GLIMPSING THE FIRST PRODUCTS FROM VIIRS

Thomas F. Lee
Jeffrey Hawkins
Arunas Kuciauskas
Kim Richardson
Jeremy Solbrig

Naval Research Laboratory
Monterey CA

Steven D. Miller

Cooperative Institute for Research in the Atmosphere
Ft. Collins Colorado

NPP Visible Infrared Imaging Radiometer Suite (VIIRS)

0130, 1330 local time orbit

“Early afternoon slot”

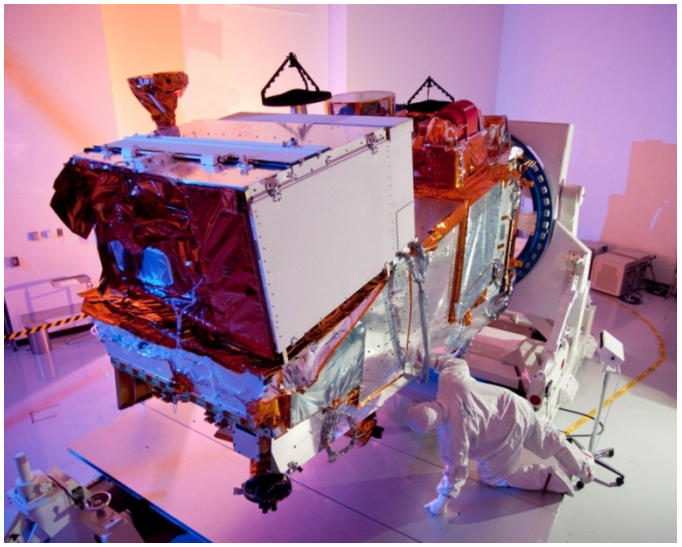
October 28 2011

Credit: NASA

Outline

- Global observations of land, ocean & atmosphere
- Multi-spectral scanning radiometer – 22 channels
- Heritage: Operational and R&D sensors
- Features: Wider swath, higher spatial resolution, constrained pixel growth, many applications.

VIIRS on NPP

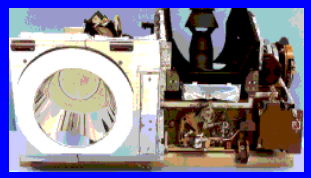


Credit: Ball Aerospace

Heritage Operational and R&D Sensors

Operational Sensors

OLS



- 74 kg
- 2 bands

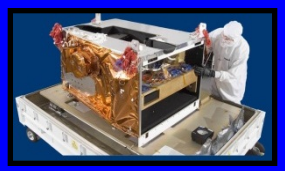
- High Spatial Resolution
- Day/Night Band
- Minimize Resolution Growth Over Scan

- Radiometric Accuracy
- SST Band Continuity

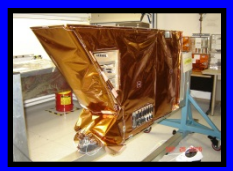
AVHRR

- 33 kg
- 5 bands

VIIRS



OMM



EM

- 275 kg
- 22 bands

R&D Sensors

MODIS

- 220 kg
- 36 bands

- Band Selection/Continuity
- Thin Cirrus Band
- Solar Diffuser
- Earthshine Lessons Learned

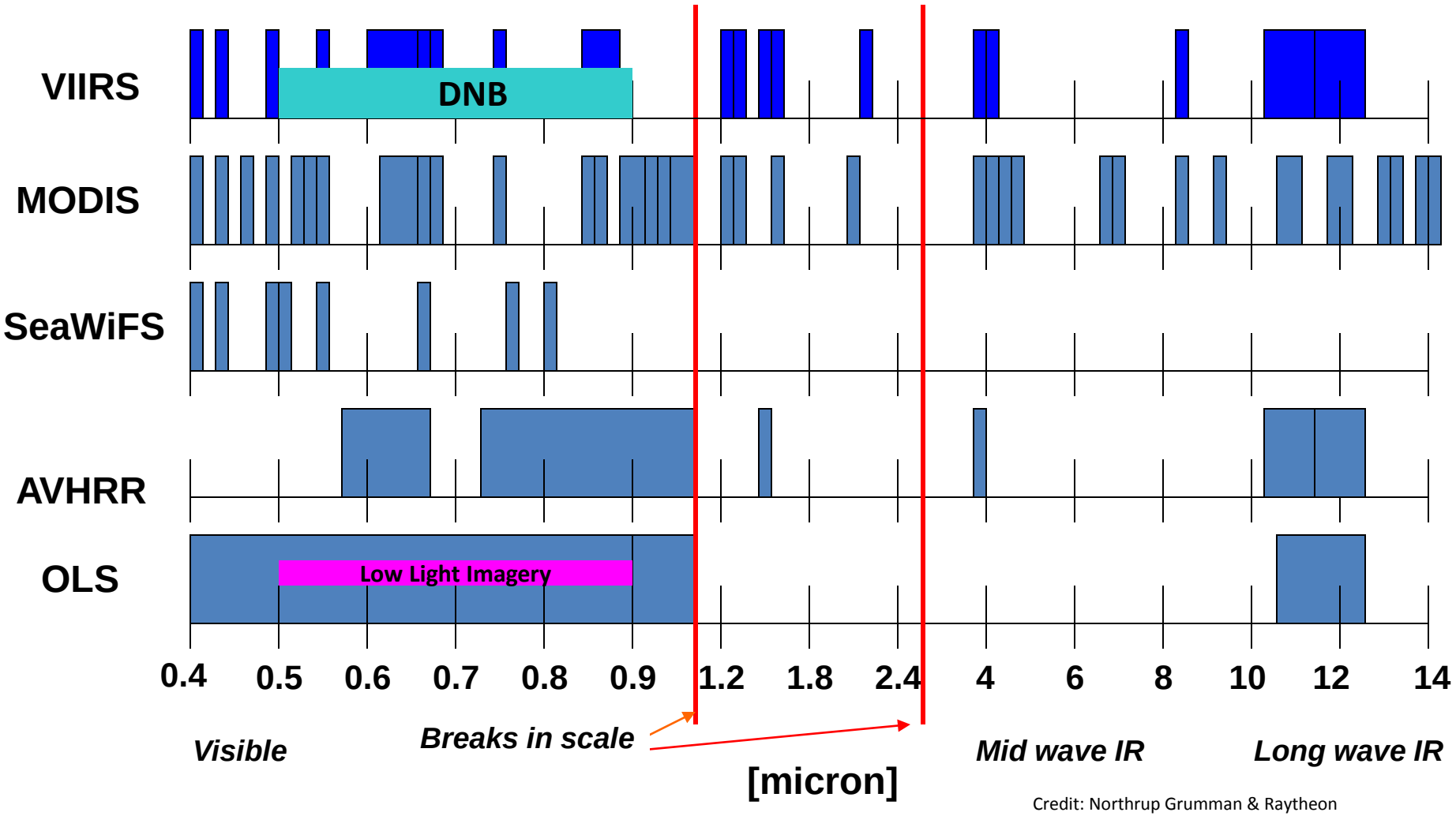
- Ocean Color Bands
- Rotating Telescope

SeaWiFS

- 45 kg
- 8 bands

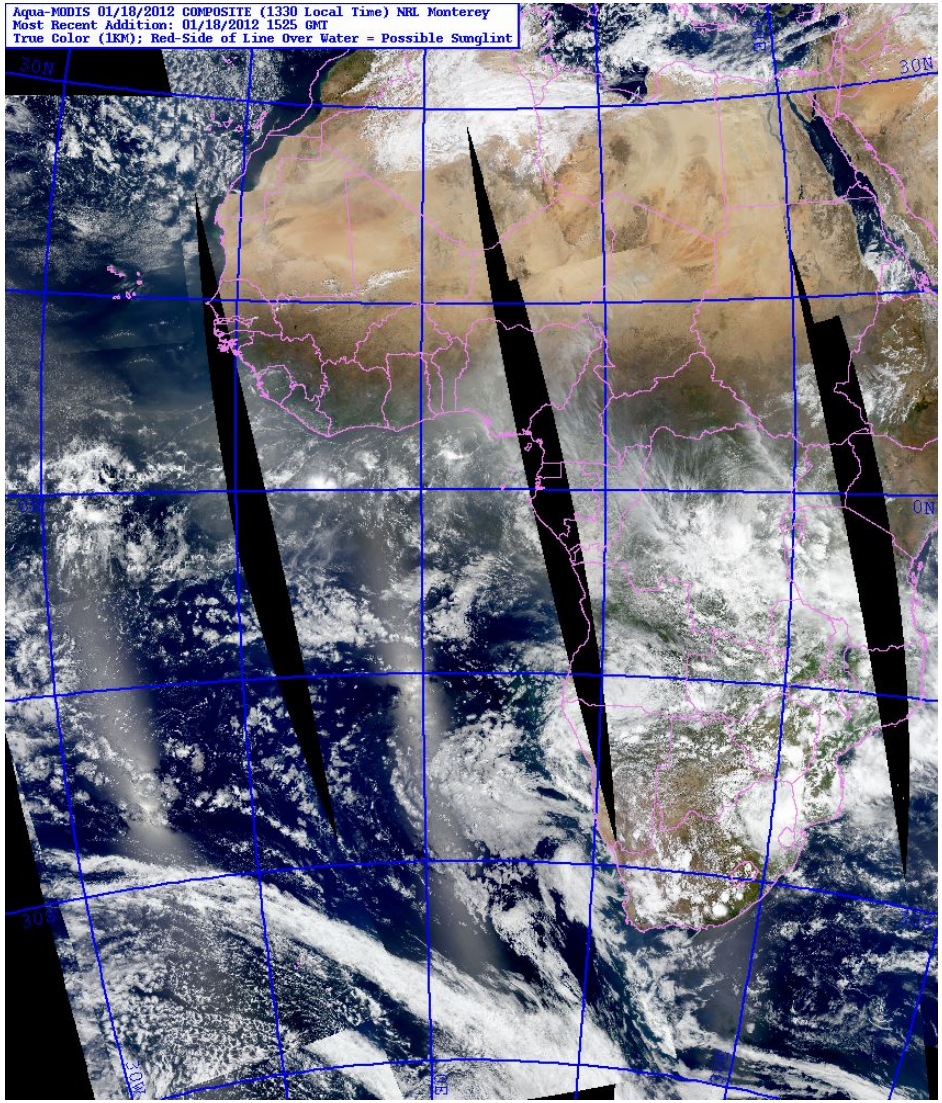
Credit: Northrup Grumman & Raytheon

Heritage Capabilities



Credit: Northrup Grumman & Raytheon

MODIS over Africa

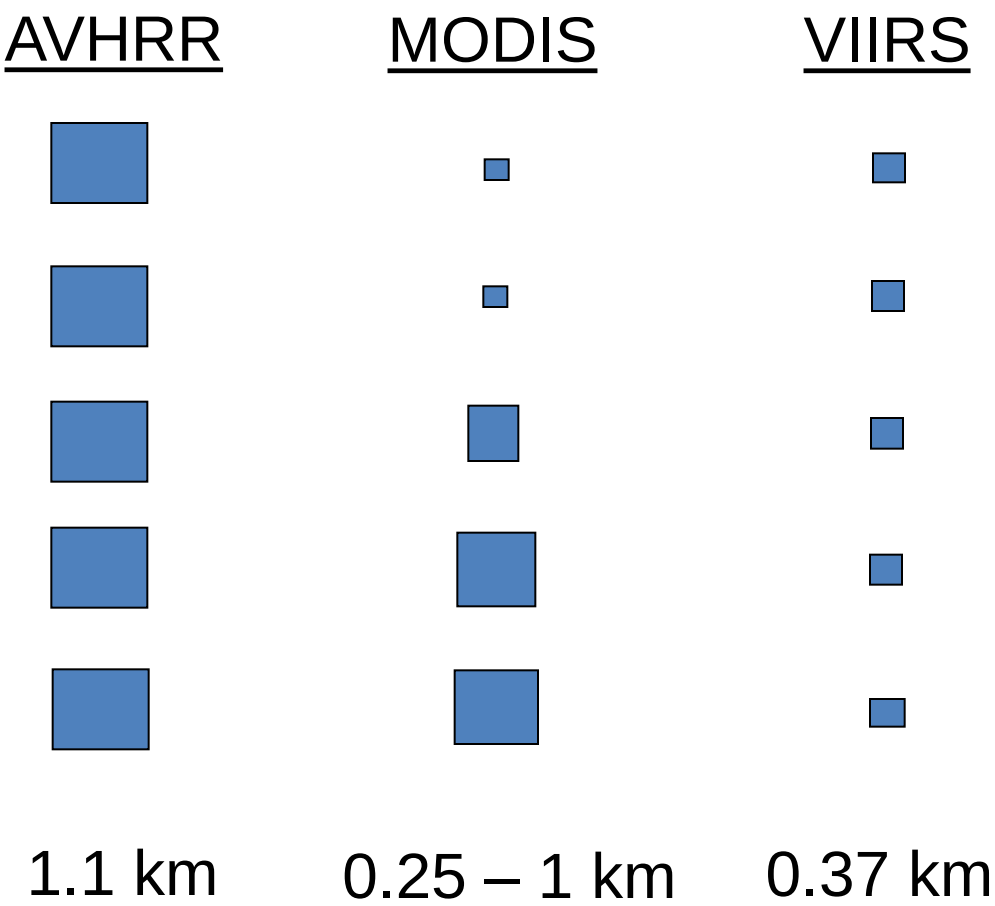


VIIRS First Global View
No Gaps Between Passes

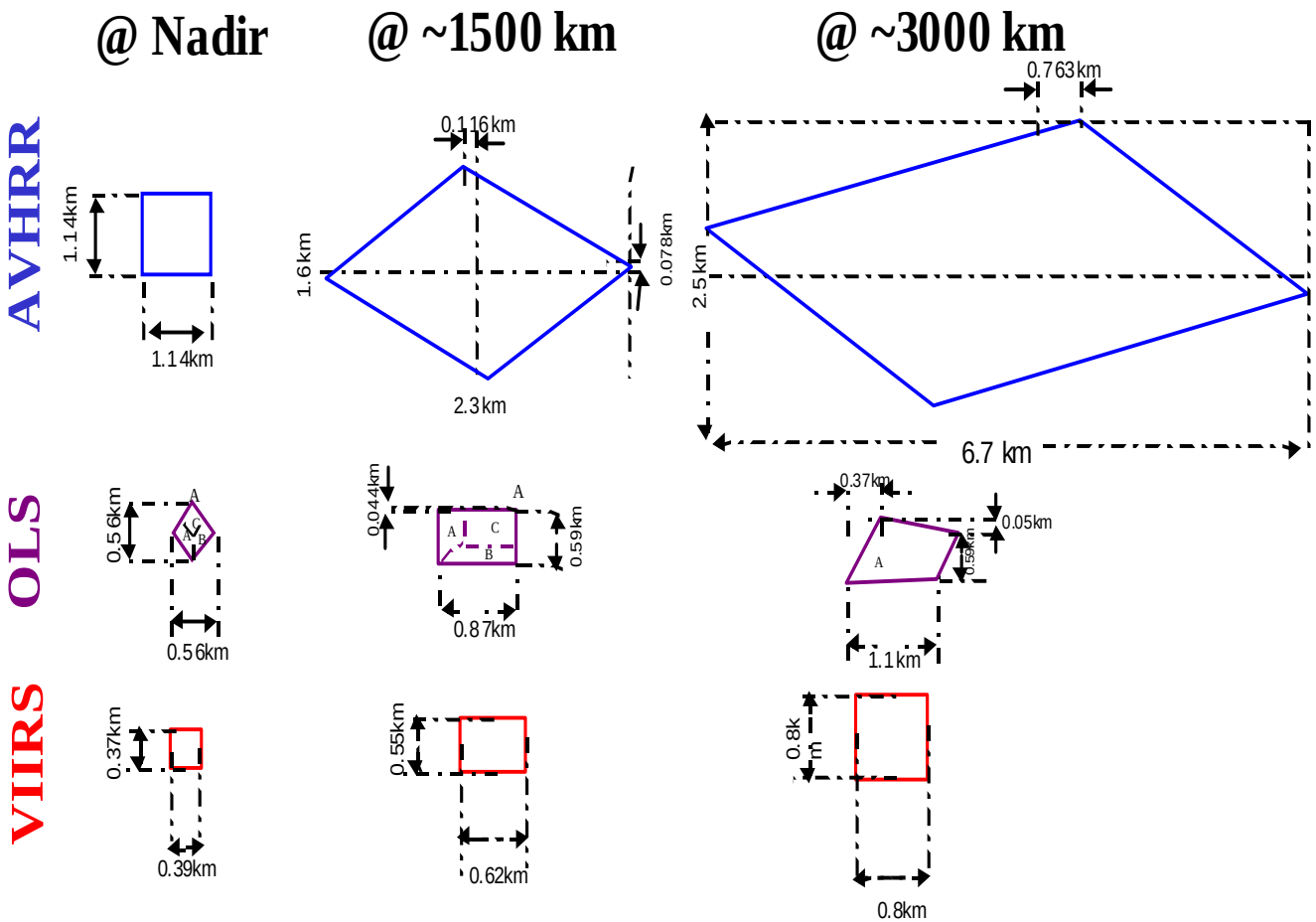
November 24, 2011
Credit: NASA

Comparison of “Imagery” Bands at Nadir

- .63 µm
- .86 µm
- 1.6 µm
- 3.7 µm
- 11.4 µm

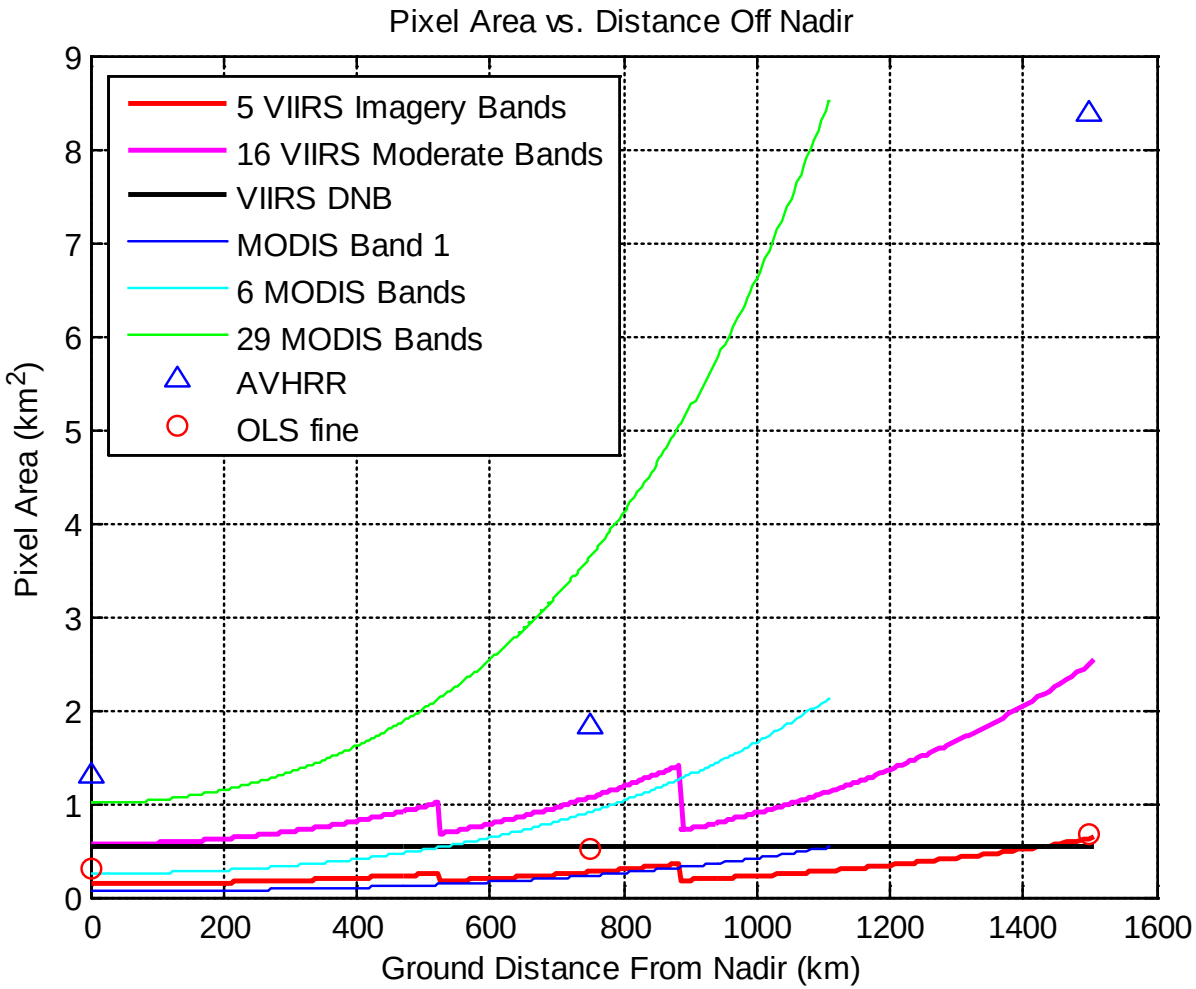


Spatial Resolution Comparisons for VIIRS, AVHRR, and OLS at Nadir and Across Swath



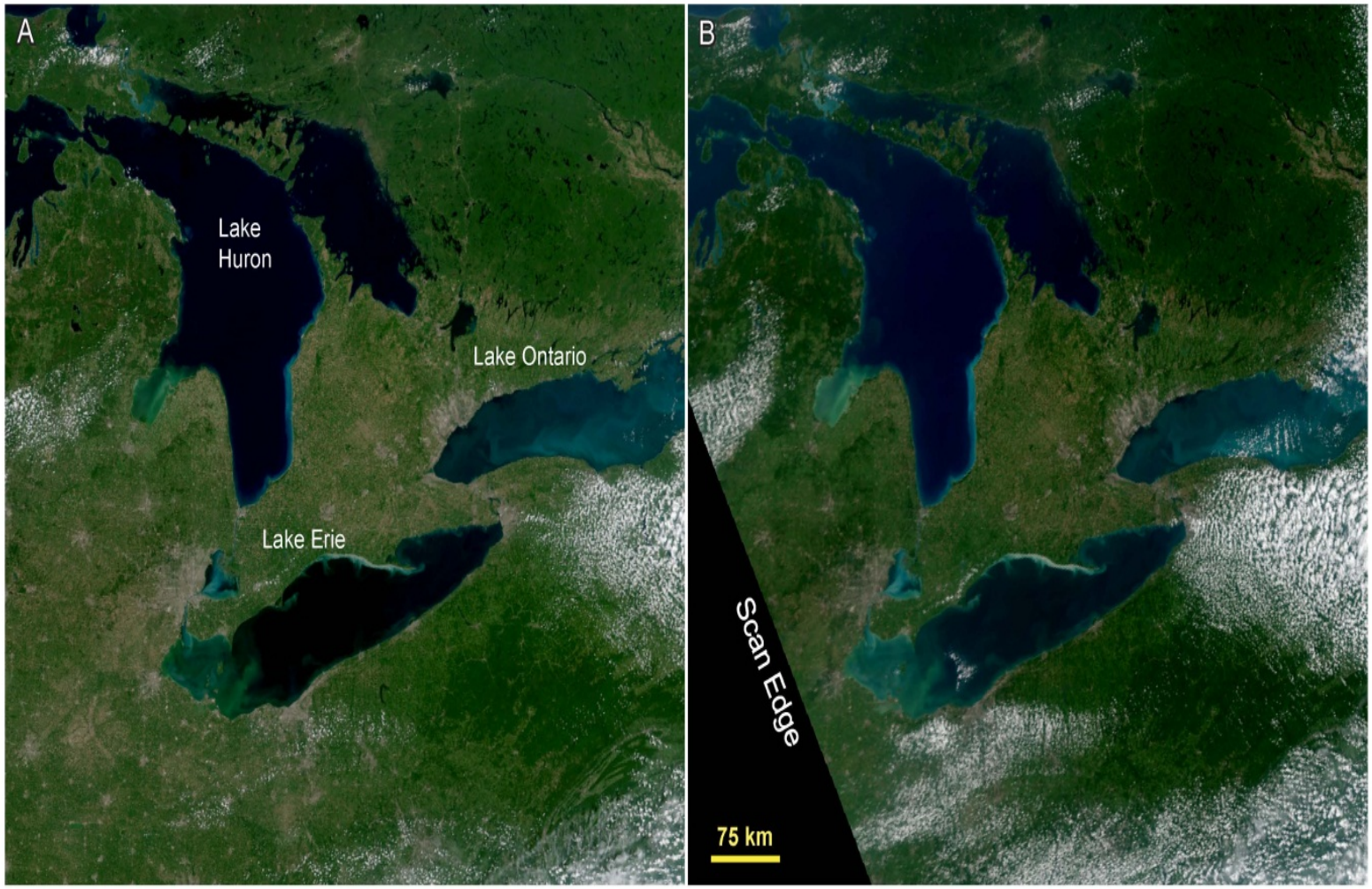
Credit: Northrup Grumman & Raytheon

Spatial Resolution Comparisons for VIIRS, AVHRR, MODIS and OLS at Nadir and Across Swath



Because of aggregation VIIRS has much better resolution away from nadir, pixel area 8 times smaller than AVHRR or MODIS

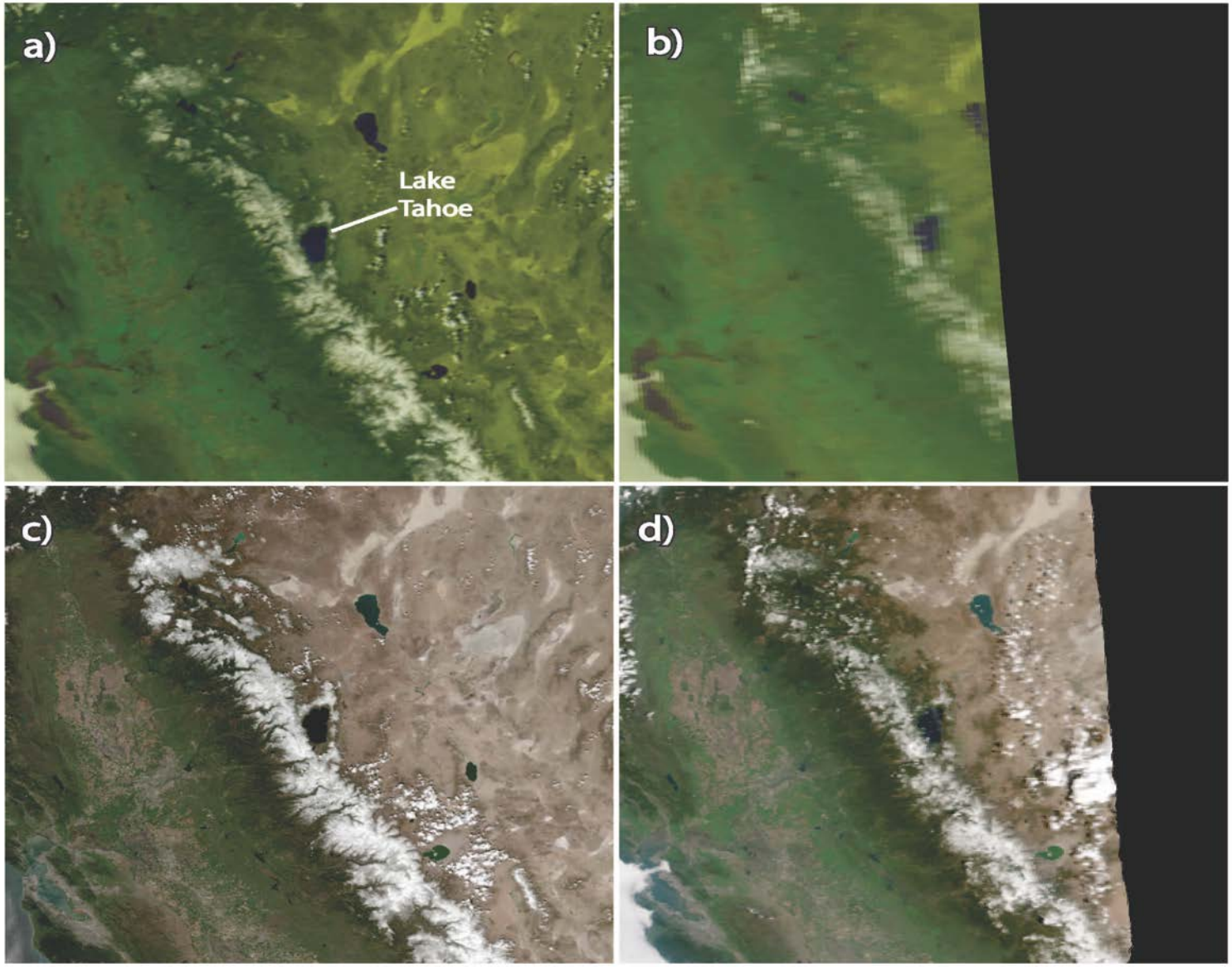
Great Lakes



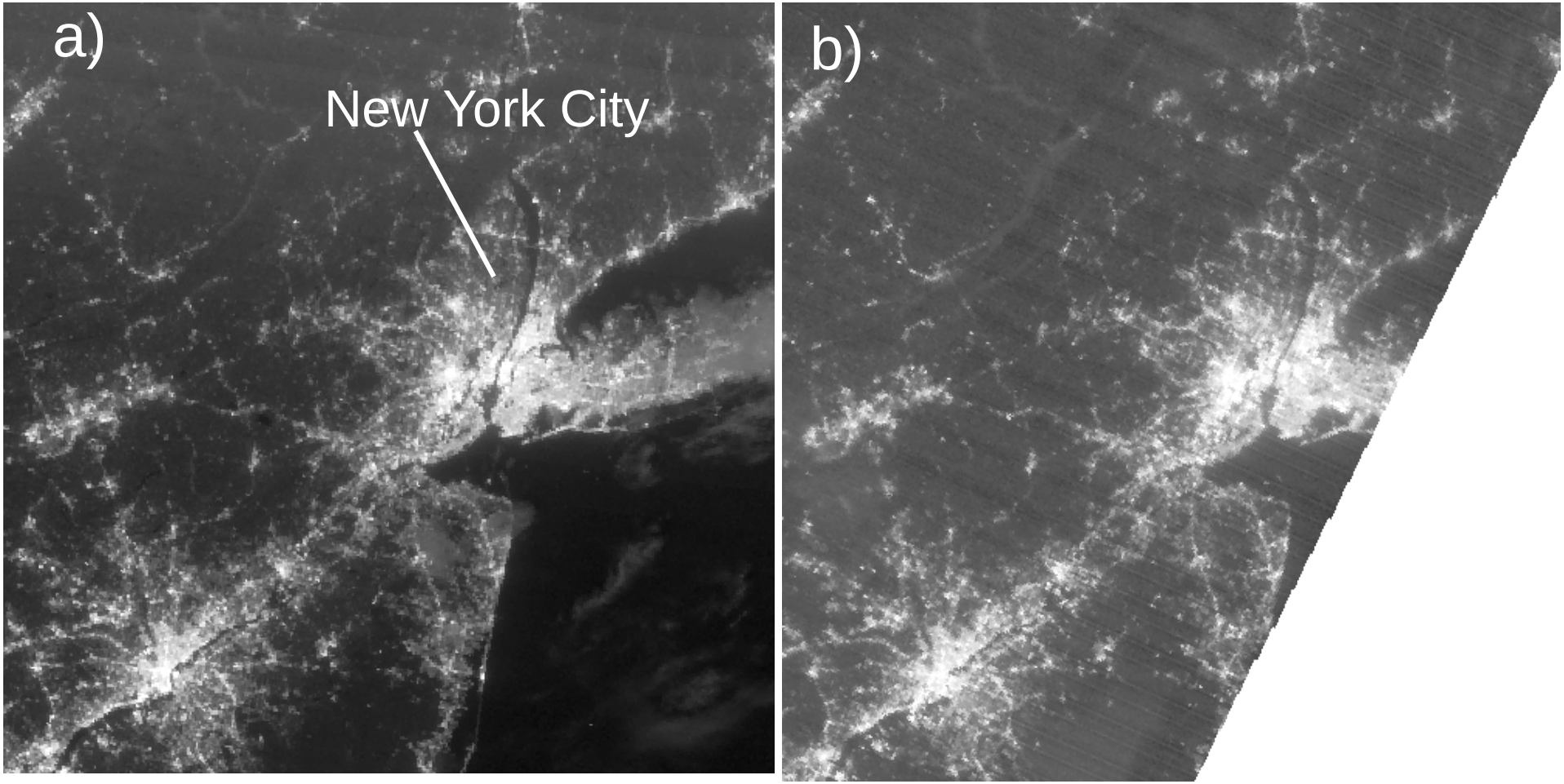
Sierra Nevada

AVHRR

VIIRS



Day/Night Band
No Pixel Expansion

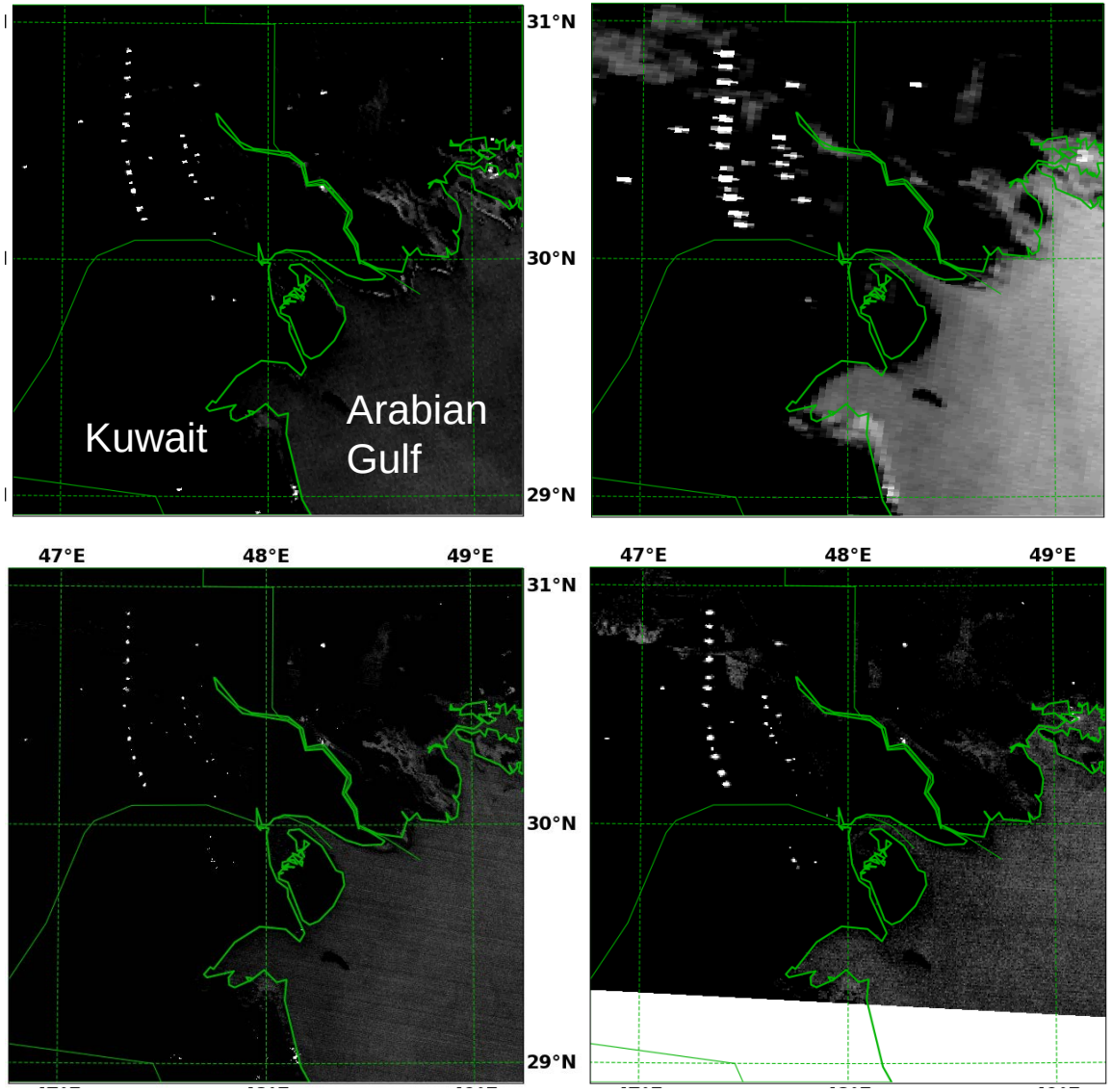


Gas Flares at Night

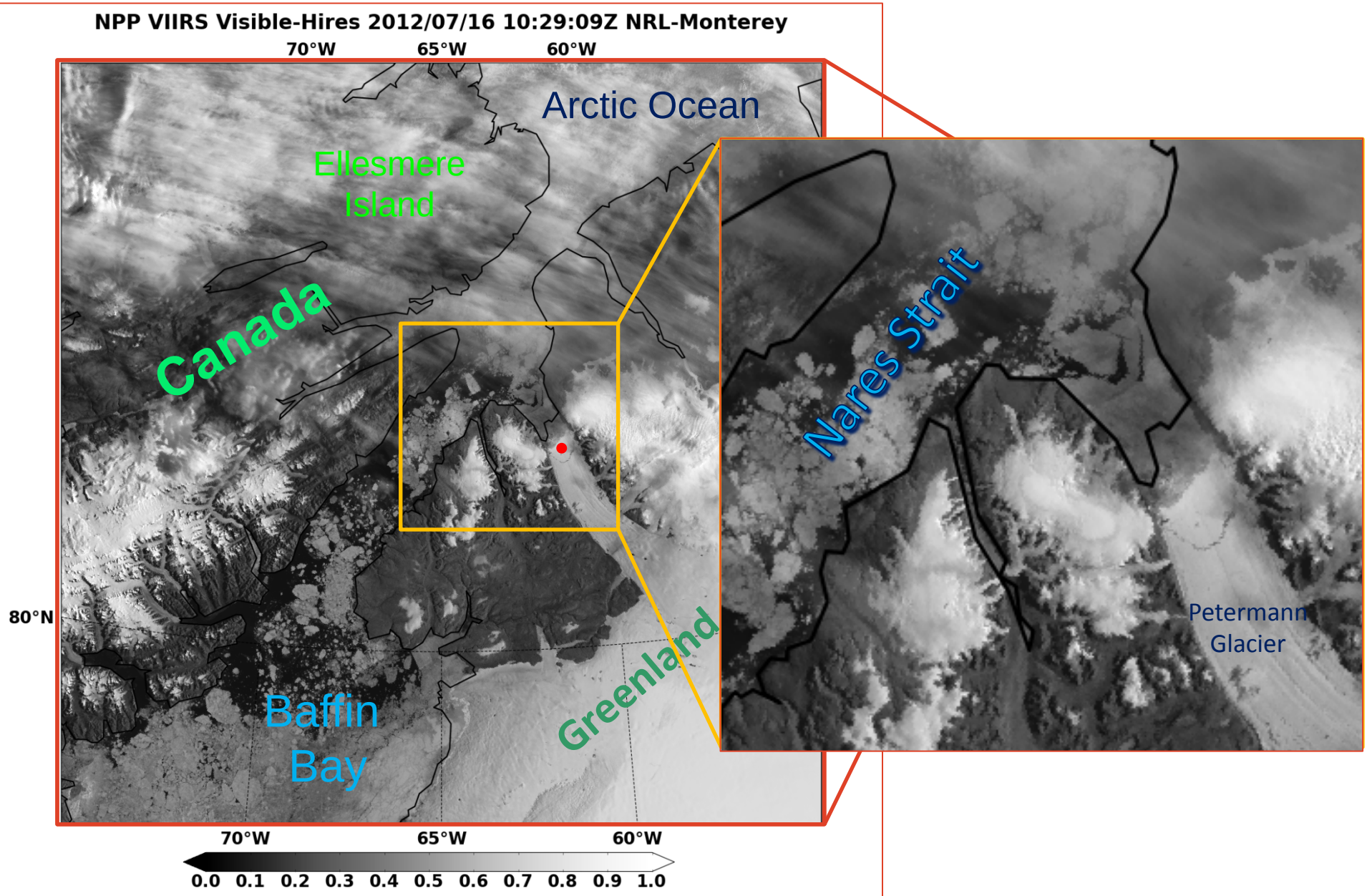
Near Nadir **Near Scan Edge**

AVHRR

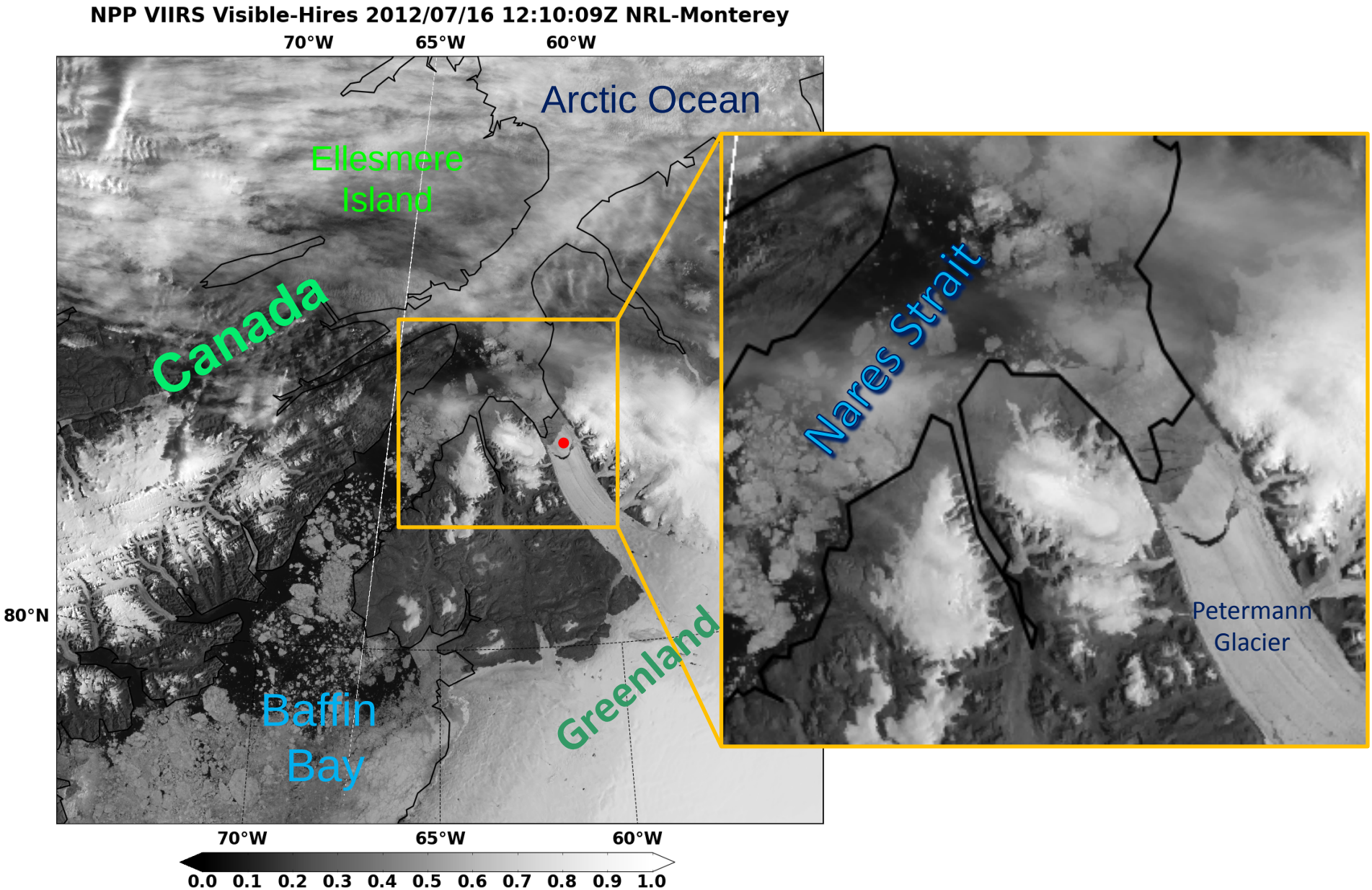
VIIRS



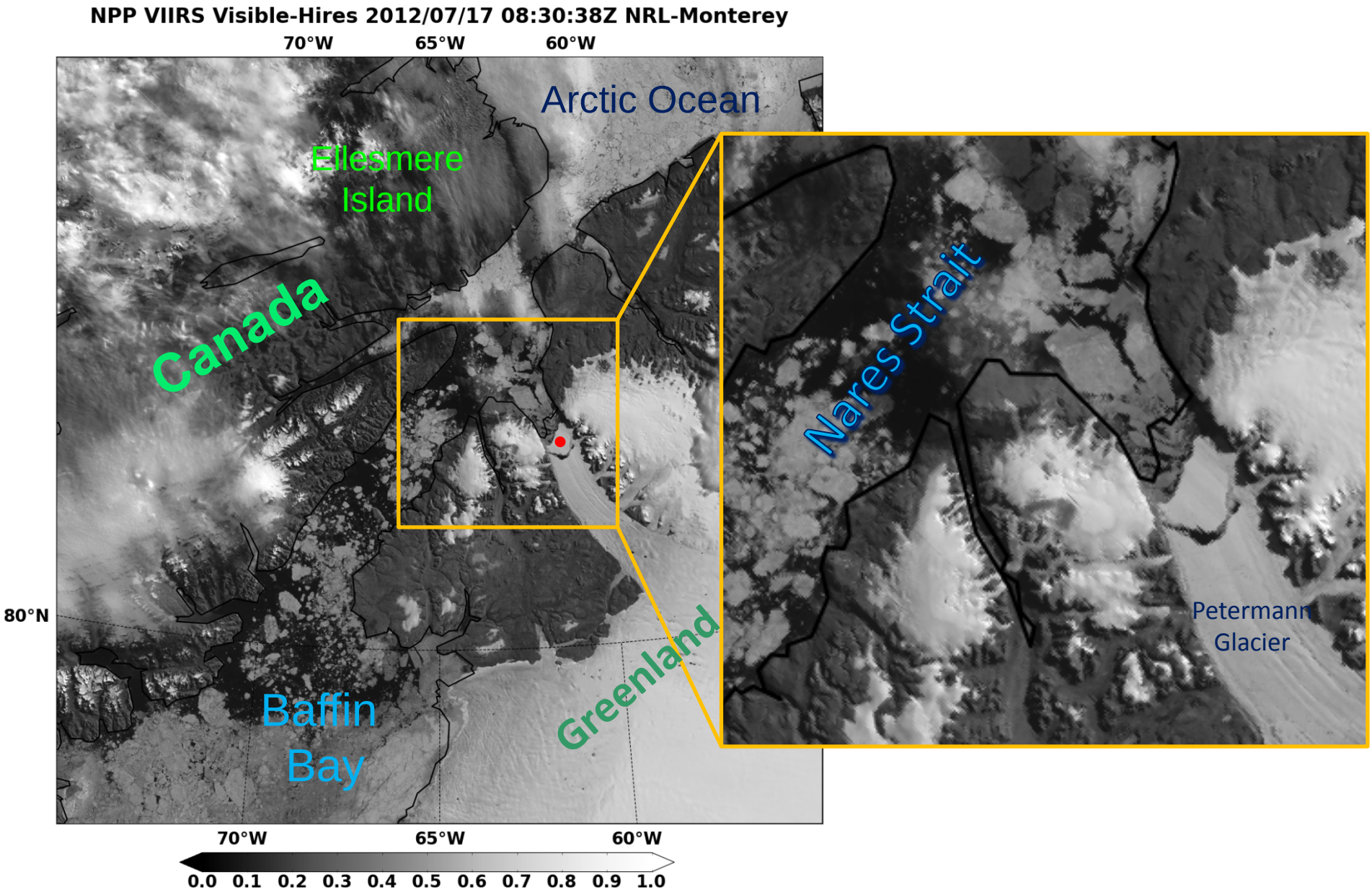
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
Initial break



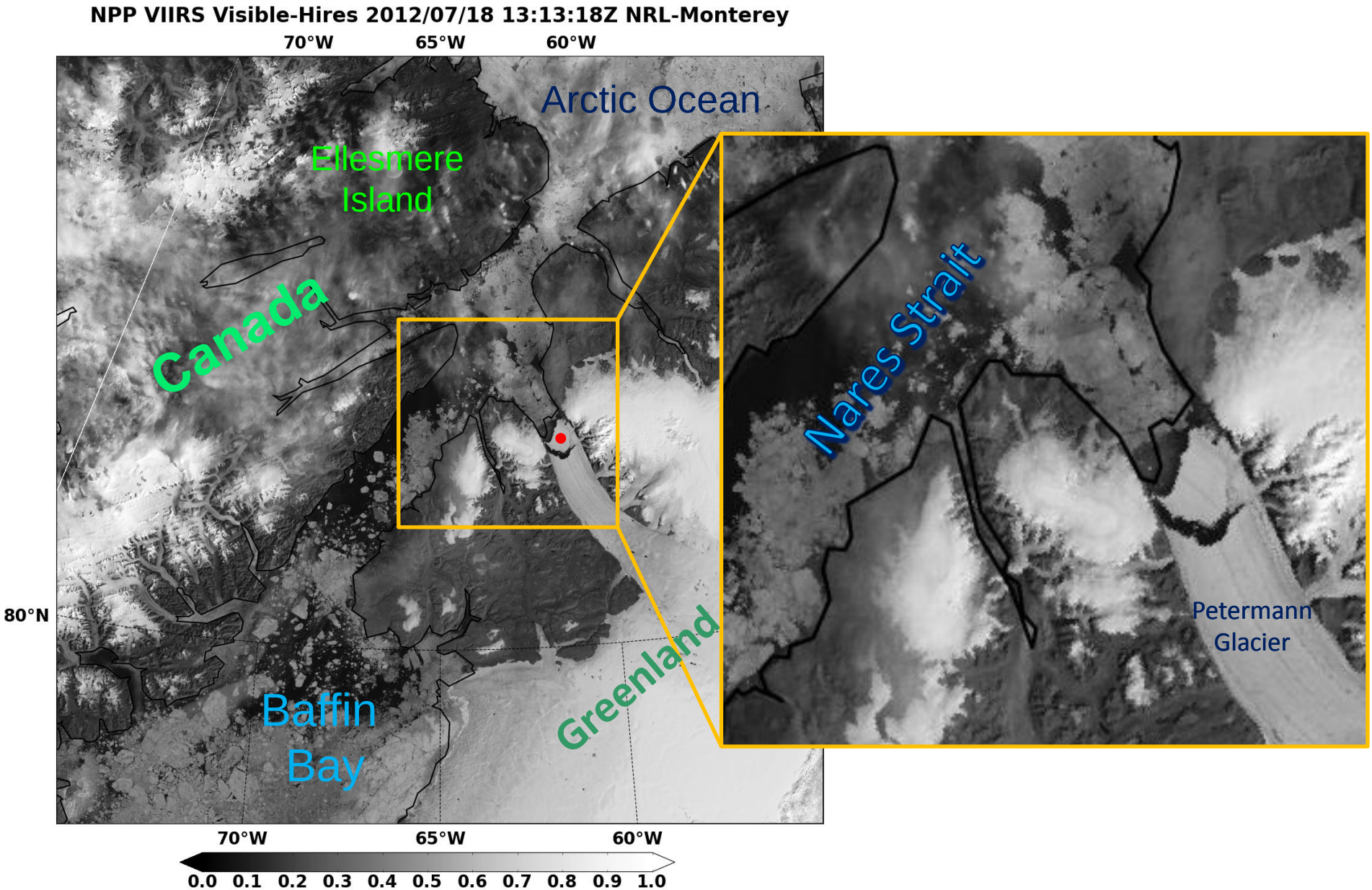
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
~90 minutes later



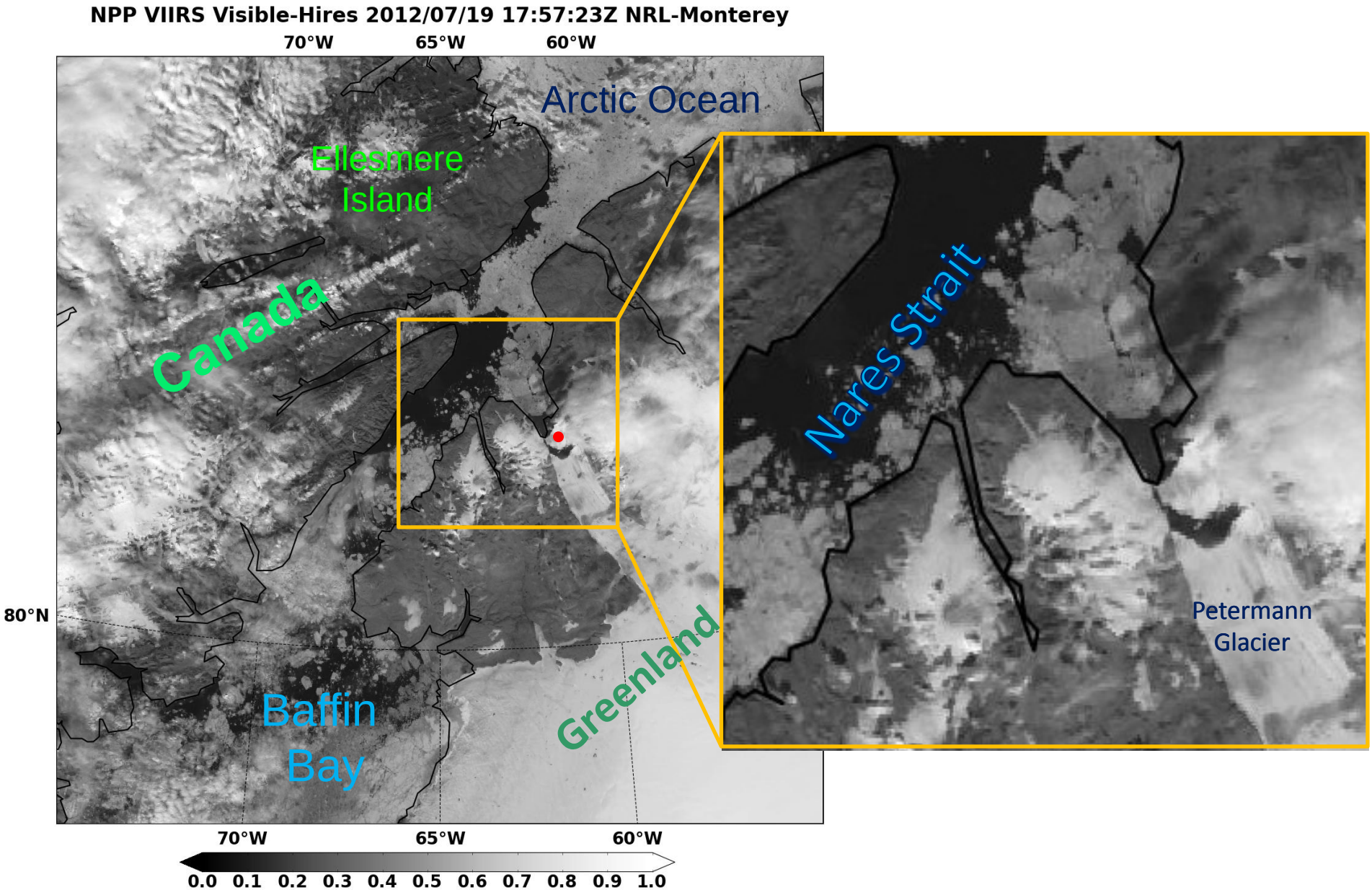
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
1 day later



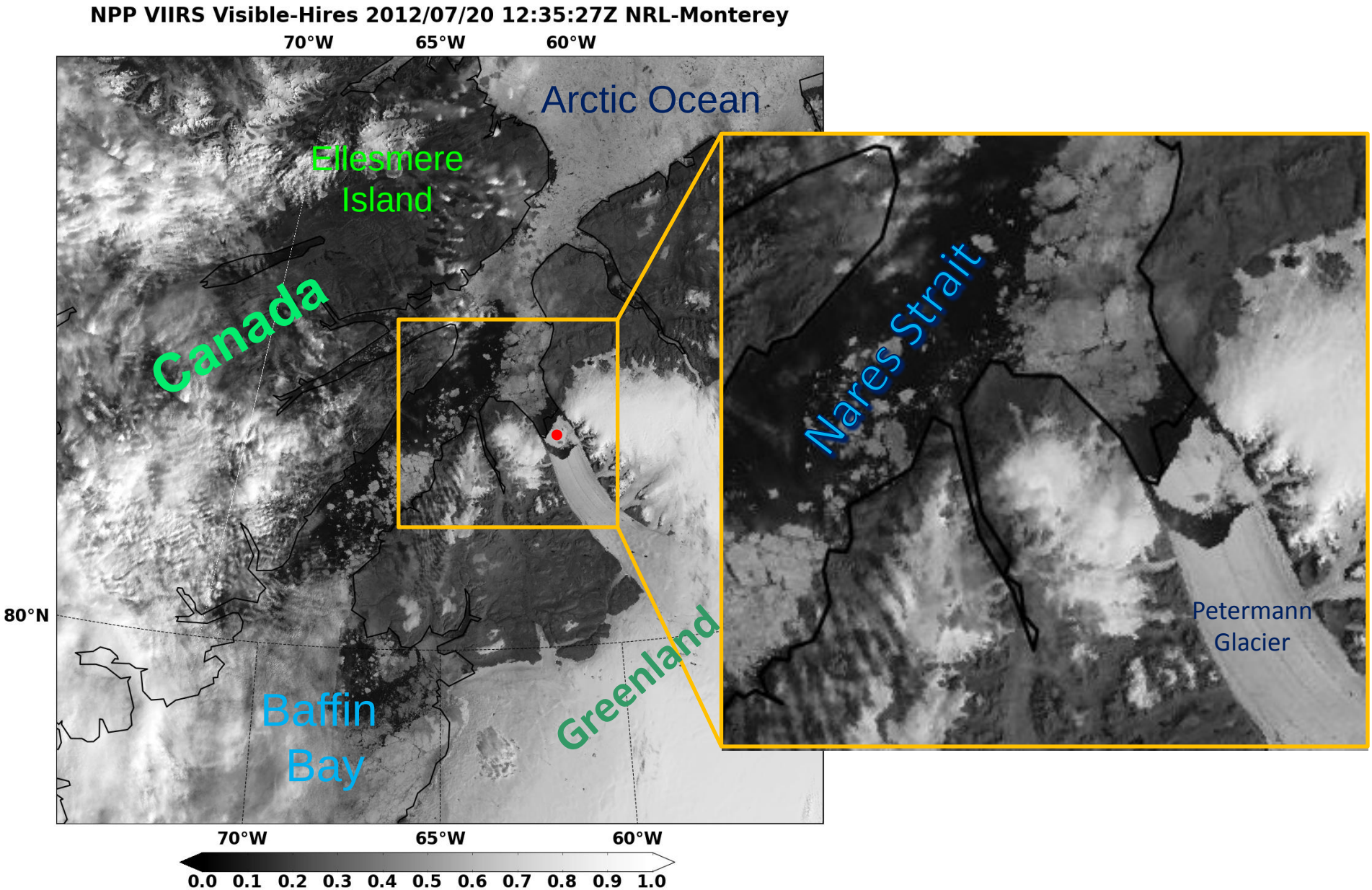
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
2 days later



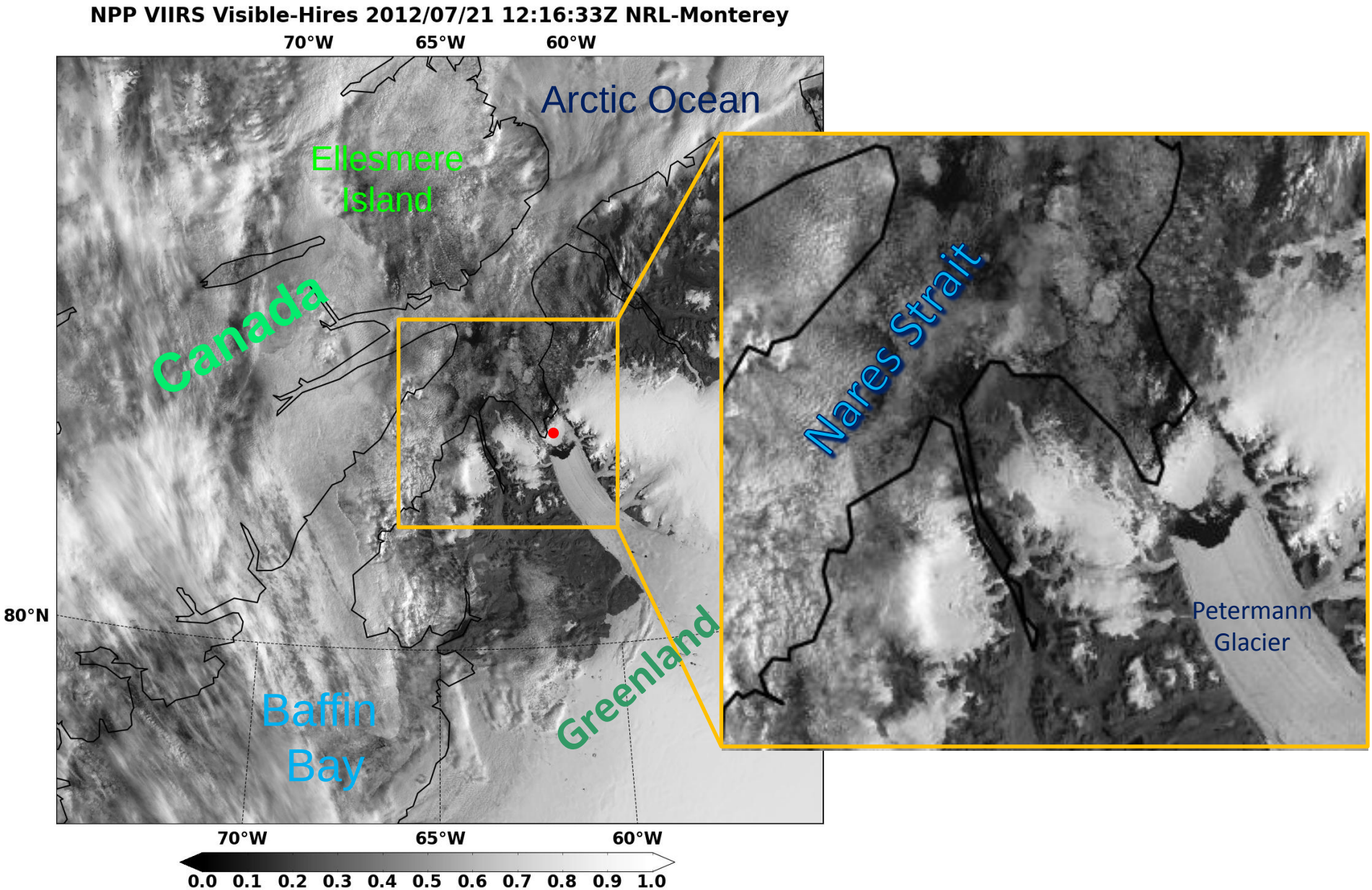
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
3 days later



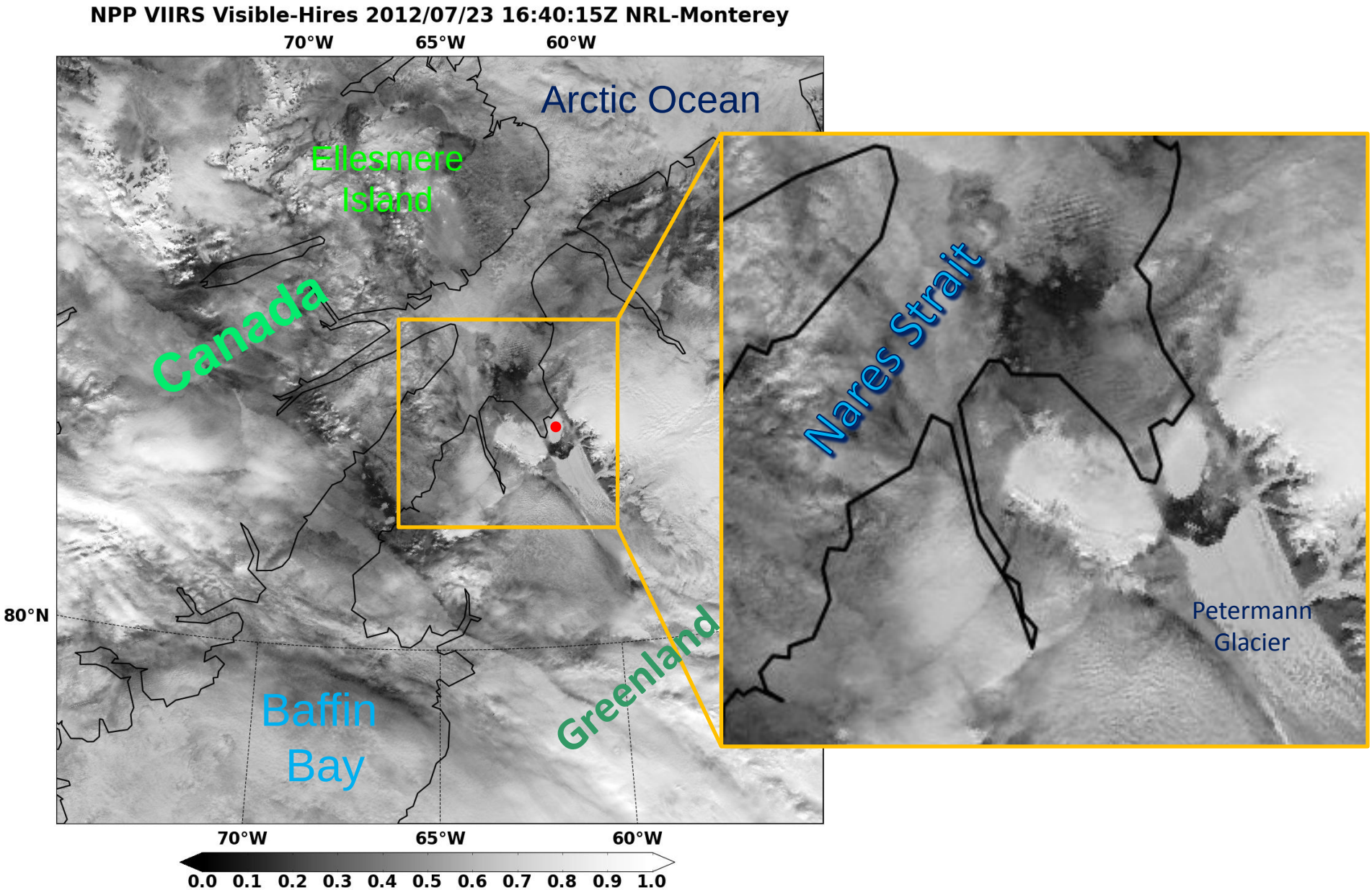
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
4 days later



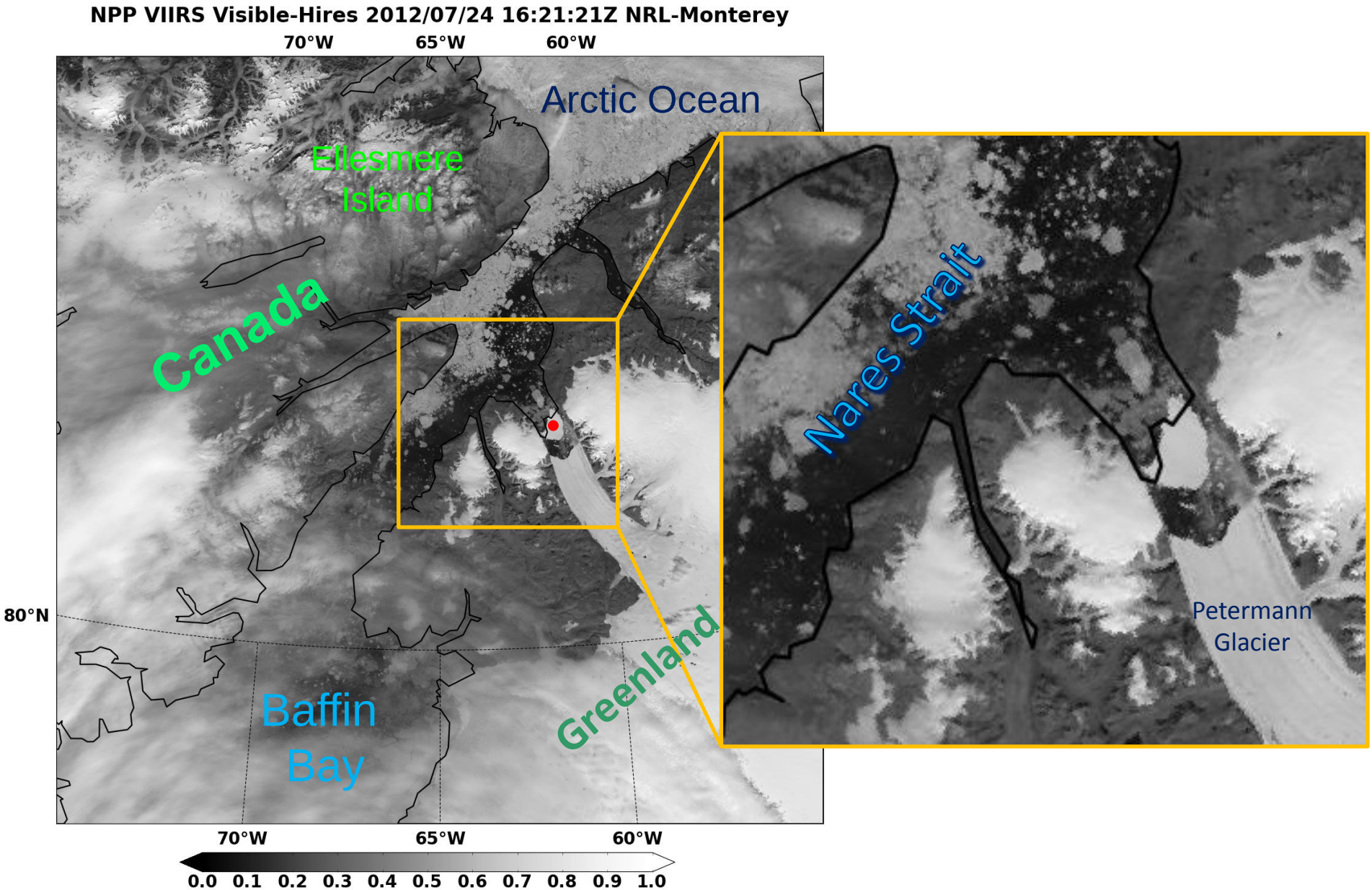
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
5 days later



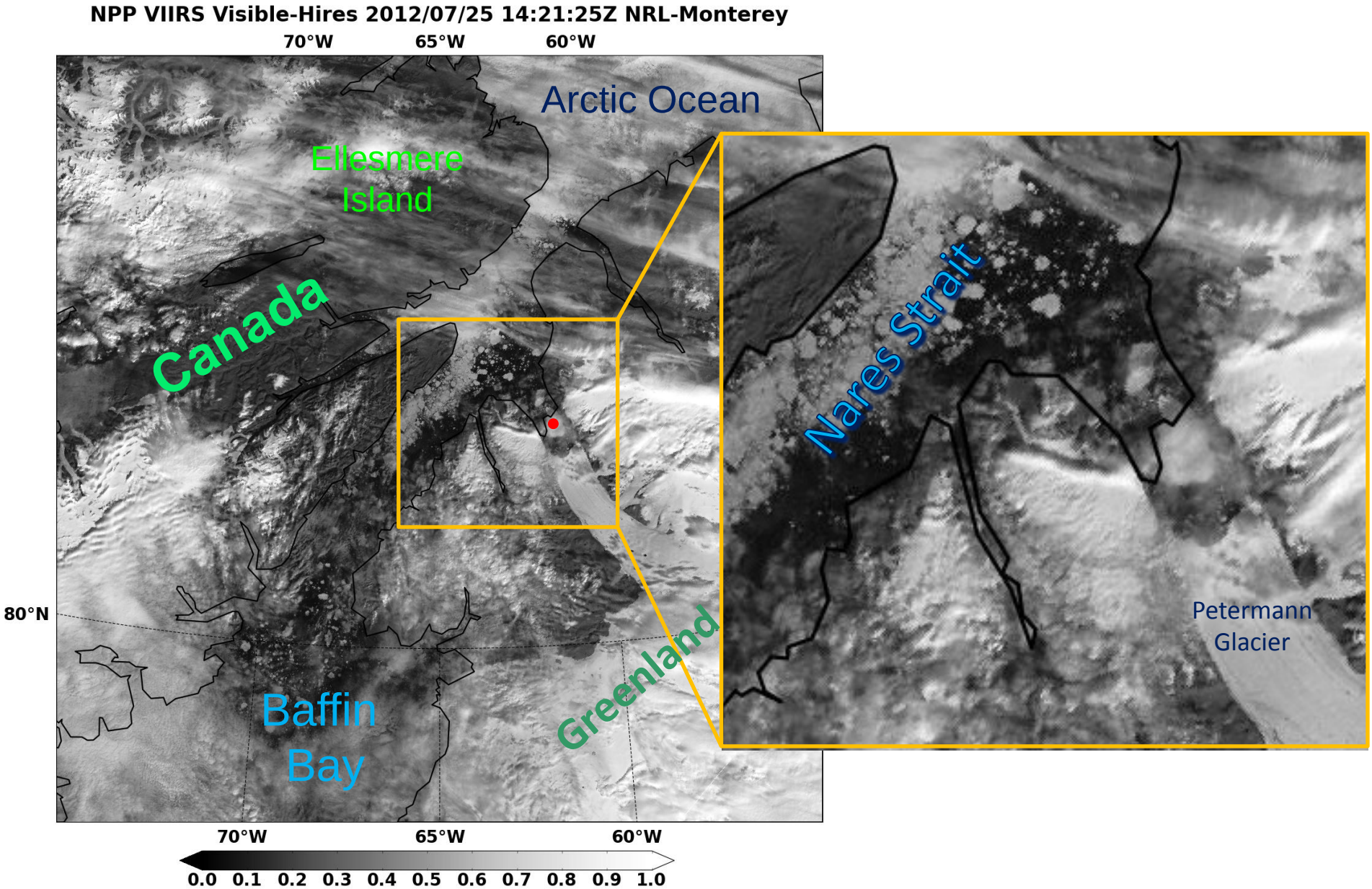
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
7 days later



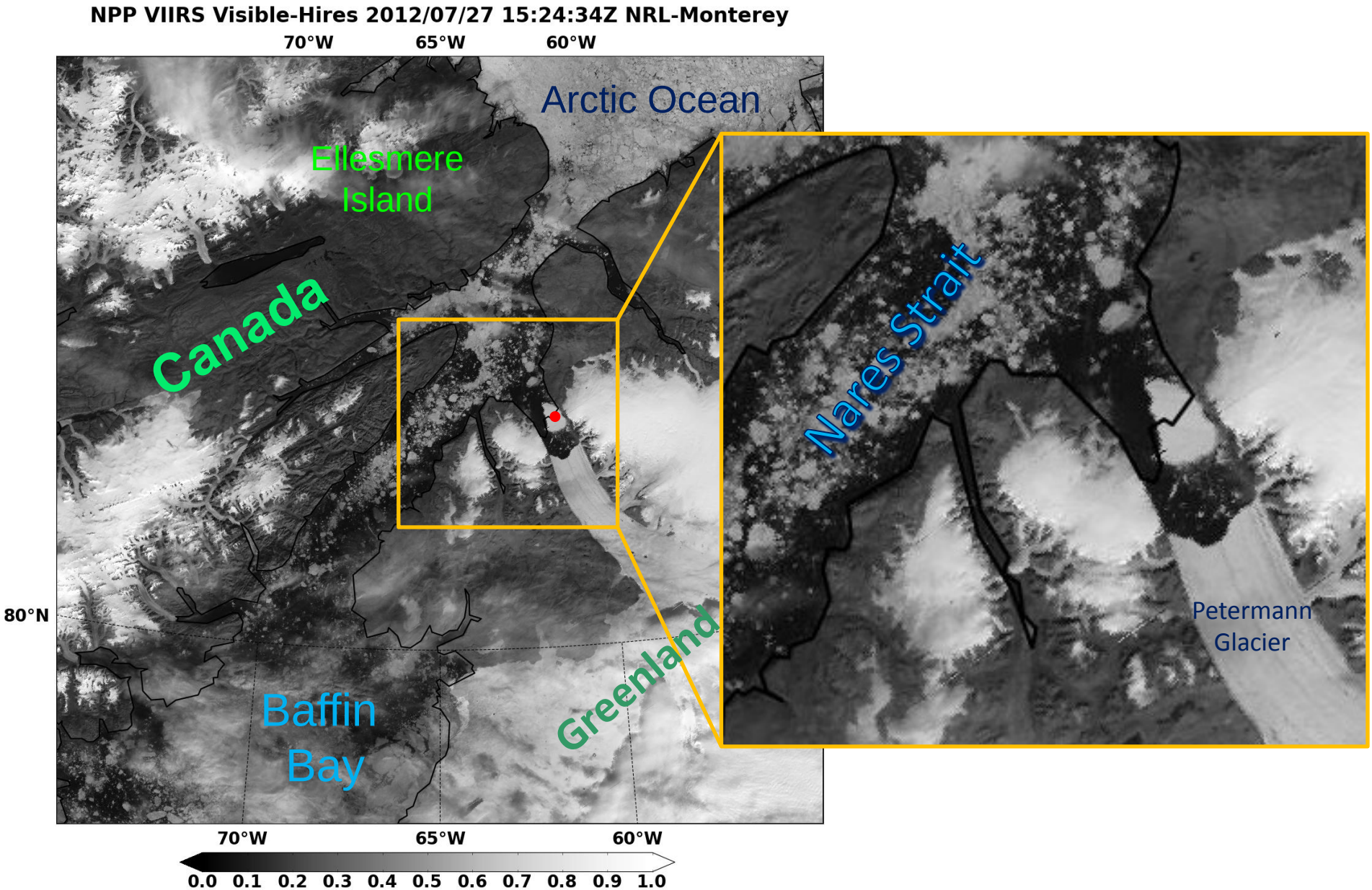
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
8 days later



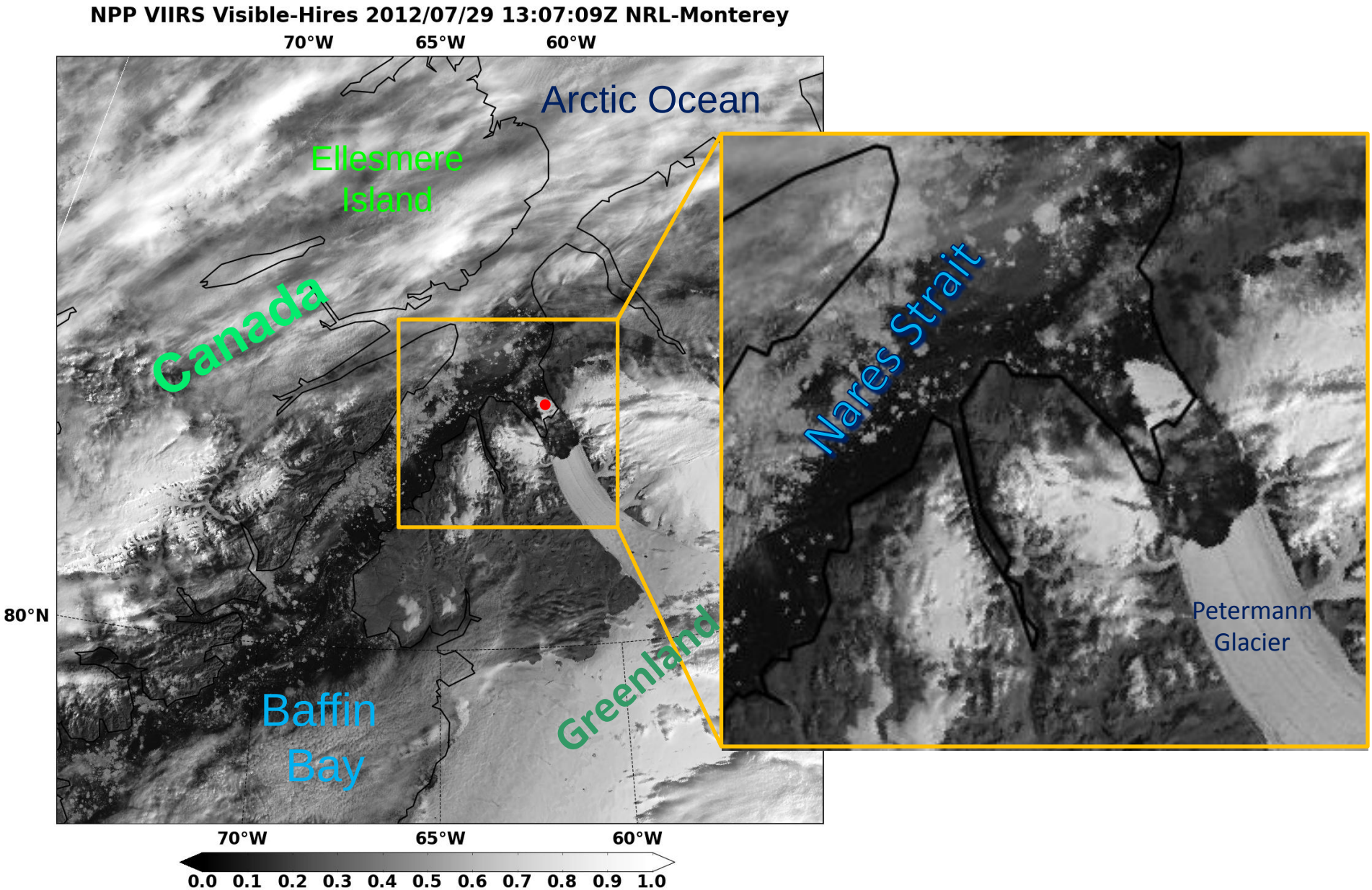
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
9 days later



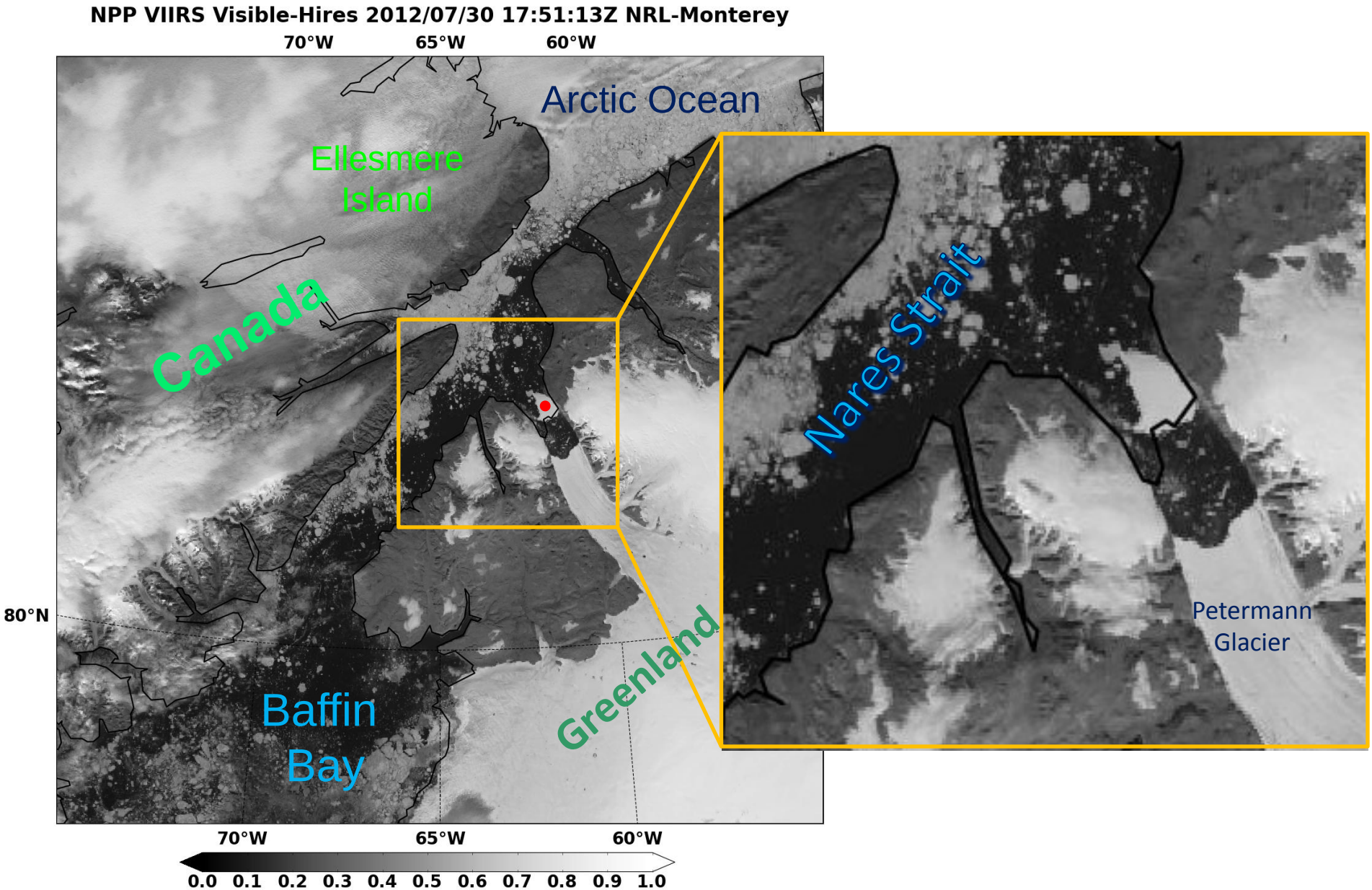
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
11 days later



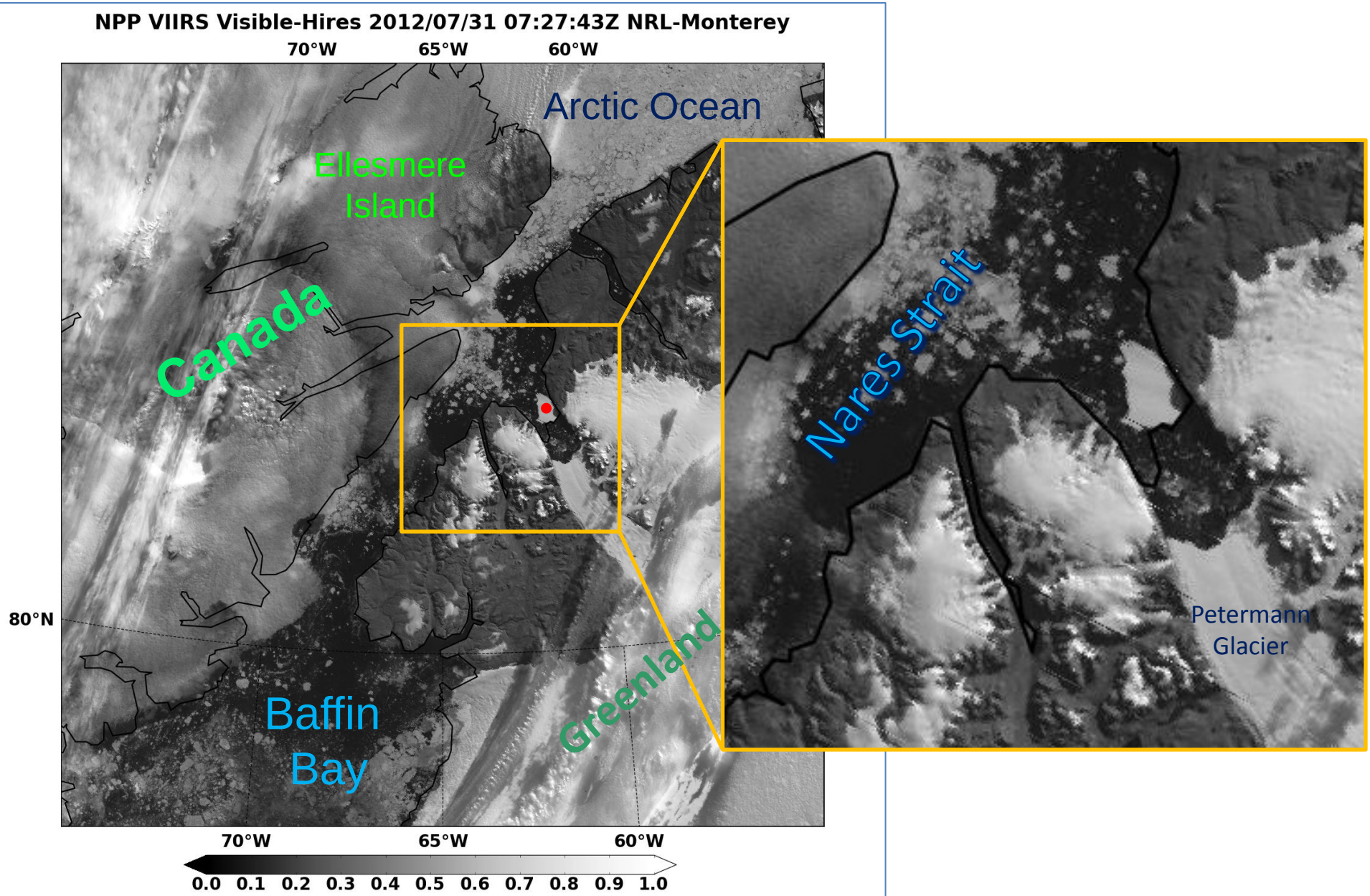
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
13 days later



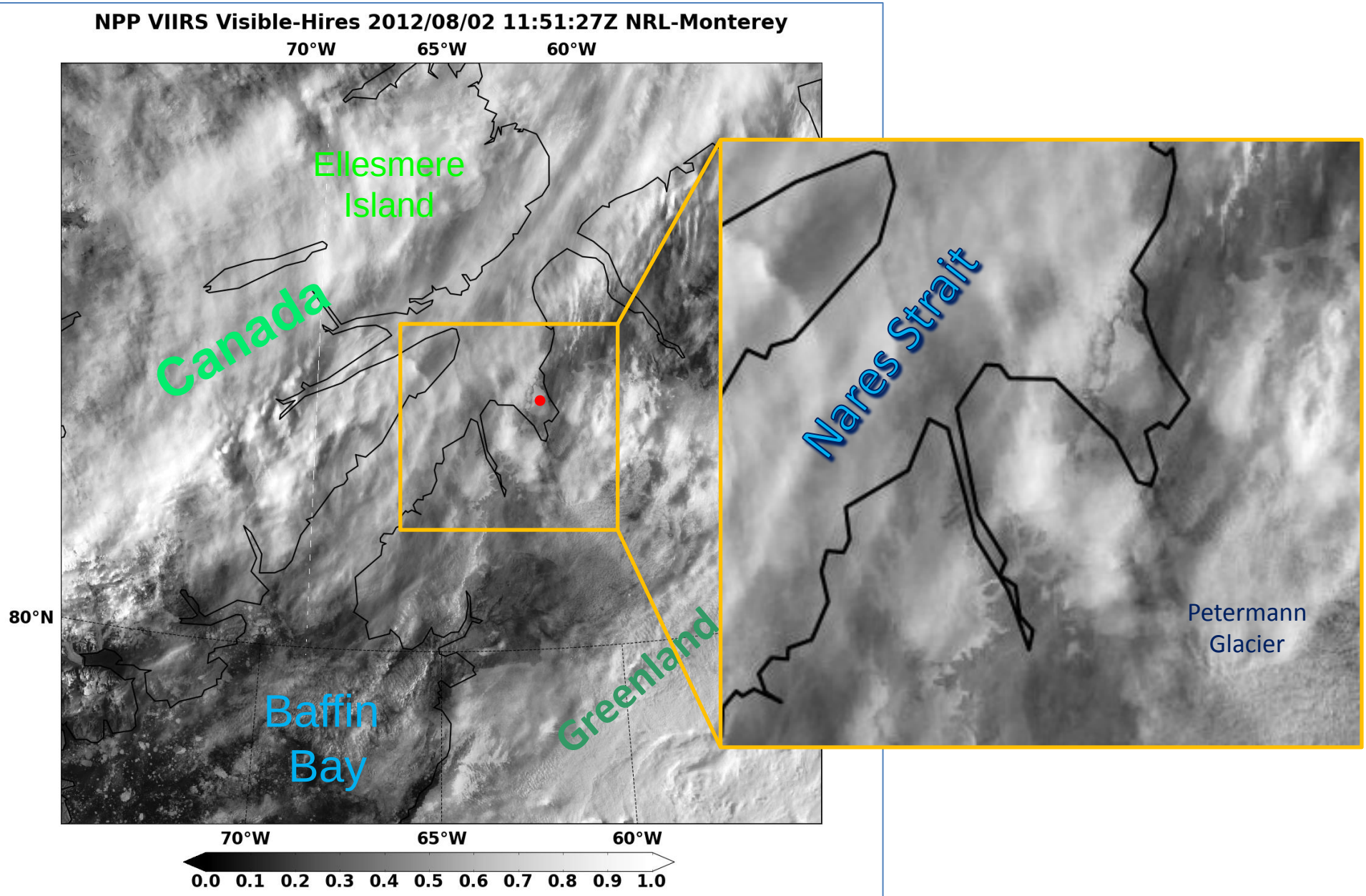
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
14 days later



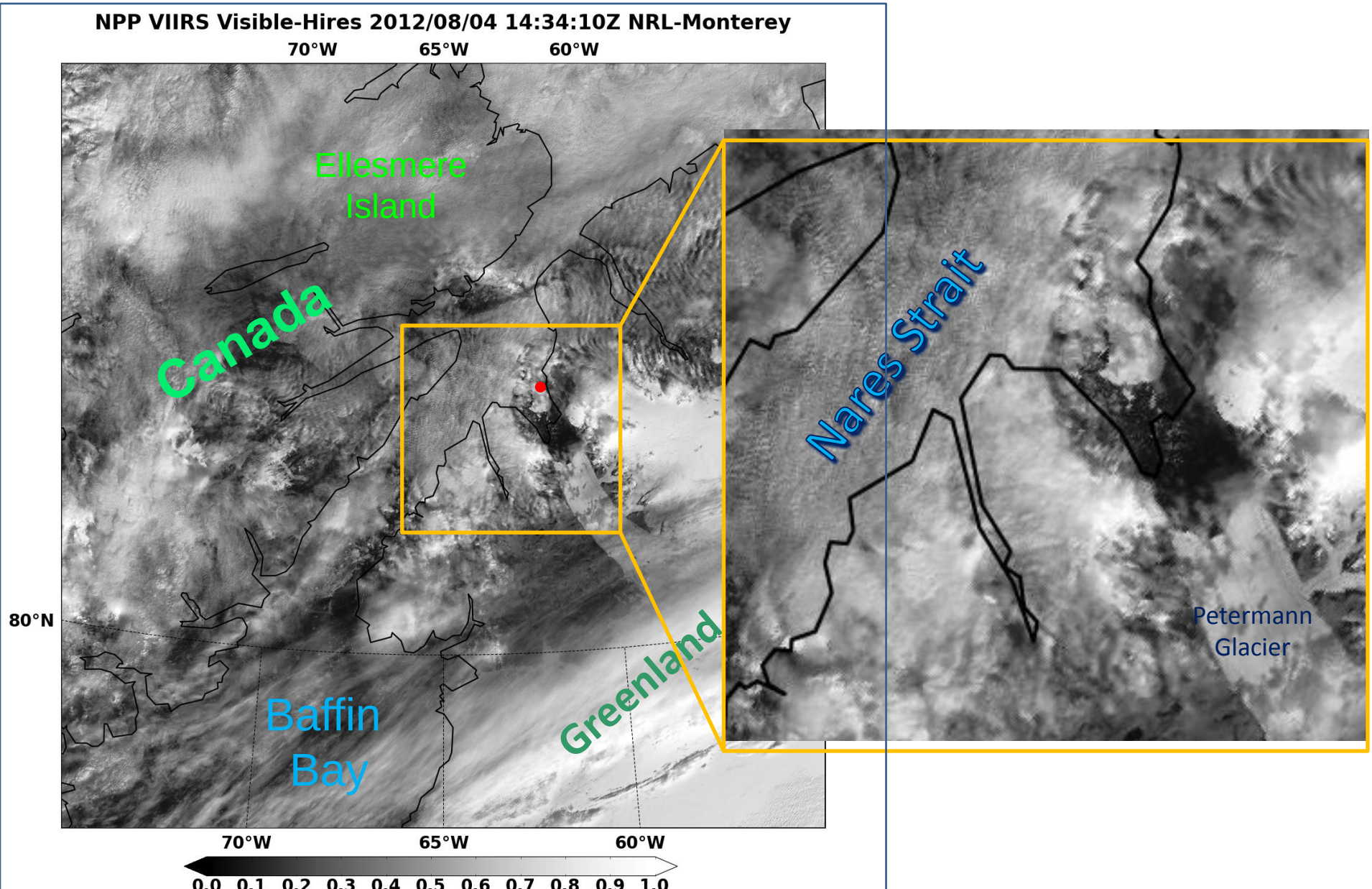
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
15 days later



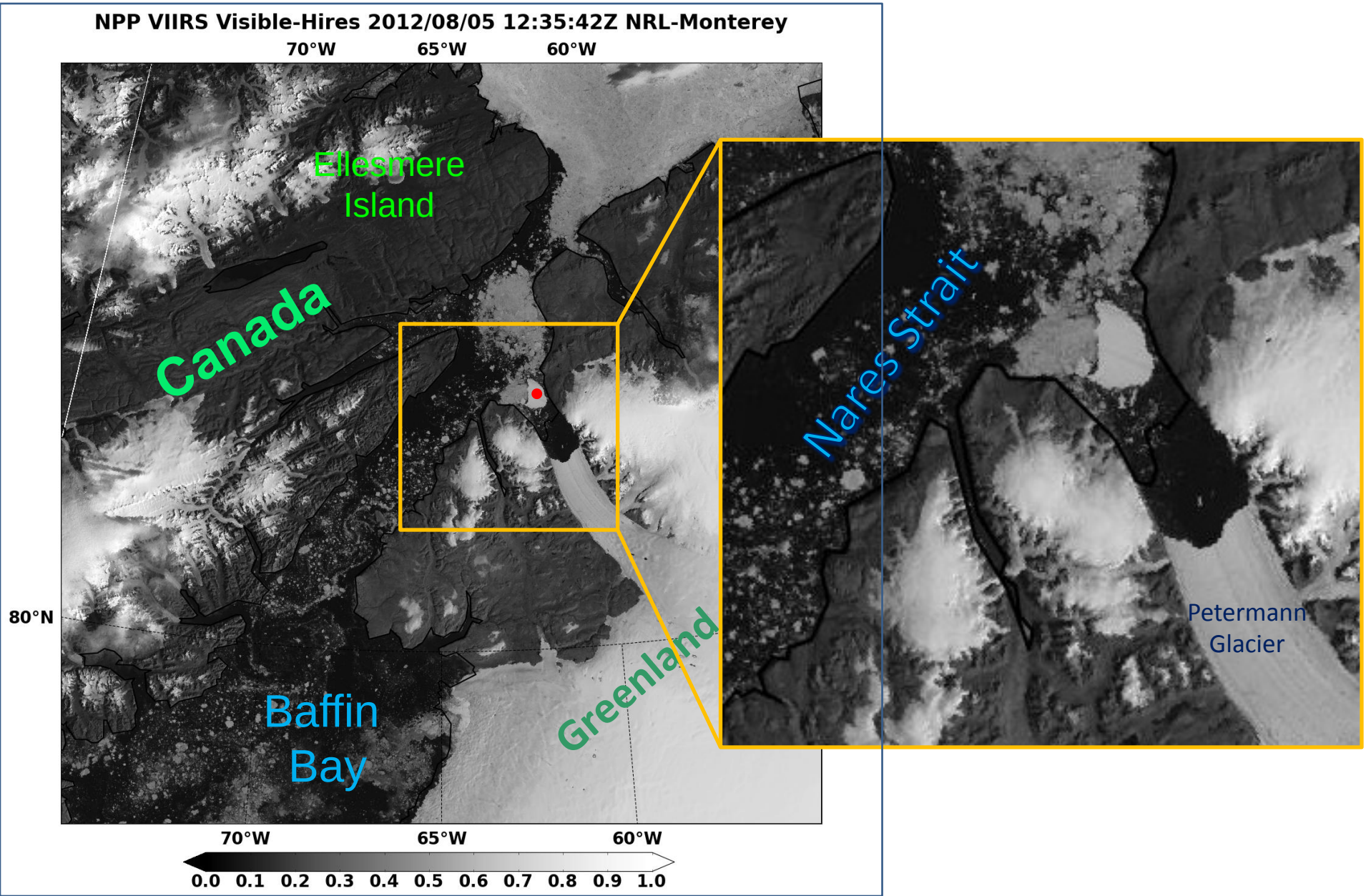
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
17 days later



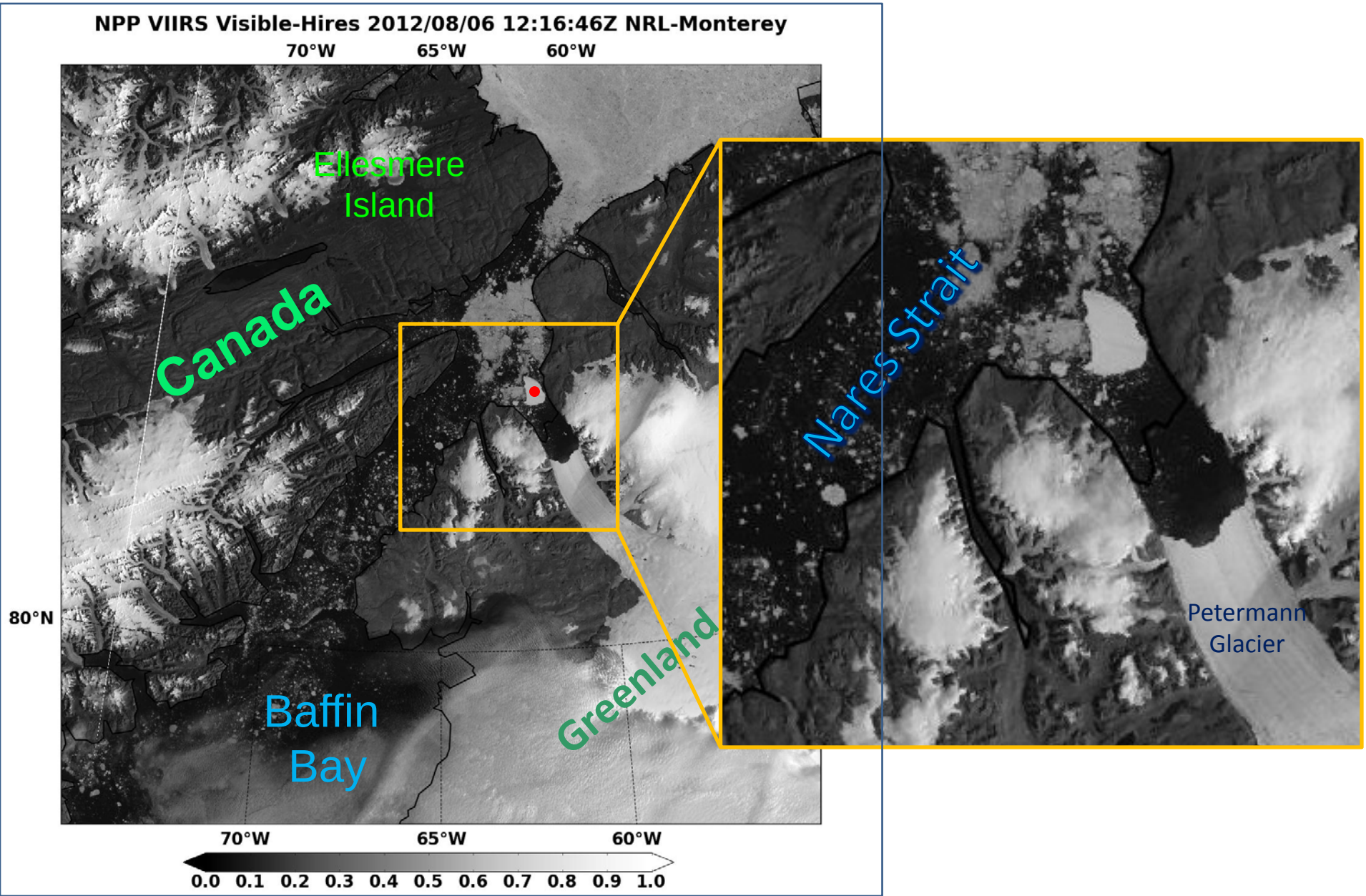
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
19 days later



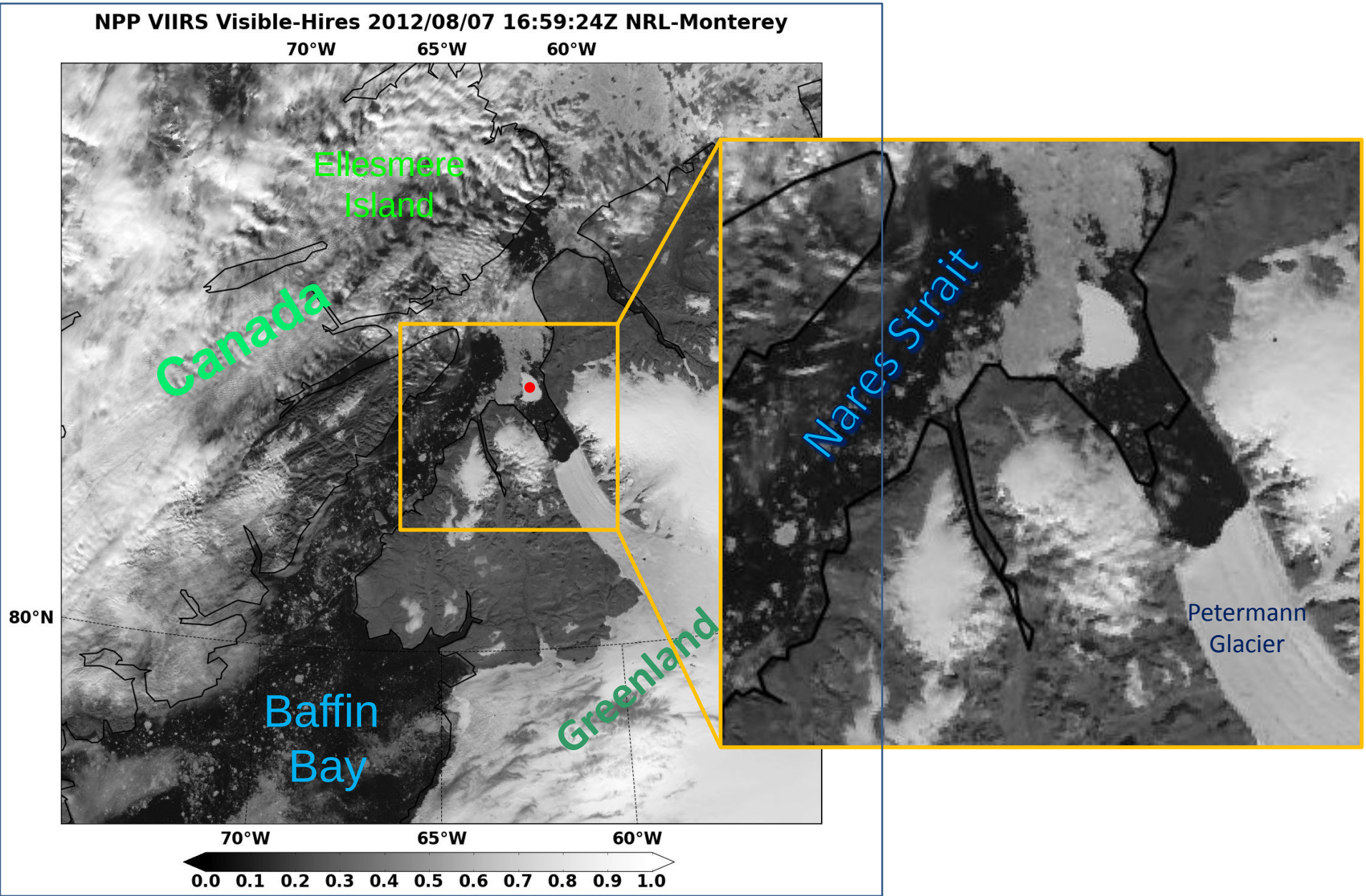
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
20 days later



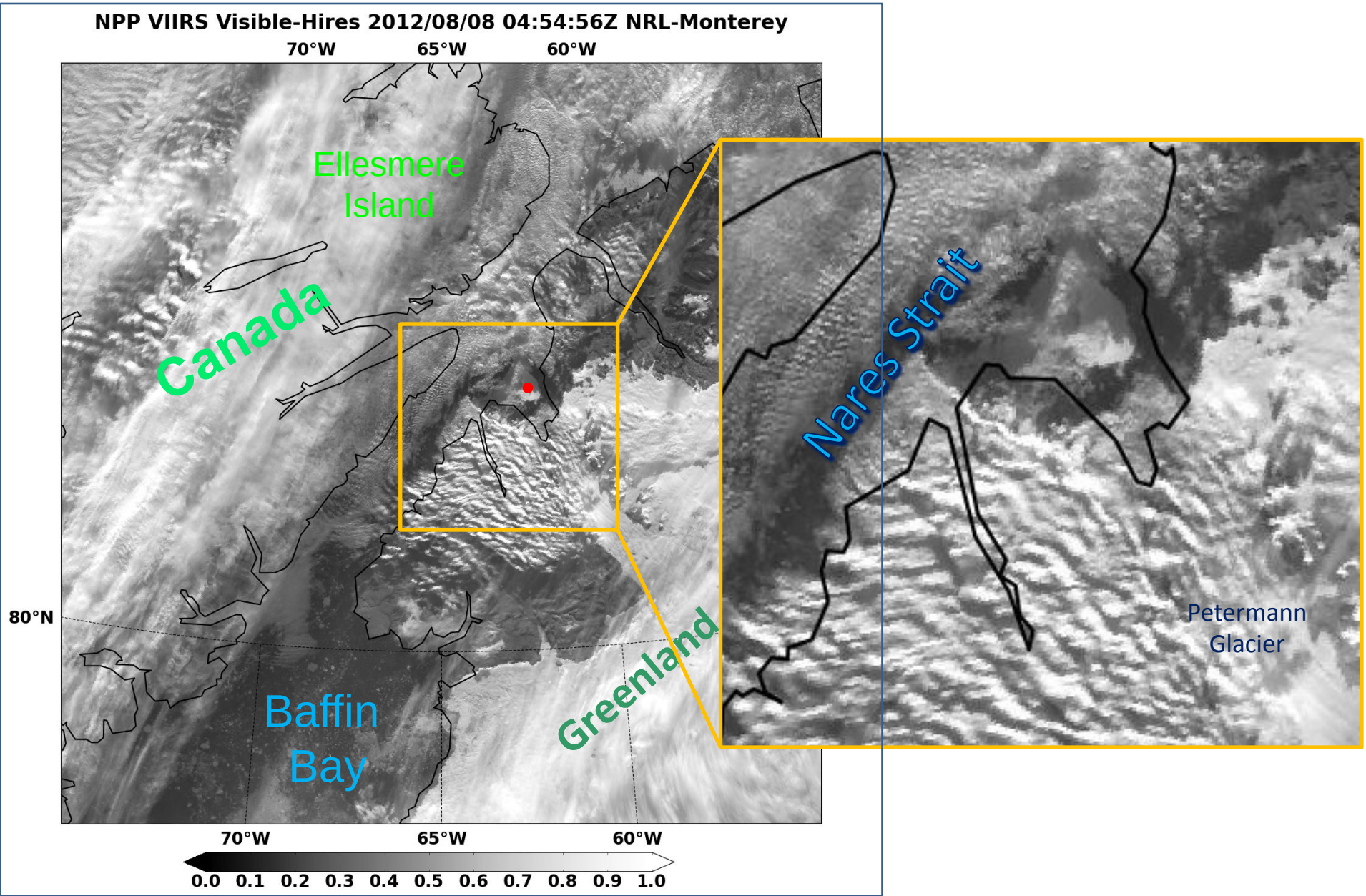
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
21 days later



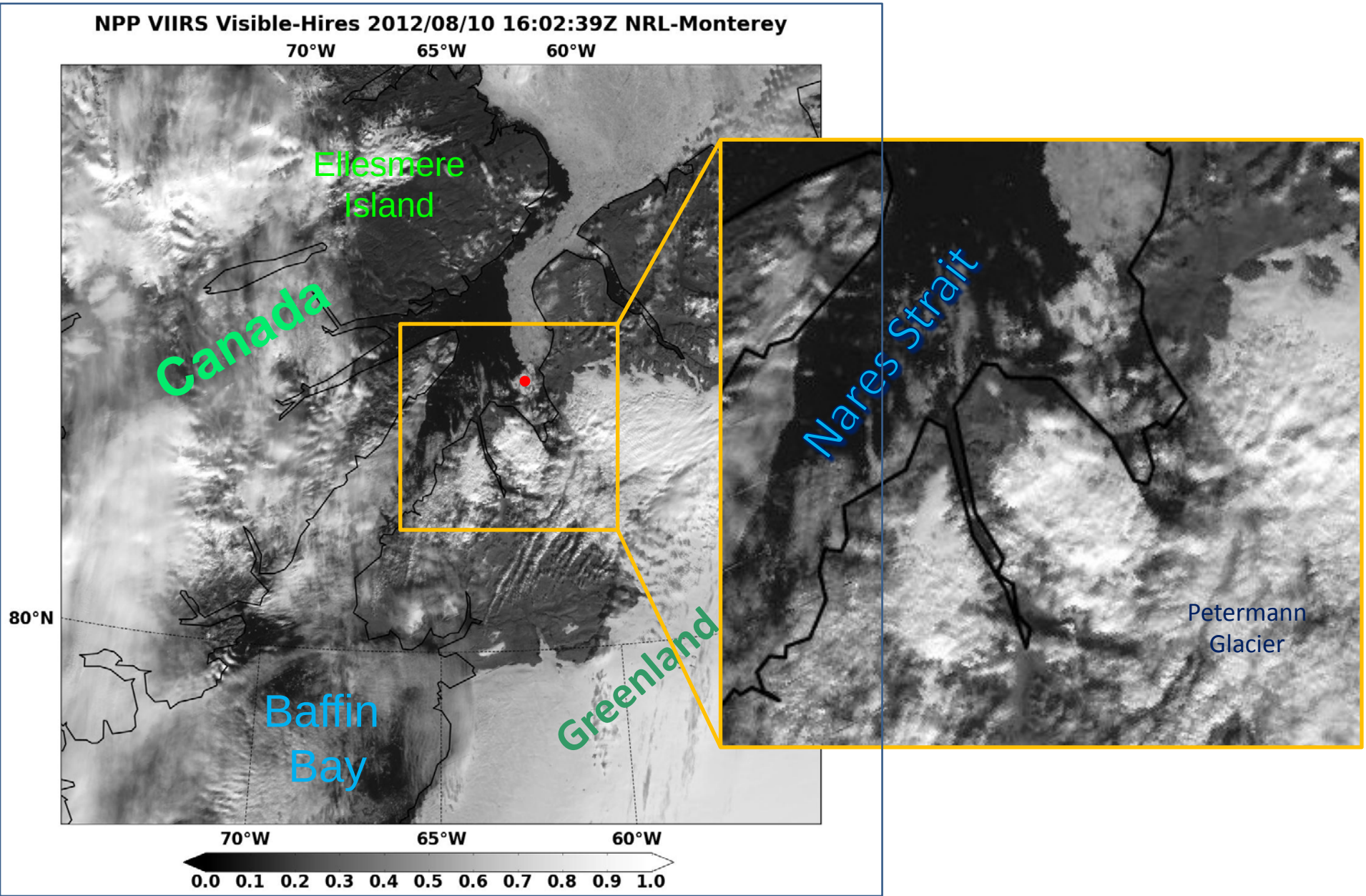
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
22 days later



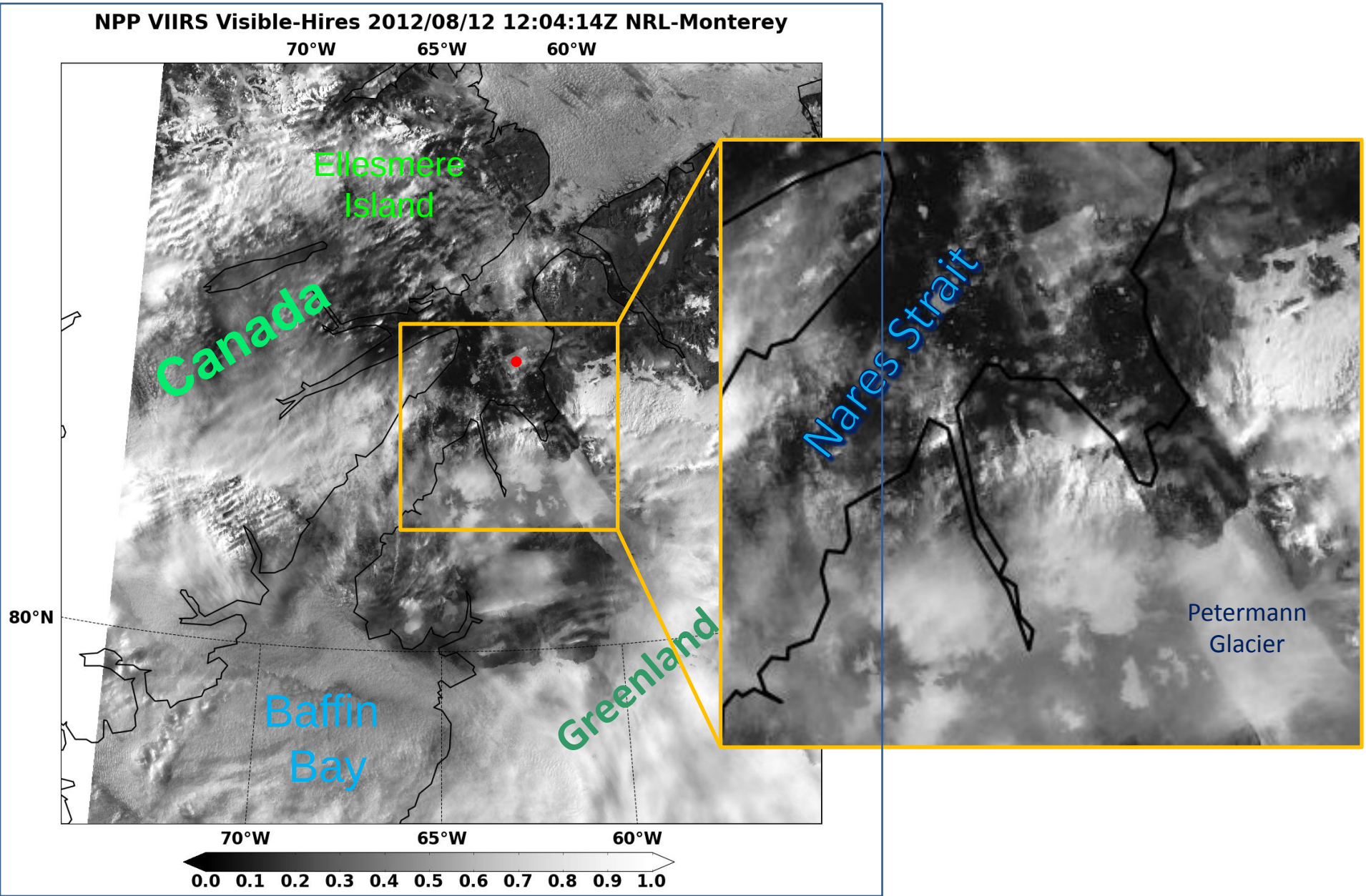
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
23 days later



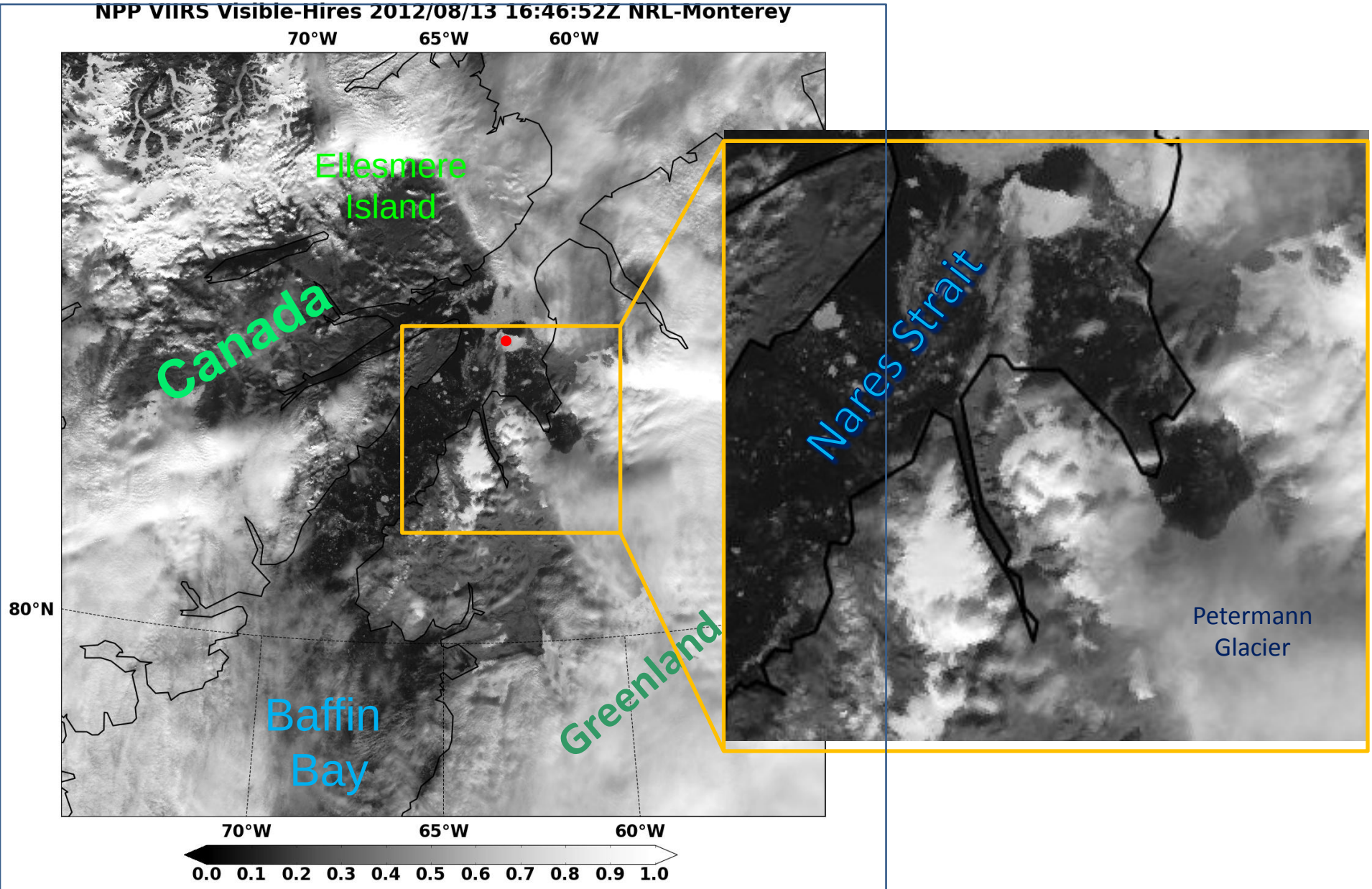
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
25 days later



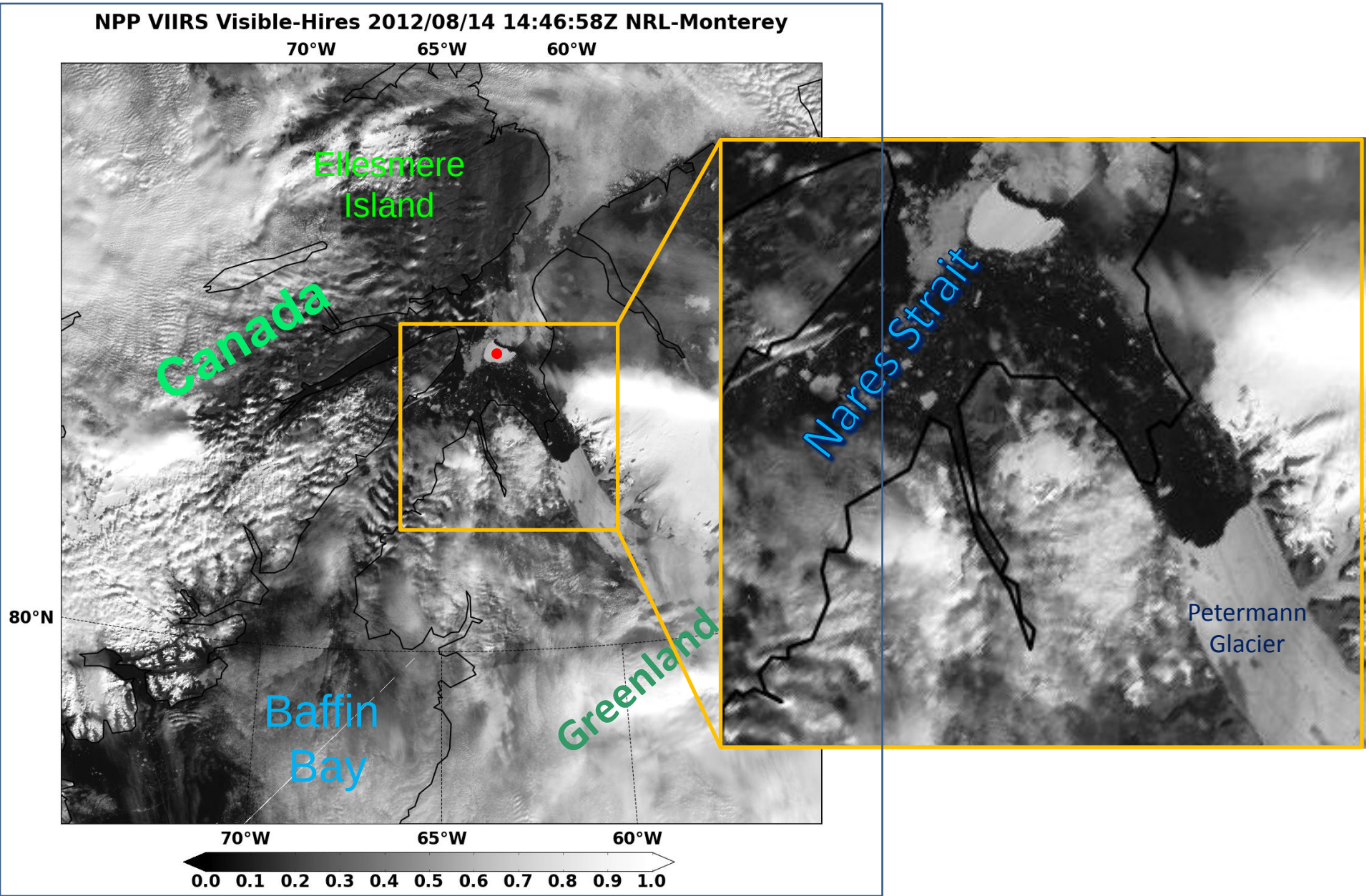
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
27 days later



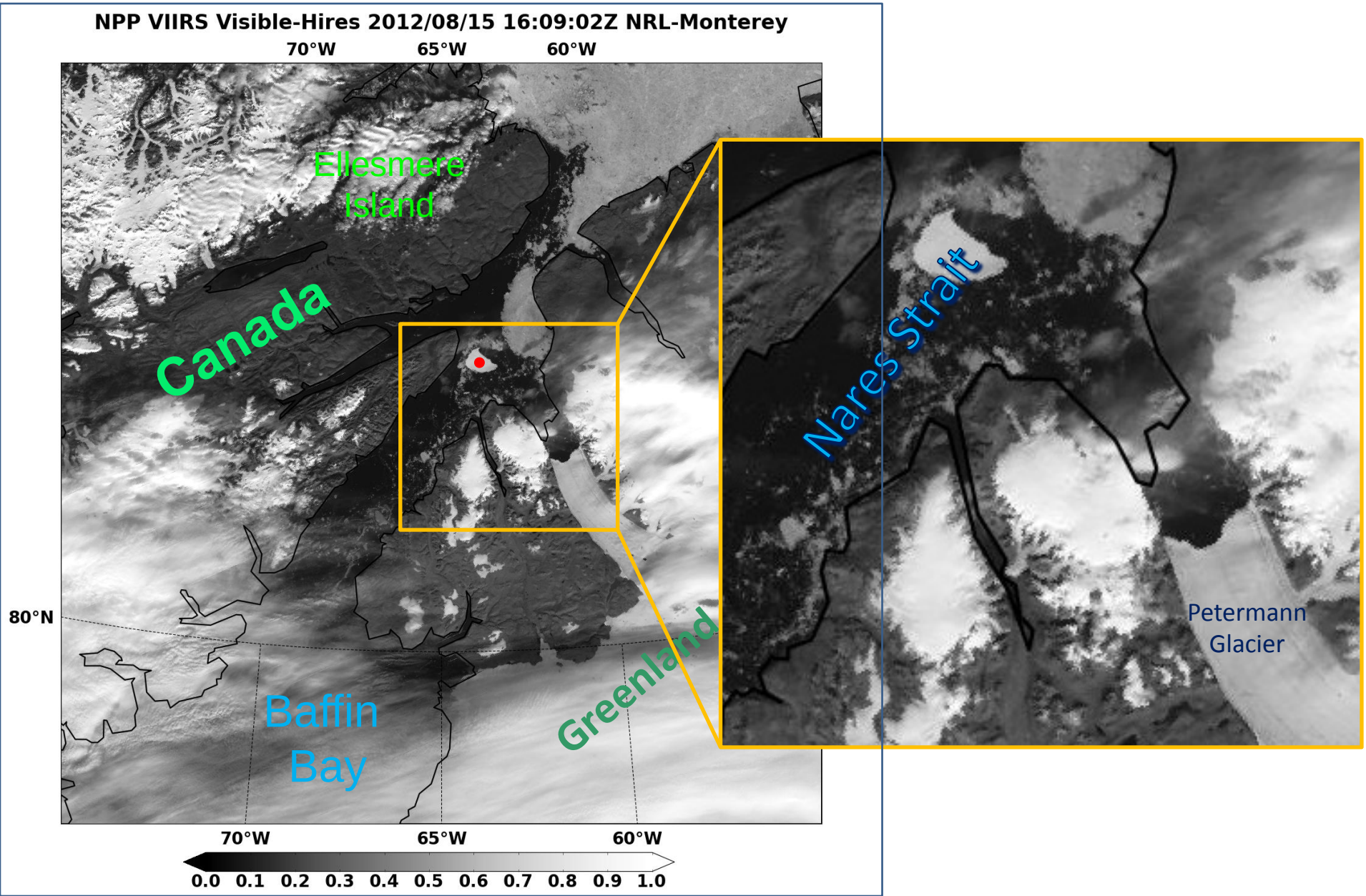
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
28 days later



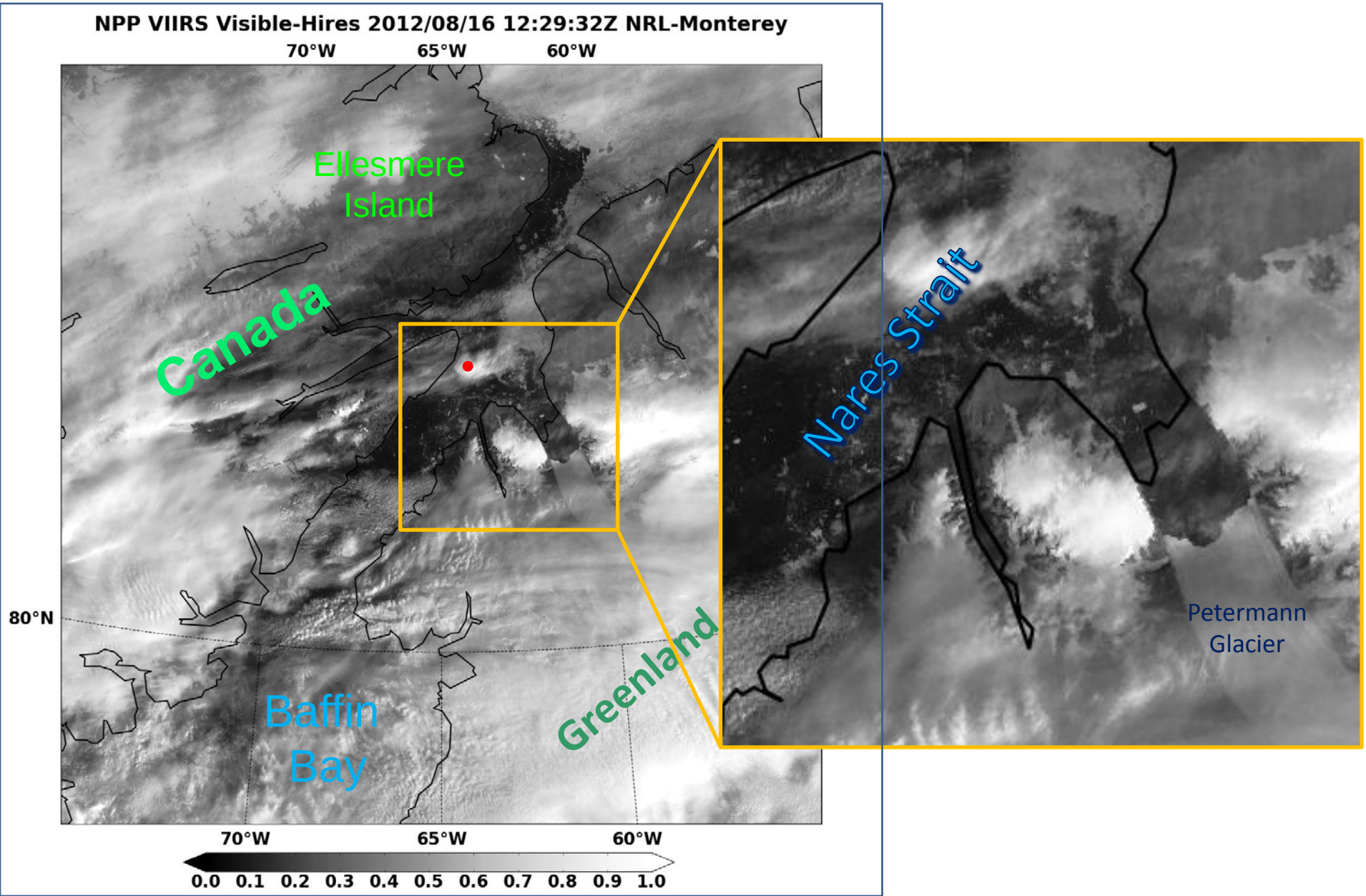
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
29 days later



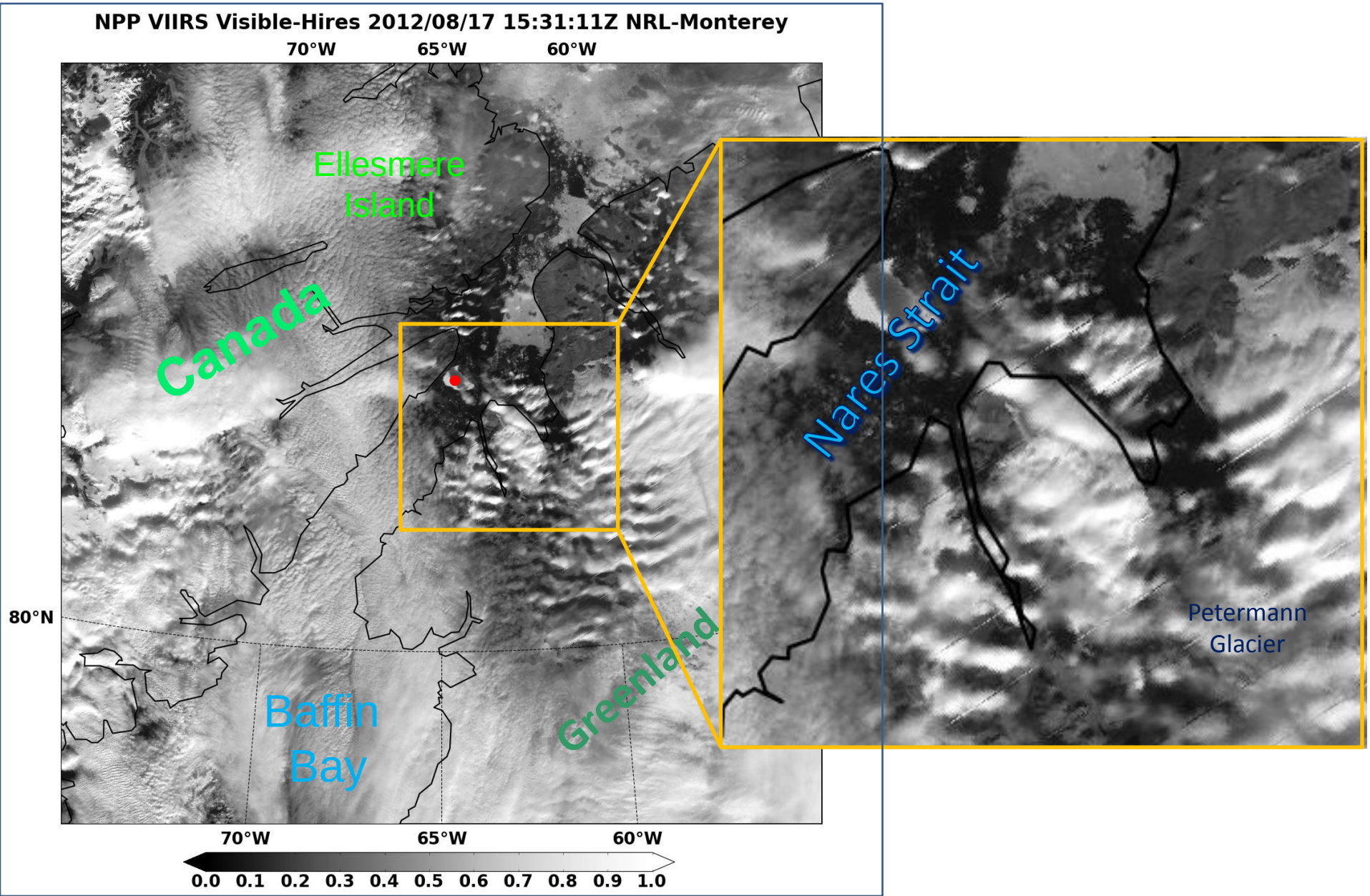
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
30 days later



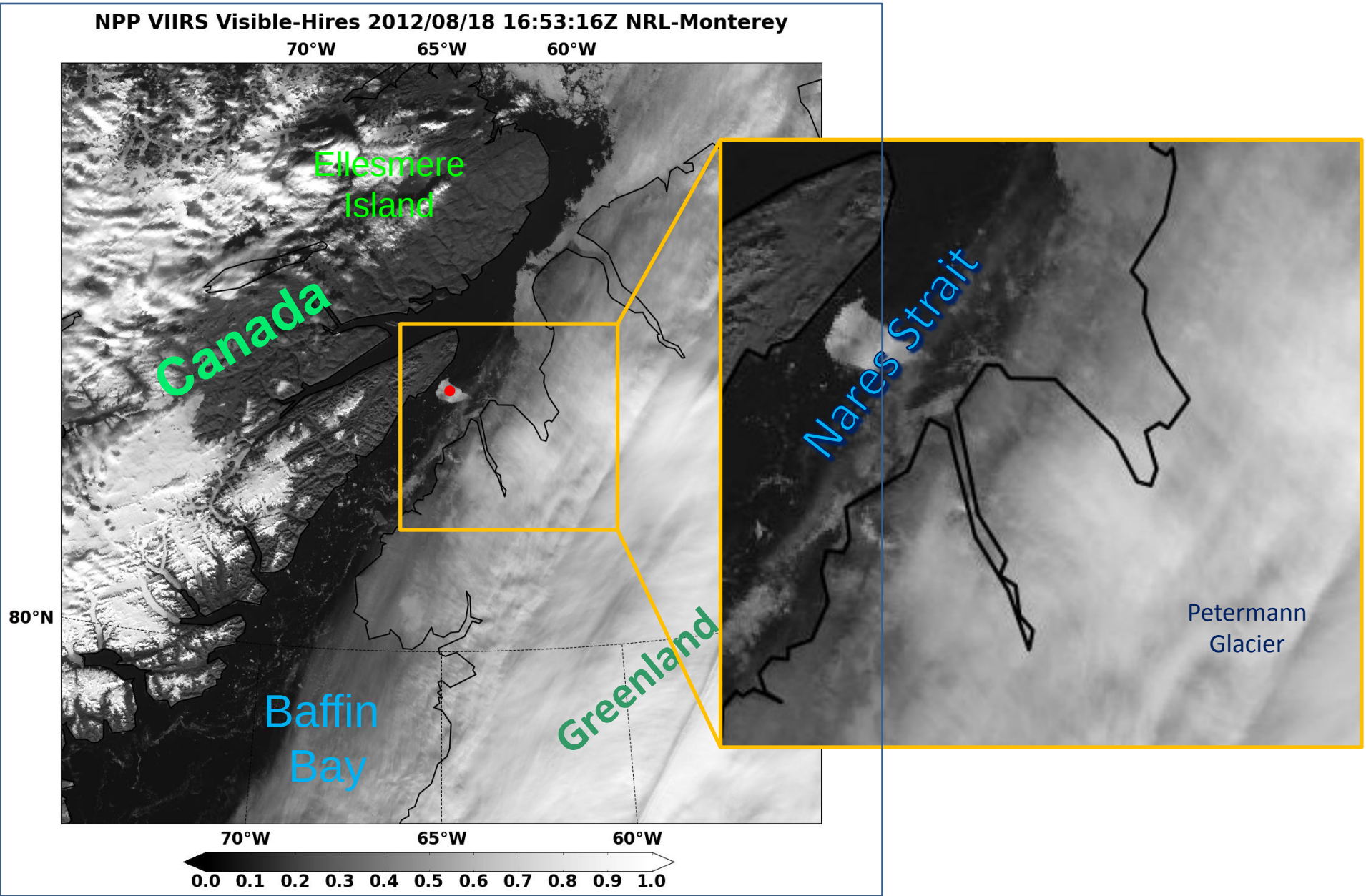
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
31 days later



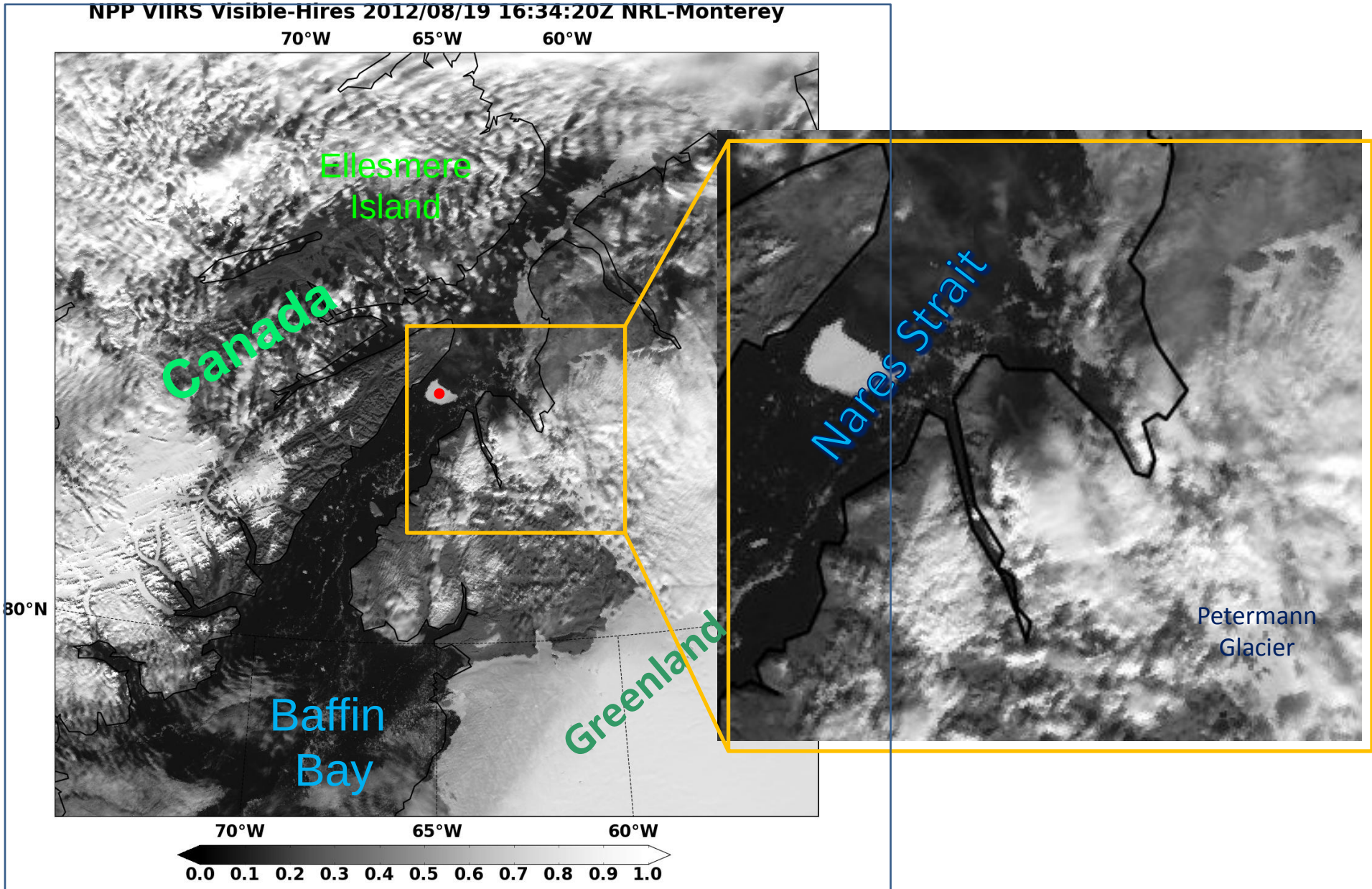
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
32 days later



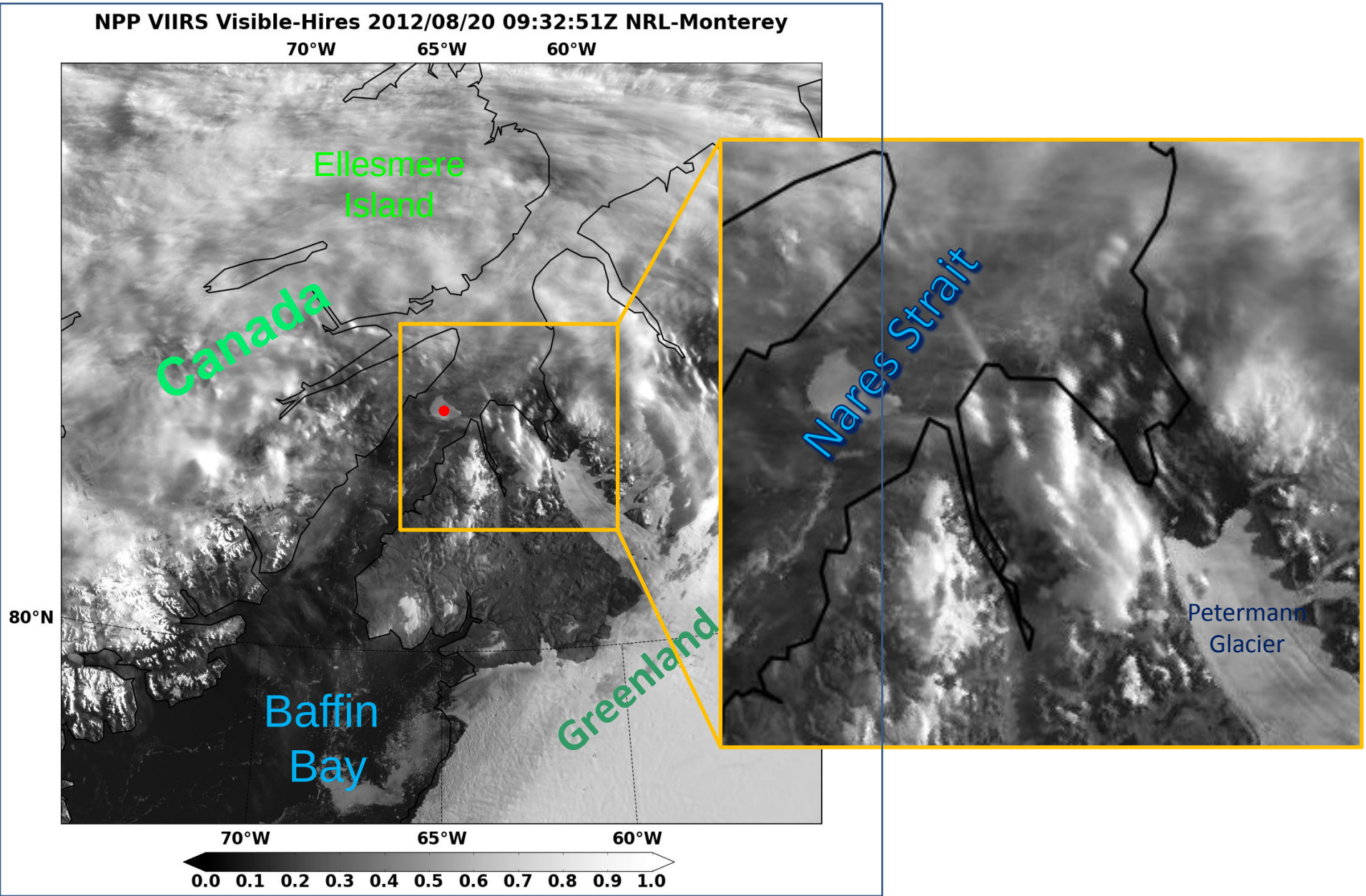
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
33 days later



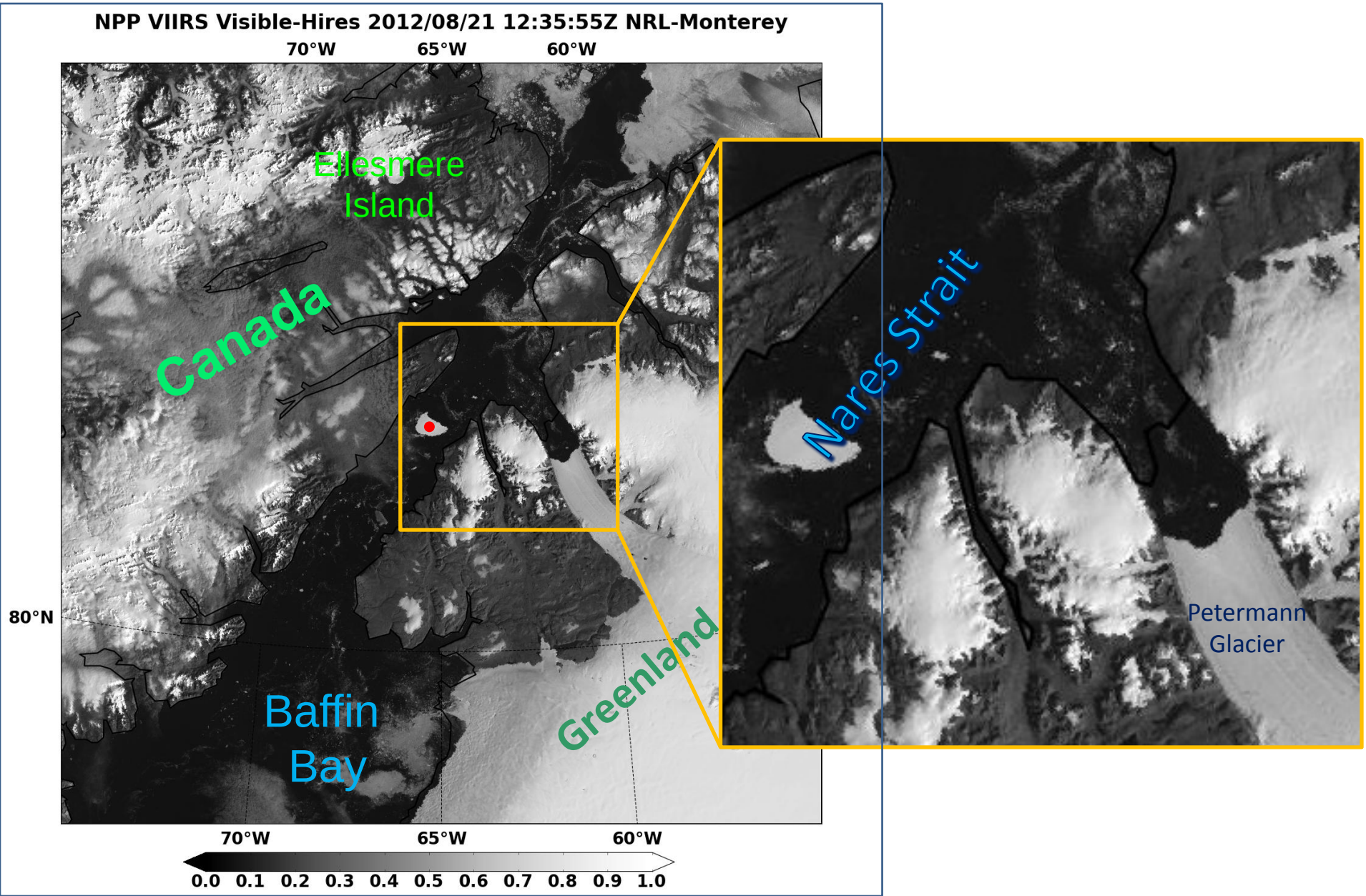
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
34 days later



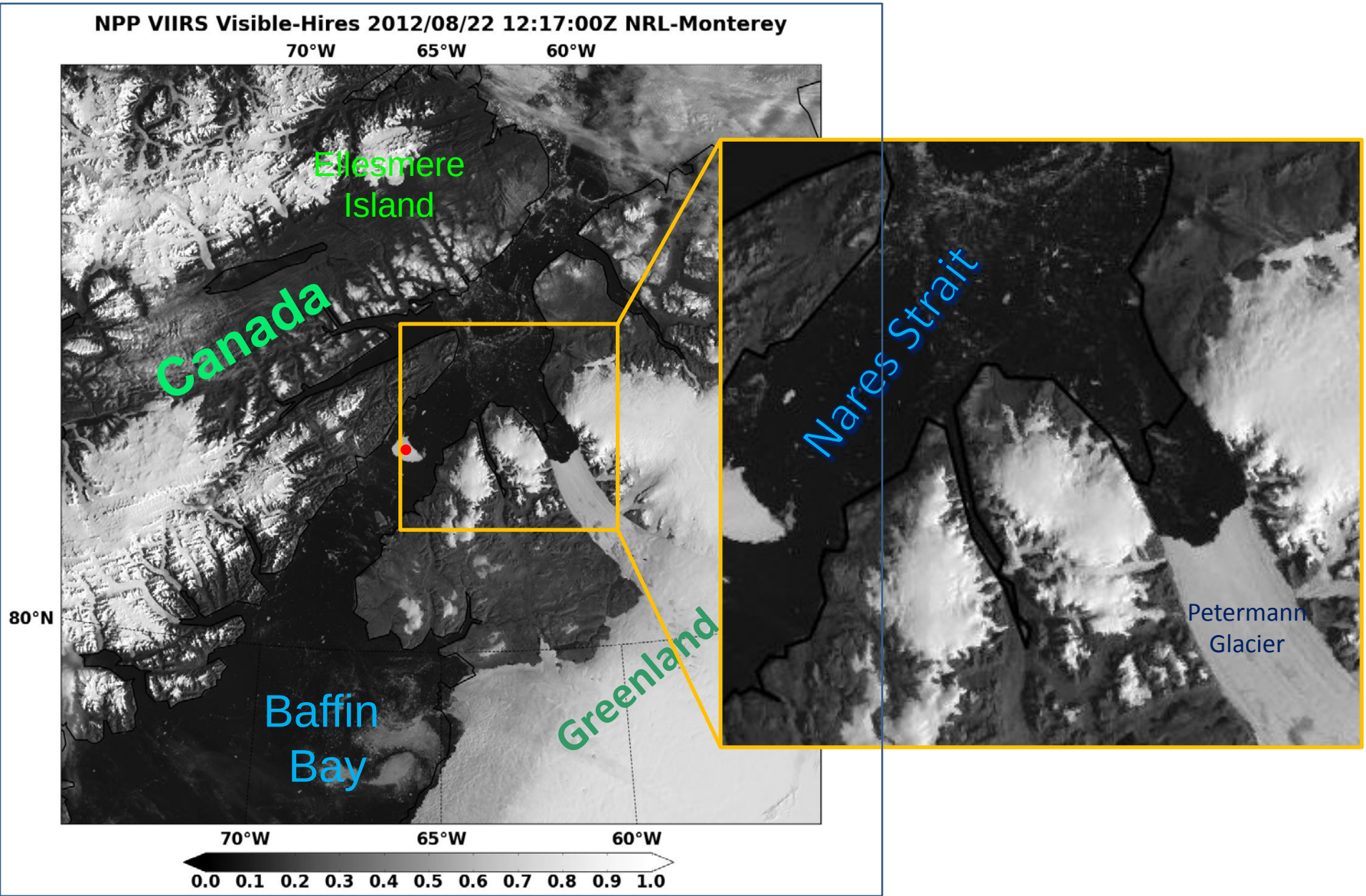
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
35 days later



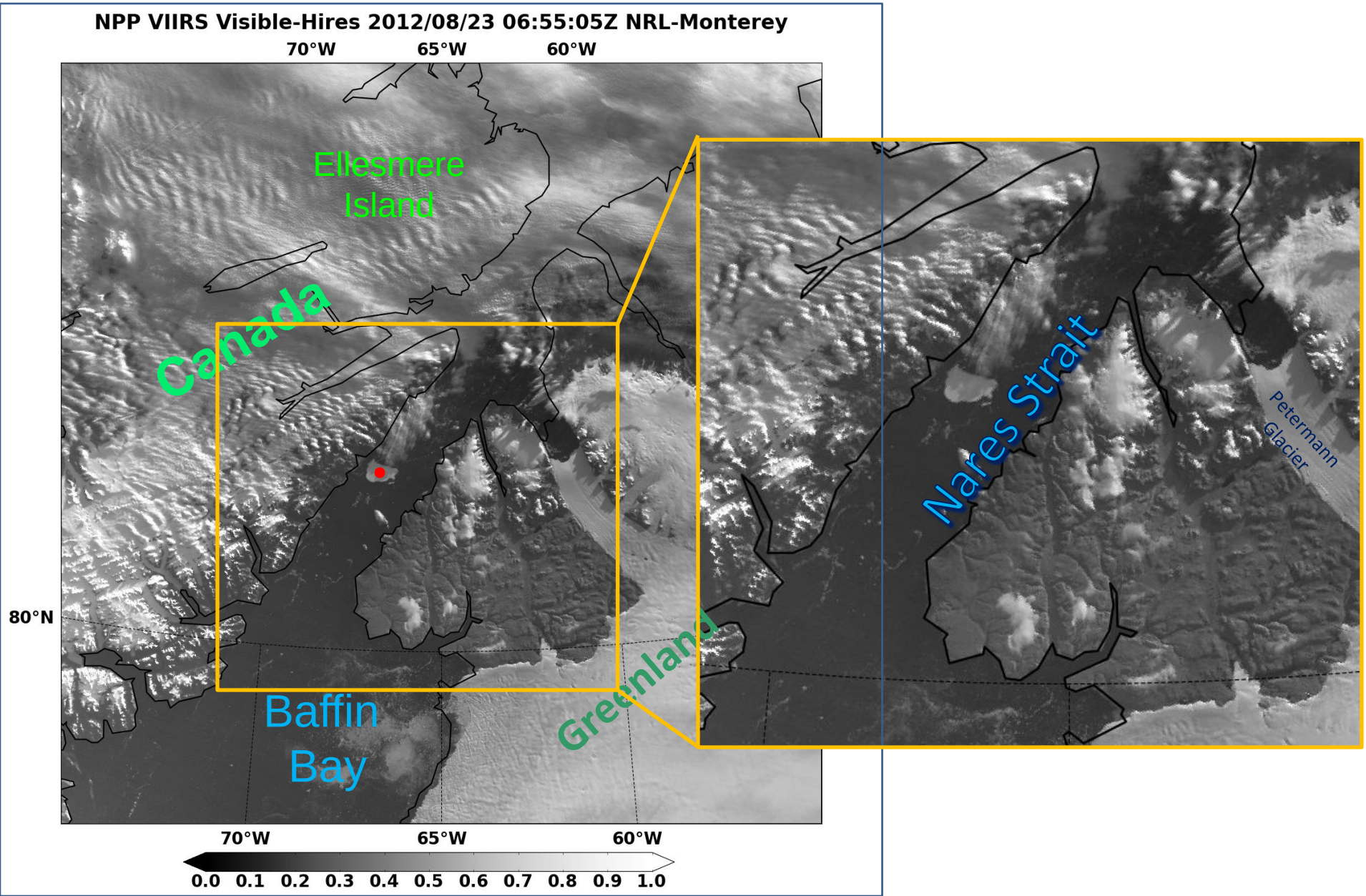
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
36 days later



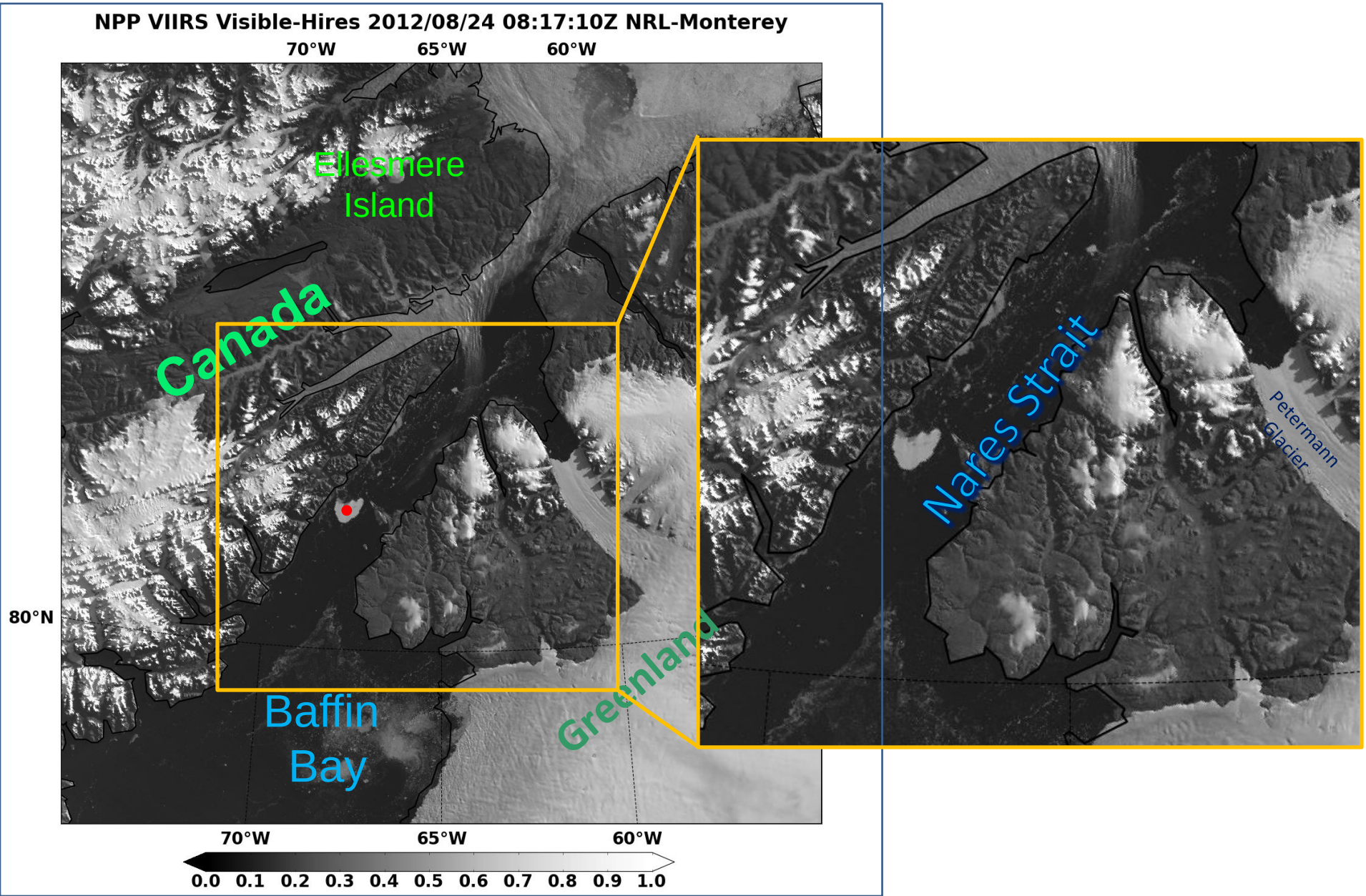
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
37 days later



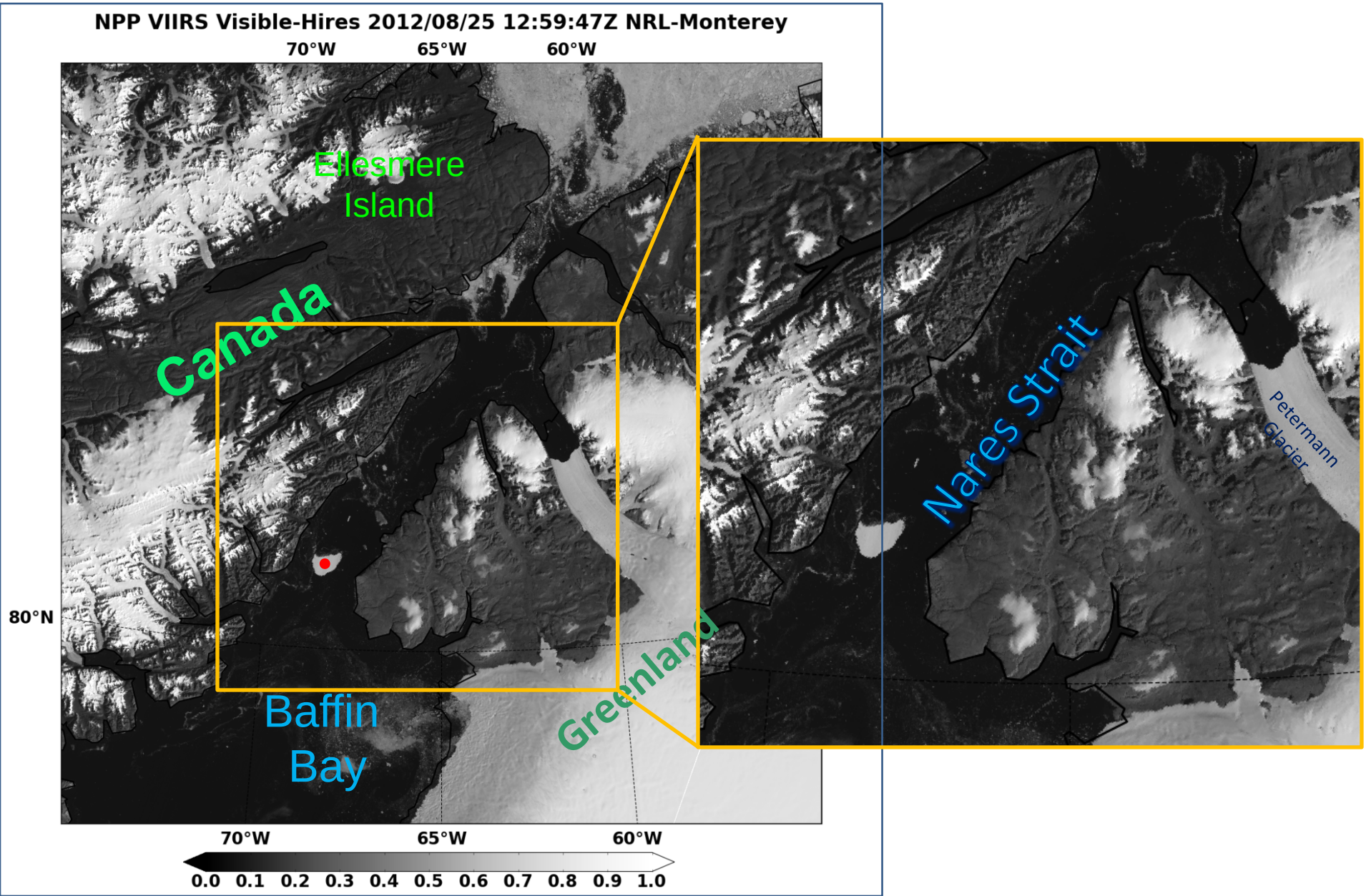
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
38 days later



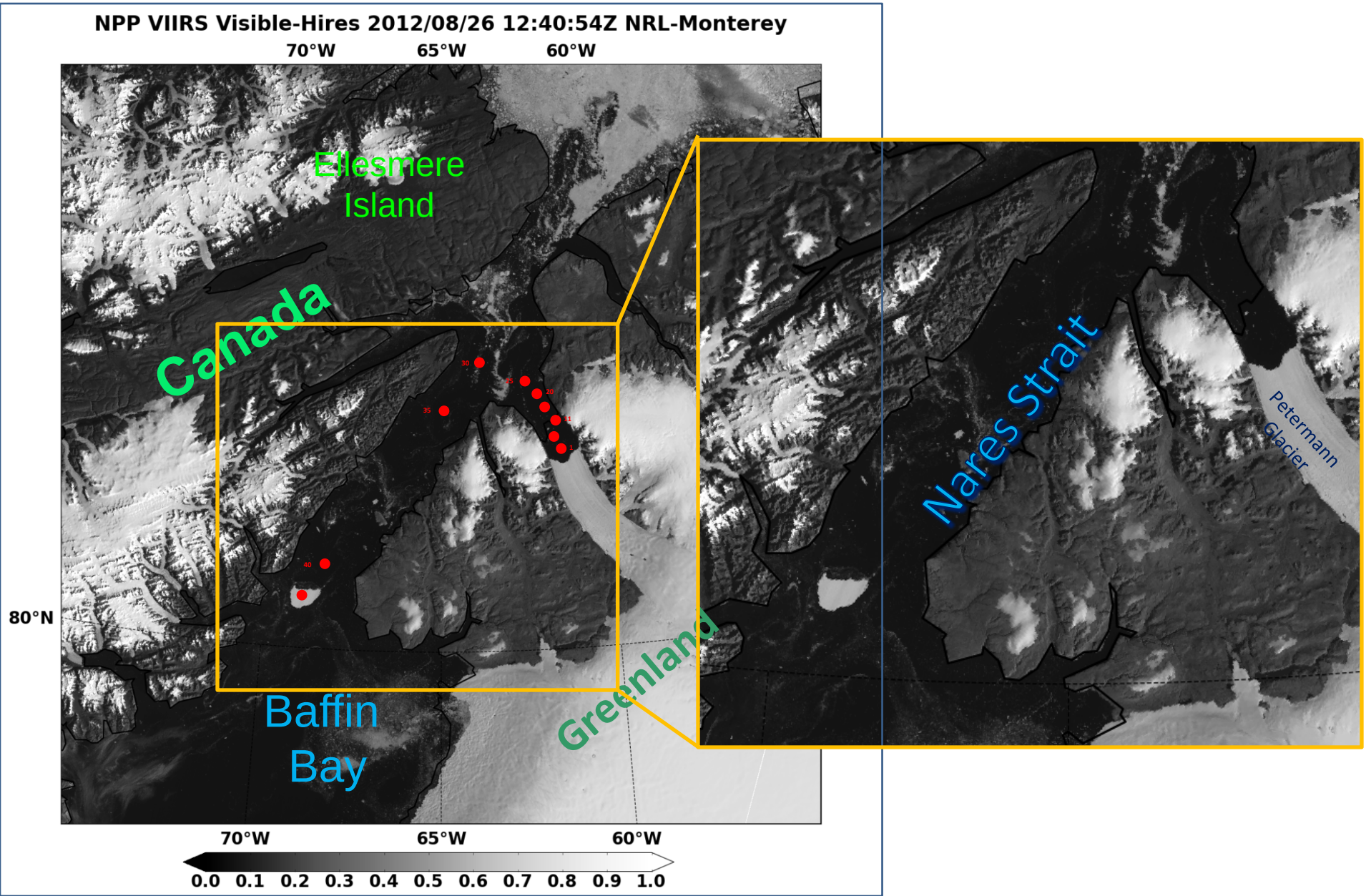
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
39 days later



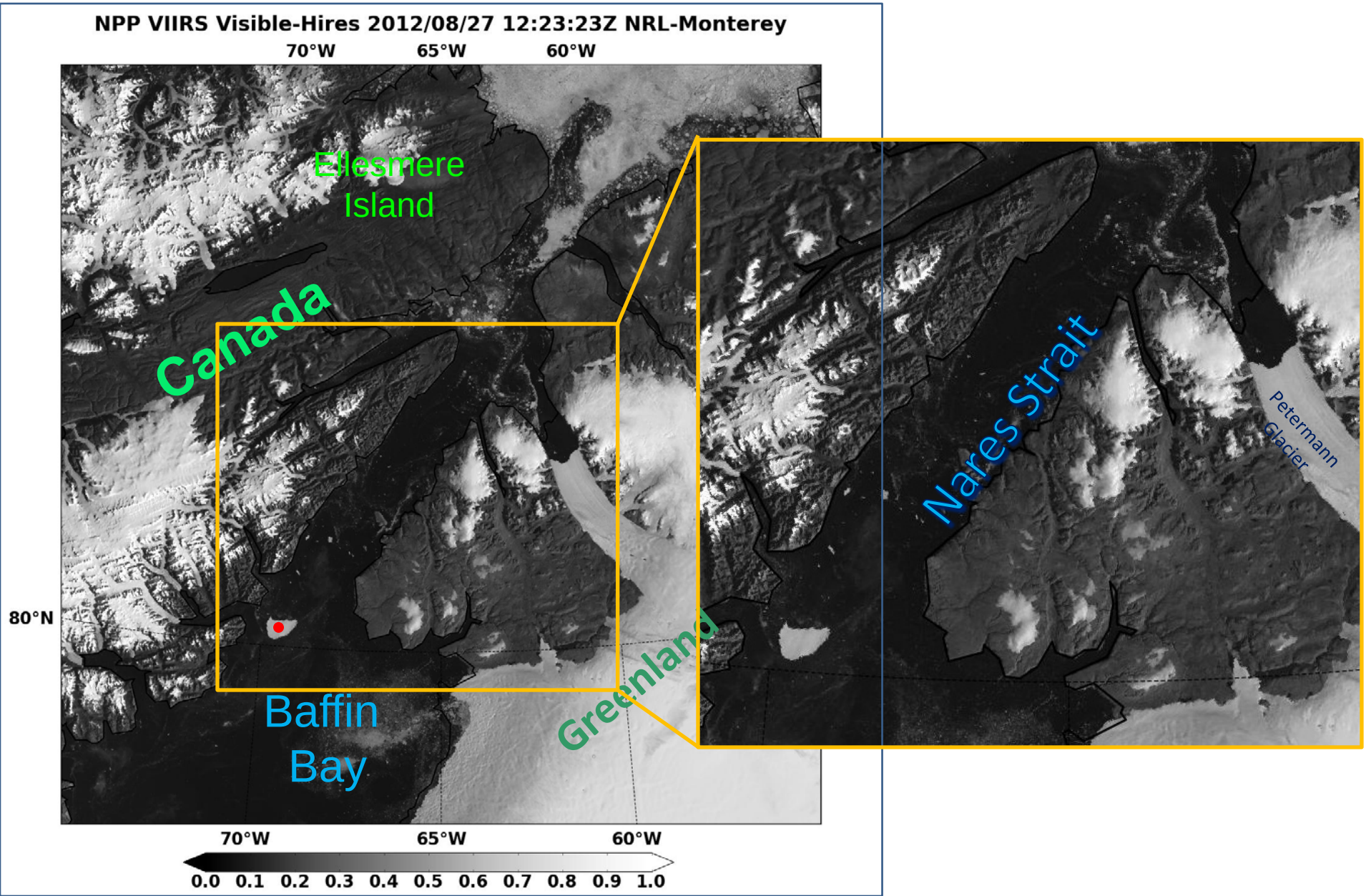
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
40 days later



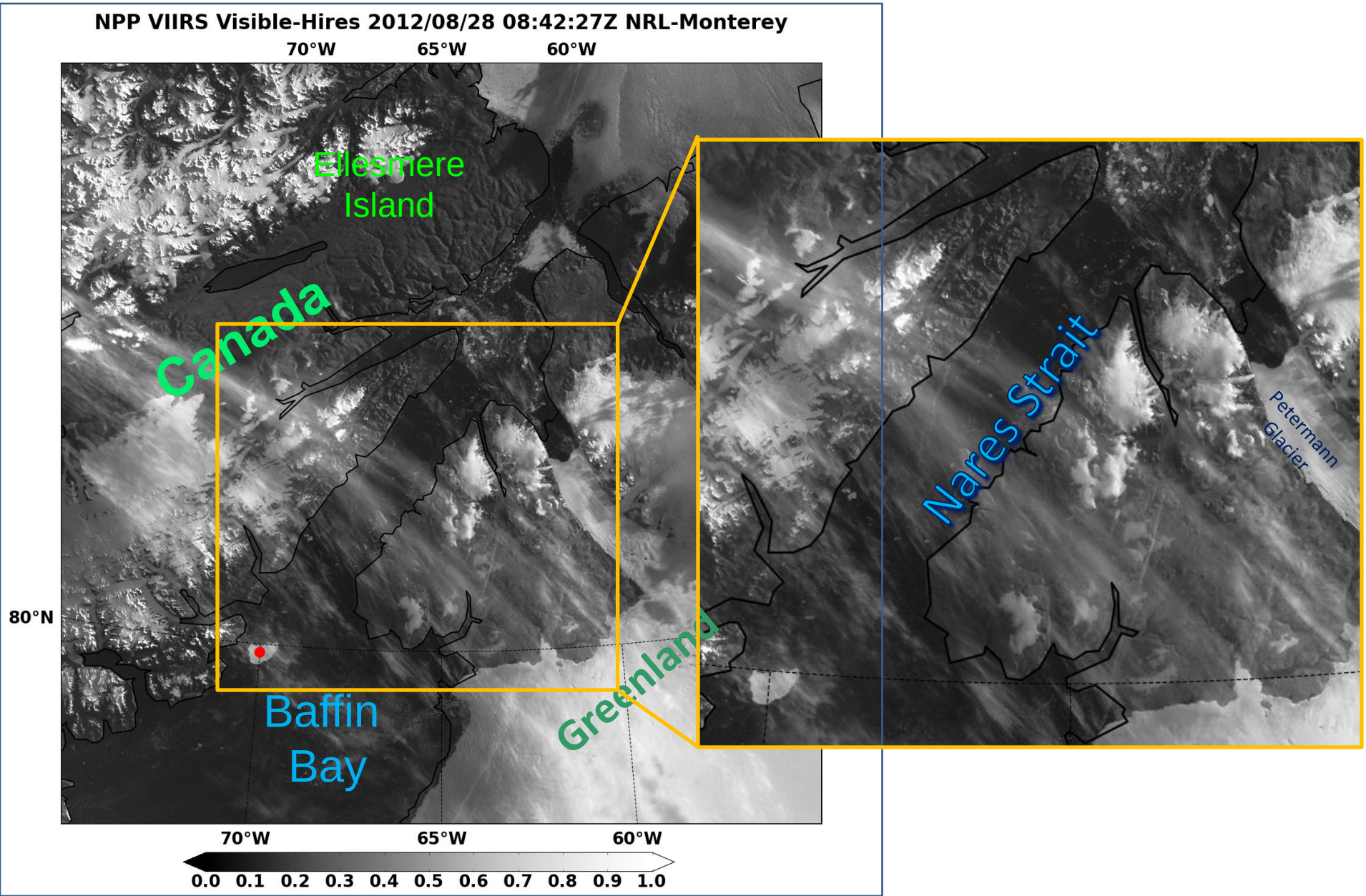
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
41 days later



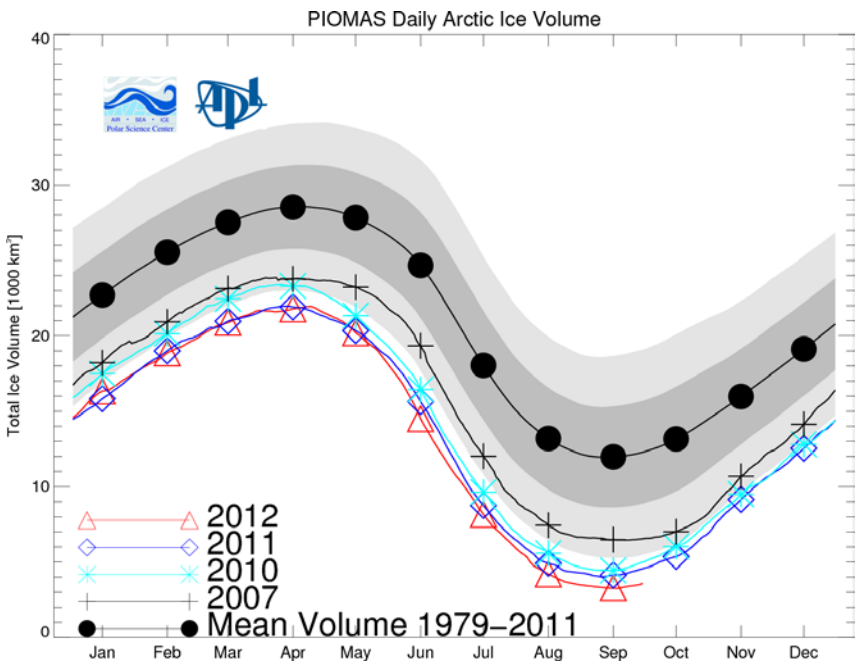
Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
42 days later

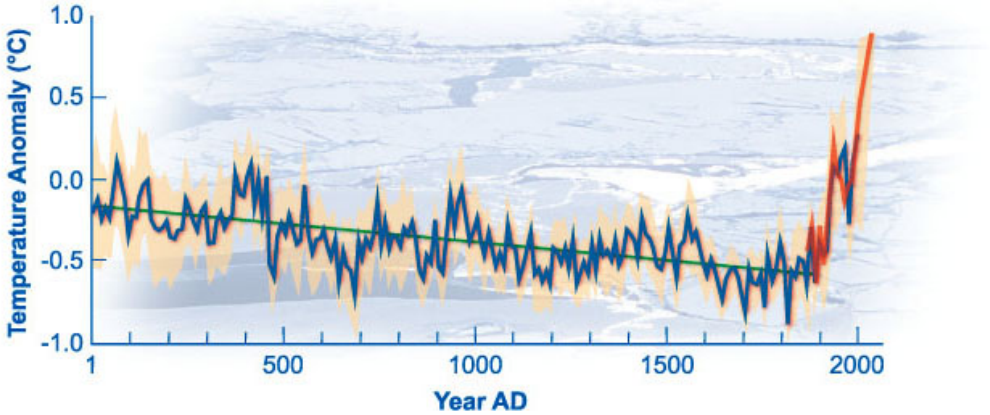


Suomi-NPP VIIRS Monitoring of Petermann Glacier
"Calving" Event
43 days later

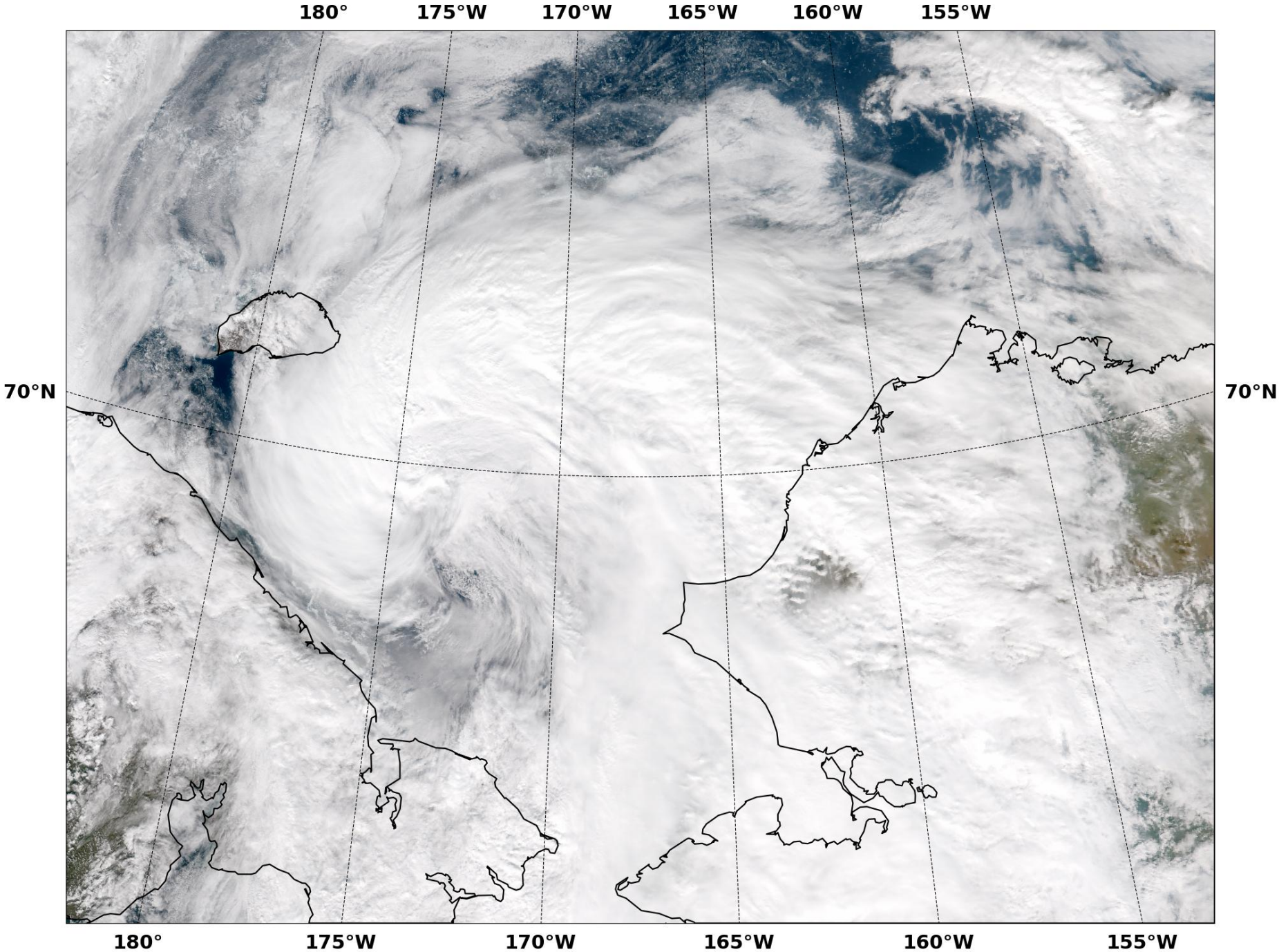


Arctic Sea Ice 2012





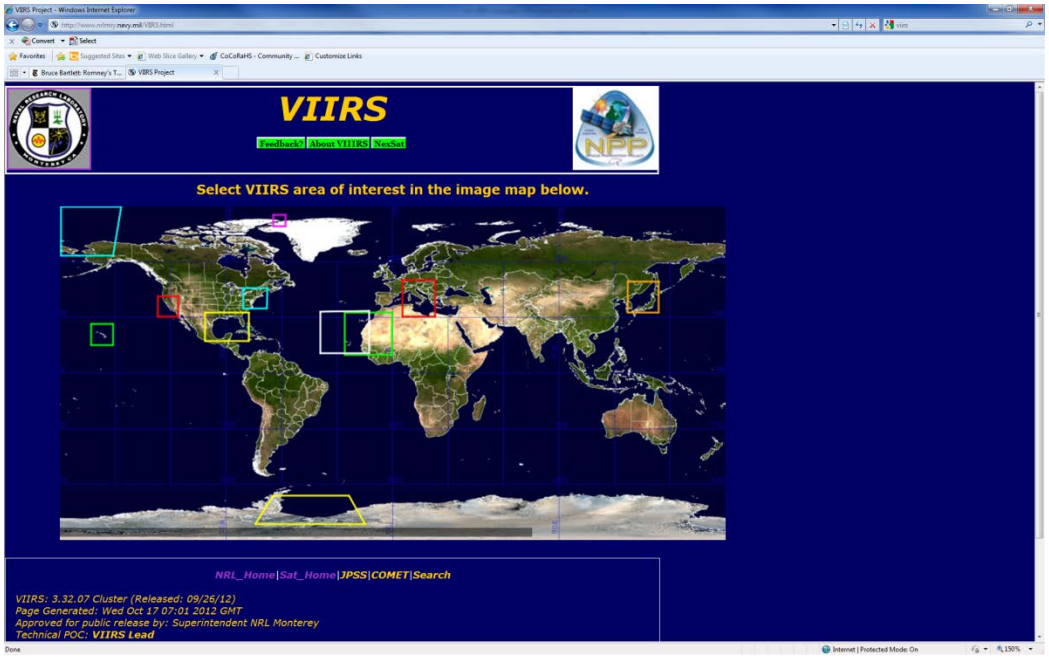
NPP VIIRS True-Color 2012/08/22 00:20:04Z NRL-Monterey



Come see our VIIRS Products

NEXSAT

http://www.nrlmry.navy.mil/NEXSAT.html

VIIRS

http://www.nrlmry.navy.mil/VIIRS.html