

MODIS and VIIRS Snow Cover Continuity

Long-term Continuity: Strategy is to use the same or very similar snow cover algorithms for MODIS and VIIRS, and series of products.

Continuity of Terra and Aqua MODIS and SNPP VIIRS snow cover products is described in Riggs, G. and Hall, D., 2020, Continuity of MODIS and VIIRS Snow Cover Extent Data Products for Development of an Earth Science Data Record, *Remote Sens.* **2020**, 12, 3781; doi:10.3390/rs12223781

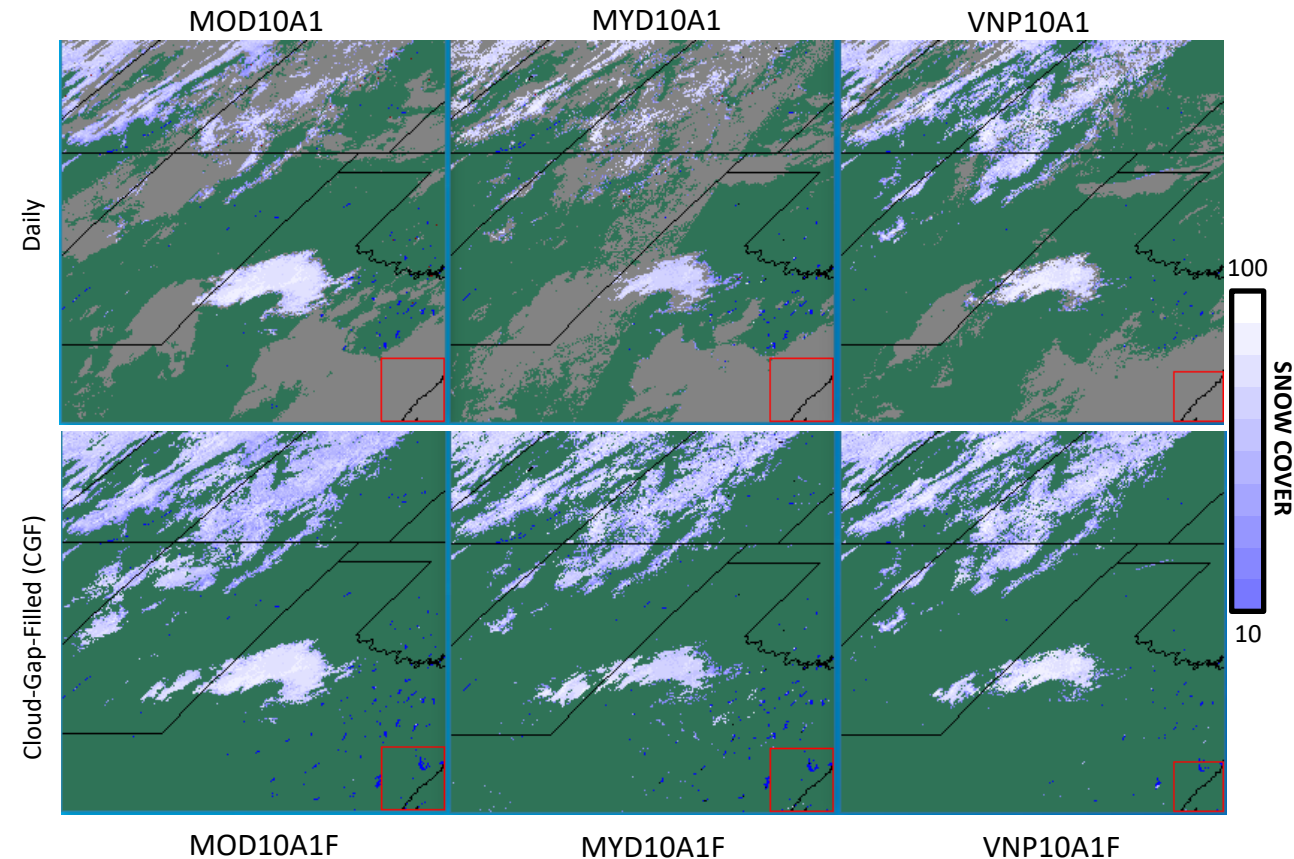
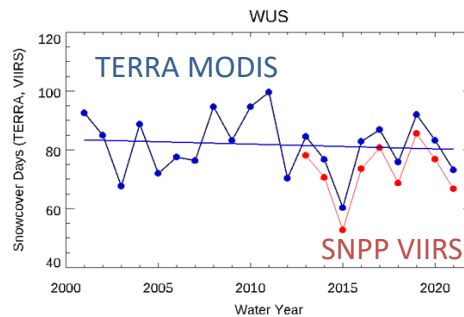
Snow Cover January 3, 2018

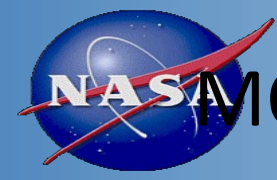
Snow cover extent spatial and temporal consistency is observed.

Confounding factors affecting continuity:

- Terra descending orbit, AM overpass / Aqua and SNPP ascending orbit, PM overpass
- MODIS 500m resolution, VIIRS 375m resolution
- MODIS and VIIRS band differences
- Cloud cover, occurrence of clouds and extent can differ between morning and afternoon
- Cloud mask algorithm differences
- Snow cover extent can change between morning and afternoon in some situations
- Sensor calibration

A comparison of Terra MODIS and SNPP VIIRS number of days of snow cover over the western US (WUS) over 8 years found consistency between products albeit there is a nearly consistent difference in number of days of snow mapped between Terra and SNPP.





MODIS and VIIRS Snow Cover Maintenance & Improvement

Include a new data filter in L2 snow cover algorithm that decreases occurrence of false snow detections along edges of water bodies and periphery of clouds. Strength--it decreases false snow detections. Weakness—it can limit snow detection in some snow-covered forest situations. Technical challenge—revise the PGE codes for MODIS C7 and for VIIRS C2.

Investigate possible ways to further decrease cloud/snow confusion to improve detection of snow cover.

Update the MODIS and VIIRS products User's Guides.

Possibly use the Algorithm Publication Tool (APT) to create revised ATBDs of existing products.

Investigate effects of Terra end of mission actions on products.

The cloud-gap-filled (CGF) products should supersede the 8-day products.

Near-term milestone: Replace current MOD10C1 daily global 5 km product with a new daily global 500 m product. A special daily global 500 m product was produced for the SnowPEX project by SIPS.

