Expanding the Frontiers of Ocean Mapping

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Where are the Ocean Frontiers?
Why do they matter?
How can we map them?
The Ocean Frontiers!
No, Mars
Our prior view: GEBCO 2014
Greenland without the ice

Sensitive areas where the ice meets the ocean

Greenland Ice Sheet = 7.4 m global sea level rise

Predicted global mean sea level rise by 2300

600 million people live within 10 m above sea level

40% lost

Why there but not there?

Petermann Glacier

Ice tongue margin 2010

Ryder Glacier

2012-07-24
Ryder 2019 Expedition
“Extending the mapping of the Ocean Frontiers”
Bathymetry is key to understand the shrinking cryosphere
Explorers Club Flag Expedition #51
How can we map the Ocean Frontiers?

1. Ensure that ALL expeditions to remote areas collect high quality multibeam bathymetry

   *Support with multibeam operators when required*

2. Add dedicated mapping days to expeditions in remote areas

   *“Map while they are there!”*

3. New expeditions dedicated days to extend the mapping of the Ocean Frontiers

4. Push technological innovations in bathymetric mapping that can be applied in remote areas

   *A specific challenge is the ice covered waters*
We tried the concept with “The Five Deeps Expedition”