National Satellite Conference

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Agenda

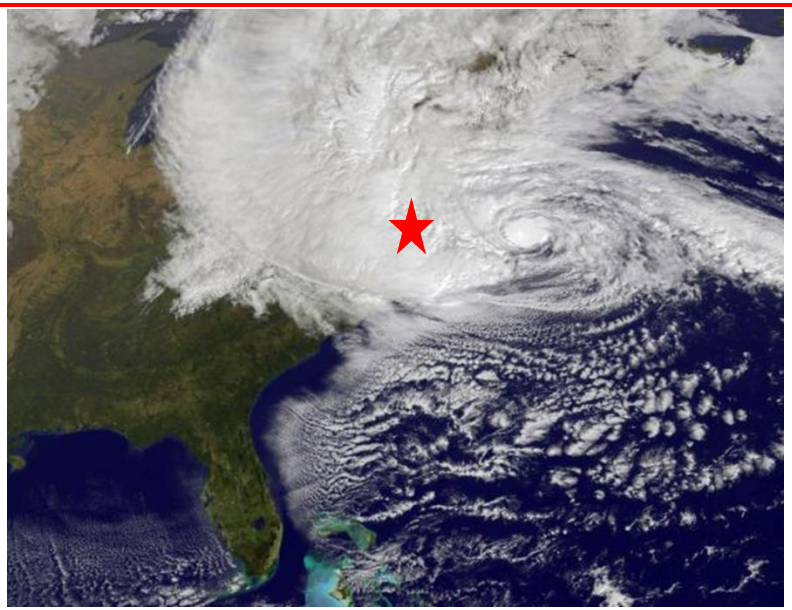
- Global Naval Operations
- Satellite Based Environmental Monitoring for Tropical Cyclones
- Polar Satellites
- Satellite Products
- Operating Area Expansion

Global Naval Operations

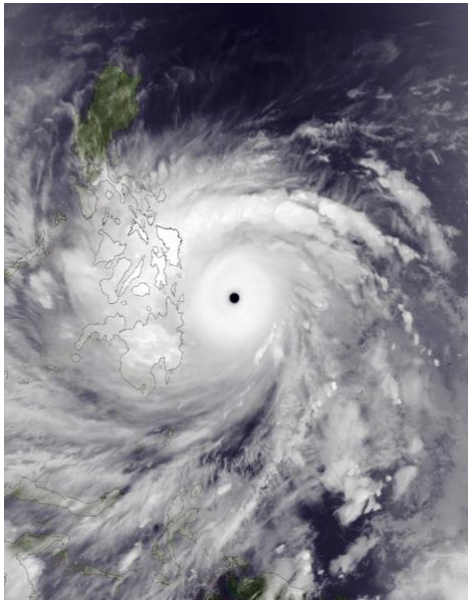
- Naval Operations and the Global Area of Responsibility
- 70% Earth's surface covered by water
- Understanding the Air and Ocean are key to successful Naval missions

Tropical Cyclone Accuracy

Hurricane Katrina



Hurricane Sandy



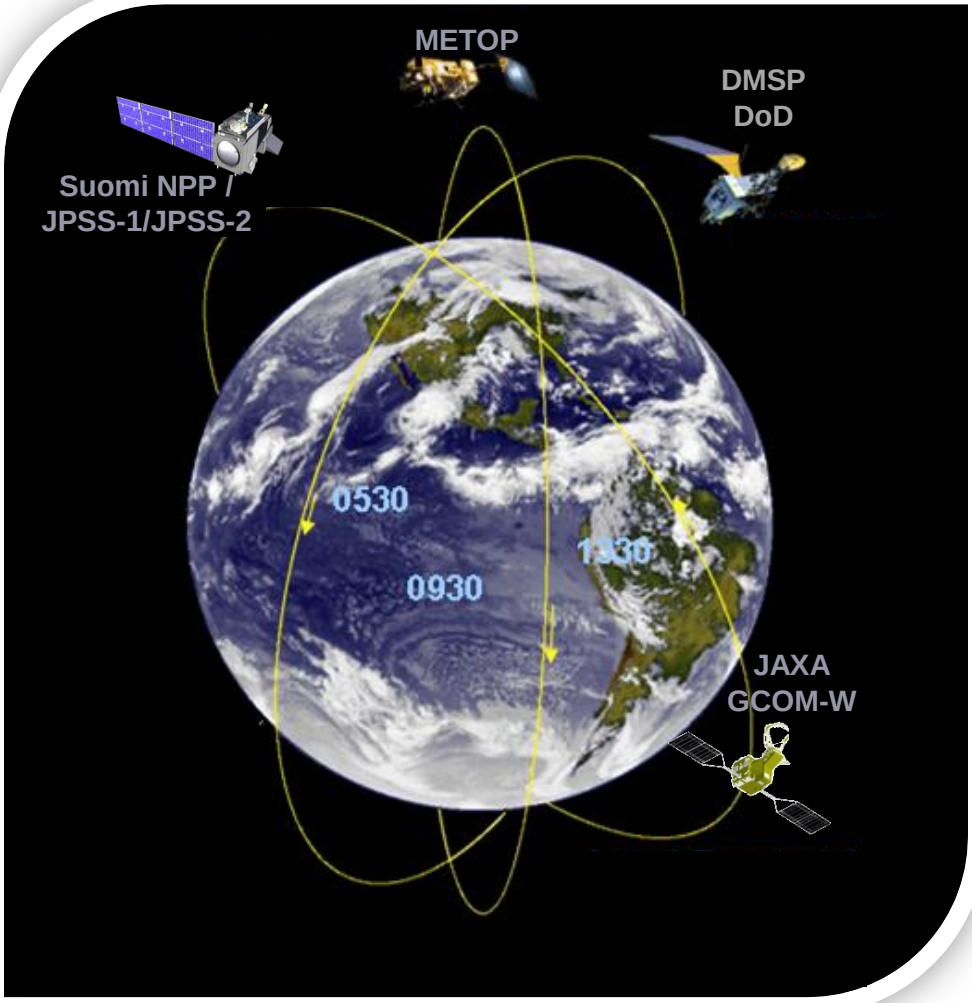
Super Typhoon Haiyan

- Tropical Cyclone accuracy for intensity and forecasting are critical to the safety and protection of Naval personnel and assets.
  - Satellite sensed data significantly improves the prediction of tropical cyclone behavior.
  - Uncertainty in the tropical cyclone track impacts Naval Operations decisions for ship sortie and resource protection activities.

Tragedy at Sea 1944

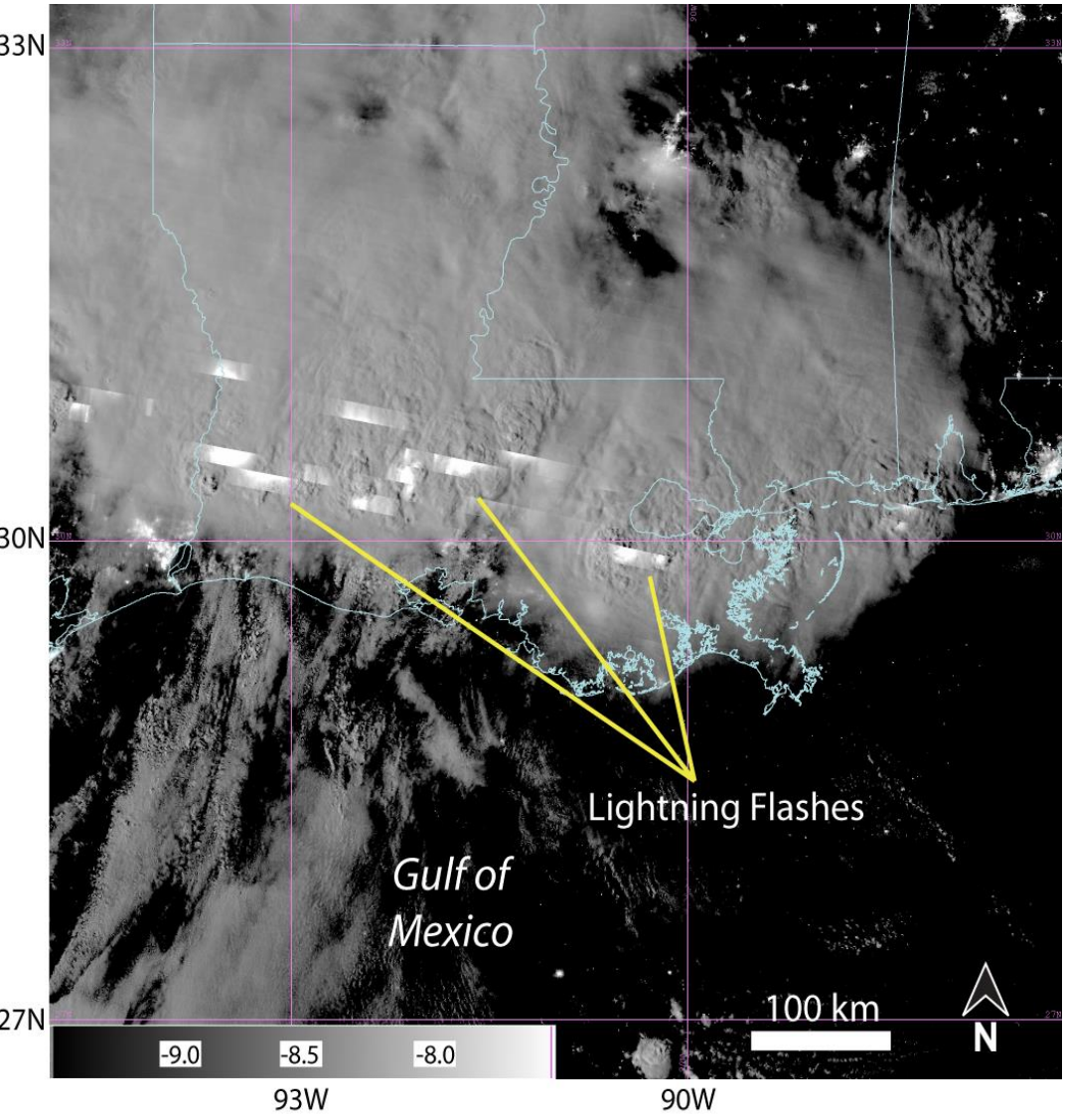
- In a December 1944 a Pacific Typhoon known as Halsey's Typhoon, 790 officers and enlisted men were lost with another 80 injured in the Western Pacific Ocean. Three U.S. Navy destroyers sank with practically all hands while five aircraft carriers, three destroyers and a cruiser suffered serious damage. 146 aircraft on various ships were lost or damaged beyond economical repair by fires, impact damage or swept overboard.

Polar Orbiting Satellites



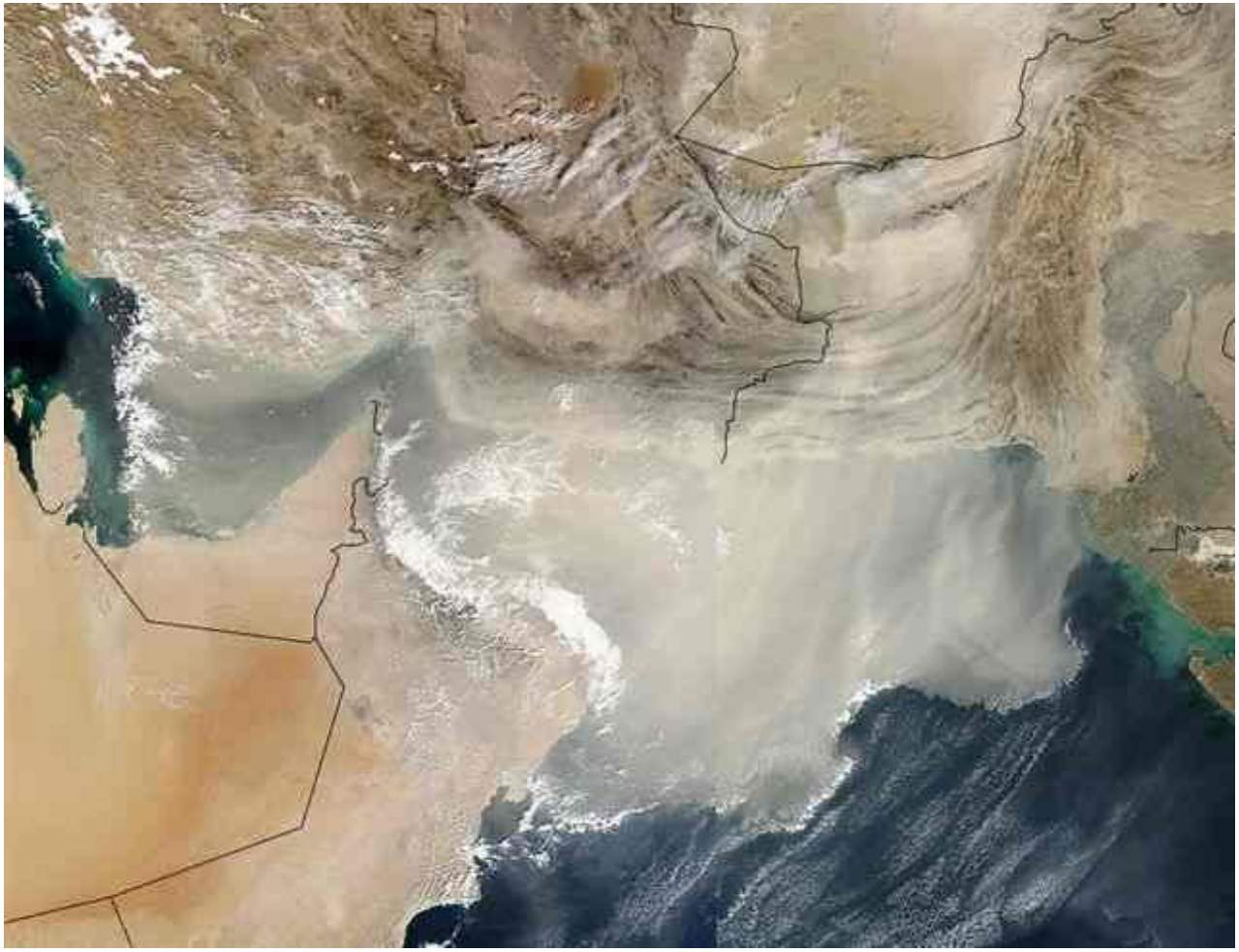
- Remote Sensing through military and civilian satellites are essential for collection of environmental data over vast oceans.
- Strengthening partnerships with NOAA, NASA and international space agencies extends DoD access to global satellite data.
- 86% of satellite derived data are used for Navy's Global Numerical Weather Prediction System.

Lightning Detection



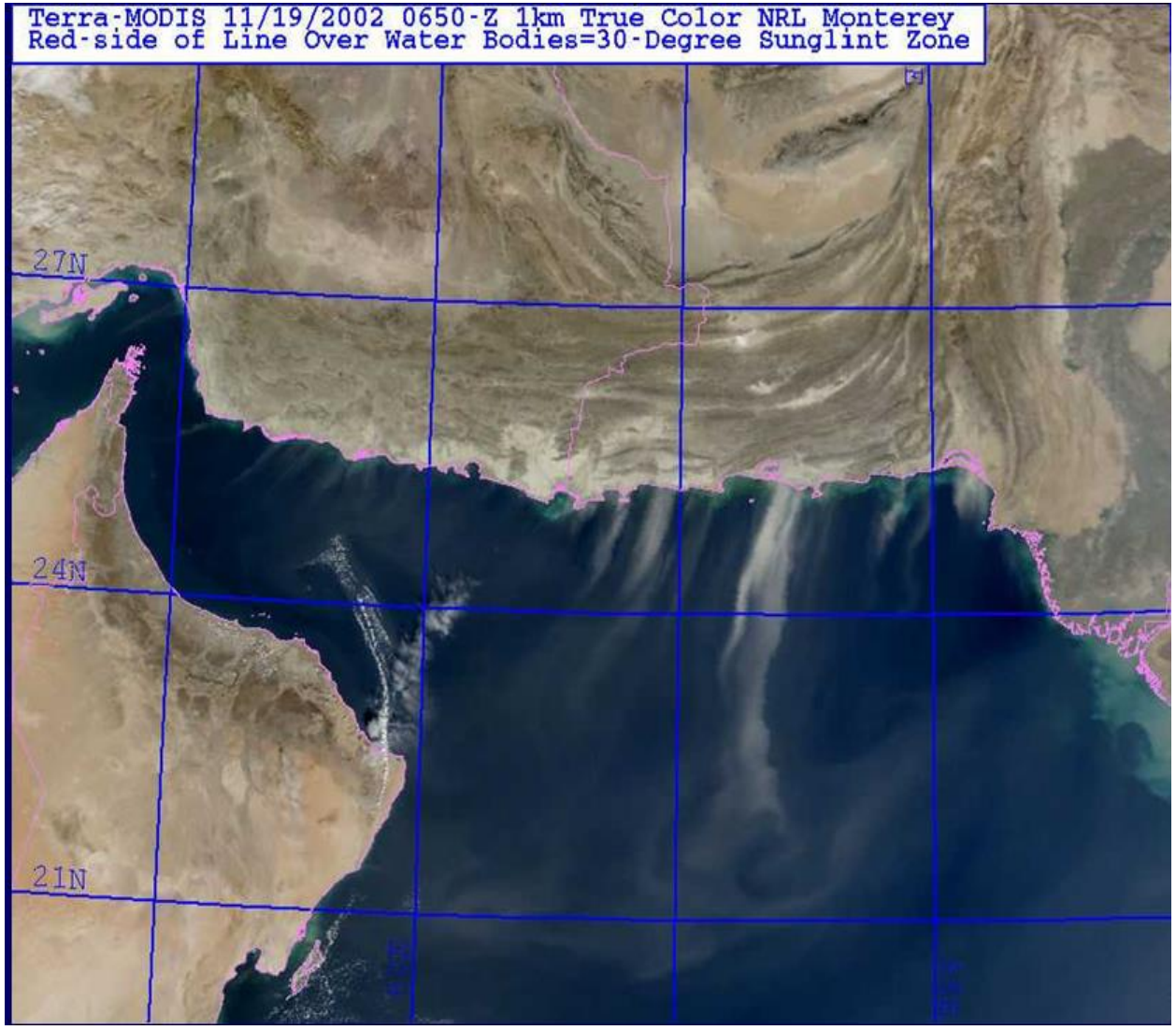
- Remotely sensing lightning detection is essential for safety of Naval Aviation.
- Visible Infrared Imaging Radiometer Suite (VIIRS) on NOAA's Suomi National Polar-orbiting Partnership (S-NPP) detects cloud to ground lightning.
- Lightning detection system utilized and key tool at Navy's Fleet Aviation Centers.

Dust Storm Detection



- Day and Night Bands (DNB) of the VIIRS sensor enables distinction of cloud and dust layers.
- DoD leverages civil environmental satellites data for tactical operations.

Dust Storm Detection



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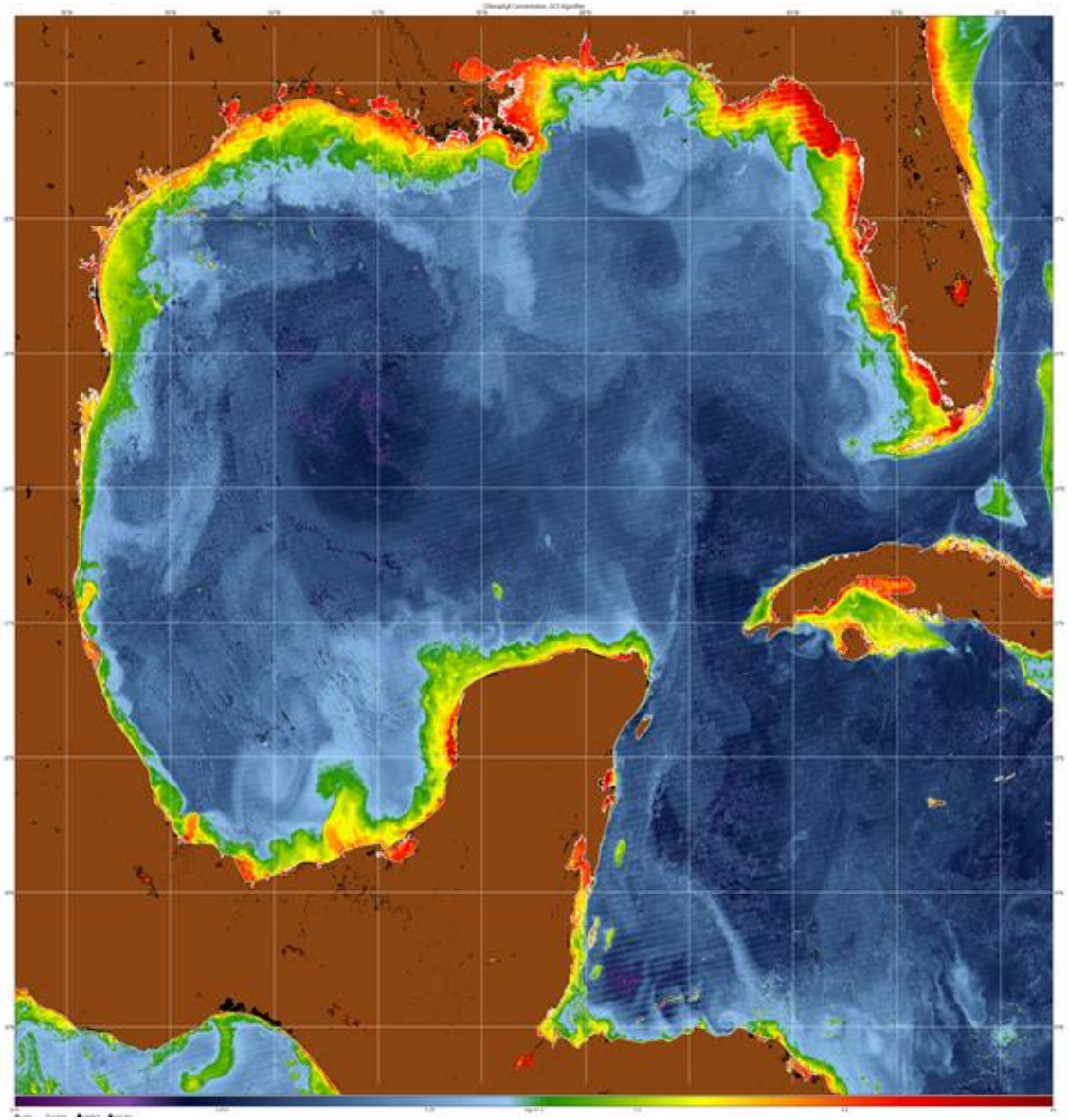
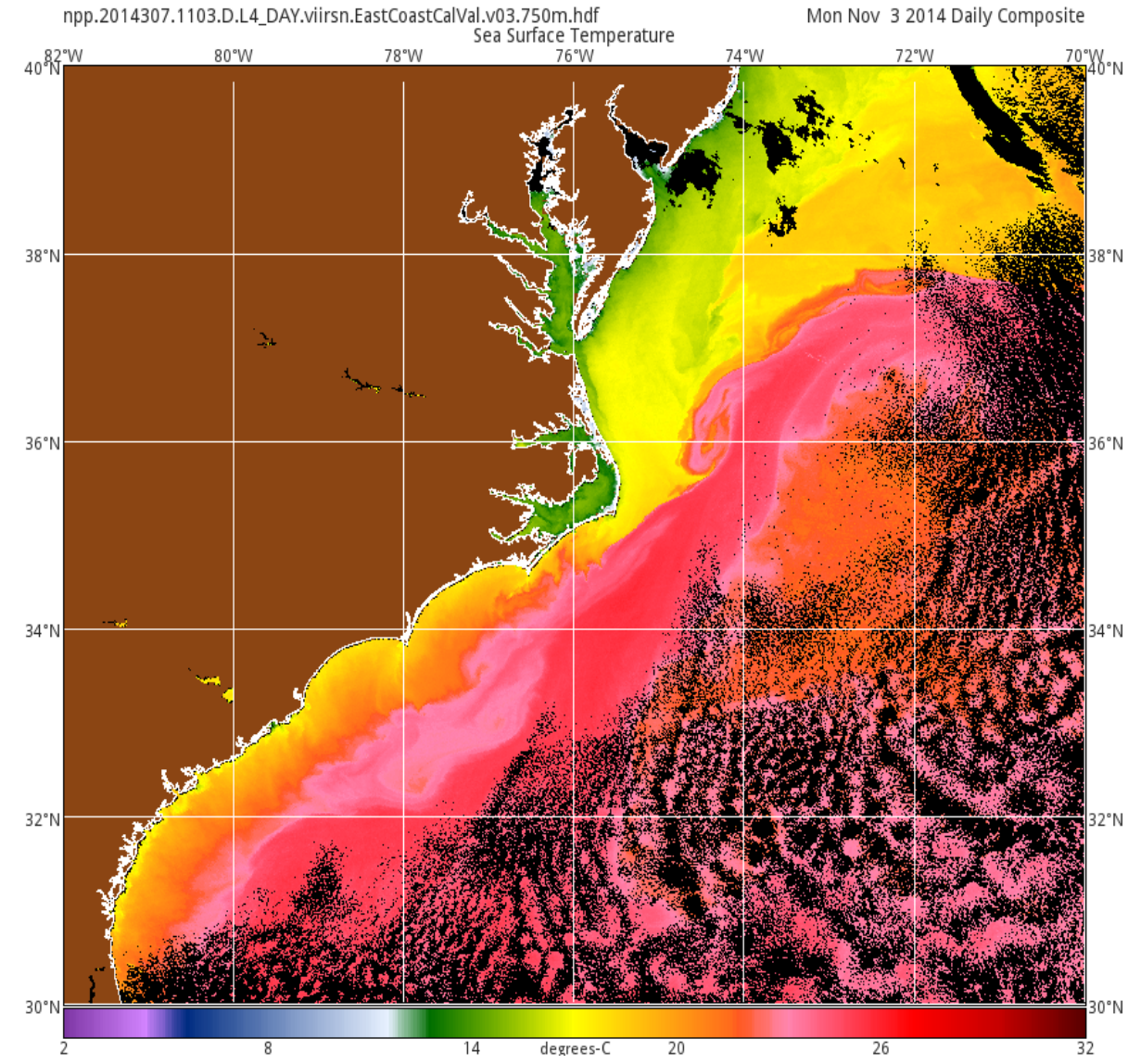
Chlorophyll Concentration



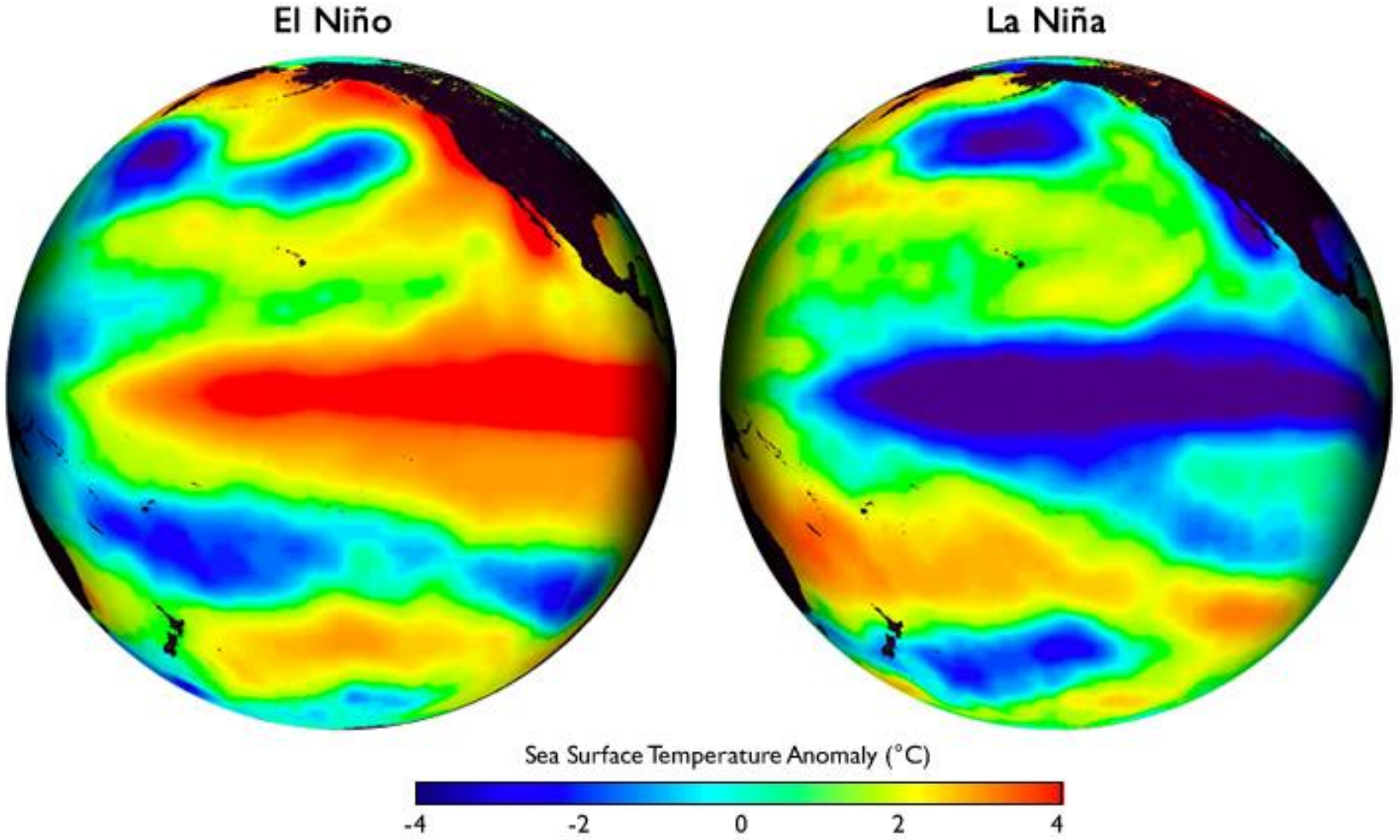
- VIIRS sensor application for chlorophyll concentration in the Gulf of Mexico.
- Utilized for tactical applications of Naval operations around the world.

Chlorophyll Concentration



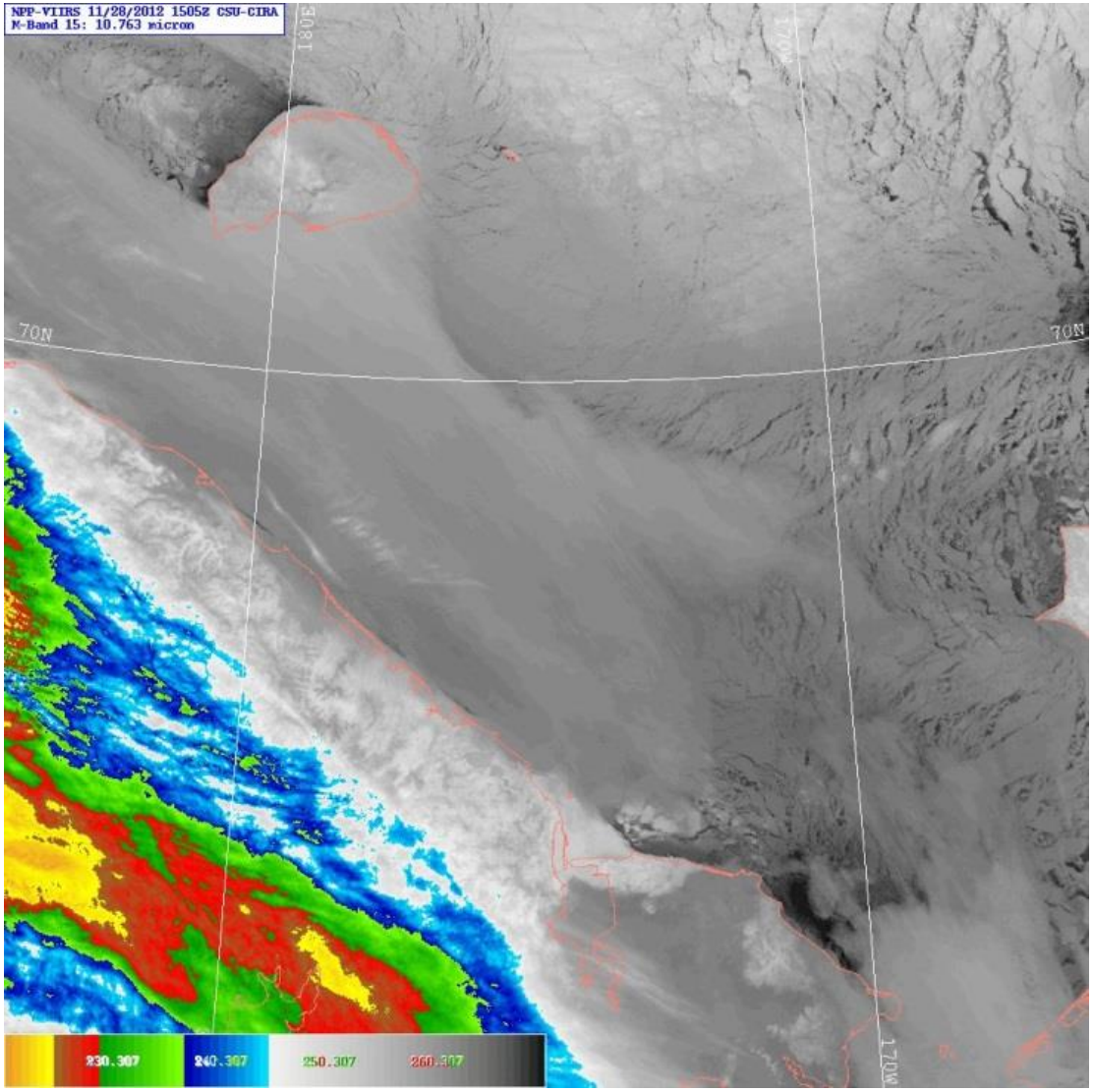
- VIIRS application for Sea Surface Temperature (SST) for the U.S. East Coast.
- Space based remotely sensed data to characterize the ocean surface.
- Utilized for tactical Naval operational applications for Anti-Submarine Warfare around the world.

El Nino and La Nina SST Anomalies



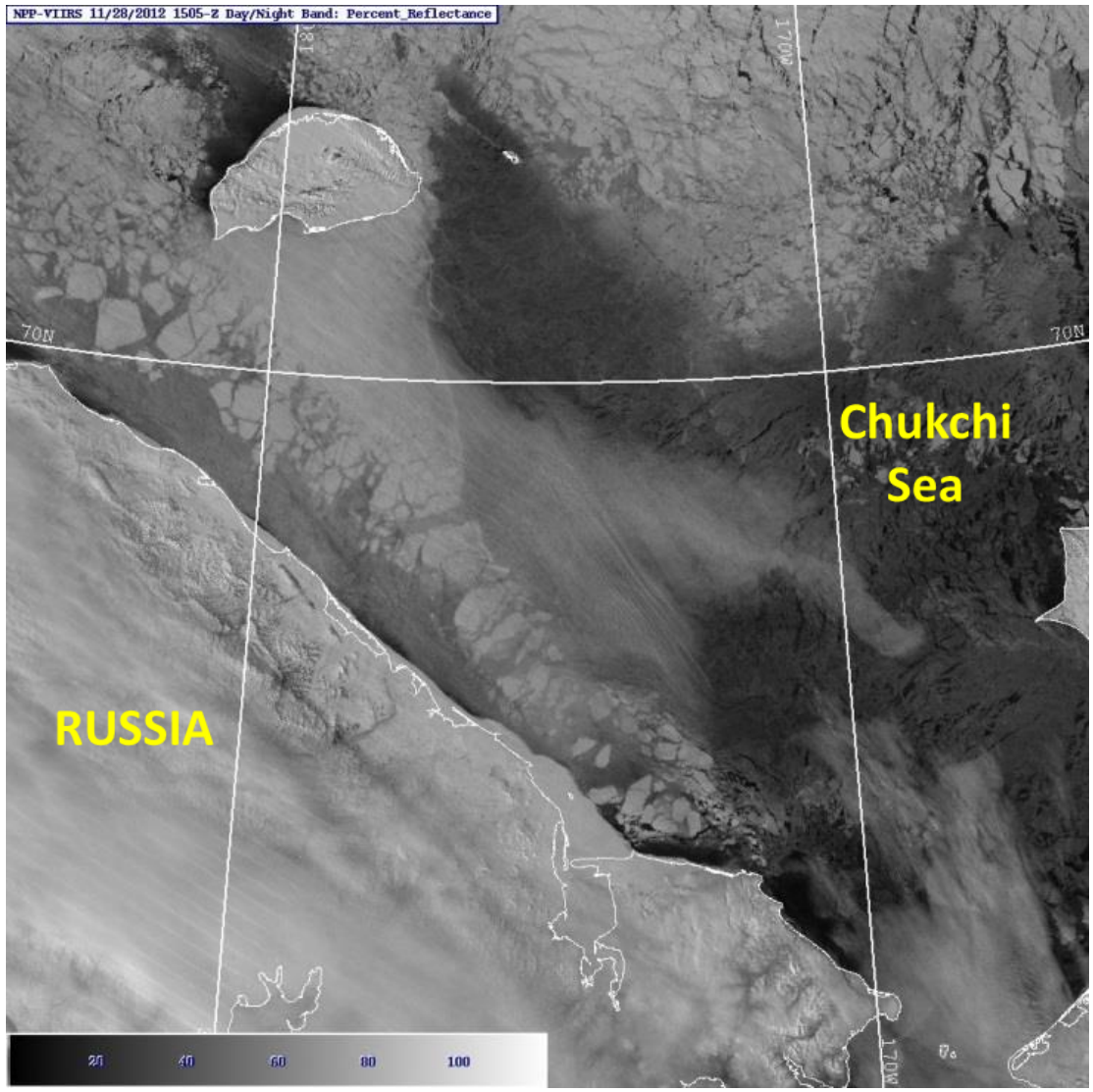
- SST Anomalies derived from satellite data enabled tracking of El Nino and La Nina events which have global meteorological impacts.

S-NPP VIIRS Day and Night Bands



- NOAA's S-NPP VIIRS Day and Night Bands enables identification of ice beneath cloud layers.
- Detection and tracking of ice concentration are essential for safety of navigation and climate prediction.

S-NPP VIIRS Day and Night Bands



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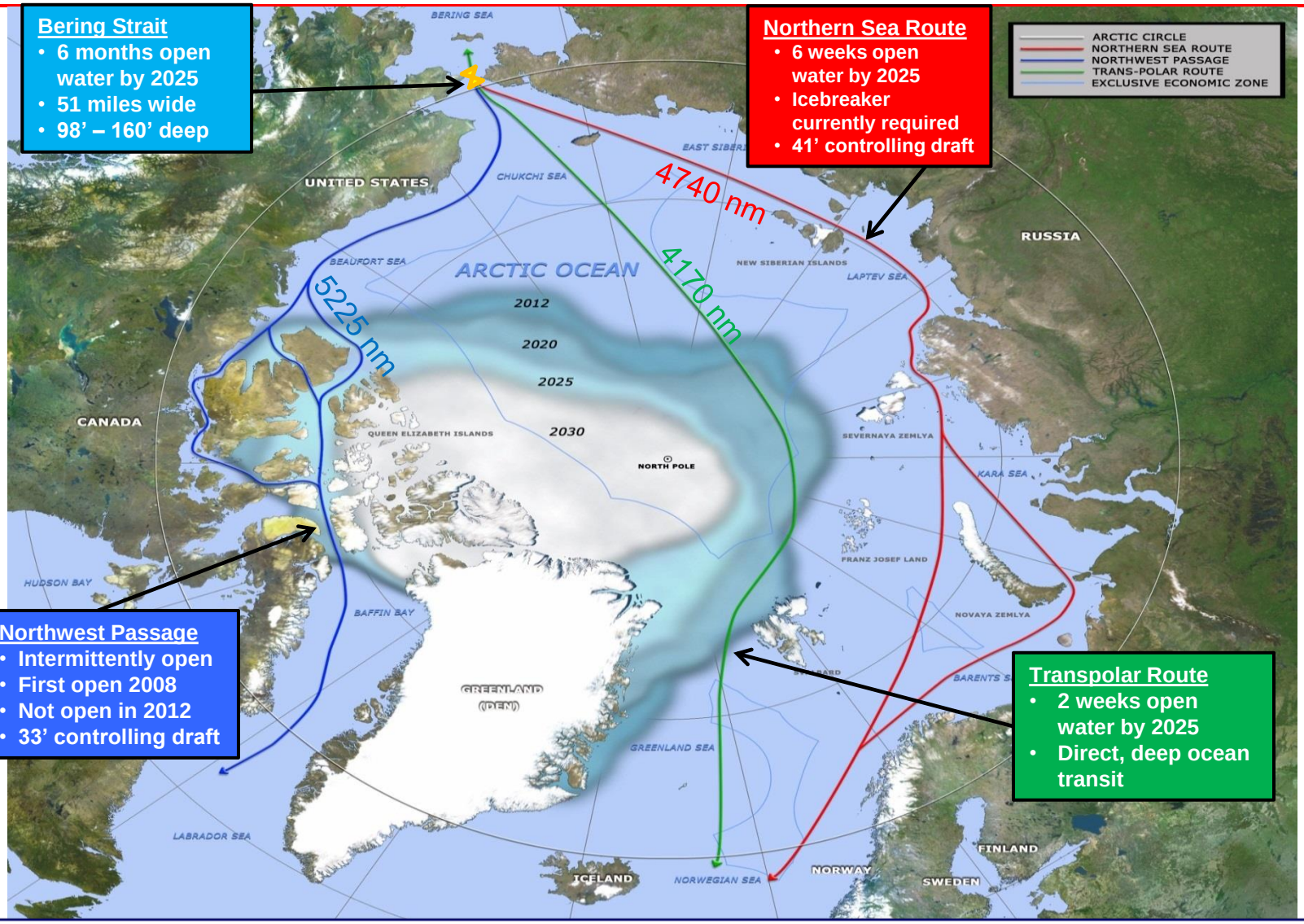
Navy Assessment – Sea Ice Minimum



Significant periods of open water conditions throughout large areas of the Arctic by 2025

Questions ?