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Building Collaborative Monitoring Programs to Manage for Ecological Sustainability in Multi-use Marine Protected Areas: Parks Canada's National Marine Conservation Areas

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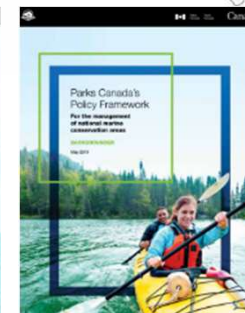
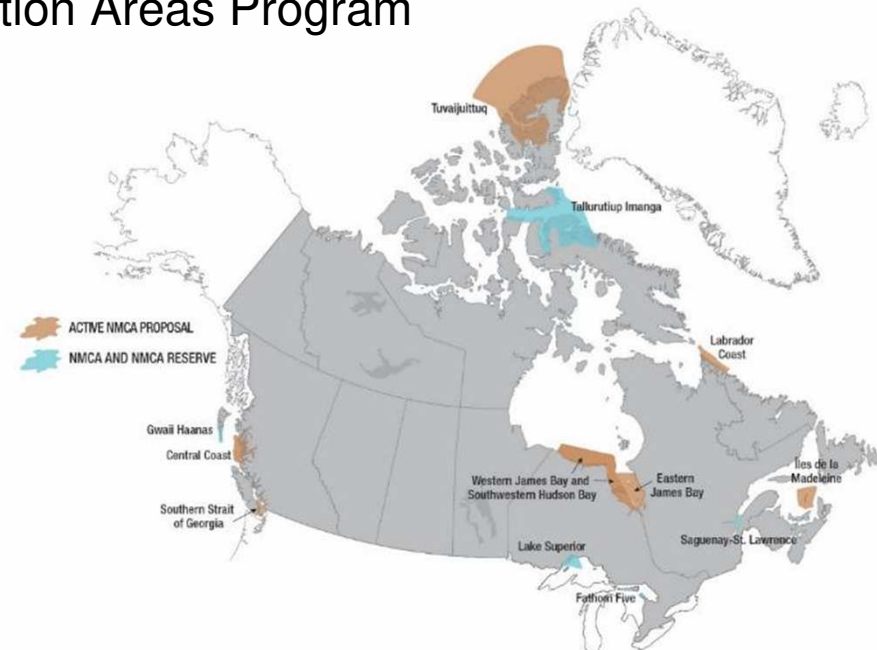
⁵Parc Marin Saguenay-St.Laurent, Quebec

⁶Tallurutiup Imanga National Marine Conservation Area, Nunavut



Context - National Marine Conservation Areas Program

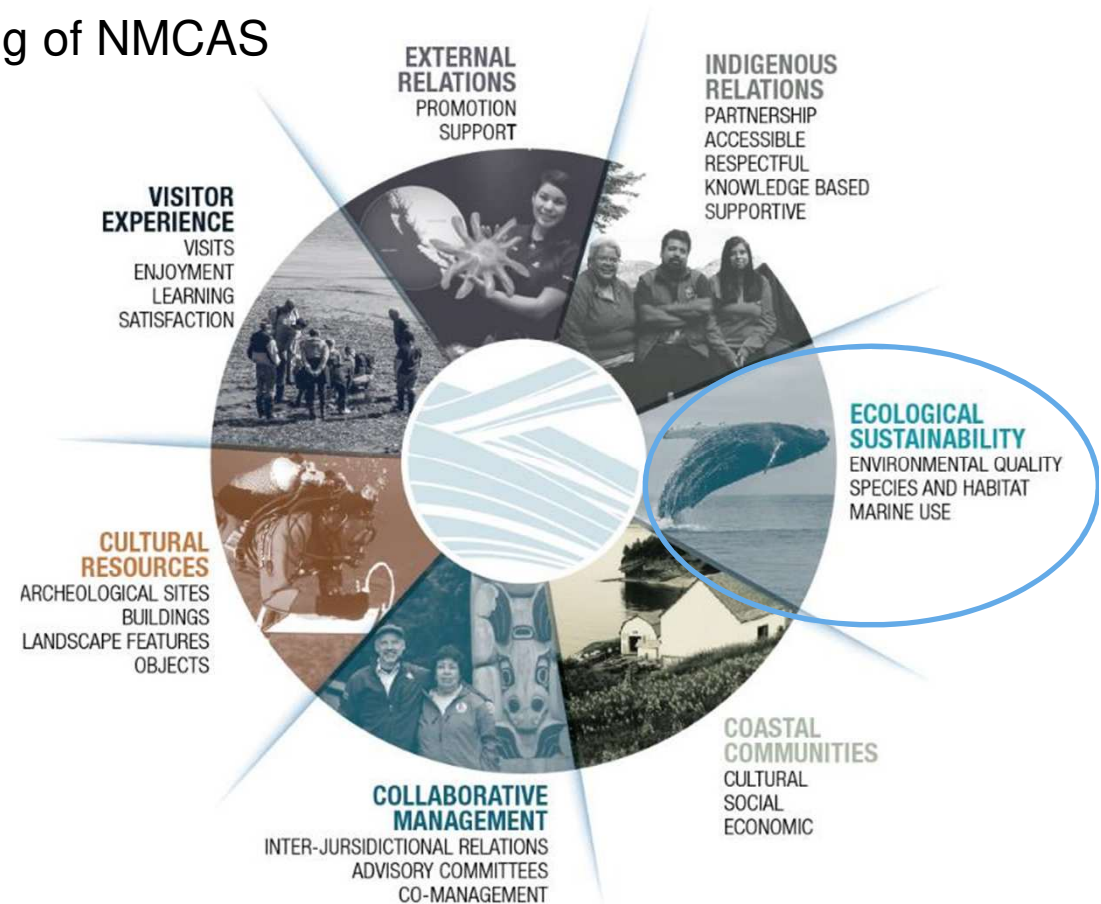
- Parks Canada collaborates with partners to manage a growing system of national marine conservation areas (NMCAs) and area reserves (NMCARs) – a type of MPA
- There are 5 NMCAs in the system today, some that were established over 25 years ago, and several others in the process of being established in collaboration with partners
- These areas are designated to protect and conserve representative marine areas for the benefit, education and enjoyment of the people of Canada and the world
- Recently Parks Canada updated the national policy and management directive to provide direction on the establishment and management of NMCAs – including monitoring
- Monitoring, evaluation and reporting are recognized as key components of management effectiveness, contributing to marine and ocean conservation





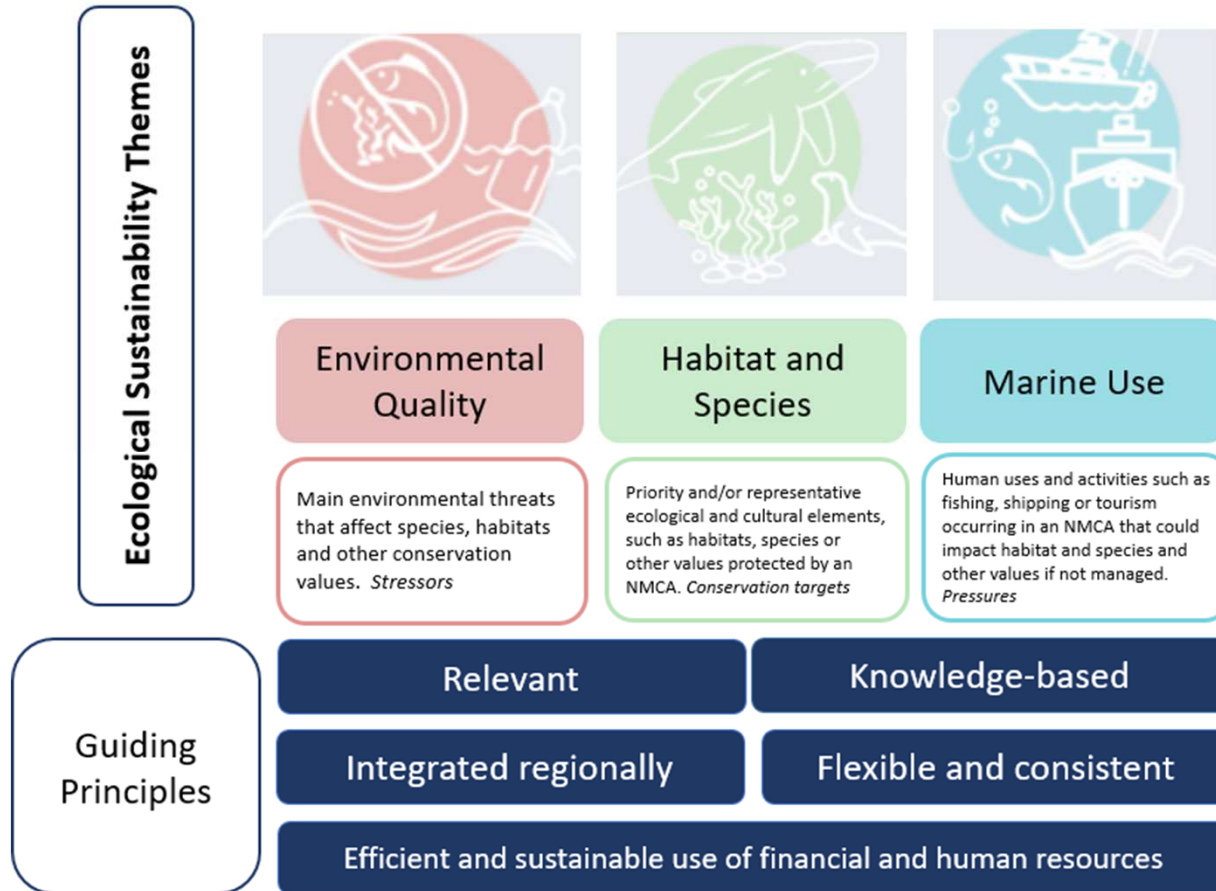
Management and monitoring of NMCAS

- Parks Canada monitors a suite of national indicators to assess the state of NMCAs and progress towards achieving inter-connected management goals
- Monitoring is a system of regular observations, measurements, or knowledge and includes science, Indigenous and local knowledge and perspectives
- Information from monitoring programs is used for:
 - Decision making
 - Assessing outcomes
 - Reporting
- For **Ecological Sustainability**, this involves tracking changes in marine ecosystems, responding to environmental threats, and ensuring ecologically sustainable use of marine resources





Draft Ecological Sustainability Monitoring Framework





Importance of collaboration in developing, implementing and maintaining monitoring programs

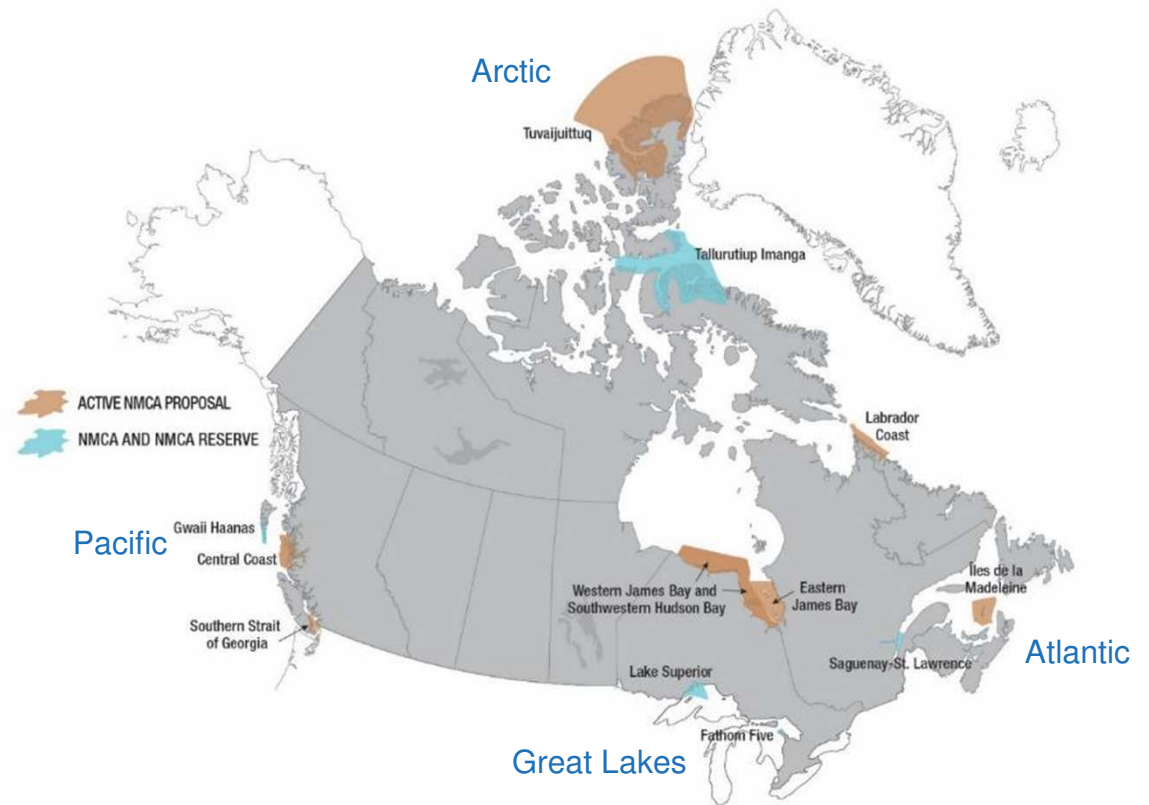
- Recognize and build upon existing science and monitoring programs
- Monitoring involves working closely with Indigenous partners, other federal departments, provincial/territorial governments, coastal communities and others (fishing and tourism sectors, non-governmental organizations, academia) to strengthen on-going monitoring and research
- Parks Canada works with multiple partners to assess the state of NMCAs at regular intervals to ensure the effective management of these places and assess progress towards meeting management objectives
- Monitoring data, observations, and knowledge on each indicator are assessed with knowledge holders and data collaborators to determine status and trend for each indicator, and confidence level in the assessment





Challenges with National Long-term Monitoring Programs

- Regional variability - size and differences in context and ecosystems across the network on NMCAs
- Time and resources required for collaboration in multi-jurisdictional and multi-interest settings
- Working with multiple sources of knowledge (Indigenous, local and scientific) to monitor and assess in ways that preserve and respect the integrity of each knowledge system
- National standards and reporting - combining individual indicator assessments into site and system-level assessments





Gwaii Haanas National Park Reserve, National Marine Conservation Area Reserve, and Haida Heritage Site



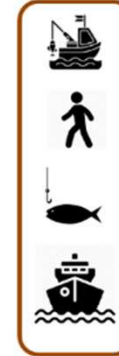
Environmental quality



Species & Habitats



Marine use



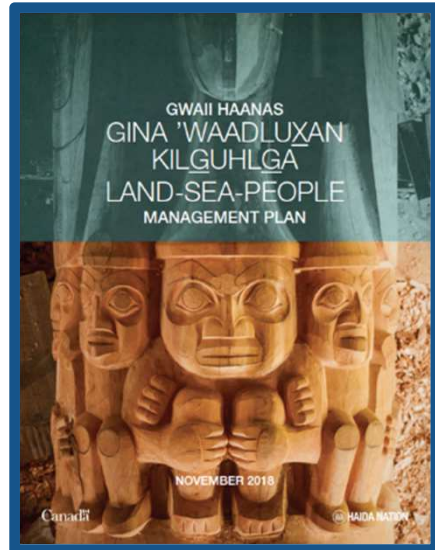
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HAIDA NATION





Collaborating to develop and implement marine monitoring program



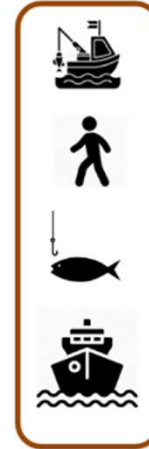
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Species & Habitats



Marine use



Canada

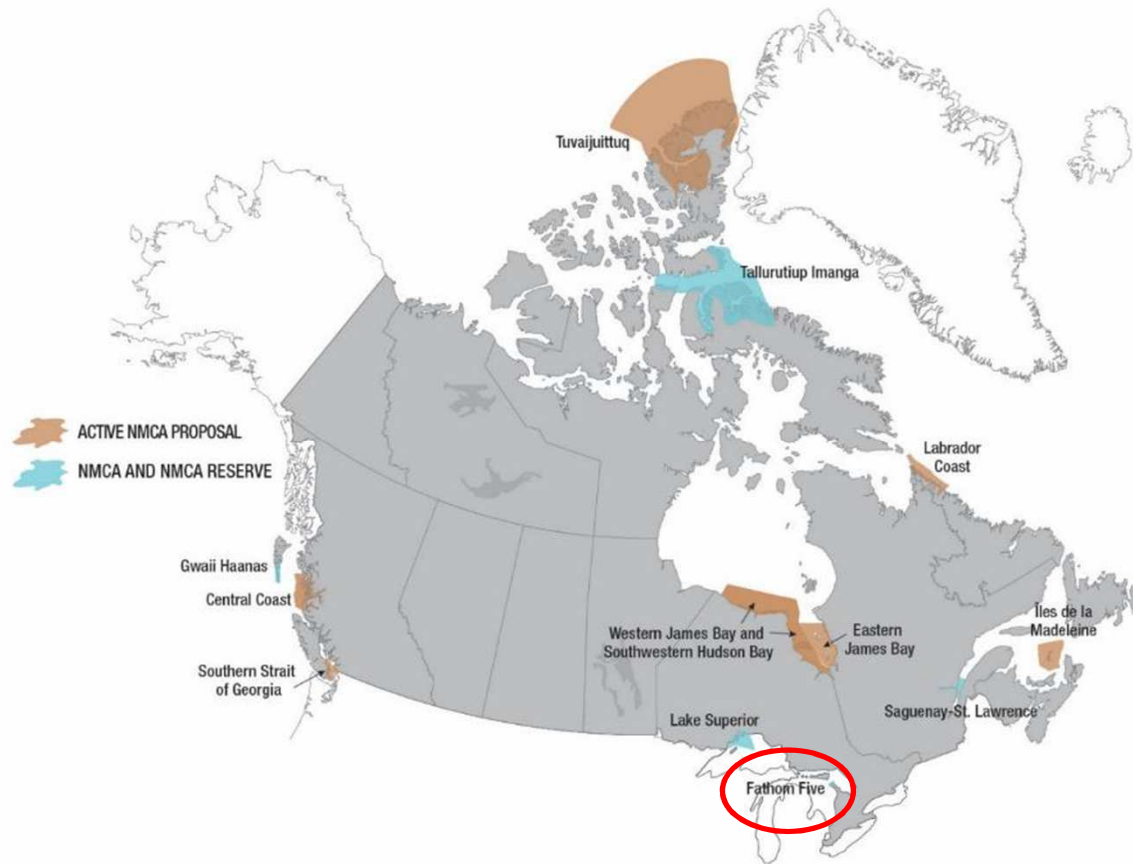
HAIDA NATION



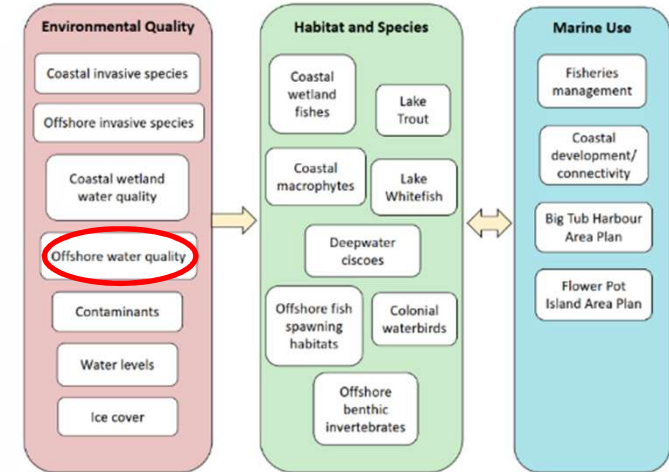
- Importance of building and maintaining relationships
- Link to Gwaii Haanas management plan objectives, key cultural and ecological priorities, and broader monitoring on Haida Gwaii, with regional to international connections
- Workshop approach to develop monitoring plan helps build and maintain partnerships, and identify opportunities to work together on monitoring



Fathom Five National Marine Park



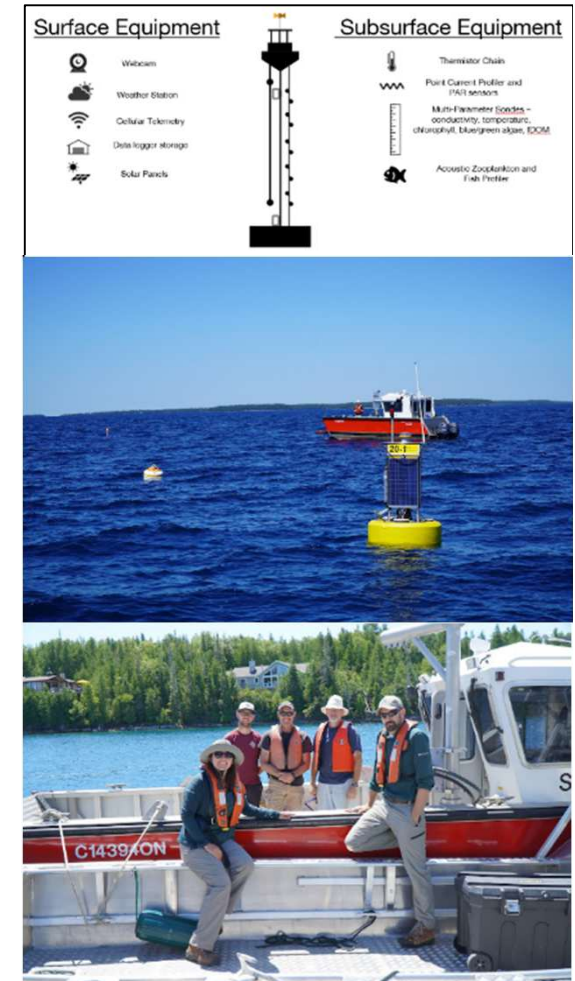
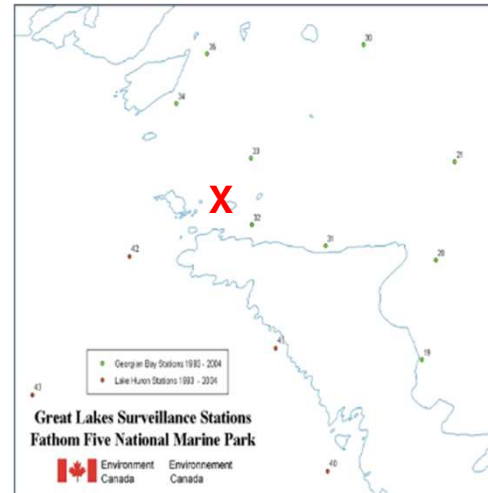
Fathom Five - Ecological Sustainability Monitoring Indicators





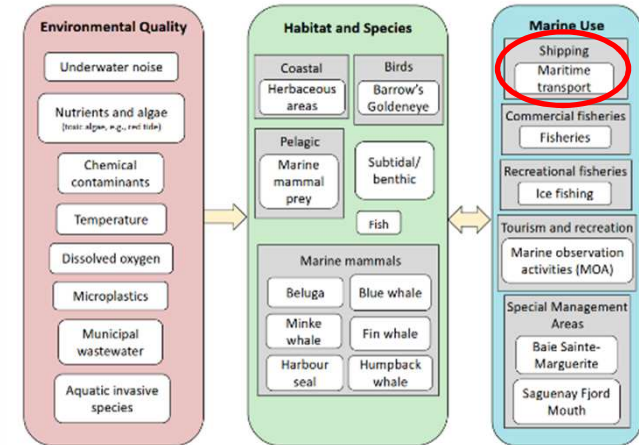
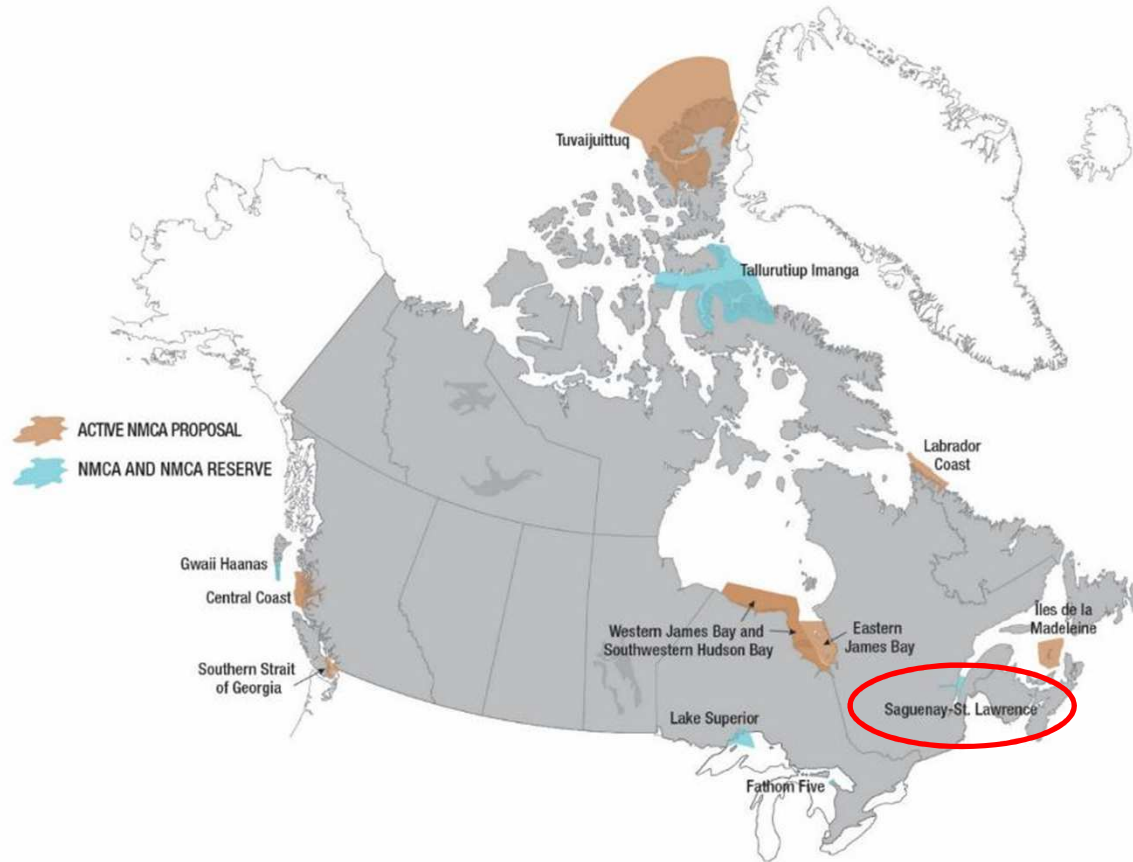
Water Quality Indicator - Collaboration

- Existing bi-national (U.S. and Canada) Great Lakes lake-wide monitoring program
- No station within Fathom Five and sampling is not yearly
- Collaborating with Environment Canada – built and deployed a water quality buoy within Fathom Five
- New technology – steep learning curve and logistical challenges in field around deployments, delays because of COVID, hardware failures, etc. – need to continue to adapt and learn
- Created opportunities for research using the data or infrastructure
- Enhance data collection for both local and lake-wide program and provides weather and condition information for visitors/residents





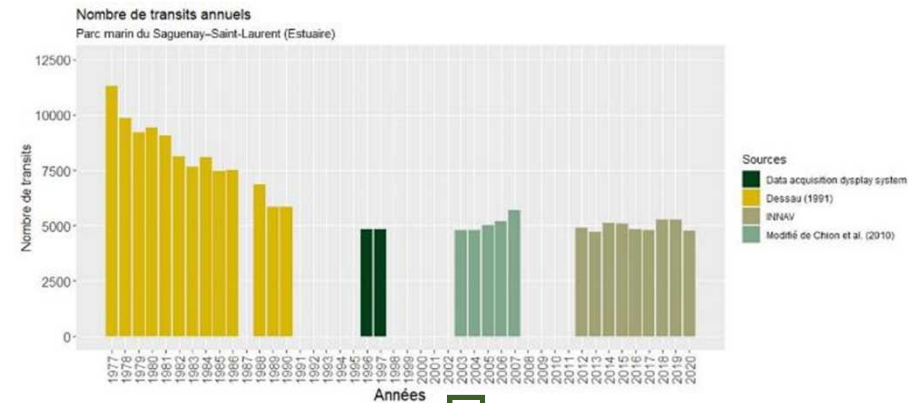
Saguenay-St. Lawrence Marine Park





Commercial shipping indicator – Evaluating Marine Use

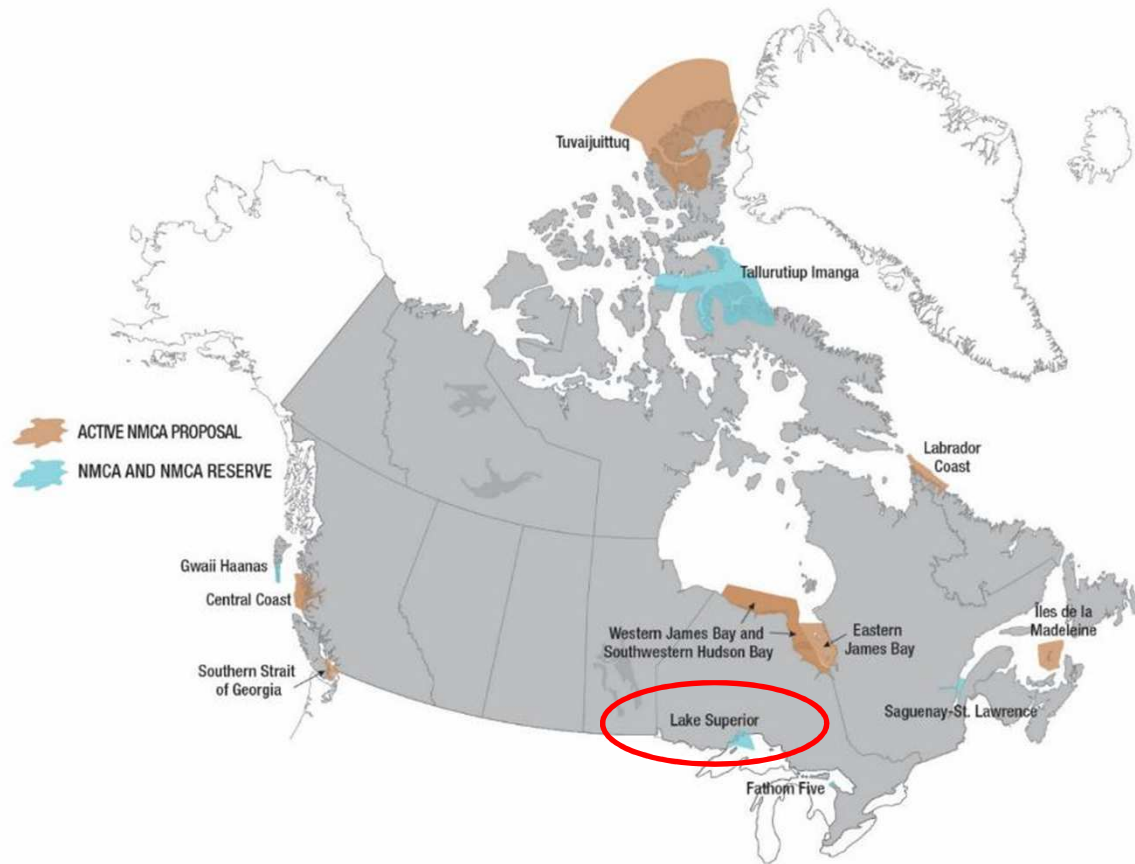
- Commercial shipping through the St. Lawrence Seaway (~5000 transits per year) is a major stressor on marine mammals present in the park (risks of collision, underwater noise, and pollution)
- Working with many partners (federal departments, shipping industry, NGOs and academia), voluntary measures are in place to reduce risks. Compliance with measures is good and increasing yearly
- Commercial shipping (number of transits, speeds and routes) have been monitored for several years but assessment of shipping is required to evaluate ecological sustainability
- A draft assessment combining several datasets and using expert-opinion evaluated that status of the commercial shipping as fair
- The evaluation helped identify data gaps, and areas for further management measures and discussion with partners



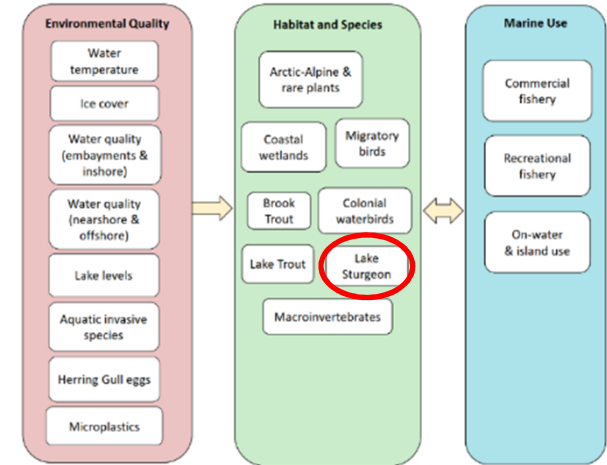
Indicateurs	Cote	Degré de Confiance
Transport maritime	▼	●



Lake Superior National Marine Conservation Area



Lake Superior - Ecological Sustainability Monitoring Indicators





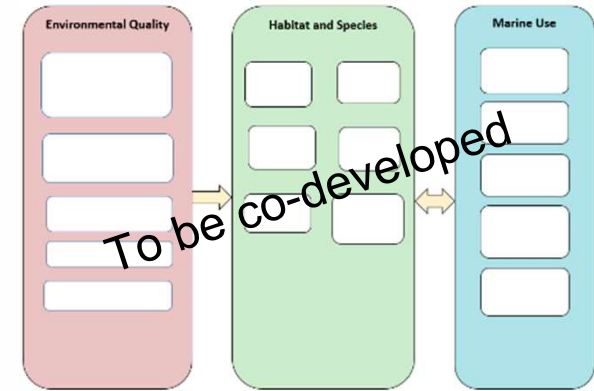
Lake Sturgeon Monitoring – Partnering

- Lake Sturgeon are iconic species in Great Lakes, being the oldest and largest fish in the Great Lakes and ecologically and culturally important
- In the Great Lakes, Lake Sturgeon are classified as at-risk or endangered
- Setting up a Lake Sturgeon Juvenile Index Survey – to monitor the progress on rehabilitation of Lake Sturgeon – both in the NMCA and links to larger bi-national (US-Canada) efforts
- Successful first year of this program for Lake Superior NMCA in 2021
- Lake-wide effort, coordinated by US Fish & Wildlife Service; Parks Canada partnered in field with Ontario Ministry of Natural Resources and Forestry for a portion of the survey
- Working with regional partners, surveyed several sites in NMCA, and caught, tagged and live released in Black Bay study area (total of 16 fish)





Tallurutiup Imanga National Marine Conservation Area





Co-developing a monitoring program – Tallurutiup Imanga

- New MPA in the Arctic co-managed by Inuit and Canada
- Inuit Impact and Benefit Agreement requirement to develop a Tallurutiup Imanga Research and Monitoring Strategy
- Value equally western science and Inuit Qaujimagatuqangit
- Link with the NMCA ecological sustainability monitoring and aligned with National Inuit Strategy on Research
- Co-management partners undertaking a series of workshops in the five communities connected to the protected area
- In each community seeking input to inform development of the Research and Monitoring Strategy:
 - Community's research and monitoring priorities and needs
 - How research and monitoring should be conducted
 - Ways to promote Inuit science and enhance Inuit participation in research and monitoring
- Plan to gather information, share back, and continue to engage as they work towards a final strategy





National system-level assessments and Reporting

- Need to combine individual site assessments to inform Parks Canada, its partners and Canadians on the state of indicators and on priority issues across the network of NMCAs
- Given the regional differences in ecosystems, stressors and context (and terminology) – hard to summarize
- Approach is to use broad indicator categories under each theme - comparable across network of NMCAs
- Consistent or standardized process for assessment
- Assessments based on workshop/expert-opinion and drawing from various knowledge sources – standardized documentation of use of evidence

icator,

NMCA ECOLOGICAL SUSTAINABILITY INDICATORS		
STATUS	TREND	CONFIDENCE
 	↑ Improving	● Very High
 	↔ Stable	● High
 	↓ Deteriorating	● Medium
 	⊕ Undetermined	● Low

		INDICATOR ASSESSMENT			
		PACIFIC SITE L	ARCTIC SITE M	GULF/ATLANTIC SITE N	GREAT LAKES SITE O
ENVIRONMENTAL QUALITY	Oceanography	↔ ●	↓ ●	↔ ●	↓ ●
	Invasive Species	↔ ●		↓ ●	⬮ ●
	Nutrients and Algae			↓ ●	↓ ●
	Contaminants		↓ ●		
	Ocean Noise	↔ ●	↓ ●	⬮ ●	
	Marine litter and plastics	↔ ●	⬮		⊕ ●
HABITAT AND SPECIES	Coastal habitats		↔ ●	↓ ●	↓ ●
	Subtidal / Benthic habitats	↑ ●			
	Pelagic habitats	↔ ●		↓ ●	↔ ●
	Sea Ice		↓ ●		
	Marine mammals	↔ ●	↓ ●	⬮ ●	
	Fish	↔ ●			↑ ●
	Marine Birds		↔ ●	↔ ●	↔ ●
	Invertebrates	↔ ●			
MARINE USE	Coastal Development				↑ ●
	Commercial Fisheries	↑ ●		↔ ●	⬮
	Recreational Fisheries			⬮	⬮
	Marine Tourism and Recreation	↔ ●	⬮	↑ ●	
	Shipping		↓ ●	⊕ ●	
	Special Management Areas		⬮	↑ ●	⬮ ●



Next Steps

- National Ecological Sustainability Monitoring Framework is work in progress – work towards a Standard
- Individual NMCAs implementing their monitoring plans (and adjusting), and as new sites become part of network – review/adjust aspects of framework
- Working with partners and learning from others is key to adapting the framework
- Advancing using NMCAs as benchmarks or sentinel sites for monitoring changes in marine ecosystems with climate change

Acknowledgements



Thank you - Merci

