atlas

A trans-Atlantic assessment and deep-water ecosystem based spatial management plan for Europe

ISSUE 2 | SEPTEMBER 2017

project news

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Coral garden in the Azores ©Gavin Newman, Greenpeace

WELCOME FROM THE ATLAS COORDINATOR

J Murray Roberts (Prof, the University of Edinburgh, ATLAS Coordinator)

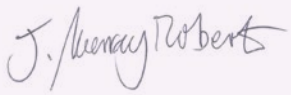
I'd like to start by welcoming all the new students, postdocs and other partners who've joined the project – you are the most important part of **ATLAS** and your work is what we all rely upon. Please reach out across our project. Make contact with others to get advice, to develop new collaborations and over the next three years you'll create a network that will stay with you for the rest of your career!

ATLAS got off to a flying start, and 2017 has been a blur of activity as the whole team have worked hard to promote the project across the world. **ATLAS** has now recruited 10 new PhD students, led or participated in 17 offshore cruises, published 12 peer-reviewed papers and has 10 more offshore expeditions being planned.

2017 has also been a critical year for the oceans with discussions at the United Nations reaching a pivotal stage. Our work in **ATLAS** has been carefully designed and timed to feed directly into these discussions, and our partnership with offshore industries is particularly important to make sure we achieve our ambitions to support a sustainable Blue Growth agenda.

Our newsletters can only ever give a snapshot of what's going on across our 25 partners in 12 countries across Europe, Canada and the USA. I hope you enjoy reading about our work at sea, in the lab and in science-policy discussions on both sides of the Atlantic.

Thanks to everyone for their great work in year one – remember **ATLAS** is all about your ideas, your project and your passion for the oceans and their future.



INTERVIEW WITH CHAIR OF ADVISORY BOARD

Jake Rice, PhD, Chief Scientist, Emeritus, Department of Fisheries and Oceans (DFO), Canada

ATLAS communications officer Claudia Junge spoke with Jake Rice at the second General Assembly in Mallorca, Spain, in March this year.

Welcome Jake!

Thank you very much, I am very happy to be here to talk with so many motivated and talented people about exciting science and its application.

What is your role as chair of the ATLAS Advisory Board? And what do you think is your biggest challenge?

I represent the diverse client communities that a successful **ATLAS** project would be relevant to. I keep a watch on how **ATLAS** is evolving and make sure it is still relevant to our individual and institutional perspectives without compromising the science.

My personal approach is that I want to get to know the people in **ATLAS** and what they are trying to achieve. The exciting challenge is how I can help knit together those individual visions to achieve a broad insight, beyond work packages. Our ultimate test will be to see how the final "sweater" fits different users in policy, industry, conservation, and science, while all threads keep their own integrity.

As the chair of the **ATLAS** Advisory Board, I see myself in a similar role as a conductor of an orchestra – making sure it all comes together.

How did you get involved in ATLAS? And what do you think are your main qualities?

I have been to a lot of places, done a lot of things...

Jake Rice presenting at the 2017 High-Level Political Forum on Sustainable Development (HLPF 2017) in New York (13 July 2017) ©IISD Reporting Service bit.ly/2tDLPZm

Well, that and Murray asked me.

I know how important it is to finish a job. But I am also continuously interested in expanding into new things. I usually express my opinion directly and clearly. I also keep an eye out for opinions that are outside the box or the common shared view. People in the Advisory Board, they see a different aspect you might not have thought about, which is exactly the point. We need to keep an open mind, always!

Which knowledge gaps is ATLAS set out to address, and what is your impression after the first year?

The resilience of deep sea and offshore seafloor ecosystems, and their abilities to recover from perturbations, are among the greatest knowledge

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gaps in marine ecology. I am confident that **ATLAS** will uniquely and profoundly contribute to addressing these gaps. I attribute this primarily to the vision and understanding that the project leaders have of the general policy landscape, and their knowledge of the science opportunities available to a well-designed and coordinated project.

During its first year, **ATLAS** has already gathered a large amount of data through its research cruises, published over 10 scientific papers, and presented its research more than 40 times in over 12 countries, including some major science and policy events. That's a great achievement!

ATLAS is a very complex project and therefore needs a clear and common functional thread through its work packages. It is also important to remember that as the "later" work packages learn, they need to feed back into the "earlier" ones. Those "later" ones could either be dependent on data collected through "earlier" ones for example or "later" ones need scientific results to give for example policy advice. In both cases, feedback to the "earlier" work packages is crucial to ensure the ongoing development of methods and protocols.

I very much enjoyed my first year as part of the **ATLAS** project and am looking forward to the next three years to come!

Jake Rice (left), with Biliana Cicin-Sain (middle) and J Murray Roberts (right) at ATLAS second General Assembly in Mallorca, Spain, 2017 ©David Johnson

You have had a very interesting and successful career, with over 20 years at DFO Canada, first as Director of Science Advice and later Chief Scientist. Would you mind sharing some of the key learning elements you take away from your roles and responsibilities in the past, which could be vital for ATLAS?

Of course, I am happy to share my thoughts and experiences! I would say my top two might be:

1. Listen to what policy makers want/need!
2. Listen to what experts have to say.

Then, from the two, develop coherent advice! Do not try to make them converge 100%, but instead, find the common denominator advice and state a few outside views. Then, outline the options and state their level of support, i.e. strongest support based on option A, weaker support (option B), and weakest support (option C).

You are retired now officially, but that hasn't stopped you from being involved in ATLAS and a million other things, has it? I am curious, what do you do to relax?

I am actually pretty good in Aikido. I have done it for 30 years and have a third degree blackbelt.

Wow, ok, you like me, right?

Haha, no worries! I also have other maybe unexpected hobbies, like crocheting.

Ah, that's where the sweater analogy comes from, I see. Is there anything you would say you live by?

I love this quote from Dorothy Parker, so maybe that comes closest: "The cure for boredom is curiosity. There is no cure for curiosity."

What a great quote to end our little chat with. Thank you so much for taking the time to talk to me, Jake. It was a great pleasure getting to know you better, and I am looking forward to the next time we get an opportunity to chat!

Thank you very much, it was my pleasure! Now, it's time to mingle...

NEWS AND HIGHLIGHTS

Introducing Keith Levesque, the new Research Vessel Coordinator as part of the AORA work on the Galway statement

The Department of Fisheries and Oceans in Canada recently appointed Keith Levesque as its new Research Vessel Coordinator/Senior Science Advisor in the Office of Partnership and Collaboration. This position will help contribute to the Government of Canada's commitment to the tri-partite Galway Statement on Atlantic Ocean Cooperation. Keith holds a bachelor's degree in biology from the Université du Québec à Montréal and pursued graduate studies in oceanography at Université Laval in Quebec City. He has over 10 years of experience developing, coordinating and implementing large-scale multidisciplinary marine field programmes in the Canadian Arctic for the ArcticNet Network of Centres of Excellence of Canada and the Amundsen Science Corporation. As Research Vessel Coordinator, Keith is responsible for the coordination of the seabed mapping efforts within the framework of the Atlantic Ocean Research Alliance (AORA) that underpin the objectives of the Galway Statement.

Contact: **keith.levesque@dfo-mpo.gc.ca**

Second ATLAS General Assembly, 24-28 April 2017, Mallorca, Spain

At the end of April 2017, the **ATLAS** Consortium gathered in Mallorca for the second **ATLAS** General Assembly. This brought together more than 65 interested individuals from all areas of the project, including scientists, policy makers, communicators and social scientists.

Attendees at the second **ATLAS** General Assembly, Mallorca, Spain ©**ATLAS** Project Office

Jake Rice chaired the **ATLAS** Advisory Board (AB) meeting on 27 April, providing invaluable feedback to the **ATLAS** Consortium on the progress of our first year and future challenges needing to be addressed. More about Jake and his work in the **ATLAS** AB are featured in the interview with him on page 2 of this newsletter.

Enjoying the outdoors on Mallorca ©AquaTT

We also welcomed representatives from our Horizon 2020 sister projects SponGES and MERCES, as well as the FP7 Project DEVOTES, who demonstrated their NEAT tool which the **ATLAS** team will be testing as part of Work Package 6.

It was safe to say the days were long and a huge number of scientific advances were covered, but we also had a well-earned rest with a field trip to the wonderful Cabrera Archipelago National Park.

The presentations from the event are available through our Communities Page on Zenodo: **zenodo.org/communities/atlas**

Clockwise from top left: Ingunn Nilssen (Statoil, Norway) talking about research on *Lophelia* polyp activity; Maria C. Uyarra (AZTI, Spain) and Anthony Grehan (NUI Galway) after the successful DEVOTES NEAT workshop with more to discuss; David JR Thornalley (University College London, UCL, UK) talking about the weakening of the Atlantic Meridional Overturning Circulation (AMOC); Peter Spooner (UCL, UK) on what assemblages of planktonic foraminifera can tell us about changing ocean currents; Always happy when thinking about deep-sea expeditions - Igor Yashayaev (DFO Canada); **ATLAS** (J Murray Roberts, UEDIN, UK) and SponGES (Detmer Sipkema, Wageningen University and Research Centre, the Netherlands) talking deep sea; and discussions in focus group on Areas Beyond National Jurisdiction (ABNJ) led by David Johnson (Seascape Consultants) and Ellen Kenchington (DFO Canada) ©AquaTT, **ATLAS** Project Office and David Johnson

EVENTS

Members of **ATLAS** have been very busy again during the first half of 2017, participating in more than 20 meetings in 10 countries. Please find a summary of a few of the events below. To read more about events and news, please visit the **ATLAS** website: **www.eu-atlas.org/meetings.html**

DATA

European Maritime Day, 18-19 May 2017, Poole, UK

European Maritime Day is the annual meeting point for Europe's maritime community. This year's event had the theme "The Future of Our Seas". It opened with a speech from Karmenu Vella, European Commissioner for Environment, Maritime Affairs and Fisheries, followed by inspirational keynotes to motivate us all to make changes in our daily lives to improve the health of the marine environment. The issue of marine plastics was a particularly highly cited issue during the conference.

28 parallel sessions and project pitches took place over the two days, including the "Blue Growth Data Workshops Part 1 and 2" which **ATLAS** team members helped organise.

The first of these workshops, "Engaging Industry - Involving industry in marine data initiatives", was co-organised by the EMODnet Secretariat (**www.emodnet.eu**) in collaboration with the COLUMBUS project (**www.columbusproject.eu**) to discuss the challenges and benefits of public-private collaboration towards data acquisition and sharing.

For the second workshop, "Offshore Energy Case Studies – Involving industry in marine data initiatives", **ATLAS** joined together with the INSITE programme (**www.insitenorthsea.org**) to address data issues pertinent to specific Blue Growth challenges such as oil/gas decommissioning and marine renewable installation.

The main message from the Offshore Energy Case Studies workshop was that emerging marine industries in sea basins across Europe would benefit from the lessons learnt during the North Sea decommissioning phase and the need to consider the full lifecycle of the oil or gas structure. Regarding data acquisition and sharing, feasibility studies for a variety of maritime industries can produce a wealth of data that needs to be gathered and stored in a central data repository before it is lost. In addition, compared to biological data, physics and chemistry datasets are significantly easier to standardise and produce data products from.

Speakers at the Blue Growth Data Workshop discussing the emerging questions and themes following their presentations. From left to right: Silvia Camporeale, Valter Martinotti, Niall McDonough, Chelsea Bradbury, Mark Johnston and Richard Heard ©Katherine Simpson and ATLAS

So, what needs to be done to standardise biological data? Some recommendations included: **1)** Environmental data sets need to be future-proofed by thinking about potential future uses and collecting marine environmental data at the highest possible resolution; **2)** Collection techniques for time series data need to be standardised to allow comparisons to be made across years and datasets; and **3)** Mapping the North Sea basin and making it a freely available public asset needs to be considered. To make proactive steps towards achieving this, ongoing dialogue needs to continue to take place between regulators, data providers (industry) and data portals at the national and European scale.

To read more about the second workshop, please visit: **www.eu-atlas.org**

By: Katherine Simpson

SCIENCE

Sponges, Corals and the World – BluePharmTrain Conference, 30-31 March 2017, Blanes, Spain

The international symposium "Sponges, Corals and the World" was a joint initiative of three European Commission funded projects: BluePharmTrain, **ATLAS** and SponGES. The symposium was held in the Blanes Centre for Advanced Studies in Spain, on marine science, blue business and society.

ATLAS was presented through an oral and a poster presentation by Georgios Kazanidis. He is a new **ATLAS** post-doctoral researcher in the "Changing Oceans" group at the University of Edinburgh and is featured in a profile on page 11 of this newsletter.

Georgios' presentation highlighted the project's objectives, structure and expected impacts.

Continued on next page

One of the **ATLAS** case studies, the Mingulay Reef Complex, was presented through a poster highlighting research activities and future challenges in this region of the Atlantic.

Through knowledge exchange, opportunities for new collaborations and fruitful discussions, the symposium made a substantial contribution to the efforts of tackling the challenge of sustainable development in the marine environment.

For more details about the conference, please visit: **bit.ly/2hlFHev**

By: Georgios Kazanidis

Georgios Kazanidis presenting ATLAS at "Sponges, Corals and the World", Blanes, Spain ©ATLAS

The aim of the science-policy events that took and will take place throughout the project, is to link research and policy and to provide policymakers and other relevant stakeholders with timely and relevant scientific knowledge in support of policy developments. Invitees to these meetings comprise senior policymakers, stakeholders from industry and non-governmental organisations (NGOs), representatives of international organisations, and leading scientists. The objective is to ensure that **ATLAS** results are brought promptly to the attention of policy makers and other relevant stakeholders in a forum where they can be discussed with all interested parties.

A few science-policy events which **ATLAS** partners have attended are featured in short below. To find out more about **ATLAS** Science in Action, please visit: **www.eu-atlas.org**

First ATLAS Science Policy Panel (SPP), 23 March 2017, European Parliament, Brussels, Belgium

Hosted by Ricardo Serrao Santos, Member of the European Parliament (MEP), this first science-policy meeting mainly served to bring the project to the attention of various stakeholders and to gather their feedback on where **ATLAS** results will be of benefit to their organisations or sectors in the future development of management of ecosystems in the Atlantic. The meeting commenced with an overview presentation by **ATLAS** coordinator J Murray Roberts (Prof, the University of Edinburgh, UEDIN) focusing on the high-level objectives of **ATLAS** work and connections between the Atlantic and other sea basins.

The chair, Sybille van den Hove (PhD, Iodine, **ATLAS** partner), invited participants to consider what Blue Growth means on each side of the Atlantic. Referencing the European Commission's document "Living well, within the limits of our planet", she noted that access to science was critical for policy makers but asked the meeting participants to consider how we might develop good strategies to not only produce the science and data, but also to share it to support sustainability and employ it to best effect in Marine Spatial Planning (MSP). It was noted that Blue Growth must be sustainable and the Commission's view is that Blue Growth is a long-term process.

The Commission's 2016 Communication on international ocean governance has huge relevance for **ATLAS**. In terms of MSP, **ATLAS** will focus on two key aspects: i) the need to better define the footprint of certain activities impacting the deep sea which will help better assess Good Environmental Status (GES), and ii) the need to better assess ecosystem goods and services so that we can understand their value more fully.

First ATLAS Science Policy Panel, 23 March 2017, Brussels, Belgium ©Bruno C. Valério

Presentations by Paul Snelgrove (Prof, Memorial University and member of the **ATLAS** Advisory Board), Cova Orejas (PhD, Instituto Español de Oceanografia, **ATLAS** partner), Telmo Morato (PhD, IMAR-UAz/University of the Azores, **ATLAS** partner), Gareth Parry (Woodside Energy, **ATLAS** advisory board member) and David Johnson (Prof, Seascape Consultants, **ATLAS** partner) set out key aspects of **ATLAS'** work and prompted discussion and advice from policy makers. In addition, Katherine Simpson (PhD, UEDIN; **ATLAS** Project Manager), Vikki Gunn (PhD, Seascape Consultants, **ATLAS** partner) and Anthony Grehan (PhD, NUI Galway, **ATLAS** partner) joined the SPP discussions.

By: David Johnson

United Nations (UN) PrepCom3, 27 March – 7 April 2017, New York, USA

PrepCom3 was the third meeting of the Preparatory Committee for ocean biodiversity established by the United Nation's General Assembly (UNGA). Discussions aimed at preparing for substantive recommendations (at the end of PrepCom4) to inform negotiations on a legally binding instrument on the "conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (ABNJ)" under the United Nations Convention on the Law of the Sea (UNCLOS), UNGA resolution 69/292 from 2015.

Representatives from 147 Member States of the UN, two non-Member States, five UN funds and programmes, bodies and offices, 18 intergovernmental organisations, and 19 NGOs attended the third session of the Preparatory Committee. For further information on the process, please visit: **bit.ly/25MHf59**

ATLAS organised the side event **"Ocean-scale science for effective marine governance: A new approach to managing Atlantic ecosystems".** For the full event feature, visit: **www.eu-atlas.org**

The outcomes of the ABNJ/BBNJ process will be featured in the next newsletter, so stay tuned!

By: David Johnson

UN Ocean Conference, 5-9 June 2017, New York, USA

The high-level United Nations Conference to Support the Implementation of Sustainable Development Goal 14, **"Conserve and sustainably use the oceans, seas and marine resources for sustainable development"**, was convened at UN Headquarters in New York on 5-9 June 2017, coinciding with World Oceans Day.

One of the greatest benefits of this conference was that it was the first time so many otherwise separate aspects of the global ocean community came together. **ATLAS** had exhibition materials and literature on permanent display on the Atlantic Ocean Research Alliance (**AORA, www.atlanticresource.org**) stand. Its great location on the way to a popular cafe meant the team had lots of great chances to meet and discuss the project with delegates throughout the week.

ATLAS partners David Johnson, Ronan Long (Prof, World Maritime University, **ATLAS** partner), Jake Rice and J Murray Roberts were all in attendance and having four people from **ATLAS** present with great back up from AORA meant they could really get the message out that **ATLAS** is underway and ready and willing to collaborate!

ATLAS was also presented at two side events:

- **Deep-sea Science for Sustainable Development**
- **Ocean Acidification: What can we do about it?**

To read more about the side events ATLAS participated in, please visit: **www.eu-atlas.org**

By: J Murray Roberts

For more information on the UN Ocean Conference, please visit: **bit.ly/2IGShXP**

ATLAS and AORA partners outside the UN in New York in front of "Stella the Seahorse", one of several sculptures made from plastic waste (see washedashore.org for more artworks) ©J Murray Roberts

Featuring collaborative research to tackle today's ocean health challenges

J Murray Roberts being interviewed at the United Nation's "The Ocean Conference", 6 June 2017. bit.ly/2taGbZk (00:49-01:06)

"These problems are so great, that there is no way any one sector can deal with them or any one nation can deal with them. The only way is to form international partnerships. To tackle these problems you have to have governments working with academic institutions working with industry, to have any hope of dealing with these [ocean health] challenges." *J Murray Roberts*

OUTREACH

WoW

“Ways of the Waves”, **(WoW)** is an artistic scientific outreach project which follows in the tradition of expeditions in the 18th and 19th centuries, when artists on board research vessels would creatively capture the investigations. **WoW** illustrates the scientific discoveries from the MEDiterranean out flow WAter and Vulnerable EcosystemS (MEDWAVES) research cruise in a novel way.

Martha Zein (artist) and Jose Luis Matoso (film maker) tracked the journey of the scientists as they followed the Mediterranean waters from the Alboran Sea to the Azores Archipelago. Through **WoW** they bring the relationship between the Mediterranean Sea and the Atlantic Ocean to another dimension. The artists shared a visual story in seven chapters over the 35 days of the MEDWAVES cruise, triggering the audiences’ passion for knowledge through astonishment.

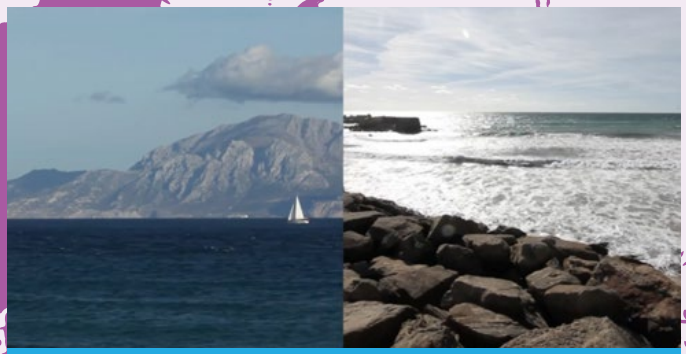
WoW believes that knowledge can be passed through beauty and art. All human beings are sensitive to beauty; when we find it, we observe it with joyful astonishment. It is said that astonishment is the first step to understanding the world, followed by curiosity.

WoW is the first campaign of CONCIENCIARTE, from the Spanish words CONCIENCIA (awareness) + CIENCIA (science) + ARTE (art) = “art with conscience”. This embracing of science through art will be enlarged through the **ATLAS** project and hopefully beyond.

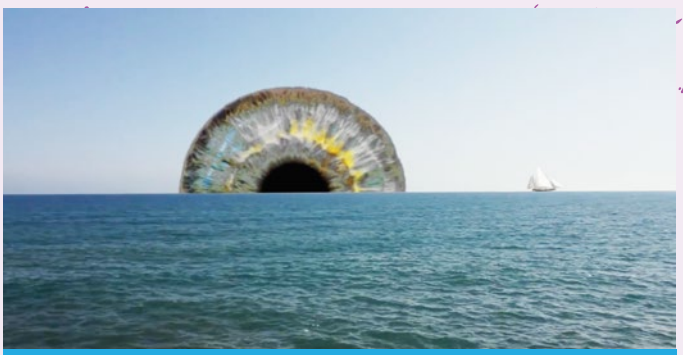
> **“ART CREATES TIES, IT DOES NOT NEED TO BE EXPENSIVE AND IT LIGHTS UP THE KNOWLEDGE HARVESTING PROCESSES. LET’S KEEP GOING...”**
>
> - Martha Zein

atlas

1. Parallel lives – www.youtube.com/watch?v=qtRbmYckfBw



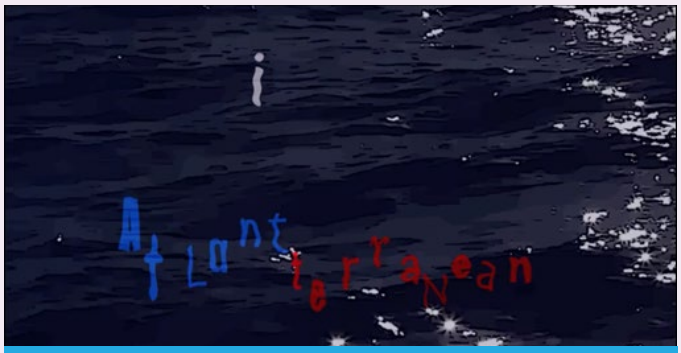
2. The Date – www.youtube.com/watch?v=mEqv-1ya_rQ



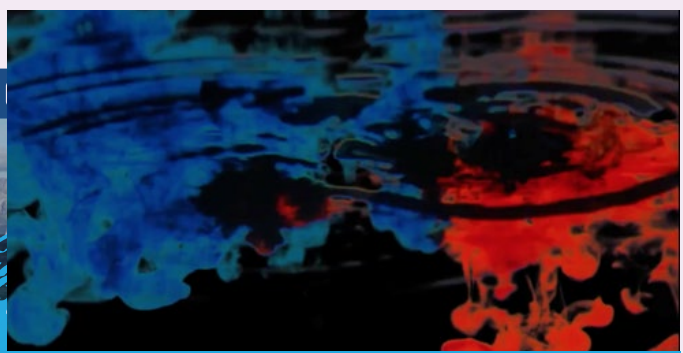
3. Eyes that see deeper – www.youtube.com/watch?v=HN4SBoZ-Ons

4. The elegant gaze – www.youtube.com/watch?v=9ZwsgjtauNw

5. The skin moves – www.youtube.com/watch?v=hywe4teOutA



6. A world in common – www.youtube.com/watch?time_continue=3&v=GH-9OQItZTY



7. The Dance – www.youtube.com/watch?v=d4uMhP4_9nI

Exhibition in Oldenburg, Germany: Oases of Life in the Deep Sea

This exhibition shows fascinating underwater images of hidden coral worlds in the dark ocean.

Nature always creates shapes with impressive beauty. But can we find what is so familiar to us in our light-flooded world in the dark deep sea? Underwater robots of **ATLAS** partners MARUM, the Centre for Marine Environmental Sciences at the University of Bremen, have dived into the depths of the Atlantic and have found a habitat full of colour and harmony. In the dark, cold-water corals form ecosystems of various shapes. Fascinating images of this deep-sea ecosystem have been on display since August 2016 in two different locations in Germany.

Dierk Hebbeln (Prof, MARUM, **ATLAS** partner) explains, "In the allegedly hostile deep sea, oases of high biological diversity develop around cold-water corals, which one would never suspect. And the fact that we are constantly discovering such oases again and again shows us that so far we have just seen the tip of the iceberg when exploring the deep sea."

To find out where and when the exhibition will be next, please visit the MARUM homepage: **www.marum.de**

Reto Weiler, rector of the Hanse Institute for Advanced Studies (left), and Gregor Eberli, visiting scientist at the MARUM, at the exhibition opening ©MARUM Bremen

Fascinated by the science art ©HWK Delmenhorst

YOUNG SCIENTIST CORNER

Name: Georgios Kazanidis
Postdoctoral Research Associate, University of Edinburgh (UEDIN), Scotland, UK

From: Volos, Greece

Education: MRes, University of Southampton (2010, UK); PhD, University of Aberdeen (2015, UK)

Georgios Kazanidis ©Karl Attard

Hi Georgios, welcome to ATLAS! I hear you are the new PostDoc in J Murray Roberts' lab at the University of Edinburgh. What brought you to ATLAS?

Thank you! Yes, I joined **ATLAS** at the beginning of 2017 and I am loving it! I have been fascinated by deep-sea research since I was a postgraduate student at the National Oceanography Centre at Southampton. I did my PhD under the supervision of Ursula Witte in Oceanlab (Prof, University of Aberdeen) working on sponges from cold-water coral reefs in the north-east Atlantic. I did my first postdoc in the same lab working on deep-sea sediments' biogeochemistry. Joining **ATLAS** is an exciting step!

What kind of research questions are you interested in?

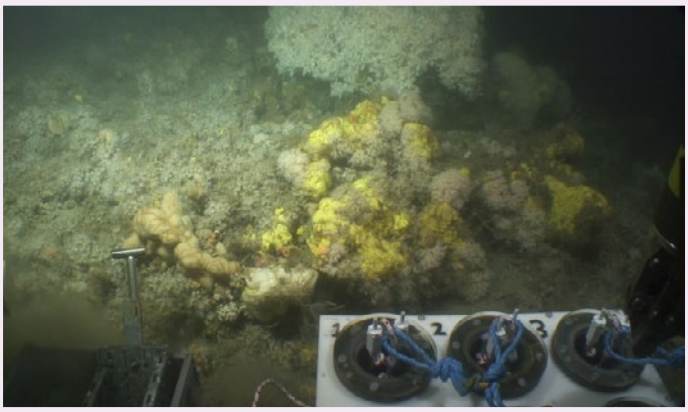
I am interested in a broad range of questions including marine invertebrates' physiology, benthic ecology, and human impact on structure and functioning of marine communities.

What is your project within ATLAS and what have you discovered so far?

Within my three-year postdoc position in **ATLAS**, I will be working on two main questions. The first is the role of environmental variability in shaping deep-sea biodiversity and biogeography in the Scottish continental shelf (Mingulay Reef Complex) and slope (Hebrides slope). The second on is the assessment of Good Environmental Status (GES) in two **ATLAS** case study areas, the Mingulay Reef Complex and the Faroe Shetland Channel. Both fields are fundamental if we are to understand and protect deep-sea ecosystems.

To answer the first research question, I will examine benthic organisms (those living on/in the seabed) collected either with a Van Veen grab (Mingulay, over the period 2003-2011) or a box corer (Hebrides, over the period 1975-2012). The identification of each species will be carried out using a microscope followed by the counting of individuals, which will help me measure biodiversity. Then, the plan is to combine biodiversity data with data on environmental conditions. The analysis aims to measure the effects of interannual and multidecadal variability in water mass structure and ocean regimes (i.e. the North Atlantic Oscillation and Atlantic Multidecadal Oscillation), respectively, on deep-sea benthos biodiversity and biogeography.

Regarding the second question, our pioneering work focuses on the selection of indicators (such as density of cold-water corals) and measurements using these indicators in order to assess GES. Compilation of data will provide important information about the condition of the ecosystems in question. Currently, we are in the initial phase of investigating this question and compiling a list of indicators that could be measured to assess GES. These include existing ones, e.g. some of those used in the NEAT tool developed through the DEVOTES project, as well as brainstorming for new ones. At the current stage of GES assessment, I am working with J Murray Roberts (Prof, UEDIN, **ATLAS** Coordinator), Lea-Anne Henry (PhD, UEDIN, **ATLAS** partner), and Cova Orejas (PhD, IEO, **ATLAS** partner).



Spongosorites coralliophaga ©Changing Oceans expedition

That sounds really exciting and incredibly useful! How will you be measuring things like density of organisms and how can you determine the species, given that your research area is hundreds of metres below the ocean's surface? What special equipment do you use?

This is indeed not a trivial task, but we have great technology we are able to use during our research

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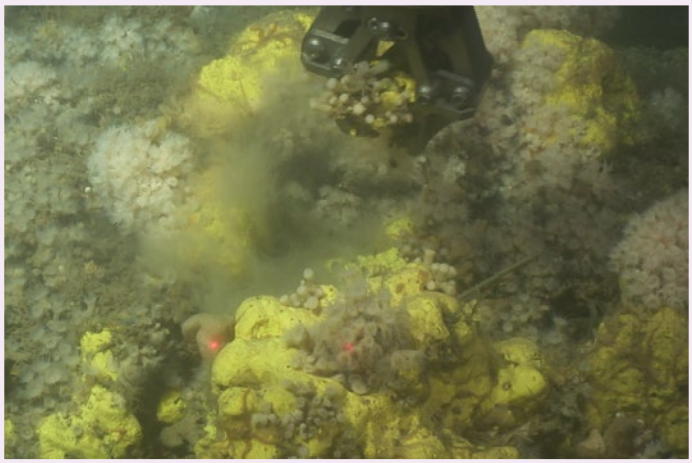
cruises. For example, we have hundreds of videos and images from Remotely Operated Vehicles (ROVs) and towed cameras, which we can analyse frame by frame. It is true that only a rather small number of species can be identified through image analysis, for the rest we will need to use alternative approaches e.g. grouping in broad categories based on specimens' morphology.

What is the most exciting part for you?
I would say the possibility to look into the future! If we can correlate biodiversity measurements with environmental data, then based on predictions about environmental fluctuations, we might get a glimpse into how biodiversity would look under future scenarios. That would be amazing! This would give us a good idea of how biodiversity responds to environmental changes in the deep sea. If we see a negative reaction for the future, we can adapt our behaviour today to preserve the ocean. Makes sense, right? So, one interesting part of my work actually has to do with increasing environmental and especially ocean awareness. It might not have been an obvious link but I hope you are starting to see how all things are connected and how my research is aiming to bring them together for a better understanding of our deep-sea ecosystems and their protection in the future.

Stalked barnacles attached on polychaete tube ©Georgios Kazanidis

What do you think every one of us can do today, to help protect our oceans, and what do you do?
Show the ocean's beauty to people around you! Of course, the whole thing is not quite as simple as that, but I think that perhaps it is the most important step. If people see and feel how amazing and beautiful our oceans are, they will want to protect them for the future. Within my circle of friends, for example, I often show them videos and images of the fascinating deep-sea.

Speaking of the fascinating deep-sea, what is your favourite deep-sea species?
Sponges, no doubt. If I had to go for a specific group, then it would be the carnivorous Cladorhizidae. Carnivory is not what you expect in sponges!



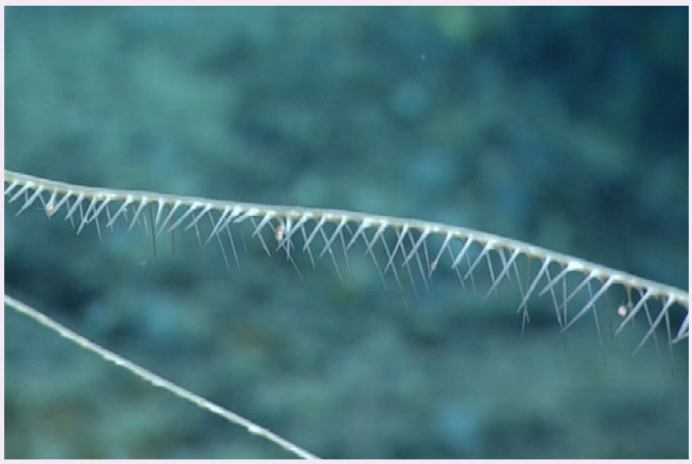
Spongosorites coralliophaga ©Changing Oceans expedition

Why sponges?
The oldest animals on earth have the bad habit to surprise even the experts! From their supply of food and space to many marine organisms, to the production of chemical compounds promising to treat human diseases like cancer, these simple looking but extremely complex organisms have many secrets we have yet to reveal!

What would be your ATLAS highlight moment? Think big!
I would say to publish in Nature and have a CNN broadcast. Well, you asked!

Indeed, I did say, "think BIG", and you did. You are on, and we cross all our fingers for you to achieve both of those goals! Thank you very much for the very interesting interview, Georgios!

"I would like to thank everyone who has given me brilliant opportunities to work in science and follow my dream, which is to work in academia and research."



Cladorhiza kenchingtonae - branch detail ©DFO. To read more about *Cladorhizidae* (carnivorous sponges), see page 16

CRUISES

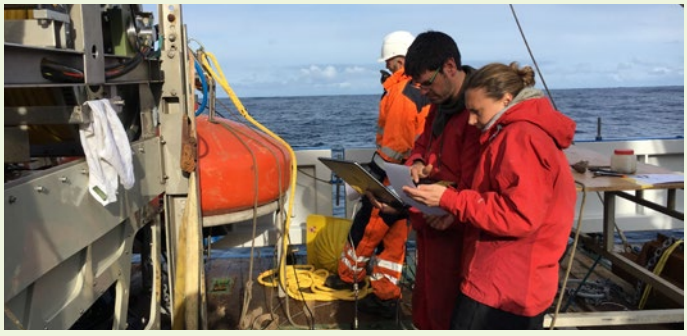
Featured cruise #1: Uncovering the functioning of cold-water coral reefs in the deep ocean, Rockall Bank Expedition, *Pelagia*, 24 April - 11 May 2017

The deep seafloor harbours one of the richest and most biodiverse ecosystems on our planet: cold-water coral reefs. Despite being situated in an environment that is typically considered to be poor in food supply, these structurally complex habitats support a highly diverse and productive reef community.

To study this interesting paradox, a group of scientists visited Rockall Bank during a cruise with the Dutch Research Vessel *Pelagia* from 24 April to 12 May 2017. Rockall Bank is situated west of Ireland and has one of the highest abundances of cold-water coral reefs in the world. The expedition was funded by **ATLAS** and the Netherlands Organisation for Scientific Research (NWO)'s VIDI programme.

During this research expedition, instruments were deployed in the water column on a moored line to understand whether the food that sustains the coral reefs is transported as pulses from the upper water column over the mounds, or from algae that are produced at the shallow parts of Rockall Bank and are carried to the mounds by transport along the slope.

Video-imaging with the Flanders Marine Institutes (VLIZ) Remote Operating Vehicle (ROV) *"Genesis"* showed that the coral mounds that were targeted during this cruise were densely populated by stony coral *Lophelia pertusa* and *Madrepora oculata*.



Last checks before mooring deployment ©NIOZ

A Royal Netherlands Institute for Sea Research (NIOZ)-designed ALBEX freefalling lander was deployed on several coral mounds to measure the variability in environmental conditions near the seabed. This lander was also equipped with an Aquatic Eddy Co-variance system that quantifies oxygen uptake, a measure for reef metabolism, upstream of the lander using high-frequency measurements of the turbulence and oxygen concentrations. These in situ oxygen-uptake data will be contrasted with on-board boxcore incubations, which were performed in temperature-controlled water, in which the metabolic activity of a small patch of reef framework was measured.

The lander was also equipped with a particle pump

***Madrepora oculata* ©Wikimedia Commons, NURC/UNCW and NOAA/FGBNMS**

to sample particles through time to study changes in the type and amount of particles in the vicinity of the reef. These filtered samples will be examined at NIOZ to determine if these particles serve as a food source for the corals and associated reef fauna.

The samples collected on this cruise will now be analysed using a variety of instrumental techniques to gain a greater understanding of the food resources available to the cold-water corals.

ROV *Genesis* on deck ©NIOZ

ROV image of Oreo mound ©NIOZ

*This article was adapted from NIOZ@Sea blog posts written by **ATLAS** partners: Dick van Oevelen, Evert de Froe, Lorenzo Rovelli and Gerard Duineveld, as well as Gert-Jan Reichart, Sabena Blackbird, Furu Mienis, and Wim Versteeg.*

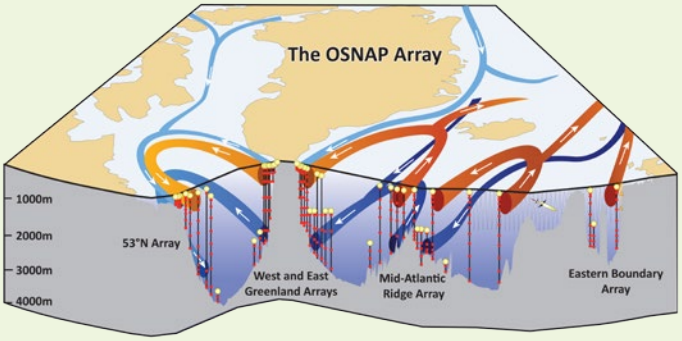
To read the full expedition blog, visit: **bit.ly/2vBrdhl**

Featured cruise #2: High-tech sensors to gather long-term biogeochemical data, UK OSNAP Expedition, RSS *Discovery*, May 2017

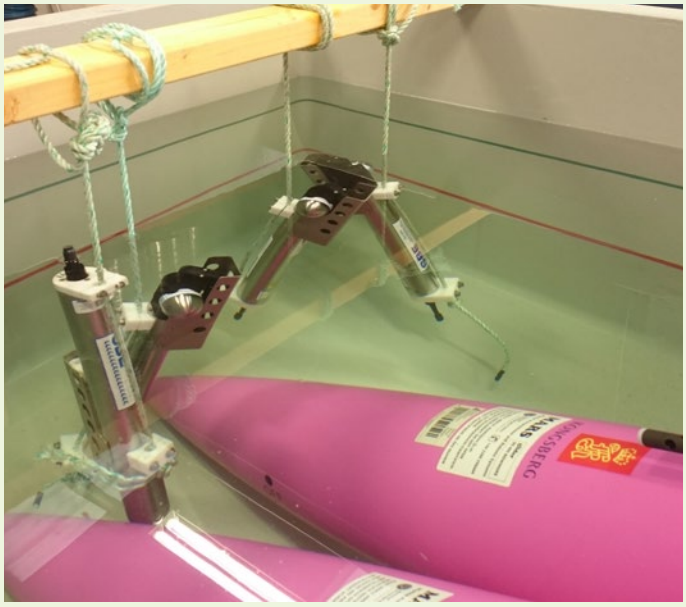
The crew of the Royal Research Ship *Discovery*, a scientific research vessel of the United Kingdom, recently deployed high-technology biogeochemical sensors onto existing "Overturning in the Subpolar North Atlantic Program" (OSNAP) moorings in the Rockall Trough, a major deep-water area in the North Atlantic Ocean and part of the **ATLAS** Case Study 3 area. By taking continuous measurements in this important yet remote location, the sensors will contribute much needed long-term biogeochemical data to further our understanding of the interactions occurring in our ocean.

John Beaton and Sharon McNeill (both from SAMS) setting up the automated water sampler on board RRS *Discovery* ©Penny Holliday (NOC Southampton)

OSNAP is an international programme designed to provide a continuous record of physical ocean properties in the subpolar North Atlantic through an array situated on moorings which cross the Atlantic.



The OSNAP array of observing instrumentation and gliders ©Wikimedia Commons, Mslozier



Testing new oxygen sensors (combined with sensors to measure temperature, salinity and pressure) at SAMS' Scottish Marine Robotics Facility, alongside two of its gliders ©Estelle Dumont

The newly deployed equipment consists of sensors to measure levels of nutrients, oxygen and pH in the Rockall Trough. A Remote Access Sampler (RAS) will simultaneously collect samples of seawater to validate and complement the automatically recorded data from the sensors.

As Stuart Cunningham (Prof, Scottish Association for Marine Science - SAMS, **ATLAS** partner) explains, adding these new sensors to the existing infrastructure is an important step: "So far, only the physical parameters of ocean circulation data can be measured at the OSNAP array. Combining this data with the new biogeochemical measurements will, for the first time, give us a long time-series of changes of ocean currents, nutrient concentrations and more. This will be a big advance in our ability to understand the interactions of ocean physics with ocean ecosystems, particularly the cold-water coral systems of the Atlantic."

To read the full press release, please visit: **www.eu-atlas.org**

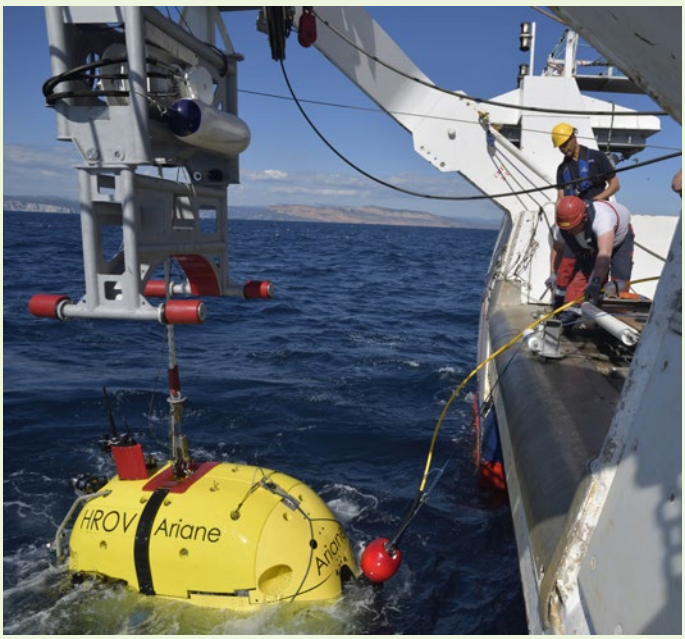
For more information on the sensors please contact Stuart Cunningham: **Stuart.Cunningham@sams.ac.uk**

To read the blog about the entire cruise, please visit: **bit.ly/2rsIEBF**

Other cruises ATLAS partners participated in: Exploring a Mediterranean canyon and its connected resources – Videocor 1 expedition, *L'Europe*, Mediterranean Sea, 28 April – 10 May 2017

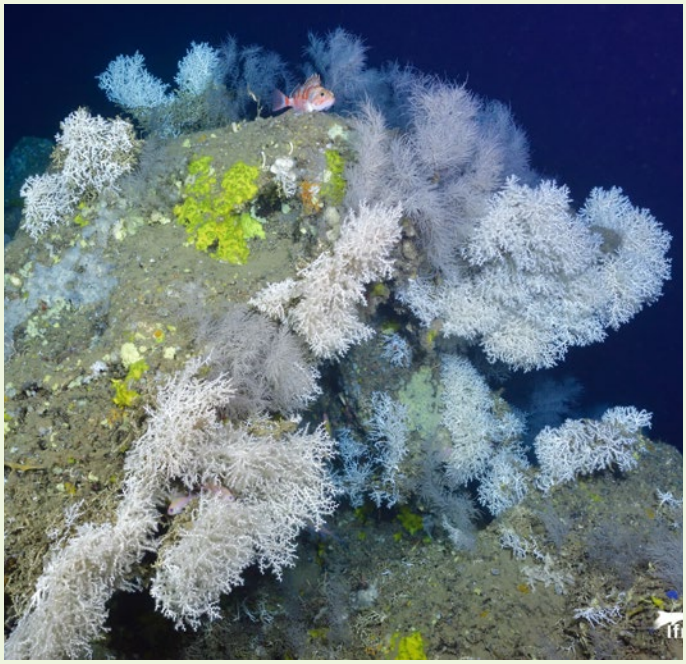
The Videocor 1 expedition (Ifremer, Principal Investigator, Marie-Claire Fabri, **bit.ly/2gWSOq2**) took place in the Mediterranean Sea with the participation of **ATLAS** partners Joana Boavida and Sophie Arnaud-Haond (both from Ifremer).

Its objectives were to conduct the first scientific cruise of the new Hybrid-ROV *"Ariane"* and collect data, images and samples of cold-water corals in the Parc National des Calanques, near Marseille, France. Photos and videos gathered during the cruise will be used to measure the seafloor surface area covered by this ecosystem and to calculate several metrics using 3D optical mapping to reconstruct geo-referenced and scaled 3D models of seafloor scenes. Collected colonies of zigzag coral (*Madrepora oculata*) will feed into **ATLAS** Work Package 4 on "Connected Resources". These colonies will be used both for reproductive studies of zigzag coral and for the assessment of genetic connectivity within and among the Mediterranean-Atlantic populations.



The new hybrid ROV Ariane being operated in the Parc des Calanques during the Videocor 1 cruise, April-May 2017 ©Olivier Dugornay

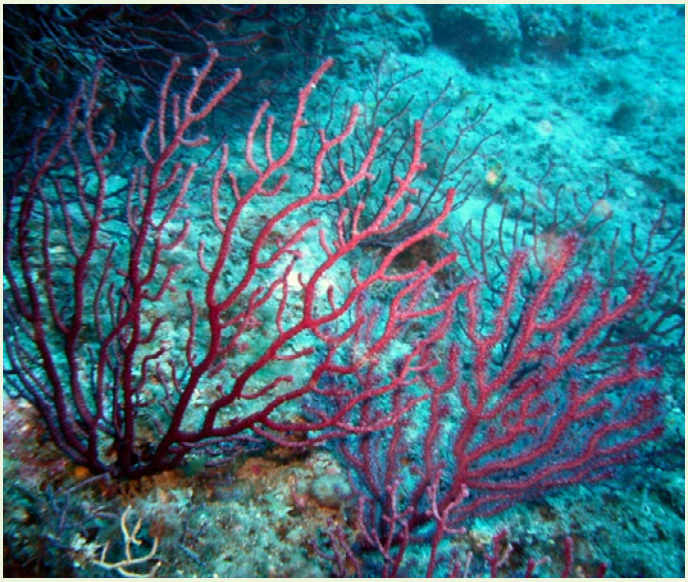
The extensive presence of cold-water corals, which was suspected based on preliminary explorations*, was confirmed at rather high densities at different depths (from 500 to 205 m), including on a vertical wall and under a large overhang. Several of the target species of **ATLAS** were present, including various sponges, gorgonians (*Eunicella sp., Paramuricea clavata*), scleractinians (*Madrepora oculata, Desmophyllum dianthus, Dendrophyllia cornigera*) and antipatharians (*Leiopathes glaberrima, Antipathella subpinnata*).



Rocky seascape discovered during the Videocor 1 cruise, with a rockfish *Helicolenus dactylopterus* surrounded by the cold-water corals *Madrepora oculata* and *Antipathella subpinnata* ©Ifremer

Visit the Ifremer website to watch a video about the expedition: **bit.ly/2eHGLwn**

*Previous research studies: (1) Fabri *et al.* (2017). *Deep Sea Research Part II: Topical Studies in Oceanography* 137, 436-453. **DOI: 10.1016/j.dsr2.2016.06.006** (2) Fabri *et al.* (2014). *Deep Sea Research Part II: Topical Studies in Oceanography* 104, 184-207. **DOI: 10.1016/j.dsr2.2013.06.016**



***Paramuricea clavata*, Portofino, Italy ©Wikimedia Commons, Yoruno**

PUBLICATIONS

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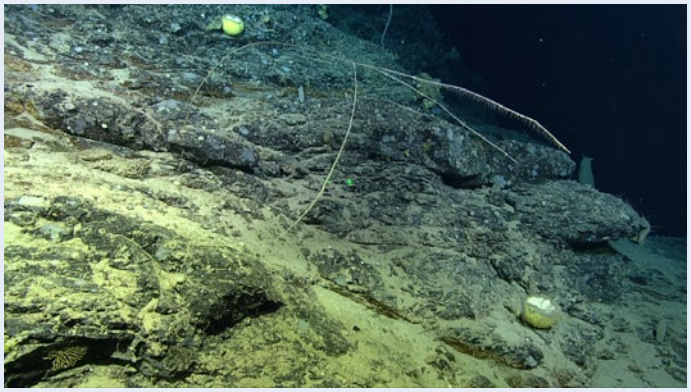
CONGRATULATIONS

New species of carnivorous sponge discovered (*Cladorhiza kenchingtonae*) and named after ATLAS researcher Ellen Kenchington from Fisheries and Oceans Canada (DFO)

The carnivorous sponge, *Cladorhiza kenchingtonae*, is approximately 2 m in length with 1 m branches along its length. It feeds on zooplankton and was discovered at a depth of nearly 3,000 m below the ocean's surface in the Flemish Cap, northeast of the Grand Banks.

The sponge was named after Ellen for her numerous contributions to Arctic and North Atlantic deep sea benthic ecology, biodiversity monitoring and protection. Ellen's work has led to the protection of benthic habitats across the globe.

To read the original publication, please visit:
bit.ly/2gX44CV



Cladorhiza kenchingtonae discovered during a research cruise of the Bedford Institute of Oceanography on the Canadian Coast Guard Ship Hudson in 2010 ©DFO

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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.