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MACKENZIE DELTA AND BEAUFORT COAST SPRING BREAKUP NEWSLETTER

Report **2017-017**

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Welcome to Breakup 2017

You may also want to check out the Mackenzie-Beaufort Breakup group on Facebook (<https://www.facebook.com/groups/1745524288993851/>).

This year, in addition to sharing the newsletter to our mailing list of >370 addresses, we are posting the newsletters on the CACCON (Circum-Arctic Coastal Communities Knowledge Network) website. You can find them at <https://www.caccon.org/mackenzie-beaufort-break-up-newsletter/>

Funding for our current breakup monitoring activity is from the Climate Change Geoscience Program of the Geological Survey of Canada, Natural Resources Canada.

Please let us know if you do not wish to receive these reports (contact info above) and we will take you off the list. For those of you living in the north, we welcome any observations of timing of events, extent of flooding, evidence of breakup, or anything out of the ordinary, and we thank you for all of the feedback received so far.

For those interested in conditions further south, we recommend that you contact Angus Pippy (Water Survey of Canada) in order to receive his very useful High Water Report: contact Angus at 867-669-4774 or angus.pippy@ec.gc.ca.

Water level data presented in our newsletters are courtesy of Environment Canada (Water Survey of Canada) and are derived from their real-time hydrometric data website at http://www.wateroffice.ec.gc.ca/index_e.html, which we acknowledge with thanks. Particular thanks to colleagues in Inuvik for keeping so many of the delta gauges operating through the difficult breakup season. Weather reports and forecasts are also from Environment Canada (Meteorological Service of Canada) at <http://weather.gc.ca>. Ice road conditions are from the GNWT Department of Transportation road reports and travel alerts (@GNWT_DOT). Daily MODIS imagery is courtesy of NASA Worldview at <https://earthdata.nasa.gov/labs/worldview/>.

Current conditions

The weather cleared over the Mackenzie region yesterday, giving us a great view in the imagery. The forecast for Inuvik today is a mix of sun and cloud with a high 19°C and Aklavik is mainly sunny with a high of 20°C. Tuktoyaktuk will warm up dramatically, with a mix of sun and cloud and a high of 18°C, wind E to SE at 20 km/h. Paulatuk will also have a mix of sun and cloud, a high 8°C, and wind becoming E 20 km/h later in the day. Sachs Harbour has a similar forecast, a mix of sun and cloud, high of 6°C, and wind becoming E 20 km/h this evening. Ulukhaktok will be mainly sunny, also with a high of 6°C, and light winds, becoming E 20 km/h later this evening.

Satellite imagery

Yesterday's MODIS-Aqua image (Figure 1) is spectacular. The big news is that the Mackenzie Bay ice bridge is broken off Shingle Point. Apart from some ice lying against the spit there, the Yukon coast is ice-free to Kay Point. There is, however, some ice filling the bay behind Shingle Point on the west side of the Blow River delta. Landfast ice remains in place in Herschel Basin, except for a small area of open water in Phillips Bay off the mouth of the Babbage and Spring rivers. Landfast ice is also still in place west of Herschel Island, hard against the coast at Nunaliuk Spit, but the lagoon behind the spit off the Firth River fan is open water. The icings in the lower Malcolm and Firth river fans are somewhat diminished in size.

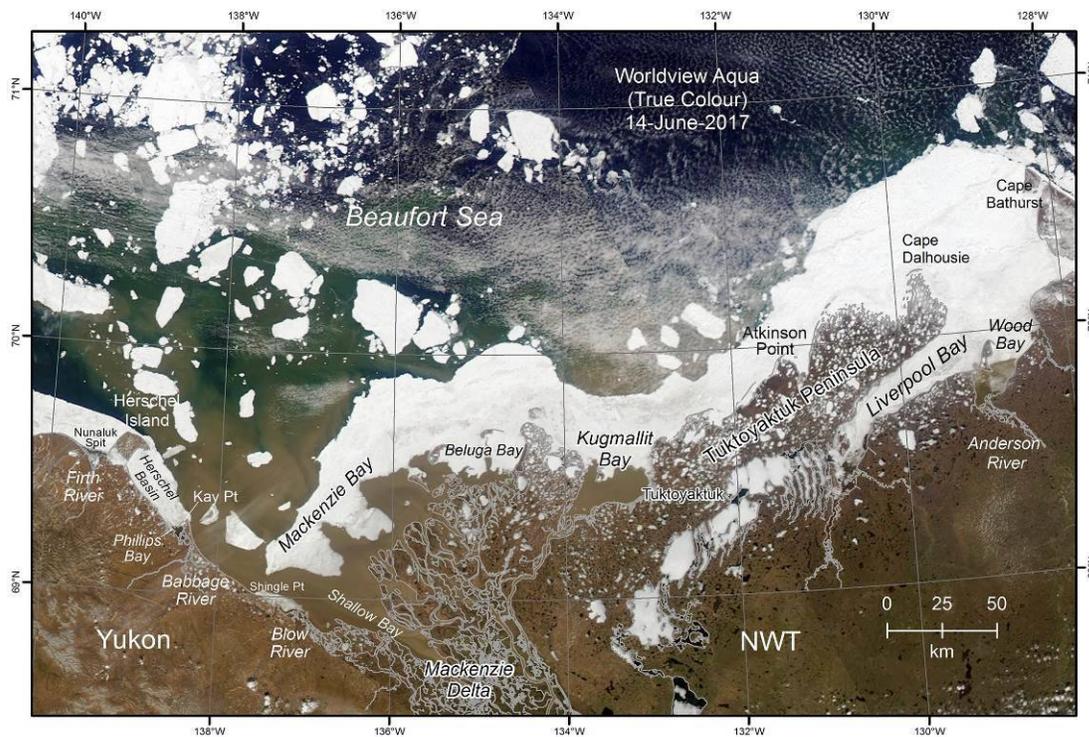


Figure 1. NASA Worldview Corrected Reflectance from the Aqua satellite for 14 June 2017, showing the mainland coast west of Herschel Island to Cape Bathurst

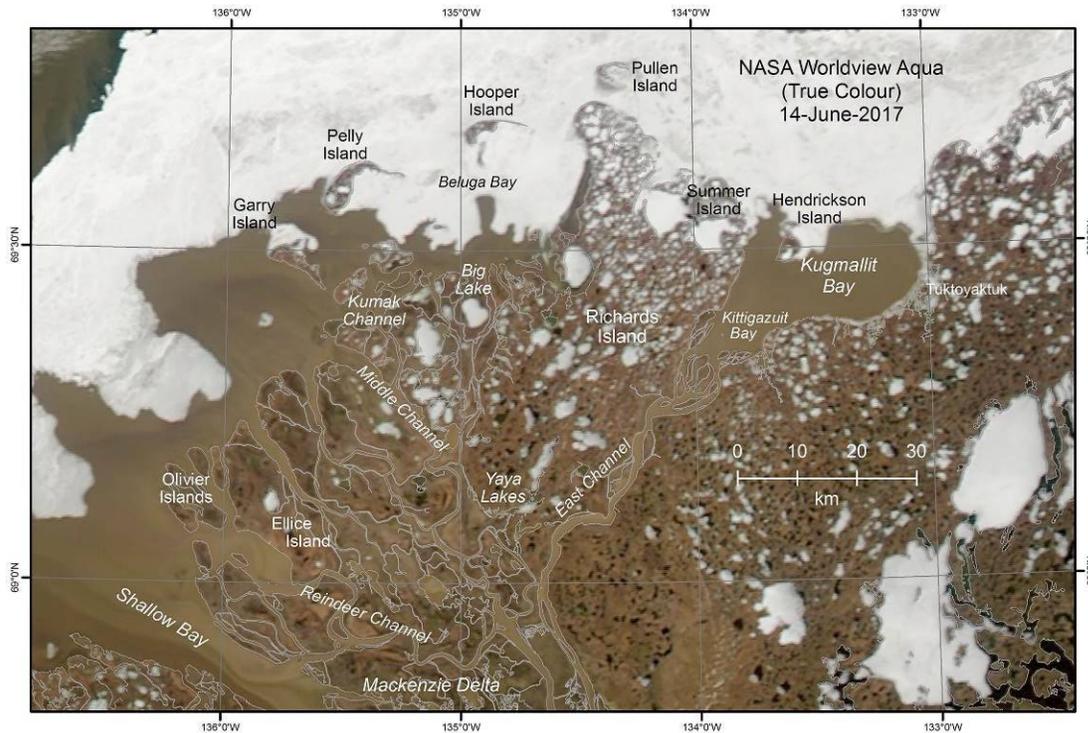


Figure 2. NASA Worldview Corrected Reflectance from the Aqua satellite for 14 June 2017, showing a closer view of the outer Mackenzie Delta, Richards Island, and Kugmallit Bay.

Expanded open water off the Delta and in Kugmallit Bay is clearly imaged in Figure 2. Ice remained yesterday at the mouth of Tuktuyaktuk Harbour but is likely to clear very soon, particularly with the easterly winds today. There is quite a bit of ice still in place in Beluga Bay behind Pelly and Hooper islands, but a wide open lead on the mudflats along the eastern shore of the bay. While there is still ice in place in many of the Richards Island lakes, the outer part of Yaya is open. In the outer Delta, the large lake on Ellice Island and delta lakes east of Middle Channel, including Big Lake, still have ice in place, though it is rotting around the edges. The lakes and bays at the north end of Richards Island are still encased in ice.

Along the Tuktuyaktuk Peninsula (Figure 1), the landfast ice remains intact but is eroding along its outer edge, where it is now exposed to a large expanse of the open Beaufort Sea. Off Atkinson Point, the width of the landfast ice is just 16 km. Liverpool Bay and the lakes at its head are all still filled with ice, except for the inner part of Wood Bay off the Anderson River delta (Figure 1). Note that the lakes in the lower right-hand corner of Figure 1 are all open.

Cloud over all the communities in Amundsen Gulf yesterday obscured our view with optical satellites. However, we can see through a little in Darnley Bay (Figure 3). The open water off the Hornaday River delta just east of Paulatuk is clearly visible, and we can see that the landfast ice in the middle of the bay is fractured, and one large triangular floe off the Brock River mouth has rotated to expose some open water. Ice remains in place in the head of Franklin Bay, including the lagoons and estuaries along its eastern shore, and in lakes on the Parry Peninsula.

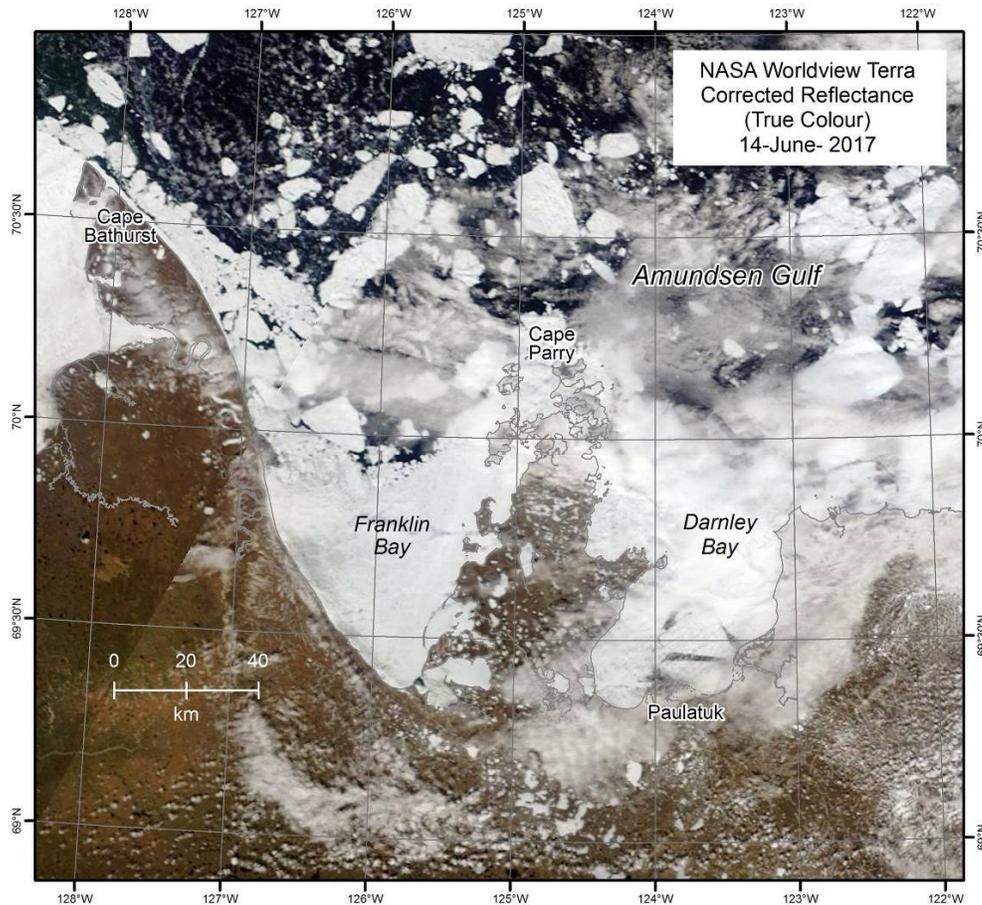


Figure 3. NASA Worldview Corrected Reflectance from the Terra satellite for 14 June 2017, fractured landfast ice visible through cloud in Darnley Bay.

Synthetic Aperture Radar (SAR) imagery is capable of imaging through cloud cover allowing data from the Sentinel 1A satellite to show the ice conditions in southeastern Amundsen Gulf yesterday (Figure 4). Mobile ice floes are moving through Amundsen Gulf after breaking away from the mouth of Dolphin and Union Strait. The Hamlet of Ulukhaktok remains iced in, with landfast ice more than 1 km wide still fronting the community. Both Prince Albert Sound and Dolphin and Union Strait remain ice covered.

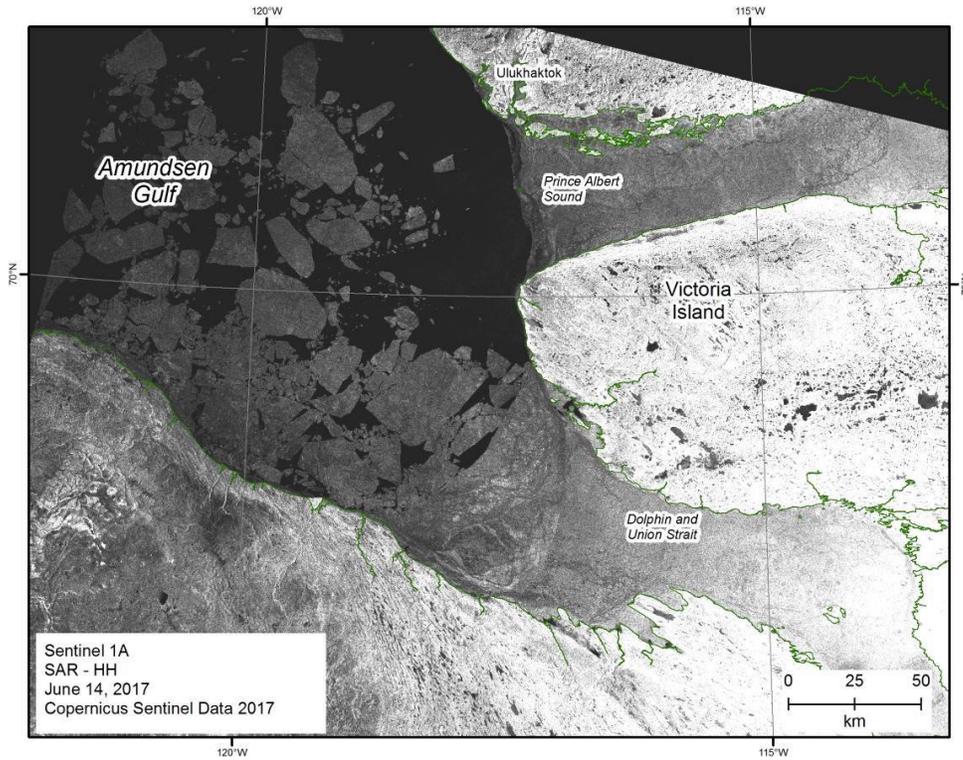


Figure 4. Sentinel 1A SAR image (HH) of southeastern Amundsen Gulf on June 14, 2017. Coastline is shown in Green (SAR data courtesy of Copernicus Sentinel Data 2017).