

Who we are



Maccaferri Innovation Center is the research and development center of Officine Maccaferri, based in Bolzano, in the NOI Techpark.

It deals with:

- creating new products for the portfolio of Maccaferri;
- Developing new technical instruments and software, to support the design and the informed use of Maccaferri products;
- Optimizing Maccaferri products for civil and environmental engineering projects.

At the center works a multidisciplinary team of highly-qualified young researchers.



MAVtech was founded in 2005 as a spin off company of the Polytechnic University of Turin. Their principal activity is the design of unmanned remotely piloted aerial vehicles (UAVs) for the aerial surveillance and civil land monitoring applications (including applications for precision agriculture, multi- and hyper-spectral image acquisition and LiDAR data). The company provides technical solutions of high performance and customized based on the needs of the applications (included customer support services and end-user training), based on the results of research and development projects.



NATURSTUDIO has decades of experience in the sector of environmental evaluation and soil-bioengineering design.

It is specialized in naturalistic analysis using environmental indicators and in research for new methodologies of expeditious analysis in the following sectors: applied botany, carbon segregation in green infrastructures and soil-bioengineering in river areas.

The company also deals with the executive design of green mitigation measures, environmental restoration and soil-bioengineering in the field of natural hazard protection and mitigation.



The Faculty of Science and Technology of the Free University of Bolzano has an active research group of Agroforestry Innovations. The activity of the research group is mainly focusing on thematic areas typical for biosystems engineering, considering the appropriate use of production technologies in agro-environmental and forestry companies. The activities are carried out by a specialized laboratory, which is currently under construction at the NOI Techpark. The laboratory is specialized in issues related to performance, energy efficiency and safety of tractors and operating machines used in different operating environments and conditions, as well as their agro-informatics applications. They conduct studies and develop prototypes in precision agriculture and conduct automated monitoring of products and processes with the aim to automate the production processes to become mobile. In addition, the research group is also active in the use of technologies for environmental monitoring activities and develops information systems and interpretative models to support the decision-making processes of agro-environmental companies.

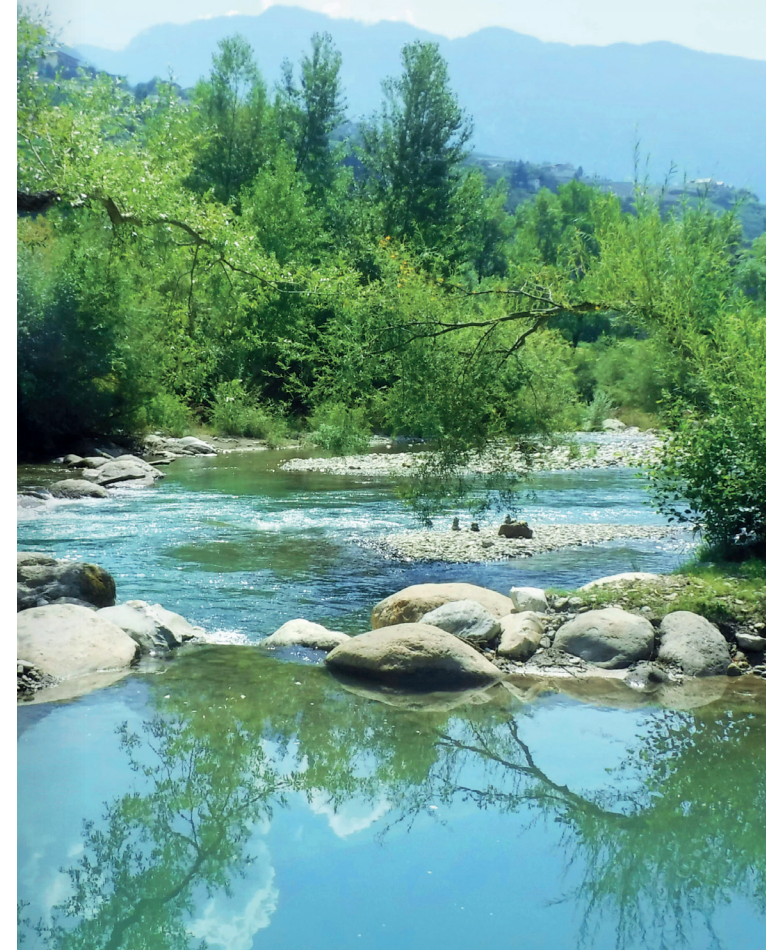


Download research material here:

wequalproject.eu



WEQUAL



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ALTO ADIGE



WEQUAL project

WEQUAL is a research project that started in 2017, when three private companies (Maccaferri Innovation Center, MAVTech and Naturstudio) and the Free University of Bolzano met and decided to concretely address an extremely current theme: **the sustainable development of the territory**.

Inspired by the recommendations of the European Commission in the field of Green Infrastructures, the project partners worked closely together to create a **web-based system** able to support the design of interventions to improve and better safeguard watercourses.

This new system is created as a **simple and practical instrument** to encourage technicians, project managers, evaluators and institutional stakeholders to use an integrated territorial approach, promoting the protection of fluvial ecosystems.

The system implements an analytical procedure that requires the evaluation of various parameters. These parameters allow to frame hydraulic structures and solutions in relation to their real capacity to contribute to the good management of the territory and the containment of environmental impacts. Some of these parameters can be obtained through automated survey techniques and using remote-sensing data captured by drones.

As part of the project, **drones** were designed, built and **equipped with high-tech sensors**, which, in a short time, allow to collect large amounts of data of the territory. The use of similar tools reduces the workload in the field, gives objectivity to the analysis and supports the assessor in the sustainable design of future interventions.

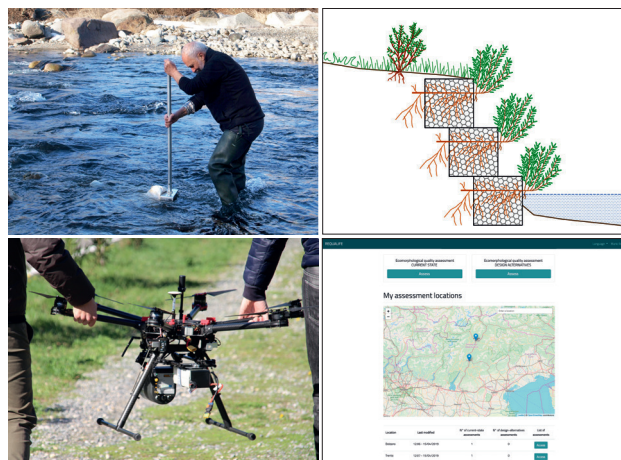


Project activities

The main activities are carried out in the field, gathering data related to different hydraulic structures and engineering solutions. The data were processed in a way to develop, calibrate and validate the analysis tools created during the project.

The concerned activities include:

- the development, calibration and validation of **WEQUI**, a methodology that rates the local eco-morphological quality of watercourses, consisting of 15 environmental indicators;
- the creation of a database of typical effects for different categories of hydraulic structures, based on observations and measurements in the field;
- the design, development and testing of drones for remote sensing surveys, with optimizations of the flight and survey techniques;
- conduct field surveys, using our drones and involving high-tech hydraulic experts, naturalists, botanists, agronomists, hydrobiologists, ornithologists;
- the development and implementation of the web-based instruments **REQUALIFE** and **WEQUAL-AMC**, two systems to support the design and evaluation of protection and mitigation structures in watercourses.



Results

At the end of the project, we will have:

WEQUI

A validated assessment method, which makes it possible to classify the eco-morphological quality of a watercourse and, when in process of designing, to predict the environmental state of projects several years after construction.

REQUALIFE

A simple, intuitive and accessible web application, which implements the WEQUI methodology and allows users to carry out quick environmental assessments.

WEQUAL-AMC

A web-service application that allows to combine environmental, technical, economic and social assessments, using multi-dimensional analysis methods to assess the best project allowing the end-users to choose the most relevant outputs for them.

4 UAV PLATFORMS

Four drones optimized for flights in a river environment and equipped with sensors suitable for environmental surveys.

ALGORITHMS

Numerous calculation codes to process and interpret data collected during field surveys, to combine evaluation parameters and to perform comparative analyses.

