"Operational Fisheries Oceanography" for improving fisheries assessment and conservation in the Mediterranean

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

*"The activities directed to **link fisheries ecology and operational oceanography** for developing information about environmental processes affecting species dynamics and distribution, and the systematic integration of those products into the fisheries assessment and management"*

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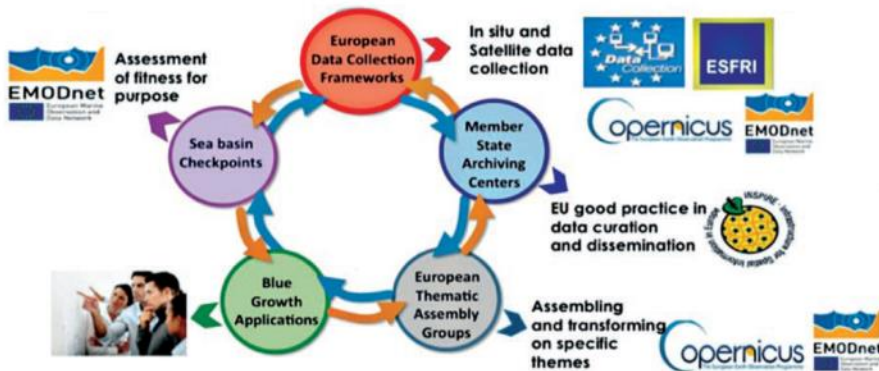
Operational oceanography

Fisheries ecology

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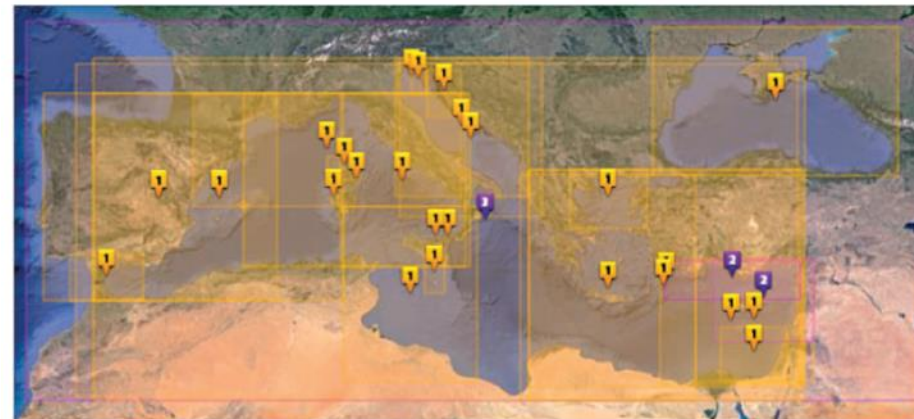
Operational oceanography

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

MONGOOS : Mediterranean Operational Network for the Global Ocean Observing System

Fisheries ecology

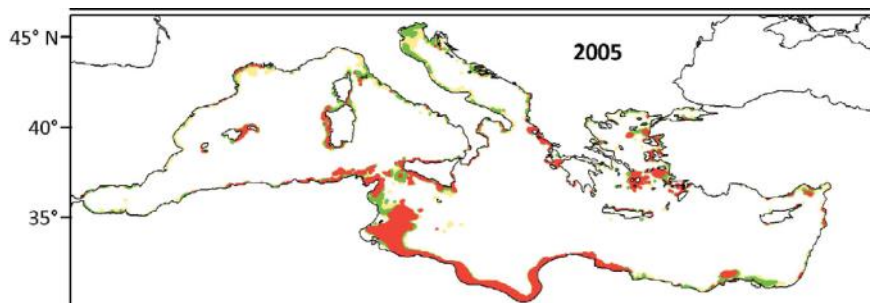Strong focus on the study of the response of fish populations to environmental variability

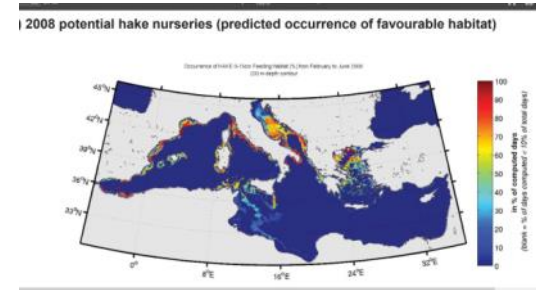# Current scenario on the two main disciplines necessary for developing "operational fisheries oceanography"

Operational oceanography

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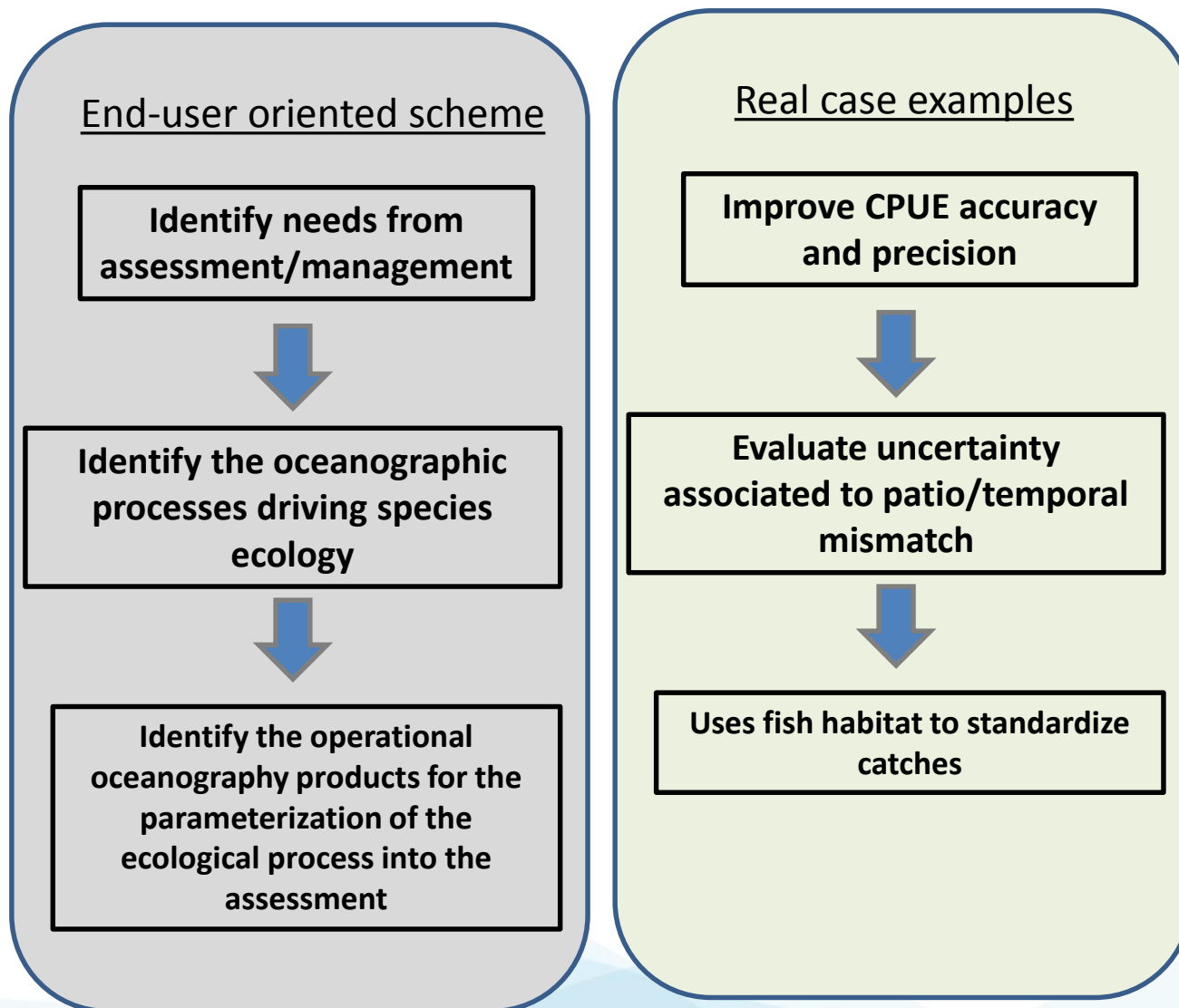
Fisheries ecology

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

(Tugores et al. 2011)

(Druon et al. 2015)

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

Fisheries ecology

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

GFCM-FAO

ICCAT

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

Med. MPAs → Spatial design and management not including surrounding seascapes (ej, connectivity)
(Amengual & Alvarez-Berastegui 2018)

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

**Scheme and levels of implementation of "Operational Fisheries Oceanography"**

End-user oriented scheme

- Identify needs from assessment/management
- Identify the oceanographic processes driving species ecology
- Identify the operational oceanography products for the parameterization of the ecological process into the assessment

Real case examples

- Improve CPUE accuracy and precision
- Evaluate uncertainty associated to patio/temporal mismatch
- Uses fish habitat to standardize catches

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

An emblematic top predator migrating to The Mediterranean

Key ecosystem top predator
(Ecowatch.org)
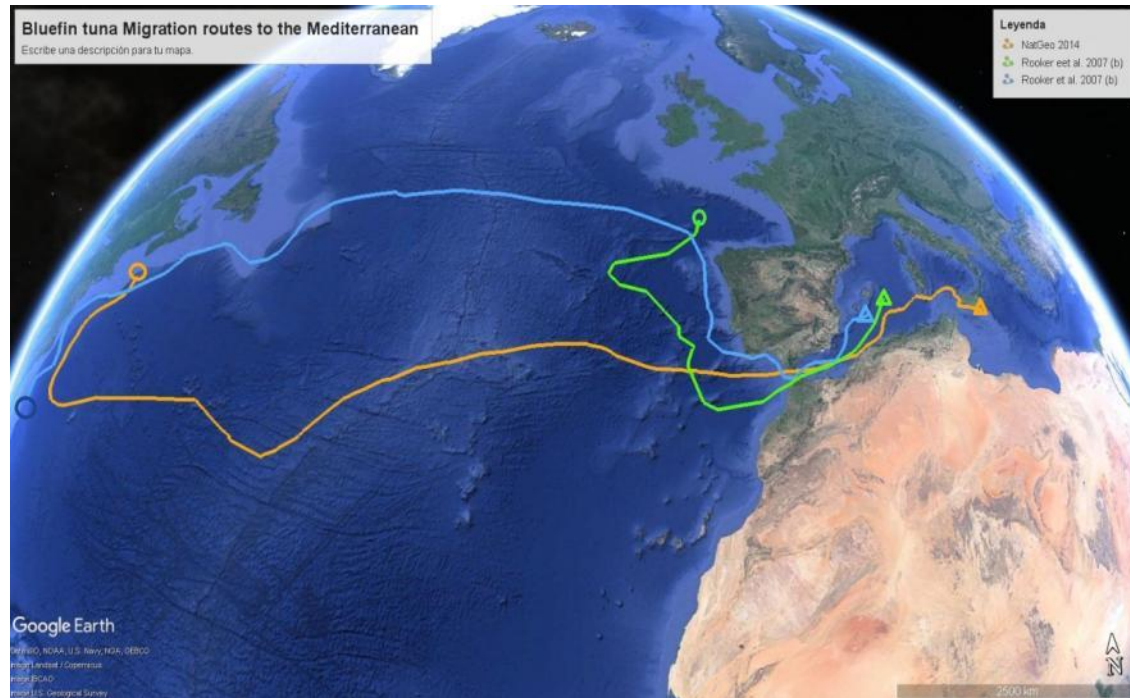
Bluefin tuna, a success study case of O.F.O

Mesoscale oceanography drives Bluefin tuna spawning ecology

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

FISHFORUM 20 18
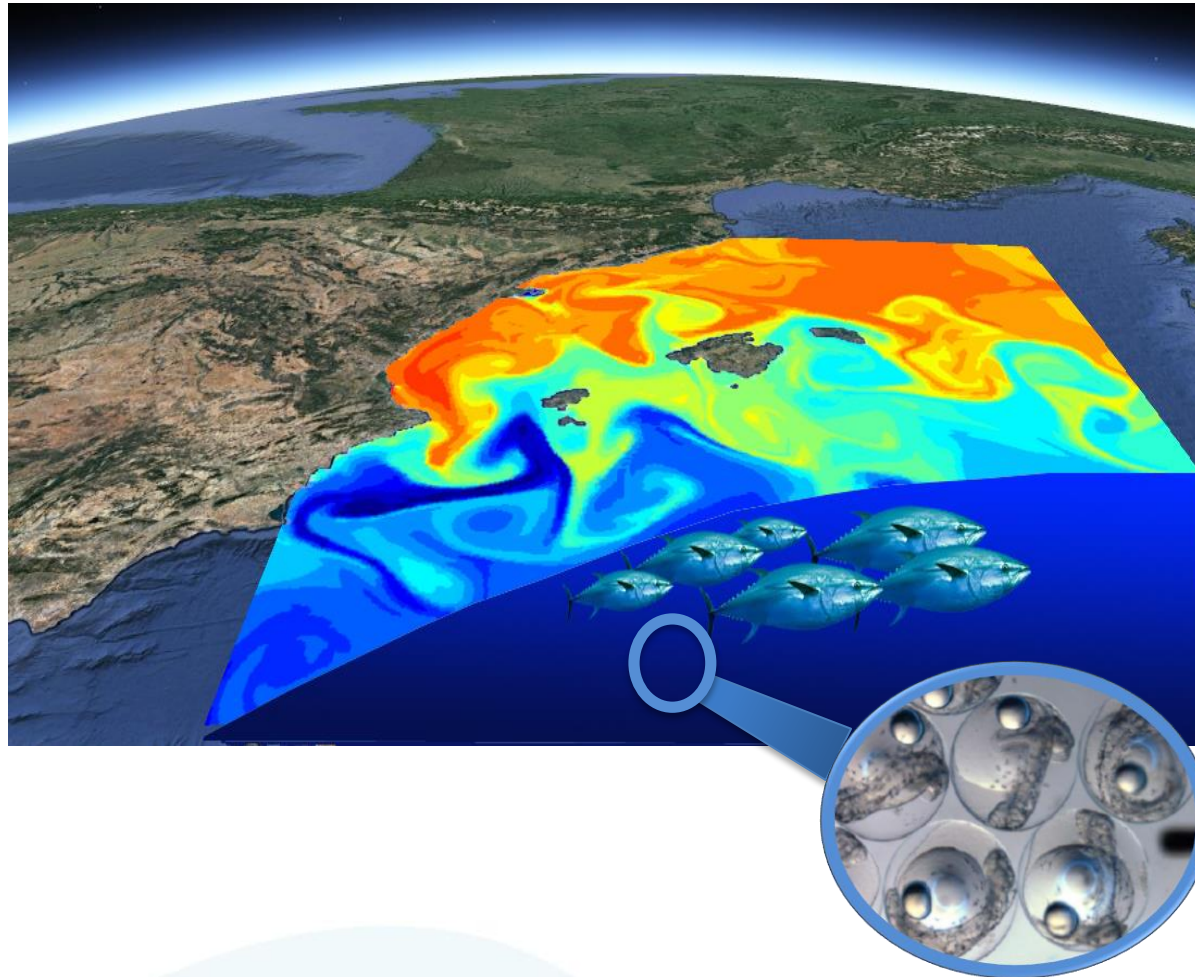
Spawning ecology driven by temperature

## Developing indicators on oceanographic scenarios (SST based) for the ICCAT ecosystem report card

Temp_Bal_SG: Mean temperature in the Balearic spawning ground, mixed layer depth,(May-Ago)

Temp_Tunisia-Malta_SG: Mean temperature in the Tunisia-Malta spawning ground, mixed layer depth,(May-Ago)

Temp_Cyprus_SG: Mean temperature in the Cyprus spawning ground, mixed layer depth,(May-Ago)
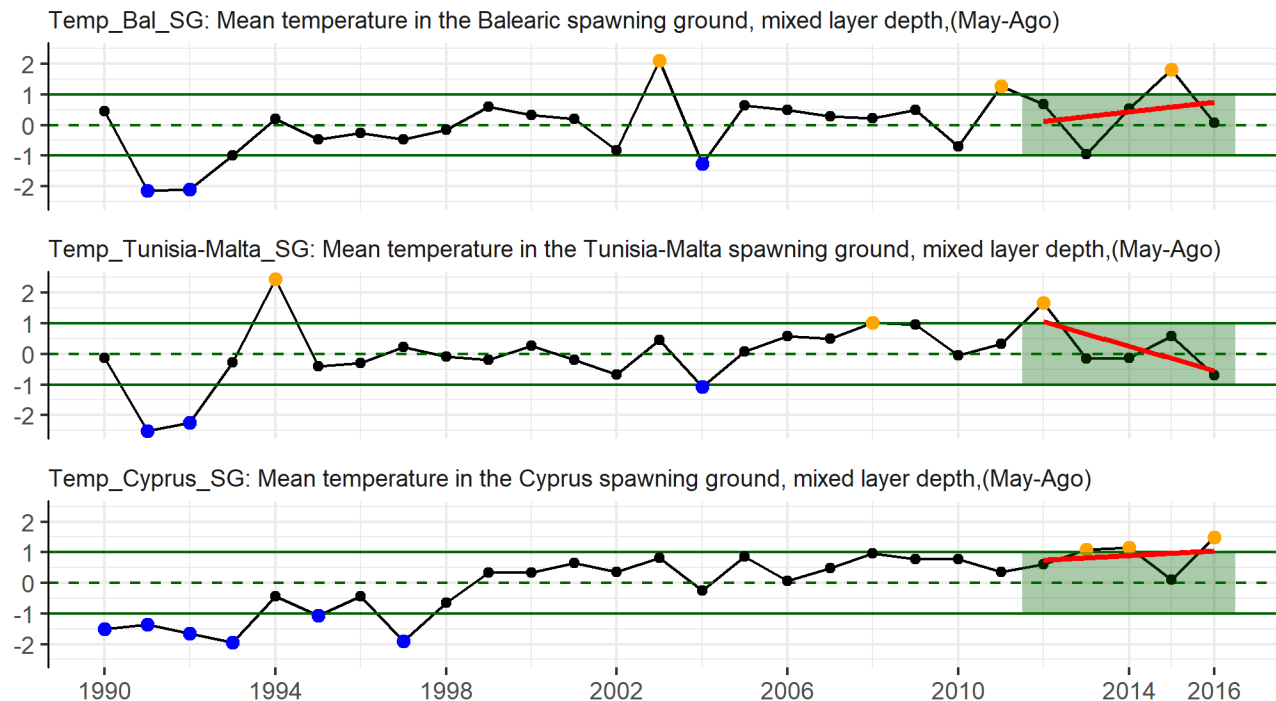
(Alvarez-Berastegui et al. ICCAT,2018)

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

Habitat standardized Larval indices as proxy for the spawning stock biomass
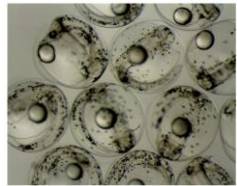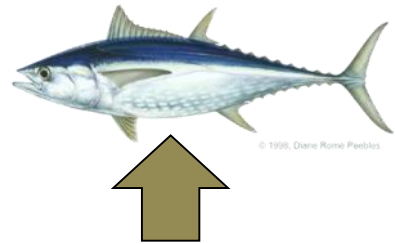
Larval abundances
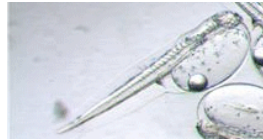
Larval length
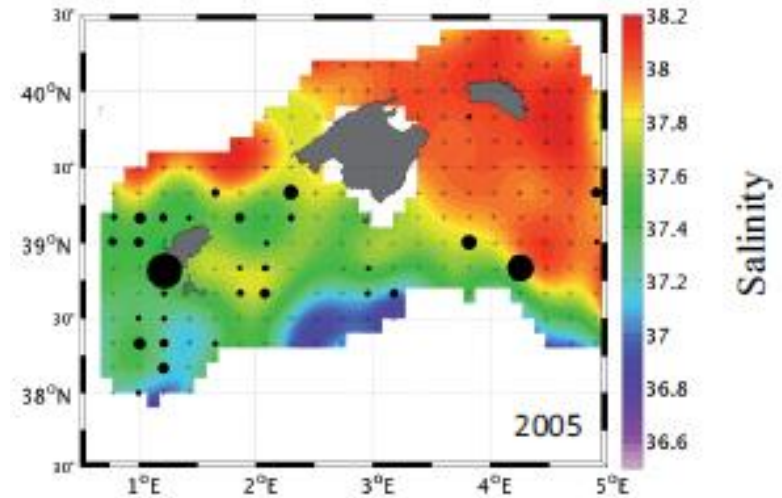
Bluefin tuna, a success study case of O.F.O

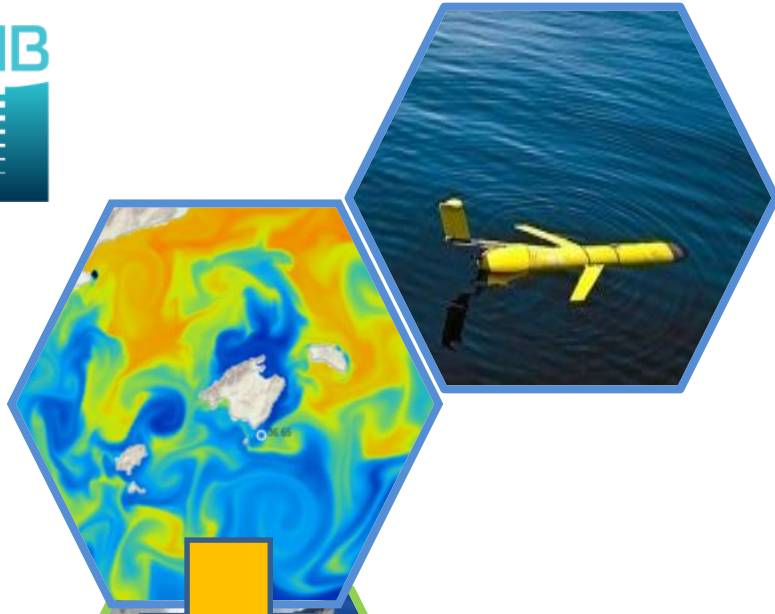**Habitat standardized Larval indices as proxy for the spawning stock biomass**
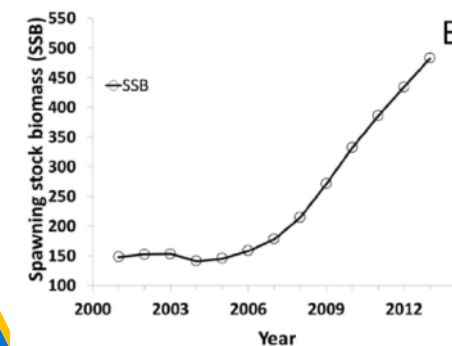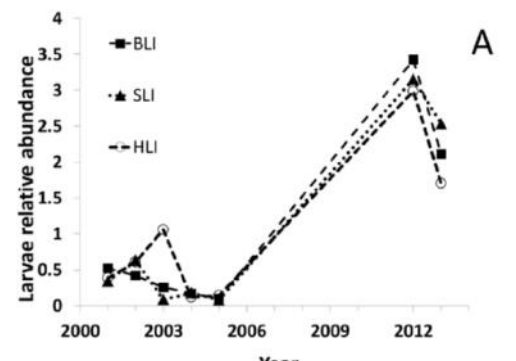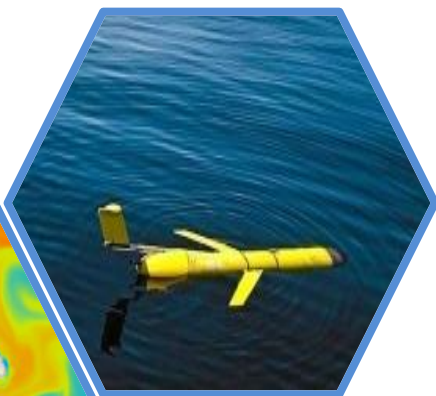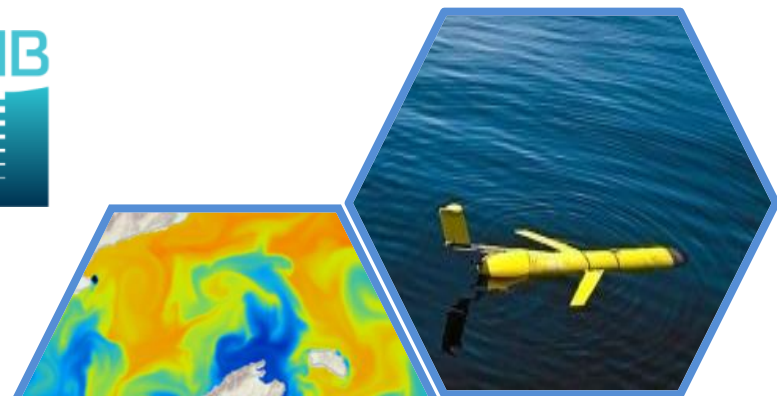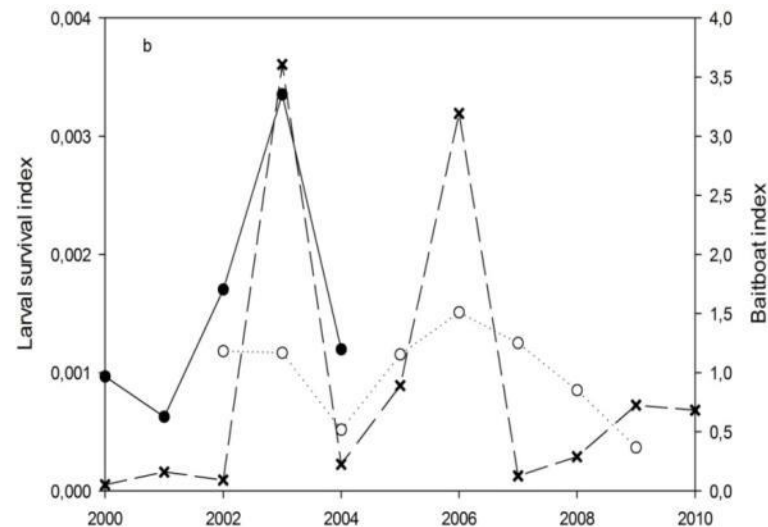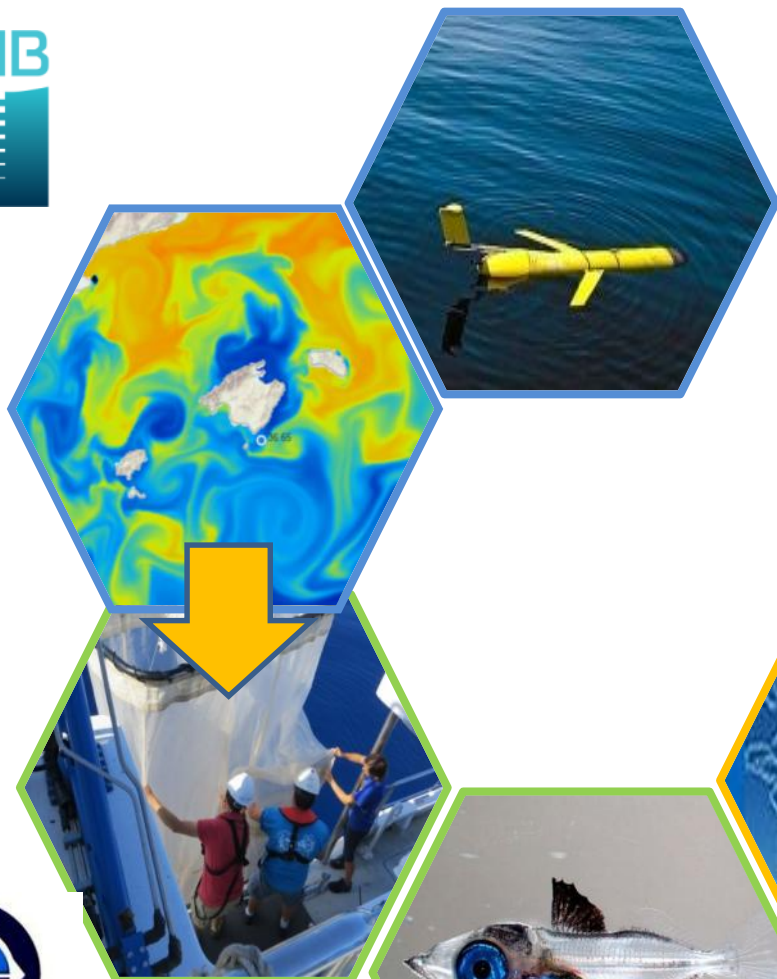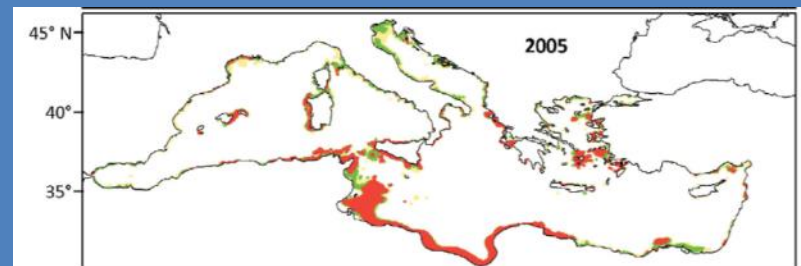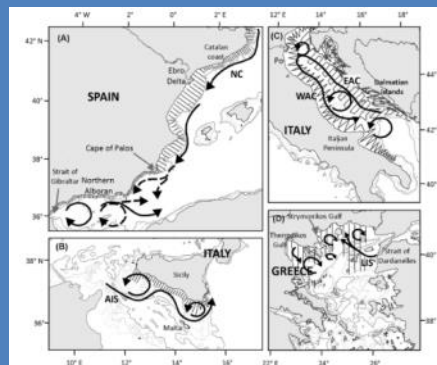

(Ingram et al., DSR, 2017)

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

Habitat standardized Larval indices as proxy for the spawning stock biomass
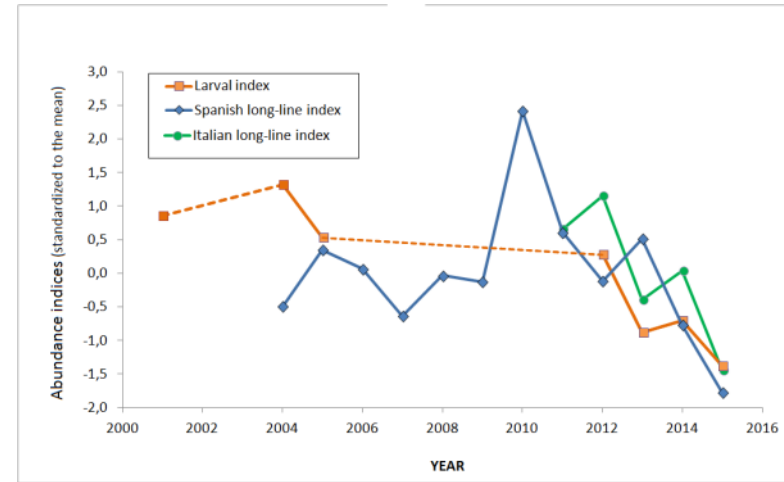
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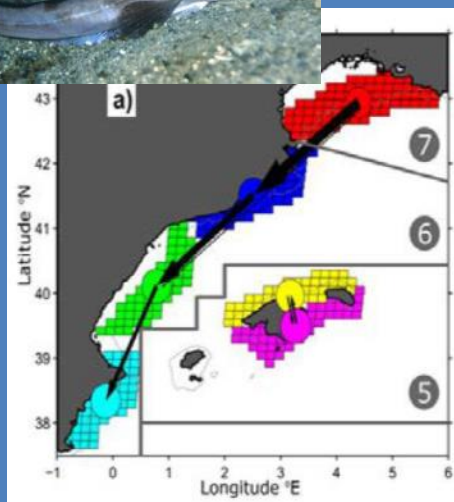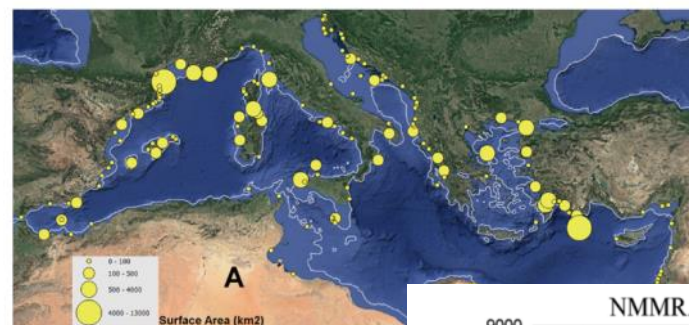

Regelero et al. ICESJM 2018
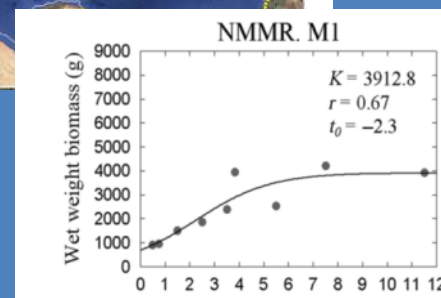
Potential impact on other species/ecosystems

Tugores et al 2011

Rossy et al. 2018

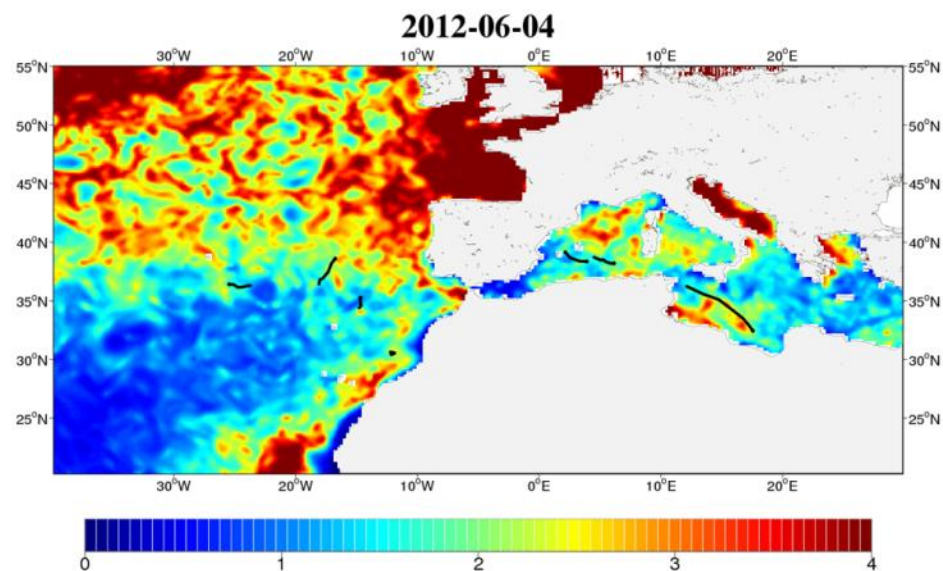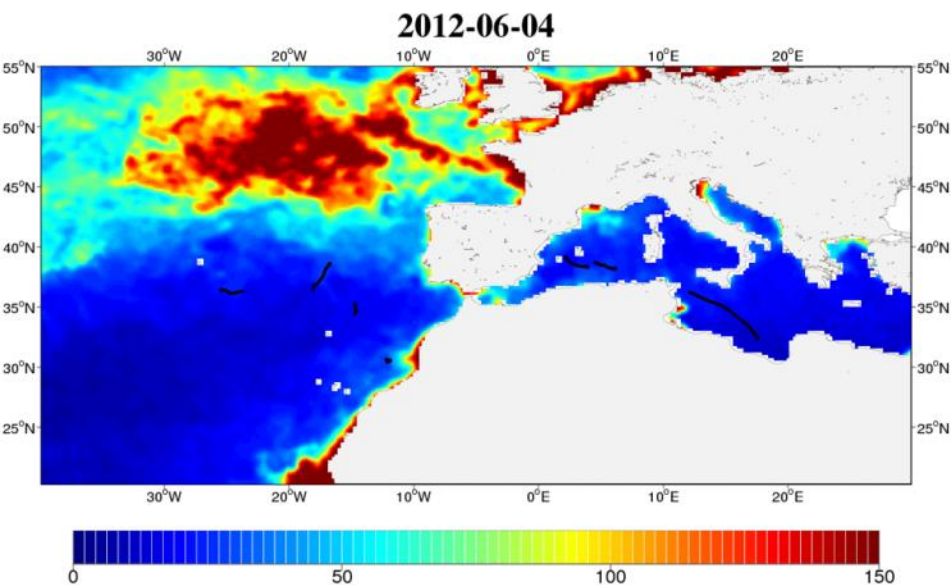Coll J. et al. 2013

Potential impact on other species/ecosystems

spatially explicit population dynamics and stock assessment model driven by environmental variables (Lehodey P., http://www.seapodym.eu/about-seapodym/)

Bluefin tracks on:

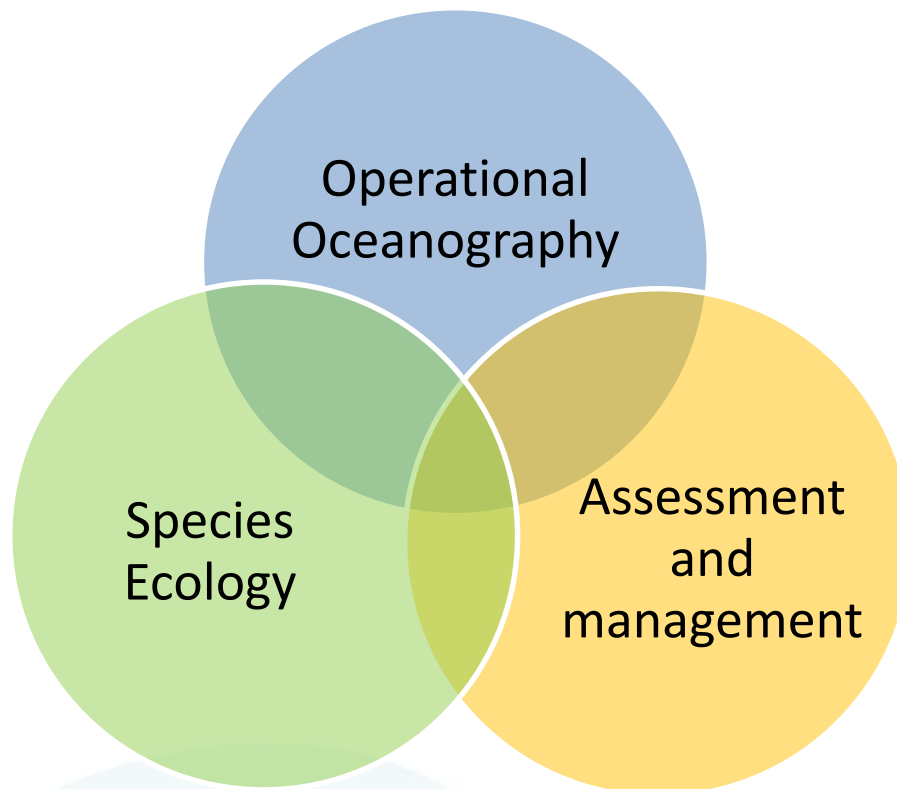Satellite derived primary production

Micronekton (seapodym)

2012-06-04

2012-06-04

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

ICES CIEM

WGOOFE

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

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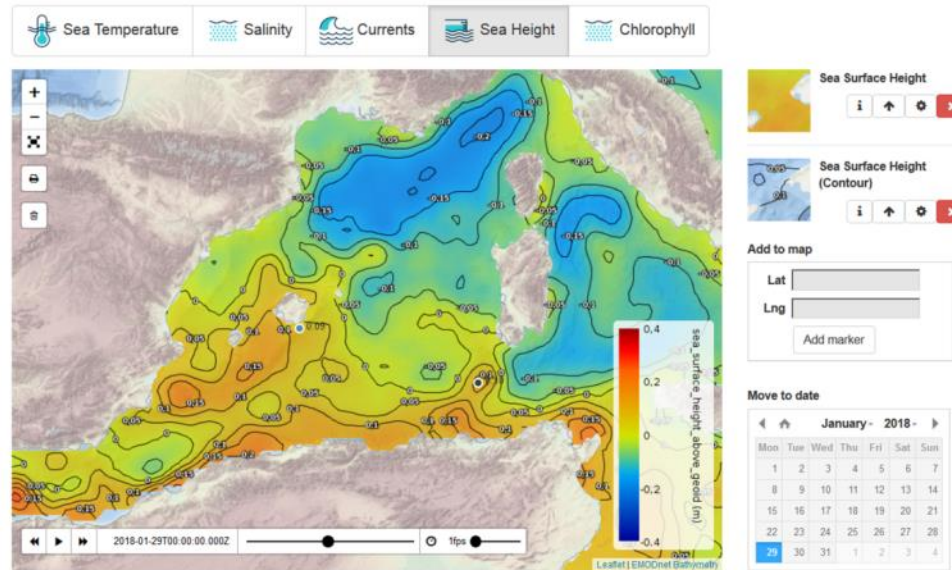
3- Software tools for **data handling**-post processing

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

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

https://oostop.wixsite.com/oostop

FISHERIES ASSESSMENT & ECOLOGY	Main gaps & challenges	1. Identification and parameterization of environmental processes driving species key 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
	Way forward	
	Succesfull study casaes	
	Background docs	
	Key organizations	
	….include other cathegories	
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