

JPSS Products from Direct Broadcast in Alaska

2018 UPDATE

CARL DIERKING & JAY CABLE

UAF / GINA

Direct Broadcast Products from GINA

Satellite Sensors

- ▶ SNPP and NOAA-20
 - ▶ VIIRS
 - ▶ ATMS
- ▶ Terra and Aqua MODIS
- ▶ NOAA-19, NOAA-18, NOAA-15, MetOp
 - ▶ AVHRR
 - ▶ AMSU

Product Types

- ▶ AWIPS single band products (RGBs created on AWIPS client)
- ▶ GeoTiff single bands and RGBs (ASIP, AFS)
- ▶ SDRs (AVO, CIMSS, CIRA, SPoRT)

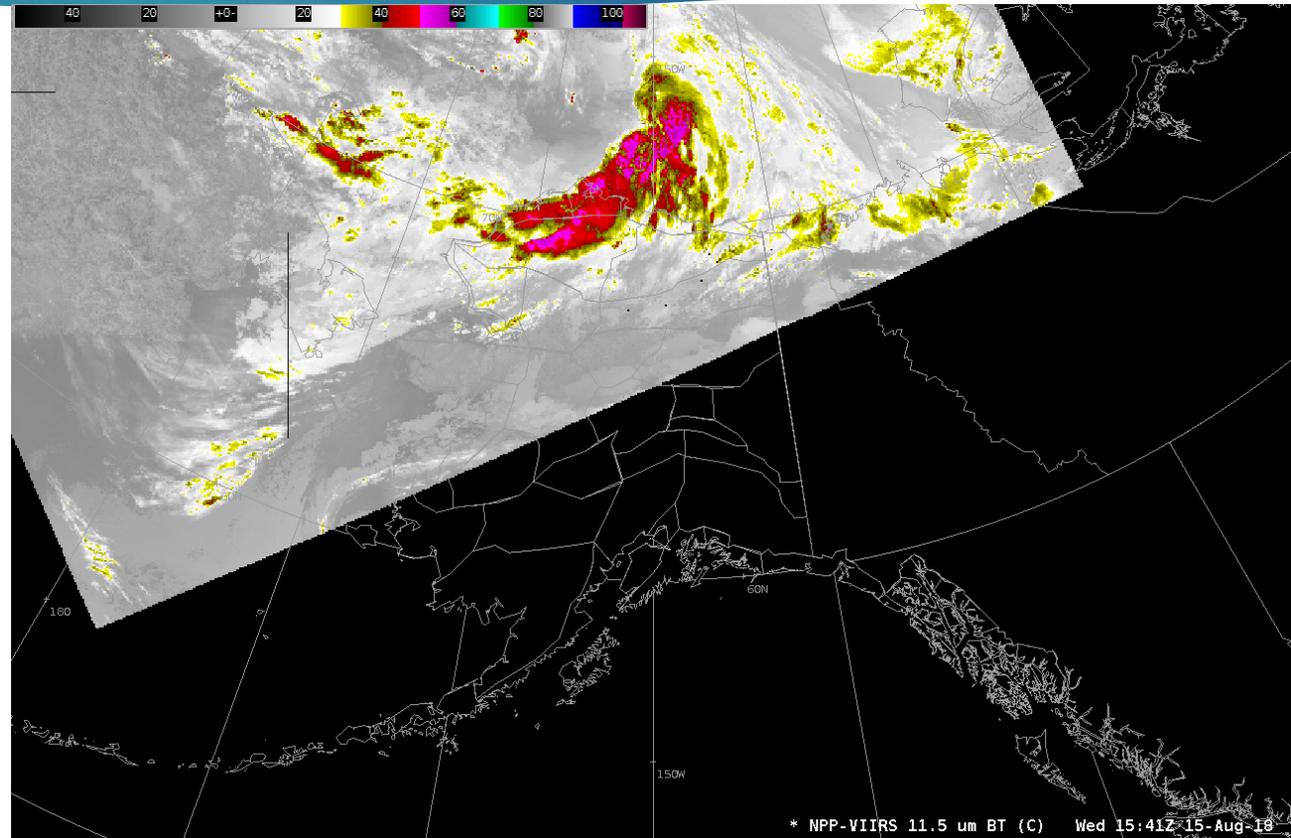
N-20 Products Currently Received at NWS

- ▶ Single Bands
- ▶ RGBs generated on AWIPS client
- ▶ River Flood (Sanmei Li)
- ▶ GeoTiff imagery for GIS (ASIP, RFC)
- ▶ NUCAPS*

** Recently fixed problem with long processing times*

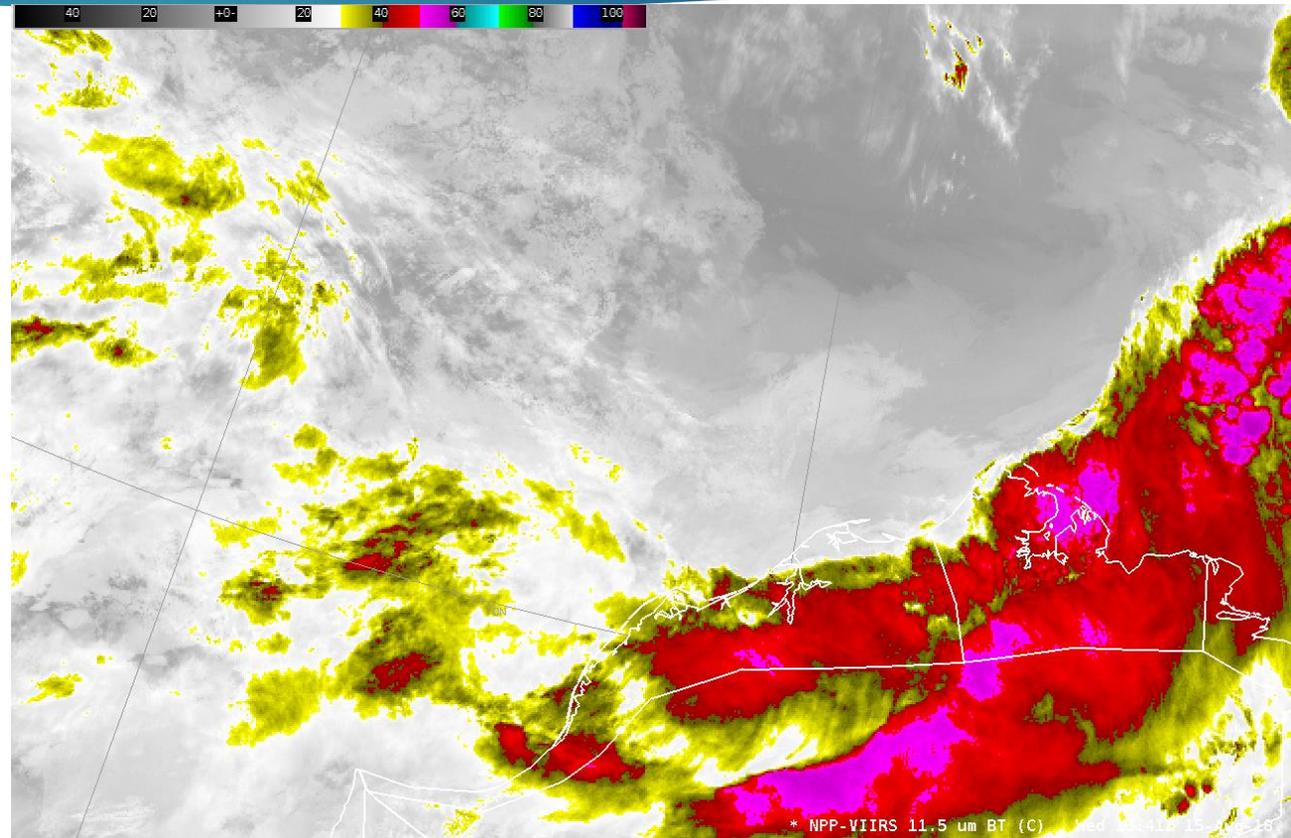
NOAA-20 & SNPP - Double Image Frequency

- Two satellite combination doubles image coverage over Alaska
- Northern Alaska - around 18 passes per day.
- Southern Alaska - 3-4 early morning and 3-4 afternoon passes per day.
- Negligible difference between SNPP and NOAA-20



Consistent Coverage over the Arctic

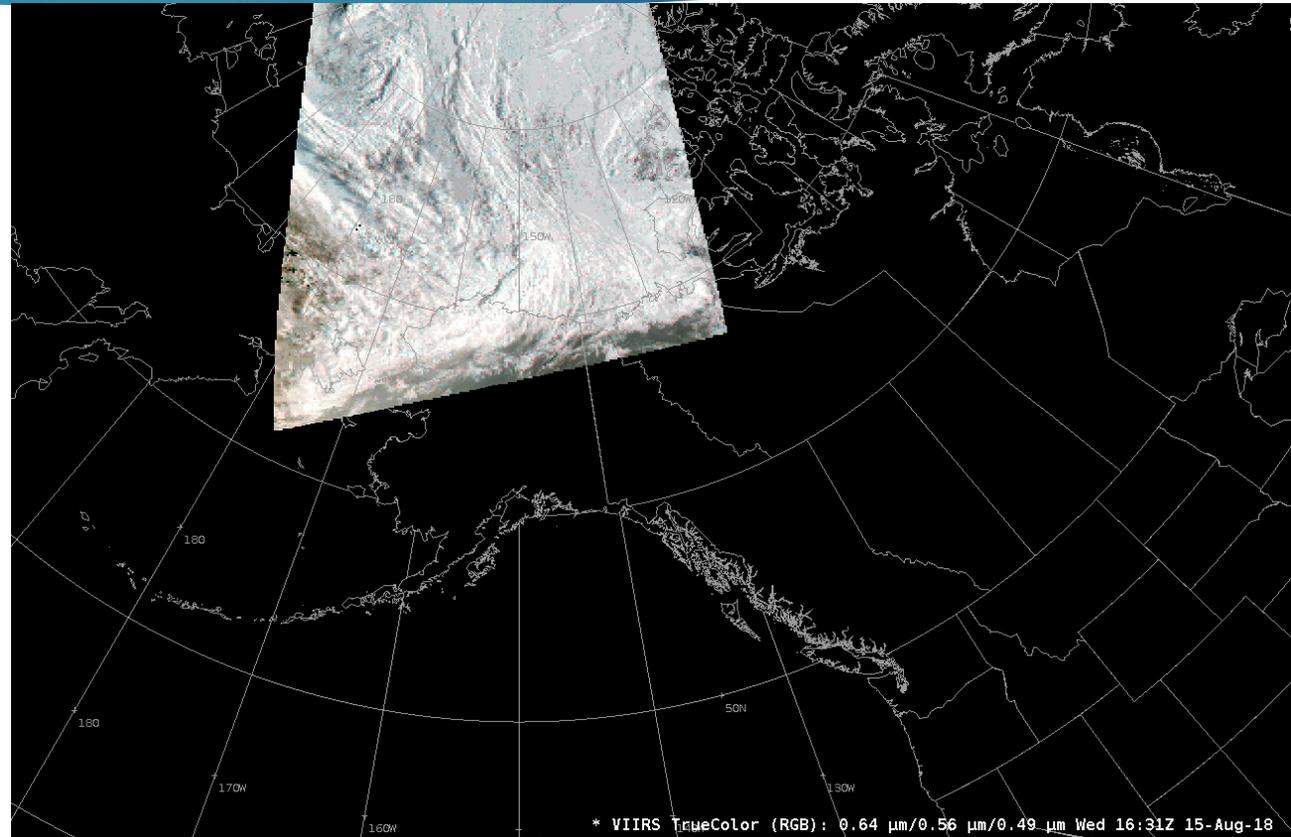
- Nearly continuous coverage over Alaska's northern coast
- Pass frequency ~ 50 min
- I-band resolution 375 m with minimal parallax



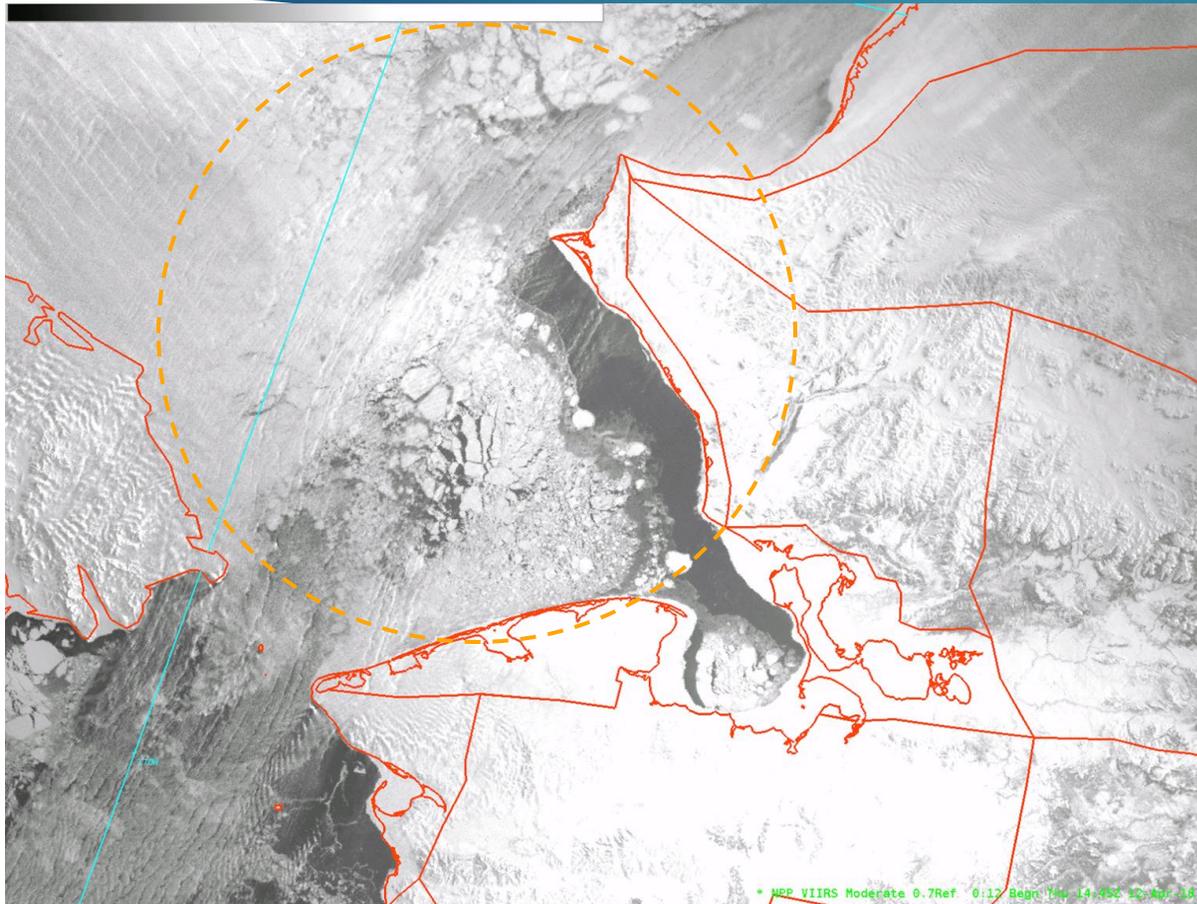
NOAA-20 & SNPP - Double Image Frequency

- Good daytime coverage of reflectance channels
- Improved support for Fire weather and Sea Ice programs

**TrueColor RGB: Red=0.64 μm
Green=0.56 μm Blue=0.49 μm**



NOAA-20 DNB Imagery



Tracking sea ice movement:

April 12, 2018

14:45z

16:25z

18:01z

19:37z

21:22z

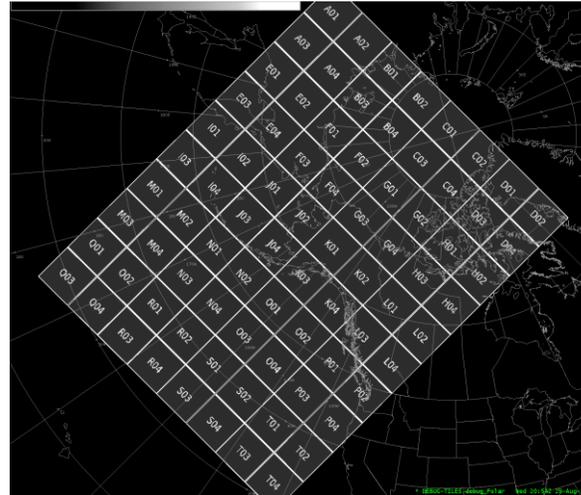
23:00z

Melissa Kreller (WFO Fairbanks)
@JPSS Arctic Summit May 8

Conversion to SCMI Tile Format

Benefits

- ▶ Full Resolution & precision (375m/750m)
- ▶ Previous “regionalsat” format restricted to 1 km and 8-bit unsigned chars.
- ▶ Same ingest process as GOES-R series
- ▶ Only tiles with data are distributed
- ▶ Provided to the NWS late June



Challenges

- ▶ Larger data files (1.5-2.0 GB per pass)
- ▶ More demand on Bandwidth
- ▶ Somewhat longer processing, delivery & display times.

Satellite Data Volume (AWIPS only)

SCMI Tiles

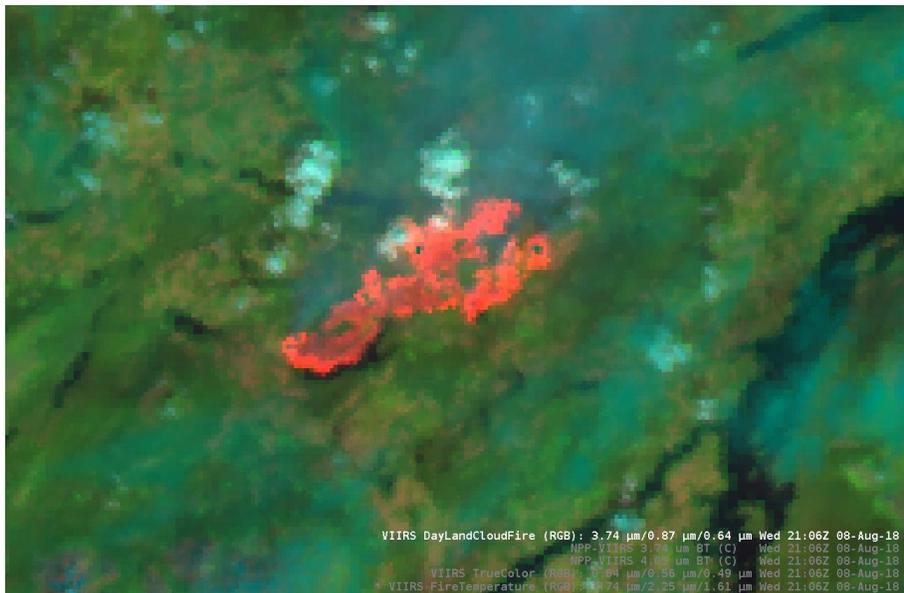
Avg File Size (MB)	Num Products	Week	Avg Daily Volume (GB)
1.82	212288	31	54.17
1.80	211100	32	53.13
1.75	14327	33	35.02 *

Regionalsat

Avg File Size (MB)	Num Products	Week	Avg Daily Volume (GB)
4.56	9259	31	5.90
4.38	9281	32	5.68
4.42	6332	33	3.91 (*)

SCMI vs Regionalsat Formats

DayLandCloudFire RGB - SCMI



375 m resolution

DayLandCloudFire RGB*: Red=3.74 μm Green=0.87 μm Blue=0.64 μm

*** Also called: NaturalFireColor RGB**

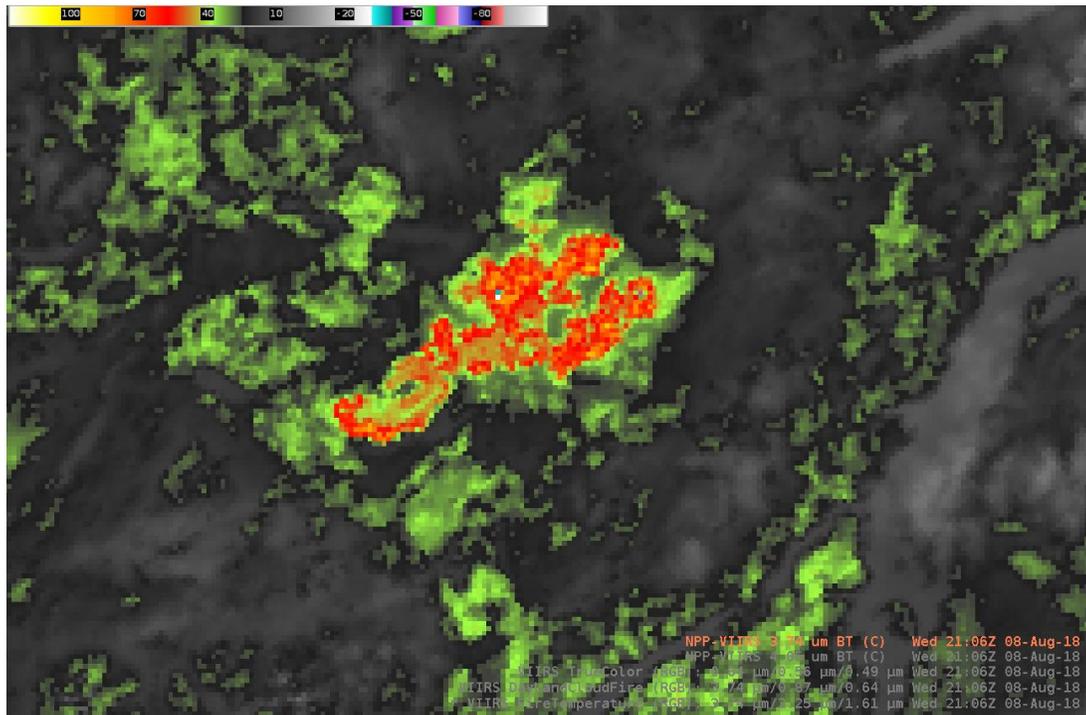
DayLandCloudFire RGB - Regionalsat



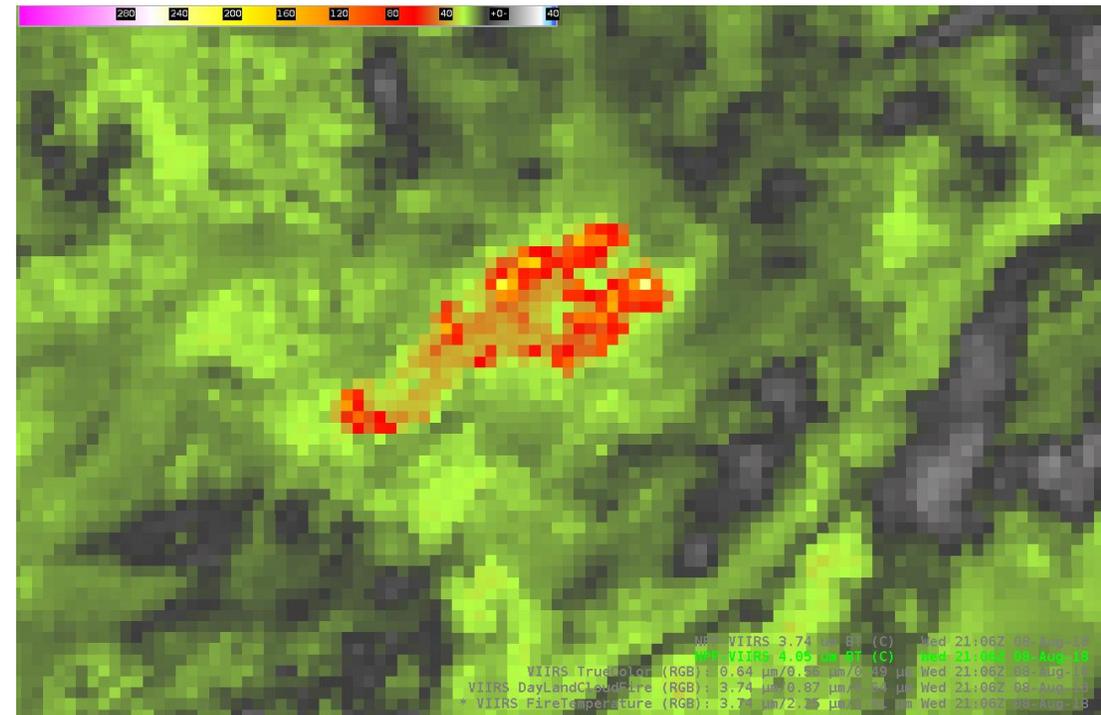
1 km resolution

VIIRS in the 2018 Fire Season

~~NOMAP-202017100808~~ **Aug 29 2018**



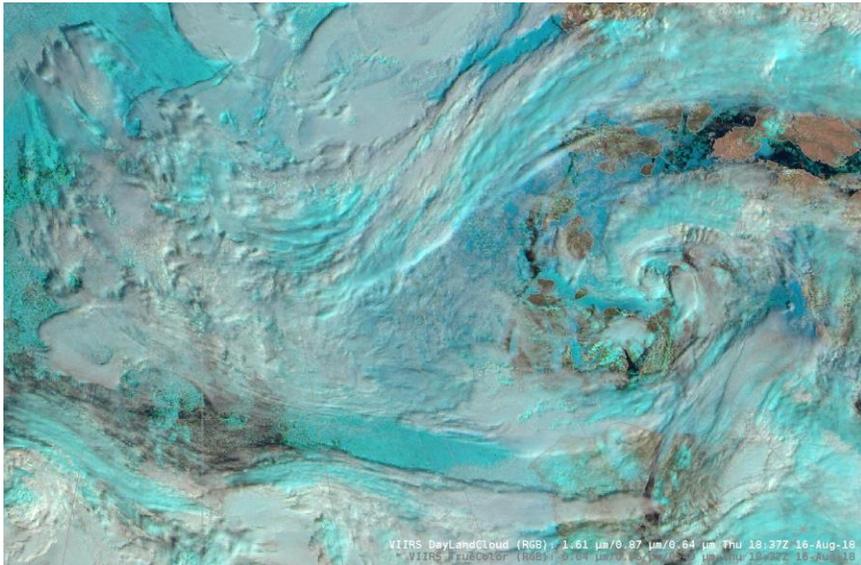
VIIRS I04 (3.74 μm)



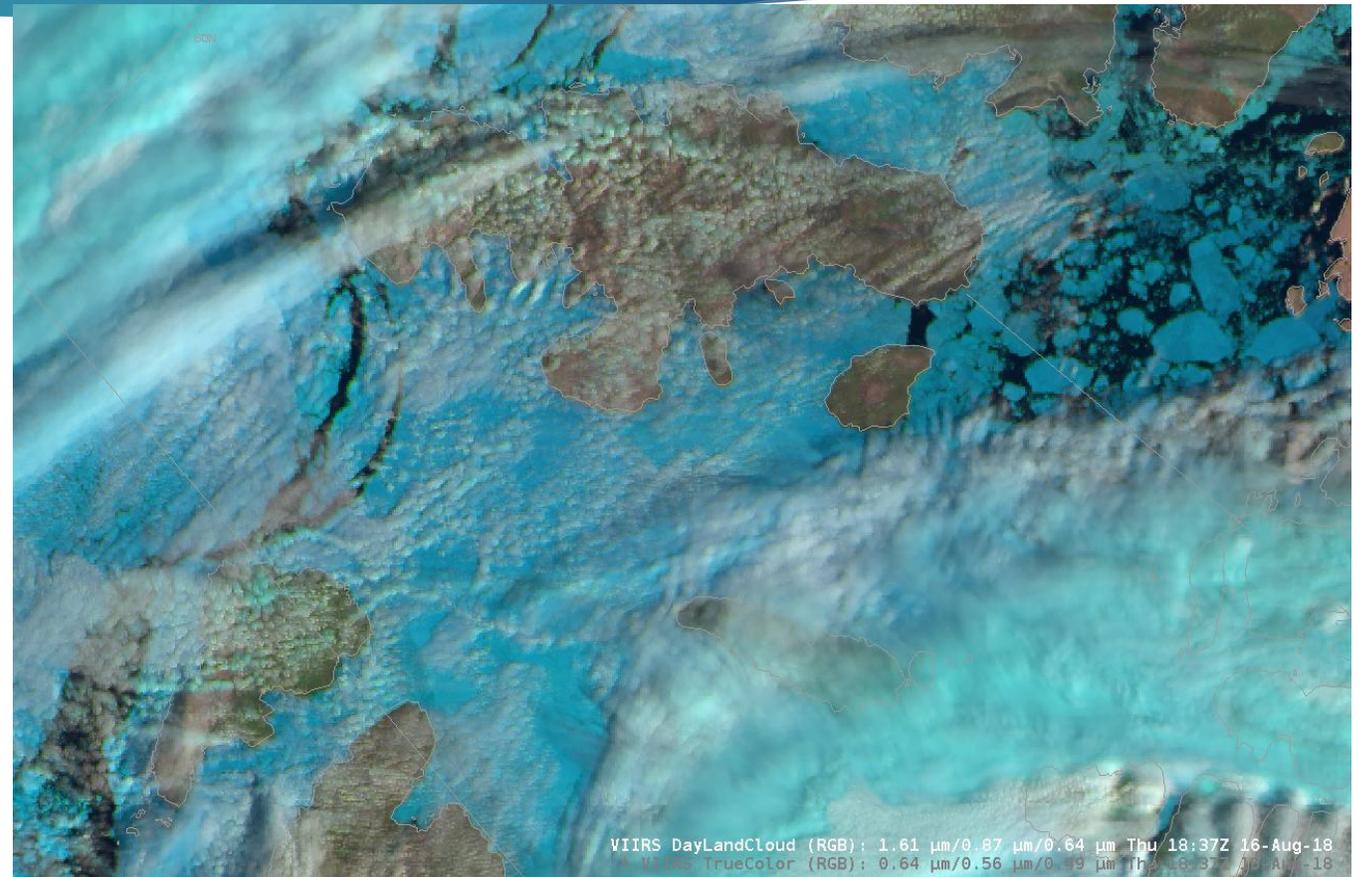
VIIRS M13 (4.05 μm)

VIIRS on Ice: DayLandCloud RGB

16 Aug 2018 (Banks Is. Prince Patrick Is.)
1750z SNPP / 1837z N-20

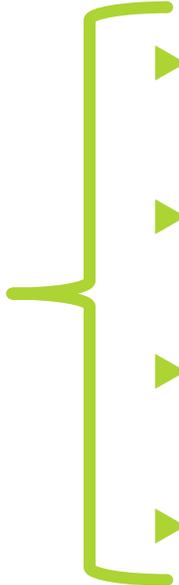


DayLandCloud RGB (or Natural Color RGB):
Red=1.61 μm Green=0.87 μm Blue=0.64 μm

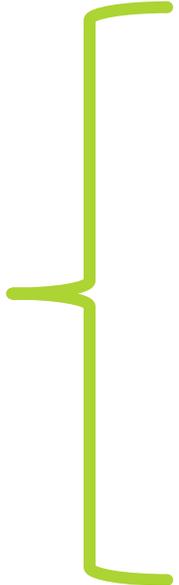


Support/Partnership for CI Development

- ▶ CIMSS:
 - ▶ River Flood and River Ice Products
 - ▶ Volcanic Ash Products
 - ▶ Low stratus and fog
- ▶ SPoRT:
 - ▶ Limb and Bias corrected RGBs
 - ▶ Gridded NUCAPS
- ▶ CIRA:
 - ▶ FireTemperature RGB & DayLandCloudFire RGBs
 - ▶ SnowCloud Discriminator

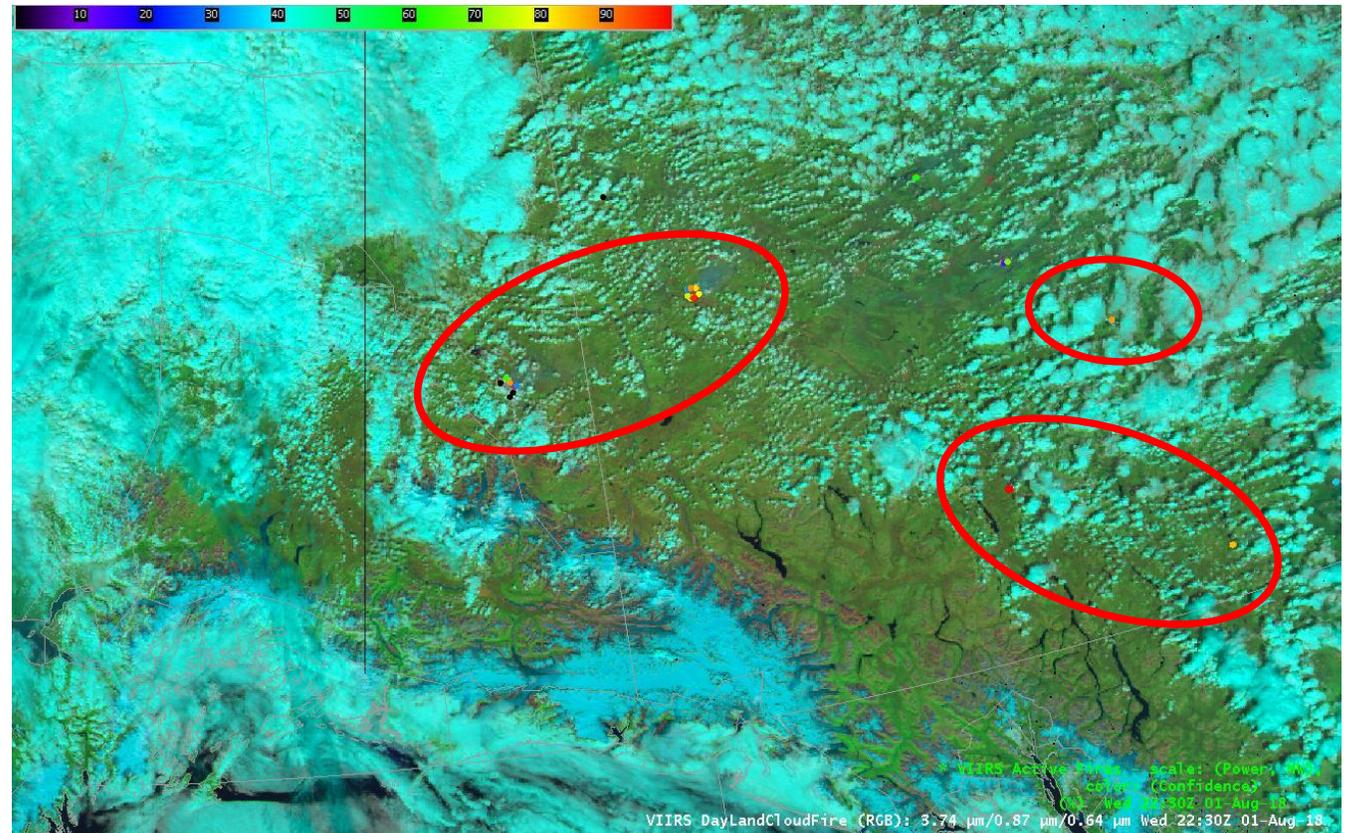
- 
- ▶ Direct Broadcast Data
 - ▶ Servers, Virtual Machines (VM)
 - ▶ Processing & Distribution
 - ▶ Support

Support for JPSS Product Evaluations

- ▶ Arctic Initiative Demonstration project
 - ▶ April 2018
 - ▶ Evaluation of Sea ice products (Concentration, Thickness, Temperature, Motion)
 - ▶ Aviation Initiative: Cloud Products Demonstration project
 - ▶ Planned for Sep or Oct
 - ▶ CLAVR-x cloud products
- 
- ▶ Direct Broadcast Data
 - ▶ Servers, Virtual Machines (VM)
 - ▶ Processing and distribution
 - ▶ Support

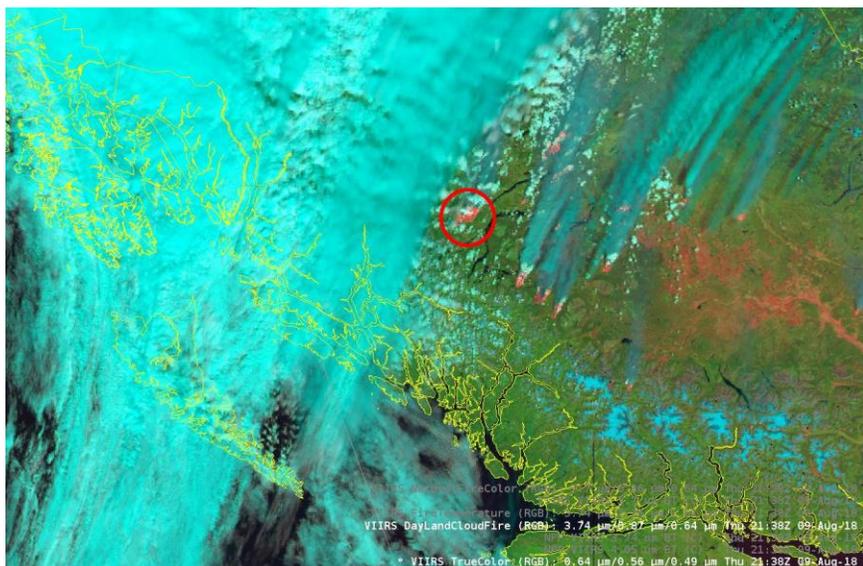
Active Fire Points

- ▶ Previously used NASA DRL software (requested by AFS)
- ▶ VIIRS Fire Point are now displayable in AWIPS
- ▶ GINA is converting to NOAA NDE Active Fire for processing

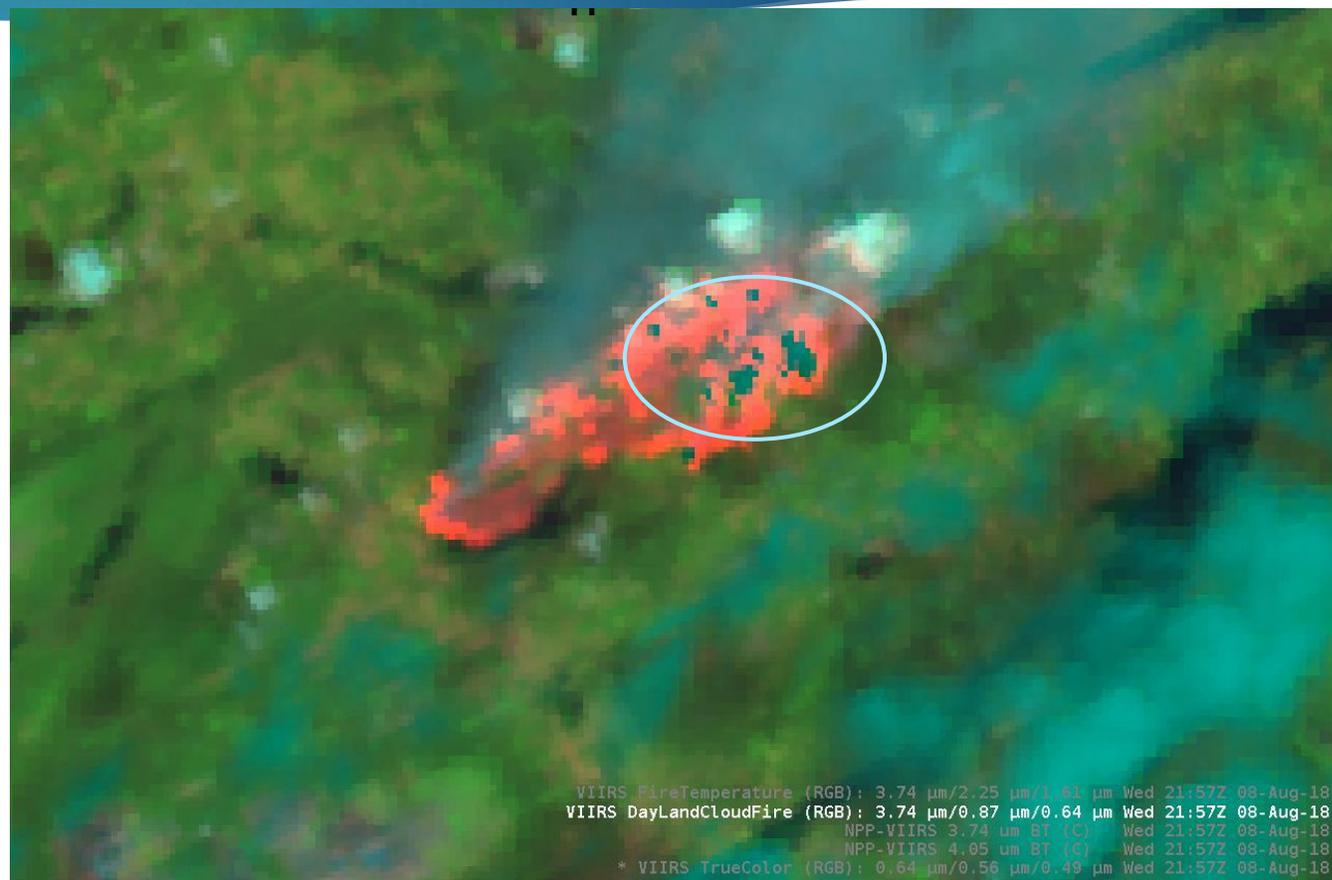


VIIRS in the 2018 Fire Season

08 Aug 2018
2017z SNPP / 2106z N20 / 2157z SNPP

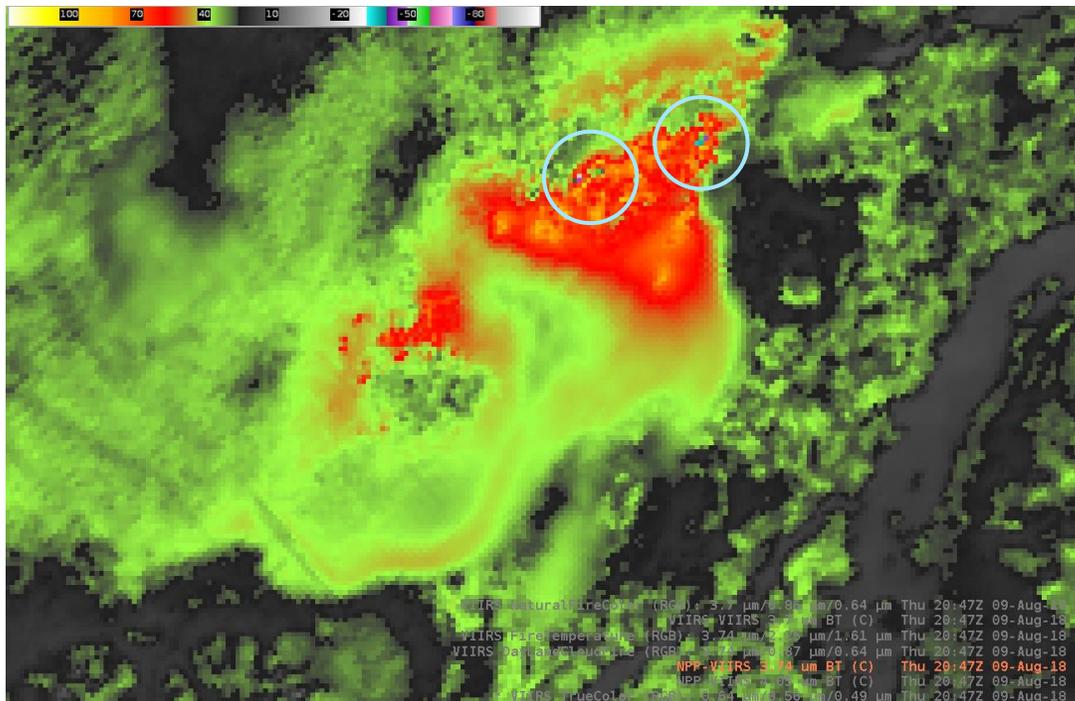


DayLandCloudFire RGB Recipe:
Red=3.74 μm Green=0.87 μm Blue=0.64 μm



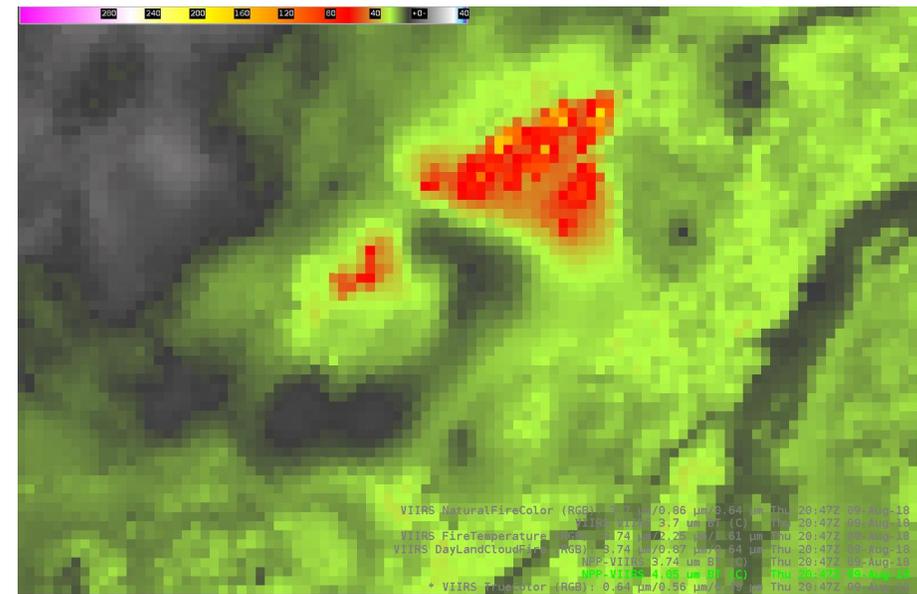
Sensor Saturation from Intense Fires

N-20 VIIRS I04 (3.74 μm) – 2047z 09 Aug 2018



Sensor Max 94 deg C

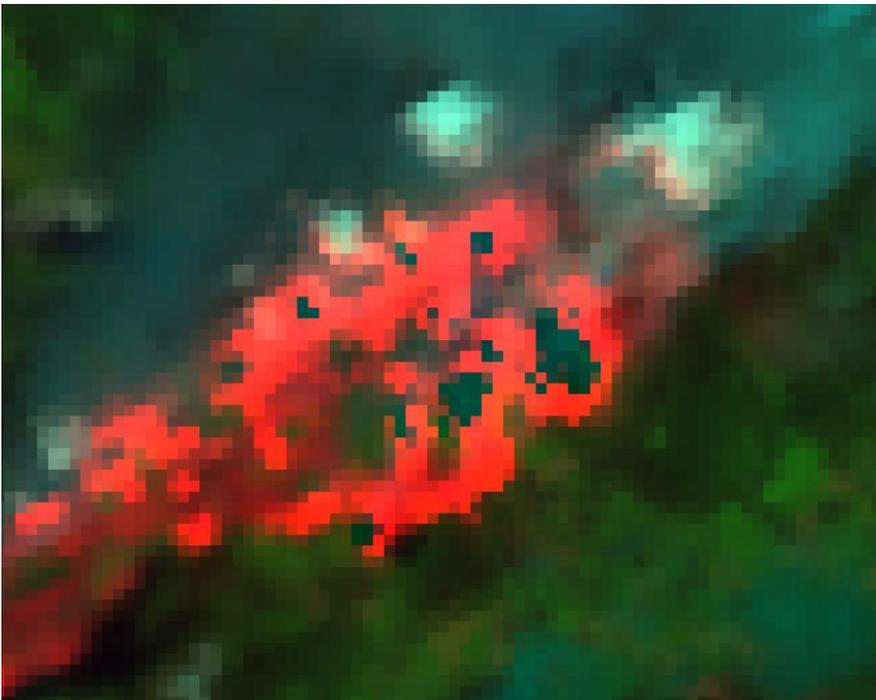
N-20 VIIRS M13 (4.05 μm) – 2047z 09 Aug 2018



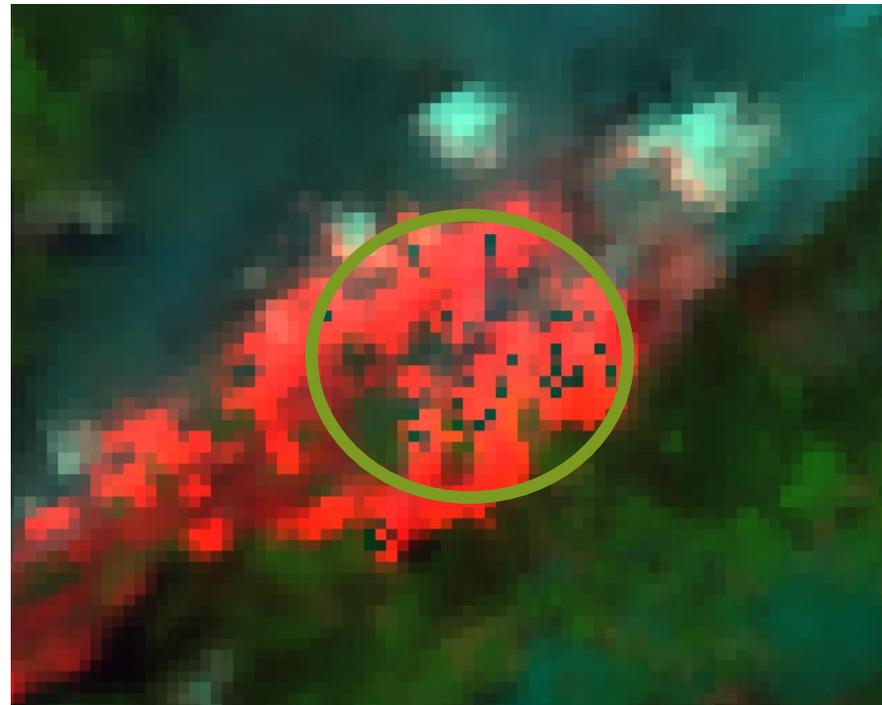
Sensor Max 360 deg C

VIIRS I04 Band Saturation Correction

DayLandCloudFire (3.74 μ m) – 2157z 08 Aug 2018



Uncorrected



Correction: Where I04 band < 0 and M13 band > 50

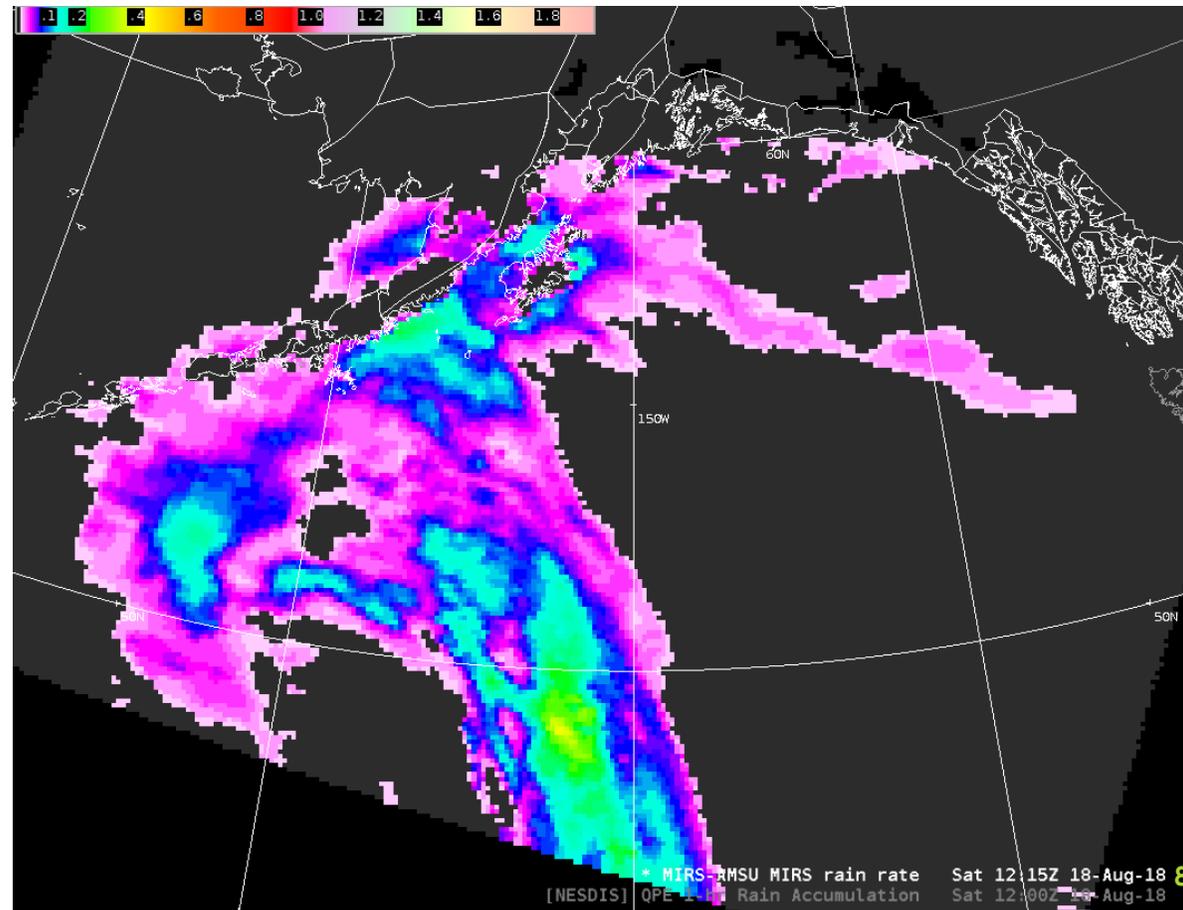
A few pixels still not being corrected.

Possibly due to SCMI reprojection.

MIRS

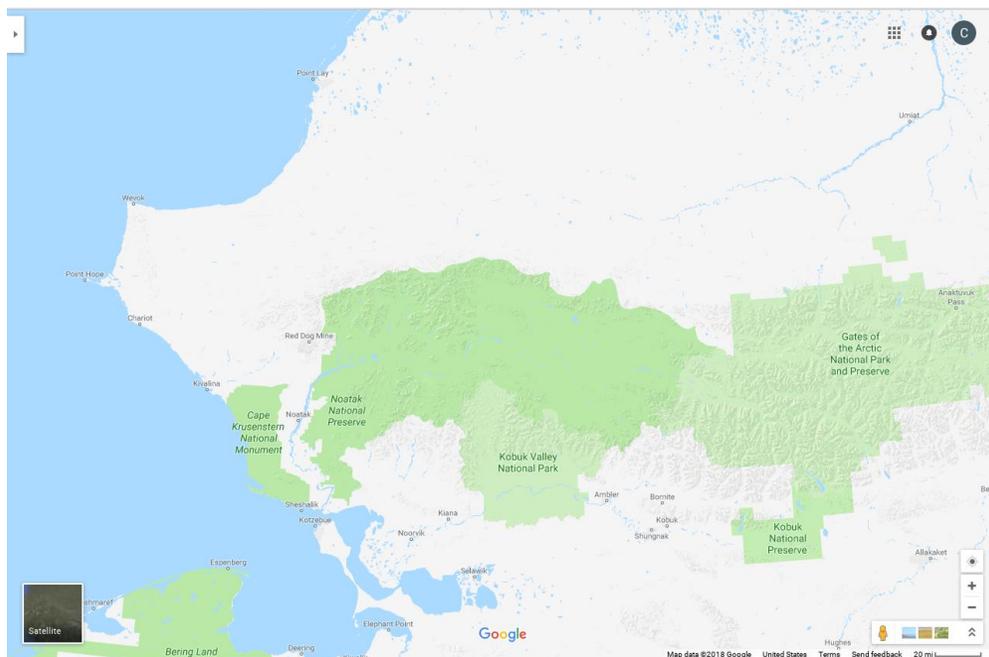
MIRS Products

- Rain Rate
- Total Precipitable Water (TPW)
- Cloud Liquid Water (CLW)
- Snow Water Equivalent (SWE)
- Sea Ice Concentration

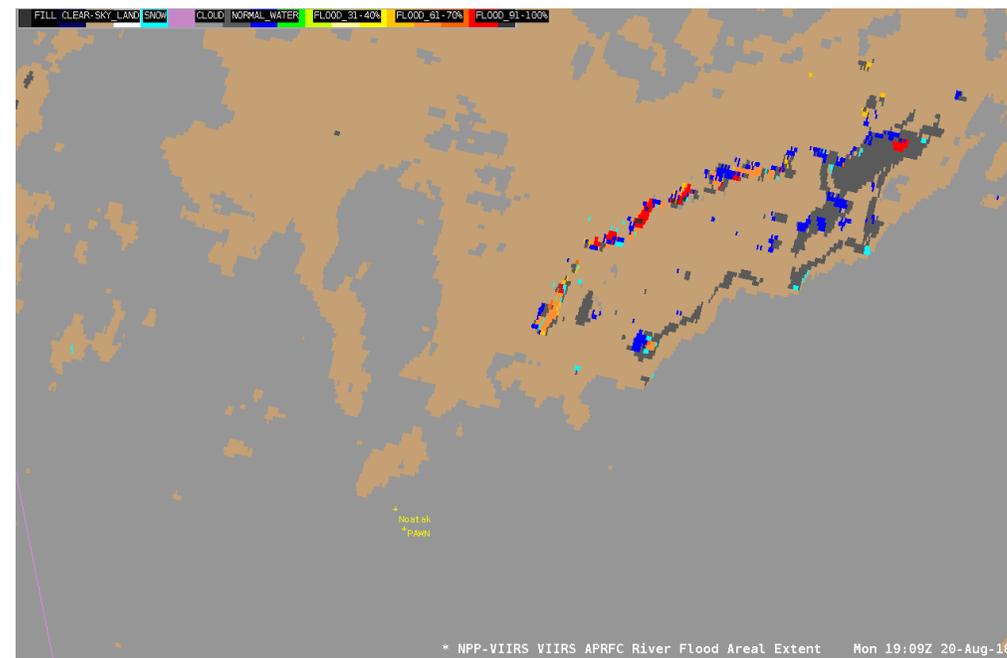


VIIRS River Flood Product

Sanmei Li (GMU) & Jay Hoffman (CIMSS)

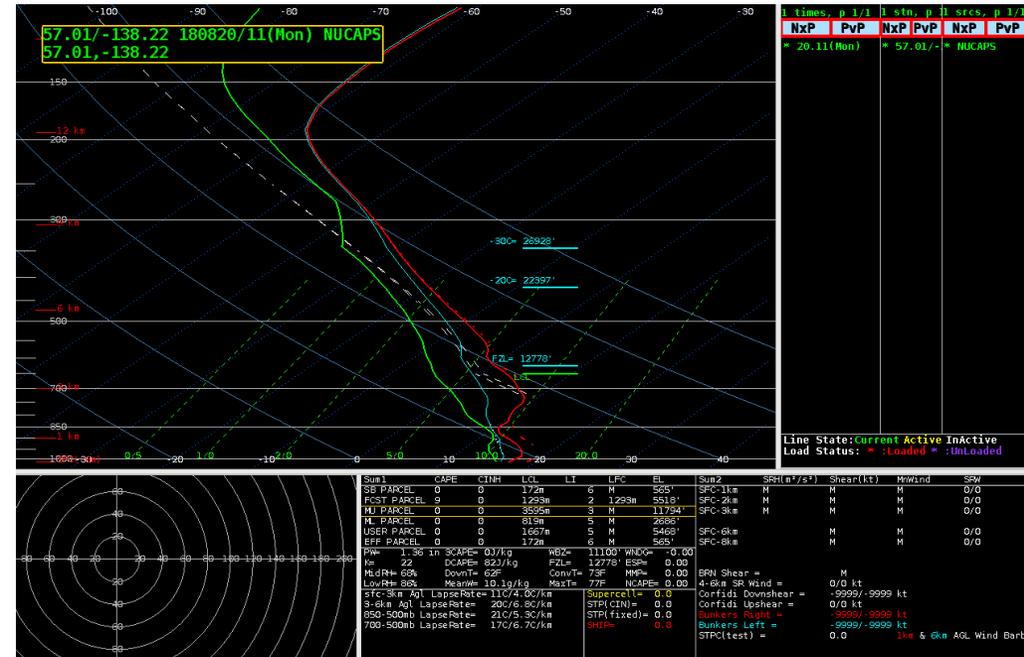
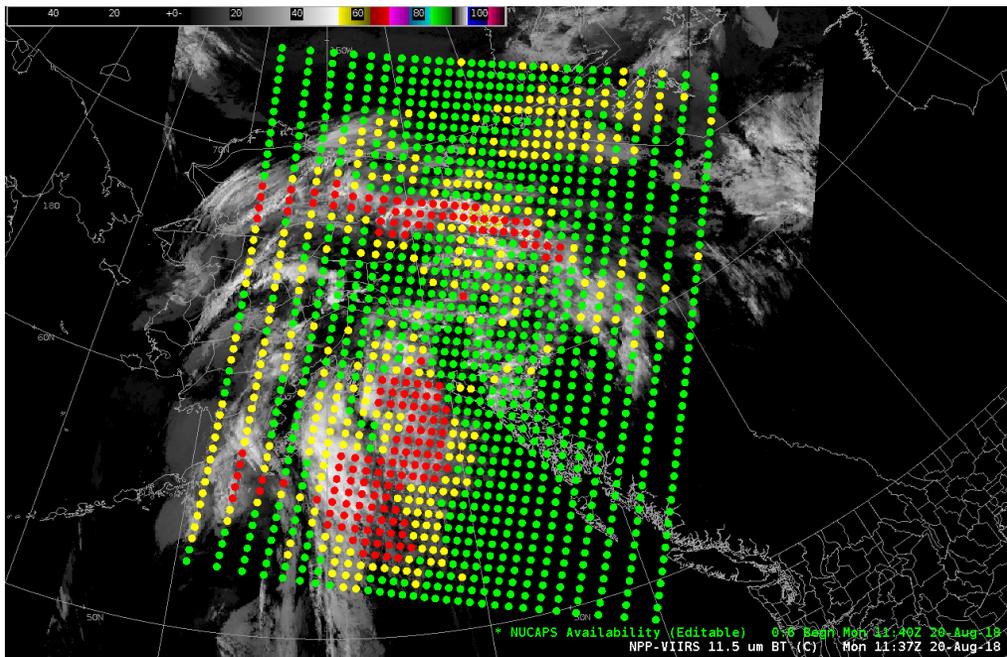


Noatak River – Noatak National Reserve



20 Aug 2018: SNPP 1821z / N20 1909z

CSPP NUCAPS



SNPP NUCAPS from CSPP - 1140z 20 Aug 2018

Processing time problem recently fixed

Future Plans

- ▶ Expand NOAA-20 products:
 - ▶ MiRS Microwave
 - ▶ River Ice Products (CCNY)
 - ▶ VIIRS Active Fire Points (I&M band)
- ▶ Distribute ACSPO SST products
- ▶ Evaluate CLAVR-x: JPSS Cloud Products Demonstration - Fall 2018