

# The NASA Scatterometer Climate Record Pathfinder Project

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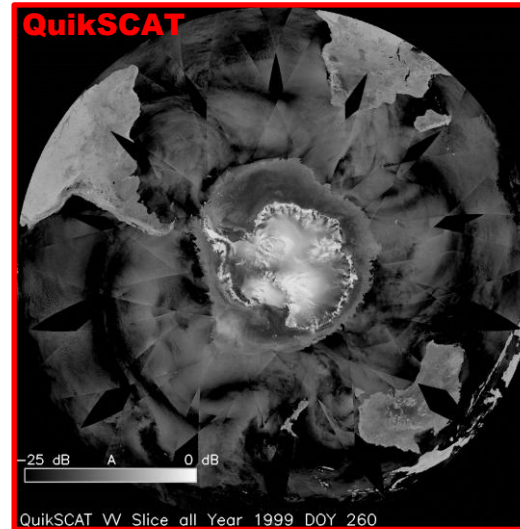
Long-term studies of global climate can benefit from a retrospective analysis of past satellite missions.

We have recently developed new C- and Ku-band enhanced-resolution radar backscatter  $\sigma^{\circ}$  image products that are derived from satellite scatterometry missions:

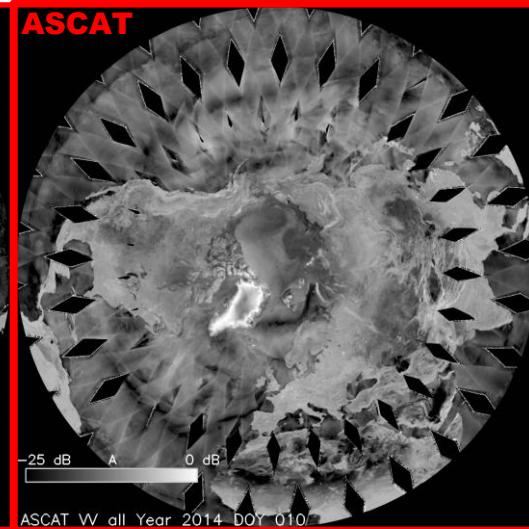
- **NASA RapidScat (2014-2016) mission, 13.6 GHz (Ku-band)**
- **NASA Quick Scatterometer (QuikSCAT) and SeaWinds (1999-2013) missions, 13.995 GHz (Ku-band)**
- **IRSO Oceansat-1, -2, and -3 (OSCAT) mission (2010-present), 13.515 GHz (Ku-band)**
- **ESA Advanced SCATterometer (ASCAT) mission (2008-present), 5.225 GHz (C-band)**

These multi-frequency satellite scatterometry missions provide global  $\sigma^{\circ}$  spanning more than three decades that are unique benchmarks for studying climate change over the Earth's land and ice surfaces, particularly over rapidly warming ice-covered surfaces, such as Greenland, Antarctica, and High Mountain Asia. Multiple options include local time of day division and azimuth modulation.

The new enhanced-resolution  $\sigma^{\circ}$  image products are consistently-processed and compatibly-gridded with existing enhanced-resolution  $\sigma^{\circ}$  and microwave brightness temperature ( $T^B$ ) image products that date as far back as 1978.



**Figure 1:** Visualization of an example VV-polarization QuikSCAT image of the Southern Hemisphere created from one day of QuikSCAT slice measurements collected on DOY 260, 1999.



**Figure 2:** Visualization of an example VV-polarization ASCAT image of the Northern Hemisphere created from one day of combined ASCAT-A and ASCAT-B measurements collected on DOY 10, 2014.



**Figure 3:** Visualization of an example VV-polarization global RapidScat image created from day of RapidScat ascending measurements collected on DOY 283: