

# An Overview of the Hudson Bay Marine Ecosystem



*This overview of the Hudson Bay Marine Ecosystem includes James Bay.*



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2005

**Canadian Technical Report of Fisheries  
and Aquatic Sciences 2586**



Fisheries and Oceans Pêches et Océans  
Canada Canada

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PREFACE

This report was prepared under contract for Fisheries and Oceans Canada, Central and Arctic Region, Winnipeg, MB. The Scientific Authorities for this contract were Don Cobb and Steve Newton.

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Cat. no. Fs 97-6/2586E

ISSN 0706-6457

Published by:

Fisheries and Oceans Canada  
501 University Crescent  
Winnipeg, Manitoba  
R3T 2N6

Correct citation for this report is:

Stewart, D.B., and Lockhart, W.L. 2005. An overview of the Hudson Bay marine ecosystem. Can. Tech. Rep. Fish. Aquat. Sci. 2586: vi + 487 p.

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## ABSTRACT

Stewart, D.B., and Lockhart, W.L. 2005. An overview of the Hudson Bay marine ecosystem. Can. Tech. Rep. Fish. Aquat. Sci. 2586: vi + 487 p.

This overview summarizes knowledge of the Hudson Bay marine ecosystem, including James Bay. It has three main objectives: 1) to establish what is known about the region; 2) to provide historical (temporal) and geographical (spatial) perspective; and 3) to establish linkages among people of different cultural backgrounds and disciplines. Interactions among the ecosystem's physical, chemical, and biological components are discussed, as are factors that stress the ecosystem such as harvesting, development activities, contaminants, and climate change. The limits of our knowledge are established. The importance of key aspects of the Hudson Bay ecosystem, and their connections and interactions, are discussed. The depth of coverage varies with the information available and its relevance.

Historical information, traditional knowledge, and scientific data have been used in the overview. They are complementary sources of information that are often in good agreement. Each source has strengths and weaknesses: historical information can be limited to archival documents; traditional knowledge relies on the experience and memory of a small population that is scattered along a very long, often inhospitable, coastline; and research has been limited by cost and logistical constraints. Where differences in conclusions exist, they are highlighted and explained whenever possible.

**Key Words:** Canada subarctic, James Bay; Hudson Bay; Roes Welcome Sound; Repulse Bay; Hudson Strait; Quebec; Ontario; Manitoba; Nunavut; Kivalliq; Nunavik; Belcher Islands; Inuit; Cree; geology; physiography; climate; oceanography; Arctic waters; hydrology; ecology; plants; invertebrates; fish; marine mammals; birds; history; human settlement; parks; protected areas; sensitive habitat; harvesting; renewable resource use; economic development; environmental impact; marine ecosystem; non-renewable resource use; hydroelectric development; sediment metals; contaminants; mercury; climate change.

## RÉSUMÉ

Stewart, D.B., and Lockhart, W.L. 2005. An overview of the Hudson Bay marine ecosystem. Can. Tech. Rep. Fish. Aquat. Sci. 2586: vi + 487 p.

Le présent document est un résumé des connaissances sur l'écosystème marin de la baie d'Hudson, y compris la baie James. Il vise les trois objectifs suivants : 1) faire un bilan des connaissances sur la région; 2) donner une perspective historique (temporelle) et géographique (spatiale); et 3) établir des liens entre les gens de spécialités et d'antécédents culturels différents. Les interactions entre les éléments physiques, chimiques et biologiques de l'écosystème sont discutées, ainsi que les facteurs qui l'agresse, comme la chasse et la pêche, les activités de développement, les contaminants et le changement climatique. Les limites de nos connaissances sont en outre établies. L'importance d'aspects clés de l'écosystème de la baie d'Hudson, et des liens et des interactions entre eux, sont discutés. L'étendue de la couverture varie selon les renseignements disponibles et leur pertinence.

Ce survol repose sur des renseignements historiques, des connaissances traditionnelles et des données scientifiques. Ce sont des sources complémentaires d'information qui montrent souvent un niveau de concordance élevé, quoique chacune ait des atouts et des faiblesses. Les renseignements historiques peuvent n'être que des documents d'archives, les connaissances traditionnelles se fondent sur l'expérience et la mémoire d'une petite population dispersée le long d'un très vaste littoral, souvent inhospitalier, alors que les recherches sont limitées en raison des coûts et des contraintes logistiques. Lorsque des conclusions différentes sont formulées, elles sont mises en lumière et expliquées dans la mesure du possible.

**Mots clés :** zone subarctique du Canada; baie James; baie d'Hudson; détroit de Roes Welcome; Repulse Bay; détroit d'Hudson; Québec; Ontario; Manitoba; Nunavut; Kivalliq; Nunavik; îles Belcher; Inuit; Cri; géologie; physiographie; climat; océanographie; eaux arctiques; hydrologie; écologie; plantes; invertébrés; poissons; mammifères marins; oiseaux; histoire; établissement humain; parcs; aires protégées; habitat sensible; chasse; pêche; utilisation de ressources renouvelables; développement économique; incidences environnementales; écosystème marin; utilisation de ressources non renouvelables; aménagement hydroélectrique; métaux dans les sédiments; contaminants; mercure; changement climatique.

## ACKNOWLEDGEMENTS

This work benefited from the assistance and expertise of many people. Don Cobb, Helen Fast, and Steve Newton had the vision to initiate this project, oversaw it as part of the Department of Fisheries and Oceans' (DFO) coastal zone management initiatives in Hudson Bay, and helped to see it through to publication.

Lionel Bernier and the late Dr. Max Dunbar contributed to earlier overview documents that were prepared to assist Parks Canada identify possible National Marine Parks in Hudson Bay and James Bay. These documents, prepared in the early 1990s for Francine Mercier and Claude Mondor, formed the basis of this work. The widely distributed sediment data for Hudson Bay were derived from the Ph.D. Thesis of Penny Henderson of the Geological Survey of Canada.

Elva Simundsson and her staff at the Eric Marshall Aquatic Research Library (DFO, Winnipeg) provided invaluable assistance in obtaining reference material. Ken Abraham of the Ontario Ministry of Natural Resources (OMNR), Danielle Baillargeon (DFO), Chris Chenier (OMNR), Brigitte de March (DFO), Miriam Fleming (Sanikiluaq), Patt Hall (DFO), Penny Henderson of the Geological Survey of Canada, Ipeelee Itorcheak (DFO), Craig Machtans of Environment Canada (EC), Martin Obbard (OMNR), Richard Remnant of North/South Consultants Inc. in Winnipeg, Pierre Richard (DFO), François Saucier (DFO), Lyle Walton (OMNR), and Brian Zawadski (Nunavut Development Corp., Rankin Inlet) kindly provided unpublished data for use in this report. Dave Rudkin of the Royal Ontario Museum and Graham Young of the Manitoba Museum (MM) kindly allowed us to use their photographs, and Martin Curtis (DFO) confirmed the identification of the invertebrate species they show. Together with many, many others they also provided published information and sound advice.

Sections of the manuscript were edited by Ross Brown (EC; climate), Don Cobb (DFO; introduction, invertebrates), Susan Cosens (DFO; mammals), Helen Fast (DFO; human occupation), Patt Hall (DFO; harvesting), Heiner Josenhans (Geological Survey of Canada; geology), Pierre Larouche (DFO; oceanography), Robie Macdonald (DFO; climate change), Mark Mallory (Canadian Wildlife Service; birds), Dale McGowan (DFO; harvesting), Steve Newton (DFO; economic development, protected areas and sensitive habitats), Simon Prinsenbergh (DFO, oceanography), David Punter of the University of Manitoba (UM; plants), James Reist (DFO; fishes), Pierre Richard (DFO; mammals), Gordon Robinson (UM; plants), Gary Stern (DFO; contaminants), Rob Stewart (DFO; mammals), and Graham Young (Manitoba Museum; geology).

Barb Stewart (Sila Consultants, Howden, MB) edited the entire manuscript, and Cecile Stewart (Arctic Biological Consultants, Winnipeg) provided editorial comments throughout this project. Mark Ouellette (DFO) formatted the manuscript for publication and prepared many of the maps. Steve Newton prepared the cover page.

We thank all of you for your efforts, which have greatly improved this work and helped to bring it to fruition.

## **DEDICATION**

*This work is dedicated to Cécile, Ceilidh, and Heather Stewart,  
whose love and understanding made it possible.*



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