Blue Economy: Innovation Clusters, Atlantic Natural Resources Management and Maritime Spatial Planning

Filipe Brandão (GMV), João Vitorino (GMV), Christine Sams (NOC), Clive Neil (NOC), Rory Scarrot (UCC), Fiona Fleming (UCC), Javier Urien (SpaceSur), Gustavo Caluori (SpaceSur)

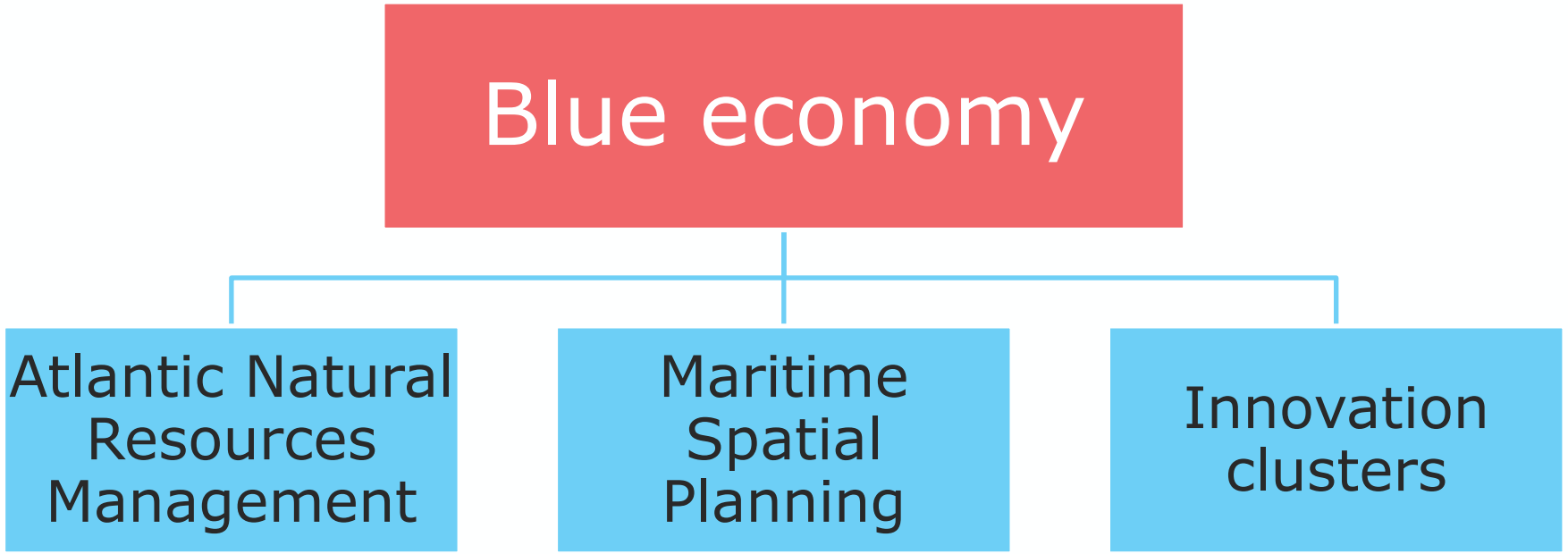
Blue Economy

1. Project Overview

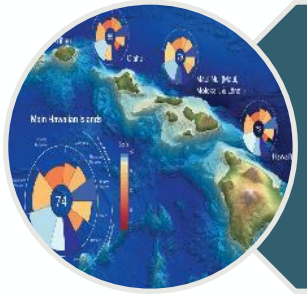
BLUE ECONOMY – Project overview

The **Blue Economy** project is part of the **ESA Atlantic Regional initiative** aiming to providing insights and solutions in the **Blue Economy thematic**

Demonstrating how EO can support the aspirations and requirements of EU marine policy



BLUE ECONOMY – Project overview



Atlantic Natural Resources Management – development and implementation of services focused **Flood and Coastal Erosion Risk Management (CCO)**

Maritime spatial planning – development and implementation of EO based services for **marine pollution detection and monitoring (APV and INIDEP)**

Innovation clusters - running throughout the project and ensuring impactful **stakeholder-centred development**, and future mapping.

Involving existing Atlantic regional clusters, and identifying existing services and gaps for a **stakeholder-driven technological roadmap**

BLUE ECONOMY – Project overview

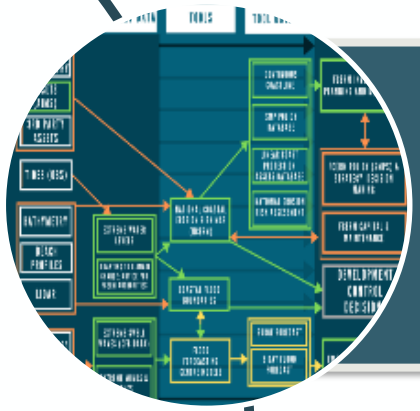
Project consortium

- **GMV** (INNOVATING SOLUTIONS)
  - Prime contractor and project leader
  - Development of marine pollution detection services
- **National Oceanography Centre** (NATURAL ENVIRONMENT RESEARCH COUNCIL)
  - Development of coastal monitoring service
  - Development of MRE service
- **UCC** (University College Cork, Ireland – Coláiste na hOllscoile Corcaigh)
  - Innovation clusters leader
- **SPACE SUR**
  - Link to stakeholders

Blue Economy

2. Case studies

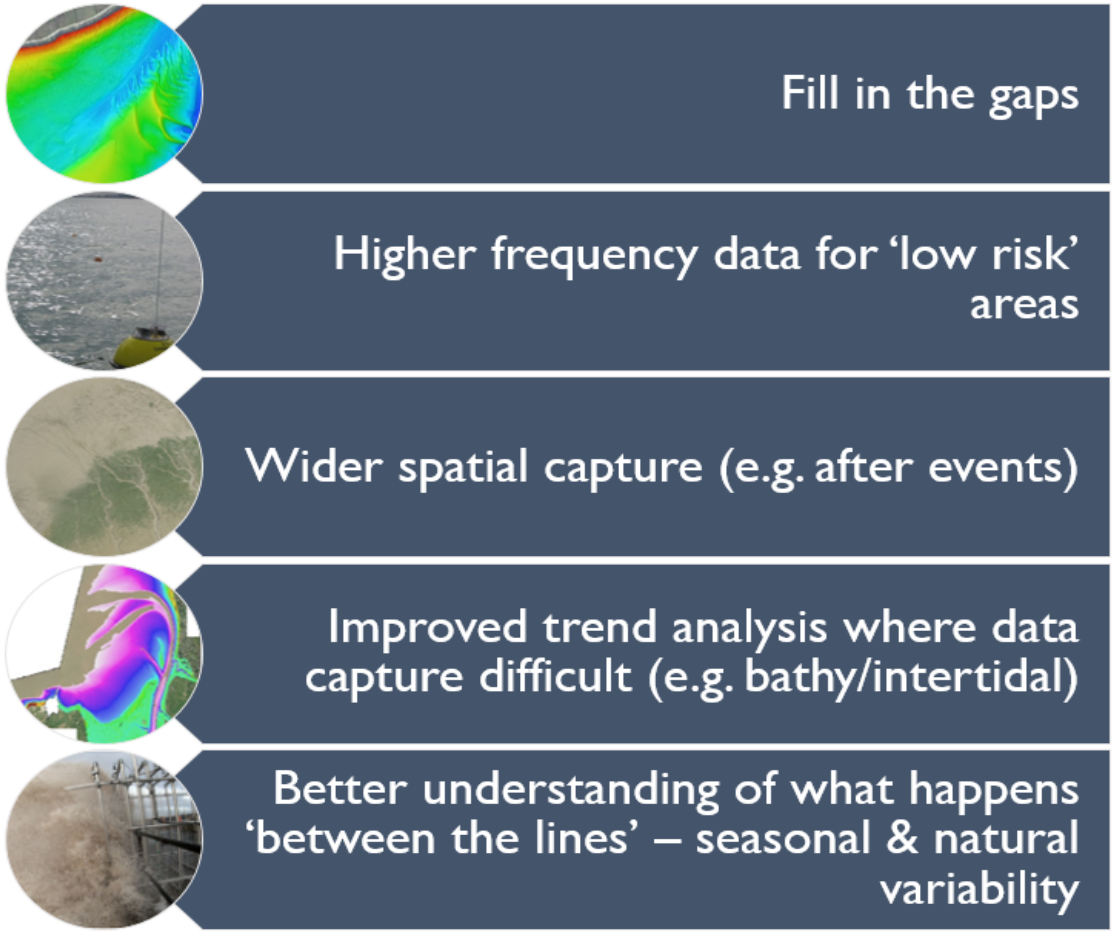
BLUE ECONOMY – Case studies



CS 1 - Flood and Coastal Erosion Risk Management

CS 2 - Marine pollution detection and monitoring

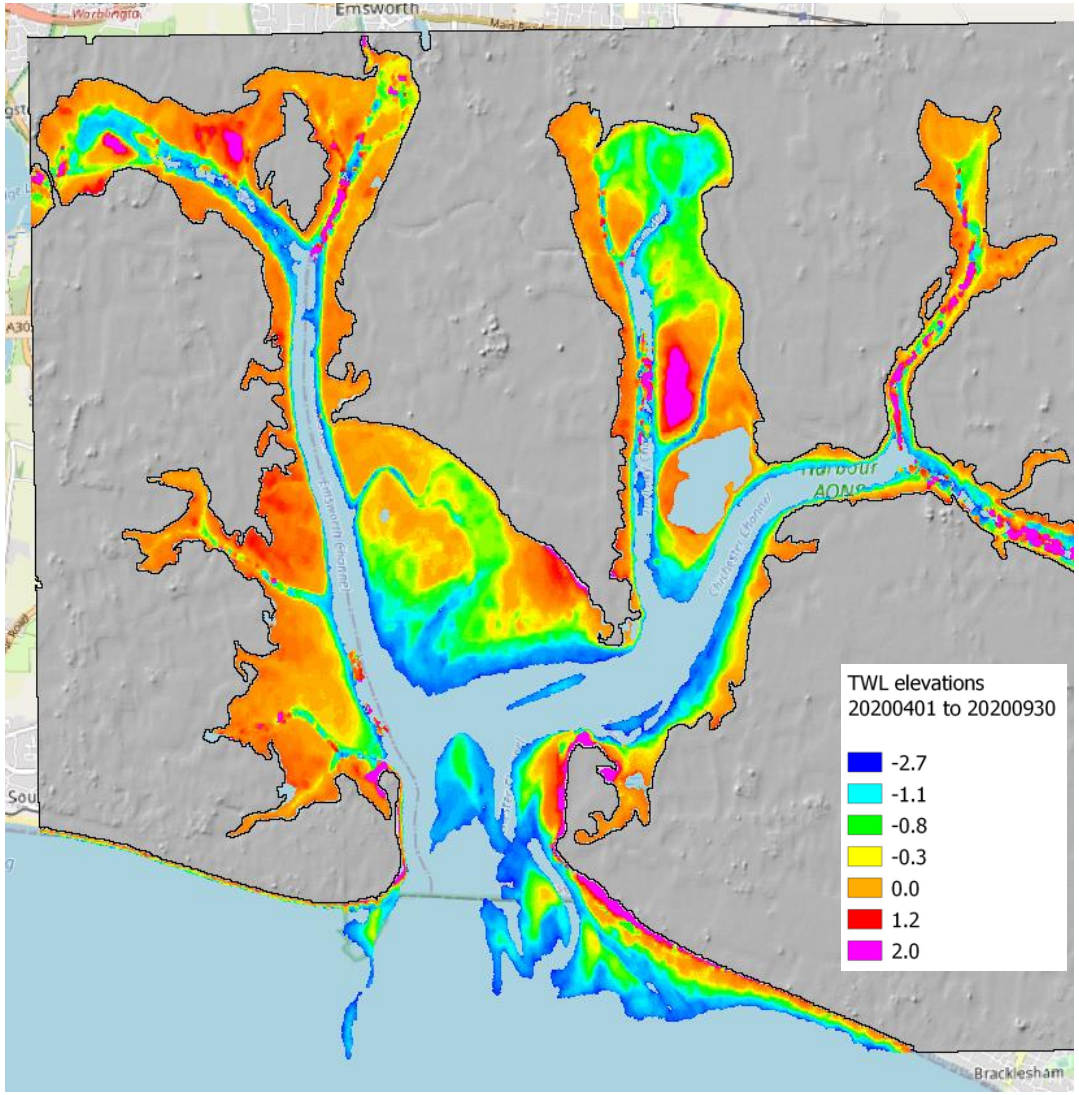
CS1 - Flood and Coastal Erosion Risk Management



- It all started with a question: *Is there a role for EO services in the coastal monitoring programmes of England and Wales ?*
- In partnership with CCO, 5 overarching possibilities have been identified (shown left)
- The focus was on intertidal topography, using / adapting data processing methods originally developed for use with Marine X Band Radar*

*work carried out by NOC's Dr Paul Bell, now available as a commercial service via Marlan Maritime Technology Ltd. Also an ongoing active research topic

CS1 - Flood and Coastal Erosion Risk Management



- There are a number of different techniques for mapping topography, that use either optical or radar data, or a combination of both
- The method under development at NOC uses freely available Synthetic Aperture Radar (SAR) Data available from the ESA Copernicus Hub
- NOC is using a series of radar images coupled with sea level height information, and use a ‘temporal waterline’ processing methodology to produce estimates of topographic height for intertidal areas – **this is referred to as ‘TWL’ processing (Temporal Water Line)**
- The technique outputs a composite estimate of heights at a minimum spatial resolution of 6.4sq.m within a defined temporal window. Experiments suggest that the best accuracy in the UK is obtained by using between 3 and 6 months of data

CS2 - Marine pollution detection services

Two services developed:

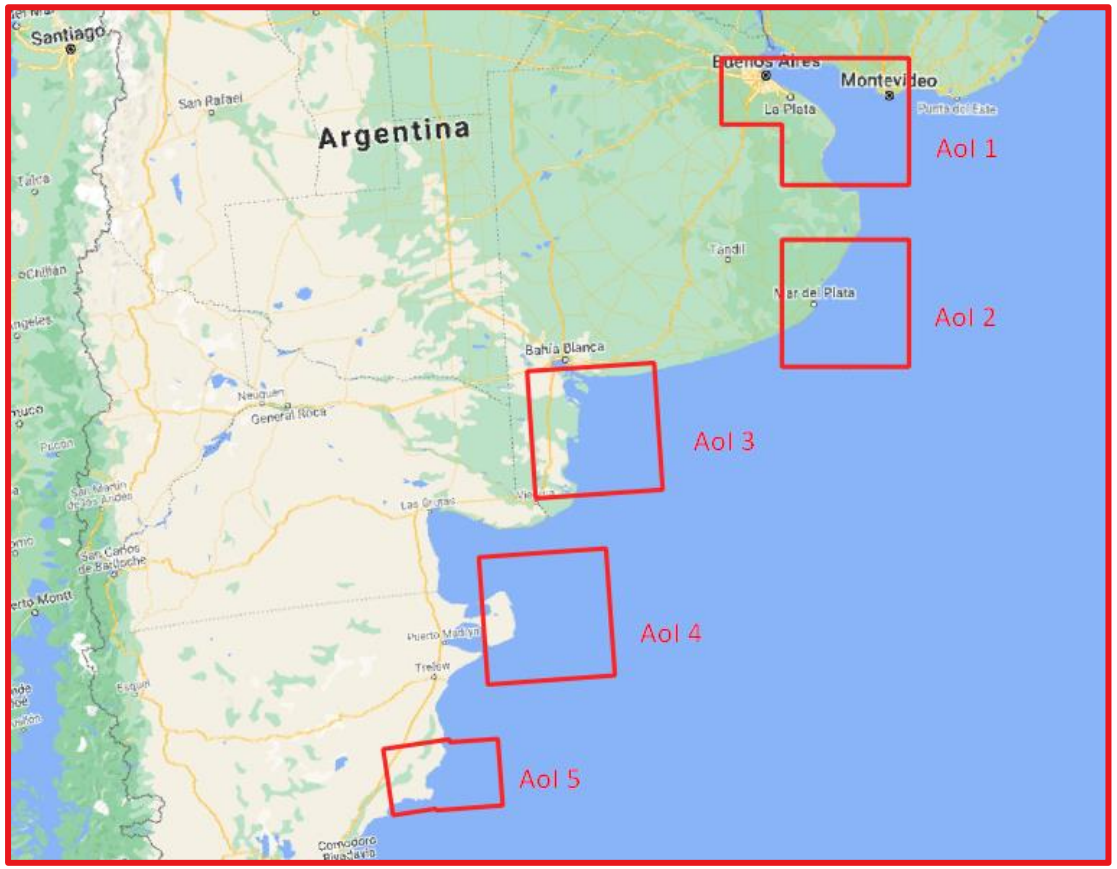
Marine litter detection and monitoring (optical based)

Marine spills detection and monitoring (SAR based)

CS2 - Marine pollution detection services

Services users

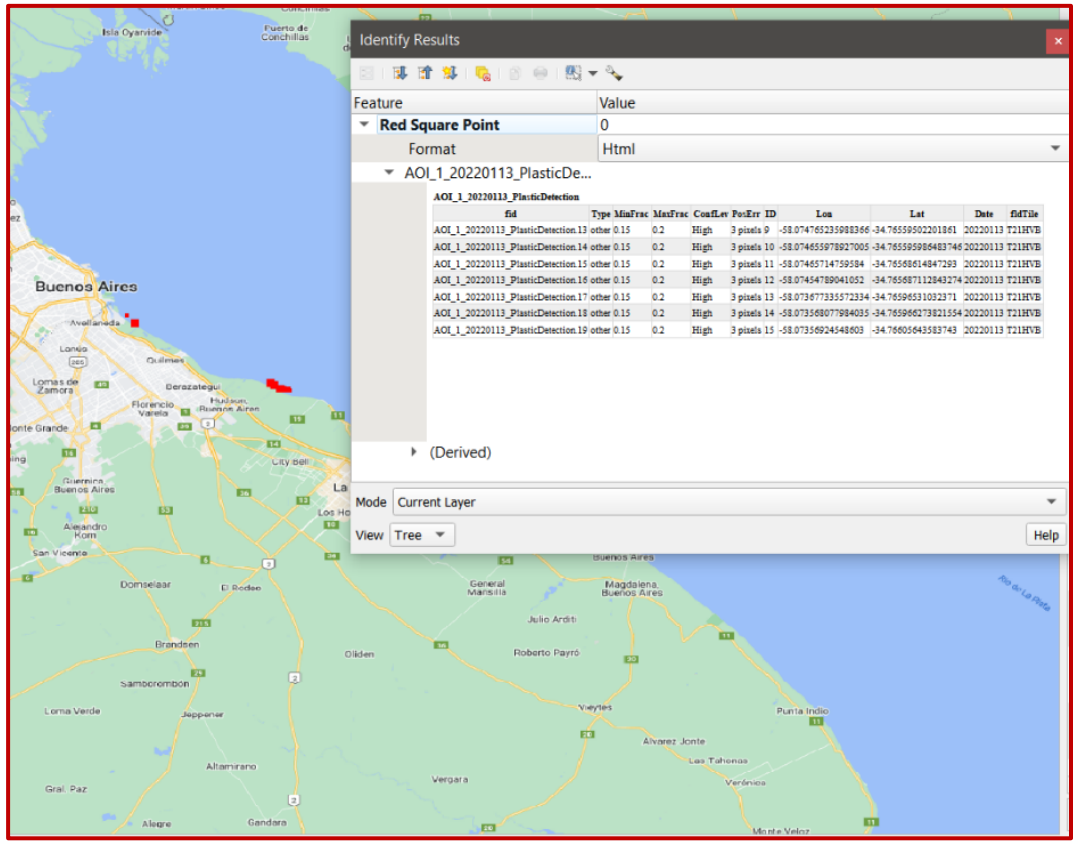
Authority Port of Vigo
https://www.apvigo.es/



INIDEP
https://www.argentina.gob.ar/inidep

CS2 - Marine pollution detection services

Marine plastics detection (Sentinel 2 based)



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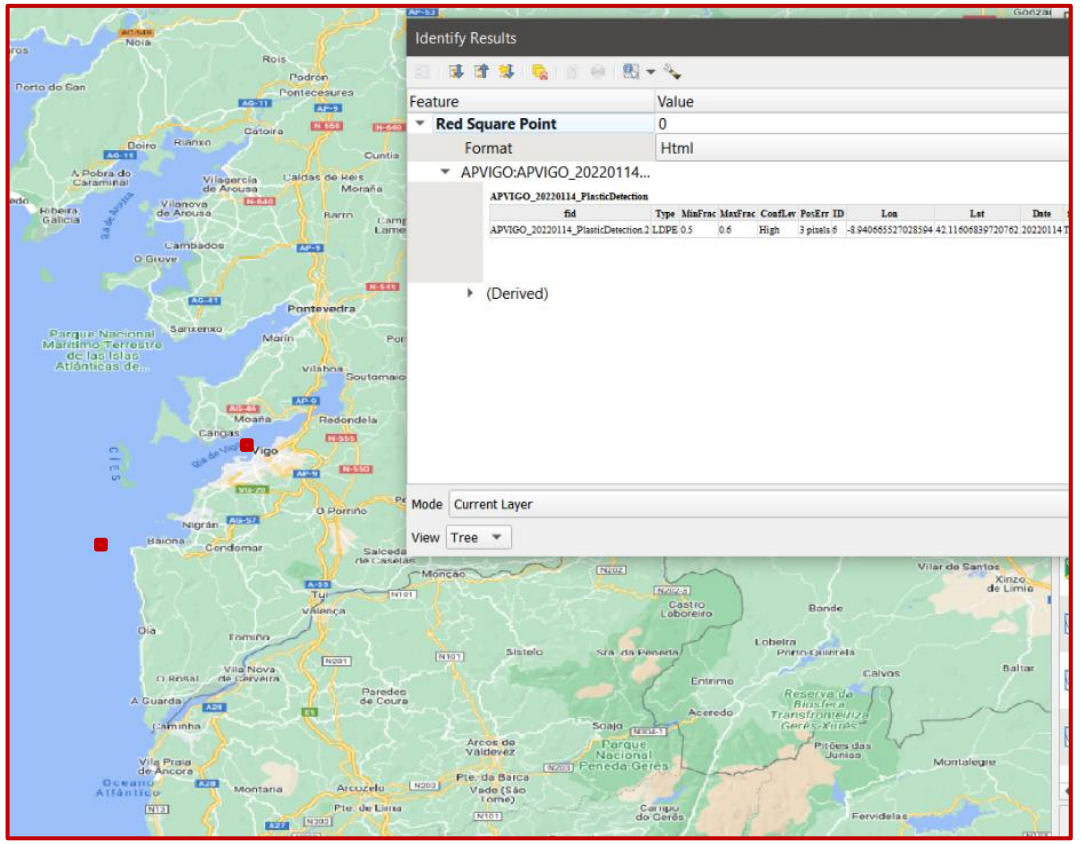

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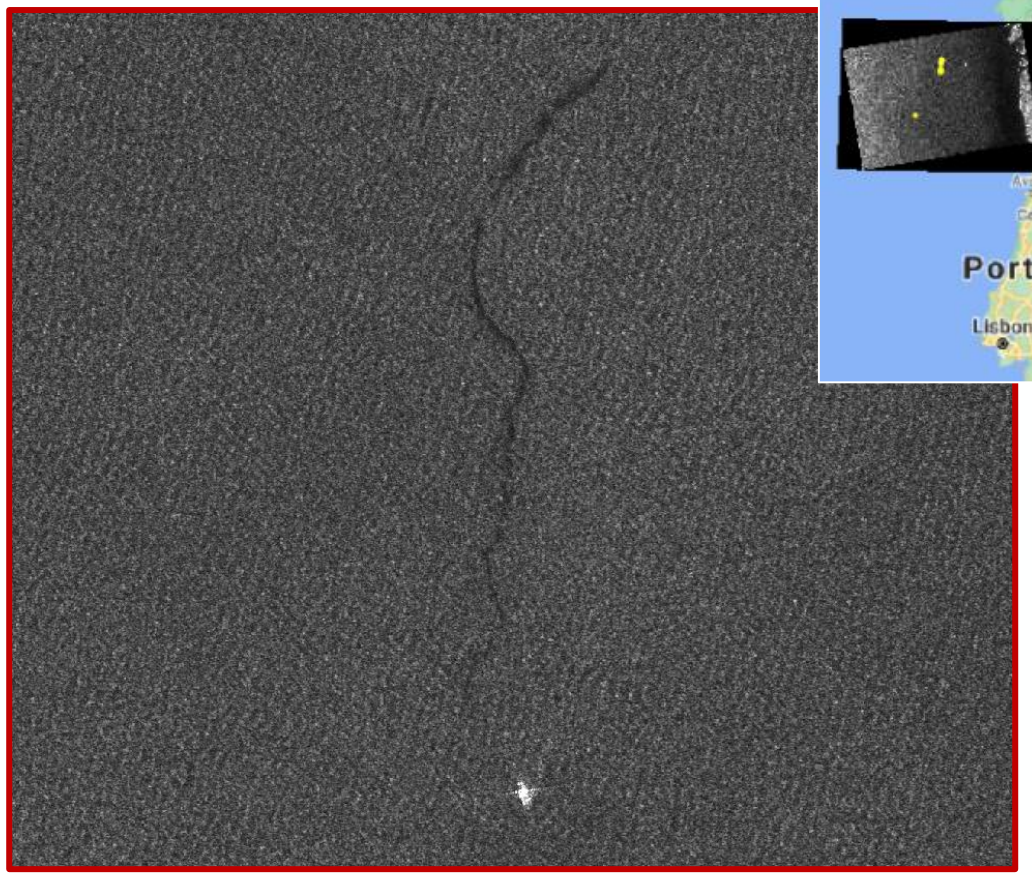
CS2 - Marine pollution detection services

Marine spills detection (Sentinel 1 based)



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Blue Economy

3. Innovation clusters

Harnessing the developed case studies

Innovation clusters

Connecting Technology development to a wider potential-use community

Enable the Blue Economy project **developments to be showcased**, and interpreted as solution avenues across a range of maritime thematics

Harness the perspectives of maritime stakeholders to shape a **roadmap for innovation cluster development** beyond the Blue Economy project itself

Foster a community of practice, rich in the range of stakeholders, and actively seeking to provide them a return on their voluntary investment of time and contributed perspectives

Innovation clusters – Engaged Stakeholders

Engaged stakeholders
AIRCENTRE - Atlantic International Research Centre
APV - Authority Port of Vigo
CCO – Channel Coast Observatory
CMC - Canary Islands Maritime Cluster
CONAE - Space Agency of Argentina
EA - Environment Agency
EMEC - European Marine Energy Centre
Eurisy
EurOcean
Future Earth
INIDEP - Instituto Nacional de Investigación y Desarrollo Pesquero
MaREI Centre for Marine and Renewable Energy Ireland, ERI, UCC
Marine South East
NEREUS - Network of European Regions Using Space Technologies
OECD - Organisation for Economic Co-operation and Development
PLOCAN - Plataforma Oceanica de las Canarias
Pôle Mer
World Ocean Council (WOC)

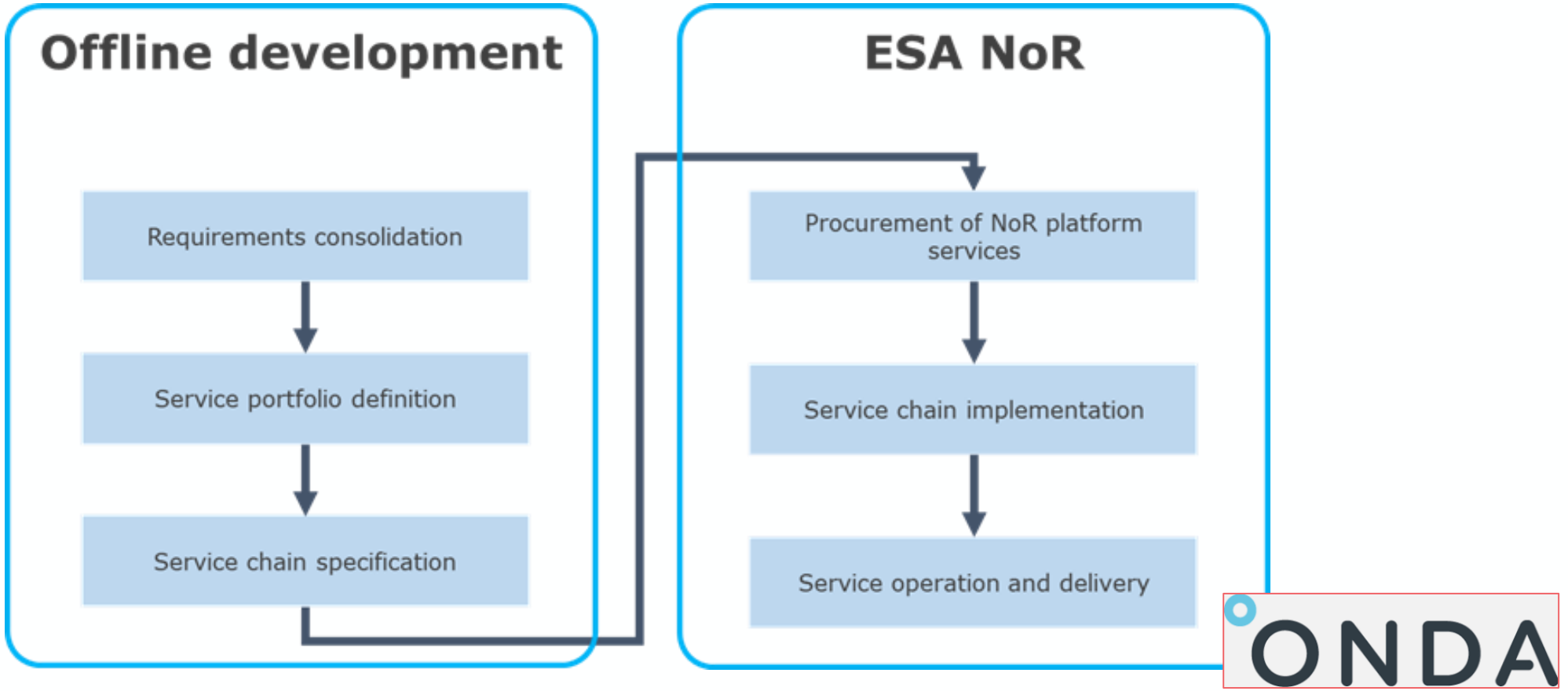
Blue Economy

4. ESA Network of Resources as processing infrastructure

ESA Network of Resources as processing infrastructure

The Network of Resources establishes a collection of services in the Resource Tier, that is ICT Resources (e.g. DIAS, AWS, Google ‘cloud’), Satellite Data (e.g. Sentinels or commercial EO missions data) and in the Platform Tier, in order to offer standardised mechanisms to access such services for what concerns both technical and commercial aspects.

Marine pollution detection services were fully implemented within NoR



ESA Network of Resources as processing infrastructure

NoR usage benefits

- Easy setup and deployment (NoR and ESA full support)
- Easy access to EO data (Sentinel 1 and 2)
- Fast online processing (technical requirements met)
- Services running 24/7 (processing orchestrators)
- Easy access to outputs by the project users

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