



POLITECNICO  
DI TORINO

# Honors thesis

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Course of  
Planning, Urban and Landscape-Environmental

Abstract

HYDROMORPHOLOGICAL QUALITY ASSESSMENT IN  
"RIVER GESSO AND STURA PARK" IN PIEMONTE

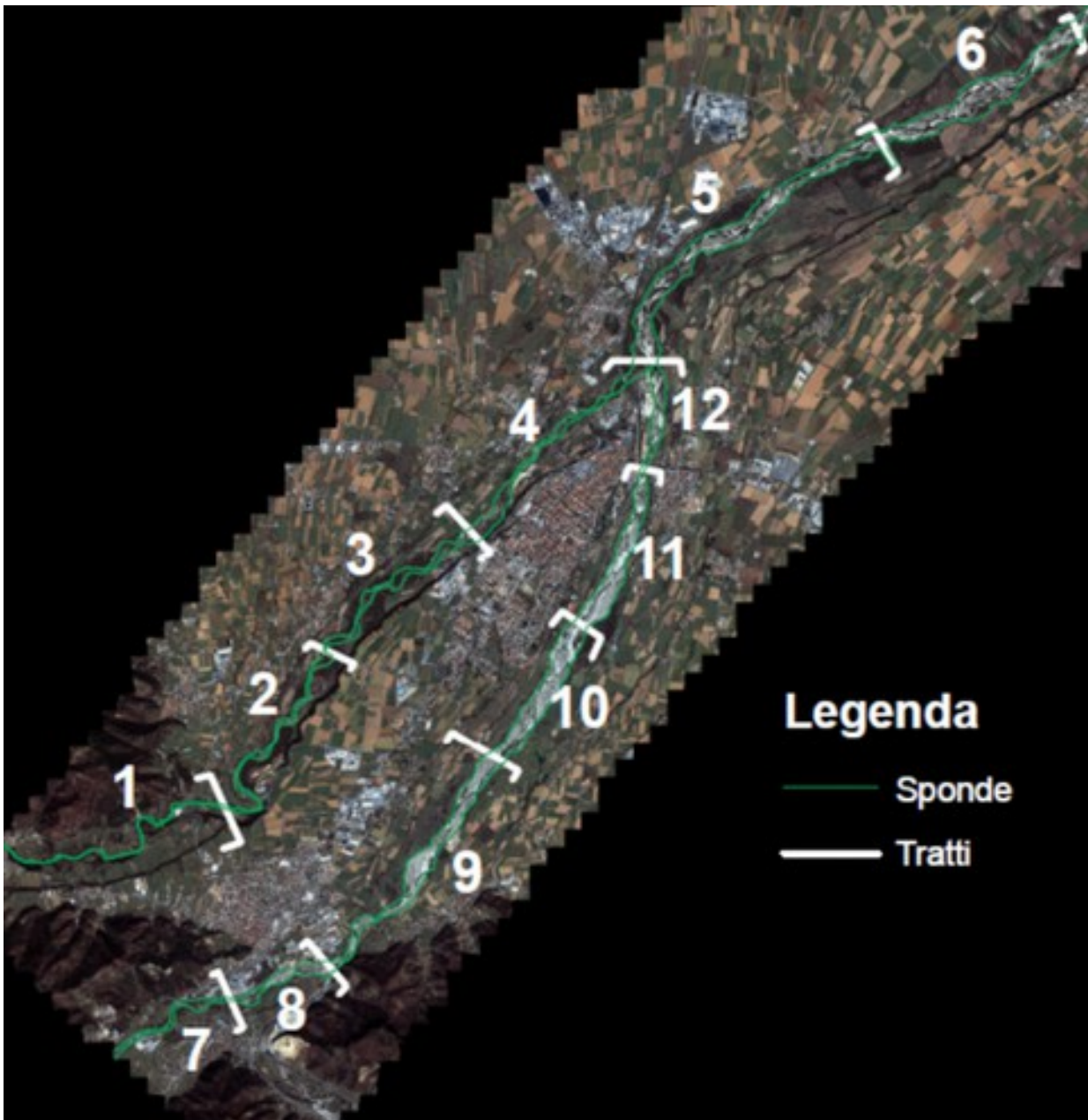
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In the thesis in question a new index for evaluating the hydro morphological quality of tracts of water is tested. This index consists of a comprehensive methodological framework which covers the analysis, evaluation and follow up monitoring of the integrated planning provided for in the "Flooding" 2007/60/CE Directive relative to flooding risk management and the Water Framework Directive (WFD) which accurately evaluates the hydro morphological aspects, in addition to the chemical and physical ones relative to the water quality and biological content, in order to reach a classification of the ecological state of the tracts of water. This methodology was the main theme for the development of this thesis which aims to expand on and test the application of this new index. The IDRAIM takes into consideration in an integrated way the environmental quality and mitigation risks linked to the processes of river dynamics. In fact, it is a system suited to supporting the management of tracts of water and their geomorphologic processes. During the experiment the IQM (Morphological Quality Index) was applied to eleven tracts of the River Gesso and River Stura of Demonte, situated within flat and hilly areas of the Gesso and Stura Riverside Park which extends through the towns of Roccavione, Borgo S. Dalmazzo, Roccasparvera, Vignolo, Boves and Centallo and the city of Cuneo.

The IQM was devised to define the prevailing morphological conditions of a tract of water with respect to a given state of reference approximately indicated by those conditions that would exist in the river bed, river banks and adjacent flood plains in the absence of man-made influences. The aim is to be able to make a technical judgement of these tracts in order to reveal the conditions that the tracts of water currently show by applying a new system suited to evaluating the morphological and ecological qualities of superficial bodies of water. For this thesis the main objective was the application of the IQM to five tracts of the River Stura and six tracts of the torrent Gesso which is a tributary on a level with the city of Cuneo. These tracts were identified during the initial phase of the thesis which required a general organization using GIS, the calculation of the various parameters used in the method of application of the IQM and the subdivision of the final tracts. For this initial phase, as well as for the implication of some sub-indices, reference to a range of cartographical data was found to be indispensable, in particular: a digital model of the terrain, digital orthographic photos, a geographical map and the land registry for forestry hydraulic systems.



In the field phase, the entire length of tracts which had been highlighted on paper was covered again on foot and relevant survey charts were compiled. Analysis of the results reveals that, in general, the tracts have a good morphological quality. To summarize, 6 tracts result in HIGH quality and 5 GOOD. Comparing these results with other applications of the IQM to similar cases, that is to areas of flat and hilly land reveals the high quality of the tracts examined, including those adjacent to the city of Cuneo, capital of the province of Piedmont.

It is clear that there is a lot of room for improvement, as improving the current situation is always possible, but these values indicate that the forestry hydraulic operations carried out in recent years have been planned and carried out near perfectly.

An example of how the various tracts in question were analyzed: Tract 4 being part of the River Stura of Demonte.



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