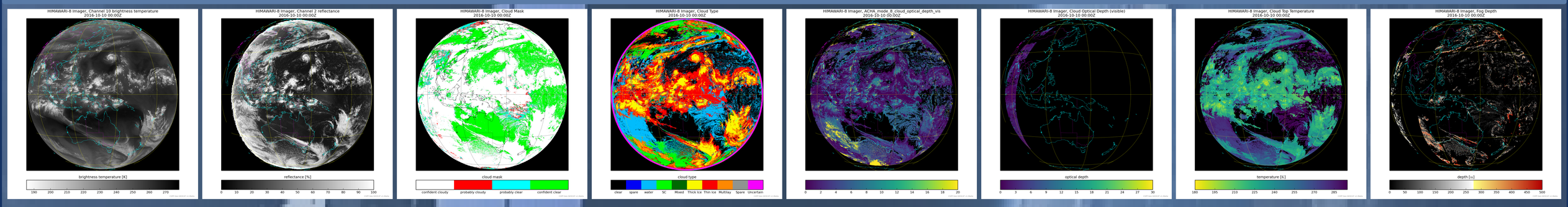
Himawari Support In The CSPP-GEO Direct Broadcast Package

Geoff Cureton

Cooperative Institute for Meteorological Satellite Studies
Space Science and Engineering Center, University of Wisconsin - Madison
1225 W. Dayton St., Madison, WI 53706, USA

Himawari-8 Full Disk Level-1/2 Products for 2016-10-10 @ 00:00Z



CSPP-GEO

- The Community Satellite Processing Package-Geostationary (CSPP-GEO) generates products from geostationary satellite data.
- Allows Direct Broadcast users to process current-generation GOES data received on their own antennas.
- Includes cloud and fog detection algorithms developed under the GOES-R Algorithm Working Group.
- Support has been extended to Japan's Himawari-8 satellite.

CSPP-GEO Geocat

- The `geocat` processing framework for creating level-1 and level-2 products are wrapped in python scripting (for ancillary retrieval and multiprocessor support) to make the CSPP-GEO Geocat package.
- Ancillary data such as GFS, and high resolution RAP files for mesoscale processing, are automatically retrieved and transcoded into a `geocat` readable format.
- Generation of navigated (see above) and unnavigated quicklooks.

Website: `http://cimss.ssec.wisc.edu/csppgeo`

What's to Come?

- Expand the list of supported products, including derived winds, aerosols etc. . . .
- Improved navigation and subsetting capability.
- Improved quicklook image generation.
- Introduction of JSON configuration files for CSPP-GEO, to preserve useful user defaults.
- Look out for the CSPP-GEO Geocat v1.0 release, coming this Winter!.

Direct Broadcast

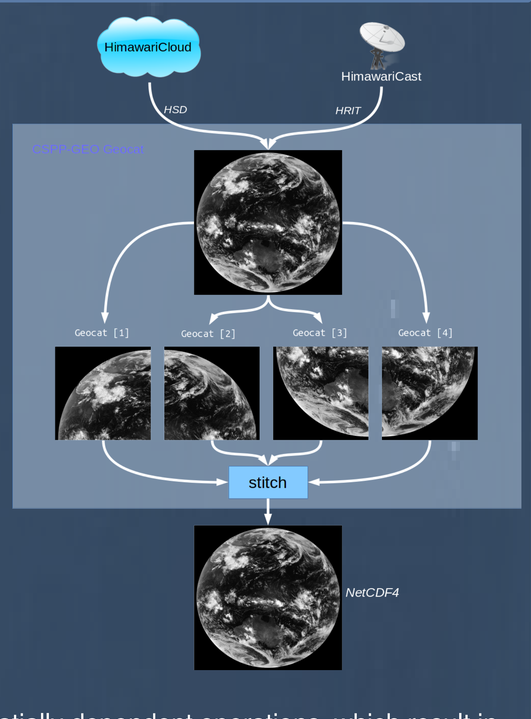
- The CSPP-GEO package will allow users with an antenna to access data directly through the direct broadcast stream, rather than over the internet, and process through to level-1 and level-2 data products.
- Direct Broadcast may be attractive to users with limited internet access or restricted bandwidth. This will soon become more relevent as the GOES-R and Himawari imagers have significantly more channels than current GOES imagers.
- The CSPP-GEO package is likely to contain newer versions of the operational product algorithms that include recent science improvements.

GEOCAT

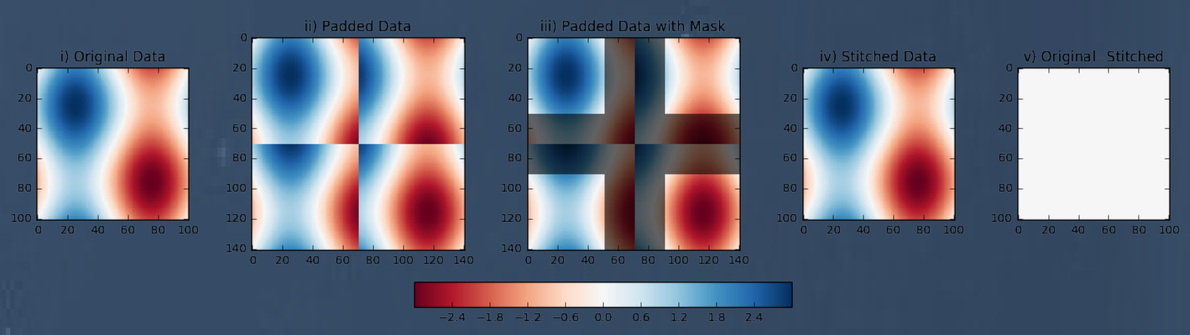
- The Geostationary Cloud Algorithm Testbed (Geocat) was developed by the GOES-R Algorithm Working Group (AWG) Cloud Application Team to serve as a cloud retrieval algorithm development testbed.
- Geocat provides a convenient interface to measured radiances, ancillary data (NWP profiles, surface emissivity, surface type, snow, etc.), fast model generated clear sky radiance profiles, and measured and/or generated data from previous image time steps.
- Geocat currently outputs level-1, level-2 and RTM data in HDF4 and NetCDF4 format.

HIMAWARI Image Segmentation

- In contrast to current GOES, Himawari-8 will generate a significantly greater amount of data, with 16 channels and an equatorial resolution approaching 2km.
- CSPP-GEO Geocat needs to be able to process a full-disk of Himawari-8 HSD in less than 10 minutes, the full-disk duty cycle.
- To handle the input data rate, we split the input HSD data into multiple segments, and run `geocat` on each segment as a separate process, generating output NetCDF4 level-1 and level-2 files for each one.
- These segments are then stitched back together to make the final output files (see right).

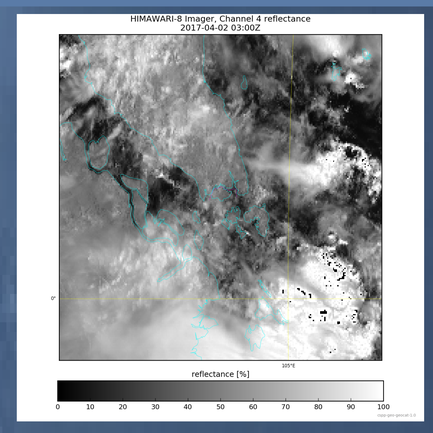


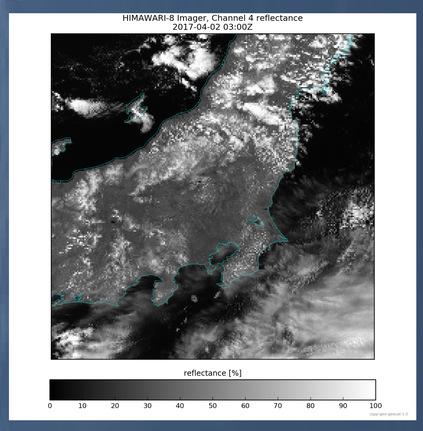
- Various level-2 algorithms used for Himawari have spatially dependent operations, which result in lower quality retrievals at the image edges.
- The image edges coincide with the limb of the full disk, so this is not an issue. But if images are segmented as above, there will be artifacts on the interior of the full disk image, which we would like to avoid.
- To remove the edge artifacts, we pad the segmentation boundaries such that the the extent of the padding exceeds the extent of the edge artifacts. After geocat hsd processed each of the segments we remove the padded regions and stitch the segments back together (see below).

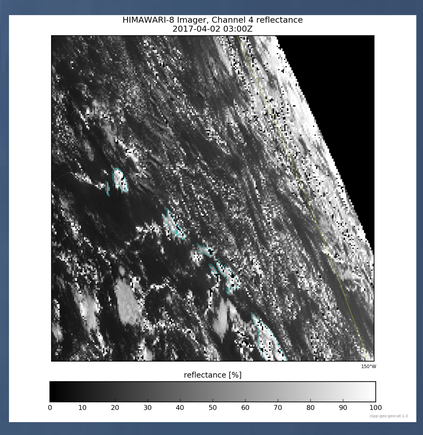


HIMAWARI Image Subsetting

- There are likely users which will only interested in the portion of the full disk which covers their geographical location.
- In such situations, rather than having to process the full disk, `geocat` allows the user to select a region of the full disk to process.
- The desired processing region may be selected with a lon/lat centerpoint and a radius (in degrees), or by giving the corners of a bounding box in image coordinates.
- Shown in the images at left are subsets of the Himawari full disk processed by `geocat` over (from top to bottom) Singapore, Tokyo, and Oahu.
- The further away the centerpoint of the desired region is from the subsatellite point, the less accurate the positioning of the bounding box, which will be investigated for later releases.
- In addition to processing subsets of the full disk with geocat, the quicklook scripts included in CSPP-GEO Geocat (which were used to create the plots at right) can also plot subsets of a full disk image, using the same lon/lat-radius and bounding-box region selection methods as `geocat`.







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`geoff.cureton@ssec.wisc.edu`

(Background image:
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