2015 Sea Ice Outlook
Regional Submission - Nares Strait

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The summer 2015 proved to be a special one with warm air entering the area with southern winds in a great part of the period.

Due to the topography with high mountains on the Canadian side of the Nares Strait and moderate heights on the Greenland side the Strait acts like a funnel with wind directions along the Strait. Observations at the automatic weather station on Hans Island (80.83°N, 66.46°W) carried out since August 2008 confirm this so that in principle there are only two wind directions, one from north and another from south.

This is also true for the month of July 2015 where observations showed winds from south in 70% of the time and 30% from north with winds in other directions in less than 1% of the time. The series of observations is short and we have only observed one month - July 2010 - where southern winds were recorded in 80% of the time. In other cases, winds were often more equally distributed although at higher velocities with northern winds.

In the present situation this influenced the drift pattern in the Strait so that very little ice drifted through the Smith Sound into the North Water. Although the ice barrier that formed in the beginning of February in the western side of the Kane Basin (see our contribution in June) broke down in the beginning of July drift did not materialize due to the establishment of a wide barrier in western Kane Basin created by the prevailing south-going current in the Strait in periods of low southern winds, Figure 1.

The southern winds carried heat to the Strait and in fact July was a continuation of southern winds since 5 June, resulting in melt of the first-year ice that formed after the formation of the barrier in the beginning of February. Therefore, ice concentration in Kennedy Channel and northwards is low consisting mainly of multiyear ice from the Lincoln Sea. Figure 2 shows the result of several days with a southern wind that moved ice onto the coast of Greenland and created a 60-km fan of open water in the Lincoln Sea.

A great deal of ice has to melt in the Kane Basin and/or days with strong northern winds are needed before easy passage into the Nares Strait can be made. Judging from previous years this is likely to happen at decreasing temperatures reaching the freezing point by the end of the month. Drift of multiyear ice from the Lincoln Sea is likely to be resumed to create difficult navigation conditions at least in the northern sections of the Nares Strait.

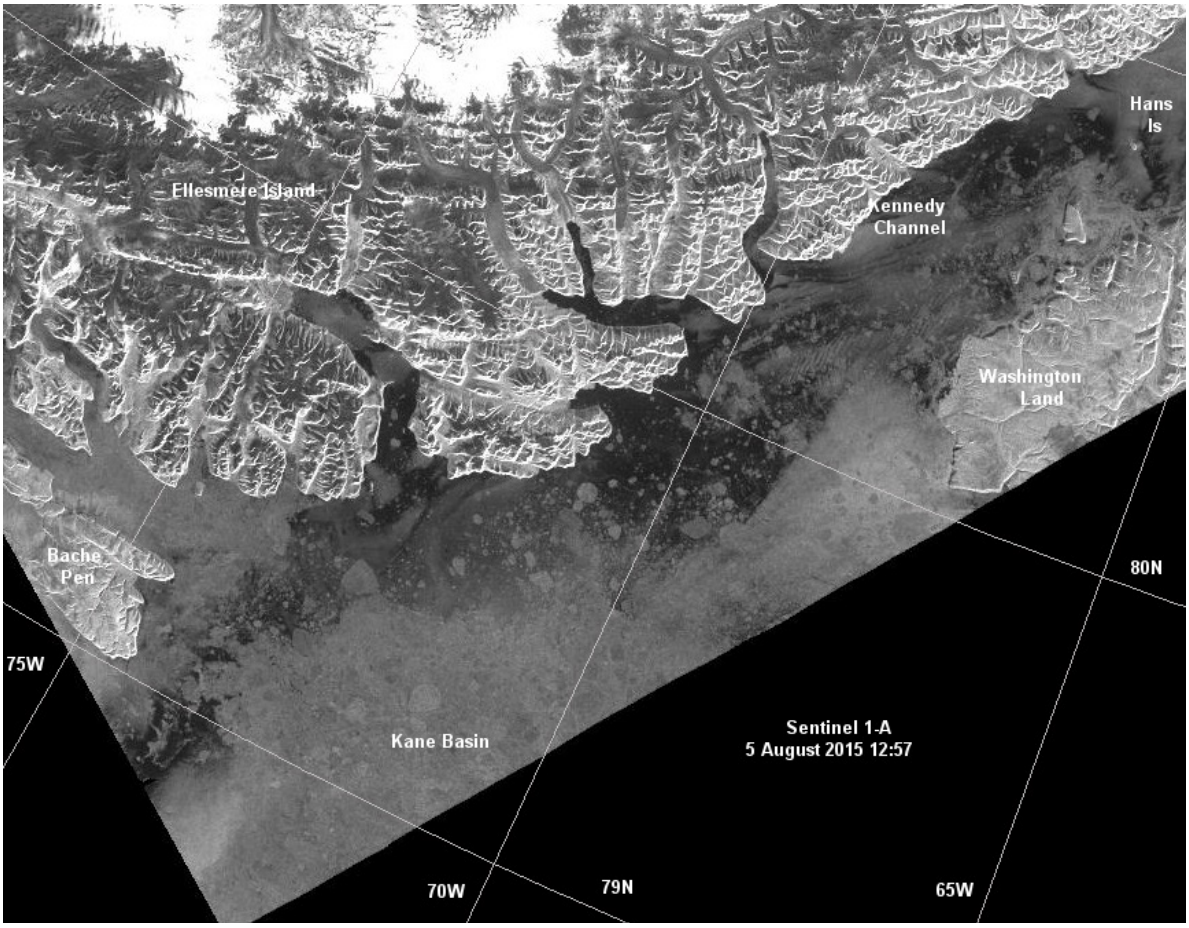

Figure 1

A radar scene acquired on 5 August 2015 at 12:57 by Sentinel 1-A showing the western part of the Kane Basin and the southern Kennedy Channel up to Franklin Island at the shore of Washington Land and Hans Island. It shows part of the Basin with an almost total coverage of first-year ice that extends to the hundred-kilometer wide Humboldt Gletscher in the east. Also, we see the effect of the very frequent occasions of winds from south – and probably from east – that causes the ice cover to extend almost to the coast of Ellesmere Island – more specifically Bache Peninsula - that prevents drift of ice southwards.

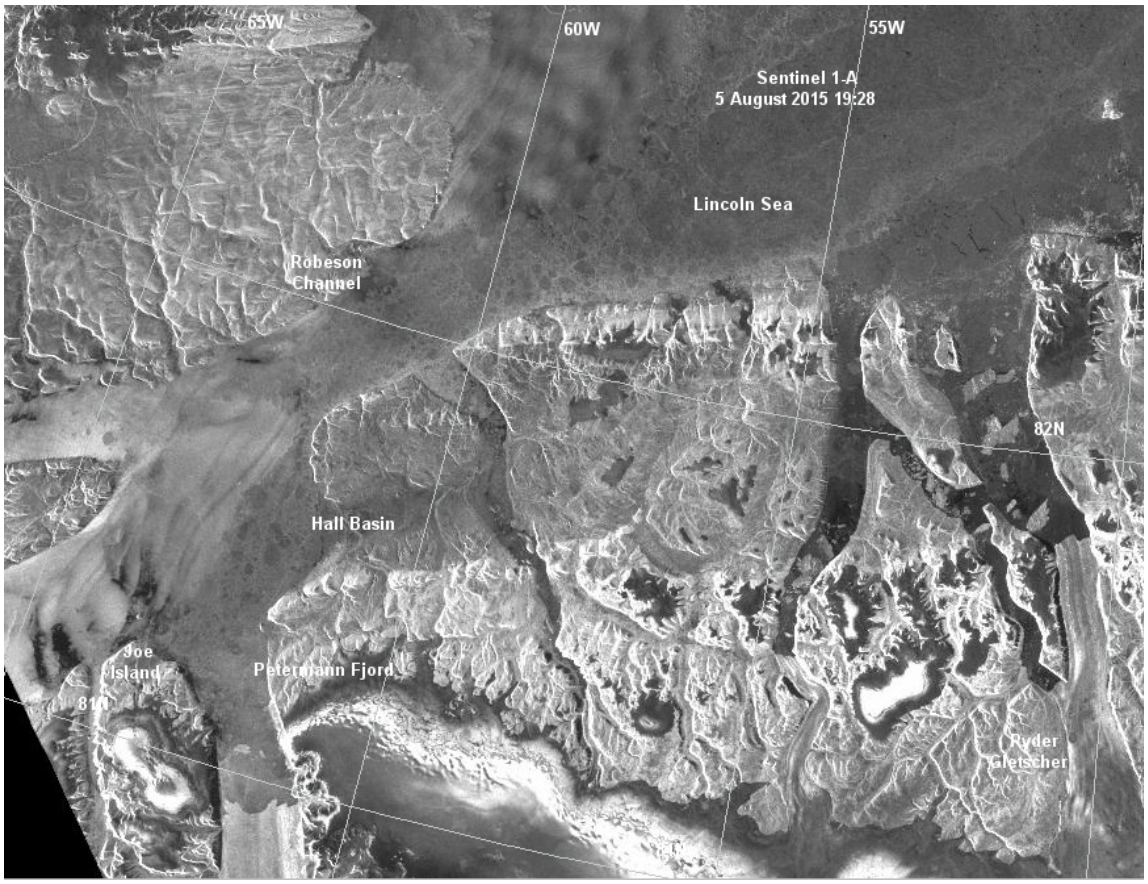

Figure 2

This radar scene was acquired 7.5 hours after that of Figure 1 showing wind patterns caused by strong southern winds in the northern part of the Nares Strait with the Kennedy Channel over the Hall Basin, into the Robeson Channel and the Lincoln Sea. It also shows the remaining sea ice being driving onto the coast of Hall Land and the northwest coast of Greenland and out in the Lincoln Sea in a northern direction. The ice blocks the opening of the Petermann Fjord showing the front of the Petermann Gletscher.

Note the two tabular icebergs that broke off the glacier on 2 August. A number of large bergs are observed in the fjords north of the Steensby and Ryder glaciers on their drift northwards towards the Lincoln Sea.