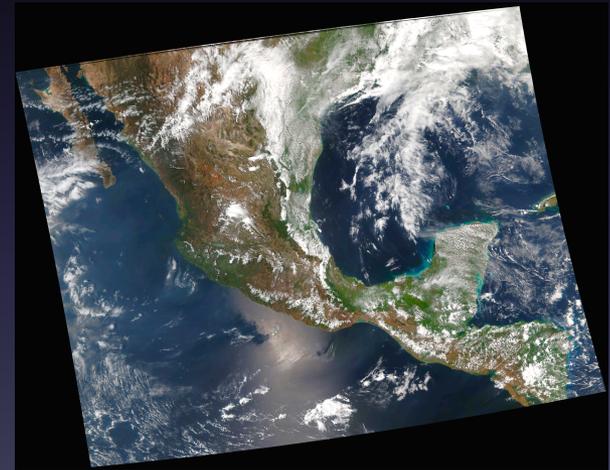


Community Satellite Processing Package (CSPP) Polar-Orbiting Satellite Software and Products

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NOAA Satellite Conference
2015/04/29



What is CSPP?

CSPP (Community Satellite Processing Package) is a collection of software systems for processing data from meteorological satellites.

The primary goal of CSPP is to support users who

- Receive satellite data via direct broadcast;
- Create Level 1B and higher level products and images in real time.

Funding is supplied by JPSS and NOAA.



CSPP Software Philosophy

The CSPP software

Creates useful products for the DB community,

Includes up-to-date algorithms,

Is pre-compiled for 64-bit Intel Linux (CentOS),

Is easy to install and operate,

Includes test data for verification,

Runs efficiently on modest hardware,

Has prompt user support.

CSPP by the numbers

Satellites supported: 7

Software packages: 10

Sensors supported: 25

Releases and updates: 29

Registered users: 913

Individual downloads: > 5000

CSPP Software (Apr 2015)



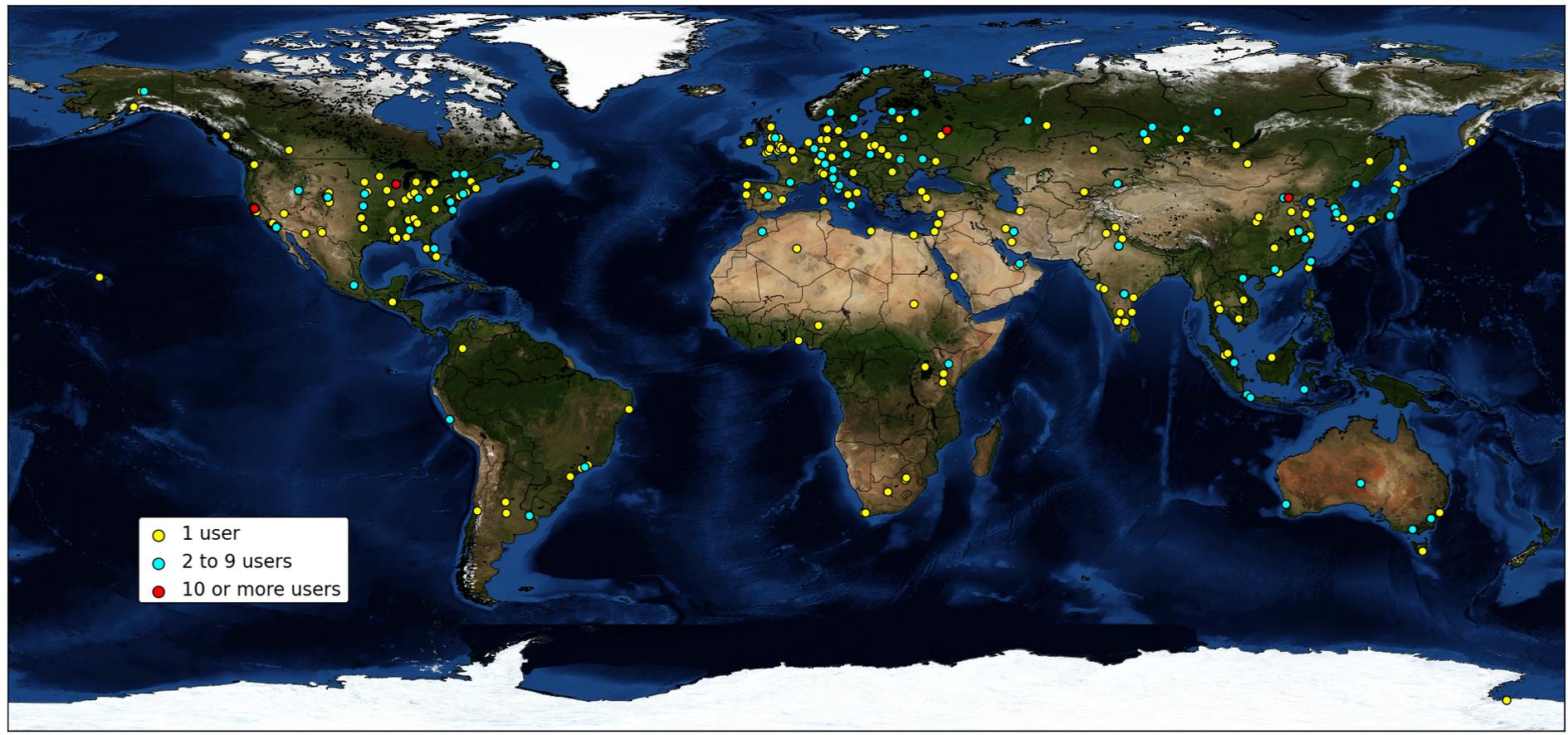
CSPP Software	Product Description
1. SDR	VIIRS, CrIS, and ATMS geolocated and calibrated earth observations.
2. VIIRS EDR	VIIRS imager cloud mask, active fires, surface reflectance, vegetation indices, sea surface temperature, land surface temperature, and aerosol optical depth.
3. HSRTV	Hyperspectral infrared sounder retrievals of temperature and moisture profiles, cloud properties, total ozone, and surface properties.
4. Polar2grid	Reprojected imagery (single and multi-band) in GeoTIFF and AWIPS formats.
5. Hydra	Interactive visualization and interrogation of multispectral imagery and hyper spectral soundings.
6. MIRS	Microwave sounder retrievals of temperature and moisture profiles; surface properties; snow and ice cover; rain rate; and cloud/rain water paths.
7. CLAVR-x	Multispectral imager retrievals of cloud properties; aerosol optical depth; surface properties; ocean properties.
8. NUCAPS	Combined hyperspectral infrared sounder and microwave sounder retrievals of temperature and moisture profiles, cloud cleared radiances, and trace gases.
9. IAPP	Combined infrared sounder and microwave sounder retrievals of temperature and moisture profiles, water vapor, total ozone, and cloud properties.
10. ACSPO	Multispectral imager retrievals of sea surface temperature.

CSPP Satellite/Sensor/Product Matrix



Satellite	Multispectral Imager	Infrared Sounder	Microwave Sounder
Suomi NPP	VIIRS <i>SDRs (Level 1B), Images, Visualization, Clouds, Aerosols, Land, Ocean</i>	CrIS <i>SDRs (Level 1B) Atmospheric Profiles, Clouds, Visualization</i>	ATMS <i>SDRs (Level 1B), Atmospheric Profiles, Precipitation, Visualization</i>
Metop-A/B	AVHRR <i>Clouds, Aerosols, Land Surface, SST, Visualization</i>	IASI, HIRS <i>Atmospheric Profiles, Clouds, Visualization</i>	AMSU, MHS <i>Atmospheric Profiles, Precipitation</i>
NOAA-18/19	AVHRR <i>Clouds, Aerosols, Land Surface, SST, Visualization</i>	HIRS <i>Atmospheric Profiles</i>	AMSU, MHS <i>Atmospheric Profiles, Precipitation</i>
Terra	MODIS <i>Images, Visualization</i>	N/A	N/A
Aqua	MODIS <i>Images, Visualization</i>	AIRS <i>Atmospheric Profiles, Clouds, Visualization</i>	AMSU <i>Atmospheric Profiles, Precipitation, Visualization</i>

CSPP Registered User Locations



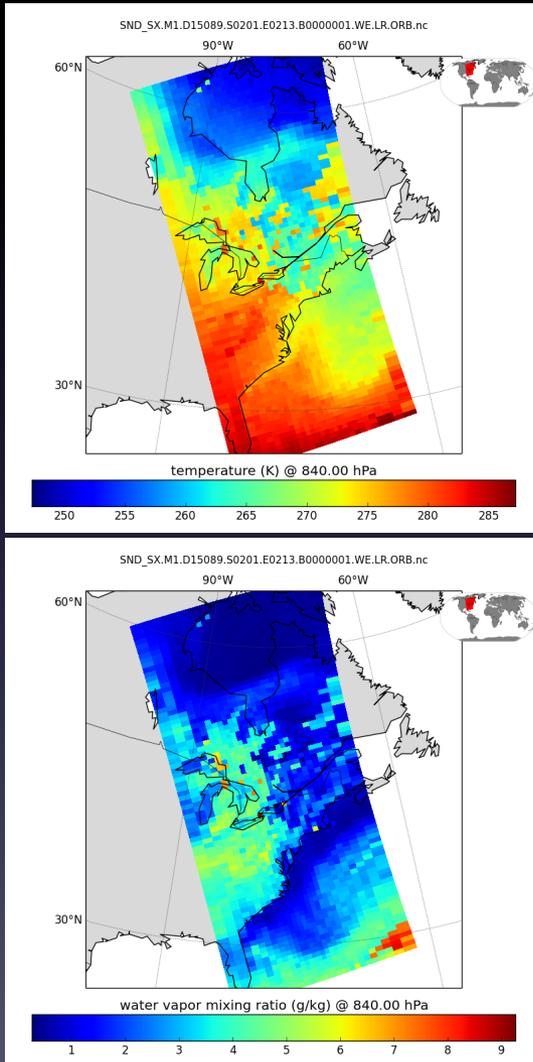
February, 2015

MIRS Examples

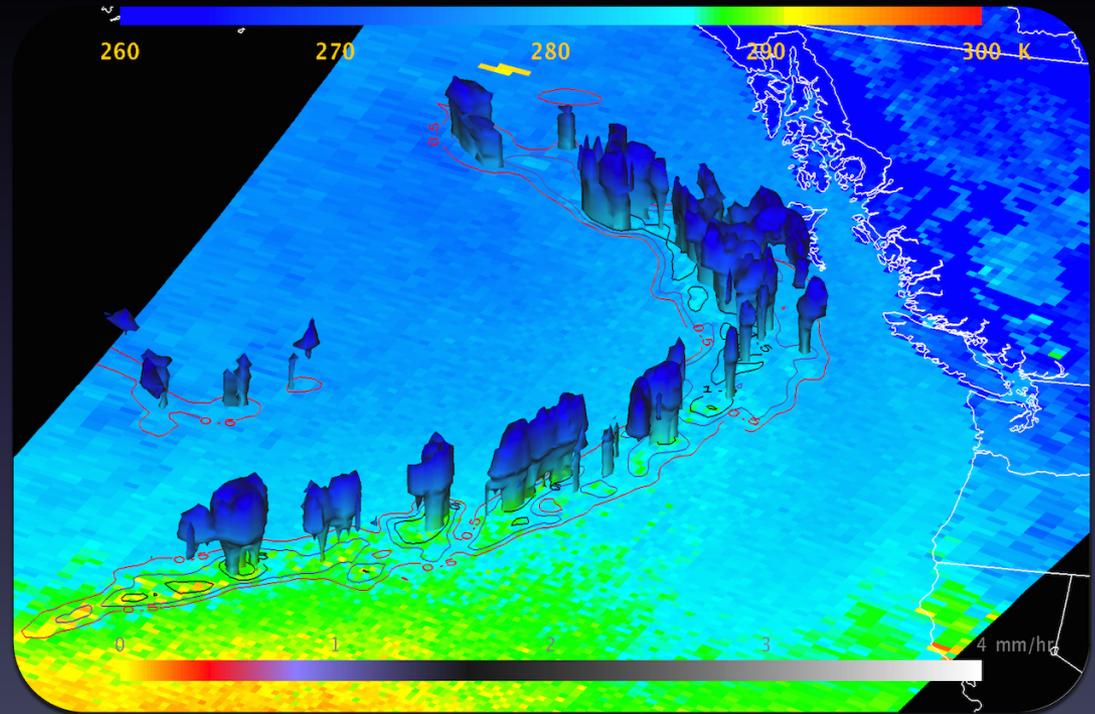
Metop-B 2015/03/30 02:01 UTC
SNPP 2015/03/18 11:03 UTC



Metop-B AMSU/MHS 840 hPa
temperature and water vapor



SNPP ATMS Surface Skin Temperature with Rain Rate
contours and isosurface of Rain Mass Profile

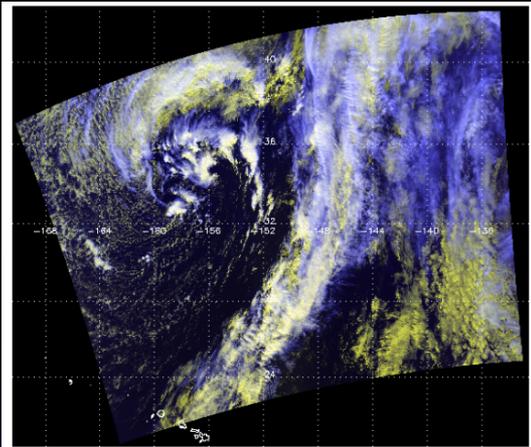


CLAIR-x Examples

SNPP 2013/03/10 23:00 UTC



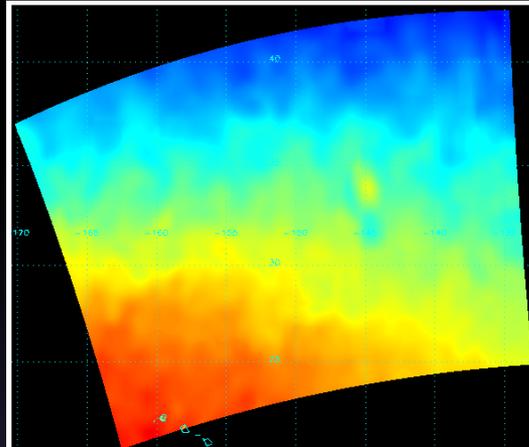
VIIRS False Color



False Color Image

Red = 0.65 μ m, Green = 0.86 μ m, Blue = 11 μ m (reversed)

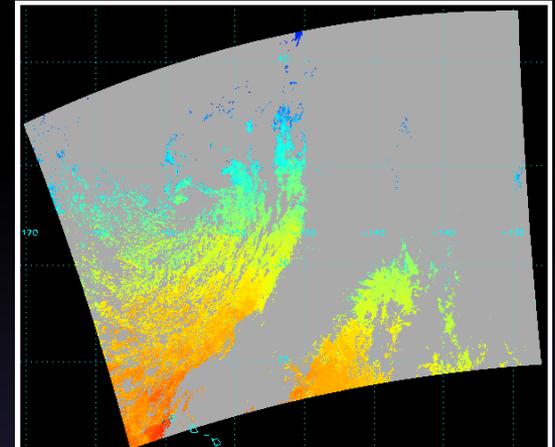
SST Ancillary Data



surface_temperature_background

280.00 284.00 288.00 292.00 296.00 300.00

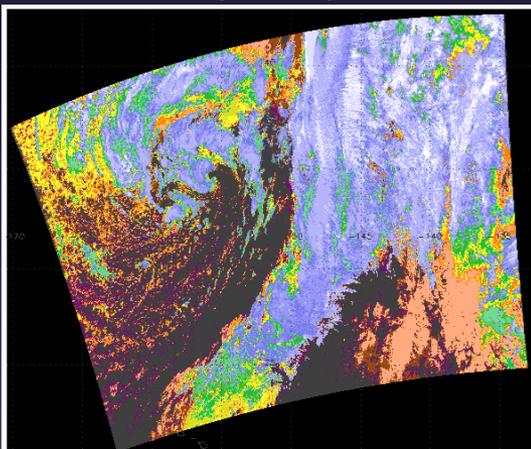
Cloud Masked SST



surface_temperature_retrieved

280.00 284.00 288.00 292.00 296.00 300.00

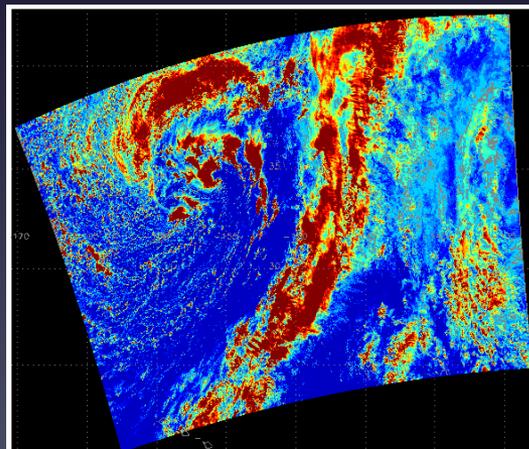
Cloud Top Temperature



Cloud-top Temperature (K)

300 290 280 275 270 265 260 255
250 245 240 235 230 220 210 0

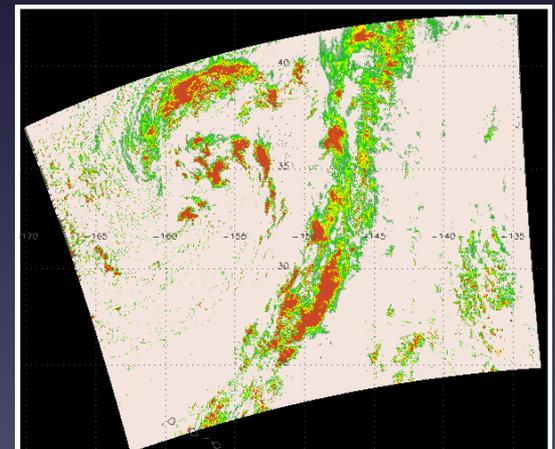
Cloud Water Path



Cloud Water Path (g/m²)

missing 0 10 20 30 40 50 60
100 120 140 160 180 200 250 300

Rain Rate



Rain Rate (mm/hr)

missing 0.00 0.10 0.20 0.50 1.00 2.00 4.00

NUCAPS Examples

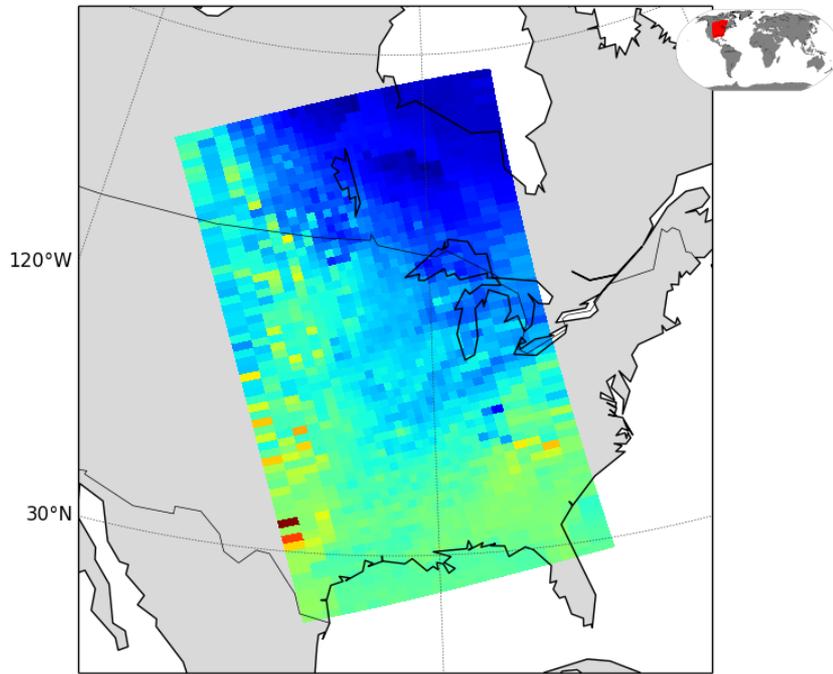
SNPP 2015/04/03 19:07 UTC



Temperature

NUCAPS-EDR_v1r0_npp_s201504031906499_e201504031907197_c201504032037040.nc

90°W



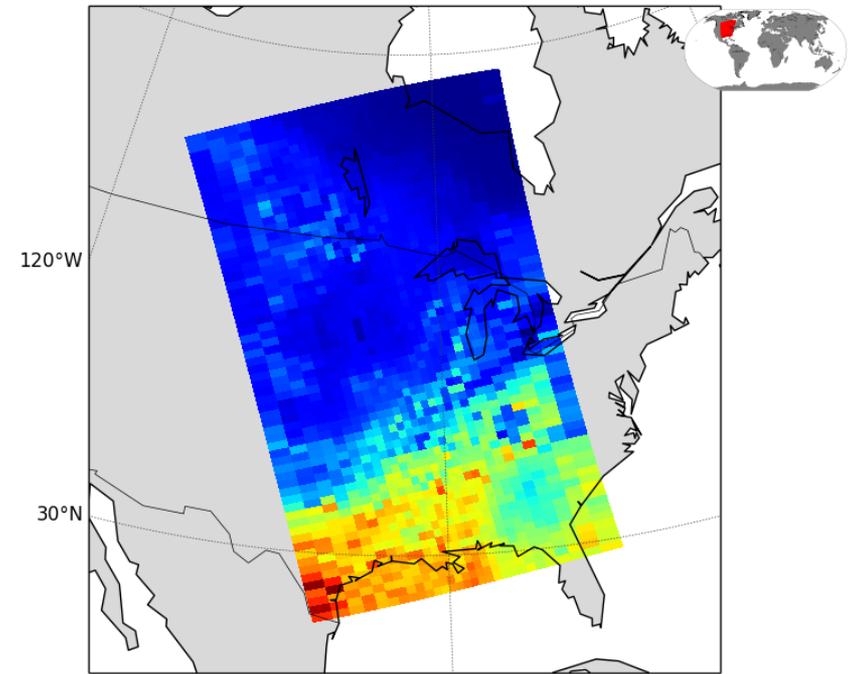
temperature (K) @ 986.00 hPa

260 270 280 290 300 310 320 330 340

Water Vapor Mixing Ratio

NUCAPS-EDR_v1r0_npp_s201504031906499_e201504031907197_c201504032037040.nc

90°W



water vapor mixing ratio (g/kg) @ 986.00 hPa

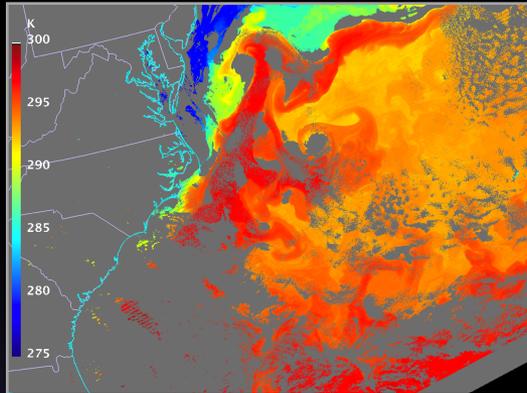
2 4 6 8 10 12 14 16

ACSPPO Examples

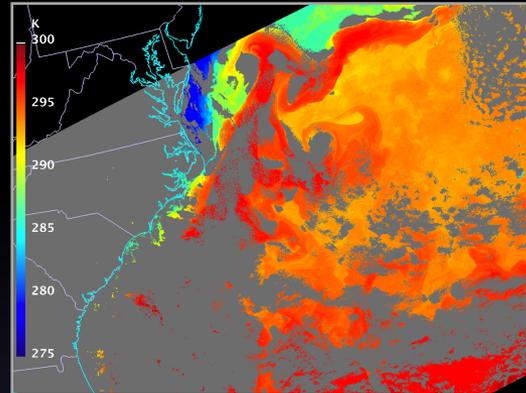
2015/04/02



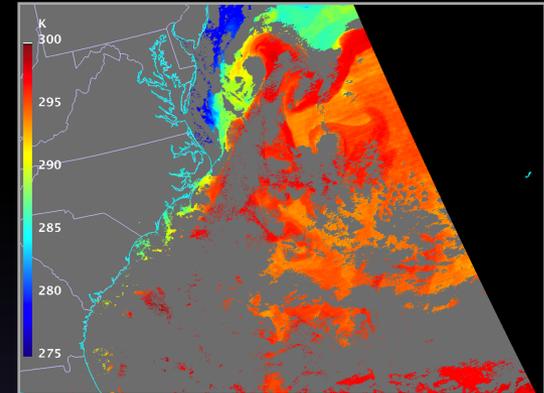
VIIRS SST 17:44 UTC



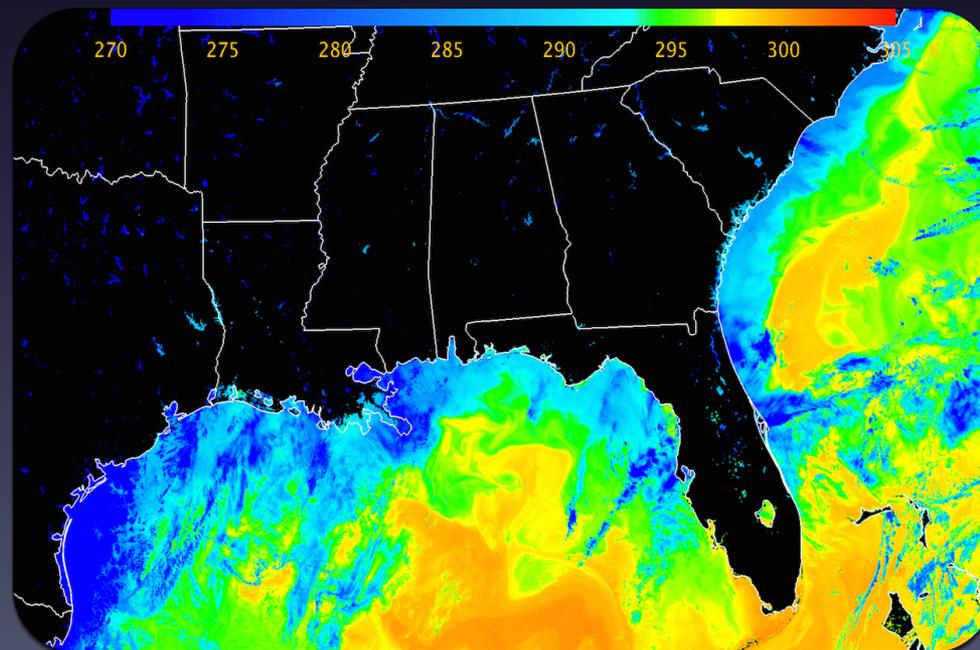
AVHRR SST 18:31 UTC



MODIS SST 18:35 UTC



VIIRS SST 2015/03/18 07:40 UTC



CSPP Summary

- CSPP continues to support the polar orbiting satellite DB community with a wide range of software and products supporting Suomi NPP, Metop, NOAA, and EOS satellites.
- CSPP GEO now supports geostationary satellites.
- We look forward to JPSS-1 in early 2017.

<http://cimss.ssec.wisc.edu/cspp/>