

# Community Satellite Processing Package (CSPP) for NPP/JPSS

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# What is CSPP?

- CSPP (Community Satellite Processing Package) is the new software system for processing direct broadcast data from Suomi NPP.
- Funded by NOAA via JPSS Project (thanks to Mitch Goldberg).
- Developed and supported by CIMSS/SSEC, UW-Madison.
- For Suomi NPP, we use the Algorithm Development Library (ADL) version of the Suomi NPP operational processing software.
- CSPP will do more than just NPP...

# Suomi NPP Launch 2011/10/28



# Suomi NPP Sensor Suite

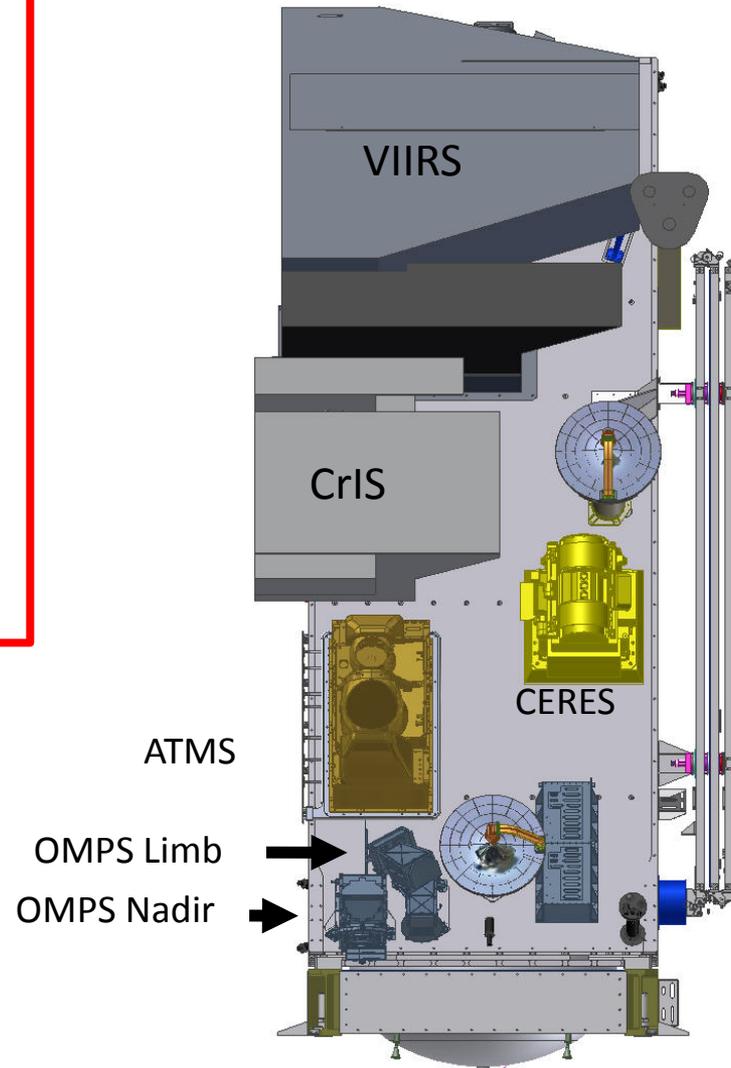
VIIRS – Medium Resolution  
Visible & Infra-red Imager

CrIS – Fourier Transform  
Spectrometer for IR  
Temperature and Moisture  
sounding

ATMS – Microwave sounding  
radiometer

OMPS – Total Ozone Mapping  
and Ozone Profile  
measurements

CERES - Earth Radiation Budget



# Suomi NPP Direct Broadcast Status

- Started transmitting VIIRS, CrIS, and ATMS science data in real-time via X-band direct broadcast starting on 23 February 2012.
- 7812 MHz, 13 Mbps.
- No encryption, licenses, or fees.
- Downlink format is described in CDFCB External Volume VII  
at <http://npp.gsfc.nasa.gov/science/documents.html>
- Intermittent issue with short signal strength drop (4 passes in 16 days) at certain overpass positions

# SSEC 2.4 meter X/L-band System

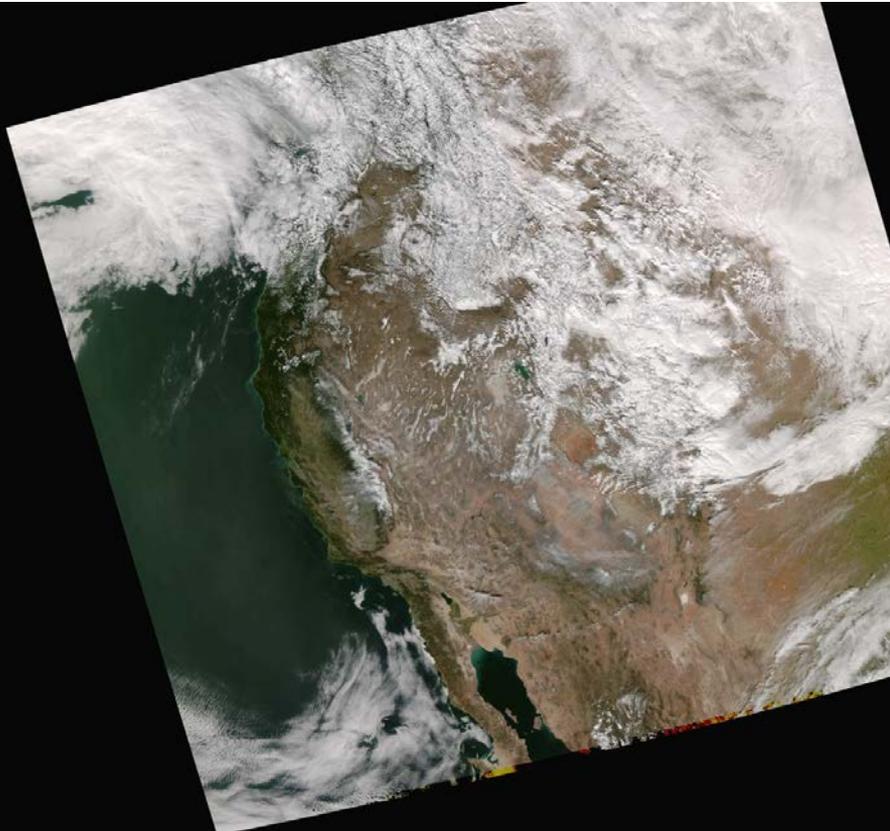
Installed Sep 2011



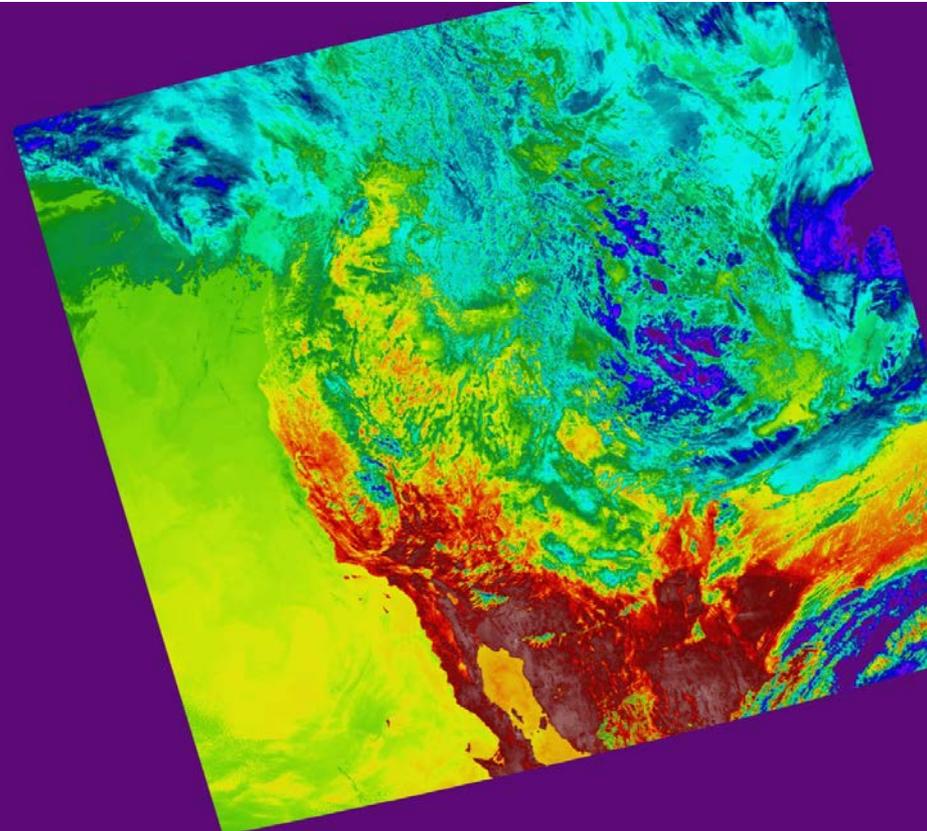
System supplied by Orbital Systems, Dallas Texas.

4/5/2012 Receives data from Suomi NPP, Terra, Aqua, POES, Metop, FY-3, FY-1.

# First Suomi NPP DB pass from SSEC 2.4 meter X/L System, 20:30 UTC, 2012/02/23

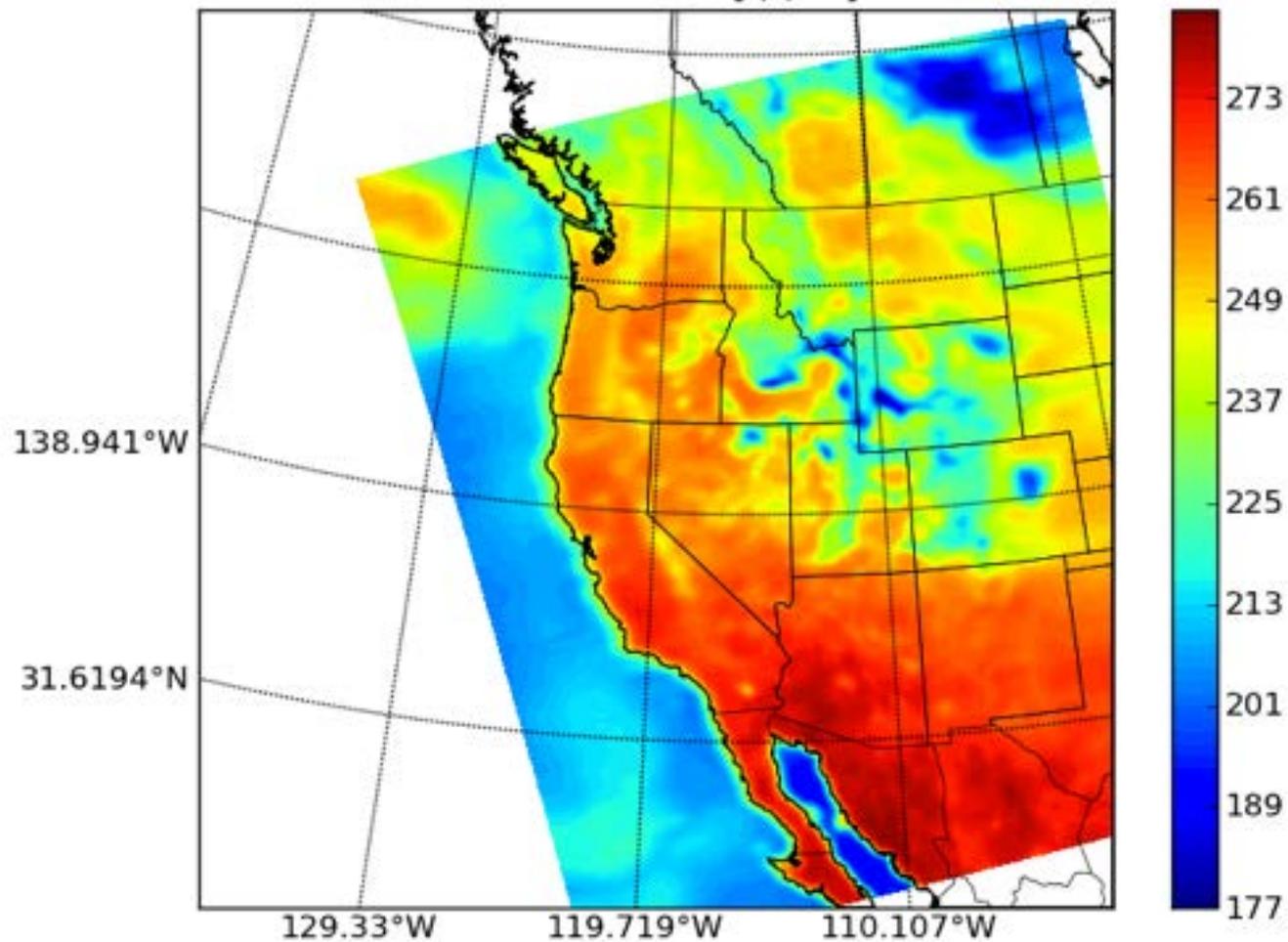


VIIRS True Color (M5/M4/M3)



VIIRS Infrared (M15)

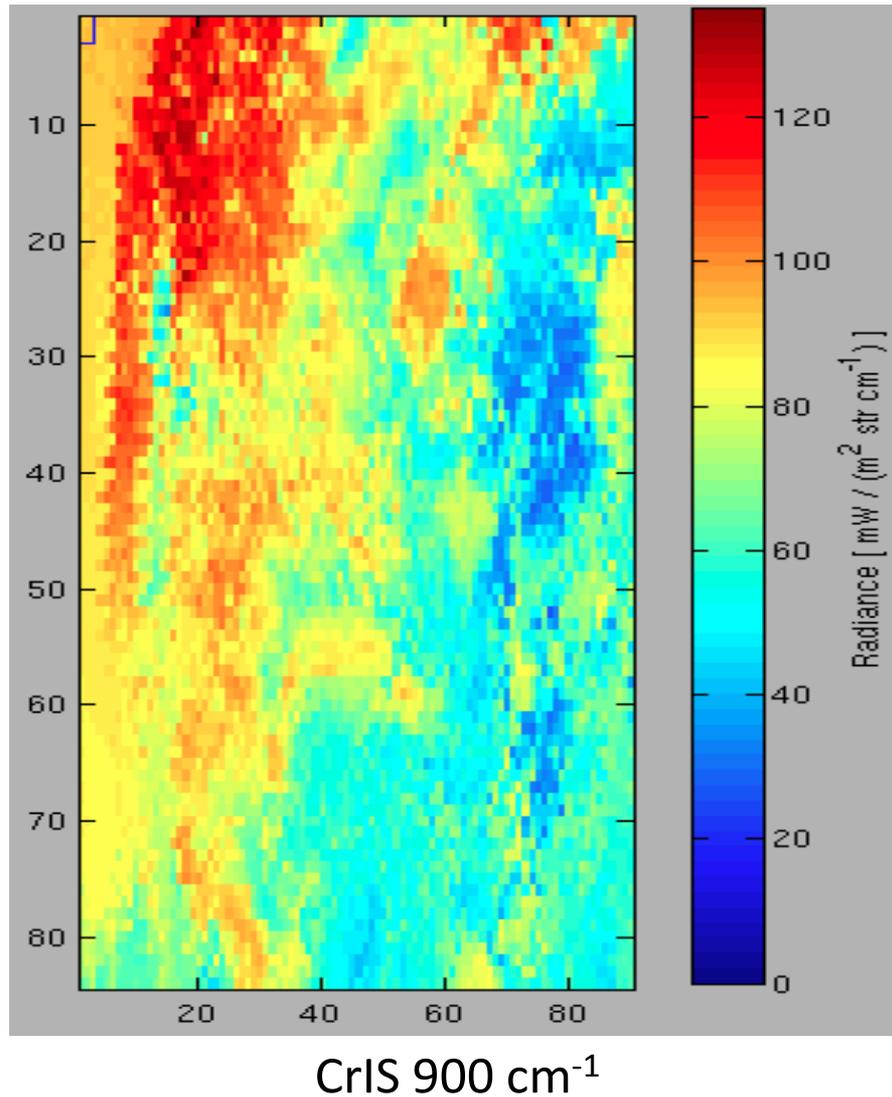
# First Suomi NPP DB pass from SSEC 2.4 meter X/L System, 20:30 UTC, 2012/02/23



ATMS Channel 16

# First Suomi NPP DB pass from SSEC

## 2.4 meter X/L System, 20:30 UTC, 2012/02/23



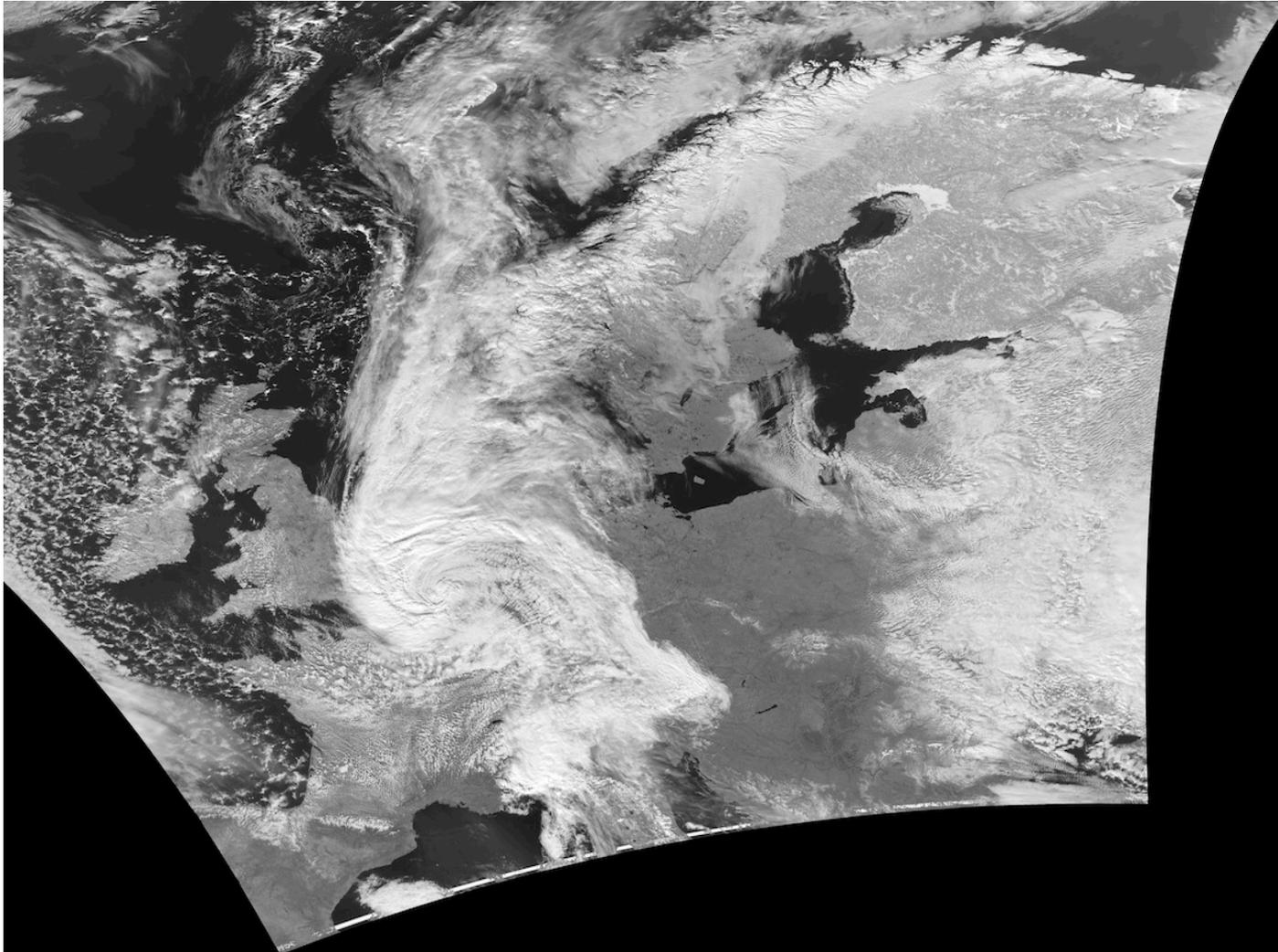
# Vendors with Suomi NPP-ready systems

- Orbital Systems ([www.orbitalsystems.com](http://www.orbitalsystems.com))
- SeaSpace ([www.seaspace.com](http://www.seaspace.com))
- Kongsberg Spacetec ([www.spacetec.no](http://www.spacetec.no))
- VCS ([www.vcs.de](http://www.vcs.de))
- ScanEx ([www.scanex.ru](http://www.scanex.ru))

Agencies able to receive Suomi NPP include:

- NASA, EUMETSAT, Meteo France, UK Met Office, SMHI, FMI, INPE, CMA

# Suomi NPP acquired and processed by Finnish Meteorological Institute, 2012/03/05



# Community Satellite Processing Package

- CSPP will include support for Suomi NPP and JPSS, POES, Metop, and FY-3.
- For Suomi NPP, supported sensors will include VIIRS, CrIS, ATMS (SDRs and a subset of EDRs)
- For POES and Metop, supported sensors will include AVHRR and IASI (Level 2 products only; Level 1 processing provided by AAPP).
- For FY-3, supported sensors will include VIIR and MERSI (Level 2 products only; Level 1 processing provided by NSMC).
- 64-bit Intel Linux is the host platform for all CSPP software.

# CSPP for Suomi NPP

- SSEC is preparing algorithms for
  - VIIRS, CrIS, and ATMS RDR to SDR processing,
  - VIIRS Cloud Mask, Active Fires, Cloud Properties, and Aerosol Properties EDRs,
  - CrIS single FOV temperature and moisture retrievals.
- Primary distribution format is compiled code (ready to run).
- Source code will be available if desired (in ADL).
- Supported host platform is Red Hat Enterprise Linux 5 (64-bit), minimum of 16 GB of RAM is required.
- Nigel Atkinson recommends dual Intel hex-core 3.06 GHz CPUs and 64 GB RAM (10 min. VIIRS pass processed in 10 min).

# About CSPP for Suomi NPP

- The CSPP software for NPP is based on the Algorithm Development Library (ADL) Version 3.1 developed by Raytheon and the JPSS project (*the same software that runs in the operational processing facility at NOAA/NESDIS*).
- SSEC has packaged the ADL software to run from the Linux command line in real-time direct broadcast mode. *We have not changed the underlying processing source code, algorithms, or data formats.*
- The output files from the CSPP NPP SDR processing software *are identical in naming, format, and structure to the corresponding files from NOAA/NESDIS.*
- The first release of CSPP will support Suomi NPP VIIRS, CrIS, and ATMS RDR to SDR processing.

# Value added features for Suomi NPP

- Ancillary data are ingested and processed automatically.
- Compiler flags are selected to provide optimized execution speed.
- Build environment is the standard ADL 3.1 environment.
- Details of run-time configuration (e.g., XML files) are transparent.
- Command line scripts require the name of the directory containing the input files, and nothing else.

# CSPP for POES and Metop

- SSEC is planning to release the CLAVR-X AVHRR Level 2 software package for POES and Metop (from Andy Heidinger, NOAA) using Level 1 data from AAPP.
- Cloud Mask, Cloud Top Properties, Cloud Optical Thickness, NDVI, SST.
- Output format is HDF4.
- Mapped image products will also be available.
- CIMSS/SSEC (Weisz/Smith) have developed a dual-regression single FOV retrieval algorithm for IASI and CrIS (temperature and moisture profiles, cloud properties), which will be released as part of CSPP.

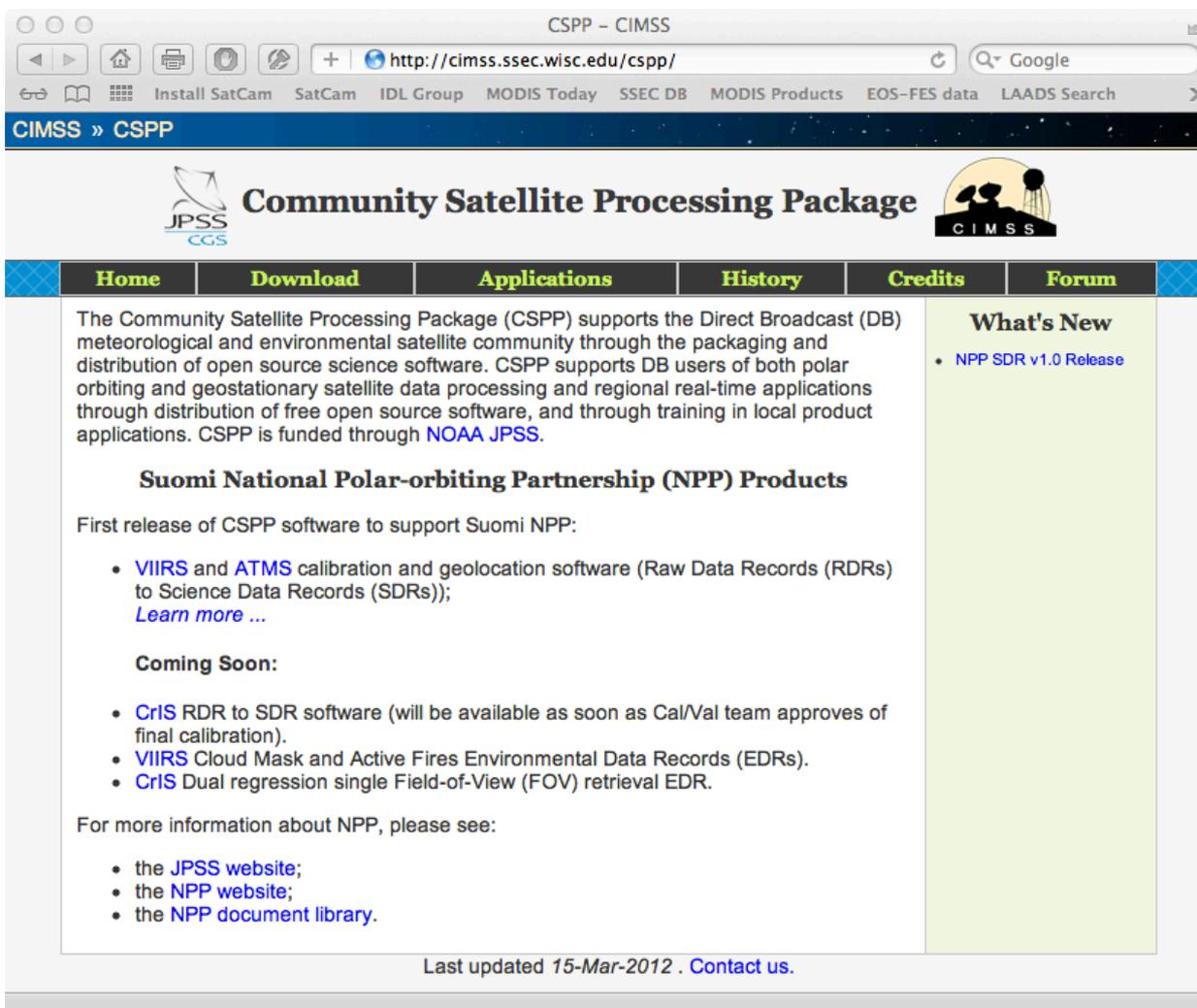
# CSPP for FY-3

- SSEC is planning to adapt the CLAVR-X AVHRR Level 2 software package for FY-3 VIRR.
- Level 1 processing is already provided by NSMC  
[http://www.nsmc.cma.gov.cn/newsite/NSMC\\_EN/Home/Index.html](http://www.nsmc.cma.gov.cn/newsite/NSMC_EN/Home/Index.html)
- Cloud Mask, Cloud Top Properties, Cloud Optical Thickness, NDVI, SST for VIRR.
- SSEC will work with NSMC to release the MERSI Image Processing System (MIPS) to the DB community. MIPS provides true and false color images from MERSI in JPEG, GeoTIFF, and KML formats.

# Near-term CSPP Milestones

- Beta1 release of CSPP for VIIRS, CrIS, and ATMS RDR to SDR Dec 21, 2011. Successfully tested by all invited agencies (about 20).
- Beta2 release of VIIRS SDR on Mar 1, 2012 (first DB capable version).
- Beta3 release for VIIRS and ATMS SDR on Mar 16, 2012 (first optimized version).
- Public version 1.0 release for VIIRS, CrIS, and ATMS SDR by Apr 15.

# CSPP Website



The screenshot shows a web browser window titled "CSPP - CIMSS" with the address bar displaying "http://cimss.ssec.wisc.edu/cspp/". The browser's search bar contains "Google". Below the browser window, the website header features the "CIMSS » CSPP" navigation bar, the JPSS CCGS logo, the title "Community Satellite Processing Package", and the CIMSS logo. A navigation menu includes links for Home, Download, Applications, History, Credits, and Forum. The main content area is divided into two columns. The left column contains a description of CSPP, a section for "Suomi National Polar-orbiting Partnership (NPP) Products", and a list of upcoming products. The right column is titled "What's New" and lists a "NPP SDR v1.0 Release". At the bottom of the page, it states "Last updated 15-Mar-2012 . Contact us."

CIMSS » CSPP

 **Community Satellite Processing Package** 

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The Community Satellite Processing Package (CSPP) supports the Direct Broadcast (DB) meteorological and environmental satellite community through the packaging and distribution of open source science software. CSPP supports DB users of both polar orbiting and geostationary satellite data processing and regional real-time applications through distribution of free open source software, and through training in local product applications. CSPP is funded through [NOAA JPSS](#).

**Suomi National Polar-orbiting Partnership (NPP) Products**

First release of CSPP software to support Suomi NPP:

- [VIIRS](#) and [ATMS](#) calibration and geolocation software (Raw Data Records (RDRs) to Science Data Records (SDRs));  
[Learn more ...](#)

**Coming Soon:**

- [CrIS](#) RDR to SDR software (will be available as soon as Cal/Val team approves of final calibration).
- [VIIRS](#) Cloud Mask and Active Fires Environmental Data Records (EDRs).
- [CrIS](#) Dual regression single Field-of-View (FOV) retrieval EDR.

For more information about NPP, please see:

- the [JPSS website](#);
- the [NPP website](#);
- the [NPP document library](#).

**What's New**

- [NPP SDR v1.0 Release](#)

Last updated 15-Mar-2012 . [Contact us](#).