

A Unique Database of Freshwater Markers to Address Anthropogenic Challenges Threatening Alpine Lakes

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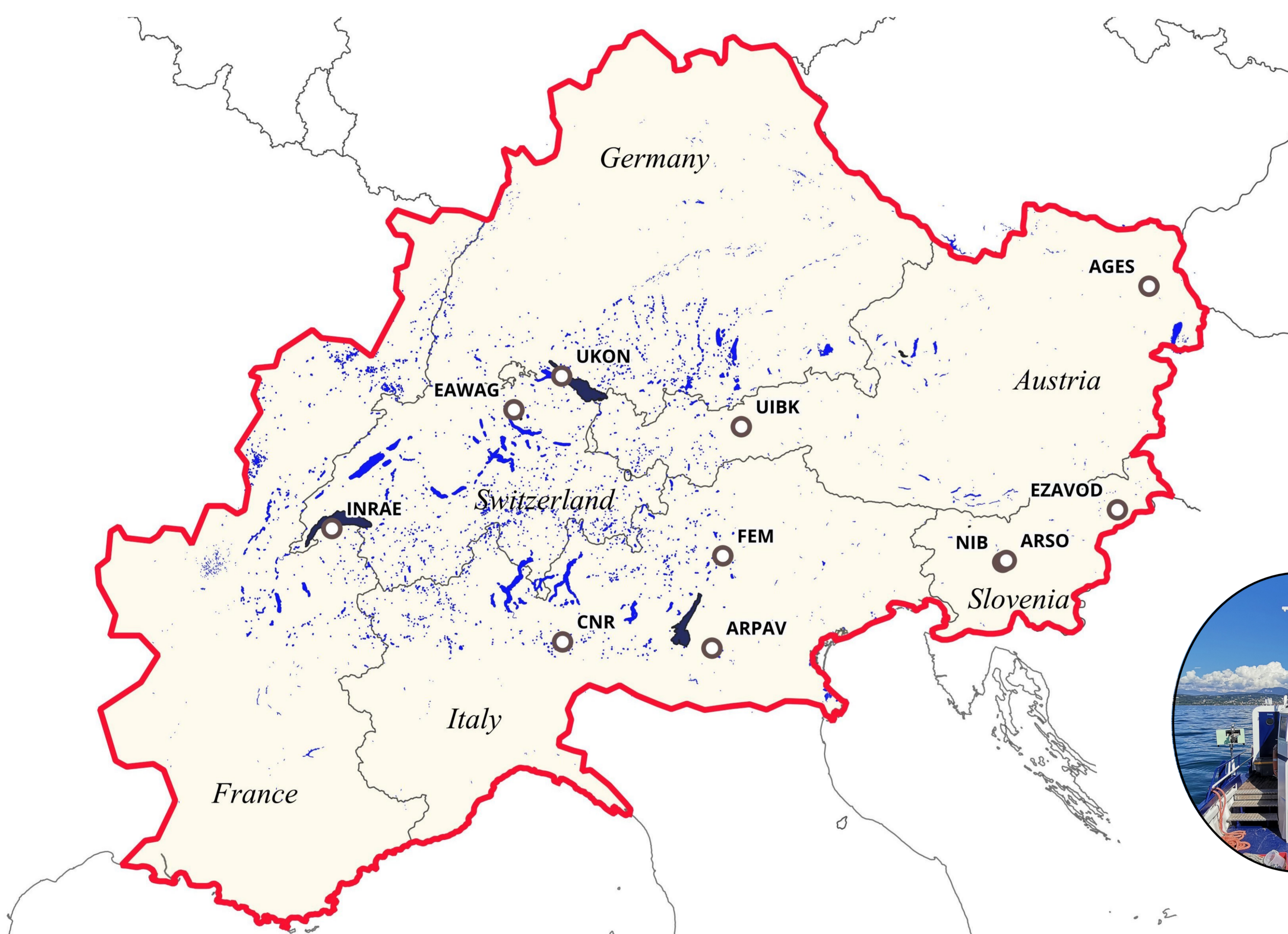
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INTRODUCTION:

Alpine lakes are affected by anthropogenic pressures, including tourism and eutrophication. Frequent cyanobacterial and algal blooms, driven by excess nutrient input and rising of water temperature, result in waters unsuitable for drinking, recreation, and industrial use. These blooms are associated with biodiversity loss, oxygen depletion, and the presence of cyanotoxins, which pose serious health risks and threaten aquatic ecosystems.

AIM:

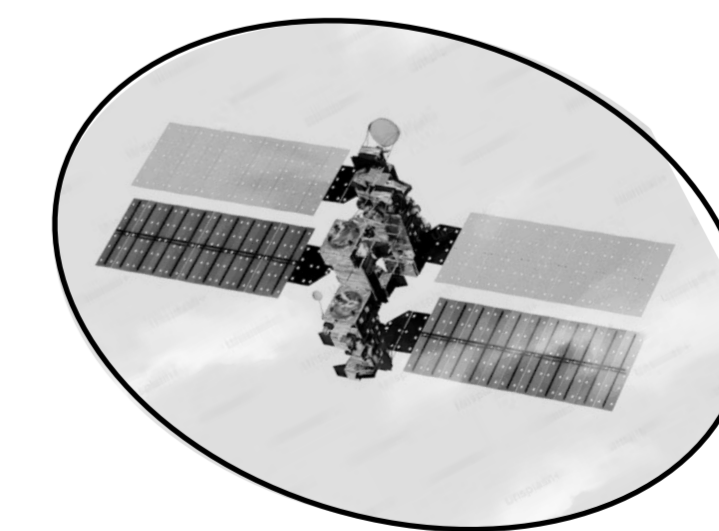
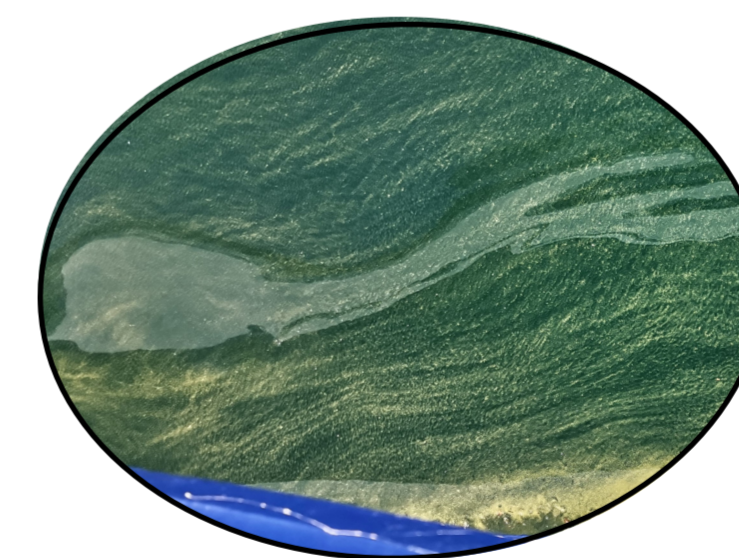
links digital Earth observation with freshwater ecological markers to support climate change adaptation and risk prevention throughout the Alpine region



11 Partners of the **Alpine Space**
with 5 key lakes:

- Garda (IT)
- Bled (SI)
- Mondsee (AT)
- Constance (DE/CH)
- Geneva (FR/CH)
- Greifensee (CH)

and several other additional lakes



STEPS:

1) Creation of a unique database of freshwater markers including:

Abiotic traditional parameters such as:

temperature/transparency/turbidity/nutrient concentrations

Biotic factors as:

chlorophyll content and molecular data derived from eDNA,

providing insights into cyanobacterial communities and toxins they produce.

2) Correlation between Freshwater Markers and Digital earth observations from remote sensing

3) Development of predictive algorithms able to assess water quality using satellite inputs.

ASPECTED RESULTS:

The outcomes will support the creation of management practices and mitigation strategies, facilitating rapid responses to water degradation, safeguarding public health, enhancing biodiversity, and preserving Alpine lakes