Mapping the Ocean Floor

Canada's commercial scallop fishing industry is partnering with the Government of Canada to expand our knowledge of the seabed.

scallop habitat

drag line

Seabed mapping generates information on various aspects of the ocean floor including highly detailed bathymetry, sediment and habitat. This is an example of how the scallop fishery uses seabed mapping.

Seeing the seabed

Working with the Canadian Hydrographic Service and the Geological Survey of Canada, the Canadian Offshore Scallop Mapping Group has undertaken a project to map the seabed in areas of commercial interest to the scallop industry.

In this initiative, the Anne S. Pierce, a retired scallop vessel, was equipped with a Simrad EM 1002 multi-beam sonar system. Data collected by the ship has been used to create high-resolution 3D maps detailing seabed substrate, habitat, topography and geology. Approximately 11,000 km^2 of important scallop habitat have been mapped to date.

Improving sustainability and catch

These 3D bathymetry charts represent a vast technological advance over traditional hydrographic charts. By allowing captains to avoid seabed hazards, they have led to lower fuel consumption, reduced gear cost, and improved fishing efficiency. Analysis has shown that using 3D bathymetry charts to direct fishing effort has made it possible to reduce incidental bycatch of non-target species and reduce the amount of ocean bottom used by scallop fishing by about 70 percent.

In addition, by integrating seabed mapping data with science survey and commercial catch data, the industry has moved to implement voluntary "closed nursery areas". These areas protect juvenile scallop concentrations until they reach harvestable size.

Fisheries Council of Canada
Conseil Canadien des Pêches

www.fisheriescouncil.ca

Micromanaging the scallop beds

Scientists at the Geological Survey of Canada have also analyzed the mapping data to generate geology maps of the offshore scallop beds. These geology maps have allowed the scallop fleet to target only areas of productive scallop habitat and avoid other habitat types.

The value of this knowledge for environmental conservation is tremendous. The geology maps allow potentially sensitive habitats to be accurately identified and avoided by the scallop fleet. In addition, with the integration of satellite and multi-beam technology and monitoring programs such as dockside monitoring and port sampling, it is now possible to use the detailed data collected to micromanage each scallop bed.

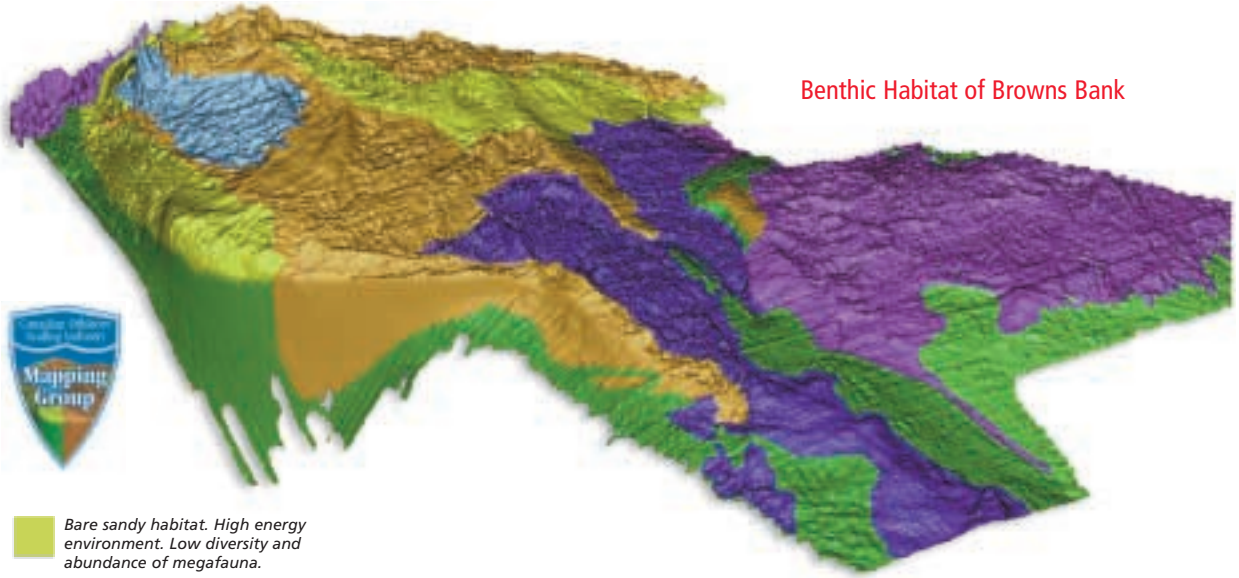
From hunting to harvesting

Using seabed mapping technology, the commercial scallop fishing industry and the Government of Canada are working together to transform the scallop fishery from a blind hunt into a cultivated, tightly controlled harvest.

The possibilities for future use of this new technology extend well beyond what has been developed to date in the scallop fishery, and the technology could be applied to other fisheries as well. With this detailed knowledge of the seabed, government agencies, fishery managers and the industry will have powerful new resources to understand how sensitive habitats and ecosystems work, and better manage ocean-related activities.

Anne S. Pierce
photo courtesy of
Clearwater Fine Foods Inc.

Benthic Habitat of Browns Bank



Bare sandy habitat. High energy environment. Low diversity and abundance of megafauna.

Deep sandy habitat. Low energy environment. Low diversity and abundance of megafauna.

Gravel with thin cover. Low energy environment. High abundance of deposit feeders.

Sand, gravel and boulders (complex habitat). High diversity and abundance of megafauna, Terebratulina – dominated community.

Subtype of Terebratulina community with dominance of tunicates and sponges.

Scallop grounds. High energy, low diversity. Gravel and sand.

Sand with minor gravel. High energy, soft coral and sea cucumbers common. Scallops present.