



SIFT – An interactive tool for satellite data visualization and analysis

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SIFT Short Course 31/05/2023

- Modern imagers produce an enormous amount of data to be handled and visualized
 - Clear need of new strategy and technologies for data visualization
- Due to the heterogeneous types of data potentially used for e.g. MTG-I Cal/Val, a multi-mission, modular and flexible approach was desirable
- Combination of two existing open source software solutions showed the most promising solution for MTG-I Cal/Val planning:
 - SIFT as graphic and visualization engine
 - Pytroll as library for data reading and processing



- *Satellite Information Familiarization Tool*, initially developed at SSEC University of Wisconsin for the use by their trainers:
 - Cross OS (Linux, Win, MacOS)
 - Designed to be fast and to cope with high-resolution imager datasets (data thinning and GPU acceleration)
 - Initially designed to visualize Himawari-8 imagery, support for GOES-R (GOES-16 and GOES-17) was added later
- EUMETSAT Vision: SIFT shall be an easy to use and responsive multi-mission data analyses and visualization application supporting many different use cases: *Cal/Val, satellite operations, science, training, etc.*
- To achieve this, EUMETSAT, together with *ask**, has developed a new version of SIFT, tailored for MTG-I Cal/Val needs.





SIFT data access and processing engine: Pytroll

www.eumetsat.int



<http://pytroll.github.io/>
<https://github.com/pytroll/>

- Pytroll is a python framework for the reading and processing of earth observation satellite data. It implements the most common operations needed for satellite data handling:
 - Product readers
 - Reprojection, resampling, overlay of cartographic features
 - Generation of RGBs, geometric/atmospheric corrections, ...
- SIFT v2.0 takes advantage of the reading and resampling capabilities of the Pytroll packages *Satpy* and *Pyresample* to import data into the visualization engine:
 - A new *Satpy* reader can directly be utilized by SIFT
 - Readers for internal data (not meant to be public) can also be added locally

Some available Satpy readers

EUMETSAT data	External data
avhrr_11b	abi_11b
fci_11c_nc	abi_12_nc
fci_12_nc	ahi_hrit
iasi_12	ahi_hds
li_12	amsr2_11b
mviri_11b_fiduceo_nc	amsr2_12
olci_11b	atdnet
olci_12	caliop_12_cloud
seviri_11b	cmsaf_claas2_12_nc
seviri_12_grib	euclid
seviri_12_bufr	gld360
sistr_11b	glm_12
sistr_12	goes-imager_hrit
vii_11b_nc	goes-imager_nc
vii_12_nc	modis_11b
	modis_12
	msi_safe
	nwcsaf-geo
	nwcsaf-pps_nc
	tropomi_12
	viirs_11b

your_reader



- SIFT v2.0 contains all EUMETSAT-led developments, targeting MTG-I commissioning and MTG-UP
- Main new features are:
 - Full support for GEO, LEO and point data, through Satpy integration
 - support for composite (RGB) visualization
 - an improved timeline manager
 - integration of a statistics module
 - full resampling functionalities using Pyresample
 - an automatic update/monitoring mode
 - partial redesign of the UI/UX
 - ... many more small but useful features!



First release of SIFT v2.0



www.eumetsat.int

- Currently in **beta** release (v2.0.0.b0)
→ We are happy about any issue/bug reports!*
 - Preferred way is through a Github issue (<https://github.com/ssec/sift>)
 - Google group coming soon
- Known installation issues (thanks for the reports!)
 - Mac is a bit problematic... We are seeing issues with older MacOS versions and Qt-related libraries
 - Running SIFT.sh with an already active conda env does not start the application – deactivating it fixes the issue
- Updated documentation is on ReadTheDocs: <https://sift.readthedocs.io/en/latest/>
- Outdated Wiki, User Manual, and website will be gradually updated

* Note: SIFT is an open-source project used at EUM, but not an official EUM tool. We are supporting the tool development on a best effort basis. We welcome contributions by the user community.



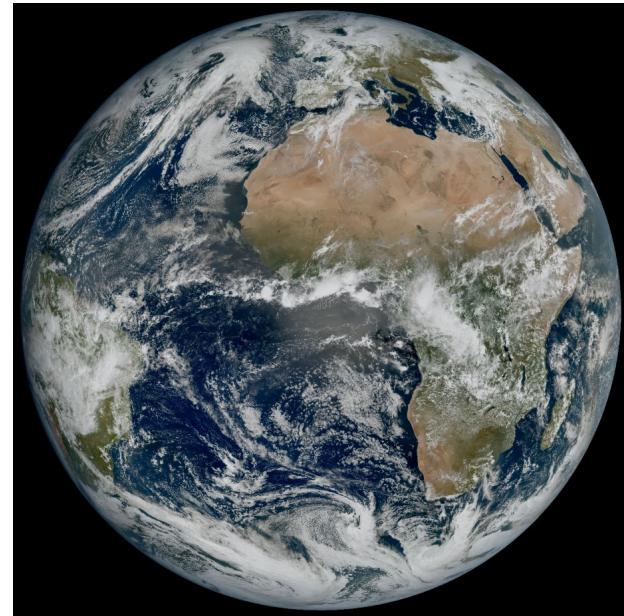
Short Satpy Example

www.eumetsat.int

```
from satpy import Scene
import glob
import os

# initialise Scene
path_to_testdata = '/path/to/data/RC/'
scn = Scene(filenames=glob.glob(os.path.join(path_to_testdata, '*BODY*.nc')), reader='fci_llc_nc')

# ----- load a composite -----
scn.load(['true_color'], upper_right_corner='NE')
scn.show('true_color')
```





Short Satpy Example

```
from satpy import Scene
import glob
import os

# initialise Scene
path_to_testdata = '/path/to/data/RC/'
scn = Scene(filenames=glob.glob(os.path.join(path_to_testdata, '*BODY*.nc')), reader='fci_llc_nc')

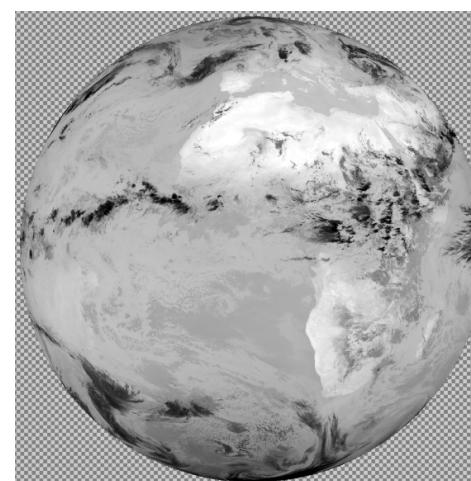
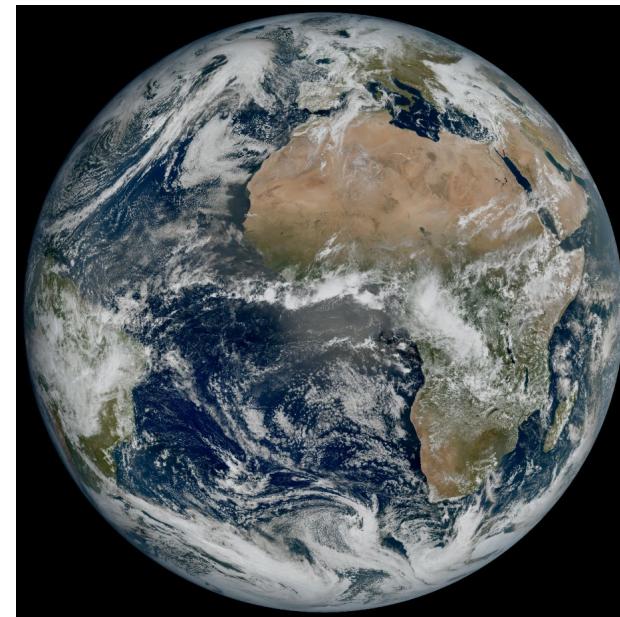
# ----- load a composite -----
scn.load(['true_color'], upper_right_corner='NE')
scn.show('true_color')

# ----- read a channel -----
scn.load(['ir_105'], upper_right_corner='NE')
scn.show('ir_105')

ir_105_val = scn['ir_105'].values

# load a different calibration
scn.load(['ir_105'], calibration='radiance', upper_right_corner='NE')

# load auxiliary data
scn.load(['ir_105_index_map', 'ir_105_time', 'ir_105_pixel_quality'], upper_right_corner='NE')
```





Short Satpy Example

```
from satpy import Scene
import glob
import os

# initialise Scene
path_to_testdata = '/path/to/data/RC/'
scn = Scene(filenames=glob.glob(os.path.join(path_to_testdata, '*BODY*.nc')), reader='fci_llc_nc')

# ----- load a composite -----
scn.load(['true_color'], upper_right_corner='NE')
scn.show('true_color')

# ----- read a channel -----
scn.load(['ir_105'], upper_right_corner='NE')
scn.show('ir_105')

ir_105_val = scn['ir_105'].values

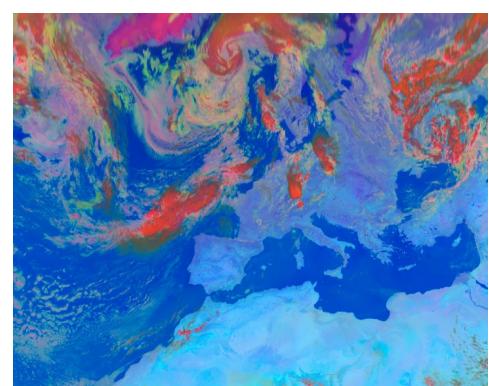
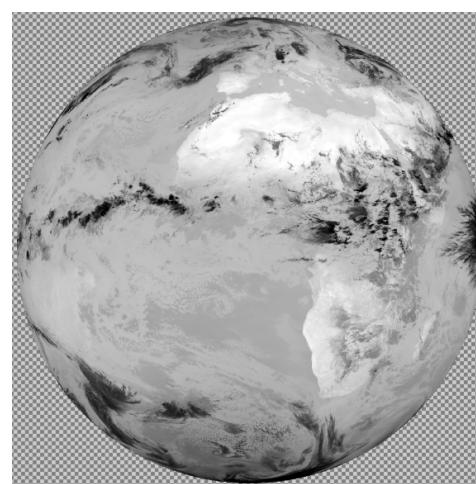
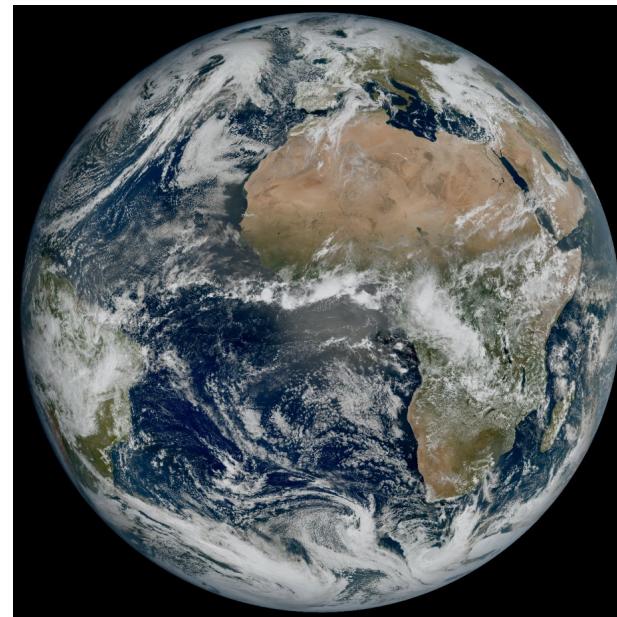
# load a different calibration
scn.load(['ir_105'], calibration='radiance', upper_right_corner='NE')

# load auxiliary data
scn.load(['ir_105_index_map', 'ir_105_time', 'ir_105_pixel_quality'], upper_right_corner='NE')

# ----- load a composite with resampling -----
scn.load(['day_microphysics'])

# ----- perform resampling -----
scn_r = scn.resample('eurol', radius_of_influence=3e4)
scn_r.show('day_microphysics')

# ----- save a dataset -----
scn_r.save_dataset("day_microphysics", filename='./day_microphysics.png')
```



SIFT Live Demo





Thank you!
Questions are welcome.



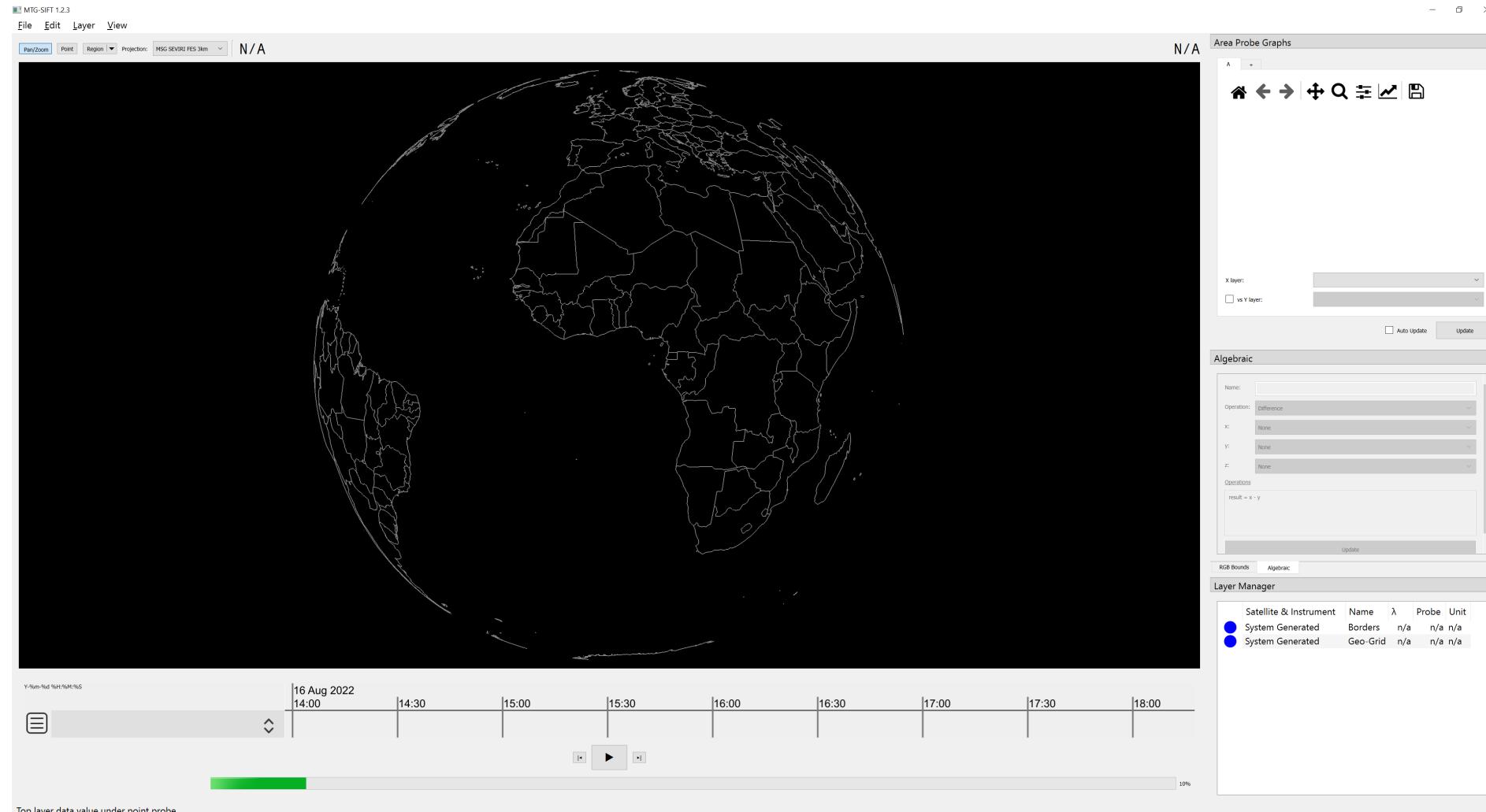
Demo Backup Slides



Starting SIFT

> python -m uwsift

www.eumetsat.int





Selecting files to open

MTG-SIFT 1.2.3

File Edit Layer View

ParZoom Point Region Projector MSG SEVIRI PES 3km N/A

Open File Wizard

Select Files to Open
Select reader & folder. Click'n'drag with mouse for easier row selection. Hold control key to extend selection. Use filter combo-box to choose from predefined patterns or write your own.

Reader: MTG FCI Level 1c NetCDF

Filter: subtype:-(coverage)-(subsetting)-(component1)-BODY-(component)-(purpose)-(format)-(oflag_),(originator)_,(processing_time:%Y%m%d%H%M%S)_,(facility_or_tool)_,(environment)_,(start_time:%Y%m%d%H%M%S)_,(end_time:%Y%m%d%H%M%S)_,(processing_mode)_,(special_compression)_,(disposition_mode)_,(repeat_cycle_in_day:>0d),_(count_in_repeat_cycle:>0d).nc

Folder: C:/Users/Stranden/Downloads/MyLocalData/documents/SIFT_TEST_DATA/FCI_L1C_RC0073

	filename	pflag	location_indicator	data_de
1	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120515_GTT_DEV_20170920120008_20170920120015_N_T_0073_0001.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
2	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120527_GTT_DEV_20170920120009_20170920120027_N_T_0073_0002.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
3	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120541_GTT_DEV_20170920120019_20170920120041_N_T_0073_0003.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
4	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120546_GTT_DEV_20170920120023_20170920120046_N_T_0073_0004.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
5	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120559_GTT_DEV_20170920120036_20170920120059_N_T_0073_0005.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
6	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120614_GTT_DEV_20170920120047_20170920120114_N_T_0073_0006.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
7	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120627_GTT_DEV_20170920120107_N_T_0073_0007.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
8	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120644_GTT_DEV_20170920120116_20170920120144_N_T_0073_0008.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
9	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120647_GTT_DEV_20170920120120_20170920120201_N_T_0073_0009.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
10	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120708_GTT_DEV_20170920120137_20170920120208_N_T_0073_0010.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
11	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120724_GTT_DEV_20170920120154_20170920120224_N_T_0073_0011.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
12	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120738_GTT_DEV_20170920120212_20170920120238_N_T_0073_0012.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
13	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120757_GTT_DEV_20170920120228_20170920120257_N_T_0073_0013.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
14	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120816_GTT_DEV_20170920120249_20170920120316_N_T_0073_0014.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
15	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120826_GTT_DEV_20170920120302_20170920120326_N_T_0073_0015.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
16	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120845_GTT_DEV_20170920120317_20170920120345_N_T_0073_0016.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
17	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120855_GTT_DEV_20170920120337_20170920120355_N_T_0073_0017.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
18	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120917_GTT_DEV_20170920120352_20170920120417_N_T_0073_0018.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
19	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120935_GTT_DEV_20170920120406_20170920120435_N_T_0073_0019.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
20	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920120951_GTT_DEV_20170920120426_20170920120451_N_T_0073_0020.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
21	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920121099_GTT_DEV_20170920120436_20170920120599_N_T_0073_0021.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
22	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920121024_GTT_DEV_20170920120455_20170920120524_N_T_0073_0022.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
23	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920121043_GTT_DEV_20170920120512_20170920120543_N_T_0073_0023.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
24	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920121103_GTT_DEV_20170920120530_20170920120603_N_T_0073_0024.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
25	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920121122_GTT_DEV_20170920120535_20170920120622_N_T_0073_0025.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
26	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920121141_GTT_DEV_20170920120555_20170920120641_N_T_0073_0026.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
27	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920121200_GTT_DEV_20170920120614_20170920120700_N_T_0073_0027.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
28	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920121204_GTT_DEV_20170920120630_20170920120704_N_T_0073_0028.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
29	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920121222_GTT_DEV_20170920120648_20170920120722_N_T_0073_0029.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
30	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920121239_GTT_DEV_20170920120652_20170920120739_N_T_0073_0030.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
31	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920121256_GTT_DEV_20170920120711_20170920120756_N_T_0073_0031.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
32	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920121257_GTT_DEV_20170920120728_20170920120810_N_T_0073_0032.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
33	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920121325_GTT_DEV_20170920120743_20170920120825_N_T_0073_0033.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	
34	W_XX_EUMETSAT-Darmstadt,IMG+SAT,MT11+FCI-1C_RRAD-FDHSI_FD_-CHK_BODY_-NC4E_C_EUMT_20170920121340_GTT_DEV_20170920120800_20170920120840_N_T_0073_0034.nc W	XX_EUMETSAT_Darmstadt	IMG+SA	

Grouped: By Group Keys

Cancel < Back Next >

Area Probe Graphs

X layer: XX_EUMETSAT_Darmstadt

Y layer:

Auto Update Update

Algebraic

Name: Difference

Operations: Difference

X: None

Y: None

Z: None

Operations: result = x - y

RGB Bounds Algebraic

Layer Manager

Satellite & Instrument	Name	λ	Probe Unit
System Generated	Borders	n/a	n/a n/a
System Generated	Geo-Grid	n/a	n/a n/a



Selecting parameters to load

MTG-SIFT 1.2.3

File Edit Layer View

ParZoom Point Region Projector: MSG SEVIRI FES 3km N/A

Open File Wizard

Select Products
Select products to add

Name Wavelength Resolution Calibration Level

Name	Wavelength	Resolution	Calibration	Level
118 <input checked="" type="checkbox"/> vis_04	0.44 µm	1000m	reflectance	N/A
119 <input type="checkbox"/> vis_04_earth...	N/A	1000m	N/A	N/A
120 <input type="checkbox"/> vis_04_index...	N/A	1000m	N/A	N/A
121 <input type="checkbox"/> vis_04_pixel...	N/A	1000m	N/A	N/A
122 <input type="checkbox"/> vis_04_platfo...	N/A	1000m	N/A	N/A
123 <input type="checkbox"/> vis_04_subsa...	N/A	1000m	N/A	N/A
124 <input type="checkbox"/> vis_04_subsa...	N/A	1000m	N/A	N/A
125 <input type="checkbox"/> vis_04_subso...	N/A	1000m	N/A	N/A
126 <input type="checkbox"/> vis_04_subso...	N/A	1000m	N/A	N/A
127 <input type="checkbox"/> vis_04_sun_s...	N/A	1000m	N/A	N/A
128 <input type="checkbox"/> vis_04_swath...	N/A	1000m	N/A	N/A
129 <input type="checkbox"/> vis_04_swath...	N/A	1000m	N/A	N/A
130 <input type="checkbox"/> vis_04_time	N/A	1000m	N/A	N/A
131 <input checked="" type="checkbox"/> vis_05	0.51 µm	1000m	reflectance	N/A
132 <input type="checkbox"/> vis_05_earth...	N/A	1000m	N/A	N/A
133 <input type="checkbox"/> vis_05_index...	N/A	1000m	N/A	N/A
134 <input type="checkbox"/> vis_05_pixel...	N/A	1000m	N/A	N/A
135 <input type="checkbox"/> vis_05_platfo...	N/A	1000m	N/A	N/A
136 <input type="checkbox"/> vis_05_subsa...	N/A	1000m	N/A	N/A
137 <input type="checkbox"/> vis_05_subsa...	N/A	1000m	N/A	N/A
138 <input type="checkbox"/> vis_05_subso...	N/A	1000m	N/A	N/A
139 <input type="checkbox"/> vis_05_sun_s...	N/A	1000m	N/A	N/A
140 <input type="checkbox"/> vis_05_swath...	N/A	1000m	N/A	N/A
141 <input type="checkbox"/> vis_05_swath...	N/A	1000m	N/A	N/A
142 <input type="checkbox"/> vis_05_swath...	N/A	1000m	N/A	N/A
143 <input type="checkbox"/> vis_05_time	N/A	1000m	N/A	N/A
144 <input checked="" type="checkbox"/> vis_06	0.64 µm	1000m	reflectance	N/A
145 <input type="checkbox"/> vis_06_earth...	N/A	1000m	N/A	N/A
146 <input type="checkbox"/> vis_06_index...	N/A	1000m	N/A	N/A
147 <input type="checkbox"/> vis_06_pixel...	N/A	1000m	N/A	N/A
148 <input type="checkbox"/> vis_06_platfo...	N/A	1000m	N/A	N/A
149 <input type="checkbox"/> vis_06_subsa...	N/A	1000m	N/A	N/A
150 <input type="checkbox"/> vis_06_subsa...	N/A	1000m	N/A	N/A
151 <input type="checkbox"/> vis_06_subso...	N/A	1000m	N/A	N/A
152 <input type="checkbox"/> vis_06_subso...	N/A	1000m	N/A	N/A
153 <input type="checkbox"/> vis_06_sun_s...	N/A	1000m	N/A	N/A
154 <input type="checkbox"/> vis_06_swath...	N/A	1000m	N/A	N/A
155 <input type="checkbox"/> vis_06_swath...	N/A	1000m	N/A	N/A
156 <input type="checkbox"/> vis_06_time	N/A	1000m	N/A	N/A

Y-%m-%d %H:%M:%S

14:00 14:30 15:00 15:30 16:00 16:30 17:00 17:30 18:00

Cancel < Back Finish

Area Probe Graphs

X layer: vis_04_sun_s... Y layer: vis_05_sun_s...

Auto Update Update

Algebraic

Name: Difference Operation: Difference X: None Y: None Z: None Operations result = x - y update

RGB Bounds Algebraic

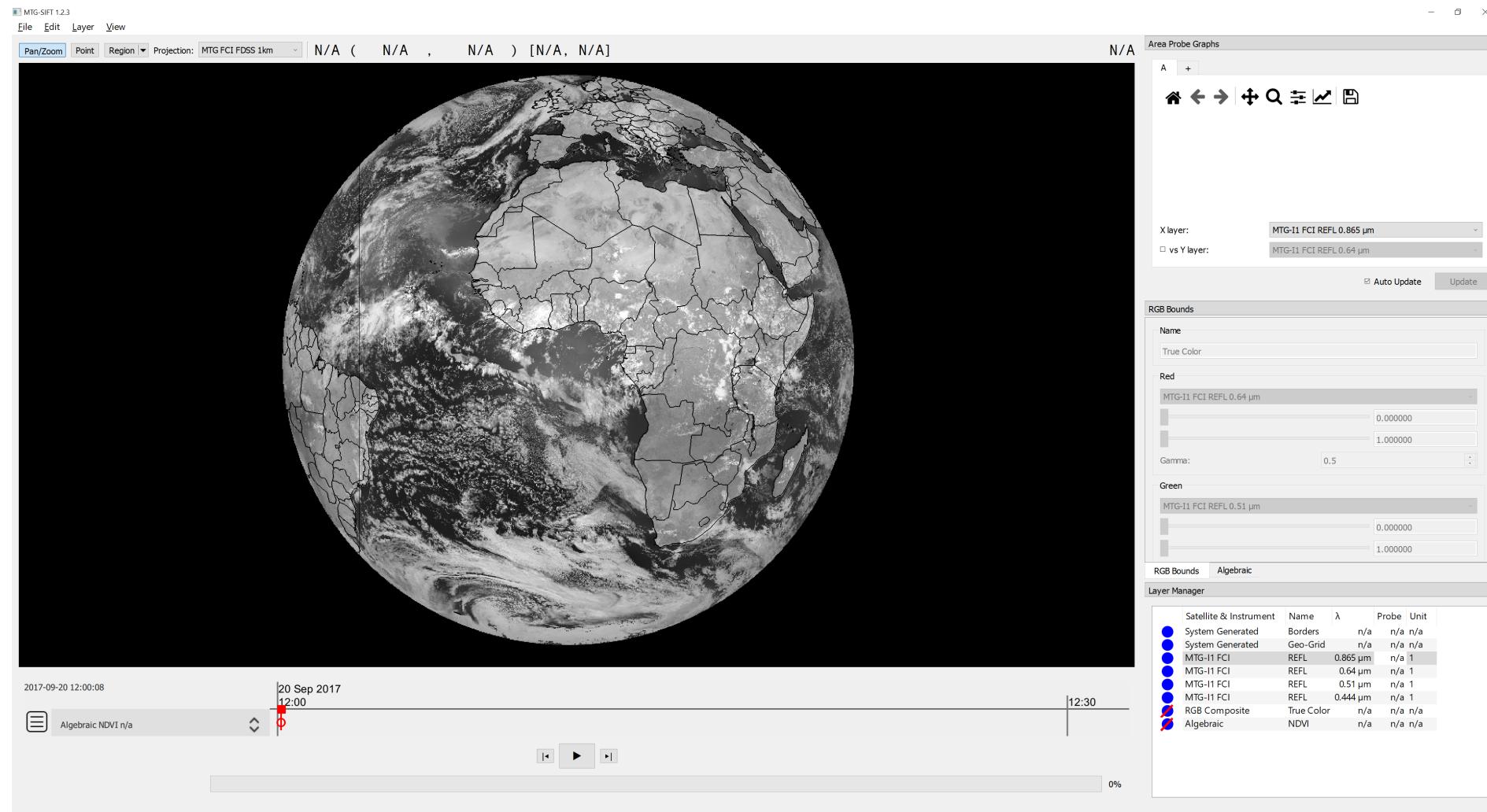
Layer Manager

Satellite & Instrument	Name	λ	Probe Unit
System Generated	Borders	n/a	n/a n/a
System Generated	Geo-Grid	n/a	n/a n/a



Data loaded and visualized

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Timeline manager:
Show time stamp of current image
Move between different acquisitions/images

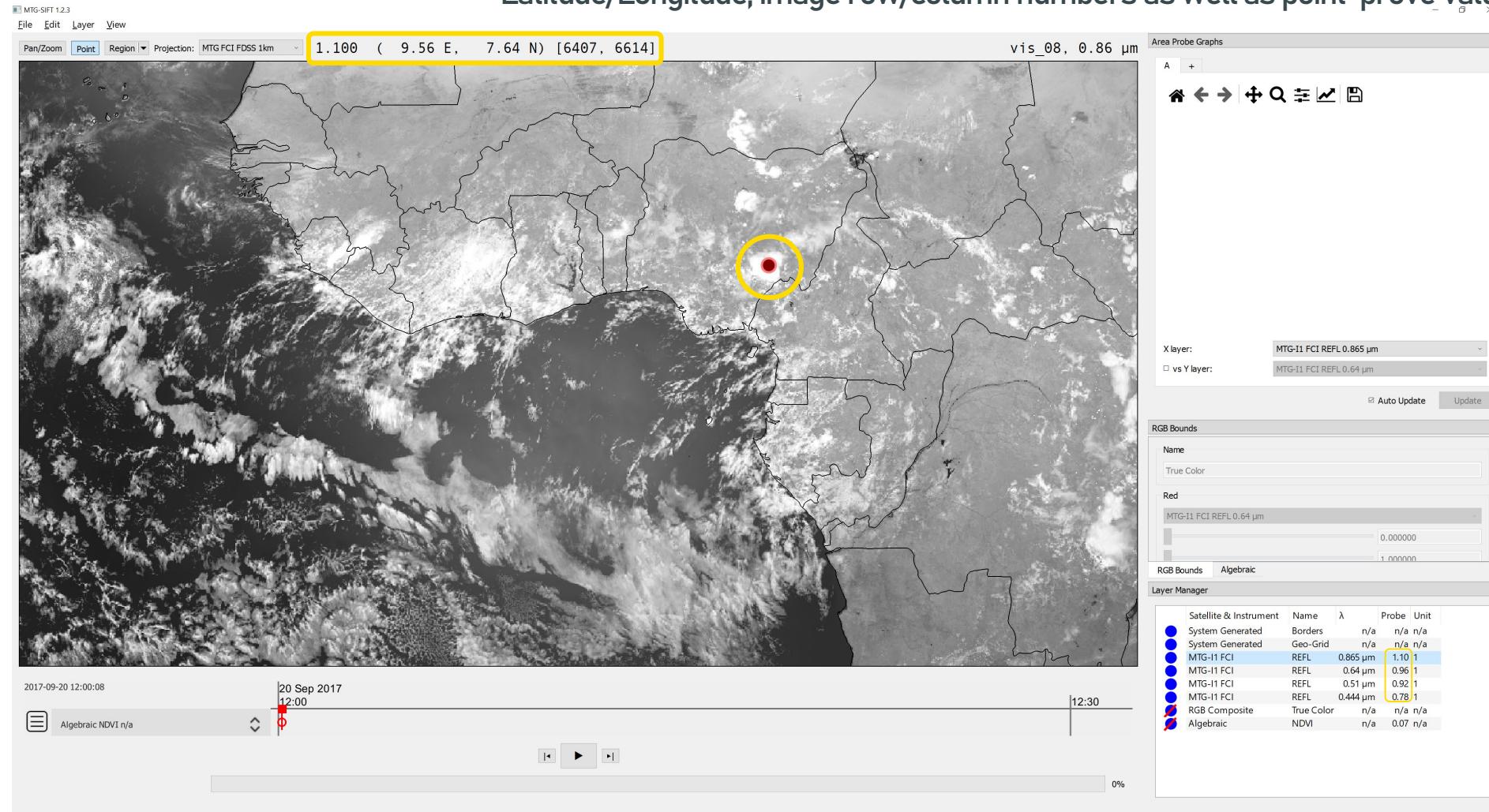
Layer manager:
Hide/show datasets
Modify dataset transparency
Move datasets up/down



Zooming, panning and point-probing

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Latitude/Longitude, image row/column numbers as well as point-probe value of upper-most layer

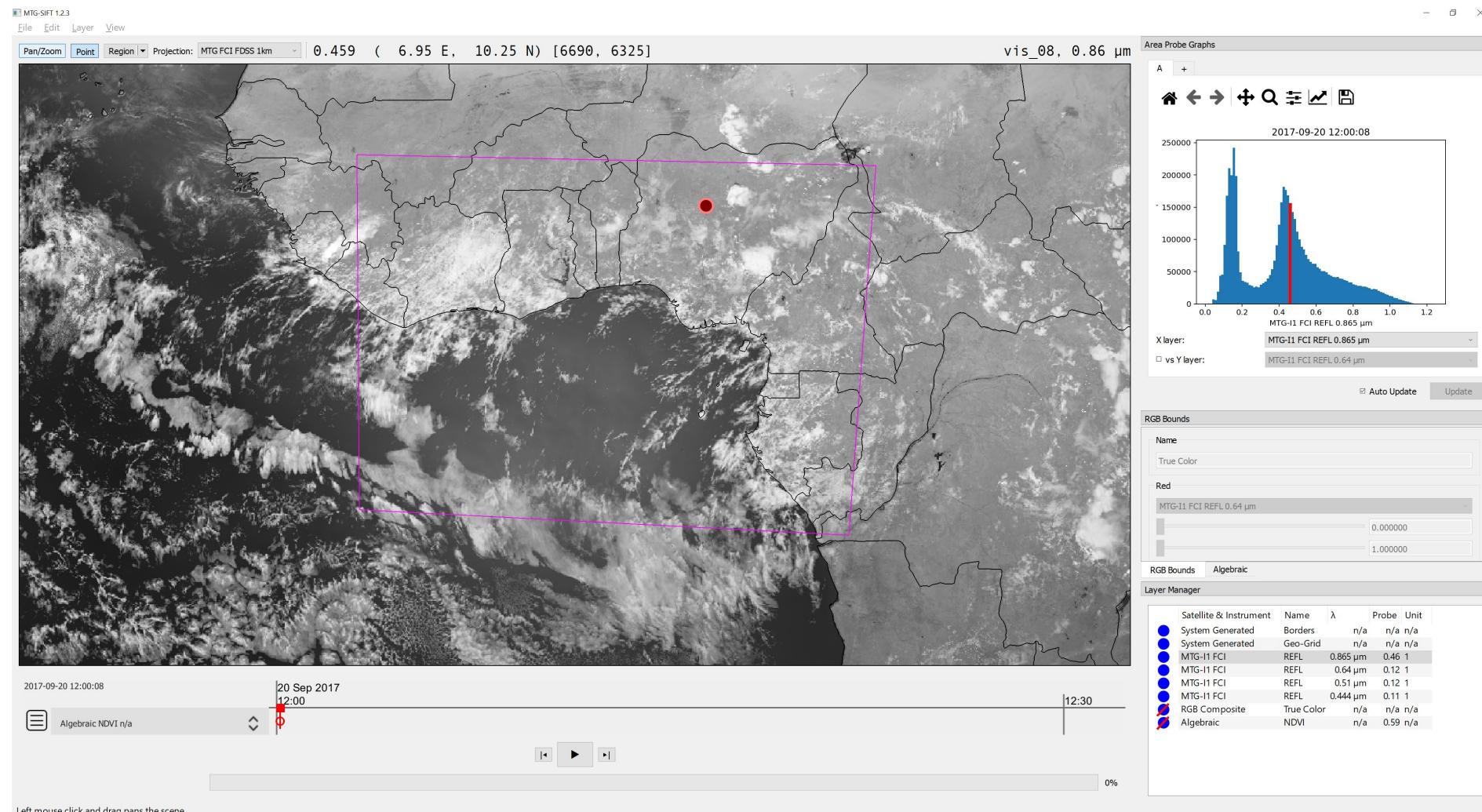


Point-probe values of all applicable datasets



Region of interest selection (point-and-click) and analysis

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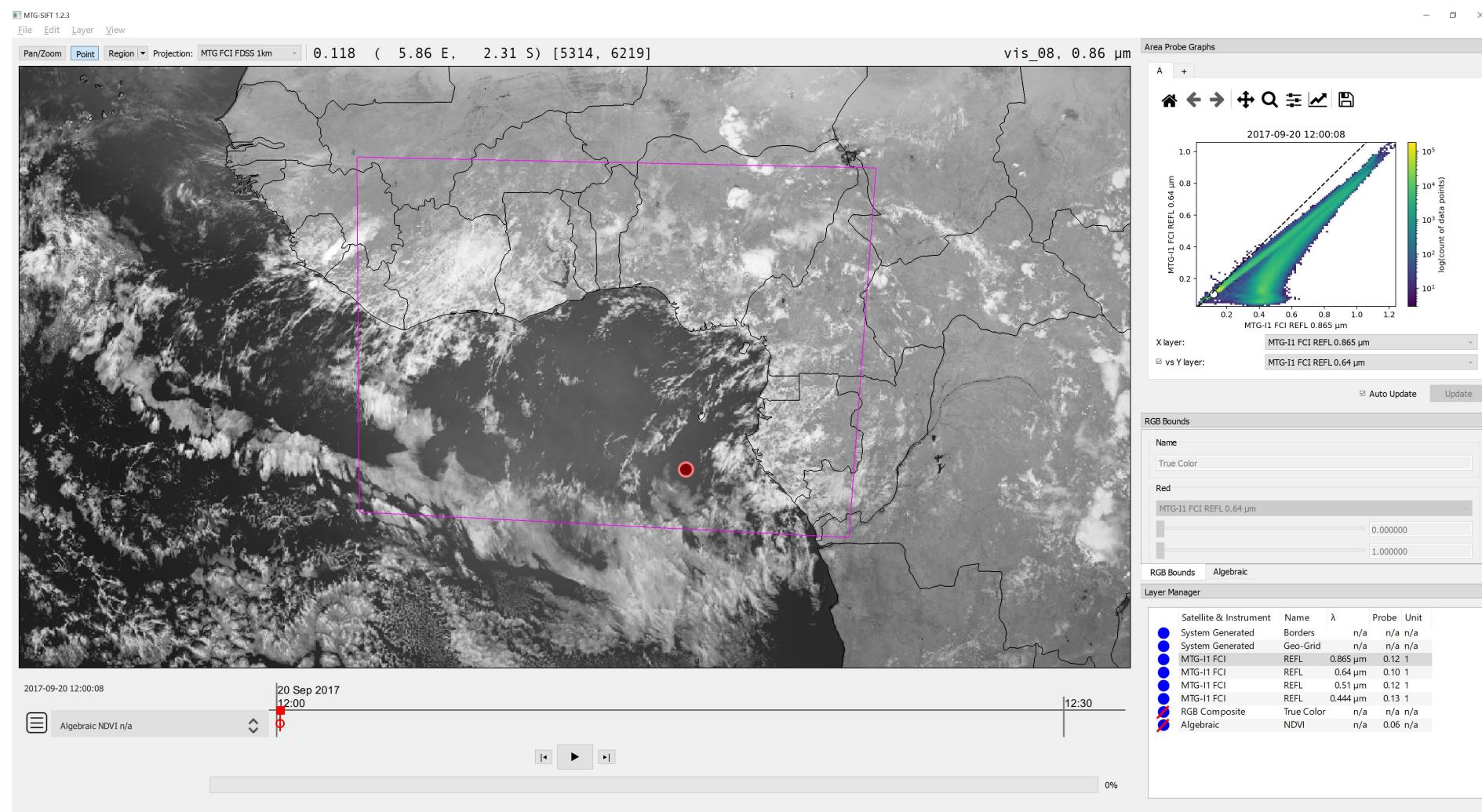


Histogram with distribution of data within region of interest.
Histogram bin containing point-probe value highlighted in red



Region of interest selection (point-and-click) and analysis

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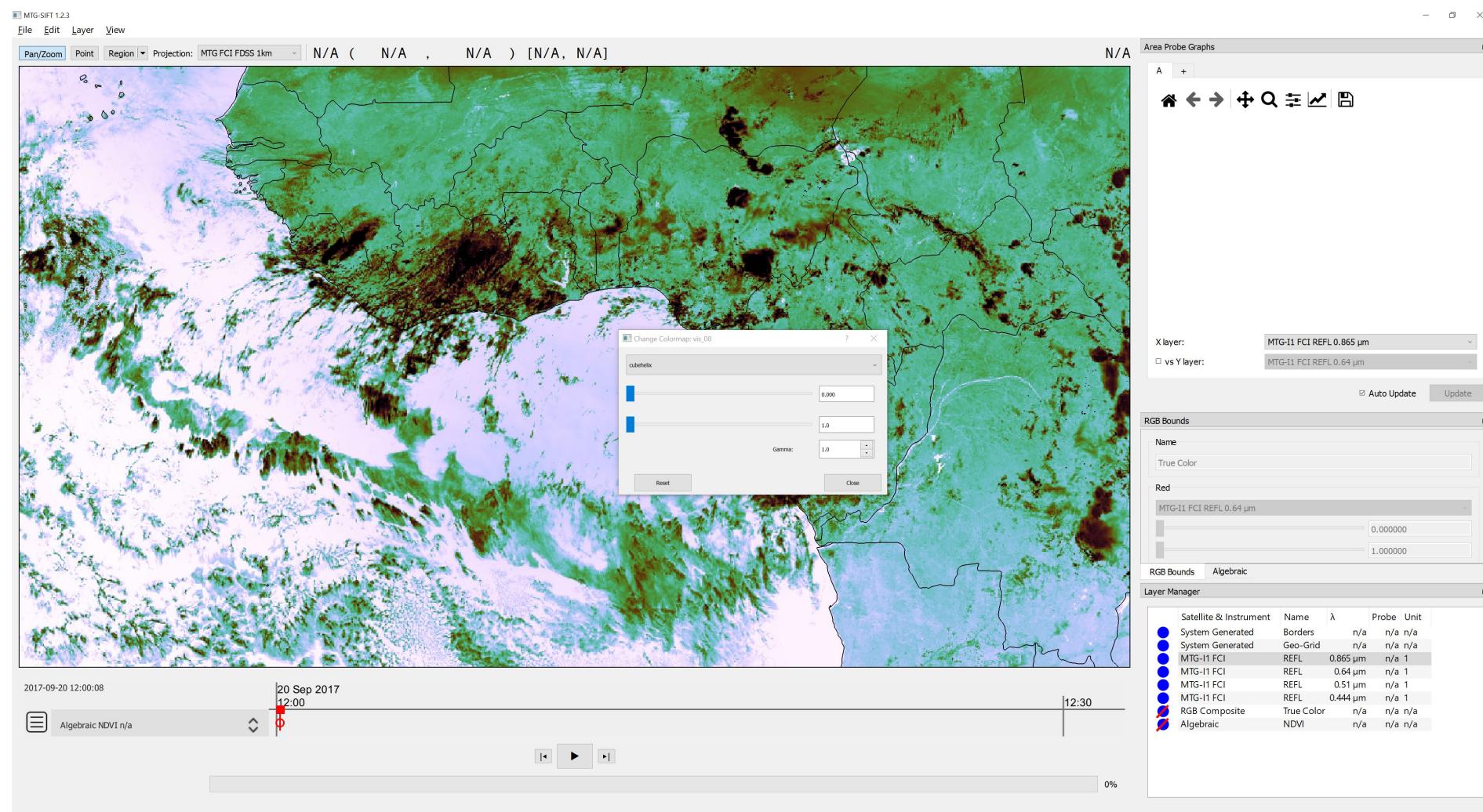


Density scatterplot showing the relationship between VIS0.6 and VIS0.8 within region of interest.
Histogram bin containing point-probe value indicated with white circle



Modifying colormap and value range

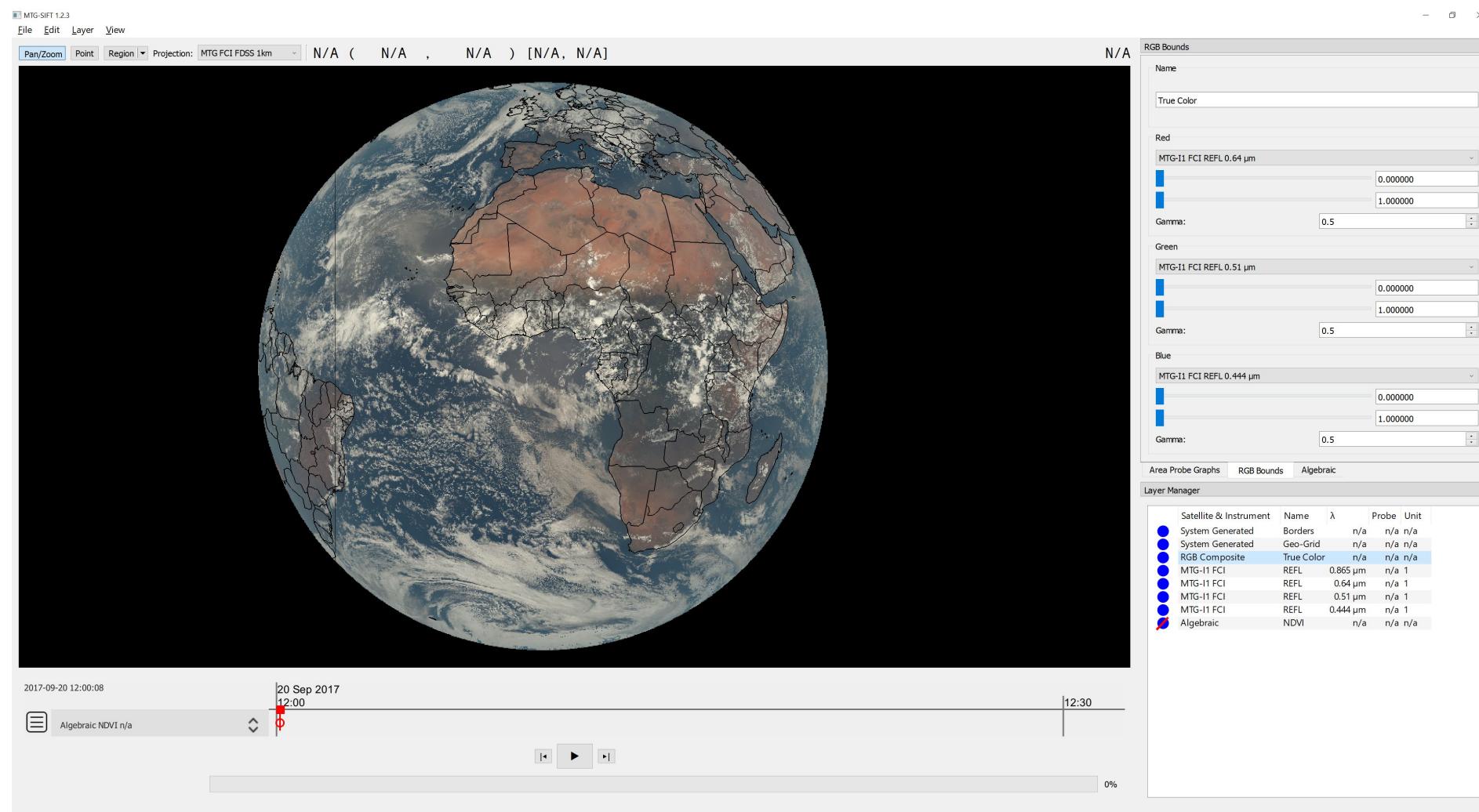
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Creating RGBs – FCI True Color

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Give the RGB a name

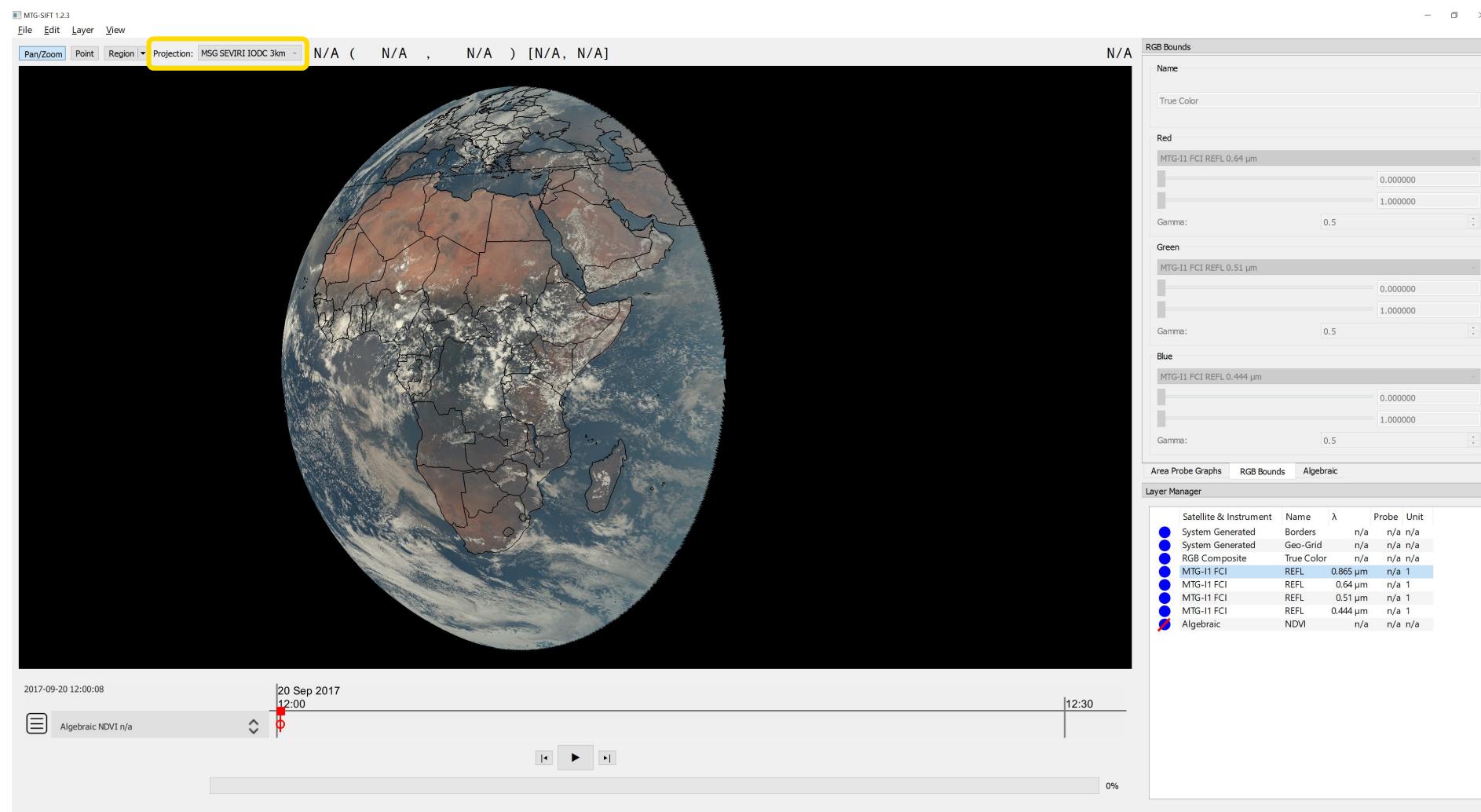
Select which datasets that should represent the red, green and blue components

Select value ranges and gamma factors



Change projection – MSG IODC service

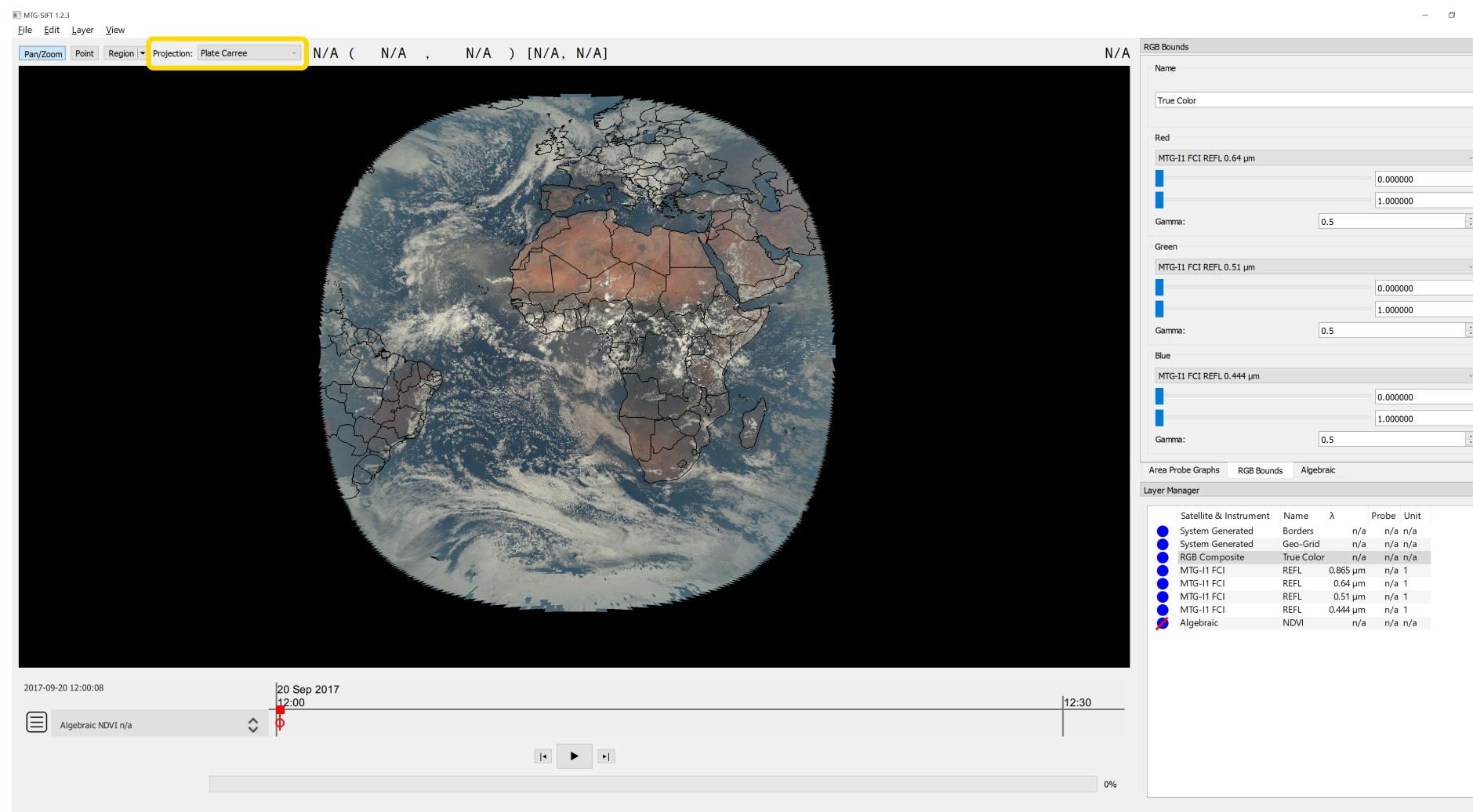
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Change projection – Plate Carree

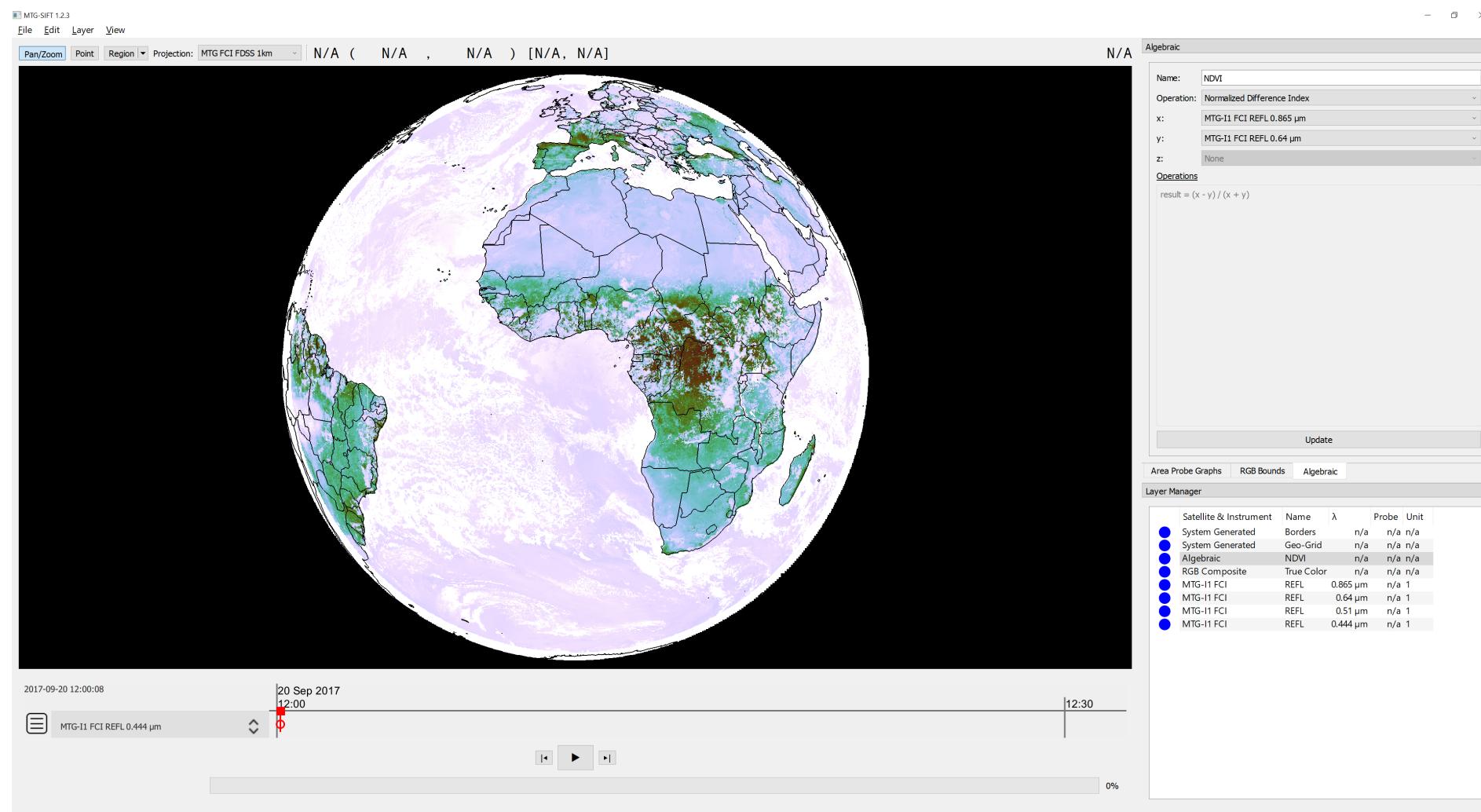
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Creating Composites - NDVI

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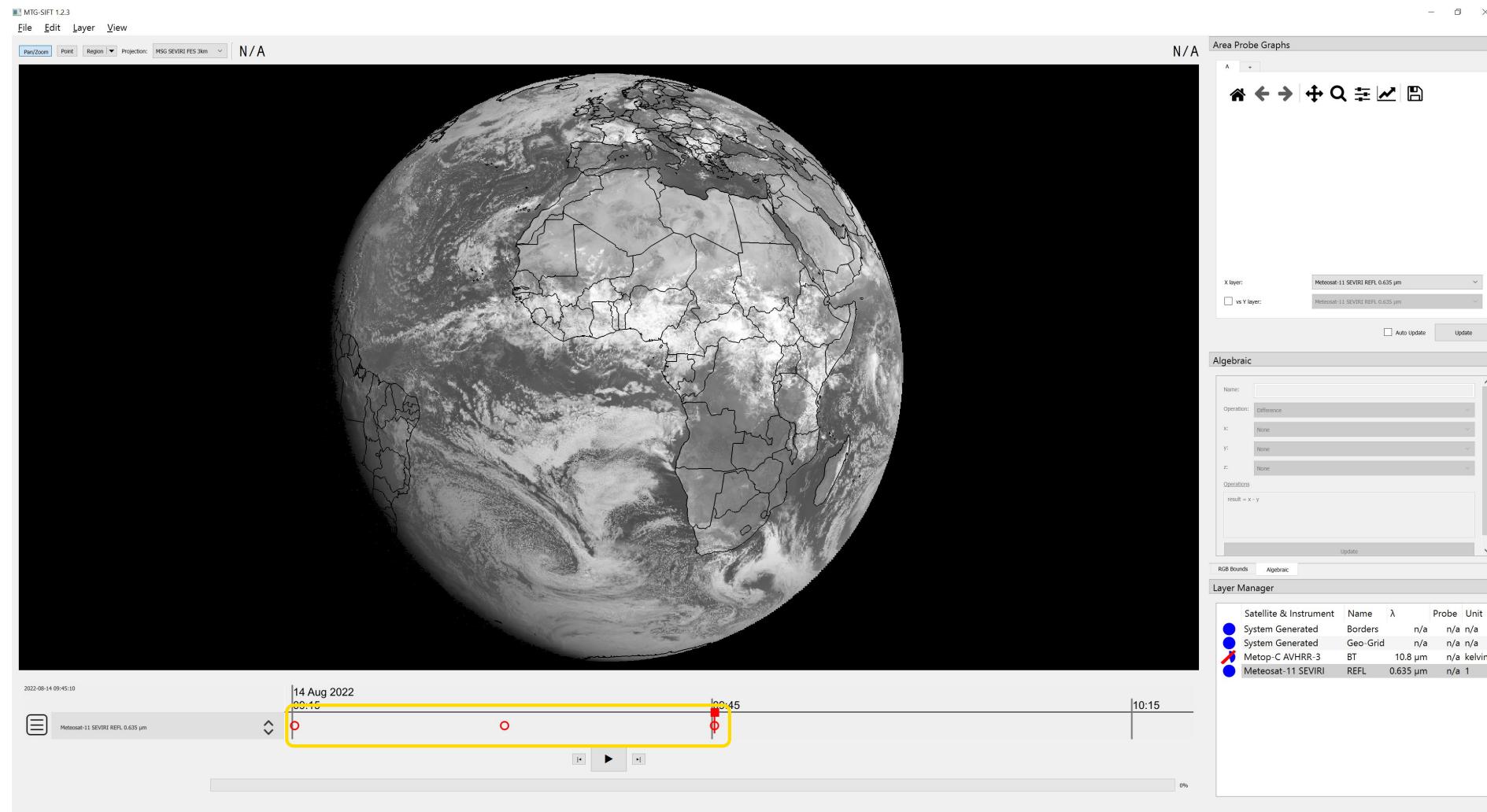


Give the composite a name
Select composite operation (e.g. difference, NDVI)
Select which datasets that should represent the composite variables
Update



MSG VIS data with multiple repeat cycles

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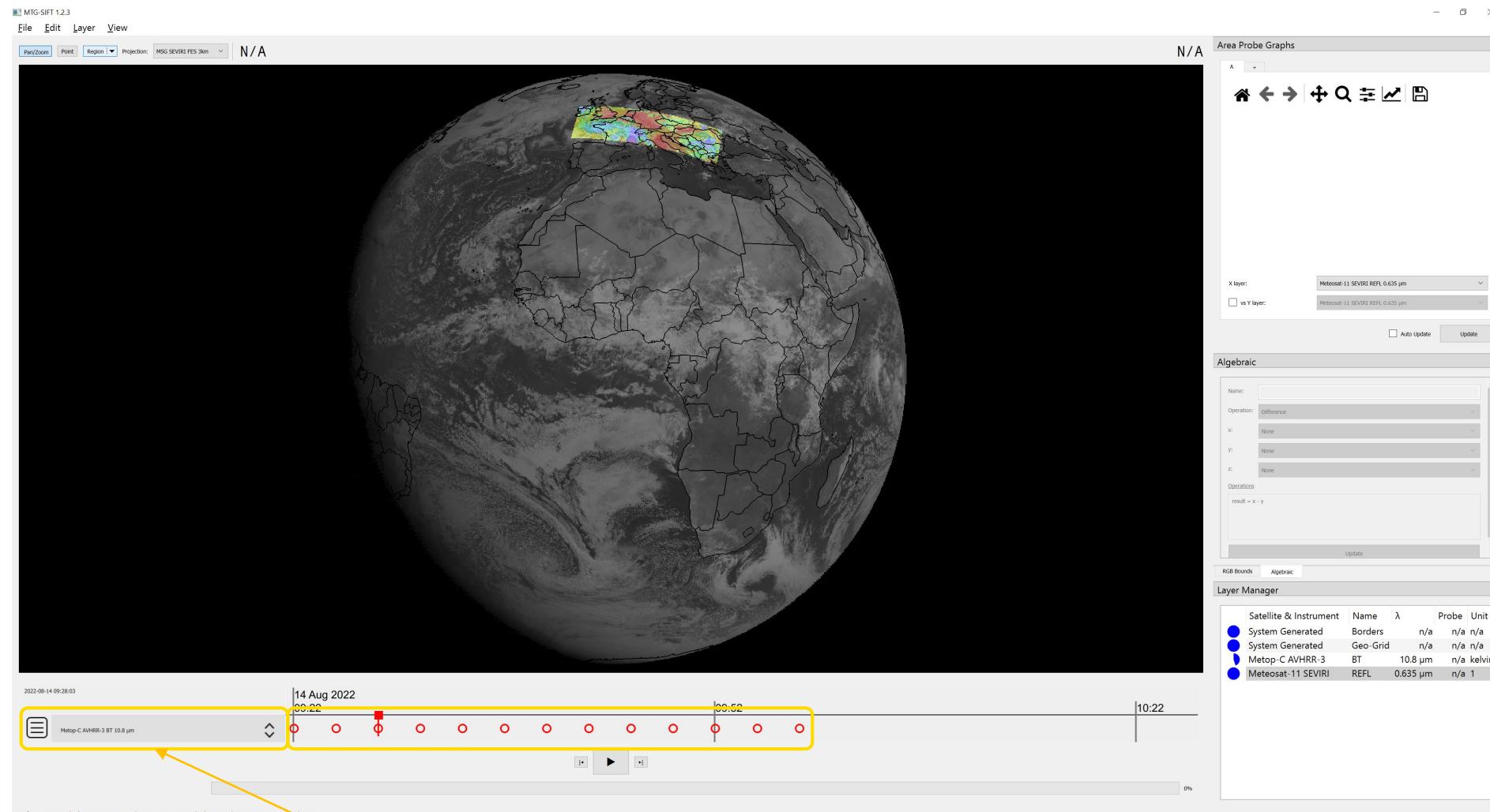
Timeline manager:

Move between different acquisitions/images
Start animation using the play button



Put AVHRR Granule on top and blend datasets

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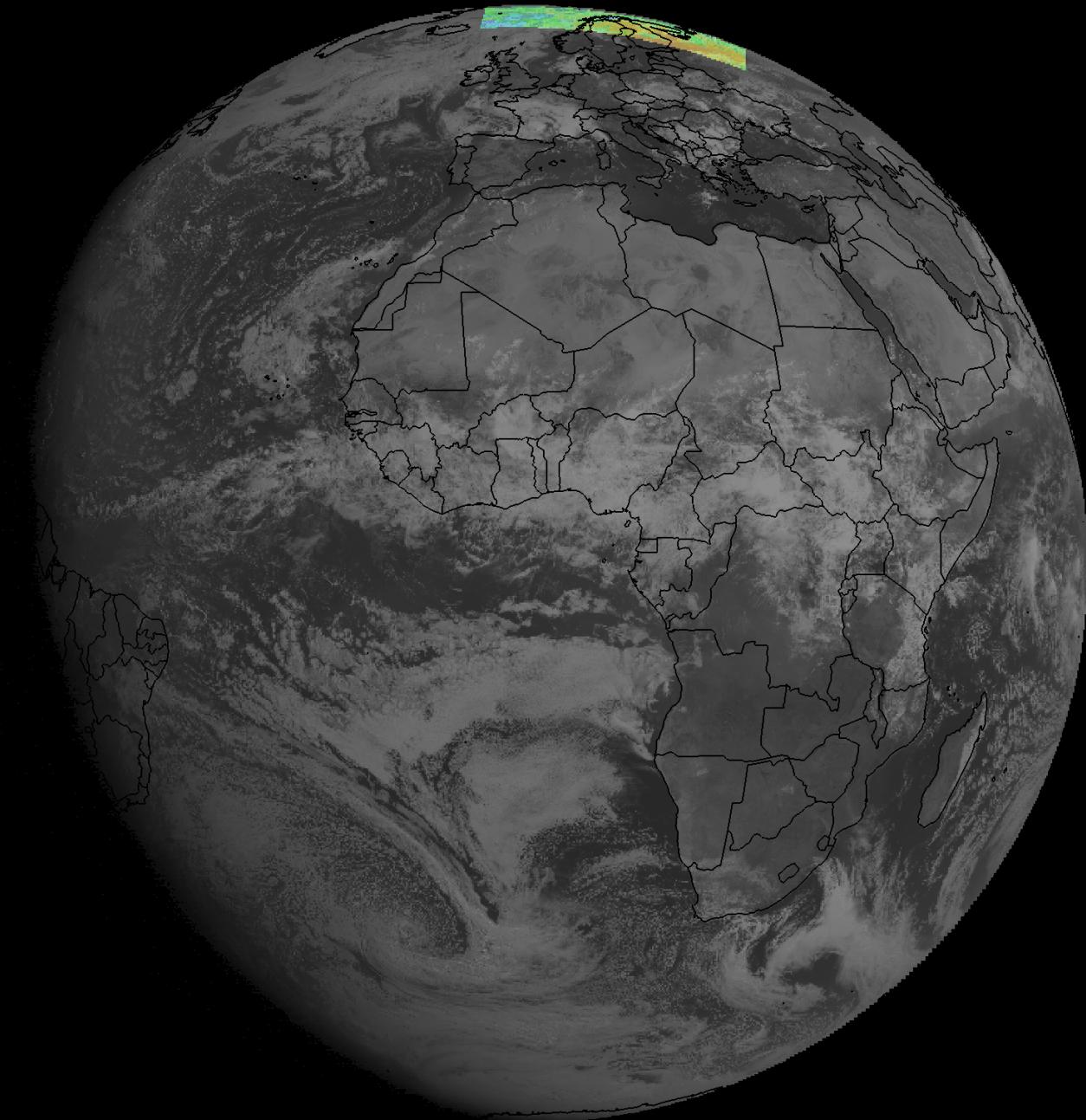


Timeline manager:
Change driving layer to swap between datasets
with different acquisition frequency

13 AVHRR IR granules loaded as separate entries.

Reduce opacity of AVHRR dataset to see MSG VIS data below.

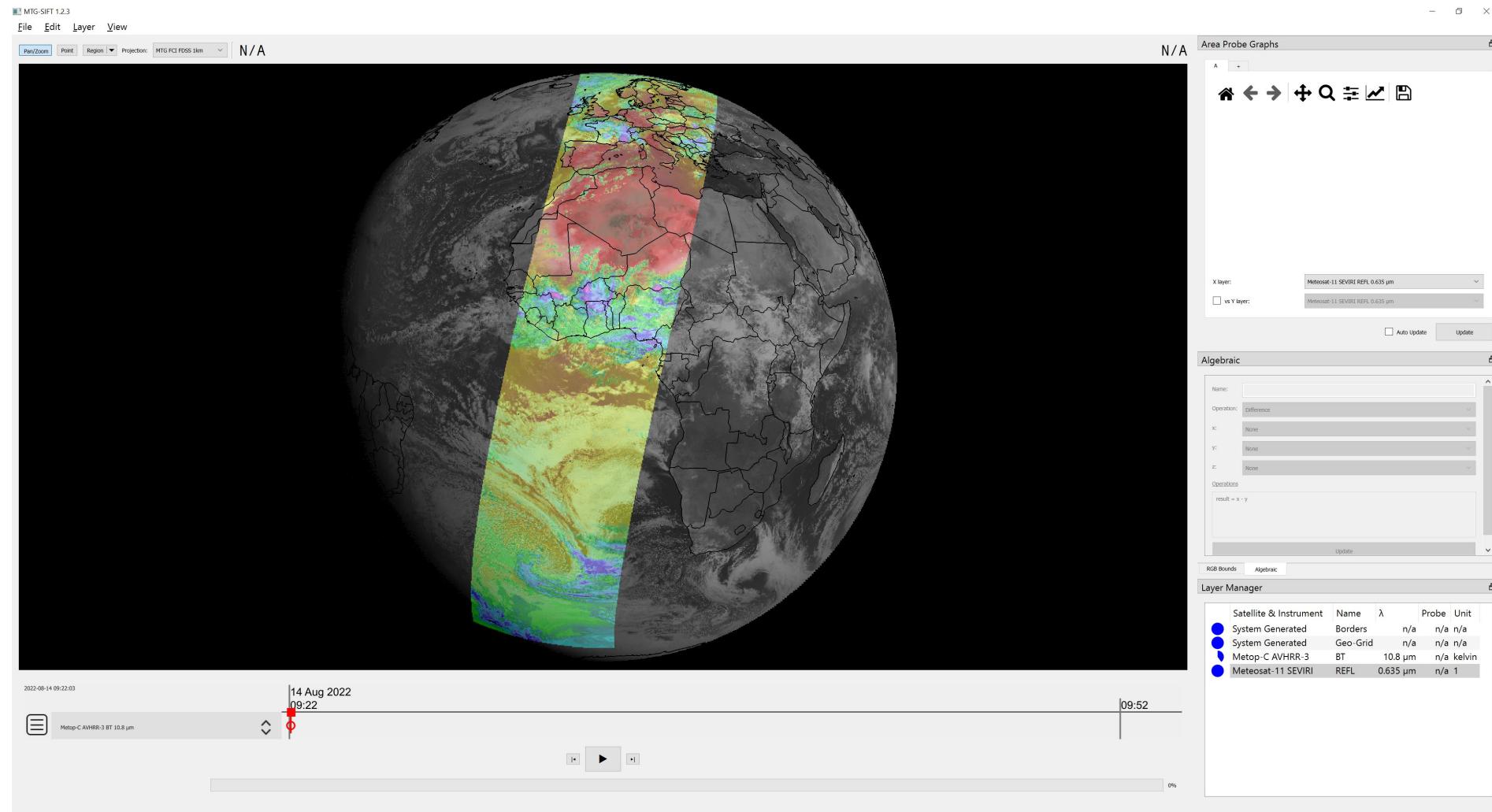
Export animation showing AVHRR acquisitions on top of MSG





Alternatively, merge all AVHRR entries and visualize as one entry

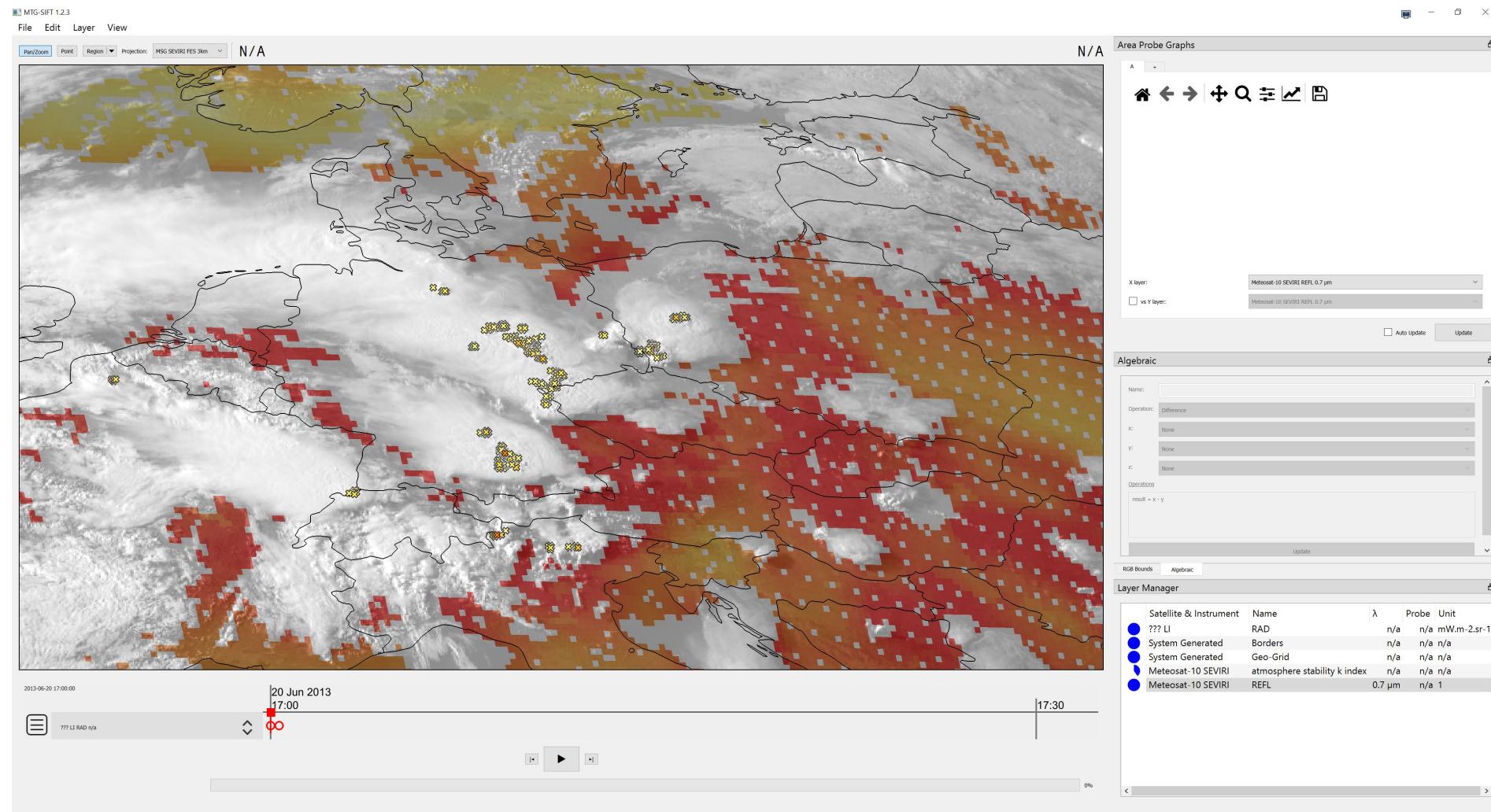
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Visualizing different dataset types at different processing levels

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MSG HRV imagery
MSG L2 k-index (GII product)
LI L2 Lightning group data (point data)

Marker colour of lightning group data selected to represent the corresponding measured radiance

Export animation showing AVHRR acquisitions on top of MSG

