
Benthic marine life in Chilean Patagonia

Blue Marine Foundation and Patagonia Projects

Project overview - June 2020



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Studying and protecting the benthic marine life in Chilean Patagonia

Headlines

- The Patagonian fjords are a surprising hotspot for cold water corals.
- Patagonia Projects scientist Dr Vreni Hausserman has discovered more than 100 new benthic coral and invertebrate species in Chilean Patagonia.
- The fjord conditions for the shallow corals are already as acidic as the world's oceans are predicted to be by 2100, making them a potentially useful model for climate change impacts.
- In collaboration with the Huinay Foundation, Patagonia Projects scientists have already documented a mass die off of corals in the fjords, likely due to climate change and/or aquaculture impacts
- The next goal is to use a Remotely Operated Vehicle (ROV) to explore the benthic life

Story

The waters of Chilean Patagonia are some of the least studied on Earth. Scientists are starting to map the biodiversity of this area but efforts are strongly focussed on marine life at the surface or in the pelagic zone. In cold waters such as those in Chile, the benthic zone – beginning at the shoreline and extending along the sea floor – has been found to be a surprising biodiversity hotspot. Dr Vreni Häussermann from the Huinay Foundation has been collaborating with Patagonia Projects since 2015 to explore the uncharted depths of the Chilean fjords, and has discovered dozens of new species each year, including many corals. Interestingly, the fjord conditions for the shallow corals are already as acidic as the world's oceans are predicted to be by 2100, making them a potentially useful model for climate change impacts. However, the benthic community in Patagonia is also under threat: Dr Häussermann documented a mass die-off of hydrocorals in the fjords, which coincided with increased Harmful Algal Blooms (HABs). The increasing HABs have been linked to the mass mortality of 350 sei whales around the Golfo de Penas region in 2015. Through teaming up with Patagonia Projects, Dr Häussermann hopes to document and monitor the benthic species in the Golfo de Penas in order to better protect them from the direct and indirect effects of human activity.

- Vreni Häusserman, Rolex Awards Laureate, 2016: <https://www.youtube.com/watch?v=eJWz8t9kQ2U>
- Vreni Häusserman, CNN article July 2020 <https://www.cnn.com/2020/07/15/world/vreni-haussermann-c2e-spc-scn-int/index.html>



Top image: Lowering the ROV into the water.
This image: Diver and cold-water corals.
Front cover: Corals and diver in the Comau fjord.
Credit: Vreni Häusserman & Günter Försterra

Papers

Directly from Patagonia Projects expeditions:

- Krapp-Schickel, T., Häussermann, V., & Vader, W. (2015). A new Stenothoe species (Crustacea: Amphipoda: Stenothoidae) living on *Boloceropsis platei* (Anthozoa: Actiniaria) from Chilean Patagonia. *Helgoland Marine Research*, 69(2), 213-220.
- Ceseña, F., Meyer, R., Mergl, C. P., Häussermann, V., Försterra, G., McConnell, K., & Melzer, R. R. (2016). Decapoda of the Huinay Fiordos-expeditions to the Chilean fjords 2005-2014: Inventory, pictorial atlas and faunistic remarks. *Spixiana*, 39(2), 153-198.

From Patagonia Projects scientists on other expeditions, on the same topic:

- Häussermann, V., & Försterra, G. (2007). Large assemblages of cold-water corals in Chile: a summary of recent findings and potential impacts. *Bulletin of Marine Science*, 81(3), 195-207.
- Häussermann, V., Försterra, G., Melzer, R. R., & Meyer, R. (2013). Gradual changes of benthic biodiversity in Comau fjord, Chilean Patagonia—lateral observations over a decade of taxonomic research. *Spixiana*, 36(2), 161-171.
- Häussermann, V., Spano, C., Thiel, M. and Lohrmann, K. (2015): First record of the sea anemone *Diadumene lineata* (Verrill, 1869) (Cnidaria: Anthozoa: Actiniaria) from the Chilean coast. *Spixiana* 38 (1): 39-42.

Activities

- Scuba diving biodiversity transects (down to 30m) of the benthic zones around the Golfo de Penas region and Canal Messier.
- Remotely Operated Vehicle (ROV) biodiversity transects of benthic zones at 500m around the Golfo de Penas region and Canal Messier.
- Invertebrate species sampling to define geographic distribution.
- BBC and CNN documentaries on marine biodiversity and threats in Chilean Patagonia.

Targets

- First publication on different benthic invertebrate of Chilean Patagonia defining provinces and ecoregions.
- Publications about mass mortality, ecology and life history of the coral.
- Further publications on effect of Patagonian Ice field Shrinkage on Coastal and fjord Ecosystems (PISCES project).

Outcomes

- Defining ecoregions using biodiversity data will be invaluable to the spatial planning of MPAs in Chilean Patagonia.
- Protection of some coral species on the IUCN Red List.
- Increased public awareness and stakeholder engagement regarding benthic biodiversity and PISCES.



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