

ENVIRONMENTAL RESEARCH AT UNB



Realize that everything connects to everything else.
(Leonardo da Vinci)

The natural world's innately complex and integrated ecosystems are being affected by human activity, which is giving rise to unexpected and contingent consequences that are difficult to reverse. In pursuit of foundational understanding, and solutions that better harmonize human activity with nature's processes,

the University of New Brunswick (UNB) is deeply committed to multi-disciplinary environmental research in both fundamental and applied science.

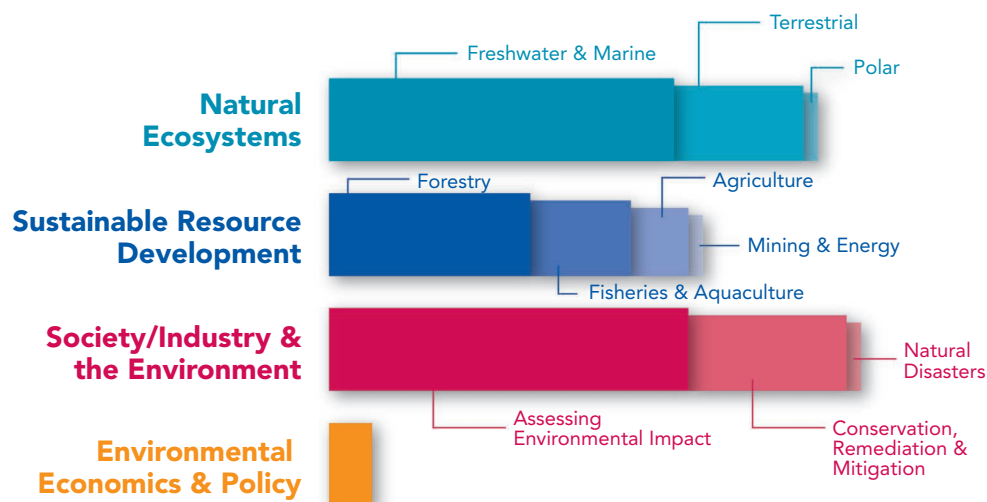
UNB conducts fundamental scientific research to understand the natural order and complexities of Earth's ecosystems – an essential step in determining how humanity can live in a sustainable manner. Research in marine and freshwater ecosystems, as well as forest/watershed environments, represent significant areas of focus and capability at the university. This includes exploration of their biotic and abiotic features, and challenges to their

ecological sustainability. Organisms ranging from microbial (viruses, soil bacteria and plankton) to complex (seaweed, invertebrates, finfish, marine and forest birds, and mammalian wildlife) are thoroughly studied, including significant genetic and genomic research. Endangered species and species of commercial interest are investigated to understand their physiology, reproductive life cycles, and habitat requirements, along with their ecological interactions and adaptations.

Assessing of societal and industrial impacts on the environment is another area of fundamental scientific research at UNB. Investigating the accumulation of persistent chemical pollutants in freshwater food webs, their effects on aquatic organisms, and their threat to human health is a significant research strength at UNB. The consequences of land development, climate change, and industry on groundwater is another area of concern engaging researchers across UNB.

UNB researchers are also active in applied environmental research exploring how humanity's actions might protect and better harmonize with world ecosystems, including the sustainable use of resources, and the preservation, protection, and restoration of the natural environment.

Research Focus Areas



Sustainable management of forest resources is an area of research leadership, focus and strength. UNB expertise in mapping and remote sensing technologies have contributed to innovative approaches to forest inventorying, forest/watershed/wet area mapping, and sustainable forest management modeling. In addition to its technical contributions supporting natural resources management, UNB has demonstrated collaboration and leadership in its research and facilitation of community-

integrated approaches to forest, watershed and fisheries management. Another area of innovation and leadership in research at UNB is an approach to aquaculture that mimics nature's own balanced trophic (food-chain) ecosystem. This approach offers greater ecological sustainability and solutions to challenges facing the aquaculture industry, while also cultivating further nutritional food products for market.

The influence of UNB's multi-disciplinary environmental research is far-reaching. The university's expertise and innovations are recognized and utilized internationally, and its research provides regulatory agencies with an evidentiary basis for the formation of effective policy.

100

Average number of faculty undertaking research in this area each year

\$11.7 million

Average amount of funding received for research in this area each year

272

Average number of research projects in this area each year

17

Faculties and Departments pursuing research in this area

- **Arts (Fredericton)**
 - Anthropology
 - Economics
- **Business Administration**
- **Computer Science**
- **Engineering**
 - Chemical Engineering
 - Civil Engineering
 - Electrical and Computer Engineering
 - Geodesy and Geomatics Engineering
 - Mechanical Engineering
- **Forestry and Environmental Management**
- **Renaissance College**
- **Science**
 - Biology
 - Chemistry
 - Earth Sciences
 - Mathematics and Statistics
 - Physics
- **Science, Applied Science and Engineering**
 - Biological Sciences

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Facilities and Groups conducting research in this area

- **Institutes and Centres**
 - Canadian Rivers Institute (CRI)
 - Dr. Jack McKenzie Limerick Pulp and Paper Research Centre
- **Labs and Research Groups**
 - Centre for Environmental and Molecular Algal Research (CEMAR)
 - Forest Watershed Research Center
 - LA-ICP-MS (Laser Ablation Inductively Coupled Plasma Mass Spectrometry) Laboratory
 - New Brunswick Cooperative Fish & Wildlife Research Unit (NBCFWRU)
 - Ocean Mapping Group
 - People in Motion Lab
 - Seaweed and Integrated Multi-Trophic Aquaculture (IMTA) Research Laboratory

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Research Chairs engaging in research in this area

- **Canada Research Chairs**
 - Aquatic Molecular Ecology and Ecological Genomics
 - Chemical Contamination of Food Webs
 - Chemical Processes and Catalysis
 - Pulp and Paper Science and Engineering
- **Other Research Chairs**
 - Molecular Systematics and Biodiversity
 - Ocean Mapping
 - Vaughn Chair in Regional Economics
 - Wildlife Ecology