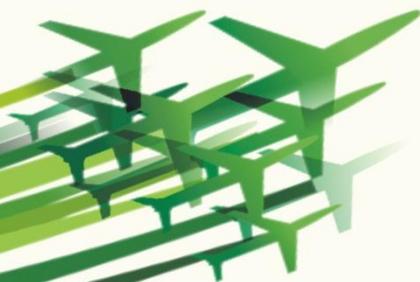




*Destination Green*



ICAO Symposium on Aviation and Climate Change, "Destination Green", 14 – 16 May 2013



## Collaborative Initiatives For Emissions Reductions

Presented by Rob Thurgur

Assistant Vice President, Operational Support

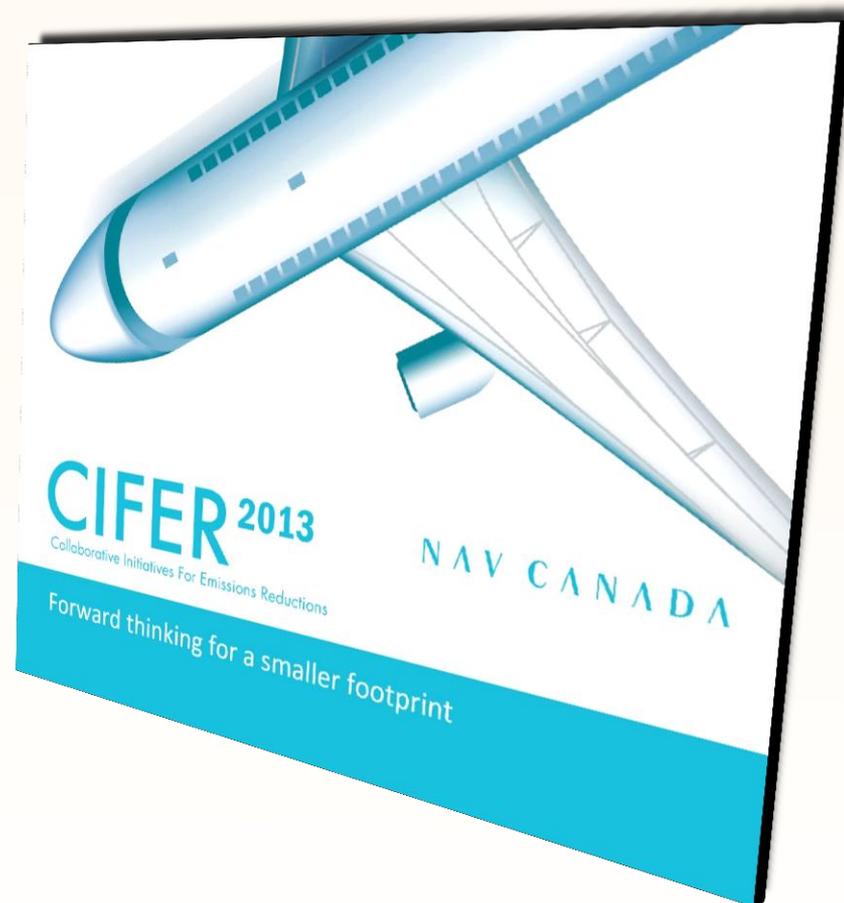
May 14, 2013



# CIFER 2013



- Describes our efforts to deliver efficiency gains to our customers and reduce the impact of aviation on the environment.
- Forecasts GHG reductions and fuel savings from current and planned programs.





# CIFER 2013



- NAV CANADA signatory to *Canada's Action Plan to Reduce Greenhouse Gas Emissions from Aviation.*



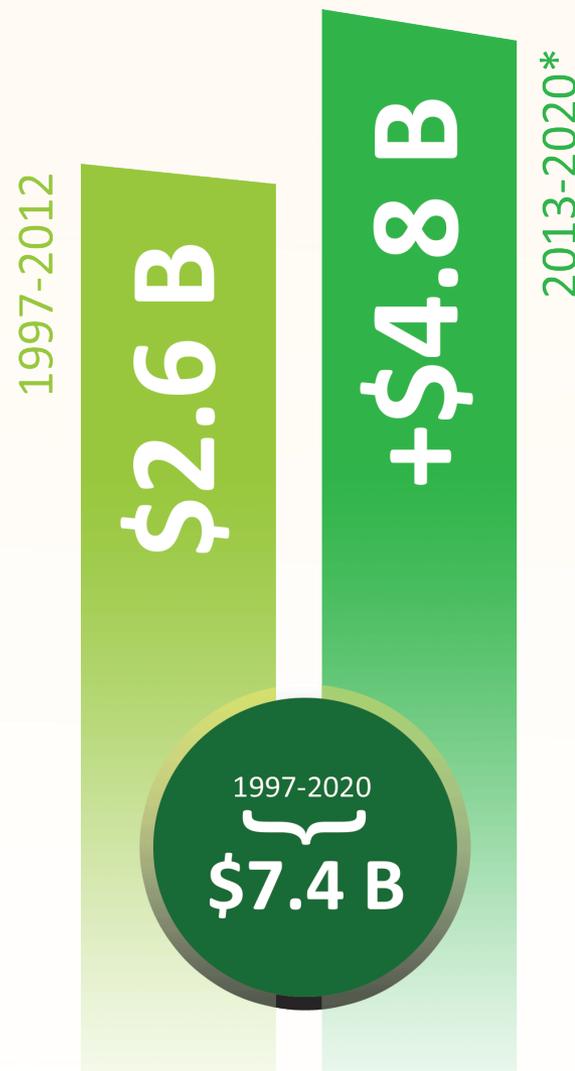


# CIFER 2013



- Customer fuel savings (\$ CAD).
- Achieved (1997-2012)
- Projected (2013-2020)

Total: \$7.4B



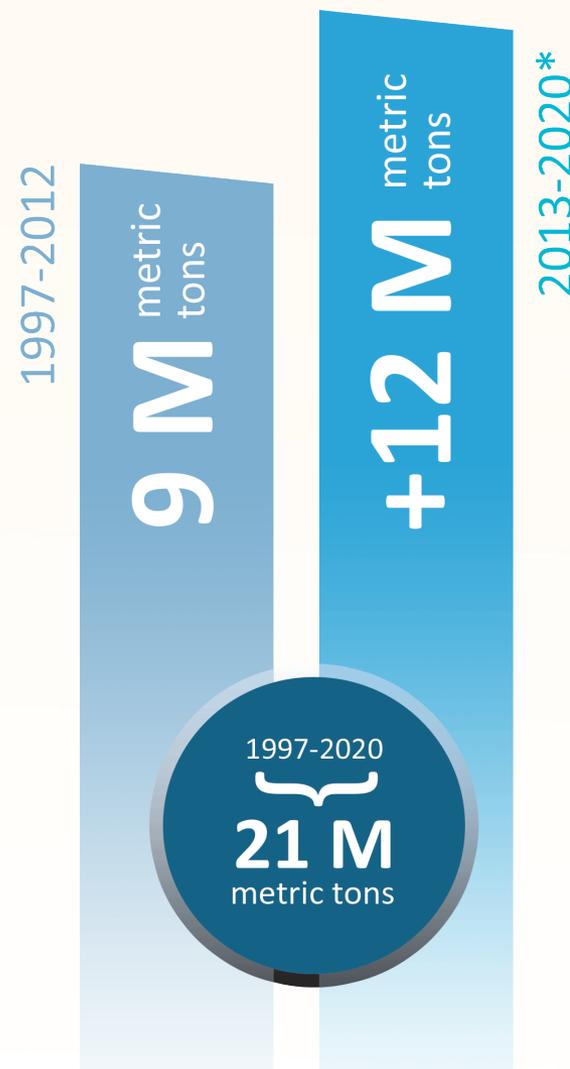


# CIFER 2013



- Related GHG emissions reductions (metric tons).
- Achieved (1997-2012)
- Projected (2013-2020)

Total: 21M





# Flexible use of military airspace



- CYR 630 & 666, CYR 629 & 665 and CYR 628 & 664 are designated Military Flying Areas northeast of Bagotville, Quebec.
- Location is strategically important for CFB Bagotville.
- But is also located in the middle of busy inbound and outbound flow to and from oceanic tracks to central-US.



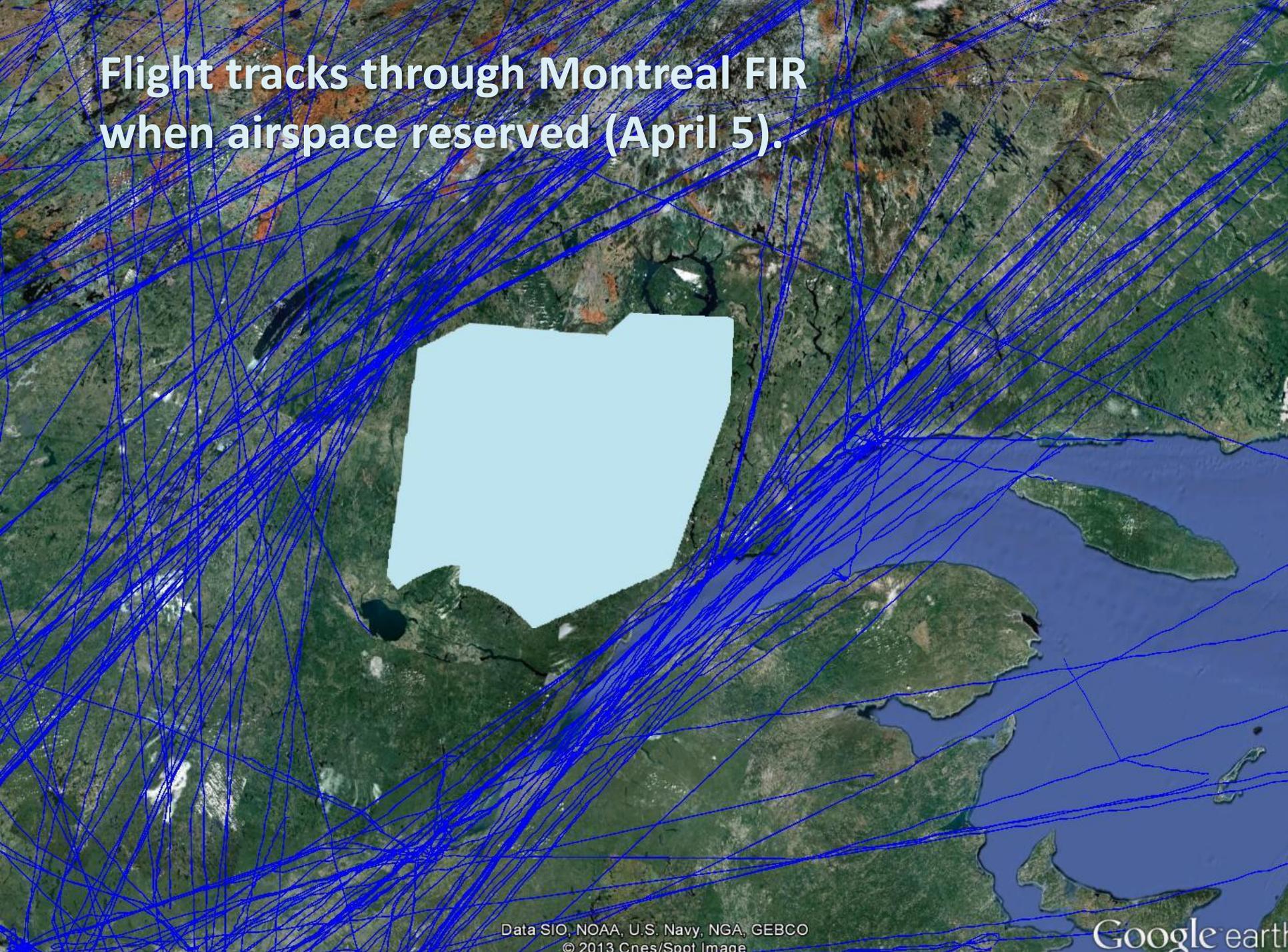


# Flexible use of military airspace

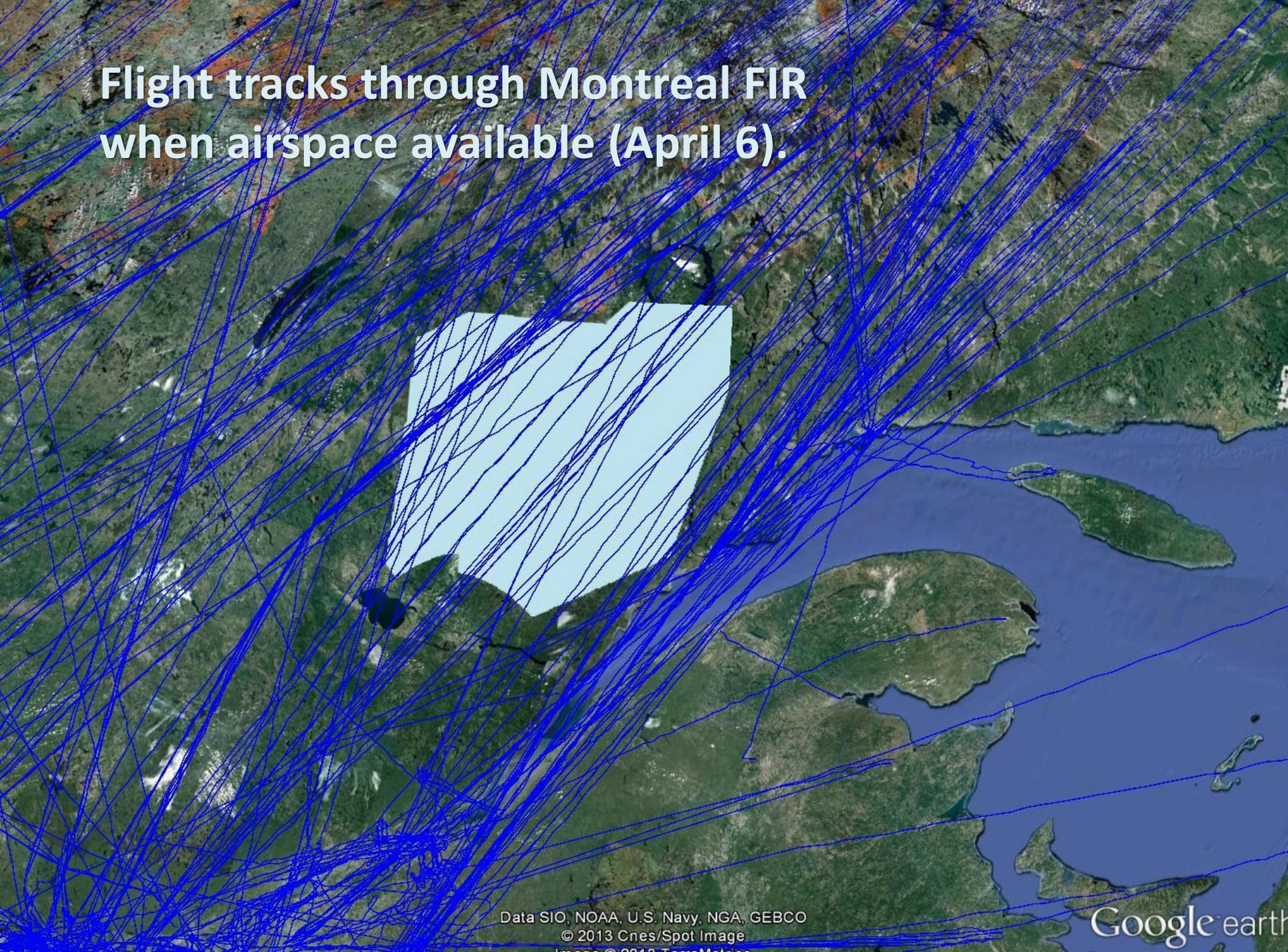


- Traditionally, Military CYR was “closed” airspace 16 hours per day weekdays, even when not in use.
- As of April 2012, agreement established to close airspace by NOTAM when required by RCAF.
- Agreement has freed airspace on most days without affecting essential capability of CFB Bagotville.
- Even when reserved by NOTAM, reservation usually less than 16 hours.

**Flight tracks through Montreal FIR  
when airspace reserved (April 5).**



**Flight tracks through Montreal FIR  
when airspace available (April 6).**





# Benefits



- Reported savings per flight ~ 6 minutes.
- Average weighted savings based on fleet mix in airspace = \$412 per flight
- Anticipated annual benefits
  - fuel savings ~ \$2 million CAD
  - reduction of over 5,000 metric tons of GHG emissions



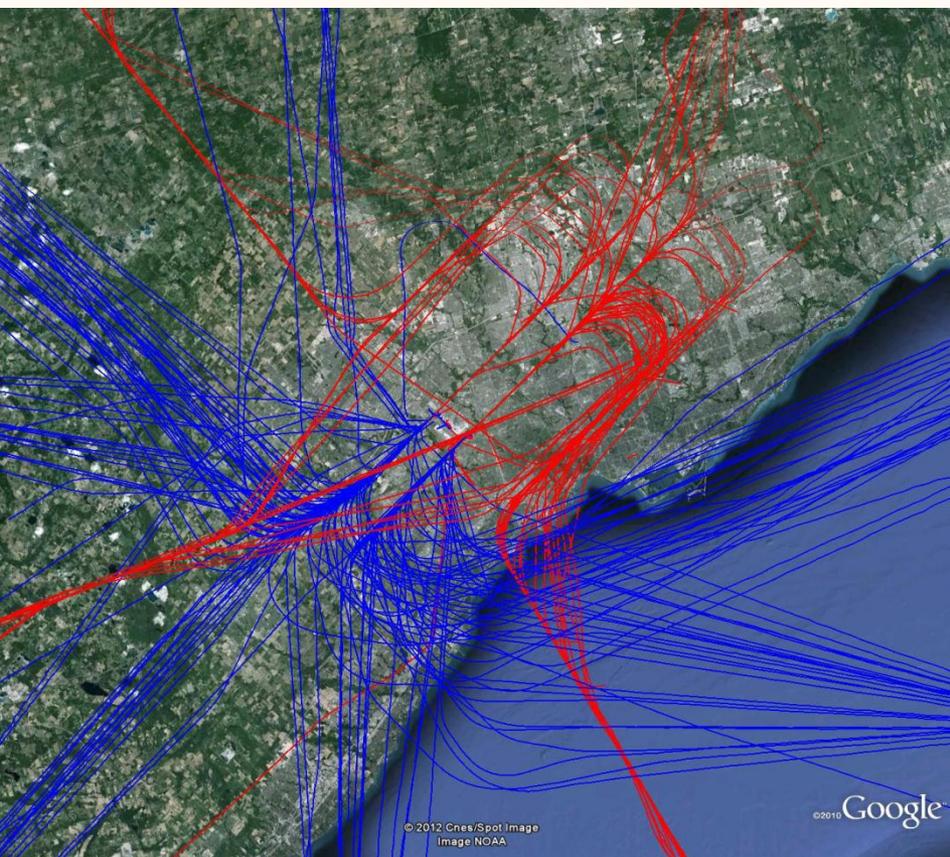
# Other airspace initiatives



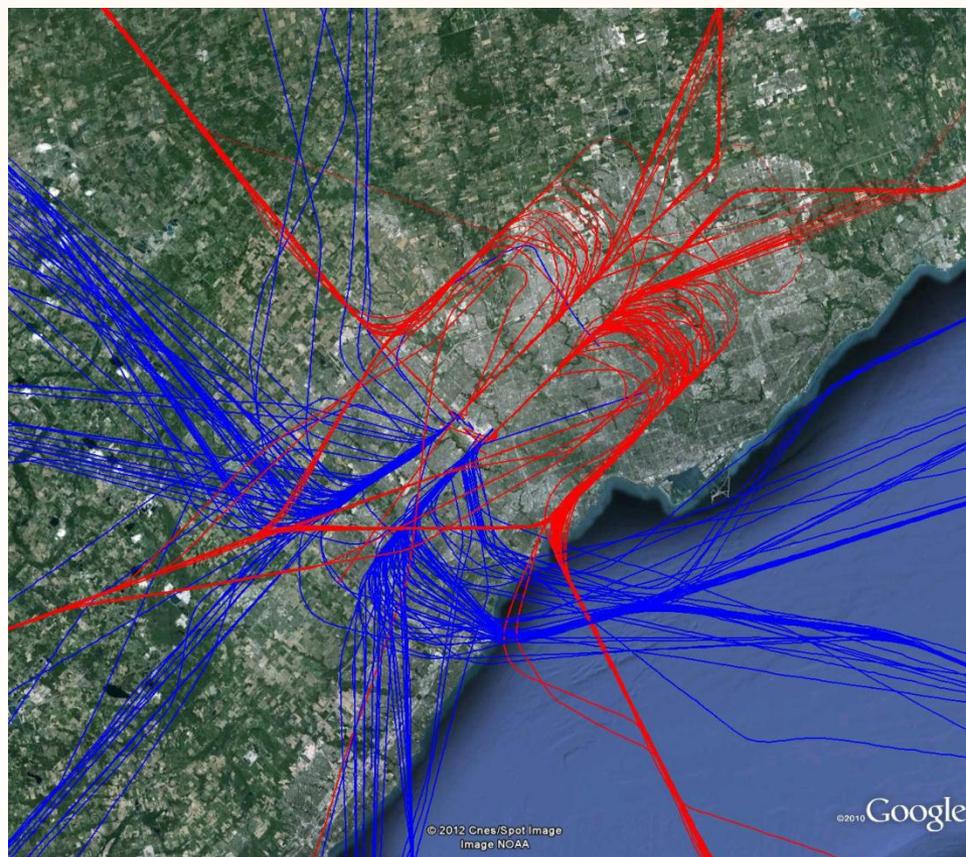
- In February 2012 we implemented a redesign of airspace in the busiest air traffic corridor in Canada between Toronto and Montreal
  
- A complete RNAV environment with:
  - segregated en route airways,
  - improved descent profiles on arrivals, and
  - a new bedpost arrival at CYYZ enabling better balancing of traffic on the main parallels.

# Toronto Pearson

**Before  
July 11, 2011**



**After  
June 11, 2012**





# Outcomes



- Simulation of the changes showed implementation would:
  - reduce cumulative flight time by over 10 hours daily based on current traffic volumes
  - reduce GHG emissions by 14,300 metric tons
  - reduce aircraft fuel burn by 5.4 million liters and \$4.3 million annually

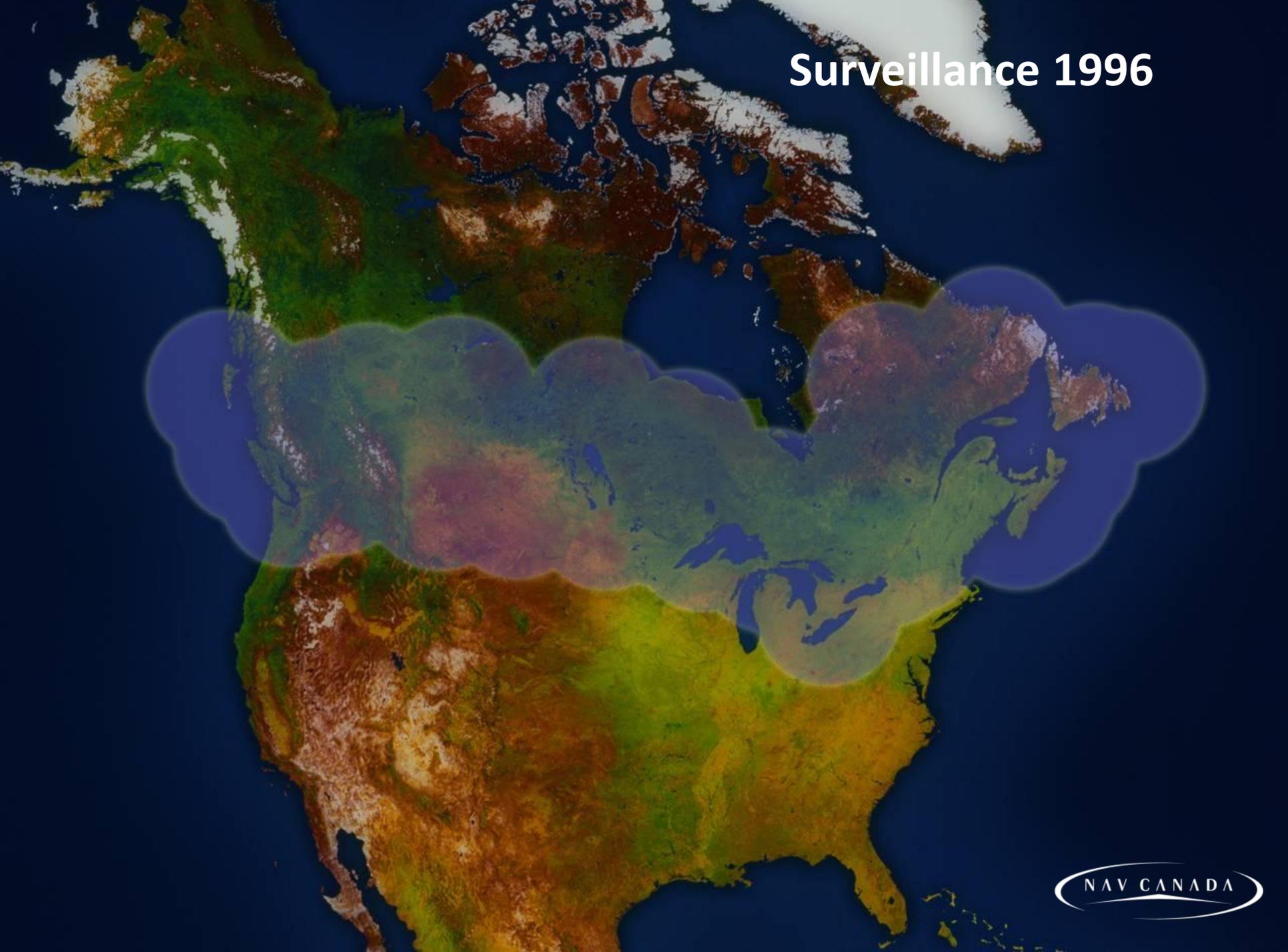


# Surveillance Strategy

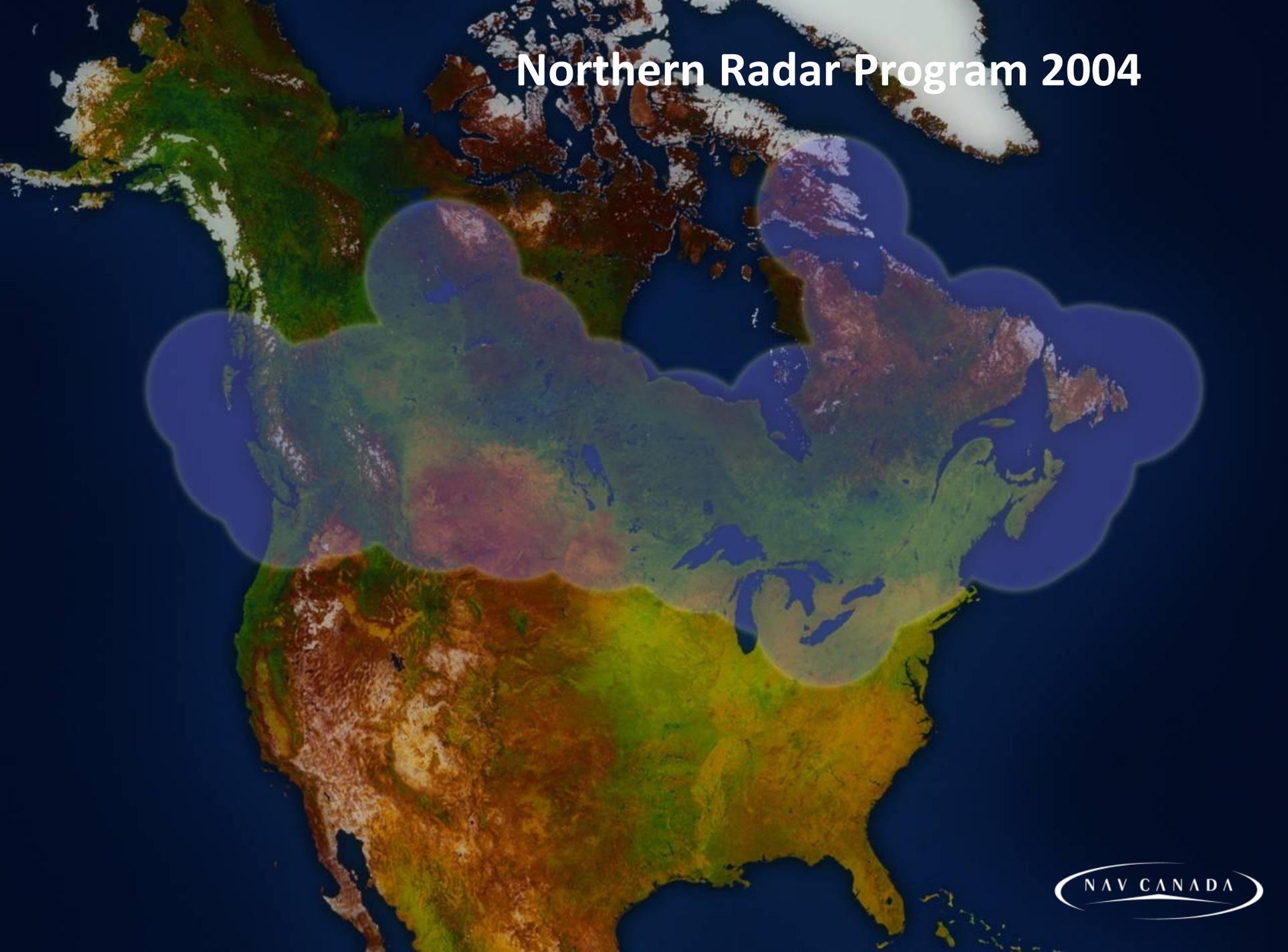


- One of the most significant things that can be done to enable efficiencies is to add surveillance to areas currently without it.
- Reduced separation standards, dynamic routings and climbs all contribute to improved flight profiles.

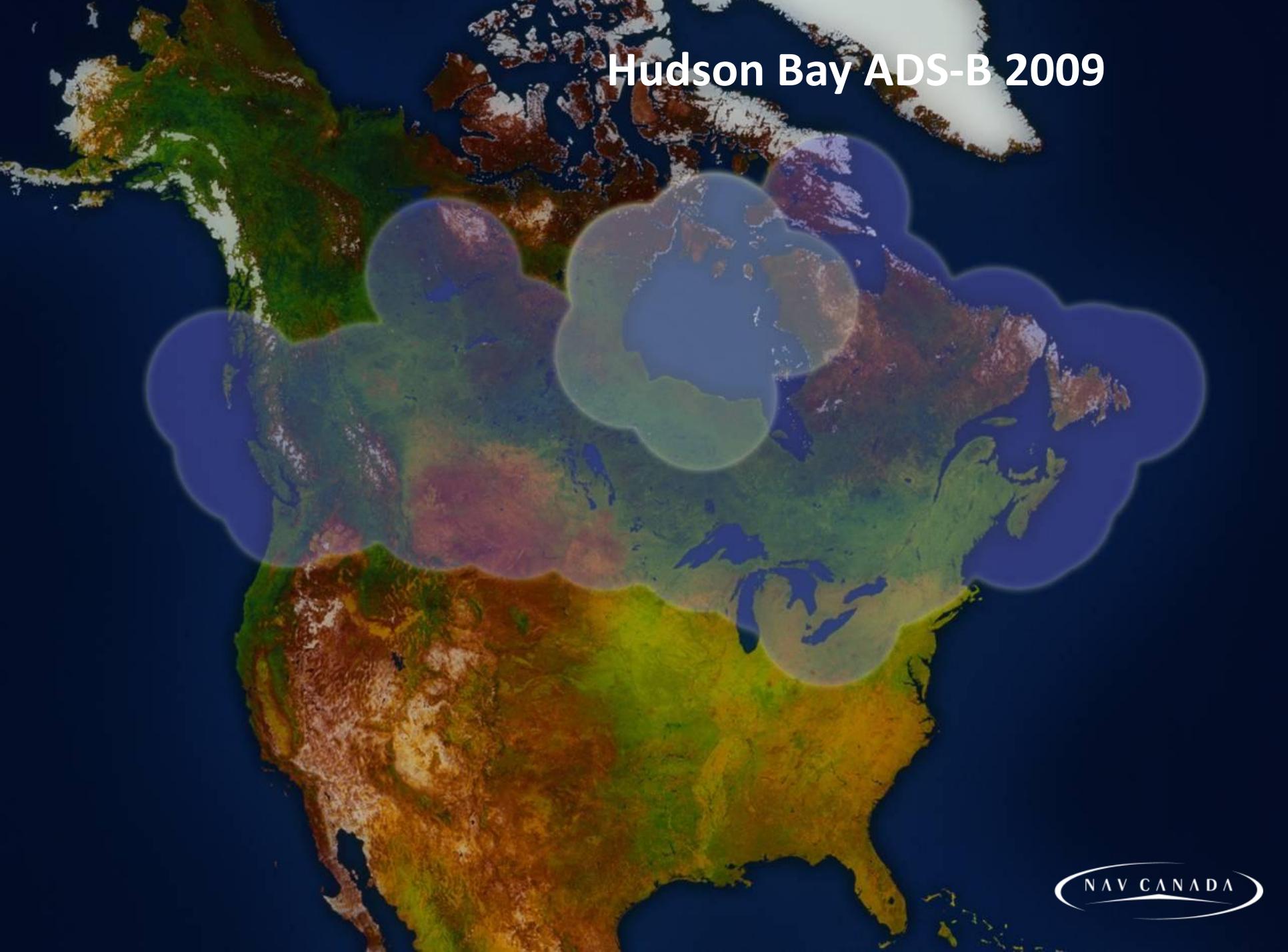
# Surveillance 1996



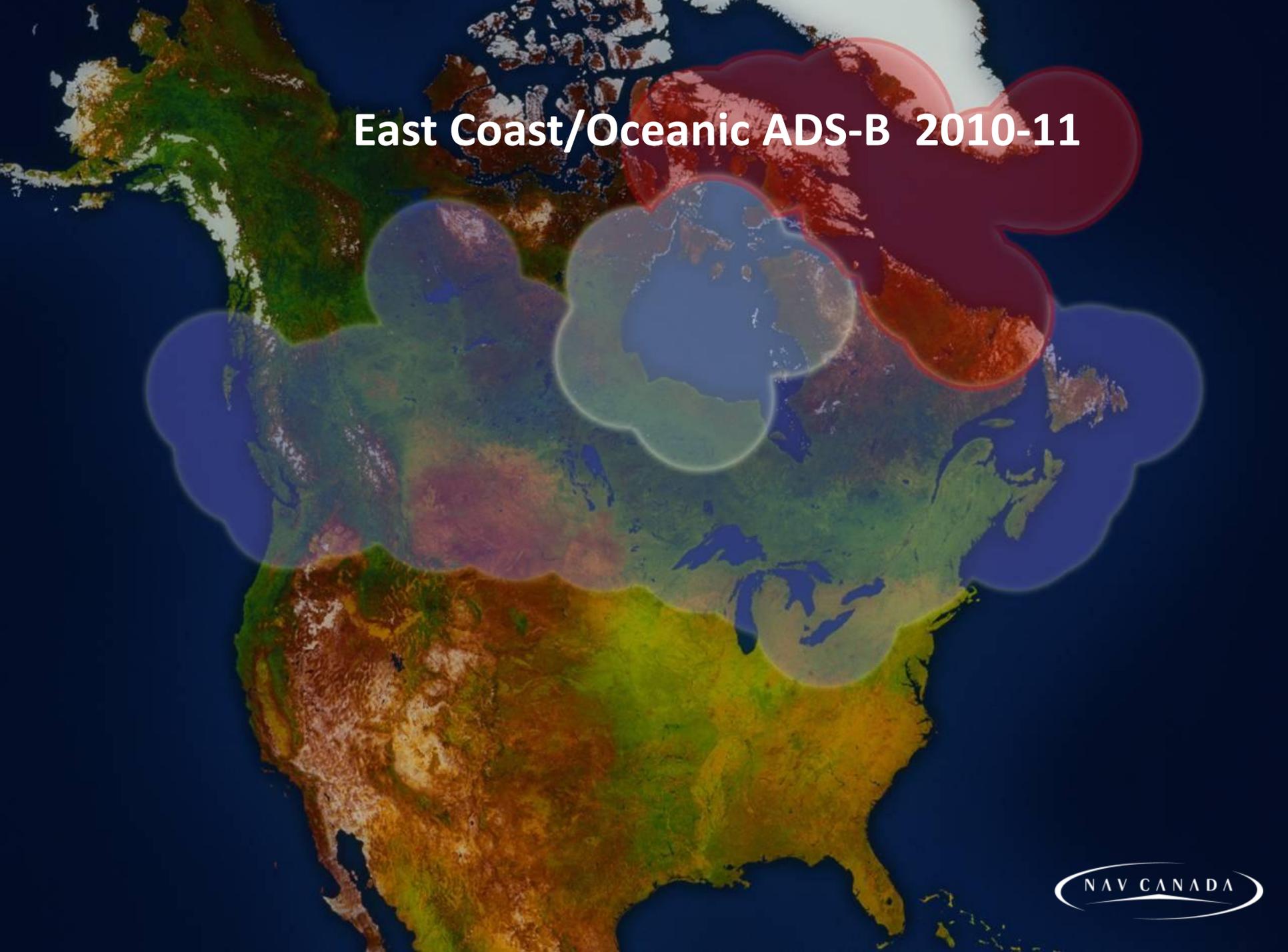
# Northern Radar Program 2004



# Hudson Bay ADS-B 2009

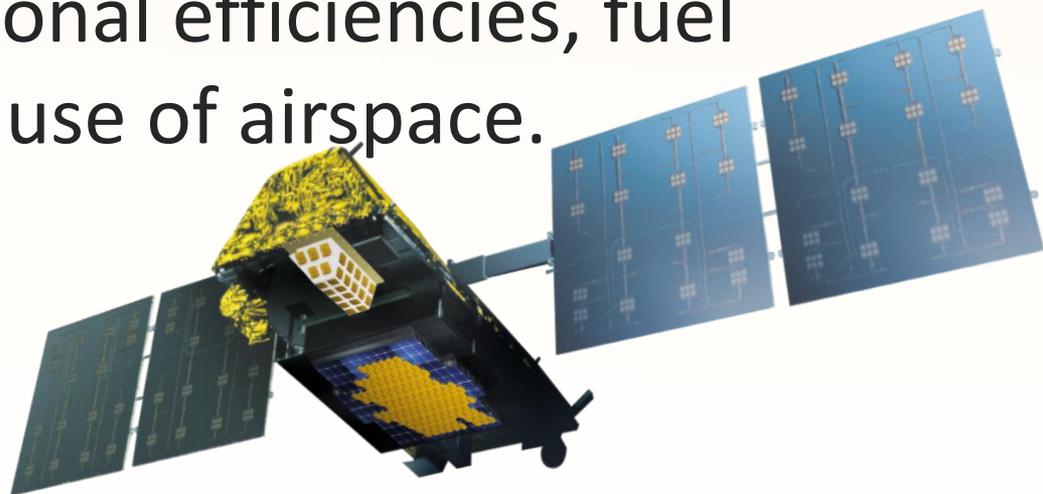


# East Coast/Oceanic ADS-B 2010-11

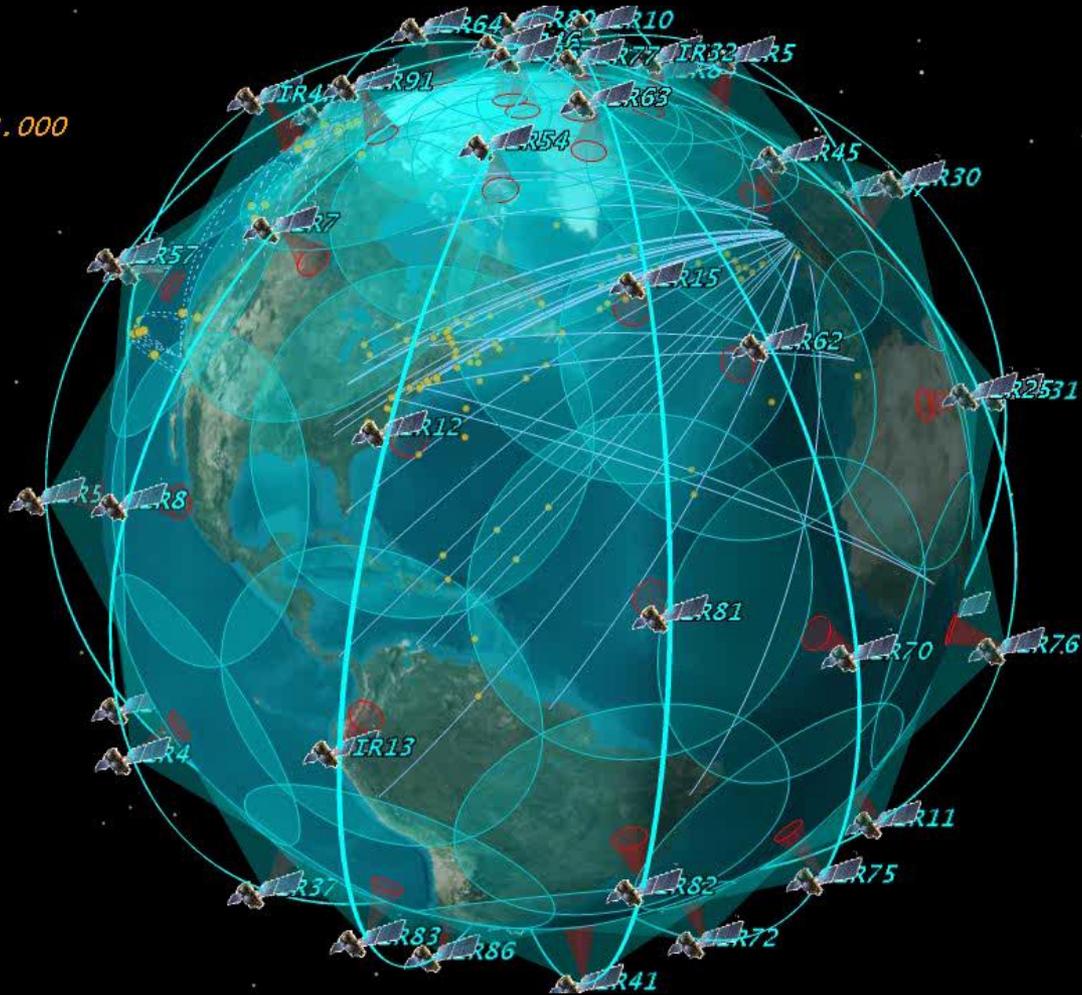


# ADS-B via Satellite

- Iridium NEXT, a constellation of 66 cross-linked Low Earth Orbit (LEO) satellites, will extend ADS-B coverage to the entire globe.
- Will enable all air traffic management agencies to increase operational efficiencies, fuel savings and better use of airspace.



21 Jul 2011 20:36:02.000



Earth Inertial Axes

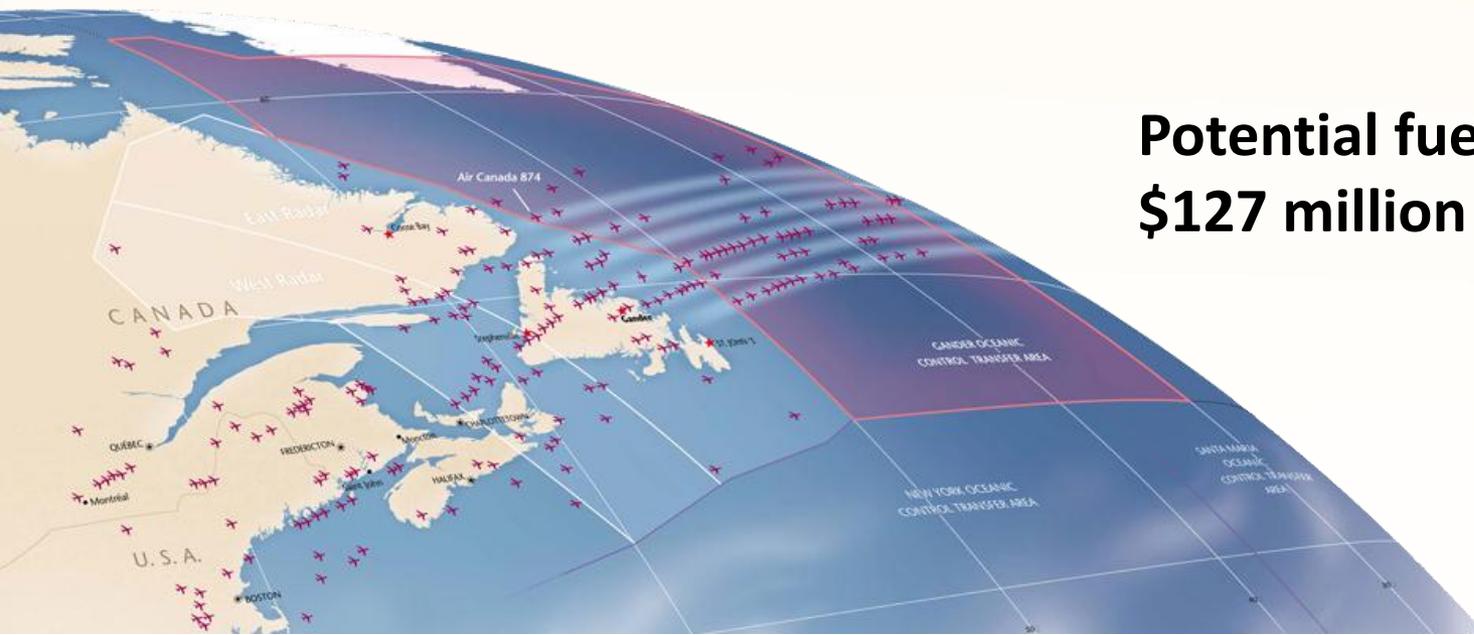




# Initial focus on the NAT

- **1,000** flights per day (1,300 peak summer day)
- **350,000** commercial flights per year
- **+23,000** military & GA flights per year
- **85%** of the flights are already ADS-B equipped
- **67%** of flights are Data Link (FANS 1/A) equipped
- **67%** are capable and use Controller Pilot Data Link Communications (CPDLC)

**Potential fuel savings of \$127 million annually**



# Thank you

