

# ATLAS

## UNDERSTANDING DEEP ATLANTIC ECOSYSTEMS

### PROJECT OVERVIEW 2016 - 2017



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## ABOUT ATLAS

ATLAS aims to advance our understanding of the North Atlantic's deep-sea ecosystems, including their connectivity, functioning and responses to future predicted changes in human use and ocean climate. Research activities are focussing on waters 200-2000 m deep where the greatest gaps in our understanding lie and certain populations and ecosystems are known to be under pressure.

As well as carrying out pioneering research and discovery, ATLAS is developing a scientific knowledge base that can inform the development of international policies to ensure deep-sea Atlantic resources are managed effectively.

This will contribute to the European Commission's long-term Blue Growth strategy to support sustainable growth in the marine and maritime sectors as a whole.



ATLAS team members at the 2<sup>nd</sup> General Assembly in Spain, 2017  
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### AT A GLANCE

**TITLE:** A trans-Atlantic assessment and deep-water ecosystem-based spatial management plan for Europe (ATLAS)

**CALL:** Blue Growth: Unlocking the potential of seas and oceans (H2020-BG- 2015-2)

**TOPIC:** Improving the preservation and sustainable exploitation of Atlantic marine ecosystems (BG-01-2015)

**INSTRUMENT:** Research and Innovation Action

**DURATION:** May 2016 – April 2020 (48 months)

**CONSORTIUM:** 24 partners plus one linked 3rd party, from 12 countries

**COORDINATOR:** The University of Edinburgh, Edinburgh, Scotland, UK

**CONTACT US:**

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## KEY ACHIEVEMENTS MAY 2016 – OCTOBER 2017

### ATLAS research cruises

ATLAS has completed an intensive schedule of offshore cruises to deliver new data on oceanography, marine biodiversity, genetics and connectivity. To date 19 ATLAS related research cruises have taken place, with a further 15 planned for 2018 and 2019.

These have included a cruise from the Scotian Shelf to Bermuda organised by ATLAS 3<sup>rd</sup> Party DFO Canada on board the *CCGS Hudson* (14/07/16 – 16/08/16); the MEDWAVES cruise, led by IEO sailing from the Alborán Sea to Azores (21/09/16 – 25/10/16); The Rockall Bank expedition, led by NIOZ on board the *RV Pelagia* (24/04/2017 – 11/05/2017) and the Ifremer Videocor 1 expedition in the Mediterranean Sea (28/04/2017 – 10/05/2017). All cruise reports are made available in Open Access through the ATLAS communities page at Zenodo (<https://zenodo.org>).

### Understanding ocean circulation

New chemical sensors have been deployed in the eastern subpolar North Atlantic in collaboration with the UK NERC funded OSNAP initiative.

This is a key advancement in our ability to understand the interactions of ocean physics with ocean ecosystems – in particular the cold-water coral systems of the Atlantic.

Using marine sediment cores, ATLAS scientists have been able to reconstruct changes in ocean circulation over the past 1000 years. Emerging results have shown that current circulation is not typical and has been weaker over the past 150 years. This needs to be considered when developing our understanding of the distribution and functioning of present-day deep Atlantic marine ecosystems.



CCGS *Hudson* arrives in Bermuda © DFO



© Cova Orejas MEDWAVES cruise



End of cruise dinner on board the *RV Pelagia* © NIOZ

### The role and functions of deep-sea ecosystems

New predictive distribution modelling approaches and theoretical models of food webs and biogeochemical cycling of deep-sea ecosystems are being developed. ATLAS researchers have unravelled food supply mechanisms to cold-water coral reefs on the Norwegian shelf based on data from the LoVe observatory operated by ATLAS industrial partner Statoil.

### Biological diversity

A publicly accessible database on deep-sea biodiversity of the North Atlantic with an emphasis on Vulnerable Marine Ecosystems has been produced. A total of 315,000 records counting circa 2,500 species fell within the North Atlantic. This database will provide the baseline information for the Habitat Distribution Models and Species Distribution Models being developed in the second stage of ATLAS and inform the work on Good Environmental Status in the Deep Sea.

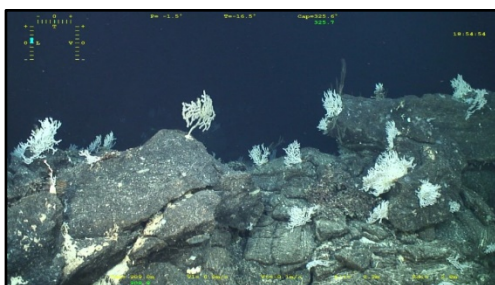
### Genetic connectivity

Candidate species for analysis have been identified based upon their important functional roles in sensitive deep-water Atlantic ecosystems and their availability in existing ATLAS partner collections. A database of this information has been produced.

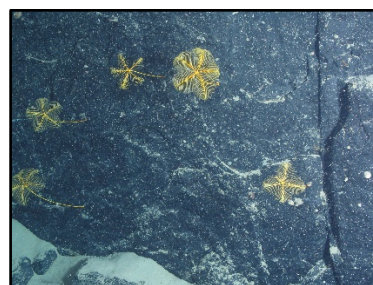
To help understand the connectivity of deep-sea benthic species and its implications for marine spatial planning, researchers have begun to model larval dispersal and life history traits in the Bay of Biscay, and on Rockall Bank.

### Socio-economic values

A Delphi has been undertaken to assess the risks of human drivers to ecosystem services supplied by the Atlantic deep sea. Respondents were asked to assess the effects and likelihood of human drivers on ecosystem services provided by Atlantic deep-sea ecosystems. Emerging results indicate that temperature change, ocean acidification, fisheries and their cumulative effects pose the most risk to ecosystem services.



Cold-water corals on an Azorean seamount  
© IMAR-UAz



Crinoids at Bay of Biscay © Ifremer

## Marine Spatial Planning

ATLAS is using the approach developed by the FP7 MESMA project: to examine marine spatial planning options across a selection of the project's Case Study areas representing deep-waters from the EU, US, Canada and ABNJs (NEAFC and NAFO Regulatory Areas). Each case study has described existing sectoral activities, mapped the spatial management institutional landscape and described (any) existing management plans. Each has the management objective of accommodating new blue economy/blue growth activity, while ensuring minimum disruption to existing activities, minimum impact on delivery of ecosystem goods and services, and achieving good environmental status as required by the Marine Strategy Framework Directive.

## Science to Policy

The timing of ATLAS aligns well with opportunities to inform and influence policy options. These include the development of a new United Nations Implementing Agreement for biodiversity beyond national jurisdiction (BBNJ) with implications for North Atlantic regional governance organisations; delivery of Agenda 2030 Sustainable Development Goals; formulation of seabed mineral exploitation regulations by the International Seabed Authority; and EU maritime policies Marine Strategy Framework Direct, Common Fisheries Policy and MSP. The ATLAS concept and initial findings have been presented at our first Science Policy Panel held at the European Parliament.

## Stakeholder Engagement

Stakeholder engagement has taken place with the offshore energy industry throughout the first period of the project. Two stakeholder events took place: The Blue Growth Data Challenge Workshop jointly organised with the INSITE programme (<http://www.insitenorthsea.org/>) through its Data Initiative project and two Blue Growth Data Workshops held at European Maritime Day. Further links with industry have been made through the ATLAS Advisory Board, with BP, Woodside Energy and Statoil providing data for the ATLAS case studies.



May 2018 European Maritime Day © European Marine Board

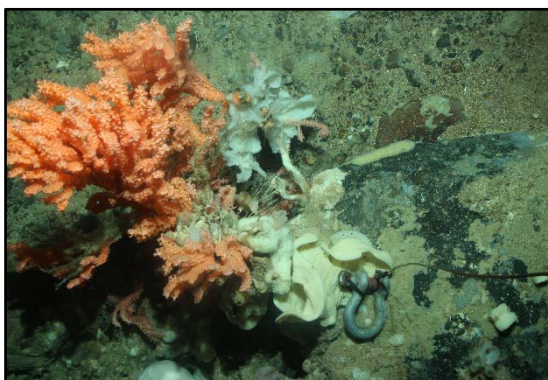


ATLAS Science Policy Panel, European Parliament, Brussels.  
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## LOOKING FORWARD

The intensive data-gathering phase of the first eighteen months of ATLAS will ultimately lead to several key outcomes:

- Improvements in our understanding of climate change resilience and feedback effects on deep-water ecosystems.
- Enhance our understanding of relationships of Atlantic ecosystems to food quality and supply.
- Develop an understanding of deep-sea ecosystem services to assist informed political decision-making based on values connected to ecosystem services.
- Ocean-scale Environmental Impact Assessments to improve sustainability of existing and new fisheries, aquaculture and marine resources.
- Location and predictive models of Atlantic vulnerable marine ecosystem distribution to provide improved rationale for Marine Protected Area management and closed areas.
- Improve cooperation among the EU Member States with respect to Atlantic ecosystem-based research as well as with International partner countries.



*Primnoa resedaeformis* and structure-forming sponges  
© DFO



Dead coral offers a habitat for a gorgonian coral, sea stars and brittle stars © Ifremer



(a) New discovery of rich coral gardens on the Formigas Complex off the Azores during the MEDWAVES cruise 2016 © Cova Orejas (b) *Vazella pourtalesi* sponge collected by ROV on the Scotian Shelf, part of the DFO cruise © DFO (c) Coral paparazzi on the MEDWAVES cruise © Cova Orejas (d) Murray Roberts finally flying home after being stuck in Brussels for 3 days due to heavy snowfall in Scotland after the ATLAS review © ATLAS Project Office (e) Cova Orejas on the hunt for marine life © IEO (f) ATLAS PhD students Cristina Gutiérrez-Zárate, Yaiza Santana Bernaldo and Berta Ramiro Sánchez attending a coral identification workshop © ATLAS Project Office (g) Matt Gianni and Telmo Morato at Colacmar 2017 © ATLAS Project Office

