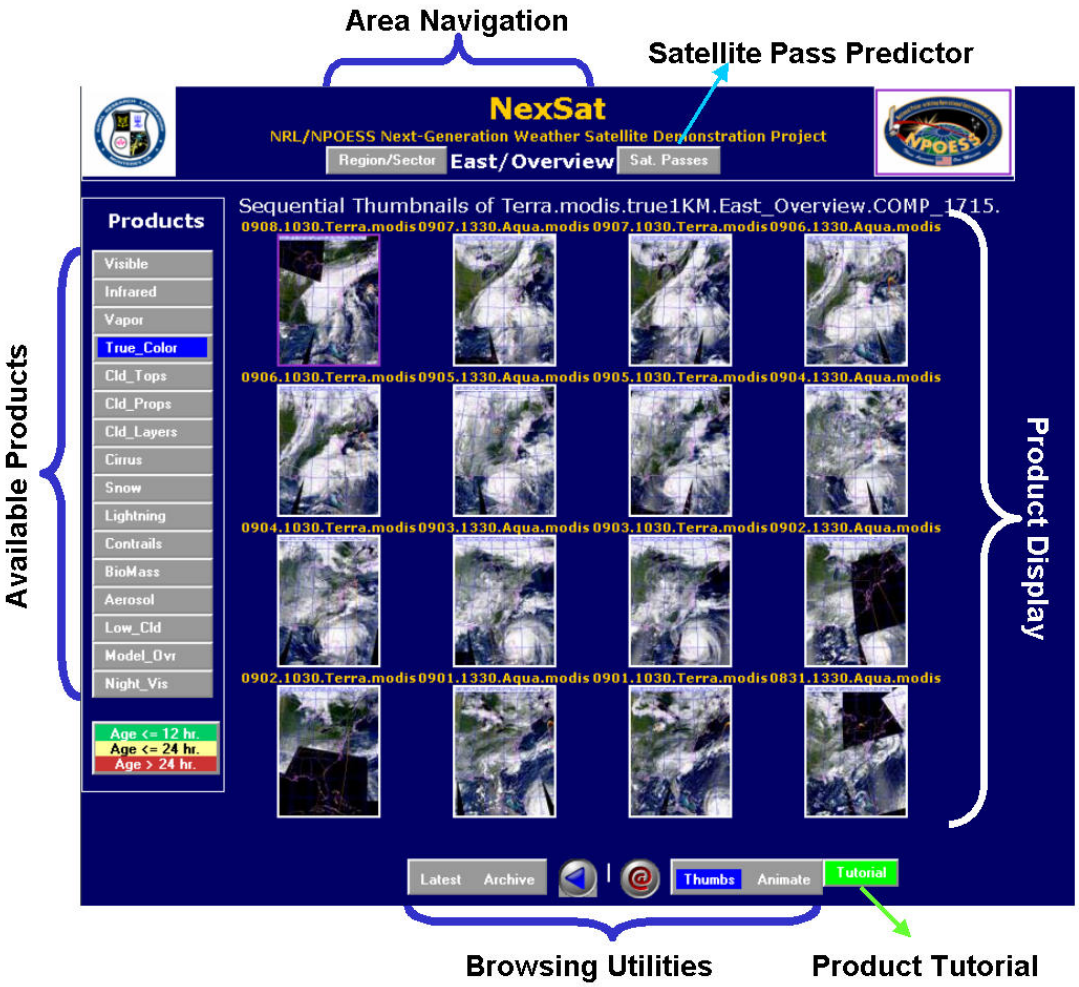
Satellite Product Tutorials:

The Purpose of NexSat



What is NexSat?

The Naval Research Laboratory, Monterey has teamed with the National Polar-orbiting Operational Environmental Satellite System (NPOESS) Integrated Program Office (IPO) to develop "NexSat"—a web site demonstrating a diverse collection of environmental products derived from a constellation of satellites over the continental United States. Included in this product suite are new applications emerging from research-grade satellites operated by the National Aeronautics and Space Administration

(NASA) that provide us a glimpse into the future capabilities anticipated from the operational NPOESS system. In particular, we leverage for this purpose the Moderate-resolution Imaging Spectroradiometer (MODIS) is a "risk-reduction sensor" for the NPOESS Visible/Infrared Imager/Spectrometer (VIIRS) sensor.

The basic idea behind NexSat is to compare MODIS capabilities against those of contemporary polar orbiting operational satellites (e.g., the National Oceanic and Atmospheric Administration (NOAA)-operated Advanced Very High Resolution Radiometer (AVHRR), and the Defense Meteorological Satellite Program's Operational Linescan System (OLS)) as a demonstration of "what's to come" on the next-generation system. Emphasized are the new capabilities arising from improved instrument technology, allow weather analysts to view finer-scale weather features with improved information content. Additional examples from NOAA Geostationary Operational Environmental Satellites are also included here to demonstrate the general utility of low-earth orbiting systems in weather forecasting when used collectively—made feasible by the vastly reduced data latencies (global data within 15-30 minutes) of NPOESS.

Why NexSat?

Weather is an uncontrollable parameter that impacts the federal budget both directly (e.g., disaster management and unemployment) and indirectly (e.g., resource shortages leading to increased prices) to the tune of billions of dollars annually. As such, the NPOESS program represents a substantial yet well-spent investment of taxpayer dollars toward both the security and economic prosperity of our nation. Through superior satellite remote sensing resources, we improve our ability to observe and predict the weather responsible for these financial impacts. This places decision makers in a better position to take the most appropriate actions to avoid or mitigate the consequences of weather.

Who Does NexSat Benefit?

While the primary function of NexSat is as an instructional tool, the availability of timely satellite products opens the door to a myriad of practical applications. By making these materials available in near real time, NexSat's audience spans the entire spectrum from the general public to Homeland Defense. The transportation industry (including aviation,

maritime, and commercial vehicle drivers) benefits from real time depiction of severe weather and regions of developing fog. Natural resource and disaster management agencies (e.g., Federal Emergency Management Agency (FEMA), fire fighters, and the Environmental Protection Agency (EPA) also benefit from updated information on significant weather events. NexSat products speak to various needs of the United States Border Patrol and Coast Guard (e.g., in terms of supporting unmanned surveillance aircraft along the nation's borders and navigating the coastal waters). In a more general sense, NexSat products address a subset of the many responsibilities of the Department of Homeland Security (e.g., high resolution city zooms with model wind overlay for now-casting of plume dispersion).

What Will I Find on NexSat?

NexSat features value-added satellite imagery products, and primarily those speaking toward future VIIRS capabilities. The product line includes VIIRS-equivalent true color city zooms, cloud height estimation, fire detection, cirrus cloud detection, dust storm detection, aircraft contrail detection, cloud/snow discrimination, nighttime low cloud detection, city light detection, and cloud microphysical property products. Where applicable, these products leverage data from NRL-MRY numerical weather prediction models and the National Lightning Detection Network (NLDN) to enhance their utility to applications beyond NPOESS-value demonstrations.

What *Won't* I Find on NexSat?

Although many products demonstrated on NexSat lend themselves directly to other applications, due to bandwidth and storage limitations no digital datasets are currently made available upon the NexSat website.

How Should I Get Started?

Although the page has been designed to be as self-explanatory as possible, new users to NexSat are encouraged to read the NexSat Browsing Tutorial to increase their familiarity and ability to make optimal use of all that this website has to offer. As indicated in the figure at the top of this module, the basic format of NexSat entails an area-selection box, an available products box, an imagery display area, and a collection of image browsing and training buttons.

Did You Know…?

The NexSat webpage emerged from a secure Internet application called "Satellite Focus" that served United States and Coalition forces during Operation Enduring Freedom (2001-2002) and Operation Iraqi Freedom (2003). The project demonstrated the use of research-grade sensors in supporting the safe operation of military assets. In addition to improving the safety of U.S. and Coalition forces, Satellite Focus provided information factoring geared toward minimization of collateral damage in terms of appropriate target and weapons selection for a given set of environmental conditions.

NexSat Product Disclaimer and Product Usage…

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NRL encourages all users to provide feedback on the utility of the page for their applications, as well as suggestions for improving the current interface/content. We also encourage you to use these materials in your presentations, and ask when you do so to please acknowledge the Naval Research Laboratory however appropriate.

Want to Learn More?

Read more details about NexSat Web Page.

Read more about how NASA-MODIS supported Operation Enduring Freedom and Operation Iraqi Freedom via the Satellite Focus Webpage.

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Technical P.O.C.: Steve Miller (miller@nrlmry.navy.mil)