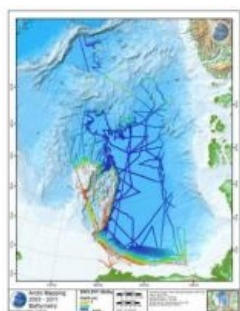


US-Canada Arctic Ocean Partnership Leads to Better Data



A recent mission marked the completion of a five-year collaboration between the United States and Canada to survey the Arctic Ocean. The bilateral project collected scientific data to delineate the continental shelf beyond 200 nautical miles from the coastline, also known as the extended continental shelf (ECS). According to Deborah Hutchinson, PhD, geologist with the USGS and US science lead and liaison on board CCG Ship *Louis S. St-Laurent*, the amount and quality of the data collected as part of these joint Arctic missions met, and often exceeded, the expectations set each year.

The U.S. has an inherent interest in knowing, and declaring to others, the exact extent of its sovereign rights in the ocean as set forth in the Convention on the Law of the Sea. For the ECS, this includes sovereign rights over natural resources on and under the seabed including energy resources such as: oil and natural gas and gas hydrates; "sedentary" creatures such as clams, crabs, and corals; and mineral resources such as manganese nodules, ferromanganese crusts, and polymetallic sulphides.

The 2011 joint Arctic mission spanned nearly six weeks in August and September and was the fourth year to employ flagship icebreakers from both countries, the U.S. Coast Guard Cutter *Healy* and the Canadian Coast Guard Ship *Louis S. St-Laurent*.

Larry Mayer, Ph.D., U.S. chief scientist on the Arctic mission and co-director of the NOAA-University of New Hampshire Joint Hydrographic Center, said that this two-ship approach was both productive and necessary in the Arctic's difficult and varying ice conditions. "With one ship breaking ice for the other, the partnership increased the data either nation could have obtained operating alone, saved millions of dollars by ensuring data were collected only once, provided data useful to both nations for defining the extended continental shelf, and increased scientific and diplomatic cooperation".

Preliminary studies indicate the U.S. ECS, including the Arctic Ocean areas surveyed, total at least one million square kilometres, an area about twice the size of California. Additional data collection and analysis will lead to more accurate estimates of the extent of the U.S. ECS.

U.S. ECS work is not limited to the Arctic and includes areas in the Bering Sea, Gulf of Mexico, the Atlantic, Gulf of Alaska, Marianas and Line Islands, as well as areas off northern California and northwest of Hawaii. In addition to Arctic survey work, the U.S. Geological Survey (USGS) led missions in 2011 to collect seismic data in the Gulf of Alaska and the Bering Sea, and scientists from the Joint Hydrographic Center collected bathymetric data northwest of Hawaii. NOAA and USGS funded the 2011 U.S. missions. Two U.S. ECS missions are planned for 2012, one in the Atlantic and one in the Arctic.

This year's U.S. Arctic mission was led by the Joint Hydrographic Center, a partnership between NOAA and the University of New Hampshire, while the Canadian mission was led by the Geological Survey of Canada of Natural Resources Canada.

Scientists on board *Healy* used a multibeam echo sounder to collect bathymetric data to create three-dimensional images of the seafloor. Scientists aboard CCGS *Louis S. St-Laurent* collected seismic data to determine the thickness of the sediments under the seafloor and to better understand the geology of the Arctic Ocean. The 2011 Arctic mission traversed more than 5,600 total miles over the Beaufort Shelf, Chukchi Borderland, Alpha Ridge, and Canada Basin and reached more than 1,230 miles north of the Alaskan coast.

Data collected by these two nations tells other scientific stories for the first time. For example, USGS scientists collected baseline data on ocean acidification and scientists from the National Ice Center compared observed ice conditions with interpretations of the same ice seen on satellite imagery.

From 2006 to date, scientists on board CCGS *Louis S. St-Laurent* have collected nearly 15,000 kilometres (9,320 miles) of seismic data. Scientists from the United States and Canada are using these data to revise models of the origin and tectonic evolution of this poorly understood portion of the ocean.

Since the start of U.S. ECS work in the Arctic in 2003, *Healy* alone has mapped more than 320,000 square kilometres (123,000 square miles, see image) of the Arctic seafloor, or about the size of Arizona.

The U.S. Extended Continental Shelf Task Force is responsible for delineating the U.S. ECS and is chaired by the Department of State with co-vice chairs from the National Oceanic and Atmospheric Administration and the Department of the Interior. Ten additional agencies participate in the task force, including the U.S. Geological Survey, Joint Chiefs of Staff, U.S. Navy, U.S. Coast Guard, Department of Energy, National Science Foundation, Environmental Protection Agency, Bureau of Ocean Energy Management, the Arctic Research Commission, and the Executive Office of the President.

<https://www.hydro-international.com/content/article/us-canada-arctic-ocean-partnership-leads-to-better-data>
