



SUMMER SCHOOL

“INTEGRATED WATER MONITORING ASSESSMENT ACROSS TIME AND SCALE”

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

Introduction of the summer school and ice breaker

Presentation of the laboratory's main analytical instruments and research applications:

- Ionic Chromatographs Thermo DIONEX ICS1000 (major ions: Na, Cl, Ca, Mg, SO₄, K, NO₃)
- Laser Isotope Spectrometers LGR DLT100 (stable isotopes of the water molecule 2H, 18O, 17O)
- Portable RAD7 DurrIDGE (222Rn activity in air, and water)
- Portable membrane inlet mass spectrometer miniRUEDI (air & water: Ne, Ar, Kr, N₂, O₂, CO₂, CH₄, H₂...)
- Spectrofluorimeter Xenius – SAFAS (dissolved organic matter characterisation)
- Spectrophotometers Thermo GENESYS UV-vis (SiO₂ and dissolved organic matter quantification)

Day 2: Zilia - Mineral still water bottling plant visit and field activities.

Site visit to boreholes, water bottling and packaging machines. Presentation of quality check monitoring procedures. Explanation of the official procedures for authorising the start-up of a bottling plant: prior scientific studies, administrative procedures. Labelling process (spring water, mineral water, etc.) according to the stability of the water quality. Marketing aspects.

Field description of the geological setting in which the spring is located, collecting information about the hosting rock and its structural setting.

Presentation of the Zilia Ph.D. study led by the University of Corsica/ Hydrogeology lab with a particular focus on the setting up of a conceptual hydrogeological model by using:

- Quantitative data: piezometry monitoring and pumping tests
- Qualitative data monitoring: mineralogical content, physicochemical properties, microbiological analyses, stable isotopes of the water molecule, noble gases, radon.

The goal is to give insights into the aquifer impluvium definition, the groundwater origins, residence time, flow path and mixing processes for better groundwater protection and economic growth of such an industry.

Observation and characterization of the geology and groundwater properties of:

- A natural spring close to the water plant → fractured Hercynian magmatic rocks
- A borehole within the water plant → colluvium of Hercynian magmatic rocks

Group activities for scientific instruments training:

- Water probes for physicochemical parameters (pH, EC, Eh, T, DO),
- Alkalinity HACH kit (HCO₃),
- Portable RAD7 DurrIDGE (222Rn activity in air, and water),
- Portable membrane inlet mass spectrometer miniRUEDI (Ne, Ar, Kr, N₂, O₂, CO₂, CH₄, H₂...)

Day 3: Pietrapola and Puzichellu - Former thermal medicinal stations and surrounding natural thermal springs, visit and fieldwork

Presentation of thermal water industries for medicinal applications from the Roman period to nowadays.

→ Observation and characterization of the geology and thermal groundwater properties in fractured Hercynian magmatic rocks.

Group activities for scientific instruments training.

Day 4: Oreza - Mineral sparkling water bottling plant visit and fieldwork.

Introduction to the geological setting of the Alpine Corsica, description of the rock types around the spring and collection of structural data related to the complex deformation history (ductile and brittle structures) that characterize the area.

Presentation of mineral sparkling water bottling plant.

→ Observation and characterization of the geology and mineral groundwater properties in metamorphic rocks.

Group activities for scientific instruments training.

Preparation for data treatment, interpretation, and conceptual GW modeling.

Day 5: University Pascal Paoli - Data treatment, interpretation, and conceptual GW modeling.

Group discussion and production of scientific aids on the geology and hydrogeology of the studied sites dedicated to scholars and teachers in secondary school to contribute to open science (e.g. documents, posters, slideshow, videos, story mapping).