



atlas

UNDERSTANDING DEEP ATLANTIC ECOSYSTEMS



Industry Engagement and Ocean Business

Atlas 4th General Assembly 3 April 2019

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WP7 Deliverable D.4

Outreach to stakeholder 'blue growth' sectors

- Questionnaire developed (sent to Steering Committee for comment)
- Structured interviews with industry representatives (underway)
- Workshop at the Ocean Business 2019 Conference Southampton (9-11 April)
- Review/Compilation of responses (May-July)
- Report on stakeholder consultation due August 2019



Methods

- 30 minute structured interviews
- Based on 1 page of information on the specific sector sent prior to the interview
- 10 sectors/10 specific sector questionnaires - (not all equally affected by/linked to deep-sea):

- Aquaculture
- Biotechnology
- Cables & pipelines
- Fisheries
- Mining
- Oil & gas
- Shipping
- Tidal & wave
- Tourism
- Wind



Aquaculture current status & challenges

Aquaculture is a growing sector in the Blue Economy, with high presence and high development potential in the Atlantic. In the North Atlantic, aquaculture is a relatively diverse sector with a wide range of fish and shellfish production species; algae aquaculture is less developed. The location of aquaculture is highly dependent on the environmental requirements of the production species. Aquaculture generally requires stable long-term locations, and increased competition for space in inshore waters may lead to aquaculture expansion offshore. The move to offshore, and accommodation of larger production species (e.g. tuna penning), will involve the development of larger, more robust systems, which require more space. Expansion may lead to conflict with existing offshore sectors, such as fisheries, as some fishing gear types will not be permitted around offshore wind and aquaculture installations. Synergies between aquaculture and other sectors are also possible, such as colocation with renewable energy in multiuse platforms, and aquaculture areas as wild fish stock refuges potentially benefitting fisheries. Understanding the best location for aquaculture is a key part of ensuring it has a place in Marine Spatial Planning (MSP). For example, moving towards integrated Multi-Trophic Aquaculture (IMTA) systems could reduce effluent and make aquaculture acceptable for a greater range of sites. However, there are considerable knowledge gaps on siting criteria for the cultivation of different species. Without this information, it is difficult to manage aquaculture sustainably, and in line with the principles of the Ecosystem Approach to Aquaculture (EAA).

ATLAS key findings

Atlantic Ocean currents, such as the Atlantic Meridional Overturning Circulation (AMOC) connect ecosystems and move vast quantities of heat, salt and energy across the Atlantic basin. ATLAS researchers have discovered that the AMOC is weakening, which may lead to a change in the suitability of offshore sites for aquaculture. Some existing sites may no longer be suitable for the species cultured there, whilst additional areas could become suitable. Changes in ocean circulation could lead to aquaculture moving into areas where other sectors are already active, which could contribute to spatial conflict. Different aquaculture species may respond to ocean circulation and pH changes differently, and wild stocks used to seed aquaculture could also shift in response to ocean circulation changes. This could lead to issues with supply and demand, for example, shellfish will be highly sensitive to ocean acidification, yet the perception of shellfish as low-carbon food could lead to increased demand. ATLAS research on ocean circulation changes, habitat suitability, biogeography and connectivity will help inform the siting of future Marine Protected Areas (MPAs). Aquaculture may be permissible within some existing and future MPAs, if environmental impacts are appropriately managed, for example through the use of IMTA systems.



This project has received funding from the European Union's Horizon 2020 research and innovation programme, under grant agreement No 678760 (ATLAS). This output reflects only the author's view and the European Union cannot be held responsible for any use that may be made of the information contained therein.



Survey Questions

1. Do you envisage new/expanded activities in the N Atlantic before 2030? What sort of activities and where?
 - 1.1. Which locations/routes are of interest for expansion?
2. Do you have any plans to work collaboratively with other sectors to address your business challenges? If so, how and with which sectors?
 - 2.1. Are there any specific examples of collaboration between sectors, e.g., existing area-use sharing mechanisms or site-specific examples of cross-sector collaboration?
3. Main business drivers moving towards 2030?
 - 3.1. How will these drivers influence your business?
4. How will the key findings of ATLAS influence your plans?
 - 4.1. What type of additional scientific information, at the basin scale, could help you plan for your business heading towards 2030?
5. Are there any current or anticipated technology developments in your sector that may help address some of the issues ATLAS has identified? If so, what are they?
 - 5.1. Are there barriers to finding/using technological solutions in your sector?
6. Do you anticipate that the development of a new legally binding instrument (BBNJ) will influence your sector's business plans?

Atlas workshop

Final Programme: 10th April 2019, Lab G1.



-Talk programme: 0930 – 1315-

	Timing	Talk Title	Speaker
Session 1: Overview. 0930 - 1015. 45 min. Chair: <i>M. Gianni</i>			
Talk 1	15	Welcome & ATLAS overview	<i>Matt Gianni, Gianni Consultancy</i>
Talk 2	15	Deep-sea mining in the North Atlantic	<i>Phil Weaver, Seascope Consultants</i>
Talk 3	15	Implications of applying an Ecosystem Approach	<i>Clare Waldman, s.Pro</i>
Session 2: ATLAS Science. 1015 – 1115. 60 min. Chair: <i>D. Johnson</i>			
Talk 4	10	Recent North Atlantic circulation changes are anomalous: implications for future variability and marine management	<i>David Thornalley, University College London</i>
Talk 5	10	Getting there: advancing knowledge on vulnerable marine ecosystems to support Blue Growth in the deep sea	<i>Georgios Kazanidis, University of Edinburgh</i>
Talk 6	10	ATLAS case studies and Marine Spatial Planning	<i>Anthony Grehan, National University of Ireland, Galway</i>
Talk 7	10	Win-wins and barriers to research-industry partnerships in the deep sea	<i>Johanne Vad, University of Edinburgh</i>
Panel discussion: Implications of ATLAS findings for Blue Growth. 20 min. Panellists: <i>D. Thornalley, G. Kazanidis, A. Grehan, J. Vad.</i>			
Coffee: 1115 – 1130			
Session 3: Blue Growth. 1130 – 1220. 50 min. Chair: <i>A. Grehan</i>			
Insights from the ATLAS Industry perspectives study: <i>Rachel Boschen-Rose, Seascope Consultants.</i> 15 min			
Open discussion: Opportunities and challenges for Blue Growth. 35 min.			
Session 4: MSP & Policy. 1220 – 1300. 40 min. Chair: <i>R. Boschen-Rose</i>			
Talk 8	15	EU-MSP Platform & spatial conflicts and synergies	<i>Clare Waldman, s.Pro</i>
Talk 9	10	Biodiversity Beyond National Jurisdiction: an update from the latest UN negotiations	<i>David Johnson, Seascope Consultants</i>
Panel discussion: Opportunities and challenges of Area Beyond National Jurisdiction. 15 min. Panellists: <i>M. Gianni, D. Johnson, C. Waldmann.</i>			
Closing remarks: 1300 – 1315. <i>M. Gianni.</i>			



11 interviews thus far

Industry reactions
Preliminary results
(interviews/sector)

- 1 Aquaculture
- 3 Biotechnology
- 0 Cables & pipelines
- 0 Fisheries
- 0 Mining
- 1 Oil & gas
- 2 Shipping
- 2 Tidal & wave
- 0 Tourism
- 2 Wind

Some emerging themes/concerns: changing environmental conditions; moving into new ocean areas; policy/regulations; cooperation & conflict with other sectors, marine spatial use/issues/planning

1. New/expanded activities in the N Atlantic before 2030?



1.1. Which locations/routes/species are of interest for expansion?

Aquacult.

Yes. Further offshore, deeper areas.
High end products: salmon, seabass, seabream, tuna

Blue biotech.

Yes. Extreme environments (deep, hot, cold, salty).
Depends on funding

Oil & Gas

Yes, continued exploration & exploitation in N Atlantic: Norway, Gulf of Mexico.
Gas & energy consumption increasing by the day. None of the current alternatives can replace O&G

Shipping

Yes, expansion to higher latitudes/Arctic
Growth in energy (LNG), cargo, cruise; possible expansion of highly automated vessels

Waves & tidal

Yes. Early stages of development; R&D, pilot testing; increasing markets
Tidal: Brittany (France), Ireland, Scotland, Wales, Bay of Fundy (Canada)
Waves: Portugal, Spain, Scotland/UK (Atlantic facing countries)

Wind

Yes, much more, on continental shelves. Bottom mounted and floating.
North Sea, English Channel, Atlantic margins of Europe and NE USA



3. Main business drivers to 2030

Business opportunities/consumer demands: wind, waves, aquaculture, blue biotech, oil & gas

Climate change/Decarbonisation/SDGs: wind, waves, aquaculture, blue biotech

Technology developments (automation, computing power, big data): Wind, waves, aquaculture, oil & gas, biotech

Plastic pollution: aquaculture, blue biotech

Legal/Environmental requirements: shipping (Ballast water, fuel/sulphur cap)

Geopolitical drivers: oil & gas, aquaculture, blue biotech (energy and food sufficiency), shipping

3.1. How will these drivers influence your business?

Oil & gas:	CC may impose limits due to public opposition Technological developments/new energy sources to power up platforms
Renewables:	Positive influence!
Aquaculture:	concern with extreme weather events, new pathologies
Shipping:	Adaptation to regulations



4. How will ATLAS' key findings influence industries' plans?

Aquaculture: Determining available spaces for aquaculture (inc. spatial conflict); Deciding whether or not to invest

Biotech: Important in terms of MSP and management; ATLAS work in terms of policy important.

Oil & gas and shipping: Adapt! Changing environmental conditions or relocated MPAs not a problem

Renewables: If Atlas recommendations are followed they may have an impact on policies, incentives, etc.



4.1. What type of additional scientific information, at the basin scale, could help you plan for your business heading towards 2030?

- Bathymetries, characterization of the ocean floor (sandy, rocky, muddy); wind speed variability
- More reliable predictive models; Current and prospective weather patterns; prediction of extreme weather phenomena
- Information to adjust seasonal closures
- Mapping ecosystems and Biodiversity hotspots: “Lack of ecosystem knowledge is a major competitive disadvantage”
- Mapping collections of marine bioresources, of products being developed
- Environmental change due to Climate change



5. Technology developments to address issues identified by ATLAS?

- Aquaculture: Cages that can be moved up and down the thermocline
Engineering/automation
Species improvement through blue biotech
- Biotech: Rapid sequencing technology
- Renewables: Technology allows moving deeper and further offshore; offshore batteries
- Shipping: data transfer at sea

5.1. Are there barriers to finding/using technological solutions in your sector?

Cost!

Aquaculture: Legal framework; Ethical issues/consumer awareness

Biotech: Legal framework (major obstacle); numerous and overlapping jurisdictions;
Lack of money, of collaboration, of infrastructures, private funding,
knowledge, preparation; Genetic specificities of marine species

Renewables: Environ. impacts, spatial conflicts, economic competitiveness, lack of incentives

Oil & gas: technological barriers, political barriers

Yes, the fact that we're working on the ocean!

Will BBNJ affect sector?



No/Probably not!

Aquacult.

Too far off. Logistical nightmare!

Wind

Only on continental shelves!

Waves &
tidal

Up to 20 NM offshore

Oil & Gas

Only on continental crust!

Yes/Probably!

Shipping

Negative: *unequal playing field*

Recommendation: *scientists must get involved to get in good advice; need for a clear model/rules*

Blue
biotech.

Negative: *restrict access to marine BD*

Positive: *Increased transparency; greater justice on the capitalisation of the use of BD*

Recommendation: *scientists must get involved to get in good advice; need for a clear model/rules*



Conclusion

- Preliminary results only
- Still need to interview offshore fishing and mining sectors, as well as more interviews with the other sectors – including at Ocean Business 2019
- Using preliminary findings/results of the Atlas Project so may need to link findings to industry concerns and vice versa in report
- Report due in August 2019
- May have additional opportunities to obtain views from industries (e.g. Science/Policy Panel) after report



And thanks to...

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Phil Weaver, Clare Waldman, David Thornalley, Georgios Kazanidis, Anthony Grehan and Johanne Vad who will be joining us for the Atlas workshop at the Ocean Business 2019 event

& LeAnne, Georgios, Johanne for comments on questionnaire

Hopefully we haven't missed anyone!

Thank You



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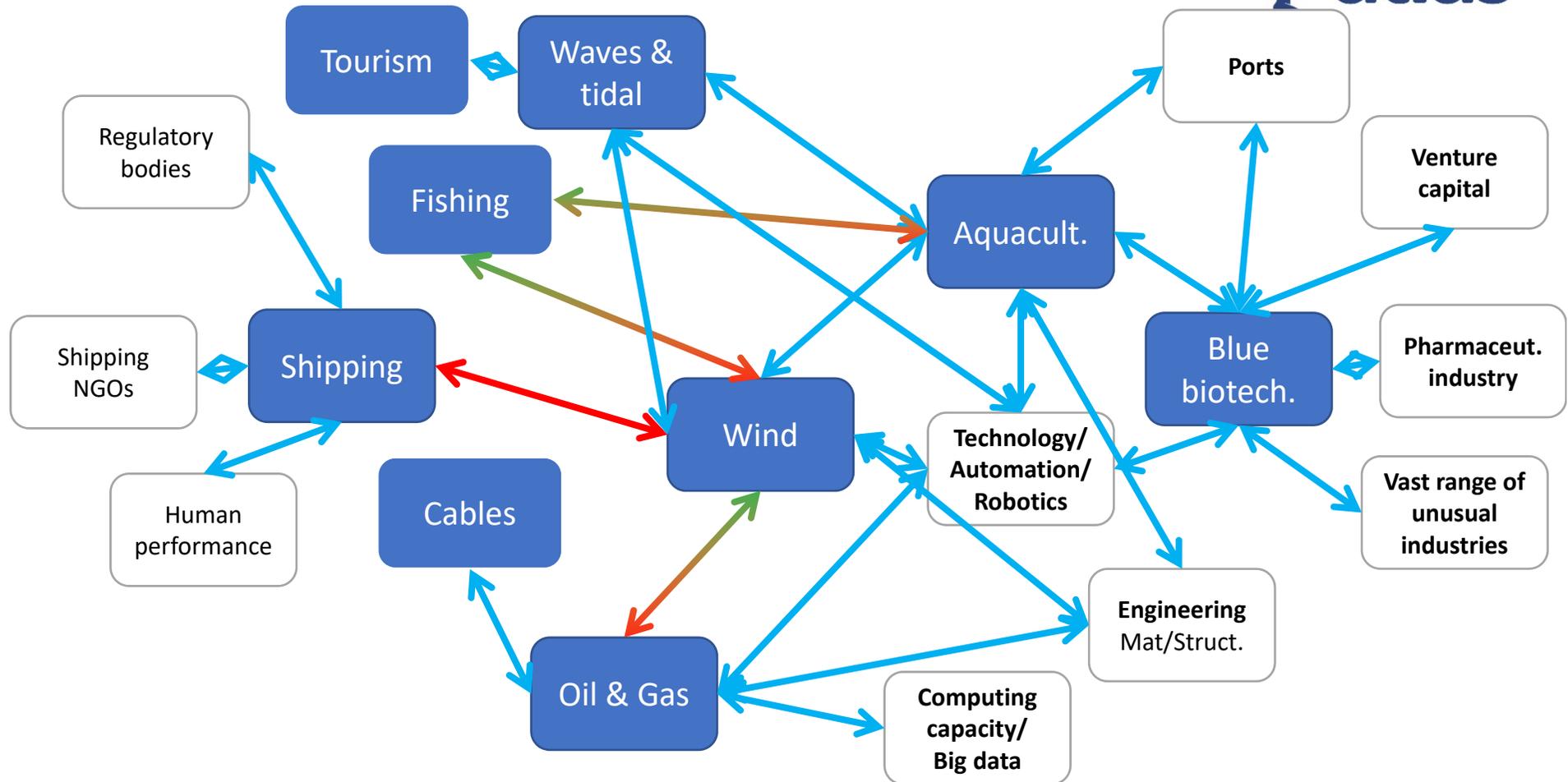
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2. Cross-sector collaboration?



2.1. Are there any specific examples of collaboration between sectors, e.g., existing area-use sharing mechanisms or site-specific examples of cross-sector collaboration?

Onshore, yes: research centres, business hubs, ports

Offshore, not really: Licensing hurdles, regulatory constraints, despite incentives.