Arctic Round Table Discussion

UAS Applications

August 2016

THE VALUE OF PERFORMANCE.

NORTHROP GRUMMAN

The Arctic Stage

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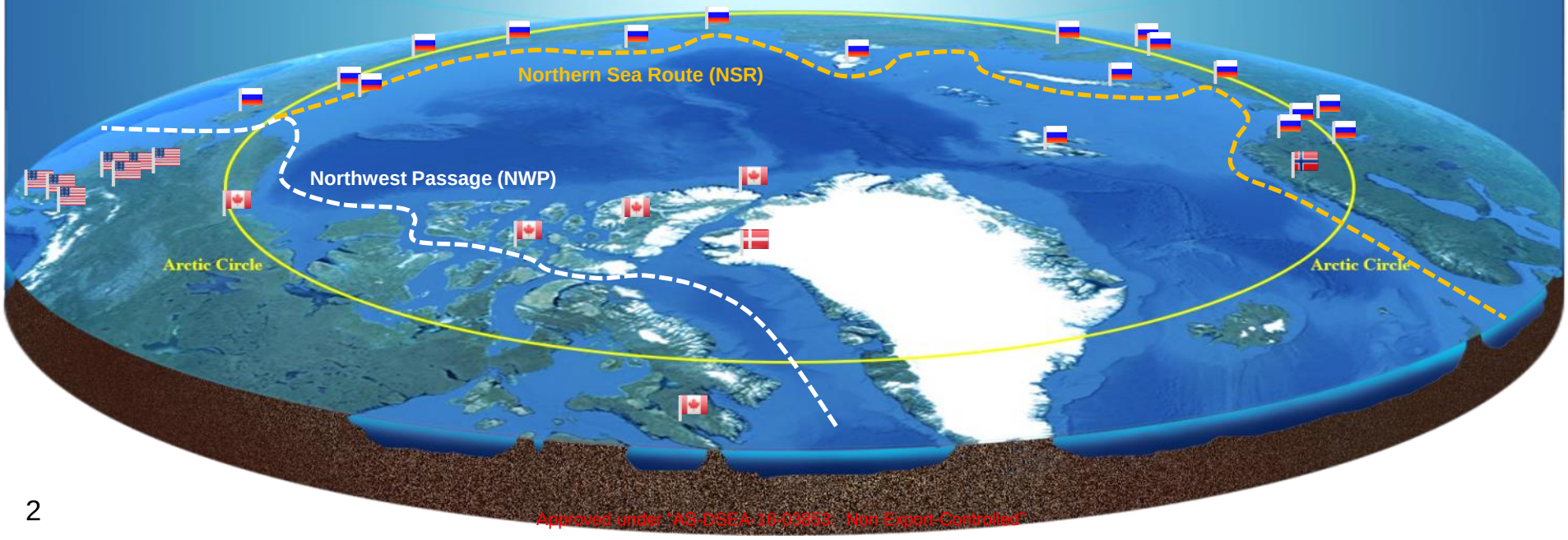
Arctic Council

USA (Chair), Russia, Canada, Norway, Denmark, Sweden, Iceland, Finland

Observers: China, France, Germany, India, Italy, Japan, South Korea, Netherlands, Poland, Singapore, Spain, UK

NGC Analysis Center Whitepaper

- ". . . Russia's actions – and future plans – are by far the most ambitious. . . in 2015, it completed its largest Arctic military exercises involving 80,000 troops, 220 aircraft, 41 ships, and 15 submarines"
- ". . . approximately 90 billion barrels of oil (13 percent of the world total), 1,669 trillion cubic feet of natural gas (30 percent of the world total), and 44 billion barrels of natural gas liquids (20 percent of the world total)."
- ". . . utilizing the NSR to ship to Kirkenes, Norway, could save 16 days from Shanghai, China, 18.5 days from Busan, Korea, and 20.5 days from Yokohama, Japan"



Arctic Domain Awareness Mission Challenges

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- Long Distances
  - 5.5 Million Square miles (approximately half the size of Africa)
  - Arctic Ocean covers an area of 6 Million square miles
  - Limited Basing
- Harsh Climate
  - Average winter temperature is -30° F (-34°C)
  - Average summer temperature is 37-54° F (3-12° C)
  - Slow Situation Development
- Limited Communications
  - Very few polar communication systems
  - Polar (North of 70°) SATCOM limited in bandwidth
  - Most SATCOM limited to below 65 Degrees Latitude
  - No existing LOS Ground Entry Points

Very Challenging Environment – Calls for Autonomous Systems

Grand Forks Arctic Reach

Equidistant to Most Concern Areas

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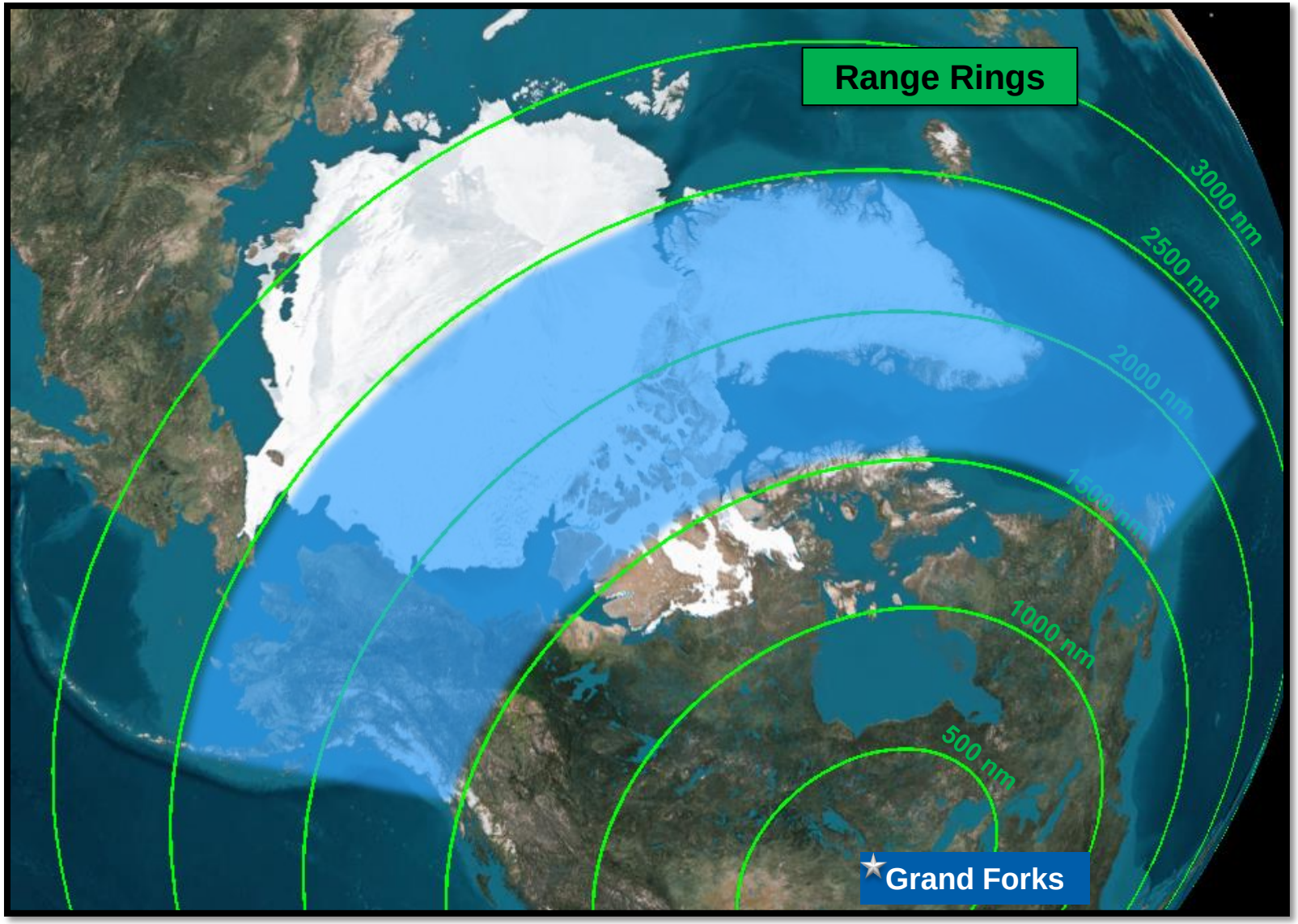

NASA Global Hawk

Potential Arctic Mission ‘17-’18 NASA GH Flights

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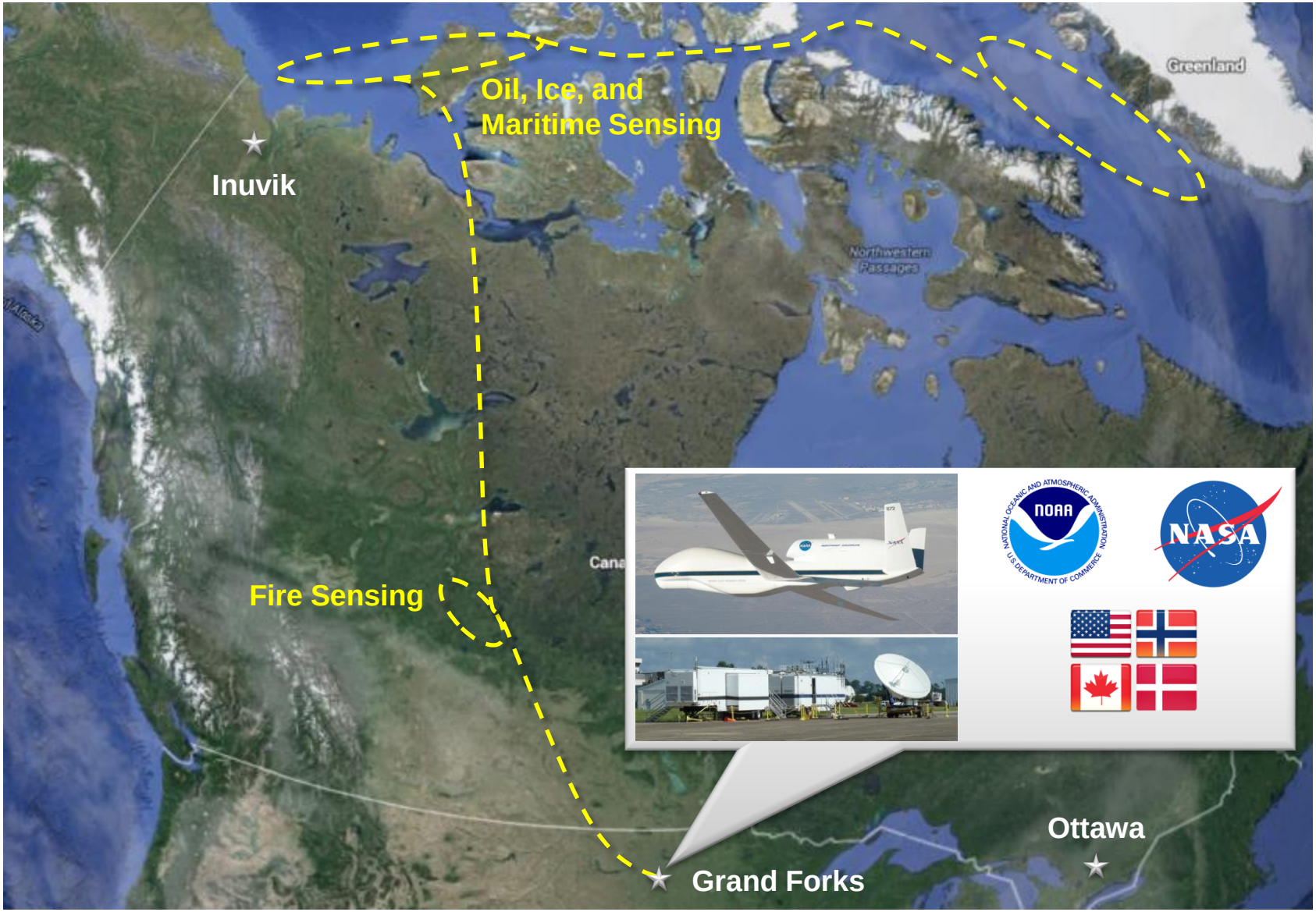

Global Hawk Arctic Reach

Basing: Grand Forks

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