

Solutions and Knowledge - Management and Transfer

WP4: Cliona Ní Cheallachain, ERINN

T4.1: René Berndt, FHA

T4.2: Alexander Dernild, SDU

T4.3 + T4.4: Caecilia Managò, ERINN

T4.5: Laura Vetter, FHG



A 'Mission Restore
our Ocean and
Waters' initiative.



Funded by the European Union, through its Horizon Europe Program, Grant No. 101056957 (PREP4BLUE). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or of the granting authority, the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them.





Welcome by WP4 Leader

Cliona Ni Cheallachain, ERINN

**WP4: Knowledge Management & Transfer
for R&I core**



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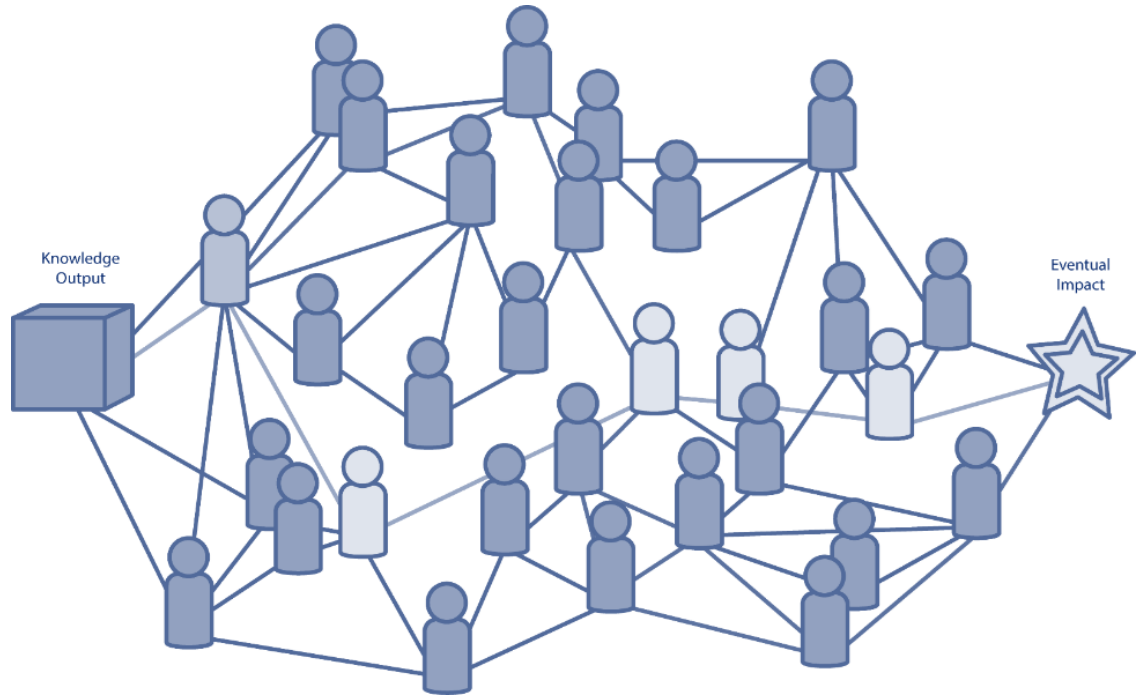


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WP4 Philosophy – Pathway to Impact is Central to Impact Achievement



It is about guiding, enabling, and accelerating the achievement of impact from publicly funded research.

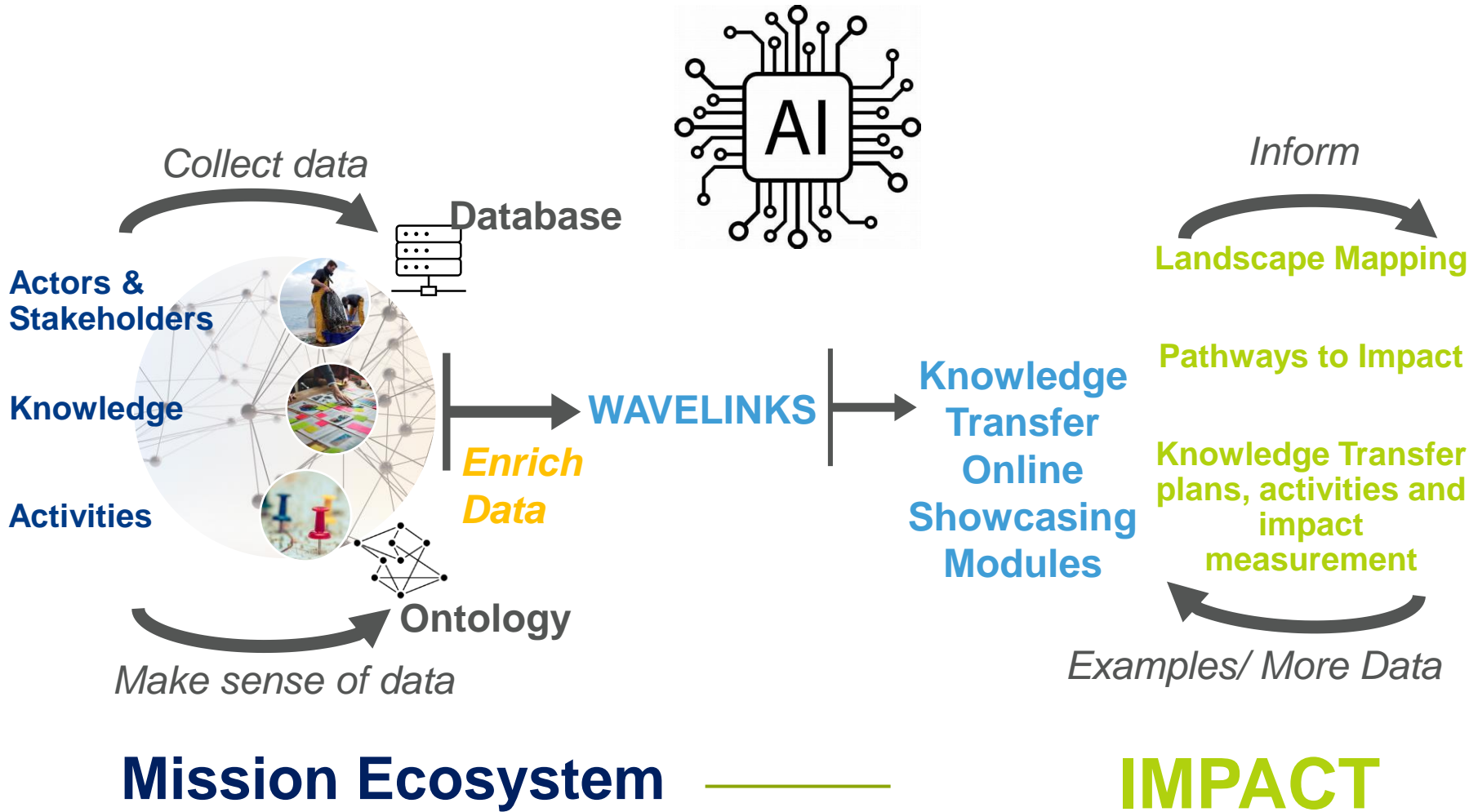


For Knowledge to have an Impact, it has to do something.



Impact Definition: A 'marked effect or influence'.

WP4 Knowledge Management



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Achieved/How to Achieve

Further Information and Links



PREP4BLUE Semantic Network

KNOWLEDGE MANAGEMENT



Knowledge Transfer Analysis
Criteria

KNOWLEDGE MANAGEMENT



Knowledge Transfer Online
Showcasing Module

KNOWLEDGE MANAGEMENT



PREP4BLUE Knowledge Transfer
Methodology

KNOWLEDGE MANAGEMENT



WaveLinks – Mission Ocean
Ecosystem Database

KNOWLEDGE MANAGEMENT



www.prep4blue.eu/resources - *knowledge management*



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WP4: Knowledge Management & Transfer for R&I core

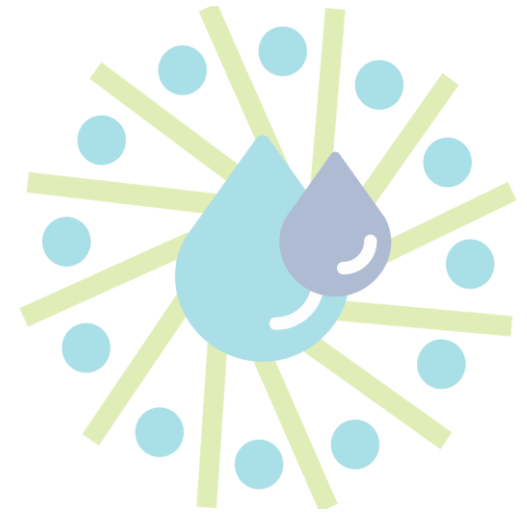
T4.1 Develop the Mission ontology as a semantic network for all Mission activities

T4.2 Mapping and Visualisation of R&I Activity Relevant to the Mission

T4.3 Collect and Analyse Mission Knowledge/ Solutions

T4.4 Knowledge Transfer of High Potential Mission Knowledge/ Solutions

T4.5 Pilot tracking of Mission Implementation and tools for assessing progress towards Targets



Presentation by each Task-Leader

T4.1: René Berndt, FHA

T4.1 Develop the Mission ontology as a semantic network for all Mission activities



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Semantic network vs Ontology

Ontology

generalised representation
knowledge in a particular
domain

Concepts
Properties
Relations

Semantic network

a way to implement an
ontology

Ontology with
real Data

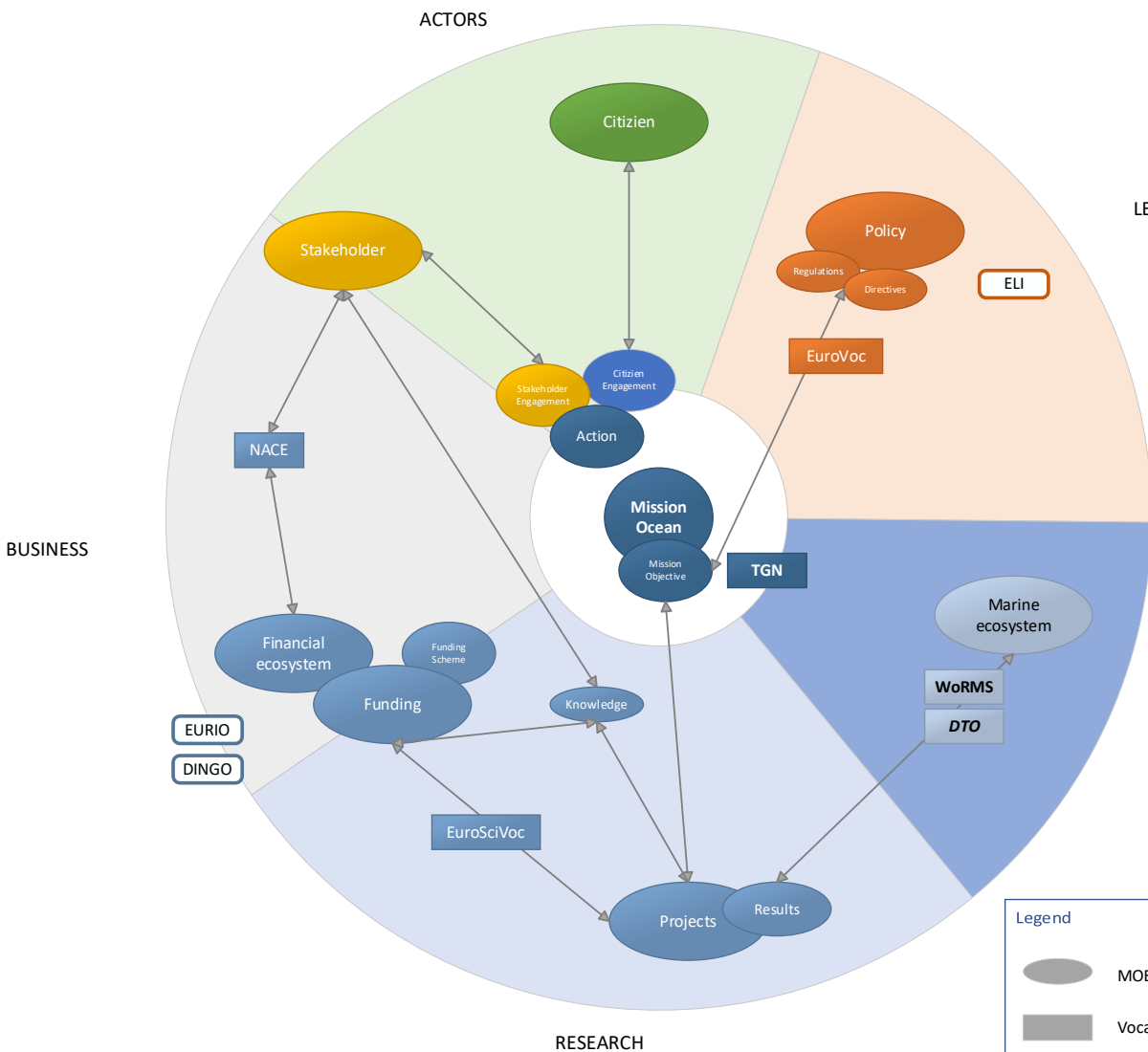


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Mission Ocean Ontology



Actors

- Institutions
- People
- Engagement Methods

Research

- Projects
- Publications + Authors

Thesauri/Taxonomies

- EuroSciVoc
- NACE
- TRL
- Getty TGN



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Mission Ocean Ontology

Based on CIDOC-CRM

- Developed by CIDOC Documentation Standards Group
- Comité international pour la documentation (CIDOC)
- International Council of Museums (ICOM)
- 2006 ISO Standard (ISO 21127:2006)

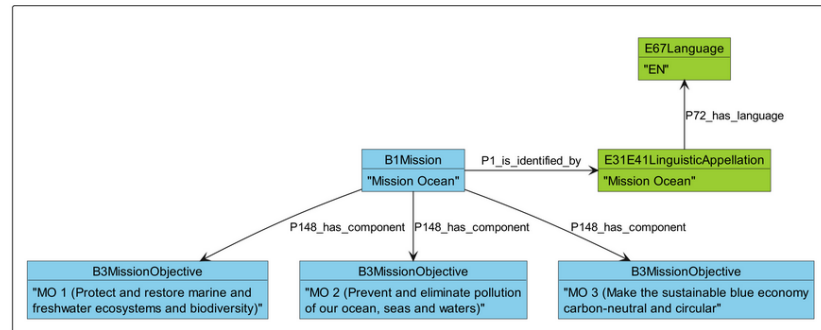
Mission and Mission Objective

Rene Berndt 18 Mar

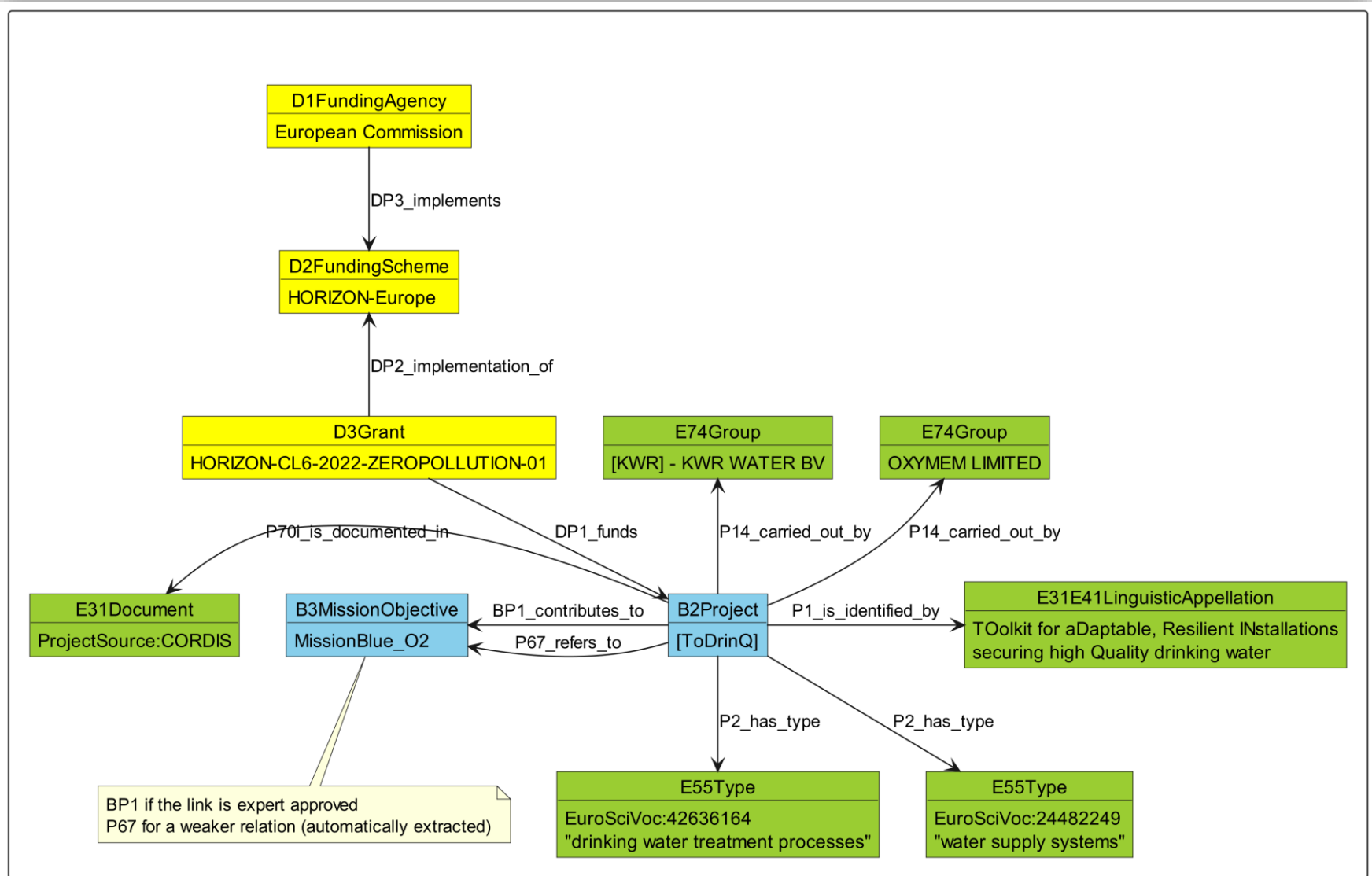
Mission and Mission-Objective

The following sample code builds the structure for the semantic network for Mission Ocean with its three objectives:

```
m = p4b.Mission("MissionBlue","EU Mission 'Restore our Ocean and Waters 2030'",url="https://research-and-innovation.ec.europa.eu/mission-blue/en",uid="MissionBlue")
m.add_objective(value="MO 1 (Protect and restore marine and freshwater ecosystems and biodiversity)", uid="MissionBlue_01")
m.add_objective(value="MO 2 (Prevent and eliminate pollution of our ocean, seas and waters)", uid="MissionBlue_02")
m.add_objective(value="MO 3 (Make the sustainable blue economy carbon-neutral and circular)", uid="MissionBlue_03")
```

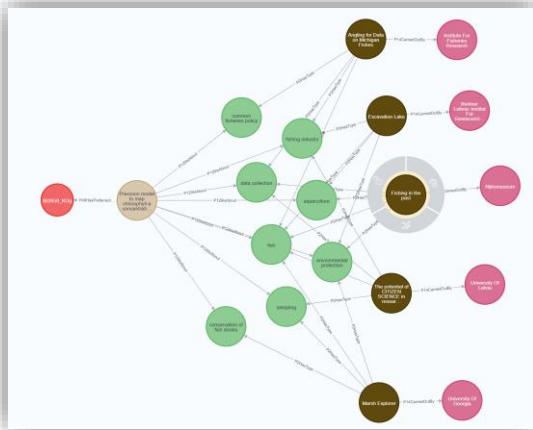


Mission Ocean Ontology



Mission Ocean Ontology

- MOE Ontology definition (RDFS)
- Toolset (Python) for building the semantic network
- Semantic Network (Neo4j)
prep4blue.ddd.fraunhofer.at
- Integrated into Wavelinks



PREP4BLUE Semantic Network

#NODES	937 061
#RELATIONS	2 212 443
#ResearchProjects	71 929
#Solutions	113
#Persons/Groups	79 732

[Graph Legend](#)

Datasources

- MOEDB
- Horizon Europe
- Horizon 2020
- FP7
- Ocean Infohub



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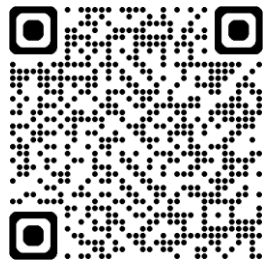


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Check it out!

PREP4BLUE D4.1: Report on
INITIAL VERSION of Mission
ontology and semantic network
and guidance for use



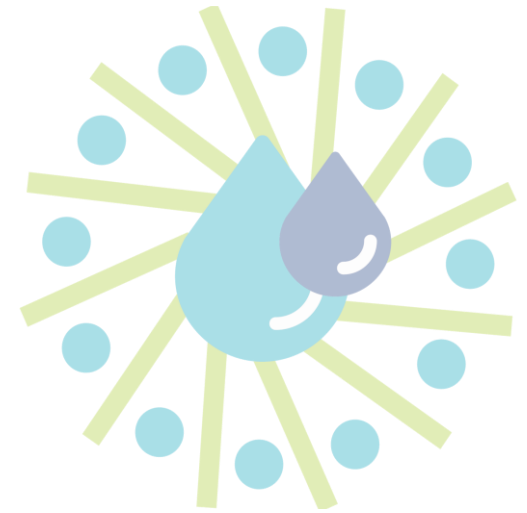
PREP4BLUE D4.3: Report on
FINAL VERSION of Mission
ontology and semantic network
and guidance for use



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Presentation by each Task-Leader

T4.2: Alexander Dernild, SDU

**T4.2 Mapping and Visualisation of R&I Activity
Relevant to the Mission**

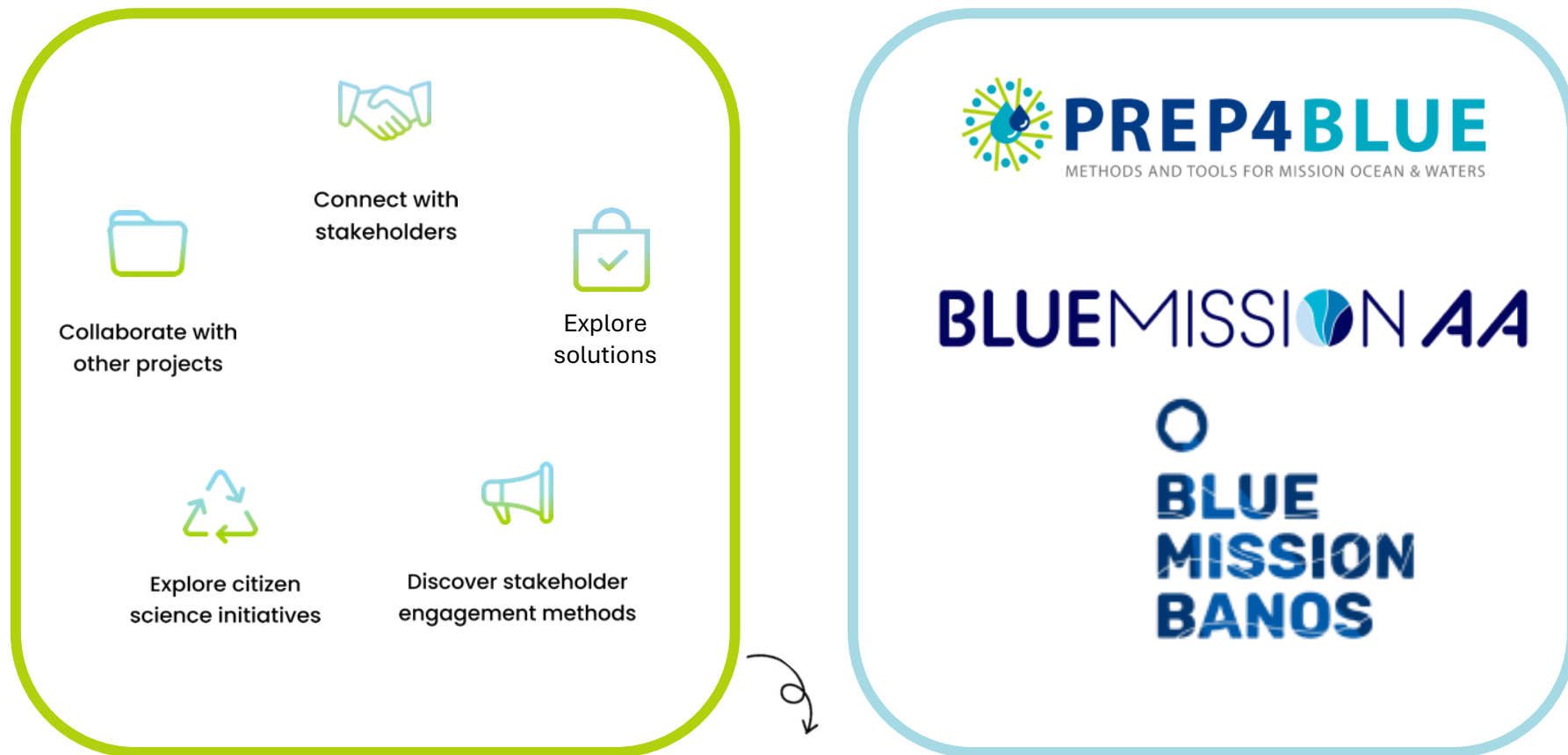


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Conception of WaveLinks



And more to come
on policies,
funding, etc.

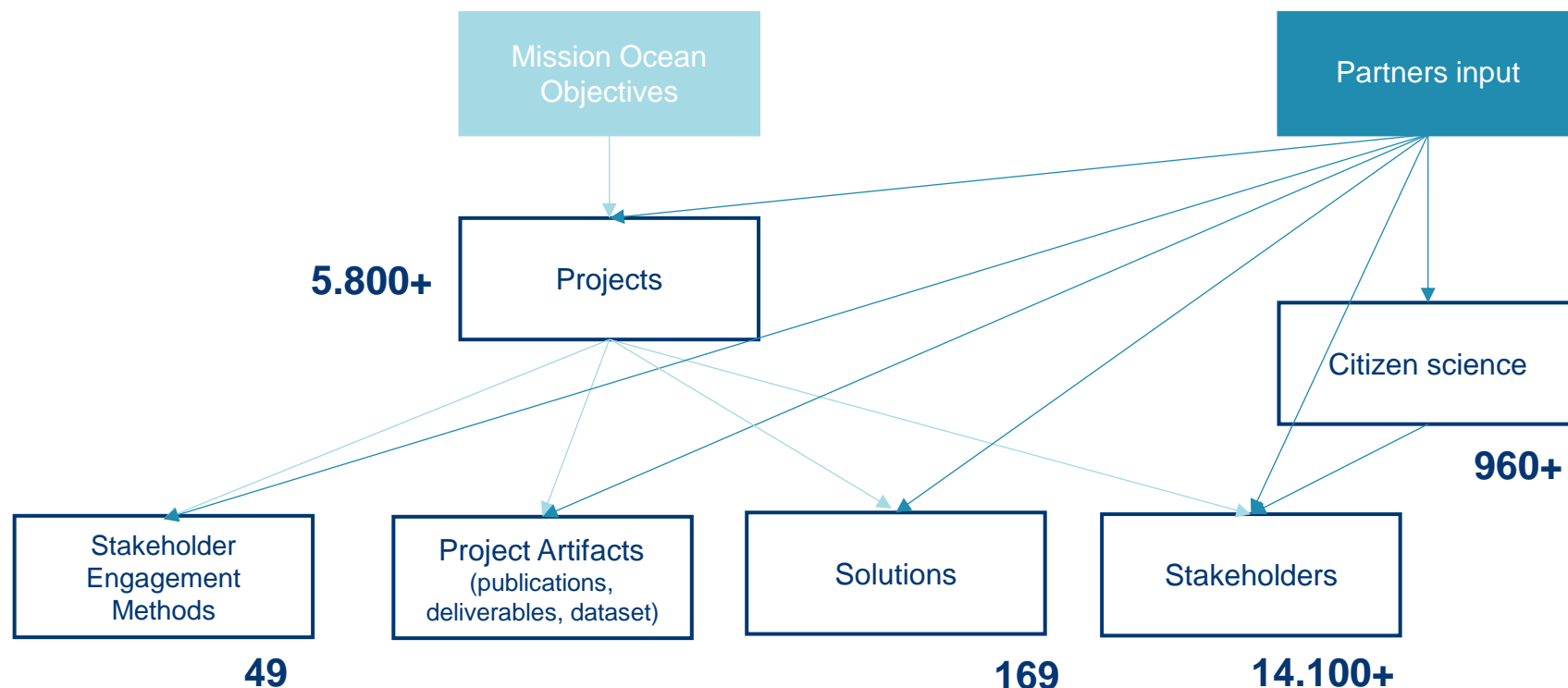


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Mission Ocean Ecosystem Database



T4.2 Mapping and Visualisation of R&I Activity Relevant to the Mission

Dashboards

SDU 

Register

Create your account and start using WaveLinks today

First name Last name

Username




Email

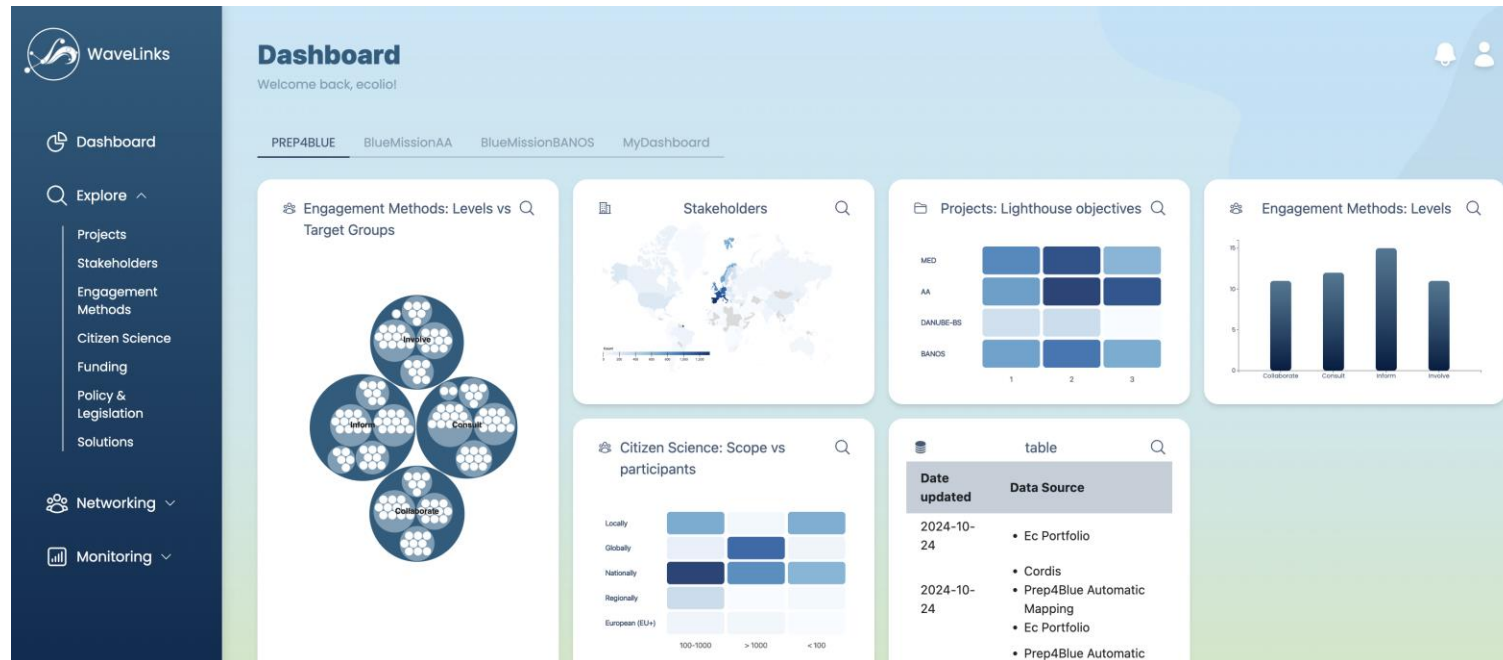
Password Confirm password

☐ I agree with the Terms & conditions

REGISTER

Already have an account? [Login](#)




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T4.2 Mapping and Visualisation of R&I Activity Relevant to the Mission

Explore the data



The screenshot displays the 'WaveLinks' 'Explore' dashboard. The left sidebar contains navigation links: Dashboard, Explore (selected), Projects, Stakeholders, Engagement Methods, Citizen Science, Funding, Policy & Legislation, Solutions, Networking, and Monitoring. The main content area features eight data visualization tiles arranged in a 2x4 grid:

- Projects:** A 3D visualization of server racks with a 'Projects' label.
- Stakeholders:** An illustration of a group of people in a meeting room with a 'Stakeholders' label.
- Engagement Methods:** An illustration of people sitting around a table in a meeting room with an 'Engagement Methods' label.
- Citizen Science:** An illustration of people participating in a beach cleanup with a 'Citizen Science' label.
- Funding:** A 3D illustration of a Euro symbol and coins with a 'Funding' label.
- Policy & Legislation:** An illustration of a balance scale with a 'Policy & Legislation' label.
- Solutions:** A visualization of a coastal landscape with a 'Solutions' label.
- Unlabeled:** A visualization of a coastal landscape with a 'Solutions' label.

The footer includes the European Union flag and text: 'Funded by the European Union under Grant Agreement ID 101093845, 101093982 and 101058957. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.' Logos for PREP4BLUE, BLUE MISSION WATERS, and BLUE MISSION BANDS are also present.



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T4.2 Mapping and Visualisation of R&I Activity Relevant to the Mission

WaveLinks

Projects

Use text, keywords and filters to find projects

[Search](#) [Overview](#) [Add new](#) [Data sources](#)

Filter by:

Clear All

Title	Start date	End date	Area	Subarea	Mission Ocean Objective	Data Source
> Joint Programming Initiative He...	2021-12-20	2025-12-31				Un Decade
> water quality biomonitoring com...	2019-12-01	2020-03-31				Prep4Blue Automatic Mapping Cordis
> industrial electrolyser for large...	2018-08-01	2018-11-30				Prep4Blue Automatic Mapping Cordis
> Reconstitution and recovery of ...	2023-01-01	2025-05-31	Mediterranean Sea		1 2  	Charter
> Columbus - Monitoring, Managi...	2015-03-01	2018-02-28			1  	Prep4Blue Automatic Mapping Cordis
> market launch of an autonomou...	2019-03-01	2021-02-28				Prep4Blue Automatic Mapping Cordis
> BUSINESS MODELS FOR ENHA...	2014-01-12	2016-09-30				Prep4Blue Automatic Mapping Cordis
> A Shipping Commitment Agains...	2021-06-01	2023-05-31	Mediterranean Sea		1 2  	Charter
> Seabed Mining & Resilience To ...	2021-06-01	2025-05-31	Pacific Ocean (North)		1 2  	Un Decade
> Establishing a national network ...	2023-05-11	2024-12-31	Mediterranean Sea		1 2  	Charter

CSV

EXCEL

PDF

Rows per page: 10 ▾

1-10 of 5887

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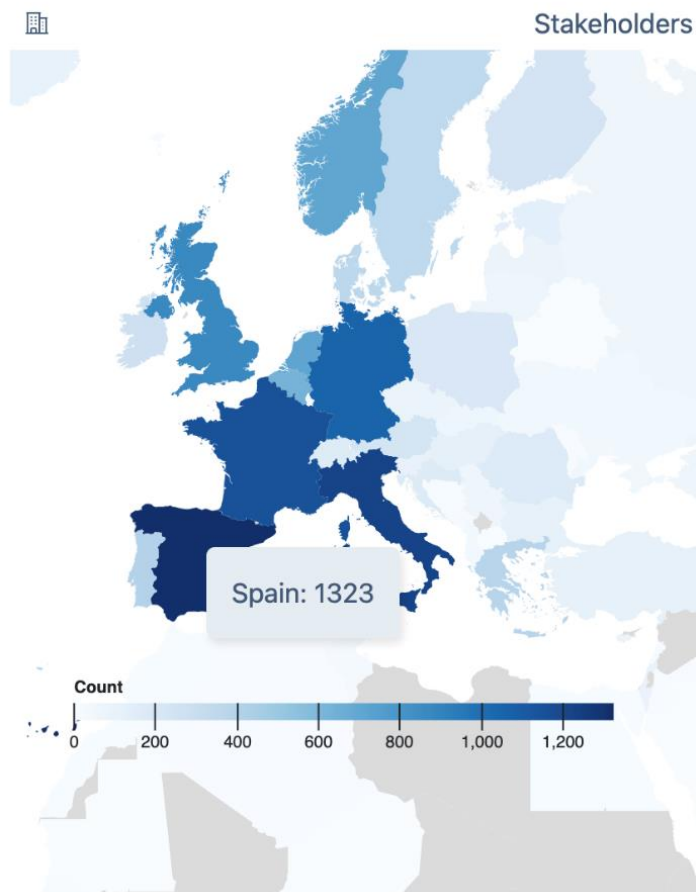


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Interactive visualizations



Projects: Lighthouse objectives



MED

AA

DANUBE-BS

BANOS

1

2

3



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T4.2 Mapping and Visualisation of R&I Activity Relevant to the Mission

Knowledge Transfer Online Showcasing Module

- WaveLinks
- Dashboard
- Explore
 - Projects
 - Stakeholders
 - Engagement Methods
 - Citizen Science
 - Funding
 - Policy & Legislation
 - Solutions
- Networking
- Monitoring
- Settings
- Help
- Contact us

Cystoseira meadows mapping in the Mediterranean Sea: comprehensive georeferenced database.

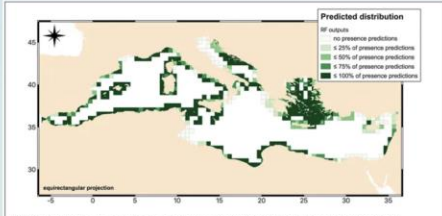
Project website [AFRIMED](#)

Background Description

Cystoseira sensu lato assemblages are being considered as habitats of critical importance for the EU (Directive 92/43/EEC; Annex I, included in "Rocky reefs") and as indicators to assess ecological status in the context of the Water Framework Directive (WFD; Directive 2000/60/EC). There is a growing focus on the status of macroalgal forests from both a conservation (Annex II of the Barcelona Convention, COM/2009/0585/FIN) and a restoration (with MERCES and AFRIMED projects) perspective to better understand the possibilities for reversing current declining tendencies through active restoration in the Mediterranean Sea. However, there is a lack of quantitative and standardised information on the distribution and temporal trends of the state of Mediterranean communities, due to the scarcity of available data (few studies have been conducted) and the use of different approaches for the various works conducted, which make it difficult to compare them.

Technical Description

The georeferenced database of Cystoseira was produced embedding catalogued grey literature, systematic review papers, EDONet (European Marine Observation and Data Network), previous database produced by FP7 EU project CoCoNet (Grant agreement no: 287844) and new data acquired from CARLIT (CARTography of Littoral and upper-sublittoral benthic communities) monitoring program; however, data are missing for some areas (east and south). To overcome the lack of information, a Habitat Suitability Model (HSM) was developed by means of 55 predictor variables (geomorphologic, environmental and anthropogenic) using the Random Forest Machine Learning technique (789059 AFRIMED KOC). This database goes beyond the state of the art as it collects various datasets and improves them with a new predicting model (HSM, 789059 AFRIMED KOC) to identify suitable areas for 20 Cystoseira species ([here the list](#)) where data were not available as well as the above mentioned predictor variables that include, among others, factors related to anthropogenic pressures e.g. Artisanal fishing, Human impact to marine ecosystems and pollutants. The Habitat Suitability Model output, showing suitable areas for Cystoseira species across the Med, is described in the figure below.



Potential Impact And Applications


The georeferenced map is accessible to all and has been used for restoration actions (TRL 9) also usable through the "Business clubs" organized by the AFRIMED project. The georeferenced map is contained in a [scientific paper](#).

The database has potential commercial exploitation in that it may be taken up by enterprises operating in marine restoration to determine which areas satisfy the requirements for restoration measures based on historical data and prediction model according to geomorphological features. Other than that, the main use that can be made is to provide policymakers with an overview of areas both for restoration activity but also to implement new protected areas since macroalgal forest provide several key ecosystem functions (nursery, feeding, etc.) and services (fishing, leisure, etc) that enhance biodiversity in the area in which they are located. Other possible applications include pre-assessments on carrying out restoration measures and assessments related to spatial planning. The map was created by considering geomorphological variables such as soil type, environmental variables such as temperature or pH, and anthropogenic variables such as distance from ports or the presence of tourists; it thus provides us with information on the different characteristics that describe the areas of the Mediterranean Sea. It is therefore possible to know where stress factors are present that can be removed or mitigated, to make the area suitable for restorative actions, suggesting to interested parties where to act and in so doing, reducing the economic expenditure for ineffective actions. These possible applications of the map contribute directly to the first Mission objective, to "Protect and restore marine ecosystem and biodiversity", in particular the restoration plan can "Contribute to relevant upcoming marine nature restoration targets, including degraded seabed habitats and coastal ecosystem" and may have a relevant application in "Protect a minimum of 30% of the EU's sea area".

Readiness level TRL 9 - Actual system proven in operational environment

Project

- AFRIMED



Potential Stakeholders

Country Organisation Type

Stakeholder	Match score ?	Common terms	Actions
Agencia Estatal Consejo Superior De Investigaciones Cientificas	41.2	<ul style="list-style-type: none"> conservation of resources ecosystem biodiversity protection of animal life environmental 	View Graph

Found 88 potential stakeholders

[Methodology behind the Online Showcasing module](#)

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T4.2 Mapping and Visualisation of R&I Activity Relevant to the Mission



Check it out!



PREP4BLUE D4.4: Report
describing Mission Ecosystem
Database and dedicated user
interfaces for Mission end-users



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Presentation by each Task-Leader

T4.3: Caecilia Managò, ERINN

T4.3 Collect and Analyse Mission Knowledge/ Solutions



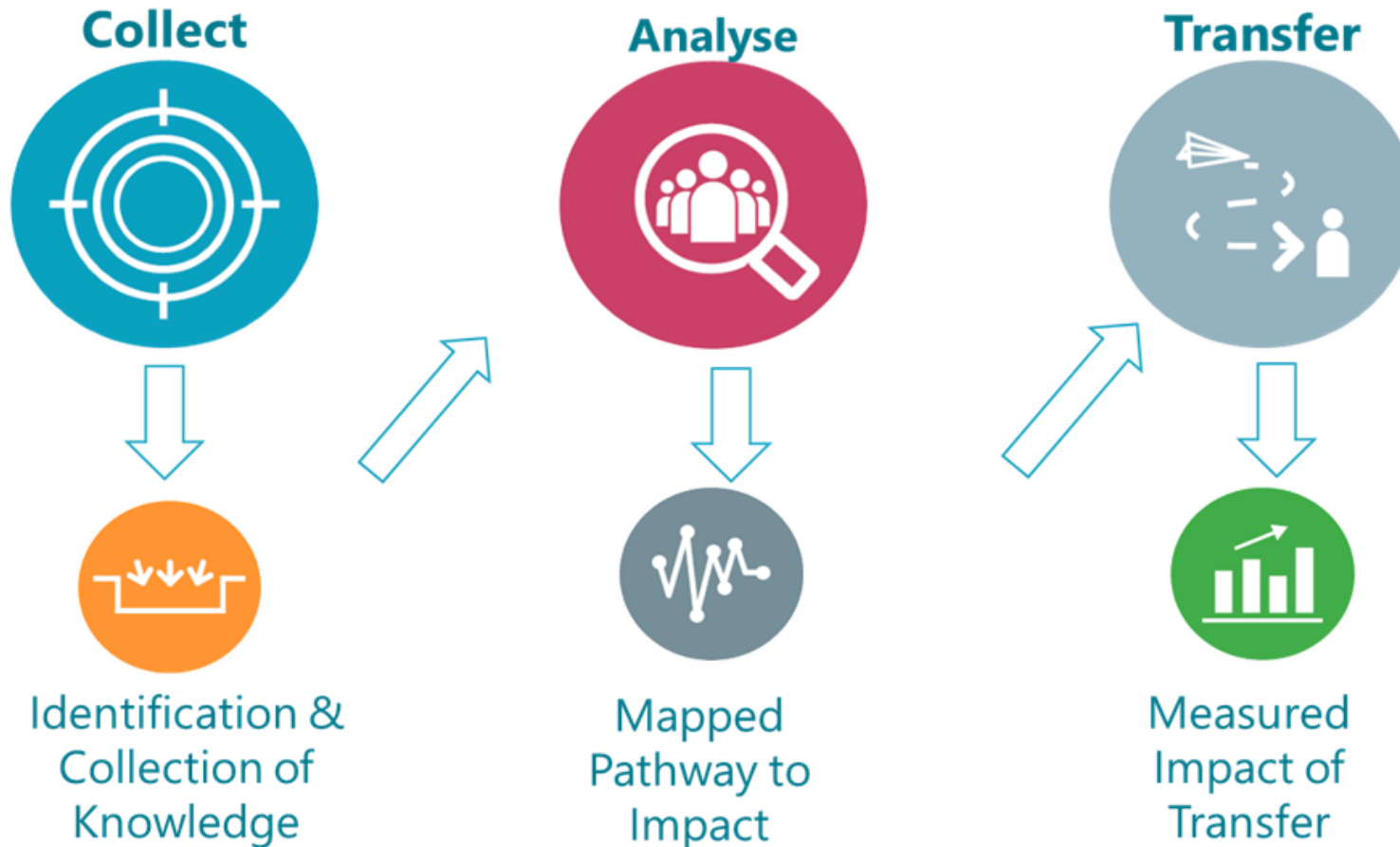
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T4.3 Collect and Analyse Mission Knowledge/ Solutions

Knowledge Transfer Method by ERINN Innovation



© Image courtesy of ERINN Innovation



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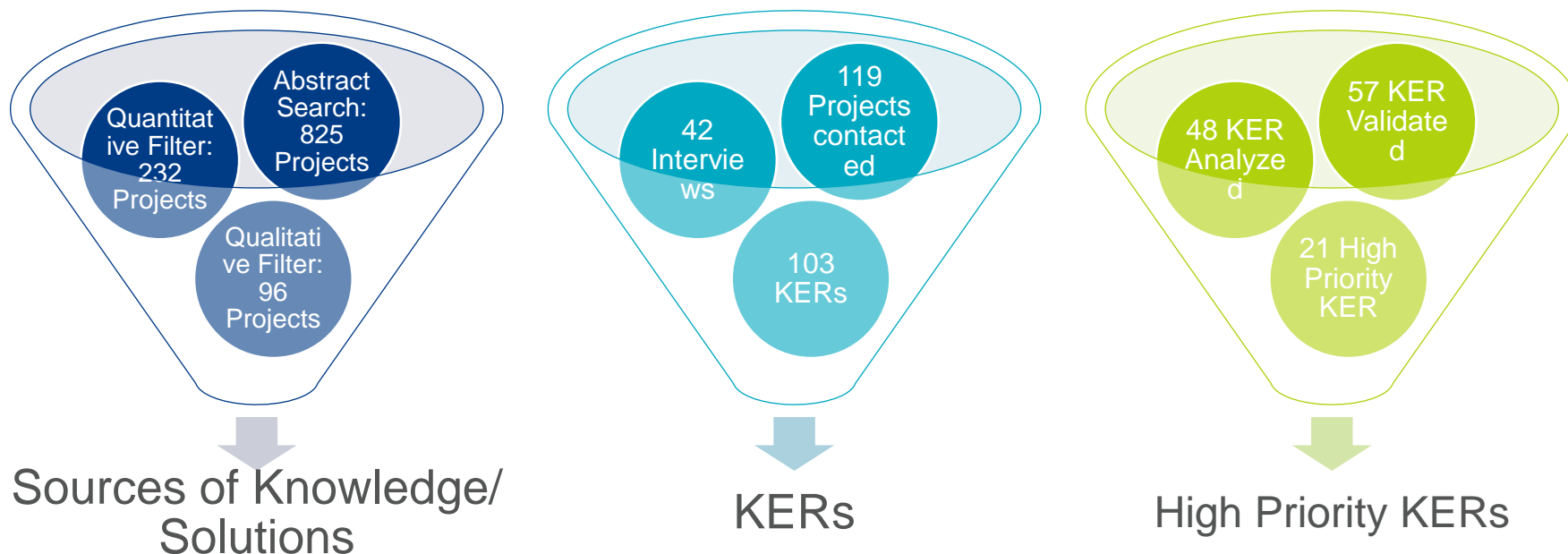


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Analysis Criteria

Criteria	Suitability*/ MISSION FIT (Contribution to target impacts...)	Application and Impact potential* By 2030	External factors and other considerations
	Indicators		
	Mission Objectives, Targets, Enablers	Maturity* : Achievable Readiness-level (TRL, BRL, MRL, SRL, IRL)*	Market (CAGR, need, readiness) and market share (TAM, SAM, SOM)
	Policies, regulations or legislations the Mission is expected to contribute to (e.g. GreenDeal, SDG)	Scale-up* and scale out potential to maximise impact	User (identified, known, clear need identified, gains and pains across the value chain addressed)
	Protect and restore the health of our ocean and waters, climate neutrality, nature restauration	Replicability* (Geographical, Sectorial etc.)	Feasibility (e.g. a new standard to be implemented into a member state)
	In a specific Lighthouse area	Uptake potential (COM-B, TAM, TAC BCW)*	Competitors (strong competitor landscape or solution easy to copy)
	Innovativeness (transformative*, incremental, disruptive)*, beyond the State of the Art	Systemic application* (sub-system, system, ecosystem)	Resources needed for scaling (time, funds)
	Not highly innovative but high value to create impact.	Negative impacts (collaterals, risks, barriers, trade-offs)	Domain-specific considerations

Knowledge Transfer Activities



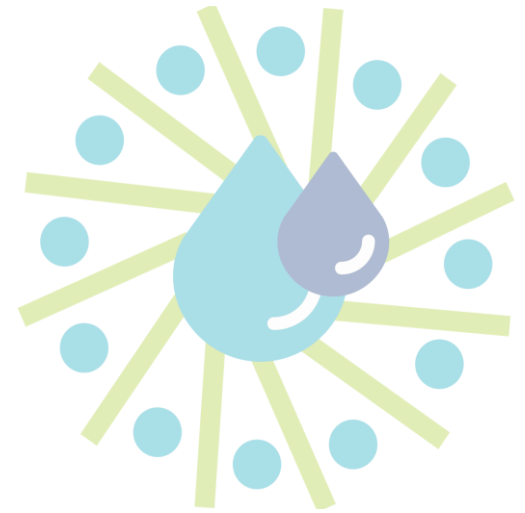
PREP4BLUE D4.2:
Customized Knowledge
Management Method for Mission
Restore our Ocean and Waters



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Presentation by each Task-Leader

T4.4: Caecilia Managò, ERINN

**T4.4 Knowledge Transfer of High Potential Mission
Knowledge/ Solutions**



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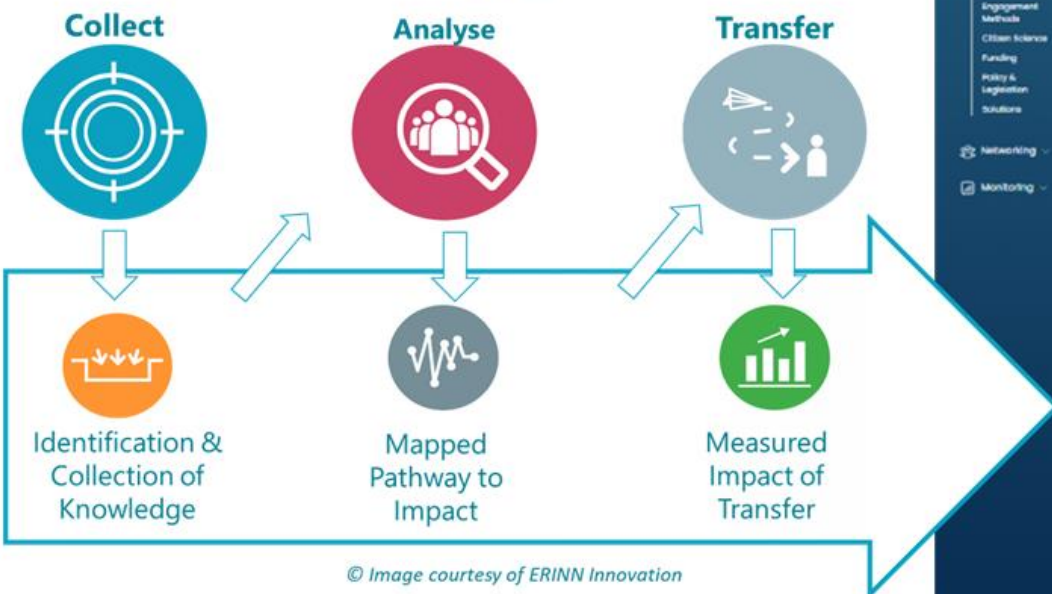
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T4.4 Knowledge Transfer of High Potential Mission Knowledge/ Solutions

Based on Knowledge Management Method by ERINN, informed through the Mission Ontology by FhA, on WaveLinks.eu, by SDU

APPROACH IN PREP4BLUE

Knowledge Transfer Methodology by ERINN Innovation



PREP4BLUE D4.5:
Demonstrations of the
Knowledge Transfer Online
Showcasing Module



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Knowledge Transfer Online Showcasing Module

Multiplatform tracking and wireless communication system enabling precision fish farming and ecosystem welfare

Project website: [Submarine](#)

Background Description: The fish farming industry seeks instruments that can monitor in real time fish health and welfare opportunity. The interest of Things (IoT) can contribute to the development of sustainable and robust aquaculture systems that ensure profitability, maintain healthy results, resources and strengthen the capacity of the sector for adaptation to climate change.

Technical Description: In the framework of the FutureBlue project, CODR, Tecnalia & Risco to non-profit cooperative partner of the project developed and tested this multiplatform tracking and communication system for simultaneously monitoring the activity and physiology of fish, as well as the main parameters of the environment where they are farmed. By using a wireless communication system, this way a real time interaction between farms and farmers will allow a rapid adaptation of actions towards a science-based decision making process. Enhanced environmental (e.g. oxygen, temperature, salinity, pressure) and biological (e.g. behaviour, activity, energetic, feeding, physiological) data, collected by a network of wireless electronic sensors, can provide accurate free scale measurements of environmental conditions, fish health, welfare and/or fish size, thus facilitating predictive modelling of the resulting performance and impact.

The real time wireless communication system and sensor network envisaged for the FutureBlue large scale demonstration activities is the result of integrating several technological solutions to isolated demands in an innovative way. The system includes a cloud platform that communicates with underwater, based on the technology offered by real time aquaculture (RTA) and "AquaSense" is a family of compact, submersible environmental off the shelf sensors, with underwater and in air wireless communications such as AquaSense DO (dissolved oxygen), Salinity, Temperature, and Current. While the "AquaSense" is the core of the system deployed in the field and it directly underwater communication from nearby sensors communicates up to 100 AquaSense sensors within a 300m radius. The hub also supports telemetry protocols for cloud, including Cellular, Wi-Fi and LoRa, as well as the VNP-B, VNP-MP accelerometer pressure tags. The sensor hub also supports third party sensors, like weather stations, via its auxiliary sensor port. The data is transmitted through a wire on a gateway device placed on the surface of the cage and will be sent over the internet (4G) connected to a cloud since that will process the data and show the results enabling data driven decision making where knowledge drives better decisions. The end-to-end system architecture is illustrated in the image below. In their most basic form, electronic sensors and tags may include radio or acoustic beacons that transmit signals, which can bring specific codes to identify animals, and allow them to be tracked using receivers that detect the transmitted signals. Because the strength of radio signals rapidly attenuates in sea water, acoustic transmissions are preferred for fish tracking in marine environments, while radio transmission is commonly used in fresh water environment. More advanced tags incorporate sensors that measure and record a suite of environmental and/or biological parameters of fish, for instance:

Readiness level: No. 7 - System prototype demonstrated in operational environment

Markets/Policy behind the Online Showcasing module:

Potential Stakeholders:

Stakeholder	Matches	Concrete terms	Actions
Assoc. Farmer OF	5	• variation of resources • environmental protection • biodiversity • fish • energy efficiency	View Graph

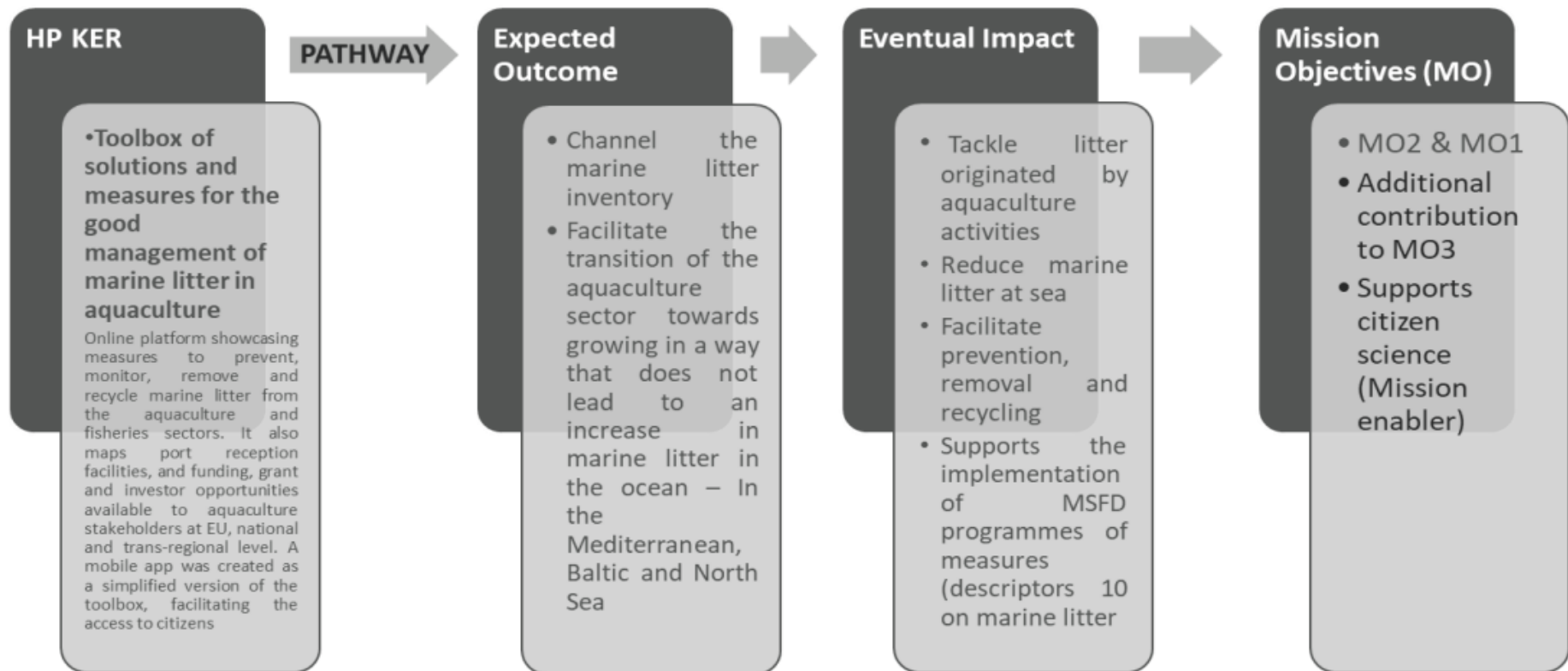
Architecture:

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From KER to Eventual Impact

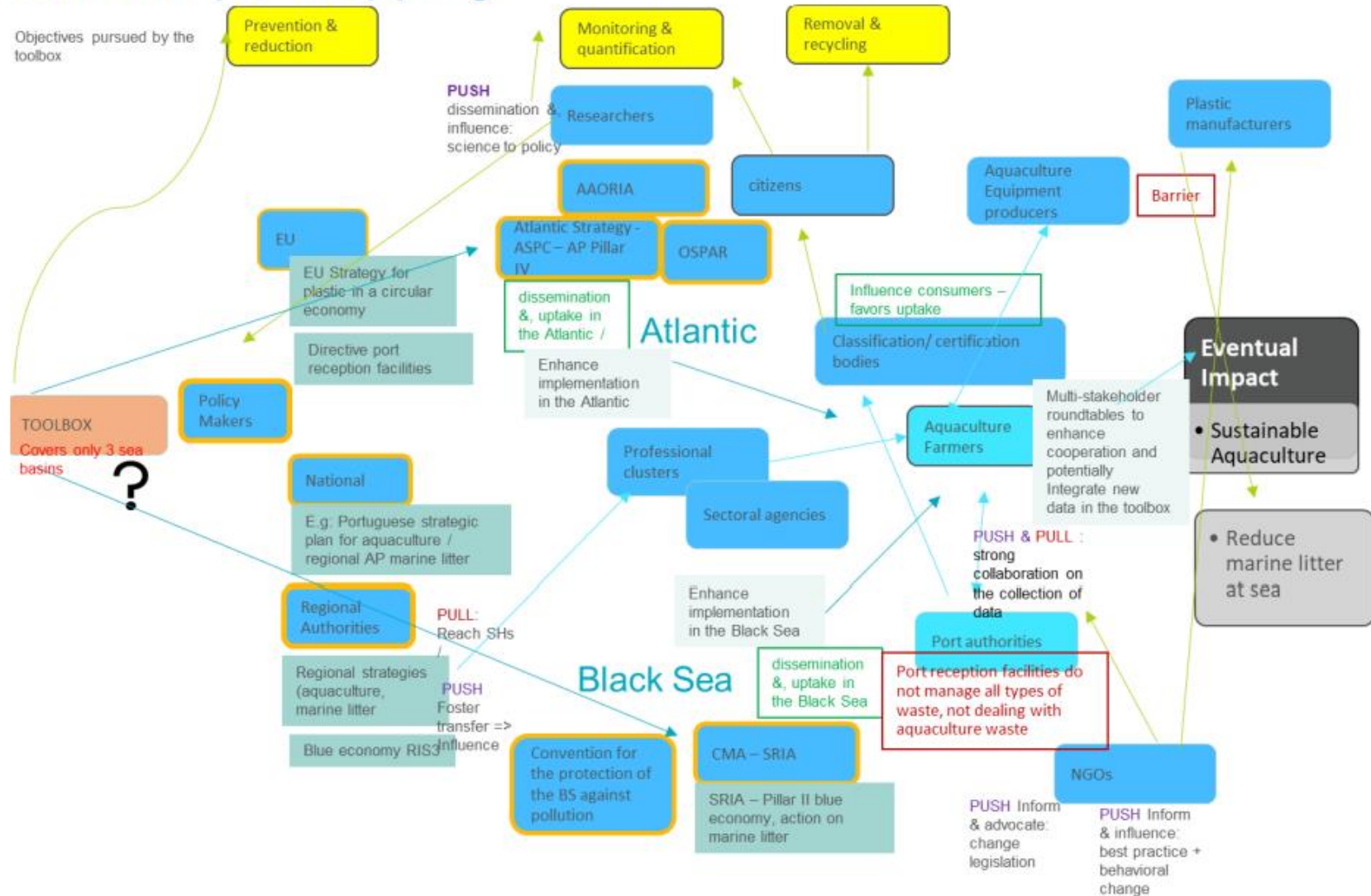


Overview of the pathway to impact for the 'Toolbox'



T4.4 Knowledge Transfer of High Potential Mission Knowledge/ Solutions

Landscape Mapping



Example of the Stakeholder Landscape Mapping for the 'Toolbox'

T4.4 Knowledge Transfer of High Potential Mission Knowledge/ Solutions

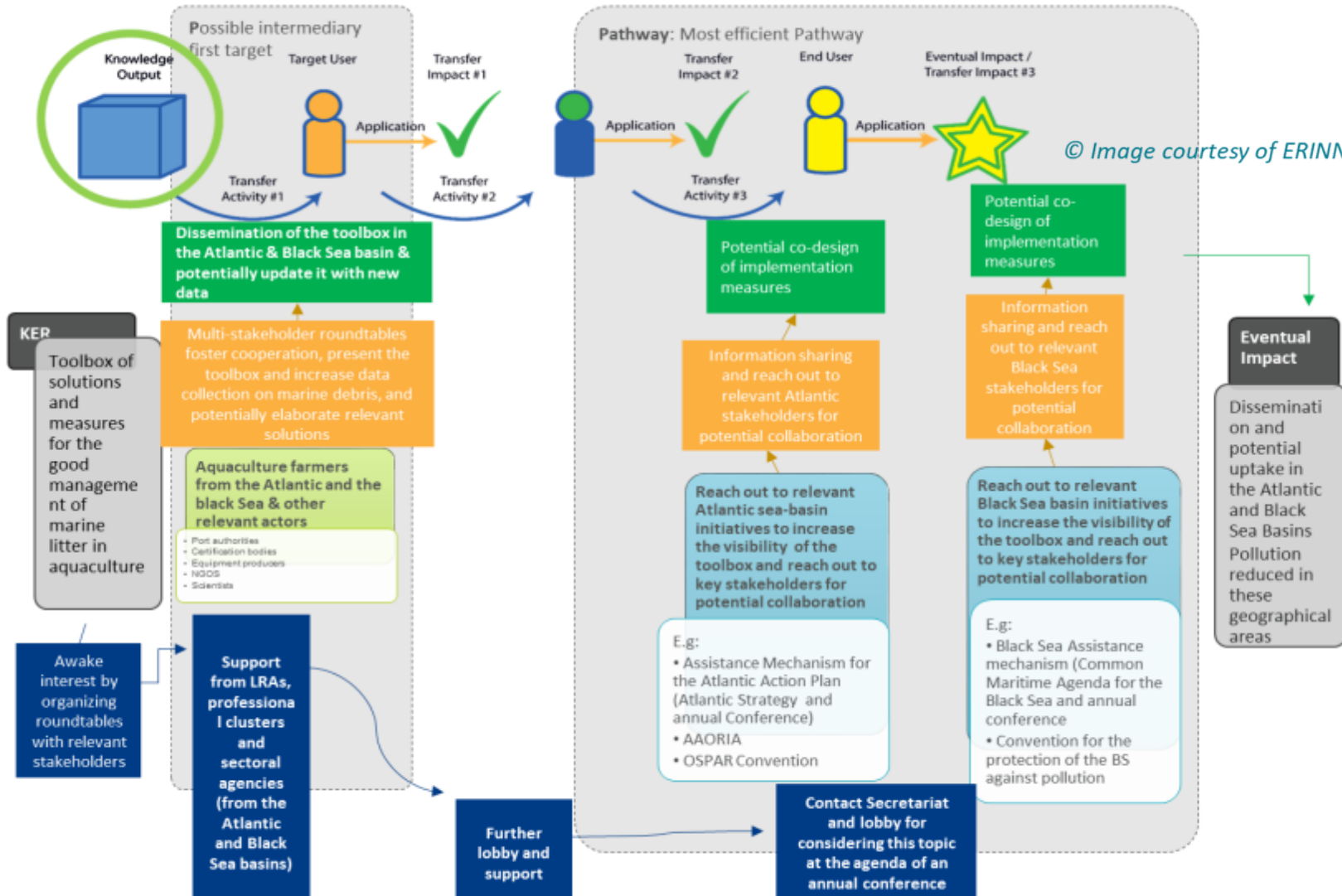
Pathway

LEGEND

Transfer activity

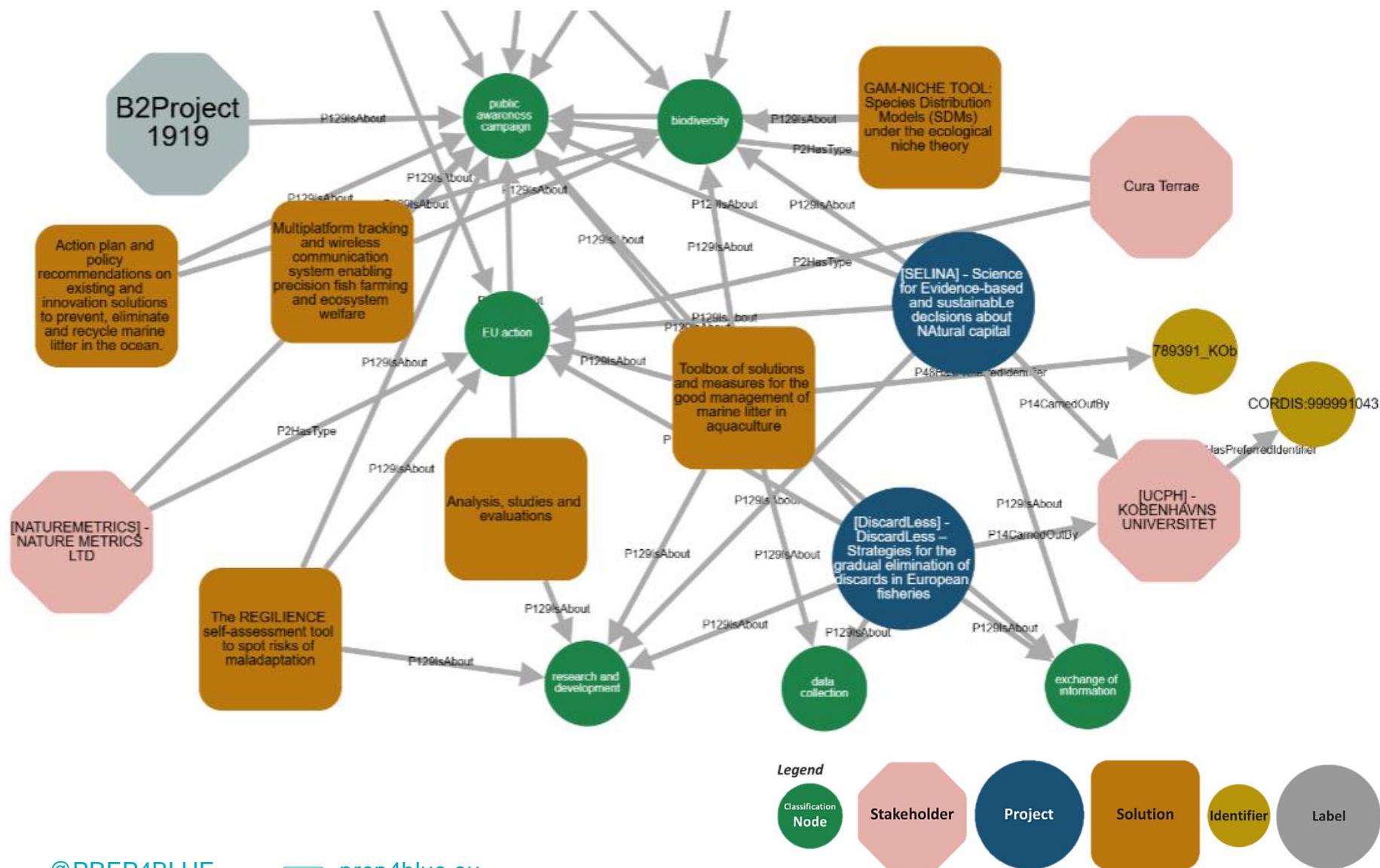
Application

Transfer impact



: Example Overview of a Full Pathway to Impact for the 'Toolbox'

T4.4 Knowledge Transfer of High Potential Mission Knowledge/ Solutions



T4.4 Knowledge Transfer of High Potential Mission Knowledge/ Solutions

Potential Stakeholders

Stakeholder	Match score ?	Common terms	Actions
Departament D'Acció Climàtica, Alimentació i Agenda Rural	329.3	<ul style="list-style-type: none">• exploitation of resources• management of resources• environmental protection• new	View Graph

Found 84 potential stakeholders ?

T4.4 Knowledge Transfer of High Potential Mission Knowledge/ Solutions



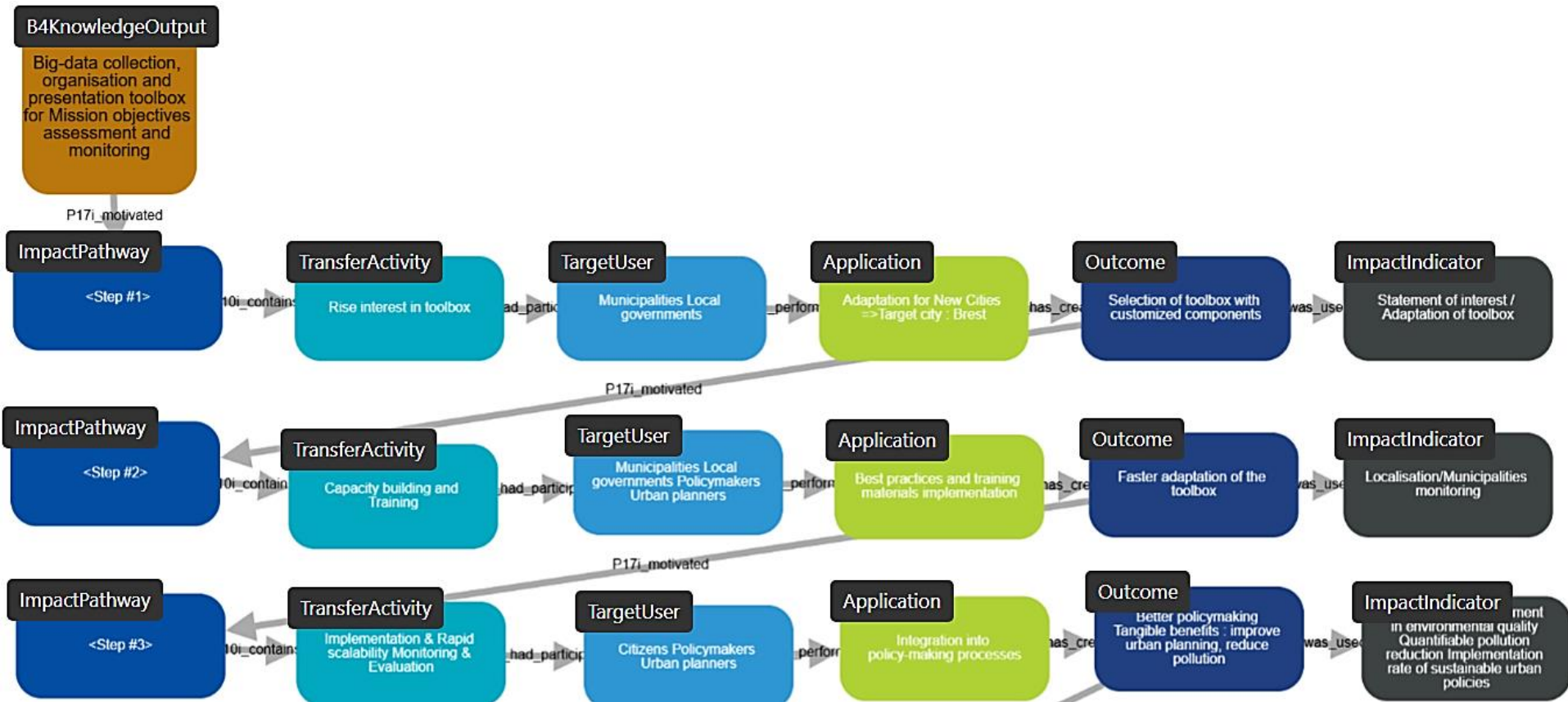
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<https://wavelinks.eu/video/KTOSM-demo>

T4.4 Knowledge Transfer of High Potential Mission Knowledge/ Solutions



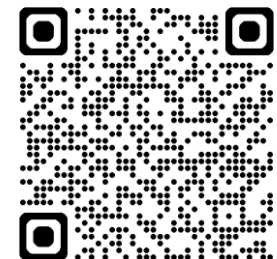
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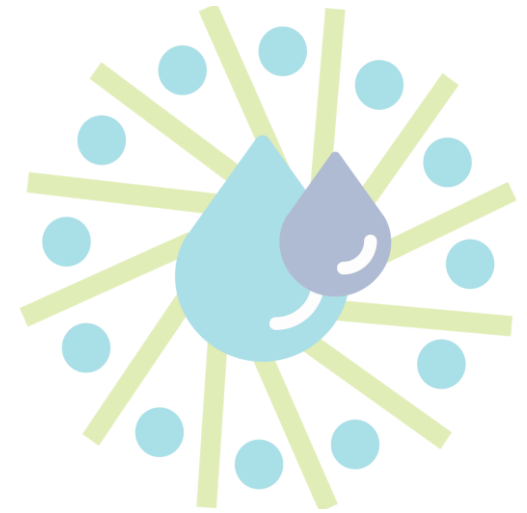


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Check it out!





Presentation by each Task-Leader

Laura Vetter, FHG

**T4.5 Pilot tracking of Mission Implementation and tools
for assessing progress towards Targets**



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- Tailored views for users
- Key functionalities: Data & information, search & filter, linkages (semantic network search), networking & collaboration, user experience
- Real-time insights on progress toward Mission Ocean goals



Tracking of Mission Progress

What we measure

1. Implementation & Activities
2. Scientific Output
3. Policy & Regulatory Impact
4. Stakeholder Engagement
5. Environmental & Societal Outcomes

How it helps the user

- Spot trends and gaps early
- Measure real-world impact
- Support funding, strategy & policy
- Stay informed and connected

➤ *WaveLinks:
Guiding Mission
Ocean with data
that matters.*

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Networking & Collaboration
Monitoring
[Mission Progress Overview](#)
KPI Dashboard
Personalization



Live Demonstration of the Knowledge Transfer Online Showcasing Module

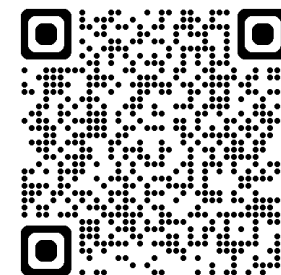
René Berndt, FHA

Alexander Dernild, SDU

Caecilia Managò, ERINN



Check it out!



**WP4: Knowledge Management & Transfer
for R&I core**



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@eumissionocean

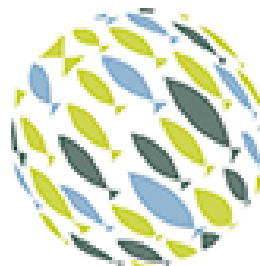


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METHODS AND TOOLS FOR MISSION OCEAN & WATERS

WP4: Solutions and Knowledge - Management and Transfer

Thank you!



A 'Mission Restore
our Ocean and
Waters' initiative.



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