SOCIB Balearic Islands Coastal Observing and Forecasting System

Multi-platform integrated assessment for the sustainability of Bluefin Tuna in the Mediterranean Sea

Alvarez-Berastegui D., Alemany F., Ingram W., Reglero P., Mourre B., Balbín R., Juza M., Tintoré J.

THE COPERNICUS MARINE WEEK
BRUSSELS, 25-29 SEPTEMBER 2017

Principle

"The Blue Economy is a knowledge based economy looking to the sea, not really for extraction of natural goods but for data to address societal challenges and inspire solutions" (R. Spinrad, NOAA).

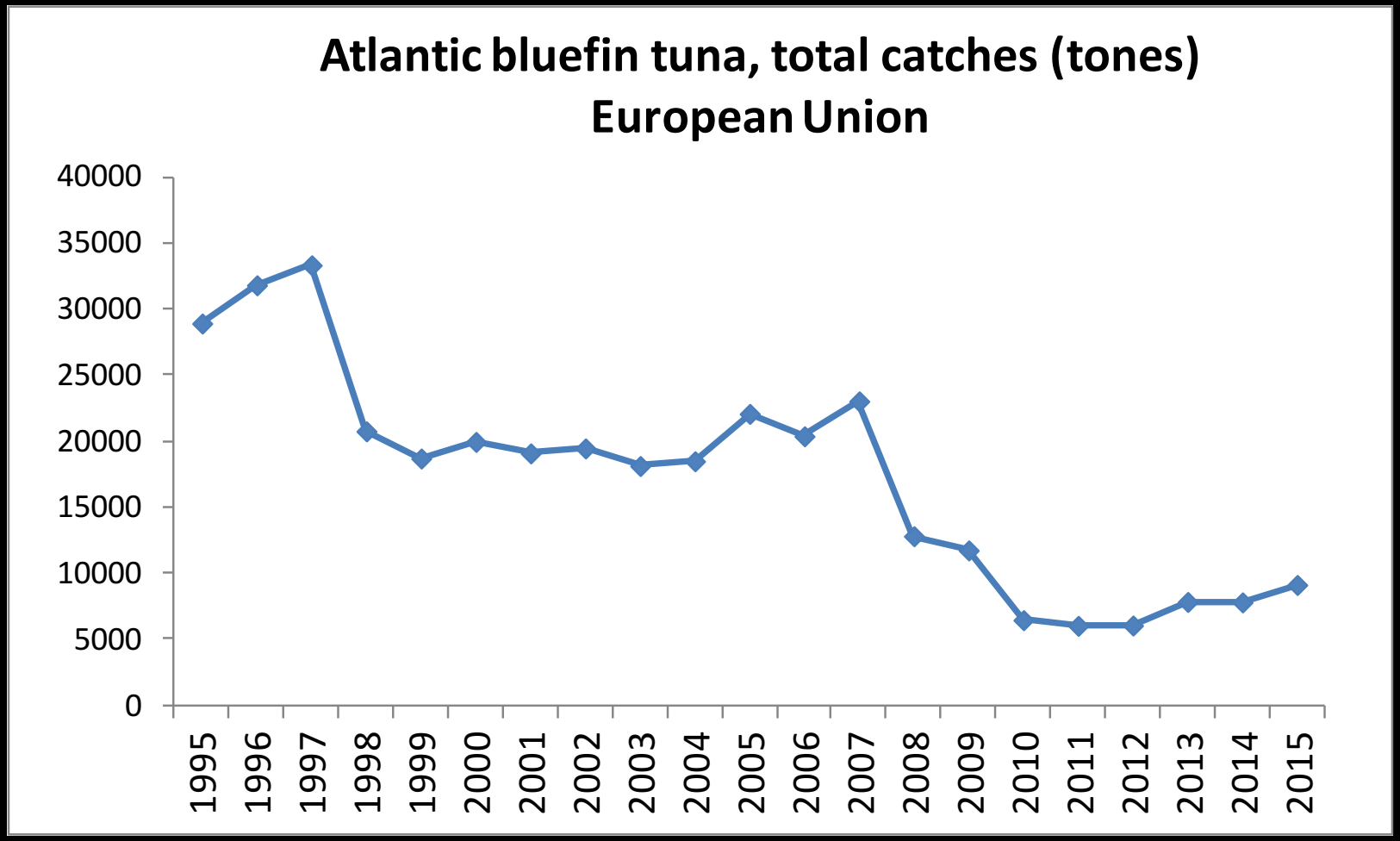
Market sectors

Photo: Tom Puchner

Fishing: Sustainable fisheries

R&D: Research & Tools for assessment and management

End users



ICCAT

Assessment & Management (TACs)

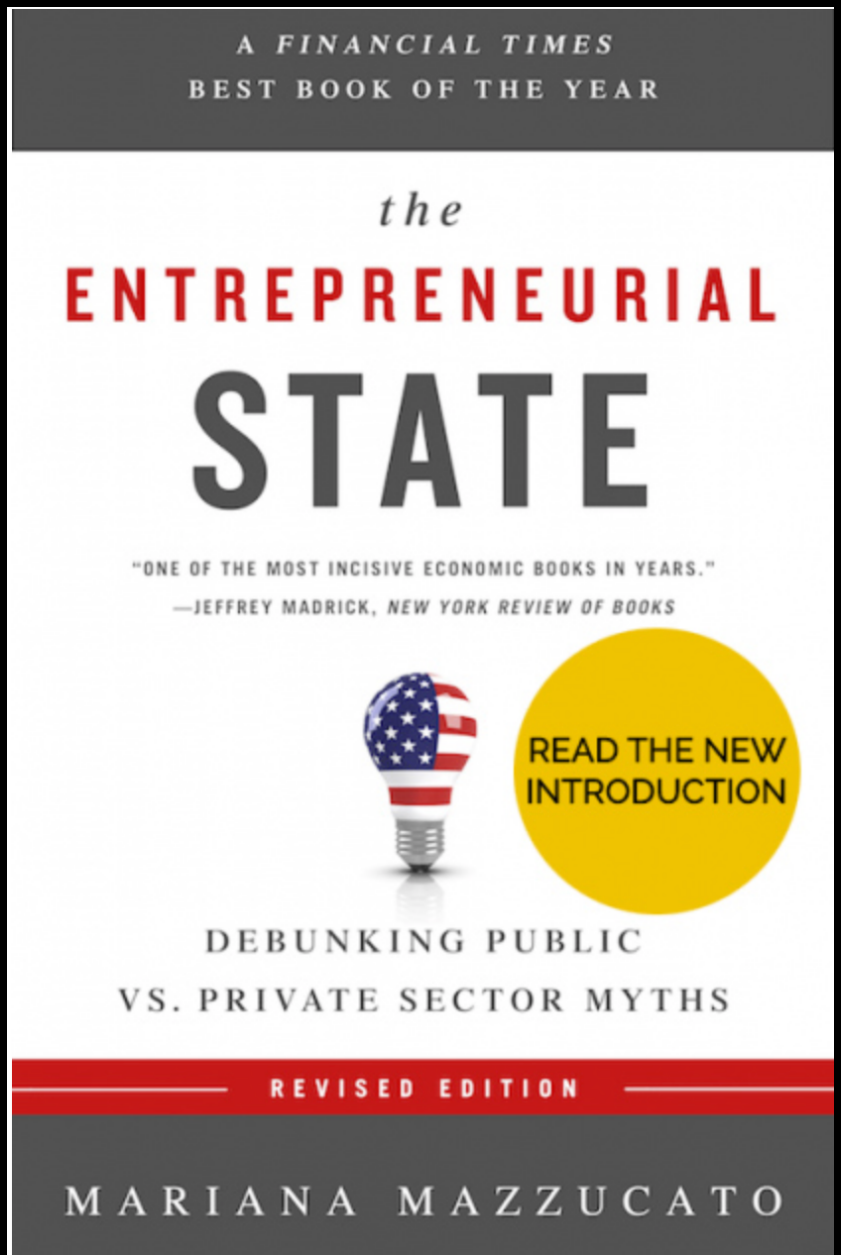
R&D fisheries assessment

Relevance

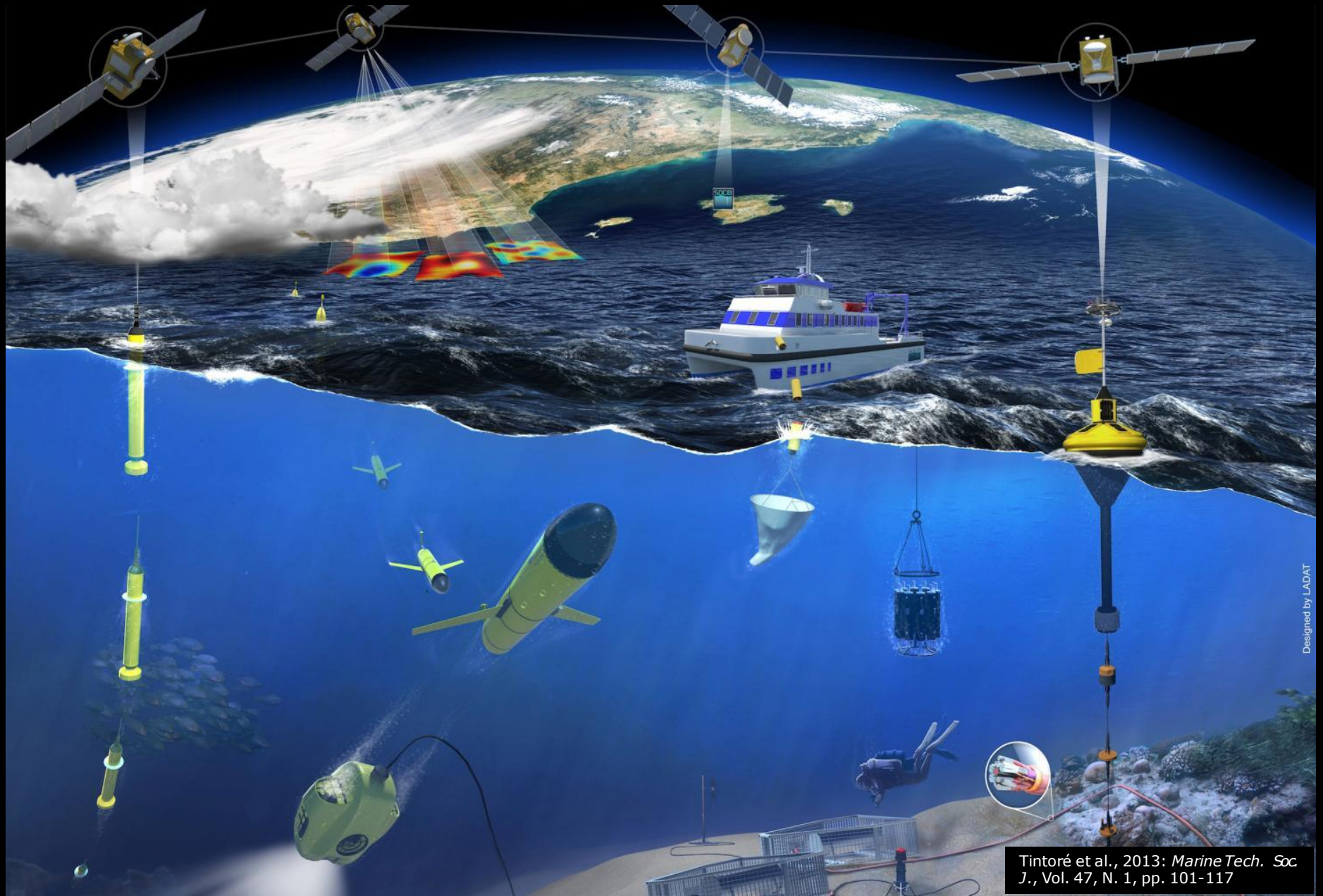
Sustain fisheries industry -traditional & advanced technological-

Ecosystem functioning and resilience

Relevance: public sector driver & mission oriented innovation

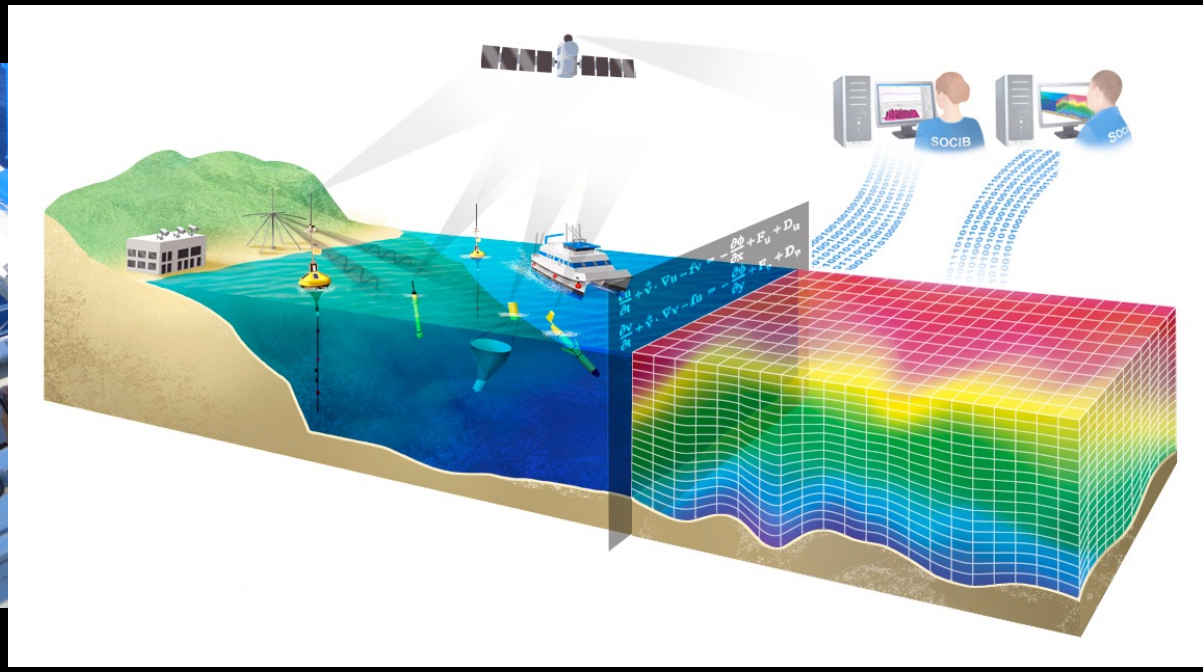


SOCIB *approach*



Tintoré et al., 2013: *Marine Tech. Soc. J.*, Vol. 47, N. 1, pp. 101-117

Mission oriented innovation: the Bluefin tuna focused research project



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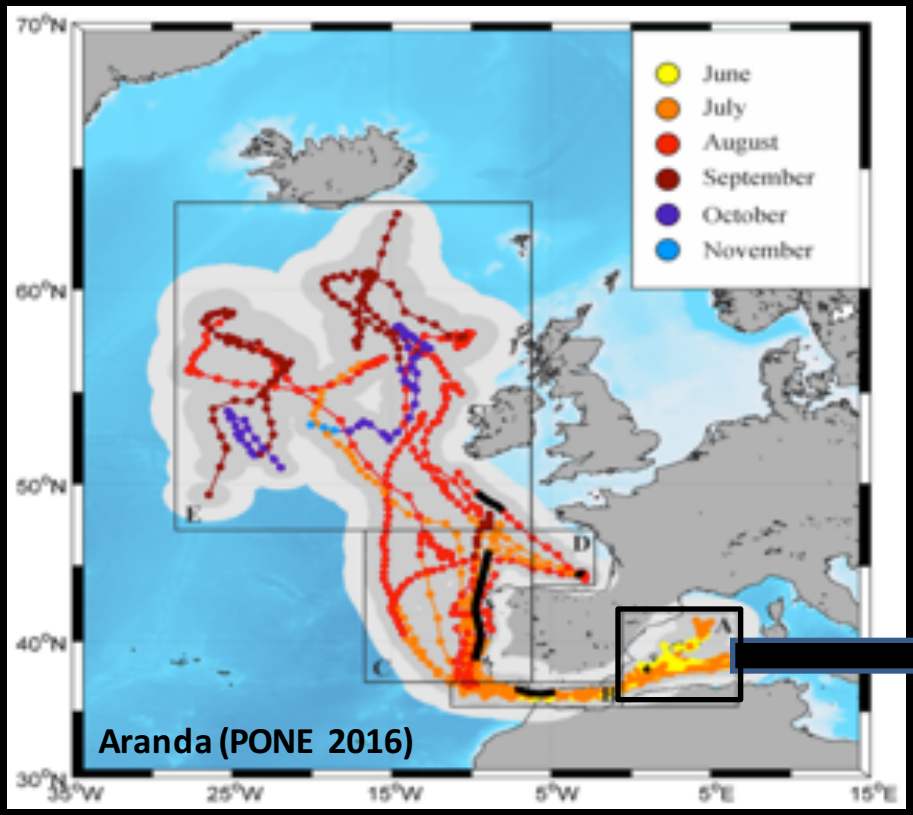
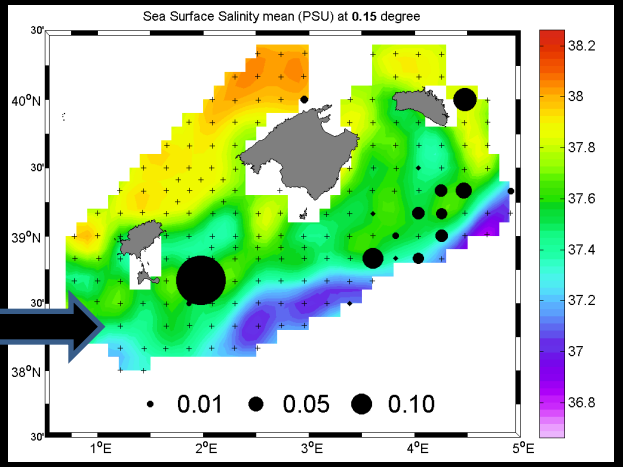
SOCIB Balearic Islands Coastal Observing and Forecasting System

Species ecology + Operational oceanography

Context





1-Fisheries assessment relies on fish abundance indices

2-Standardization of abundances observed to the habitat is needed but not widely implemented: very relevant for Bluefin tuna

ICES Journal of Marine Science

ICES International Council for the Exploration of the Sea
CIEM Conseil International pour l'Exploration de la Mer

ICES Journal of Marine Science (2016), 73(7), 1851–1862. doi:10.1093/icesjms/fsw041

Contribution to the Themed Section: '*Seascape Ecology*'

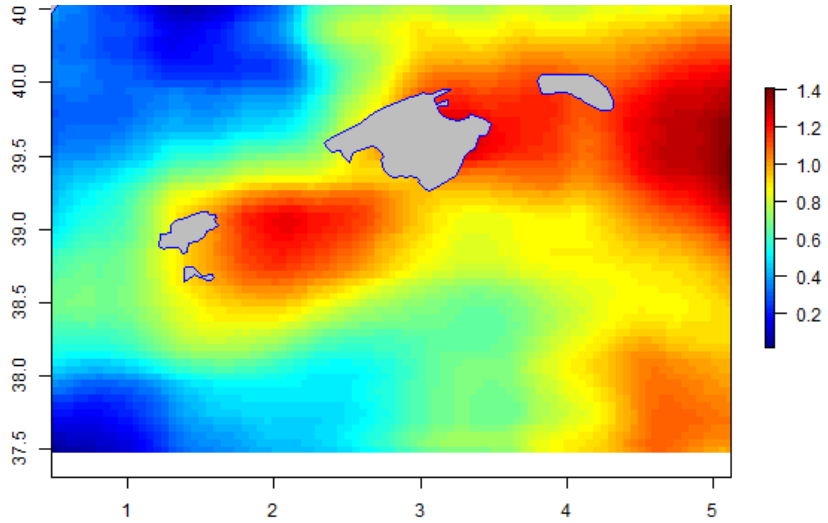
Original Article

Pelagic seascape ecology for operational fisheries oceanography: modelling and predicting spawning distribution of Atlantic bluefin tuna in Western Mediterranean

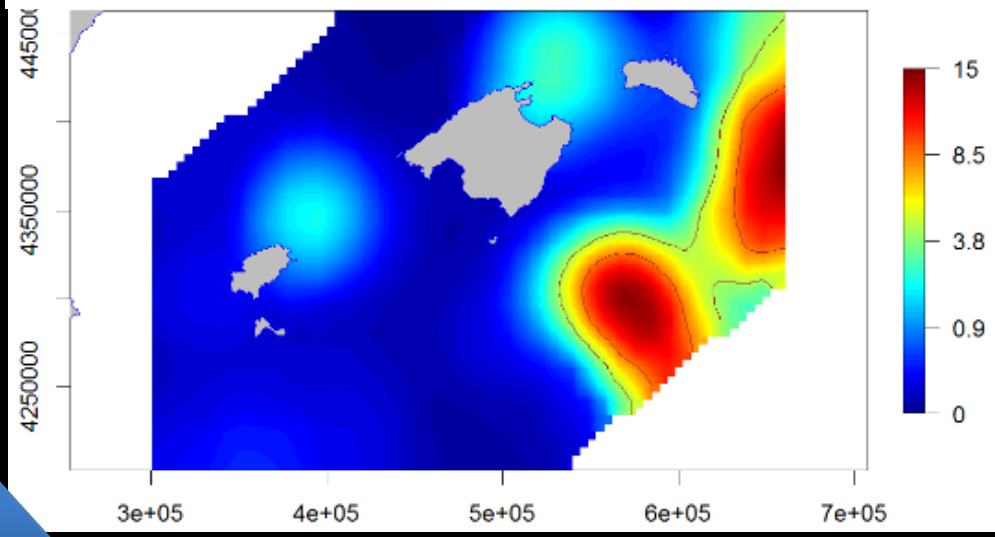
Diego Alvarez-Berastegui[1]*, Manuel Hidalgo[2], María Pilar Tugores[2], Patricia Reglero[2], Alberto Aparicio-González[2], Lorenzo Ciannelli[3], Mélanie Juza[1], Baptiste Mourre[1], Ananda Pascual[4], José Luís López-Jurado[2], Alberto García[5], José María Rodríguez[6], Joaquín Tintoré[1,4], and Francisco Alemany[2]

Spawning Areas

Temperature increase in spawning area during summer (ºC)



Predicted spawning areas



Identification of key ocean variables driving Bluefin tuna spawning ecology & developing operational oceanography products

Generalized Additive Model - GAM

Spawning areas

Alvarez-Berastegui et al. ICES J. Mar. Sc. (2016)

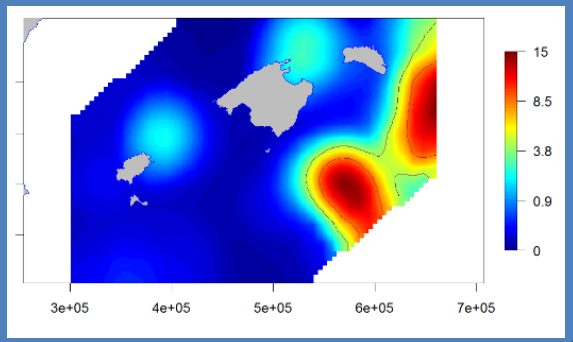
Application

- **Development of larval abundance indices used by ICCAT** since 2017 as fisheries independent index assessing spawning stock biomass
- Design Ichthyoplankton surveys

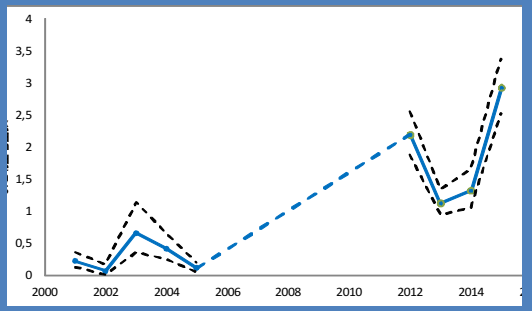
Design ichthyoplankton surveys

Standardization of larval abundance indices

Predicted spawning areas



Assessing bluefin tuna adult populations



Alemany et al. 2010, Reglero et al. 2012, Alvarez-Berastegui et al. 2016; Ingram et al. 2017; Alvarez-Berastegui et al. 2017

CMEMS Products Used

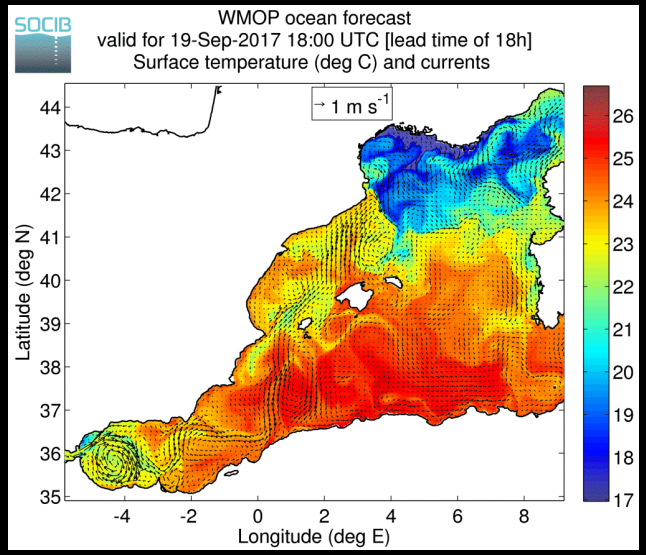
1-CMEMS provide:

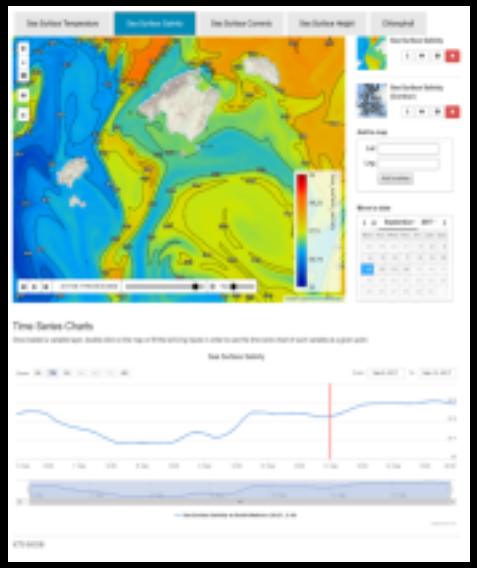
-Forcing conditions for High-resolution local models (WMOP)

-Satellite Surface Chl-a (Mediterranean adjusted algorithms)

- SST

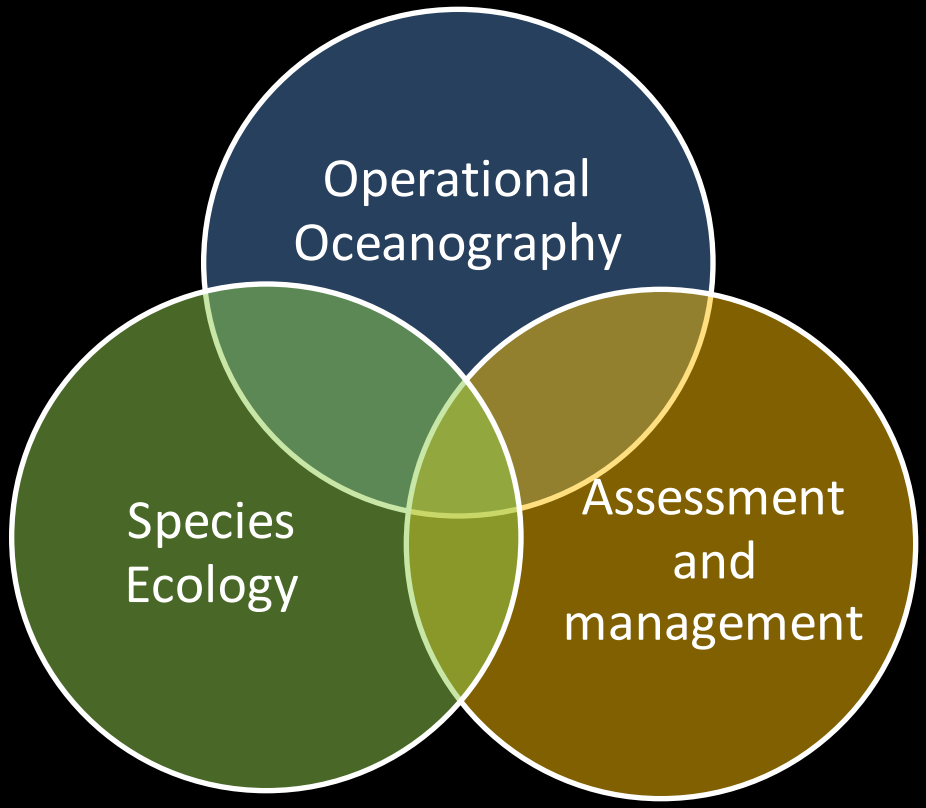
2-SOCIB develops new products for monitoring ecological relevant processes and for data exploration





Improvements Needed

Improving multidisciplinary approach
Towards mesoscale
Validation



Improvements Needed

IMBeR

CLIOTOP

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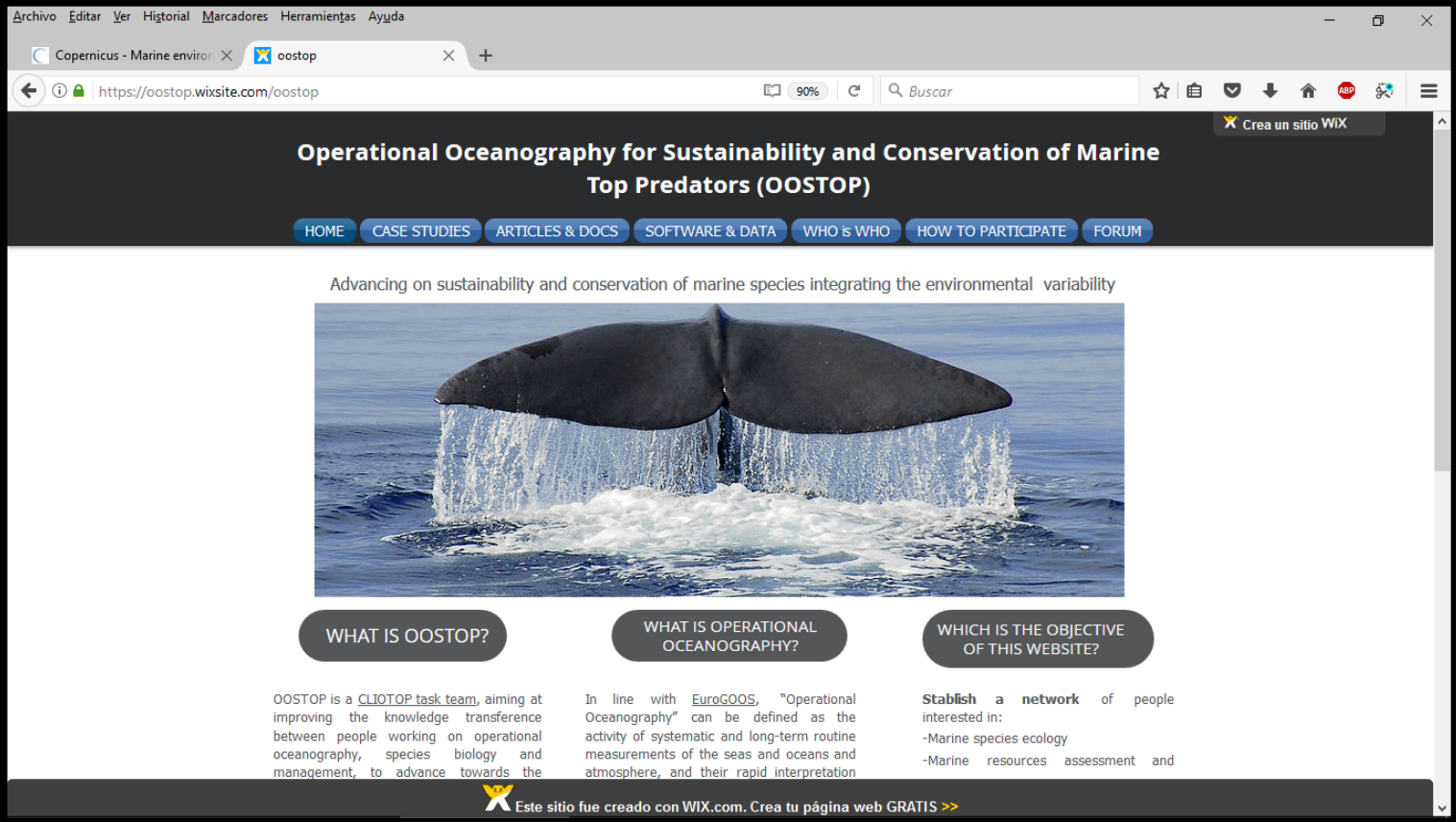
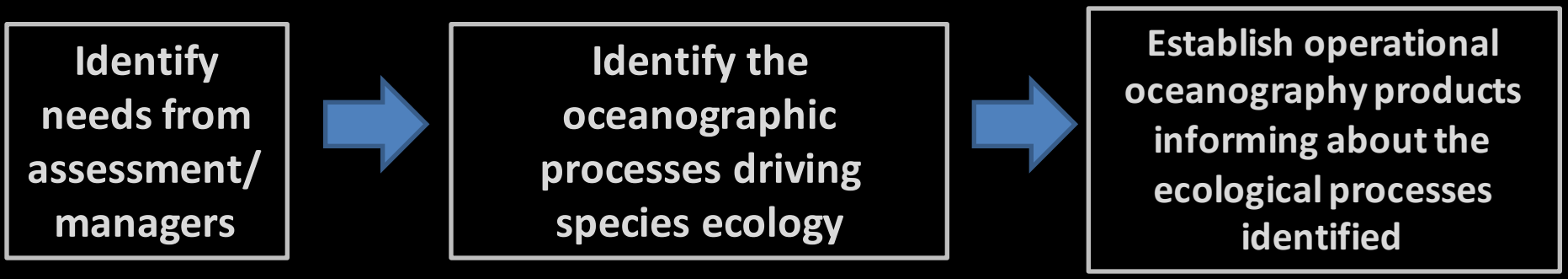


Summary

…. the sustainability of Bluefin Tuna in the Mediterranean Sea requires… :



Three core elements for

“Operational fisheries oceanography”

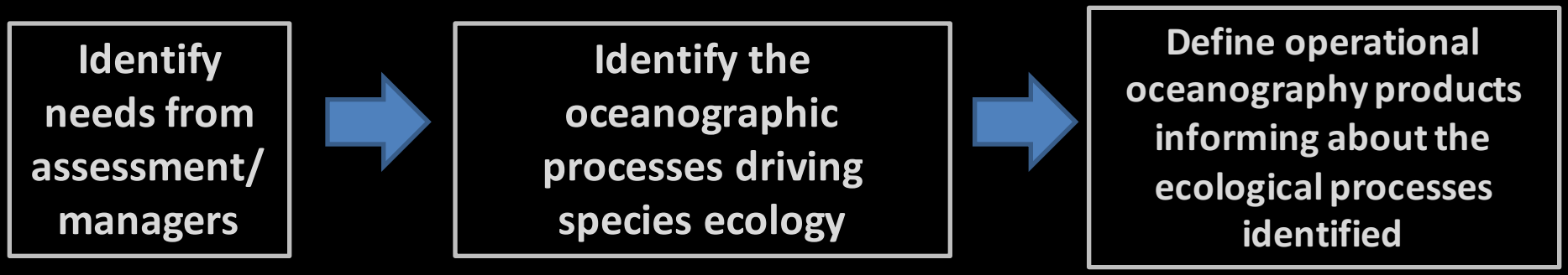
Summary

- IEO develops long time monitoring of bluefin tuna reproductive ecology in the Balearic Sea

- SOCIB develops operational oceanography services targeting fisheries assessment and management institutions

- Linking species ecology and operational oceanography allowed modeling spawning areas, applied for improving the quality of larval abundance estimations used for assessment by ICCAT

Three core elements for "Operational fisheries oceanography"



Thank you