Fundamental Overview and Challenges of the Arctic Marine Program in Canada

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Ann Arbor, Michigan
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Contents

• Overview of Canadian Arctic Marine Coverage
• Arctic Clients
• Products Issued
• Challenges
• Future Needs
Canadian Arctic Marine Coverage

- Domestic Marine Program
- International Waters for METAREAs
- Inland Waters
MAP INDICATING THE SOUTHERN AND NORTHERN ROUTES THROUGH THE NORTHWEST PASSAGE

Legend
- Southern Route (most popular: less ice)
- Northern Route (less popular: more ice)

Herschel Island
Tuktoyaktuk
Kugluktuk
Cambridge Bay
Holman
Resolute Bay
Pond Inlet
Gjoa Haven
Arctic Marine Activity

Northwest Territories Environment and Natural Resources, 2015.
Page 5 – April 27, 2016
Arctic Clients

Inuit
Pleasure Craft
Cruise Ships
Research Trips
Fishing
Cargo / Fuel
Arctic Clients - Inuit

- Used marine areas throughout the year for:
  - near shore commercial and traditional harvesting all year long
  - Recreational, reaching cabins and camps
  - Especially in winter means to visit other communities (snowmobile more affordable than boat)
  - Hunting for country food very important
Arctic Clients – Resupply

Desgagnés Transarctik Inc.
Arctic Clients – Resupply

Desgagnés Transarctik Inc.
Arctic Clients - Resupply

- Tankers provide a fuel supply link to Arctic Coastal Communities
- Off-load fuel using floating pipelines
  - Increased Sensitivity to Wind and Ice

Photo courtesy Chris King

PetroNav vessel offloading fuel using floating pipeline
Arctic Clients - Mining

First Unescorted Commercial Trip through Northwest Passage
Polar Class 4 Icebreaker

Sept 19 2014
MV Nunavik 29 day journey from Deception Bay to Bayuquan, China
-21000 tonnes nickel concentrate

-40% reduction in distance & time compared to Panama Canal
Products Produced

- **Text Products**
  - Short Range Forecast, Winds, Weather, Waves
  - Marine Advisories
  - Long Range Wind Forecast (Day 3-5)
  - METAREAs

- **All products text based – majority of clients accessing information through Radio means**

- **Some Visualization products used by some clients (using an FTP server)**
Challenges Faced

- Severity of Weather
- Mandate – with the devolution of the NWT
- Local Effects
- Data Availability
- Climate Change – increasing season length
Storm Surges and Erosion

http://geonames.nrcan.gc.ca/search/search_e.php
Local Effects

- Local effects captured by Observations
- Radar Sat Imagery since 2010 helped to determine effect of expected local effects and identify new features
Local Effects

Downslope Winds

Channeling & Barrier Jet

RADARSAT-2 SCWA HH HV Ascending, 24 Sep 2012 01:58:49 UTC CMOD with GEM REG NORTH AMERICA Winds 24 Sep 2012 00 UTC +02 hr No buoy wind reports were available for this area.

RADARSAT-2 SCWA HH Ascending, 07 Sep 2010 22:36:12 UTC With GEM REG NORTH AMERICA Winds 07 Sep 2010 10 UTC +04 hr No buoy wind reports were available for this area.
Data - Analysis
Future Needs

- Wave Forecasts for Shallow Waters
- Storm Surge Models
- Remote Sensing
- Moving beyond Text Forecasts
Questions

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Crystal Serenity sails the Northwest Passage 2016

Crystal Cruises