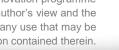


## An integrated assessment of Atlantic ecosystems in space and time

**EuroMarine General Assembly** 16 January 2020, Marine Biology Station Piran, Slovenia

J Murray Roberts, iAtlantic coordinator







### This overview:

- Wider landscape, ATLAS & call for proposal
- Objectives
- Consortium
- iAtlantic regions & expedition plans
- Project structure & leadership
- Open to collaboration



# Oceans are on the agenda







1872-1876 150<sup>th</sup> anniversary









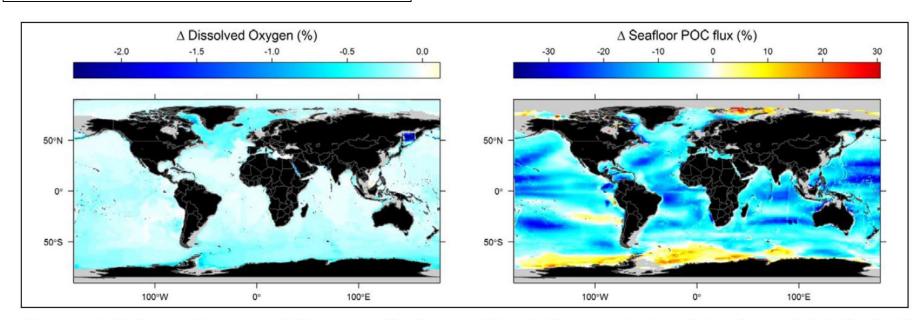


#### **REVIEW**

## Major impacts of climate change on deep-sea benthic ecosystems

Andrew K. Sweetman\*, Andrew R. Thurber\*, Craig R. Smith\*, Lisa A. Levin\*, Camilo Moral\*, Chih-Lin Weil\*, Andrew J. Gooday\*\*, Daniel O. B. Jones\*\*, Michael Rex\*\*, Moriaki Yasuhara\*\*, Jeroen Ingels\*\*, Henry A. Ruhl\*\*, Christina A. Frieder\*.III, Roberto Danovarol\*\*\*, Laura Würzberg\*\*\*, Amy Baco\*\*\*, Benjamin M. Grupe\*.S\$\frac{5}{5}\$, Alexis Pasulka\text{IIII}, Kirstin S. Meyer\*\*\*, Katherine M. Dunlop\*, Lea-Anne Henry\*\*\* and J. Murray Roberts\*\*

- Abyssal temp ↑ 1°C within 84 years
- O<sub>2</sub> declines in areas deep-water formation
- Up to 40-55% ↓ in POC flux in some regions
- Rapid pH ↓ at bathyal depths



**Figure 3: Relative environmental changes at the deep seafloor in the year 2100.** Relative change (%) in dissolved oxygen (mL L<sup>-1</sup>) and seafloor POC flux (mg C m<sup>-2</sup> d<sup>-1</sup>) conditions that could be seen at the deep (> 200 m) seafloor by 2100 relative to present-day conditions. DOI: https://doi.org/10.1525/elementa.203.f3





### At a Glance

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

Call: EU Horizon 2020: BG-2015-2 (Unlocking the potential of seas and oceans)

**Duration:** May 2016 – April 2020 (48m)

Consortium: 24 partners +1 linked 3rd

party, from 12 countries

**Budget: €9.3**M

**Coordinator:** University of Edinburgh (UK)

Focus: Providing essential new knowledge of North Atlantic ecosystems through data gathering and synthesis

Impact: Discoveries and outputs will inform and facilitate stakeholder agreement on marine policy and regulation and spur Blue Growth

Core activities: 25+ research cruises investigating 12 case studies across the Atlantic

2016-2020



## ROYAL SOCIETY OPEN SCIENCE

rsos.royalsocietypublishing.org



3:160494.



Cite this article: Fox AD Henry L-A Corne atmospheric variability R Sac onen sci

Sensitivity of marine protected area network connectivity to atmospheric variability

Alan D. Fox<sup>1,2,†</sup>, Lea-Anne Henry<sup>1,†</sup>, David W. Corne<sup>2</sup> and J. Murray Roberts 1,3,+

<sup>1</sup>Centre for Marine Biodiversity and Biotechnology, School of Life Sciences, and <sup>2</sup>Department of Computer Science, Heriot-Watt University, Riccarton Campus Edinburgh EH14 4AS, UK

601 S. College Road, Wilmington, NC 28403-5928, USA

- 70 researchers and 10 PhD students employed
- 34 Offshore research expedition
- 60 ATLAS publications with 74 in preparation
- Media reach 85.5M persons with coverage including BBC (Radio and TV), Sky News, The Times, The Washington Post, The Guardian, and NPR podcast

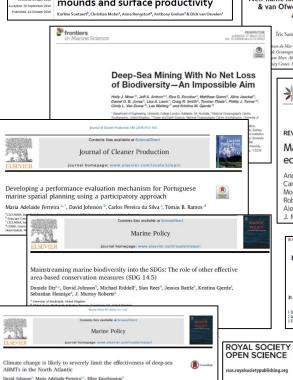
Development of a sensitive detection method to survey pelagic biodiversity using eDNA and quantitative PCR: a case study

https://www.eu-atlas.org/resources/atlas-library



**Ecosystem engineering creates** a direct nutritional link between 600-m deep cold-water coral mounds and surface productivity **♣ZooKevs** 

New name for the soft coral Alcyonium rubrum Stokvis & van Ofwegen, 2006 (Alcyonacea, Alcyoniidae): Alcyonium burmedju nom. n.





Camilo Moral, Chih-Lin Weil, Andrew J. Gooday\*\*, Daniel O. B Moriaki Yasuhara<sup>‡†</sup>, Jeroen Ingels<sup>§§</sup>, Henry A. Ruhl<sup>‡\*</sup>, Christina Roberto Danovaro Person, Laura Würzbergtt, Amy Bacott, Benjar Alexis Pasulka™, Kirstin S. Meyer , Katherine M. Dunlop\*, J. Murray Roberts\*\*\*\*

Evidencias de expulsión de fluidos en el complejo Hespérides en el talud medio del Golfo de Cádiz

Evidence of fluid venting on the Hespérides complex at the middle slope of the Gulf of Cádiz

Lionfish (Pterois sp.) invade the upper bathyal zone in the western Atlantic frontiers

ICES \*\*\*\*\*

Mar Biol (2017) 164:112 DOI 10.1007/s00227-017-3141-

of devil ray at seamounts

Laura M. Gargan<sup>1,2</sup> · Telmo Morato<sup>3</sup> · Christop Jeanette E. L. Carlsson<sup>1,2</sup> · Jens Carlsson<sup>1,2</sup>

METHOD

Cold-Water Coral Habitats in Submarine Canyons of the Bay of Biscay

Inge M. J. van den Beld¹\*, Jean-François Bourillet³, Sophie Arnaud-Haond ¹³, Laurent de Chambure\*, Jaime S. Davies ¹¹, Brigitte Guillaumont¹, Karine Olu¹ and Lénaick Menot¹

Marine Science

**ICES** Journal of

Contribution to the Themed Section: 'Case studies in operationalizing ecosystem-based

Food for Thought Moving from ecosystem-based policy objectives to operational implementation of ecosystem-based management measures

Roland Cormier, 1,4 Christopher R. Kelble, 2 M. Robin Anderson, 3 J. Icarus Allen, 4 Anthony Grehan, 5

and Ólavur Gregersen<sup>6</sup>

ieesthacht, Germany NOAA, Atlantic Oceanographic and Meteorological Laboratory, Ocean Chemistry and Ecosystems Division, 4301 Rickenbacker Cause ntal Science Division, Science Branch, Fisheries and Oceans Canada, PO Box 5667, St. John's, NL ATC 5X1, Canada

Plymouth Marine Laboratory, Prospect Place PL1 3DH, Plymouth, UK SEarth and Ocean Sciences, School of Natural Sciences, Nat ingl University of Ireland Galway, Room A107, University Road, Galway, Ireland H91 TK33 Syntesa Paterns & Associates, Fyri Oman Brú2, FO-510 Cata, Faroe Islands

Peer.

Assessing the living and dead proportions of cold-water coral colonies: implications for deep-water Marine Protected Area monitoring in a changing ocean

(B)

Johanne Vad<sup>1,2</sup>, Covadonga Orejas<sup>3</sup>, Juan Moreno-Navas<sup>4</sup>, Helen S. Findlay<sup>5</sup> and

<sup>1</sup> School of Engineering Geoscience Infrastructure and Society, Heriot-Watt University, Edinburgh, United Kingdom
<sup>2</sup> School of Geoscience, Grant Institute, University of Edinburgh, Edinburgh, United Kingdom

Instituto Español de Oceanografia, Centro Oceanografico de Baleares, Palma, Spain
 Physical Oceanography Research Group, Universidad de Malaga, Málaga, Spain
 Plymouth Marine Laboratory, Plymouth, UK

Marine Policy

Scientific rationale and international obligations for protection of active

C.L. Van Dover", S. Arnaud-Haond<sup>b</sup>, M. Gianni<sup>c</sup>, S. Helmreich<sup>d</sup>, J.A. Huber<sup>e</sup>, A.L. Jaeckel<sup>f</sup>,

A. Metaxas<sup>a</sup>, L.H. Pendleton<sup>a</sup>, S. Petersen<sup>a</sup>, E. Ramirez-Llodra<sup>a</sup>, P.E. Steinberg<sup>a</sup>, V. Tunnicliffe

hydrothermal vent ecosystems from deep-sea mining

Center for Marine Science, University of North Carolina at Wilmington, Wilmington, NC, United States of

Next Gen Pop Gen: implementing a high-throughput approach Research 3 to population genetics in

Congreso Geológico de España

boarfish (Capros aper)

D. Palomino<sup>1</sup>, J.T. Vázquez<sup>1</sup>, N. López-González<sup>1</sup>, L.M. Fernán

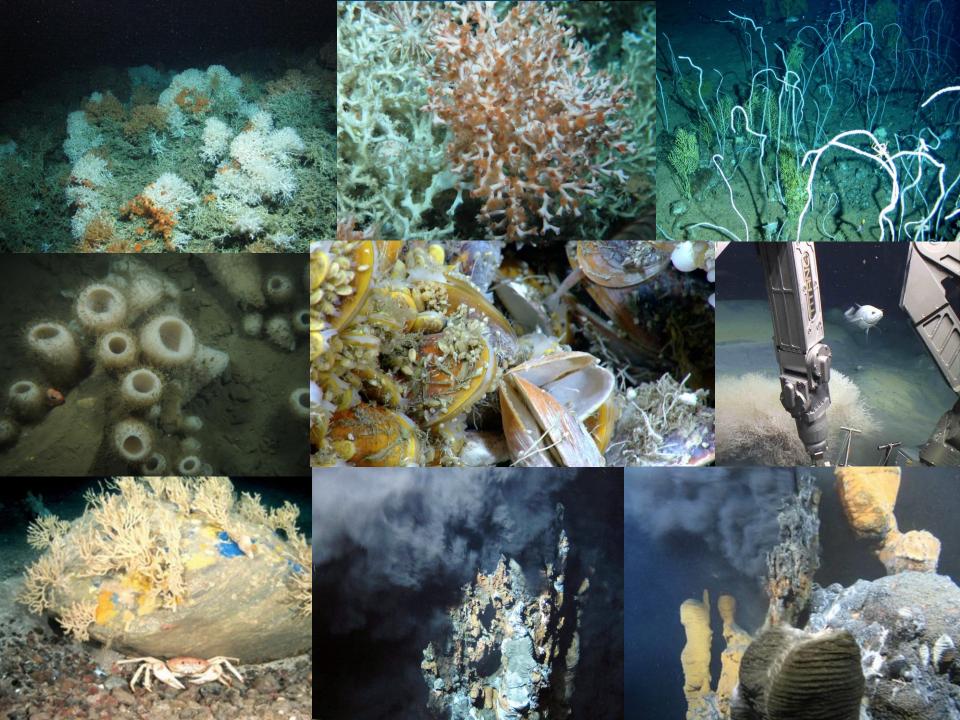
Instituto Español de Oceanografia. CO de Málaga, Puerto Pesquero s/n, 29640, Fo

stituto Español de Oceanografía. CO de Cádiz, Muelle Pesquero s'in, 11006, Cádiz (t cultad de Ciencias, Universidad de Málaga, Campus de Teatinos s'in, 29071, Málaga

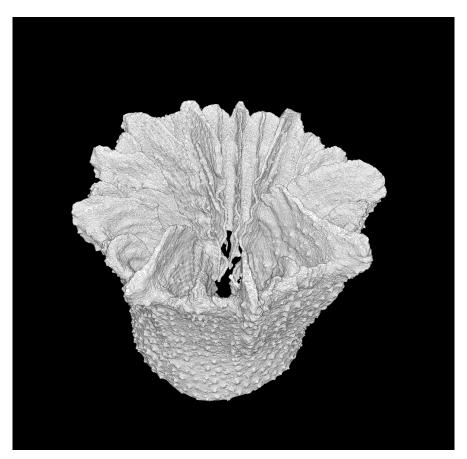
plementing a high-throughput appro Edward D. Farrell, Jeanette E. L. Carlsson and opulation genetics in boarfish (Copros oper) 2. Soc. open sci. 3: 160651. Jens Carlsson ttp://dx.doi.org/10.1098/rsos.1606 Area S2 Research Group, School of Biology and Environmental Science/Earth Institute, University College Dublin, Belfield, Dublin 4, Republic of Ireland

Cite this article: Famell ED. Carlsson JEL

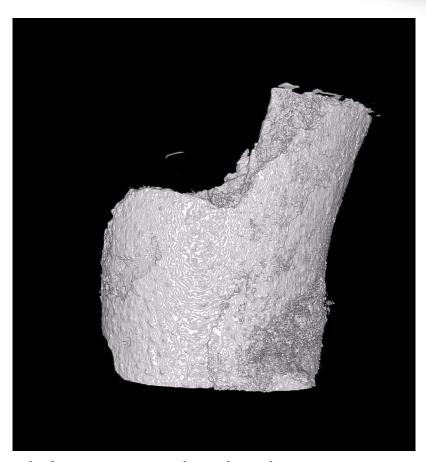
arlsson J. 2016 Next Gen Pop Gen:



## Synchrotron reconstructed images



Skeleton protected by tissue



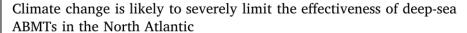
Skeleton exposed to dissolution



Contents lists available at ScienceDirect

Marine Policy

journal homepage: www.elsevier.com/locate/marpol



David Johnson<sup>a</sup>, Maria Adelaide Ferreira<sup>a,\*</sup>, Ellen Kenchington<sup>b</sup>

<sup>a</sup> Seascape Consultants, Ltd., Jermyn's House, Romsey SO52 0QA, UK

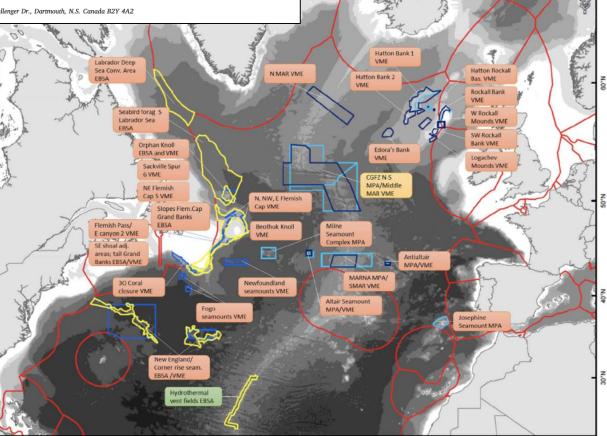
b Fisheries and Oceans Canada - Bedford Institute of Oceanography, P.O. Box 1006, 1 Challenger Dr., Dartmouth, N.S. Canada B2Y 4A2



Impacted

Low impact

No impact



30°W

20°W

10°W



Fig. 2. Expected effect of changing environmental variables on main taxa listed in the conservation objectives for each North Atlantic ABMT in ABNJ. Green: no expected impact; Yellow: low expected impact; Orange: impacted. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)









## Belém Statement on Atlantic Research and Innovation Cooperation

Conference in Lisbon on 13-14 July 2017

FOR THE EUROPEAN UNION

FOR THE DEPARTMENT
OF SCIENCE AND
TECHNOLOGY, A
GOVERNMENT
DEPARTMENT OF THE
REPUBLIC OF
SOUTH AFRICA

FOR THE MINISTRY OF SCIENCE, TECHNOLOGY, INNOVATIONS AND COMMUNICATIONS OF THE FEDERATIVE REPUBLIC OF BRAZIL

Carlos Moedas

Commissioner for Research, Science and Innovation G.N.M. Kernelly

Naledi Pandor

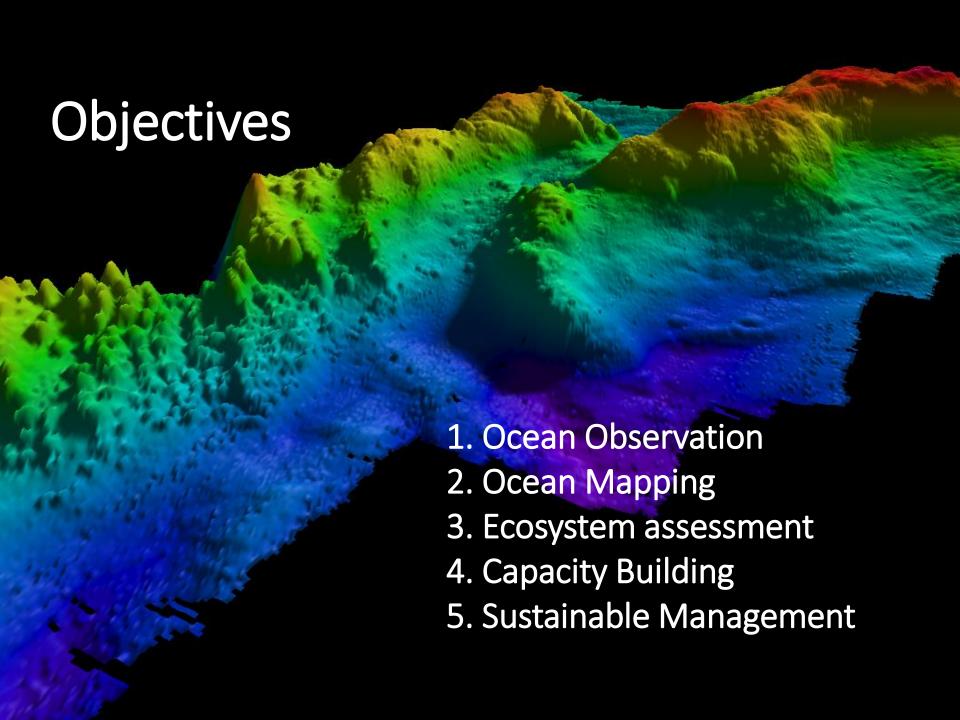
Minister of Science and Technology Gilberto Kassab

Minister of State for Science, Technology, Innovations and Communications



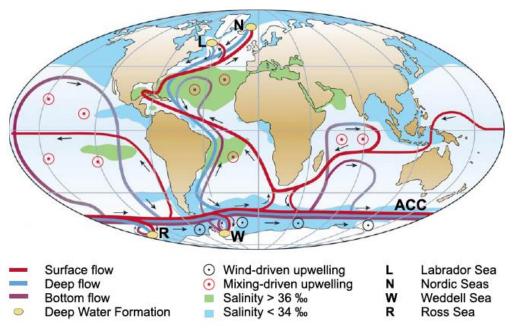


[B] 2018-2019 - Assessing the status of Atlantic marine ecosystems





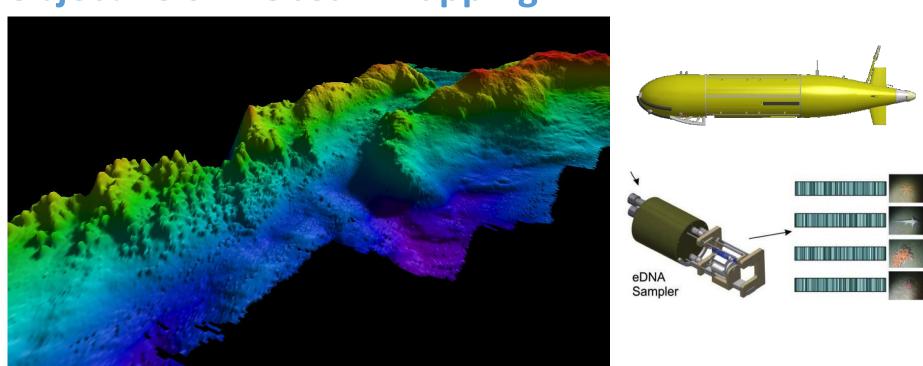
## **Objective 01 - Ocean Observation**



Standardise South and North Atlantic Ocean observations to enable short, medium and long-term assessments of Atlantic Ocean circulation and its physico-biogeochemical environment.



## **Objective 02 - Ocean Mapping**



Map deep and open-ocean ecosystems at basin, regional and local scales.



## Objective 03 - Deep & open ocean ecosystem

assessment











Assess the stability, vulnerability, and any tipping points of deep and open-ocean Atlantic ecosystems to changes in ocean circulation, and effects of single and multiple stressors.



## **Objective 04 – Capacity building**





Align and enhance human, technological and data inter-operability capacities for cost-effective cooperation and planning across the Atlantic.



## **Objective 05 – Sustainable Management**





Define requirements for sustainable management with industry, regulatory and governmental stakeholders to reflect societal needs and inform policy developments that ensure and encourage a sustainable Blue Economy.





#### INTERGOVERNMENTAL CONFERENCE ON MARINE BIODIVERSITY OF AREAS BEYOND NATIONAL JURISDICTION

Participation ▼

Statements

Side Events

Training opportunities

Search the UN

Resources

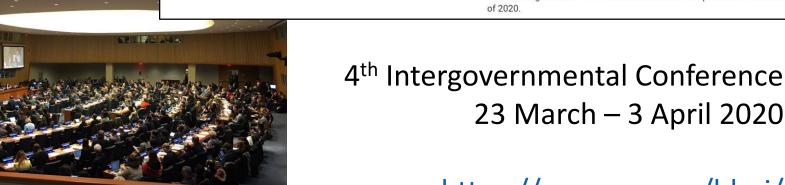
Intergovernmental Conference on an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (General Assembly resolution 72/249)



In its resolution 72/249 of 24 December 2017, the General Assembly decided to convene an Intergovernmental Conference, under the auspices of the United Nations, to consider the recommendations of the Preparatory Committee established by resolution 69/292 of 19 June 2015 on the elements and to elaborate the text of an international legally binding instrument under the United Nations Convention on the Law of Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, with a view to developing the instrument as soon as possible.

In accordance with resolution 72/249, the Conference held a three-day organizational meeting in New York, from 16 to 18 April 2018, to discuss organizational matters, including the process for the preparation of the zero draft of the instrument.

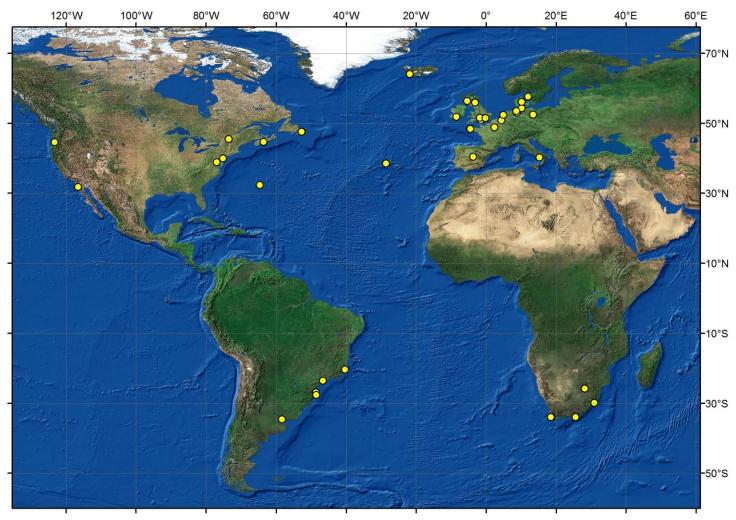
The Conference will meet for four sessions. The first session was convened from 4 to 17 September 2018 and the second session from 25 March to 5 April 2019. The third session will be convened from 19 to 30 August 2019. The fourth session will take place in the first half



https://www.un.org/bbnj/









## **Beneficiary Partners**









































































## International Partners























Pêches et Océans Canada Fisheries and Oceans Canada



## WP8, 9 – Co-ordination, Management & Ethics

#### WP6 - Capacity Building, Policy, Stakeholder Engagement & Outreach

Facilitating bi-lateral capacity building and knowledge transfer

#### WP1

Atlantic Oceanography and Ecosystem Connectivity

Defining the status and dynamics of Atlantic ecosystems stemming from the physical ocean environment Assessment of ecosystems over space

#### WP2 - Mapping Atlantic Ecosystems

Predicting the distribution of habitats and functional traits at a variety of scales

Assessment of ecosystems over time

**WP3** - Drivers of Ecosystem Change and Tipping Points Quantifying how key components of Atlantic ecosystems change over time

#### WP4 - Impact of Multiple Stressors

Quantifying the impact of multiple environmental stressors on pelagic and benthic ecosystems

WP5

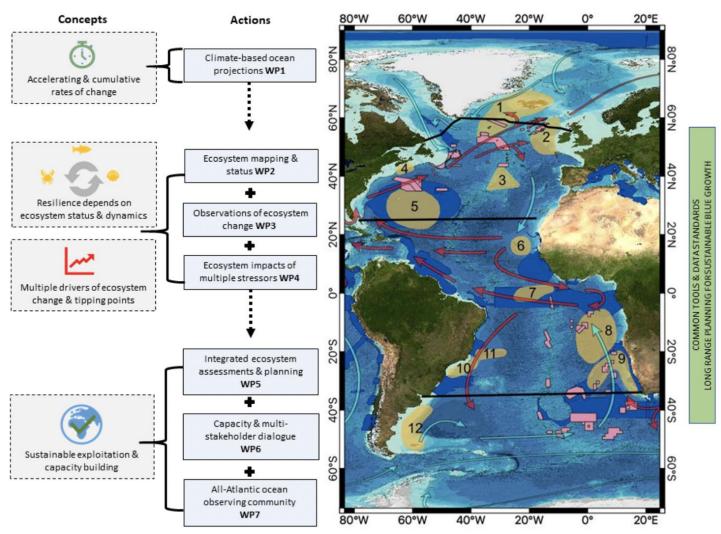
Spatial and Temporal Management and Protection

Synthesis of iAtlantic ecosystem assessments linking variation in space and time.

Development of GIS products

#### WP7 - Data Management

Facilitating data integration, reuse and uptake of project results





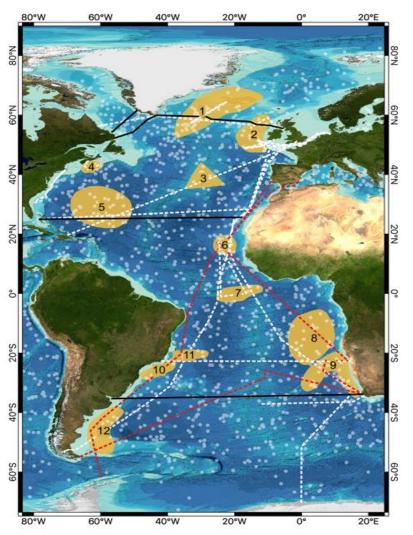


Chart illustrating the density of ARGO floats (grey circles) and positions of transatlantic monitoring arrays (black lines) providing oceanographic data to iAtlantic. Dashed white lines illustrate tracks of iAtlantic cruises with the two S Atlantic Demonstrator Capacity Building cruises iMirabilis and iCorsage shown in red.



July – October 2020 Inc. transit seabird & marine mammal observers



Q2 2021
Inc. "Ahoy, all hands on deck" training

## Expedition coordinators





Cova Orejas (IEO)

Boris Dorschel (AWI)



Arne Biastoch (GEOMAR)



WP2

Veerle Huvenne (NOC)



WP3

Lea-Anne Henry (UEDIN)



WP4

Andrew Sweetman (HWU)



WP5

Telmo Morato (IMAR-UAZ)



WP6

Vikki Gunn (Seascape)



Tina Dohna (UniHB)



**Didier Jollivet** (SU)



Colin Devey (GEOMAR, deputy iAtlantic coordinator)



Marjorlaine Matabos (Ifremer)



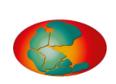
Marina Carreiro-Silva (IMAR-UAz)



Kate Larkin (EMODnet)



Sebastian Unger (TMG)



**PANGAEA** (UniHB)

**WP8 - Coordination** 



Murray Roberts (UEDIN, iAtlantic coordinator)

**SW Atlantic** 



**Angel Perez** (UNIVALI-Brazil)

**SE Atlantic** 



AJ Smit (UWC-South Africal)

**NW Atlantic** 



Ellen Kenchington (DFO Canada)

**NE Atlantic** 



Stefán Áki Ragnarsson (MFRI Iceland)

**Expeditions** 



Cova Orejas (IEO)



iAtlantic Steering Committee



**Boris Dorschel** (AWI)





SCRIPPS INSTITUTION OF OCEANOGRAPHY



Phil Williamson (Chair)











Alan Leonardi









Wendy Brown



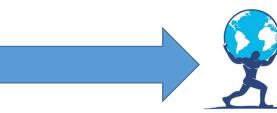




### iAtlantic embraces collaboration

- Funded alongside TRIATLAS & AquaVitae (2019) and Mission Atlantic & AtlantECO (2020)
- AANChOR coordination support action
- 5-6 Feb 2020 All Atlantic Ocean Research Forum Brussels
- Links between iAtlantic Fellowship and Atlantic Ambassadors
- Working group on UN decade of ocean science
- Builds upon H2020 ATLAS project (2016-20)













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@iAtlanticEU



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# Thank you!

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