SIMILE: An integrated monitoring system to understand, protect and manage sub-alpine lakes and their ecosystem

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Introduction

Timeline

- More complex transformations
- More resources requested
- More natural risks
- More resources exploitation

Food
Water
Raw material
Energy

Interreg
Introduction

**Nutrient loads**

**Mitigation actions**

**Climate change**

These changes affect and alter the known dynamic. Global warming affects the water temperature and consequently the nutrient concentration in water bodies [1]

**The need of monitoring**

The SIMILE project
System for the Integrated Monitoring of Insubric Lakes and their Ecosystems

An innovative project to improve the analysis of lake water quality, integrating data from sensors, satellite images and information provided by the public.
The problem - 1

The analysis of unknown effects is required to understand how ecosystems react to the individuated new pressures.

Traditional methods are a fundamental source of information but with some limitations:
• Temporal resolution
• Spatial resolution
• High cost of instruments and technical personnel
The problem - 2
Two working tasks

Monitoring system

Business Intelligence Interface
Monitoring system - Raft placement
Monitoring system - Edge computing

MODBUS Sensors
- Temperature
- Dissolved Oxygen
- Chlorophyll
- Weather station

NB-IoT • LTE-CATM1
Monitoring system

- 6 sensors to measure Dissolved Oxygen
- 1 weather station
- 2 sensors to measure Chlorophyll-a and Cyano

- Sensing every minute
- 15 min aggregation
- Data transmission every 20-30 minutes
Three indexes to indicate the health state of the lakes
Server Architecture

**Server side**
- istSOS
- QA
- Report
- Process

**Web client**

* Open source  * Standard  * Quality of Services
Thank you