Interreg
Italy - Croatia
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European Regional Development Fund

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FAIRSEA

Fisheries in the AdriatIc Region - a Shared Ecosystem Approach

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

Photo: Jacopo Pasotti

FAIRSEA

Fisheries in the AdriatIc Region - a Shared Ecosystem Approach

Simone Libralato|OGS

Second International Stakeholder Meeting
23th February 2020

FAIRSEA

Fisheries in the
AdriatIc Region -
a Shared Ecosystem
Approach

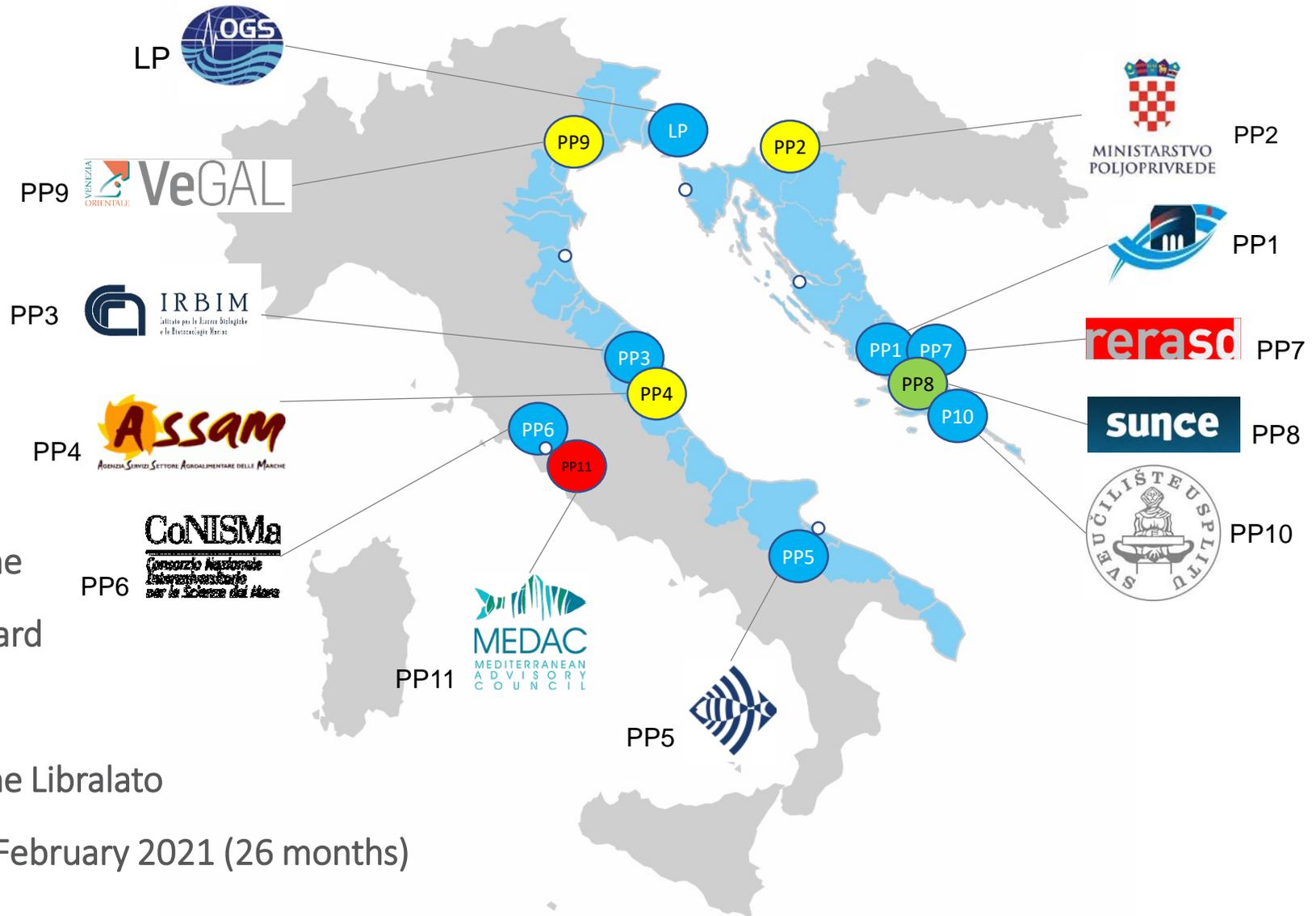2014 - 2020 Interreg V-A

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

LP

PP9   VeGAL   VENEZIA ORIENTALE

PP3   IRBIM   Istituto per le Risorse Biologiche e le Biotecnologie Marine

PP4   Assam   Agenzia Servizi Settore Agroalimentare delle Marche

PP6   CoNISMa   Consorzio Nazionale Interuniversitario per le Scienze del Mare

MEDAC   MEDITERRANEAN ADVISORY COUNCIL

PP11

PP5

PP2   MINISTARSTVO POLJOPRIVREDE

PP1

PP7   reras

PP8   sunce

PP10   SVEUČILIŠTE U SPLITU

3

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)
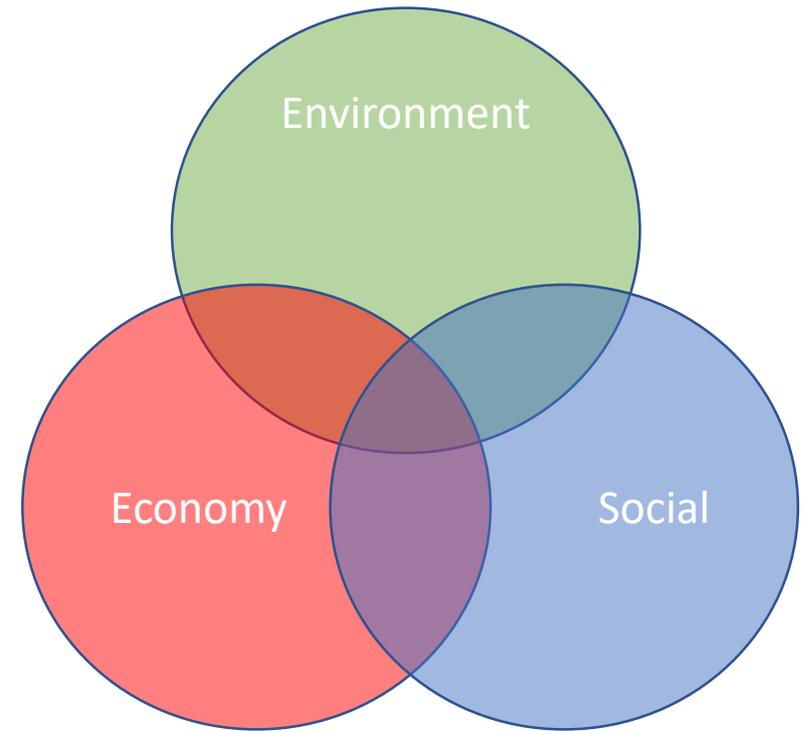
"Clearly, economic and social objectives [of fisheries] will not be met while a stock is in such a depleted state that the long-term sustainability of the fishery is threatened, but equally, biological objectives are unlikely to be met without consideration being given to economic and social objectives." Beddington et al., 2007, Science
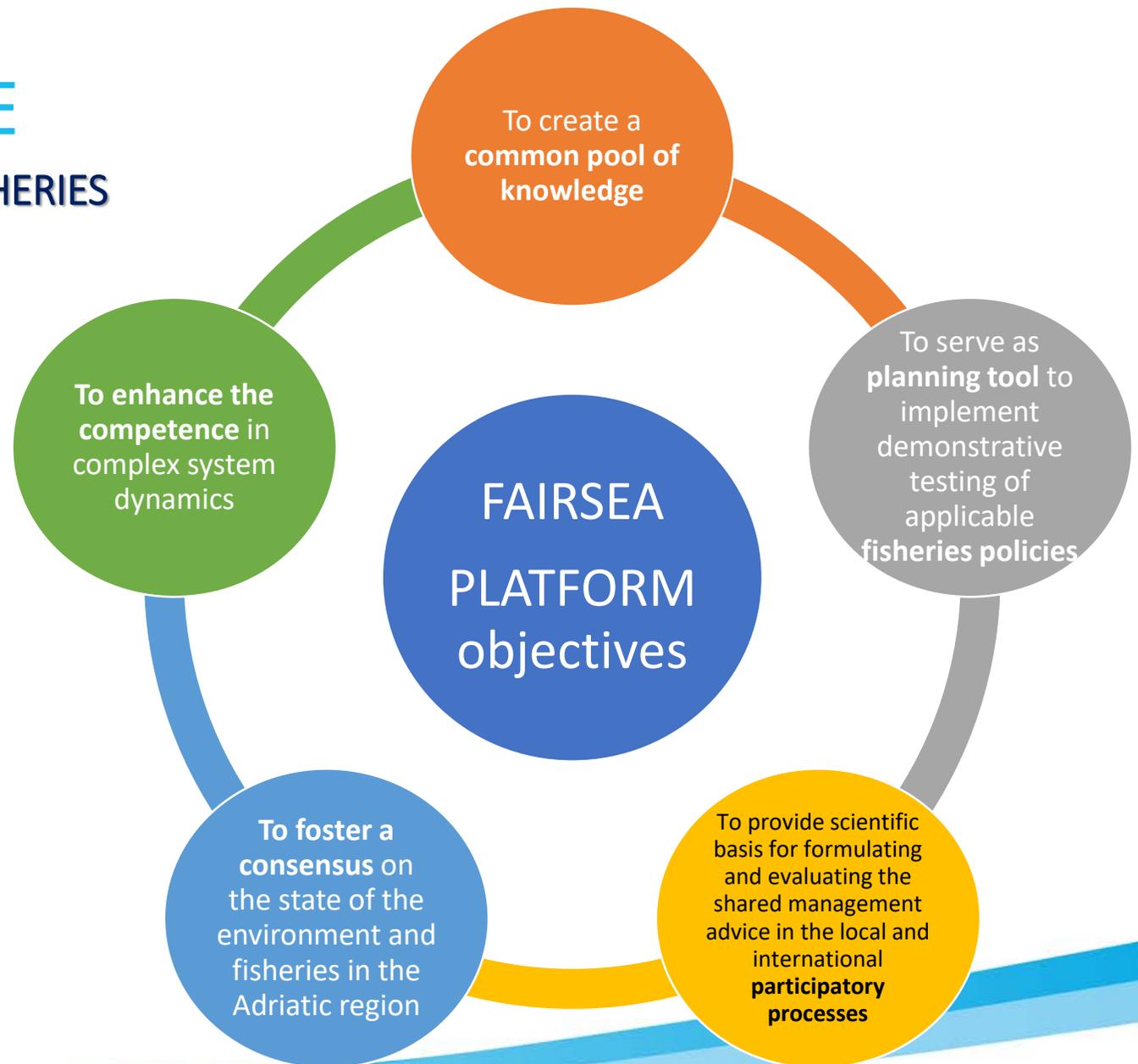
FAIRSEA RATIONALE
A SHARED ECOSYSTEM APPROACH
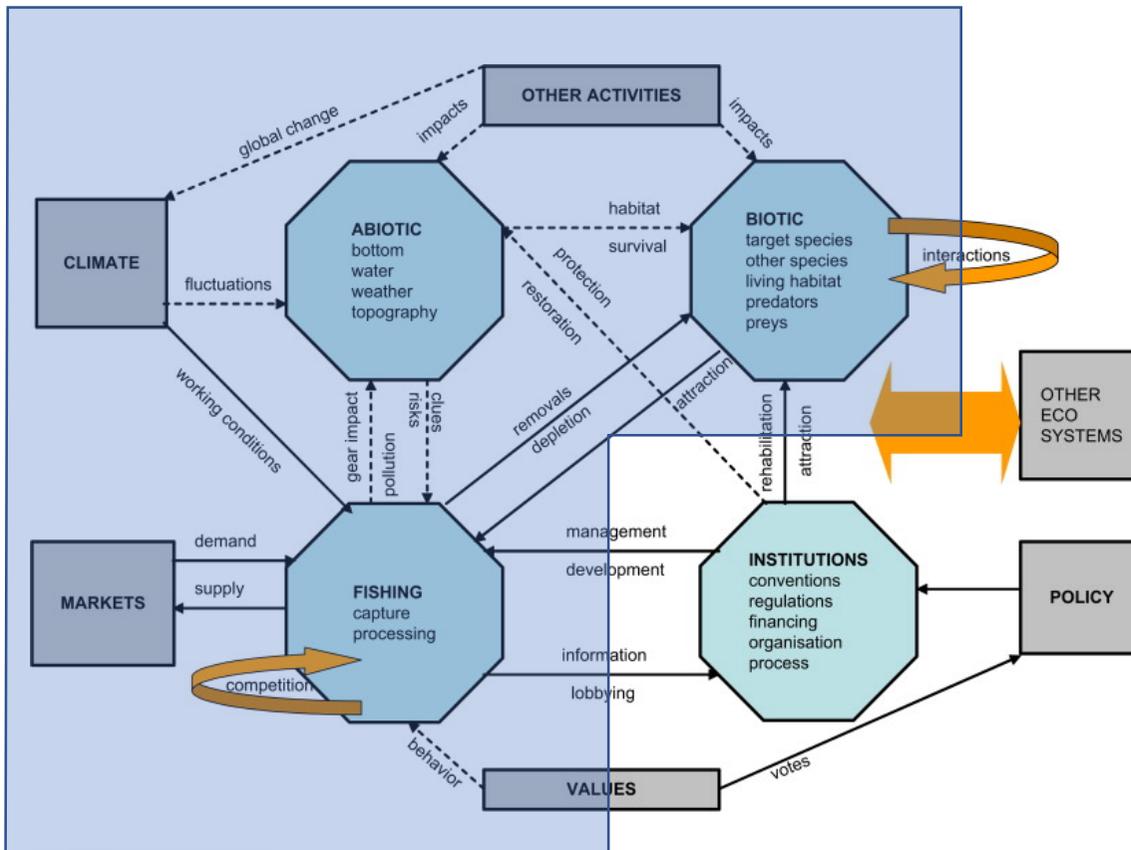
- **Aim:** increase fisheries productions within a sustainable framework or at least identifying ways that assure a more **economically efficient and sustainable** harvesting of marine resources

- **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

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.
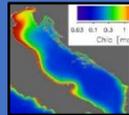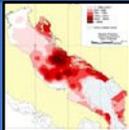
FAIRSEA PLATFORM objectives

To create a **common pool of knowledge**

To serve as **planning tool** to implement demonstrative testing of applicable **fisheries policies**

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

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

To enhance the competence in complex system dynamics

THE PLATFORM

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

INTEGRATING PROCESSES (NOT only LAYERS)

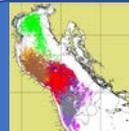
HYDRO
water circulation & connectivity

BGC
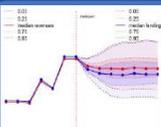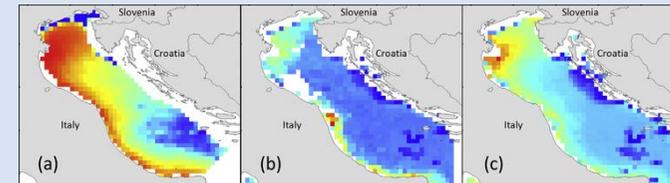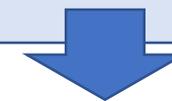biogeochemical & plankton processes

BSTAT
Distribution of resources

FSTAT
Catches and fleets statistics

EFFORT
Spatial distribution and dynamics

BIOECO
Bio-economic responses

FWM
Food web dynamics

IRBIM
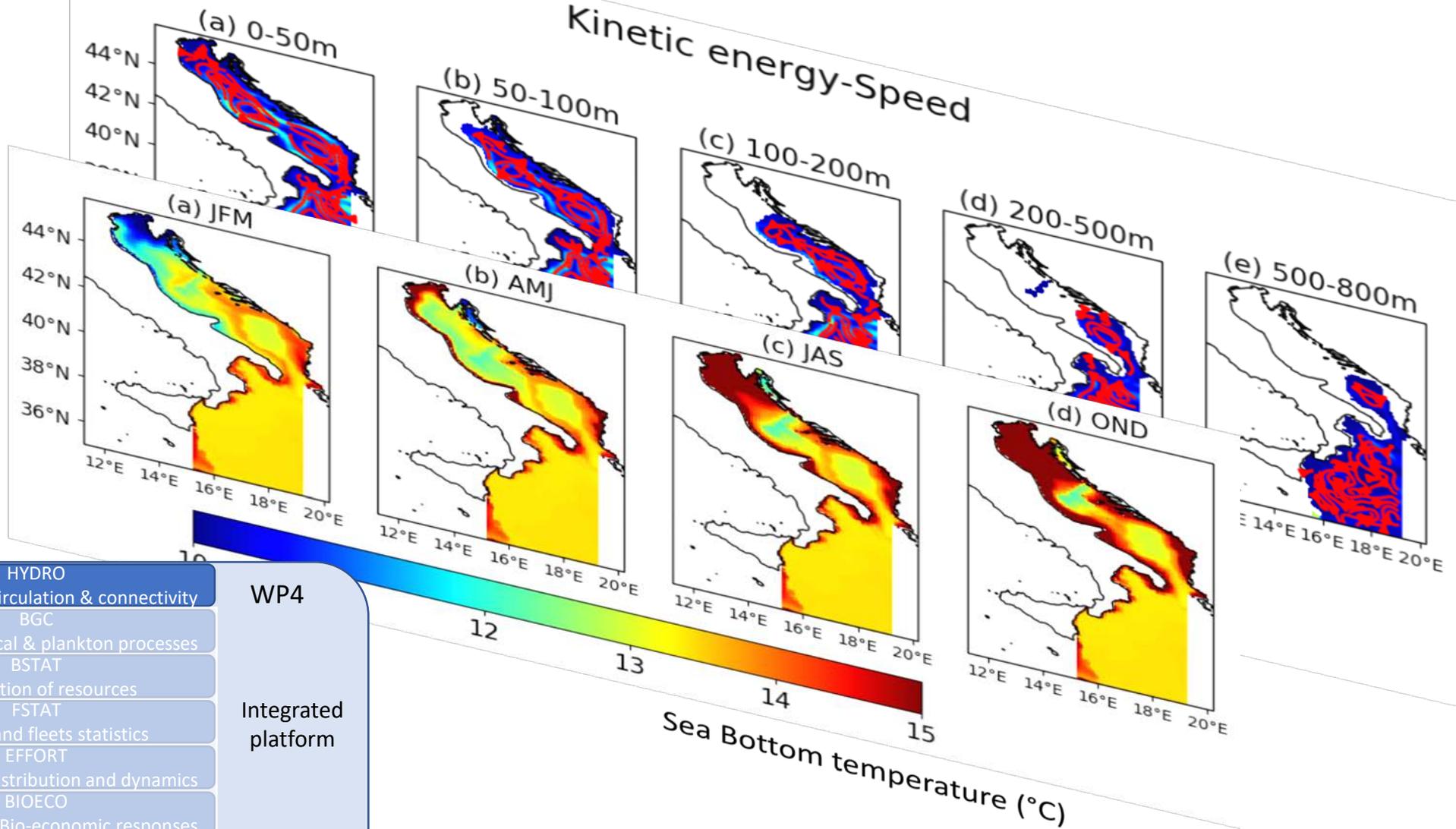Istituto per le Risorse Biologiche e le Biotecnologie Marine

WP4

Integrated platform

Spatio-temporal integration using modelling tool(s)

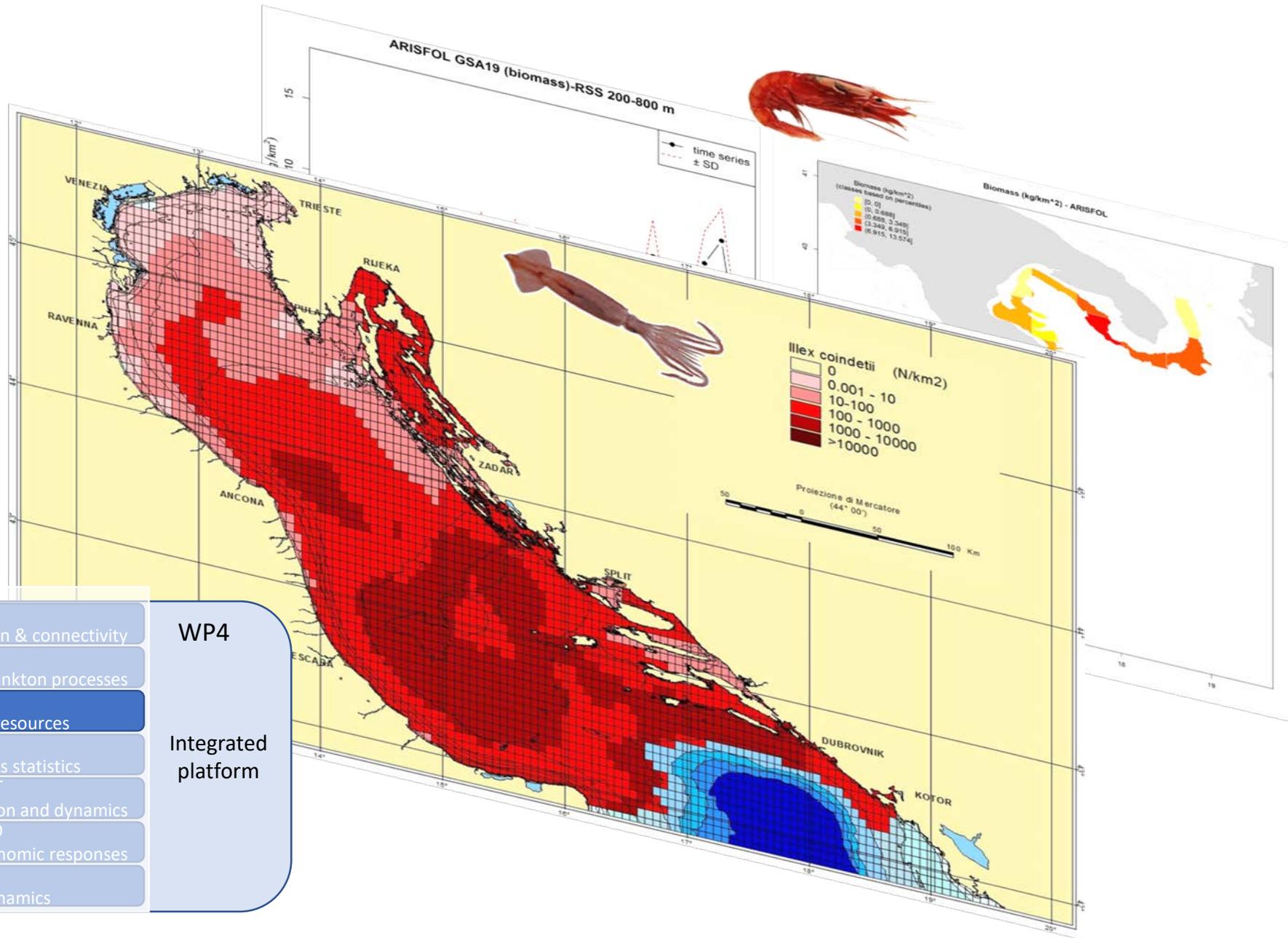Alternative management scenarios
Supporting management plans develpment

Kinetic energy-Speed

(a) 0-50m
(b) 50-100m
(c) 100-200m
(d) 200-500m
(e) 500-800m

(a) JFM
(b) AMJ
(c) JAS
(d) OND

Sea Bottom temperature (°C)

10   12   13   14   15

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

WP4

Integrated platform

(a) 0-50m

(b) 50-100m

CHL

(c) 100-200m

(d) 200-500m

(e) 500-800m

(a) JFM

(b) AMJ

(c) JAS

(d) OND

Sea Bottom Oxygen (°C)

180   200   210   220   230   240

HYDRO
water circulation & connectivity

BGC
geochemical & plankton processes

BSTAT
Distribution of resources

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Spatial distribution and dynamics

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WP4

Integrated
platform

ARISFOL GSA19 (biomass)-RSS 200-800 m

time series
± SD

Biomass (kg/km*2) - ARISFOL

Illex coindetii   (N/km2)

0
0.001 - 10
10-100
100 - 1000
1000 - 10000
>10000

Proiezione di Mercatore
(44° 00')

WP4

Integrated
platform

HYDRO
water circulation & connectivity

BGC
geochemical & plankton processes

BSTAT
Distribution of resources

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Food web dynamics

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

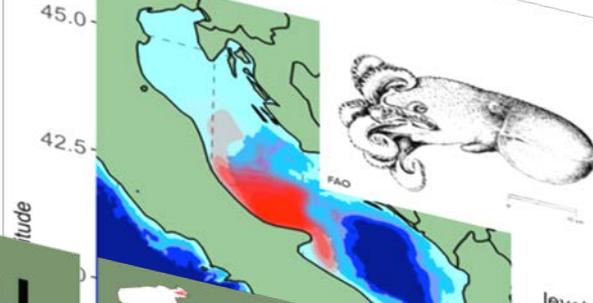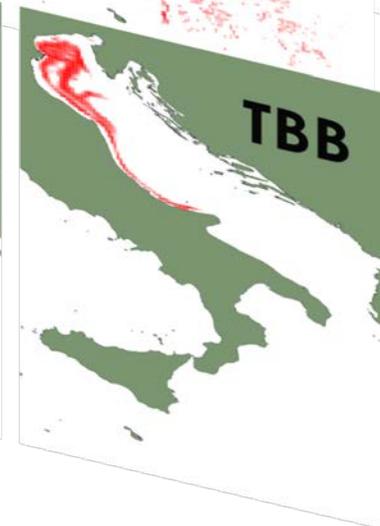GSA 17 Landings (tons) by Target Species and Country
Source: STECF 19-06 AER

WP4

Integrated platform

HYDRO
water circulation & connectivity

BGC
geochemical & plankton processes

BSTAT
Distribution of resources

FSTAT
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EFFORT
Spatial distribution and dynamics

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Bio-economic responses

FWM
Food web dynamics

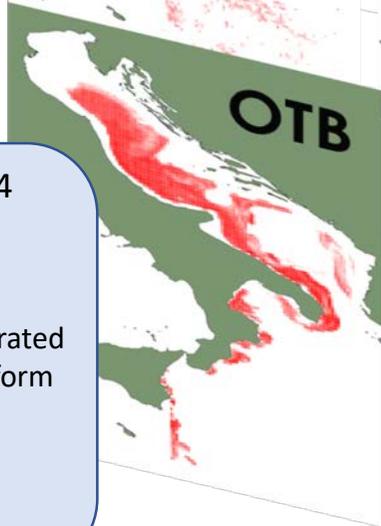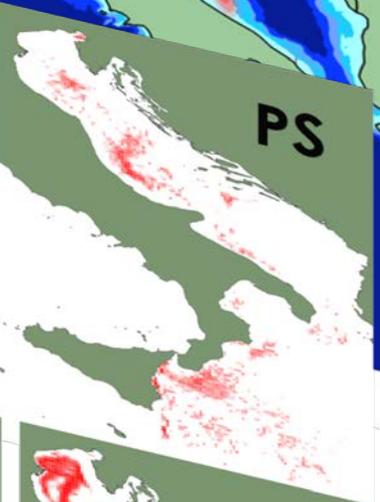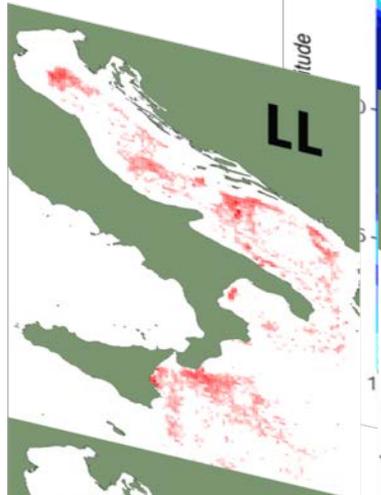Eledone cirrhosa
LPUE (Kg/m/h)

Merluccius merluccius
LPUE (Kg/m/h)
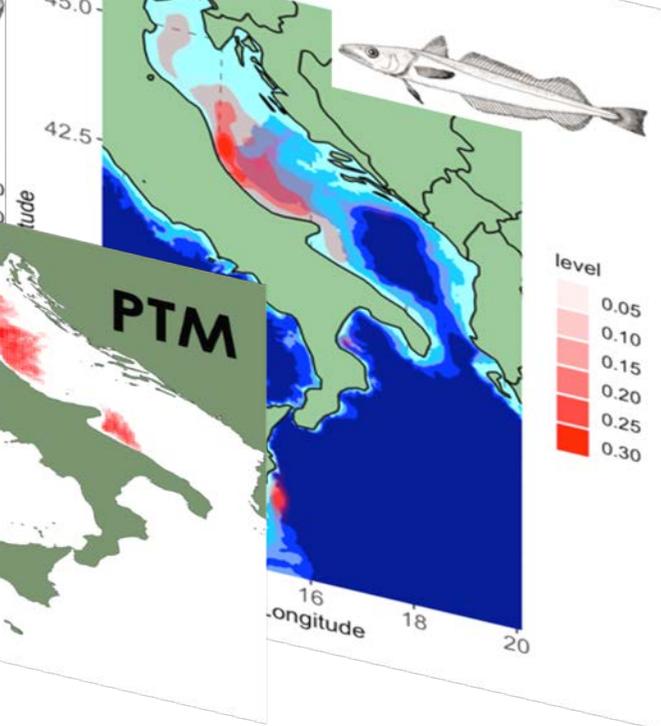
level
0.05
0.10
0.15
0.20
0.25
0.30

LL

PS

PTM

OTB

TBB

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

WP4

Integrated
platform

Utility per indicator

MCDA

MEY

- u_GVA
- u_RBER
- u_WAGE
- u_EMPL
- u_SSB
- u_F
- u_Y
- u_D

Gross Value Added
Profit
ROI

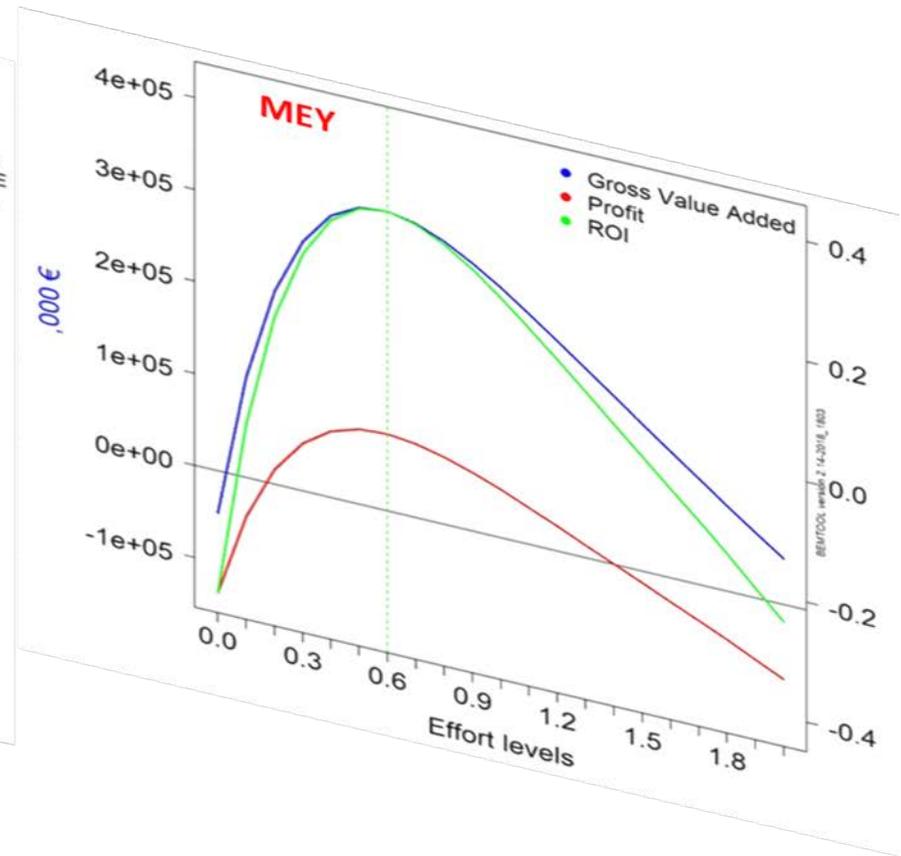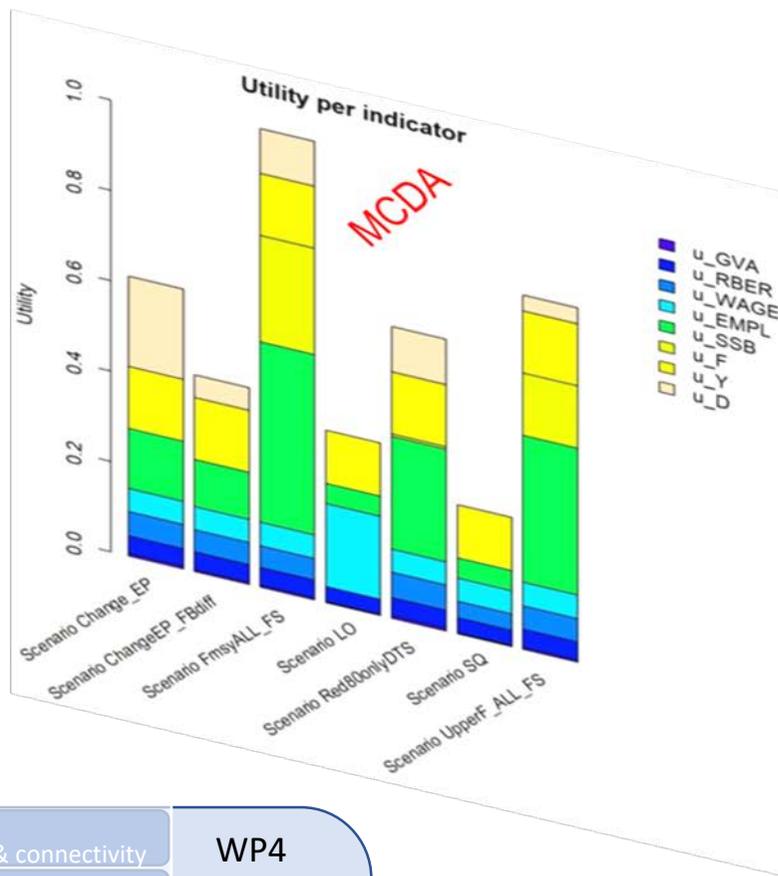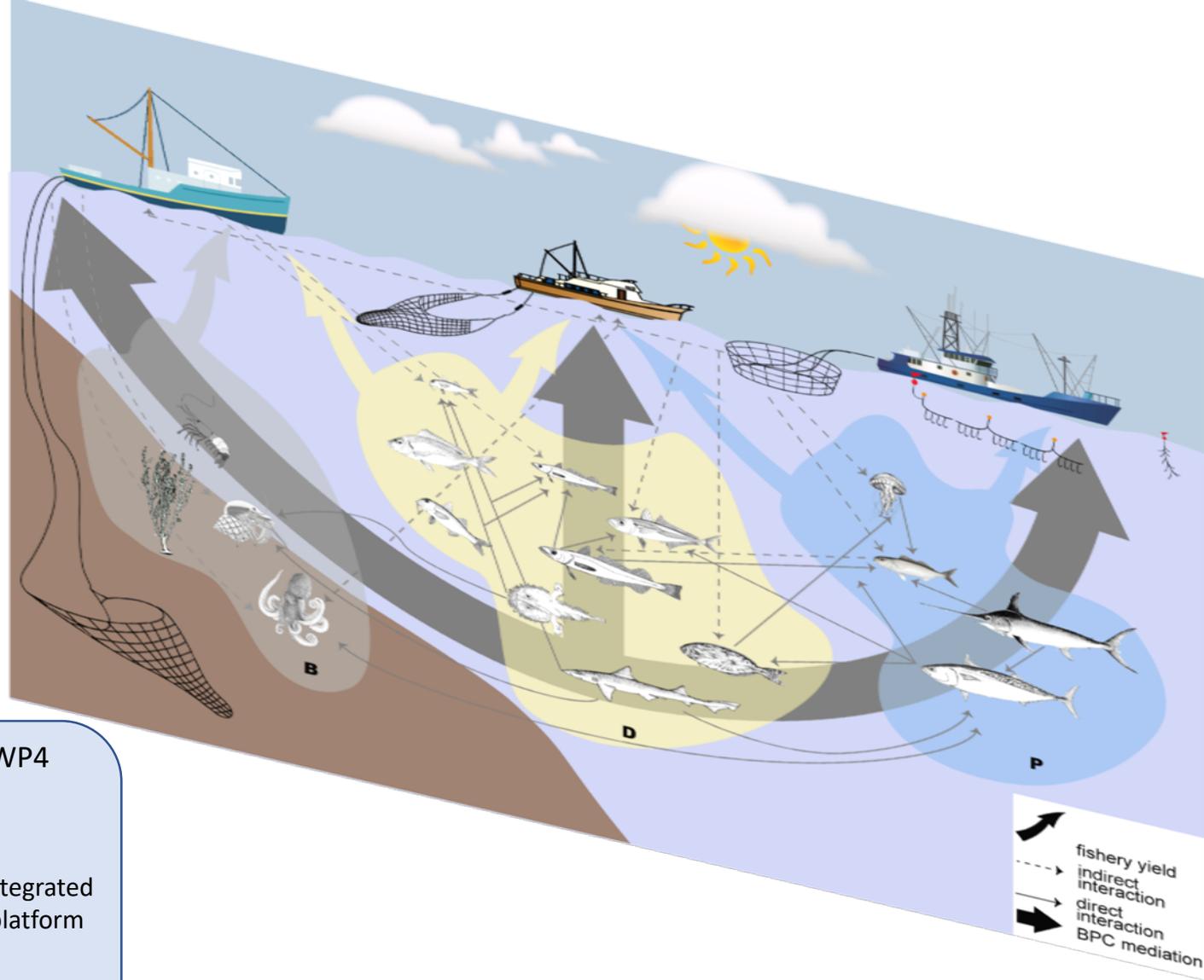|	
HYDRO water circulation & connectivity	WP4
BGC geochemical & plankton processes	
BSTAT Distribution of resources	
FSTAT Catches and fleets statistics	Integrated platform
EFFORT Spatial distribution and dynamics	
BIOECO Bio-economic responses	
FWM Food web dynamics	

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

WP4

Integrated platform

B

D

P

fishery yield
indirect interaction
direct interaction
BPC mediation
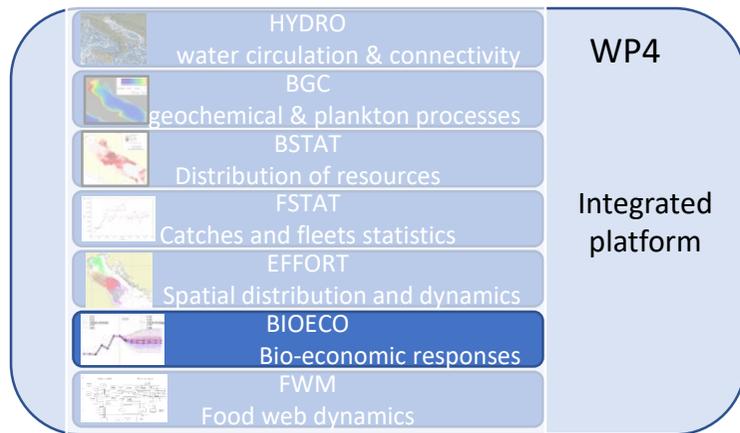
FAIRSEA Modules

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 1/16o, 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 4.1 (downloadable from OTHER OUTPUTS). Through a drop-down menu you can choose to view different vertical end 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 1/16o, 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 (N1p), 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 end 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 distr... at different levels, estimating the time series of a wide set of population state-indicators for the selected number of species. D... in 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 dat...

☐ 🌐 **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 dat...

☐ 🌐 **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 in 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
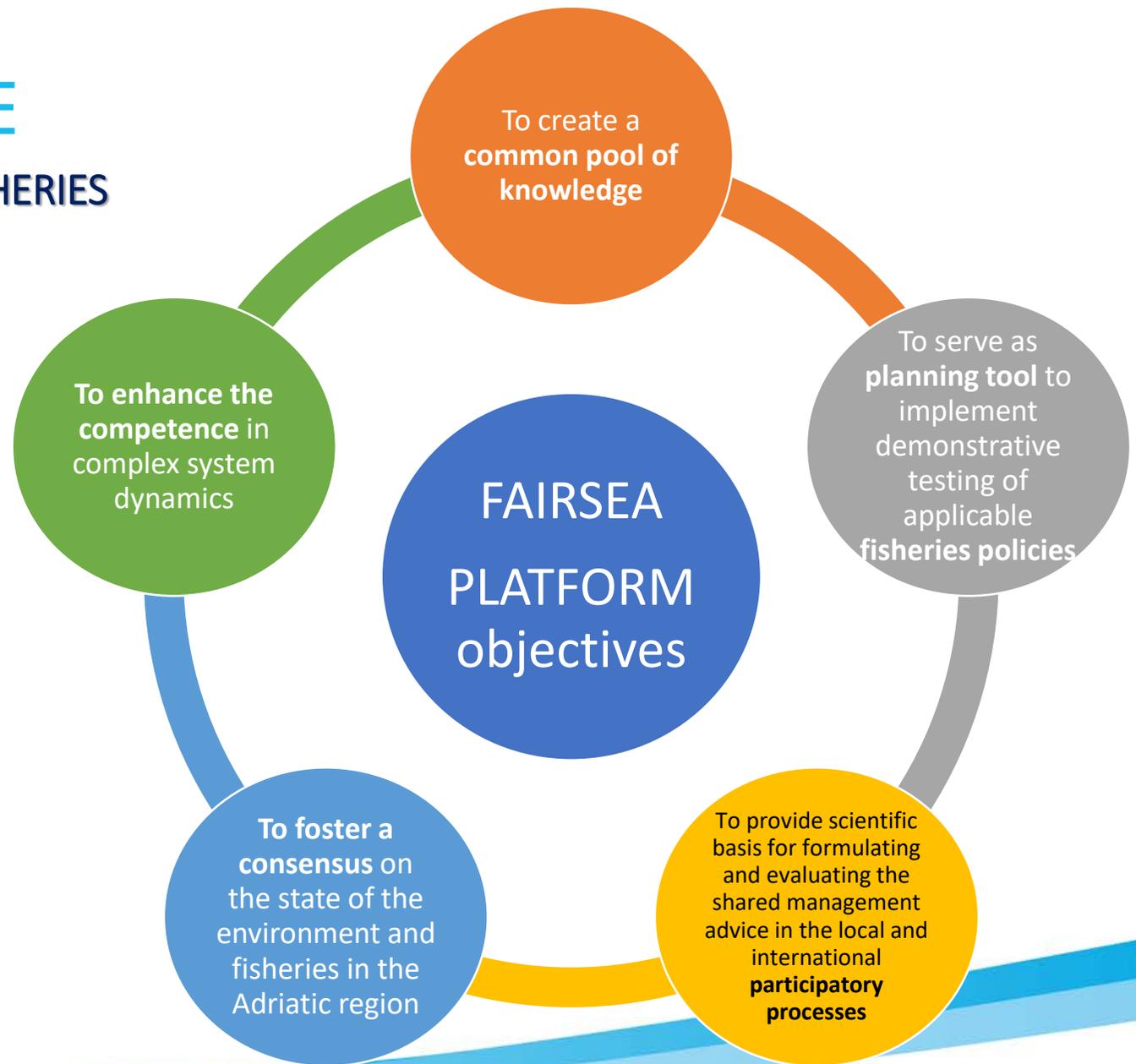
Username

Username

Password

Password

Login

Lost Password?

FAIRSEA is financed by Interreg V-A IT-HR 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
f FAIRSEA Facebook page

Interreg Italy - Croatia FAIRSEA EUROPEAN UNION
European Regional Development Fund

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.

To create a **common pool of knowledge**

To serve as **planning tool** to implement demonstrative testing of applicable **fisheries policies**

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

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

To enhance the **competence** in complex system dynamics

FAIRSEA PLATFORM objectives

Interreg
Italy - Croatia
FAIRSEA
European Regional Development Fund

EUROPEAN UNION

Share knowledge and data

For an ECOSYSTEM APPROACH TO FISHERIES

To create a
**common pool of
knowledge**

**FAIRSEA
PLATFORM
objectives**
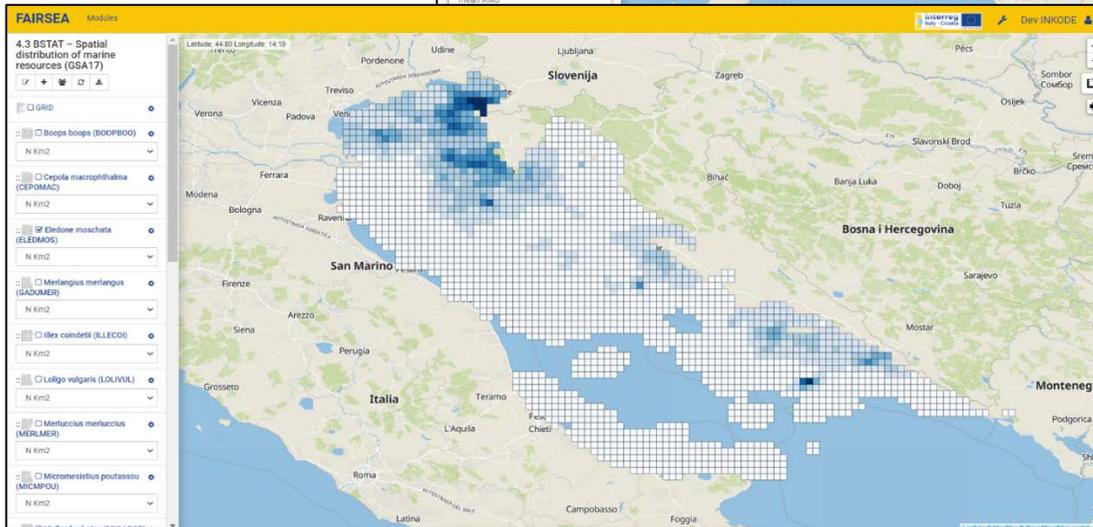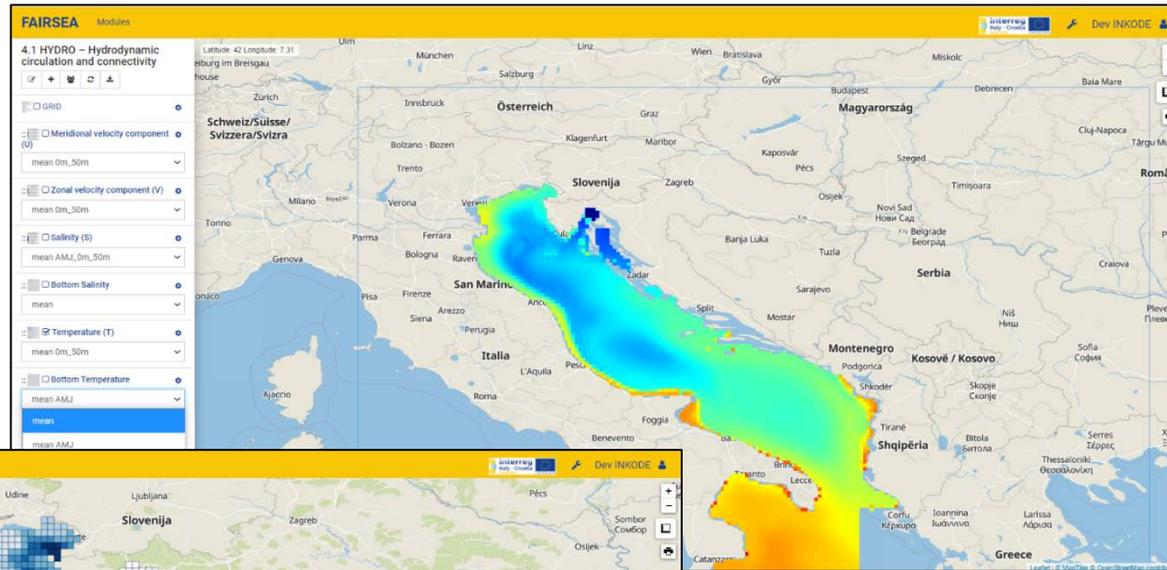
Develop tools for discussion

On ECOSYSTEM APPROACH TO FISHERIES

Discussion game usage

13 Sept 2019, Master Sustainable blue growth, Trieste
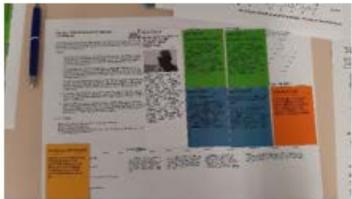
Upcoming events using FAIRSEA playdecide

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

FAIRSEA PLATFORM objectives

nhance the mpetence in mplex system dynamics

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

play decide

FAIRSEA

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Move toward an integrated decision support tool

On ECOSYSTEM APPROACH TO FISHERIES

FAIRSEA PLATFORM objectives

To serve as **planning tool** to implement demonstrative testing of applicable **fisheries policies**
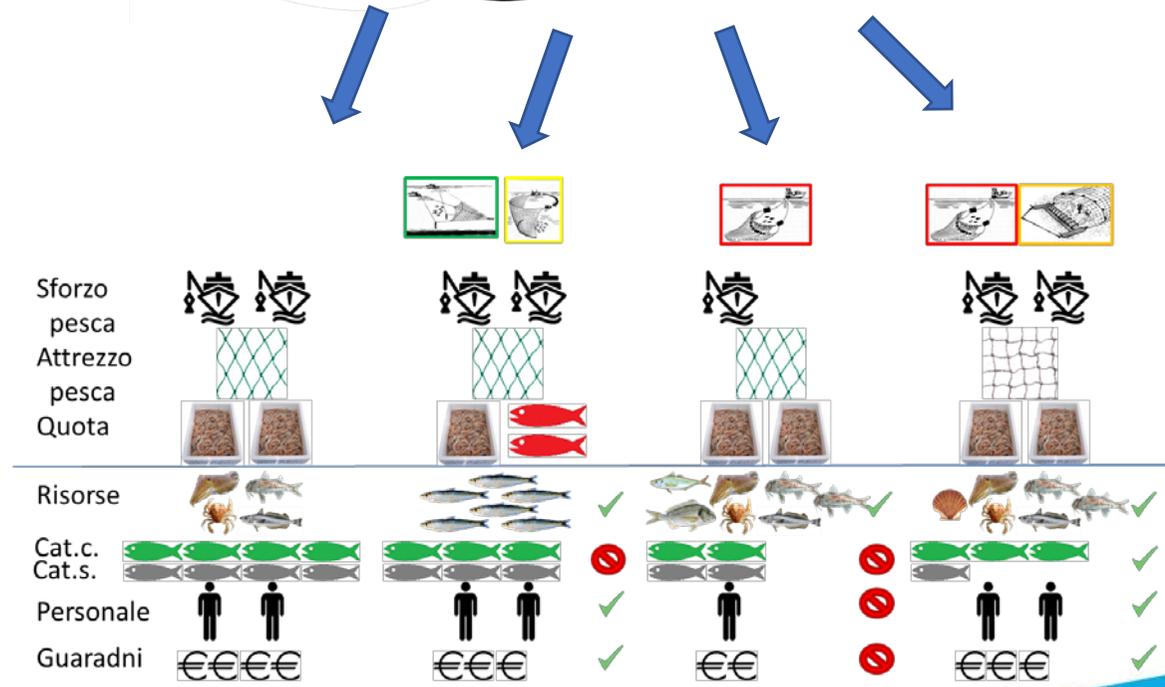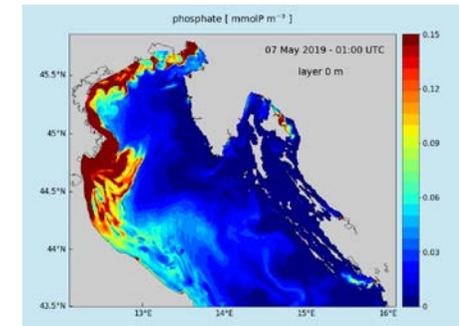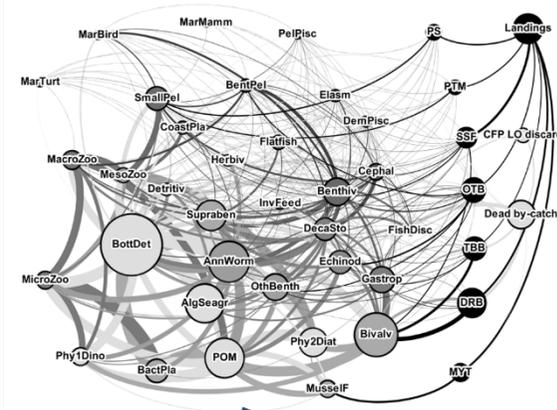
Increasing capacities

On ECOSYSTEM APPROACH TO FISHERIES

To enhance the **competence** in complex system dynamics

FAIRSEA

PLATFORM objectives

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

2-4 players

8+ years

45 min

Increasing public awareness

On fisheries issues

FAIRSEA PLATFORM objectives

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

enhance the competence in complex system dynamics

Partecipatory approach
On ECOSYSTEM APPROACH TO FISHERIES

FAIRSEA PLATFORM objectives

implemen
demonstrat
testing o
applicabl
fisheries pol

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

a
on
the
and

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European Regional Development Fund

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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
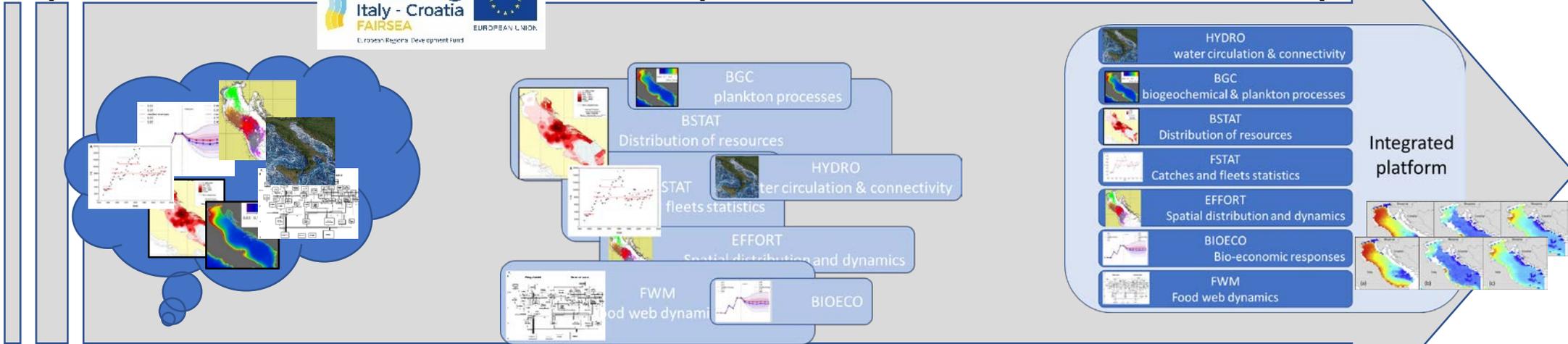
The platform development can be a mutual occasion

MUTUAL BENEFIT

FAIRSEA workplan

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

Interreg
Italy - Croatia
FAIRSEA
European Regional Development Fund

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BACKGROUND

STATE OF ADRIATIC FISHERIES

- Stock assessments (STECF and SAC-GFCM) indicates critical status for assessed pelagic and demersal recourses

- 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
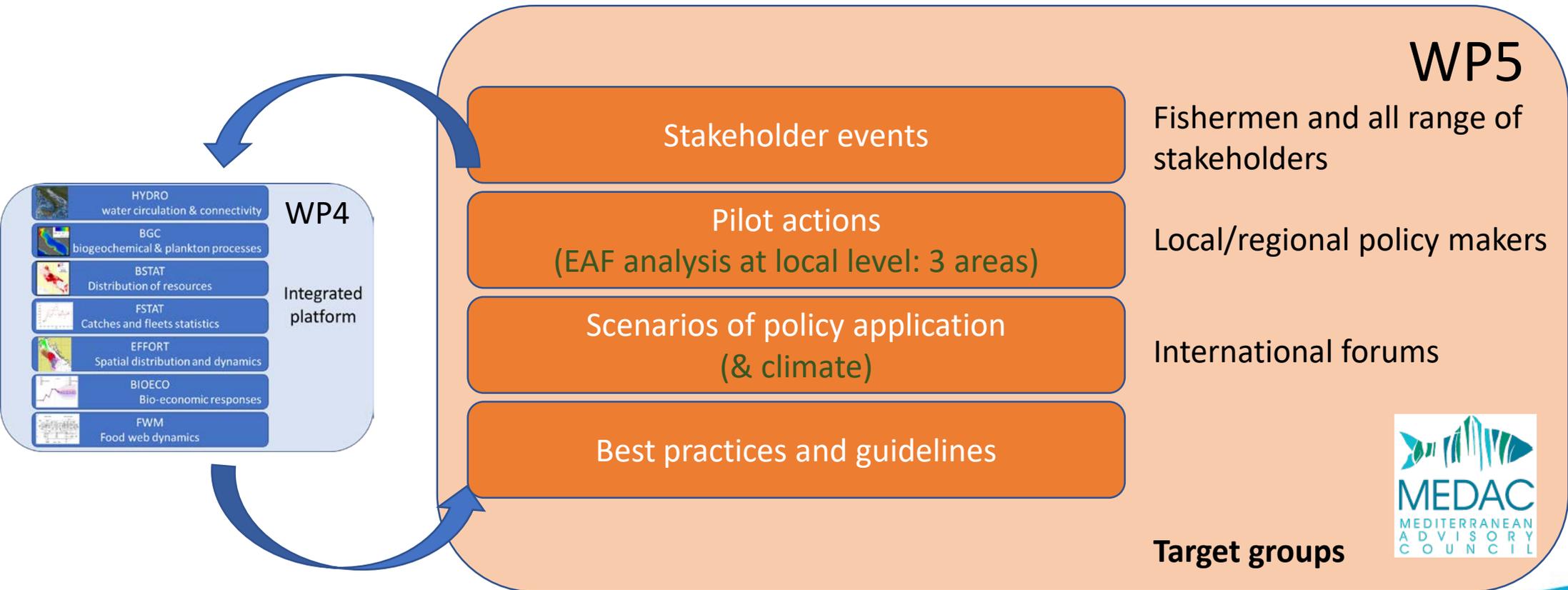
FAIRSEA GENERAL OBJECTIVES

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.
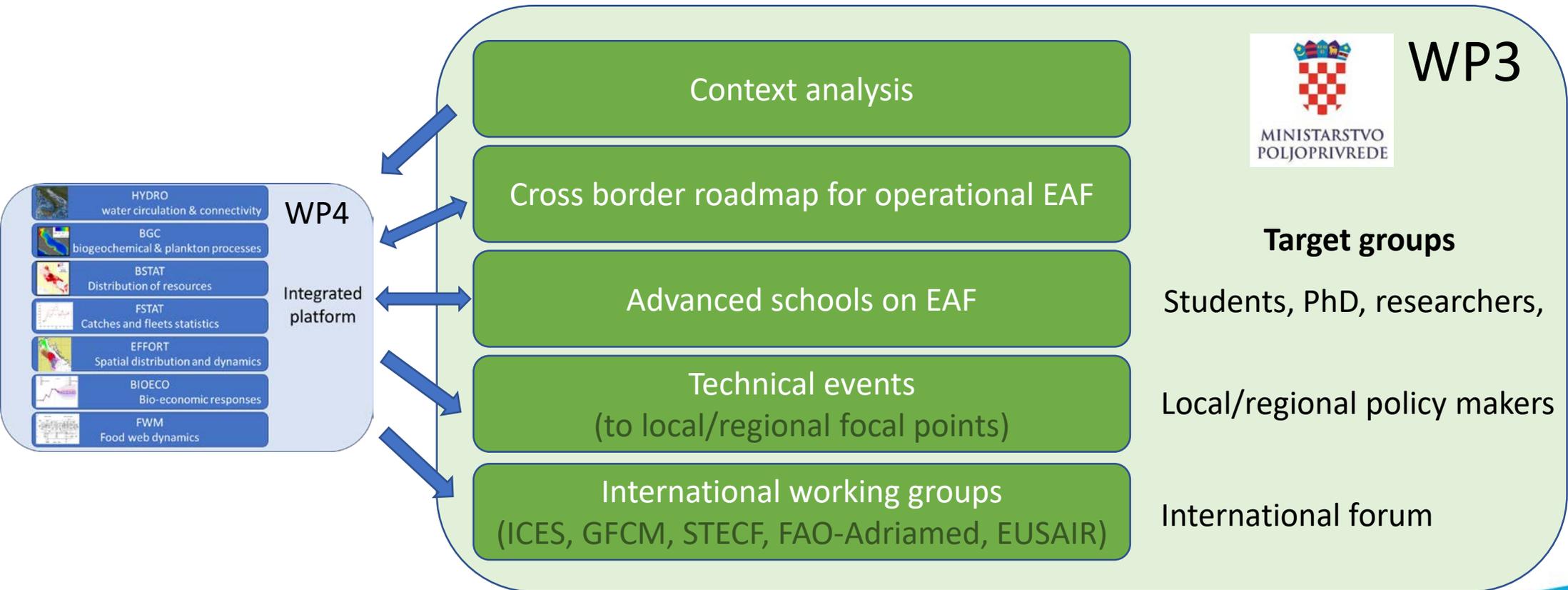
STAKEHOLDER ENGAGEMENT

TOWARD A DECISION SUPPORT SYSTEM

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

WP5

WP4

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

Integrated platform

Stakeholder events

Pilot actions
(EAF analysis at local level: 3 areas)

Scenarios of policy application
(& climate)

Best practices and guidelines

Fishermen and all range of stakeholders

Local/regional policy makers

International forums

MEDAC
MEDITERRANEAN
ADVISORY
COUNCIL

Target groups

Interreg
Italy - Croatia
FAIRSEA
European Regional Development Fund

EUROPEAN UNION

SHARING & ENHANCING

TECHNICAL CAPACITIES

WP3

WP4

Integrated platform

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

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)

MINISTARSTVO POLJOPRIVREDE

Target groups

Students, PhD, researchers,

Local/regional policy makers

International forum

GENERAL STRUCTURE

Managing, coordinating and communicating the project