Development of an AI based system for optimal site selection for the SUNBIO platforms HORIZON-MISS-2023-OCEAN-01

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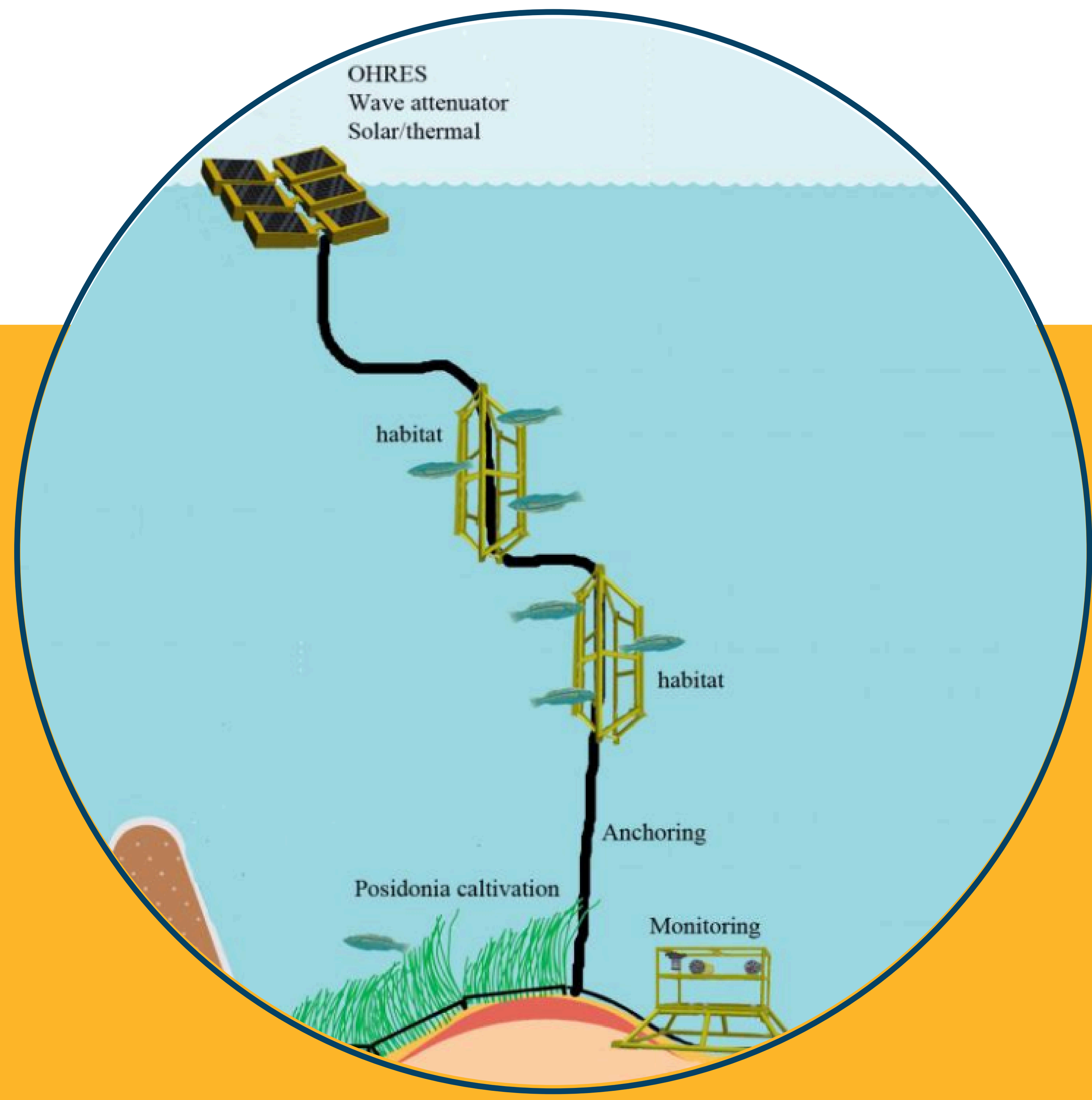

Abstract

This research presents an AI-based Decision Support System for selecting optimal coastal sites for green energy generation platform sustaining intelligent observatories for ecological monitoring. By integrating biological (i.e., imaging) and environmental (oceanographic and metheorological), geographic-structural, and socio-economic data, the system identifies suitable locations based on the platform characteristics.

Initial application:

SUNBIO Project

SunBio

Sustainable & Nature Inclusive Offshore Energy with the Parallel Biodiversity Flourishing, Protection & Monitoring. HorizonE(HorizonEu program; -GAP-101157493); https://sunbioproject.eu/

Data Domains

Structural data, including bathymetry, slope, seabed type, and distance to coast.

Environmental data, such as sea temperature, currents, salinity, solar radiation.

Socioeconomic data, covering maritime traffic, fishing activity, protected areas, tourism pressure, and legal constraints that influence site suitability from a human-use and policy perspective.

Spatio-temporal data, consisting of time series and spatial distributions of coastal fish species densities, *Posidonia oceanica* coverage, benthic fauna, and derived ecological indicators. These include descriptors aligned with the Marine Strategy Framework Directive (MSFD, 2008).

Current work:

Literature Review:

Reviewing scientific research on marine spatial planning, AI for site selection...

Bibliometric Analysis:

Identifying research trends using VOSviewer, CorText and RStudio. Writing on “How to bibliometrics”.

Data Definition & Gathering:

Selecting key environmental and structural parameters. Collecting data from EMODnet, COPERNICUS, EMSO (OBSEA; www.obsea.es), Port Authroities (e.g. the Spanish “Puertos del Estado), etc.

Expected outcomes:

- ✓ AI model for marine site suitability analysis
- ✓ Validated use case with the SUNBIO offshore platform at the OBSEA Test-Site
- ✓ Scalable tool for broader marine and environmental applications