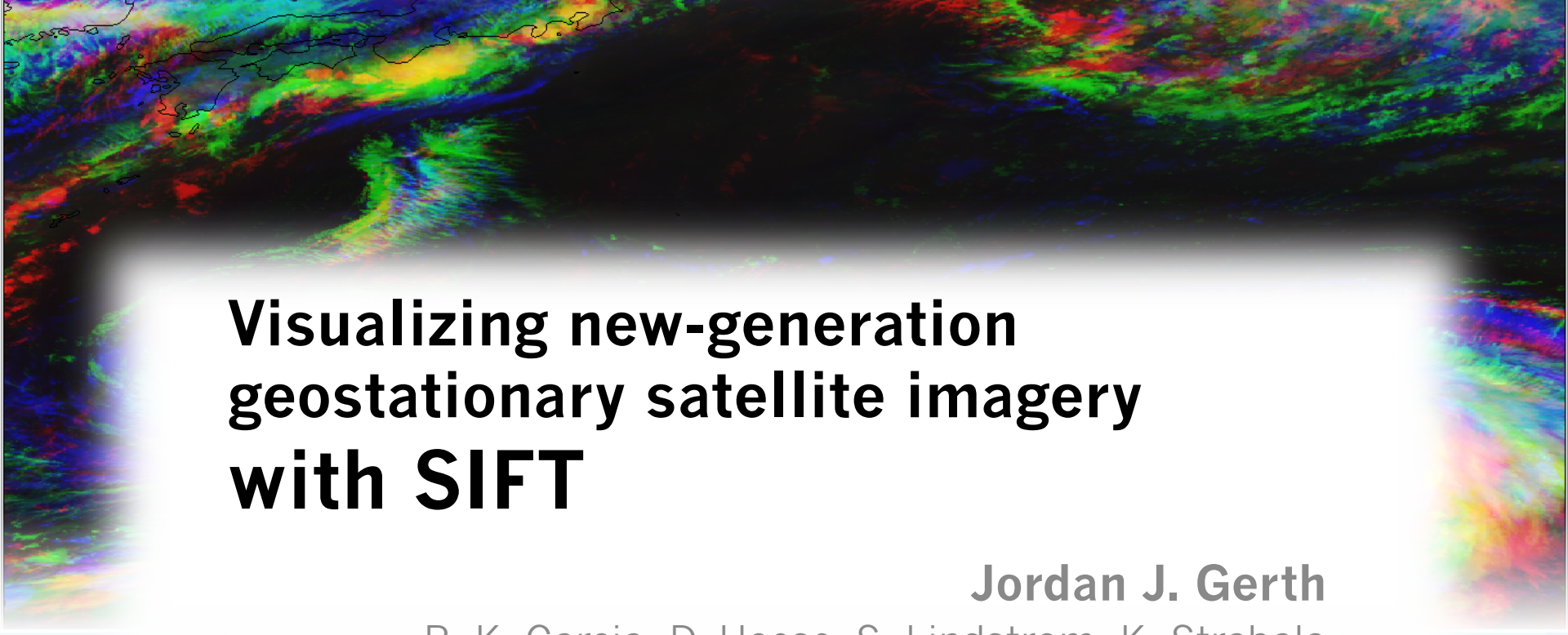

Visualizing new-generation geostationary satellite imagery with SIFT

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American Meteorological Society Annual Meeting ◆ 4.3 ◆ 23 January 2017

The Satellite Information Familiarization Tool (SIFT)

- Developed in Python using the PyQt Toolkit
- Cross-platform (Windows, Mac, and Linux) graphical user interface (no command line)
- Loads GeoTIFFs of archived Himawari-8 imagery stored locally (SSD recommended)
- Available to download for free (GPLv3 license)
- Development of the software and expansion of the capabilities is ongoing

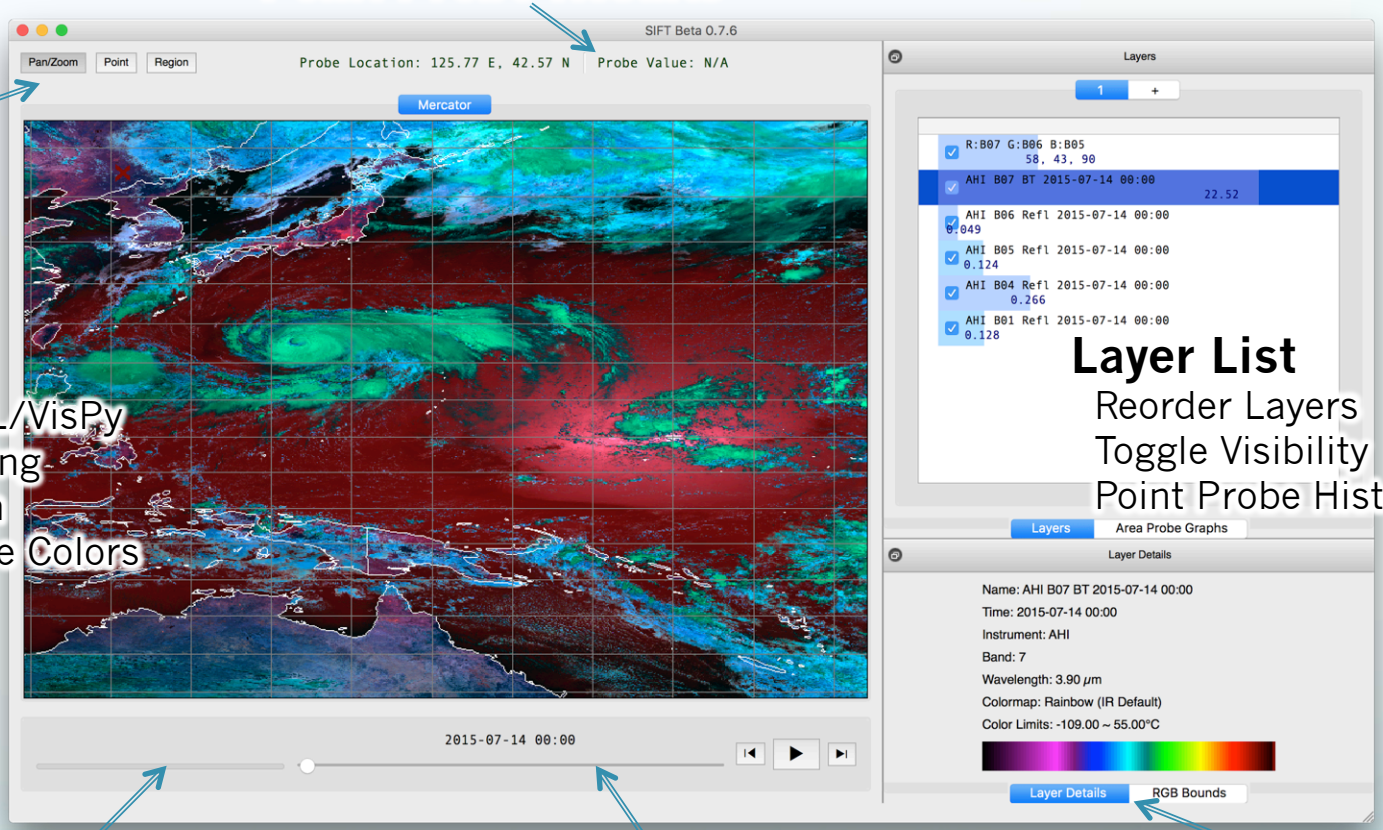
Motivation for SIFT

- Basic, modern, and standalone software to display, loop, and allow for the manipulation of new-generation geostationary satellite imagery was not available.
- The intended users are scientists, students, and operational meteorologists.
- It is a tool for both training and discovery.
- SIFT is part of the United States National Weather Service operational meteorologist training program.

SIFT Features and Functions

Point Probe Results

Tools
- Pan/Zoom
- Point Probe
- Area Selector



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

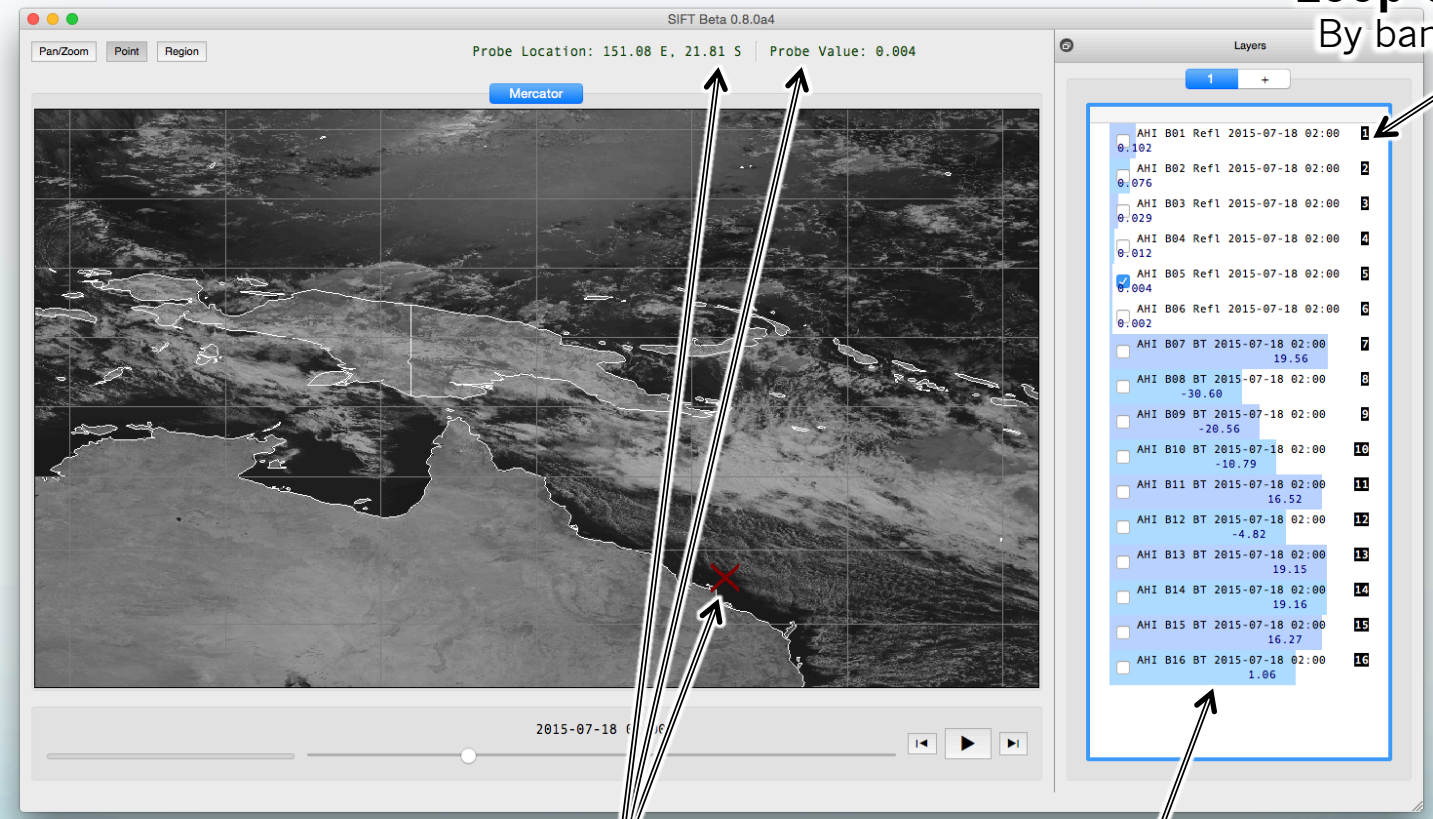
Layer List
- Reorder Layers
- Toggle Visibility
- Point Probe Histogram

Background Task Status

Animation Control
- Step-through or Autoplay
- Adjustable Speed Control

Layer Metadata
- Band Information
- Color Bar and Limits

SIFT Point Probe Feature

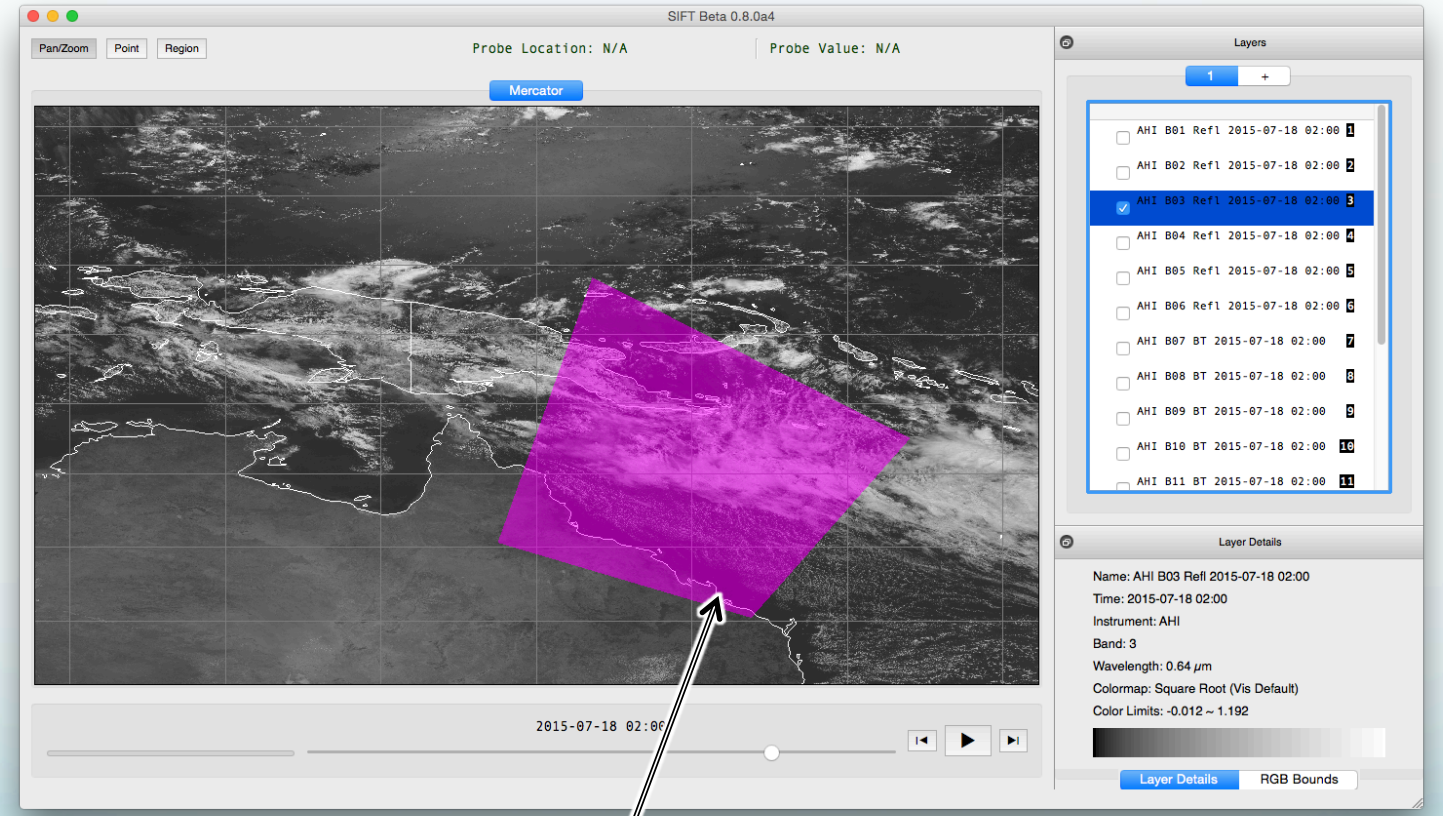


Loop Order
By band or by time

Point Probe
Denoted on map display
Coordinates and value shown

Layer List
Probe value shown for all other loaded layers

SIFT Region Selection Feature

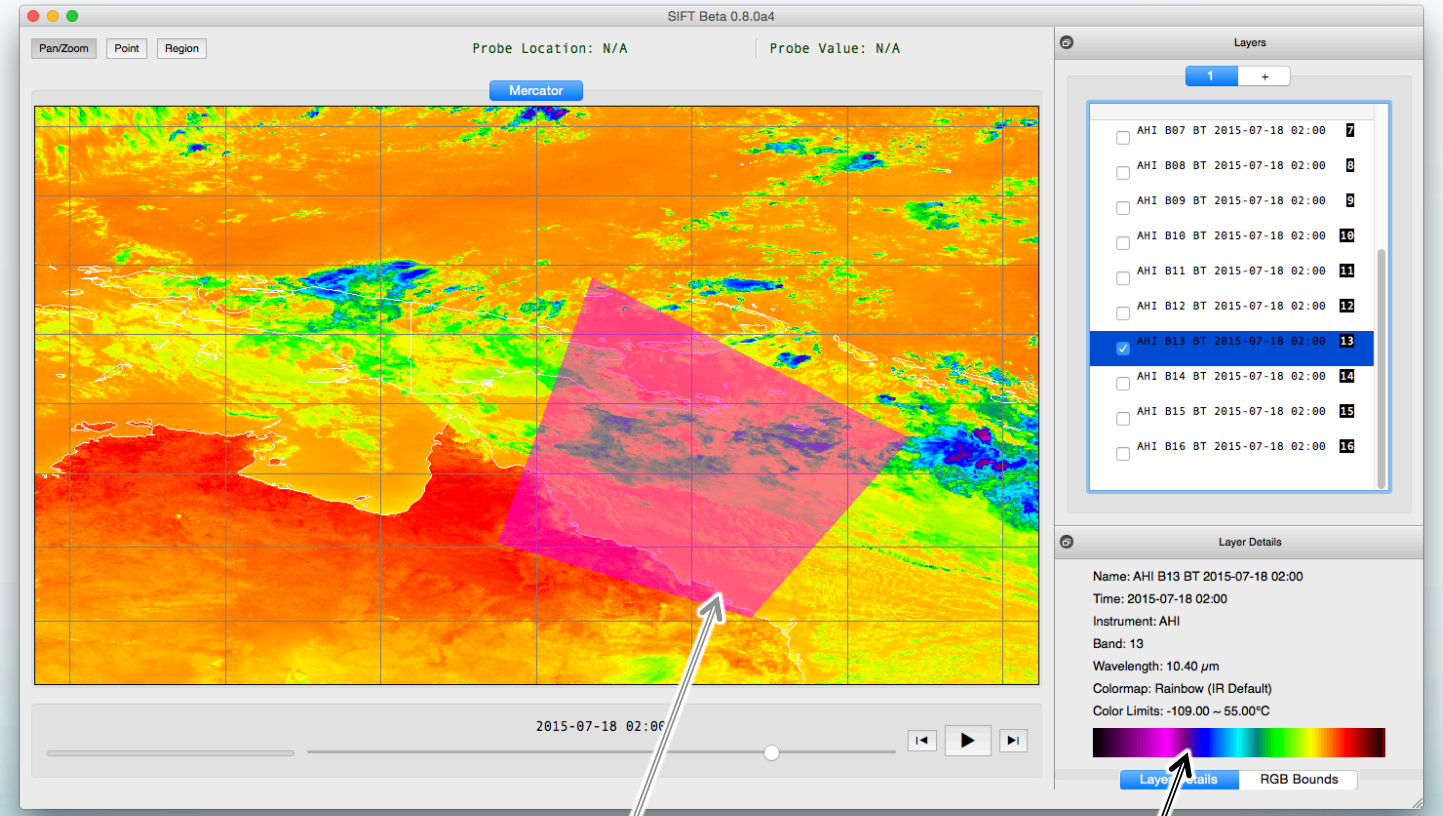


Region Selection

Denoted on map display

Semi-transparent

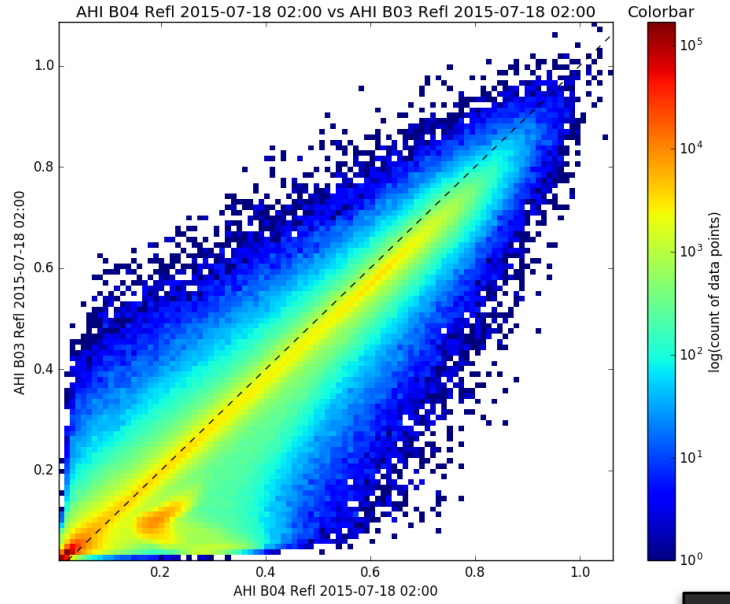
SIFT Region Selection Feature

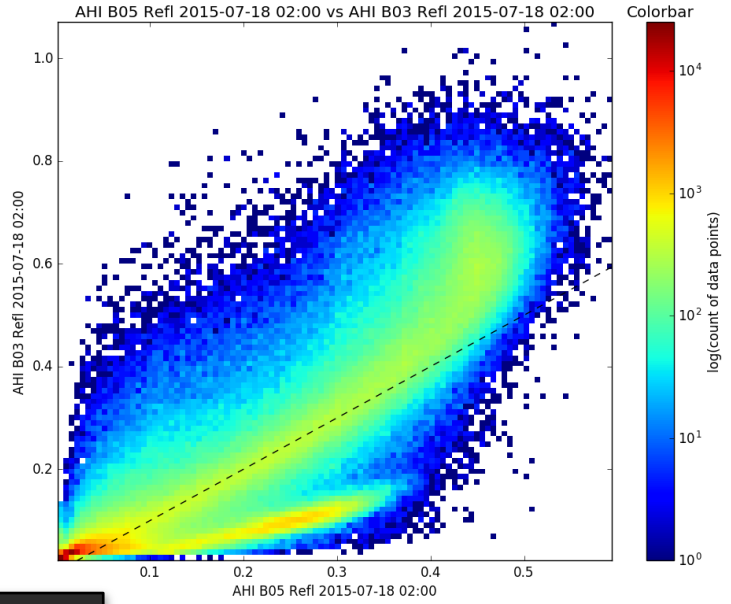


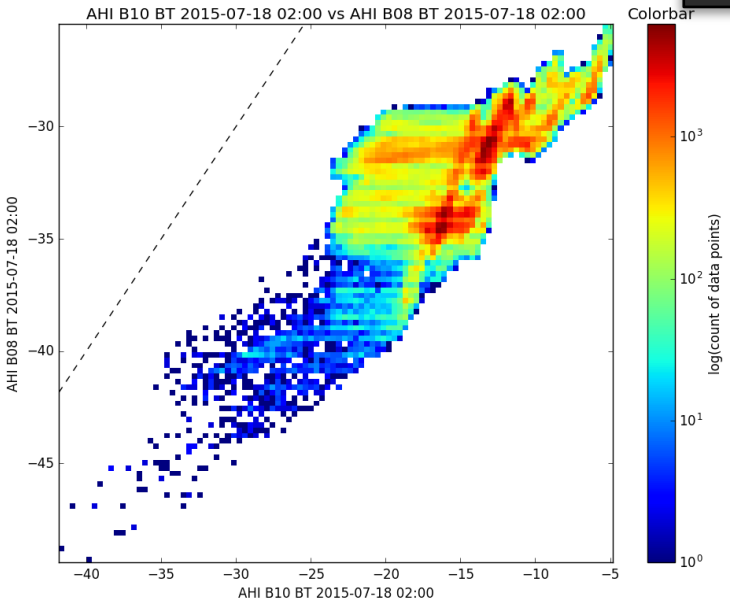
Region Selection
Denoted on map display
Semi-transparent

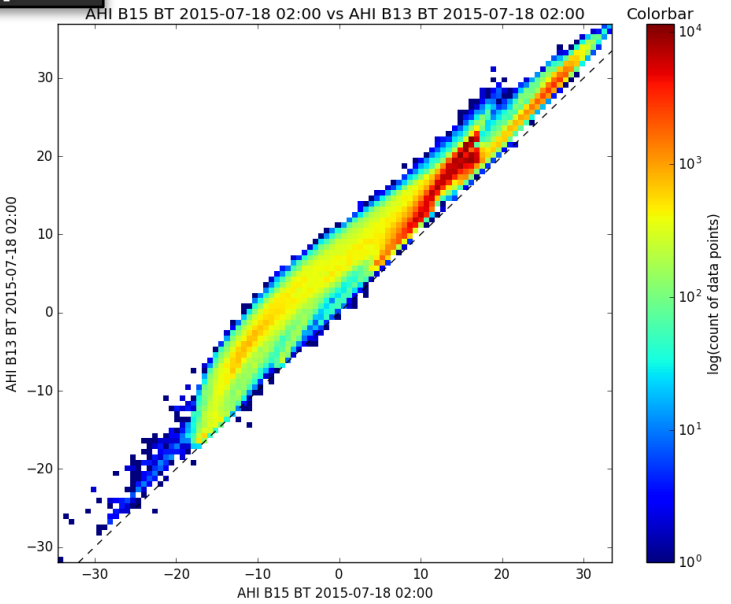
Layer Details
Change based on selected layer in the list

SIFT Area Probe Graphs

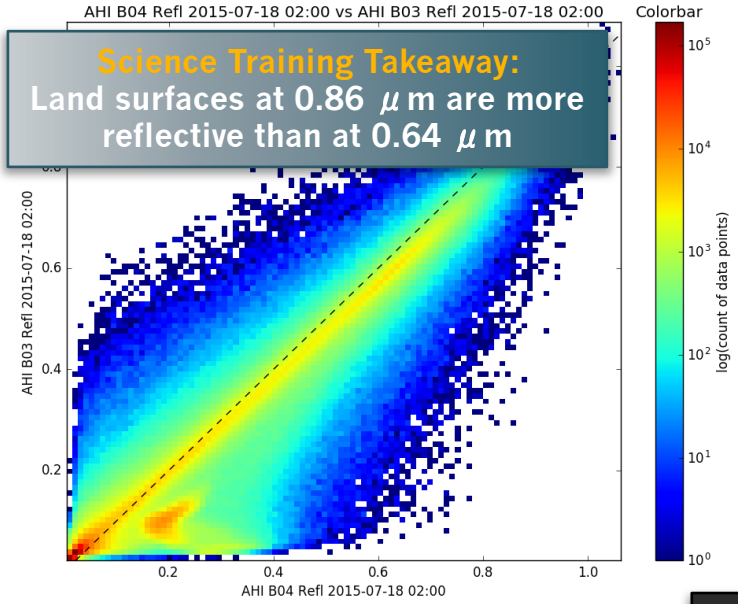




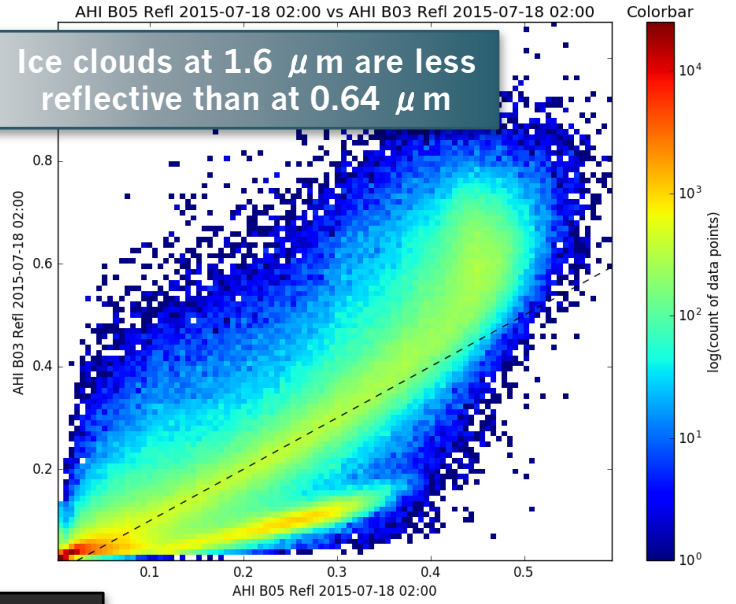




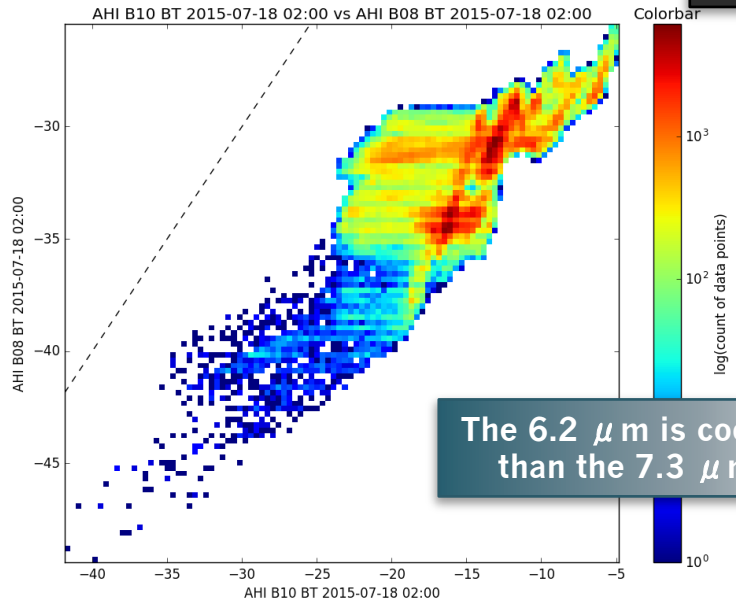
SIFT Area Probe Graphs



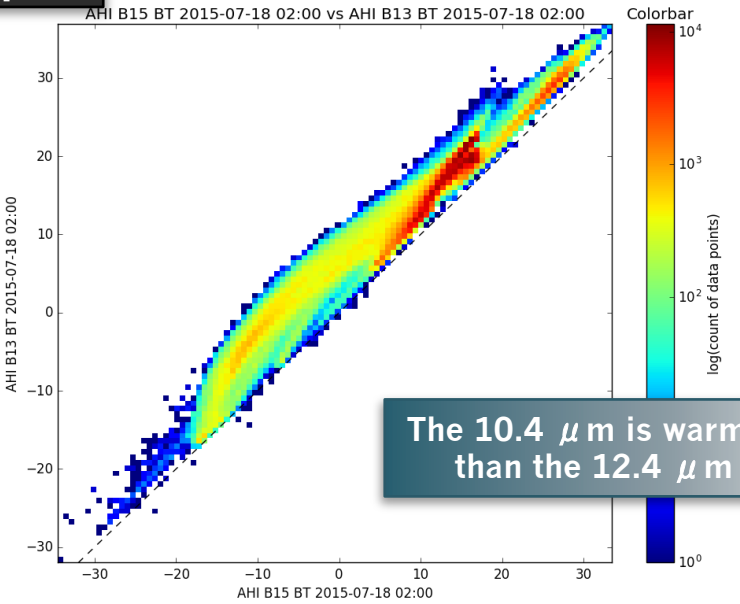
Science Training Takeaway:
Land surfaces at 0.86 μm are more reflective than at 0.64 μm



Ice clouds at 1.6 μm are less reflective than at 0.64 μm



The 6.2 μm is cooler than the 7.3 μm

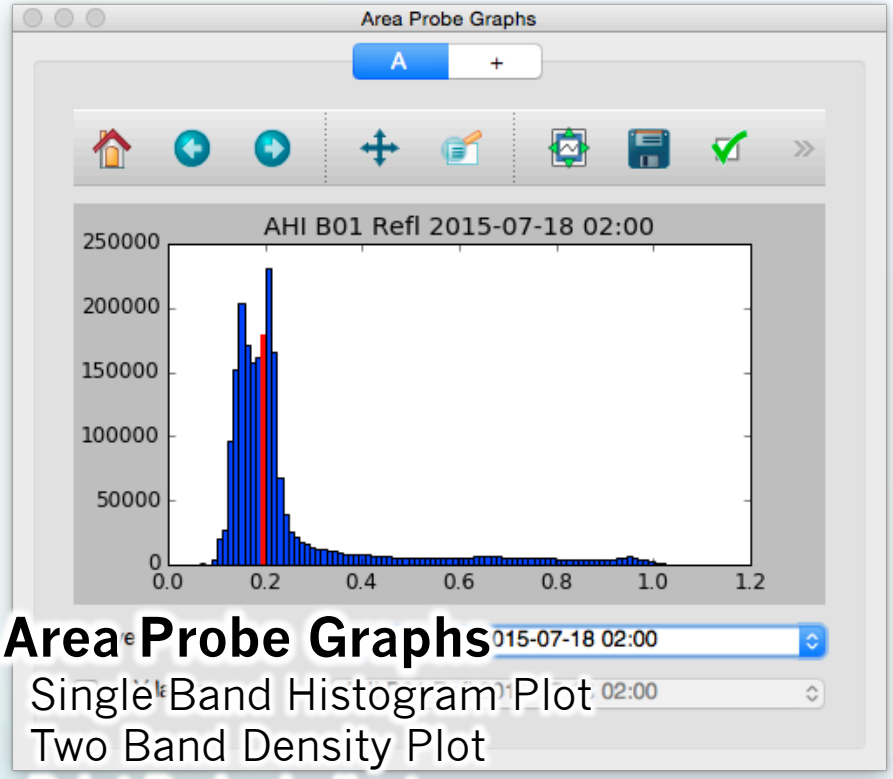


The 10.4 μm is warmer than the 12.4 μm

Applying Science Training

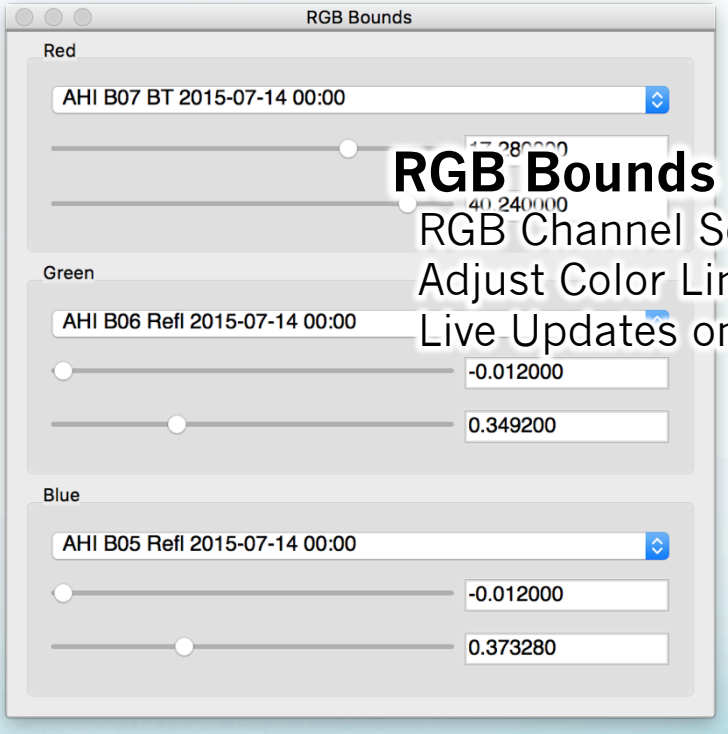
Science Training Takeaway	Prospective Application
Land surfaces at 0.86 μm are more reflective than at 0.64 μm	River flooding is more easily identified, but contrast between clouds and land is reduced in the 0.86 μm
Ice clouds at 1.6 μm are less reflective than at 0.64 μm	Thick glaciated clouds can be indicative of thunderstorms
The 6.2 μm is cooler than the 7.3 μm	The water vapor channels can be used to assess the depth of certain tropospheric features
The 10.4 μm is warmer than the 12.4 μm	The difference in brightness temperature for clear fields of view is related to low-level water vapor concentration

SIFT Features and Functions



Area Probe Graphs

- Single Band Histogram Plot
- Two Band Density Plot
- Point Probe Indicator
- Save Graph Image
- Pan/Zoom Graph Image
- Publication Ready



RGB Bounds

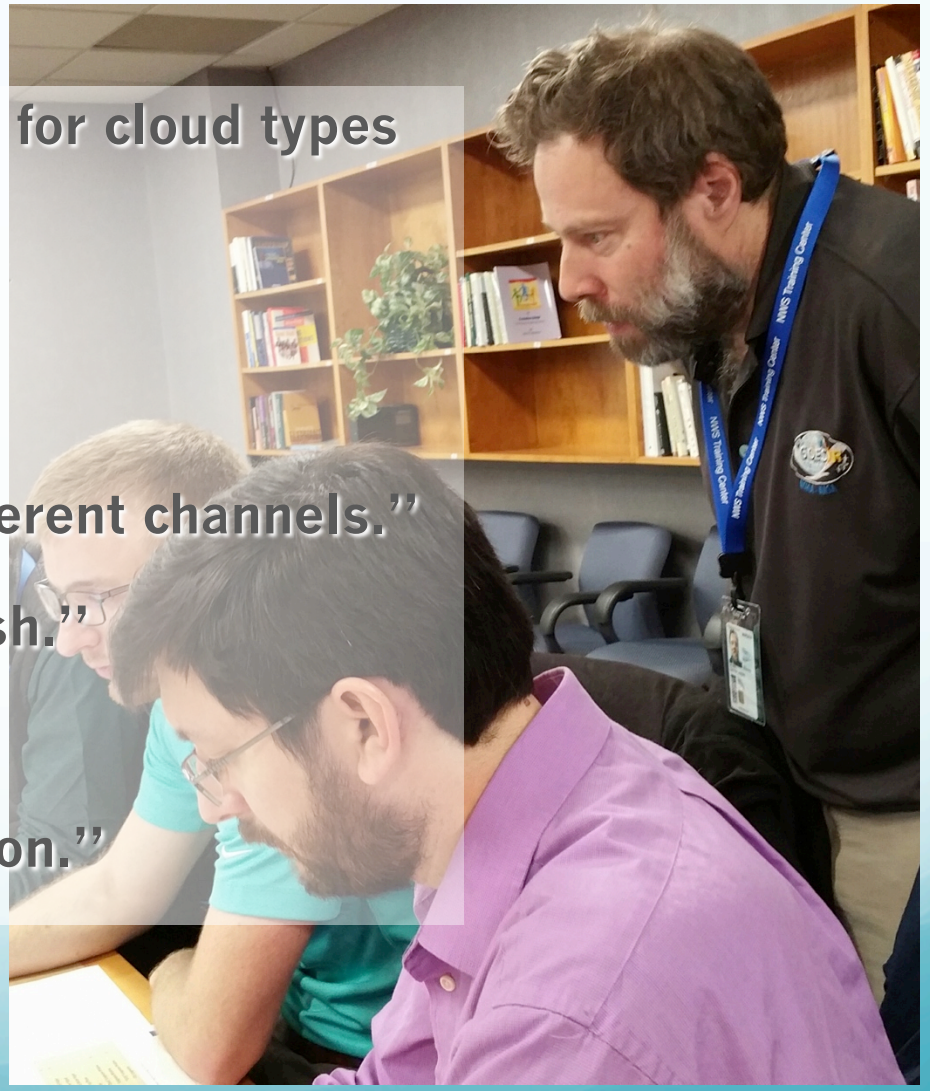
- RGB Channel Selection
- Adjust Color Limits
- Live Updates on Display

Future Enhancements to SIFT

- A selection window for users to load a given time range and subset of bands instead of individual files
- Improved experience for looping and selecting imagery layers
- Additional projections and related changes for GOES-R
- Better performance and file support beyond GeoTIFFs
- Display and handling for derived products created with the Community Satellite Processing Package for geostationary satellites

SIFT Accolades from Users

- “A very interesting way to look for cloud types and layers.”
- “All seemed fine to me.”
- “Great training tool overall.”
- “Nice tool to look at many different channels.”
- “SIFT is fast and does not crash.”
- “Stable software.”
- “Very quick. Excellent resolution.”



Excerpts from written survey results following Honolulu forecast office training workshop

Download SIFT and Case Data

SIFT

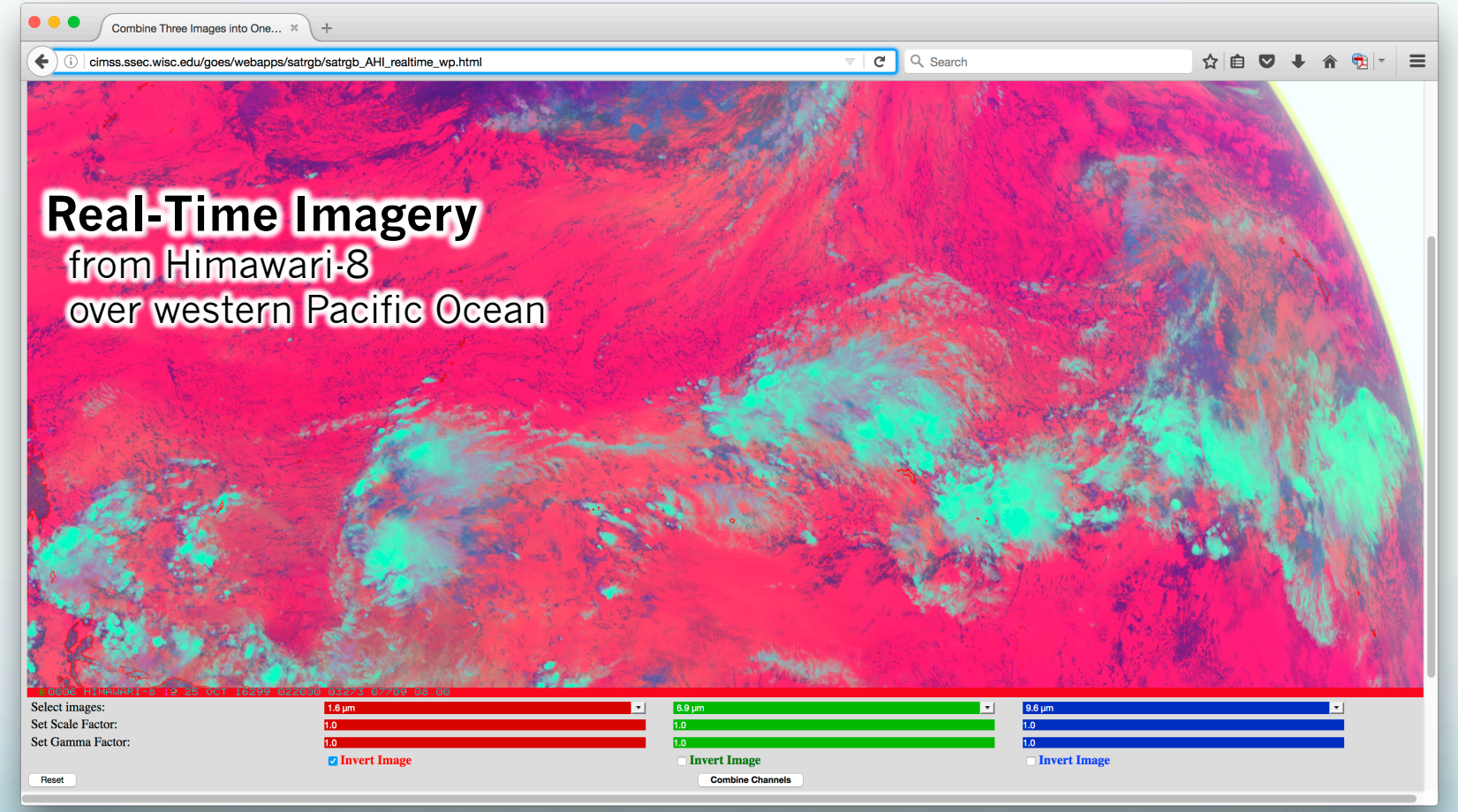
Case Data

- SIFT: ftp://ftp.ssec.wisc.edu/pub/sift/dist/
  - Windows 7+ exe (118 MB)
  - Mac OS X dmg (259 MB)
  - 64-bit CentOS/RedHat Linux tar.gz (278 MB)
- Case Data: ftp://ftp.ssec.wisc.edu/ABI/sift_data/AHI/

SIFT and Other Software

- SIFT is the latest software in the CIMSS/SSEC arsenal for visualizing satellite imagery.
- Other software includes:
  - HYDRA
    - Specific training application for polar-orbiting satellite imagery
  - McIDAS-X
    - Legacy software with scripting capability
  - McIDAS-V
    - Graphical user interface for various meteorological data

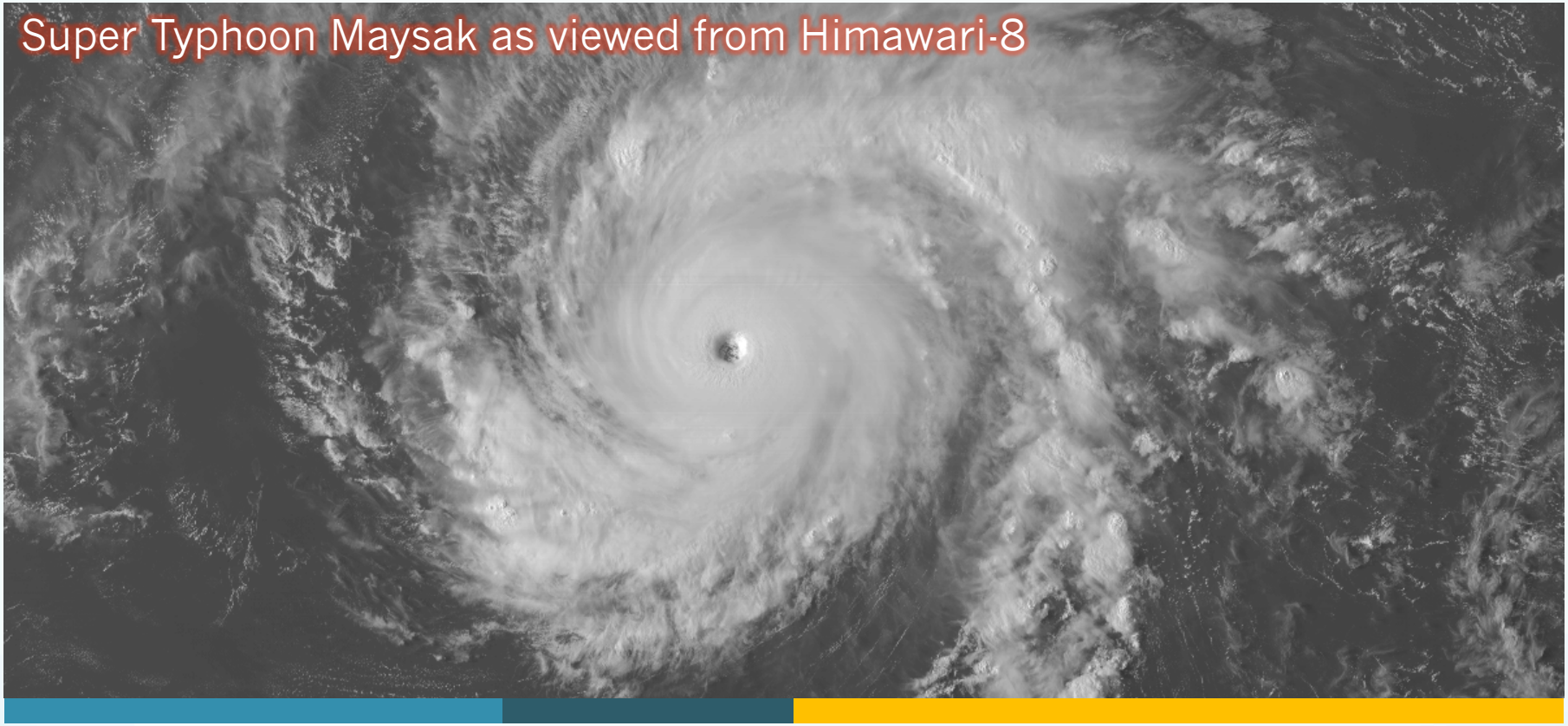
Create RGB Composites Online



http://bit.ly/2e5KrCY

“Observations Lead the Way”

1. Observations (or networks) that are needed to benefit your future research, application or product development
2. Recommended instruments that are needed to make these observations
3. Your view on the greatest observational needs for your discipline in general



Questions? Comments?

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