A large, bright nuclear explosion with a massive mushroom cloud is centered in the background. The sky is a pale blue, and the ground below is a hazy, light brownish-grey. Two thick red horizontal lines are positioned above and below the main title text.

**A Potential Path to an Accident
Involving Russia's Strategic Nuclear Forces**

**Search Fans of Russian
Strategic Nuclear Early Warning
Radars Attacked by Ukraine**

Presentation to Schiller Institute

June 1, 2024

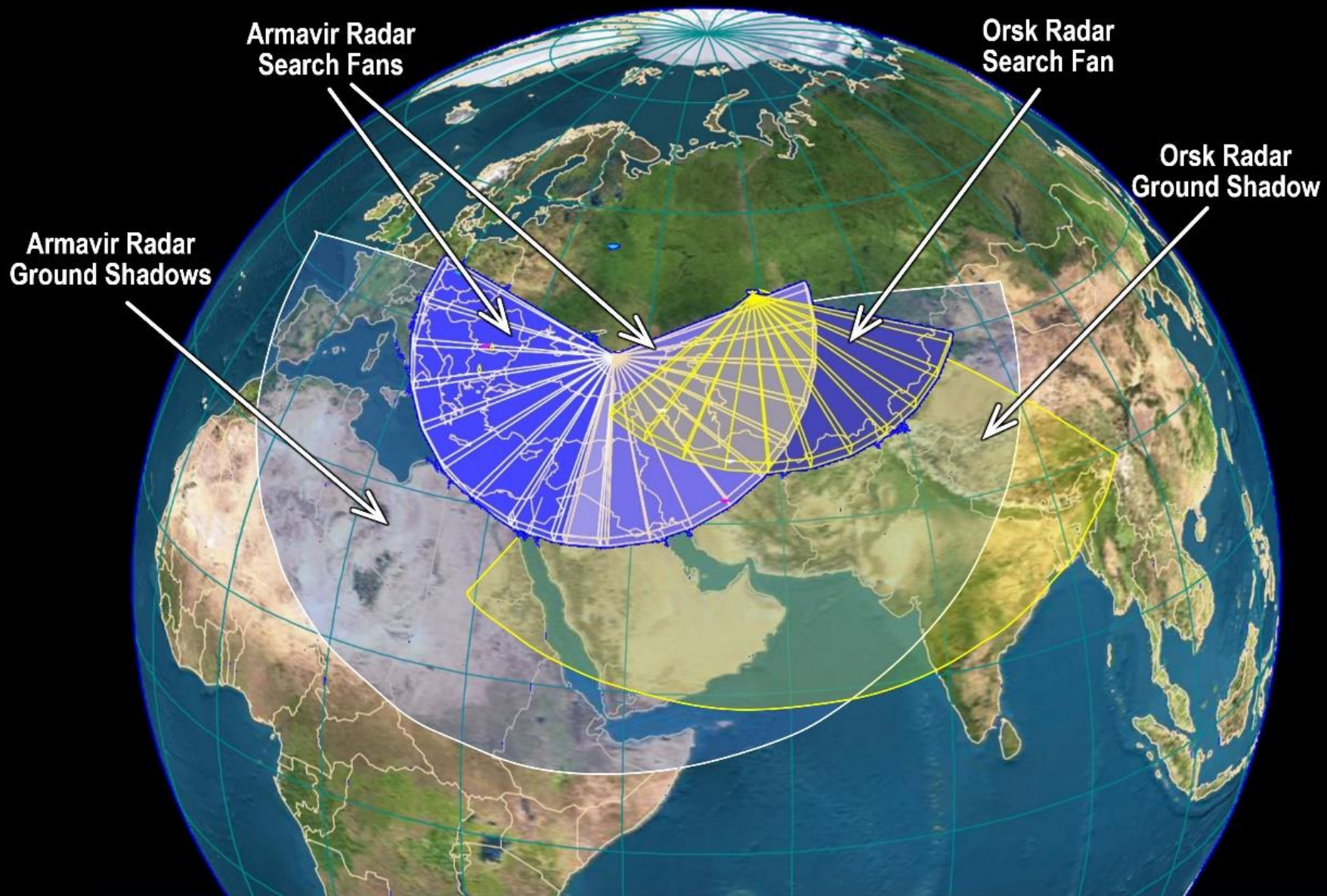
Theodore A. Postol

Professor Emeritus of Science, Technology, and National Security Policy

Massachusetts Institute of Technology

postol@mit.edu; 617 543-7646

Search Fans of Russian Strategic Nuclear Early Warning Radars Attacked by Ukraine



UHF Radar Stations at Armavir



UHF Radar Stations at Armavir



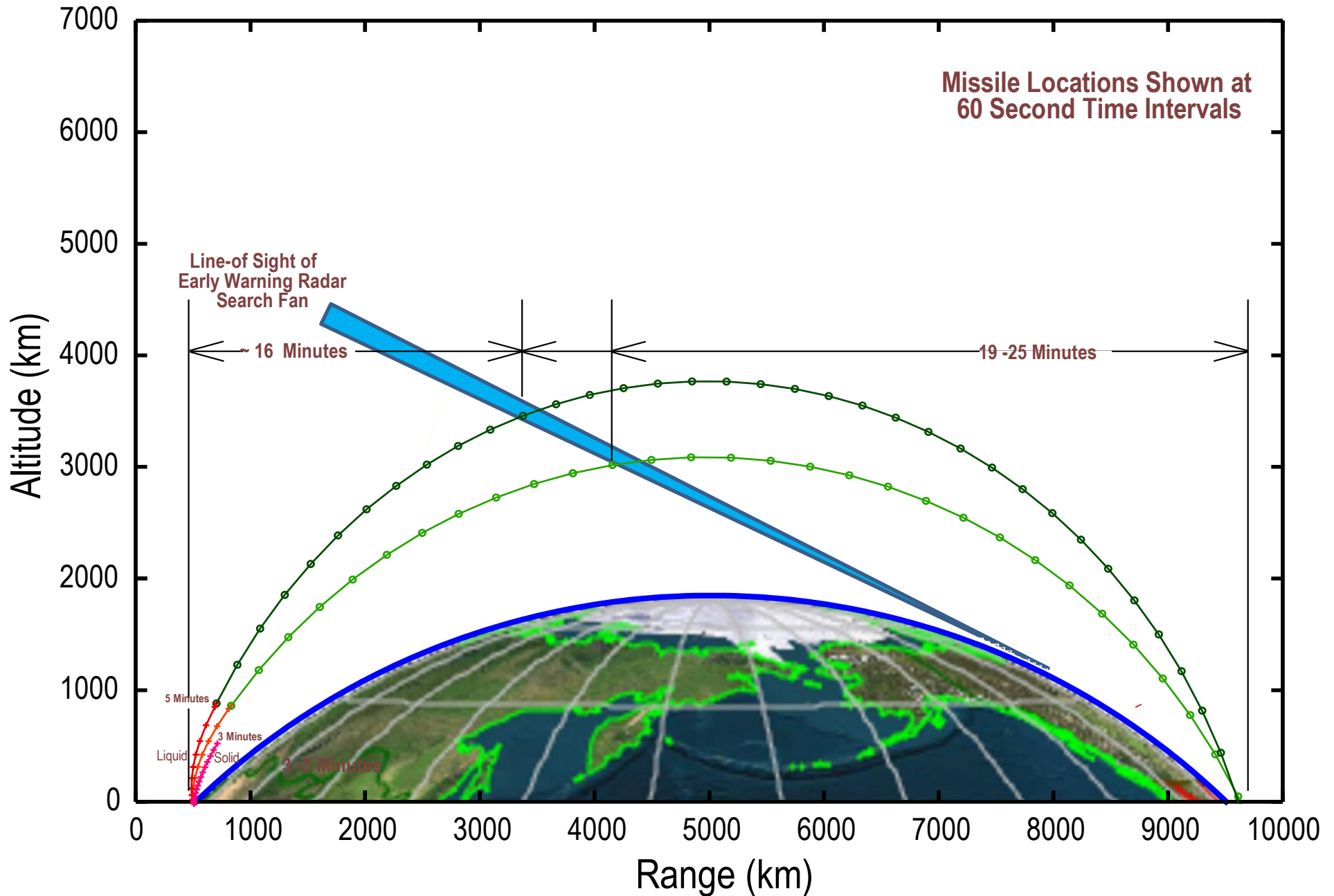
VHF Radar Station at Orsk



Russian Leadership Has 1/3 to 1/4 the Warning Time Compared to That of US Leaders



Warning Times Associated with a Russian Strategic Nuclear Attack with Land-Based ICBMs



Estimated Time Needed to Carry Out Nuclear Launch-Operations No Matter What Response Is Chosen

Time Needed to Carry Out Basic Nuclear Weapons Launch-Operations

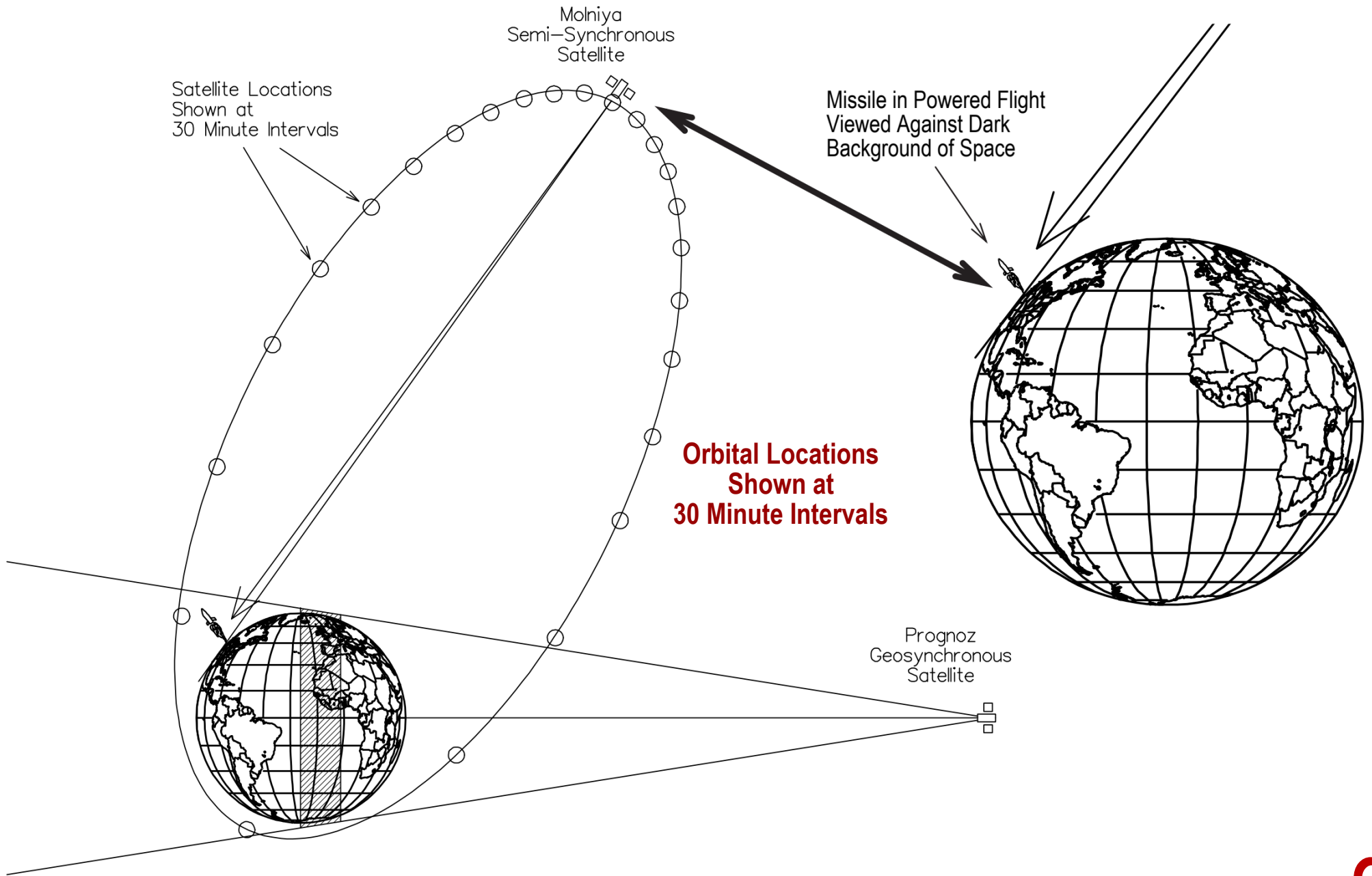
Time for attacking missiles to rise over the horizon into the line-of-sight of early warning radars	1 minute
Time for radars to detect, track, and characterize detected targets, and to estimate the size and direction of motion of targets	1 minute
Military and civil command conference to determine response	1 to 3 minutes
Time for command and unit elements of silo-based forces to encode, transmit, receive, decode, and authenticate a launch order	2 to 4 minute
Time for missile crews to go through full launch procedures	1 to 3 minutes
Time for launched missile to reach a safe distance from its launch-silo	1 minute
Total time consumed in unavoidable and essential operations	7 to 13 minutes

If a short time-line attack is attempted against Russia, a Russian response aimed at launching silo-based missiles before nuclear weapons detonate on them would require time for several technical operations. Time would also be needed by political leadership to assess the situation and decide whether or not to launch the silo-based missile force. The amount of time available for decision-makers to assess the situation and decide whether or not to launch silo-based nuclear forces is the difference between the time it takes for warheads to arrive at targets and the time needed to carry out operations no matter what response is chosen.

Russian Molniya Infrared Satellite Constellation

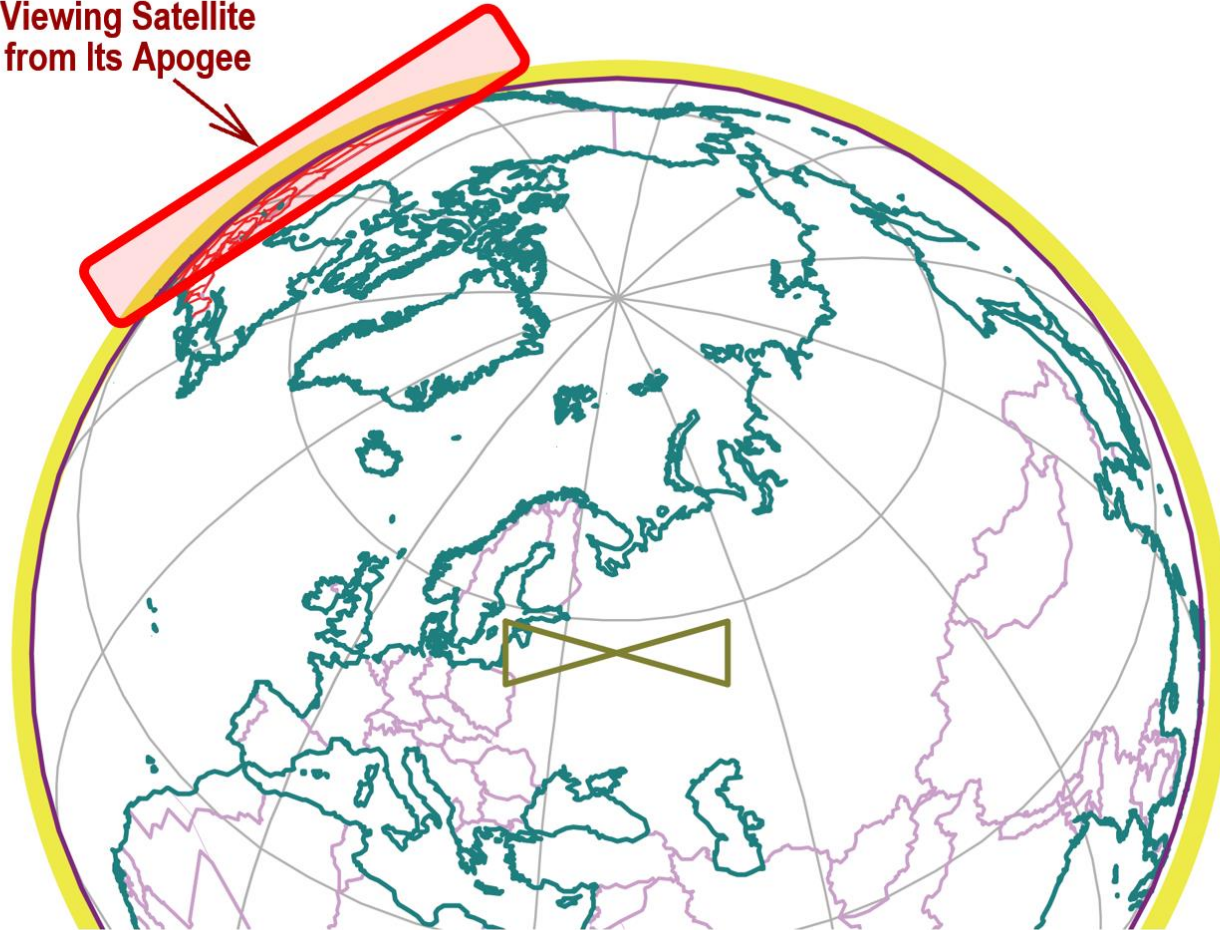
Russian Molniya Infrared Satellite Constellation

This Constellation Was Fully Populated during the False Alert of 1995
Nine Oko-1 or Oko-2 Satellites Required for 24-Hour Coverage

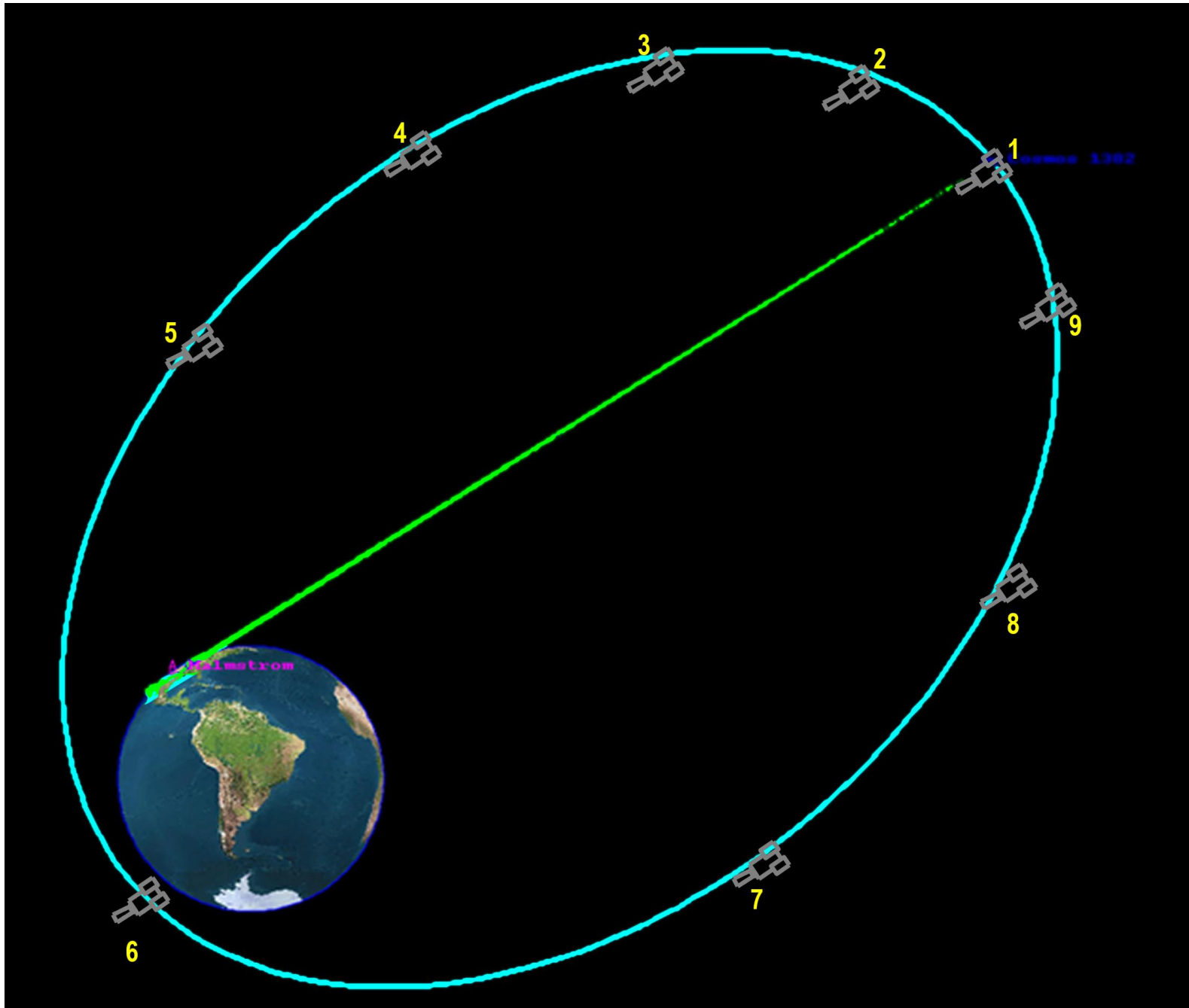


View of Earth-Limb from Apogee of Cosmos 2510

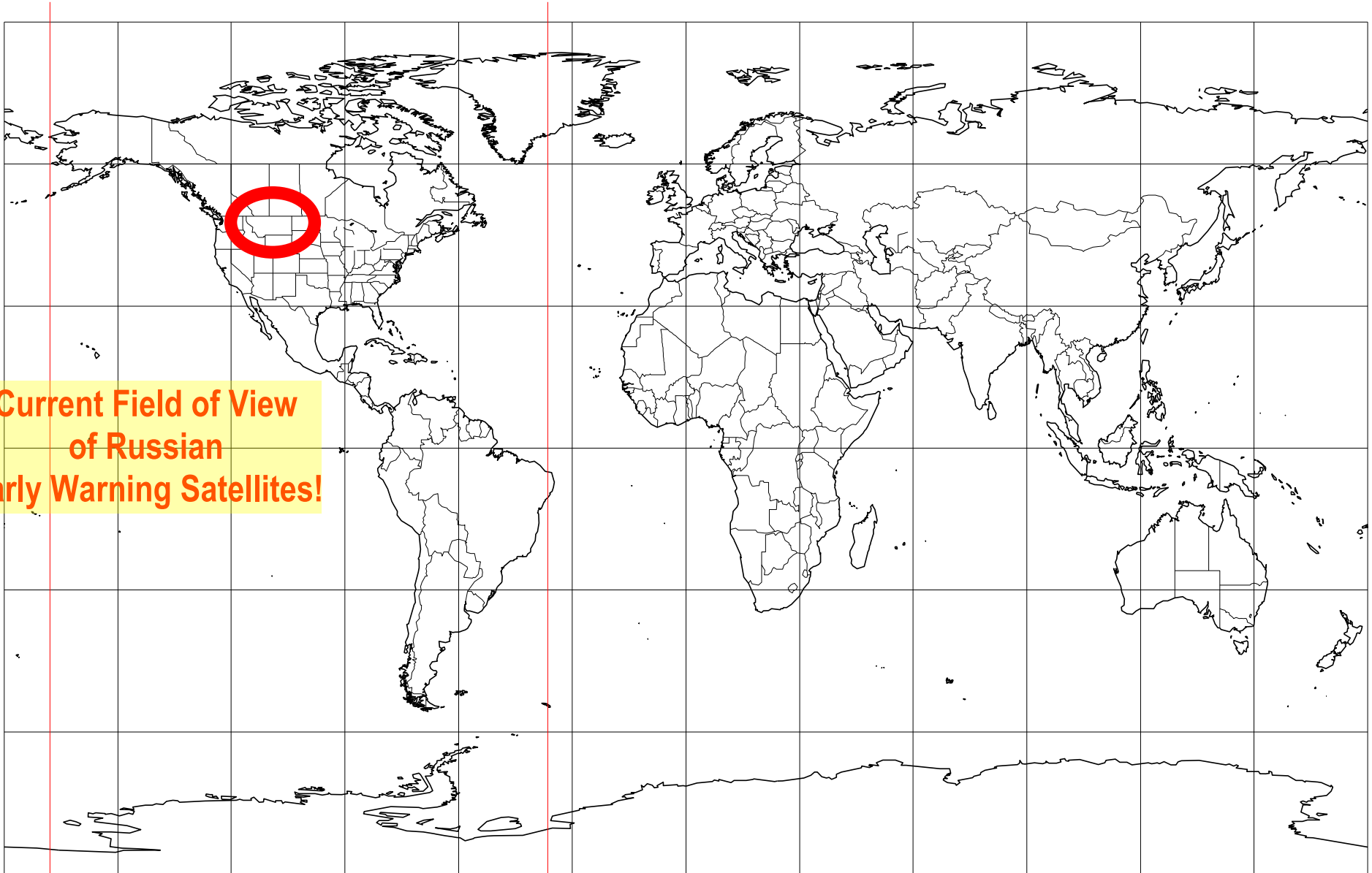
Field of View of Earth-Limb
Viewing Satellite
from Its Apogee



Molniya Satellite at Apogee



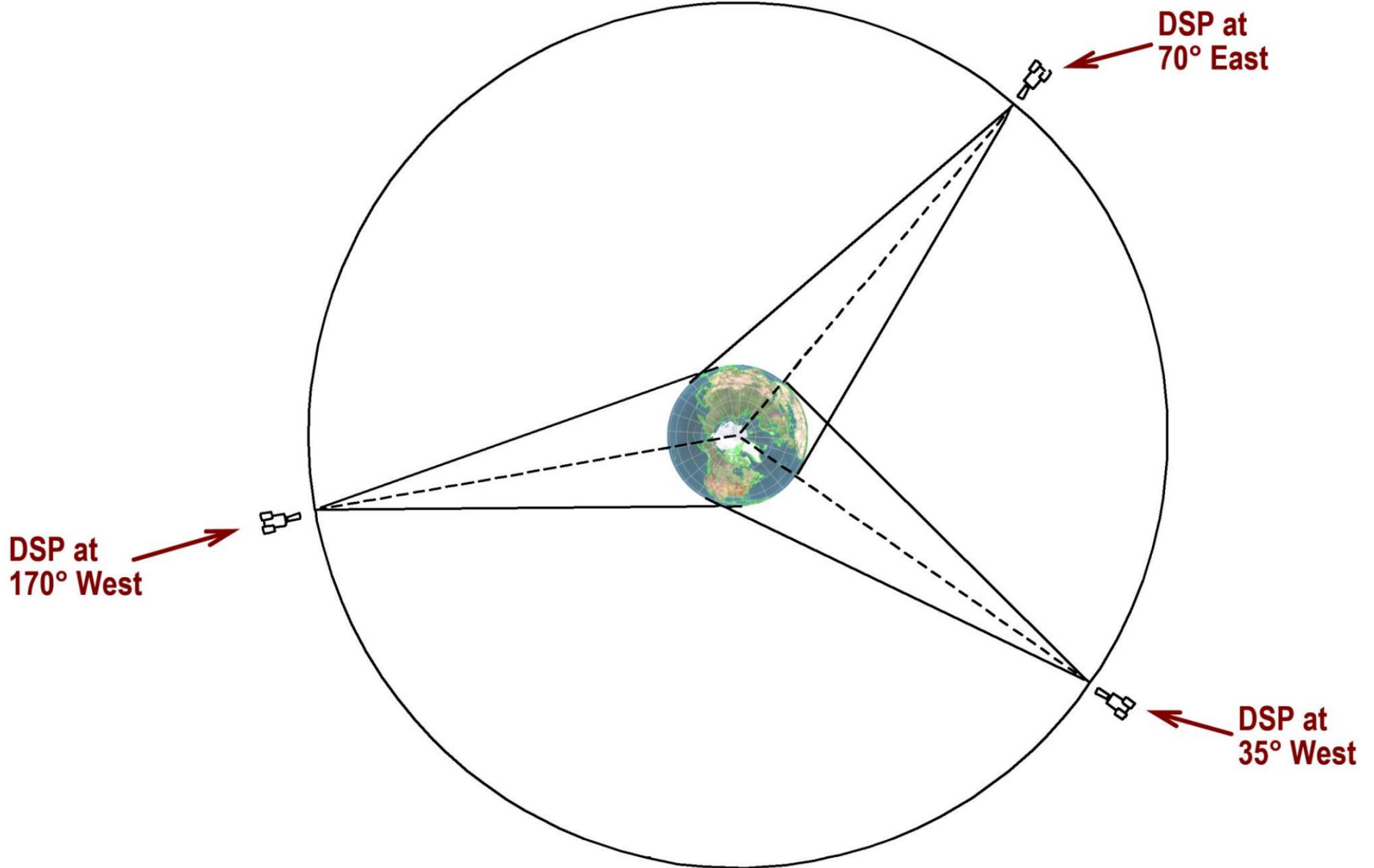
Current Field of View of Russian Molniya AND Prognoz Early Warning Satellite Constellations



**Current Field of View
of Russian
Early Warning Satellites!**

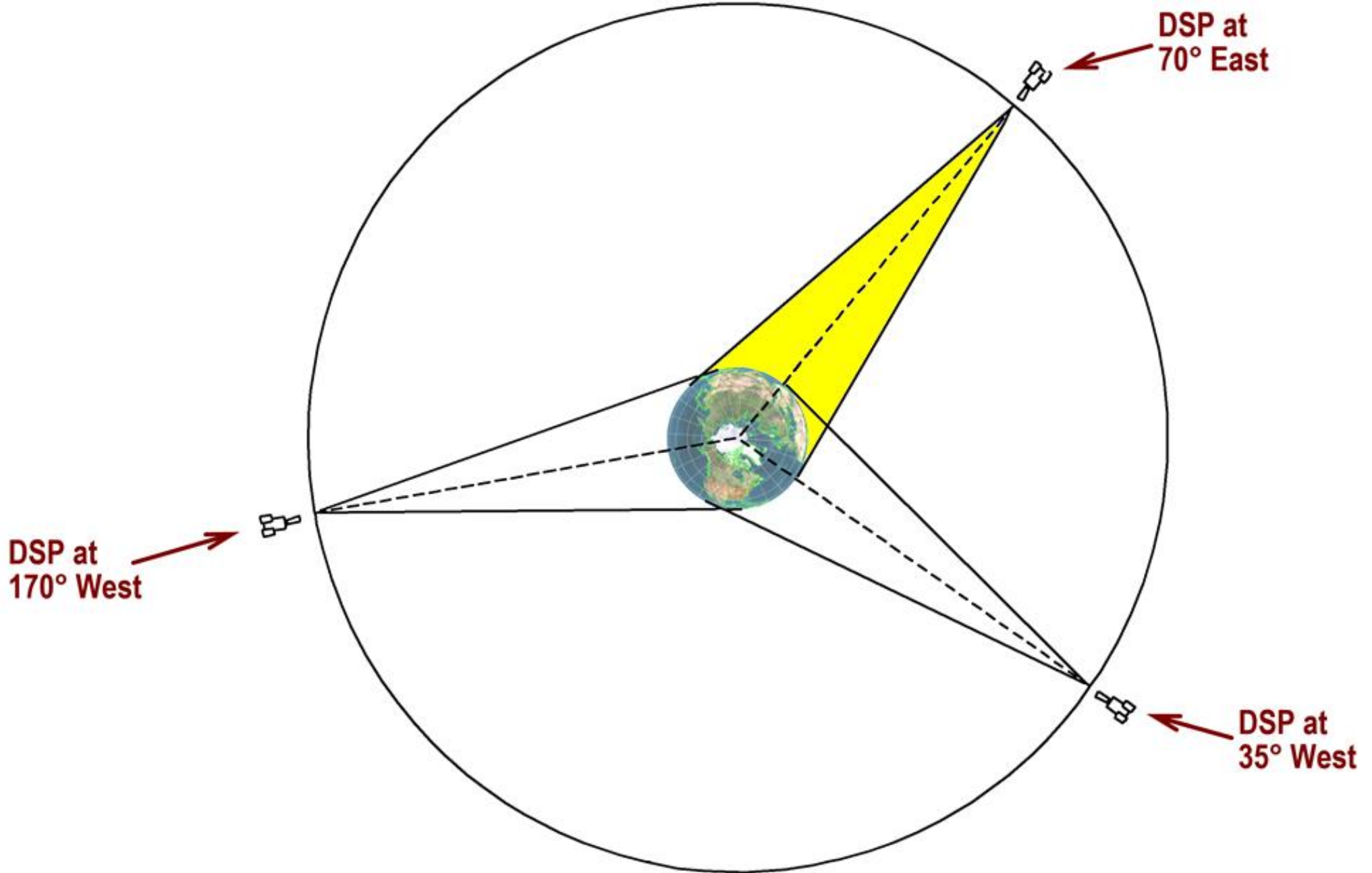
US Satellites Look STRAIGHT DOWN at the Earth

Rough Locations of US LOOK-DOWN Early Warning Satellites



Comparison of Russian and US Areas of Missile Launch Monitoring

Rough Locations of US LOOK-DOWN Early Warning Satellites

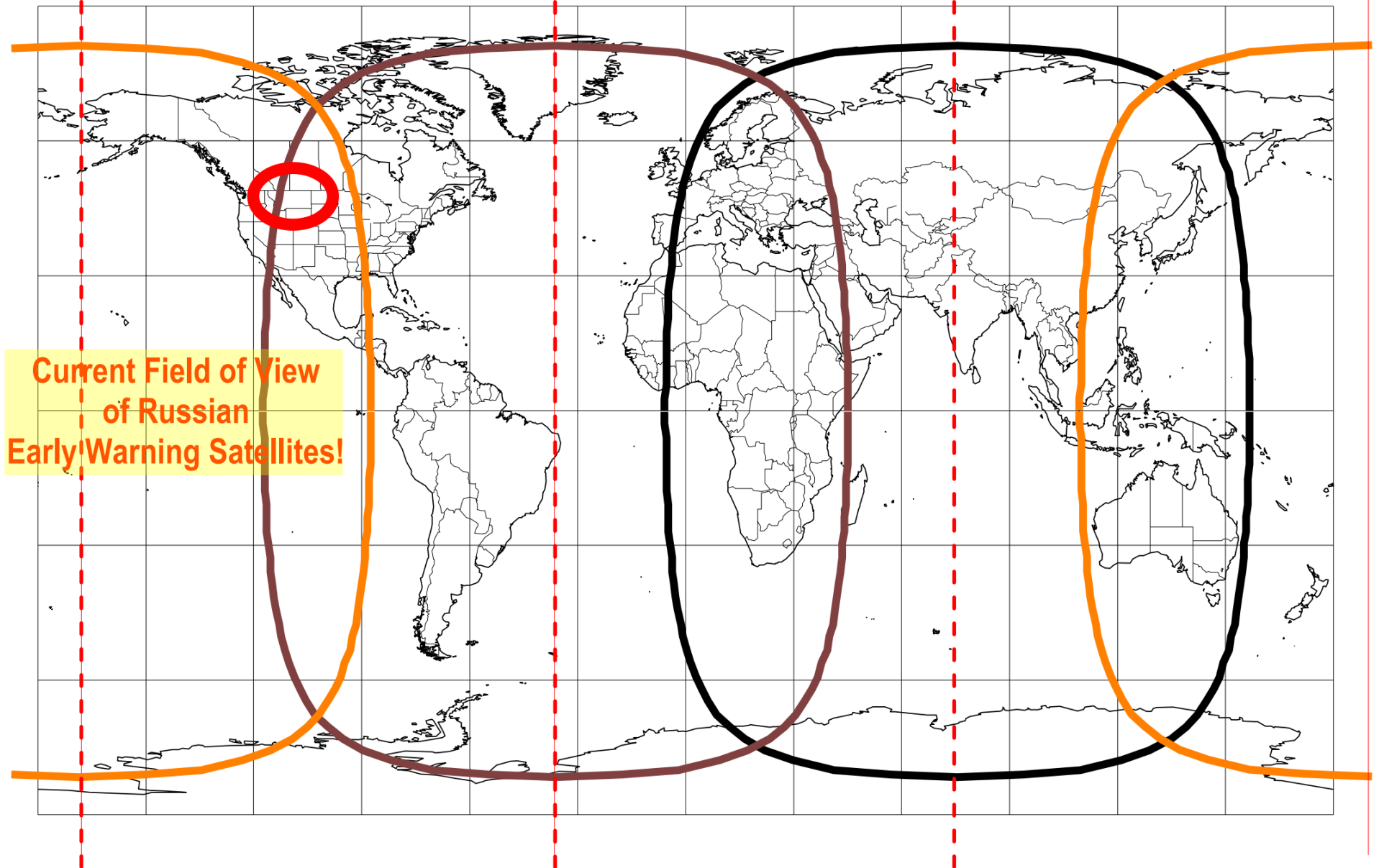


Comparison of Russian and US Early Warning Satellite Fields of View

170° West

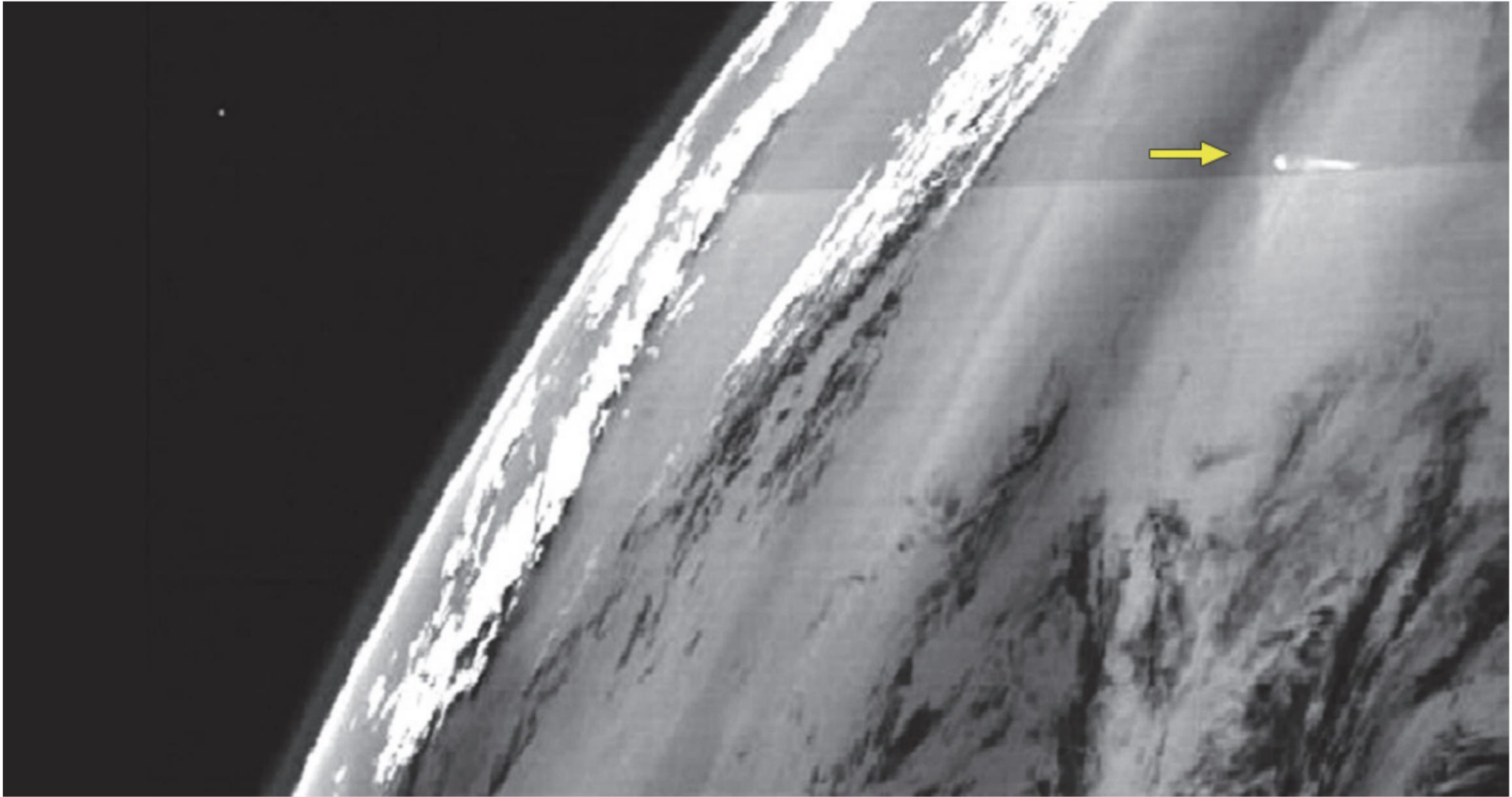
35° West

70° East



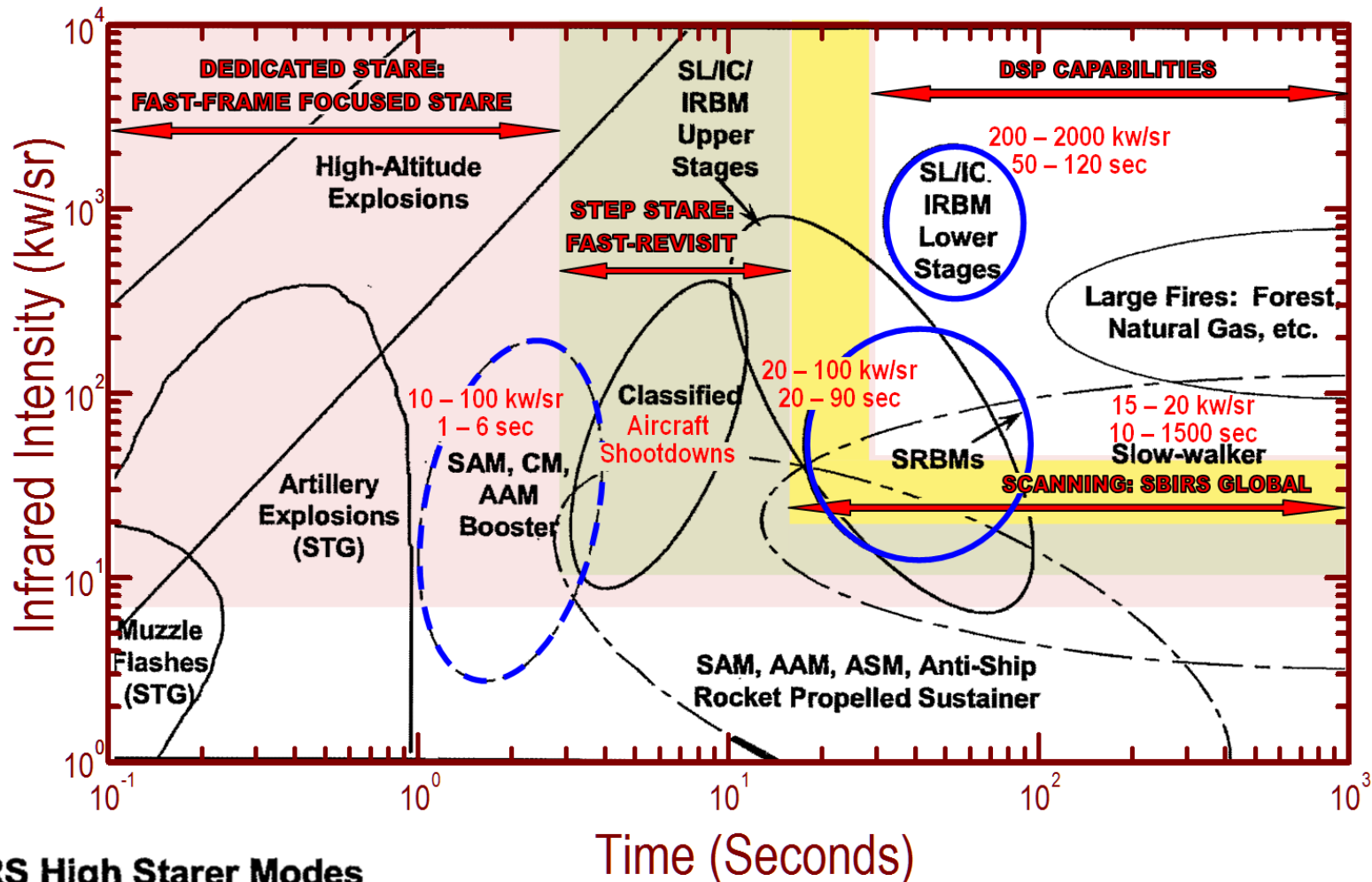
Current Field of View
of Russian
Early Warning Satellites!

Space-Based Infrared System Infrared Image of Delta IV Launch Vehicle in Flight



The first and only image released for public use from the Sbirs system is this one exclusively provided to Aviation Week for publication in Nov. 20, 2006. It captures the heat plume emitted by a Delta IV predawn launch from Vandenberg AFB, California, Nov. 4, 2006, that was carrying a Defense Meteorological Satellite Program spacecraft en route to insertion into polar orbit. The plume is readily visible against the backdrop of Earth, which in the wee morning hours sees little heat and sunlight. This image was degraded by the Air Force for unclassified use. Credit: U.S. Air Force

Representative SWIR & STG Intensity and Duration of IR Events

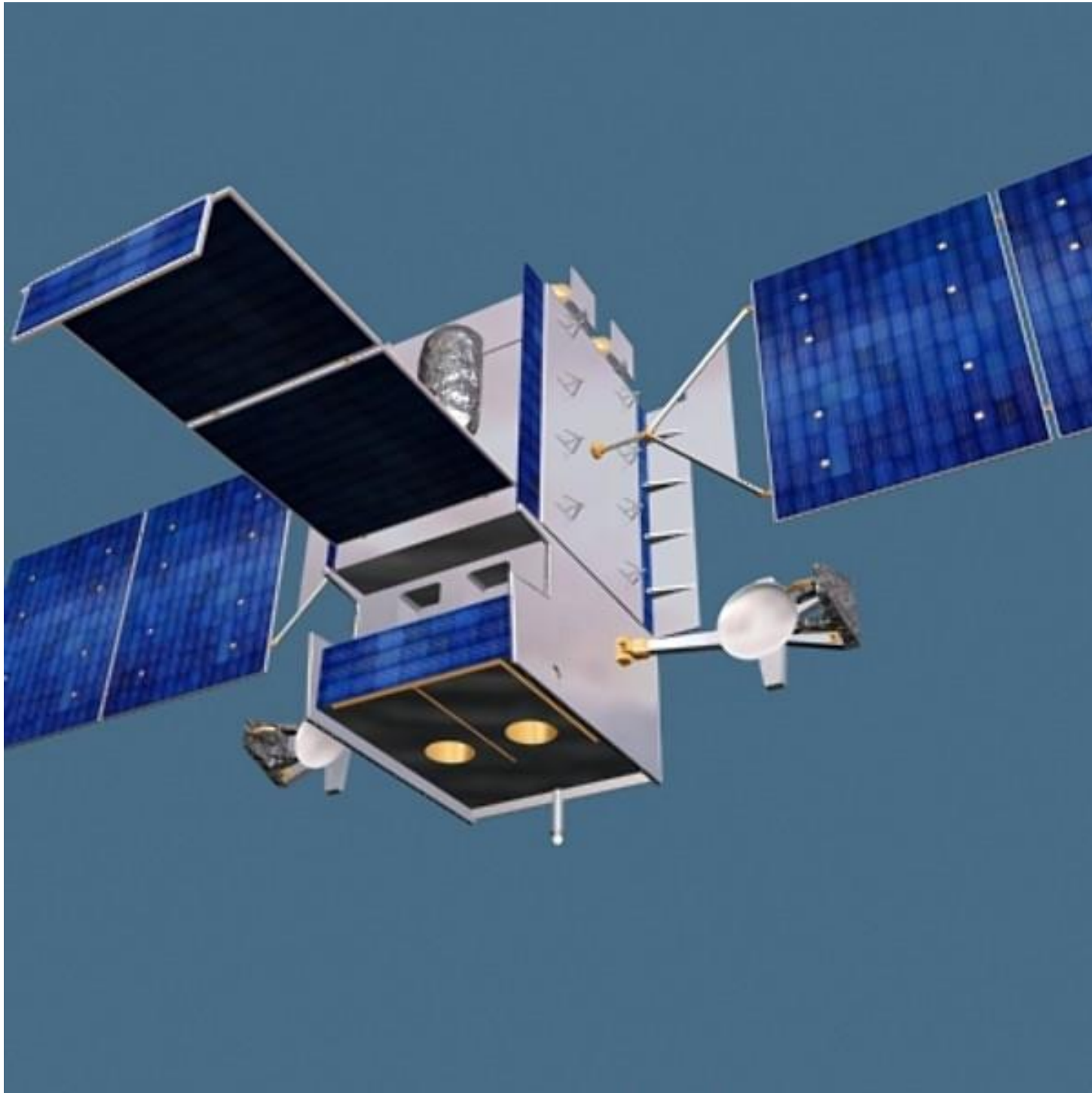


SBIRS High Starer Modes

- Step-Stare - Theater Major Regional Conflict (MRC)
- Step-Stare - TI Fast Revisit Focused Area (FR FA)
- Dedicated Stare – Fast Frame Focused Area (FF FA)*
- Step-Stare - TI High Sense Focused Area (HS FA) – not shown

SBIRS Transformational Capability
 Col. Roger Teague
 Commander, Space Group
 Space Based Infrared Systems Wing
 Space and Missile Systems Center
 30 November 2006

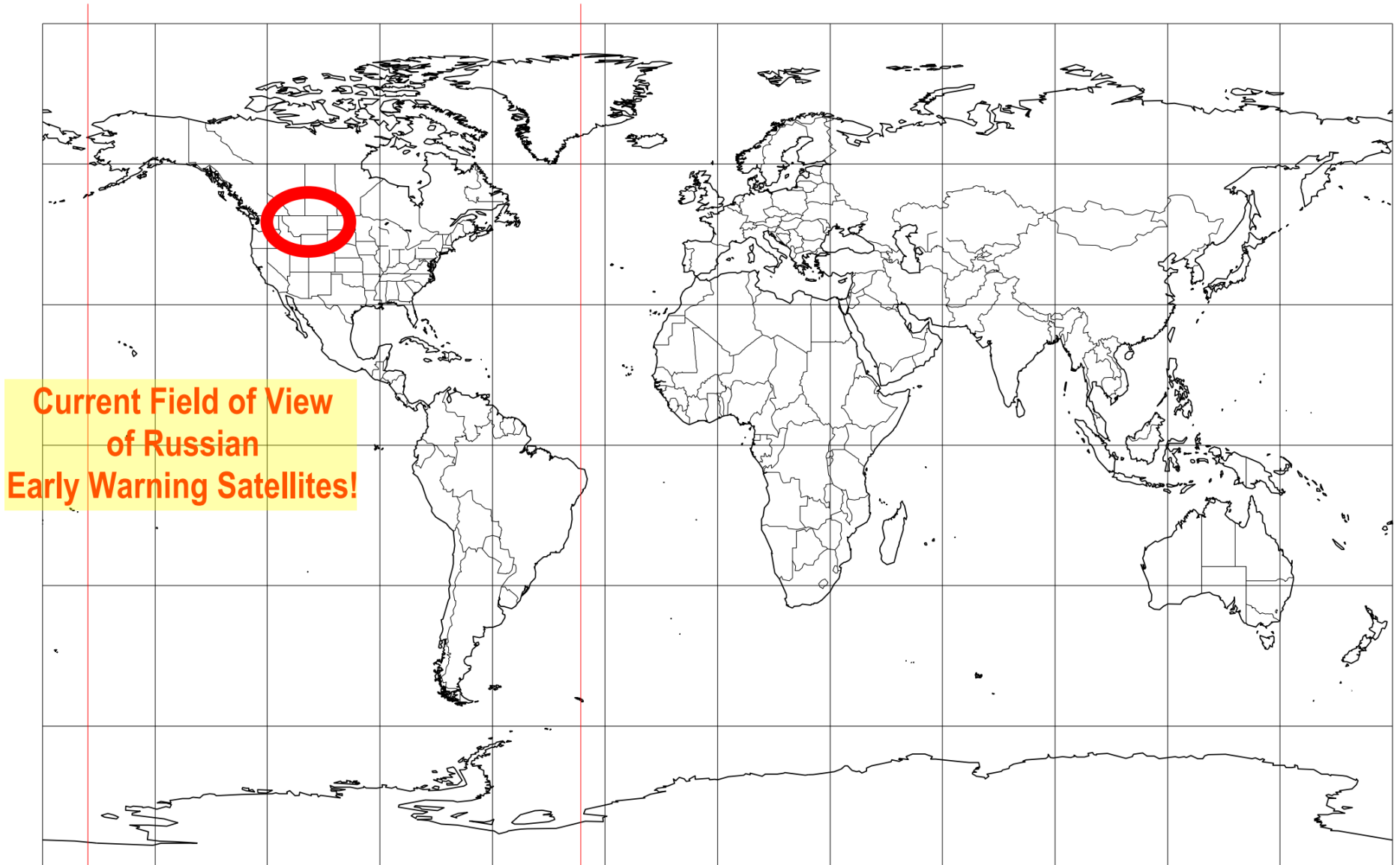
Depiction of a Space-Based Infrared System Satellite



Space-Based Infrared System Satellite Under Construction



Current Field of View of Russian Molniya AND Prognoz Early Warning Satellite Constellations



Comparison of Russian and US Early Warning Satellite Fields of View

