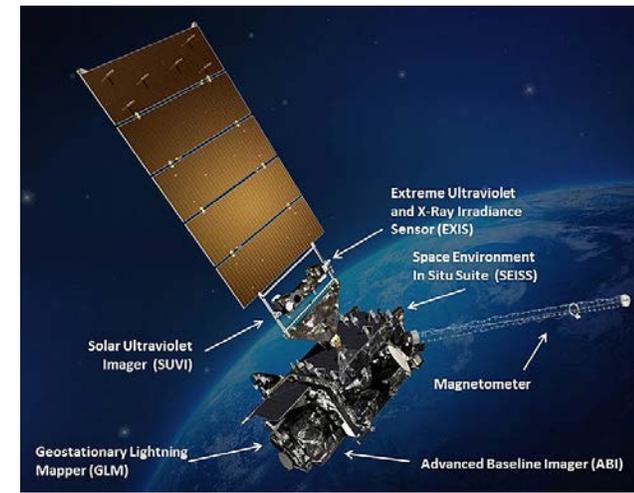




PennState



Very Quick Overview of the 16 Bands on the GOES-16 Advanced Baseline Imager (ABI)

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National Air Quality Conference

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Where to Go for More Information

- We are just going to scratch the surface today! Please spend some time learning about the ABI's products:
 - Direct observations from each band
 - Derived products from combinations of bands
- 2-page fact sheets from the [GOES-R](#) program and [CIRA](#) for each band (extremely useful)
- Links to imagery, band info, calibration (everything you could possibly want) from [CIMSS](#)
- [BAMS article on ABI](#) (April 2017)

Places to Start Viewing Actual ABI Imagery

- [College of DuPage Experimental GOES-16 Viewer](#) (CONUS and full disk)
 - Also has product description for each band
 - This is the site I use for GOES imagery! (It's great!)
- [NOAA'S GOES-East Image Viewer](#) (CONUS and full disk)

Visible (red) Imagery for Continental US (GOES16)

College of DuPage

NEXLAB Experimental Satellite
Support Unidata | Disclaimer/FAQ

Select a Sector Category:

- View Global Sectors
- View Continental Sectors**
- View Regional Sectors
- View Sub-Regional Sectors
- View Localized Sectors
- View Mesoscale Floater Sectors

Select a Product:

ABI Bands

01: Visible (blue)	02: Visible (red)
03: Veggie (NIR)	04: Cirrus (NIR)
05: Snow/Ice (NIR)	06: Particle Size (NIR)
07: Shortwave IR	08: Upper-level WV
09: Mid-level WV	10: Lower-level WV
11: CLD Top Phase	12: Ozone
13: Clean (LWIR)	14: Long-wave IR
15: Dirty (LWIR)	16: CO2 (LWIR)

RGB Color Products

True-Color	Airmass
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GOES-16 BAND 02 (VISIBLE - RED) 0.5 KM | VALID 26 JAN 18 03:07:23 UTC

48

Save

GOES-East Home CONUS Views Full Disk Views Mesoscale Views Regional Views Caribbean / Atlantic About

GOES-East Image Viewer

Full Disk View - GeoColor : 26 Jan 2018 - 0245 GMT

(click image for zoomable enlargement)

25 Jan 2018 - 22:19 EST
26 Jan 2018 - 03:19 UTC

NOAA

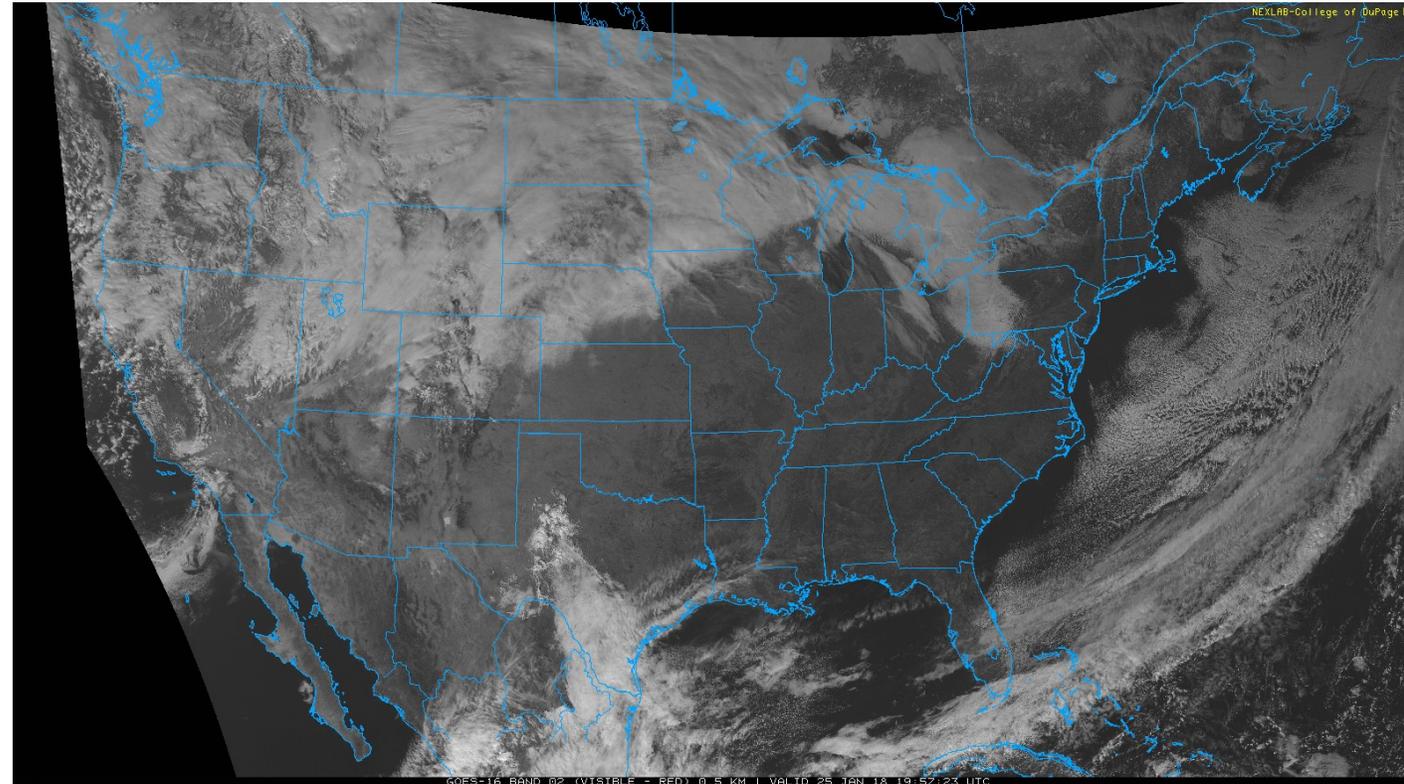
ABI Gives You What You Are Used To – At Higher Resolution!

Imager Band Number	Imager Band Name	Wavelength Range (μm)	Spatial Resolution (km)	Corresponding ABI Band(s)	ABI Band Spatial Resolution (km)
1	Visible	0.55-0.75	1	2 (red)	0.5
2	Shortwave IR	3.8-4.0	4	7 (shortwave IR)	2
3	Water Vapor	5.5-7.0	8	8, 9, 10 (upper-, mid-, low- level water vapor)	2
4	Longwave IR 1	10.2-11.2	4	13, 14 (clean longwave IR, longwave IR)	2
5	Longwave IR 2	11.5-12.5	4	15 (dirty longwave IR)	2

ABI Bands (Probably) Most Useful for Everyday Forecasting

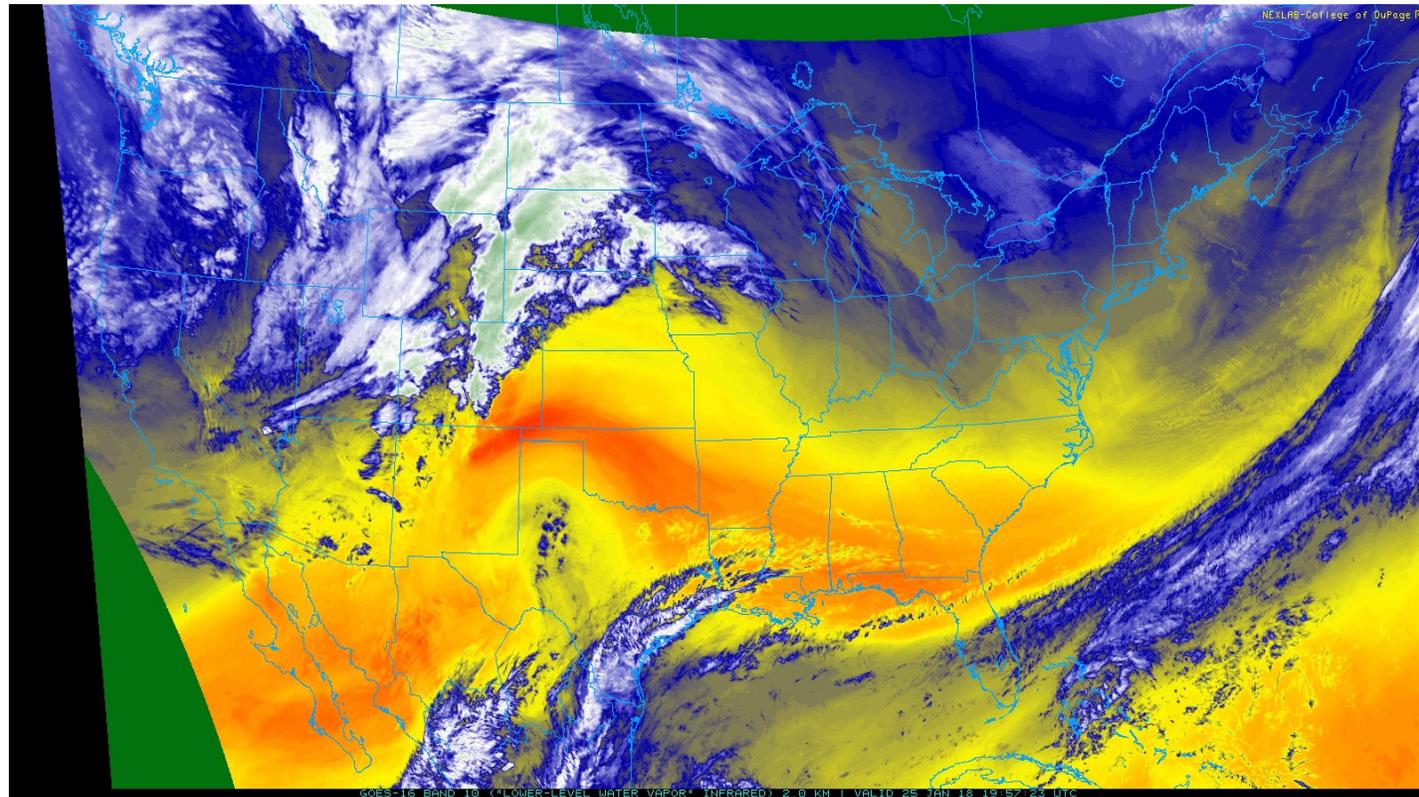
ABI Band 2: Visible (Red)

- Highest spatial resolution (0.5 km) of all the ABI bands
- 0.64 μm
- Only available in the daytime!
- Use it in the same way you are used to using the Imager visible channel 1
 - Clouds, fog, snow on ground
 - Convective development
 - Location of storms, fronts



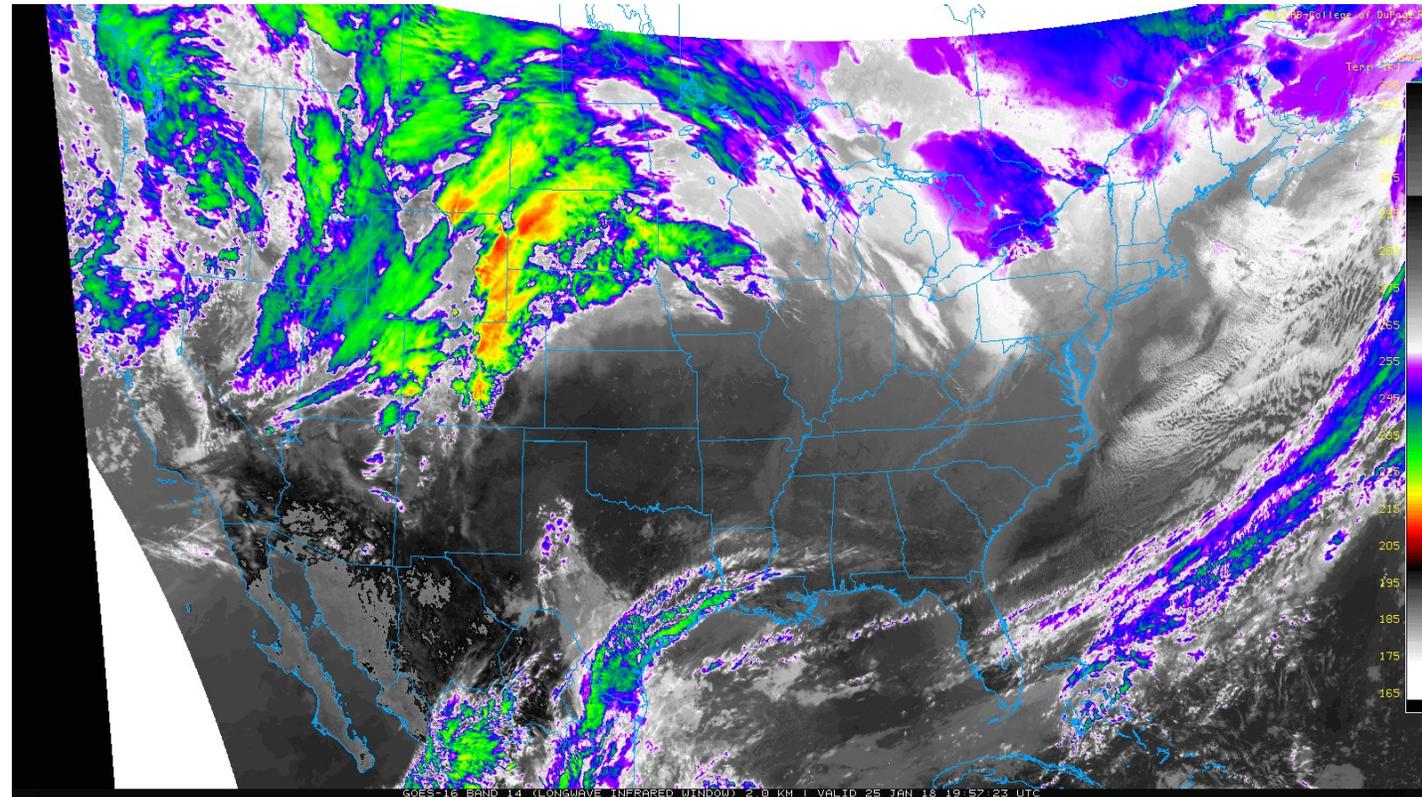
ABI Bands 8, 9, 10: Water Vapor

- Instead of one broad water vapor band, ABI gives you three!
 - 8: Upper-level (6.2 μm)
 - 9: Mid-level (6.9 μm)
 - 10: Low-level (7.3 μm)
- Available during the day and night
- Use the same way you are used to using the Imager water vapor channel 3
 - Location of jet stream
 - Troughs/ridges



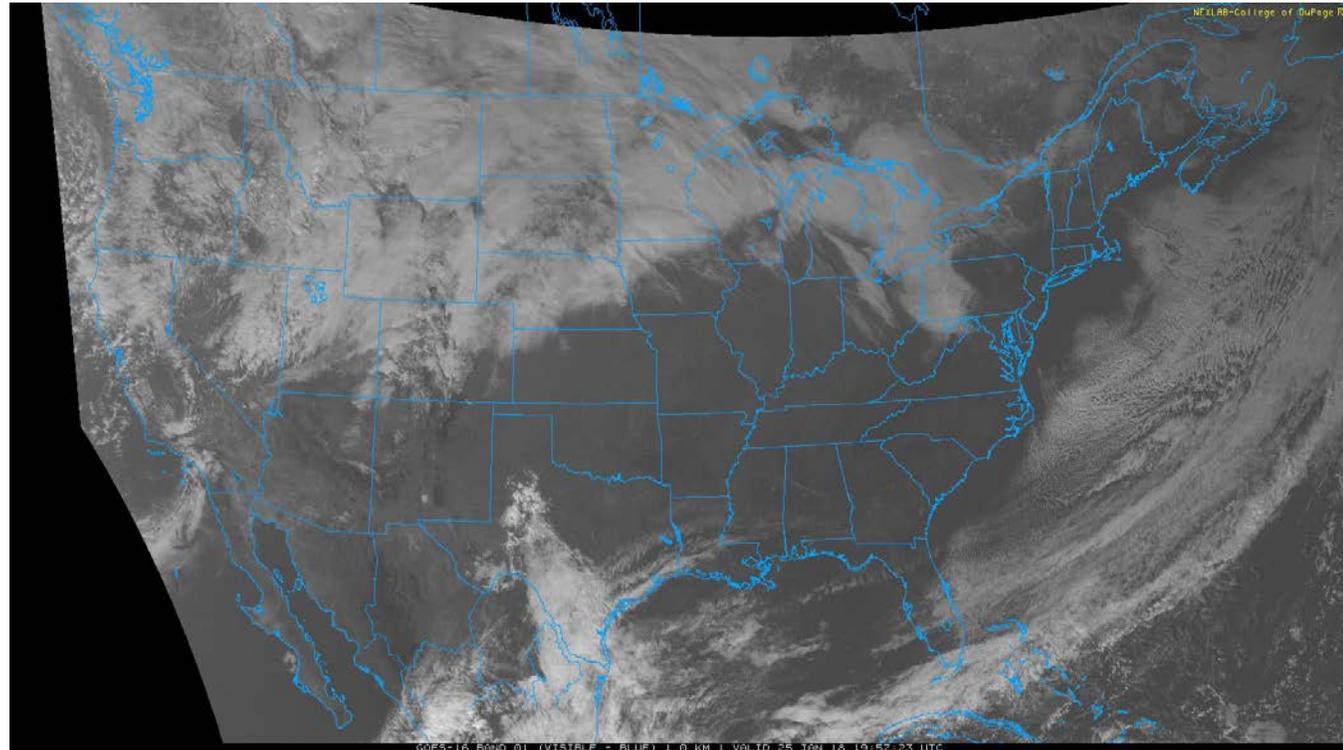
ABI Bands 13, 14: Longwave IR

- ABI has two longwave IR bands that correspond to Imager IR channel 4
 - 13: “clean” LWIR (10.3 μm)
 - 14: LWIR (11.2 μm)
- Available during the day and night
- Use these bands the same way you are used to using the Imager IR channel 4
 - Clouds at night



GeoColor (Derived from ABI Band 1 – Blue)

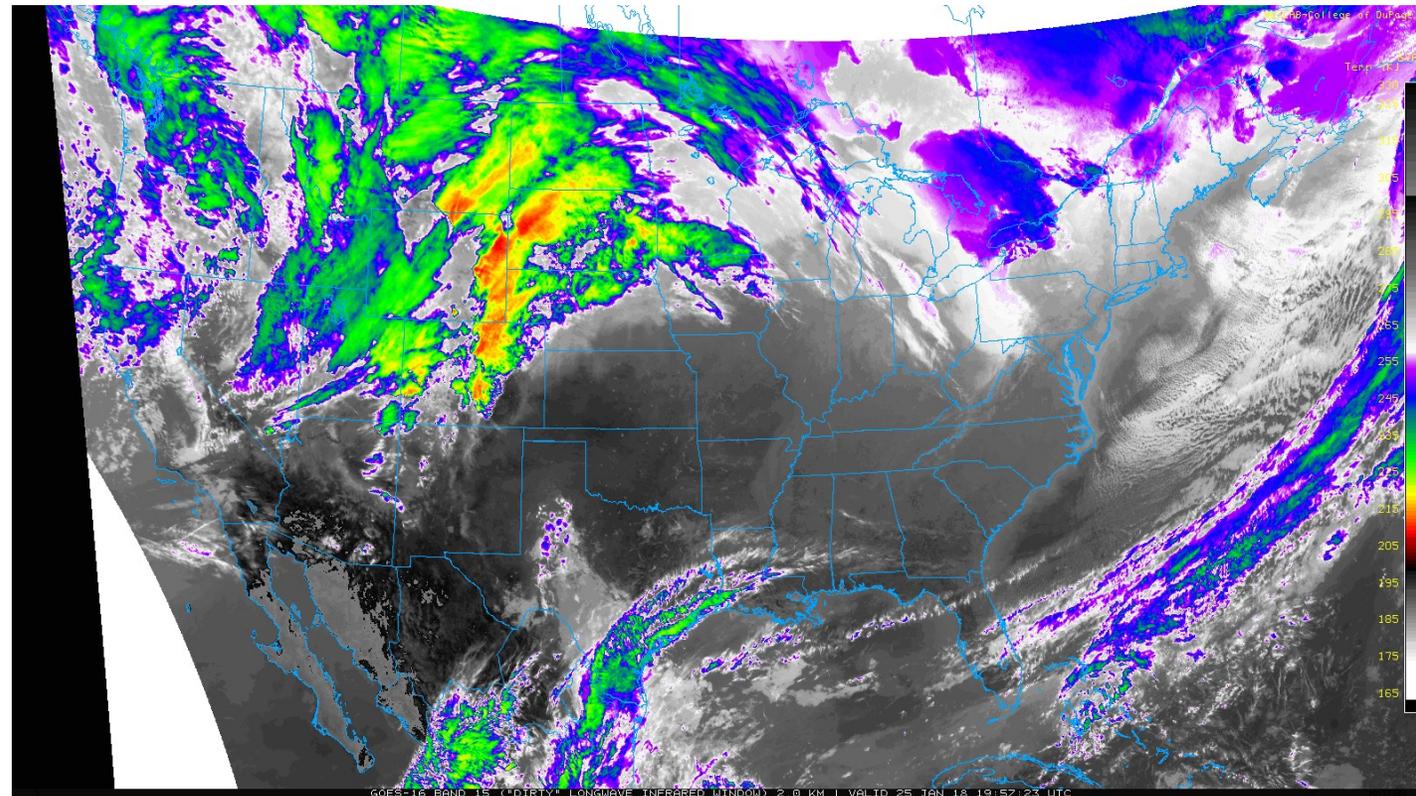
- ABI has two visible bands: red (band 2) and blue (band 1, 0.47 μm)
 - Official use of blue band is for aerosols, but GeoColor is much more user-friendly
 - GeoColor is combination of red, blue, and synthetic green
 - Blue band is black/white, lower spatial resolution (1 km) than red band
 - Difficult for average user to pick out aerosol plumes
 - Much easier to see smoke, dust, haze in GeoColor (since it's in color not B/W)
- GeoColor is available from NOAA's GOES-16 image viewer
- COD has a "true color" but it's NOT the GeoColor product



ABI Bands (Probably) Less Useful for Everyday Forecasting (More for Specialized Applications)

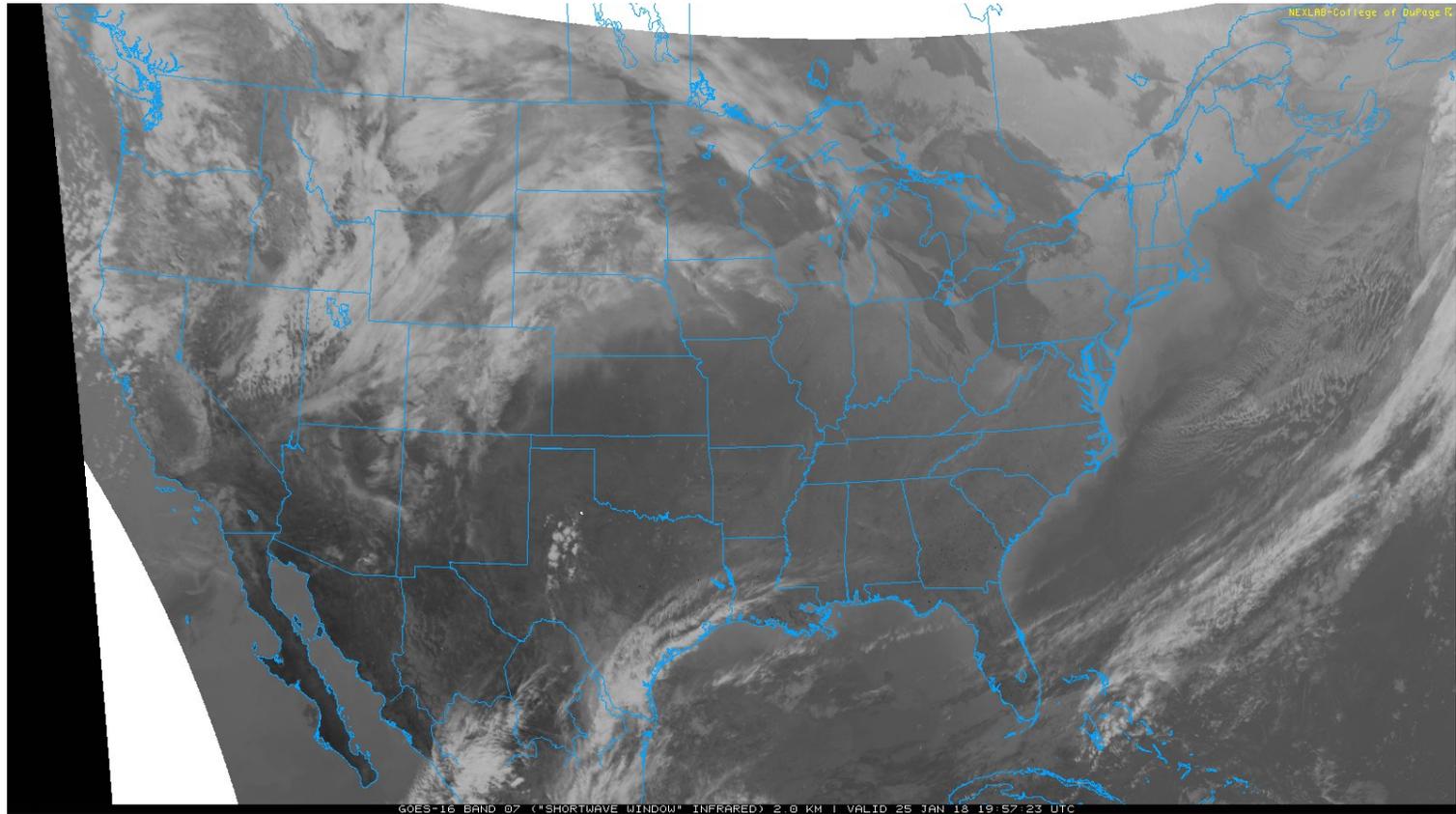
ABI Band 15: Longwave IR

- ABI has a longwave IR band that corresponds to Imager IR channel 5
 - 15: “dirty” LWIR (12.3 μm)
- “Dirty” refers to interference from water vapor absorption
- Available during the day and night
- Not really used on its own, but in conjunction with the a “cleaner” IR channel (like band 13) and as part of derived cloud products



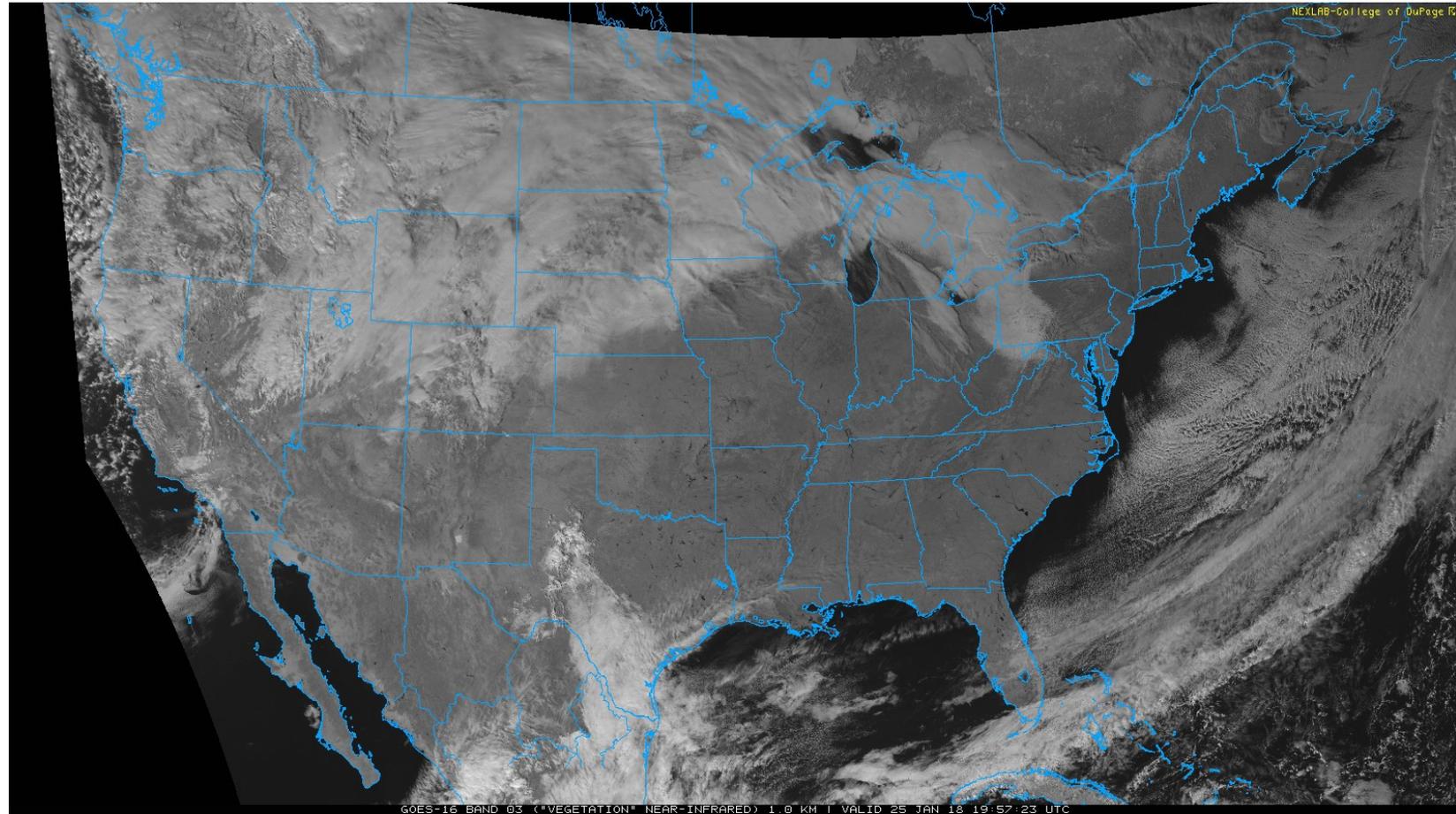
ABI Band 7: Shortwave IR

- Similar to Imager shortwave IR channel 2 but with higher resolution
- 3.9 μm
- Available during the day and night
- Same uses as the Imager shortwave IR channel 2:
 - Fog/low clouds at night
 - Fires (hotspots)
 - Volcanic eruptions
 - Snow and ice



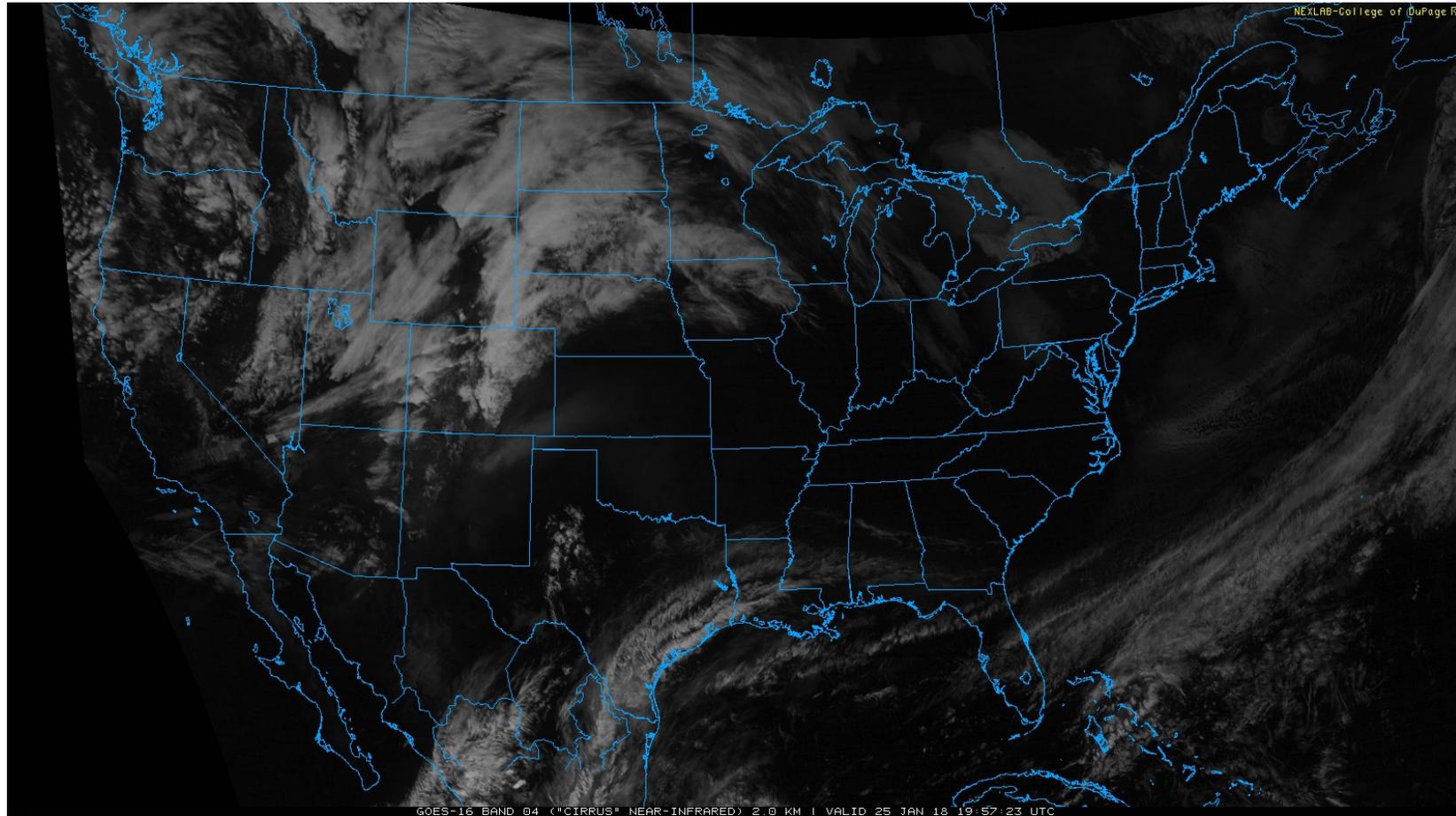
ABI Band 3: Veggie (near IR)

- New band (not on Imager)
- 0.86 μm
- Only available in the daytime!
- Main applications:
 - Burn scars
 - Vegetated land



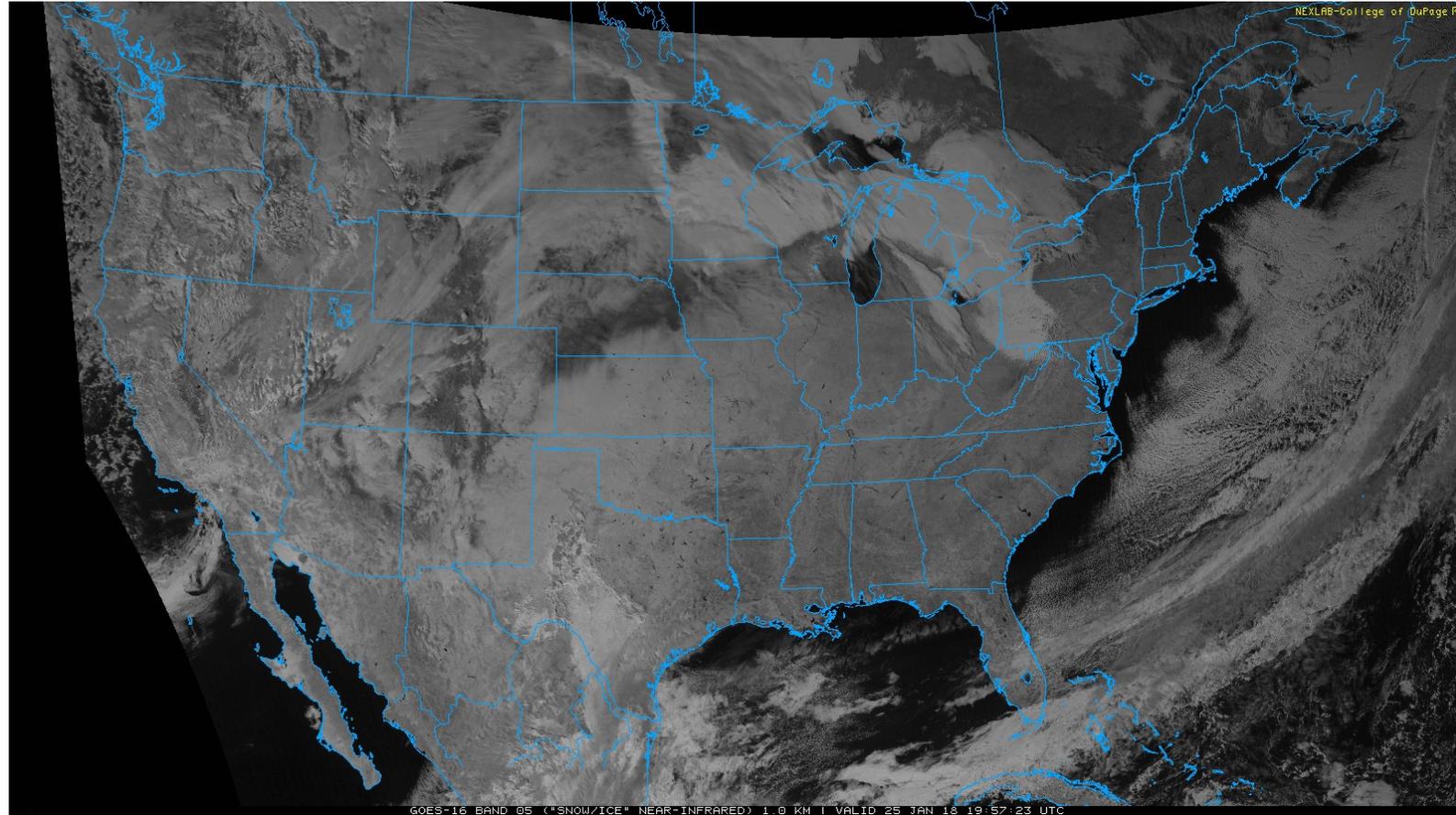
ABI Band 4: Cirrus Clouds (near IR)

- New band (not on Imager)
- 1.37 μm
- Only available in the daytime!
- Main applications:
 - High, thin clouds during the daytime



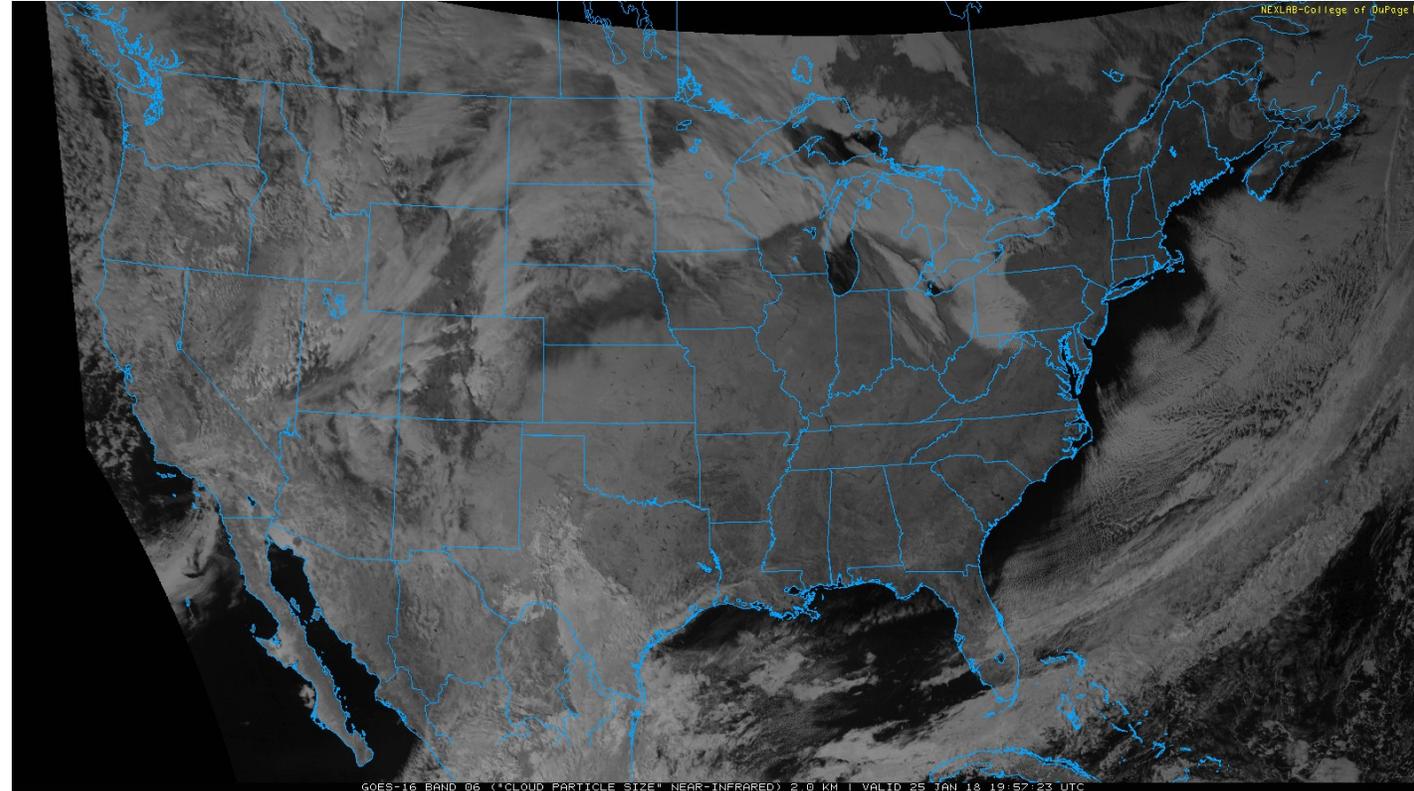
ABI Band 5: Snow/Ice (near IR)

- New band (not on Imager)
- 1.6 μm
- Main applications:
 - Water clouds (bright) vs. ice clouds (dark) during the day
 - Fire hotspots at night



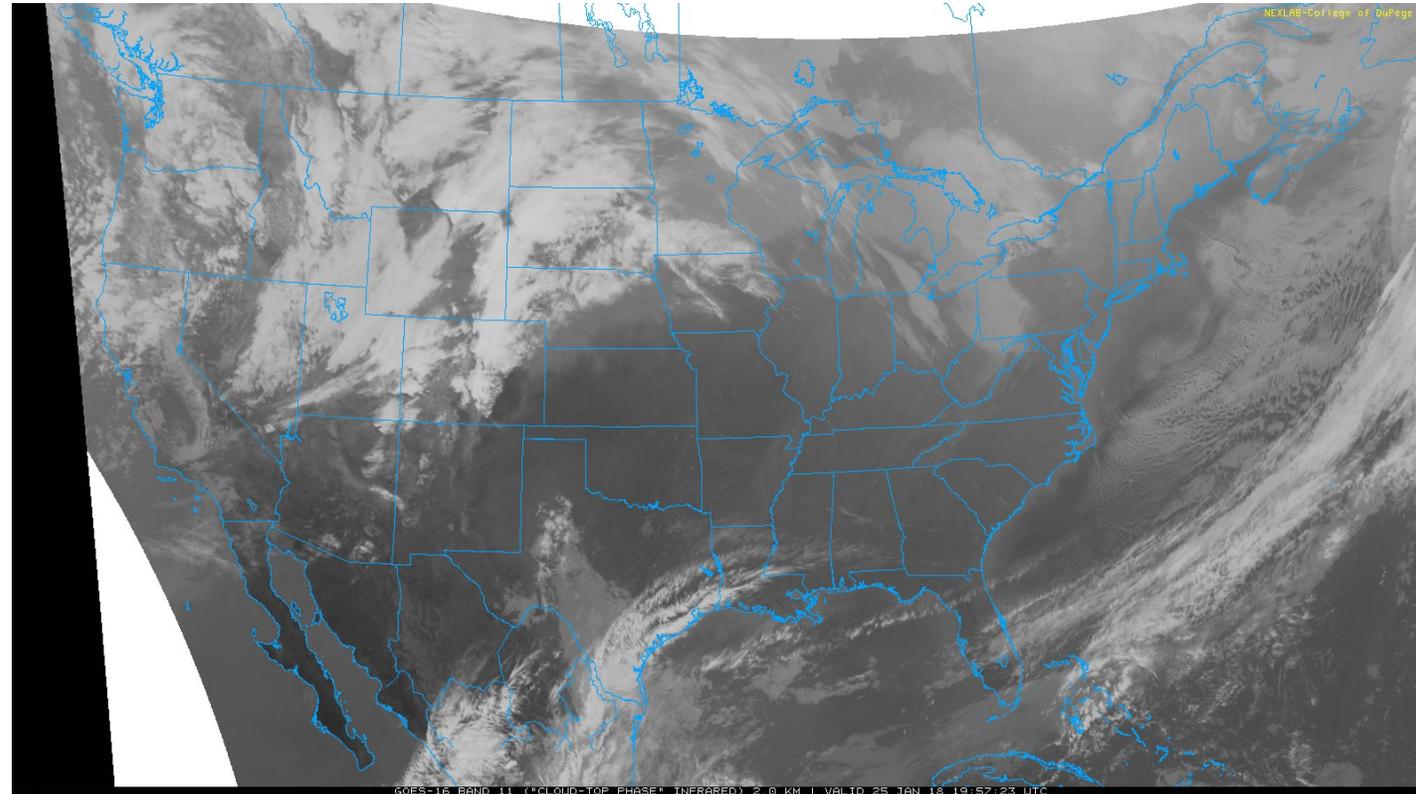
ABI Band 6: Cloud Particle Size (near IR)

- New band (not on Imager)
- 2.2 μm
- Not really used on its own, but in conjunction with other bands as part of derived cloud products (cloud particle size, cloud mask, AOD)
- Fire hotspots at night



ABI Band 11: Cloud Top Phase (IR)

- New band (not on Imager)
- 8.4 μm
- Not really used on its own, but in conjunction with bands 14 and 15 to derive cloud top phase and type products
- SO₂ plumes from volcanic eruptions



ABI Band 12: Ozone (IR)

- Sort of a new band (not on Imager but on Sounder)
- 9.6 μm
- Primary use is in derived products for dynamics near the Tropopause
- Also component in derived total column ozone product
- Everyone asks me if we can use band 12 for ground-level O_3 ! (We can't)
 - 90% of O_3 is in the Stratosphere, so ABI can't "see" O_3 in Troposphere
 - Also, interference from water vapor absorption at 9.6 μm
 - Not even useful for identifying Stratospheric inversions
 - Use difference b/w ABI bands 8 and 10 (upper- and low-level water vapor) instead

ABI Band 16: CO₂ (IR)

- 13.3 μm
- Used in many derived products:
 - Cloud mask
 - Cloud-top height
 - Tropopause deliniation