

Transport Canada's Northern Transportation Adaptation Initiative

Northern Transportation Conference 2013 (Yellowknife, NWT)



Canada

OVERVIEW

- Program Summary
- Networks of Expertise
 - Network of Expertise on Permafrost
 - Network of Expertise on Transportation in Arctic Waters
- Collaboration / Partnerships
- Sharing Results



PROGRAM SUMMARY

Background:

- Transport Canada's Northern Transportation Adaptation Initiative (NTAI) is part of the Government of Canada's efforts to help Canadians adapt to a changing climate (involving 9 departments/agencies).
- 5 year initiative (2011 2016).

Key Objective:

• To develop and implement new innovative technologies, advance knowledge, and ensure capacity-building with a view to enhancing the resilience of existing and future Northern transportation infrastructure and operations to climate change.





PROGRAM SUMMARY (CONTINUED)

- NTAI supports **five research priorities**, including:
 - collection of baseline data and data modelling;
 - climate change vulnerability assessments of the northern transportation system;
 - fundamental knowledge and understanding of climate change;
 - development/evaluation of innovative tools, technologies, and best practices; and
 - training and capacity-building.
- Examples of activities supported by the NTAI:
 - scoping studies;
 - new adaptive technologies;
 - training and exchange seminars;
 - development of best practices and guidelines;
 - workshops/conferences to foster collaborative relations and knowledge sharing; and
 - recommendations to support future policy development and decision making.

NETWORKS OF EXPERTISE

- The NTAI is supported by two networks of expertise: The Permafrost Network and the Network of Expertise on Transportation in Arctic Waters (NEXTAW).
- The Permafrost Network and NEXTAW bring together subject matter experts from government, academia and the private sector.



- Both Networks serve as forums for collaboration between the research community and northern-based practitioners while advising on priority transportation research needs in the North;
- Targeted invitations to submit project proposals are sent bi-annually through the Networks. Proposals from within TC, including regional offices, are also welcomed.
- Project proposals are peer reviewed by the Networks, providing a constructive challenge function and ensuring synergies between proposals.

THE NETWORK OF EXPERTISE ON PERMAFROST (PERMAFROST NETWORK)

- TC established the Permafrost Network in June 2010
- The Network has focused its work on the following research areas:
 - collection of baseline data and data modelling,
 - highway embankment studies;
 - effects of snow accumulation on transportation infrastructure;
 - innovative tools, technologies and best practices; and
 - climate change vulnerability studies.



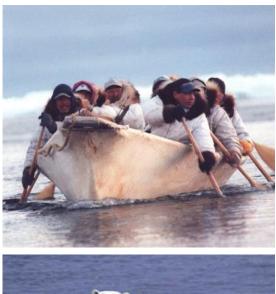
THE NETWORK OF EXPERTISE ON PERMAFROST (PERMAFROST NETWORK): STUDIES

- Scoping studies were funded through NTAI to better define the scope of future work in the priority areas for research.
- <u>Completed Studies</u>:
 - Highway Embankment Vulnerability to Snow Accumulation in Permafrost Terrain
 - Remote Sensing Literature Review
 - Vulnerability Assessment of NWT Airports
 - Air Convection Duct Techniques
- On-Going Studies:
 - Evaluating the Performance of Highway Embankments on Degraded or Degrading Permafrost
- Projects to be Explored/Approved:
 - Best Practices for Ice Wedge Characterization and Mapping;
 - Improving Maintenance Operations (post-construction) for Transportation Infrastructure in Permafrost Regions; and
 - Detailed Analysis (case studies) of Construction Techniques for Transportation Infrastructure in Permafrost Regions.



THE NETWORK OF EXPERTISE ON TRANSPORTATION IN ARCTIC WATERS (NEXTAW)

- TC established the Network of Expertise on Transportation in Arctic Waters (NEXTAW) in February 2012
- The Network has focused its work on the following research areas:
 - efficient hydrographic data collection;
 - impacts of changing ice and weather conditions on marine infrastructure, community re-supply and maritime traffic;
 - innovative construction methods for resilient marine infrastructure;
 - sustainability of marine re-supply in support of communities and resource development; and
 - training and capacity building.





THE NETWORK OF EXPERTISE ON TRANSPORTATION IN ARCTIC WATERS (NEXTAW): STUDIES

- Scoping studies were funded through NTAI to better define the scope of future work in the priority areas for research.
- <u>Completed Studies</u>:
 - Ice islands and icebergs fluxes
 - Climate change adaptation assessment for transportation in Arctic waters
 - Scoping Study to Examine Strategies for Managing Arctic Yacht Tourism

On-Going Studies:

- Exploring Plausible Futures for Marine Transportation in the Canadian Arctic A Scenarios Based Approach
- Canadian Arctic Bathymetry Data Compilation and Assessment
- ARCTRAIN: Arctic Transportation Training for Northern Residents
- Projects to be Explored/Approved:
 - Impacts of a changing climate on navigation on the Mackenzie River
 - Sea ice changes in Hudson Bay and their impacts on shipping to and from the Port of Churchill
 - Adaptation strategies and policy options for Arctic shipping

COLLABORATION / PARTNERSHIPS

- Transport Canada leverages many different collaborative relations and partnerships to support the adaptation of the northern transportation system to climate change.
- On-going agreements with all three territorial governments (Nunavut, Yukon and NWT) and several academic institutions (e.g., Université Laval and Université de Montréal):
- Research projects in collaboration with other federal departments:
 - Assessing Risks of ship-mediated aquatic invasive species introduction and efficacy of treatment technologies in context of adapting to a warming arctic environment (with the Department of Fisheries and Oceans Canada)
 - Evaluating Response Time to Search & Rescue Assets (with the National Research Council Canada)
- International engagement through Arctic Council initiatives, participation of Alaska on our Permafrost Network and a Joint Research Program between Canada and China.



SHARING RESULTS / INVOLVEMENT

Webinar Series

- Highlight Canadian research and showcase program results
- Encourage knowledge sharing and promote synergies between disciplines (e.g., engineering, geography, permafrost science)

Arctic Council Initiatives

- Arctic Adaptation Exchange: Facilitating Adaptation to Climate Change develop an on-line information portal. NRCan is the lead department, while TC contributes through an interdepartmental working group [ON-GOING]
- Arctic Maritime and Aviation Transportation Infrastructure Initiative (AMATII)

 <u>http://arcticinfrastructure.org/</u> [COMPLETED]

How can you get involved?

- Read about our Innovation Policy Branch, Grant & Contribution Program, etc., at <u>http://www.tc.gc.ca/eng/innovation/innovation-policy-menu.htm</u>
- Share information related to on-going research initiatives/projects with TC
- Contact us to become involved in the Network

THANK YOU!

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