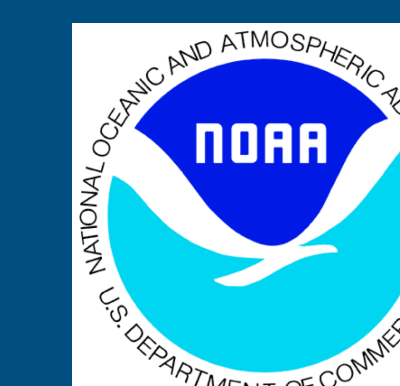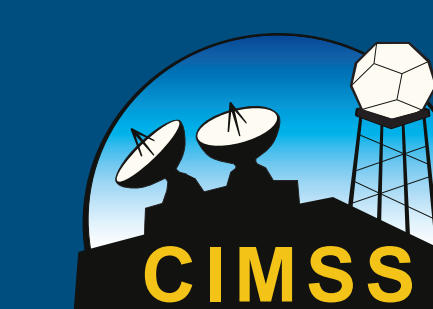# Community Satellite Processing Package for Geostationary Data (CSPP Geo) Level 2 Products and Image Generation

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## CSPP Geo Software for Direct Broadcast

The CSPP Geo project is funded by the NOAA GOES-R program to create software allowing users to process data received directly from geostationary satellites.

The GOES-15, GOES-16, GOES-17 and Himawari-8 satellites are currently supported.

This poster is focused on Level 2 product and image generation capabilities. Software is also available to process raw data feeds and tile and convert data.

All software is:

- ☑ Publicly available free of charge
- ☑ Distributed as binary packages for 64-bit CentOS6-compatible Linux
- ☑ Distributed with all required 3rd party software bundled
- ☑ Easy to install and run
- ☑ Released with an optional test data package

Software downloads: http://cimss.ssec.wisc.edu/csppgeo/
User support: csppgeo.issues@ssec.wisc.edu
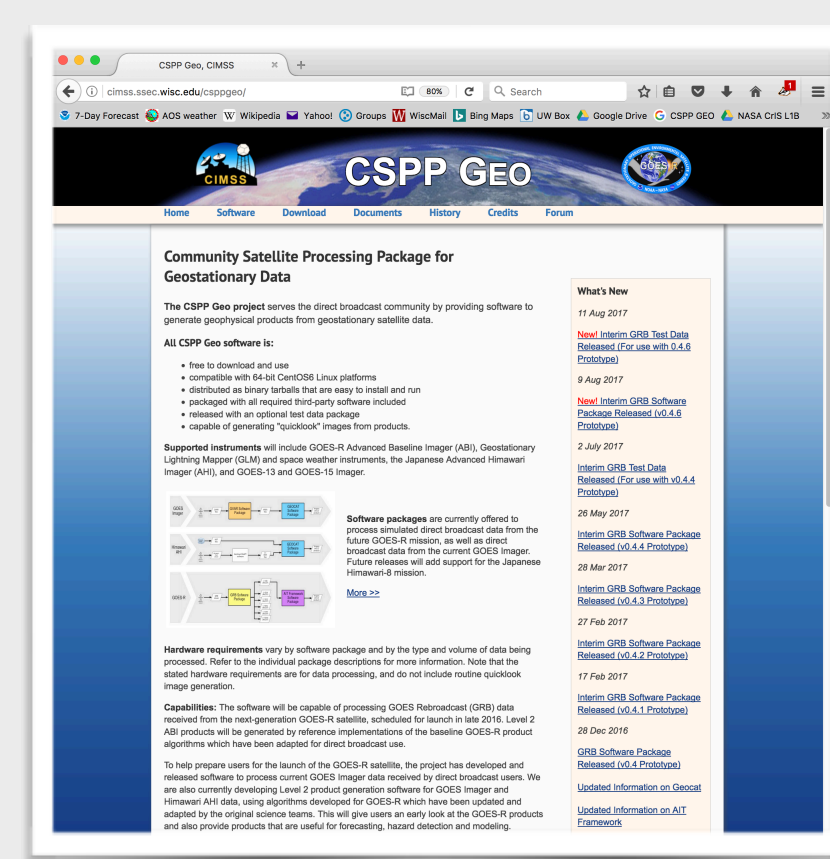
## AIT Framework Package for GOES-16 ABI Level 2 Products

The AIT Framework software allows generation of Level 2 geophysical products from GOES-16 Level 1B data, as received via GRB at a direct broadcast site. The output format is NetCDF-4.

The core processing software was developed by NOAA STAR. Products are generated by research versions of the operational algorithms that were developed by the GOES-R science teams.

AITF Version 1.0 was released in August 2019, and includes the products shown in the table on the right.

Changes planned in the next year include:
- Added products:
  - ➡ Winds
  - ➡ Rainfall Rate
  - ➡ Cloud Cover Layers.
- Migration to enterprise product algorithms, representing the first major science upgrade since the launch of GOES-16
- Support for GOES-17, as thermal anomaly mitigated algorithms become available via NOAA STAR

*Quicklook images of AIT Framework Level 2 products (ABI CONUS)*



*Products supported by CSPP Geo AIT Framework v1.0*
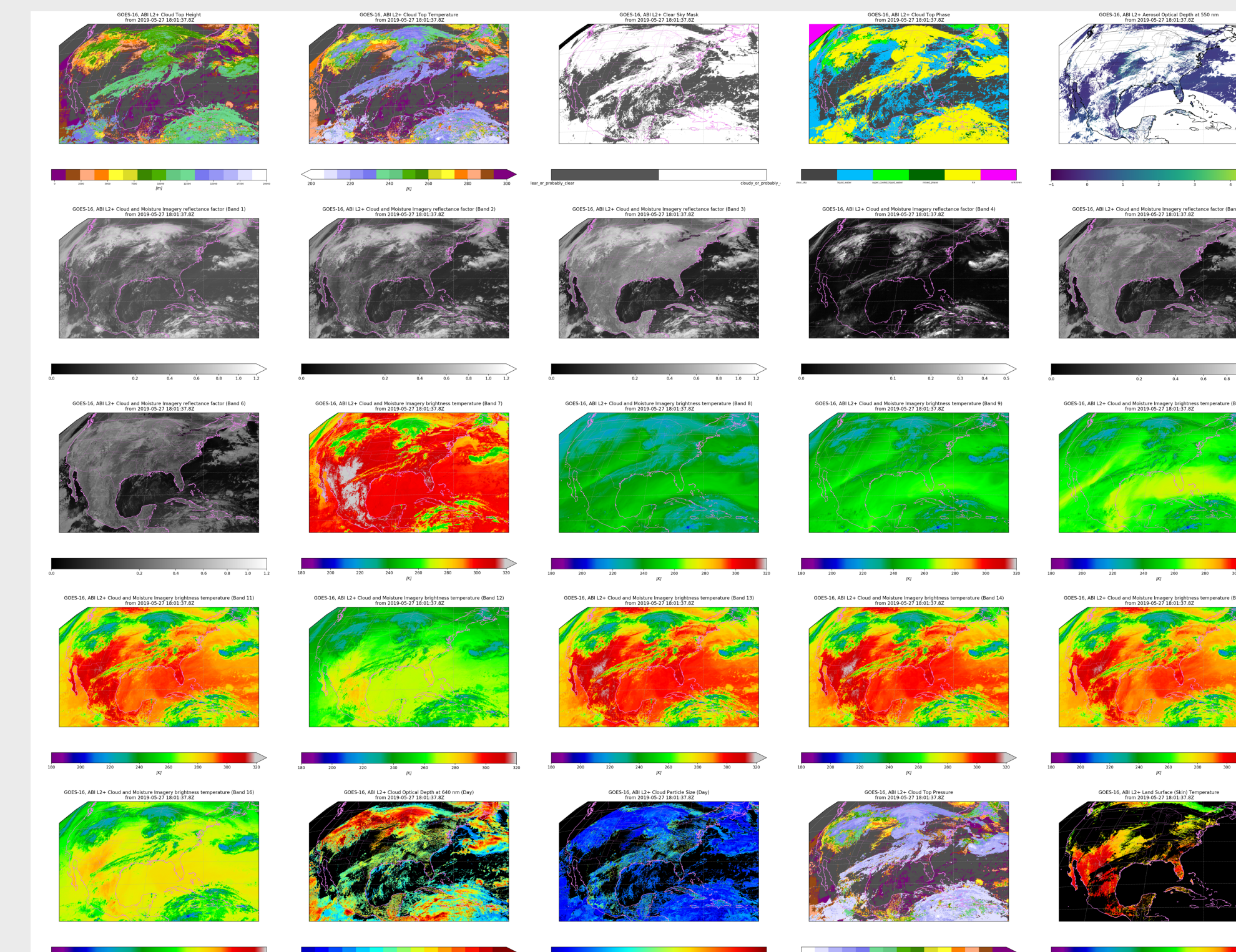
| Products supported by CSPP Geo AIT Framework v1.0 |
| --- |
| Aerosol Detection: Smoke and Dust |
| Aerosol Optical Depth |
| Clear Sky Masks |
| Cloud and Moisture Imagery |
| Cloud Optical Depth (day/night) |
| Cloud Particle Size Distribution (day/night) |
| Cloud Top Height |
| Cloud Top Phase |
| Cloud Top Pressure |
| Cloud Top Temperature |
| Land Surface Temperature (Skin) |

## Geo2Grid Package for High Quality Image Generation

The Geo2Grid software allows users to generate high quality images in geoTIFF format, to create animations and to remap data to predefined or user-defined projections.

Supported instruments are GOES-16 and GOES-17 ABI, and Himawari AHI. Support for GK2A AMI is currently being added.

True color and "composite" RGBs can be generated, as well as single-band images.

True color images include the following enhancements
- Rayleigh atmospheric correction
- Artificial green band (GOES-16 and -17)
- Sharpening to 500m
- Solar zenith angle correction
- Enhancement (logarithmic stretching to bands)

*Single band and RGB images generated with Geo2Grid (ABI CONUS)*



*Images supported by CSPP Geo Geo2Grid v1.0*

| Images supported by CSPP Geo Geo2Grid v1.0 |
| --- |
| Single-Band Brightness Temp. or Reflectance |
| True Color |
| Natural Color |
| Airmass (ABI-only) |
| Ash (ABI-only) |
| Dust (ABI-only) |
| Fog (ABI-only) |
| Night Microphysics (ABI-only) |
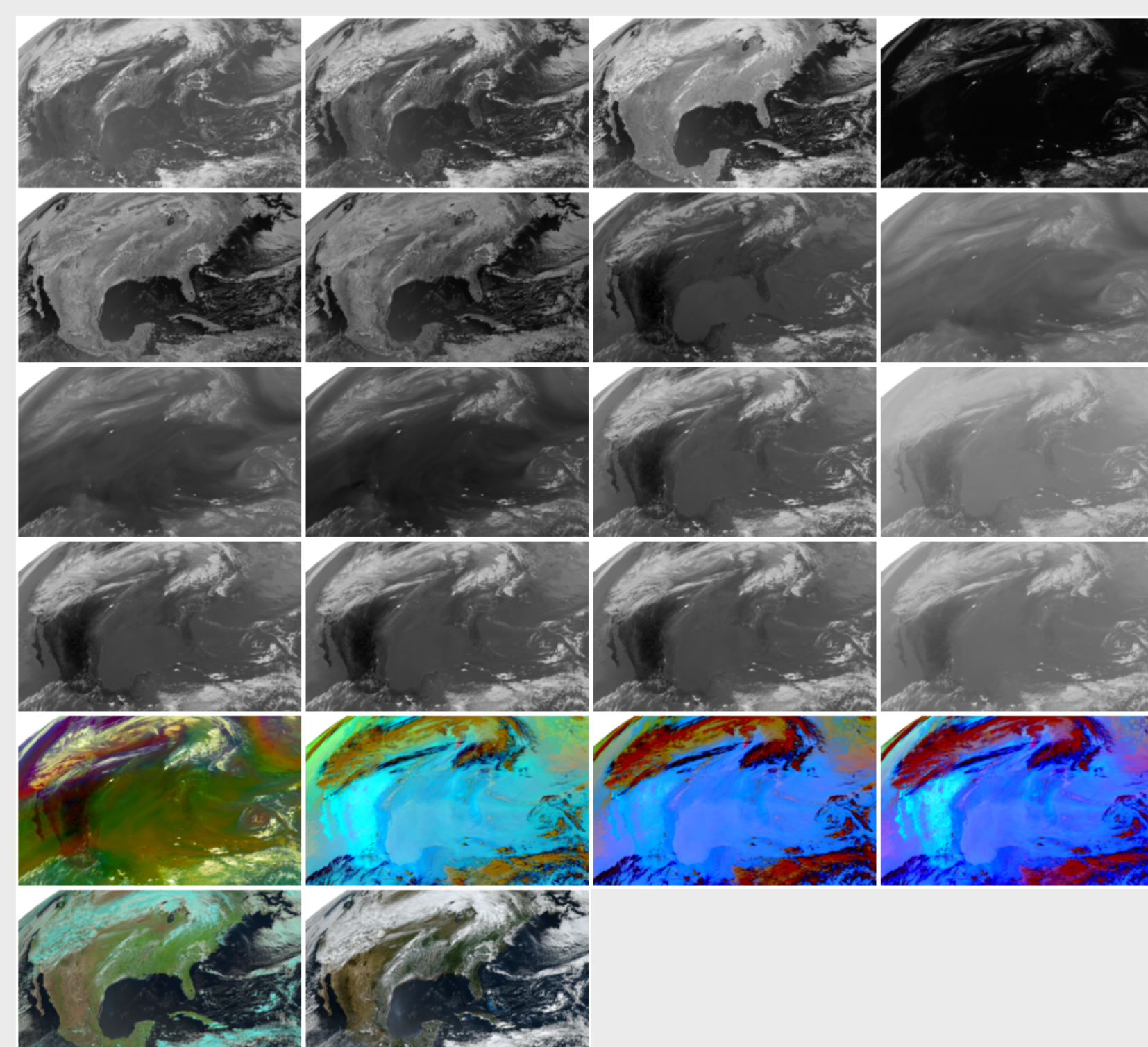
## GEOCAT Package for Himawari-8 AHI Level 2 Products

The GEOCAT software allow generation of Level 2 products from Himawari-8 AHI data, as well as data from the legacy GOES-15 Imager. The output format is NetCDF-4.

The core GEOCAT software was developed by NOAA scientist Mike Pavolonis and was adopted by many of the GOES-R science teams for product development. Products are generated by experimental research versions of algorithms that were developed by the science teams.

GEOCAT is currently at beta status. The products shown in the table at the right are supported by the current beta (v1.0.3b). To obtain the beta, contact the CSPP Geo team (csppgeo.issues@ssec.wisc.edu).

*Quicklook images of GEOCAT imagery and Level 2 products (AHI Full Disk)*



*Initial set of GEOCAT products*
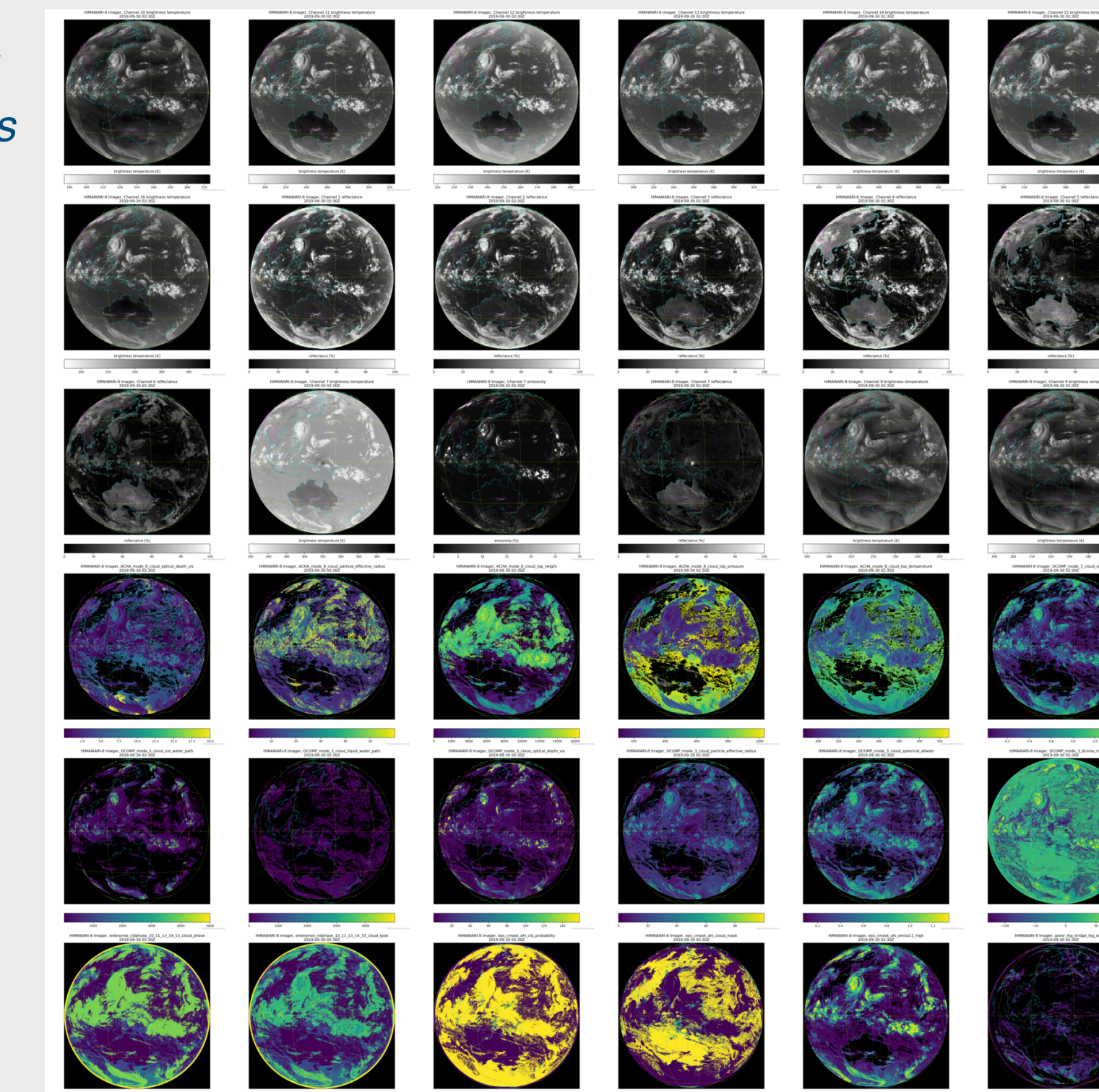
| Initial set of GEOCAT products |
| --- |
| Clear Sky Masks |
| Cloud and Moisture Imagery |
| Cloud Optical Depth |
| Cloud Particle Size Distribution |
| Cloud Top Height |
| Cloud Top Phase |
| Cloud Top Pressure |
| Cloud Top Temperature |
| Low Cloud and Fog (GOES-15 only) |

## Views from four ABI-class imagers in Geo orbit, 2019 Sept 30
### True color images created with Geo2Grid
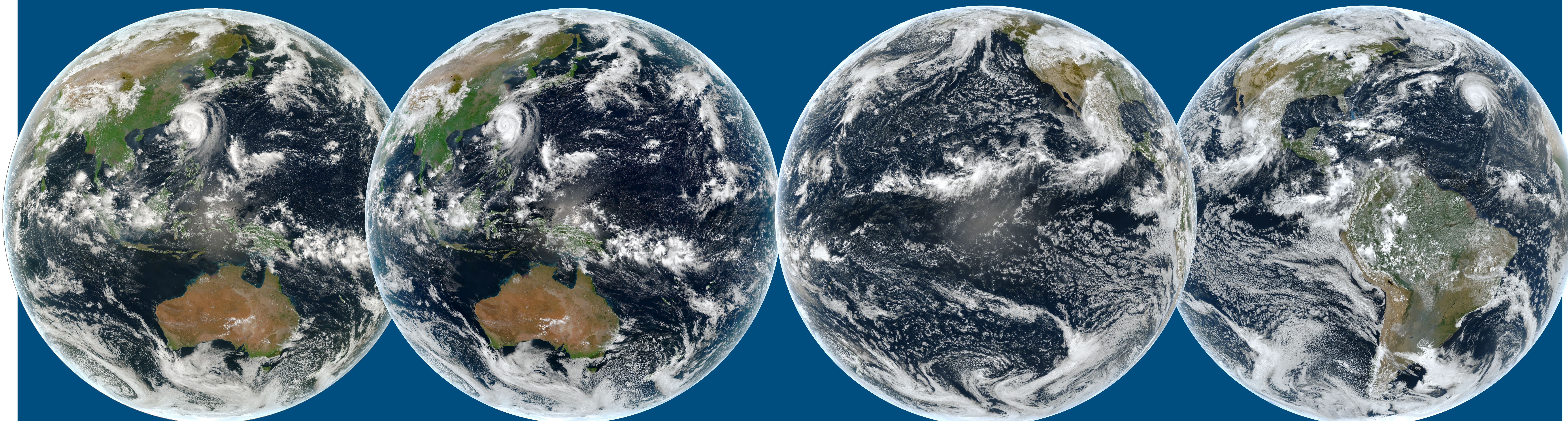


**GEO-KOMPSAT-2A AMI (Korea)**
**experimental capability**
**0300z**

**Himawari-8 AHI (Japan)**
**0230z**

**GOES-17 ABI (United States)**
**2040z**

**GOES-16 ABI (United States)**
**1650z**