

The future of Humans and fish pOPulations: fOstering transdisciPlinarity and interdisciPlinarity for sustainable marine social-ecological sytems

HOPOPoP

Rationale & overall objective

Sustainability of marine coastal fisheries → Necessity to consider the entire Social-Ecological system

Iroise Sea

- Significant expertise
- PNMI
- ZABRi

Other worlwide case studies

HOPOPoP (2022-26)

- Inter- and transdisciplinary consortium
- Strong interactions with international experts and local socio-economic actors
- New interactive methods based on model simulations, gaming and virtual reality

Understand the dynamics of coastal Social-Ecological system and support the transition to sustainability

Consortium

HOPOPoP

Co-PI :

LEMAR laboratoire des sciences de l'environnement marin UBO | CNRS | IRD | Ifremer

AMURE CENTRE DE DROIT ET D'ÉCONOMIE DE LA MER Ifremer UBO CNRS

Local consortium : UBO, Ifremer, ENIB, UMS, CNRS

- LEMAR
- AMURE
- DG Ifremer
- DYNECO
- DECOD/LBH
- LETG
- ENIB – CERV
- ISblue, UMS 3113

National Partners

- CNRS-LIENS
- CIRAD-UMR SENS

Interdisciplinary International Advisory Board

CSIRO

DTU

UNIVERSITY OF HULL

AZTI MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

WAGENINGEN UNIVERSITY & RESEARCH

Universität Hamburg DER FORSCHUNG | DER LEHRE | DER BILDUNG

Socio-economic actors

- PNMI - National Iroise Marine Park
- OFB - French Biodiversity Office
- Oceanopolis
- Socio-economic actors of the Iroise fisheries
- Associations of recreational uses in Iroise
- Other actors, users or citizen

Objectives & structure of the project

Towards inter- & trans-disciplinarity to support sustainability in marine social-ecological systems

Prospective (WP5)

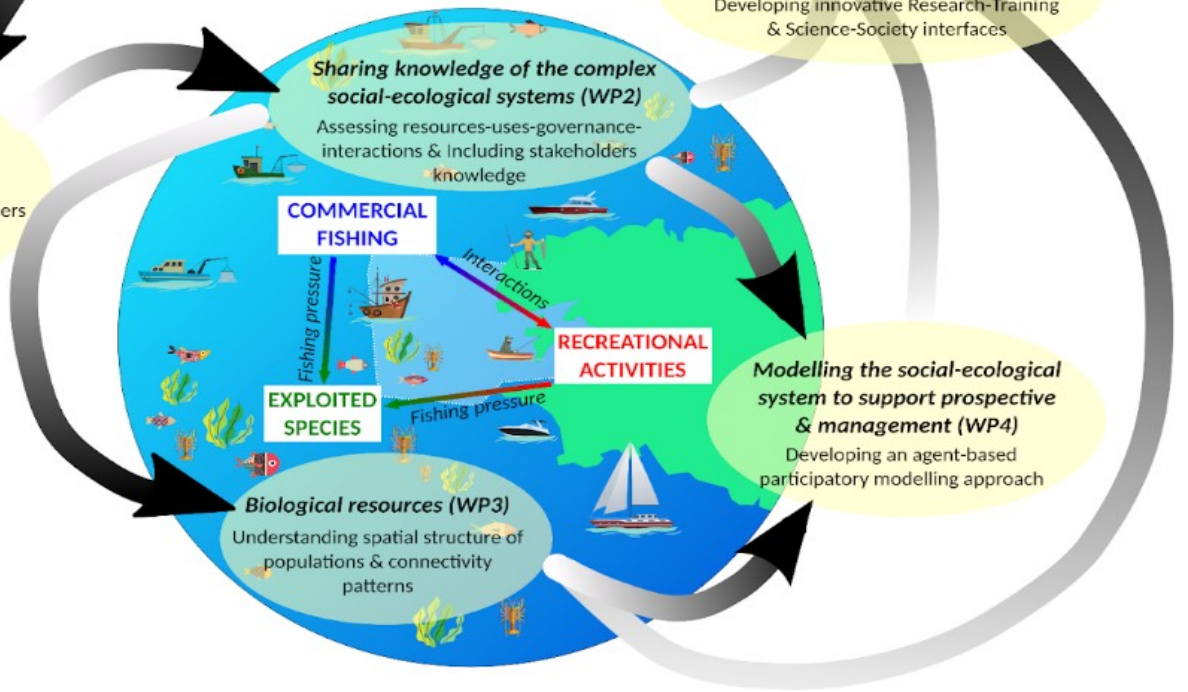
- Developing qualitative representations and prospective scenarios
- Involving stakeholders

Serious games & virtual reality (WP6)

Developing innovative Research-Training & Science-Society interfaces

International reflexive approach (WP1)

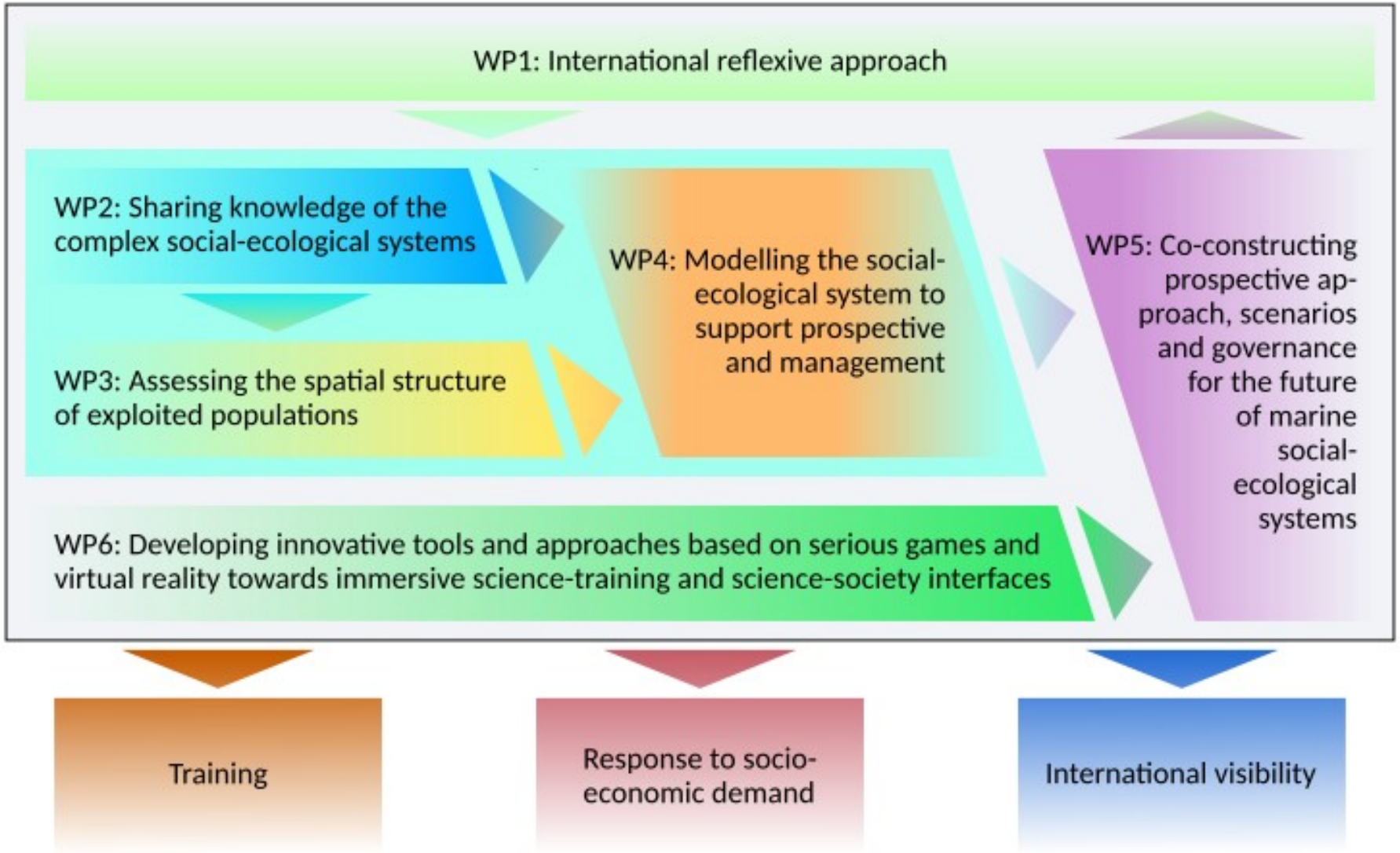
- Guidelines from International Advisory Board
- Lessons from international workshops: (1) Stakeholders engagment, (2) Spatial dimension of processes, (3) Supporting management



Modelling the social-ecological system to support prospective & management (WP4)

Developing an agent-based participatory modelling approach

General framework



General framework

WP1: International reflexive approach

Coordinators. *Grégory Charrier (UBO, LEMAR) & Olivier Thébaud (Ifremer, AMURE)*

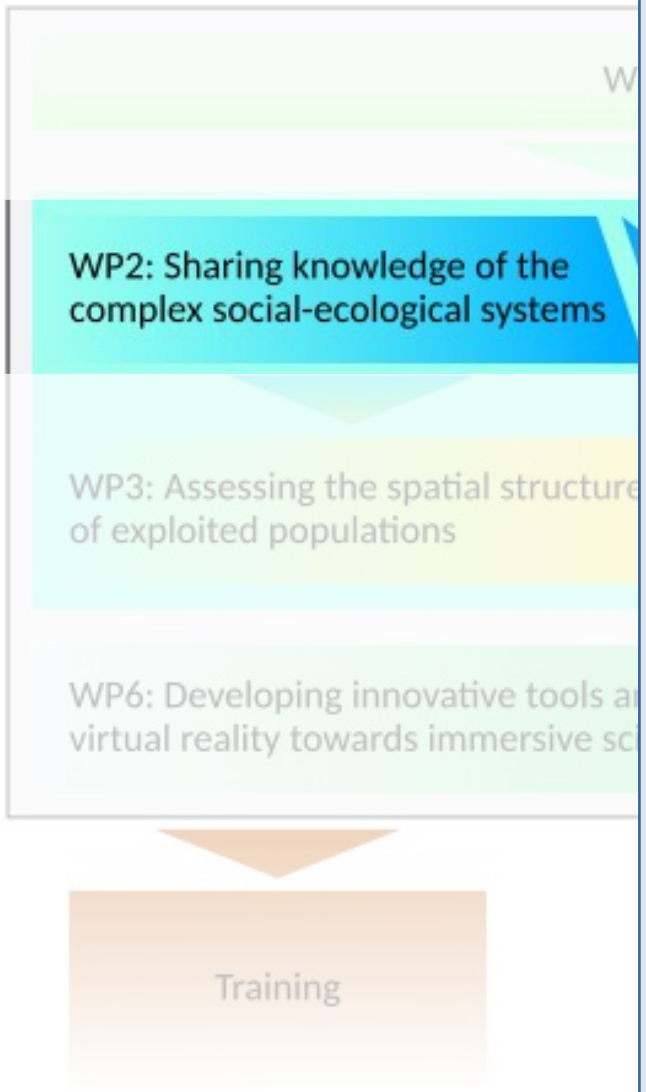
***Objective*. Sharing experiences, practices and lessons learnt from worldwide case studies among scientists of different disciplines and managers involved in supporting marine social-ecological management**

(WP1.1) Interdisciplinary IAB evaluate the strategy of HOPOPoP and provide guidelines

(WP1.2) Three international reflexive workshops among scientists and managers

1) *Linking science, society and action towards sustainability*
2) *How to integrate spatial structuration and connectivity issues into adaptative management schemes?*
3) *Prospective approaches and scenarios for the evolution of coastal SES*

General framework



Coordinators. *Ingrid Peuziat (UBO, LETG) & Martial Laurans (Ifremer, DECOD/LBH)*

***Objective*. Building a comprehensive and shared representation of the complex interactions in the social-ecological systeme of the Iroise Sea, including stakeholders knowledge**

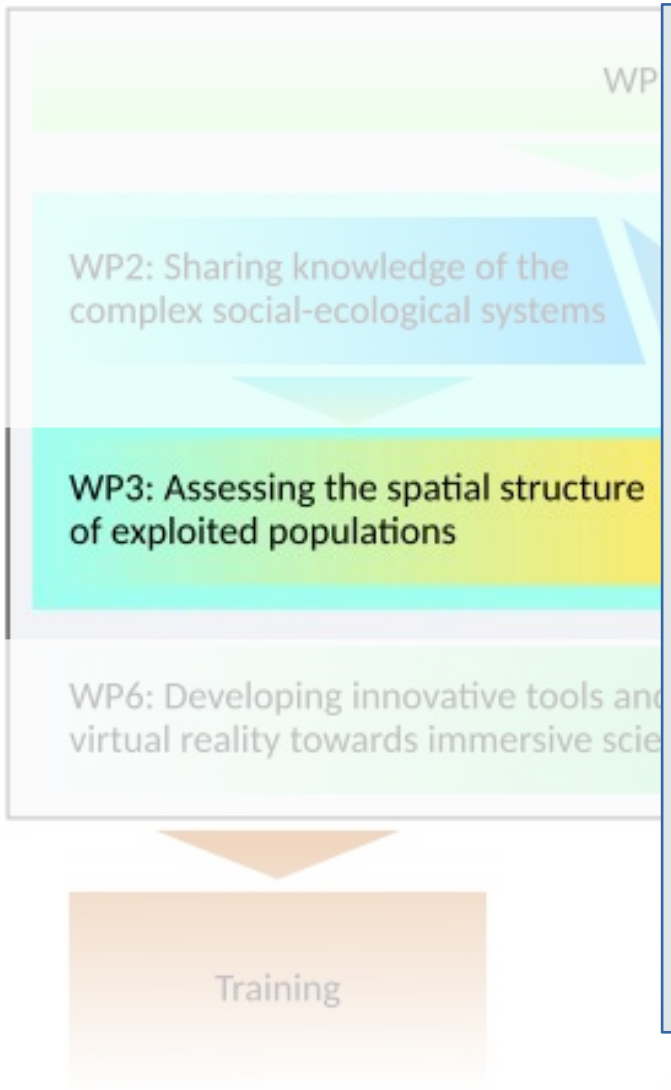
(WP2.1) Exploring resources-uses-governance-science interactions

(**WP2.2**) Analysis and representation of the dynamics, evolution and sustainability of coastal fishing fleets in Iroise

(WP2.3) Analysis of the dynamics and strategies of the recreational boating activities

(**WP2.4**) Visualizing shared knowledge through web interfaces to explore interactions between commercial and recreational maritime activities

General framework



Coordinators. *Grégory Charrier (UBO, LEMAR) & Christophe Lebigre (Ifremer, DECOD/LBH)*

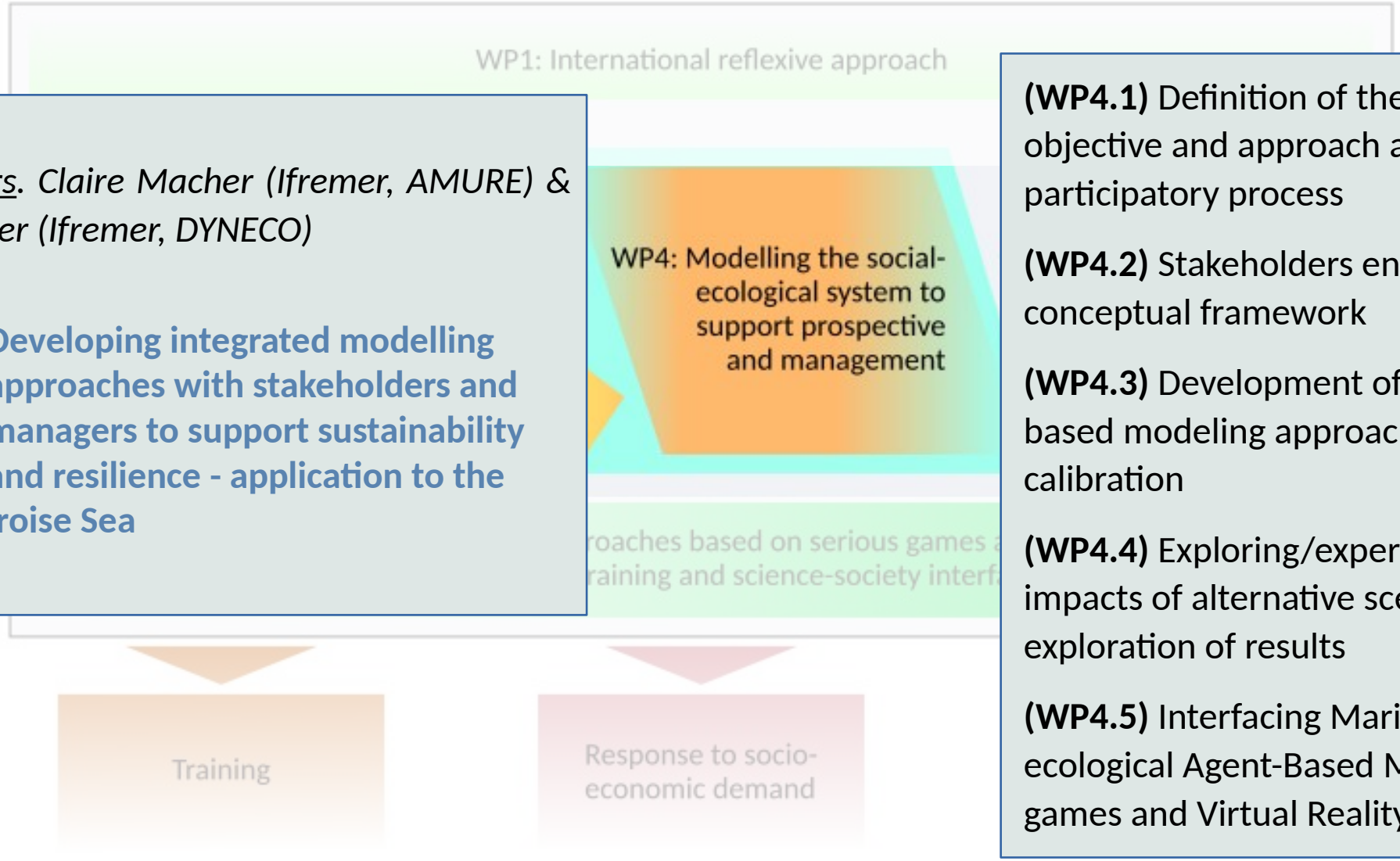
Objective. **Identification of the factors shaping the population structure and connectivity patterns for the main exploited species in the Iroise Sea and adjacent waters**

(WP3.1) Meta-analysis to identify the main drivers of spatial population differentiation and connectivity patterns in the area

(WP3.2) Collection of lacking data with the most appropriate approach

(WP3.3) Exploration of local adaptation processes that shape population differentiation among contrasted habitats

General framework



Coordinators. *Claire Macher (Ifremer, AMURE) & Cédric Bacher (Ifremer, DYNECO)*

Objective. **Developing integrated modelling approaches with stakeholders and managers to support sustainability and resilience - application to the Iroise Sea**

(WP4.1) Definition of the modelling objective and approach and of the participatory process

(WP4.2) Stakeholders engagement and conceptual framework

(WP4.3) Development of an agent-based modeling approach and calibration

(WP4.4) Exploring/experiencing impacts of alternative scenarios, exploration of results

(WP4.5) Interfacing Marine Social-ecological Agent-Based Model, serious games and Virtual Reality

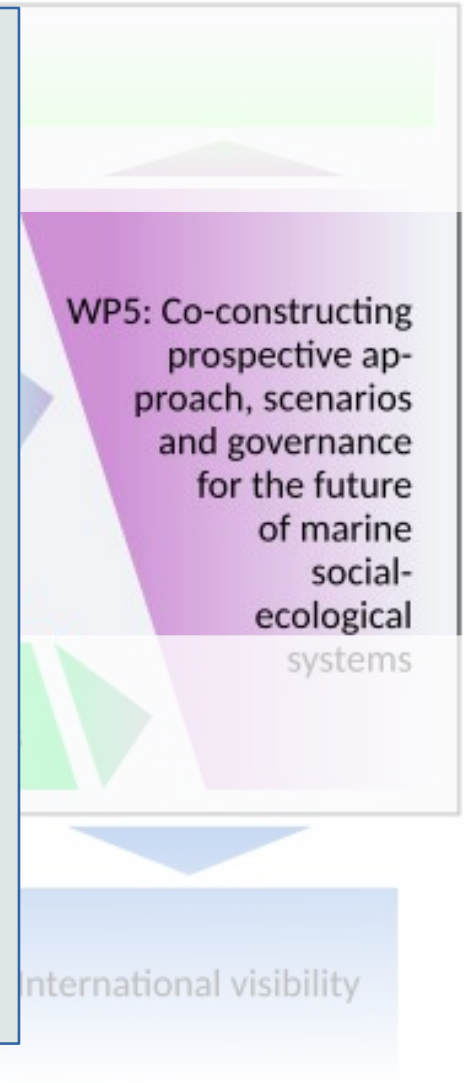
General framework

Coordinators. *Manuelle Philippe (UBO, AMURE), Claire Macher (Ifremer, AMURE) & Denis Lacroix (DG Ifremer)*

***Objective*. Construction of future scenarios to anticipate the evolution of the socio-ecosystem in response to global changes and local forcing, and build possible and sustainable solutions**

(WP5.1) Building a Prospective Approach to explore the futures of Iroise 2050 from sharing among International similar Case Studies

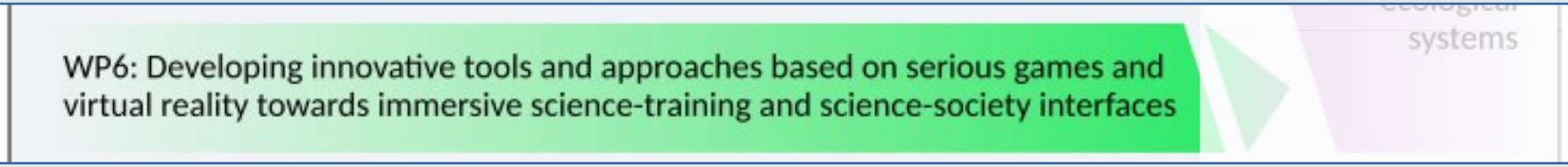
(WP5.2) Building scenarios with stakeholders (fishermen, yachtsmen and institutions involved in the conservation and management of resources and territories…) and citizen



General framework

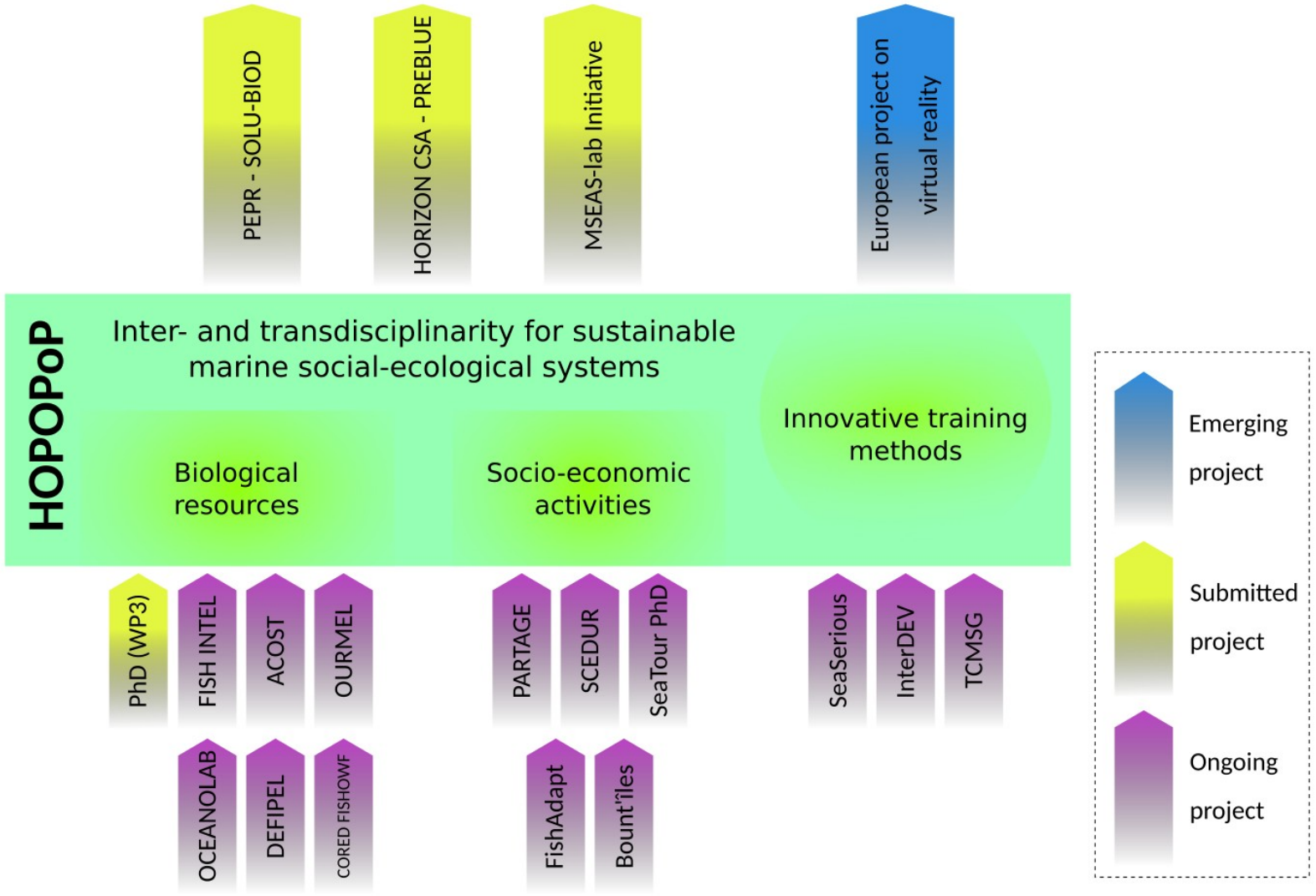
Coordinators. *Ronan Quérec (ENIB - CERV) & Frédérique Alban (UBO, AMURE)*

Objective. **Providing a set of innovative tools, approaches, training activities, and media resources co-constructed with partners of the project for students and larger audience, to promote interdisciplinary knowledge on complex marine SES, appropriation of stakes and ocean literacy**



(WP6.1) Virtual reality - Exploring interactions between natural and social processes using virtual reality
(WP6.2) Serious Games - Developing a common interdisciplinary training module on modelling complexity and serious games with applications to Iroise Sea
(WP6.3) Ocean Literacy, Communication and dissemination based on videos and web interfaces developed in connection to WP2.

Structuring role of the project



International dimension

- **High level Interdisciplinary International Advisory Board engaged in the project**
- **International workshops :** cross-study comparison and international reflexive approach
- International mobilities of the PhD Student and M2
- Development of links to international community of practices and networks including the participatory modelling community of practice, the IEMSS (International Environmental Modelling and Software Society) or agent-based modelling networks
- Links to ICES SIHD & SIIECS and ICES/PICES supported MSEAS network, as well as SMARTNET (UN decade joint ICES/PICES initiative on multidisciplinary maine science)

Training dimension

- Interdisciplinary training
  - ✗ Shared course about the management of marine fisheries
  - ✗ Interdisciplinary field course for the conservation and management of coastal socio-ecosystems (project InterDEV)

- Serious games and virtual reality
  - ✗ Explore and experience the spatial complexity of coastal SES
  - ✗ Shared teaching unit will be developed regarding complex modelling via serious games (inter-semsester)

- Project-based training