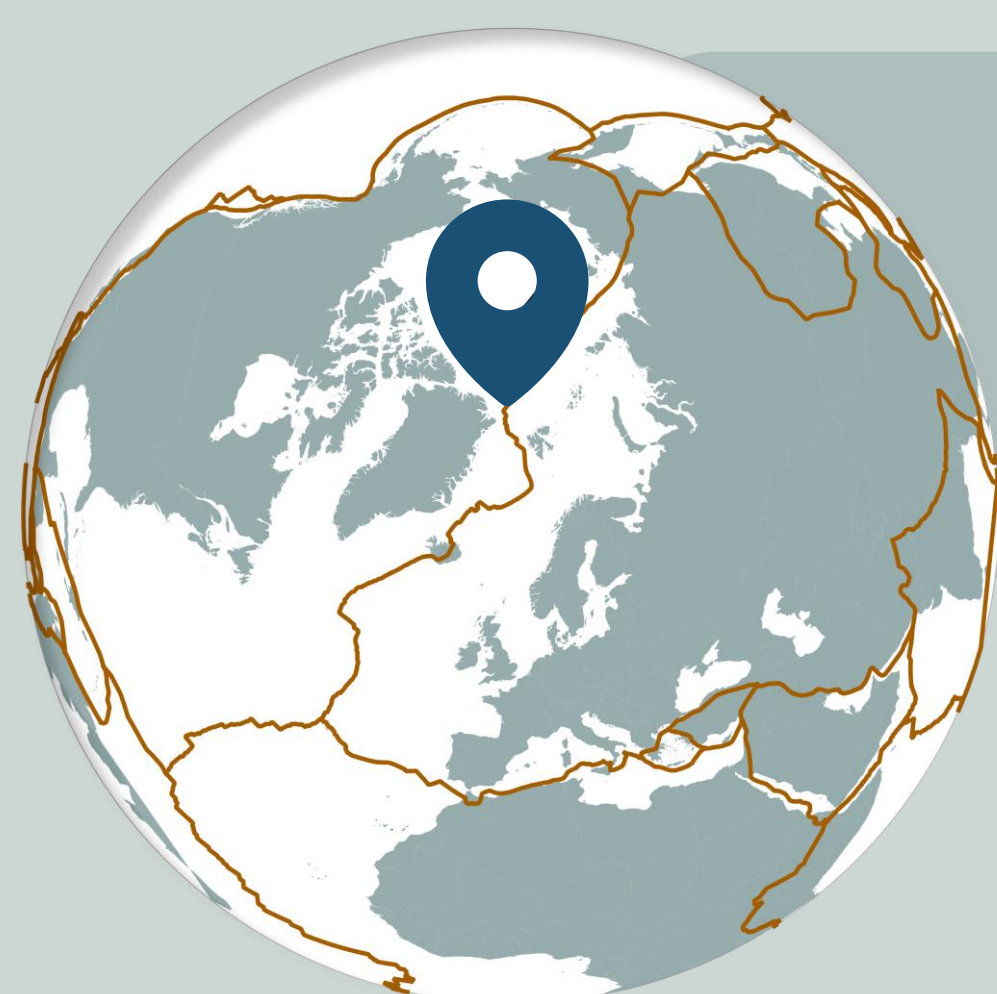


Reuse and recycle

How the merging of opportunistic data could be used to produce a 3D model of complex seafloor topography

How would you carry out a habitat mapping study on a 20 m tall vertical structure? With standard techniques it's not possible and that's only one of the reasons 3D models are needed in seabed mapping.



Aurora vent field
Gakkel Ridge, Arctic Ocean
Expedition PS137 – July 2023

With detailed camera metadata, you can create detailed 3D models.

SAVE YOUR METADATA!

3D model from color and contrast corrected images



"YOU SPIN ME ROUND ROUND"
Scan to look at the 3D model yourself!

METHOD: STRUCTURE-FROM-MOTION

- 1** We grouped sequences of seafloor visible images from 2 cameras installed on a ROV.
- 2** We applied a color and contrast correction to images from both cameras.

CONTRAST

Increased contrast, increased noise!
To avoid enhancing the noise we applied a contrast limit to the adaptive histogram equalizer (CLAHE).

COLOR

We changed RGB values to match the colors of the two cameras.

- 3** We applied structure-from-motion technique to corrected images.

Images were aligned in Agisoft Metashape to identify tie-points (matching features across images), which are then used to generate 3D models.

RESULTS

3,6% more images were aligned and **8,3%** more good quality tie-points* were identified when working with corrected images.

Six vents were reconstructed in an area of approx. 125m², that's the size of half a tennis court.

*we classify as good quality tie points the ones with a reprojection error of less than 1 pix

WHAT'S NEXT?

- Habitat mapping
- Training of autonomous vehicles' trajectories

GET IN TOUCH!
Are you also working with ROV images and multibeam data? Let's connect!
Find me on LinkedIn: [linkedin.com/in/tea-isler-g106a4150/](https://www.linkedin.com/in/tea-isler-g106a4150/)
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