



Visualizing Himawari and GOES-R imagery with SIFT

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WISCONSIN
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Typical Software Complaints

- Complex user interface
- Simple tasks are not intuitive to complete
- Difficult to find/create the right data format(s)
- Cannot use the same software for different satellites or data sets
- Cost
- Poor performance
- Cannot easily export images or animations for presentations or papers
- International colleagues use different software
- Not for all major operating systems

Satellite Information Familiarization Tool

*An easy graphical user interface
for meteorological satellite users*



Pan/Zoom

Point

Region

Projection:

Himawari Geos

N/A (

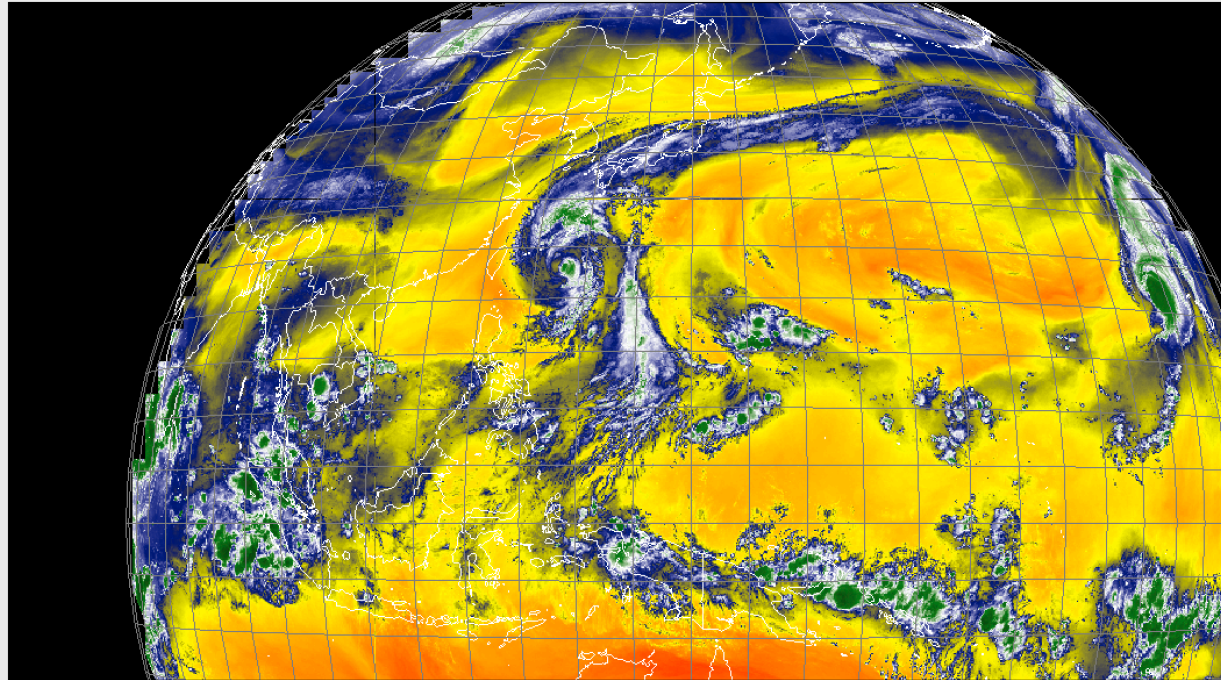
N/A

,

N/A

)

N/A



2018-10-04 00:00:19



Layers

- H8 AHI B05 Full Disk 2018-10-04 00:00:00
- H8 AHI B10 Full Disk 2018-10-04 00:00:00
- H8 AHI B13 Full Disk 2018-10-04 00:00:00

Layers

Area Probe Graphs

Layer Details

Name: H8 AHI B10 Full Disk 2018-10-04 00:00:19

Time: 2018-10-04 00:00:19

Instrument: AHI

Band: 10

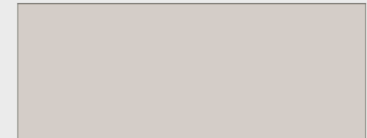
Wavelength: 7.30 μm

Colormap: WV Dry Yellow

Color Limits: -109.00 ~ 55.00°C



Composite Details



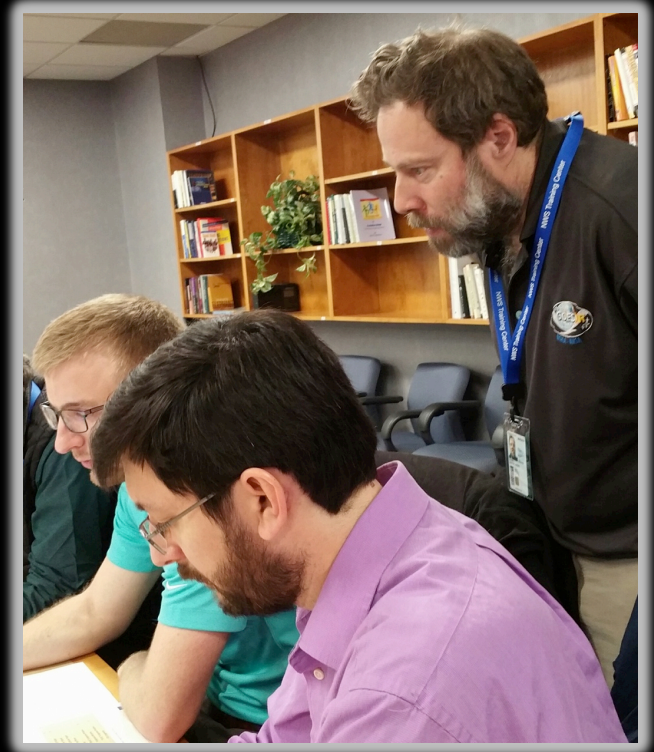
Layer Details

RGB Bounds

Timeline

About SIFT

- Open source
- Based on Python
- Originally developed for the United States National Weather Service (NWS) in 2015
- Now open to community development
- Free (GPLv3 license)



About SIFT

Current operating systems supported:

- Windows
- MacOS
- CentOS/RedHat Linux

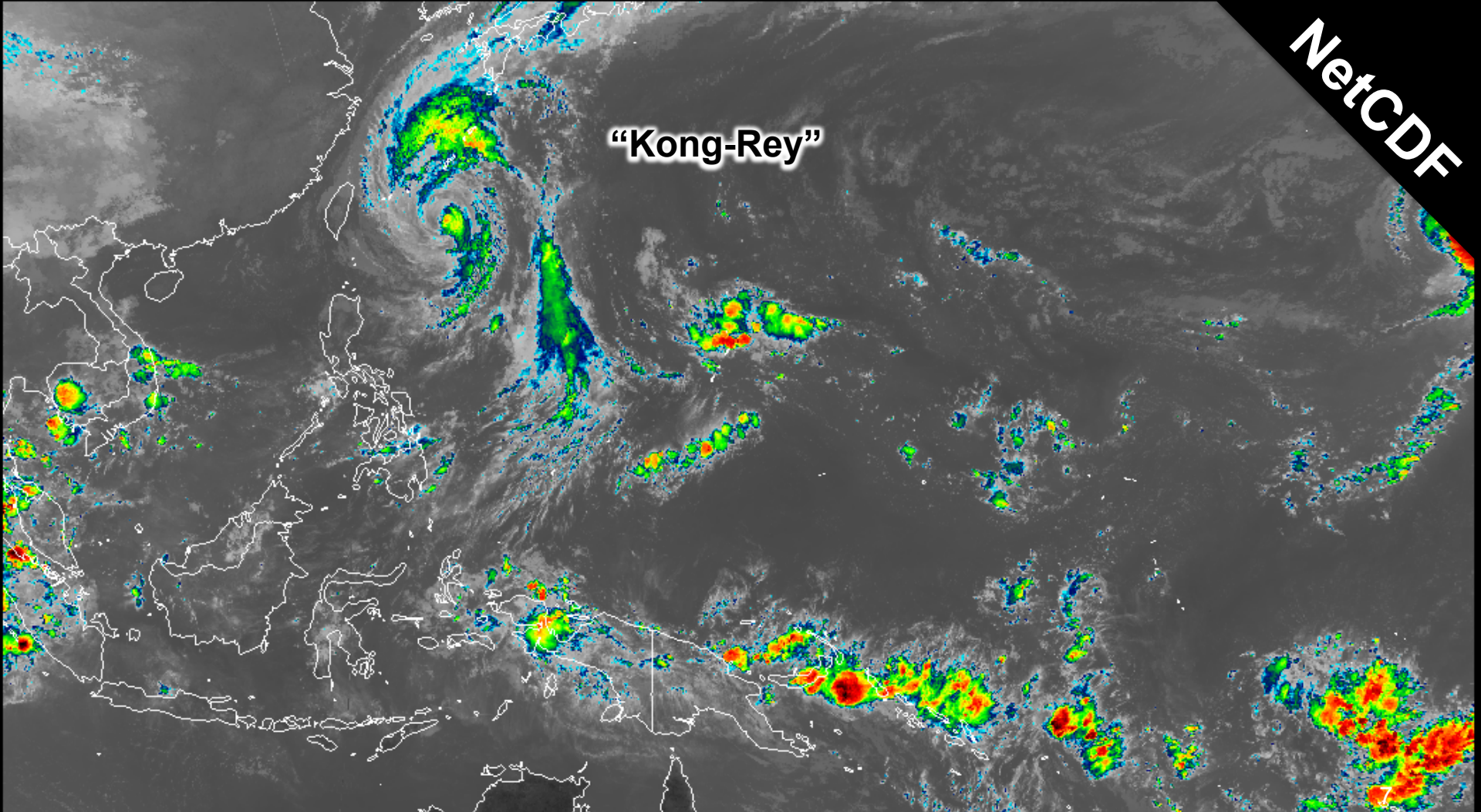
A developer version is also available.

Current data formats supported:

- GOES-16/17 ABI L1b NetCDF
- Himawari-8/9 AHI (after conversion to netCDF)
- Gridded Binary (GRIB2)

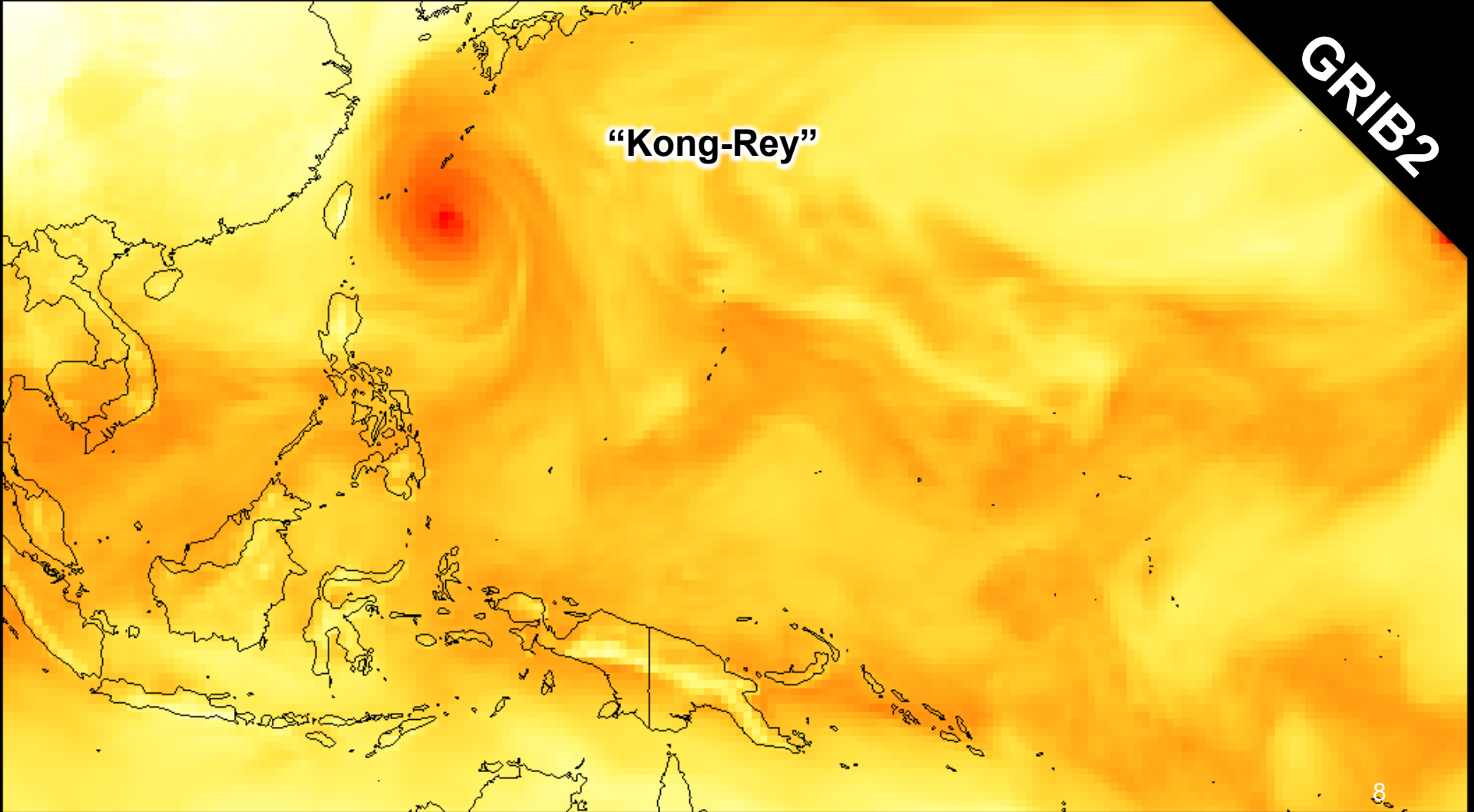
NetCDF

“Kong-Rey”



GRIB2

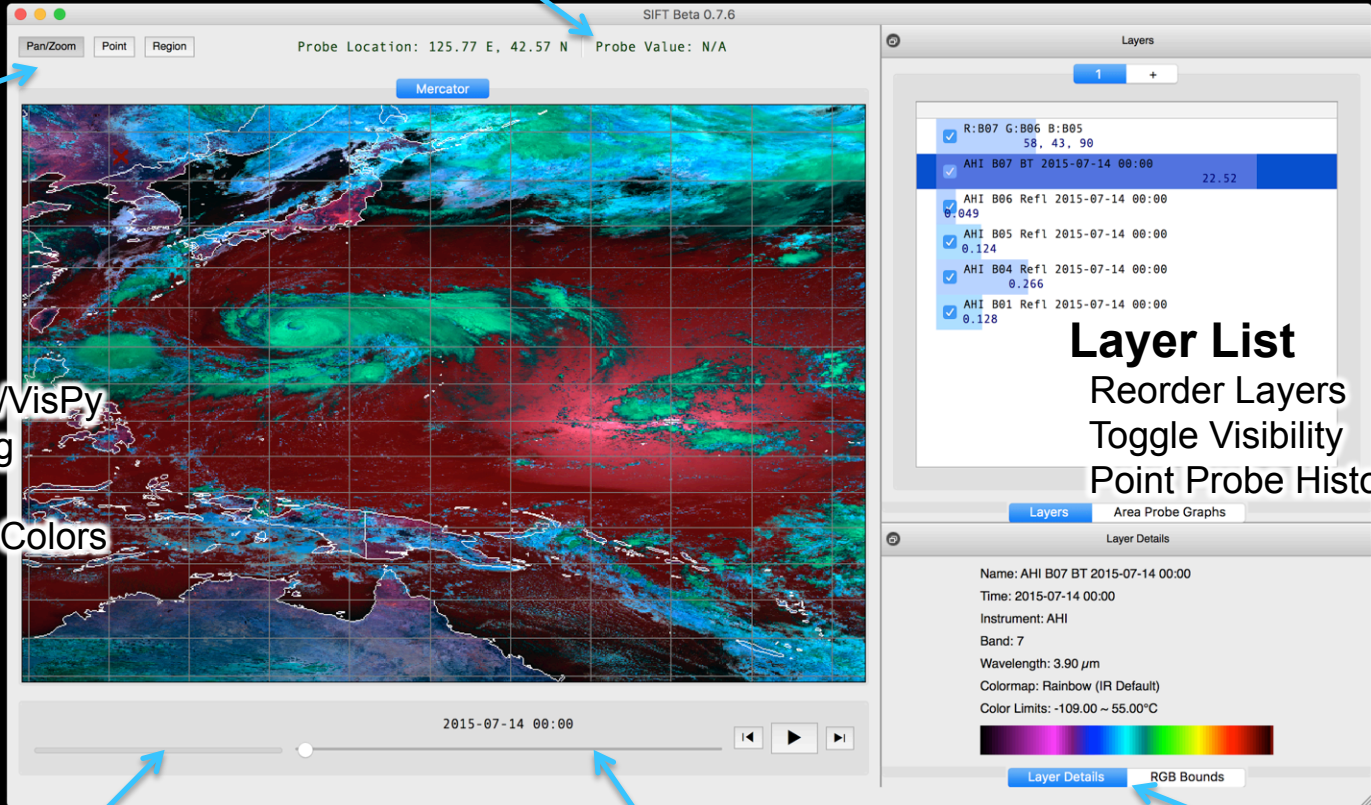
“Kong-Rey”



SIFT Features

- Loop across multiple bands or multiple times
- Create Red-Green-Blue (RGB) composites
- Calculate arithmetic composite for multiple bands
- Change or customize color enhancements
- Compare fields over a user-defined area using a density plot
- Click to probe layers at a lat-lon coordinate

Point Probe Results



Tools

- Pan/Zoom
- Point Probe
- Area Selector

Map Display

- Powered by OpenGL/VisPy
- Panning and Zooming
- Dynamic Resolution
- Configurable Outline Colors

Background Task Status

Animation Control

- Step-through or Autoplay
- Adjustable Speed Control

Layer Metadata

- Band Information
- Color Bar and Limits

Pan/Zoom

Point

Region

Projection:

Himawari Geos

N/A (

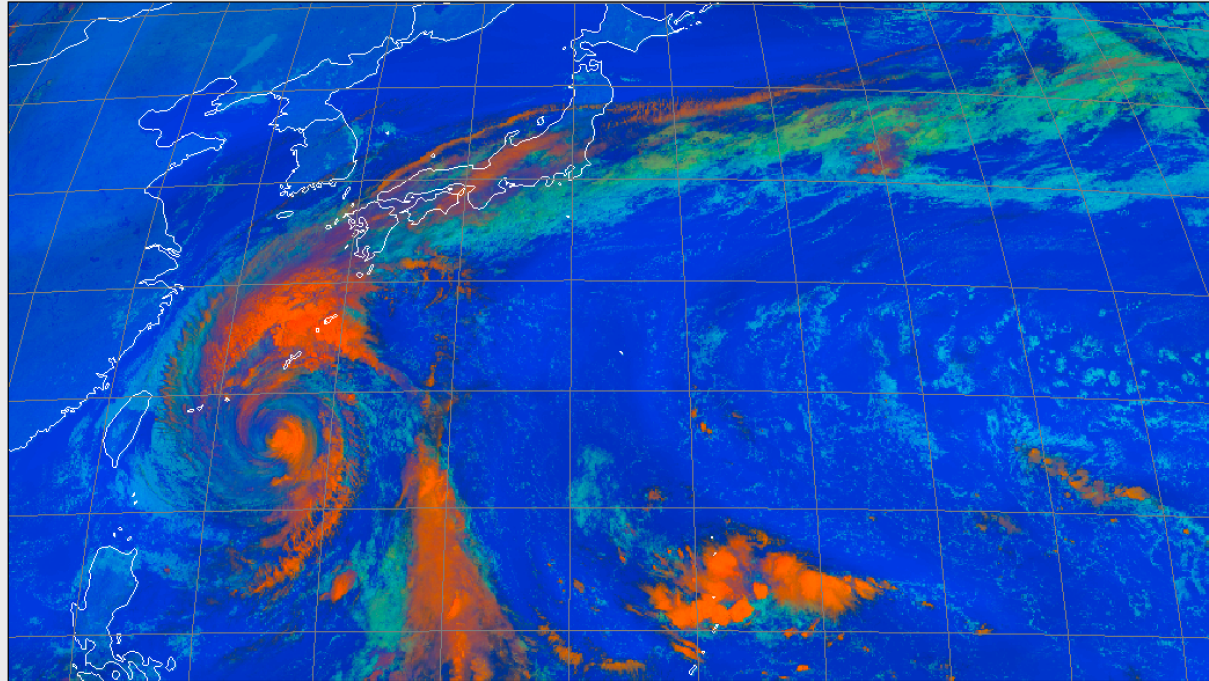
N/A

,

N/A

)

N/A



2018-10-04 00:00:20



RGB Bounds

Red

B13 10.40 μ m toa_brightness_temperature ge

10.000000

-60.000000

Gamma: 1.5

Green

B05 1.60 μ m toa_bidirectional_reflectance ge

0.000000

0.700000

Gamma: 0.7

Blue

B10 7.30 μ m toa_brightness_temperature ge

-50.000000

0.000000

Gamma: 0.7

RGB Bo...

La...

Area Probe Gr...



Layer Details

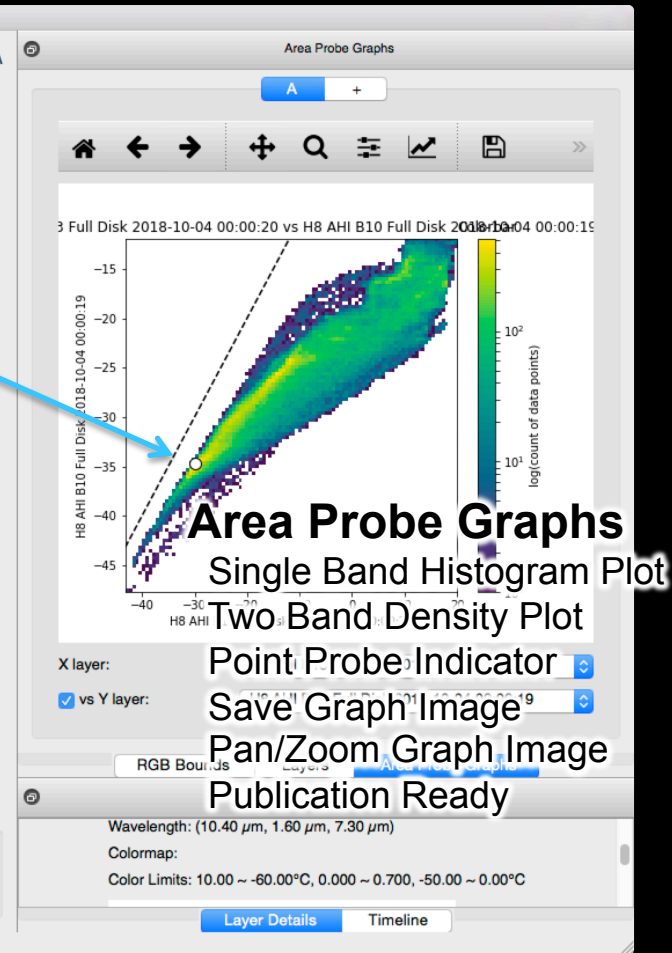
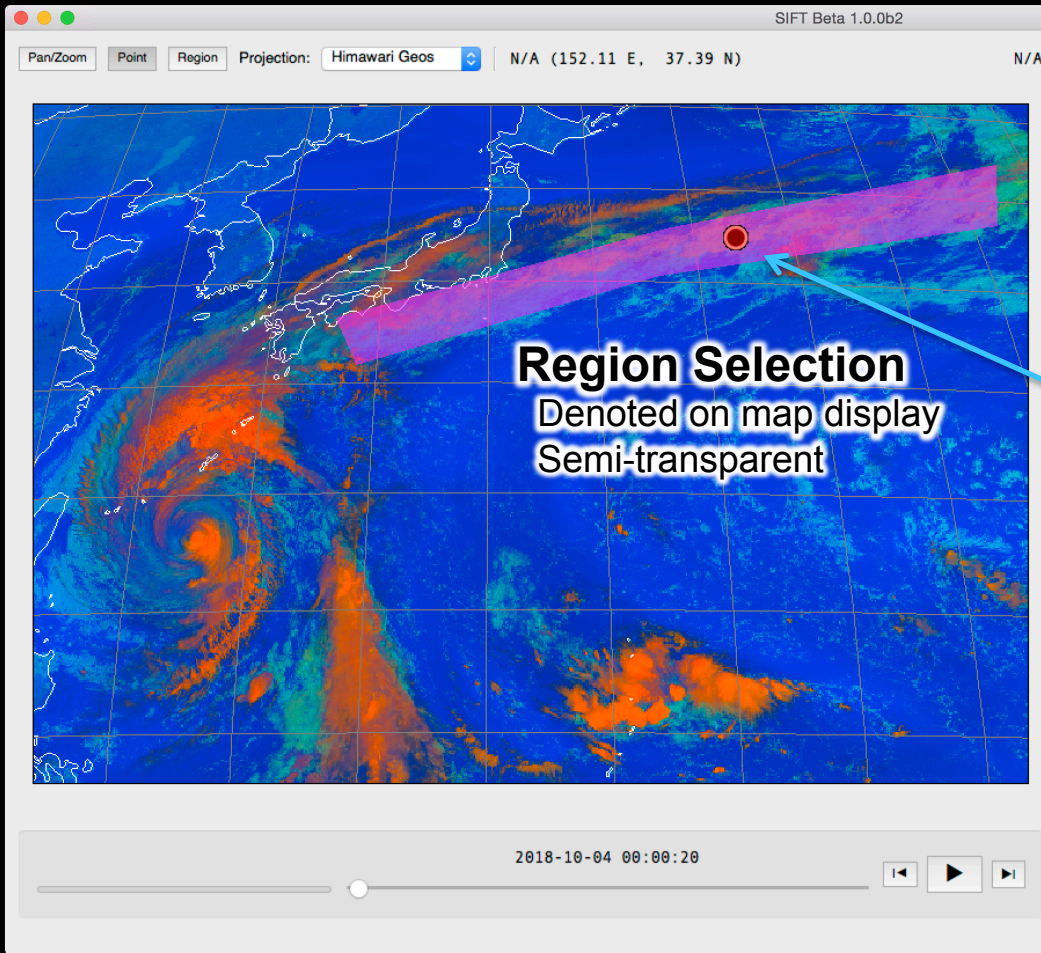
Wavelength: (10.40 μ m, 1.60 μ m, 7.30 μ m)

Colormap:

Color Limits: 10.00 ~ -60.00°C, 0.000 ~ 0.700, -50.00 ~

Layer Details

Timeline



SIFT Beta 1.0.0b2

Pan/Zoom Point Region Projection: Himawari Geos 4.716 (152.11 E, 37.39 N) B13-B10

2018-10-04 00:00:00

Layers

- Himawari-8 AHI B13-B10 2018-10-04 00:00:00
4.716
- R:B13 G:B05 B:B10 <multiple times>
146,145, 78
- H8 AHI B05 Full Disk 2018-10-04 00:00:20 0.397 1
- H8 AHI B10 Full Disk 2018-10-04 00:00:19 -34.67°C 2
- H8 AHI B13 Full Disk 2018-10-04 00:00:20 -29.95°C 3

Create Algebraic Layer

Name: B13-B10

Operation: Difference

x: B13

y: B10

z: B13

Operations

result = x - y

Cancel OK

Wavelength: ---

Colormap: New Blue

Color Limits: -80.000 ~ 80.000

Layer Details Timeline

Download SIFT

1.0.0 beta is now available

<http://sift.ssec.wisc.edu/>

**“Very quick.
Excellent
resolution.”**

**“Great training
tool overall.”**



Supported Projections

Mercator

SEVIRI FES

SEVIRI IODC

LCC (CONUS)

Himawari Geos

GOES East

GOES Test

GOES Central

GOES West

Polar (Alaska)

Help SIFT Grow

- Seeking new software developers and data providers
- Contribute ideas for new features or capabilities
 - Desire to support all international geostationary weather satellites with accessible data
- Expand our user and support base
 - Establish a community to test future builds

NOAA Satellite Training Site

NOAA Satellite Training and Operations Resources (STOR)

Home Operational Aids Quick Training AWIPS Items Archived Data

Prep Course Reference Current Mesosector Locations

QUICK GUIDE APPLICATIONS MATRIX

(Note: To see full matrix on screen, reduce screen to 80 %)

Single Band Application Quick Guides

Band #	Central Wavelength	Nickname	Burn Scars	Cirrus and Contrails	Cloud Heights	Cloud Phase	Clouds over Ice	Clouds over Land	Clouds over Water	Convection - MCS Decay	Convection - New Cells	Dust	Extratropical Cyclone	Fires	Flooding	Fog	Ice Cover	Solar Radiation	Smoke	Snow	Tropical Cyclone	Tropopause	Turbulence	Vertical Velocity
1	0.47 μm	Blue Visible Band														X			X					
2	0.64 μm	Red Visible Band					X				X	X				X								
3	0.86 μm	Veggie Band	X					X			X					X								
4	1.37 μm	Clouds Band																						
5	1.64 μm	Clouds Band																						
6	2.24 μm	Cloud Particle Size Band				X	X								X									
7	3.90 μm	Shortwave													X									

Satellites:

- Geostationary (GOES-R)
- Polar (JPSS)

Formats:

- Quick Guides
- Quick Briefs
- Job Aids

<https://vlab.ncep.noaa.gov/web/stor>

Terima Kasih

Download SIFT: <http://sift.ssec.wisc.edu/>

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