Spatio-temporal modelling to assess ecosystem condition and services in the Intercontinental Biosphere Reserve of the Mediterranean (Spain – Morocco) using k.LAB

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Abstract: This study is framed under the AQUACROSS project, which aims to support EU efforts to protect aquatic biodiversity and ensure the provision of aquatic ecosystem services. The study area is the Intercontinental Biosphere Reserve of the Mediterranean: a one million hectare reserve that passes through the Strait of Gibraltar and includes river basins, coastal and marine waters. The case study aims to identify the major drivers and pressures, such as water management and planning, fragmentation of water bodies, pollution, water uses, water prices, illegal extraction, drought and water scarcity. A set of indicators will be identified to assess the provision of ecosystem services across the reserve, which can be applied to the 20 diverse natural protected sites in both Andalusia and Morocco and cover the three water realms. Data on case study characterization and water bodies statistics, uses, prices, plans and strategies will be collected and modelled to forecast the future provision of aquatic ecosystem services spatially over time using k.LAB, a software platform designed to integrate models through semantics. The most visible application of k.LAB has been the ARIES project, a suite of state-of-the-art ecosystem services models aimed at supporting science-based decision-making, which allows to account for synergistic relationships and potential trade-offs between ecosystem services in space and time. Lastly, the case study will further extend these models to examine green/blue infrastructures as nature-based management solutions in the Mediterranean context.

Keywords: Ecosystem services; semantic modelling; protected areas.