# Validation Status of JPSS VIIRS Ice Products

Hong Zhang<sup>1,</sup> Richard Dworak<sup>1</sup>, XuanjiWang<sup>1</sup>, Yinghui Liu<sup>2</sup>, and Jeff Key<sup>2</sup>



Introduction

<sup>1</sup>Cooperative Institute for Meteorological Satellite Studies, University of Wisconsin–Madison (hongz@ssec.wisc.edu) <sup>2</sup>NOAA/NESDIS Center for Satellite Applications and Research, Madison, WI

NOAA21 VIIRS NDE v3r2 SIC (Arctic 2023 5 22)

NOAA21 AGE (Arctic 2023 5 22)

## Examples of NOAA-21 Ice products

A variety of ice products are generated with data from the Visible Infrared Imaging Radiometer Suite (VIIRS) onboard the NOAA-20 and NOAA-21 satellites. VIIRS sea. river. and lake ice products include ice surface temperature (IST), ice concentration (SIC), ice thickness (ITHK), and ice age (IAGE). NOAA Enterprise algorithms are employed to generate these products operationally. The products are fundamental to weather prediction, hazard detection, fishery, transportation, recreation, and climate monitoring.

### **Current Status**

The NOAA-21 VIIRS ice products have been operational since May 2023. Extensive validation has been performed. Daily, weekly and monthly VIIRS ice products have been compared with data from AMSR2, Landsat, CryoSat-2/SMOS, Canadian Ice Service, and US National Ice Center over both the Arctic and Antarctic regions. The comparisons of collocated VIIRS IST with in-situ MOSAiC measurements during (Multidisciplinary drifting Observatory for the Study of Arctic Climate) from October 2019 to September 2020 were performed as well. Results show that all the ice products meet the accuracy and precision requirements.





Figure 1: VIIRS ice surface temperature, ice concentration, ice thickness, and ice age daily composites of the Arctic on May 22, 2023.

#### Validation





Figure 3: SIC difference of NOAA-21 and AMSR2 on May 16, 2023 in the Arctic (left); right is the case study of NOAA-21 SIC to Landsat on July 23, 2023. NOAA-21 SIC does a good job capturing sea ice edge and pack ice to the north.



Figure 4: Monthly histogram of SIC (left) and THK (right) of NOAA-21 and NOAA-20 in December 2023 in Arctic.

#### **Conclusions**

In summary, the validation results show that JPSS VIIRS Enterprise ice products meet JPSS accuracy and precision requirements. The VIIRS ice products have played an important role in monitoring the environment, aiding in maritime navigation, hazard detection, and improving weather forecasting.

This work was supported by the NOAA JPSS Program Office.