McIDAS-V Support for the GOES-R Program

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McIDAS-V → VisAD + IDV + HYDRA

VisAD + IDV: The Core of McIDAS-V

The foundation of McIDAS-V is SSEC's Visualization for Algorithm Development (VisAD) and the Integrated Data Viewer (IDV) from Unidata. Both are built in Java™ to provide a versatile data analysis and visualization toolkit for geoscience data. Key attributes of VisAD / IDV include:

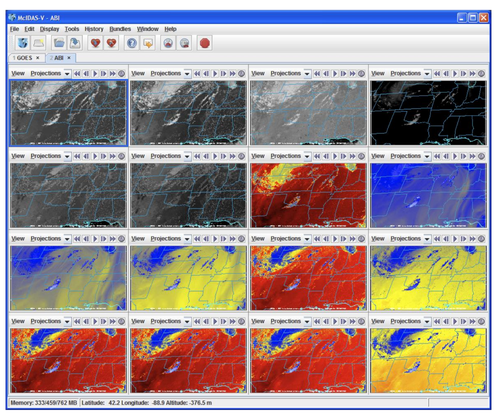
- A mathematical data model that embraces virtually any numerical data set,
- A general display model that supports 2-D and 3-D displays, and also allows direct manipulation of multiple data views,
- Metadata that is integrated into each data object,
- Adapters for multiple data formats (e.g. netCDF, HDF-5, McIDAS, Vis5D, etc.) and access to remote data servers through HTTP, FTP, DODS/OPeNDAP, and ADDE protocols.

HYDRA: Innovative Data Analysis Tools

- The Hyperspectral Data Research Application (HYDRA) developed at SSEC allows scientists to interrogate and display multi and hyper-spectral satellite data.
- HYDRA can display radiance spectra, multi-band imagery, scatter plots and transects.
- With the forthcoming GOES-R and NPP/NPOESS programs the HYDRA data interrogation capability is a key feature for the McIDAS-V toolkit.

McIDAS-V Display of GOES-R ABI 16 Bands

This 16-band ABI image has been simulated using a high-resolution WRF numerical model, along with advanced forward models. The visible (bands 1-2), near-IR (bands 3-6) and IR (bands 7-16) clearly show how each of the ABI bands are sensitive to various parts of the atmosphere/ocean/land/phenomena. The images (via a multi-band AREA file) are displayed in McIDAS-V using a customized plug-in. Note that McIDAS-V allows for unique color-enhancements for each panel. In addition, the panels can be rotated/zoomed either independently or altogether. The same color range was applied for each spectral range. For example the visible/near IR and IR bands respectively..



McIDAS-V is open source, freely available software

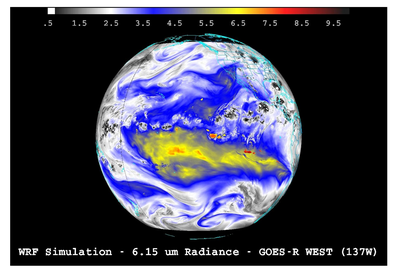
Visit the McIDAS-V web site to download the latest release (version 1.02), User Guide, Training Materials, and join the Forum

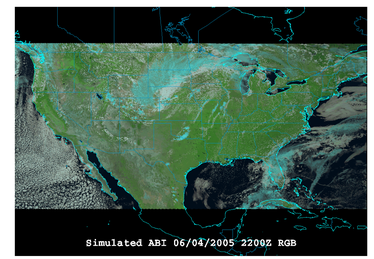
http://www.ssec.wisc.edu/mcidas/

Poster QR code

ABI Simulated Data in FGF

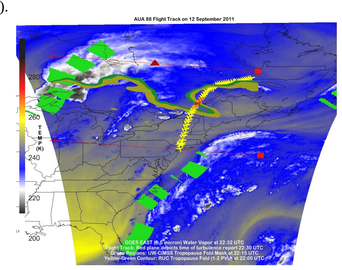
The figure below shows the WRF simulation of the 6.15 µm (left) radiance and "pseudo color" RGB from ABI (data provided by J. Otkin, SSEC/CIMSS). These images were remapped to the GOES-R Fixed Grid Format (FGF) navigation, simulating the GOES-R West (137W) and CONUS domains. McIDAS-V has the capability display data on the ABI fixed grid data from both simulated data and real data , when it becomes available.

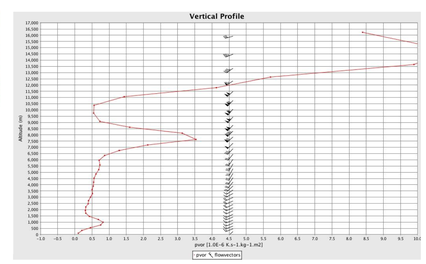




Data Analysis and Visualization in 4 Dimensions

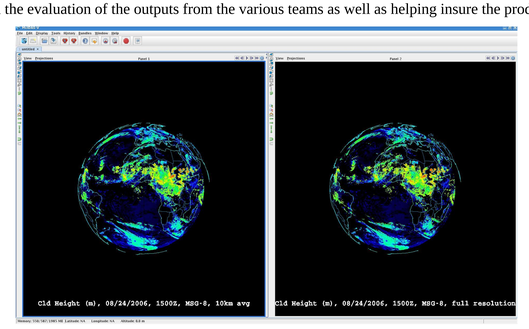
McIDAS-V is able to display images and data in three spatial dimensions and with time. Below is an example from the GOES-R Turbulence Algorithm showing a case of mid-air turbulence from 9/12/2011. The image on the left shows the flight path of Austrian Airlines 88, along with the tropofold mask product and RUC Tropofold values. The image on the right shows potential vorticity and the flow vectors from the RUC at 30.8N, 71.4W. (data from A. Wimmers, 2011).





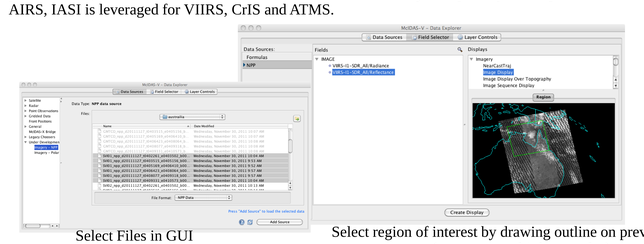
GOES-R ABI Framework

The image (below) shows the difference between the ABI cloud height algorithm, processed as part of the AWG AIT framework system using EUMETSAT Meteosat Second Generation SEVIRI data as a proxy data source, in the standard pixel level output verses the resolution required by the required specifications. McIDAS-V has been able to visualize virtually all of the output from the GOES-R AIT Framework and is continuing to help support the display of all ABI products within the McIDAS-V environment. This will allow for a consistent and unified view. More importantly, it will allow for comparison and quality assessment of the various products as they relate to one another and/or for comparisons between the input and output files. This process has helped in the evaluation of the outputs from the various teams as well as helping insure the product output adheres to CF file standards.



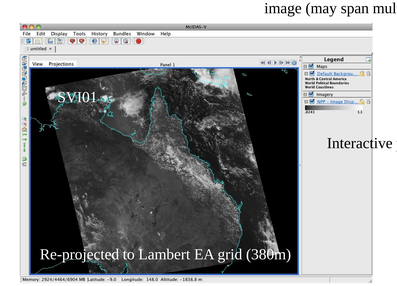
Suomi NPP

Extensions to the McIDAS-V framework provide simplified access to Suomi NPP product files generated by IDPS, and made available from the NOAA CLASS and SSEC PEATE. This includes under-the-hood time aggregation of granules, and automatic integration of data, geolocation, and metadata stored in separate product files (HDF5 and XML). Interactive visualization and analysis capability developed for MODIS, AIRS, IASI is leveraged for VIIRS, CrIS and ATMS.

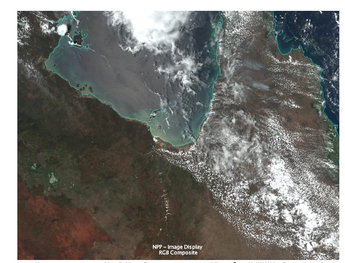


Select Files in GUI

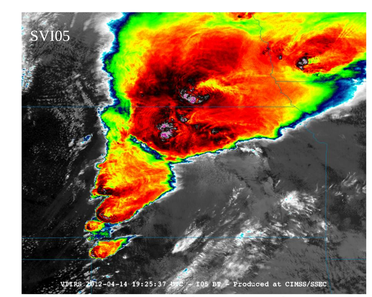
Select region of interest by drawing outline on preview image (may span multiple granules)



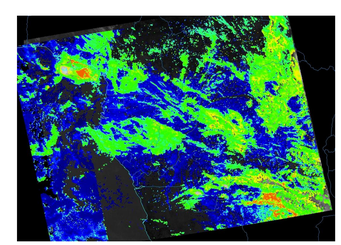
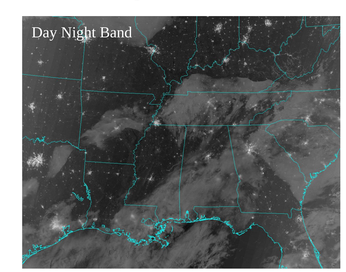
Interactive pan and zoom display.



Interactive RGB Composite Tool. VIIRS M5, M4, M3.



Interactive image enhancement tool.



Overlay SDR and EDR VCTHO (Cloud Top Height)