**Title**: **Marine biological indicators for climate- and weather-related hazards** (SSD BIO/07)

**Research project:**

The present research project entitled “**Marine biological indicators for climate- and weather-related hazards**” belongs to the Spoke DS8 “Science underpinning Climate services for risk mitigation and adaptation” – PNNR Project RETURN  
Multi-Risk sciEnce for resilienT commUnities undeR a changiNg climate”

**Activity plan:**

The candidate will work within the research group “Ecology and Conservation of Aquatic, Marine and Coastal environments (CoastEcol)” of the Department of Biological, Geological and Environmental Sciences (BiGeA), in Ravenna, under the supervision of Prof. Federica Costantini and Prof. Sonia Silvestri.

The objective of this research grant is to contribute to the realization and regular update of a database of biotic indicators readily usable into decision support systems and mathematical models for mitigation of – and adaptation to – climate-related hazards. Moving from the collection of a systematic list of biotic indicators of the ecological status of coastal systems, the candidate will review, re-examine, improve and tailor them to the specific needs of the RETURN project. Once a complete inventory of impact-oriented hazard biotic indicators is created, the candidate will focus on selected case studies with the purpose of mapping the spatio-temporal distribution of selected biotic indicators. Among the indicators considered in the study, the candidate will focus on those useful for the assessment of the state of ecosystems, as for example: reduction in the extent of natural and semi-natural ecosystems, ecosystem integrity and ecosystem connectivity indexes, number of red -list species, invasive alien flora and fauna species, etc.

The project will consist of:

* Literature review, including available databases, scientific and grey literature on the reduction of natural and semi-natural coastal ecosystems extent and coastal ecosystem health, to be used within decision support systems and mathematical models in the decision-making process for the mitigation of - and adaptation to – climate-related risks.
* Analysis of sources and types of data available at Italian regional and national scales.
* Assessment of biotic databases for coastal systems including their characteristics, gaps and needs.
* Mapping the spatio-temporal distribution of selected biotic indicators.
* Intermediate and final reports.

**Required Skills:**

Requested skills are:

* Proven experience in the field of marine ecosystem and community ecology in coastal, estuarine and lagoon habitats
* Proven experience in the use and management of large databases and digital cartography (GIS)
* Proven experience in field activities with preference for scuba diving sampling skills
* Proven knowledge in programming (R, Phyton, Matlab)
* Proven experience on statistical analysis on ecological and environmental data (R, Primer)
* Proven experience in writing scientific reports and articles
* Good knowledge of spoken and written English
* Basic knowledge of Italian

**Sintesi in italiano:**

Questo progetto di ricerca si propone di valutare e definire vari indicatori ecologici fondamentali per misurare lo stato di salute degli ecosistemi costieri e marini. Tali indicatori saranno inclusi in una banca dati più ampia di indicatori multirischio da utilizzare in scenari climatici passati e presenti. Inoltre, verranno utilizzati all’interno di sistemi di supporto alle decisioni/modelli finalizzati alla mitigazione di – e adattamento a – rischi climatici a livello nazionale.

**Sintesi in inglese:**

This research project aims to define and evaluate some key ecological indicators to assess the quality of marine and coastal ecosystems. These indicators will be included in a database of multi-hazard indicators for past and current climate scenarios. Moreover, they will be used in decision support systems/models for the mitigation of - and adaptation to - risks related to climate at the national level.