



UNIVERSITY OF  
CALGARY

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# Arctic Sovereignty and Airships: New Ideas for New Problems

Airships to the Arctic V  
Approaching the Tipping Point  
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Calgary, Alberta, Canada

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# Main Themes

- Canada is facing a Transforming Arctic that requires action
- The Arctic is a state of massive transformation
  - Climate Change
  - Resource Development – (was up to a high \$140+ barrel of oil- now \$80 barrel)
  - Geopolitical Transformation/Globalization
- The World Will be coming to the Arctic
- Canada will need to know what is happening – can airships provide part of the Answer?

# What does Canada need to do?

- Surveillance
  - Need to know what is happening
- Enforcement/Reaction
  - Need to be able to respond

# Challenges of the Canadian North

- Distances
- Severe Climate
- Lack of Infrastructure
- High Latitude
- Expenses

# Distances



Source: Canadian Military Journal

# Infrastructure



Source: Nightsky.com

# Geo-political Arctic Threats

- Current geo-political threat level is nebulous and low – for now
  - Expanded Definition of Threat – Environmental; Military; Economic
  - Issue is the uncertainty as Arctic States and Non-arctic states begin to recognize the significance of the Arctic
- 1) Arctic as a Geopolitical Transit Point
  - 2) Arctic as a New Source of Resources

# Part I: How to Think about Canadian Arctic Power and its Challenges

## -Why do we need to know?

- Problems will be mainly Maritime/Aerospace
- Arctic Security
- Sovereignty and Security



# Sovereignty and Security

## Two Interdependent Concepts

- Sovereignty for Canada by itself is Meaningless
  - Sovereignty is a means and not an end
  - Canadian tendency (academic, policy and public) to separate the two interdependent concepts
- Sovereignty must be used to
  - I) Provide Security for Canadians
  - II) Allow for the provision and promotion of Canadian well-being

# Security in the Canadian Arctic

<b>Traditional Security</b>	<div> <div>→</div> <div>←</div> </div>	<b>Traditional Security/ Non-Traditional Security</b>	<div> <div>→</div> <div>←</div> </div>	<b>Non-Traditional Security</b>
Military		Policing		Environmental
Diplomatic				Economic
				Cultural

# The Maritime/Aerospace Security Challenges in/to Canadian Arctic

- No immediate Security threat
- Boundary dispute – diplomatic/scientific terms
- Considered low to medium complexity
- Involves “friends/allies” and former enemy



# Canadian Arctic Disputes

- Northwest Passage
  - Issue of Control
- Maritime Boundary Issues
  - i) Beaufort Sea : Canada and US
  - ii) Lincoln Sea: Canada and Denmark
  - Iii) Continental Shelf
  - Control of Resources; Determination of Environmental Standards
- Land Boundary Issue
  - Hans Islands
  - Maritime Access

# Land Boundary Dispute: Hans Island



# Part II: The Changing Arctic

## -Why is the World Coming to the Canadian Arctic

- Physical Change
  - Climate Change
- Economic Change
  - Technological Changes
- International Legal Change
  - UNCLOS
- Geopolitical Change
  - Russia, US, Norway, Denmark
  - China, South Korea, Japan



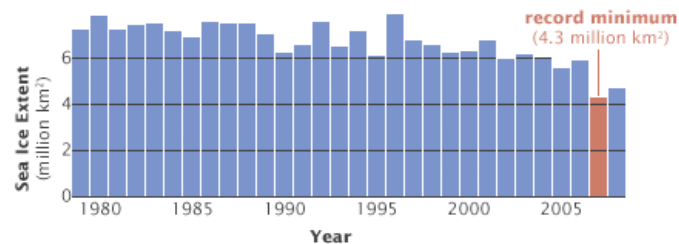
# Movement of Ice Sept 2007-April 2008



Source: Canadian Ice Service



# Ice Cover 1979-2008

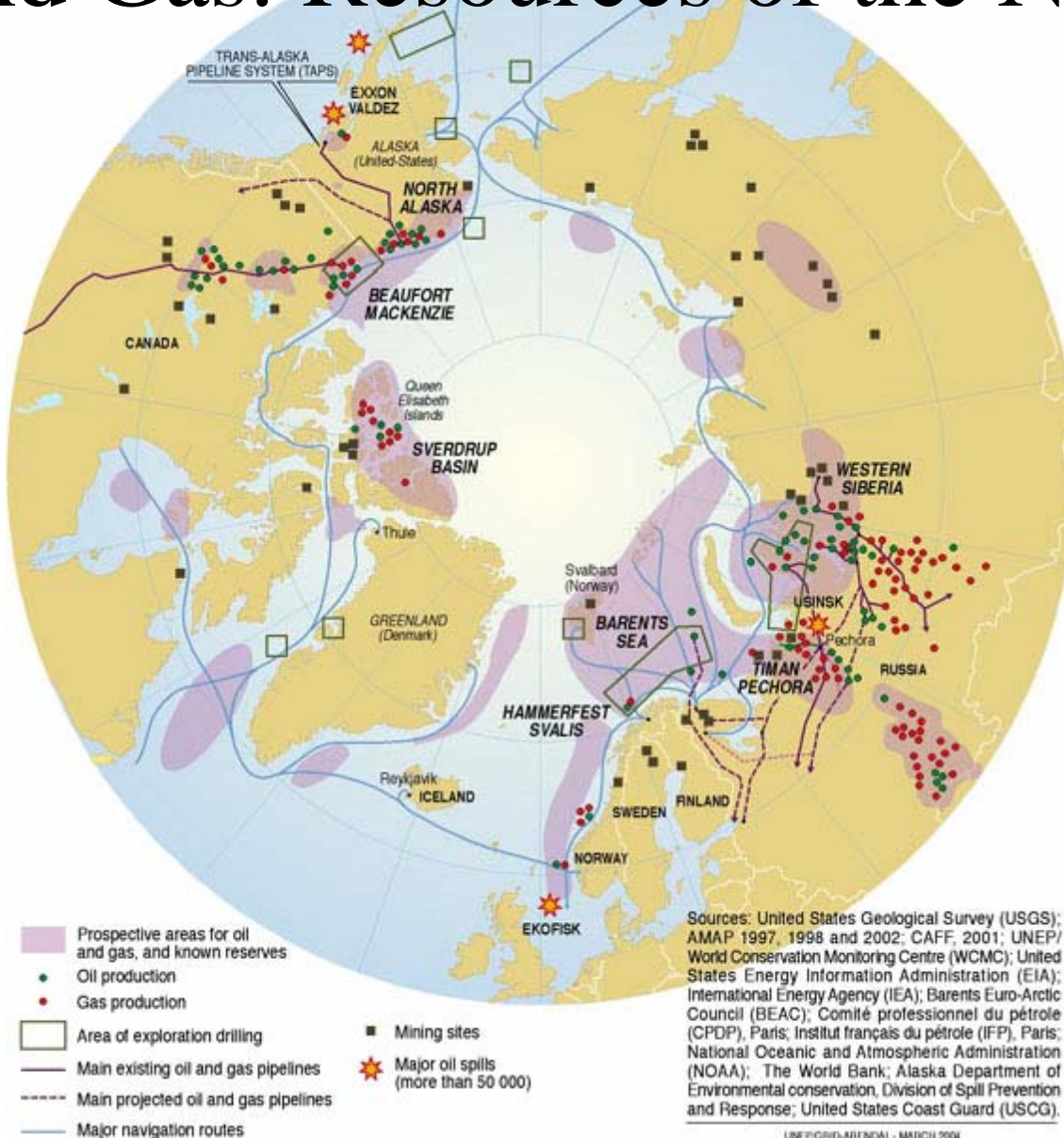


Source: National Snow and Ice Data Centre

# The Changing Economics

- Search and Exceptions of New Resources
- Changing Economic Realities
- New Technologies

# Oil and Gas: Resources of the North



Source: AMAP

# US Geological Survey Arctic 2008

- To determine the sources of traditional energy supplies
- No consideration of non-traditional energy
  - E.g. gas hydrates
- Main Findings
  - 30% of undiscovered Natural Gas in Arctic
  - 13% of undiscovered Oil in Arctic

# New Oil and Gas Activity –North America

- Exxon/Mobil, Imperial - Cdn Beaufort Sea/Mackenzie Delta: \$585 million five years 2008-2013
- BP – Cdn Beaufort Sea/Mackenzie Delta: \$1.2 billion
- Both Companies are doing Seismic Work 2007-2009 and ongoing
- Shell – off Alaska North Slope: \$44 million
  - Currently trying to understand Court Decision
- Continued Debate over Gas Pipelines

# New Technologies: 1st Arctic Shuttle Tanker



Innovative and challenging technology for Arctic Shuttle Tanker has been developed and constructed by SAMSUNG Heavy Industries in Korea.

The Vessel is world 1st Arctic Shuttle Tanker which is intended for independent operation in arctic region with the following specialties:

#### MAIN PARTICULARS

• Length	234.7 m
• Breadth	34.0 m
• Depth	21.0 m
• Deadweight	70,000 mt

#### PERFORMANCE & PROPULSION

• Speed in Ice	3.0 kts
• Speed in Open water	15.7 kts
• Azipod	10,000 kW x 2 sets

#### WINTERIZATION

• Design Air Temp	-45°C
• Anti-icing & De-icing Design	

#### OWNER & BUILDER

• Owner	Sovcomflot
• Builder	Samsung Heavy Industries

#### BUILDING SCHEDULE

• Contracted	Nov. 10 2005
• Delivered	Jan. 1 2008



Source: Samsung  
Heavy Industries



# New Technologies: Proposed Arctic LNG



## ARCTIC LNG CARRIER OVERVIEW

- Ice Class Baltic Ice 1A / RMRS LU4
- Winterization Extreme Low Air -40 C
- CCS Reinforced Mk-III, Combl. or SPB
- Trading Route Russia/Baltic Sea – USA/Europe

## HULL FORM & PERFORMANCE VERIFICATION

- Ice Collision Dynamic Motion Analysis & Test
- Sea-keeping Analysis under harsh condition
- Speed in Ice and Open water

## RELIABLE STRUCTURE DESIGN

- Structural Safety Assessment with Krylov
- Cargo Containment System Safety Assessment with GTT
- Ice Collision Simulation & Test



AMSUNG

Source: Samsung  
Heavy Industries

# Tourist / Cruise Ship Activity

## Cruise Ships in 2007 - 9

Akademik Ioffe - Russia  
Kapitan Khlebnikov – Russia  
MV Polar Star – Barbados (Norway)  
MV Explorer – Liberia (UK)  
Hanse Explorer (Antigua and Barbuda)  
Lyubov Orlova – Malta (Russia)  
MV Bremen – Bahamas (Germany)  
Ocean Nova (Bahamas)  
MV Hanseatic – Bahamas (Germany)



## Cruise Ships in 2008 - 7

Akademik Ioffe - Russia  
Kapitan Khlebnikov – Russia  
MV Polar Star – Barbados (Norway)  
MV National Geographic Explorer – USA  
Lyubov Orlova – Malta (Russia)  
MV Bremen – Bahamas (Germany)  
MV Hanseatic – Bahamas (Germany)  
(Source: JTFN)





# Adventurers



2003: 3

2004: 5

2005: 9

2006: 6, 3 NWP transits

2007: 6, 4 NWP transits

- Adventurers normally intend to transit the Northwest Passage

- 6 adventurer sailboats operated in the Arctic, 4 of which successfully transited the NWP in August 2007, the Berserk II, Luck Dragon, Cloud Nine and the Babouche. - 2008

*For Aug 2008 at least two sailboats "Southern Star and Arctic Wanderer" will be operating in Canada's Arctic. (Source: JTFN)*

# Chinese Arctic Interest



- 1<sup>st</sup> Arctic Voyage: July-Sept 1999
- 2<sup>nd</sup> Arctic Voyage: July-Sept 2003
- 3<sup>rd</sup> Arctic Voyage Summer 2008
- 4<sup>th</sup> Arctic Voyage Summer 2009?

Xue Long in Antarctica



# The Changing International Legal Regime

- UNCLOS
  - Article 76
  - Article 234
  - International Straits/ Internal Waters

# Maritime jurisdiction & boundaries in the Arctic

[www.dur.ac.uk/ibru/resources/arctic](http://www.dur.ac.uk/ibru/resources/arctic)



# New Geopolitics of the North

- Russia
  - Renewed Assertiveness
  - Petrodollars
- United States
  - Multi-lateral reluctance/emerging concern to act
  - International Role as remaining Superpower
- Norway
  - Refocus on North
  - Growing Interest (Concern?) with Russia
- Denmark
  - Issues with Greenland – social; energy
  - New Naval capabilities
- Iceland
  - Economic melt-down
- Finland/Sweden
  - NATO – Loyal Arrow
- Canada
  - Re-examining its Arctic capabilities
  - Renewed Assertiveness

# Renewed Russian Strengths

- 1990's Period of Extreme Reduction
- 2000's Renewal
- Russian State Rearmament Programme 2007-2015
- 6 SSBN 995 Borey
- 2 SSN 885 Yasen
- 6 Diesel 677 Lada



Yury Dolgoruky



# The New Russian Northern Fleet?

- Resumption of Northern Fleet Operation
  - 2 month Tour - Mediterranean & North Atlantic
  - Tour to Caribbean
- Commitment to have 5-6 Carrier Battlegroups by 2025/30
  - Northern based
  - Admiral Vladimir Vysotsky



Source: RIA Novosti

# Resumption of Russian TU-95 (Bear) Arctic Flights, August 18, 2007

- If US/EU position on Northwest Passage is correct then these aircraft have the right of over-flight





# Russian Surface Fleet Return to Arctic Waters



Severomorsk

Summer 2008



Marshal Ustinov

# Russia Resumes Arctic Exercises

- Twin Submarine Test Missile Launch near North Pole 2009
  - 2 Delta IVs SSBN plus several SSNs
- Large Military Exercise in Arctic Region 2009
- Planned Paratrooper drop 2010 North Pole

# US Arctic Forces

- Submarine Forces:
  - US – Seawolf and Los Angeles Class; (Virginia Class?)
  - Cooperation with UK
  - ICETEX March 2009 – 2 LA class SSN
- Missile Development

Missile Defence – Ft. Greely



USS Honolulu 2003



HMS Tireless 2007 after accident

# Fort Greely – Delta Junction



# Norwegian Developments

- Fridtjof Nansen class - 5
  - Aegis system (air combat)
- Purchase 48 F-35 JSF Aircraft Nov 2008
  - (air combat)



Roald Amundsen and Admiral Kuznetsov 2008

Source: RNoAF



# Danish Naval Building

- Substantial Re-building Northern and General purpose surface fleet post 1989
- 4 Thesis – ice-capable
- 2 Knud Ramussen – ice capable
- 12 Flyvefisker - multi role (air combat)
- 2 Abasalon/3 Iver Huitfeldt – multi role (air combat)

# Danish Vessels



Thesis class



Inspection Ship (*Inspektionsfartøjer*  
or OPV) P570 *Knud Rasmussen*  
(*Knud Rasmussen* class)



Flyvefisker class

# Part III: Canadian Arctic Policy and Actions

## -What is Canada doing?

- Military/Maritime
- Circumpolar Efforts



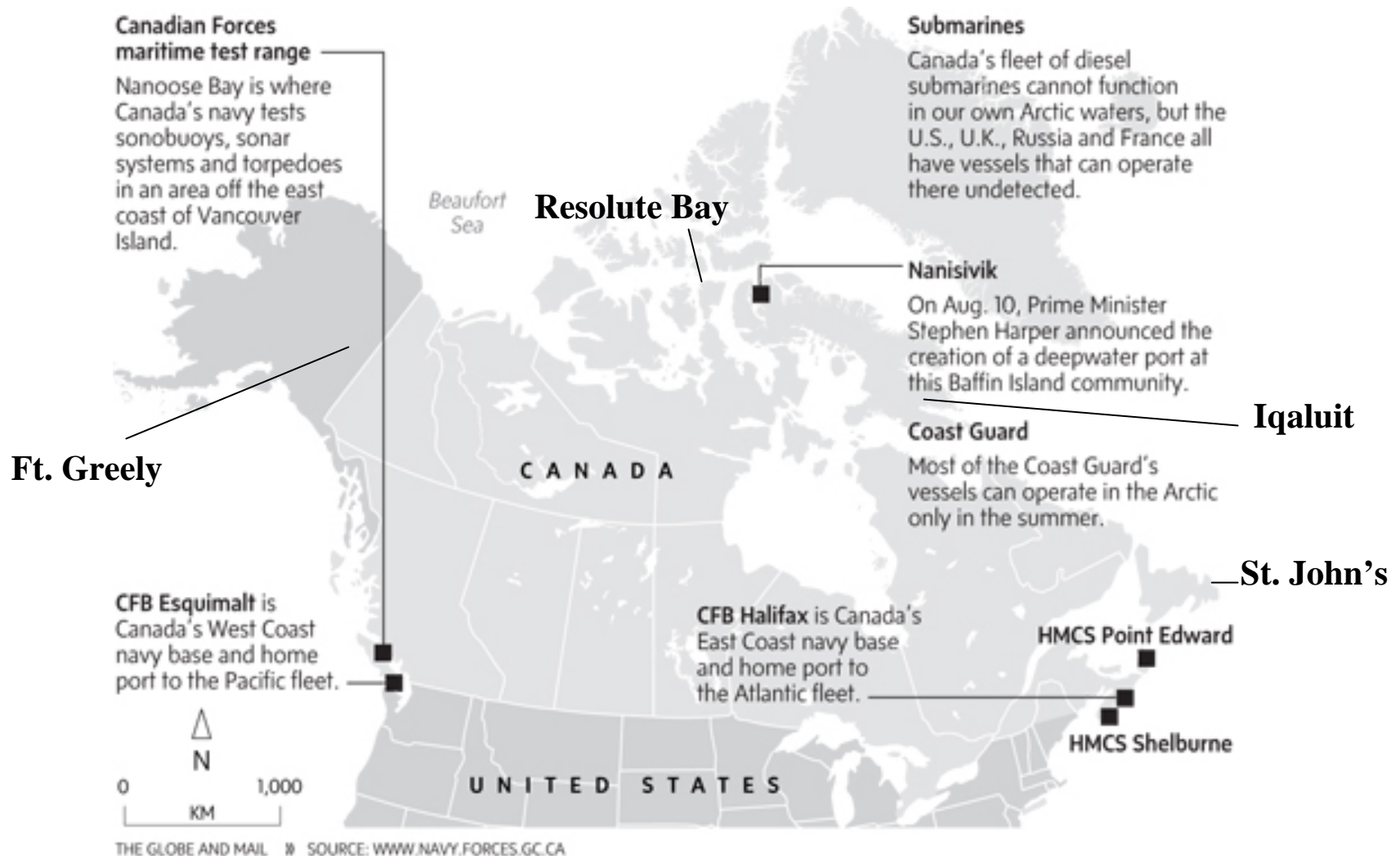
# Canadian Security Actions

- New Military Operations since 2002
- 6-8 Arctic Offshore Patrol Vessels
- Nanisivik Refueling Facility
- Resolute Bay Training Facility
- Increased Rangers Patrols
  - Number 58 to 61
  - Training and Equipment
- Northern Watch
- Throne Speech Oct 2007
  - Northern Strategy (Sovereignty/Security)

# Canadian Security Actions (cont.)

- Feb 2008 Budget – \$720 Million Icebreaker
- June 2008 Canada First Defence Strategy (Harper White Paper)
  - Focus on Arctic Security
- Postponement (Cancellation?) of Joint Support Vessels
- Mandatory Reporting of Ship Traffic – Nordreg (April 1 2010 ?)

# Base Location



# Forward Operating Locations



Source: DND

# Arctic Offshore Patrol Vessel



- "Be capable of operations in Canada's three oceans
- Be first year ice capable in the Arctic
- Contribute to maritime domain awareness
- Support other departments, agencies and ocean research
- Have a gun armament for constabulary missions "

- DND

Source JTFN

# Surveillance

- North Warning System
- RADARSAT II
- Rangers
- Aurora CF-140
  - Are being slowly phased out
- Northern Watch
  - Technology
- Will need for April 1, 2010 – Mandatory Nordreg
- Existing Systems has gaps

# Rangers

## Rangers



Source: JTFN

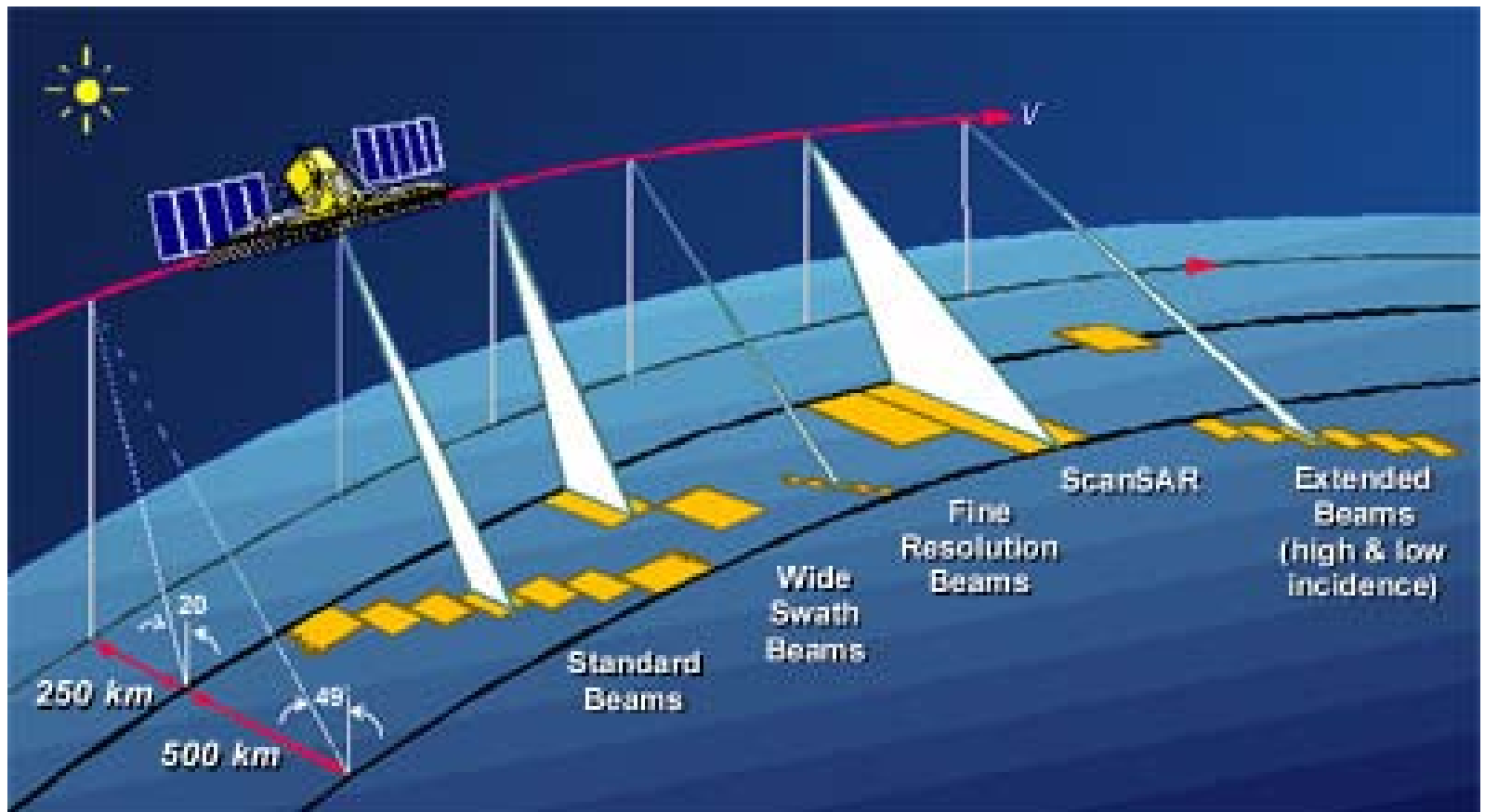
Source: JTFN



# RadarSat II

- Canadian Built System
- Excellent Day/Night; Cloud cover
- Operational- April 2010
- Limited to Vessels 50-100 metres
  - Many of problem ships are smaller
  - Yachts; fishing vessels
- Limited Search Ability

# RadarSat II



Source JTFN

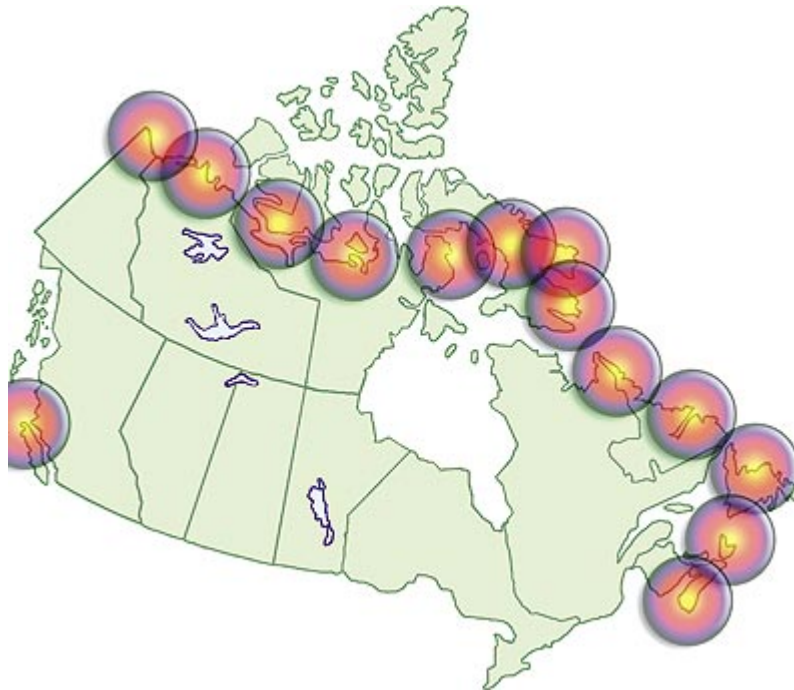
# RADARSAT 2 and POLAR EPSILON



Source: JTFN

# North Warning System

- Updated DEW Line 1980s
- Some sites not operational
- Static System



# New Possibilities

- UAVs
- Good for Distances
- Problems with high Latitudes: GPS Lock
- Problem with basing requirements
- Problems with weather

# Airships

- Long Station Period
- Can Carry RadarSat style surveillance
- Mobile
- Provide Visible evidence of surveillance
- Can engage in other missions if necessary
  - search and rescue

# Conclusion

- Geopolitics Concerns reduced immediately after end of Cold War
- New concerns are arising as Arctic is perceived/becoming more accessible
- Issues will be Maritime/Aerospace
- Issues will be knowing and acting in the North
- Canada needs to be Prepared
- Airships are logical part of Solution