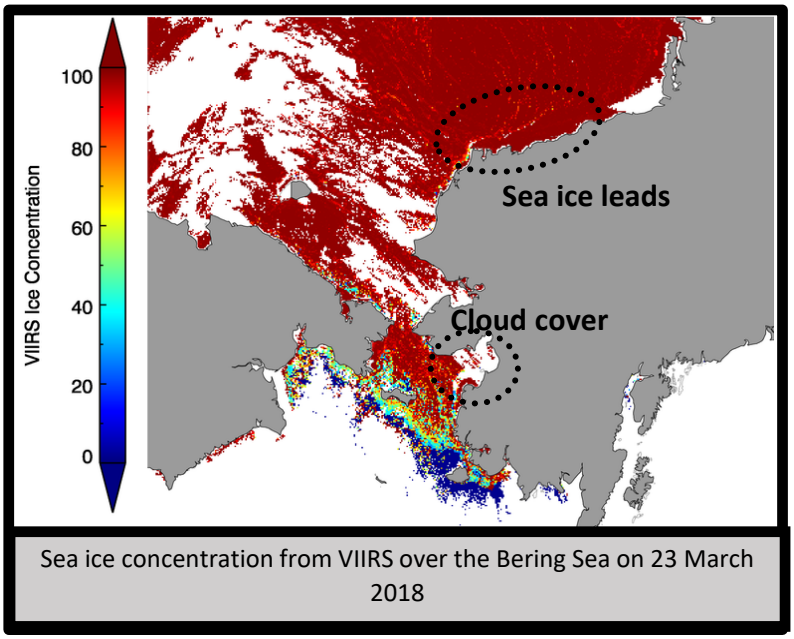
VIIRS Ice Concentration

Quick Guide

Why is VIIRS Ice Concentration Important?

Over ocean and inland water bodies, changes in sea ice impact the surface energy balance. The fraction of an area that is covered by ice is given by the VIIRS Ice Concentration product. Ice information is important for planning commercial transportation, water management, and damage control. Data from VIIRS (on Suomi-NPP and NOAA-20) are used to produce 750-m resolution ice concentration plots for the Arctic and Antarctic, including inland waters. This product comes at a much higher spatial resolution than typical passive microwave sea ice products.



Sea ice concentration from VIIRS over the Bering Sea on 23 March 2018

Which VIIRS Channels are used?

VIIRS Band	Wavelength (µm)	Band Product Used
M5	0.672	Reflectance (Daytime)
M7	0.862	Reflectance (Daytime)
M10	1.602	Reflectance (Daytime)
M15	10.7	Brightness Temperature (Daytime/Nighttime)
M16	11.8	Brightness Temperature (Daytime/Nighttime)

Link to Advanced Theoretical Basis Document: (ATBD)

Impact on Operations

Primary Application: Accurate retrievals of ice concentration have great socioeconomic value due to its impact on fisheries, hunting, herding, transportation, and agriculture.

Application: Long-term records of ice concentration are valuable for climate change studies, as sea ice affects energy and moisture and heat exchange between the atmosphere and underlying water.

Application: Modeling studies require accurate sea ice retrievals for proper atmospheric circulation.

Limitations

Limitation: Ice concentration is not retrieved if less than 10% of all pixels in a search window are not covered by ice.

Limitation: Some clouds have similar spectral signatures as ice, and can interfere with this algorithm if not completely masked out . No retrievals can be carried out for cloudy pixels.

Limitation: Multiple overpasses are required to form a composite image, which is still susceptible to clouds causing missing data.

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