

Canadian Contributions to NEREIDA 2009-2010

NAFO PotEntial VulneRable Marine Ecosystems-Impacts of Deep-seA Fisheries



Surveys and Sampling Tools

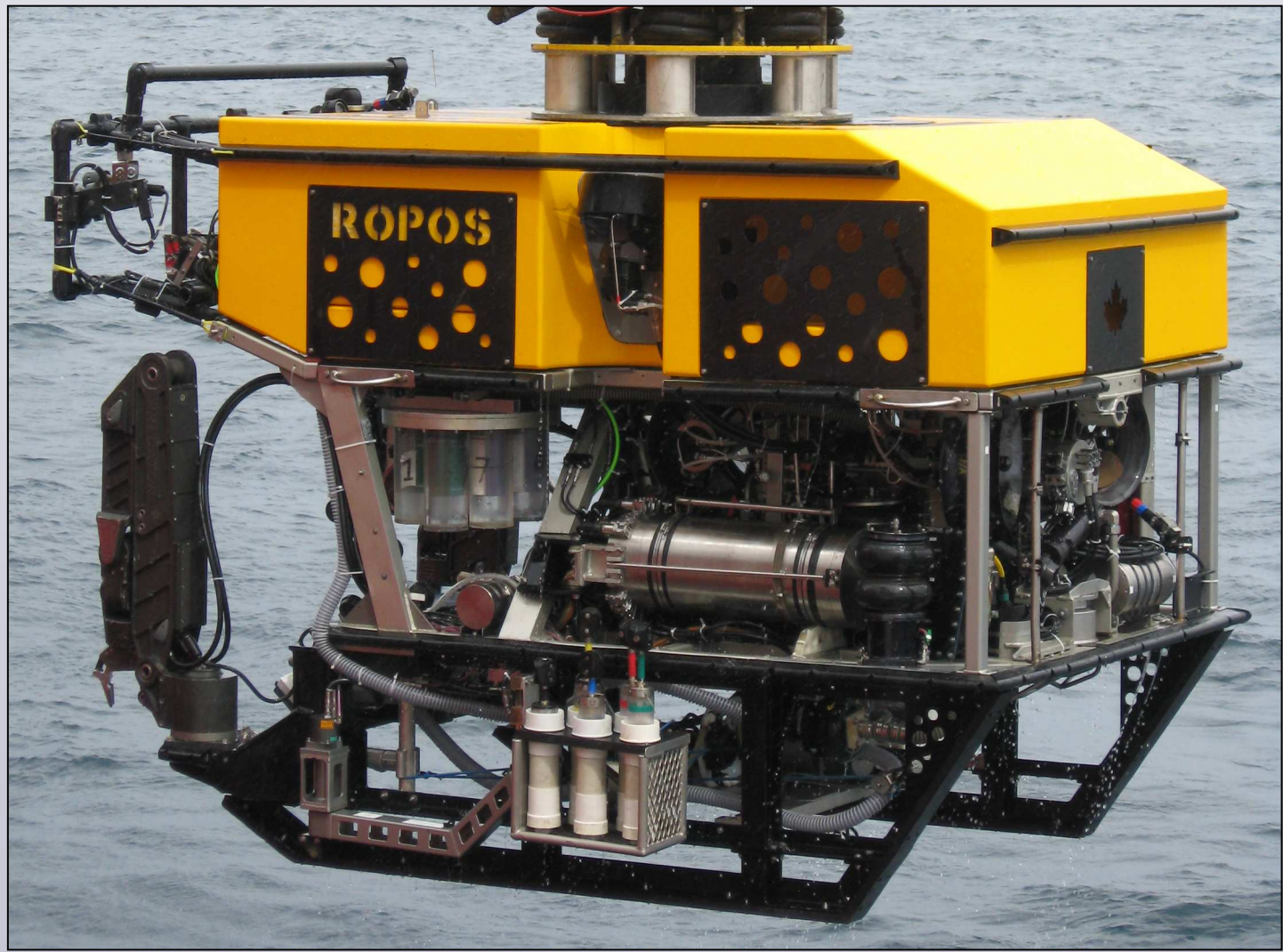
The United Nations General Assembly Resolution 61/105 calls upon "States to take action immediately, individually and through regional fisheries management organizations and arrangements, and consistent with the precautionary approach and ecosystem approaches, to sustainably manage fish stocks and protect vulnerable marine ecosystems, including seamounts, hydrothermal vents and cold water corals, from destructive fishing practices, recognizing the immense importance and value of deep sea ecosystems and the biodiversity they contain".

NAFO developed a methodology for the determination of significant concentrations of coral and sponge taxa from research vessel survey bycatch. This methodology was established over a series of meetings by NAFO scientific working groups commencing in March 2008 and ending in May 2009. The NAFO Fisheries Commission at their 2009 meeting in Bergen, Norway closed 11 areas covering 2500 square kilometres to bottom fishing activities to protect sponge grounds, sea pen fields and large gorgonian corals as well as black coral habitat within the fishing footprint of the NRA. These closures were in addition to previous closures to protect seamounts, and coral habitat in Division 3O. The objectives of the Hudson/NEREIDA missions were to collect *in situ* data on corals and sponges from the NRA both in existing fishing areas and in potential exploratory fishing areas outside of the current fished area. Three different sampling tools were used to conduct video and photographic surveys of the benthos. ROPOS and the 4KCam worked the deeper waters to 3000 m, while CAMPOD operated at shallower depths to 700 m. These data will be used to relate bycatch data to actual abundance on the bottom and to provide more detailed information on the benthic habitat in areas currently protected but scheduled for review in 2010 and 2011. New data from the deep waters of Flemish Cap (to 3000 m) provide a first description of the benthos outside of the fished area in the NRA.



CCGS Hudson - Canada's most famous scientific ship. Commissioned in 1964 and still making important scientific contributions after 47 years on the high seas. CCGS Hudson is 90.4 m in length with 3740 gross tonnage. She is owned and operated by the Canadian Coast Guard and carries 60 berths, with 28 of those available to scientists. There are three laboratories, one fore and aft and one below deck as well as chart rooms and computer banks off the bridge. CCGS Hudson has been the mainstay of the oceanographic research programs on the east coast of Canada.

Sampling Tools



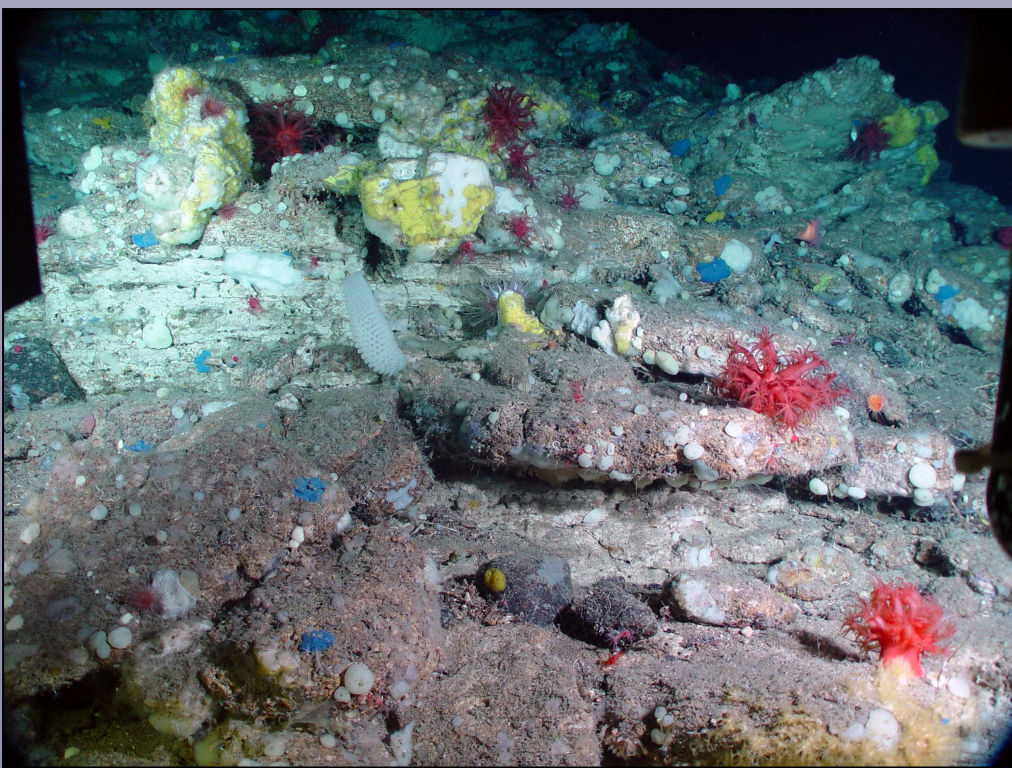
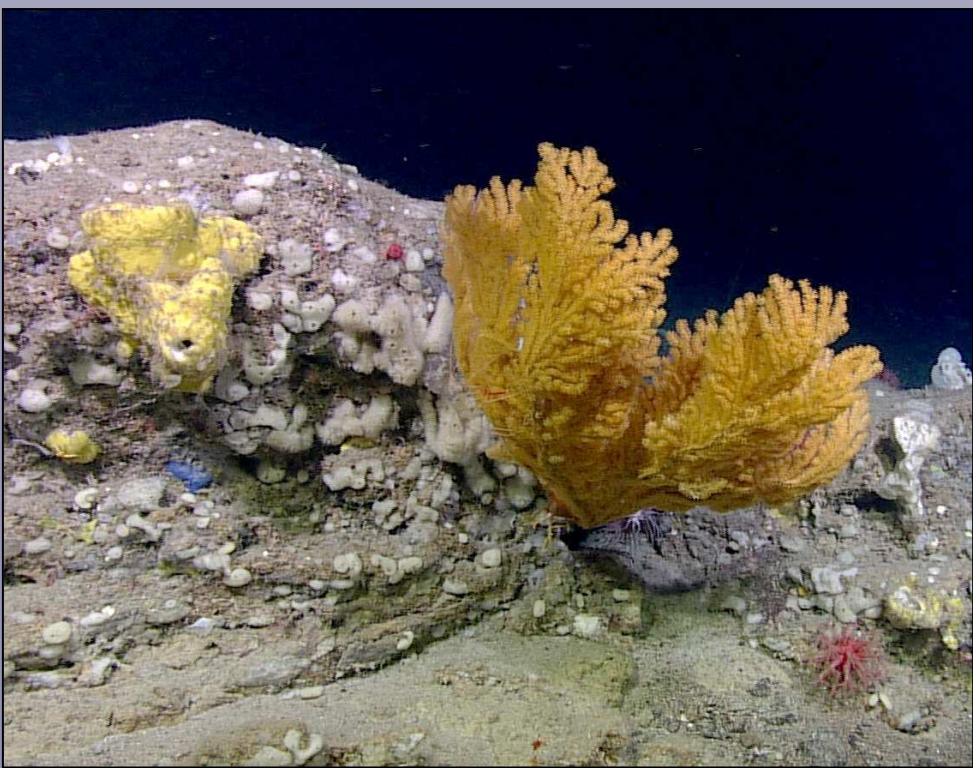
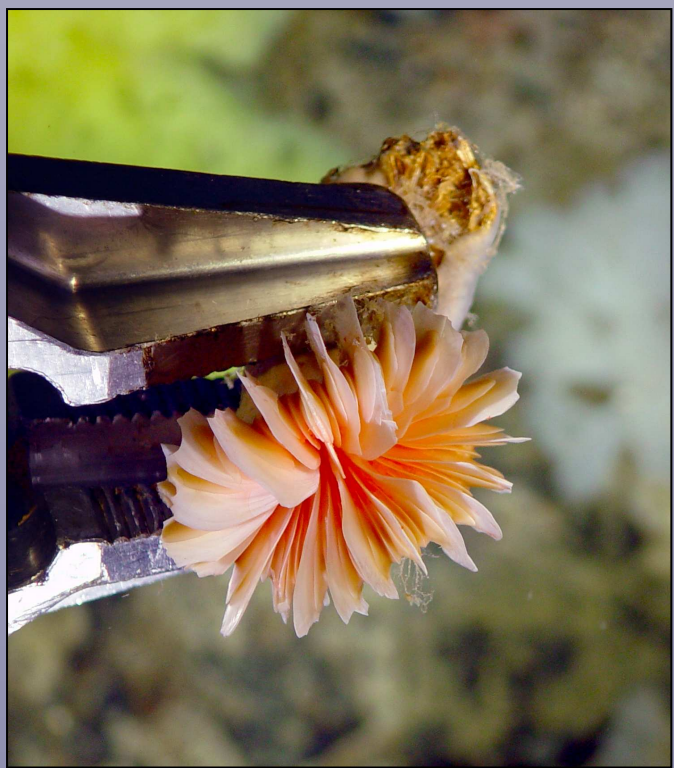
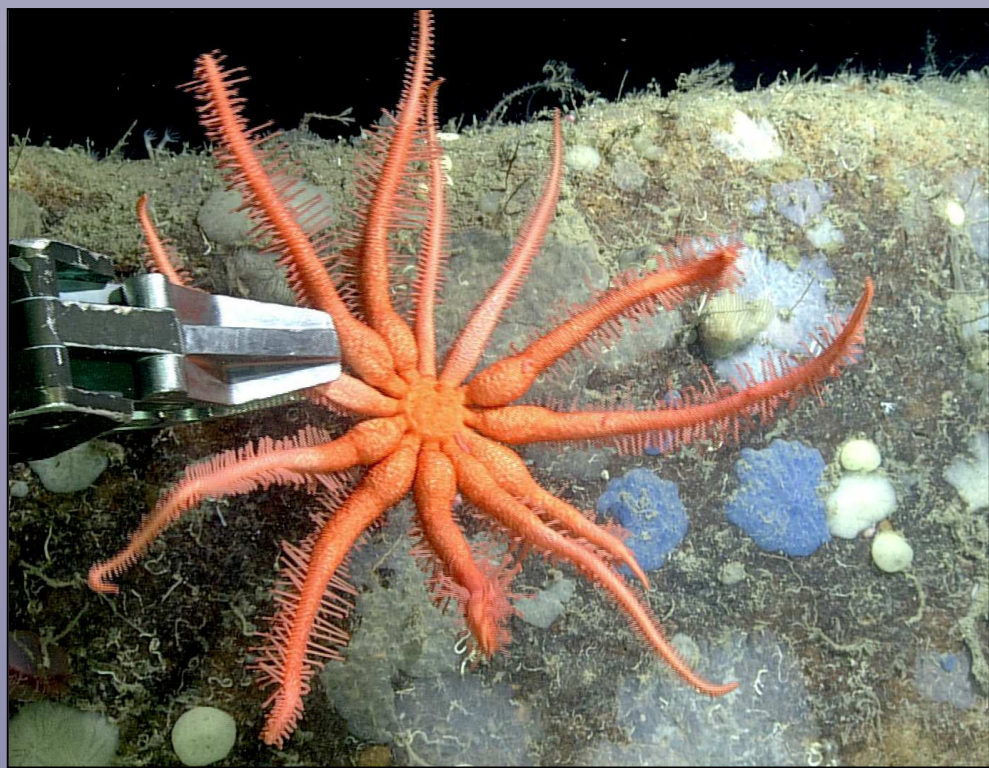
ROPOS
ROPOS (Remotely Operated Platform for Ocean Science) is an ROV owned and operated by the Canadian Scientific Submersible Facility in British Columbia, Canada. The ROV is controlled and powered from a surface vessel. Electrical power is supplied through an umbilical or tether, which also has an optical fibre for telemetry and data. A wide angle SIT low light camera with a tilt function was used to monitor the forward movement of the vehicle. A Sony DXC-990 three CCD, broadcast quality NTSC colour image camera with 16x zoom and pan, tilt, and extend functions was used to collect video data. ROPOS is equipped with a manipulator arm and specimen box, allowing for the collection of samples. It carries 4 corers for sediment sampling and continuous-recording temperature probes can be placed on the vehicle. ROPOS can be configured to operate at depths of 1000 m (540 fathoms), 2,500 m (1,350 fathoms) and (rarely) 5,000 m (2,700 fathoms). She has worked from Hudson on 4 east coast missions, configured to 2,500m.



4K Camera System with VladCam Bullet HD Video
The 4K camera system built by GSCA in 2008 was a 4000m depth capable digital still camera system enclosed in a rugged aluminum roll cage. A Canon Rebel Eos Ti 12 megapixel camera housed in a pressure case was triggered by a near bottom mechanical switch/acoustic pinger to take vertical still photos illuminated by two Canon flashes. To simplify the operations a non-conductor hydrostatic wire was used to lower and raise the camera via a ship winch. Subsea positioning was achieved using an ORE Trackpoint II USBL system. The VladCam Bullet HD video camera was a separate system that ran autonomously and was developed by GSCA in 2009 with 2000m depth capabilities. A Sony HD-SR12 camcorder powered internally and recording to memory sticks was mounted inside a pressure case. The VladCam was mounted to the side of the 4K camera roll cage in a vertical view and a "state of the art" high intensity LED Matrix light (Deep Sea Light & Power) was angled to provide constant illumination of the bed. When near the bed the high colour temperatures of this light (6000° K) allowed for true colour high definition video of the benthic flora and fauna. This system was not live view so was set to record at the surface then quickly downloaded on recovery and backed up on hard drives. A small autonomous SeaBird pressure/temperature recorder was also attached to the 4K cage for mission 2009030.

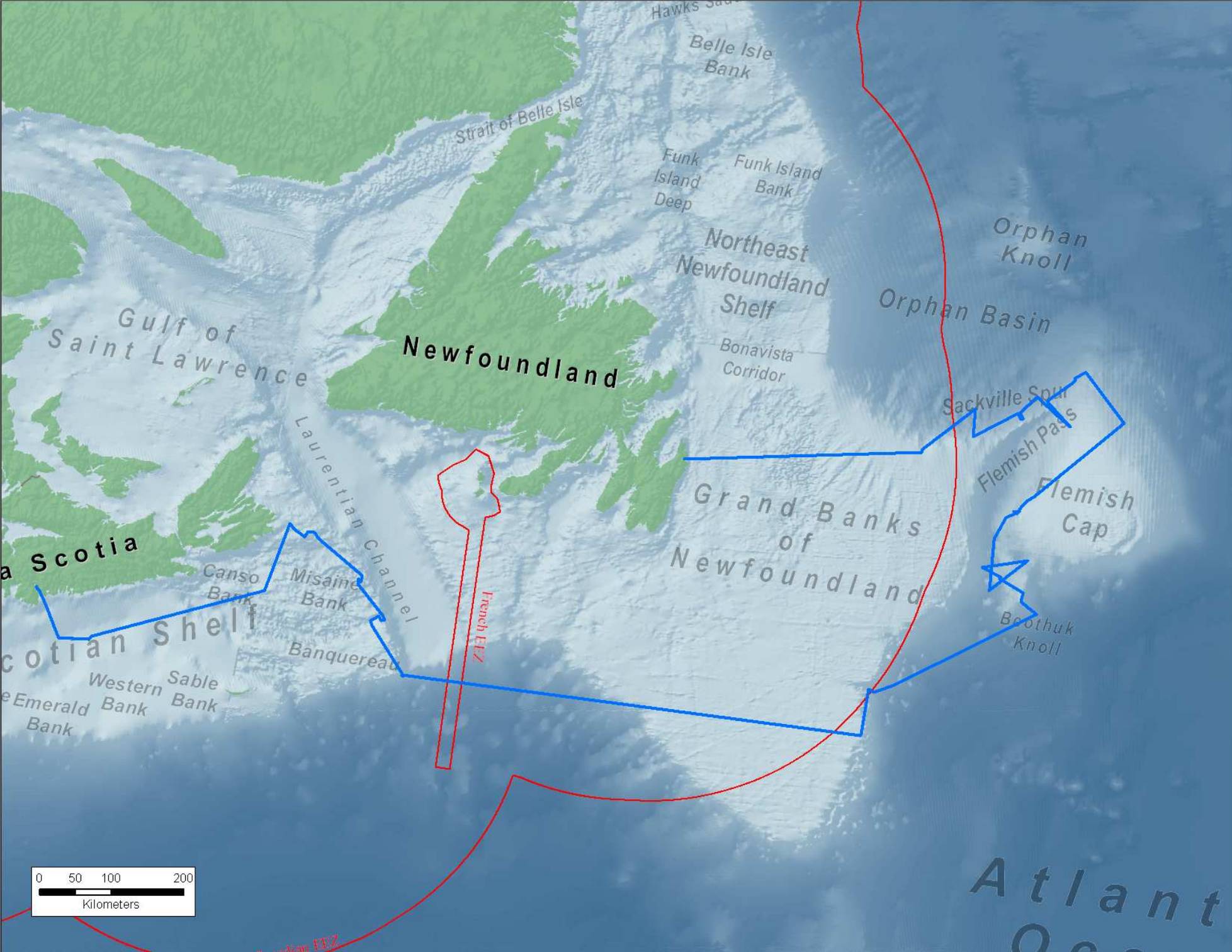


CAMPOD
The Campod is a light weight, three-legged platform equipped with a video system. For very high resolution colour imagery of the sea floor, a 35mm Nikon F4 with two high speed flashes was mounted on the frame. Designed primarily for making images of the benthic environment, the configuration of the device focuses on minimising its hydrodynamic presence in the field of view of the cameras. The Campod's open profile and wide stance, supported on three spindly legs, achieves this goal, while providing stability and sufficient separation for proper illumination. Campod, developed at DFO, Bedford Institute of Oceanography, has been copied around the world!



Surveys

2009 Hudson Cruise - 4K Cam



2010 Hudson Cruise - ROPOS

