

Wetland Geospatial data Harmonization: an Open Catalogue for the Massaciuccoli Lake Basin



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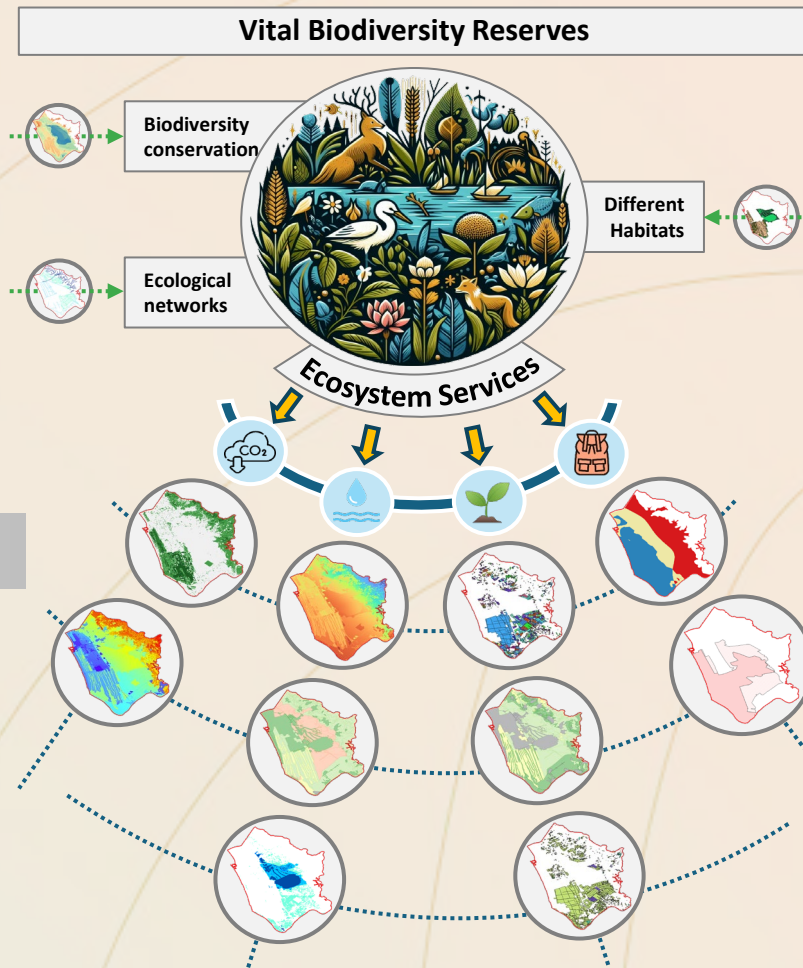
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Context

Wetlands are important biodiversity reserves and represent **critical ecosystems**. These environments include an extraordinary diversity of plants, animals and aquatic species. They contribute substantially to the **preservation of biological diversity** and provide a **wide range of habitats**. These areas also acts as vital connectors within larger **ecological networks**.

They influence the surrounding areas and enrich the overall biodiversity of entire ecosystems. Additionally, wetlands **provide** many **ecosystem services**, from climate regulation to water purification, carbon sequestration, food supply, tourism and recreation. It is essential to develop **ecosystem models** that predict the evolution of the area **starting from a cognitive reference framework**.



Case Study

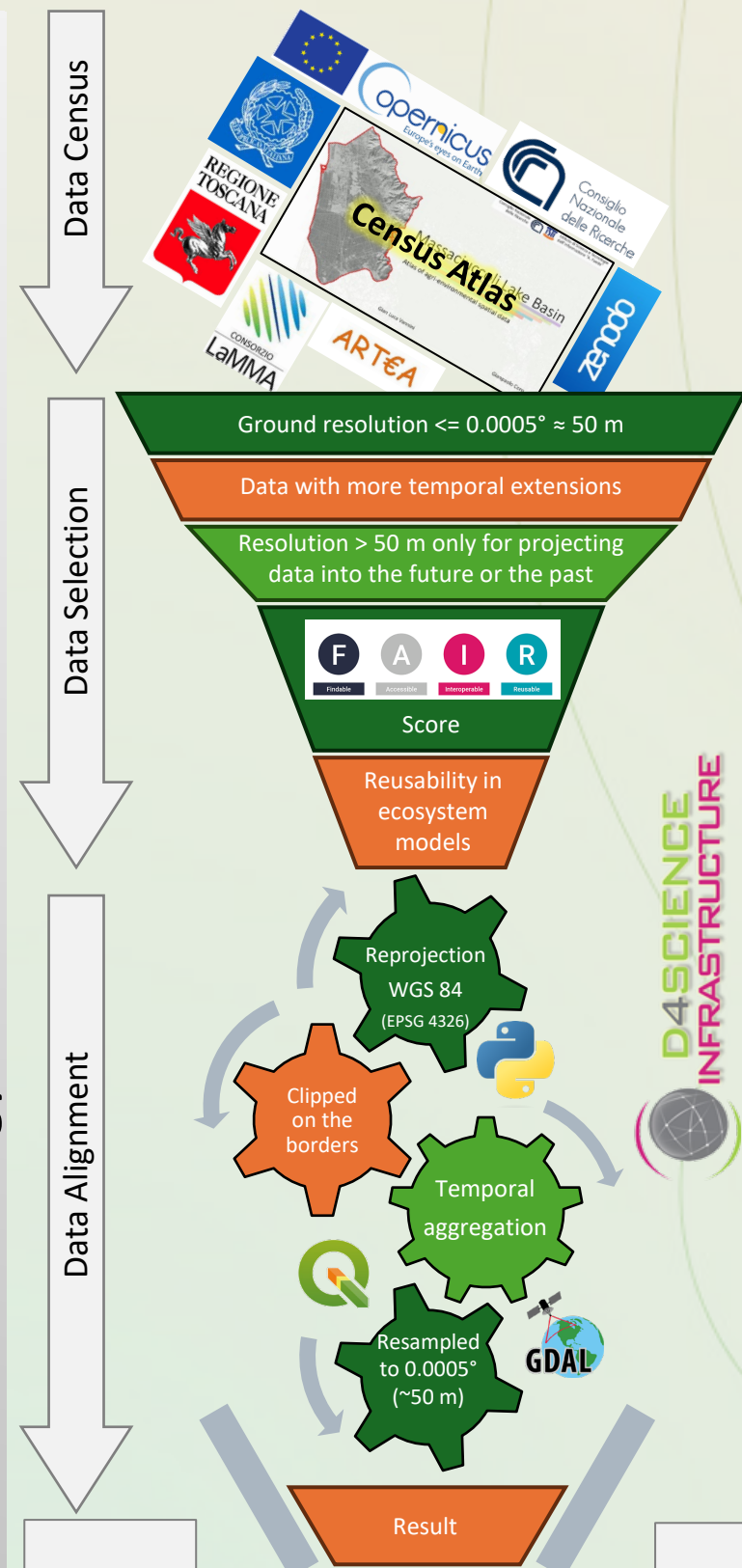
The **Massaciuccoli Lake Basin** is a **RAMSAR wetland** located in the Versilia Plain, a particular **transition area** between the Apuan Alps and the Tyrrhenian Sea. This area is an important natural attraction in Tuscany. Thanks to its hydrogeological, environmental and

chemical characteristics, the area is **home to native and rare species**. The lake area is also an important hub for the **migratory routes** of many birds but at the same time, these characteristics also influence the **presence of invasive alien species** introduced by humans.

Cognitive Framework

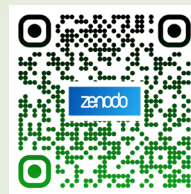
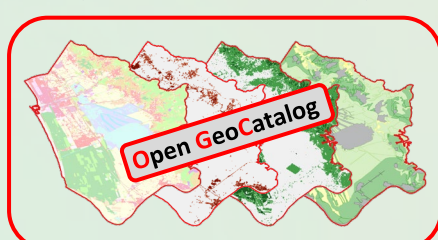
To **spatially characterize** the wetlands and describe the main **variables** related to **ecosystem services**, a semi-automatic workflow was defined. **148 datasets** representing **75 environmental, geomorphological and socio-economic variables** associated with the Lake Massaciuccoli Basin were collected. The data cover **five temporal snapshots**: **remote past** (1950-1980), **near past** (1981-2015), **present** (2016-2024), **near future** (2050 according to RCP2.6, RCP4.5 and 8.5) and **far future** (2100 according to RCP2.6, RCP4.5 and 8.5). The raster data were **harmonized and resampled** to a resolution of **0.0005° (~50 m)**. The vector data were aligned and cropped to the basin boundaries. The **metadata**, compliant with the **INSPIRE** directive, contains descriptions of the data contents, **primary sources** and their levels of **FAIRness**.

Methodology Harmonization of Geodata



Open GeoCatalogue

Data Publication



Link

<https://zenodo.org/records/11243783>

https://services.d4science.org/group/itineris_criticalzonevre/geonetwork