Planned Tools and Correlative Data for the Execution of NPP Calibration and Validation

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Overview

The Joint Polar Satellite System (JPSS) Data Products Algorithm Group will execute the NPP Validation program in collaboration with disciplined experts from the user communities to ensure the data products comply with the requirements of the sponsoring agencies. The NPP validation teams are developing and utilizing a number of tools to support validation of the Sensor Data Records (SDRs) and Environmental Data Records (EDRs), as well as preparing to utilize a number of correlative data sources for post launch comparison. This poster highlights a subset of these tools and datasets.

McIDAS-V

Data Visualization

The 5th version of the Man computer Interactive Data Access System (McIDAS-V) displays weather satellite (including hyperspectral) and other geophysical data in 2- and 3- dimensions, and can be used to analyze and manipulate the data with its powerful mathematical functions. The 5th version of McIDAS incorporates NPP proxy data generated from MODIS. The image below shows the usage of VIIRS bands 1 and 2 to create an Normalized Difference Vegetation Index (NDVI) product.

For more information please visit:
http://www.ssec.wisc.edu/mcidas/software/v/
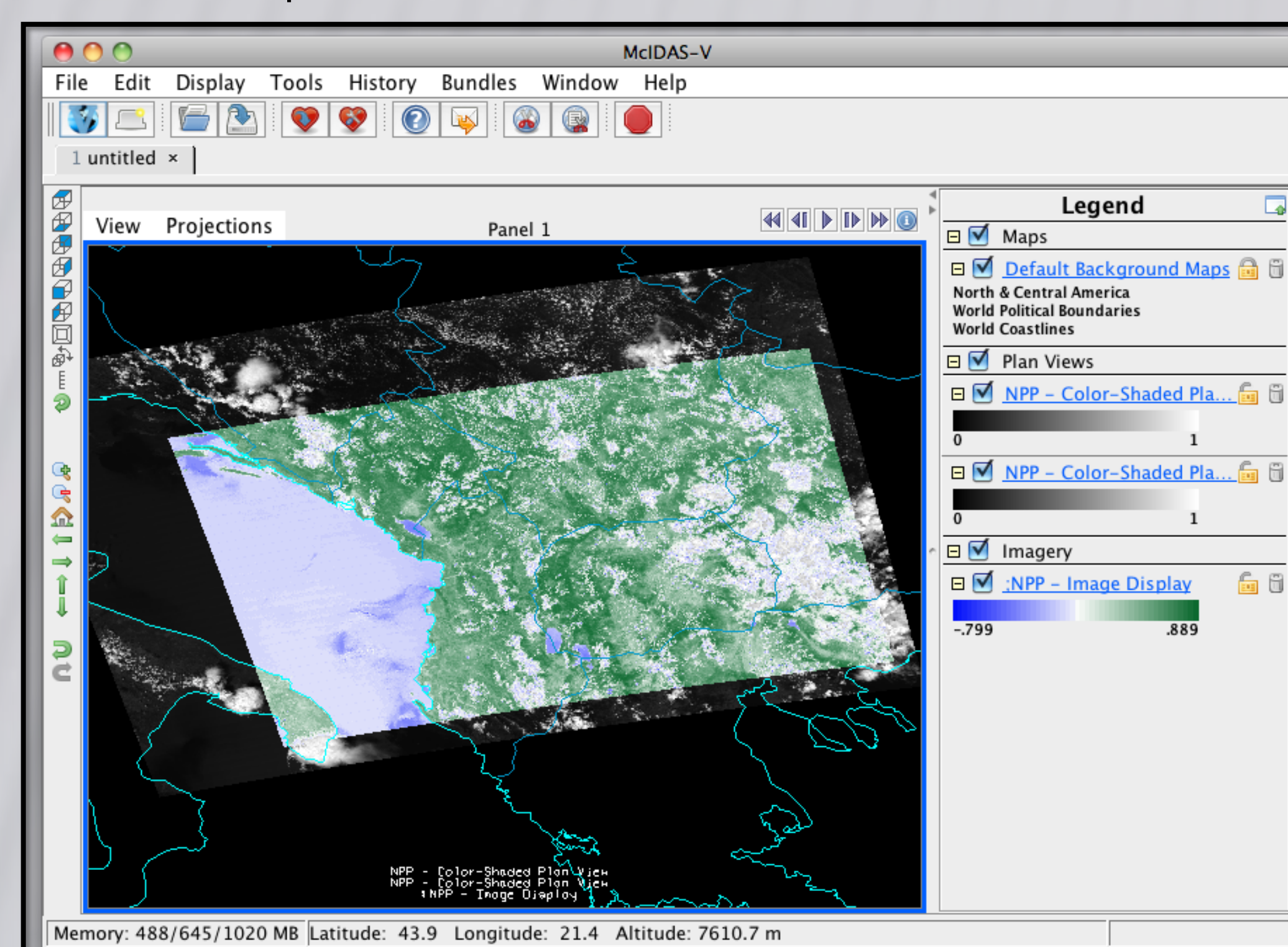
## VIIRS Cloud Mask Visualization Tool
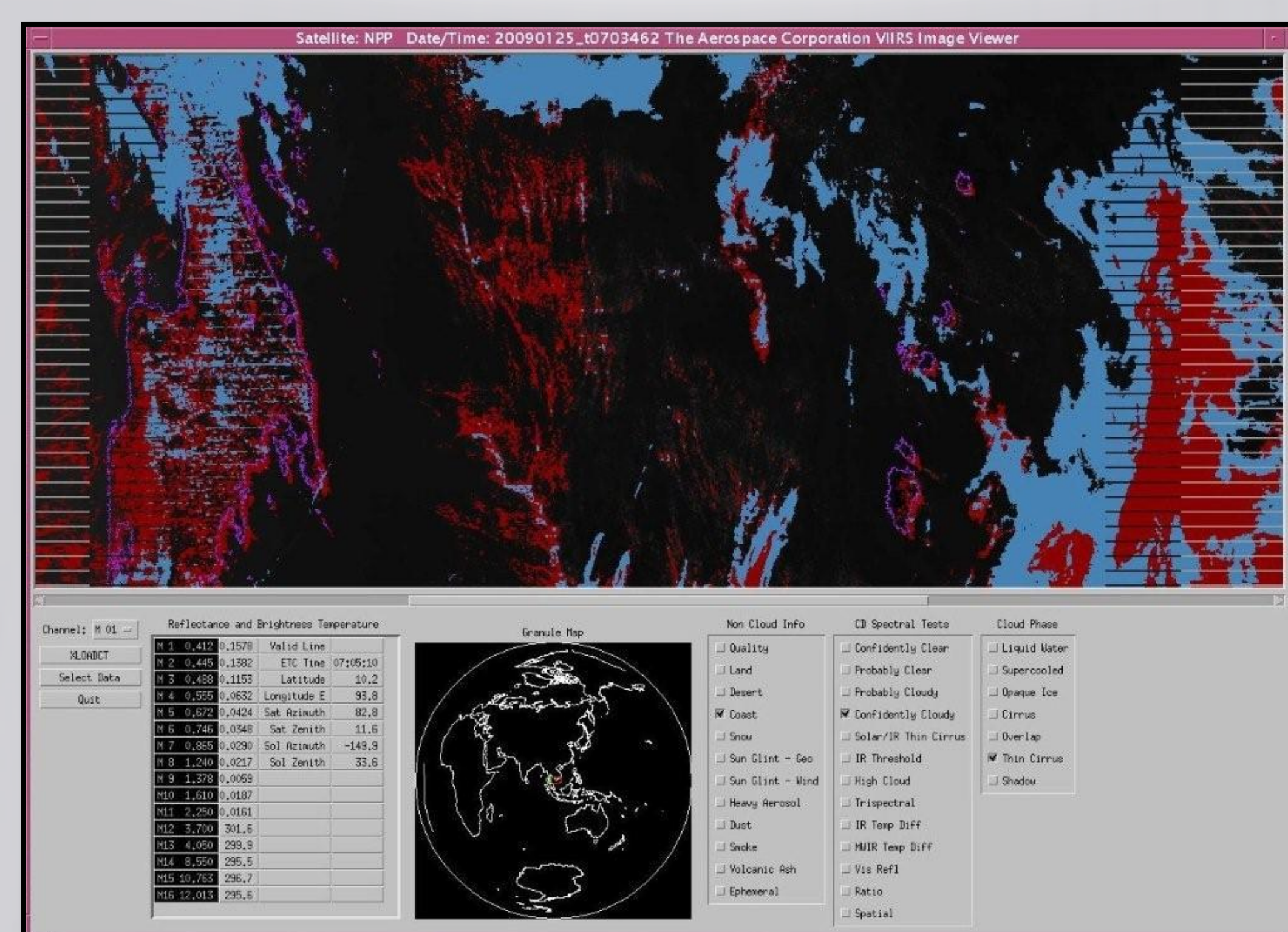
The ANEPH (Aerospace Nephanalysis) visualization tool allows the cloud mask experts to display and analyze the VIIRS Cloud Mask (VCM) output along with the associated VIIRS channel inputs. The left side contains the reflectances/brightness temperatures along with other fundamental inputs (e.g. viewing angle) used in producing the VCM. The right side is a series of buttons that allows the user to display the result from each cloud detection test, as well as the cloud phase and other associated information contained in the VCM output. The combination of both gives the user information needed to "tune" VCM thresholds and optimize VCM results. The image above shows the current version of the tool. The color scheme is purple for coast, red for confidently cloudy, and blue for the thin cirrus cloud phase.

NPROVS

Identifies co-lated Data

The NOAA PROducts Validation System (NPROVS) operated by the Center for SaTellite Applications and Research (STAR) provides routine (daily) compilation of collocated radiosonde/dropsonde (Red in the diagram) and derived satellite products (soundings, in Green the diagram). The immediate goal is to provide consistent protocols for inter-comparing EDRs from the current suite of satellite and ground truth platforms soon to be expanded to MetOp- B (April 2011) and JPSS-NPP (early 2012). This interface provides multiple options for graphical display and statistical analysis of the satellite and radiosonde profiles and a broad range of functionality spanning routine monitoring and validation to more detailed troubleshooting and root cause (deep-dive) analysis.
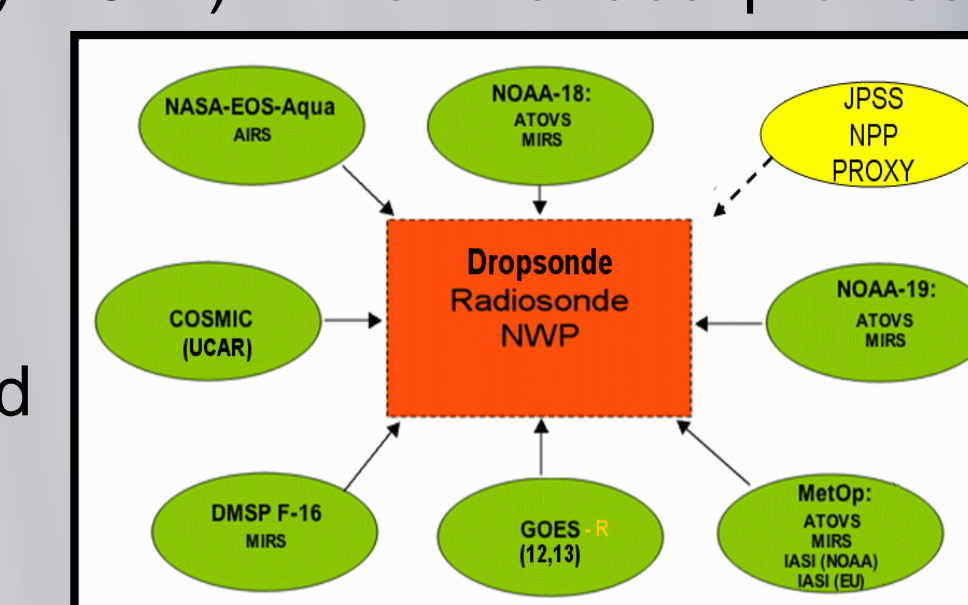
Further Information including software and dataset downloads is available at the NPROVS web site: http://www.star.nesdis.noaa.gov/smcd/opdb/poes/NPROVS.php.

NPROVS is also on display at the NOAA exhibit booth and symposium poster #567. NPROVS is funded in part by the JPSS Cal/Val program for EDRs at STAR.
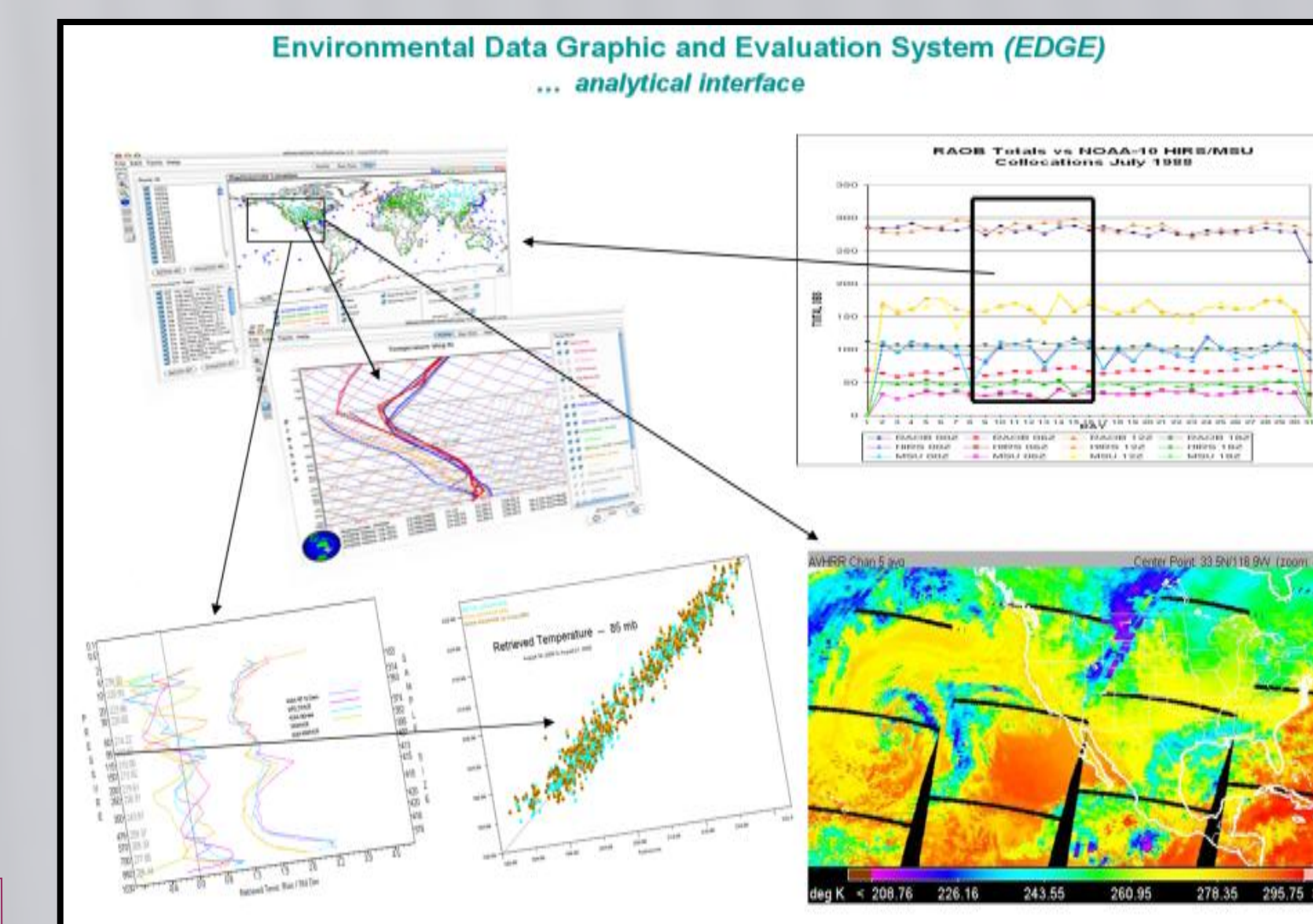
Ocean Proxy Data Generator

Proxy data for the Visible/Infrared Imaging Radiometer Suite (VIIRS) is being generated in near real time from MODIS Aqua and being utilized in preparation for ocean color validation. The Ocean Proxy Generator (OPG) is based on: a) developing hyperspectral water leaving radiance derived from level 2 of the MODIS processing, b) propagating the radiance to the top of the atmosphere, and c) convolving the top of atmosphere radiance with the VIIRS spectral response. The processing is performed per pixel to construct a VIIRS proxy image. The processing is provided by the Government Resource for Algorithm Verification Independent Test and Evaluation (GRAVITE) system at NOAA and the Automated Processing System (APS) ocean color software developed at NRL SSC. Near Right: The spectral changes to generate NPP data from MODIS data require that the water leaving radiance (nLw) at the ocean surface be hyperspectralized and propagated back through the atmosphere and convolved with the spectral response of the VIIRS sensor. Far right: Chesapeake Bay Chlorophyll Concentration October 10, 2010.
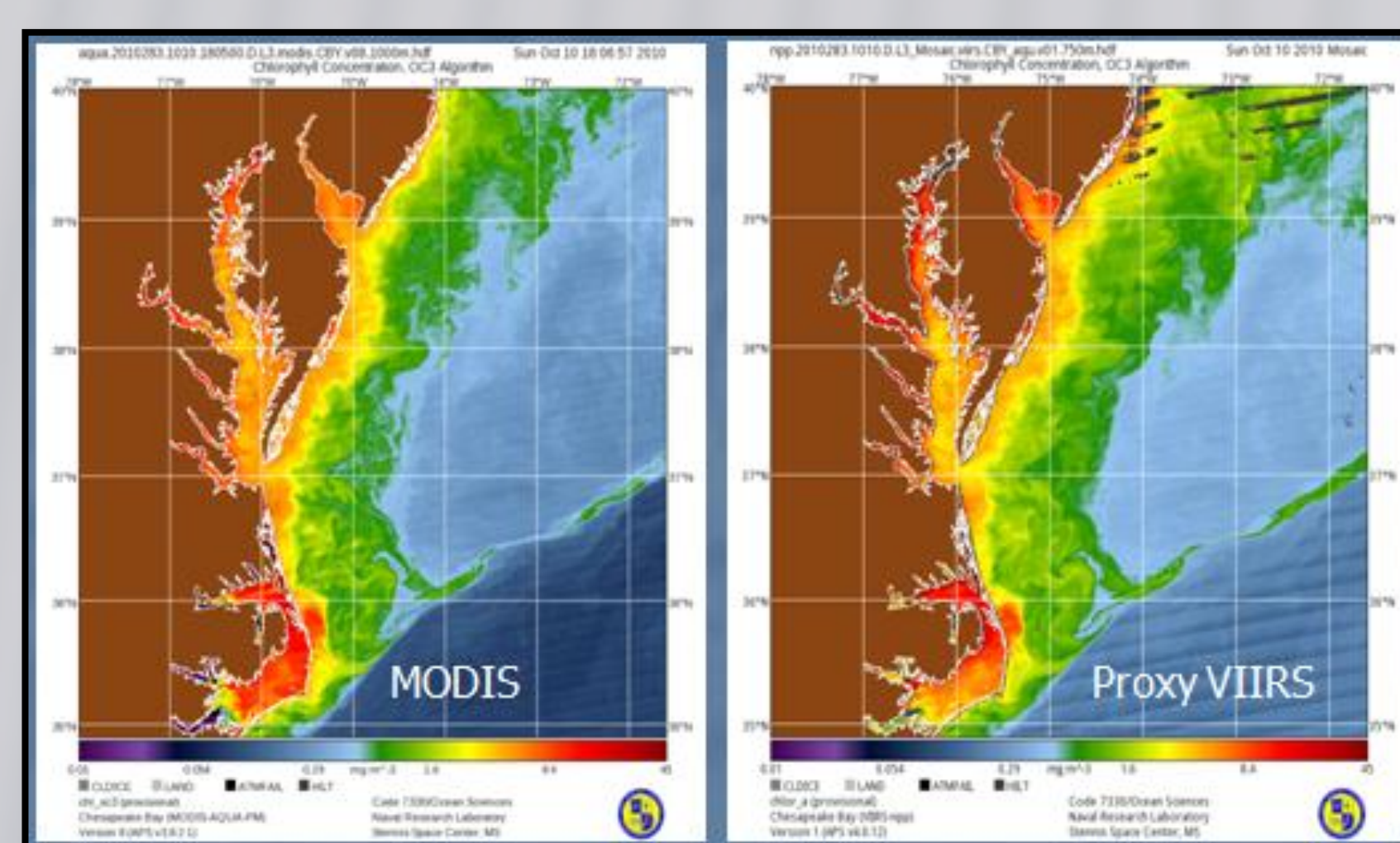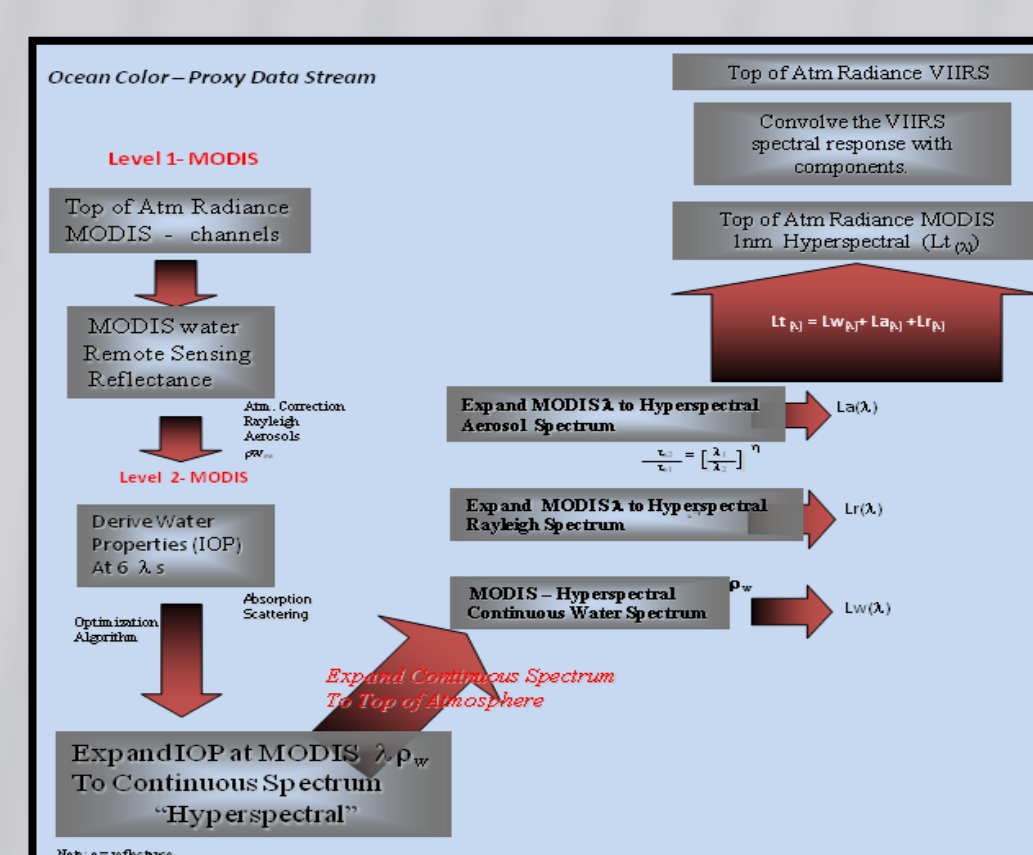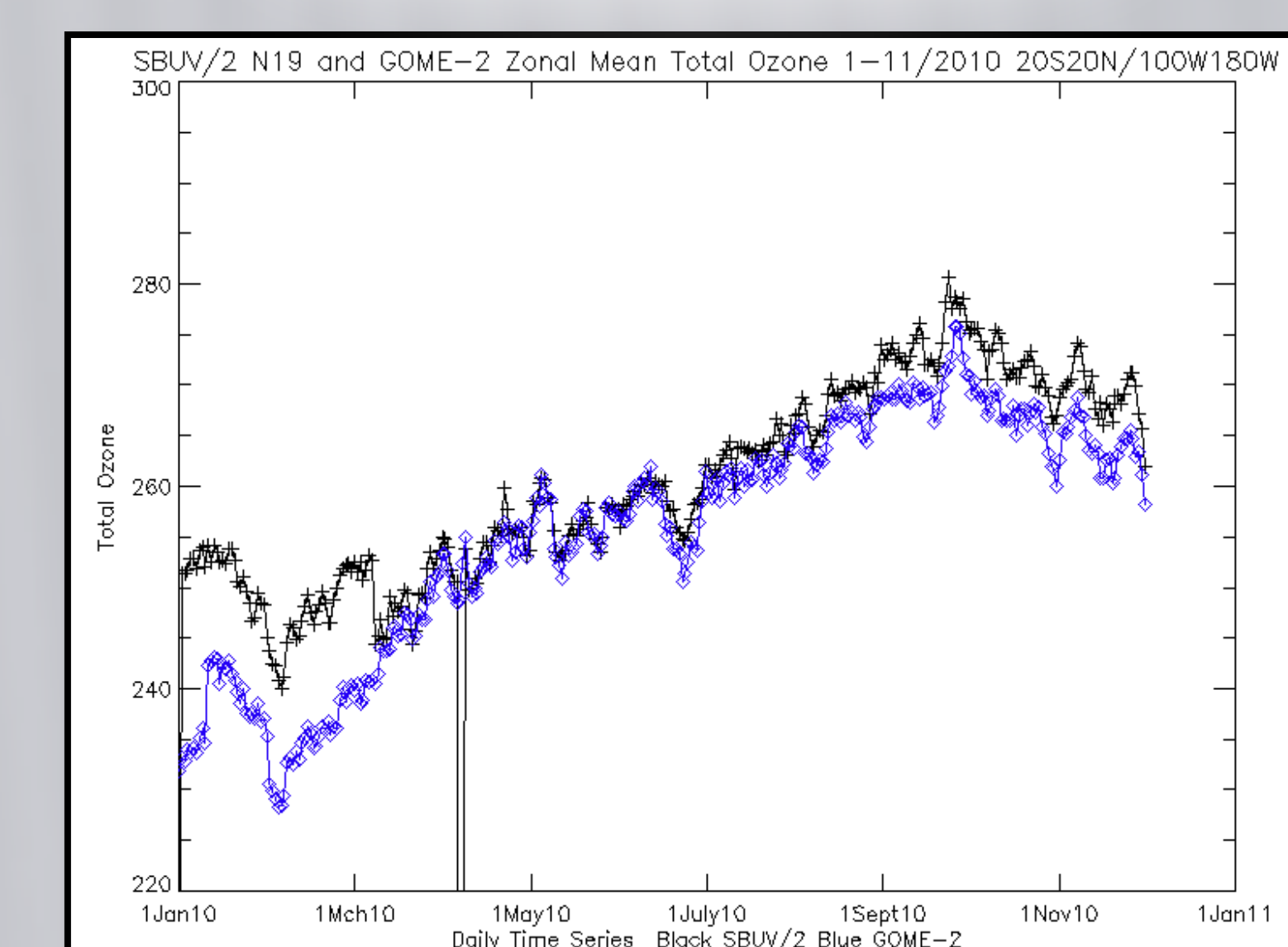

The Satellite Integrated Calibration/Validation System (ICVS) developed by NOAA/STAR provides an integrated system that incorporates pre-launch and post-launch, and onboard and vicarious calibration; and provides operational and long-term monitoring, as well as forward calculations of radiances. To the right is a plot of Daily Zonal Mean Total O3 Comparisons of GOME-2 vs. SBUV/2 for January-November 2010. The ozone validation team will be adapting the ICVS for additional OMPS Total Column EDR comparisons. Similarly, they will be implementing plots of residuals for the Nadir Ozone Profile products.

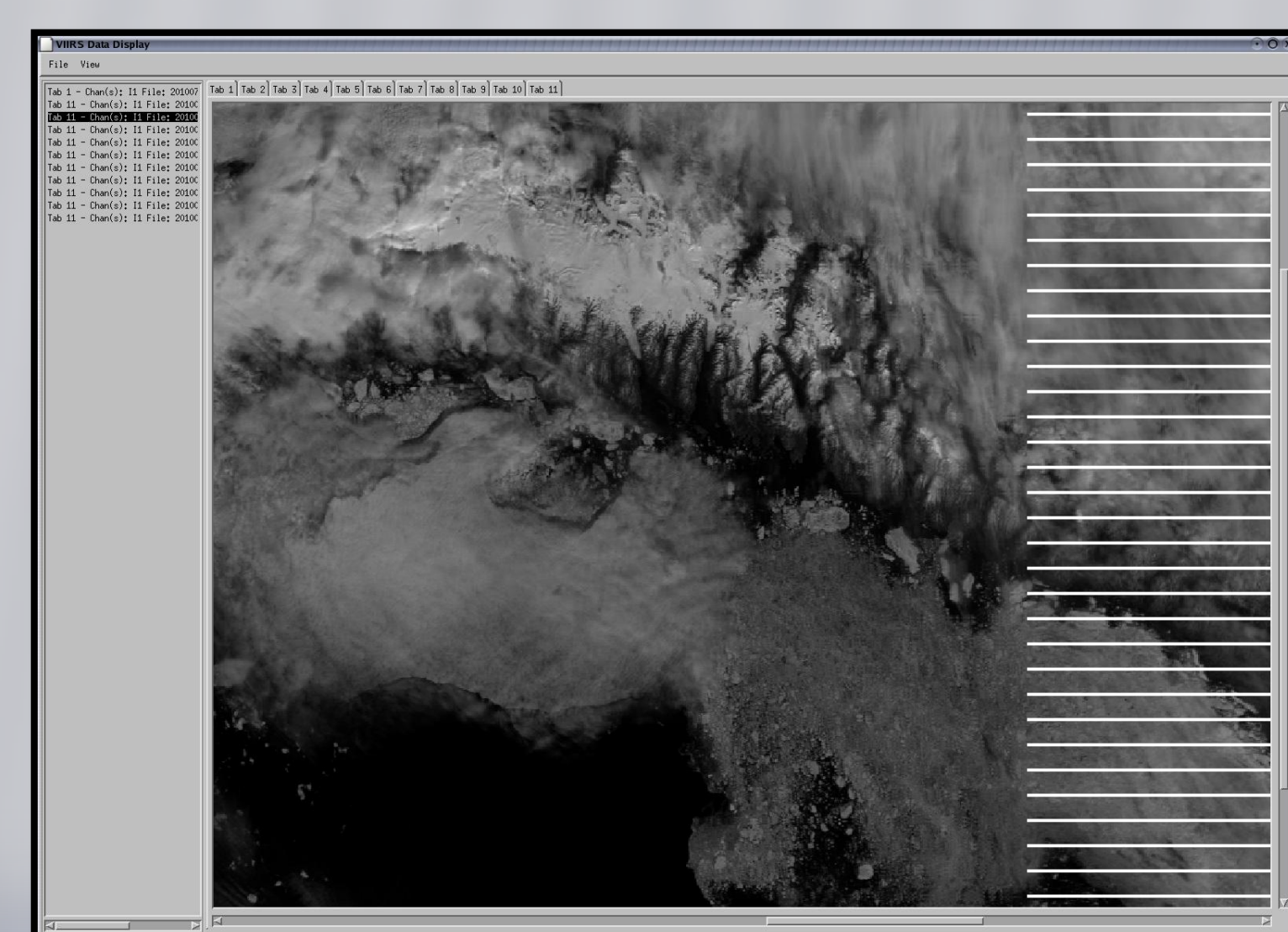For access to the ICVS and more information, please visit http://www.star.nesdis.noaa.gov/smcd/spb/icvs/index.php. Please visit the Products Demonstration frames at http://www.star.nesdis.noaa.gov/smcd/spb/icvs/index.php to see the current ozone-related figures, and visit https://gsics.nesdis.noaa.gov/wiki/GPRC to see a general collection of calibration monitoring figures.

ICVS - Cal/Val and Data Monitoring

Site Spatial Characterization Method

The Site Spatial Characterization Method brings together knowledge of the intrinsic biophysical properties of a measurement site, and the surrounding landscape to produce a number of geostatistical attributes that describe the overall variability, spatial extent, strength of the spatial correlation, and spatial structure of surface albedo patterns at separate seasonal periods throughout the year. Right: FLUXNET UMBS, External variability, Leaf-Off Conditions: The presence of lake water near the 50m flux tower increases the structural variability of this site at distances > 2.0km.
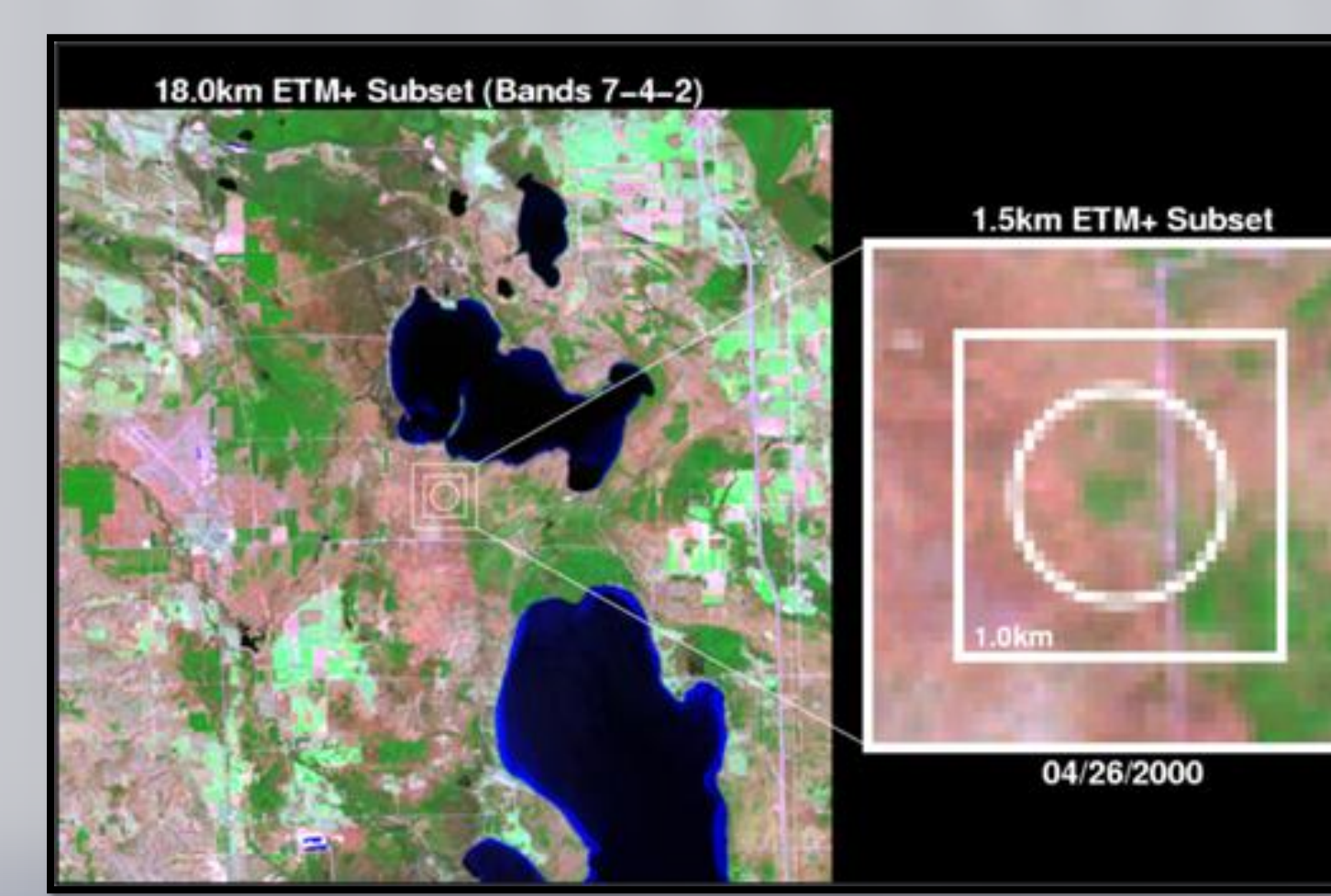
Imagery Tool

Naval Research Laboratory (NRL) is developing a tool for better viewing of VIIRS data. This tool allows the SME to display VIIRS data in either radiances or reflectances, as well as provides the capability to select and display specific VIIRS channels. Additional channels can be displayed in different windows for easy viewing. The screenshot to the right depicts the main display GUI for this tool.