



# Destination Earth

Core Service Platform Use Cases

Contractors



## Global Fish Tracking System

Making fishing more sustainable



Destination Earth

Funded by  
the European Union



Implemented by



# Overview & Consortium

- Implement a fish tracking system based on biologging data and high resolution ocean temperature and bathymetry.
- State of the art modeling techniques combined with large scale cloud computing to estimate the movement of tagged fish.
- Develop a Decision Support Tool, exposing the modeling outputs in an intuitive way for decision makers.



Biologging and Fish Track Reconstruction

**simula**

Infrastructure for cloud computing



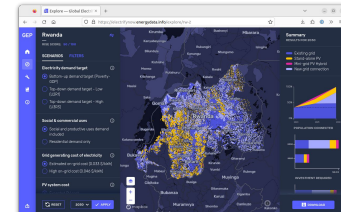
development**SEED**

Interface Development & Consortium lead

# From Data to Insight

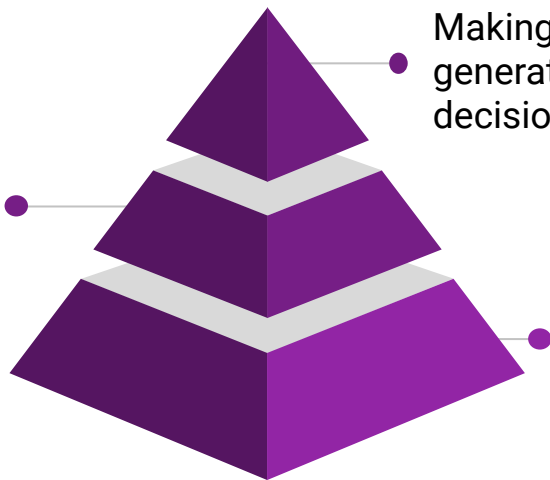
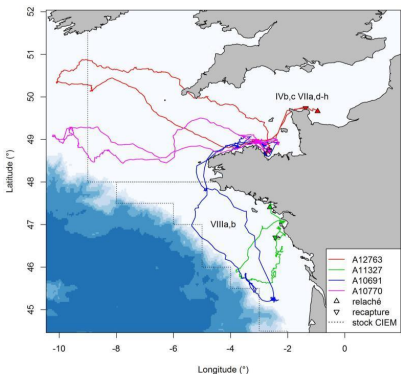


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## Fish Track Modeling

Based on biologging data of individual tagged fish and the ocean around them

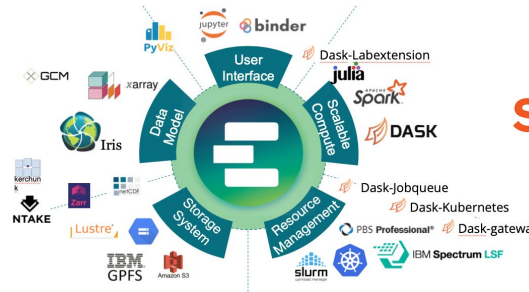
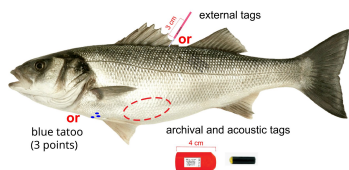


## Web Interface

Making the vast amount of data generated by the model useful to decision makers.

## Pangeo Infrastructure

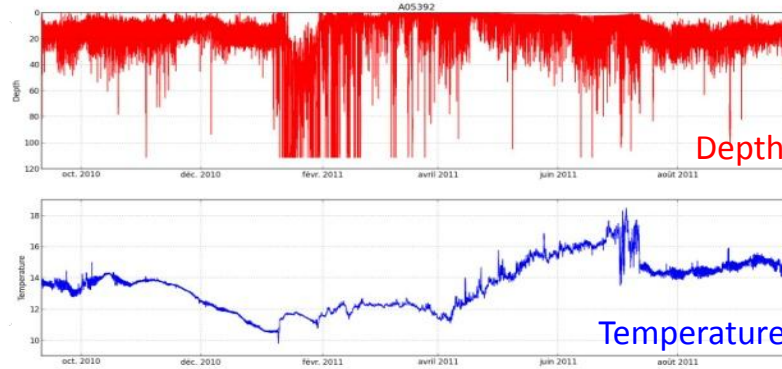
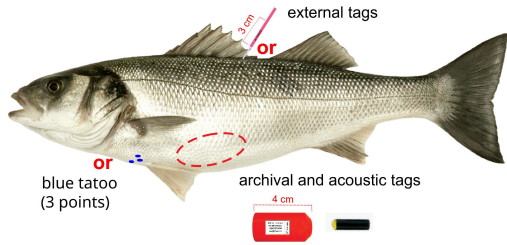
Cutting edge models will be combined with the cloud based simulations from the DestinE ocean data based on pangeo.



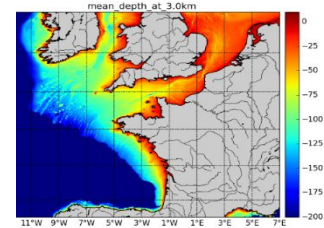
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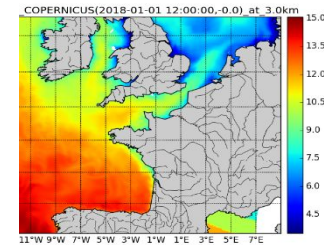
# Fish Tracking Modeling



Bathymetry



Temperature at depth

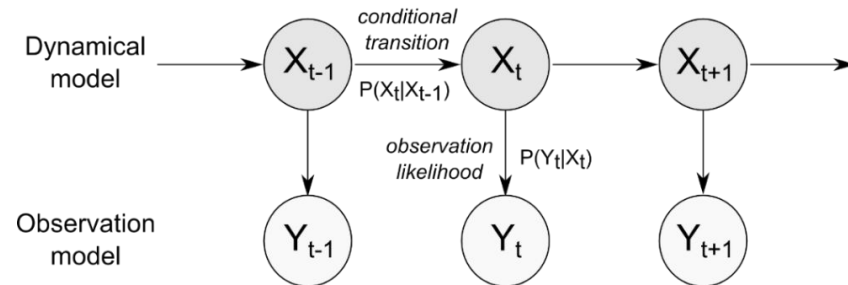


We will reconstruct fish movement based on biologging data collected by Ifremer on European seabass.

Biologging involves attaching small devices to animals to track their behavior and gather environmental data. This method is crucial because tracking fish directly underwater is very challenging.

To achieve this, we will use an HMM model to geolocate fish by utilizing temperature and pressure data from the biologging devices and comparing them with ocean temperature and bathymetry from the reference geophysical fields.

*Hidden states sequence  
(here the daily fish positions)*



*Observations sequence  
(here the temperature and depth conditions)*

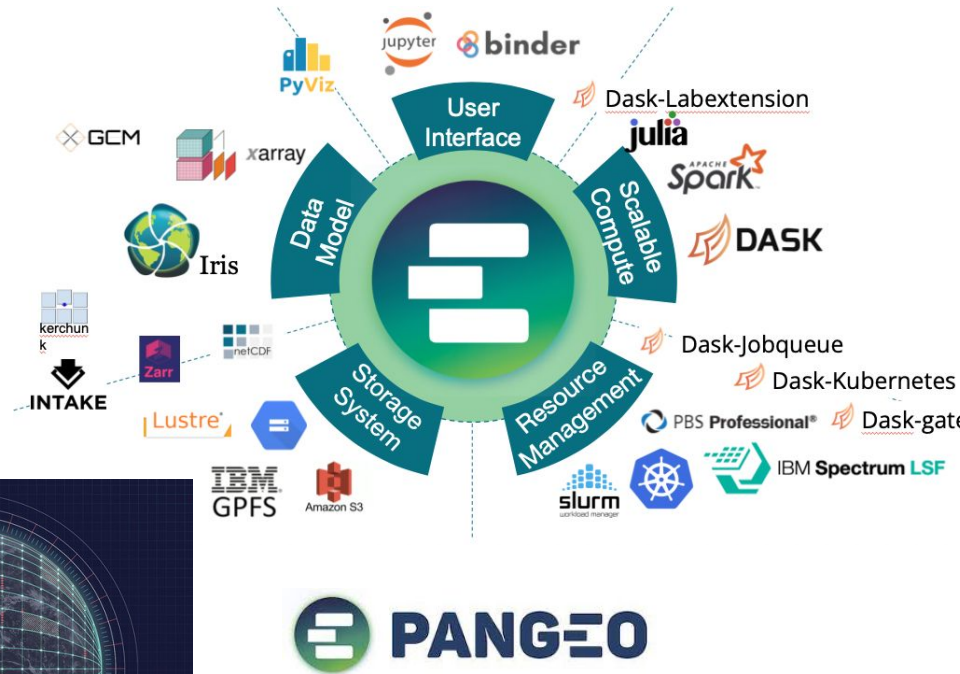
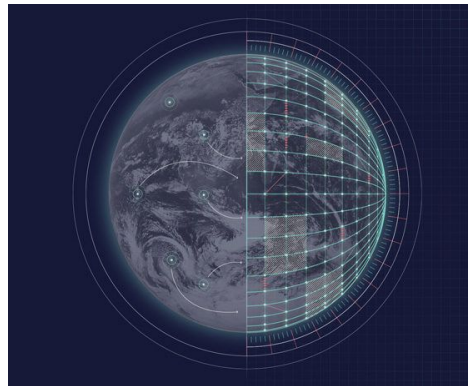
# Pangeo Infrastructure

Our project will rely heavily on the pangeo software stack for large-scale cloud-based computation of fish tracks.

The Pangeo ecosystem was created by a community of engineers and geoscientists specifically to address big data geoscience challenges.

To leverage the advancements in biodiversity research, we have developed a software package called “Pangeo-fish”.

Implementing Partner 



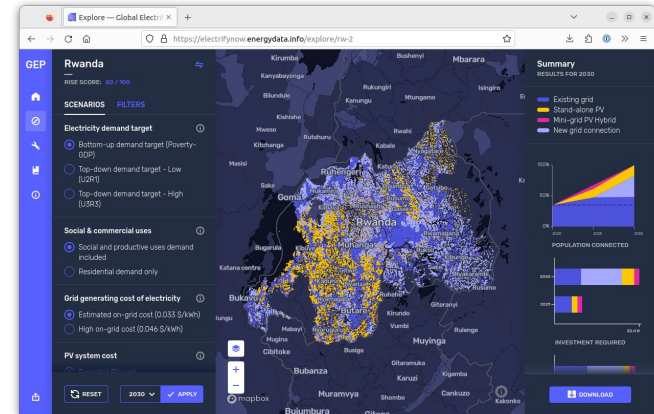
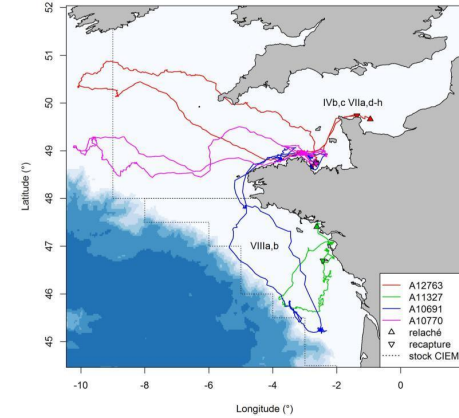
# Web Interface

Our project will develop specialized decision support tools for analyzing jointly fish track reconstructions.

We will implement user-friendly data visualization tools for tracking fish movements and environmental parameters, in order to answer such questions and help decision-making.

- Where do fish spawn ?
- Where are the fish swimways ?
- Are these essential fish habitats stable over years ?
- How robust is the positioning of these habitats to errors and biases from reference geophysical fields ?
- Which ocean conditions fish encounter during their journey ?

We will enable data sharing and collaboration through cloud-based platforms and ensure scalability and adaptability for various fish species.



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Core Service Platform Use Cases



## Contact us

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*communicating to markets*

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