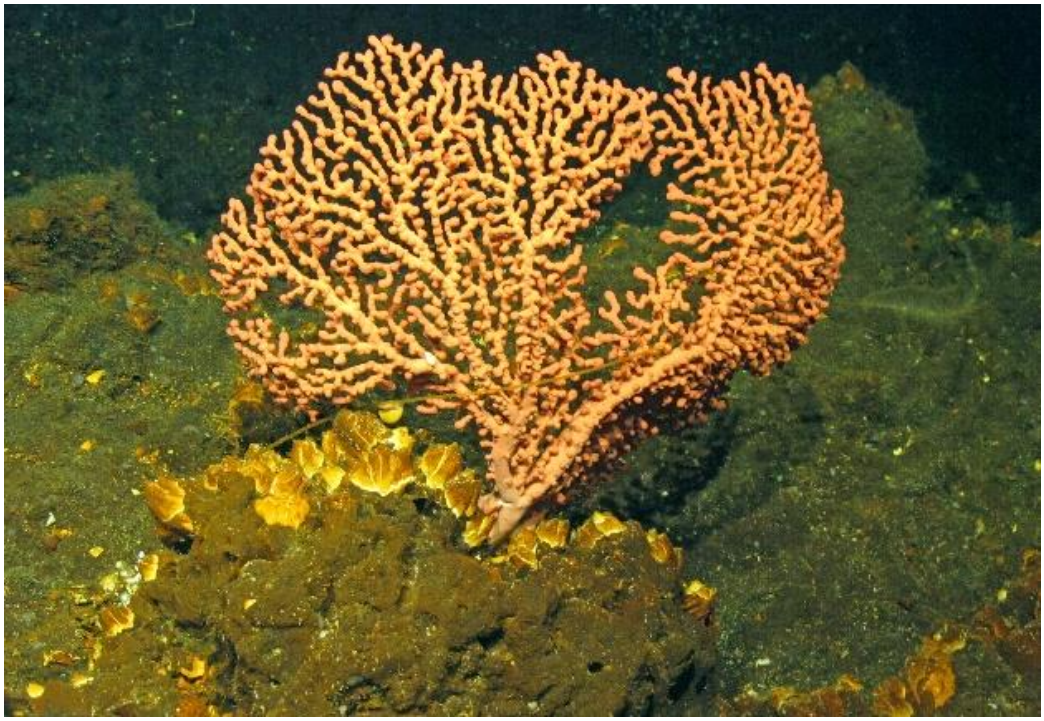
New Climate Model Projects Major Impacts on Coral and Commercially Important Fish Habitats in the Deep Atlantic due to Climate Change

Press release: 20 February 2020

A new model has projected that current trends in climate change could place over 50% of North Atlantic cold-water coral habitat at risk, while suitable habitats for commercially important deep-sea fish could shift by up to 1000 km northwards. These effects could have far-reaching impacts on the ocean, including significant loss of suitable habitats for deep-sea species, which will in turn affect economies and communities reliant on fish stocks.

The model, published in the journal Global Change Biology, was developed by researchers as part of the EU-funded **ATLAS** and **SponGES** projects, which aim to advance understanding of deep Atlantic ecosystems and support greater ocean governance and management.

The model uses new projections of deep Atlantic water properties and a larger compilation of species occurrence data than in similar studies. It is the first study of its kind to assess how much suitable habitat may be lost, gained, or sustained as areas for certain species to survive if global carbon emissions continue on their current trajectory. These areas, termed refugia, allow isolated pockets of species to survive in otherwise unfavourable conditions.



Picture 1: Sea fan *Paragorgia arborea.* © ROV Luso, Fundação Oceano Azul & IMAR

The ocean plays a crucial role in global climate regulation through uptake and storage of heat and carbon dioxide. However, changes linked to this regulation have consequences for the health of the

ocean, including warming, acidification and deoxygenation of the ocean's waters, leading to decreased food availability at the seafloor and ultimately compromising key ecosystem services. The new model's projections for key Atlantic cold-water coral and deep-sea fish habitats for commercially important fish species incorporate data on these effects, based on global carbon emissions continuing at their current, high trajectory, until 2100.

Dr Telmo Morato, **ATLAS** principal investigator at IMAR – University of the Azores, commented:

> *"The model projections were clear; a significant decrease in the suitable habitat for cold-water corals and a marked shift towards higher latitudes for deep-sea fish. This adds to the increasing scientific evidence demonstrating the severe and far reaching effects of climate change. We are only beginning to understand the creatures and communities that live at the bottom of the deep ocean. If we do not take significant measures to reduce our carbon footprint, we may lose these fragile deep ocean ecosystems before we unlock their secrets."*

The study focused on scleractinian and octocoral corals which are indicators of vulnerable marine ecosystems, and deep-sea fish species that are commercially important in several regions. The octocoral species were found to be under particularly high threat, with modelling projecting that loss of habitat could lead to local extinctions. The study also projected very limited climate change refugia for cold-water corals, highlighting the need for proper consideration of climate change in deep-sea regulations.

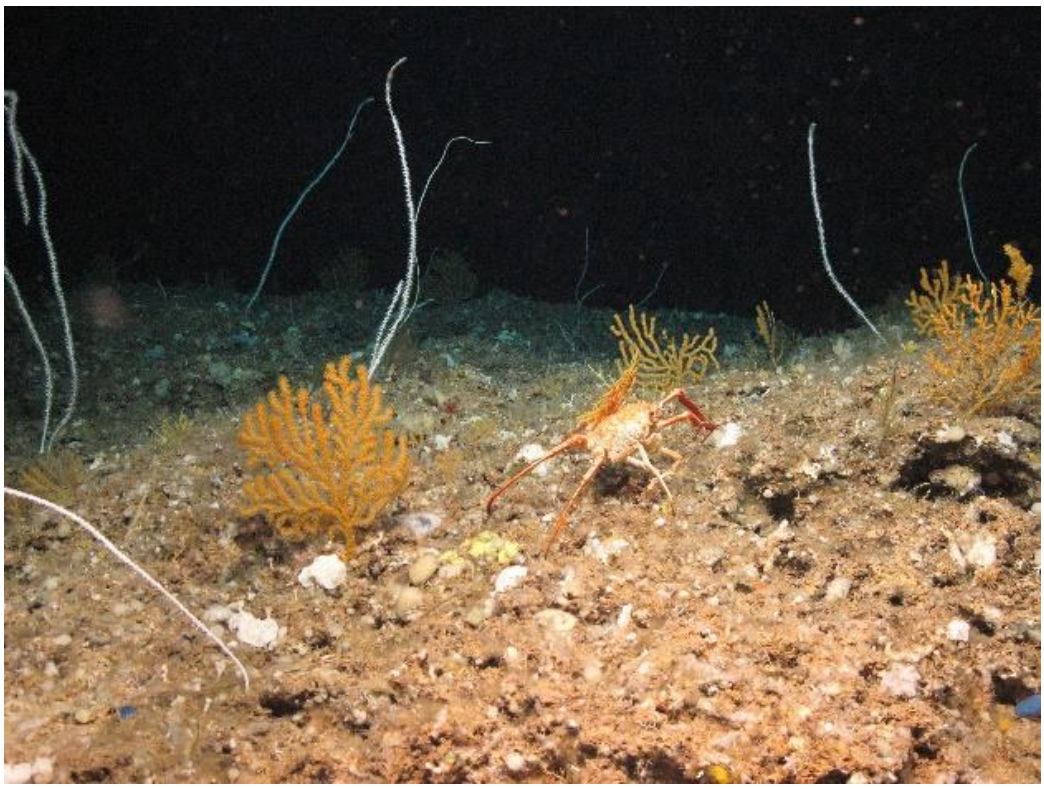
Picture 2: A Greater Forkbeard (*Phycis blennoides*) swimming over cold-water coral reef in the Logachev coral mound complex (**ATLAS** Case Study Rockall Bank, NE Atlantic). © J Murray Roberts, Changing Oceans Expedition 2012 (cruise JC073)

Commenting on the significance of the results, Professor J Murray Roberts, **ATLAS** project coordinator at the University of Edinburgh said:

> *"We are at a major tipping point for the future of cold-water corals. In the next century, we are going to see huge areas of the Atlantic become unsuitable for cold-water coral growth. Corals are the architects of the ocean and, without them, countless other species lose their habitat. Most of the changes we predict are caused by global climate change. We must do all we can to limit carbon dioxide emissions and carefully conserve those areas of the Atlantic that become climate refuges."*

The study authors noted that the projected consequences for species may be worst case scenarios because the models used rely on business-as-usual projections of carbon emissions, not taking into account any potential future climate mitigation measures. However, by providing these insights, the results emphasise the need to better understand how climate change will affect life in our oceans and highlight the importance of preserving climate refugia.

ATLAS project researchers hope that their projections will be adopted in future long-term sustainable environmental management and conservation policies at a global level, such as those relating to Vulnerable Marine Ecosystems. These measures can form part of the response to the wider challenge of mitigating climate change and its associated effects, including dramatic changes such as those forecasted in this study.



Picture 3: Sea fan *Acanthogorgia sp*. in a coral garden, Azores. © ROV Luso, Fundação Oceano Azul & IMAR

Publication Reference:

Morato *et al.* (2020) Climate-induced changes in the suitable habitat of cold-water corals and commercially important deep-sea fishes in the North Atlantic. Global Change Biology. https://doi.org/10.1111/gcb.14996

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Notes to Editors

ATLAS ("A Trans-Atlantic Assessment and deep-water ecosystem-based spatial management for Europe") is a research and innovation action funded under the European Union's Framework Programme for Research and Innovation, Horizon 2020, Grant No 678760. It is the largest integrated study of deep Atlantic ecosystems ever undertaken. The four-year project was launched in May 2016 and has a total budget of €9.4 million. Led by the University of Edinburgh (Scotland, UK) **ATLAS** brings together 25 partners (and one linked third party) from 10 European countries, the USA and Canada. For more information on the **ATLAS** project, please visit www.eu-atlas.org.

For more information on the ATLAS project, please visit www.eu-atlas.org, follow @eu_atlas on Twitter and LinkedIn (https://www.linkedin.com/groups/7063683/) or contact Prof J Murray Roberts (Murray.Roberts@ed.ac.uk).

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*Issued on behalf of the **ATLAS** project by AquaTT. If you do not wish to receive further updates from AquaTT, please reply to this email with "unsubscribe" in the subject line.*