CSPP / CLAVR-x

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Embrace Change!

CLAVR-x is meant to be configurable, by changing the "options" file you can:

- turn channels off or on
- control how many scan lines are processed
- use different channel combinations for DCOMP and ACHA (see below). Maybe you want to use the same algorithm for all sensors? You can!

By changing the level2 include file and recompiling, you can also limit or expand the product list!

The Clouds from AVHRR Extended (CLAVR-x) Processing System…

- was designed for NOAA AVHRR Operational Processing, but has since been expanded to support MODIS, VIIRS and many Geostationary Imagers.
- offers users direct access to the latest cloud algorithms from NOAA for JPSS and GOES-R.
- primarily generates cloud products, but also supports some surface and other products.
- has been available as part of CSPP since May 2014 (and a major update is coming soon.)

More Information

http://cimss.ssec.wisc.edu/clavrx/

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

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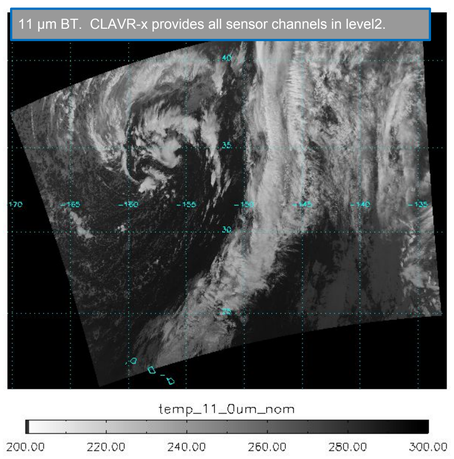
Calibrated Radiances

- Calibrated observations from all channels are available in the level2 output.
- Sensor and solar viewing geometries are available including glint and scattering angles.
- CLAVR-x only operates on the resolution of the IR bands (1 km for MODIS, 750 m for VIIRS).
- VIIRS DNB is interpolated to the VIIRS M-band projection (750 m).



Three Painless Steps and All of This is Yours!

1. Download the CSPP-CLAVR-x package from the CSPP website
2. Modify one configuration file to match your local environment
3. run_clavrx.sh 3 /my/viirs/l1b/ /my/workspace/ /my/clavrx/output/

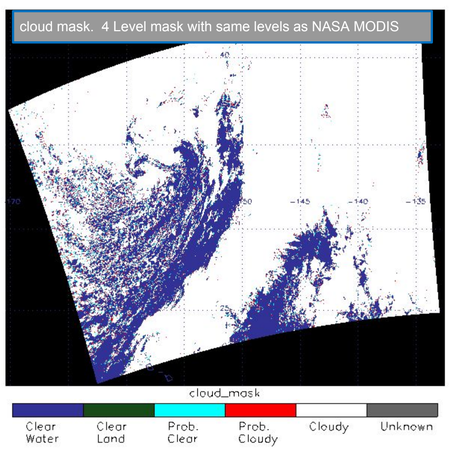
CSPP-CLAVR-x comes precompiled with common defaults, wrapped with scripts that automatically download dynamic ancillary data for you, and includes a full copy of the source code.

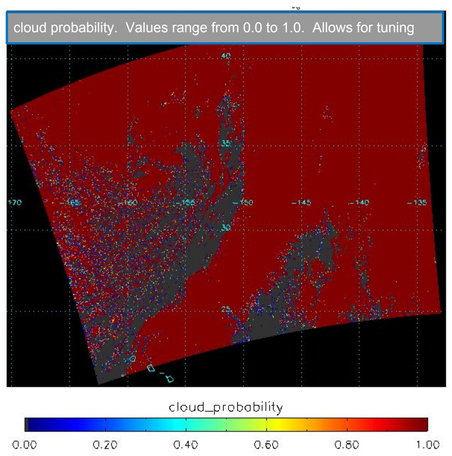
CLAVR-x supported by the JPSS Program

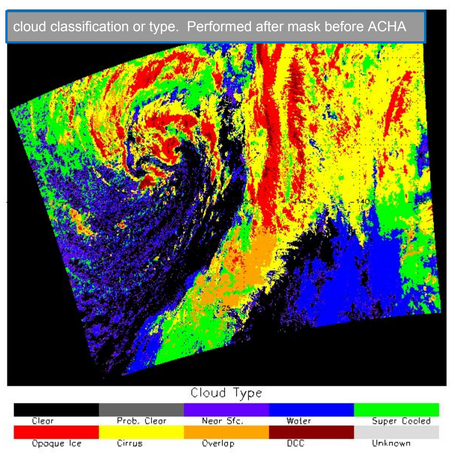
The following images are all products in CLAVR-x Level2 Files from CSPP. Data is SNPP VIIRS

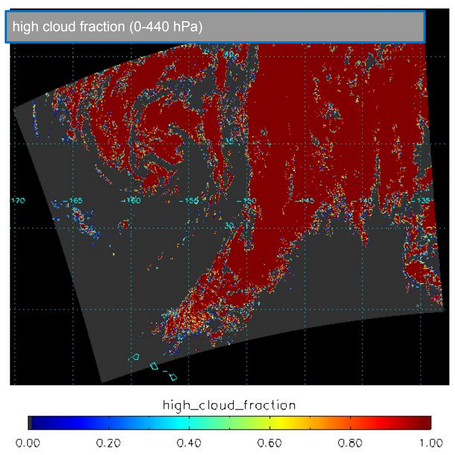
Cloud Detection and Typing

- CLAVR-x employs a naïve Bayesian cloud mask which was trained using CALIPSO/CALIOP.
- Products are a 4-level mask and a cloud probability field.
- Users can employ their probability thresholds to optimize cloud detection for their needs.
- Cloud fractions are computed from cloud mask values on 3x3 pixel arrays. Uncertainty estimates also given.



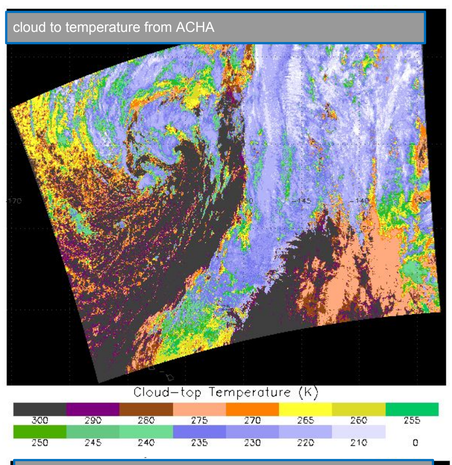


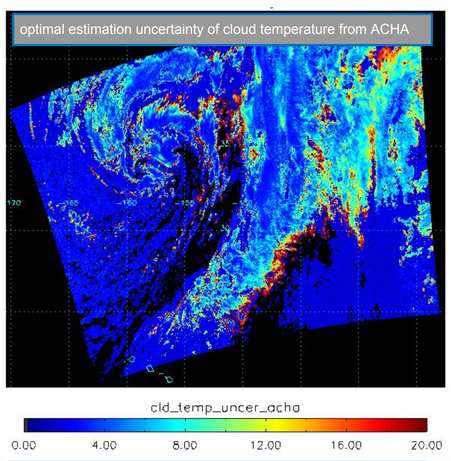


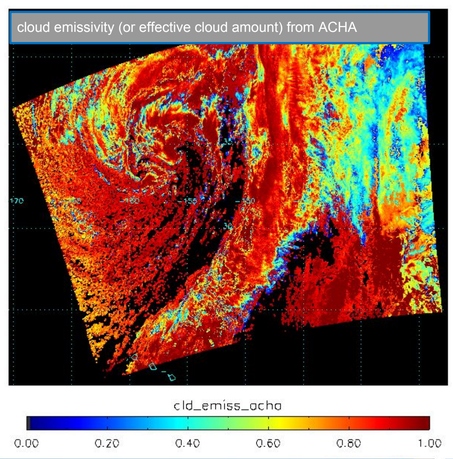


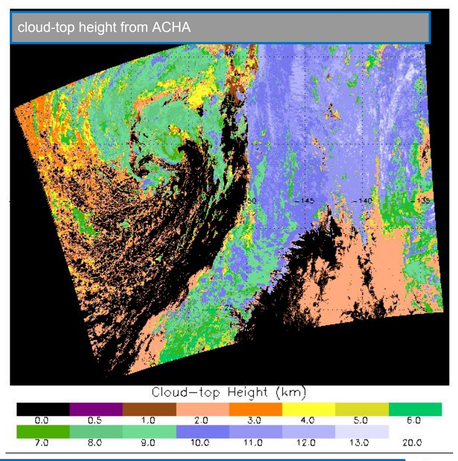
Cloud Height Products (ACHA)

- ACHA is the NOAA AWG Cloud Height Algorithm
- ACHA runs on most IR channel combinations
- ACHA generates cloud temperature, emissivity and microphysical index.
- ACHA is an Optimal Estimation (OE) approach makes uncertainty estimates.
- Pressure and height derived from temperature and NWP profiles



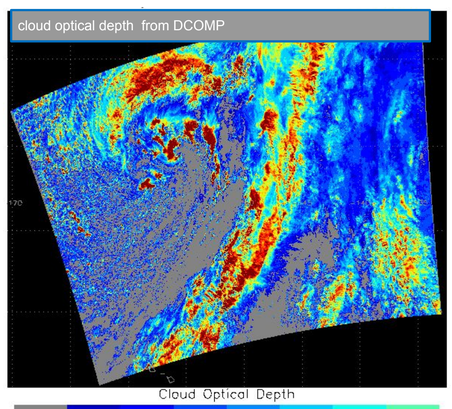


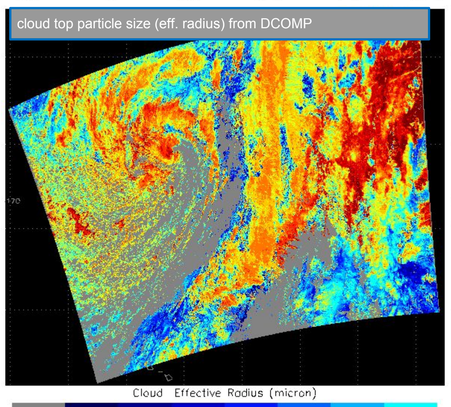


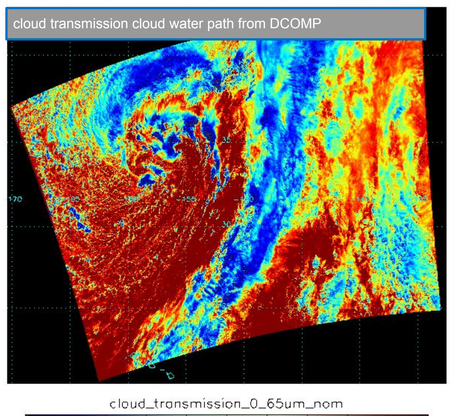


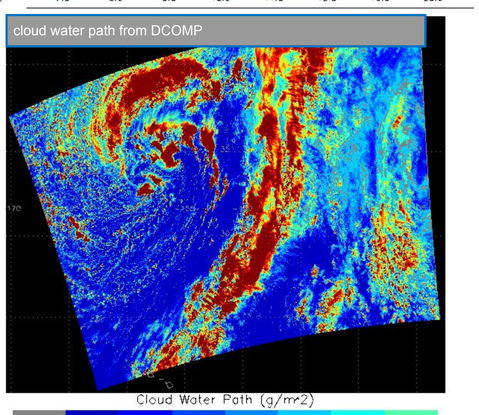
Cloud Optical Properties (DCOMP)

- Daytime Cloud Optical and Microphysical Properties (DCOMP).
- DCOMP uses solar reflectance to estimate cloud optical deph, particle size and water path.
- DCOMP is also an OE algorithm and makes uncertainties.
- DCOMP also provides other products like solar cloud transmission and albedo and precipitation estimates.
- See Andi Walther about DCOMP at Night with VIIRS using Lunar Reflectances!



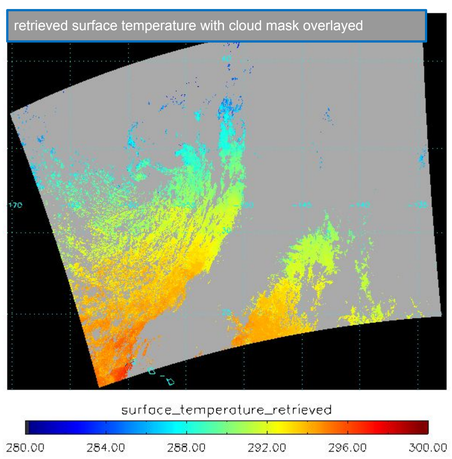


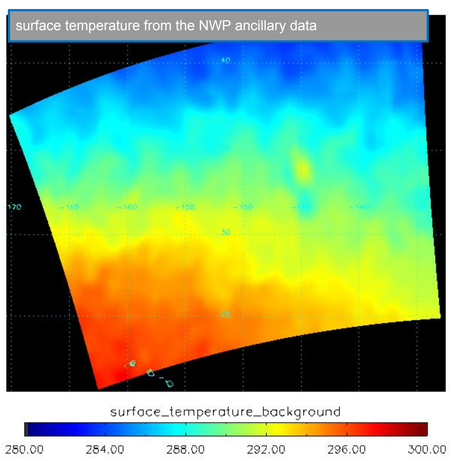


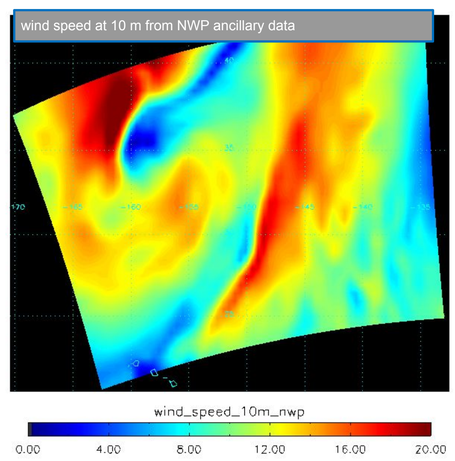


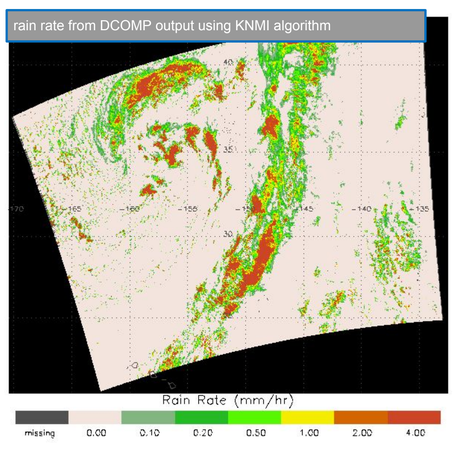
Other Products

- CLAVR-x also includes other products like surface temperature, OLR and rain rates.
- CLAVR-x includes selected products from the NWP ancillary data which are temporally and spatially interpolated to the satellite projection. These can be used to diagnose meteorological condition.
- Coupled with the Level-1 observations, the NWP ancillary data can support generation of new products from CLAVR-x.









All of these sensors are supported by CLAVR-x! Data and images are available at the CIMSS website.