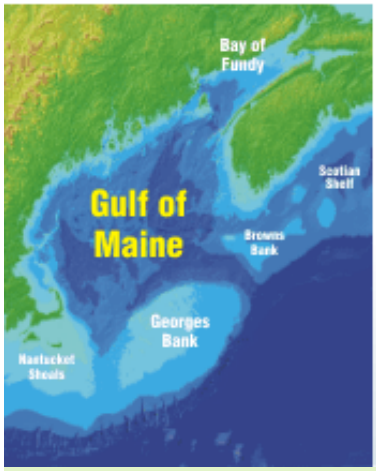

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Gulf of Maine Times

Promoting Cooperation to Maintain and Enhance Environmental Quality in the Gulf of Maine

What Lies Beneath:

Exploring the Gulf of Maine Biodiversity Discovery Corridor

Printer Friendly Page

By Peter Lawton

Fifty Canadian, U.S., and international marine scientists gathered in St. Andrews, New Brunswick, in early March 2007 for a three-day workshop to assess the progress made in the two years since the establishment of a new regional marine science research and outreach initiative, the Gulf of Maine Biodiversity Discovery Corridor.

The Discovery Corridor is a large swath of ocean extending from the Fundy Isles in the lower Bay of Fundy across the major banks and basins of the northern Gulf of Maine and beyond Georges Bank to depths of 6,000 metres (19,685 feet). The corridor, 90 kilometres (56 miles) wide at the coast, broadens as it runs 800 kilometres (497 miles) offshore to a width of about 220 kilometres (137 miles) at its outer limit. The corridor provides access to deep water habitats relatively close to shore and includes both well and lesser known areas. The notion of “discovery” captures not only new species and distributions, but new approaches and understandings of ecosystem functioning.

As director of the Centre for Marine Biodiversity http://www.marinebiodiversity.ca/en/home.html and lead coordinator for the initiative, this was a pivotal meeting for me. A discovery corridor running from the shoreline out to the deepest parts of the Atlantic Ocean is a powerful means by which to engage scientists and non-scientists in a new appreciation of marine biodiversity. It was rewarding to see how this community has come together in a short time and to hear about new research.

Biodiversity in the Gulf of Maine

The idea for discovery corridors first arose in national

meetings on marine biodiversity science held in Canada in 2002 and sponsored by the Centre for Marine Biodiversity, Fisheries and Oceans Canada (DFO), and the International Census of Marine Life http://www.coml.org. Marine scientists took up this concept enthusiastically, starting a number of new research projects in 2004 which, over time, will increase our understanding of the distribution and abundance of marine organisms within the northern Gulf of Maine.

SOURCE: CANADIAN SCIENTIFIC SUBMERSIBLE FACILITY/ROPOS 2006
The bubblegum coral (Paragorgia arborea) is the largest benthic marine invertebrate. It is shown here growing alongside another coral species (Primnoa resedaeformis) in the Discovery Corridor. The image was taken using the deep water remotely operated vehicle ROPOS during the July 2006 CCGS Hudson mission.

The areas within which to develop the Discovery Corridor were discussed in regional meetings in St. Andrews and Monction, New Brunswick, and in Woods Hole, Massachusetts. The Woods Hole meeting was held as part of the Gulf of Maine Pilot Census of Marine Life Program http://www.usm.maine.edu/gulfofmaine-census/; the Discovery Corridor is also considered a foundation project within this initiative. The final area selected includes coastal portions of Maine, New Brunswick, and Nova Scotia, and encompasses both U.S. and Canadian waters as it extends offshore, offering opportunities to mount joint research funded by both countries.

New species

At the recent workshop in St. Andrews, a team led by Ellen Kenchington, a DFO research scientist at the Bedford Institute of Oceanography in Dartmouth, Nova Scotia, reported on a large number of new species occurrences. By new, Kenchington includes deep sea coral species recorded for the first time in the corridor, as well as confirmations of organisms originally recorded in natural history explorations of the Gulf of Maine in the late 19th century.

PHOTO: COURTESY FISHERIES AND OCEANS CANADA, BEDFORD INSTITUTE OF OCEANOGRAPHY
In 2005 researchers discovered that isolated offshore rock pinnacles in Jordan Basin support a diverse community of bottom-dwelling organisms, dominated by sponges and sea anemones.

A specific aspect of the first two offshore Discovery Corridor research cruises in 2005 and 2006 was to add to scientific knowledge on the distribution and status of deep sea corals, both within existing marine conservation areas in the Northeast Channel and in deeper waters beyond present conservation management areas. The cruises have returned a substantial amount of new information on these structure-forming colonial organisms, which fall within a major class of marine organisms called *Anthozoa*, or sea anemones.

For Kenchington, who is involved in deep sea coral research in several areas of the Maritimes, the large number of new species records from the Discovery Corridor was particularly satisfying. “Three species of gorgonian corals that we collected in 2006 represent new records for Canadian waters. Among the sea pens we have now added two species to the known Canadian fauna,” she said. “Finding three different species of black or thorny corals in the corridor was perhaps the major highlight for me of these new coral records, as only one species of this group has previously been reported from Atlantic Canada.”

Many of these new coral observations come from deep water offshore of the current Coral Conservation Area (CCA). Within the CCA, the extended depth sampling capability and high-resolution imagery made possible by using the submersible vehicle called ROPOS (remotely operated platform for ocean science http://www.ropos.com), has allowed researchers to broaden the understanding about the distribution of two principal coral species. New depth (greater than 700 metres or 2,297 feet) and individual colony size records have been established within the CCA for *Paragorgia arborea* (2.4 metres or 7.9 feet high) and *Primnoa resedaeformis* (1.2 metres or 3.9 feet high) corals, based on follow-up analysis recently completed in Metaxas' laboratory at Dalhousie University.

Another new observation obtained by the researchers during the 2006 research mission that sampled the seabed to depths of 2,500 metres (8,202 feet) was a series of still and video images, as well as collection of several specimens of

blue and yellow deep sea holothurians or sea cucumbers. Anna Metaxas, a marine scientist from Dalhousie University, Halifax, Nova Scotia, and one of the principal scientists on this cruise, has reported seeing these soft-bodied creatures often during deep sea research she has conducted around the world, but was enthused to see them so close to home. These sea cucumbers creep along the sea floor, ingesting the upper few millimetres (less than one inch) of sediment as they move. It is this upper layer that is the richest in nutrients raining down from more productive waters hundreds or thousands of metres (hundreds or thousands of feet) above. These new specimens appear to belong to the families *Psychropotidae* and *Synallactidae*, groups of deep sea cucumbers, and would represent new Canadian records of such species.

Technology opens up the deep sea

In 2005 scientists used two Canadian DFO seabed observation and sampling systems operated off the Canadian Coast Guard Ship (CCGS) Hudson. One of them, Campod, is an observation system deployed by cable from the ship that carries downward-looking video and digital camera systems. Its companion system, Videograb, allows an operator at the surface to see an image of the seabed between the jaws of a bottom grab sampler. Using both systems, scientists were able to obtain high-resolution images and samples from seabed communities to depths of 500 metres (1,640 feet) in offshore basins such as Jordan and Crowell, and the Northeast Channel, a major channel into the Gulf of Maine between Georges and Browns banks.

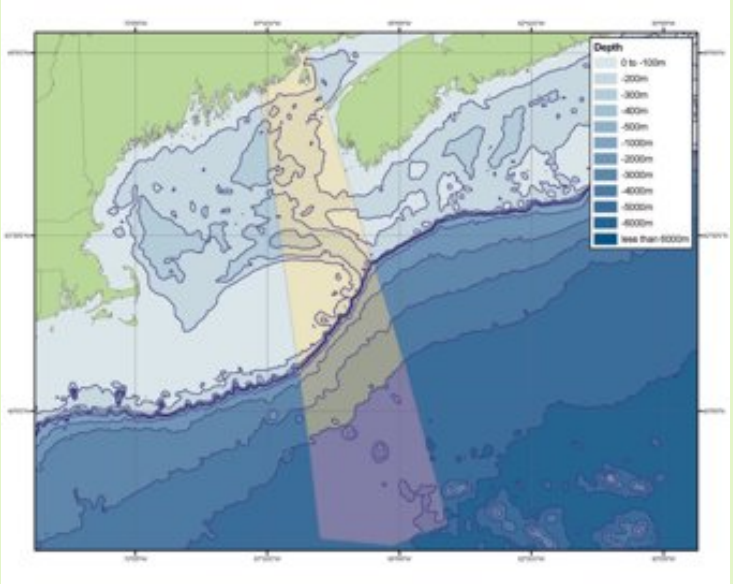

PHOTO: COURTESY WORLD WILDLIFE FUND - CANADA
Click on image to enlarge
The Discovery Corridor extends from the lower Bay of Fundy across the northern Gulf of Maine and beyond Georges Bank to depths of 6,000 metres (19,685 feet).It is 90 kilometres (56 miles) wide at the coast and broadens to 220 kilometres (137 miles) at its outer limit around 800 kilometres (497 miles) offshore.

These new observations in deep waters will be compared with recent studies on the distribution and abundance of marine organisms in coastal portions of the corridor. Working with John Roff of Acadia University, Wolfville, Nova Scotia, Maria-Ines Buzeta from DFO's Biological Station, St. Andrews, New Brunswick, is exploring the degree to which physical environment such as bottom type, annual range and variability of tidal currents, and temperatures are important in determining the makeup of seabed communities in shallow coastal areas.

Based on the success of the 2005 mission, a group of Canadian university and government scientists secured the use of ROPOS for the two-week mission in the outer portions of the corridor in 2006. Two Canadian university researchers, Metaxas of Dalhousie and Paul Snelgrove at Memorial University in St. John's, Newfoundland, obtained funding from the Natural Sciences and Engineering Research Council of Canada to bring this national marine science platform across country from the Canadian west coast. Working again on the CCGS Hudson, a team of researchers extended high-resolution sampling of the seabed to 2,500 metres (8,202 feet).

And what of the broader interpretation of marine biodiversity mentioned initially? The Gulf of Maine Biodiversity Discovery Corridor takes advantage of the fact that there is an existing marine interpretation facility based in St. Andrews, the Huntsman Marine Science Centre at the coastal origin of the corridor. The corridor project also has offered opportunities for regional artists to become involved in interpreting this scientific work. Halifax-based printmaker and independent film producer Peter MacWhirter participated in the CCGS Hudson research cruise and produced a series of original watercolors. He also obtained video interviews with marine scientists that he hopes to incorporate into an independent film about marine biodiversity and its significance to society. By engaging artists, as well as marine educators, we hope to develop an understanding and appreciation of the Gulf of Maine Biodiversity Discovery Corridor that is inclusive and accessible.

Peter Lawton is director, Centre for Marine Biodiversity, at Fisheries and Oceans Canada, Biological Station, St. Andrews, New Brunswick. For more information visit the discovery corridor at http://www.marinebiodiversity.ca or contact Lawton at LawtonP@mar.dfo-mpo.gc.ca.