

“Implementing operational fisheries oceanography in the Mediterranean”

A way for the operational integration of environmental variability into fisheries

Alvarez-Berastegui D., , Hidalgo M., Reglero P., Balbín R., Mourre B., Coll J., Rotllán P., Heslop E., Tugores M.P., Iglesias M., Alemany F., Tintoré J.

Operational fisheries oceanography

“...is about the practical integration of environmental variability into the fisheries assessment and provision of advice”

We define it as:

*“The activities directed to **link fisheries ecology and operational oceanography** for developing information about environmental processes affecting species dynamic, and the **systematic integration** of that information **into the fisheries assessment** and management”*

Current scenario on the two main disciplines necessary for developing
“operational fisheries oceanography”



Operational oceanography



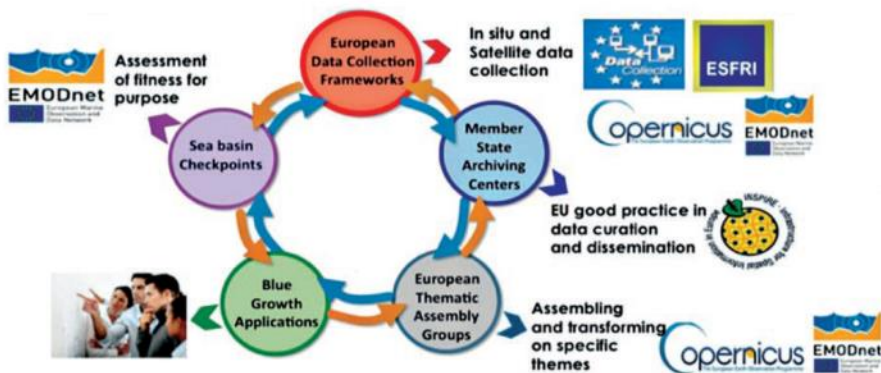
Fisheries ecology

Current scenario on the two main disciplines necessary for developing
“operational fisheries oceanography”



Operational oceanography

Advancing fast, propelled by improvement of the data quality, quantity and accessibility

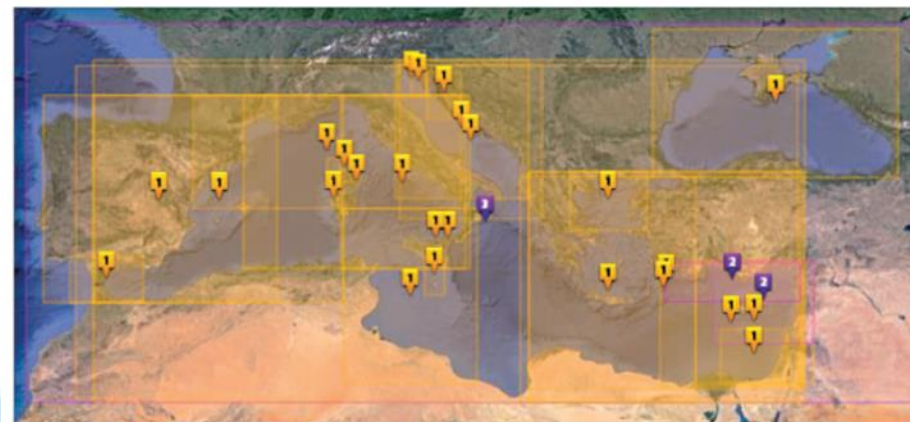


MONGOOS : Mediterranean Operational Network for the Global Ocean Observing System



Fisheries ecology

Strong focus on the study of the response of fish populations to environmental variability



Current scenario on the two main disciplines necessary for developing
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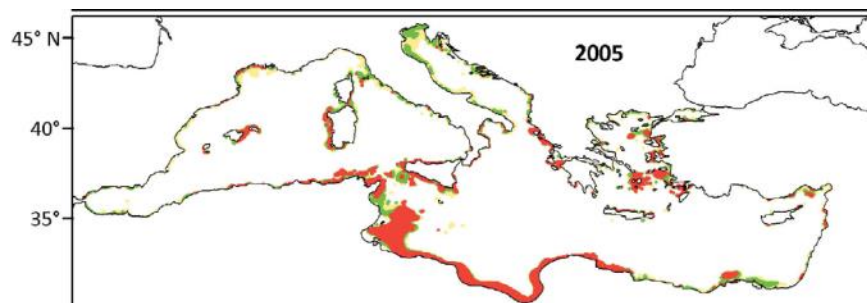
Operational oceanography

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Fisheries ecology

Strong focus on the study of the response of fish populations to environmental variability



(Tugores et al. 2011)

Current scenario on the two main disciplines necessary for developing
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Operational oceanography

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Fisheries ecology

Strong focus on the study of the response of fish populations to environmental variability

FISHERIES ASSESSMENT PERSPECTIVE

GFCM-FAO

ICCAT

Med. MPAs

VPA, XSA, SS, CMSY
(FAO 2017 a, FAO 2017b
ICCAT 2018, ICCAT 2017)

Spatial design and management not including surrounding seascapes (e.g., connectivity)

(Amengual & Alvarez-Berastegui 2018)

NO SYSTEMATIC INTEGRATION
OF ENVIRONMENTAL
VARIABILITY INTO
THE ASSESSMENT FOR FISHERIES
AND CONSERVATION

A general scheme for “Operational Fisheries Oceanography”

General scheme for implementation

Identify key environmental drivers of species relevant ecological process



Design indicators to parameterize the env. variability



Integrate into fisheries assessment (stock assessment, spatial management)



Evaluate the improvement on the assessment

Real case examples

Frontal areas driving the spatial distribution of species



Design habitat suitability indices



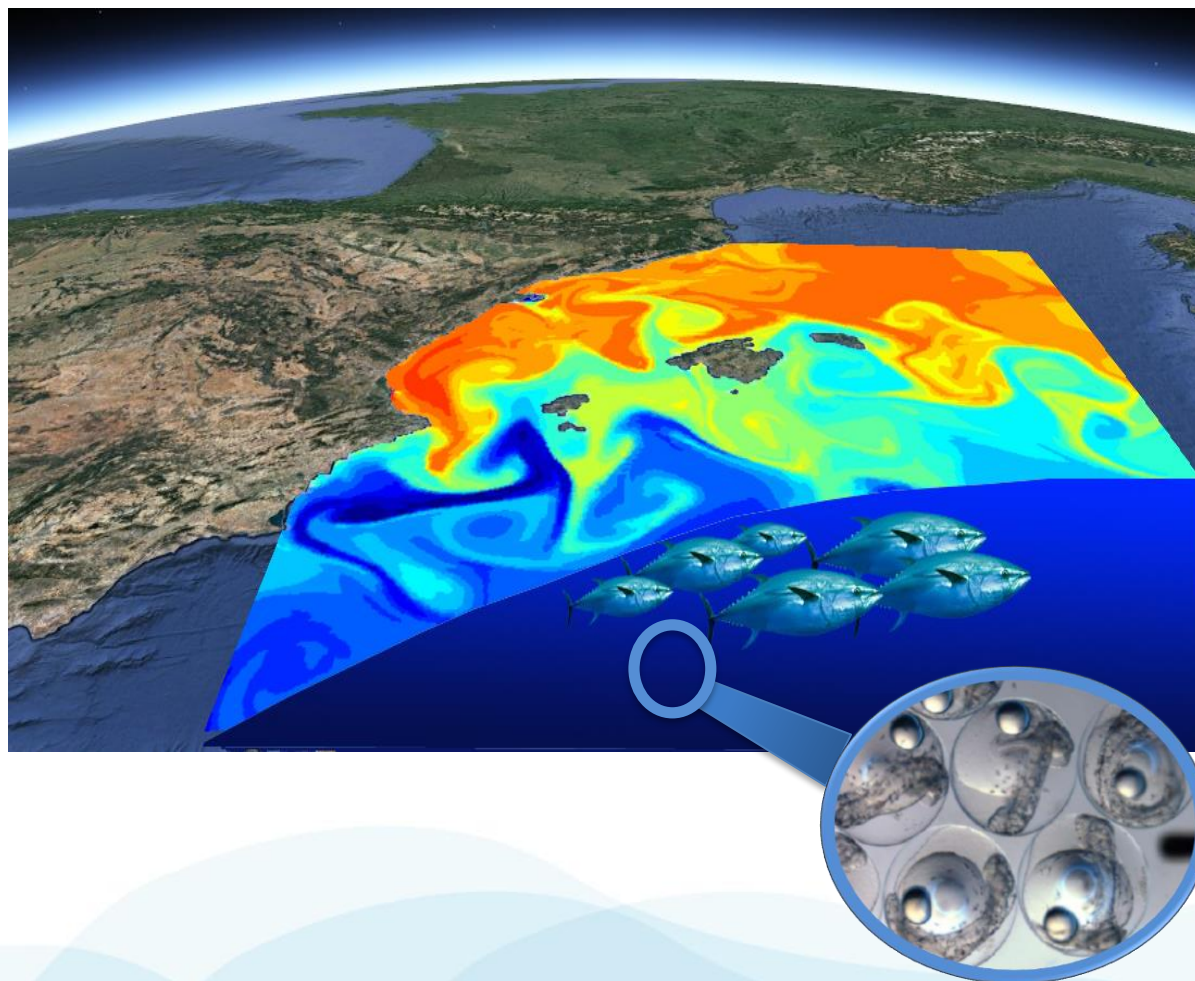
Standardize abundance indices resolving the fishing effort/species location mismatch



Analyse the coefficient of variation of new CPUE versus non standardize CPUE

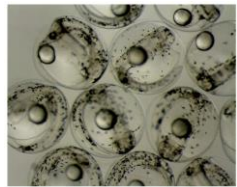
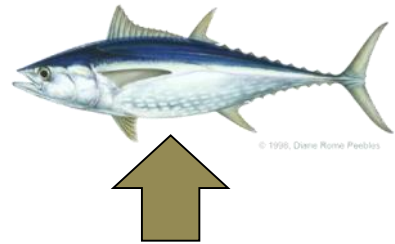
Bluefin tuna, a success study case of O.F.O

Mesoscale oceanography drives Bluefin tuna spawning ecology

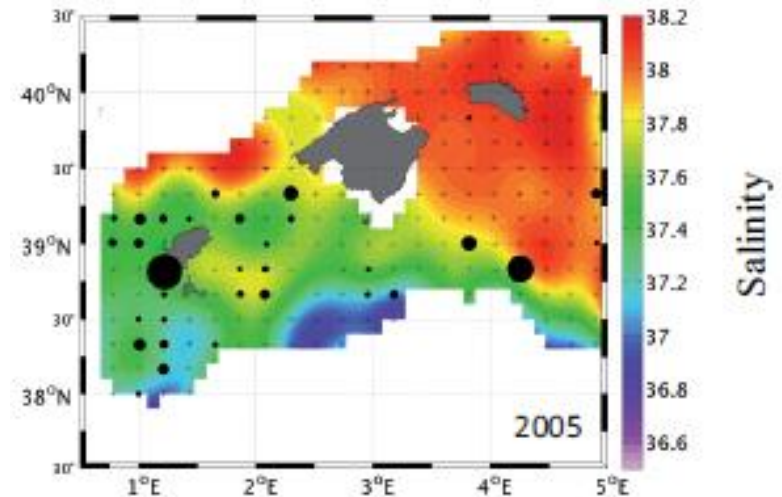


Bluefin tuna, a success study case of O.F.O

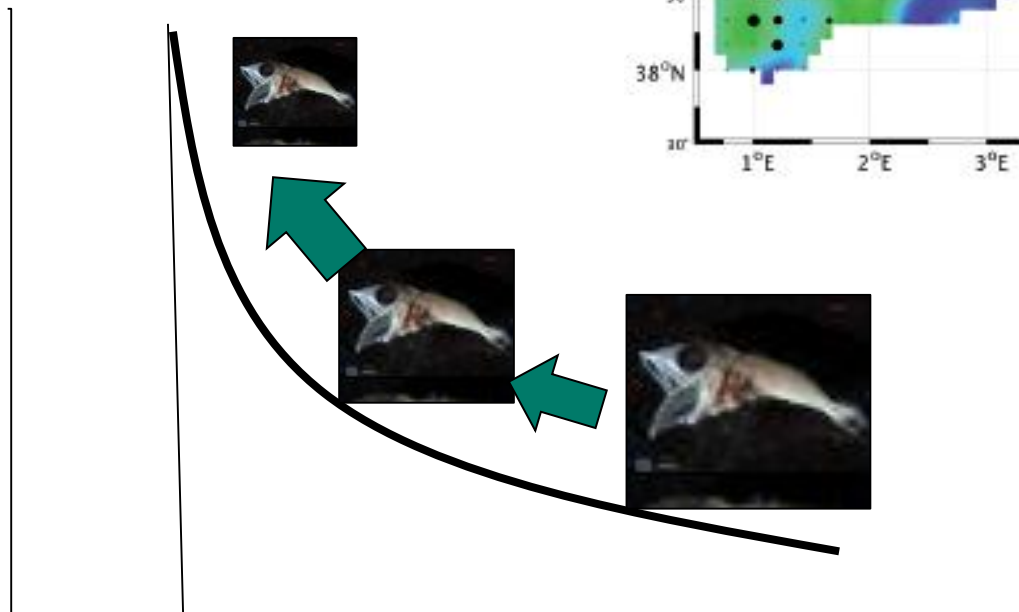
Habitat standardized Larval indices as proxy for the spawning stock biomass



Yolk-sac larvae

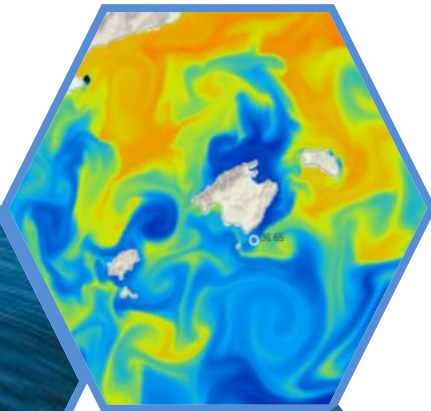


Larval abundances

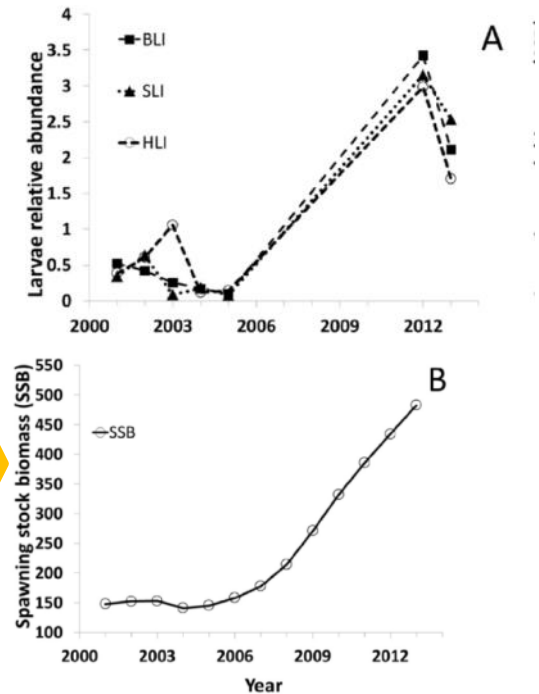


Larval length

Bluefin tuna, a success study case of O.F.O



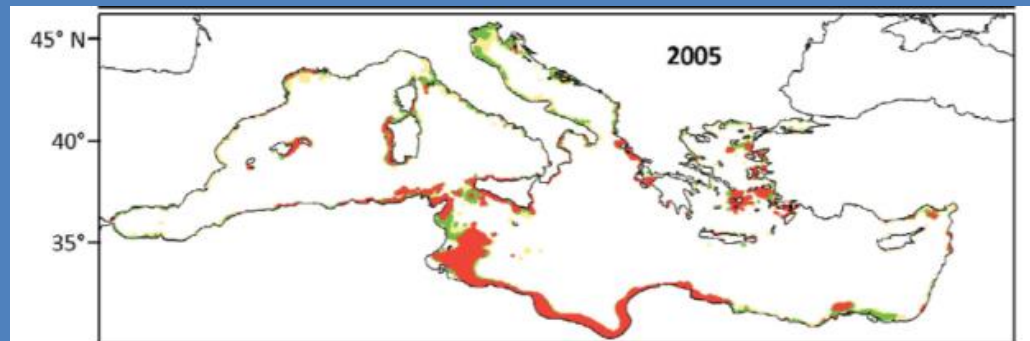
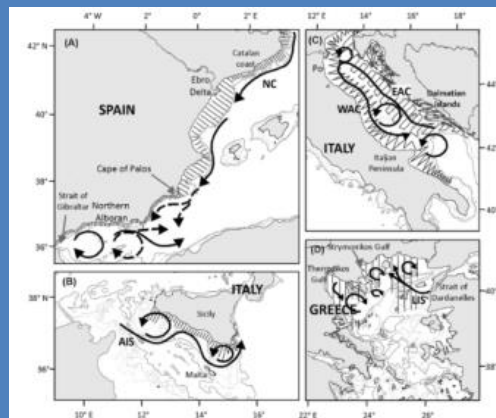
**Habitat standardized Larval indices as proxy for the spawning stock biomass.
A fisheries independent index of abundance**



(Ingram et al., DSR, 2017)

Potential impact on other species/ecosystems

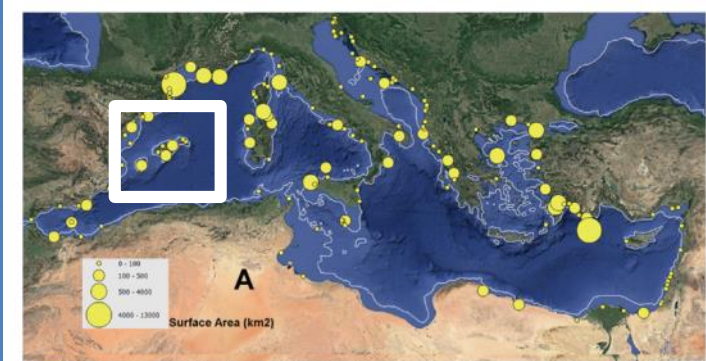
Improving abundance indices of small pelagics from acoustic surveys



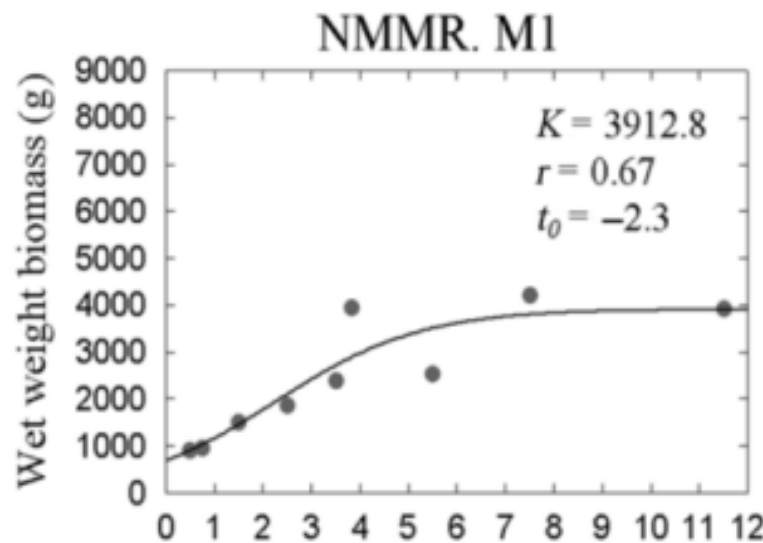
Tugores et al 2011

Potential impact on other species/ecosystems

Identify MPA carrying capacity for obtaining reference levels of coastal fish assemblages and evaluate population status in exploited areas

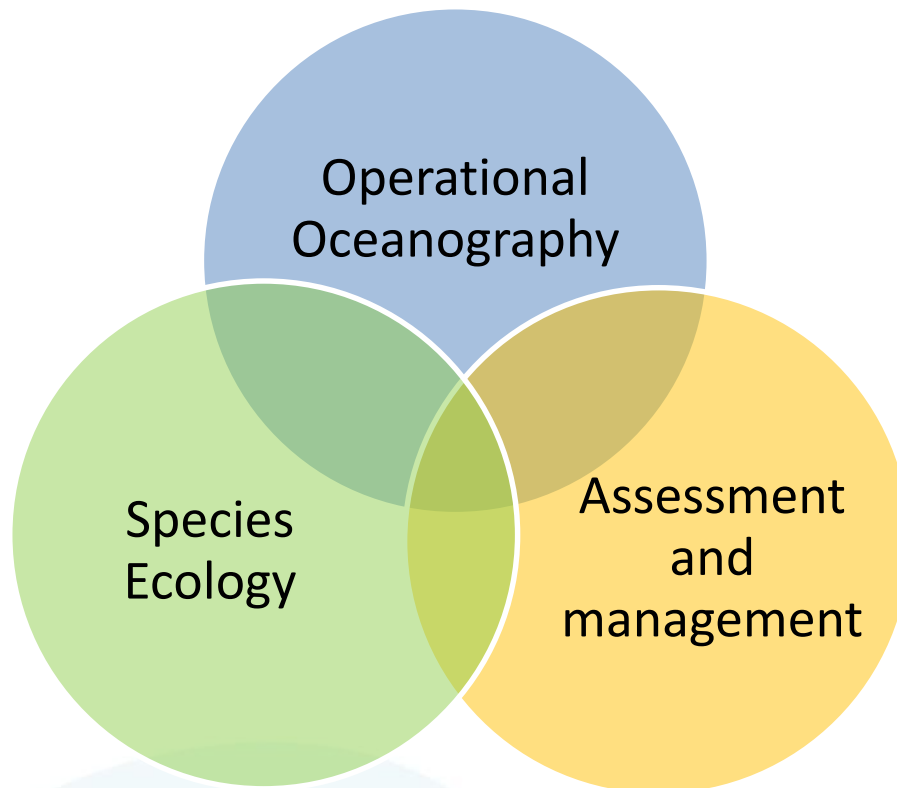


Coll J. et al. 2013



Towards “operational fisheries oceanography”

-Bridging the gap between the two disciplines is a key for reaching an effective operational fisheries oceanography



Gaps and Challenges Fisheries sciences



Methods WG
EcosystemsWG

mongoos



1- Adequate identification and parameterization of **environmental drivers** affecting species ecological processes.

2- Improve **assessment approaches** (CPUEs, models, etc) to assimilate operational oceanography information

3-Improve **capacity building** on O.O data processing and environmental data assimilation

Gaps and Challenges Operational Oceanography



Methods WG

Ecosystems

mongoos



WGOOFE

1- Identify needs: define **product specifications** (e.g. Parameters, scales, quality) for O.O. to be applied in modeling of dynamic processes driving the ecology of the species of interest

2- **Data accessibility** (interfaces, formats, etc)

3- Software tools for **data handling**-post processing

Way forward to Reach O.F.O best practices

- Identify successful study cases of O.F.O
- Design and promote new study cases with potential of success
- Connect experts on operational oceanography, fisheries assessment and ecology
- Set a working group on “operational Fisheries oceanography” linking GFCM and ICCAT with O.O structures (MONGOOS, Copernicus).
- Aligning MONGOOS objectives with the requirements of the fisheries end users community in marine ecosystems.
- Foster the capacity building:
 - operational fisheries oceanography into the fisheries community
 - Within fisheries community for integrating env. Variability
- Measure the impact of O.F.O

FORUM
ON
FISHERIES
SCIENCE

IN THE
MEDITERRANEAN
AND THE
BLACK SEA



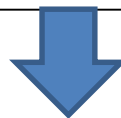
FISHFORUM²⁰¹⁸



WORKSHOP

Toward operational fisheries oceanography in the Mediterranean Sea:
gaps, challenges, opportunities from open access data and integrated
tools

Monday 10 December, Malaysia Room, 15:00 – 17:30



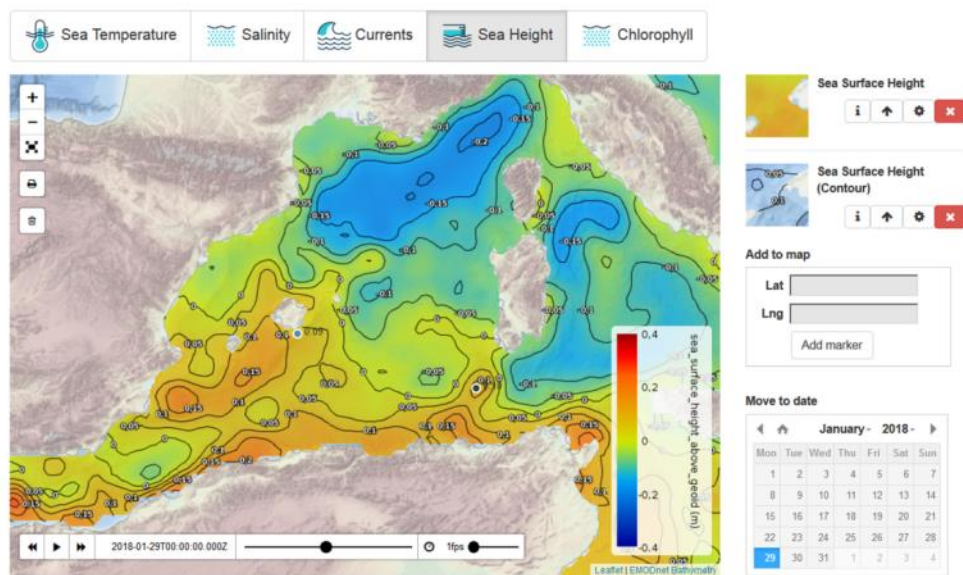
A network on “Operational fisheries oceanography”



**A network for the integration of environmental variability into fisheries advice
By linking fisheries assessment and operational oceanography**

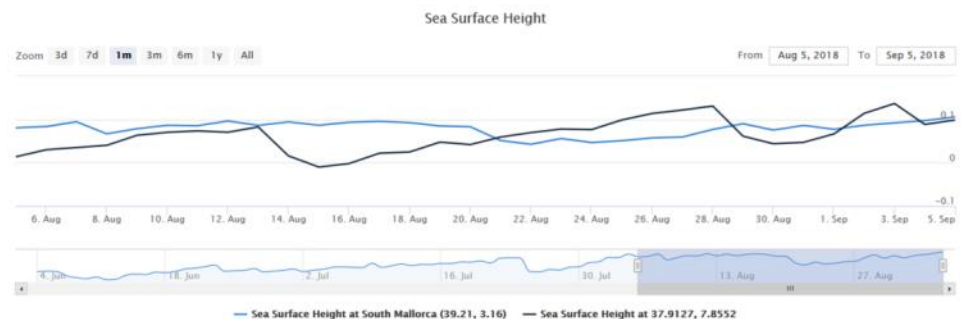
<http://apps.socib.es/oceanography-exploration/>

Oceanography exploration tool



Time Series Charts

Once loaded a variable layer, double-click on the map or fill the lat & lng inputs in order to see the time series chart of such variable at a given point.



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