MODELLING ECOSYSTEM TYPES WITH SEMANTICS

Company Description

BC3 is a Research Centre on the causes and consequences of climate change. Led by one of the most recognized scientists in the Climate Change field -Prof. Maria José Sanz, we produce multidisciplinary knowledge to support decision making towards sustainable development at the international level. With a multidisciplinary team, connected to the main scientific institutions, networks and socio-economic agents, for a decade, our contribution to research of climate change and to the science-policy interface puts us in a unique position to offer knowledge, tools, new methodologies and cross-cutting proposals, that we lead towards action in a collaborative framework with stakeholders, to design and help implement policies aimed at sustainable development.

Information

Deadline: 2024-08-15
Country: Basque Country
Category: Academia
City: Leioa
Province: Bizkaia

Company

BC3 Basque Centre for Climate Change

Main functions, requisites & benefits

Main functions

The Basque Centre for Climate Change (BC3) offers a full-time technical scientific modelling position on the World Ecosystem Extend Dynamics (WEED) project funded by the European Space Agency from 2024 to 2026. The project aims to develop a globally applicable, open-source knowledge base and toolkit for a comprehensive mapping of the extent and distribution of ecosystem types, according to different ecosystem typologies, and for monitoring the temporal variations in ecosystem extent. The project builds on the research activities of Research Line (RL) 5 of BC3 on Integrated Modelling of Coupled Human-Natural Systems. During the past decade, the RL has envisioned and built the ARIES (ARtificial Intelligence for Environment and Sustainability https://aries.integratedmodelling.org/ platform, a technology that integrates network-available data and model components through semantics and machine reasoning. Its underlying open-source software (k.LAB, https://docs.integratedmodelling.org/technote/) handles the full end-to-end process of integrating data with multiple modelling paradigms. A key focus of ARIES is to integrate spatially and temporally explicit ecological and economic models to support Natural Capital Accounting, which includes ecosystem extent and services. Job Description: As the definition of ecosystem types is multi-domain, touching on the semantically different dimensions of vegetation, soil, biodiversity, agriculture and more, the problem of characterizing ecosystems semantically is very complex and hardly suitable for a traditional, dichotomic ontology approach. The candidate will contribute to the development of an ecosystem extent ARIES authority that will merge semantics from community-endorsed vocabularies from all corresponding dimensions, connecting to the reasoning engine in ARIES by turning flexible ecosystem specifications into reasoning-ready concepts. The authority will support the definition of different ecosystem typologies and will enable any possible crosswalk between them, while also assessing and documenting uncertainty in cases where crosswalk results remain ambiguous. More broadly, the researcher will work with a team of programmers and modelers on diverse scientific modeling and integration applications to (1) research existing authoritative semantic resources and integrate them with ARIES where possible, (2) create new semantic resources as needed, (3) co-develop tools to make semantic annotation easier and more intuitive for scientists with limited exposure to semantics, and (4) develop and build community within and beyond the ARIES team around the application of semantics to environmental modeling. Key Responsibilities: To contribute to the research project dedicated to mapping ecosystem types using semantics and develop robust, flexible, and interoperable models for ecosystem characterization and analysis over time. To contribute to model development and data integration within the ARIES platform, working closely with a 20+-strong team representing diverse cultural and disciplinary backgrounds. To coordinate project tasks and meetings with the WEED project collaborators. National and international travelling and participation in project meetings when required. Broadly contribute to the ARIES platform, a semantic web infrastructure that uses AI to build computational solutions to environmental, policy and sustainability problems.

Requisites

Ideal Requirements and Skills: Suitable Degree for developing the tasks of the job description (a master's degree at minimum), e.g. a