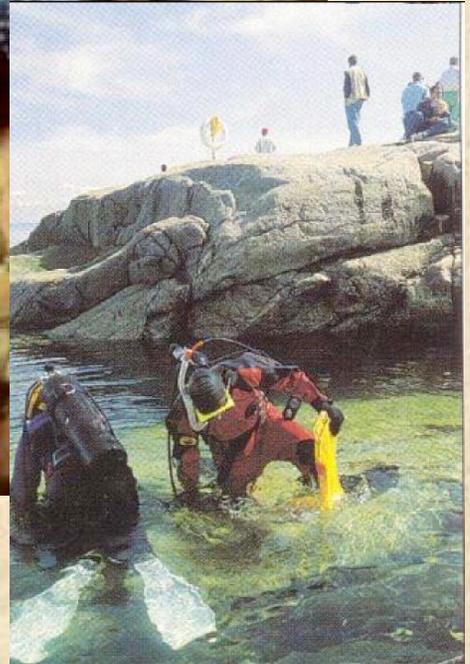


**EVALUATION OF MANAGEMENT
EFFECTIVENESS AT THE
SAGUENAY–ST. LAWRENCE
MARINE PARK, QUÉBEC, CANADA
-
A CASE STUDY**

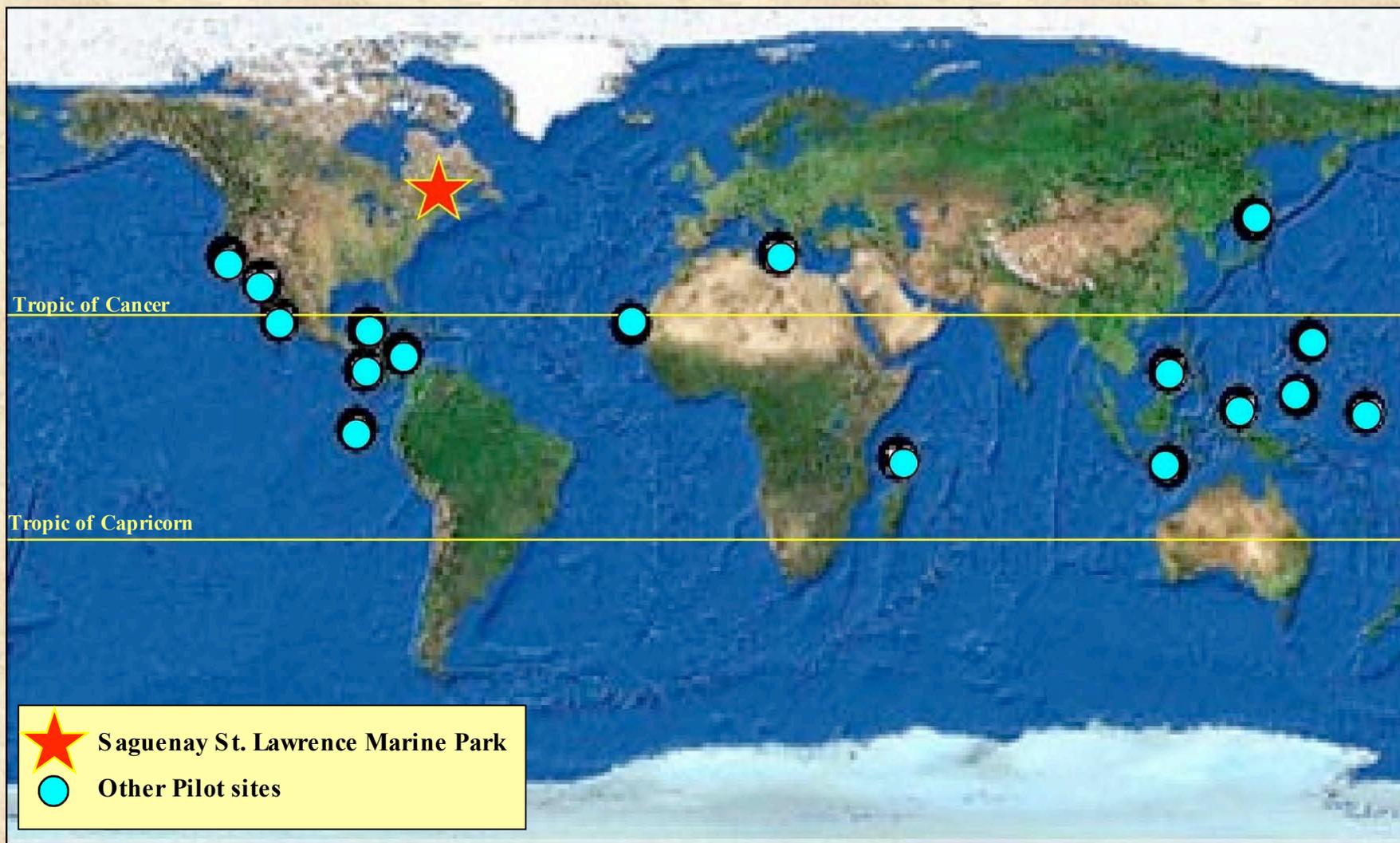
Sylvain Archambault¹ and Nelson Boisvert²

¹ Environmental consultant

² Parks Canada



Location of MEI Pilot sites



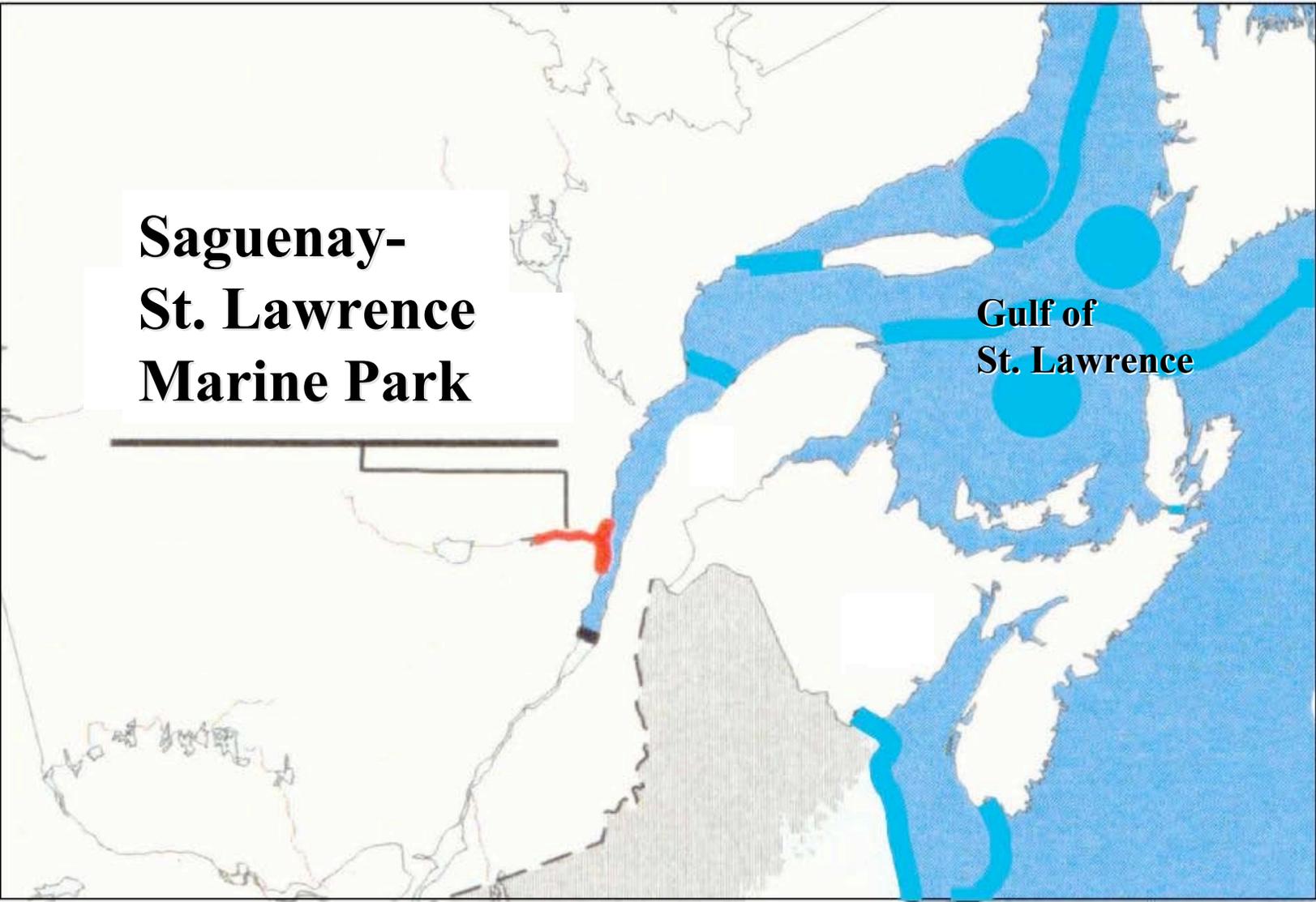
Adapted from MEI website

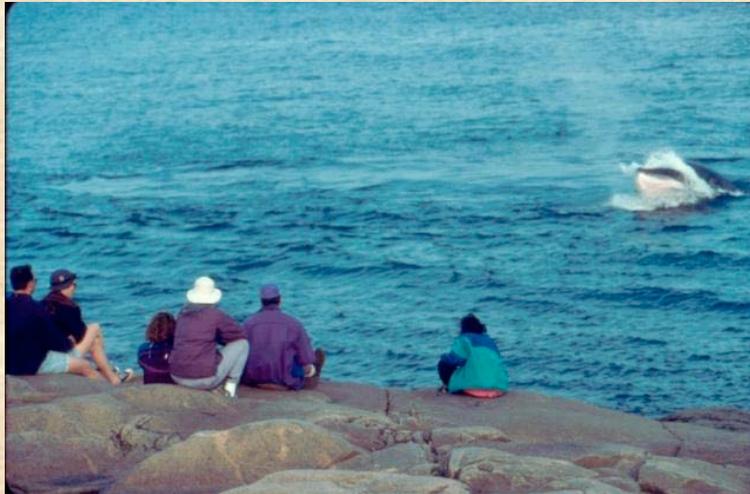
Objectives of pilot site study

- Formation of a work group (MPA managers and professionals)
- Review of MPA goals and objectives
- Selection of a number of indicators to monitor MPA
 - biophysical
 - socioeconomic
 - governance
- Development of an indicators measurement workplan
- Collection, analysis and reporting of data
- Review of draft Guidebook

**Saguenay-
St. Lawrence
Marine Park**

**Gulf of
St. Lawrence**





Source Nelson Boisvert

Whale watching activities

- Land-based observation
- Observation from watercrafts
- Observation from aircrafts



Source : Alain Dumas



Source Nelson Boisvert

Education and interpretation



Source Nelson Boisvert

Other tourist activities

- Recreational diving
- Kayaking
- Sailing
- etc.



Harvesting activities

Commercial

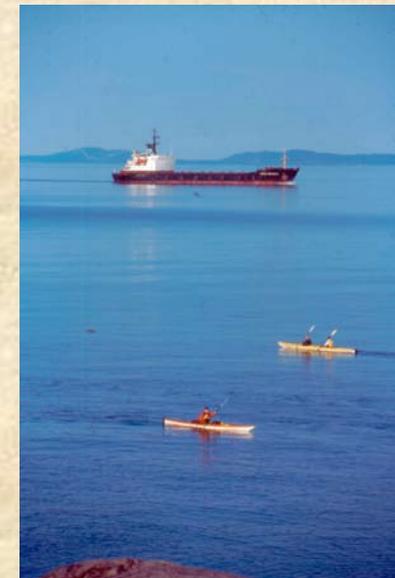
- Fisheries (shellfish, crab, halibut, etc.)
- Seal hunting

Recreational

- Recreational ice fishing
- Recreational open water fishing
- Migratory bird hunting

Other commercial activities

- Commercial shipping
- Ferryboats



Source Nelson Boisvert

Management structure

1990 : Agreement between federal and Québec governments

1998 : Legislation by **both** governments creating the Park

Co-management between the two governments

Co-Ordinating Committee (9 members)

Advisory committees

- Public relations, marketing
- Infrastructures
- Ecosystems management and research
- Education and interpretation

SSLMP - Management plan general objectives

•Conservation

Management of ecosystems and natural resources to insure preservation of park's marine ecosystems, underwater landscapes and cultural features

•Education and interpretation

Activities to complement conservation

•Scientific research

Better understanding of ecosystems to support conservation, management and education

•Land use for sustainable development

Manage resource harvesting and activities with a conservation approach

•Regional integration

Insure efficient partnerships with local communities and stakeholders

Indicators selection

Biophysical indicators (B)	Total number :	10
	Selected :	9
Socioeconomic indicators (S)	Total number :	16
	Selected :	6
Governance indicators (G)	Total number :	16
	Selected :	6
Total number selected :		21

Indicator B1 : Focal species abundance



Source Parcs Canada

Main focal species monitored

- Beluga whale population estimation by aerial survey

Methodology : Gosselin *et al.* (2001)

Partnership : Dept. Fisheries and Oceans

Monitoring periodicity : 3 years

Other focal species monitored :

- Non-resident whale survey (indirect estimation)
- Barrow's Goldeneye aerial inventory

Indicator B2 : Focal species population structure

- Beluga whale population estimation (aerial survey)
- Discrimination of age group
 - 1-2 years old (*dark grey*)
 - 3-4 years old (*pale grey*)
 - Adult (*white*)



Source Alain Dumas

Methodology : Based on Gosselin *et al.* (2001)

Partnership : Dept. Fisheries and Oceans

Monitoring periodicity : 3 years

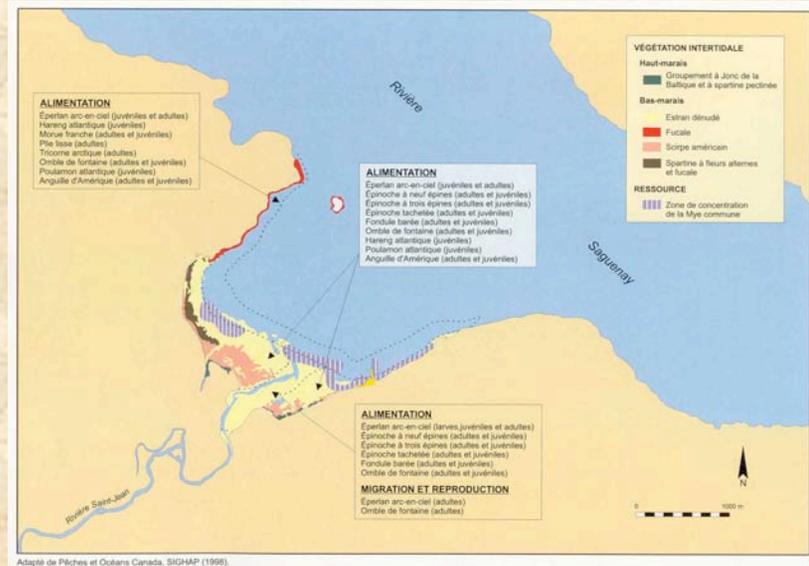
Indicator B3 : Habitat structure and complexity

SIGHAP GIS System

- Important habitats
- Main species distribution
- Species life cycle

Various monitoring activities already tested or planned

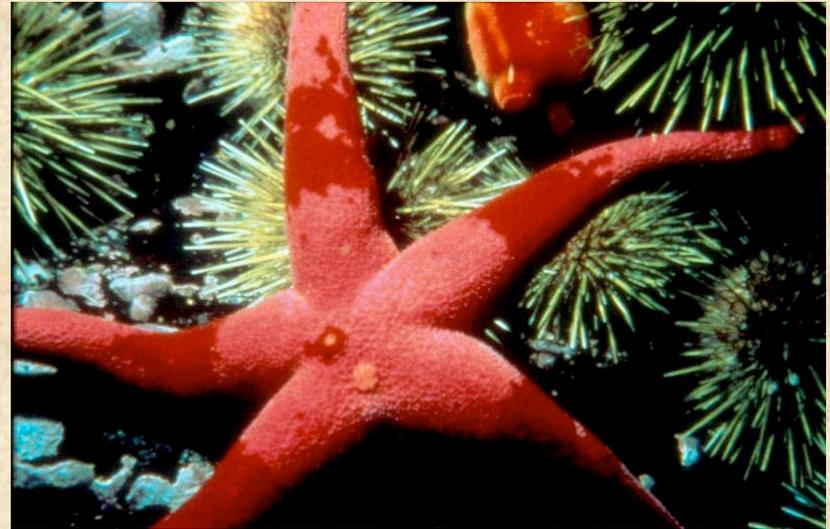
- Shore artificialization monitoring (Environnement Québec)
- Satellite imagery of coastal habitats
- Pelagic habitats monitoring (Parks Canada)



Source SIGHAP

Indicator B4 : Composition and structure of community

- Restricted to the epibenthic communities of « Les Escoumins » diving sites
- Description of community
- Impact of diving on community (composition, structure)



Source Parcs Canada

Methodology : Archambault *et al.* (1998)

Partnership : Dept. Fisheries and Oceans

Monitoring periodicity : 2-3 years ?

Indicator B6 : Food web integrity



Source J.-F. St-Pierre

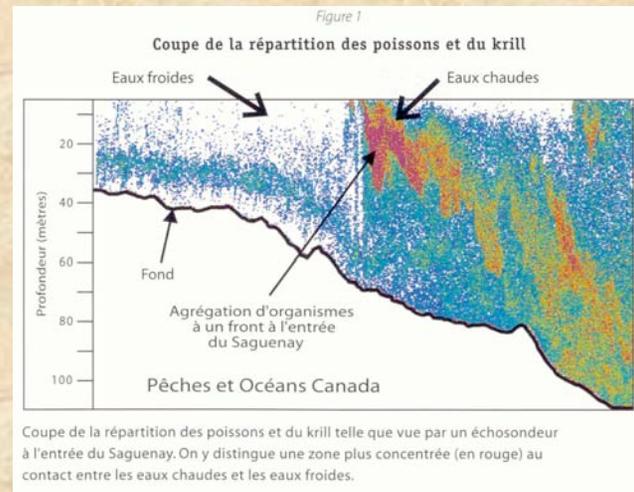
Study of main food web of SSLMP :

- Phytoplankton
- Copepods, krill
- Pelagic fishes (smelt, capelin, herring, etc.)
- Beluga and non-resident whales

Methodology : Harvey *et al.* (2002), Ménard (1998), Gosselin *et al.* (2001)

Partnership : Dept. Fisheries and Oceans, SSLMP

Monitoring periodicity : yearly to 3 years



Indicator B8. Water quality

Monitoring of environmental contamination :

- Necropsies of beached beluga whales (DFO, SSLMP, St-Hyacinthe school of veterinary medicine)
- Shellfish water contamination (Environment Canada)



Source J.-F. St-Pierre

Methodology : Martineau *et al.* (2002), DFO (1992)

Partnership : Dept. Fisheries and Oceans,
Environment Canada, SSLMP

Monitoring periodicity : yearly

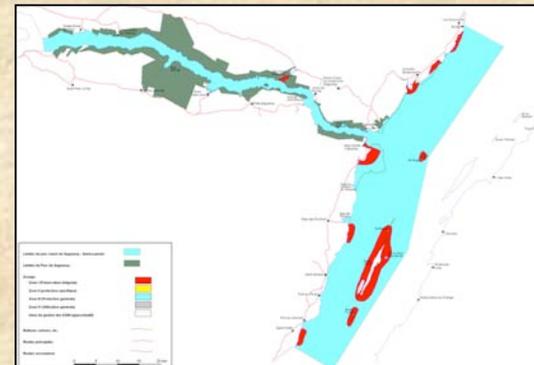
Indicator B9. Area under no or reduced human impact

Updating of no-take zones :

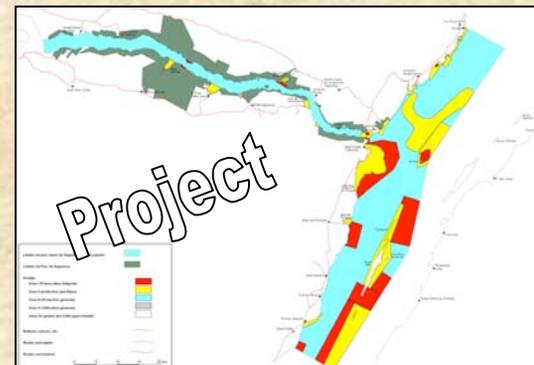
- Strict reserve zones (no-human activities)
- No recreational or commercial harvesting
- No commercial harvesting

Public consultation

Management plan



1995



2006 ?

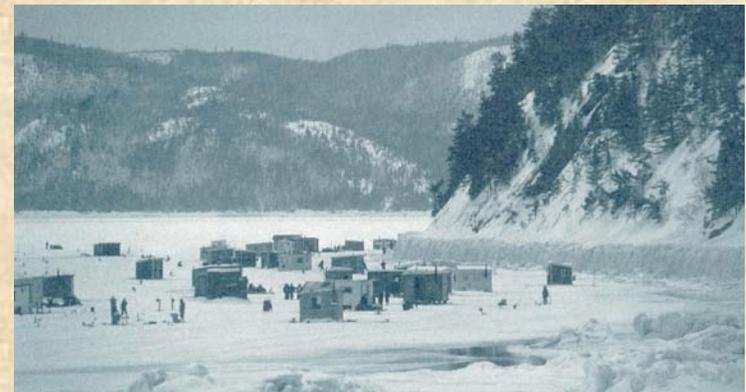
Indicator B7. Type, level, and return on fishing effort

Recreational ice fishing monitoring

Methodology : Lambert and Bérubé (2002)

Partnership : Dept. Fisheries and Oceans, FAPAQ, SSLMP, Alcan, fisher ass., Tourist ass.

Monitoring periodicity : yearly



Source Nelson Boisvert

Other recreational fishing monitoring :

- Saguenay summer recreational fishing
- Estuary summer recreationnal fishing

Indicator S5. Perception of local resource harvest

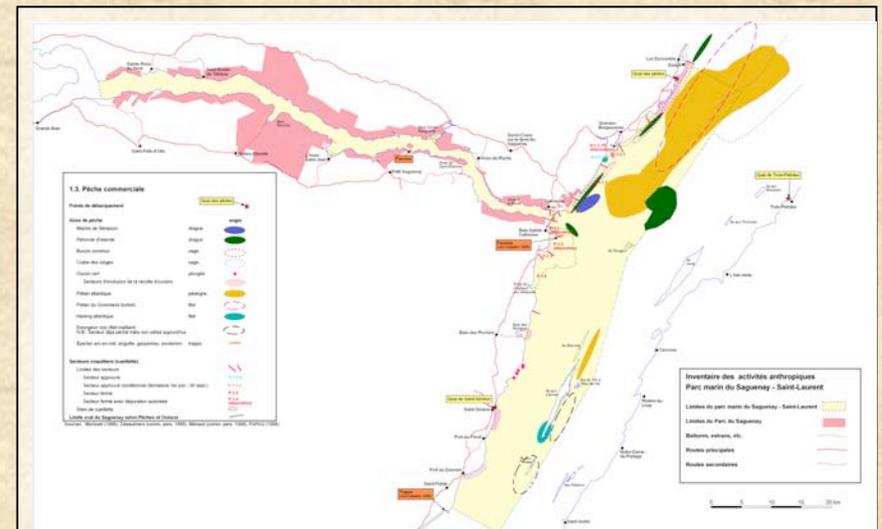
Yearly survey of ice fisher perception

Indicator S1. Local marine resource use patterns

Description and spatial distribution of all human activities

- Commercial harvesting
- Recreational harvesting
- Touristic activities
- Other commercial activities

Integration to SIGHAP GIS system



Source Archambault (1998)

Methodology : study by Archambault (1998)

Staff : SSLMP

Monitoring periodicity : 5 years

**Indicators potentially measured
using a comprehensive visitors survey**

Indicator S3. Level of understanding of human impacts on resources

Indicator S14. Distribution of formal knowledge to community

Indicator G4. Local understanding of MPA rules and regulations

Indicator G16. Degree of information dissemination to encourage stakeholder compliance

Various socioeconomic indicators target users or local communities.

Focus will be put on most numerous type of visitors :

Whalewatching cruises clients

large ships
small boats
zodiacs

Comprehensive survey :

- Profile of visitors
- Expectations
- Satisfaction with park experience
- Various indicators...



Source Alain Dumas

Methodology : Giroul *et al.* (2000)

Partnership : Univ. Québec à Trois-Rivières, SSLMP

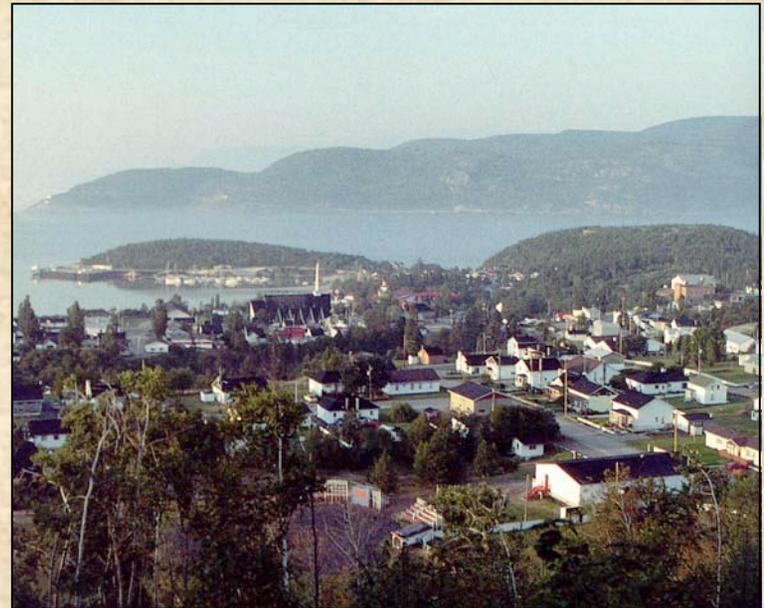
Monitoring periodicity : 5 years ?

Indicator S11. Community infrastructure and business

Study limited to towns modified by tourism (Tadoussac, etc.)

- Municipal infrastructures
- Tourist infrastructures
- Land-use modification study

Inventory of all municipal waste water treatments plants



Source : Alain Dumas

Methodology : based on study by Poulin (2002)

Staff : SSLMP

Monitoring periodicity : 5 years

Indicator S16. Changes in conditions of ancestral and historical sites, features, and/or monuments

Inventory of sites

Reporting on physical condition of sites, monuments, etc.

- Land-based sites
- Underwater sites (wrecks, etc.)



Source : Bohème Aventure

Partnership : Parks Canada (Underwater archaeology Serv.), ArcheoTopo, etc.

Monitoring periodicity : 5 years ?



Source : ArcheoTopo

Governance indicators measured by marine park staff

Indicator G3. Existence and adoption of a management plan

Indicator G5. Existence and adequacy of enabling legislation

Indicator G9. Degree on interaction between managers and stakeholders

Indicator G12. Level of stakeholder participation and satisfaction in management processes and activities

