GeoCod

Geomatics for the Sustainable Management of Fish Stocks

La Geomatique au Service de la Gestion Durable des Stocks de Poissons

Overview

Rodolphe Devillers
Geography, Memorial University

GEOIDE

GeoCod

- Two years project
  - January 2006 → December 2007 = very short!
- ~ $250,000 (cash + in-kind)
- (short-term)-Research (undergraduate/graduate students)
- Develop a “big picture” of the evolution of fish stocks and their relationships with environmental changes in the North-West Atlantic region

Researchers

- Four Canadian researchers
  - Rodolphe Devillers – Geography – MUN (*Project Leader*)
  - Mir Abolfazl Mostafavi – Geomatics – Laval (*Deputy Leader*)
  - Marie-Josée Fortin – Zoology – U. of Toronto
  - George Rose – Fisheries Conservation Chair – MI/MUN
- Two International researchers
  - Stewart Fotheringham – National Center for GeoComputation – Ireland
  - Geoff Meaden – GIS Fisheries Unit – England

Memorial University of Newfoundland

VELUT ARBOR ÆVO

MARINE INSTITUTE

UNIVERSITÉ LAVAL

GeoCod

Partners

- Canadian Centre for Fisheries Innovation (CCFI)
- CIDCO - Center in Marine Geomatics (Rimouski)
- Fisheries and Aquaculture Newfoundland (DFA)
- Fisheries and Oceans Canada (DFO)
- IFREMER (~ French DFO)
- St-Lawrence Observatory (SLO)
- World Wildlife Fund (WWF)

Region of Interest

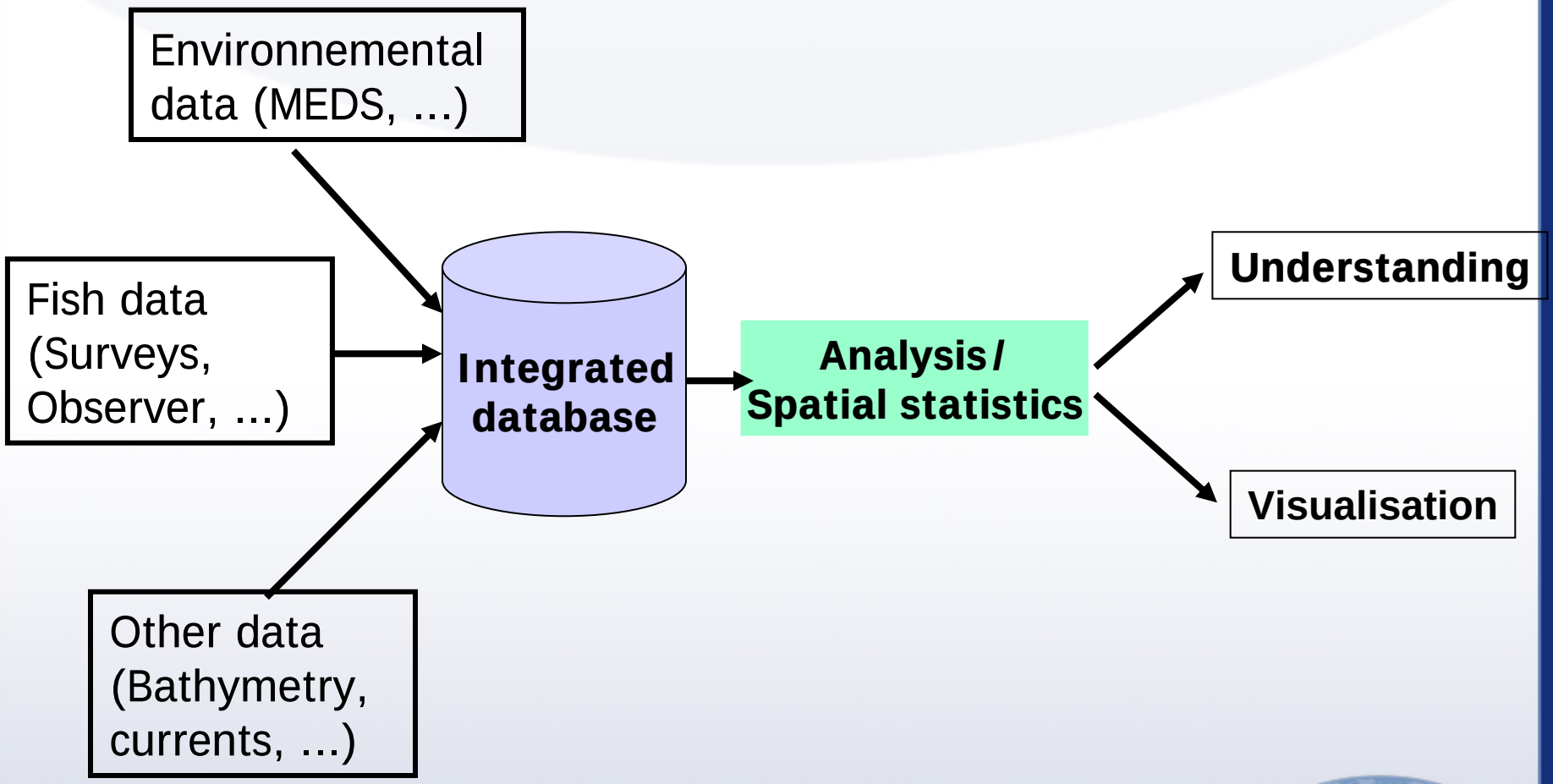
Objectives

1. To **integrate heterogeneous** fisheries and environmental **data into a single data model** that will be suitable for subsequent analyses and visualisation

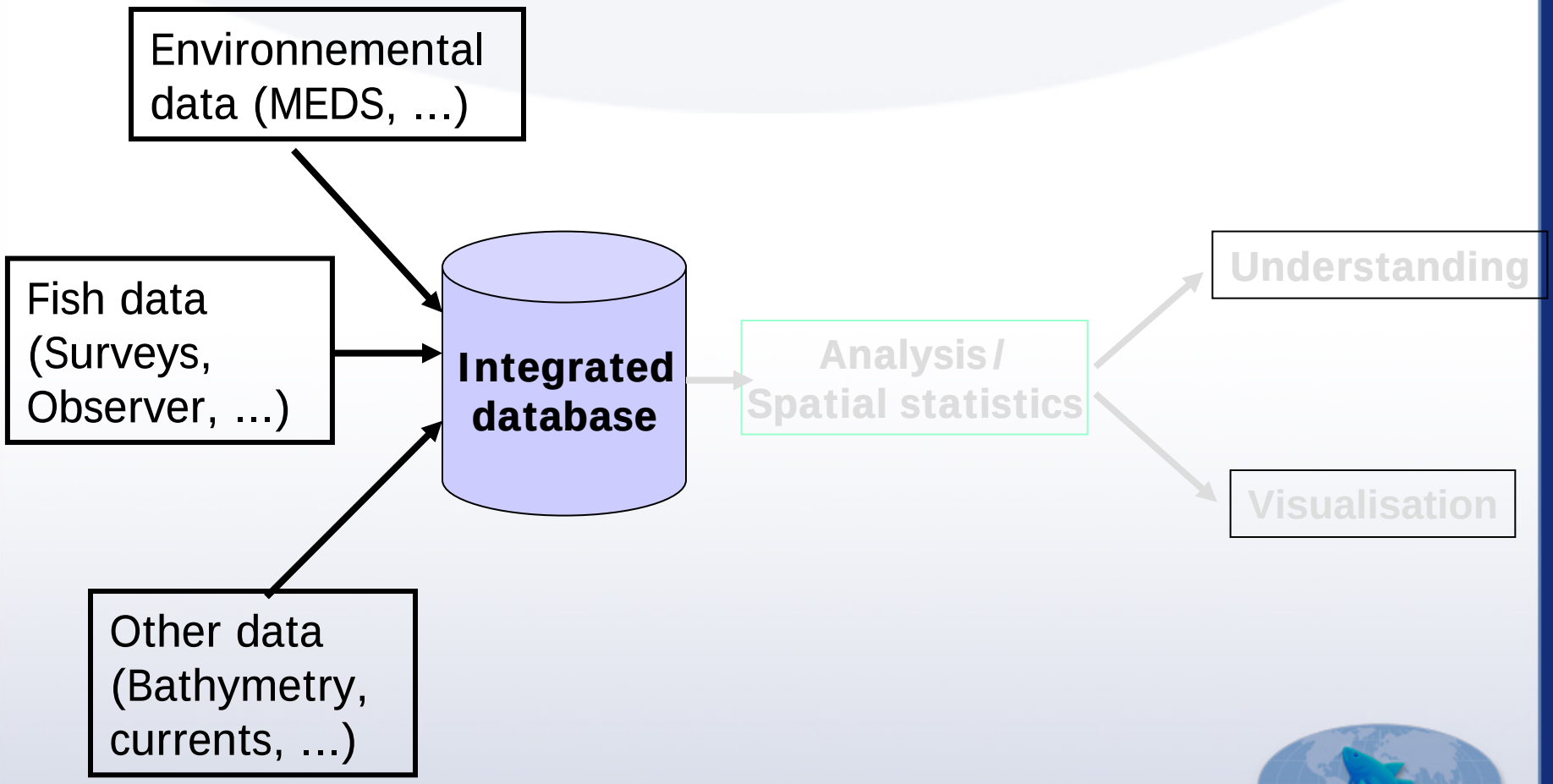
2. To **use spatial statistics to analyze** the dramatic decline of groundfish (e.g. cod), distribution shifts of pelagic (e.g. capelin) and changes of snow crab and shrimp, and their interactions, **in relation to environmental and climate change**

3. To **develop spatio-temporal visualization tools** to help decision-makers gain better insight into dynamic relationships between species distributions/abundances and the environment

General approach



Collection | **Integration/ management** | Analysis | Visualisation



Memorial University

- 1:15-1:35 Rodolphe Devillers (Geography, MUN)

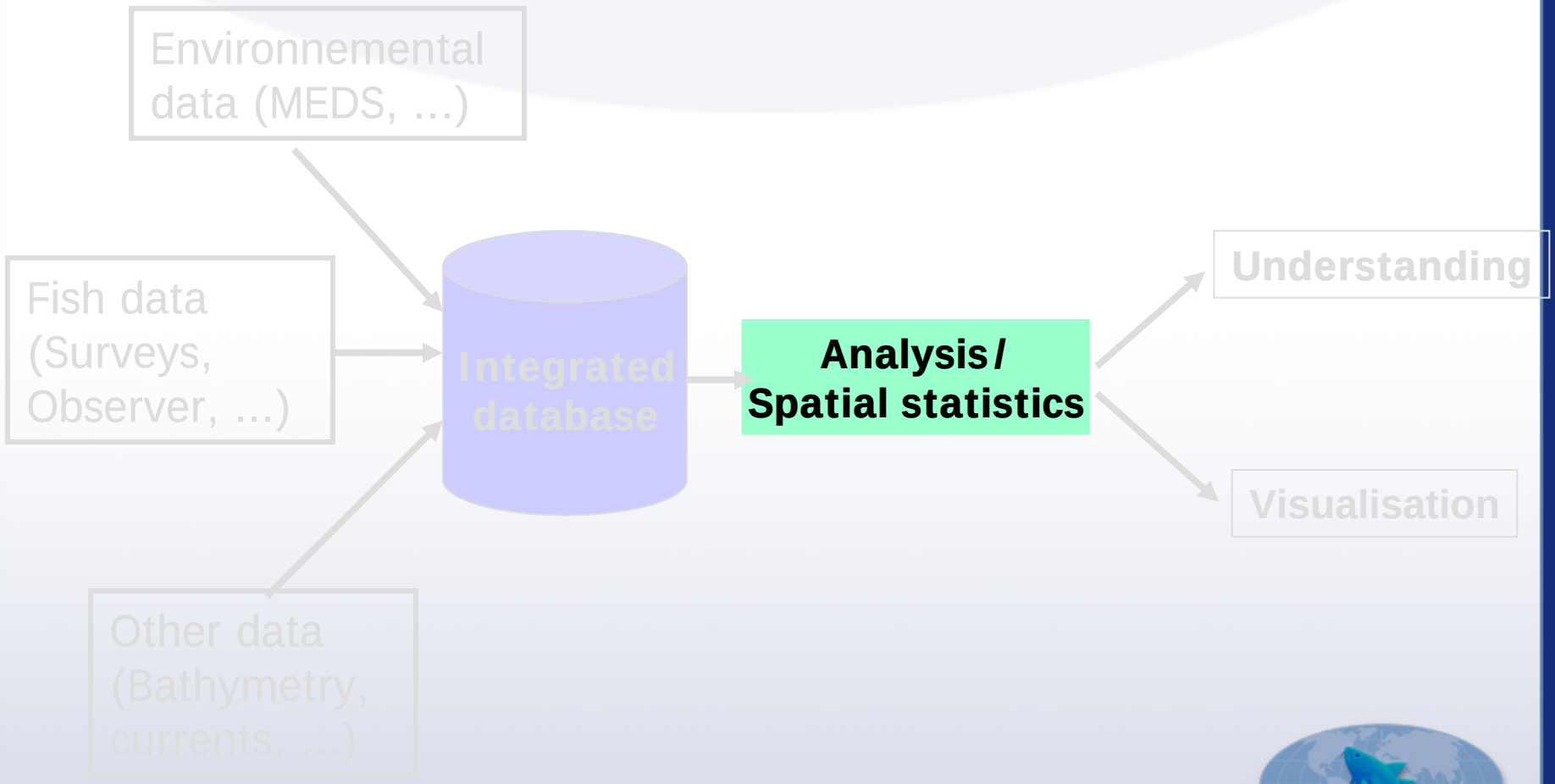
  GeoCod integrated database of fisheries data (Cod, Shrimp, Crab and Capelin)

Collection

Integration/ management

Analysis

Visualisation



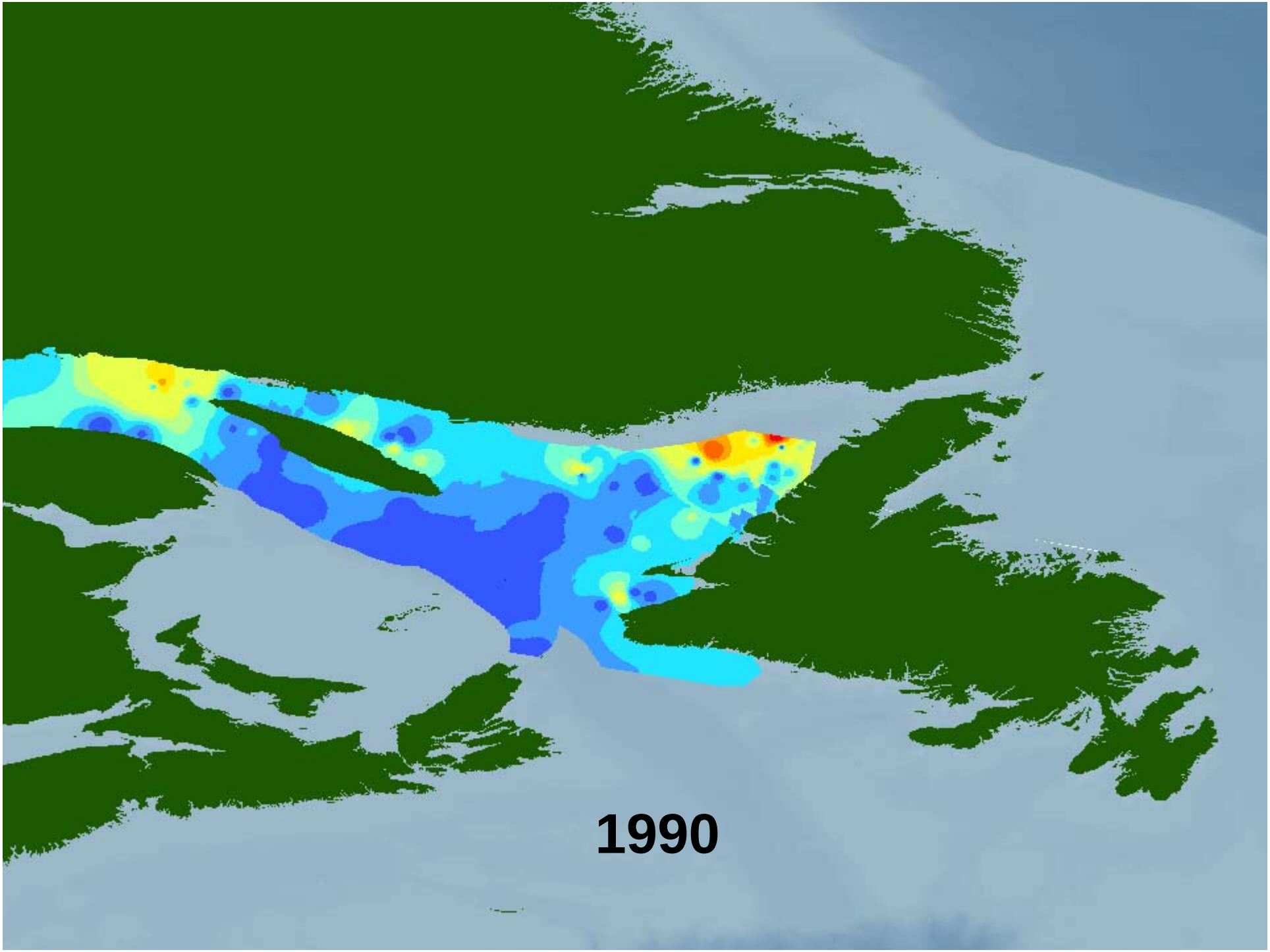
U. of Toronto + Marine Institute

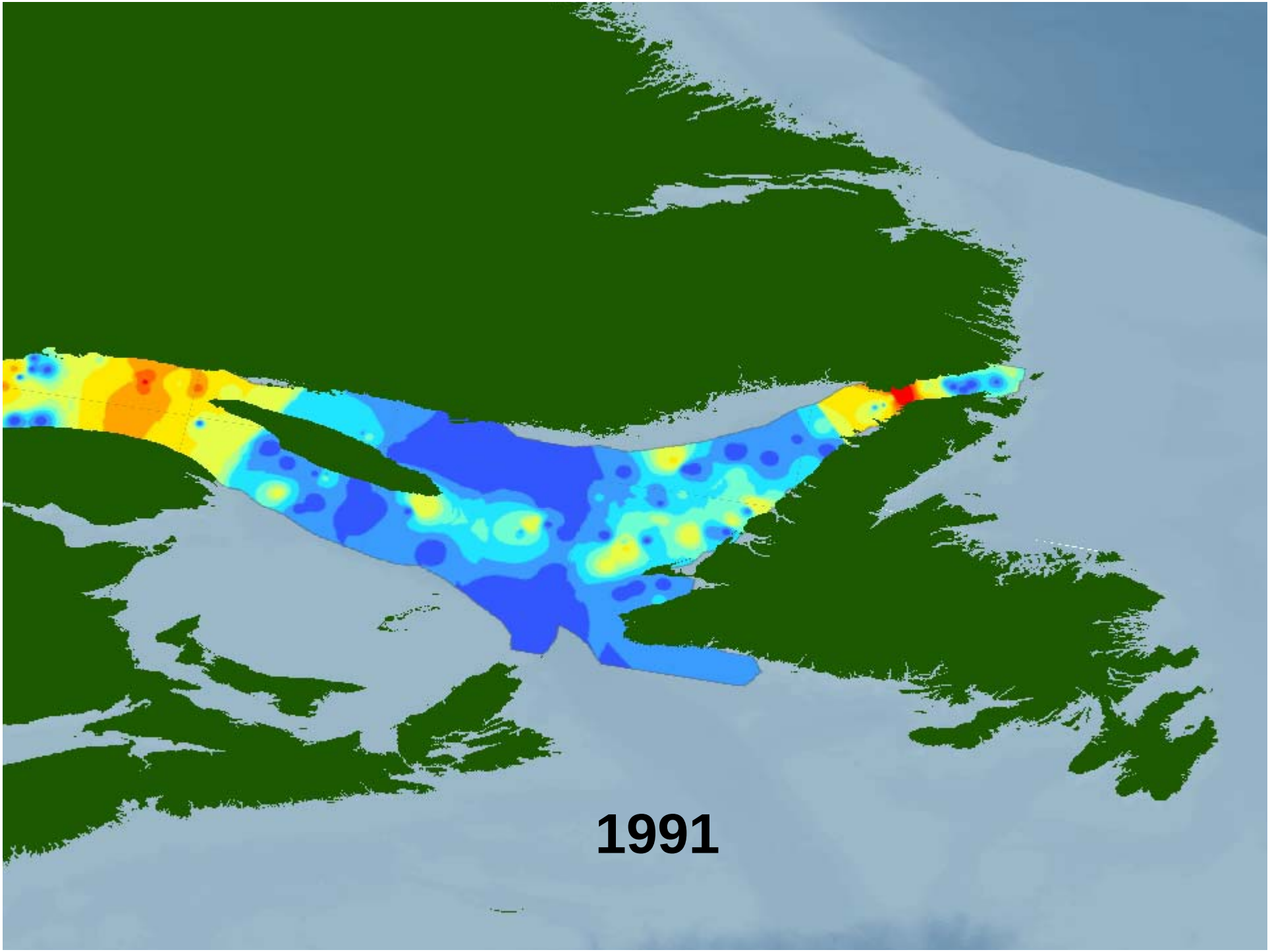
- 1:35-1:55 Randy McVeigh and Marie-Josée Fortin (Ecology and Evolutionary Biology, U. of Toronto)

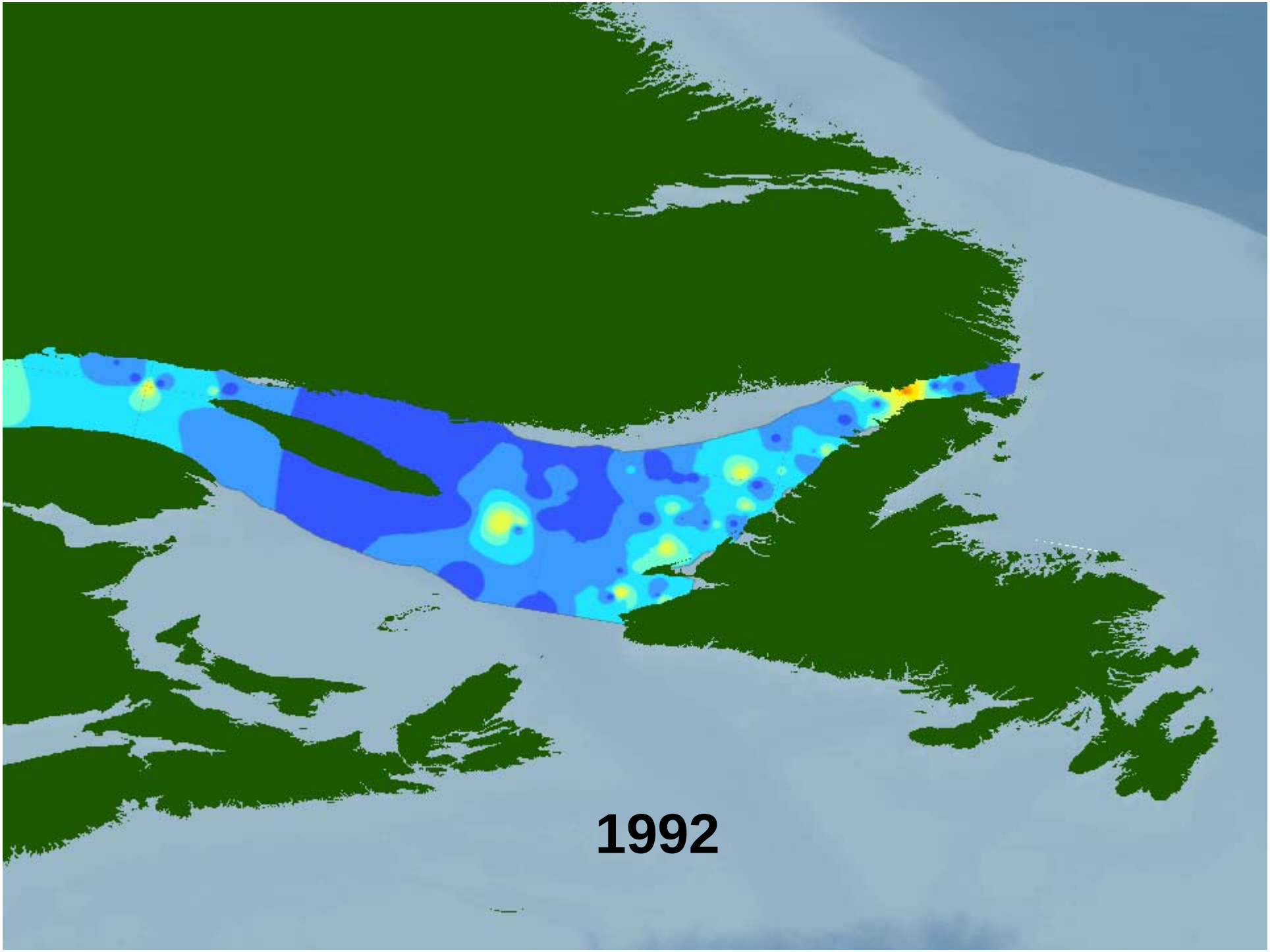
  Fisheries mapping and interpolation of catch data

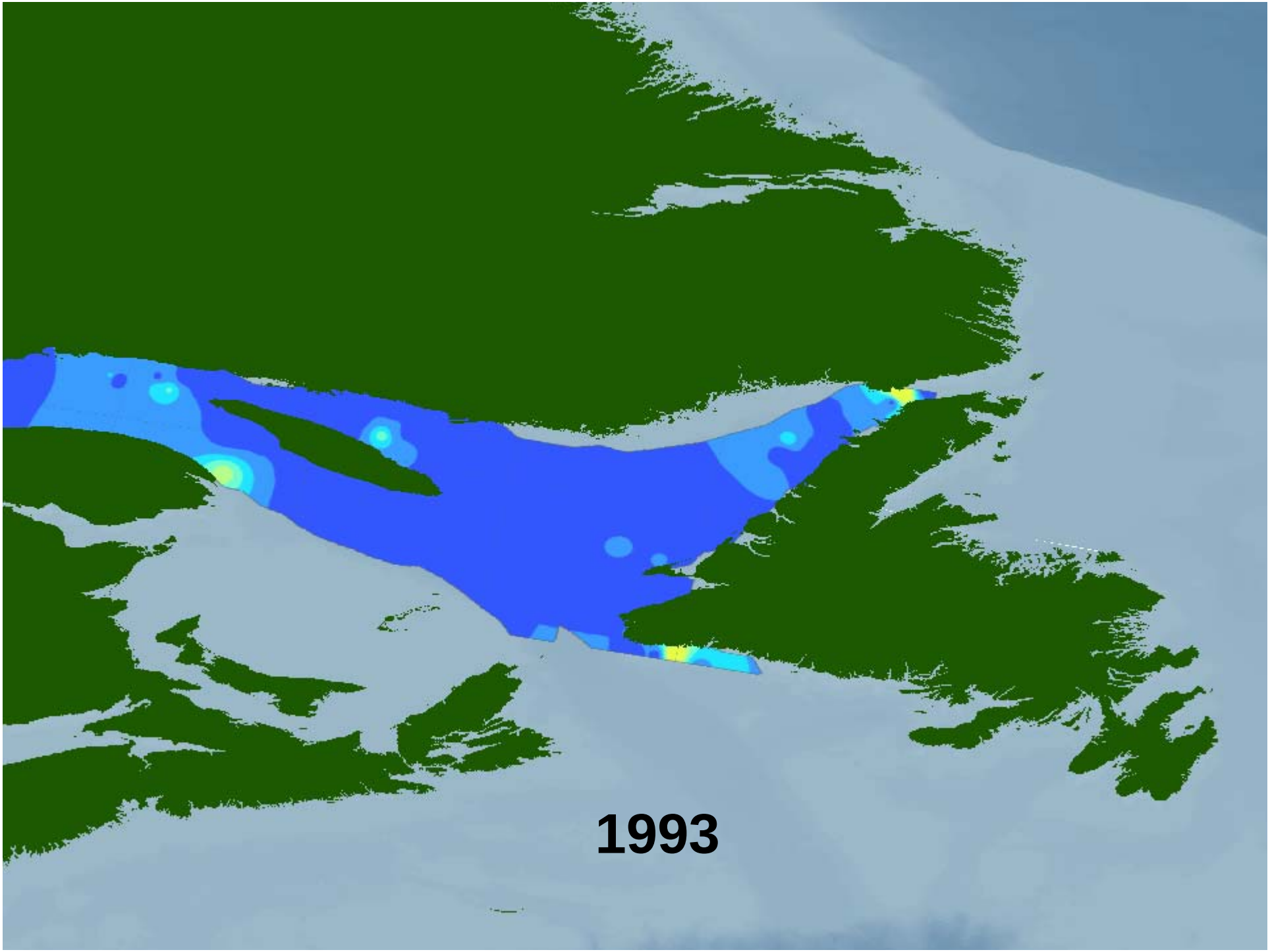
- 1:55-2:15 Jonathan Ruppert (Ecology and Evolutionary Biology, U. of Toronto)

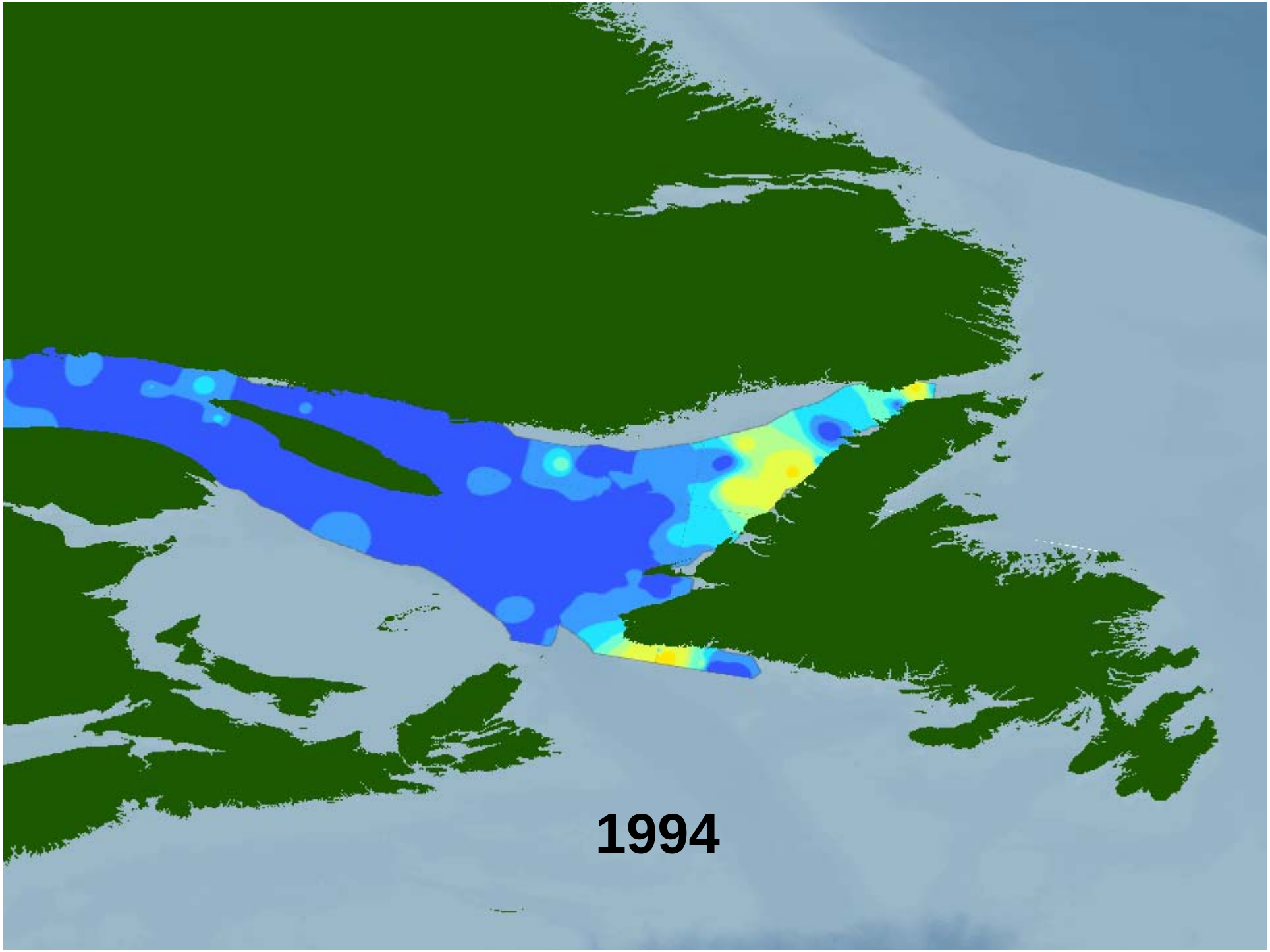
  Spatio-temporal analysis of Atlantic cod distribution in the Northern Gulf of St. Lawrence using CART

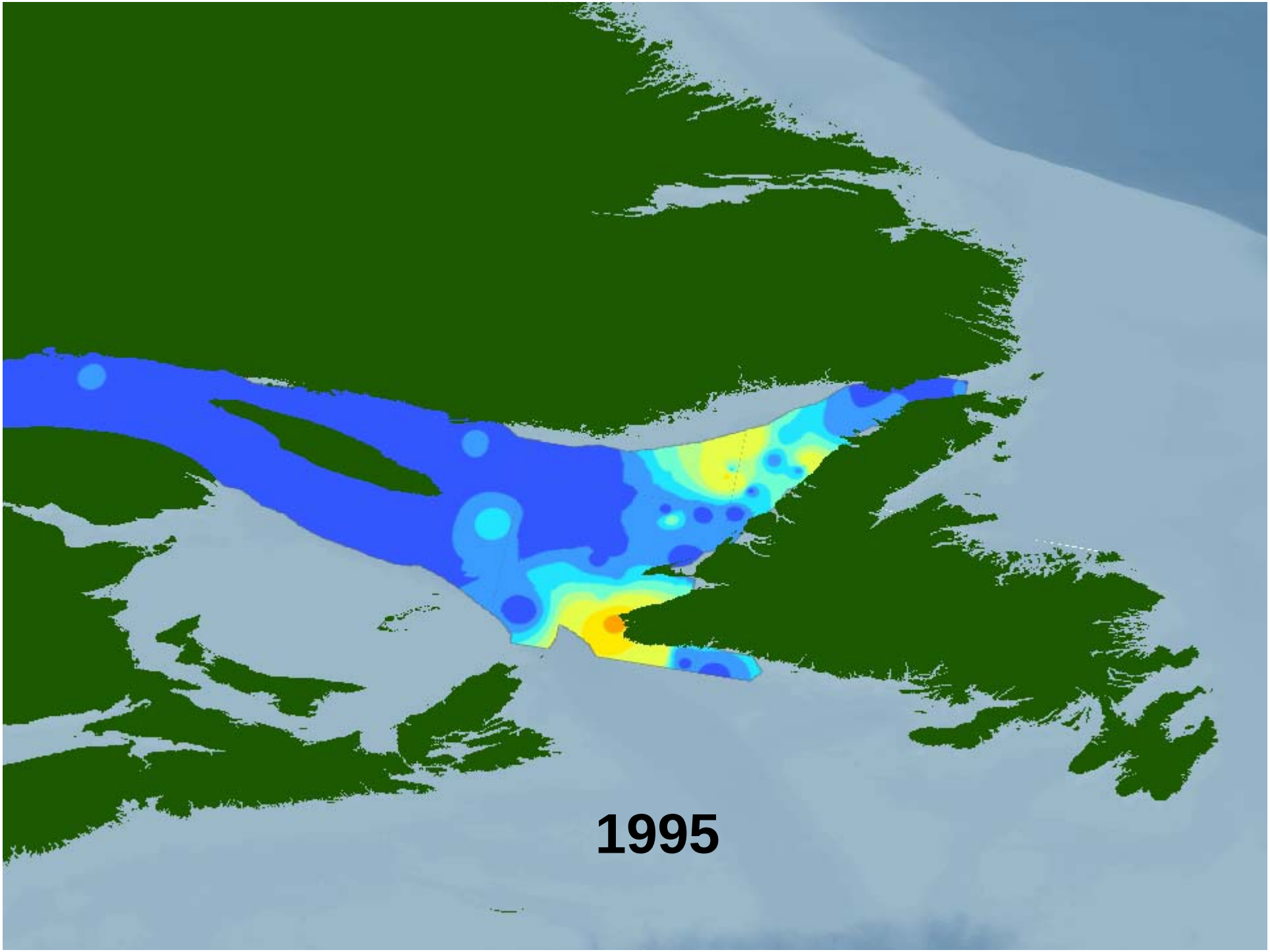

1990

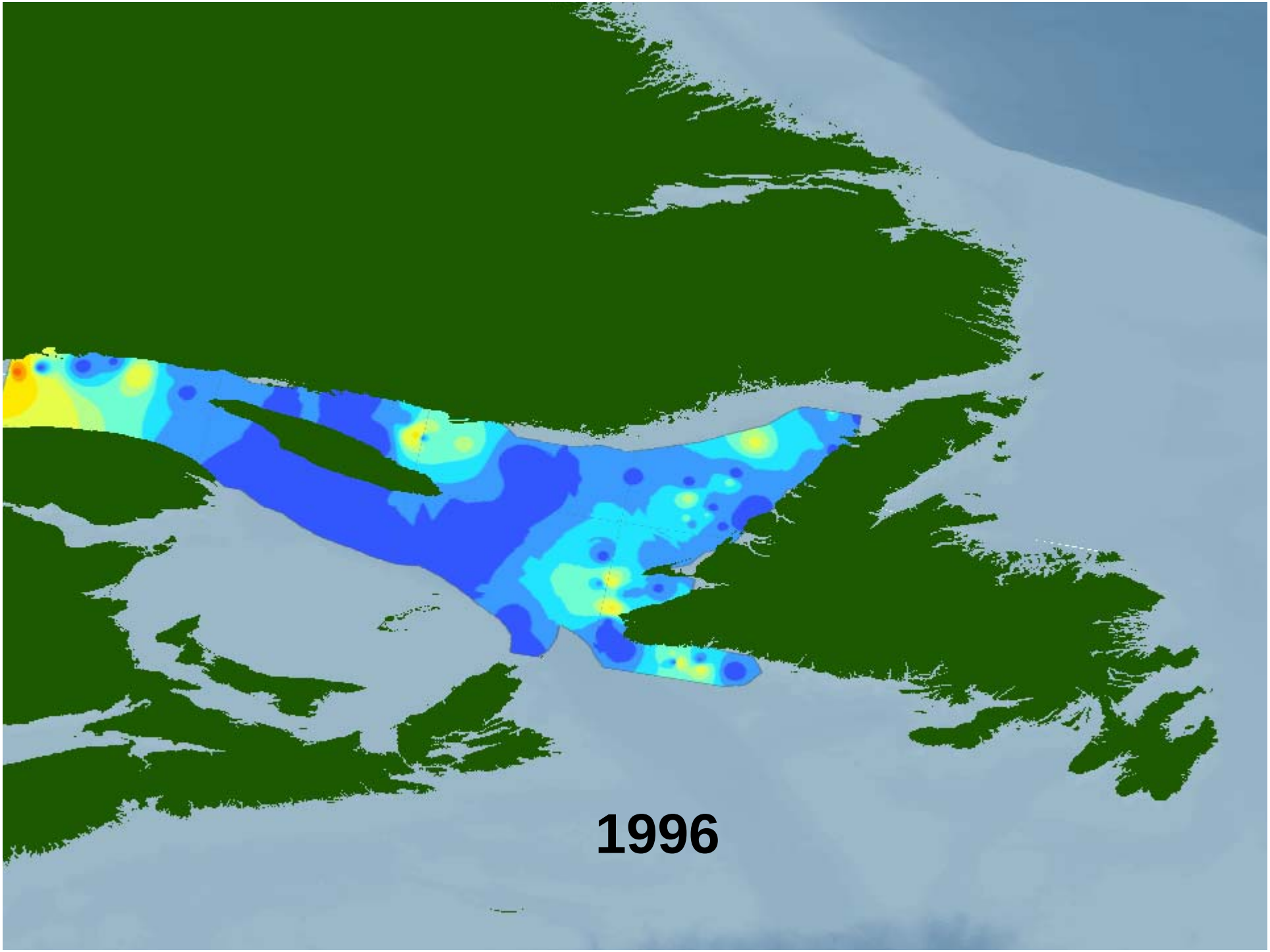

1991

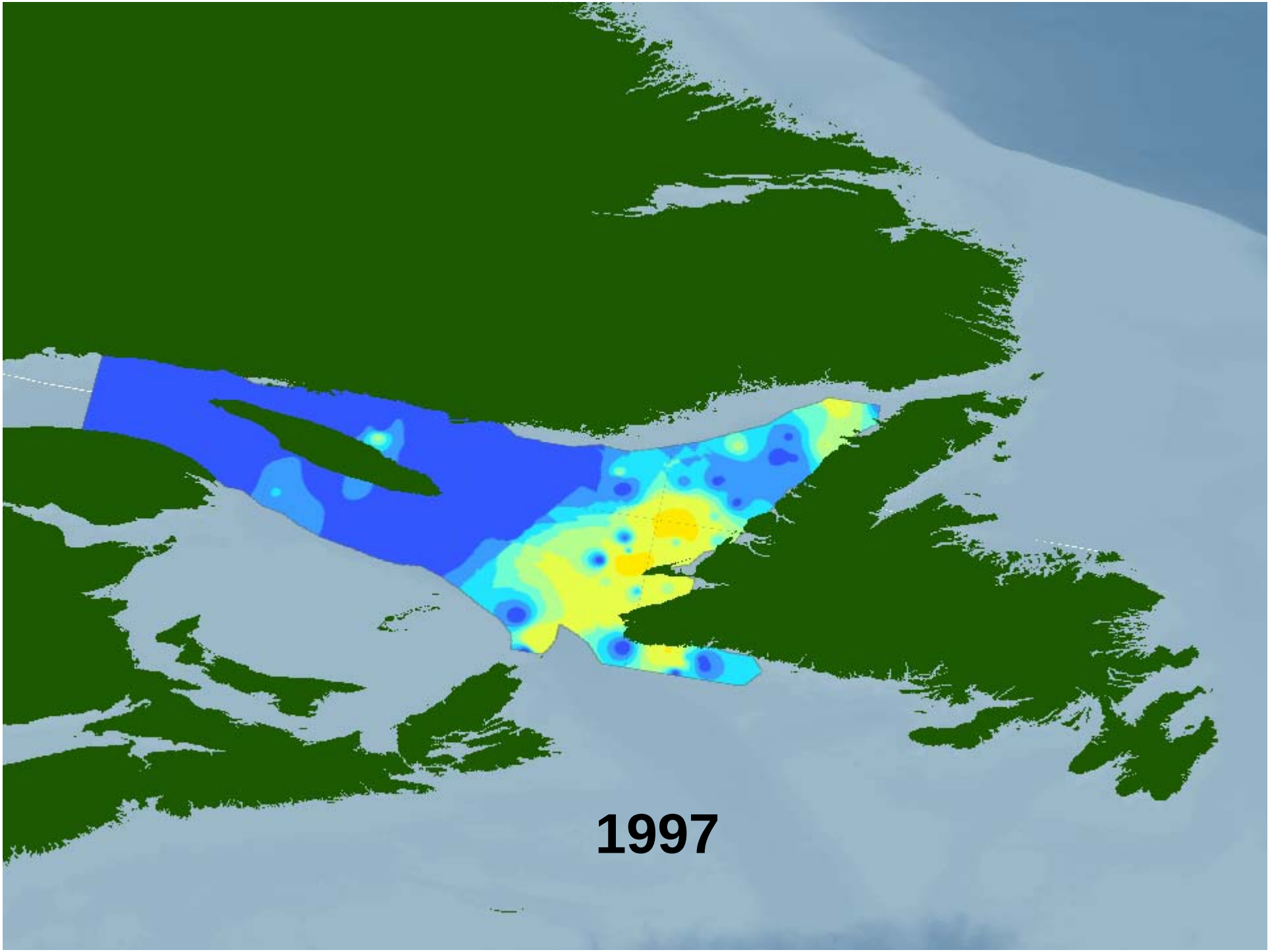

1992

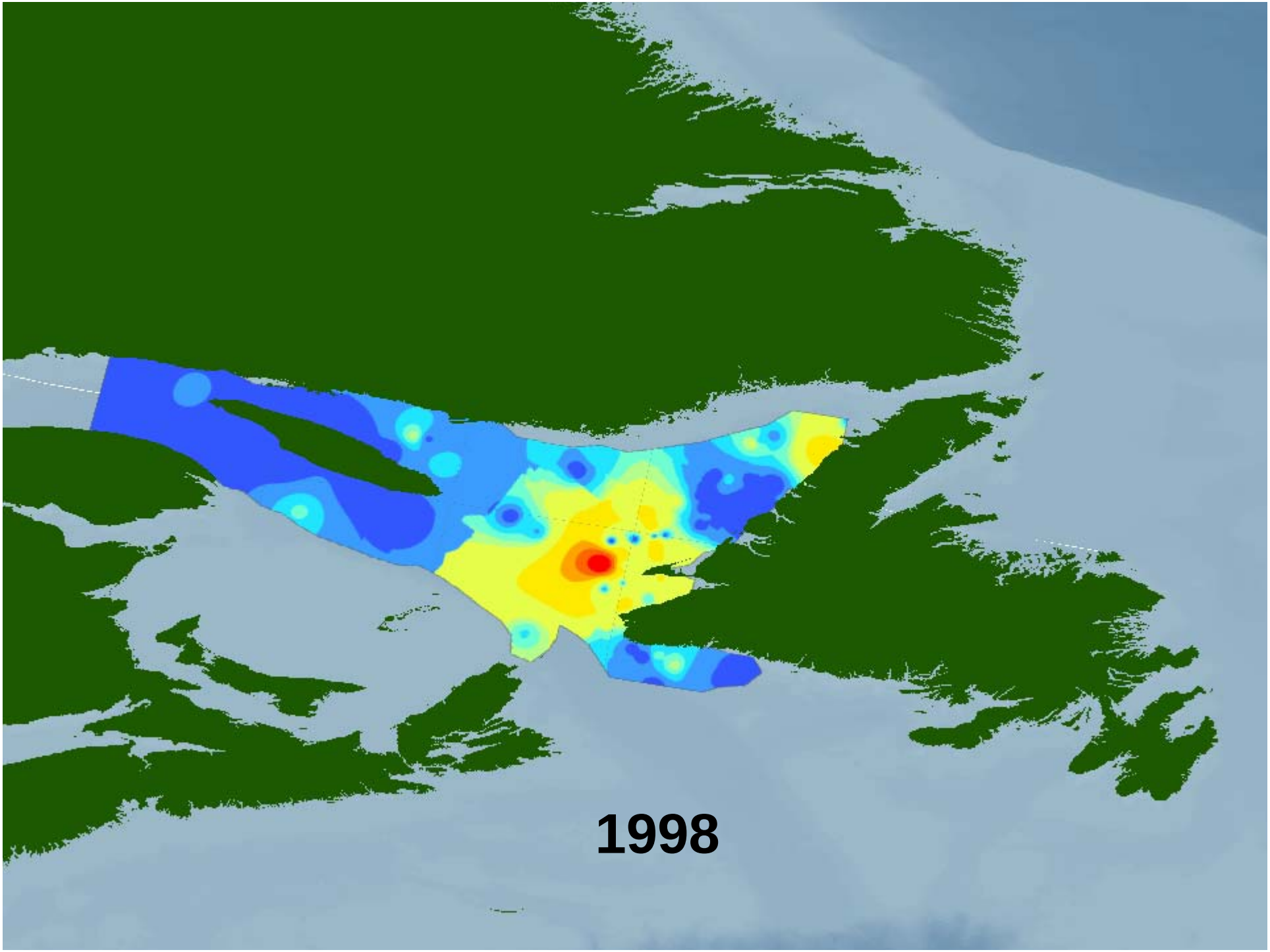

1993

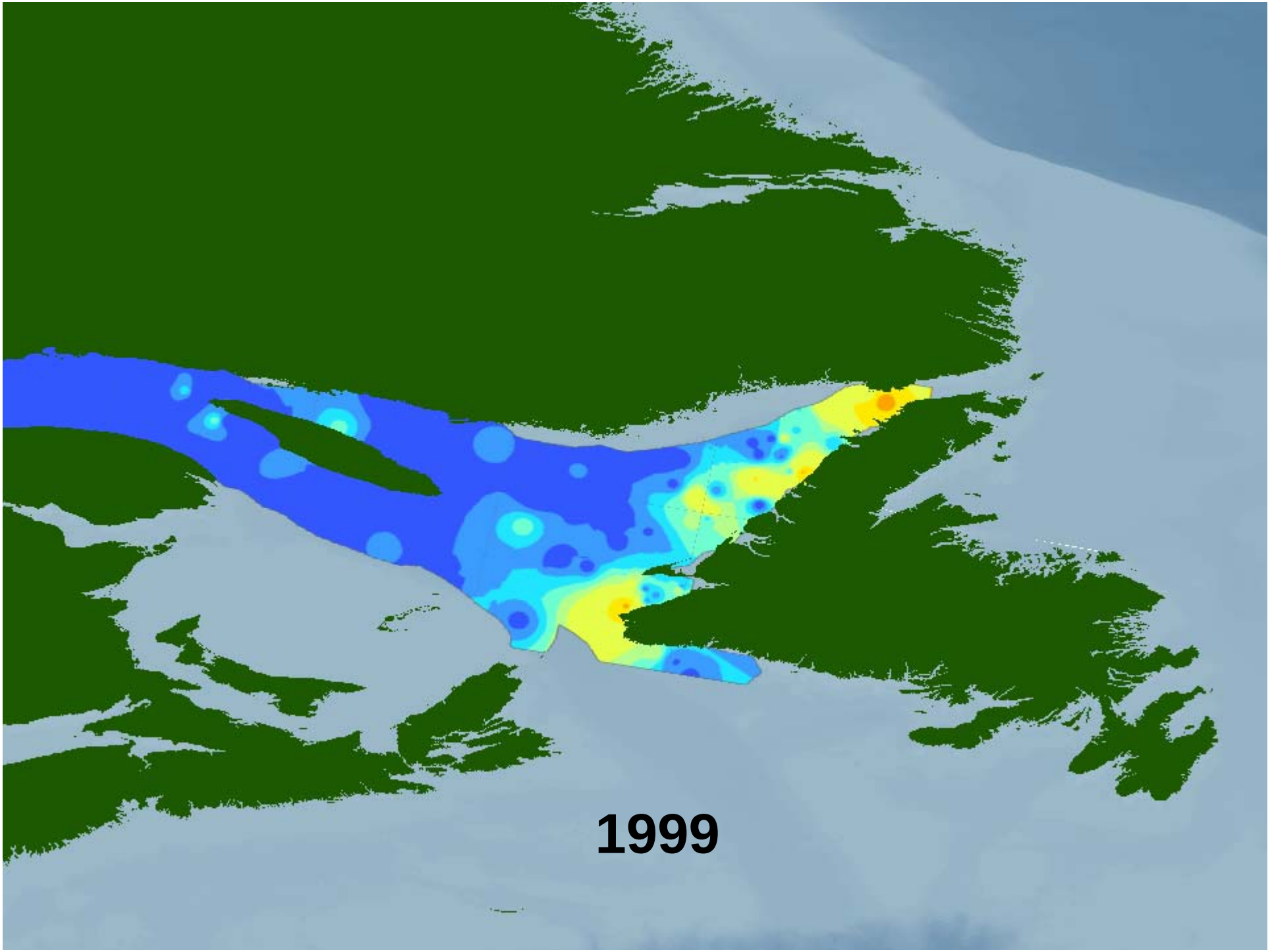

1994

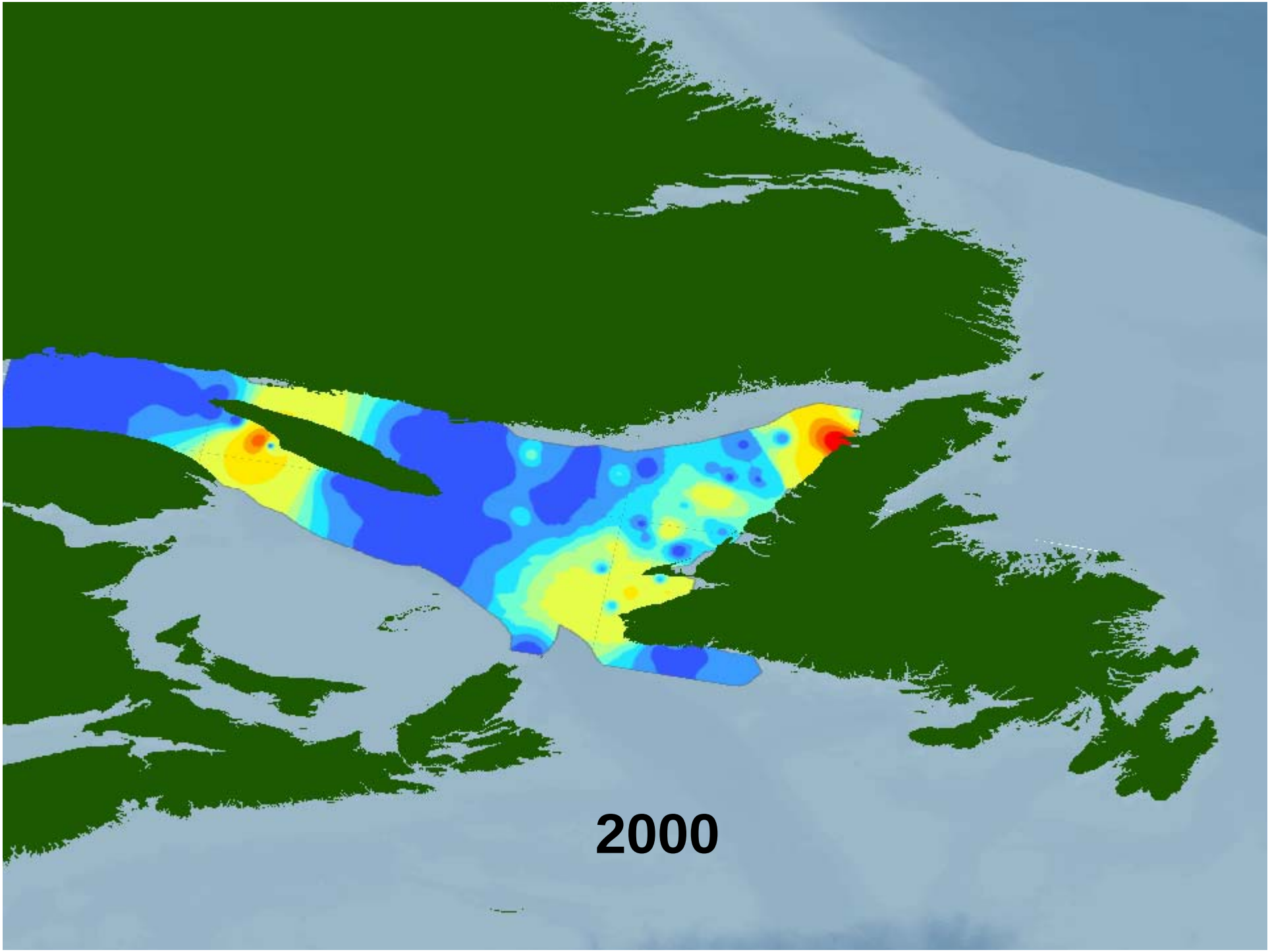

1995

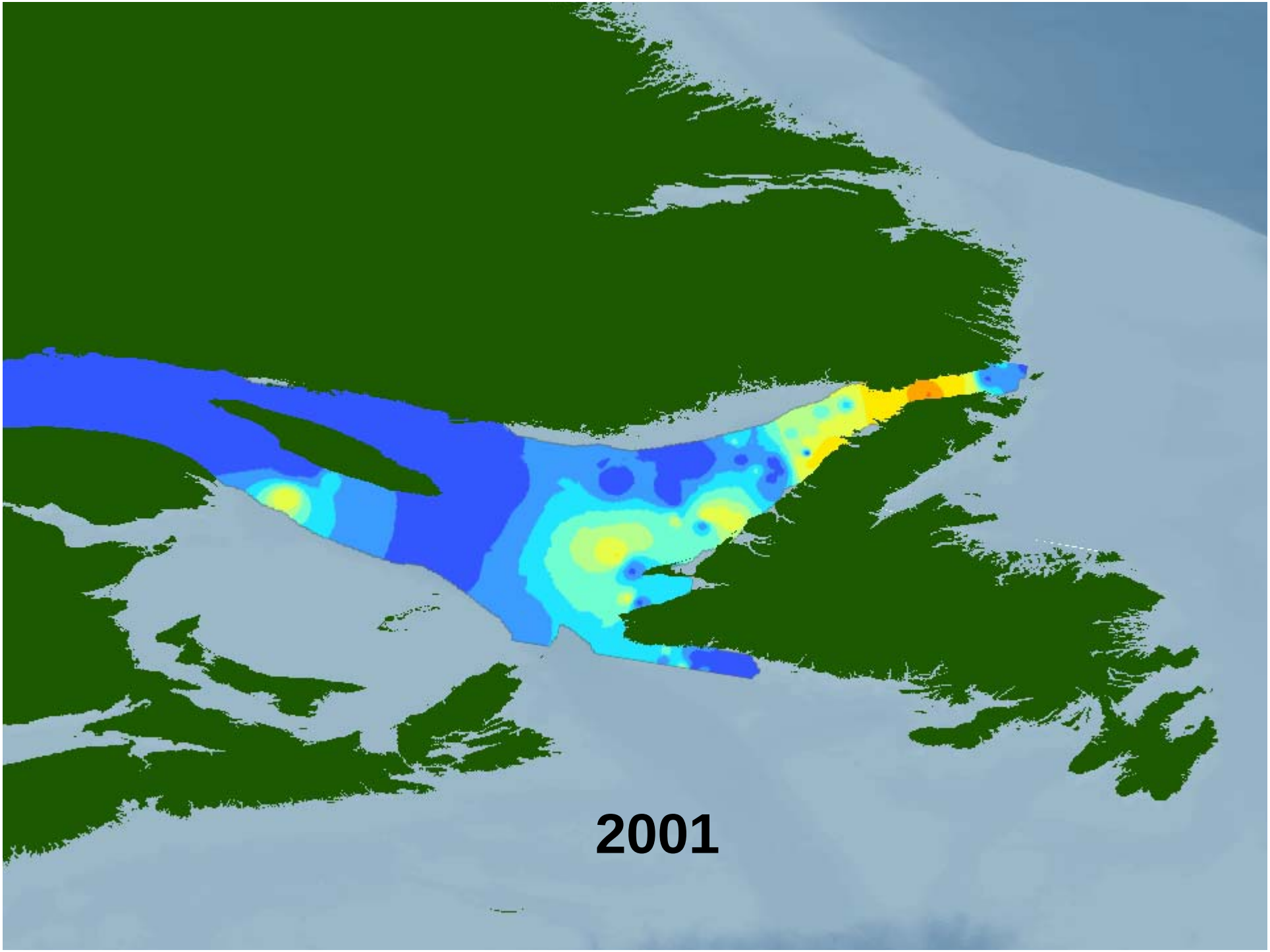

1996

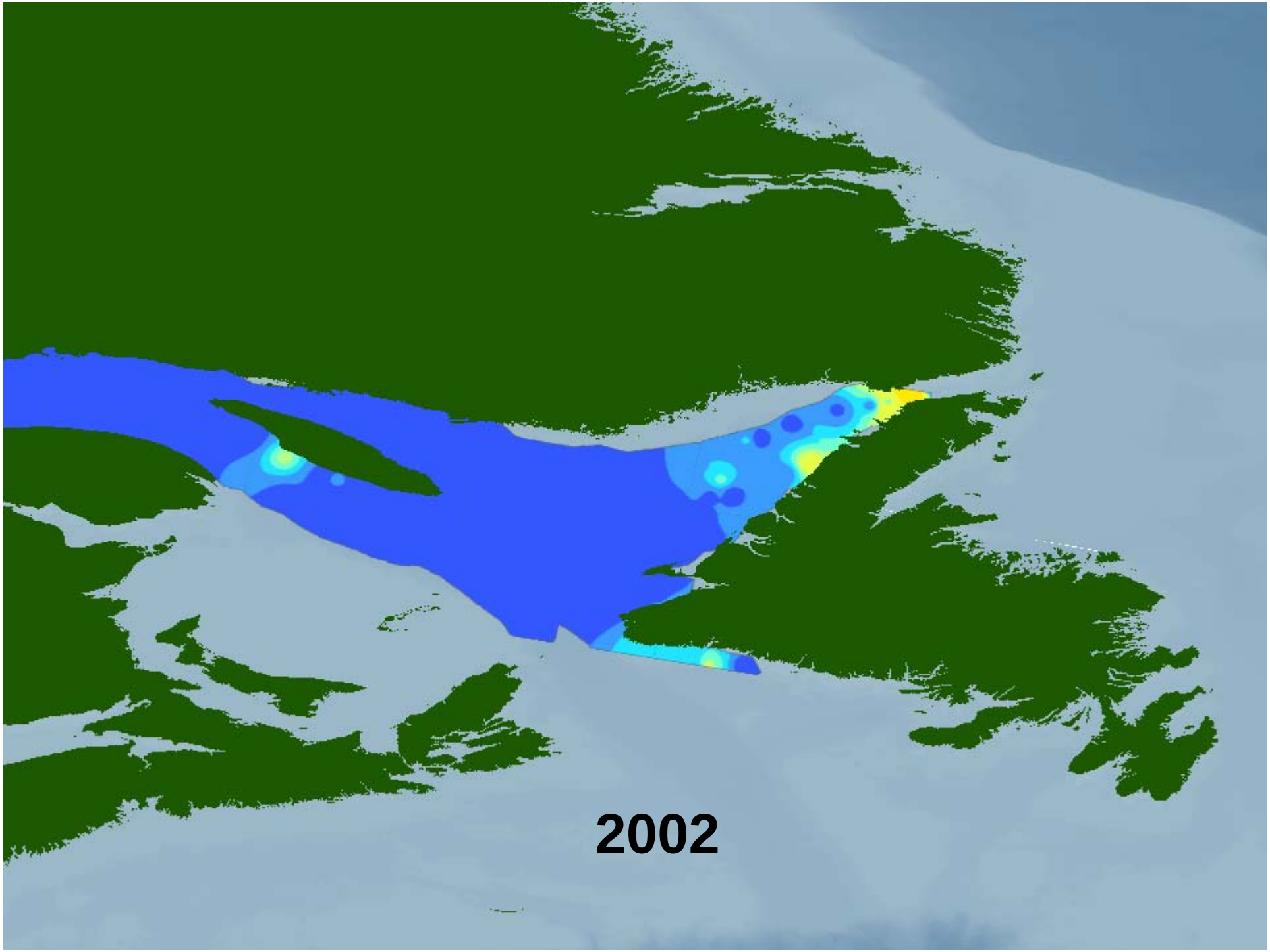

1997

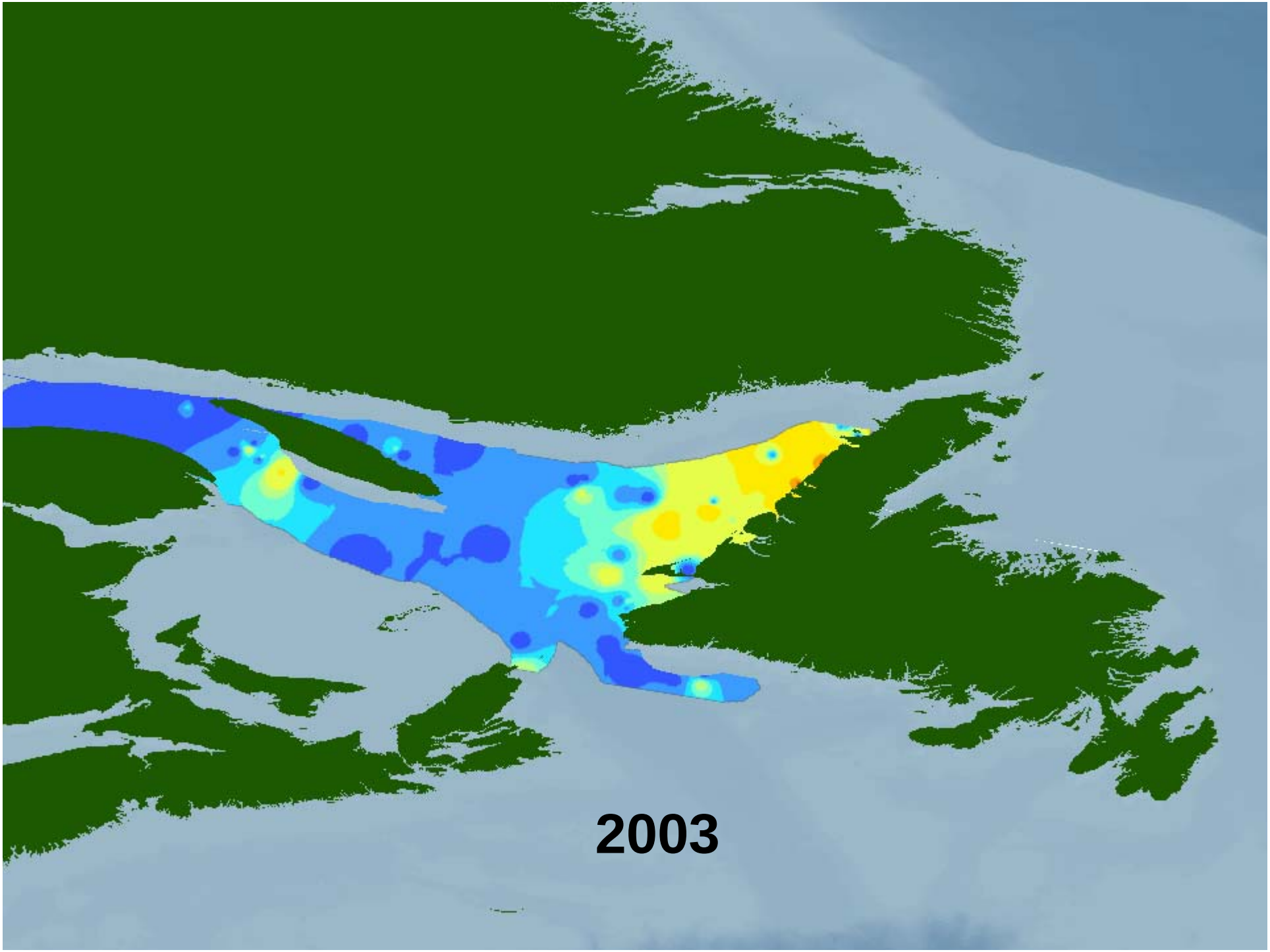

1998

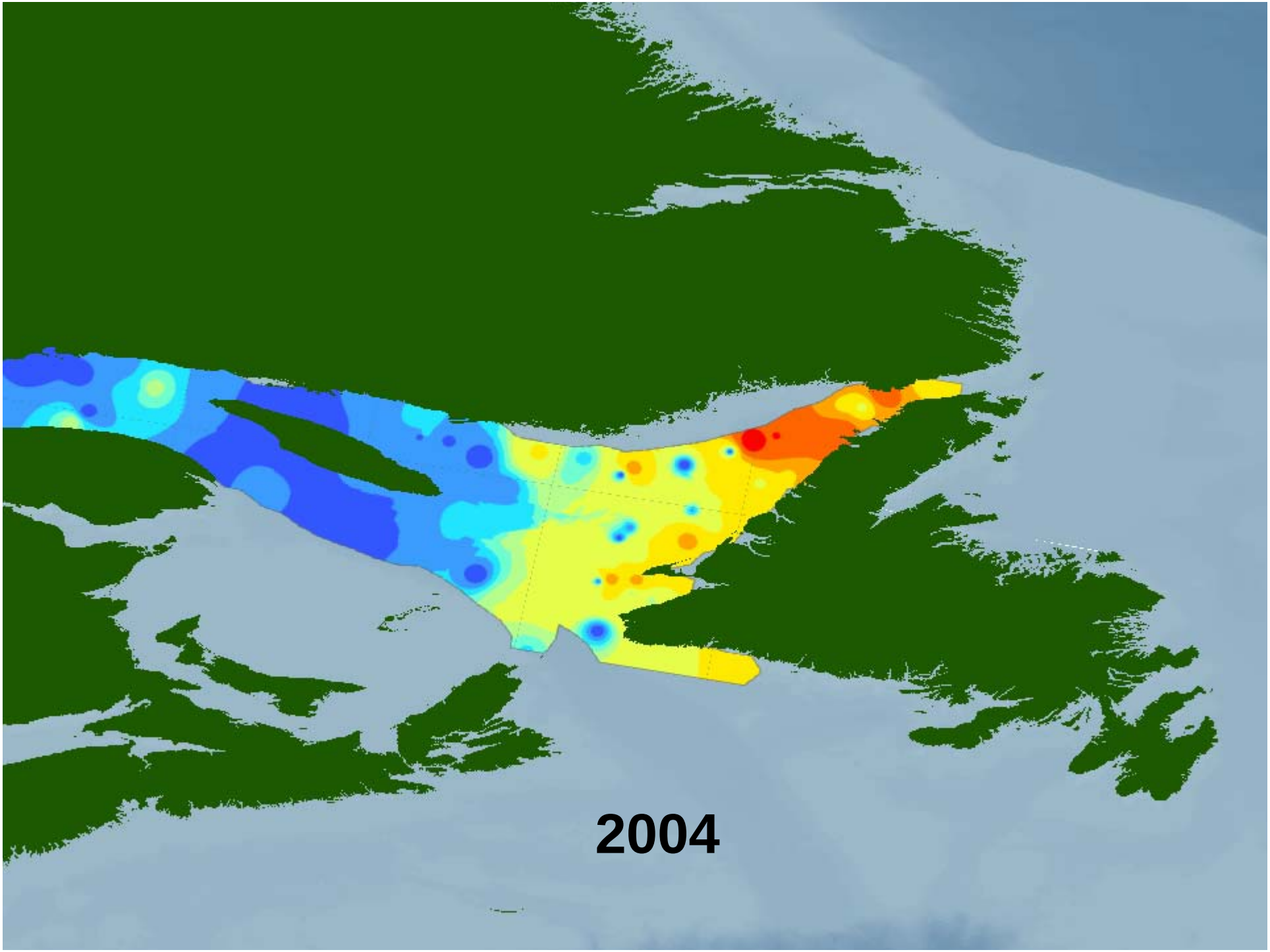

1999

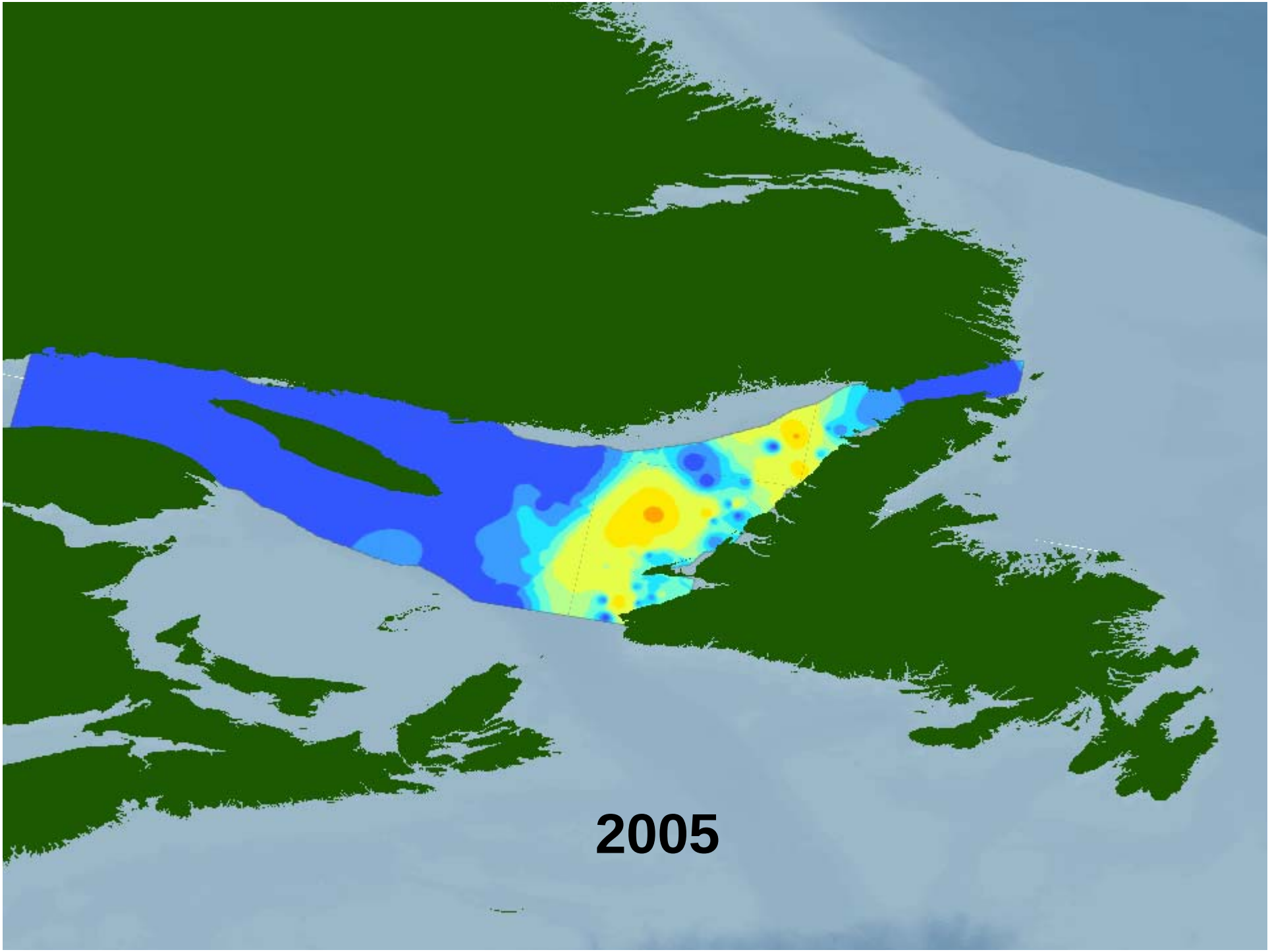

2000

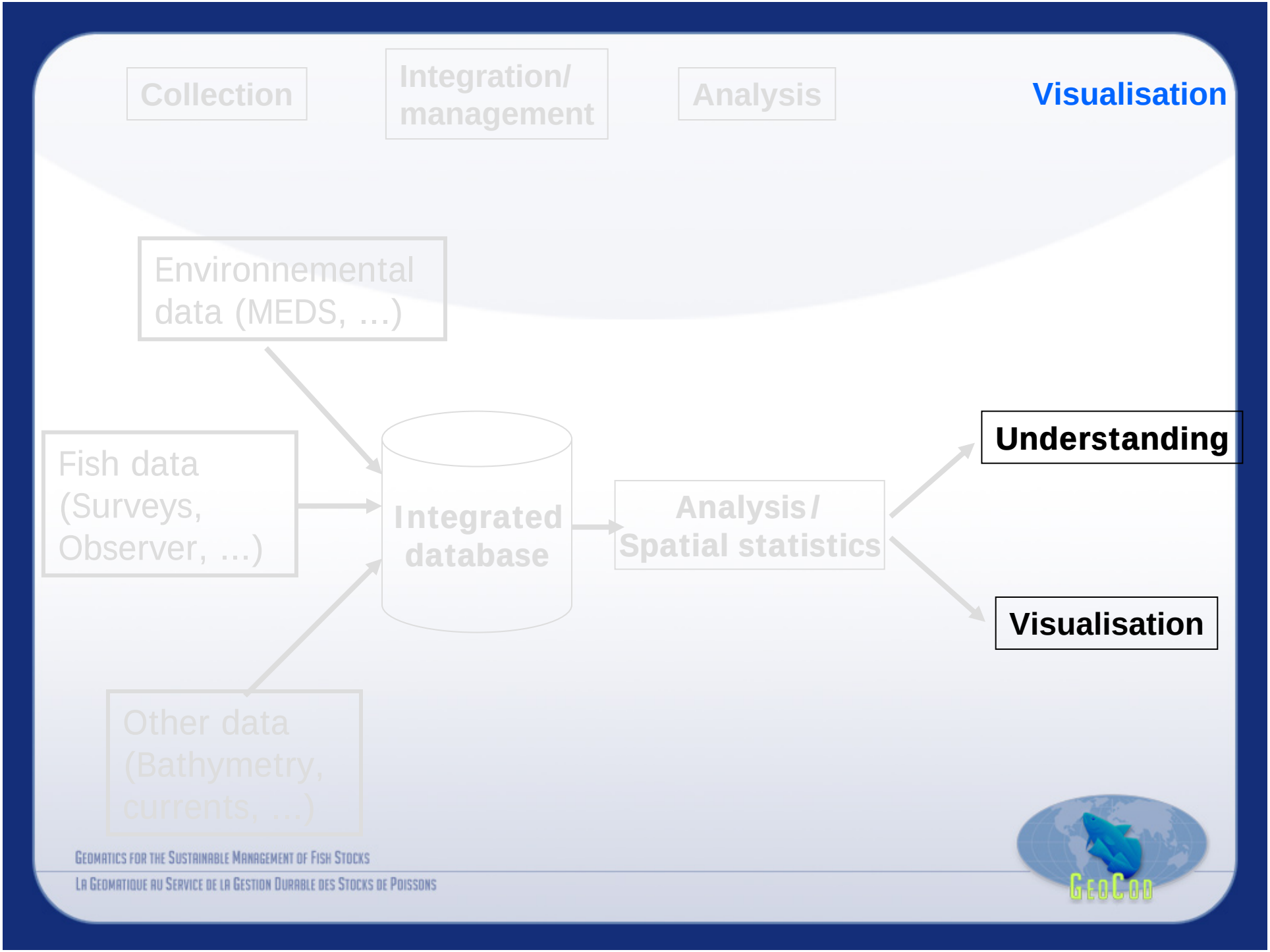

2001


2002


2003


2004


2005


Collection
Integration/ management
Analysis
Visualisation
Environnemental data (MEDS, …)
Fish data (Surveys, Observer, …)
Other data (Bathymetry, currents, …)
Integrated database
Analysis / Spatial statistics
Understanding
Visualisation
Geomatics for the Sustainable Management of Fish Stocks
La Geomatique au Service de la Gestion Durable des Stocks de Poissons
GeoCod

Laval + Memorial

- 2:15-2:35 Valérie Carette and Mir Abolfazl Mostafavi (Géomatique, U. Laval)

  Representation of fish aggregations and their spatio-temporal evolution according to the environmental parameters

- 2:35-2:55 Krista Jones and René Enguehard (Geography, MUN)

  GIS-based fisheries data visualization tool

Conclusions

- We want to get the big picture, a first cut
- Innovations:
  - Integration of data from different DFO regions +USA
  - Analyses of long time-series
  - Use of spatial statistics
- We want to qualify and/or quantify the effects of
  - Fishing activities
  - Climate changes (Temperature, Salinity)
  - Main trophic changes

  on cod, shrimp, crab and capelin abundances and distributions