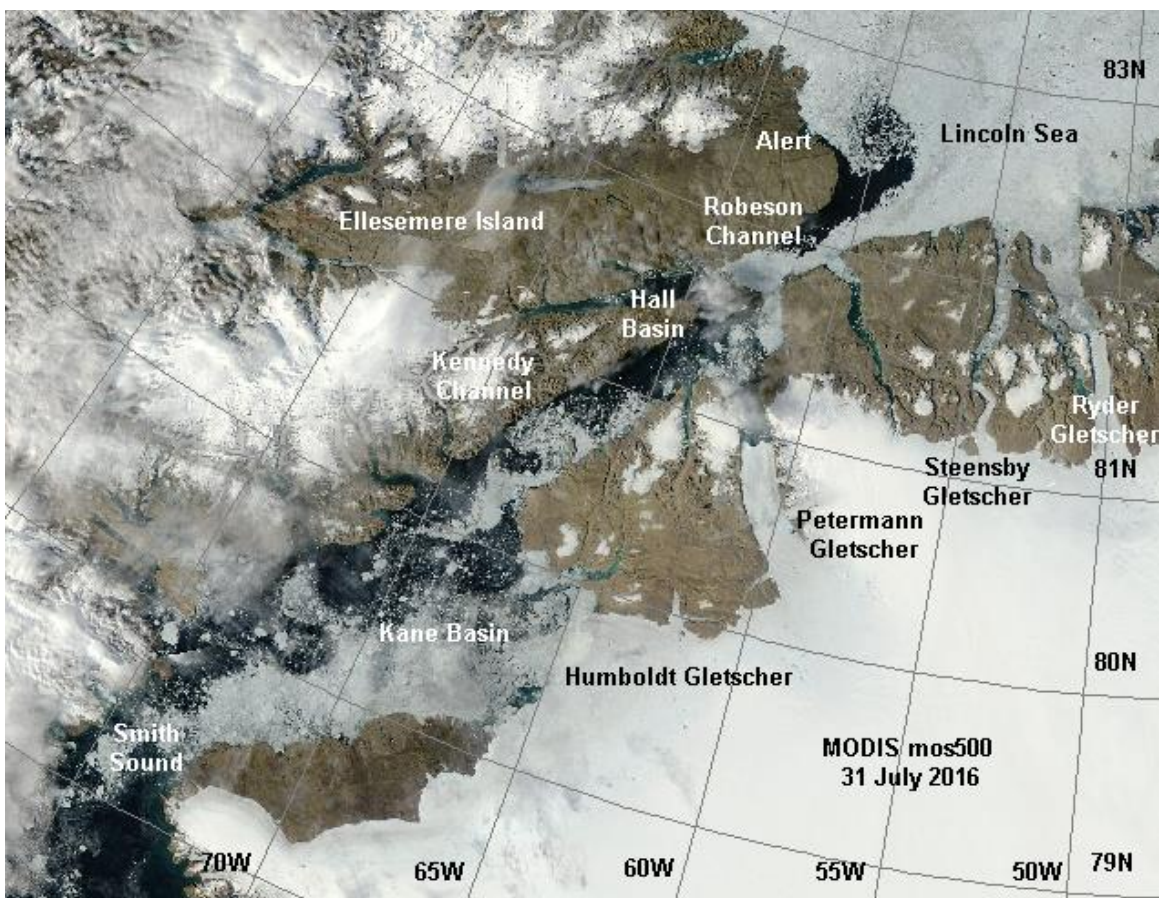


Lincoln Sea and Nares Strait



The MODIS mosaic above of 31 July shows the result of a month where the ice in Nares Strait was subject to a steady northern wind during an 11-day period in the first half part of the month and another period of 6 days by the end of the month with a southern wind. that continues into the month of August. With the northern wind the greater part of the ice in the Kennedy Channel moved into the Kane Basin and the Smith Sound joining ice drifting out the north-eastern part of the Kane Basin. During the month the weekly average air temperature increased from 4.0°C to 8.3°C by mid-July decreasing to 6.7°C by the end of the month resulting in appreciable surface melt of the floes. These temperatures are one to two degrees higher than in 2015.

The patterns of ice in the Robeson Channel and the Lincoln Sea are clearly an effect of the southern wind. With the wind continuing the ice in the Hall Basin and southern Robeson Channel will drift into the Lincoln Sea modifying the pattern subject to the positive air temperatures. In fact, radar data from the Sentinel 1A satellite show the wind pattern in the multitude of melt water ponds on the ice passing the 83°N latitude.

By the end of July the ice in the Kane Basin – mostly first year ice – is present along the coast of Inglefield Land with growlers from the active northern part of the Humboldt Gletscher.

In the cause of August we expect that a great deal of the ice canopy will melt leaving patches of ice along the shores. However, much depends upon winds that could move ice into the Nares Strait from the Lincoln Sea supported by the prevailing south-going current. We feel sure that we shall not have a situation like that in August 2009 with an ice-free Nares Strait that made it possible for the Greenpeace ship ‘Arctic Sunrise’ to anchor at the ice edge in the Lincoln Sea at about 82.2°.

Note the tabular icebergs produced by the very active Steensby and Ryder glaciers in the north east. However, we recognize that during the many years of observation of the Lincoln Sea and the Nares Strait we have not observed an ice island in the Lincoln Sea – with one exception – a radar scene acquired by ERS-1 in August 1991 showing an ice island just outside the fjords leading to the glaciers. Literature reports on the Ward.Hunt ice island, WH-5, that coming from west along the coast of Ellesmere Island passed the Lincoln Sea and the Nares Strait in 1963.

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Footnote: The meteorological data referred to above originate from the automatic weather station on Hans Island (80.80°N, 66.46°W) in the center of the Kennedy Channel that was installed in May 2008. We label the wind as north and south since experience has shown that lined with high mountains on both sides the Channel acts as a funnel with winds generally switching from one direction to the opposite one within two hours. We do not refer to the wind speed since data do not seem correct. Clearly it is courageous to assume that measurements on Hans Island represent the Nares Strait in general. However, comparison with model meteorological data (College of Earth, Ocean, and Atmospheric Sciences) at points along the Strait defends that they can be used for an overall type of analysis as that presented here.