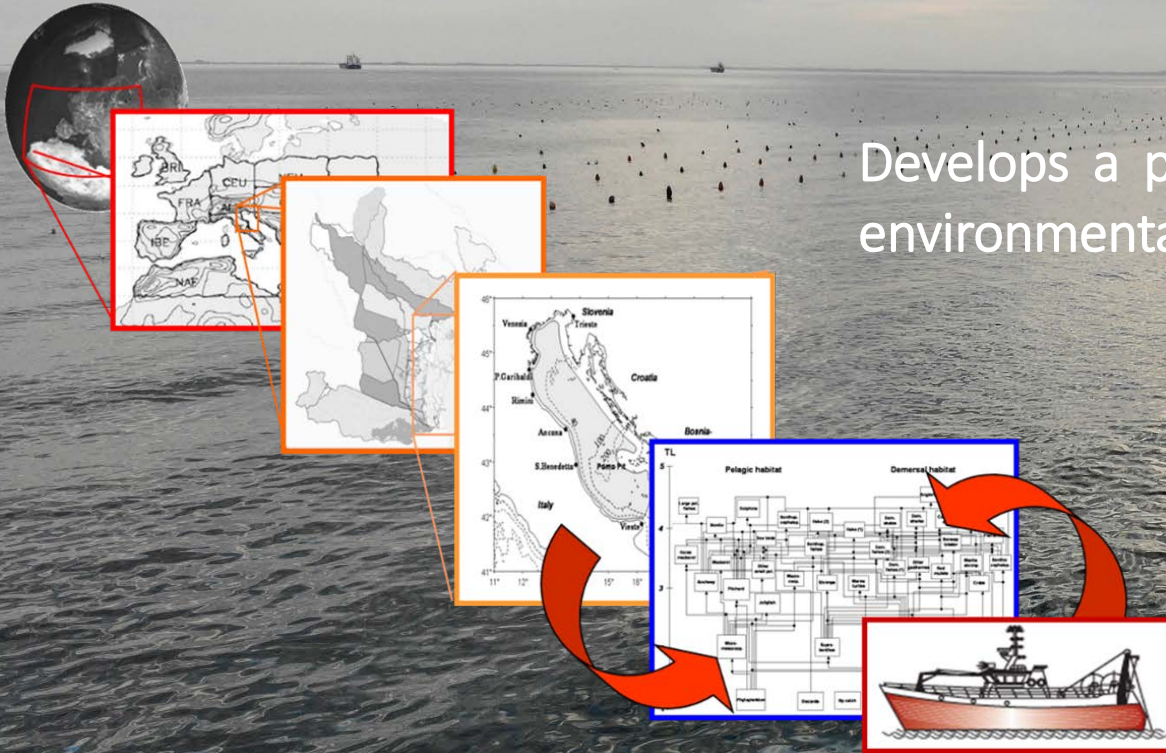


Develops a platform integrating economic, social and environmental aspects related to Adriatic fisheries



A science-based tool for supporting sustainable management of marine resources and for improving communication, participation, capacities useful to fisheries management

FAIRSEA

Fisheries in the Adriatic Region - a Shared Ecosystem Approach

Simone Libralato | OGS

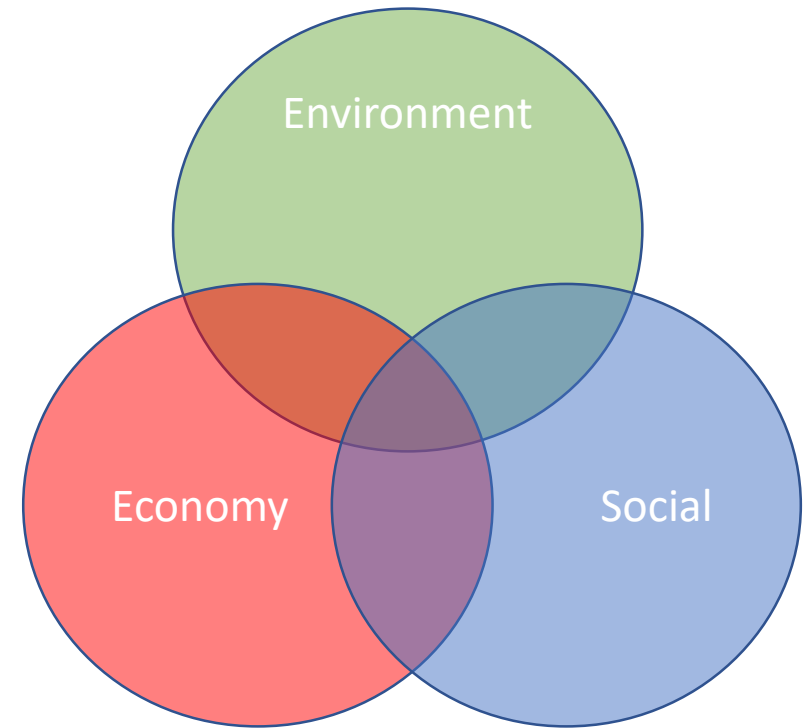
Transnational seminar for MEDITERRANEAN & BLACK SEA FLAGS - FARNET
26th November 2020



BACKGROUND

ECOSYSTEM APPROACH TO FISHERIES

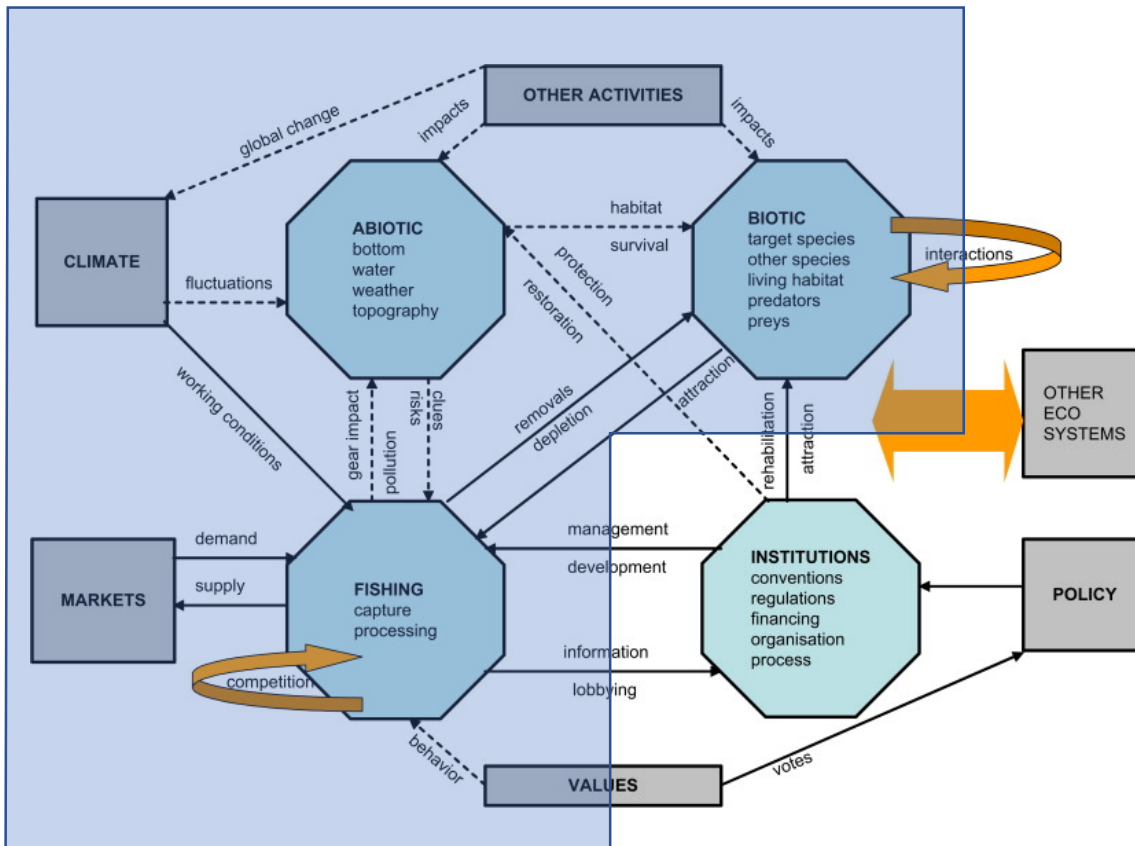
translate the economic, social and ecological policy goals and aspirations of sustainable development of EAF into operational objectives, indicators and performance measures (FAO guidelines)



“Clearly, economic and social objectives [of fisheries] will not be met while a stock is in such a depleted state that the long-term sustainability of the fishery is threatened, but equally, biological objectives are unlikely to be met without consideration being given to economic and social objectives.” Beddington et al., 2007, Science

FAIRSEA RATIONALE

A SHARED ECOSYSTEM APPROACH

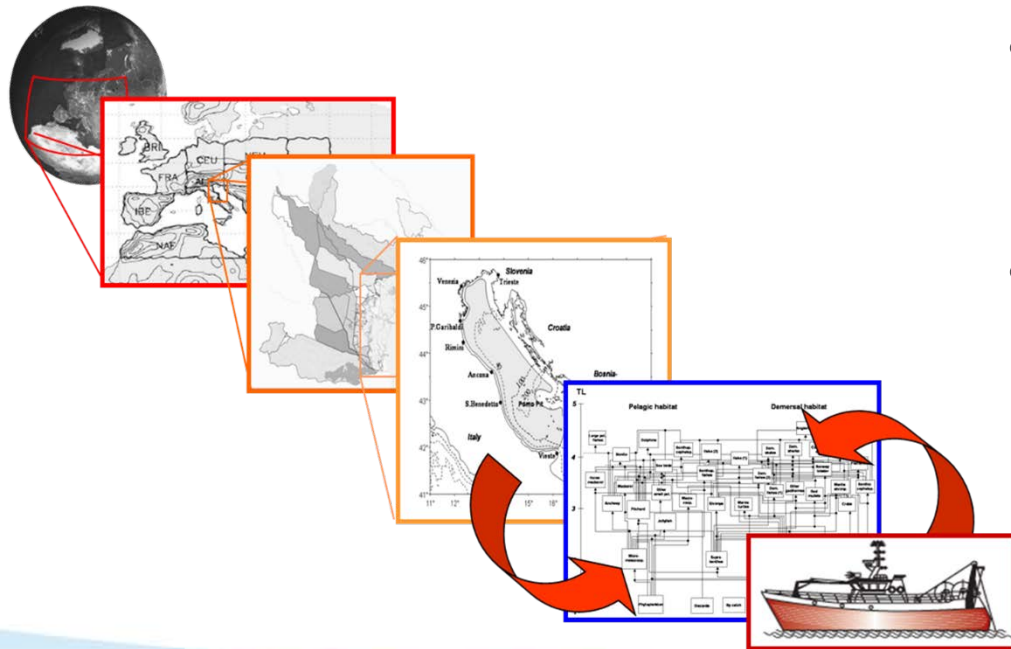


- **Aim:** increase fisheries productions within a sustainable framework or at least identifying ways that assure a more economically efficient and sustainable harvesting of marine resources
- **Method:** Transboundary and transdisciplinary development of a conceptual and applied approach that facilitate an harmonized and optimized management.
- **How:** developing collectively an integrated platform for sharing efforts, sharing data, sharing methods and test solutions. A tool contributing to developing fisheries management plans

THE PLATFORM

INTEGRATED DECISION SUPPORT TOOL

- **Integration of environmental variability.** Application of a transboundary and transdisciplinary approach that integrates physical, biochemical and biological processes
- **Multispecies, multigear approach.** Harmonized management can be achieved by going beyond single species and single gear approaches, and at the same time moving beyond boundaries.
- **Fisheries displacements and fisheries socioeconomic drivers** need to be included in the approach
- Moving toward an **operational application of the ecosystem approach to fisheries** useful for providing advice for management plans development

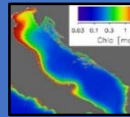


THE PLATFORM

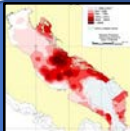
INTEGRATING PROCESSES (NOT only LAYERS)



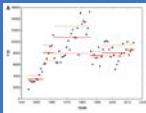
HYDRO
water circulation & connectivity



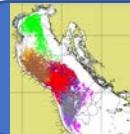
BGC
biogeochemical & plankton processes



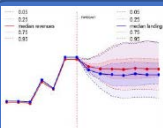
BSTAT
Distribution of resources



FSTAT
Catches and fleets statistics



EFFORT
Spatial distribution and dynamics



BIOECO
Bio-economic responses



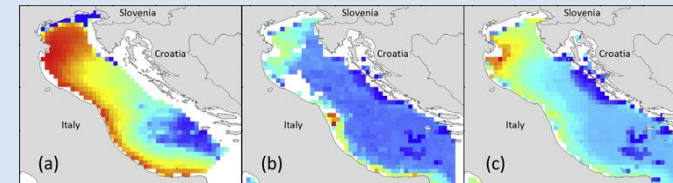
FWM
Food web dynamics

The platform is a spatially explicit dynamic tool integrating cornerstone elements for an ecosystem approach to fisheries



WP4

Integrated platform



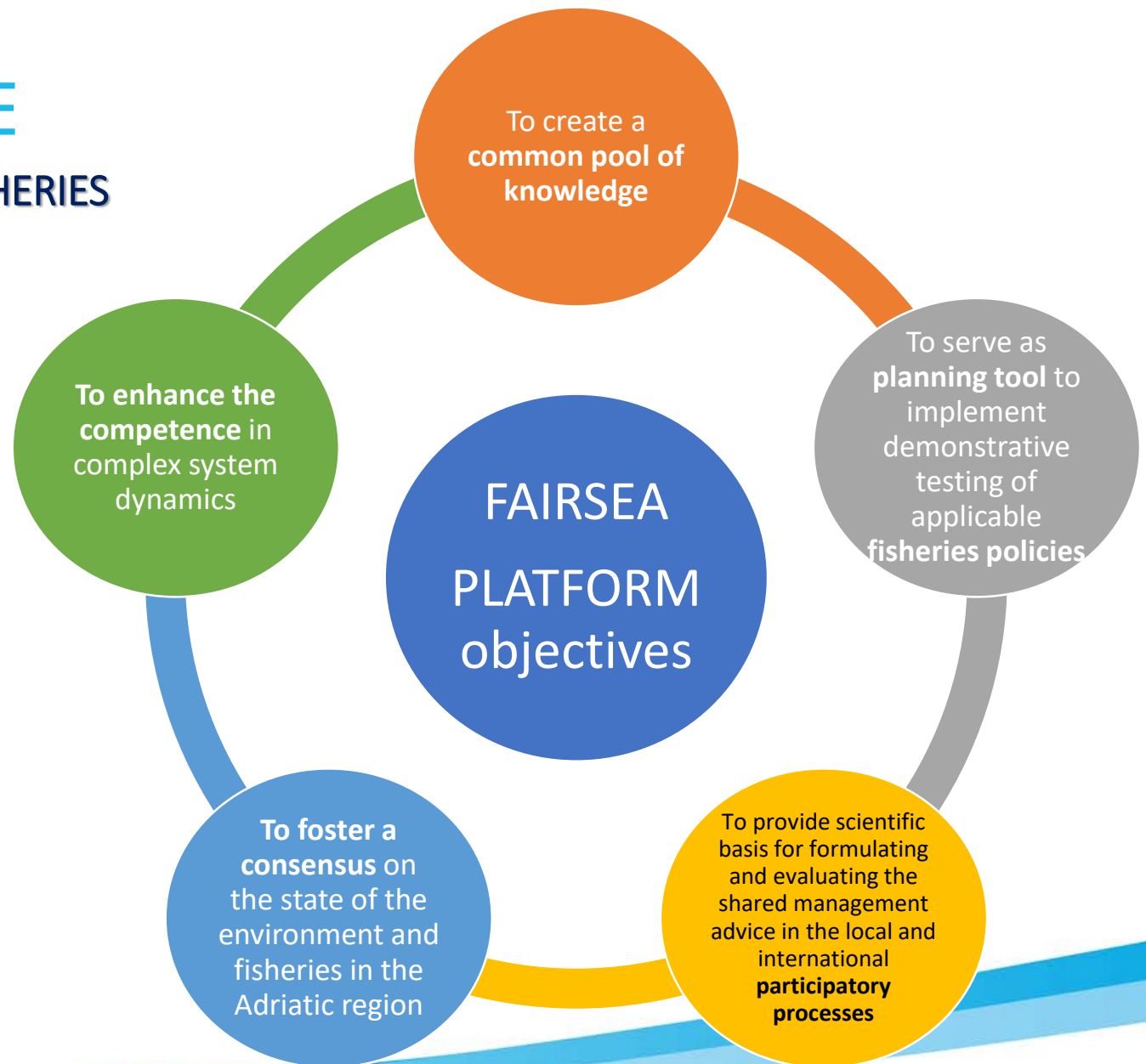
Spatio-temporal integration using modelling tool(s)



**Alternative management scenarios
Supporting management plans development**

A QUANTITATIVE ECOSYSTEM APPROACH TO FISHERIES

The main result of FAIRSEA will be the development of an INTEGRATED PLATFORM FOR A QUANTITATIVE ECOSYSTEM APPROACH TO FISHERIES that goes across territorial boundaries and involves several disciplines.



FAIRSEA Modules

search Filter

4.1 HYDRO – Hydrodynamic circulation and connectivity

This module contains the description of the physical properties of the Adriatic and Ionian basins provided by a multidecadal reanalysis of the Mediterranean Sea. In particular, describes the coupled physical-biogeochemical reanalysis modeling system and focuses on the physical (i.e., hydrodynamic) aspects, while the biogeochemical properties are presented in the module BGC. The analysis is based on the Copernicus physical and biogeochemical reanalysis, which covers the period 1999-2018. Data have a spatial resolution of 1/160, while the vertical discretization consists of 72 unevenly-spaced vertical levels (i.e., 3-5 m thick levels in the first 50 m, ~10 m at 100-150 m depth and 20-50 m between 200 and 2000 m). The data processed in the present report are available from the Copernicus Marine Environment Monitoring Service (hereafter CMEMS, <http://marine.copernicus.eu/>). The physical variables selected are temperature, salinity and the meridional and zonal component of the currents (these two variables can be used as a proxy of the connectivity). All the details about this module can be found in the Deliverable 4.4.1 (downloadable from OTHER OUTPUTS). Through a drop-down menu you can choose to view different vertical and temporal levels. The winter seasons is defined as the period encompassing January-February-March (JFM), spring as the period encompassing April-May-June (AMJ), summer as the period encompassing July-August-September (JAS), fall as the period encompassing October-November-December (OND). The temporal averages have been computed considering the following vertical averaged levels: 0-50 m, 50-100 m, 100-200 m, 200-500 m and 500-800 m.

4.2 BGC – Biogeochemical processes and dynamics

This module contains the description of biogeochemical properties of the Adriatic and Ionian basins provided by a multidecadal reanalysis of the Mediterranean Sea. In particular, describes the coupled physical-biogeochemical reanalysis modeling system and focuses on the biogeochemical aspects, while the physical properties are presented in the module HYDRO. The analysis is based on the Copernicus physical and biogeochemical reanalysis, which covers the period 1999-2018. Data have a spatial resolution of 1/160, while the vertical discretization consists of 72 unevenly-spaced vertical levels (i.e., 3-5 m thick levels in the first 50 m, ~10 m at 100-150 m depth and 20-50 m between 200 and 2000 m). The data processed in the present report are available from the Copernicus Marine Environment Monitoring Service (hereafter CMEMS, <http://marine.copernicus.eu/>). The biogeochemical variables selected are chlorophyll-a, dissolved nitrogen (DIN), phosphate (NIP), dissolved oxygen (both in water column and on bottom), phytoplankton carbon biomass (PC), zooplankton carbon biomass (ZC), particulate organic carbon or POC, pH and net primary production (ppn). All the details about this module can be found in the Deliverable 4.2.1 (downloadable from OTHER OUTPUTS). Through a drop-down menu you can choose to view different vertical and temporal levels. The winter seasons is defined as the period encompassing January-February-March (JFM), spring as the period encompassing April-May-June (AMJ), summer as the period encompassing July-August-September (JAS), fall as the period encompassing October-November-December (OND). The temporal averages have been computed considering the following vertical averaged levels: 0-50 m, 50-100 m, 100-200 m, 200-500 m and 500-800 m.

4.3 BSTAT – Spatial distribution of marine resources (GSA17)

The main objective of this sub-module is to produce a database of standardised indices and maps of commercial species distribution at different levels, estimating the time series of a wide set of population state-indicators for the selected number of species. Diff. OTHER OUTPUTS section. Standardization process results are available only for some target species using MEDITS or SOLE.

4.3 BSTAT – Spatial distribution of marine resources (GSA18)

The main objective of this sub-module is to produce a database of standardised indices of commercial species distribution in different levels, estimating the time series of a wide set of population state-indicators for the selected number of species. Diff. OTHER OUTPUTS section. Standardization process results are available only for some target species using MEDITS survey data.

4.3 BSTAT – Spatial distribution of marine resources (GSA19)

The main objective of this sub-module is to produce a database of standardised indices of commercial species distribution in different levels, estimating the time series of a wide set of population state-indicators for the selected number of species. Diff. OTHER OUTPUTS section. Standardization process results are available only for some target species using MEDITS survey data.

4.4 FSTAT – Fisheries production and capacity

This module contains a dataset (D4.4.1 Annex downloadable from OTHER OUTPUTS) including information for the last decade.

Interreg Italy - Croatia FAIRSEA EUROPEAN UNION

Fisheries in the Adriatic Region – a Shared Ecosystem Approach

The FAIRSEA is a European Territory Cooperation project financed under the priority 1 "Blue innovation". Specific Objective 1.1 "Enhance the framework conditions for innovation in the relevant sectors of the blue economy within the cooperation area" of the INTERREG V-A Italy-Croatia Programme 2014-2020. The project focuses on the fisheries sector, key driver for the blue growth of the Adriatic communities, towards a sustainable co-management of resources and marine ecosystem protection. The transboundary nature of marine resources requires a cross-border cooperation and a shared "Vision" to properly tackle and address the different socio-economic and environmental challenges related to fisheries activities management. In this context, FAIRSEA Project aims at enhancing transnational capacity and cooperation in order to promote the sharing of knowledge and good practices between regional and transnational key actors in the sector of sustainable fisheries management in the Adriatic Sea as well as to implement innovative approaches adopting an ecosystem approach to fisheries (EAF). Coordinated by the OGS of Trieste (IT), the project involves a consortium of 12 strategic and operational partners from Italy and Croatia that will make to best use of their complementary expertise to address and support the application of the EAF ensuring a strong and interactive engagement of institutional, technical and socio-economic stakeholder project activities.

FAIRSEA integrated platform^{v. 0.8}

The main result of the FAIRSEA Project will be the development of an integrated platform for a quantitative ecosystem approach to fisheries that goes across territorial boundaries and across several disciplines. The platform will integrate biological/ecological processes (i.e. considering water mass circulation, physical-chemical properties, plankton productivity, dynamics of resources including their interactions) and fisheries bio-economic dynamics (including fisheries displacement). This high technological and innovative platform will be used as a planning tool to implement demonstrative testing of applicable fisheries policies both at local (subareas) and Adriatic scales. It will provide a scientific basis for formulating and evaluating the shared management advice in the local and international participatory processes, involving management authorities, experts and stakeholders. The Project will also provide an answer to the need of reference points, best practices and guidelines for the optimisation between ecological and socio-economical sustainability of fisheries in the Adriatic Sea.

Platform access

Username

Password

Login

Lost Password?

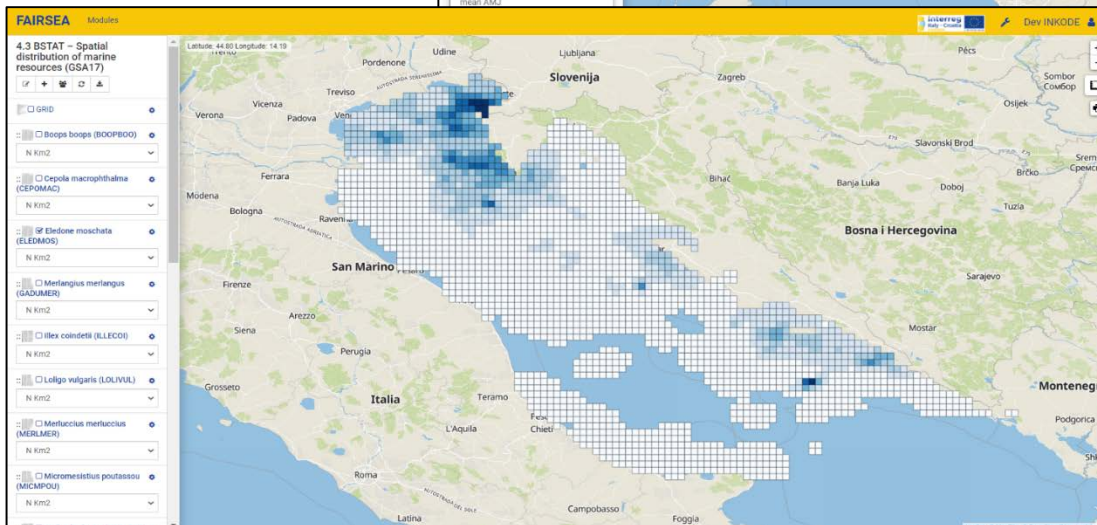
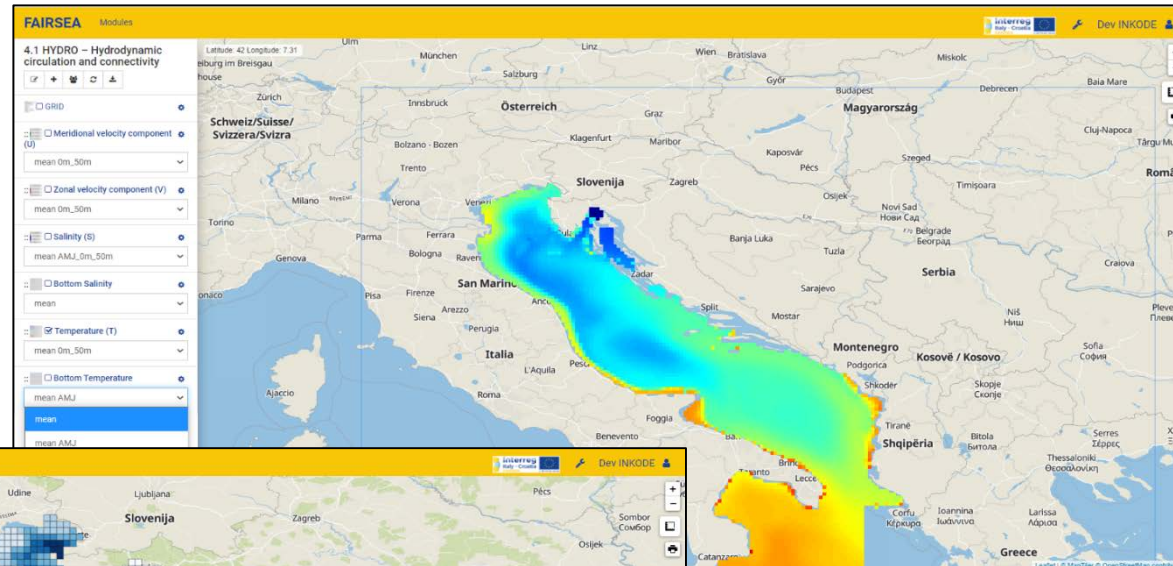
FAIRSEA is financed by Interreg V-A ITR CBC Programme (Priority Axis 1 – Blue Innovation)
 Project budget: € 2 060 000 (ERDF+national co-financing)
 Programme co-financing: € 1 751 000 (ERDF)
 Start date: 01 January 2019
 End date: 28 February 2021
 FAIRSEA website
 FAIRSEA Facebook page

Share knowledge and data

For an ECOSYSTEM APPROACH TO FISHERIES

To create a
common pool of
knowledge

FAIRSEA
PLATFORM
objectives



Participatory approach

On ECOSYSTEM APPROACH TO FISHERIES



FAIRSEA
PLATFORM
objectives

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To provide scientific
basis for formulating
and evaluating the
shared management
advice in the local and
international
**participatory
processes**

IVORY TOWER?

NO: PARTECIPATORY APPROACH!

Developing the platform also through (your) involvement as a way to:

Share objectives to reduce the risk to make something useless;

Identify the perceived important factors to be embedded;

Decide together scenarios to test;

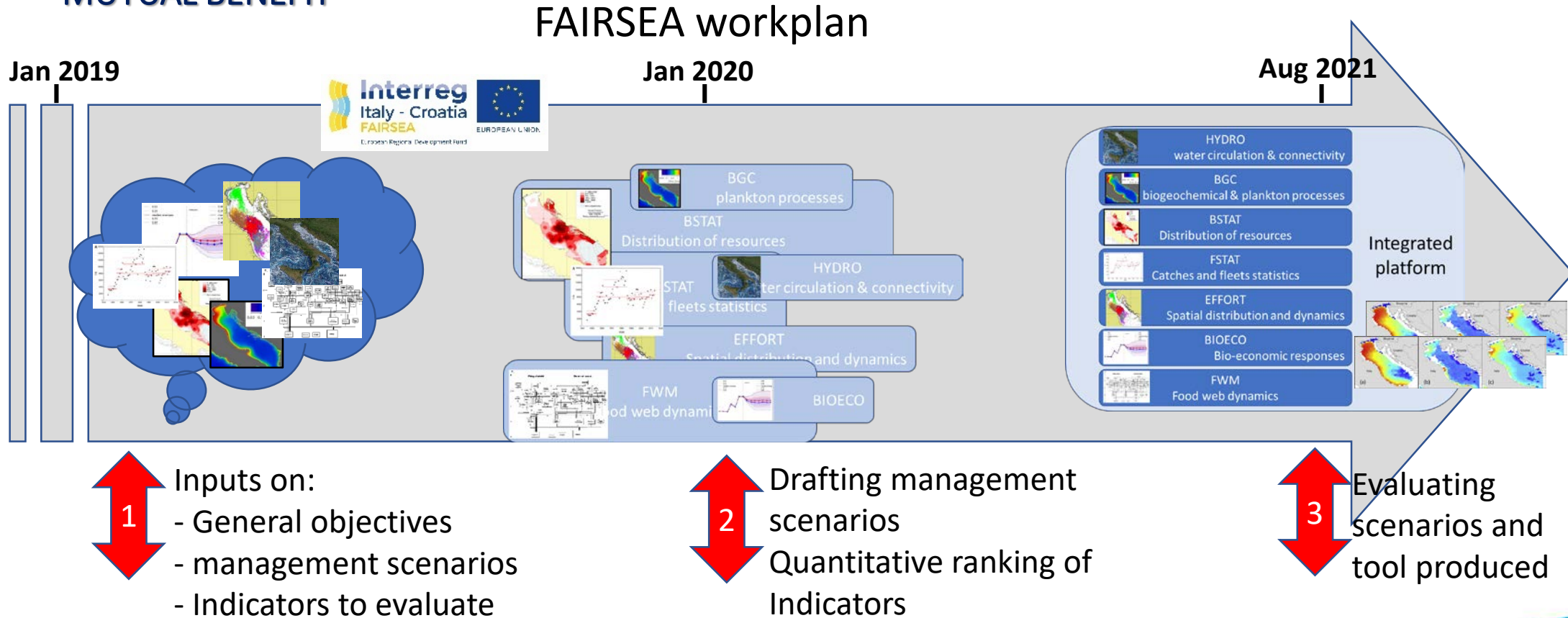
Evaluate results



PARTECIPATORY APPROACH

MUTUAL BENEFIT

The platform development can be a mutual occasion



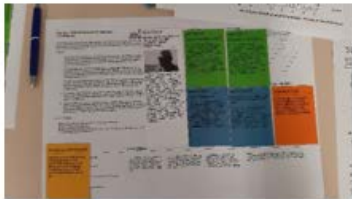
STAKEHOLDERS

Develop tools for discussion

On ECOSYSTEM APPROACH TO FISHERIES

Discussion game usage

13 Sept 2019, Master Sustainable blue growth, Trieste



Upcoming events using FAIRSEA playdecide

<https://playdecide.eu/playdecide-kits/167469>

Enhance the competence in complex system dynamics

FAIRSEA PLATFORM objectives

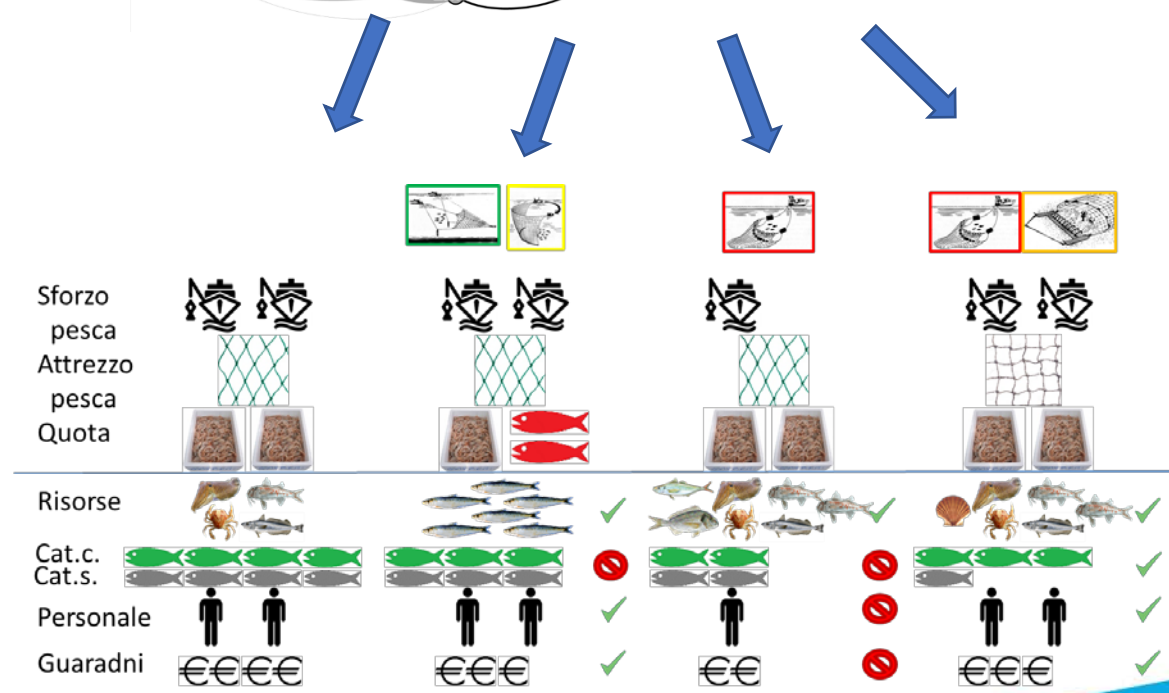
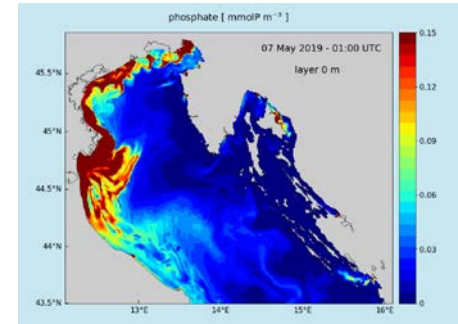
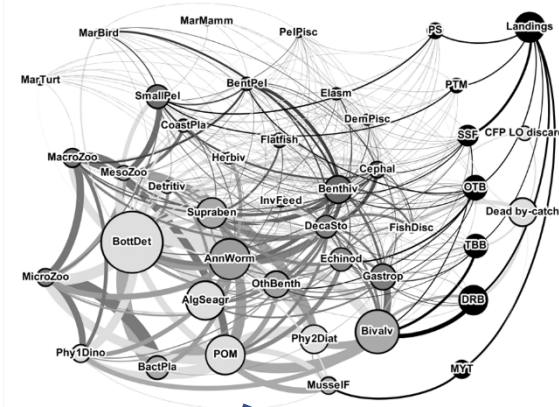
To foster a consensus on the state of the environment and fisheries in the Adriatic region

T
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Move toward an integrated decision support tool

On ECOSYSTEM APPROACH TO FISHERIES



Increasing capacities

On ECOSYSTEM APPROACH TO FISHERIES

To enhance the competence in complex system dynamics

FAIRSEA
PLATFORM
objectives



AMARE-MED 2019

First advanced school on quantitative methods for ecosystem approach to fisheries application

Single and multispecies approaches for data rich and data limited conditions

DESCRIPTION

The 1st offering of the FAIRSEA school will include in-depth investigation of options for data-limited situations using the FishPath decision support tool, developed at The Nature Conservancy, in conjunction with CSIRO and NOAA, and of single and multispecies models using CEATTLE developed at NOAA. The course is highly technical, with practical hands-on computer activities, assignments and programming. Candidates must apply through the online form and will be selected (max 30) on the basis of expertise, skills, interest. Candidates from the CBC Italy-Croatia programme area will be supported by the project. During the course, an introduction to Monte-Carlo methods for data-limited stock assessment (e.g., CMSY, AMSY) will be given.

KEYNOTE SPEAKERS



André PUNT
School of Aquatic and Fishery Sciences
(Seattle, USA)

Natalie DOWLING
CSIRO
(Tasmania, Australia)

Gianpaolo CORÒ
CNR
(Pisa, Italy)

VENUE: Istituto Veneto di Scienze, Lettere ed Arti (IVSLA), Venezia

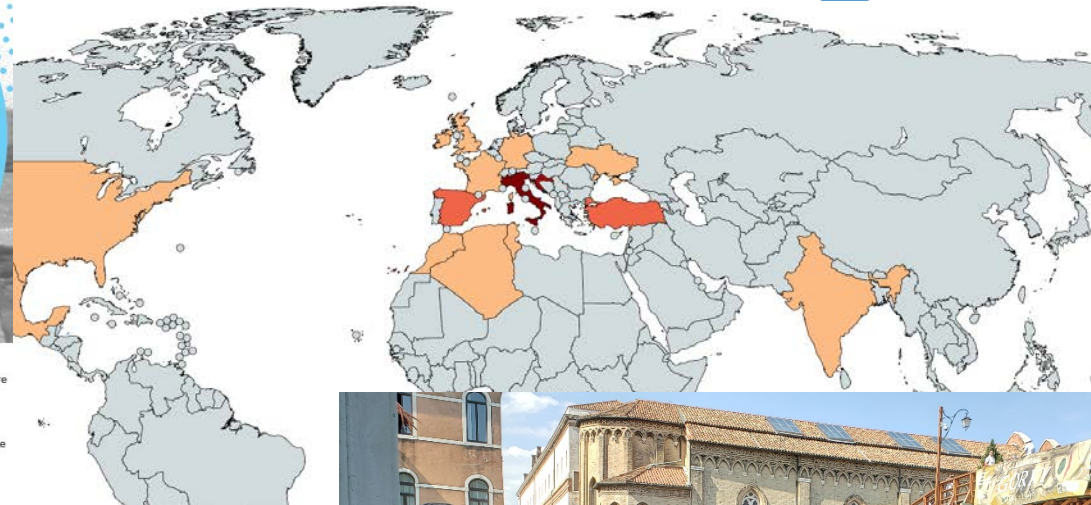
ORGANIZING COMMITTEE
Simone Libralato, Davide Agnetta, Giuseppe Scarcella

SCIENTIFIC COMMITTEE

Simone Libralato (OGS), Angelo Bonanno (CNR), Roberto Carlucci (CONISMA), Piera Carpi
Francesco Colloca (CNR), Fabio Fiorentino (CNR), Tomaso Fortibuoni (ISPRA)
Marino Gatto (PoliTecnico Milano, IVSLA), Marco Marani (Univ. Padua, IVSLA),
Saša Raičević (ISPRA), Giuseppe Scarcella (CNR), Svijetlana Krstulović Šifner (Univ. Split), Cosimo Solidoro (OGS)
Maria Teresa Spedicato (COISPA)
Nedo Vrgoc (IOF)

- WHEN
01-06 July 2019
- WHERE
Venice (Italy)
- INFO & REGISTRATION
<http://echo.inoga.it/amare-med>
- APPLICATION DEADLINE
15 April 2019

CONTACTS
ECHO Group at OGS
(D. Agnetta, S. Libralato)
Email: echo@ogs.trieste.it



European Regional Development Fund

Increasing public awareness

On fisheries issues



Competence in complex system dynamics

FAIRSEA PLATFORM objectives

To foster a consensus on the state of the environment and fisheries in the Adriatic region



Learning through gaming

On complexity of marine ecosystems and fisheries issues



Enhance the competence in complex system dynamics

FAIRSEA PLATFORM objectives

To foster a consensus on the state of the environment and fisheries in the Adriatic region

To build a shared vision and address

-  2-4 players
-  8+ years
-  45 min




THANKS for the attention


Istituto Nazionale di Oceanografia e di Geofisica Sperimentale – OGS
(National Institute of Oceanography and Applied Geophysics – OGS)
Section Oceanography
ECHO Group Ecology and Computational Hydrodynamics in Oceanography



Simone Libralato, FAIRSEA project coordinator

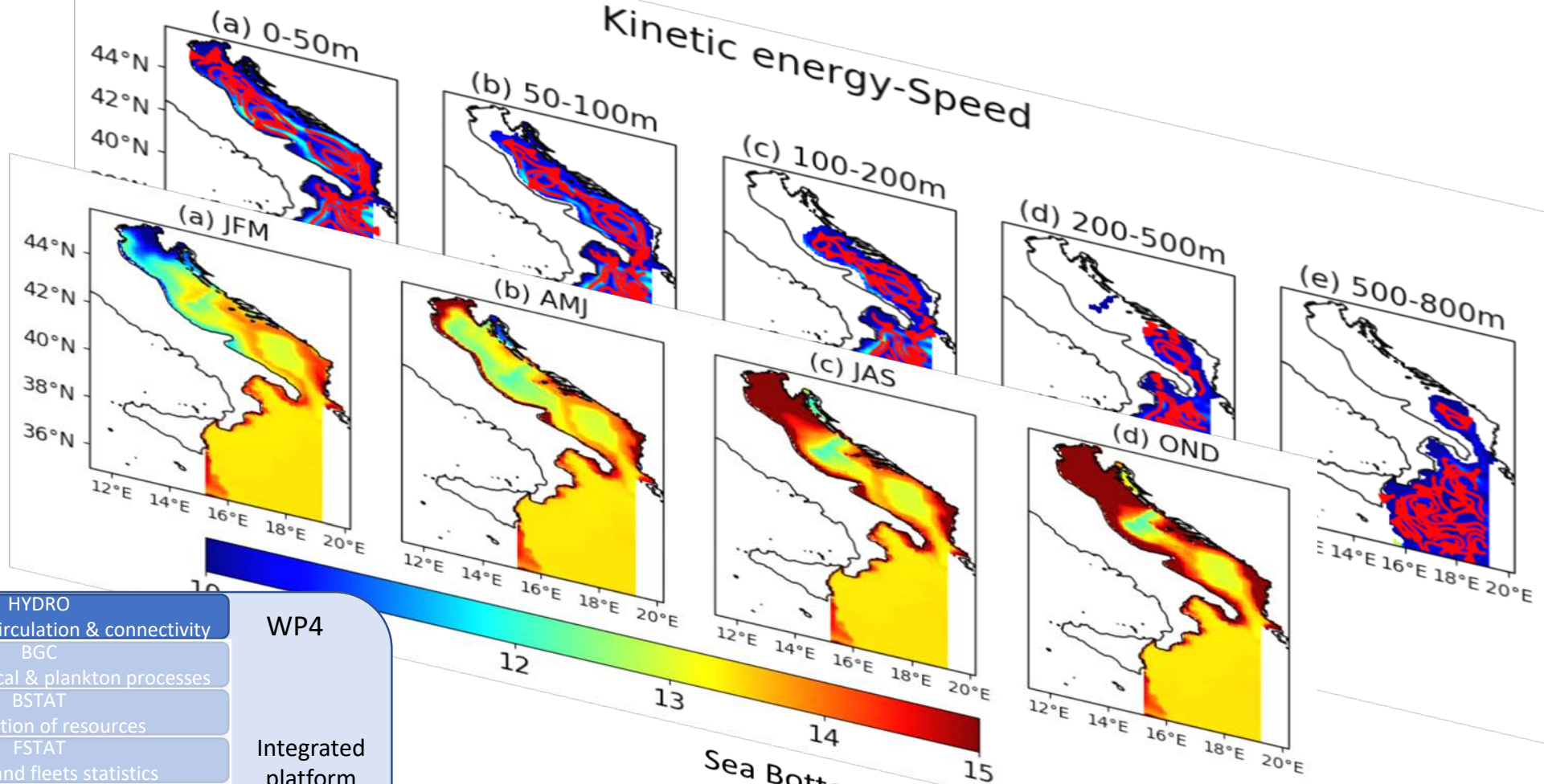
 Via Beirut 2/4, 34151, Trieste, Italy

 slibralato@inogs.it








 +39 040 2140628

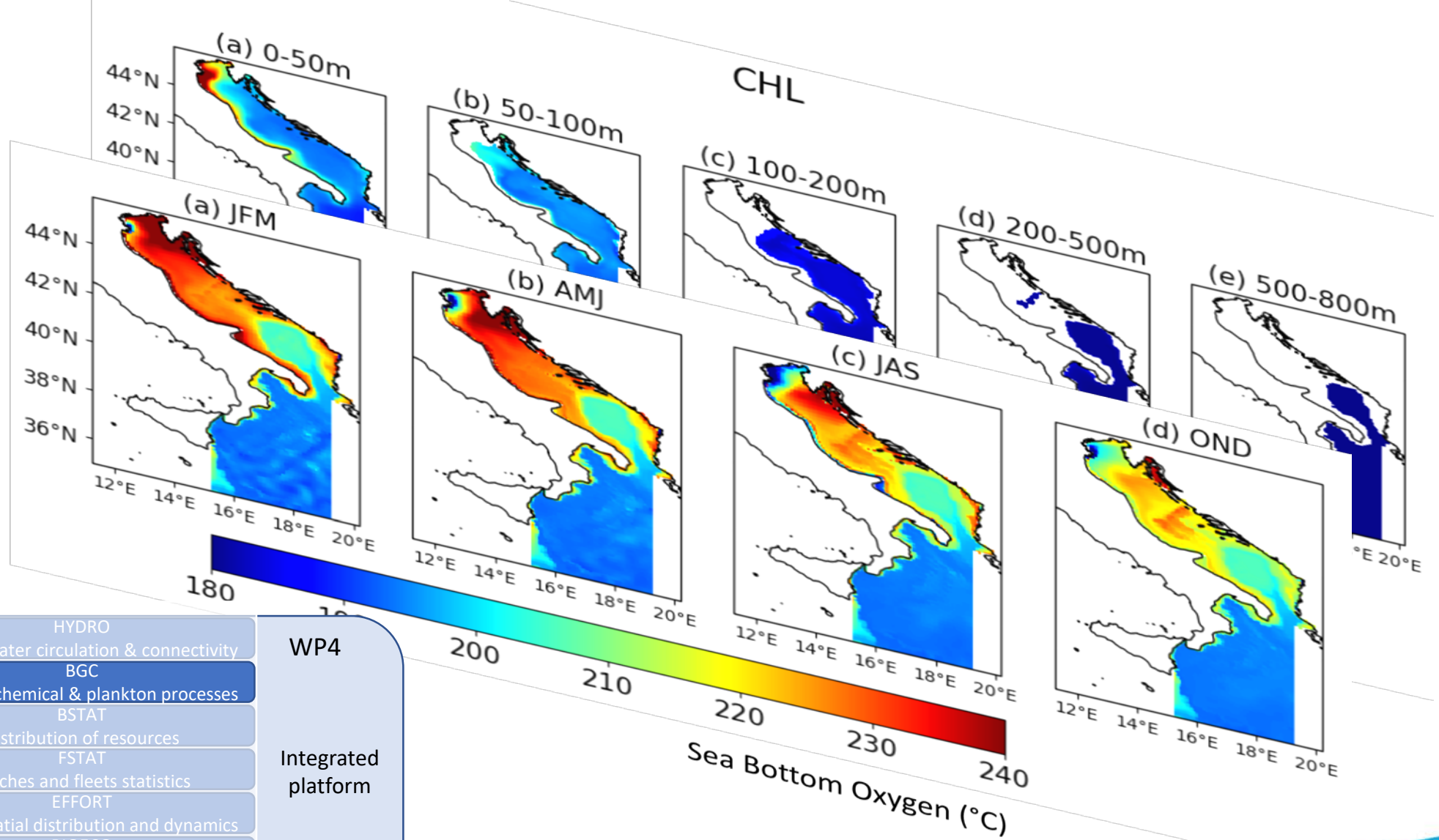
 www.inogs.it
www.italy-croatia.eu/fairsea

Kinetic energy-Speed

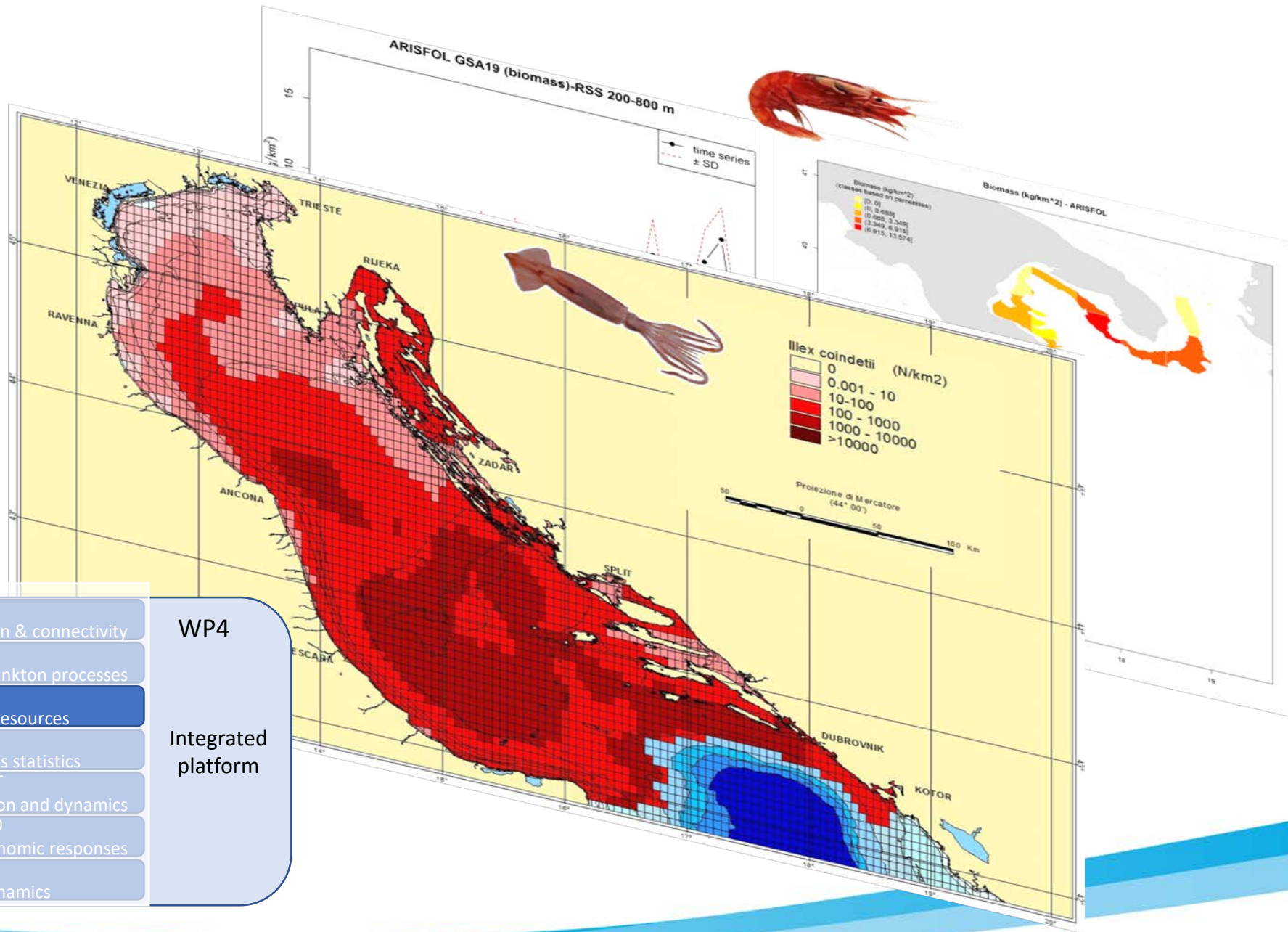


Sea Bottom temperature (°C)

	HYDRO water circulation & connectivity	WP4
	BGC geochemical & plankton processes	
	BSTAT Distribution of resources	Integrated platform
	FSTAT Catches and fleets statistics	
	EFFORT Spatial distribution and dynamics	
	BIOECO Bio-economic responses	
	FWM Food web dynamics	



	HYDRO water circulation & connectivity	WP4
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WP4

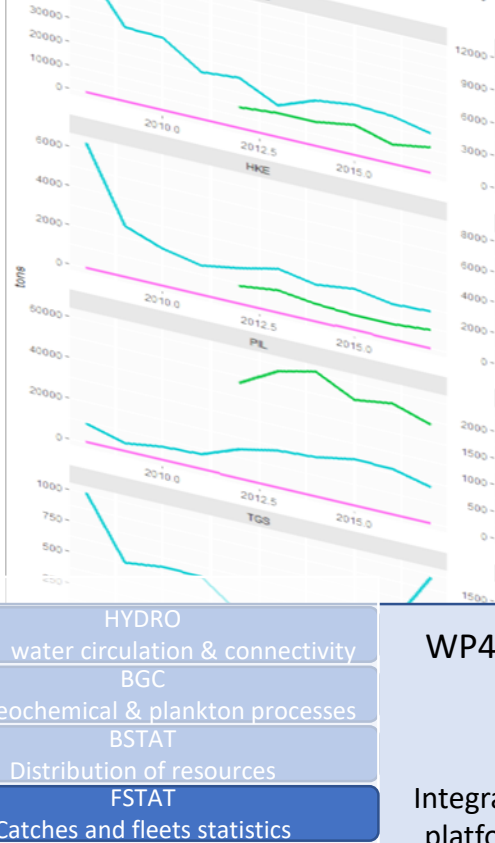
Integrated platform

- HYDRO
water circulation & connectivity
- BGC
geochemical & plankton processes
- BSTAT**
Distribution of resources
- FSTAT
Catches and fleets statistics
- EFFORT
Spatial distribution and dynamics
- BIOECO
Bio-economic responses
- FWM
Food web dynamics

GSA 17 Landings (euro) by Target Species and Fishing Technique
Source: STECF 19-06 AER



GSA 17 Landings (tons) by Target Species and Country
Source: STECF 19-06 AER



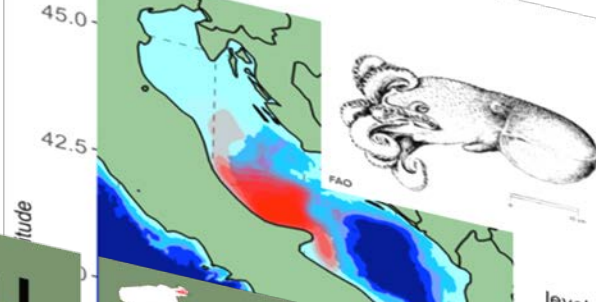
COUNTRY
CYP
ESP
HRV
ITA
MLT
SVN

WP4

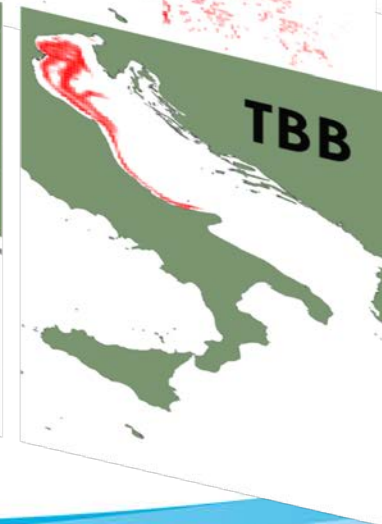
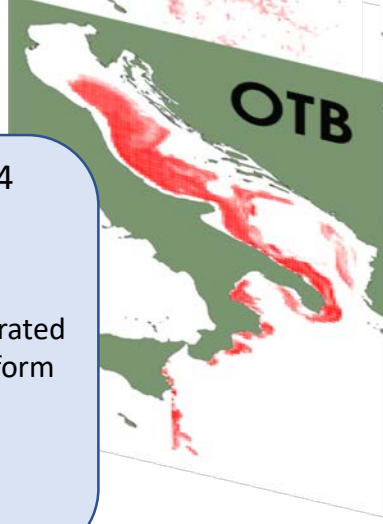
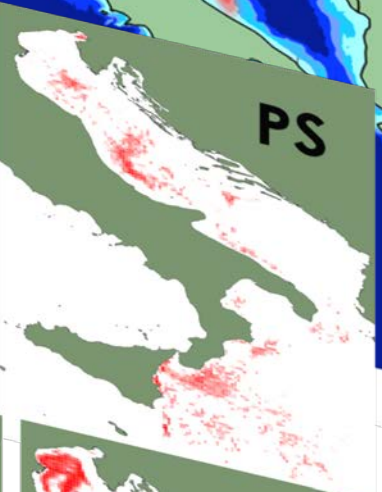
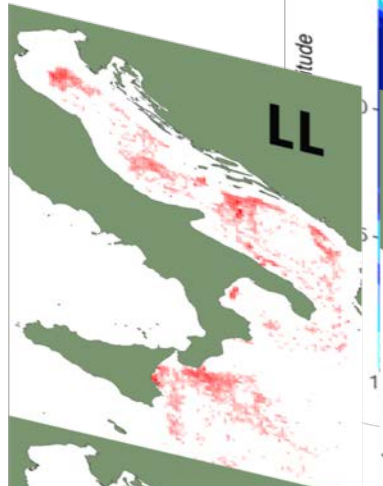
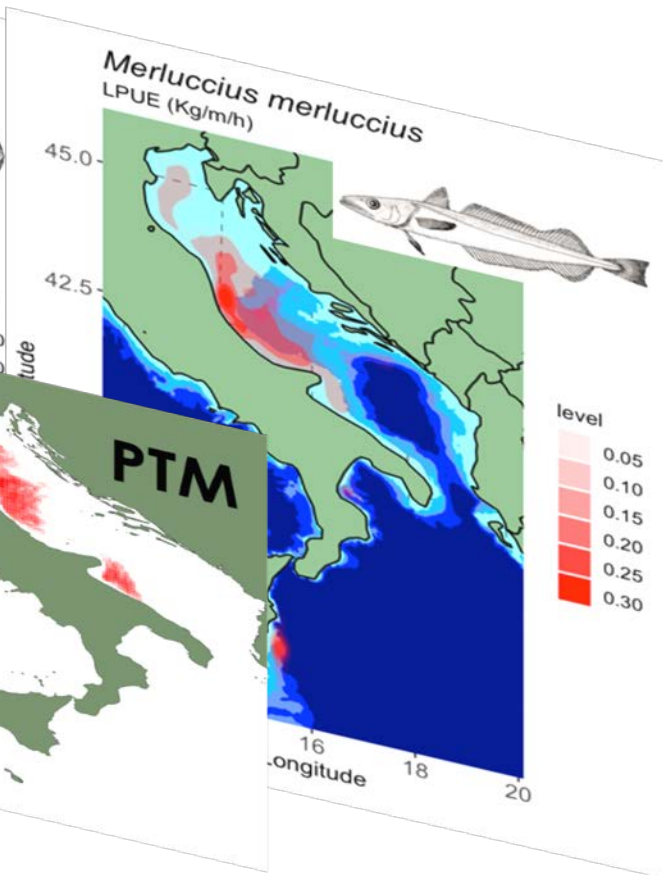
Integrated platform

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Spatial distribution and dynamics
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Bio-economic responses
- FWM
Food web dynamics

Eledone cirrhosa
LPUE (Kg/m/h)










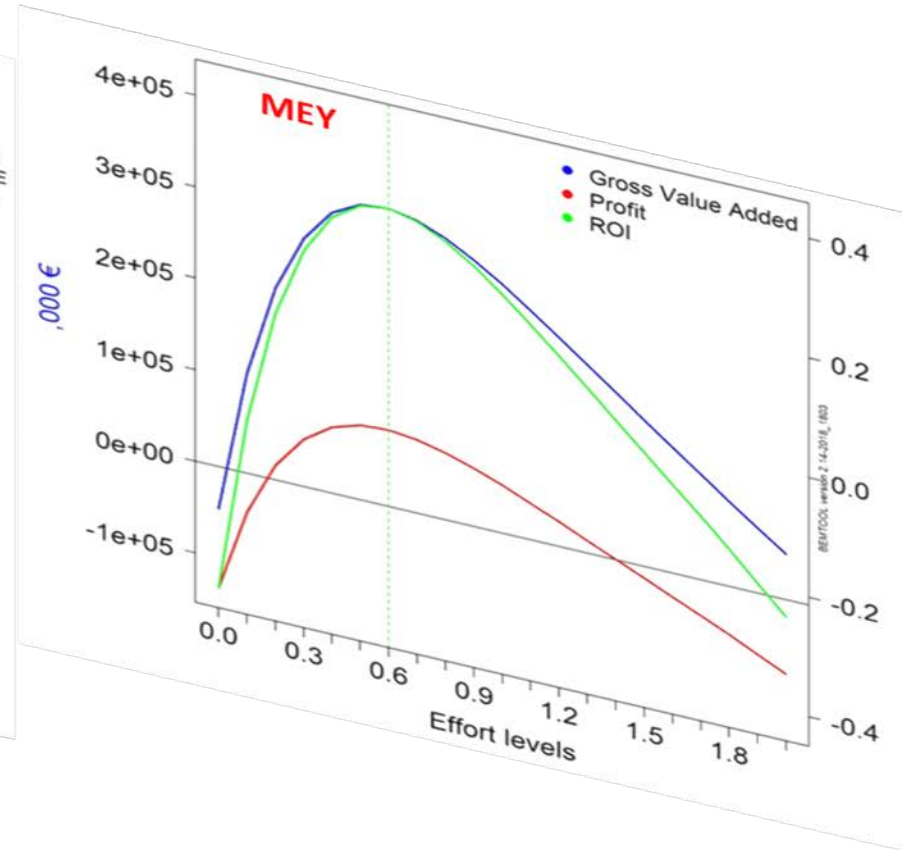
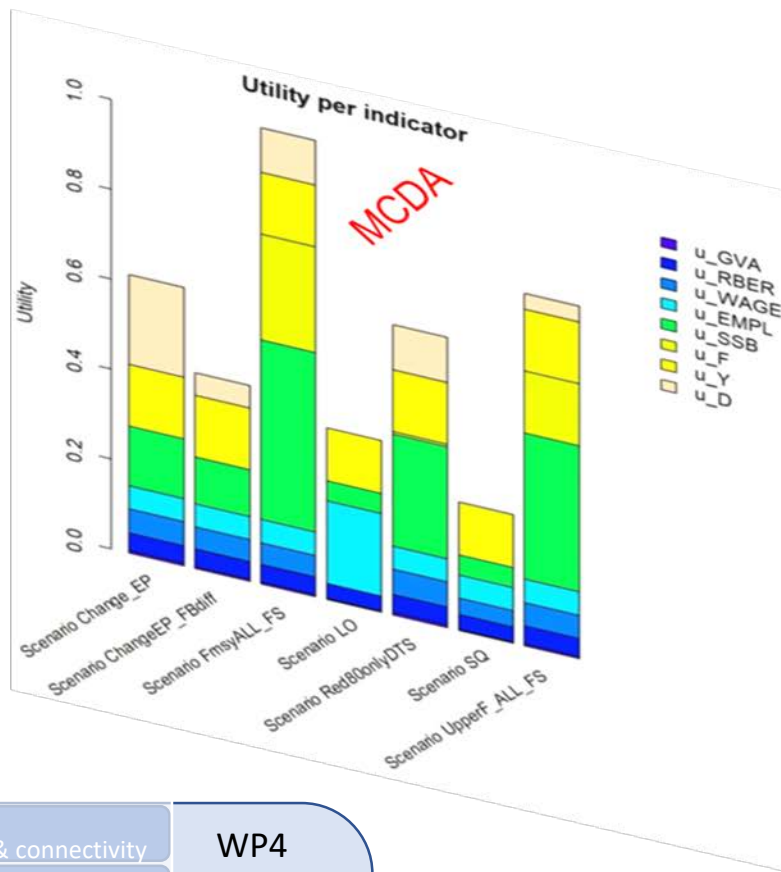
Merluccius merluccius
LPUE (Kg/m/h)



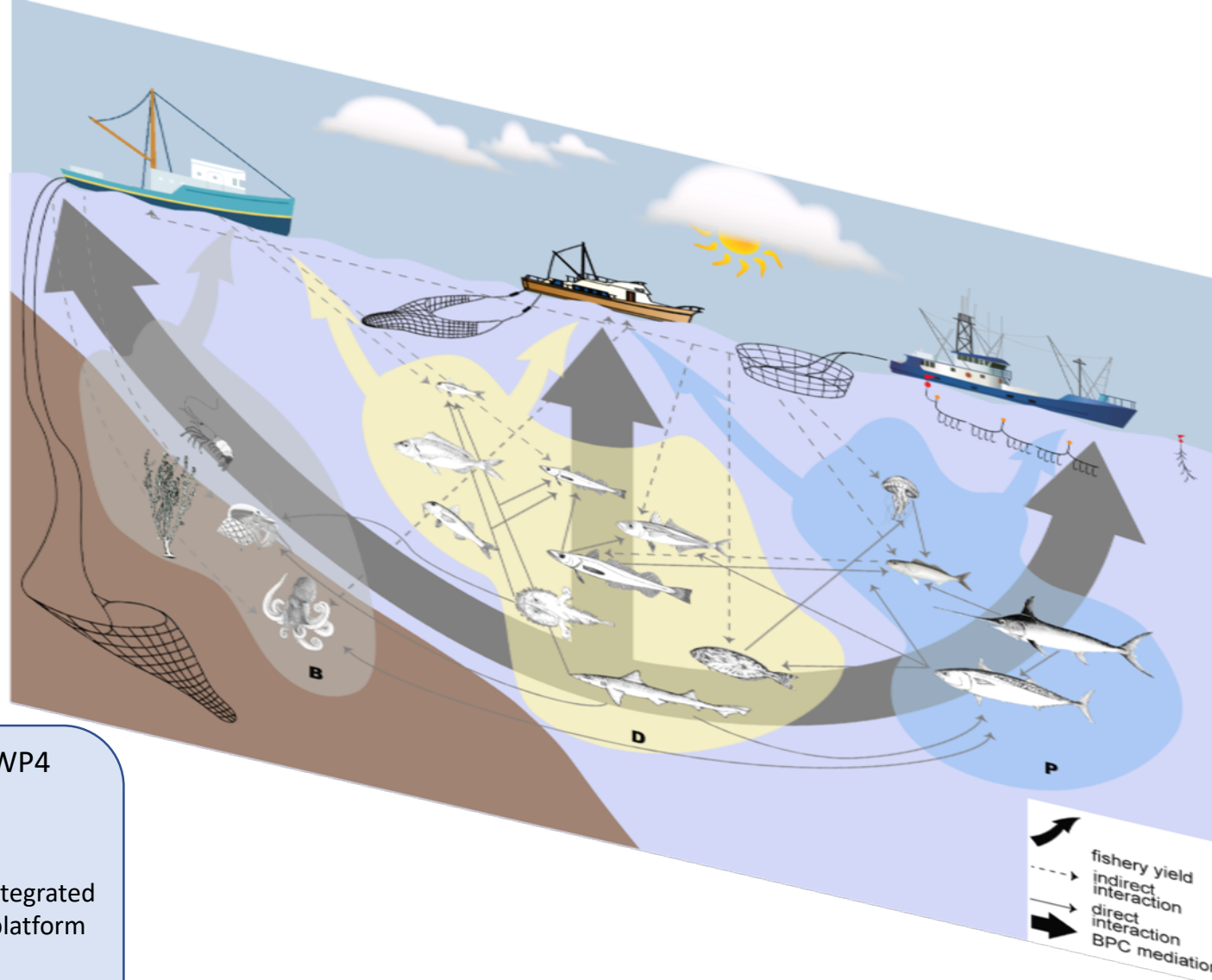
WP4

Integrated platform

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water circulation & connectivity
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







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WP4

Integrated platform

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Food web dynamics

FAIRSEA

Fisheries in the Adriatic Region - a Shared Ecosystem Approach

2014 - 2020 Interreg V-A

Italy - Croatia CBC Programme

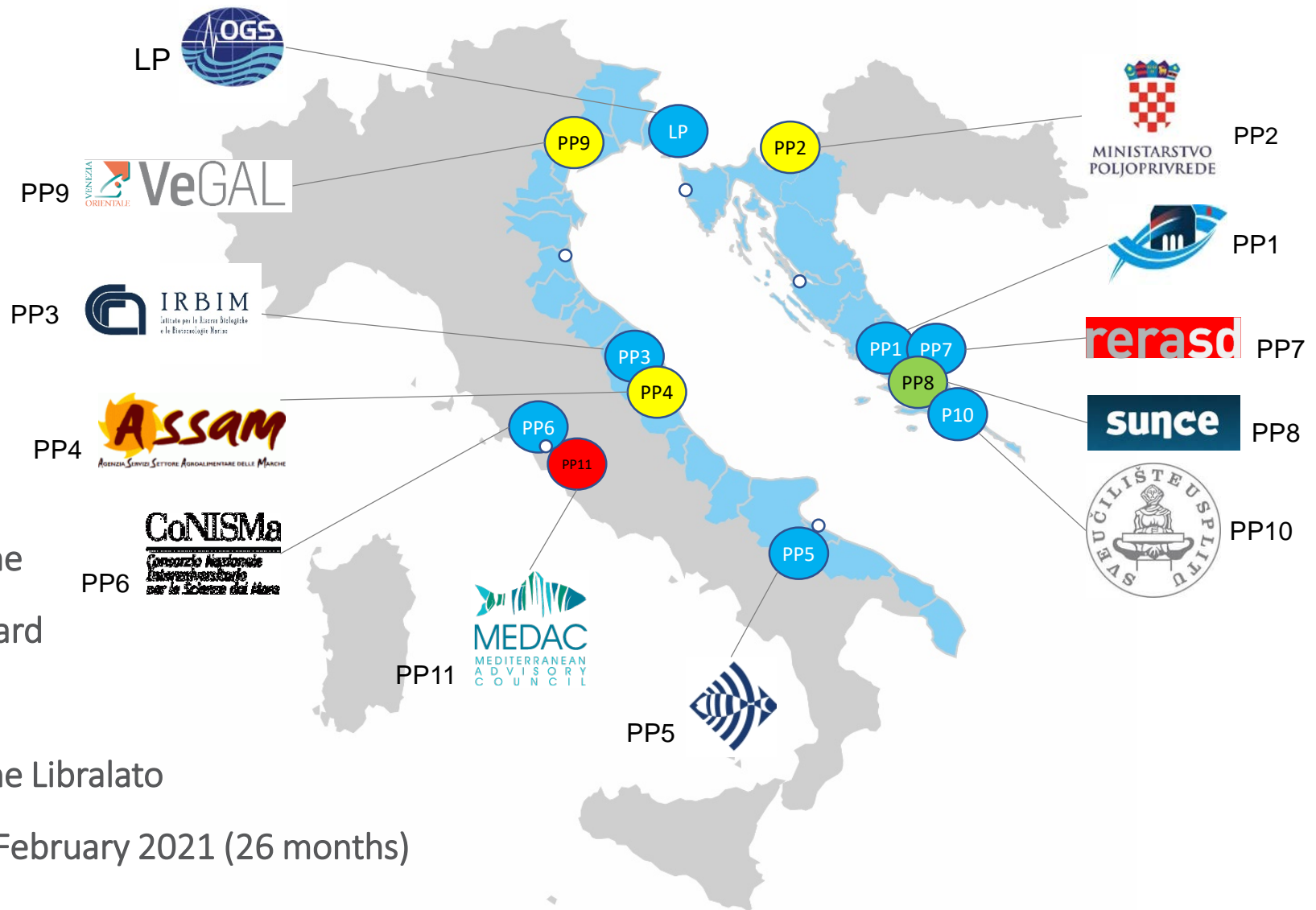
Call for proposal 2017 Standard

Leading partner: OGS

Scientific Responsible: Simone Libralato

Duration: January 2019 end February 2021 (26 months)

Total budget: 2.060.00,00 Euro



BACKGROUND

STATE OF ADRIATIC FISHERIES

- Stock assessments (STECF and SAC-GFCM) indicates critical status for assessed pelagic and demersal resources
- Landings variability due to several factors (environmental factors, long term changes, exploitation effects, regulations, etc).
- Establishment of large Fisheries regulated area (Pomo pit)
- Multi-target multi-gear fisheries



FAIRSEA GENERAL OBJECTIVES

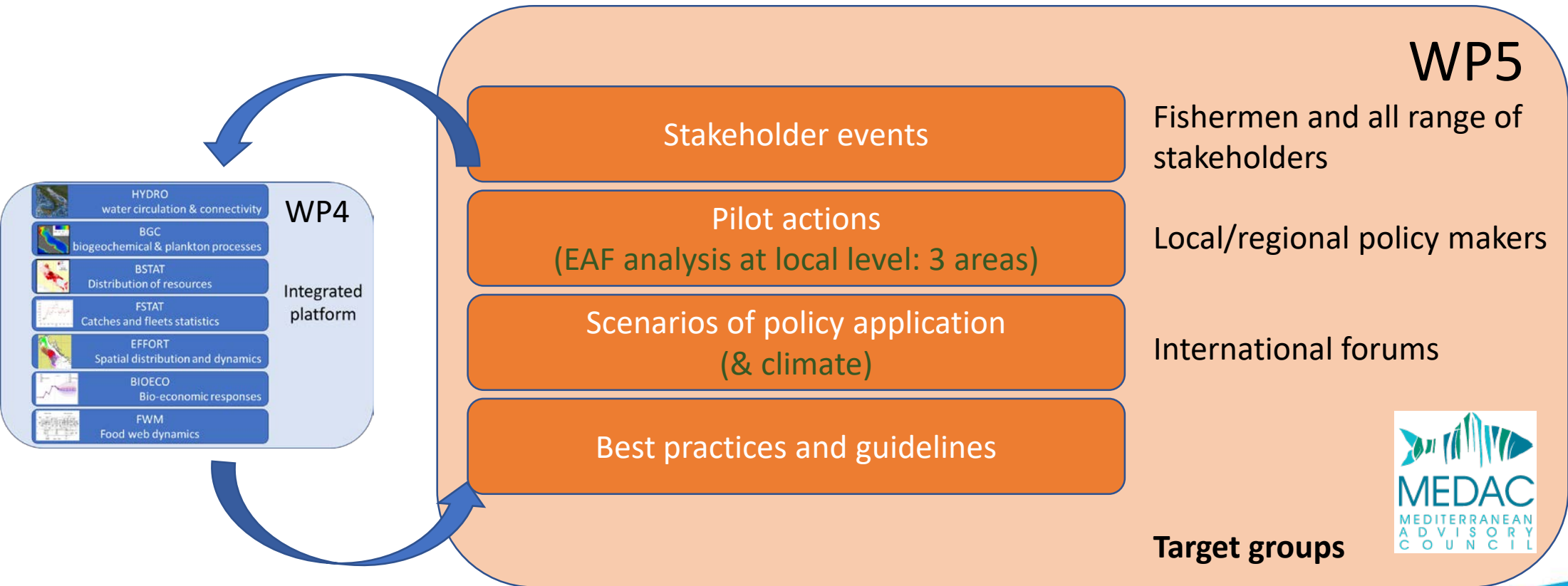
DEVELOP INTEGRATED UNDERSTANDING

- Develop a spatially explicit science-based shared integrated platform that will constitute an innovative and applied framework in the Adriatic region for **management and planning management**. The platform that will allow to share expertise, create a common pool of knowledge, boost the operational application of the ecosystem approach to fisheries, enhance the competence in complex system dynamics, foster a consensus on the state of the environment and fisheries in the region, evaluate management alternatives to support management plans.
- **Enhancing transnational capacity and cooperation** in the field of an ecosystem approach to fisheries in the Adriatic region by exchanging knowledge and **sharing good practices among partners and beyond**. The best way to reach sustainability, in fact, is **to ensure stakeholders' participation in the process** that requires time, trust, transparency and efficient steering.

STAKEHOLDER ENGAGEMENT

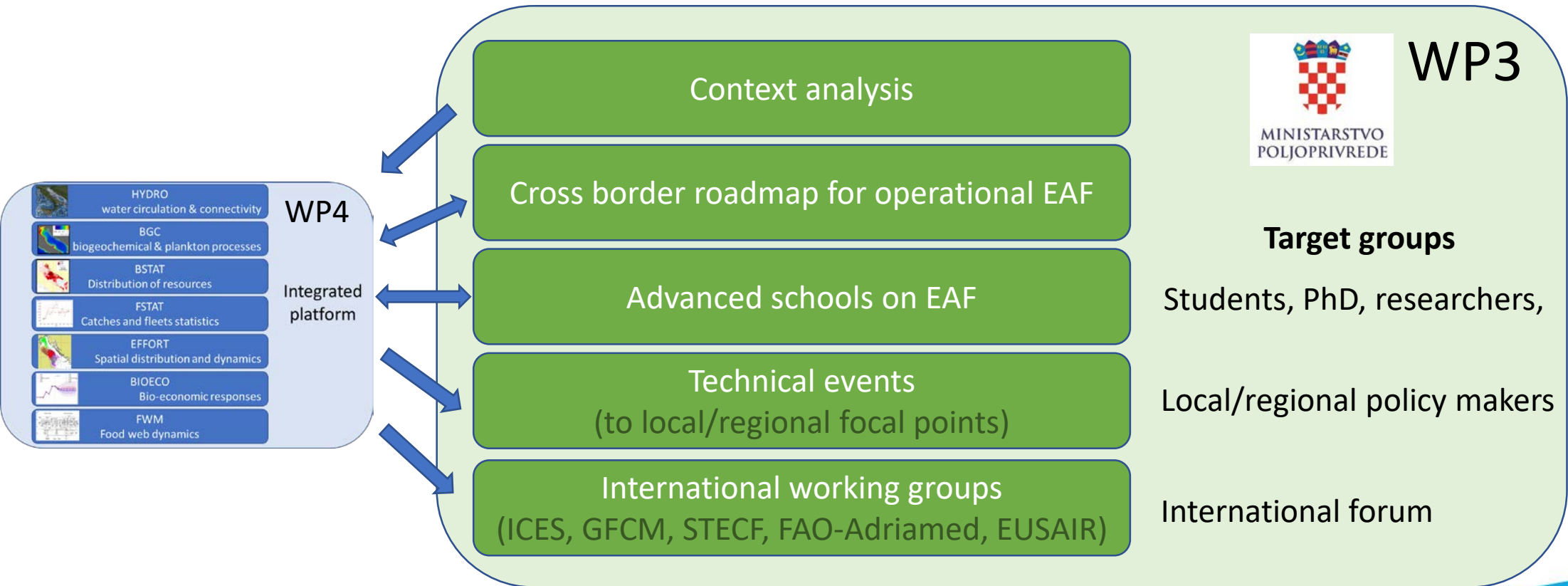
TOWARD A DECISION SUPPORT SYSTEM

to ensure stakeholders' participation (two ways) in the process



SHARING & ENHANCING

TECHNICAL CAPACITIES



GENERAL STRUCTURE

Managing, coordinating and communicating the project

WP1- Management & Coordination




WP2- Communication



WP3

- Context analysis
- Cross border roadmap for operational EAF
- Advanced schools on EAF
- Technical events (to local/regional focal points)
- International working groups (ICES, GFCM, STECF, FAO-Adriamed, EUSAIR)


Sharing and enhancing Technical capabilities



MINISTARSTVO POLJOPRIVREDE

WP4

Integrated platform



Consiglio Nazionale delle Ricerche

- HYDRO water circulation & connectivity
- BGC biogeochemical & plankton processes
- BSTAT Distribution of resources
- FSTAT Catches and fleets statistics
- EFFORT Spatial distribution and dynamics
- BIOECO Bio-economic responses
- FWM Food web dynamics

WP5

Toward an applied DSS



MEDAC
MEDITERRANEAN
ADVISORY
COUNCIL

- Stakeholder events
- Pilot actions (EAF analysis at local level: 3 areas)
- Scenarios of policy application (& climate)
- Best practices and guidelines