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[Français](#)
[Home](#)
[Contact Us](#)
[Help](#)
[Search](#)
[nserc.gc.ca](#)

Home > How Does It Work? > Strategic Networks > **Canadian Healthy Oceans Network**

What we do

Advantages for Companies

How Does It Work?

Find an Expert

Strategic Networks

Are You Eligible?

Protecting Your Intellectual Property

Frequently Asked Questions

Partner List

Related Resources

Government Partners

Partners from Other Organizations

Impact Stories

Media

 **New to Partnerships?**

 **Contact Us**

 **Find an Expert**

## Canadian Healthy Oceans Network

 [Bookmark](#) |  [Print Page](#)

### Challenge

The sustainability of Canada's three oceans depends on clear scientific advice in the face of numerous stakeholder activities. Fishing disturbance (overfishing, bycatch, alteration of food webs, habitat damage), introduced species, habitat destruction, pollution in the forms of eutrophication and chemical loading, and climate change all pose potential threats to ocean health and function. Recent research suggests that ocean health is compromised when biodiversity loss occurs, because many different species contribute to complex, interlinked ecological processes. Indeed, there is growing recognition that the diversity of life in the ocean, encompassing all levels from genes to species to ecosystems, represents an irreplaceable natural heritage that is crucial to human well-being and sustainable development. This new ecosystem level approach to sustainable use moves beyond the single species focus that has dominated ocean management in the past, but it also requires a broader array of tools, expertise, data and policy applications. There is compelling scientific evidence that Earth and its oceans are on the verge of a major biodiversity crisis, and that this crisis may present challenges that are as complex as those associated with climate change. With these diverse, interrelated threats to ocean health, a new framework for marine conservation is urgently needed. Importantly, this framework must encompass university and government scientists as well as policy-makers at a national level.

The NSERC Canadian Healthy Oceans Network (CHONe) is taking the lead in aligning the excellent but broadly scattered capacity in Canadian marine science to develop scientific guidelines for the conservation and sustainable use of marine biodiversity resources, in partnership with policy makers.

### Network Structure

The NSERC Canadian Healthy Oceans Network (CHONe) is a strategic partnership between Canadian university researchers and government scientists that is made up of 65 researchers from 15 universities and multiple federal research labs from coast to coast in Canada. Chone (pronounced Ko-Nee) is also a marine worm that occurs in all of Canada's three oceans and characterizes healthy benthic habitats.



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The Network will train a large cohort of interdisciplinary undergraduate and graduate students, and several postdoctoral researchers who will work in multiple university and DFO laboratories. The Network governance structure is comprised of a Board of Directors, a Scientific Advisory Committee, and Research Theme leaders made up of a university co-leader and a Fisheries and Oceans Canada co-leader. The CHONe administrative office, led by Network Director, Paul Snelgrove, is housed at Memorial University of Newfoundland.

## Research Objectives

CHONe will address a need for *scientific guidelines for conservation and sustainable use of marine biodiversity resources*. The research themes of the Network have three broad foci: **Marine Biodiversity**, **Ecosystem Function** and **Population Connectivity**. Within these themes, we will:

- determine functional and species biodiversity in relation to habitat diversity;
- determine how ecosystem function and health are linked to biodiversity and agents of disturbance, including natural and anthropogenic sources; and
- determine how dispersal of early life stages (larvae, juveniles) influences patterns of diversity, resilience and source/sink dynamics of species and communities.

## Outcomes

Key priorities of the Network include:

- narrowing the communication gaps between marine science, management and policy in Canada;
- training the next generation of scientists to work at the interface between science, policy and management for the betterment of Canada's oceans;
- producing a marine biodiversity database for Canada's three oceans that will represent a baseline and a rich information resource for future generations;
- raising public awareness of the rich biodiversity of Canada's oceans and its importance to future generations; and
- developing tools to assess ecosystem health and predictive tools that will improve the effectiveness of efforts to conserve biodiversity and ocean function.

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