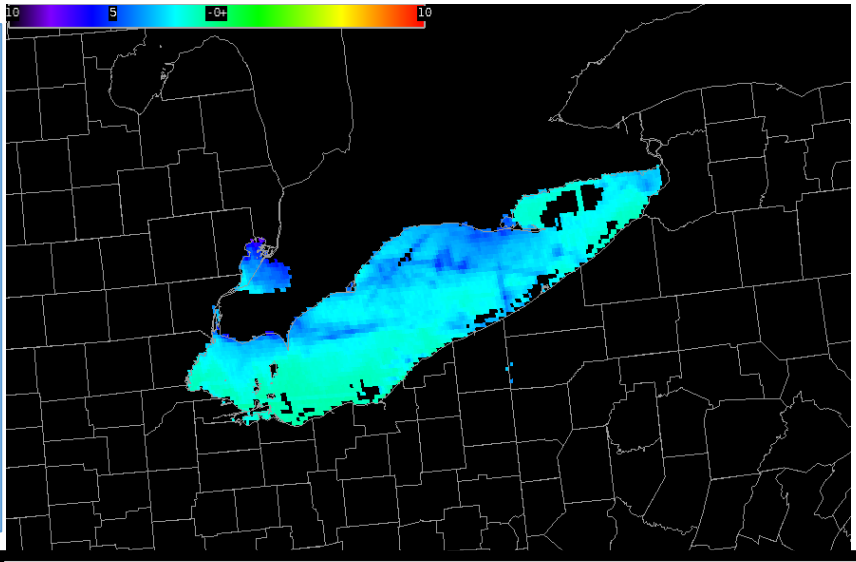
Ice Surface Temperature Quick Guide

Why is Ice Surface Temperature important?

The GOES-R Ice Surface Temperature (IST) product shows the surface temperature of detected ice. The product is computed using the equation below:

$$Ts = a + bT_{11} + c(T_{11}-T_{12}) + d\,[(T_{11}-T_{12})(\sec\theta - 1)]$$

θ is the local zenith angle, and the coefficients a, b, c, and d are functions of T_{11}. See the ATBD (linked at right) for more details.



Ice Surface Temperature from GOES-16 ABI at 0900 UTC, 21 February 2022

ABI Band	Wavelength (μm)	Band Product Used
14	11.2	Brightness Temperature, *i.e.*, T_{11}
15	12.3	Brightness Temperature , *i.e.*, T_{12}

Useful Links

Advanced Theoretical Basis Document (ATBD): (Link)

CIMSS Satellite Blog Post on all ice Products (Link)

Operational Information

Ice Surface Temperature: Provides information on ice temperatures, which can be used to infer if melting will be imminent.

How often? This full-disk product is produced every hour. Thus, it can be used over the course of a day (for example) to view temperatures in partly cloudy conditions if the clouds are moving.

Resolution: Full pixel-sized resolution: 2-km resolution at nadir. At a 60-degree zenith angle, resolution is around 5 km.

Clouds: Best practice is to use this product in tandem with cloud information so you can distinguish between no ice and no ice signal because of clouds.

Limitations

Clear Sky only Product: The coverage is computed only in regions where clouds are not present (in particular: where the GOES-R Cloud Mask shows 'Clear' or 'Probably Clear' conditions)

Temperature accuracy and range: Temperature values are accurate to within 1° C, and detected values range from -40° C to 2° C. Positive values are produced to indicate possible melting conditions.

How far from satellite nadir: Quantitative values are produced at local zenith angle < 67 degrees.

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