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Abstract

Integrated Coastal Management seems to be the next challenge for future development of sustainable growth of marine economies. The most emergent activities in the context of developing marine economies are renewable energies and aquaculture, which have increasingly been enabled to operate in hostile environments. Competition over space will become a critical issue for the sustainable development of the marine environment and will require creative and innovative solutions for co-location of activities.

Marine Spatial Planning- MSP is a fundamental tool for balancing sectorial interests and achieving a sustainable Blue Growth, elucidating trade-offs of individual and combined uses of marine resources. A systematic approach towards MSP that identifies opportunities for the co-location of activities is essential to minimize conflicts, optimize the use of space, and reduce operation costs. In this sense, and due to the lack of approaches that address the co-location of wave energy, wind energy and aquaculture activities in a site selection scope, a methodological approach has been developed and implemented for the integrated assessment of co-location opportunities for wave, wind and aquaculture facilities in a Global, National and Regional scales.

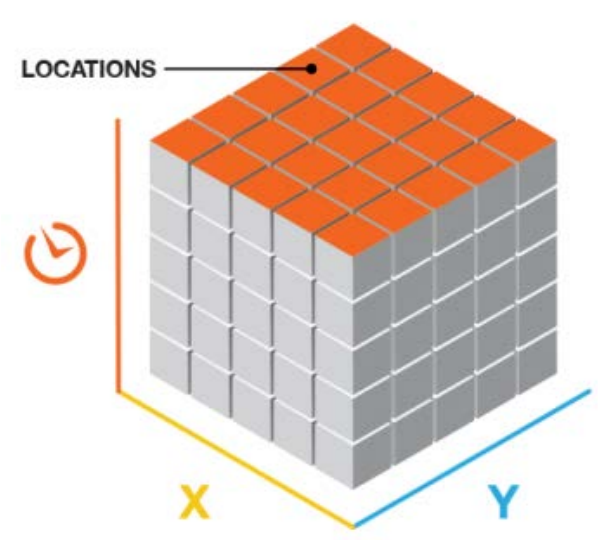


Objectives

The aim was to develop the **“Blue Time Machine”**, which provides a digital representation of the past, present and future conditions from our “Blue Planet”. This representation allows us to obtain new findings, possible threats and opportunities, derived from past conditions to climate change scenarios. .

Methods

The combination of different data sources (Copernicus Marine Service¹, EMODnet², Copernicus Climate Service³, USGS, NOAA, etc.), and further geospatial analysis have allowed us to build the IH Marine Spatial Platform. Four main subsystems have been designed and developed:



1. Metocean Data Management Data Cube



2. Interoperability protocols OGC Standards (WMS, WCS, etc)



3 Analysis on the fly and interoperability



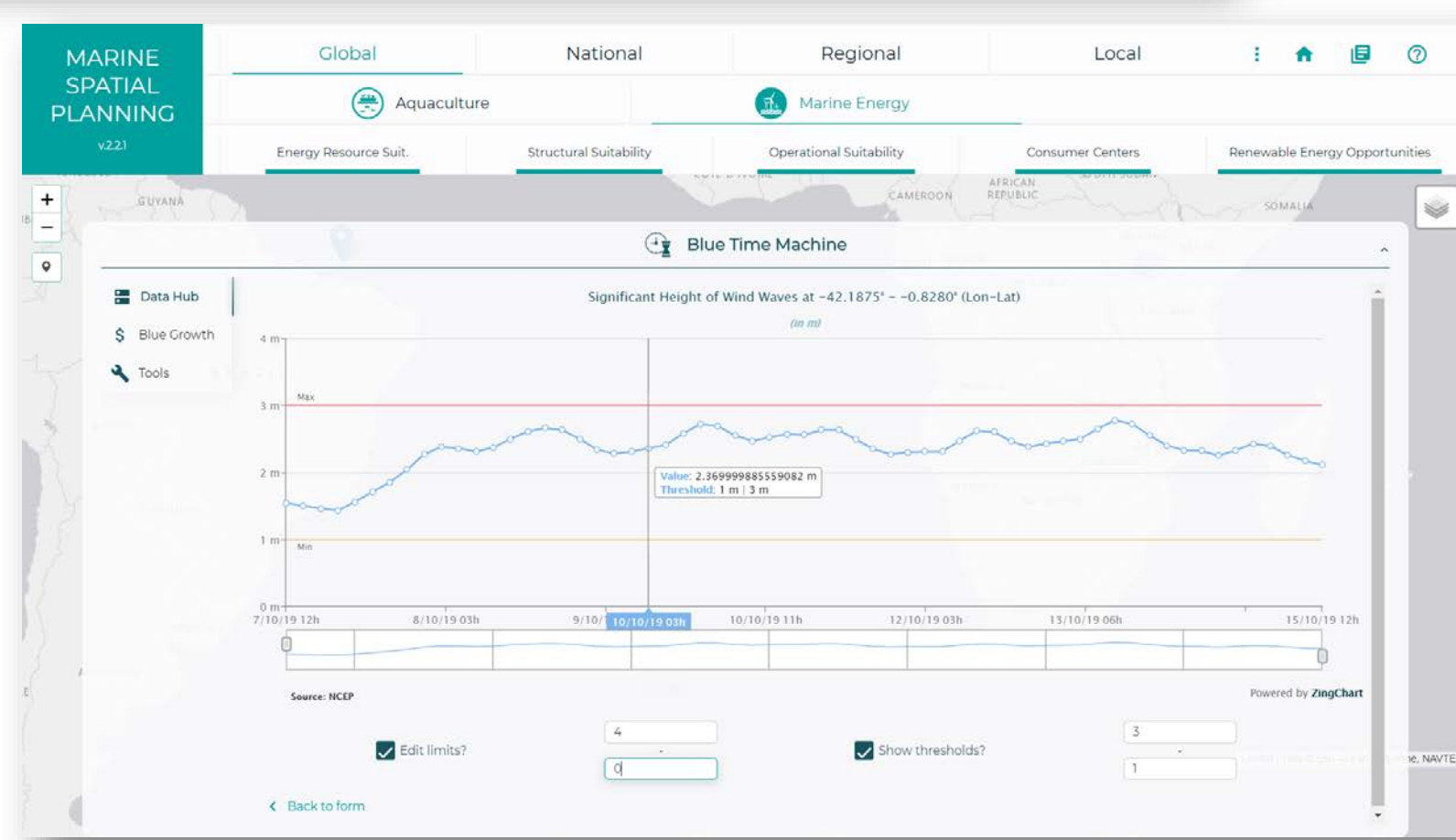
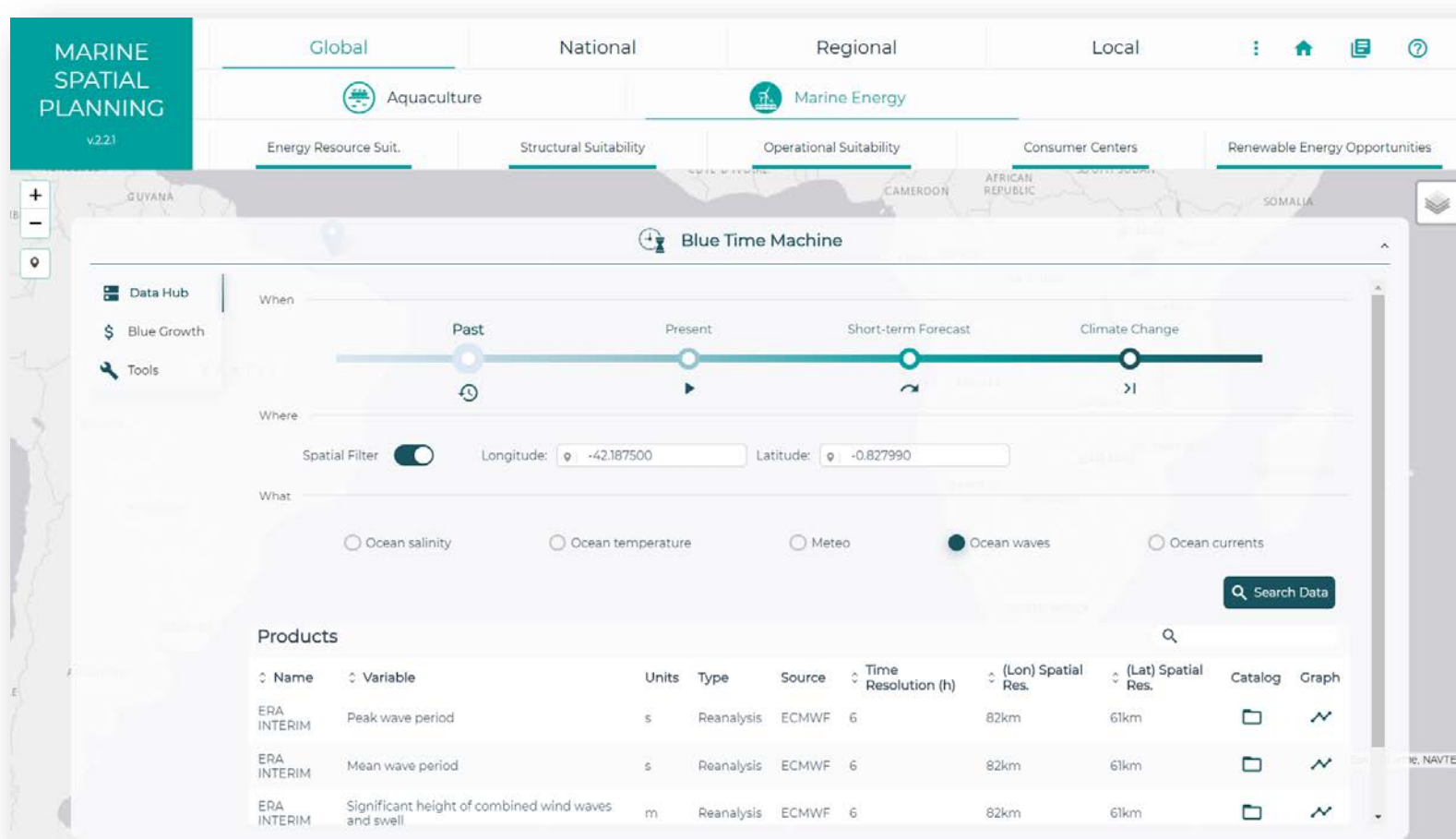
4. User Interface and User Experience

Results

<http://msp.ihcantabria.com/>

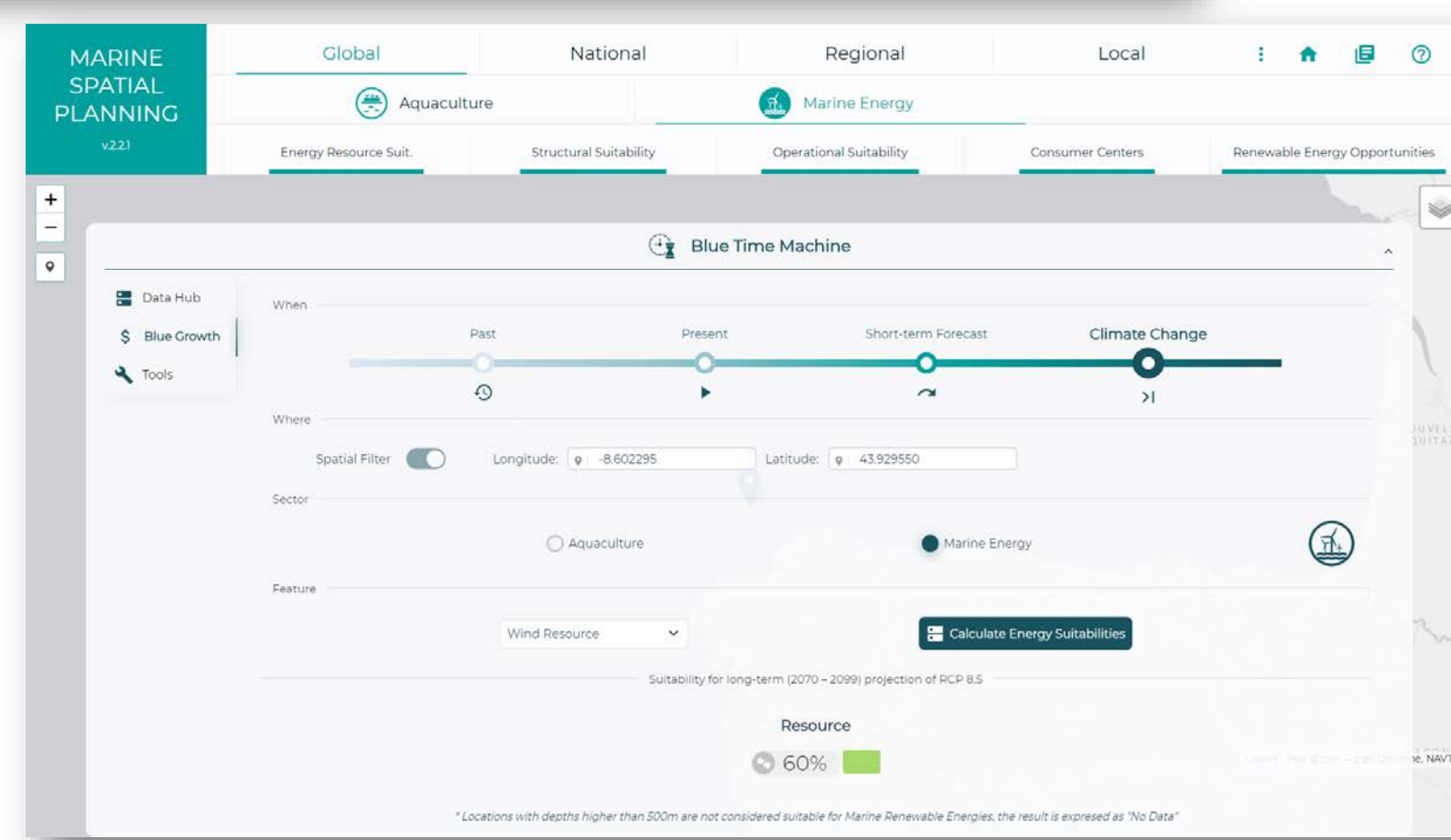
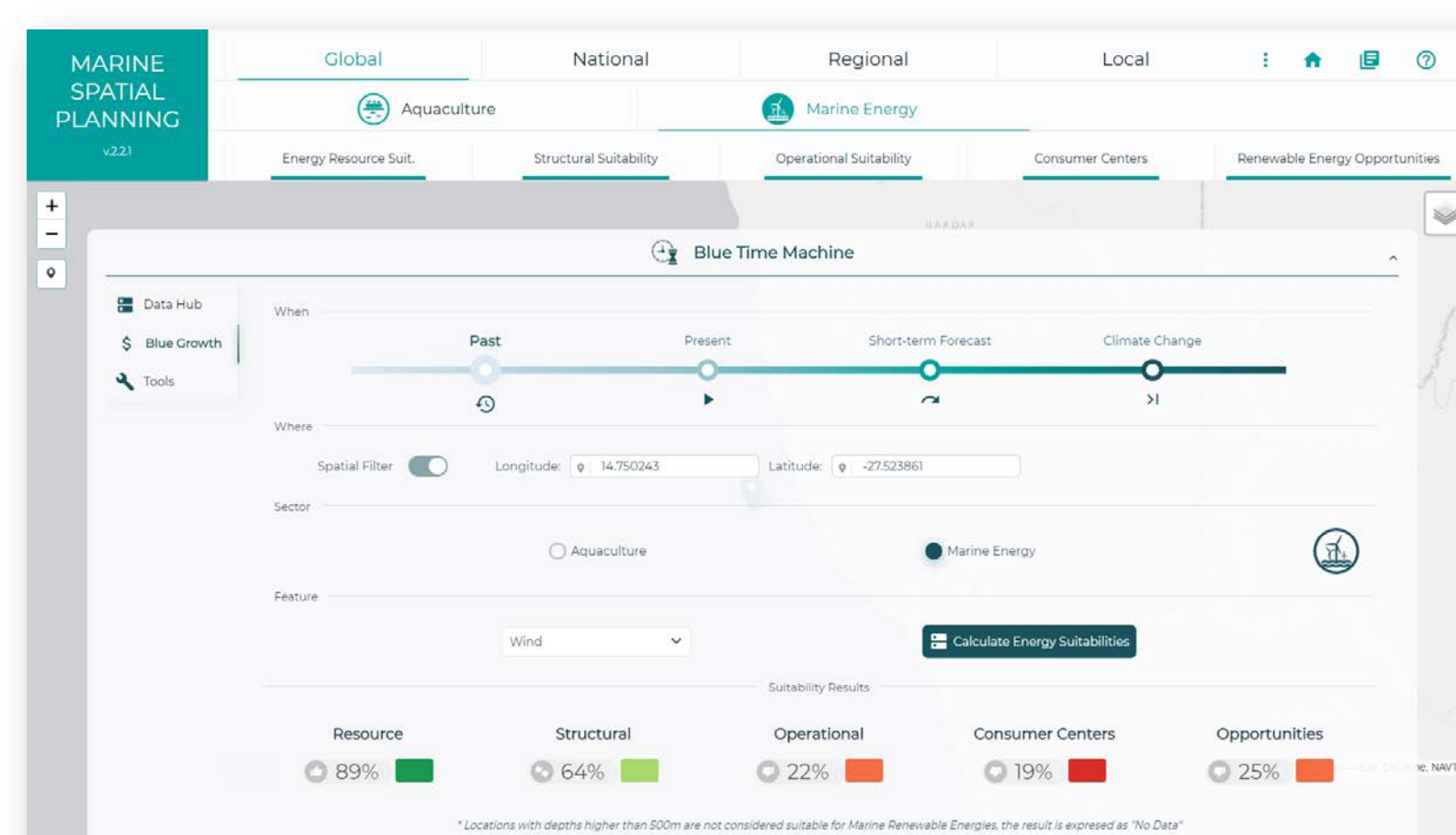
Data Hub

Marine Renewable Energies & Aquaculture



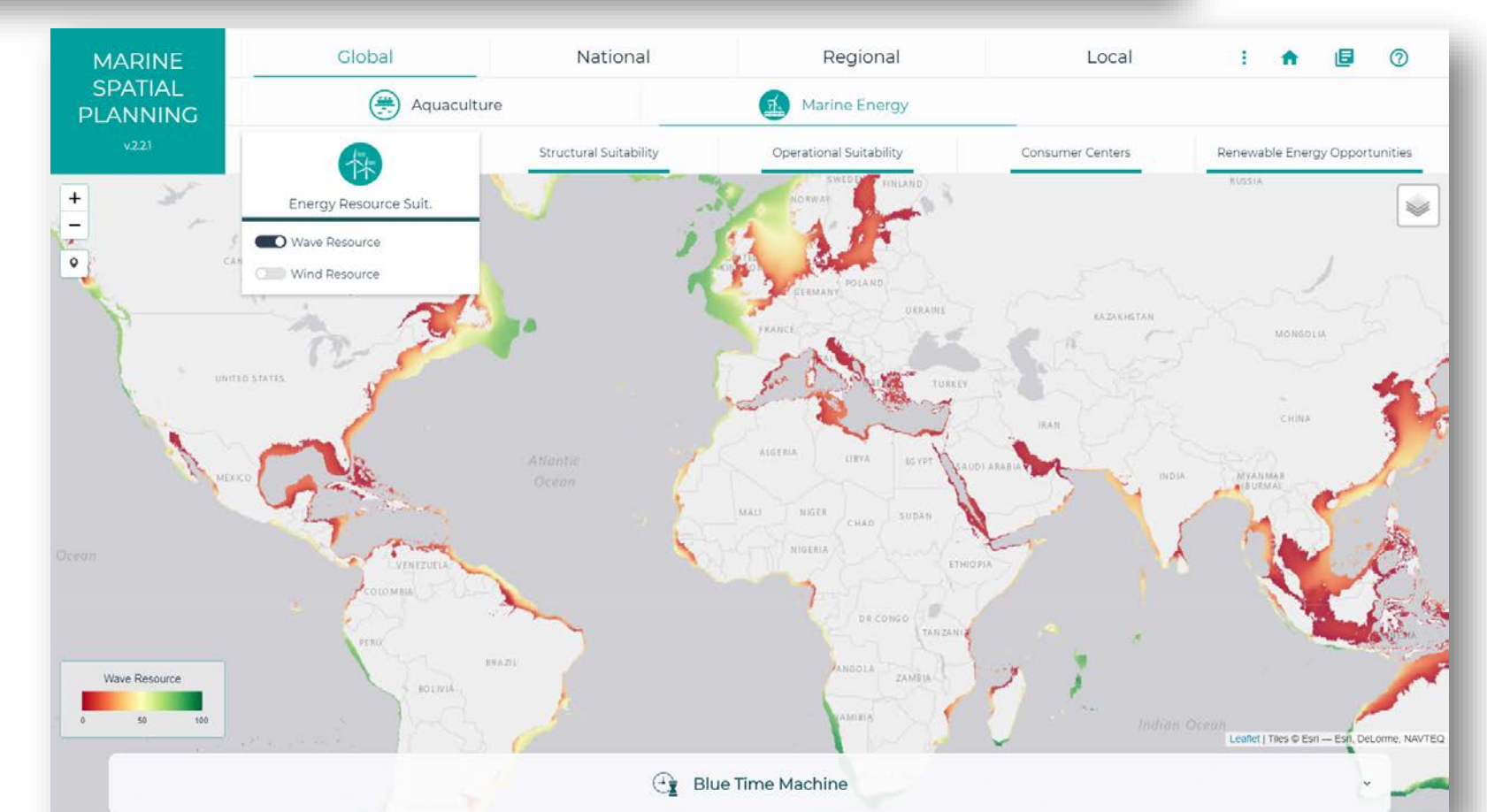
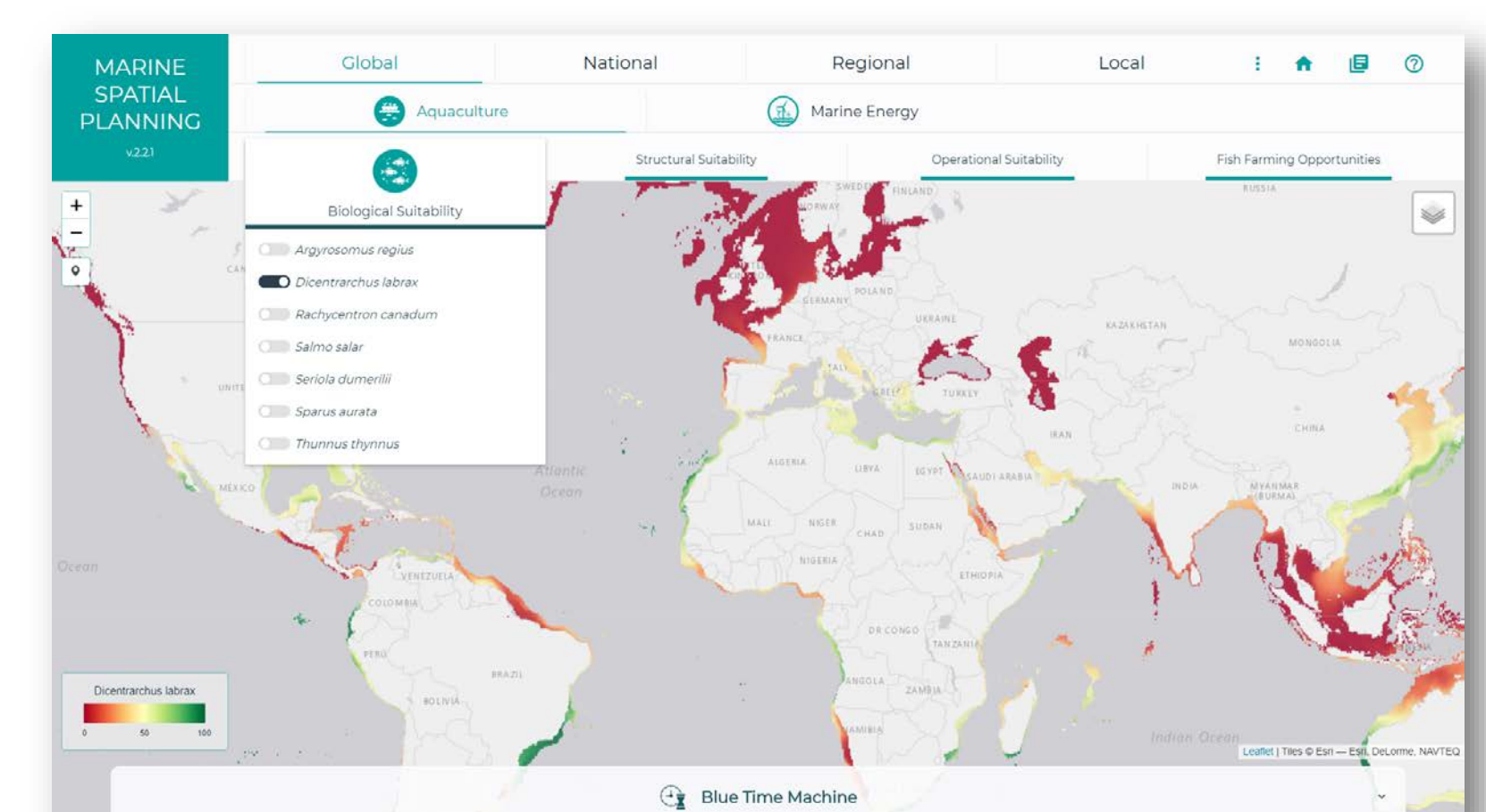
Blue Growth

Marine Renewable Energies & Aquaculture



Co-location opportunities

Marine Renewable Energies & Aquaculture



Conclusions

The MSP Platform provides a screening tool based on scientific methodologies⁴ that allow to obtain a digital representation of the past, present and future conditions: (1) past information- identification of suitable areas for economic activities (aquaculture, marine energy, etc.), (2) daily information and day to day management operation for different activities (marine renewable energies, aquaculture, etc.), (3) long term information (>20 years)- wider vision and strategy for companies or administrations, in which climate change scenarios must be considered.

References

1. Copernicus Marine Environment Monitoring Service (CMEMS) - <http://marine.copernicus.eu/>
2. EMODnet - <http://www.emodnet.eu/>
3. Copernicus Climate Service (C3S) - <https://climate.copernicus.eu/>
4. Science on IH-MSP section of the MSP Platform <http://msp.ihcantabria.com>

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