

SUMMER SCHOOL

“INTEGRATED WATER MONITORING ASSESSMENT

ACROSS TIME AND SCALE:

GROUNDWATER-WETLAND ECOSYSTEM INTERACTIONS”

Day 1: University Pascal Paoli - Presentation of the summer school teaching team, activities planning and goals of the school.

11am – 2pm: Participants arrival and registration

2pm – 3pm: Official opening of the Summer School

3pm – 4pm: Lecture 1 – Discovering Geodiversity and biodiversity of the Mediterranean: case of the Corsica Mountainous Island.

4pm – 5pm: Lecture 2 – Introduction on geochemical and isotope tracers for Aquifers and Wetland-Groundwater Ecosystem interactions studies

5pm – 5.30pm: Short talk – Natural tracers to study groundwaterwetlands interactions: the case of temporary ponds

7.30pm: Ice breaker

Day 2: Field activity in the Coastal Lagoon of Biguglia.

8am – 6pm: Site visit to the lagoon and surrounding areas for in situ measurement of physic-chemical parameters and training on sampling and storage procedures for general chemistry, isotopes and contaminates of emerging concerns (CECs).

Field description of the geological setting, collecting information about the hosting rock and its structural setting.

Group activities for scientific instruments training: Water probes for physicochemical parameters (pH, EC, Eh, T, DO), Alkalinity HACH kit (HCO₃), Portable RAD7 Durrige (222Rn activity in air, and water).

Visit to the local Eco-Museum (ECOMUSEE DU FORTIN).

The goal is to give insights into natural and anthropogenic contribution to lagoon water chemistry, integrating geological, geochemical, microgeological information with a socio-economic assessment of the impacts on the natural ecosystem. Surface and groundwater inputs to the lagoon will be highlighted combining electric conductivity and Radon activity. The subsequent impact on the salinity, nutrients, and pollutants repartition will be discussed through the lens of phytoplanktonic communities’

structuration which gives an idea of the ecological state of the Biguglia lagoon nature reserve, which is part of a constantly expanding urban area.

Day 3: Field activity in the low-altitude peatland of Moltifao (Asco Alpine watershed, Ponte-Leccia)

8am – 4.30pm: Site visit to the peatland and surrounding areas for in situ measurement of physico-chemical parameters and training on sampling and storage procedures for general chemistry and isotopes analysis.

Field description of the geological setting, collecting information about the hosting rock and its structural setting.

Group activities for scientific instruments training: Water probes for physicochemical parameters (pH, EC, Eh, T, DO), Alkalinity HACH kit (HCO₃), Portable RAD7 Durrige (222Rn activity in air, and water),.

The goal is to give insights into the characterization of the bedrock tectonic structuration interactions and their impact on water quality and the settings of the watershed. In addition, the field investigations combined to the existing scientific knowledge, will highlight the intricate water and carbon cycles interactions within peatlands. Indeed, the evaluation of carbon storage capacity of a Mediterranean peatland under changing climate conditions is making possible by analysing seasonal geochemical data, focusing on the water sources contribution over seasons (rainwater, river water, shallow groundwater, deep groundwater). Surface and groundwater flow significantly influencing peatland carbon dynamics, with groundwater identified as a key CO₂ source, underscoring the need to consider water-carbon interactions in global climate models.

5pm – 6pm: Isotope hydrology and geochemistry laboratory tour at UCPP:

- 2 Laser Isotope Spectrometers LGR and Picarro (Oxygen-18, Oxygen-17 and Deuterium)
- 4 Ionic Chromatographs Thermo DIONEX ICS1000 (major ions and selected trace metallic elements)
- 1 spectrofluorimeter SAFAS
- 1 Eigenbrodt rain sampler NSA 181K-cooled for sequential sampling of rain episodes
- 2 RAD7 and 2 RAD8 Durrige with accessories for 222Rn measures in air and water
- 1 Portable membrane inlet mass spectrometer miniRUEDI (Ne, Ar, Kr, N₂, O₂, CO₂, CH₄, H₂...).

8pm: Gala Dinner

Day 4: Field activity the hardrock-river hydrosystem of the Tavignano valley (Corte).

8am – 12am: Site visit to valley of the Tavignano for in situ measurement of physico-chemical parameters, flow tests and training on sampling and storage procedures for general chemistry and isotopes analysis.

Field description of the geological setting, collecting information about the hosting rock and its structural setting.

Group activities for scientific instruments training: Water probes for physicochemical parameters (pH, EC, Eh, T, DO), Alkalinity HACH kit (HCO₃), Portable RAD7 Durrige (222Rn activity in air, and water), river flow rate determination using OTT acoustic/induction flowmeter.

The goal is to give insights for springs and river monitoring and to understand how to set up a monitoring network for surface-groundwater interaction. Furthermore, it will allow to give concepts to improve hands on experience on the characterization and quantification of the contributions of rainfall, runoff, and groundwater to river flows in Mediterranean regions, with a focus on groundwater's crucial role in maintaining base flows during dry periods. This will allow participants to discover models describing hydrological processes, providing key insights for sustainable water management and assessing the resilience of water resources in the face of climate change.

12am – 6pm: lunch and group work for poster preparation

Day 5: University Pascal Paoli - Data treatment, interpretation, and dissemination.

9am – 10am: Lecture 3 – Organic compounds and isotopes for pollution sources tracking in aquifers and eco-hydro systems

10am – 12am: Posters presentation, Poster Award and delivery of diplomas

2pm: Wrap-up and Summer School closure