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Investigating the impacts of commercial anchorages on benthic ecosystems

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Investigating the Impacts of Commercial Anchorages on Benthic Ecosystems

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Diving into anchorages

As the shipping industry expands and ports are busier, more ships need anchorages, ships are staying longer, and spreading out to previously little used areas. Anchorages are often sited in soft sediment areas; which are understudied, high diversity ecosystems important for ecosystem function. This research aims to document changes in seafloor ecosystems in anchorage areas through multibeam bathymetric surveys, Remotely Operated Vehicle (ROV) surveys, and sediment sampling.

Bathymetric surveys

Imagery from multibeam surveys were used to delineate presumed anchor scour and pock marks (Image 1).

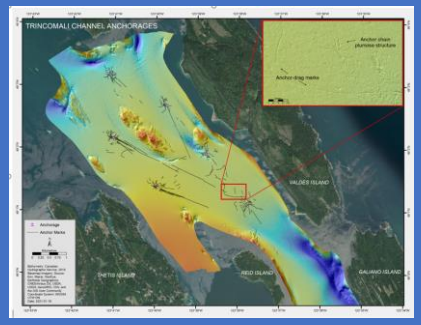

Image 1. Multibeam imagery of presumed anchor drag and chain marks in Trincomali channel anchorages

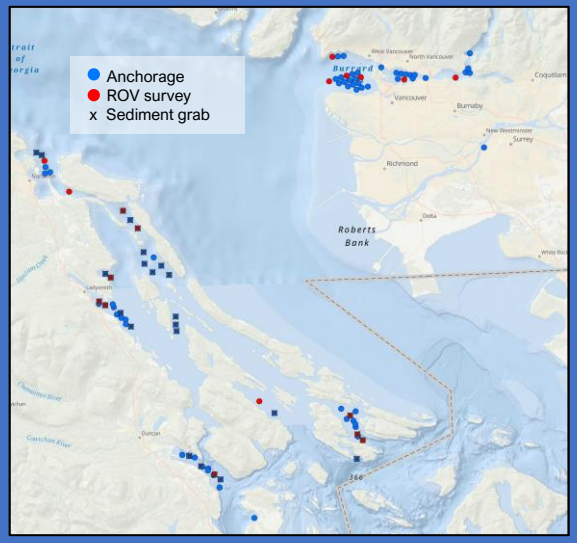

Image 2. Canadian Salish Sea commercial anchorages surveyed with ROV and locations of grab sediment samples

ROV surveys

Seafloor surveys of 19 anchorages were conducted in October-November 2021 (Image 2) using a Phantom ROV (Image 3). Videos are being analysed and annotated for species diversity and signs of disturbance. (Image 4)

Image 3. The MV Manyberries, our ship platform (left) and the ROV, "Phantom HD2" (right), used for seafloor surveys

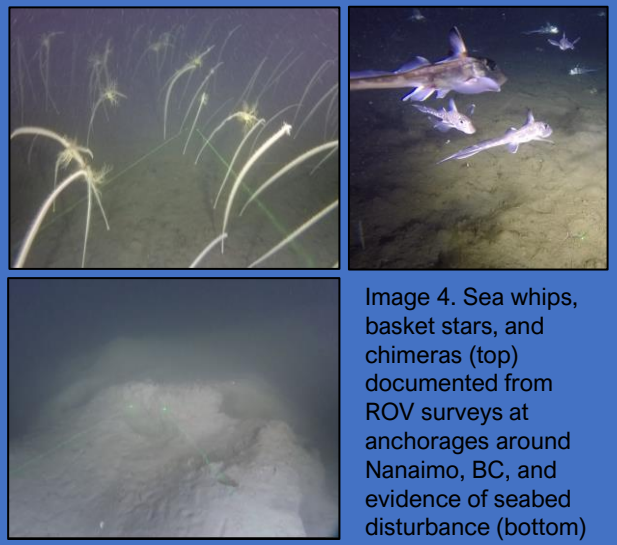

Image 4. Sea whips, basket stars, and chimeras (top) documented from ROV surveys at anchorages around Nanaimo, BC, and evidence of seabed disturbance (bottom)

Sediment samples

We collected sediment grab samples from 28 anchorages. These samples were filtered and fractions subject to species identification. Fauna greater than 500 µm included 124 unique species from nine classes, including molluscs, cnidarians, echinoderms, arthropods, and annelids (Image 5).

Image 5: Selection of species identified from anchorage sediment grab samples (Image credit: iNaturalist)

Next steps

Year two of the project includes additional ROV surveys, repeat bathymetric surveys to examine temporal change, and the collection of additional grab samples for species diversity.

We respectfully and gratefully acknowledge that this research was conducted on the traditional and unceded territory of the Coast Salish Peoples, encompassing many First Nations and Tribes.

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