



Joint European Research Infrastructure network for Coastal Observatory – Novel European eXpertise for coastal observaTories - **JERICO-NEXT**

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I. Introduction

The aim of WP8 is to increase understanding of the importance and optimise the impact of JERICO-NEXT research for targeted end-users across policy, industry, science and educational sectors and the wider public and to promote uptake of JERICO-NEXT Services for Trans National and Virtual Access. The main objectives are:

- To create an end-user panel for engagement and fostering 2-way communication with public, policy, research, education and industry user groups.
- To inform, engage with and identify requirements of the key user groups.
- To ensure best possible uptake of new knowledge and evidence.
- To enhance European capacity building in operational marine sciences (through training).
- To optimise JERICO-NEXT international impact.
- To promote the potential of Coastal Observatories to support ocean science technological development through Transnational Access.
- To design, launch, maintain and host the JERICO-NEXT website with integrated communication portals for disseminating relevant data, information and project products and services.

SLR is the lead for Task 8.4: Inform and Engage Industry, through which several of these objectives of JERICO-NEXT WP8 were addressed. The purpose of Task 8.4 is to establish links and credibility with industry. The approach to the task is to

- Build on the results of, and extend, the Forum for Coastal Technologies. Industry members of the user group (D8.1) with members of JERICO-NEXT will be the core of a cluster of expertise in coastal environmental monitoring. The cluster will provide equipment and sensor development to address gaps in the suite of environmental monitoring techniques required to meet new regulatory standards.
- Agree cluster membership and invite participants (including government agencies)
- Three workshops on new coastal environmental monitoring technologies focusing on prioritising future investment and as a result –
- Set up a Knowledge Transfer Network (KTN) for coastal environmental monitoring,
- Provide a “Tender Watch” service to the JERICO-NEXT community.

The presentations at the three workshops confirmed to potential end users that JERICO labelled products and services are harmonised and standardised.

Oceanology International 2016, Sea Tech 2016 and Ocean Business 2017, premier events for marine science and ocean technology, were selected as appropriate occasions to target these objectives. This report describes the activities and outcomes of the three workshops, and other business to business events, on new coastal environmental monitoring technologies.





II. Methodology

The methodologies adopted for Task 8.4: Inform and Engage Industry evolved during the project as lessons learned were adopted and the strategy was modified accordingly. The tools adopted to inform and engage are listed below.

1. Database of JERICO-NEXT Cluster Members

The starting point was the database of marine observatory partners, end users and sub-contractors that had been compiled for previous EC funded projects beginning with ESONET and guided by the Forum for Coastal Technologies. A subset of coastal observatory partners, end users and sub-contractors was generated and populated. From this group an End Users Panel was created (D8.1) and a cluster membership was generated (List of participants available on request). The members of this cluster were invited to participate in 3 workshops in 2016, 2017 and 2018 on new coastal environmental monitoring technologies. The objectives of the workshops were to:

- Make private sector companies aware of the JERICO-RI capability to deliver coastal observation data, products and services
- Get more external private sectors companies accessing and using data, products and services produced in JERICO-NEXT.
- Improve the value chain between JERICO-NEXT providers, intermediate users and end users by promoting and facilitating access to JERICO-NEXT and data in collaboration with WP5 and WP6.

2. Workshops at International Conference and Exhibitions

The workshops were conducted at international trade conferences, primarily Oceanology 2016, Ocean Business 2017 and combined workshops with other European projects on best practices (AtlantOS, EMSO-ERIC, ENVRI-plus) in 2018. The workshop selected provided opportunities for private sector companies to promote their products and services to customers in the marine sector. For example, Oceanology International 2016 attracted 7,836 delegates from 79 countries and 520 exhibiting companies from 33 countries, Ocean Business 2017 attracted 4,350 visitors from 61 countries and Oceanology 2018 had over 500 exhibitors from over 79 countries. See Annex 1 and 4 for attendees. For Oceanology 2016, E-mails were sent to a list of 605 addresses on 21st January, 12th February and 7th March 2016 inviting them to the two events. Each e-mail was tailored to provide more information on the events as time progressed. The e-mail invites were followed up with personal visits to the stands of those companies who were exhibiting, with fliers advertising the events. The events were prominently advertised in the Oceanology 2016 Event Catalogue and on the Oceanology 2016 website and smartphone app.

3. Distribution of Flyers and 1:2:1 Meetings with Exhibitors at International Conference and Exhibitions





In addition to the workshops, SLR promoted the activities of the JERICO-RI by distributing flyers to exhibitors that provided information on:

- how to access the RI through Transnational Access (TNA),
- the ESONET YELLOW PAGES (EYP) and
- invitations to the workshops.

One to one discussions were held with exhibitors (potential end users, sub-contractors, partners and private and public sector customers). These contacts were added to the database (list available on request). For “A Connected Ocean” Sea Tech Brest, general emails advertising the event accompanied by an agenda and flyer, were distributed via the JERICO Next email list to over 400 addresses. Flyers were also distributed at the “Harnessing Our Ocean Wealth” Conference in Galway on the 30th June/1st July 2017. Targeted emails were sent to directors/managers of over 40 companies inviting them to attend the workshop. A B2B Participant Information Form was sent to each company invite.

4. B2B Meetings

Ocean Business 2017 also provided opportunities for Business to Business Meetings (B2B) organised by the Enterprise Europe Network. SLR participated advertising the products and services generated by the JERICO-RI (see Annex 5).

In parallel with the promotional workshops and B2B meetings, SLR developed a knowledge transfer network (KTN) to:

- 1) Identify exploitable results from the JERICO-RI that may be of interest to the industry end users and
- 2) Alert the industry end users to the existence of these exploitable results.

A questionnaire was sent to all JERICO-NEXT partners to identify the exploitable knowledge outputs from the JERICO-RI (see Annex 6 and attached). The exploitable knowledge outputs were disseminated through the KTN.

5. Tender Watch Service

A JERICO-NEXT Tender Watch service was also established to identify the commercial opportunities (other than grant awards) for revenue generation from coastal observation and related science. The service is primarily aimed at the JERICO-NEXT partners. The exercise illustrates the range of sectors (ports, harbours, shipping, coast guard, environmental agencies, offshore engineering, dredging, offshore renewable energy) that are contracting coastal observation services. The tender watch was designed to stimulate JERICO-NEXT partners to enter into public private partnerships to tender for some of the large scale international opportunities e.g. UNDP, Large Marine Ecosystems (LMEs), large infrastructure projects and government contracts (see Annex 7, attached and <http://www.jerico-ri.eu/project-information/tender-watch-service/>).

The Tender Watch service between 2016 and 2018 showed that government (e.g. UK Environment Agency, Abu Dhabi Government, Japan Coast Guard) and international agencies (e.g. United Nations Development





Programme) were the main contractors of coastal observatory services, not just in Europe but in the Middle East (e.g. Abu Dhabi, Egypt) and the Far East (e.g. Japan). Contracts for coastal observatory services were also awarded by marine renewable energy companies (e.g. FEW Baltic II Wind Farms, Sabella Tidal Energy), and the shipping industry (e.g. DHI Denmark for Kiel Canal Project, Dublin Port Company, Aberdeen Port).

6. Other Tools of Engagement

As a result of a poor response to the second workshop at “A Connected Ocean” conference, from 11th to 13th October 2016, part of Sea Tech Brest 2016, SLR reviewed the engagement strategy. There are numerous reports written on engagement with potential end users, to inform, consult, involve and collaborate. The basic tools of engagement are:

- Face to face
- Printed material
- Online
- Social media: facetime, twitter, website, LinkedIn Group

The consensus from experience is that face to face and printed materials are the most effective with online and social media providing support. Face to face engagement is resource intensive but delivers the best results. Therefore:

- SLR persisted with face to face workshops with intermediate users
- SLR promoted online access to JERICO data and physical access to the JERICO- for testing and certification (TNA).
- SLR selected the choice of conference to attend on a more strategic basis. The conference must be international (not regionally defined) and have a large exhibition component with significant private sector business attendance.
- SLR made applications to B2B events organised by others.
- SLR improved training in the demonstration of online access to JERICO-RI data because it proved to be the best way to promote JERICO-RI in face to face meetings with potential end users.
- SLR proposed a fast track TNA approach (without payment to the private sector company) for the private sector.

In summary, the demonstration of online access to JERICO-RI data in one to one meetings at conference exhibitions has proved to be the most effective method of engagement with potential private sector end users.

Industry engagement in JERICO-NEXT may be measured in terms of the following key performance indicators:

- Take up by industry of TNA
- Number of B2B meeting requests received by SLR, representing the JERICO-NEXT partnership
- Number of patents or licence agreements taken out by JERICO-NEXT partners
- Number of products or services purchased by the private sector from JERICO-NEXT partners
- Number of private sector contracts, including public private partnerships, entered into by JERICO-





NEXT partners

Key performance indicators above have been met by JERICO-NEXT partners such as SOCIB and CNR (see attached KTN Questionnaires). The JERICO-NEXT consortium is composed of 33 partners representing 15 European countries. The partners have a wealth of experience and expertise in all aspects of coastal observations from the technology used to collect the data through to outputs and dissemination of data products.

III. Description of JERICO-NEXT activities during the conferences, workshops and events.

1. **Oceanology International 2016** (15-17 March, London, UK)

Fifty-eight (58) people attended the “Innovation Meets Industry” workshop and twenty three (23) people attended the “Technology Cluster Workshop”. The list of attendees with contact details are in Annex 1.

SLR established a core cluster of expertise in coastal environmental monitoring, based on the existing contact databases of End Users compiled in previous Marine Observatory Networks. The contact database was used to invite 605 potential end users of coastal observatory products and services to **Oceanology International 2016** in London, the world’s premier event for marine science and ocean technology. SLR organised two events at Oceanology 2016, distributed flyers advertising the JERICO-NEXT User Engagement Panel, and displayed a poster during the Technology Cluster Workshop.

- a. The first event: “Ocean Observatories: Innovation Meets Industry”, showcased the achievements of ocean observatories and the new technologies evolving from the scientific activities of marine observatories across Europe. Attendees learned about the business case for accessing marine observatories; heard about advances in standardisation, inter-operability, data management, online access to data and sensor web enablement. Attendees were informed about the possibility to have access to existing marine observatories to test new equipment in controlled surroundings by applying to TNA calls in JERICO-NEXT project. The event was a good opportunity to present the coastal infrastructures of JERICO-NEXT, the objectives of the project particularly in terms of technology development but also the availability of the data, products and services. A half hour question and answer session ended the meeting.

The full list of presentations is below:

- Introduction of the Business Case for Ocean Observatories – Nick O’Neill, SLR
- Marine Observations and Forecasts for Use by Industry – Glenn Nolan, EuroGOOS
- Sharing Ocean Observing Infrastructure for Science and Innovation – Eric Delory, EMSO-ERIC
- Demonstration of Online Data Access to Ocean Observatory Data – Shane Lavery, SLR
- Observatories and Facilities Available for Transnational Access in the JERICO-NEXT– Laurent Delaunay (Ifremer)
- Overview of collaboration and end users in Coastal Zone Observation – Michelle Devlin (Cefas)
- New Innovative Marine Research Infrastructure Focused on Technology Development – Paul Gaughan (Marine Institute)



- Standardising European Ocean Observatory Infrastructure for Scientific and Industry Impact Research and Monitoring Applications – Henry Ruhl (NOC)



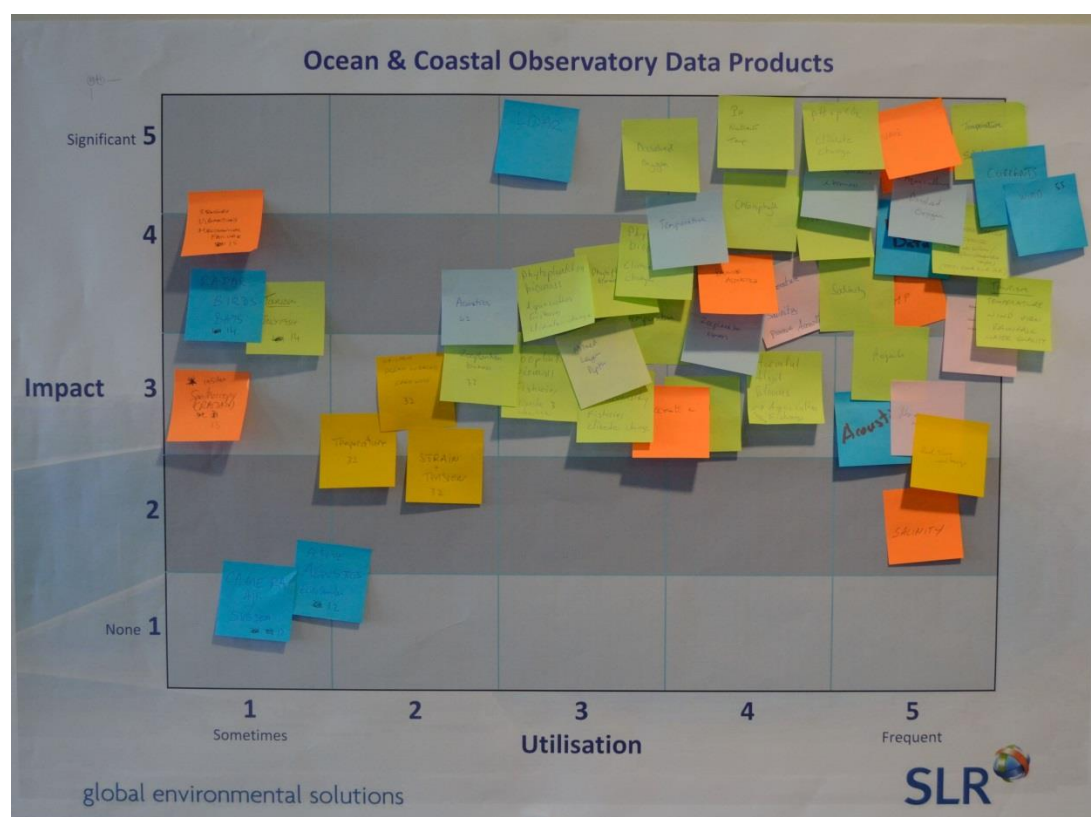
Figure 1 Attendance at Innovation Meets Industry Workshop 15th March 2016

- b. The second event: “a Technology Cluster Workshop”, represented an opportunity for end users of marine observation data to provide input to the managers of marine observatories on the relevance and impact of different data sets to business activities. A significant amount of marine environmental data is being generated by observatories across Europe and can be used by SMEs to generate cost effective commercial products and services. Fit for purpose sensors and other equipment could also be commercialised by manufacturers. The workshop was designed to present the data and equipment currently available from the JERICO-NEXT infrastructure and learn from the business community and end users which data and equipment has the most relevance and impact in the different business sectors of shipping, ports, metocean forecasting, defence, submarine cables, marine environmental monitoring, deep sea mining, oil and gas exploration and offshore renewable energy operations

This workshop was perfect to address the main target of JERICO-NEXT, which is to provide continuous and more valuable coastal data coupling physical and biological information by further developing, harmonising and integrating nationally funded marine observing systems collecting physical, chemical and biological parameters from different platforms. JERICO-NEXT aims to provide researchers and other stakeholders with data that can sustain both innovative high-quality research, new knowledge supporting European directives, and business opportunities.

The workshop was organised and chaired by SLR and lasted two and a half hours with half an hour assigned to a brief description of the observatories and associated scientific activities. After a short introduction to present the objectives of the workshop, attendees were invited to define what a cost effective, standardised, interoperable ocean or coastal observatory would look like and in particular what parameters should be prioritised. The question of how to guarantee the source, quality,

function and value of data generated by the ocean observatories was addressed. A wall chart was designed as a matrix of business relevance and impact (Figure 4). Attendees were asked to comment on the core parameters measured by the marine observatories and selected by the scientific community. There were also asked to indicate the relevance and impact of measurements from observatories on their business activities. The exercise provided an opportunity for observatory managers, scientists and industry end users to discuss together the data needs, barriers to access, and problems encountered with ocean observatory infrastructure. Time was allocated to discuss the outcome of this exercise and the intention was to reach agreement on what the critical parameters to measure from an end user point of view would be. The source, quality function and value of the data were discussed.



2. A Connected Ocean (11- 13 October 2016, part of Sea Tech, Brest, France)

SLR engaged with exhibitors, including dotOcean NV, Orange Marine, Liquid Robotics, EMS, CLS, NKE, Metocean Solutions, and Oceanwise Ltd, and distributed the A5 flyer and explained the activities of the coastal observatory cluster. During the event, SLR met with the French Marine Cluster Pôle Mer Atlantique and Pôle Mer Mediterranee and exchanged information on how effective Marine Clusters are and how they operate. The business model for using public data for private citizen services was also discussed.

General emails advertising the event, with an agenda and flyer (see Annex 2), were distributed via the JERICO Next email list to over 400 addresses, and flyers were distributed at the Harnessing Our Ocean Wealth



Conference in Galway on the 30th June/1st July. Targeted emails were sent to directors/managers of over 40 companies inviting attendance at the workshop. A B2B Participant Information Form was sent to each company invited (see Annex 3).

3. NERC Oil and Gas Decommissioning Brokerage Event (5 July 2016, Aberdeen, UK).

JERICO-NEXT products and services (e.g. HF radar guidelines, recommendations, glider toolbox, online data visualization, equipment testing, tsunami warning, ICZM indicators, oil spill monitoring) were promoted during this industry research event that addressed the environmental monitoring challenges related to the decommissioning of offshore oil and gas production infrastructure. 20 private sector end users, including Shell, OMV, Marathon Oil, Chevron, BMT Cordah, Arup, and AECOM were present.

4. Harnessing Our Ocean Wealth conference (1 July 2016, Galway, Ireland).

JERICO-NEXT products and services were promoted to a number of potential end user companies including Woodside Energy, Wood Group Kenny, the Port of Waterford, Techworks Marine, and CathX Ocean. SLR advertised the facilities (Buoy and cables) in Galway tB SmartBay Ireland, a JERICO Next partner, for Sonardyne.

5. Ocean Business 2017 (4-6 April 2017, Southampton, UK)

Workshops were organised by SLR to present JERICO-NEXT objectives. An A5 flyer was distributed advertising the JERICO-NEXT TNA calls and three posters were displayed and presented. Thirty-two companies from nine countries registered and SLR had one-to-one meetings with 8 of these companies to advertise the coastal facilities in JERICO-NEXT project.

SLR booked a room with the organisers of Ocean Business 2017 in February. The workshop was entitled “Coastal Observatories: Innovation Meets Industry” and was advertised with the appropriate EC funding acknowledgements in the Oceanbuzz Magazine issue 485 on 28th February and in the Ocean Business 2017 catalogue which is read by more than 5,000 visitors from over 65 countries. The workshop was also featured on the EuroGOOS website events page (<http://eurogoos.eu/events/coastal-observatories-innovation-meets-industry/>). Once the time, date and location of the workshop was confirmed and the advertisements had appeared on the Ocean Business 2017 website and newsletter, SLR e-mailed all of the 143 JERICO contacts in our Outlook database for coastal observatories including the cluster Forum of Coastal Technologies. This was followed up by telephone calls to key JERICO partners and end users. Three A5 flyers were produced, one advertising the JERICO Next TNA call, one advertising the ESONET Yellow Pages sensor catalogue, and one advertising the workshop. In addition, a number of posters were printed describing the JERICO infrastructure and the facilities on offer under the TNA. Shane Lavery and Nick O’Neill arrived on Monday 3rd April and circulated among the more than 350 exhibitors who were setting up, distributing the flyers and explaining to those who were engaged in the coastal zone about the workshop, the transnational access and the data, data products and services that are being generated in the coastal zone by the JERICO infrastructure.

Twelve people attended the JERICO-NEXT “Innovation meets Industry” workshop, and eight invited guests attended the FixO3 “Innovative Products and Services Commercialisation” workshop earlier in the day. The





list of attendees with contact details are in Annex 4. At the “Innovation Meets Industry” workshop the business case for ocean and coastal observatories was discussed.

In addition, SLR registered as a JERICO-NEXT partner in the Ocean Business 2017 brokerage event organised by the Enterprise Europe Network. SLR advertised access to operating JERICO coastal observatory research infrastructure to test validate/validate new sensors and equipment. Thirty-two companies from nine countries registered and SLR had one to one meetings with 8 of these companies. SLR promoted the JERICO infrastructure and activities to a new group of companies in a range of different sectors including subsea cameras, geophysical and environmental survey companies, project management companies specialised in capacity building for marine companies in the developing world, equipment manufacturers, and integrators of sensors systems.

The JERICO Next workshop – Coastal Observatories: Innovation Meets Industry, was held on Tuesday 4th April at 1pm. The JERICO Next posters were displayed prominently during the sessions. Open to all, the workshop was an opportunity for end users of marine observation data to provide input to the managers of coastal observatories in the JERICO-NEXT partner on the relevance and impact of different data sets to business activities.

6. ENVri Plus 1st EU Environmental Research Infrastructures – Industry Joint Innovation Partnering Forum (18-19 May 2017, Grenoble, France).

49 private companies attended with a large number exhibiting and presenting their products and services; 82 representatives from operators of environmental monitoring research infrastructure; 4 National Metrological Institutes; and 15 public institutes including representatives from the European Commission. SLR visited the 28 industry exhibition stands and interacted with the exhibitors to discuss business models for collaboration with research infrastructure including JERICO-NEXT partners. SLR chaired a Round Table Discussion in Session 3 Promoting Public Private Partnership between Environmental Research Infrastructures, Industry and Government Agencies. The composition of the panel: Nick O'Neill, Participants: Dominique Durand (CEO COVARTEC, AQUACOSM, JERICO-NEXT), Catherine Freissinet (Head of R&D and Innovation Environment Department ARTELIA Eau & Environment), Brigitte Plateau (President Grenoble Institute of Technology), and Sandro Fuzzi (CNR, Head of Bologna Technology Centre).

The participants discussed how to access tenders and how to achieve the optimum balance between private sector clients and publicly funded marine science contracts. The discussions attempted to identify solutions on how to break down barriers and facilitate public private partnerships in delivering cost effective environmental monitoring.

IV. Outputs of the Conferences, Meetings and Events

1. Oceanology 2016

At the “Innovation Meets Industry” workshop the business case for ocean and coastal observatories was discussed. Two main business drivers were identified:



- de-risking commercial operations in the marine sector by improving metocean and climate change modelling
- developing new cost-effective sensors, power systems, high bandwidth communications, data processing and data interpretation

The marine science and technology business contributes £2 billion per annum to the UK economy, with more than a third of this in exports, and delivers into a number of market sectors (Society of Marine Industries, 2015). In the USA business activity in ocean measurement, observation and forecasting is worth \$7 billion per annum (ERISS Corporation, 2016). Ocean observatory products and services targets this market. Figure 1 lists the different sectors that buy products and services generated by coastal observatories.

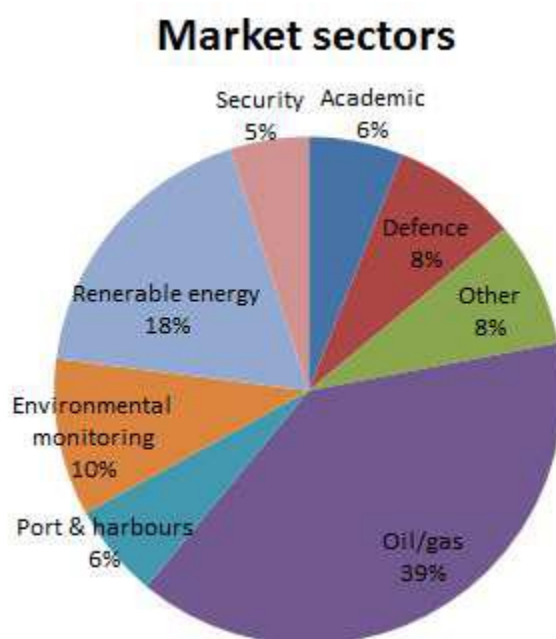


Figure 2 Market Sectors (from SMI 2015)

Given government greenhouse gas (GHG) emission reduction targets, driven by the COP21 Paris meeting (2015), and the acknowledgement by citizens that climate change is a societal challenge, companies must safeguard and future proof their marine operations through rigorous environmental monitoring. They need to understand better the marine environment in which they operate and mitigate any adverse environmental impacts that their operations cause. The workshop identified how the existing observatories can help marine sector business by providing:

- data that reduces the cost and environmental impact of marine operations;
- standardisation and interoperability that reduces costs
- test beds to obtain cost effective technology qualification

The scientific community has identified core parameters that will be measured at each observatory and the data sets are growing constantly; access by industry to the infrastructure has been simplified; and examples



of ocean observatories funded by BP and Statoil to monitor environmental impact of oil and gas operations offshore Angola and Norway were described.

A summary of the most relevant feedback included:

- A LinkedIn interest group for the Industry/Ocean Observatory Forum members would keep them informed of new developments and encourage posting of business issues for discussion and sharing of lessons learned
- Access to the infrastructure by industry using the transnational access procedure is too time consuming and science focused.
- Observatory locations are based on scientific criteria that do not always match the business need for observatories in locations of commercial activity (shipping lanes, oil and gas production).

The Technology Cluster Workshop on Wednesday 16th March was more interactive. There was a short introduction to the objectives of the workshop when attendees were invited to imagine what a cost effective, standardised, interoperable ocean observatory would look like. They were also asked to describe what parameters they would like to have measured. The question of how to guarantee the source, quality, function and value of data generated by the coastal observatories was also addressed. By way of introduction, a simplified supply chain diagram was presented that divided end users groups into 4 tiers. Attendees were invited to identify which Tier best described where they fitted in the supply chain and to add to the list of end users (Figure 3). The tier 1 end users companies for coastal observatory products and services, identified by the workshop attendees, operate in the following sectors shipping, ports, metocean forecasting, defence, submarine cables, deep sea mining, offshore oil and gas exploration and production, offshore renewable energy, fisheries/aquaculture, tourism and environmental monitoring. There were discussions about the main driver of coastal observation which is environmental monitoring and the fact that it is now regulatory driven. The workshop identified the fact that there are now companies emerging who can best be described as “integrators” or “intermediaries” who design observatories tailor made to deliver solutions to client needs in this area.



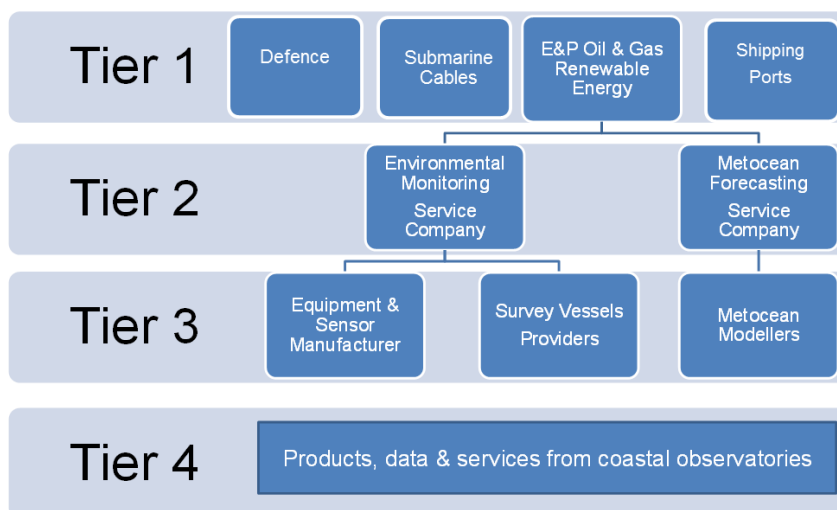


Figure 3 Simplified Supply Chain Diagram for Coastal Observatory Products & Services

The core variables, identified by the scientific community as required measurements for every coastal observatory, were discussed and attendees invited to add variables that are important to their needs. The following list was agreed and are by order importance:

- temperature,
- salinity,
- pressure,
- dissolved O₂,
- turbidity,
- currents,
- passive acoustics,
- wind,
- wave,
- camera,
- sediment trap,
- geophysical seismometers,
- gravity,
- magnetics,
- pH,
- CO₂
- fluorescence (phytoplankton, biomass, zooplankton),
- nutrients.

The results of the consultation were analysed by SLR in terms of where the parameters identified lay on the matrix of impact versus utilisation (Figure 4):

- Parameters in the top right quadrant have high impact and utilisation. They are recognised and applied. They represent the core parameters which should be on every observatory where and when it is possible.
- Parameters in the bottom left quadrant are low priority from a business case point. Parameters in the top left are considered having high impact but are not utilised frequently (low availability, lack of awareness). They need to be investigated and promoted to end users.
- Parameters falling in the bottom right quadrant are well used but have low impact. Parameters falling into this quadrant may need some product development to increase impact.

At the end of the exercise the attendees identified the critical parameters to be measured and where product development was required. There were also some discussions about the source (type of sensor), quality (quality control through standardisation and calibration), function (for making business decisions) and value (cost implications would be of not having the data).



Figure 4 Result of Interactive Exercise showing impact versus utilisation matrix



Impact	5 Significant	Sensors/Vibrations/Mech Failure		Dissolved Oxygen LIDAR	Chlorophyll Nutrients pH Temperature Temperature	BBL Mass/Energy Exchange Nutrients pH and CO2 Salinity Temperature Dissolved Oxygen Fish Abundance Currents Wave Data Wind Currents
	4	Radar (Birds/Bats) Jellyfish	Acoustics	Phytoplankton Biodiversity Phytoplankton Biomass Phytoplankton Biomass Zooplankton Biomass Zooplankton Biomass Mixed Layer Depth	Passive Acoustics Salinity Temperature Temperature Zooplankton Biomass Acoustics Passive	Surface currents Wave Wind Nutrients Salinity Temperature Temperature Wind
	3	In situ Spectroscopy	Zooplankton Biomass Currents Wave Strain/ Tension Temperature	Sand Zooplankton Biodiversity Zooplankton Biodiversity Acoustics	SPM Algal Blooms	Noise Monitoring Acoustics Real-time Monitoring
	2	Active Acoustics (Echosounder) Camera (Air and Subsea)				Salinity
	1 None					
		1 Sometimes	2	3 Utilisation	4	5 Frequent
Defence						
Environmental Monitoring						
Fisheries						
Offshore Renewables						
Oil & Gas E&P						
Submarine Cables						
Tourism						
Metoccean Forecasting						

Figure 5 Interpretation of Interactive Exercise

Some preliminary feedback from the discussions and important outcomes of the matrix of impact versus utilisation (Figures 4 and 5) included:

- Conductivity is not the best measurement for salinity – the development of other sensor types to measure salinity is to be encouraged. NKE, one of the identified companies with innovative products and services is developing such a salinity sensor based on refractive index
- Seabed sampling and lab analysis for baseline environmental monitoring cannot currently be replaced by coastal observatories,
- Some low impact, low utilisation parameters such as cameras may be low impact because observatories are not providing them. The Serpent programme (<http://www.serpentproject.com/>) indicates that subsea cameras have potentially high impact. This is further borne out by the development of innovative camera imaging products by Cathx Ocean (<http://www.cathxocean.com/>)



- Vibration and strain measurements on coastal observatories are of interest to industry and should be measured and promoted.
- The need to deliver real time environmental monitoring through cabling or improved bandwidth communications remains.
- More product development in biological sensors is required
- More data products based on processing and interpretation of passive acoustic monitoring is required, particularly in relation to cetacean monitoring
- The most useful observatory data to collect for fisheries research and management are temperature and salinity in the upper layers 0-50 m, current speed and direction (ADCP) at a number of levels in 0-100m layer, primary production (chlorophyll a) levels in upper layers, thermocline depth and intensity of boundary layer, nutrients (nitrates, phosphates and silicates)
- Observatories in the Mediterranean seem to be much more applied and collect data that is much more useful to maritime industries than the Atlantic coastal sites.

(a) Sea Tech Brest 2016

SLR ran a workshop at Sea Tech involving flash presentations on the expectations, needs, and challenges of current commercial end users of ocean data, followed by an opportunity for one to one meetings between companies and researchers with innovative products that may have commercial applications. The workshop was to complement SLR's work at other conferences such as Oceanology in London and Ocean Business in Southampton (2016), which were organized with the aim of demonstrating advances in data capture, access and analysis by the ocean observation research community.

Nick O'Neill and Shane Lavery visited the exhibition area of the Sea Tech Conference and engaged with exhibitors, attended the ACO "Connected Ocean" Conference proceedings "Interoperable marine data: What is the Blue Growth Potential" and participated in open debate on open data access, the role of industry in providing data access and the public funding of data acquisition. They engaged with the French Marine Cluster Pole Mer to understand how effective marine clusters operate. They participated in a workshop "The power of open access interoperable marine data for the maritime sector: an untapped resource?". The business model for using public data for private citizen services was discussed. The bottleneck of lack of resources for data management was identified and it was suggested that intermediaries could be financed to integrate the data. SMEs were encouraged to develop new services based on databases held by other companies and public institutes.

(b) Ocean Business 2017

Marine environmental data is being generated by a large number of existing coastal observatories within JERICO-RI. SMEs can generate commercial products and services based on this data. The workshop was designed to present what data is currently available and learn from the business community and end users which data sets have most relevance and impact in the different business sectors of shipping, ports, metocean forecasting, defence, submarine cables, marine environmental monitoring, aquaculture, oil and gas exploration and offshore renewable energy operations.



Dr. Glenn Nolan, Secretary General of EuroGOOS set the scene by giving an introductory talk on “Use and sharing of marine observations and data by industry” and launched the COLUMBUS guide on engaging industry in use and sharing of public marine data. Glenn identified some of the challenges in the uptake and application of open marine data and information for economic development and innovation purposes by the private sector:

- Research shows that coastal observatories and public data-sharing initiatives and their products have limited visibility beyond the marine monitoring and observing community which mainly consists of scientists, operational service providers and actors from public administrations.
- There is often a perception in the private sector that free and open data initiatives are only useful for public bodies and the private sector has concerns about the quality of free data.
- Marine data-sharing initiatives sometimes use data formats and standards which are not commonly used by industry and/or data policies restricting the re-use for commercial purposes. This discourages industry involvement.
- Marine data managers and private sector users speak different languages and finding common ground on issues like terminology, standardization and quality control is a challenge.
- Availability doesn't imply usability. A complex user interface (e.g. for a data portal) will preclude or inhibit non-specialists from the private sector from using these resources.
- Industry is much more likely to rely on long term consistent and dependable data, rather than data generated by short term projects, and in many cases it is of limited use to them otherwise.
- Offshore and coastal operators need very detailed data and custom-made products at much higher level of complexity than what is offered by public data repositories.

Whilst a traditional ‘marine knowledge’ value chain of sorts can be visualised, from data collection, to data-sharing, to intermediaries developing value added data or data products or services through to end-users in the more traditional maritime sectors, the reality is much more complicated and non-linear. Understanding this can help to maximise the potential of marine data.

Glenn then proposed a number of solutions to these challenges:

- Industry representatives should be included in the governance and take part in the entire cycle of decision making, development and operation of marine observation and data sharing initiatives.
- There is a need for marine data-sharing initiatives to develop a more service oriented approach.
- Data, products and services offered by marine observation and data initiatives should be presented in a user-friendly, attractive and intuitive way which is adapted to the target users.
- Presenting case study examples and practical data product applications can trigger interest where there may previously have been none.
- There is a significant role for maritime clusters in connecting marine data initiatives with industry and vice versa.
- Brokerage, including one to one meetings and stakeholder user workshops should be targeted at the appropriate level by presenting case study examples and practical data product applications.



The traditional 'marine knowledge' value chain from data collection, to data-sharing, to intermediaries developing value added data or data products or services through to end-users in the more traditional maritime sectors and the new blue growth sectors (see Figure 3 above) was presented by SLR.

The JERICO-NEXT workshop involved lively discussion from the participants in relation to the role of EU projects in overcoming barriers to commercialisation faced by researchers and developers of innovative products and services in the marine sector.

Two distinct categories of end users were defined during the discussion:

- Blue Growth end users include marine tourism, marine renewable energy, aquaculture, mineral resources, and blue biotechnology
- Traditional sectors are fisheries, ports and harbours, offshore oil and gas, defence, and insurance. Within these sectors companies can fit anywhere from Tier 1 end users to Tier 4 researchers, data providers, and producers of data products and sensors (see Figure 3).

A third group, national policy customers, was added and the role of citizen science in acquiring data was raised. Based on interviews and one to one meetings the current highest priority business drivers for Tier 1 companies are risk reduction, cost effectiveness, and regulatory compliance. They look to Tier 2 companies including environmental monitoring companies (e.g. Gardline) and metocean companies (e.g. Meteo Group) to deliver these results. The Tier 2 companies in turn rely on Tier 3 companies such as equipment manufacturers, metocean modellers, survey vessels, etc. to deliver cost effective solutions to reduce operational risks.

Questions were raised among the group about the clarity of definition of Tier companies. It was suggested that they tiers should be considered as business spaces and the relationships between tiers was not rigid. The interaction between tiers could be in both directions and Tier 1 companies could jump Tier2 and Tier 3 companies to have a direct relationship with a Tier 4 infrastructure. Tier 4 researchers could develop Decision Support Services and deliver to Tier 1 or Tier 2 level. This resulted in a discussion on the roles within each Tier level and the pathways between each for particular sectors.

The barriers to commercialisation encountered can include access to test beds, for example a Tier 3 sensor company looking for access to Tier 4 infrastructure. This shows that pathways are not just from Tier 4 up to Tier 1, but that they can also go the other way. Some sectors such as policy (e.g. MSFD) can go directly from Tier 4 to Tier 1 (policy customers), and similar can be seen in other areas such as citizen science.

There is an incentive for everyone to try to get to Tier 1, bypassing other companies and achieving the largest margin possible. Some attendees questioned the logic of some EU projects, as they can result in a proliferation of data, and a need for all projects to have company involvement. It was suggested that companies should be encouraged to identify the best commercial opportunities developed by the many different EC funded marine observatory projects. Many of the end users of marine observatory data are consultants producing data products for a single company, whereas others, like the insurance industry, produce decision support data products from large amounts of data for many customers in different sectors.





Tier 4 companies experience more pressure to produce products directly for Tier 1 end users and some scientists produce data without asking large company end users what they want or need. Pressure from the framework programme results in researcher spin-offs forming SMEs to access funding. Researchers are judged by the amount of publications and research funding they receive. This results in a self-sustaining system without true interaction with businesses.

The barrier of the intellectual property rights, the role of public bodies in developing commercial data products based on publicly funded data acquisition and competition with the private sector was discussed. The solution of public private partnerships and the need to understand what works and what has not worked was raised. The need for industry to have a role, even as technical advisors, in EC funded projects was discussed to track data use and promote open access.

SLR presented some of the findings from the JERICO-NEXT End User Panel Workshop in Helsinki. In response to questions he said that the workshop had identified the data products and services that were most often accessed by the private sector and had influenced business decisions. The intention is to ensure that all current and future coastal observatories include these parameters in their data stream since these were the ones most likely to be accessed by the private sector to provide solutions to current business needs.

(c) ENVRI Plus 1st EU Environmental Research Infrastructures – Industry Joint Innovation Partnering Forum

SLR attended the two-day event which included flash talks by private sector companies, a trade exhibition of technology suppliers and a conference of presentations and round table discussions. The meeting was structured in such a way that there was plenty of opportunity to have one to one meetings with environmental monitoring service providers during coffee breaks where we discussed barriers to winning private sector business.

In advance of the conference the participants were asked to suggest an example of a successful public private partnership that they are familiar with. Some examples of successful public/private collaboration in partnerships include the French Marine cluster Pole Mer (<http://www.pole-mer-bretagne-atlantique.com/en/>) and the Irish cluster Geoscience Ireland (<http://www.geoscience.ie/>). An Irish example of industry collaboration in a national research programme is the Irish Centre for Research in Applied Geoscience (<http://icrag-centre.org/>). The role of the public sector as a lead contractor awarding public contracts to innovative companies and setting an example to the private sector companies who are contracting observatory services was also on the agenda.

Private companies and the public sector collaborate to create gain (e.g. new business revenue) or pain relief (e.g. lower health, safety and environmental risk).

Cristina Sams presented on the public private partnership experience of the UK National Oceanography Centre. She pointed out the difference in language, motivation and culture between the public and the private sector and the need to engage and listen to each other. While the private sector is driven by earning revenue and profit the currency of the scientist is the number of peer reviewed papers published in any one





year. She discussed the translation gap – who invests and who delivers. The private sector customers are looking for decision support tools, not data. A single point of access is required where scientific researchers can combine with private sector modellers to provide decision support to public and private customers.

Minna Vekova described a successful public private partnership in Finland, Airmodus OY, which manufactures sensors used in aerosol research and sells them to industrial users, vehicle engine developers and air quality authorities. Monica Miguel Lago representing 75 companies in the European Association of Remote Sensing Companies discussed the challenges in her sector and in particular clarifying the boundary between public and private actors, a factor which is inhibiting private investment in new products and services. Public sector customers dominate with a total market share of 65%. The Marketplace Alliance for EO Services is an initiative to address the fragmentation of the remote sensing sector. It will offer all companies and customers a simpler way to develop and sell products and with a low transaction cost. The importance of a certification scheme to increase the confidence of customer organisations in the products and services being offered was highlighted.

The recommendations based on these findings is that

- A selection of tier 2 companies targeting environmental monitoring companies will be made from the Oceanology International 2016 Event Catalogue of Exhibitors, the Ocean Business 15 Show Catalogue following consultation with the existing marine cluster organisations PoleMer, IMERC, Maritime UK, DLTm, and Marine SE.
- JERICO-NEXT coastal infrastructures should be demonstrated to the selected tier 2 environmental monitoring companies at Oceanology 2018 in London.
- a representative selection of these tier 2 providers of infrastructure and integrators will be invited to future workshops to identify the associated functionality and additional services to be added to the JERICO-NEXT service offering to meet the needs of these niche high impact industry sectors.
- Opportunities for public private partnerships between public sector partners in JERICO-RI and a representative selection of these tier 2 providers of infrastructure and integrators should be explored.
- JERICO-NEXT partners should apply to the SME Instrument to obtain financial support for commercialisation of products and services developed by them.

(d) Oceanology 2018

At Oceanology 2018, SLR demonstrated online access to JERICO data to exhibitors who were among the selected tier 2 environmental monitoring companies. On 14th March Nick O'Neill presented a paper promoting JERICO-RI entitled "Cost Effective Long-Term Environmental Monitoring for Producing Assets from Commissioning through to Late Life Management". As the number of oil and gas field decommissioning projects increases around the world the need for cost effective best practices for environmental impact assessment is being recognised by regulators and oil and gas operators. As regulation of decommissioning projects evolves in Europe the industry is working with the marine environmental research community and the regulator to find affordable best practice solutions for in-perpetuity environmental monitoring that can be shared with other jurisdictions offshore Africa and the Middle East. The JERICO RI is one such solution.





V. Conclusions

SLR has increased the number of contacts between JERICO-NEXT partners and industry end users by introducing JERICO-NEXT activities to a broader range of sectors, including aquaculture, offshore wind operators, port developers, coastguard, and the defence industry. Increased industry engagement has been achieved primarily through events, conferences and workshops and face-to-face meetings. These activities were supported by flyers, banners and social media activities. As a result, members from industry represented the sector on the JERICO-NEXT User Panel, a Knowledge Transfer Network (KTN) has been established, and cluster membership has been increased. These networks and events have facilitated detailed discussions about the complexities of the supply chain, indicated the highest value, highest use parameters by sector, and highlighted the need to engage industry in all aspects of ocean monitoring to support fit-for-purpose systems that meet industry end-users requirements.

During the different events, SLR identified that the end user companies are interested in commercialising innovative sensors, but also by processing the data generated by coastal observatories for elaborating data products to specific sectors. SLR

- At Oceanology International 2016 JERICO-NEXT brochures were distributed to in excess of 200 companies advertising the JERICO-NEXT User Engagement Panel.
- At the NERC Oil and Gas Decommissioning Event we introduced the JERICO-NEXT project partners to 20 new companies engaged in the niche, growing decommissioning sector in the North Sea.
- SLR promoted JERICO-NEXT products and services to a number of potential end user companies, and facilitated access (TNA) to SmartBay Ireland, a JERICO-Next partner, for Sonardyne at Harnessing Our Ocean Wealth conference in Galway in July 2016,
- At Sea Tech in Brest, SLR identified 26 new potential end users, dominantly French-based, but with an international geographic spread, including companies from New Zealand.

A significant output from discussions at Sea Tech was the need for JERICO-NEXT partners to make their data available on a recognised, well known, well managed database such as EMODnet. Secondly, it was clear that the primary end users of JERICO-NEXT data are likely to be “integrator” companies such as CLS Group (<http://www.cls-telemetry.com/>), who process and interpret marine data and deliver specific products and services tailored to discrete industry sectors such as ports, shipping, aquaculture, marine renewable energy.

A large number of business sectors have been identified as potential end users of coastal observatory data. The tools adopted to inform and engage industry are networking through targeted events, business to business (B2B) events and establishing a special interest group or user engagement panel. Workshops were organised and one to meetings were held at Oceanology 2016, Sea Tech 2016, NERC Decommissioning Brokerage Event, Envri+ Forum with Industry 2017, Ocean Business 2017 and Oceanology 2018. In response to industry requests the data generated by JERICO-RI is now loaded on the EMODnet data portal and available directly from the JERICO-NEXT website through the Virtual Access activity. An end user panel was established and met in Helsinki in 2017. JERICO-NEXT SME partners have been made aware of the SME Instrument as a mechanism to assist commercialisation of IPR generated within the project. A knowledge output template has been circulated to all partners to identify exploitable IPR within the project.





The role of the public sector as a lead contractor awarding public contracts to innovative companies and setting an example to the private sector companies who are contracting observatory services was also addressed in workshops and one to one meetings. Some examples of successful public/private collaboration in partnerships include the French Marine cluster Pole Mer (<http://www.pole-mer-bretagne-atlantique.com/en/>) and the Irish cluster Geoscience Ireland (<http://www.geoscience.ie/>). An Irish example of industry collaboration in a national research programme is the Irish Centre for Research in Applied Geoscience (<http://icrag-centre.org/>). Private companies and the public sector collaborate to create new business revenue and/or lower health, safety and environmental risk. There is a difference in language, motivation and culture between the public and the private sector and there is a need to engage and listen to each other. While the private sector is driven by earning revenue and profit the currency of the scientist is the number of peer reviewed papers published in any one year. Clarifying the boundary between public and private actors is important because it can inhibit private investment in new products and services. In the remote sensing sector public sector customers dominate with a total market share of 65%. The Marketplace Alliance for EO Services is an initiative to address the fragmentation of the remote sensing sector. It will offer all companies and customers a simpler way to develop and sell products and with a low transaction cost. This could be a model for the JERICO-RI in the future. A certification scheme to increase the confidence of customer organisations in the products and services being offered is important.

The private sector customers are looking for decision support tools, not data. A single point of access is required where scientific researchers can combine with private sector modellers to provide decision support to public and private customers.

A JERICO-NEXT Tender Watch service was also established to identify the commercial opportunities (other than grant awards) for revenue generation from coastal observation and related science. The service is primarily aimed at the JERICO-NEXT partners. The tender watch service will be updated regularly.





References

- ERISS Corporation. (2016). *The Ocean Enterprise - A Study of US Business Activity in Ocean Measurement, Observation and Forecasting*. Maritime Alliance.
- Society of Marine Industries. (2015). *Annual Review of UK Marine Scientific Industries*. AMSI.





ANNEXES

Annex 1 List of attendees at Oceanology 2016 Workshops

**Technology Cluster Workshop @ Oceanology 2016: Participant List and Contact Details-
Wednesday March 16th from 9-11:30 am**

	Name	Company/Affiliation	Email address
1	John Allen	SOCIB	john@myocean.co.uk
2	Eleanor O'Rourke	MARINE INSTITUTE	Eleanor.orourke@marine.ie
3	Diarmuid O'Conchuibhair	MARINE INSTITUTE	diarmuid.oconchuibhair@marine.ie
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10	Ingrid Puillat	IFREMER	ipuillat@ifremer.fr
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12	Dominique Durrand	COVARTEC	durrand@covartec.ue
13	Glen Nolan	EUROGOOS	glen.nolan@eurogoos.eu
14	Paulo Favali	ILGV/EMSO	paulo.favali@ilgv.it
15	Rosemarie Butler	Marine Institute	rosemarie.butler@marine.ie
16	Laura Beranzoli	EMSO/INGV	laura.beranzoli@ingv.it
17	Flavia Taggiasco	EMSO	f.taggiasco@interimoffice@emso-eu.org
18	Edel O'Connor	MARINE INSTITUTE	edel.oconnor@marine.ie
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20	JF. Rolin	IFREMER	jrolin@ifremer.fr
21	R. Liptrot	FUGRO	Rr.liptrot@fugro.com
22	Emma Heslop	SOCIB	eheslop@socib.es
23	Jonh Picard	EMSO/INGV	johnpicard99@gmail.com



**"Innovation Meets Industry" @ Oceanology 2016 Participant List and Contact Details -
March 2016 14:00-17:00**

Tuesday 16

	Name	Company/Affiliation	Email address
1	P. Watson	OCEAN POWER TECH	pwatson@oceanpowertech.com
2	L.Delauney	IFREMER	laurent.delauney@ifremer.fr
3	Henry Ruhl	NOC UK	h.ruhl@noc.ac.uk
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5	Patrick Farcy	IFREMER	patrick.farcy@ifremer.fr
6	Luisa Cristini	NOC.UK	luiscr@noc.ac.uk
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22	John Huthnance	NOC.UK	jmh@noc.ac.uk
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44	Dave Ward	COMMISSIONERS OF IRISH LIGHTS	dave.ward@cil.ie
45	Paul Gaughan	MARINE INSTITUTE	x
46	Aodhan Fitzgerald	MARINE INSTITUTE	x
47	Edel O'Connor	MARINE INSTITUTE	x
48	Jorge Calvin	Omniaaccess	x
49	Felim O'Toole	SLR ENVIRONMENTAL CONSULTANTS	fotoole@slrconsulting.com
50	Shane Lavery	SLR ENVIRONMENTAL CONSULTANTS	slavery@slrconsulting.com
51	David Mills	BANGOR UNIVERSITY	x
52	Jon Rees	CEFAS	x
53	Alexandru-Ioan Cercel	MARINE RESEARCH LTD	x
54	Caitriona Nic Aonghusa	MARINE INSTITUTE	x
55	fabio sacchetti	MARINE INSTITUTE	x
56	Ronald Varlemann	TERRA4 GmbH (NKE)	varlemann@terra4.de
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58	Eric Comerma	RPS	ecomerma@rps.com

Reference: JERICO-NEXT-WP5-D8.4-V8

Annex 2 Sea Tech Flyer and Proposed Agenda for JERICO Workshop



The flyer is titled "SEA TECH event" and "JERICO NEXT B2B MEETINGS EVENT". It features a vertical strip of images on the left showing various marine technologies: an offshore platform, a yellow autonomous underwater vehicle (AUV), a coastal monitoring station, a yellow buoy, a green autonomous surface vehicle (ASV), a yellow and black autonomous underwater vehicle (AUV), a white autonomous surface vehicle (ASV), and a white ship. The main text area is white with a blue border. It includes the JERICO next logo, the SLR logo (SLR global environmental solutions), and the event details: Tuesday 11th October 2016, Seatech, Brest. The text describes the event as a showcase for products and services, a collaboration on testing and promoting innovative techniques for coastal zone monitoring, and a progress on the commercialisation of innovative technologies within the Jerico Next partnership. It also provides contact information for Shane Lavery and Nick O'Neill.

SEA TECH event JERICO NEXT B2B MEETINGS EVENT

JERICO next

SLR global environmental solutions

Tuesday 11th October 2016
Seatech, Brest

SLR will be bringing together companies to showcase their products and services and explore opportunities to collaborate on testing and promoting innovative techniques for coastal zone monitoring to industry clients. The objective of our B2B meetings is to progress the commercialisation of innovative technologies within the Jerico Next partnership and identify opportunities for Jerico Next infrastructure providers and product and service developers to promote their activities to end users.

For more information and to book your opportunity for 1-2-1 meetings with interested end users, contact Shane Lavery or Nick O'Neill at smlavery@slrconsulting.com or noneill@slrconsulting.com

ACO2016 The challenge of observation data integration
A connected ocean



WP8 MEETING ON TASK 8.4

OUTREACH, COMMUNICATION AND ENGAGEMENT

BREST, 11TH OCTOBER 2016

Agenda

11 , October 2016			
Time slot	Title	Speaker	Reference document
14:00	Flash Presentations on Expectations, Needs, and Challenges of Marine Data End Users	TBC	
14:30	B2B Meetings		
15:00	Coffee Break		
15:15	B2B Meetings		
17:00	Close of Meeting		
<u>End of the meeting</u>			





Annex 3 Sea Tech B2B Participant Information Forms








Participant information sheet Tuesday 11th October 2016 Seatech, Brest

Please fill in your details and answer the questions below, and insert a photo of yourself, and return a copy of the completed form to: smlavery@slrconsulting.com

As the event is all about creating a network of people, a printed copy of your form will be displayed on the walls of the venue, throughout the workshop, to help you find each other and connect with the right people. By returning the form to SLR you are giving your consent for the information to be shared with other attendees at the event.

Thanks, and please return your form **before COP on 30th September 2016** so we can print it in good time and bring it along.

<p>Name: DELMAS roger</p> <p>Organisation HOCER</p> <p>Contact details: Roger.delmas@hocer.com P: 33 298 41 03 13 M: 33 685 02 78 21</p>	<p>Photo:</p>
<p>My work / research is about (under 50 words):</p> <p>On-line detection and quantification of organic pollutants using UV spectrometry and fluorimetry and coupling with automated on-line SPE.</p>	
<p>What I am looking for, from this workshop (under 50 words):</p> <p>People interested in organic matter, hydrocarbons and nutriment monitoring in seawater.</p> <p>Resources, skills, people, ideas I'd like to find (under 50 words):</p>	<p>What I'd like to discuss (under 50 words):</p> <p>Used of UV signal for monitoring NO3 and COD/TOC contents of water</p> <p>What resources, skills, people and ideas I can offer to others (under 50 words):</p>
	<p>20 Experience on on-line organic matter monitoring in river and industrial water. Existing analysers (Aquapod)</p>




Participant information sheet Tuesday 11th October 2016 Seatech, Brest

Please fill in your details and answer the questions below, and insert a photo of yourself, and return a copy of the completed form to: smlavery@slrconsulting.com

As the event is all about creating a network of people, a printed copy of your form will be displayed on the walls of the venue, throughout the workshop, to help you find each other and connect with the right people. By returning the form to SLR you are giving your consent for the information to be shared with other attendees at the event.

Thanks, and please return your form **before COP on 30th September 2016** so we can print it in good time and bring it along.

<p>Name: Tomoko Kakee</p> <p>Organisation Yokohama National University</p> <p>Contact details: kakee@ynu.ac.jp</p>	
<p>My work / research is about (under 50 words):</p> <p>My research examines existing and emerging international norms regarding environmental and socio-economic impacts from deep sea mining in areas within national jurisdiction.</p>	
<p>What I am looking for, from this workshop (under 50 words):</p> <p>The way how JERICO-NEXT is cooperating with its partners to promote their activities to end users.</p> <p>Resources, skills, people, ideas I'd like to find (under 50 words):</p>	<p>What I'd like to discuss (under 50 words):</p> <p>what could be important or necessary elements for dissemination of technology</p> <p>What resources, skills, people and ideas I can offer to others (under 50 words):</p>
<p>Coordination by JERICO-NEXT</p> <p>Promotion of technologies to potential end users</p>	<p>No idea yet</p>

Reference: JERICO-NEXT-WP5-D8.4-V8

**Annex 4 List of attendees at Ocean Business 2017 Workshop**

Name	Organisation	Email
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**Annex 5 List of B2B Meetings at Ocean Business 2017 Brokerage Event**









5 April, 2017 / Southampton, United Kingdom
Ocean Business 2017

Agenda for **Nick O'Neill**

SLR Environmental Consulting (Ireland) Ltd



Wednesday 05.04.2017

09:00 – 09:30 Table 11	Meeting with Grégory Maurin Sales & Marketing Manager at Subsea Tech	
09:30 – 10:00 Table 3	Meeting with Phil Wilson Sales Manager at MMT	
10:00 – 10:30 Table 18	Meeting with Roland Dangerfield MD at Sentinel Aviation	
10:30 – 11:00 Table 4	Meeting with Fabienne VALLEE President, general manager at SeaTopic	
11:00 – 11:30 Table 19	Meeting with Simon Williams Business Development Manager at Bela EMS	
14:30 – 15:00 Table 4	Meeting with Malcolm Hart Director at Plain Sailing Communications Ltd	
15:30 – 16:00 Table 9	Meeting with Durval Tavares CEO at Aquabotix Technology Corporation	
16:00 – 16:30 Table 5	Meeting with Ron Collier VP of Business Development at SubC Imaging	



**Annex 6 KTN Questionnaire**

Knowledge Output Template														
	Deliverable	Short Title	Knowledge Output Description	Knowledge Type	Where to find it	Who to Contact for more Information	Owner & other Beneficiary(s) involved	Ready for uptake or further research necessary	Sector(s) of application	Target user & application	Exploitation mechanisms and activities (past/potential)	Possible exploitation partner(s)	Patents or other IPR exploitation (licences)	Impact (established/potential/expected)
JERICO PARTNER Knowledge Output Type 1. Exploitable technical result 2. Guidelines/Standards 3. Product 4. Prototype 5. Technical manual 6. Services/Tools 7. Software/Modelling tools 8. Training activity/Learning module	If the knowledge output is a Jerico project deliverable or milestone please use its official title and number	Give the knowledge output a title	Give a comprehensive description of the knowledge output including scope, geographical area, parameters etc to make the knowledge output fully understandable to a non-expert	The knowledge output types from Jerico of interest to industry are divided into: Products such as sensors, power systems, IT architecture, etc; Processes such as software for data analysis, data processing techniques etc, and Services such as testing facilities, data interpretation, provision of coastal buoys with data collection and interpretation, training courses in new techniques,	Give information on where to find the knowledge output e.g. website address, scientific journal reference, fact sheet. If not publicly available state this.	Name, e-mail and contact telephone number of the knowledge generator or main contact point.	Give names and contact details. Owner: foreground developed through the project is owned by the partners who have directly contributed to its creation.	Is the knowledge output ready to enter a supply chain or is more RTD needed to prove the concept/validate the knowledge? If RTD is required provide details including timing	State as many sectors as you think would benefit from this knowledge. Examples could be defence, ports/harbours, renewable energy, marine engineering, oil and gas, shipping, marine tourism etc	Who could use the knowledge and how do you want them to apply the knowledge? The focus is on private sector industry applications. This could be to deliver public sector programmes e.g. environmental monitoring by state agencies. For more than one end user use the rows below to list end user and specific application	Indicate a channel that has been used or can be used to reach a group of end users. Examples are events and networking, face to face, using intermediary groups (name where possible), collaborators, consultancy, training courses, licensing, spin offs etc	Who would exploit the knowledge? Who could be a possible multiplier with a mandate to help transfer knowledge to a particular group of target users. Possible examples are spin offs, investors, innovation support agencies, sectoral development bodies, public research organisations.	Would you consider it suitable to apply for a patent or other IPR exploitation mechanisms for this knowledge output? Are there any confidential issues which would affect the provision of this knowledge to third parties? If applicable give more information. This can entail measures already taken or measures intended.	Give details and try to quantify where possible. Core indicators of impact could be patent grant, number of spin offs, number of publications, gross licence revenue, research agreements with SMEs.
1. IFREMER, French Research Institute for the Sustainable Exploitation of the Sea														
2. SYKE, Finnish Environment Institute														
3. IBWPAN, The Department of Coastal Engineering and Dynamics														
4. DMJ, Riks Meteorologiske Institut														
5. NIVA, Norwegian Institute for Water Research														
6. IMR, Havforsknings instituttet														
7. DELTARES, Stichting Deltares														
8. OGS, Istituto Nazionale di Oceanografia e di geofisica Sperimentale														
9. CNR, Consiglio Nazionale Delle Ricerche														
10. UOM, International Ocean Institute – Malta Operational Centre														
11. HCMR, Hellenic Centre For Marine Research														
12. NERC, Natural Environment Research Council														
13. INGV, Istituto Nazionale Di Geofisica e Vulcanologia														
14. HZG, Centre for Materials and Coastal Research GmbH														



Annex 7 Tenderwatch Examples





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Contracting Entity Name	Address	Main Activity	Date of Contract Award	Notice Type	Description of equipment and services	Contract value	Contractor Name2	Address3
Environment Agency (UK)	Kingfisher House, Goldhay Way, Orton Goldhay, Peterborough, PE2 5ZR	Anglian Coastal Monitoring programme, Phase 9 (2016 – 2021): Hydrodynamics Services	01/07/2016	Invitation to Tender	The hydrodynamic network is used as a part of a long-term programme of coastal monitoring, to analyse coastal processes and provide data for operational and strategic shoreline management	N/A	N/A	N/A
Mercator Ocean	Ramonville Saint-Agne, France	Development of operational oceanography in Europe	01/10/2016	Invitation to Tender	Set up of Copernicus Marine Environment Monitoring Services	N/A	N/A	N/A
Sabella	Quimper, Brittany, France	Tidal Energy	12/03/2017	Contract Award	Current, wave sensors, underwater video, hydrophones	?	Rtsys	Brittany, France
Abu Dhabi Government	Abu Dhabi, UAE	Coastal environmental monitoring of corals and seagrass	20/03/2017	Contract Award	Eight coastal buoys for water quality monitoring	?	OSL	UK
Baltic Trade and Investment	Gdansk, Poland	FEW Baltic II Wind Farm	15/04/2017	Contract Award	Watchkeeper buoy-metoccean monitoring	?	Axys Technologies	Canada
DCNS Energies	Paris, France	Offshore Engineering	17/04/2017	Contract Award	Analysis of historical metocean conditions	?	Open Ocean, Metocean Analytics	Technopole Brest, France
DHI Denmark for Kiel Canal Project	Kiel, Germany	Shipping Canal	20/09/2017	Contract Award	Network of 7 of 1.9m data buoys multiparameter water quality sensors and AWAC on a gimbal to monitor currents and waves	?	OSL	UK
United Nations Development Programme	New York	International Development	28/09/2017	Invitation to Tender	Wave Rider, Current Profiling System and CTD for supporting Egyptian National Observation System in coastal Area	N/A	N/A	N/A
Dublin Port Company	Alexander Basin, Dublin	Port Facilities, Alexandra Basin Redevelopment Project	19/10/2017	Contract Award	Marine buoys providing real-time detailed sea-state data on turbidity, wave and current profiles. The buoys will also provide a platform for acoustic detection of whale and dolphin activity during the Alexandra Basin Redevelopment Project	€1.8m	TechWorks Marine	DunLaoghaire, Ireland
Japan Coast Guard (JCG)	Japan	Maritime monitoring and safety around Japan	12/03/2018	Contract Award	Multi-year, ocean monitoring program to provide enhanced, real-time situational awareness of ocean currents, wave activity, and weather along Japan's coastlines	?	Liquid Robotics	USA
Norfolk Dredging Company	Florida, USA	Dredging for shore protection projects	26/04/2018	Contract Award	Coastal shorebird monitoring and turbidity monitoring	?	Marine Ventures International	8524 SW Kansas Ave, Stuart, FL 34997, USA
The Underwater Centre (TUC)	Fort William, Scotland	Development of underwater technologies for autonomous locating and tracking of subsea pipelines.	?	Basic Agreement	In November 2017, Kawasaki successfully completed a verification test at TUC for automated underwater docking of a prototype AUV to its charging station, involving contactless charging and large-capacity optical communication. For the upcoming test, leveraging on synergies of its technologies, Kawasaki plans to use a prototype AUV equipped with a robot arm with an attached inspection tool unit (currently under development), to achieve autonomous locating and tracking of subsea pipelines.	?	Kawasaki Heavy Industries Ltd	
Meteo France	73, avenue de PARIS 94165 SAINT MANDE Cedex FRANCE	supply of TRIAXYS directional wave buoys	?	8 year framework agreement	TRIAxYS directional wave buoys which use satellite telemetry to build a wave measurement network along the coast of France.	?	AXYS Technologies	2035 Mills Rd W, Sidney, BC V8L 5X2, Canada
Unknown leading company		Supply of Sabertooth underwater electric robotic vehicles	?	Purchase Order	Supply of Sabertooth underwater electric robotic vehicles that can operate in both fully autonomous (AUV) and tethered (ROV) modes	?	Saab Seaeeye	
Dutch non profit organisation		Development and delivery of a remote offshore monitoring system for a Dutch nonprofit that is developing advanced technologies to rid the world's oceans of floating plastic.	?	Contract Award	The monitoring system will be used to gain real-time insight into the performance of the first-ever ocean cleanup system, which will be deployed during trials starting later this year on the U.S. west coast.	?	Seatools	Numansdorp, Netherlands
Kativik Regional Government	P.O. Box 9 Kuujuaq, Quebec, J0M 1C0	Provision of cable route survey support for the proposed Eastern Arctic Undersea Fibre Optic Network (EAUFON) submarine telecoms cable system		Contract Award	EAUFON is a planned submarine cable with landing points at multiple communities in Canada's Nunavut region intended to be ready by 2020.		WFN Strategies	Sterling Virginia
Saab, Kockums	Sweden	Supply of probe equipment for marine surveys	?	Contract Award	The supply four customized MDAS SVX2 probes to a Swedish naval surface vessel and stealth technology designer. The MDAS SVX2 is an advanced probe, combining sound velocity with salinity and density technologies to provide a versatile instrument that delivers data profiles	?	Valeport	Totnes, UK
BHP		Acquisition of ocean bottom node seismic data in the Western Gulf of Mexico	?	Contract Award	The acquisition of up to 1,004 sq. miles of ocean bottom node seismic data in the Alaminos Canyon and East Breaks areas of the Western Gulf of Mexico. The survey, located in water depths ranging from 2,500 to 7,250 ft., will employ two seismic source vessels and Fairfield Geotechnologies' newest ocean bottom node technology, ZXPLR™.	?	Fairfield Geotechnologies	1111 Gillingham Lane, Sugar Land, Texas, USA 77478
Dragados	UK	Supply of Turbidity Monitoring Package for Harbour Expansion	?	Contract Award	OSL have provided construction company Dragados UK with a turbidity monitoring solution to report on the dredging activities of the Aberdeen Harbor Expansion Project.	?	Ocean Scientific International Ltd (OSL)	Havant, Hampshire, UK.
Multiple contracting entities		Subsea intervention and survey services - multiple contracts	01/07/2018	Contract Award	M2 Subsea's extensive fleet of ROVs have been mobilized across the globe for contracts in the North Sea, Southern North Sea, Gulf of Mexico, India and the Middle East with workscopes ranging from inspection surveys to leak detection studies	£10m	M2 Subsea	Based in Aberdeen UK and Houston Texas



Reference: JERICO-NEXT-WP5-D8.4-V8