Implementation and support of a VIIRS Near-Real Time Rapid Fire System for Fire Monitoring at the US Forest Service

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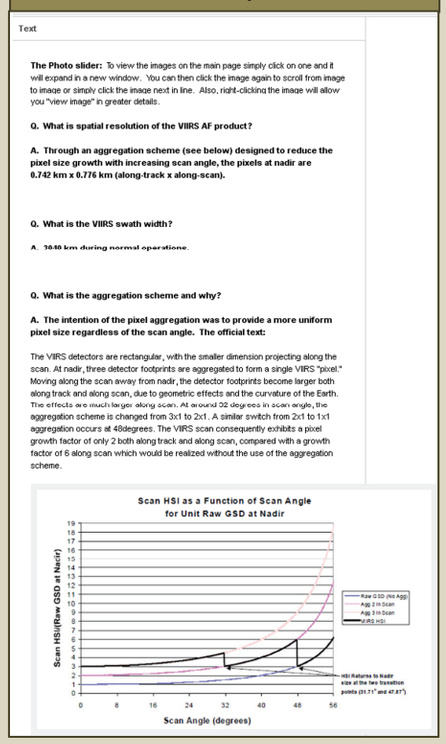
Introduction & Background

The current NPP/VIIRS active fire (AF) algorithm is based on an earlier version (Collection 4) of the MODIS algorithm, therefore lacking the improvements developed, tested, and implemented in the Collection 5 and Collection 6 MODIS algorithms. In addition, the AF product does not contain a spatially-explicit fire mask, fire radiative power (FRP), and additional fire metadata delivered with the MODIS AF product. In order to optimize data continuity between MODIS and VIIRS, the VIIRS active fire science team has developed a processing chain to automatically download, ingest, and generate evaluation test data for end-users, such as the USFS. A web-based user interface provides selected data testers access to value-added mapping/visualization products that display the IDPS-generated VIIRS fire detection data. The website offers side-by-side comparisons of MODIS and VIIRS for selected fire incidents in the U.S., and will eventually offer comparisons with the updated VIIRS algorithm (based on MODIS collection 6 adapted for VIIRS). A database to catalog and store initial user feedback has been created which will inform and support any necessary adjustments into the IDPS operational algorithm. Finally, we are working with the GOFC-GOLD Regional fire networks to identify end users to engage in the evaluation and feedback process.

It is our goal that improvements to the AF product will eventually include a fire mask with flagged fire pixels and corresponding detection confidence, as well as other relevant information (e.g. clouds), pixel-level QA, and fire-pixel radiometric and algorithm information. We also foresee adding FRP retrievals to meet new data requirements. These improvements would reduce the latency in end-user product adoption and increase the continuity with current AF products, specifically MODIS.

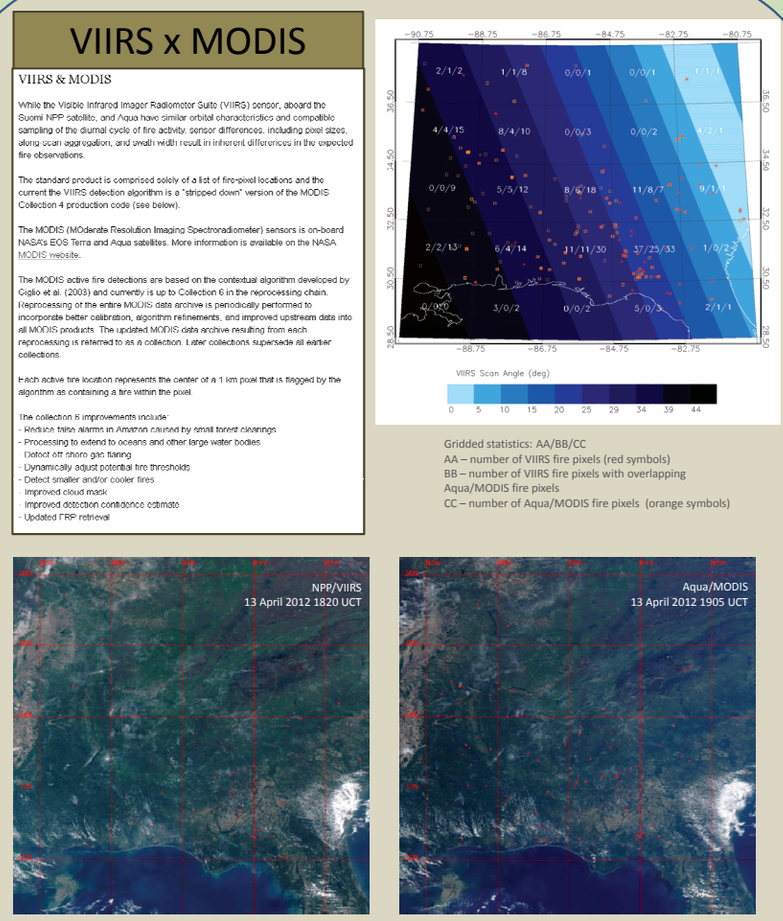
VIIRS Active Fire Front Page
http://viirsfire.geog.umd.edu/

FAQs



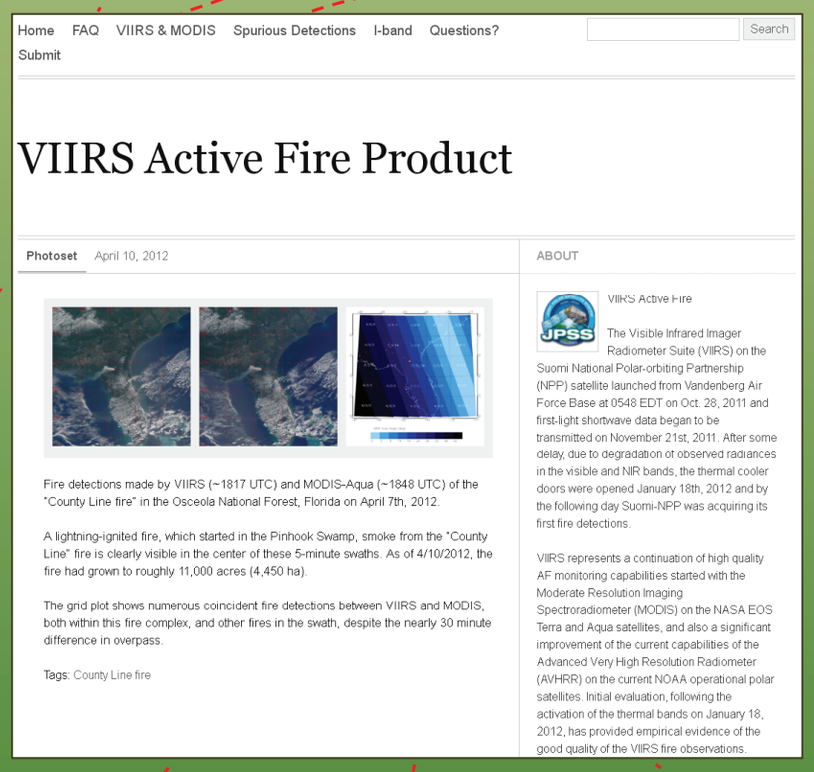
Questions&answers describing fundamental aspects of the VIIRS SDR and active fire data are listed in a separate FAQ section

VIIRS x MODIS

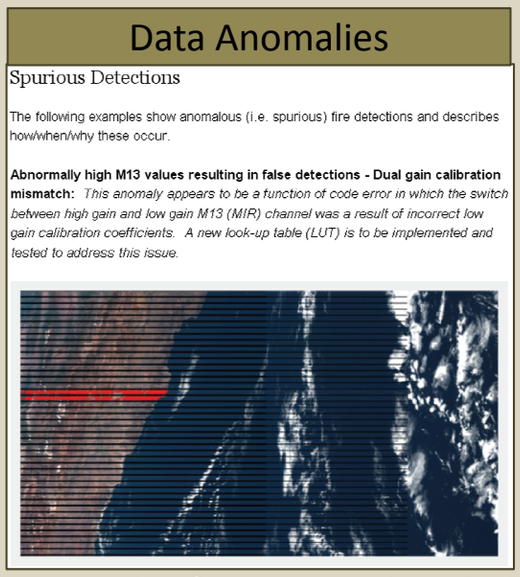


Gridded statistics: AA/BB/CC
AA – number of VIIRS fire pixels (red symbols)
BB – number of VIIRS fire pixels with overlapping Aqua/MODIS fire pixels
CC – number of Aqua/MODIS fire pixels (orange symbols)

Comparison between near-coincident NPP/VIIRS and Aqua/MODIS active fire data are displayed for selected regions and acquisition dates



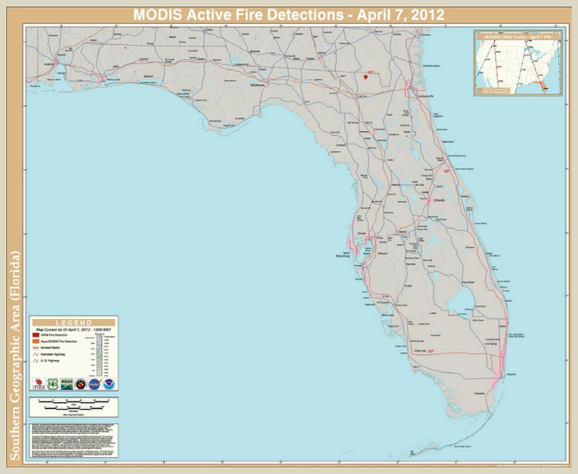
Data Anomalies



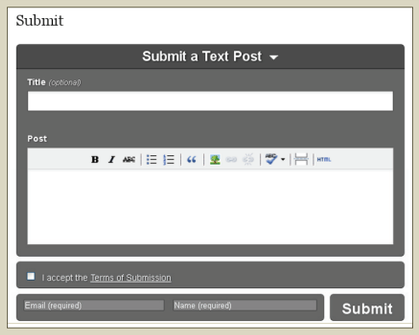
SDR and associated fire product anomalies are listed and described using representative data subsets

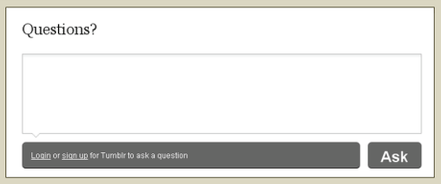
User Readiness

Baseline active fire HDF5 test data are converted to user-ready ASCII files carrying fire pixel coordinates in GIS-friendly format. NPP/VIIRS fire active test data have been succcesfully ingested into USDA Forest Service active fire mapping program and displayed alongside with MODIS data. This effort continues with additional tests being performed to help improve user experience.



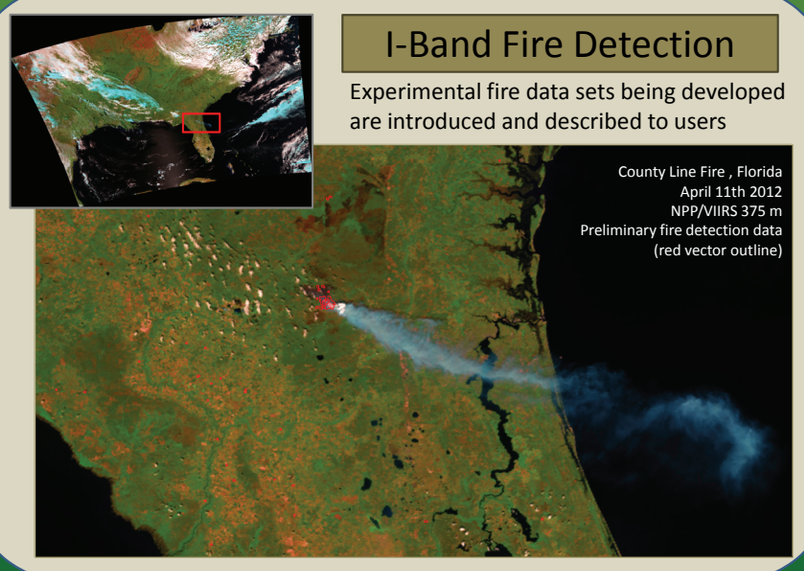
User Feedback & Outreach





User feedback links are available to facilitate exchange with science team. Additionally, team contact information (email address) is provided at the main front page.

Outreach activities including the dissemination of NP/VIIRS fire information among the international community are being coordinated with support from GOFC-Gold and partner regional fire networks (URL: http://gofc-fire.umd.edu/)

I-Band Fire Detection

Experimental fire data sets being developed are introduced and described to users