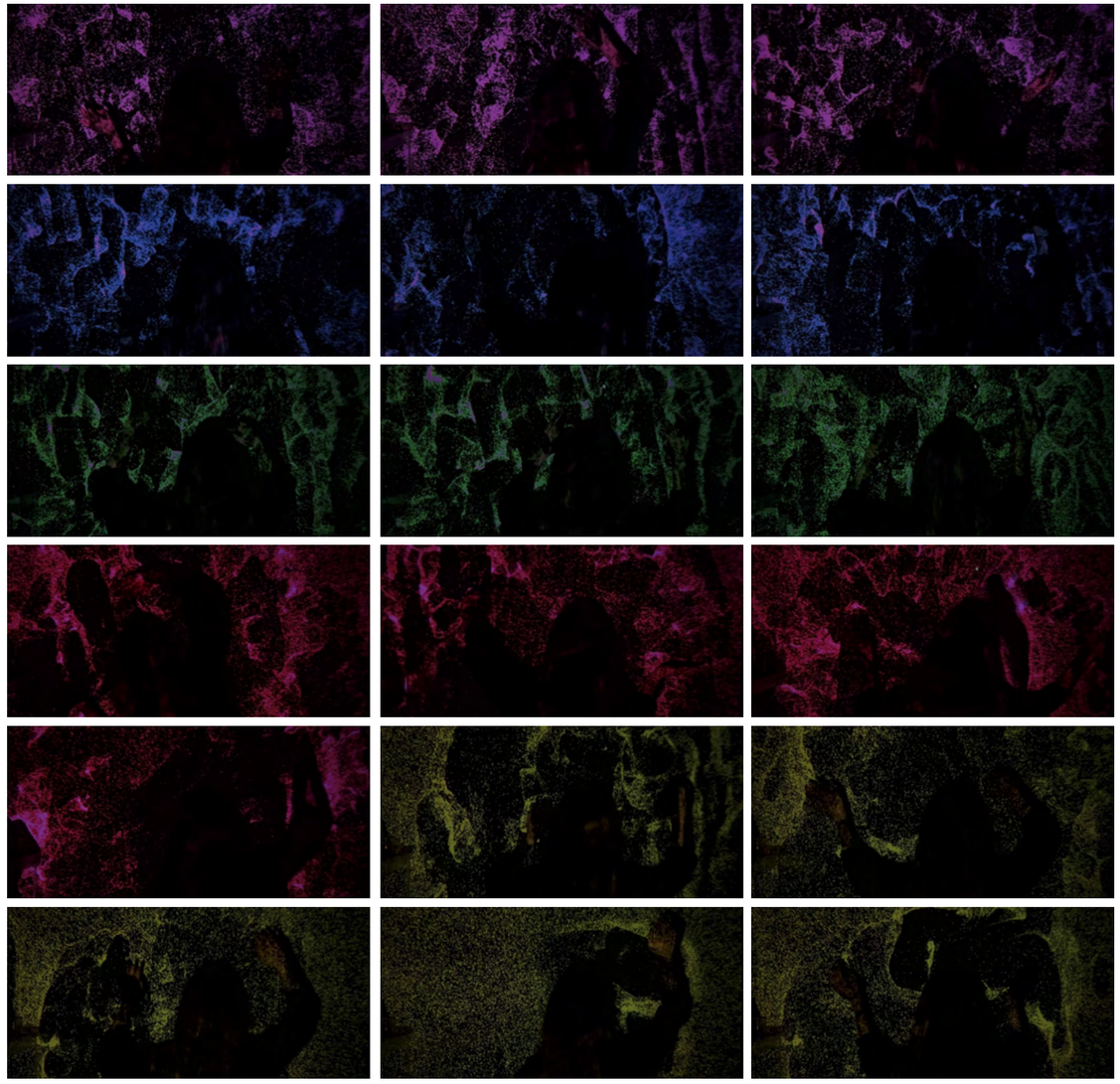
https://www.eea.europa.eu/themes/air/air-pollution-sources-1

BORDO CLIMA

The algorithmic script allows the particles to move thanks to a sensor sensitive to the movement of the human body. The biometric sensor was adjusted and parameterised so that a specific value of light acquired (0.1 - 1.0) corresponded to a specific human action with a different impact on the emission of air pollutants (1 - 10).
In particular, the more light acquired by the sensor, the more pronounced the movement of particles, the greater the impact of human action on that specific pollutant.



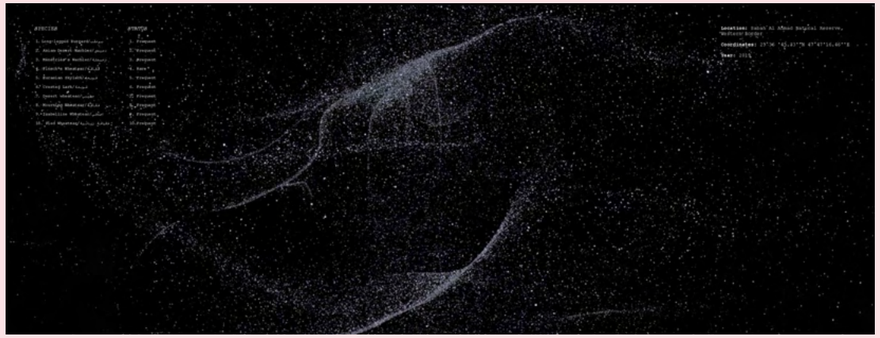
sensing the atmosphere

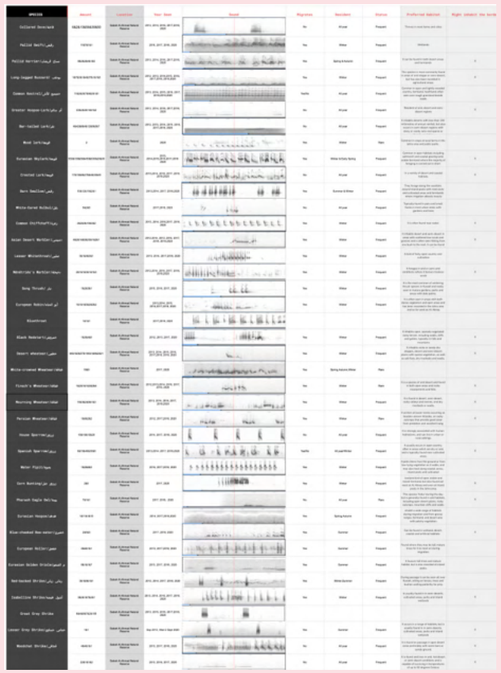


SPACE WARS

Maees Hadi - Kuwait Pavillon

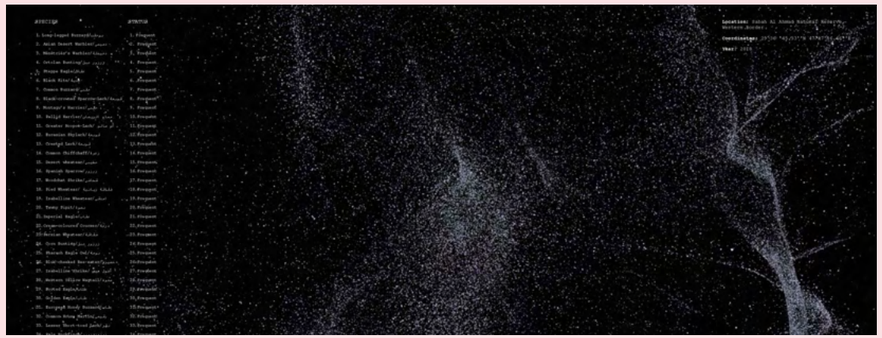
"Sound is a vital component of any environment, and it can provide us with an understanding of the material world as a feature of a point in space.
Our sense of vision has generally dominated the way we understand and acquire knowledge of spaces and places.
We only look through linear space, and linear time, we don't smell, we don't taste, we don't touch'. And we don't listen".





images courtesy of Maees Hadi as part of Space Wars, the Kuwait Pavilion at the 17th International Architecture Exhibition, La Biennale di Venizia.

“This project examines the border condition between the Sabah Al-Ahmad Nature Reserve and a military base on-site. It uses data mining as the primary methodology for investigation. The generated medium derives from sources of information and sound data of birds that inhabit and migrate through these spaces. The Sabah Al-Ahmad Nature Reserve is a war-printed landscape located north of Kuwait’s capital.
A variety of borders shape the reserve, separating and confining it from the rest of the national space. There is a coastal border to the southeast, and a fenced perimeter to the west shared between the reserve and a former military base.

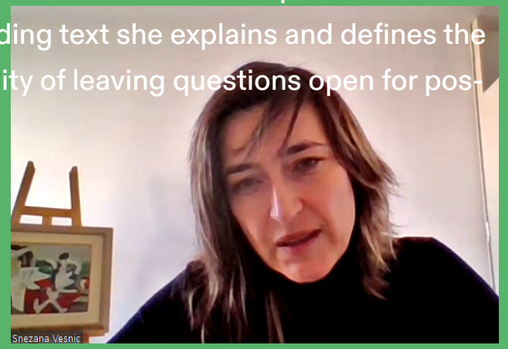


The sound of the border’ examines the western edge created by these two adjacent conditions by analysing sound. The project looks beyond cartography and its visual limitations by researching alternative modes of investigation”.

-art and science-

Snezana Vesnic
The theoretical project

The definition of theoretical project and the question of the open project.
PhD Professor Snezana Vesnic contributed by constructing a specific methodology at a conceptual level, which makes it possible to better define the premises and objectives of the research. Through this concluding text she explains and defines the terms of the theoretical project and the possibility of leaving questions open for possible future scenarios



Snezana Vesnic, architect, she works at the University of Belgrade, with a focus on the relation between architecture, design and concept. Founding partner of the architectural studio Neoarhitekti Studio (2000) from Belgrade.
Her field of research covers the studies of the theory of form, intuition and supersymmetry, and her projects can be described as poetic brutalism od new modernity.
She is the co-author of the building for Textil Uzice and a laureate of a large number of awards and honors, such as the oldest architecture award in Serbia
(by Novosti company), that she received in 2008. She was an award-winning author, as part of the project by CAB: “Women in architecture”.

www.politocomunica.polito.it/en/news/allegato/(idnews)/13520/(ord)/2/(idc)

First, I would say that a "theoretical project" could be any project that exceeds the possibility of its materialization. You can find this concept in Alberto Pérez-Gómez. He uses it to denote this difference between the symbolic intentionality (contained in a theoretical project) and its embodiment. In my view, besides such phenomenological arguments, the inability to materialize an architectural concept excites the desire for the object outside oneself. This state of an increased desire gives the theoretical project some sort of meta-potentiality, out of which a truly new concept of the real could be developed. Thus, its speculative character could be used to retain the 'meta' position in dealing with a contemporary situation.
In relation to this, hypothetical models could refer to the specific situation you choose (or construct) in order to employ the potentiality of a theoretical project. A hypothetical model is, therefore, always a context-specific architectural construct which could push forward your project. 'Hypothetical' here means the possibility to overcome the limitations of the real, that is, the given context. Considered as a prototype, a hypothetical model is an instrument for retrieving the connection with the real, but only in a way which could uncover the architecture's possibility to materialize the potential found in a theoretical project.
The prototype is, therefore, an architectural method of performing the potential of a concept, but not forsaking its contingency. In other words, a prototype is a model of dealing with the formal always from your meta position – that is, not lowering to the objective singularity.
Regarding your approach to the contemporary problems of the Anthropocene, I don't think you should lay stress on specific inferences, or inferences as such at all. I advise you not to think about materialization of your concept in terms of implementation.

This also has something to do with what I mean by "open project". An open project would be the one which does not exclude the need for its materialization as something that does not change its content. Rather, through such a translation, the non-objective qualities of a project are being actualized in order to make a singular derivation of it, and thereby reconfiguring its initial content.

PhD Snežana Vesnić, assistant professor
Faculty of Architecture of the University of Belgrade.

Bordoclima ends with an open question.
The questions that remain suspended mean that no real reaggregation takes place in the closing phase but that the result seems to remain apparently blurred.
The outcome, in the form of a probabilistic scenario, makes it possible to branch out a series of specific projects that fit into the chains of effects of heterogeneous places in a given time. The availability of a certain experimental cartographic and mapping apparatus can lead to convergence from different elements and data. Tools of this kind can allow us to move towards an action of design closure with reference to contingent conditions, creating a scenario that opens up multiple possibilities and does not exclude the concretization of a real transformation of space.
There is a willingness to suspend, even at the end, in order to reflect on what has been learned and what can be put aside as a ground for possible future projects. The forward projection of the research is therefore a stimulus towards a new technical, critical and creative spatial approach.

SOSPENSIONE CHIUSA

4. FAR FROM EQUILIBRIUM
4.1. EPIGENETIC LANDSCAPE
4.1.1 MORPHOGENETIC FIELDS

Il concetto di paesaggio epigenetico vede
le sue origini nella disciplina della biologia genetica e fu introdotto nel 1957 come modello biologico da Conrad Waddington. Il termine deriva dall'epigenesi, processo per cui le forme emergono gradualmente da ambienti omogenei e geni indifferenziati, e manifestano una loro differenziazione nei successivi stadi di sviluppo. Questo modello proposto da Waddington vuole fare emergere la complessità dei sistemi in un continuo stato evolutivo: la differenziazione genica nel modello di paesaggio epigenetico viene rappresentata da un diagramma costituito da una serie di rilievi e cavità che una cellula può attraversare nel suo percorso verso uno specifico stato di sviluppo tipologico. Ciascuno di queste cavità infatti rappresenta un possibile percorso di evoluzione del singolo tipo (Waddington 1940).
La forma in evoluzione viene rappresentata nel diagramma di Waddington appunto dalle traiettorie possibili di una sfera, da un punto più alto a uno più basso della superficie generata in una continua ricerca dello stato di equilibrio nelle differenti configurazioni assunte nel tempo. Questo modello spaziale e temporale introduce la possibilità che la differenziazione della forma consideri l'intervento di fattori esterni: ciò che risulta infatti è una relazione tra forme fenomeniche (fenotipi) e campi morfogenetici, generando una superficie topografica ondulatoria le cui molteplici cavità corrispondono alle possibili traiettorie che la forma di un qualsiasi corpo, considerato come elemento dinamico, può assumere (Kwinter 1992).
Il concetto viene ripreso da Sanford Kwinter nel suo saggio "Landscapes of Change: Boccioni's 'Stati d'animo" e applicato nella disciplina del paesaggio e dell'architettura, come possibile chiave di lettura e disegno dei fenomeni e processi complessi non lineari che costituiscono il pianeta. Kwinter pone a confronto la teoria dei modelli classici con quella topologica.
Nella teoria classica, la forma è concepita in maniera idealizzata senza considerare l'influenza della materia come forza dinamica su una forma idealizzata e isolata. In questo modello, la materia si riduce a un substrato inerte che non è in grado di intervenire sulla genesi della forma. Kwinter appoggiandosi all'epigenetica propone un modello dinamico, relazionale e performativo; un luogo molteplice di connessioni, eventi, di forze e azioni in gioco nello svilupparsi del tempo e dello spazio.
La forma esiste in continua evoluzione e sviluppo attraverso differenti stati di equilibrio e scenari possibili nello spazio e nel tempo; non è da considerarsi fissa o statica, proprio perché si colloca in uno spazio che kwinter definisce transformational space. Questo principio di spazio di trasformazione viene identificato come una necessità all'interno del progetto architettonico e di paesaggio, soprattutto in un contesto storico che vede urgenze sociali e naturali continuamente agenti di trasformazione e modulazione. Le modulazioni del paesaggio epigenetico corrispondono quindi a tendenze o scenari, non deterministici. Al contrario il paesaggio epigenetico , assorbe e rende creativa tutta la contingenza, come una molteplicità generata da un campo di forze estremamente complesso. Questo permette di comprendere nella pratica del design a livello applicativo quali possono essere le nuove forme dei sistemi complessi, che verranno a generarsi nel tempo, e di conseguenza quali azioni progettuali possono rispondere alle diverse evoluzioni, modulazioni spaziali in uno specifico istante.
Operativamente all'interno della ricerca, la teoria del paesaggio epigenetico viene inserita proprio a livello metodologico come azione progettuale di buona pratica. Le mappature scientifiche effettuate sui luoghi considerati portano alla produzione di trasformazioni dello spazio che si sviluppano nel tempo: la nuova forma fluida del bordo si genera in un continuo processo dinamico spazio-temporale, producendo nuovi scenari e topografie possibili.

4.2 ABDUCTIVE LOGIC
4.2.1 NON-LINEAR REASONING

Il concetto di abduzione e logica abduttiva venne introdotto nelle teorie della logica moderna e formulato dal filosofo americano Charles Sanders Peirce, nel suo lavoro sulla logica delle discipline scientifiche, come una dei tre tipi principali di inferenza accanto alla deduzione e all'induzione. Mentre la logica deduttiva e quella induttiva riuscirono a prendere posizione come pilastri nella filosofia della scienza,
la logica abduttiva rimase un concetto più nascosto. Secondo Peirce invece quest'ultimo è da considerarsi la base del metodo scientifico, poiché si definisce come processo di formazione di explanatory hypotheses, e come unica operazione logica per l'introduzione di qualsiasi nuova idea e spiegazione di "sorprendenti osservazioni" (CP 5.172, 1903); inoltre definisce l'abduzione come quell'operazione che include qualsiasi altro tipo di processo per cui vengono generate teorie e concetti. Nelle sue lezioni ad Harvard del 1903, Peirce pronunciò le tre cotary prepositions del pragmatismo, descritte come aspetti di funzionamento della mente: 1. Tutto ciò che è nella nostra mente è basato su qualcosa generato dai nostri sensi; 2. Il giudizio percettivo include generalità, permettendoci di generare formulazioni generiche; 3. Il subconscio utilizza l'abduzione per generare il giudizio percettivo senza che esso venga criticato dalla mente cosciente.
Se supponiamo come afferma il filosofo, che il giudizio percettivo, basato appunto su premesse osservate, è sostanzialmente abduzione, allora il pragmatismo non è nient'altro che "la logica dell'abduzione" motivo per cui risiede alla base del metodo scientifico. "L'abduzione arriva in un "flash", come un' illuminazione. I pezzi erano già presenti nella nostra mente; ciò che è nuovo è la loro connessione. Così l'abduzione è, alla radice, una connessione, una relazione". (CP 5.189, 1903) La percezione e l'abduzione sono quindi considerate nel ragionamento logico entrambe inferenze applicabili nel metodo, poiché, basandosi su osservazioni e percezioni di concatenazioni di fenomeni, permettono di scoprire qualcosa che non conosciamo.
Sebbene l'abduzione affermi le sue conclusioni solo in modo ipotetico, ha una forma logica definita. Peirce presentò la descrizione logica standard nella settima lezione ad Harvard sempre del 1903:
Il fatto sorprendente, C, è osservato;
Ma se A fosse vero, C sarebbe un fatto ovvio,
Quindi, c'è motivo di sospettare che A sia vero.
(CP 5.189, 1903)
Questo schema rivela perché l'abduzione è chiamata anche retroduzione: è un ragionamento che porta da un effetto di una conseguenza ammessa al suo antecedente.
Questo processo di formulazioni di ipotesi in un continuo passaggio tra insiemi di elementi che costituiscono il fenomeno, può essere inserito nella pratica progettuale dell'architettura e del paesaggio. Se consideriamo infatti le fasi iniziali dei processi del progetto come istanti di formulazione di ipotesi sperimentali, proposte speculative, che si basano sull'osservazione di fenomeni concreti e vengono testate attraverso mappature, disegni, modelli è evidente come la logica abduttiva può divenire strumento utile alla progettazione. Generare scenari possibili, frutto dell'osservazione di un fenomeno, effettuando continui passaggi di scala tra processi ed elementi che costituiscono il generale e il particolare, diviene così un'operazione metodologica fondata, soprattutto all'interno di discipline come l'architettura e il paesaggio, che rivolgono l'attenzione a problematiche scalari differenti. Il metodo abduttivo viene infatti utilizzato nel ragionamento per la struttura logica circolare con cui ipotesi, fenomeni e affermazioni vengono collegate. Esso esce dalla logica binaria e permette nella ricerca di lavorare attraverso logiche non lineare in uno schema di azione e retroazione come approccio generale all'osservazione e alla progettazione di un luogo.

4.3 PUNTI DI DISCONTINUITÀ
4.3.1 HOLOGRAMS OF CONFLICT

Il concetto di punti di discontinuità, presentato nel capitolo 3, ovvero quei luoghi emblematici, ologrammi del conflitto, che caratterizzano l'area dei Balcani, identificati e mappati all'interno del nuovo Masterplan, viene ripreso in una dimensione progettuale. Questi punti sono luoghi elica, in cui il bordo, caratterizzato da una coincidenza tra bordo amministrativo e bordo ecologico, si muove nella sua dimensione fluida a causa di fenomeni umani e non umani. Le proprietà di queste eliche interagiscono con la nuova natura fluida del bordo, acquisendo anch'esse un regime liquido o gassoso. Sono stati scelti come luoghi di sperimentazione del metodo, tre punti caratteristici lungo lo stesso tratto del confine che divide gli stati Croazia e Bosnia Erzegovina, distinti tra loro per specifiche proprietà del regime fluido a cui appartengono e per la tipologia di fenomeno conflittuale che vi si manifesta.
01. bc1 - Velika Kladusa è il primo punto, una città di confine, localizzata in Bosnia, segnata dalla forte crisi delle migrazioni che coinvolgono da molto tempo la Balkan Route. Questo punto è caratterizzato dal regime gassoso (0L1G), in quanto su di essa vi agisce la figura del gradiente, intendendo quest'ultimo come spostamento sul bordo di esseri umani. Questo luogo emblematico è segnato anche dalla presenza del fiume Glina, come elemento di conflitto e soglia tra i due stati.
10. cb6 - Trgovska Gora, è il punto in Croazia caratterizzato dal regime liquido (1L0G) e dalla forte presenza di un conflitto ancora aperto. In questo luogo di confine, il cui paesaggio è caratterizzato dal fiume Una, Croazia e Slovenia prevedono di stoccare i rifiuti nucleari prodotti dalla centrale nucleare slovena Krsko, con forte disapprovazione da parte della cittadina bosniaca di Dvor. Il punto trascina con sé le problematiche legate all'inquinamento delle acque del fiume e del suolo, dimostrando attraverso successive mappature la tridimensionalità del bordo in movimento.
11. cb7 - Slavonski Brod, è il terzo punto, localizzato in Croazia, più a est sul confine. Questo luogo discontinuo è caratterizzato da un regime fluido ibrido tra liquido e gassoso (1L1G) per via della presenza del fiume Sava, particolarmente soggetto a esondazioni, e dalla presenza di forte inquinamento aereo a causa della vecchia raffineria di petrolio nella cittadina bosniaca Bosanski Brod. Il punto viene scelto come esemplificativo della dimensione aerea del bordo, che supera la dimensione statica e tangibile dei confini architettonici amministrativi.
Tutti e tre i punti sono scelti all'interno del territorio poiché accomunati dalla presenza dell'elemento ecologico del fiume, e i suoi relativi processi di esondazione che colpiscono l'area, e dalla catastrofe/evento scatenante dell'instabilità: il terremoto del 29 dicembre 2020, evento sismico che ha avuto come epicentro la città di Petrinja, Croazia. Questi fenomeni permettono di formulare attraverso la raccolta dei dati ad essi relativi e le conseguenti mappature, ipotesi di scenari futuri, ovvero paesaggi possibili la cui la cui morfogenesi è influenzata dai fenomeni umani e non umani specifici che li caratterizzano.

4.4 SETACCIO OF SYNCHRONICITIES
4.4.1 PENTAGRAM OF THE COLLECTIVE

In "Politiche della Natura. Per una democrazia delle Scienze" (2005) Latour dice che siamo vincolati e situati dentro una macchina politica che produce verità/scienza e non possiamo (mai) guardarla da fuori (a parte immaginarla come modello). Quindi, dall'interno di questa macchina, siamo costretti a "credere" alla verità/scienza che continuamente produce, in un ciclo che muta nel tempo. Latour definisce questa macchina di costruzione della verità (ma non della realtà) come "Collettivo", procedura globale applicabile a tante situazioni. Il collettivo si definisce solo per il suo movimento: le entità respinte all'esterno dal potere di ordinamento ritornano in appello, per inquietare il sistema. Il modello del Collettivo è un'ipotesi di movimento che si accompagna spesso a rappresentazioni di tipo reticolare. Lo stesso Latour ha sviluppato la teoria dell' Actor Network Theory, secondo la quale le entità della rete vengono descritte sulla base dell'azione che stanno compiendo e che ci consente quindi di prenderle in considerazione. L'ANT usa delle reti di relazioni, che possono essere declinate considerando le diverse entità che la compongono.
Quando si inizia a parlare congiuntamente di movimenti (cicli, sequenze, processi) e di reti (relazioni, sistemi di attori), bisogna inquadrare le differenza tra la dimensione diacronica e quella sincronica. Il ciclo del Collettivo è un modello diacronico che possiamo applicare ai processi di progettazione architettonica e urbana, che serve pero a far comparire una rete di documenti e entità come se fossero un insieme sincronico.
Il processo nella realizzazione del Pentagramma del Collettivo parte dalla struttura srotolata del ciclo in cui la dimensione diacronica del tempo in ordinata è scandita dall'apertura iniziale del conflitto in uno specifico punto del confine e si chiude con un'apparente chiusura finale in cui il problema rimane irrisolto, sospeso, che corrisponde al contemporaneo. Il movimento degli attori e degli attanti attraverso le controversie del collettivo viene discretizzato in segmenti solo dopo aver osservato il ciclo nella sua dimensione di totalità circolare. Qui infatti il diagramma ciclico del collettivo Latouriana si impone come un "Fucile Fotografico" per catturare nel movimento dei frame distinti. Da un processo diacronico cerchiamo di estrapolare frame sincronici.
I raggi del cerchio scandiscono la temporalità degli avvenimenti, e mostrano l'irruzione di entità, attori e attanti in diverse fasi. "Setacciando" il diagramma ciclico, a partire da degli avvenimento scatenanti specifici, le "catastrofi" che hanno reso instabili e discontinui questi punti, è possibile individuare nuovi reticoli lineari, in cui sulla stessa dimensione (tempo) si trovano Istituzioni locali e europee, governi, documenti ed eventi che hanno costruito uno specifico frame sincronico.
In che modo la dimensione sincronica di un luogo, può assumere una terza dimensione legata allo spazio e non più al tempo?
Come possiamo mettere in movimento "spaziale" un diagramma che non tiene conto della variabile tempo?

4.4.2 MACHINE

L'instabilità del confine tra Bosnia e Croazia è caratterizzata da numerose catastrofi, rotture. In termini socio-tecnici (e anche sociologici) la rottura è detta "controversia". Una controversia è un problema aperto, ibrido, di solito di natura sociale e tecnica (Latour 1992).
Di fronte alle controversie, ad un problema o irruzione (che implica una associazione socio-tecnica) si possono compiere due tipi di azione: descriverle o modificarle (per riassemblarle) descrivere o modificarne la lettura. Nel primo caso compiamo indagini su cosmogrammi che sono esplosi (cosmogrammi postumi). Compiamo un lavoro etnografico, genealogico, storico. Nel secondo caso partiamo da situazioni aperte di cui possiamo definire un cosmogramma preventivo, e cerchiamo di chiuderle, di imploderle, di condensarle in una nuova cosa cosmica. Vale a dire che compiamo un lavoro progettuale, è un lavoro socio-tecnico di assemblaggio.
La condensazione progettuale verso una nuova cosa cosmica è una nozione che consente di vedere il progetto come un'azione di mappatura e composizione di parti eterogenee di mondo, piuttosto che come una creazione ex nihilo o un processo isolato e specializzato (solo tecnico, solo sociale, solo creativo).
I cosmogrammi e le cose cosmiche (Tresch 2007) sono due definizioni sincroniche, due «fermo-immagine», attraverso cui possiamo cogliere la successione divergenza/convergenza con cui procediamo nel corso di un progetto architettonico. Dalla divergenza-apertura alla convergenza-chiusura, tendenzialmente dispieghiamo e ripieghiamo ciclicamente e continuamente, a tutte le scale possibili.
Il Collettivo si rivela, si esplicita solo in rapporto a un'interruzione del corso normale (e implicito) dell'azione, ovvero quando incappa in una controversia.
Tre sono i cosmogrammi che derivano dalla discretizzazione del collettivo. Uno per ogni punto di discontinuità.
Apparentemente adimensionali, i 3 diagrammi assumono la forma di una Macchina performante per il progetto, nel momento in cui il concetto di terza dimensione di territorio e del bordo (Elden 2013) viene trascinato nella logica del diagramma. La nuova ascissa infatti diventa proprio la dimensione spaziale del bordo,
che verticalizza i frame in una nuova visione dimensionale, dove i frame sincronici diventano piani che permettono di individuare le relazioni interne tra diversi luoghi nello spazio, in cui la stessa controversia ha fatto irruzione comportando complicazioni e chiusure diverse.
Disassemblare il ciclo del collettivo in piani sincronici è come esplicitare o explicare (spiegare/dispiegare).
L'idea di realizzare un modello di macchina universale, in grado di setacciare le sincronicità in un sistema aperto di relazioni nello spazio multidimensionale, vuole essere la base per poter strutturare su di essa nuove questioni e scenari progettuali.
Il nuovo confine geopolitico, all'interno di questa macchina del contemporaneo, viene letto nella sua tridimensionalità nel setaccio, diventando effettivamente la terza dimensione del diagramma. Il piano sincronico comune ai tre collettivi diacronici dei luoghi, che viene estrapolato dalla macchina stessa, genera un setaccio di sincronicità che è di fatto un gradiente. Il setaccio, in questo senso, è lo strumento che permette di vedere il gradiente del confine sovrapponendo entità diverse. Esso fornisce un gradiente eterogeneo con diverse specificità.

4.5 SCIENCE OF POSSIBILITIES
4.5.1 A PROBABILISTIC SCENARIO

A seguito delle relative indagini effettuate sui tre punti di discontinuità individuati e delle mappature generative di tre scenari di trasformazione dello spazio specifici, il progetto teorico e la macchina diagrammatica vengono trascinati all'interno di un unico scenario probabilistico lungo il tratto di confine tra croatia e bosnia herzegovina che accomuna questi tre luoghi.
L'immagine prodotta riassume in una visione olistica, una probabile mutazione del bordo caratterizzata dalle tensioni e dai conflitti generati da ciascun punto.
Il bordo acquista la terza dimensione generando una possibile configurazione performativa che utilizza le figure metodologiche e la struttura teorica del modello in movimento, creando così nuove forme di un paesaggio epigenetico, in cui gradienti, esternalità e pattern offrono possibili nuovi modelli topologici e dinamici.
Il concetto teorico di paesaggio epigenetico viene utilizzato a livello pratico e progettuale in modo letterale, come un paesaggio fluido performativo in continua evoluzione delle forme spaziali, ibridando ecologia e architettura.
Il nuovo scenario probabilistico di mutazione del bordo viene così generato come risultato dei processi ecologici specifici del luogo, e come esito della costruzione di un setaccio del conflitto come strumento operativo di messa in relazione di elementi umani e non umani,
Gli elementi e le tracce statiche dell'architettura e della geopolitica si intersecano con gli elementi ecologici nella generazione di nuove forme. Questi scenari emergono sul territorio come ologrammi del conflitto, luoghi di eccezione in cui la morfogenesi avviene in una condizione di continuum spazio tempo. La genesi di queste nuove forme di paesaggi epigenetici deriva dall'osservazione dei fenomeni globali e locali, sperimentando il nuovo linguaggio e la nuova metodologia in una logica abduttiva, che prevede circolarità e fluidità nella direzione del progetto, effettuando continui passaggi di scala, dal generale al particolare e la creazione nuove immagini contemporanee.
In questo senso, la produzione di uno scenario probabilistico assume un significato fondamentale all'interno della ricerca. La logica non risolutiva, conflittuale con cui la metodologia si pone, e la dimensione dinamica del modello vengono in questo modo rafforzate e lasciano aperte questioni tipiche del contesto contemporaneo: umani e non umani sono attori in un progetto sulla fragilità, sull'instabilità del confine, ecologico e architettonico, che intende l'Ecologia come scienza delle possibilità e non come disciplina in grado di definire esiti spaziali definitivi.

4.6 A DIGITAL MODEL
4.6.1 DIGITAL ATMOSPHERE MODEL

La ricerca, impegnata in meccanismi politici, sociali, ecologici e tecnologici, sperimenta e sospende le sue questioni nella creazione di un modello digitale e interattivo. Al fine di gettare le basi per nuove possibili intuizioni metodologiche vengono mutati e trasgrediti i confini di diverse discipline per strutturare un algoritmo in grado di visualizzare uno dei disturbi fluidi sui confini. L'obiettivo del modello digitale nel contesto contemporaneo è quello di realizzare un'installazione interattiva che mostri uno specifico tema/fenomeno attraverso esperienze digitali e multimediali. L'idea nasce a partire dall'esistente "Modello digitale di elevazione" (DEM, Digital Elevation Model), ovvero la rappresentazione delle quote distribuite su un territorio, o di una superficie, raccolte in formato digitale. Ciascuna quota viene attribuita ad un specifico pixel che compone il formato raster del DEM, dove i dati di elevazione vengono elaborati e acquisiti attraverso sensori montati sui satelliti. Partendo proprio dal Satellite, per la realizzazione del "modello digitale dell'atmosfera", vengono per prima cosa acquisiti i dati relativi agli inquinanti aerei (CO_2, PM2.5, PM 10, SO_2, NO_2) in uno specifico arco di tempo (1 mese). I dati acquisiti vengono manipolati per far sì che il valore numerico acquisisca la forma di gradiente, e ogni immagine ottenuta viene processata con le altre per ottenere la media dei valori nell'immagine finale, che verrà poi sovrapposta a quelle degli altri inquinanti.
Attraverso questo processo è stato possibile realizzare le "Cards from Atmosphere" (cap3.2.1 Something in the Air), ovvero i gradienti di inquinanti relativi a uno specifico confine. In questo modo è stato possibile mappare le tensioni politiche e di sovranità che esistono nella dimensione aerea dello spazio. L'obiettivo dell'installazione è quello di relazionare in maniera virtuale e in tempo reale, l'intensità dell'azione dell'uomo sul movimento delle particelle di inquinanti sopra un confine. Per la realizzazione del modello in movimento è stato utilizzato un linguaggio di programmazione visuale basato su nodi che funzionano in relazione a contenuti multimediali interattivi in tempo reale. In particolare a governare il movimento dei gradienti e delle particelle sulla linea del confine, è la telecamera del sensore in grado di catturare i movimenti e controllare il comportamento delle particelle. Per simulare in maniera speculativa l'interferenza dell'uomo sul movimento dei gradienti viene messa in relazione l'intensità delle Bitmap con cui il sensore acquisisce l'immagine del movimento, con una tabella in cui vengono elencate le principali fonti di inquinamento umano (industrie, traffico urbano/aereo etc) in relazione all'inquinamento prodotto.

SOSPENSIONE CHIUSA

Bordoclima finisce con una domanda aperta.
Gli interrogativi che rimangono sospesi fanno si che non avvenga una vera e propria riaggregazione nella fase di chiusura bensì che il risultato rimanga apparentemente sfocato.

L'esito, sottoforma di scenario probabilistico, fa si che si possano diramare una serie di progetti specifici che si inseriscono nelle catene degli effetti di luoghi eterogenei in un determinato tempo. La disponibilità di un certo apparato sperimentale cartografico e di mappature può portare alla convergenza a partire da elementi e dati diversi. Strumenti di questo tipo possono permettere di porsi verso un'azione di chiusura progettuale in riferimento alle condizioni contingenti, creando uno scenario che apre molteplici possibilità e non esclude la concretizzazione di una vera e propria trasfomazione dello spazio. C'è una volonta nel sospendere anche in chiusura proprio per riflettere su cosa si è appreso e cosa può essere messo da parte come terreno di possibili progetti futuri.
La proiezione in avanti della ricerca si pone quindi come stimolo verso un nuovo approccio spaziale tecnico, critico e creativo.

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"When the world ceases to be the place of our personal wishes and personal hopes, when we face it as free men, observing it with admiration, curiosity and attention, we enter the realm of realm of art and science. If we use the language of logic to describe what we see and feel, then we are engaging in a scientific research.
If we communicate it through forms whose are not accessible to conscious thought, but are perceived through intuition and perceived through intuition and ingenuity, then we enter the field of art.
Common to both experiences is a passionate dedication to what transcends dedication to that which transcends the will and self-interest".

Albert Einstein

fig. 29
particles in the atmosphere

Ad Alessandro ed Elisa, per aver acceso in noi una luce.
Alla nostra amicizia che le ha permesso di brillare.

BORDO CLIMA

New Calligraphies of Moving Borders

Federica Pessotto
Lucia Rebolino

FEBRUARY 2022

MArch. Thesis

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