MACKENZIE DELTA AND BEAUFORT COAST SPRING BREAKUP NEWSLETTER

Report 2017-016
June 13, 2017 at 19:00 UTC

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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 forecast for Tuktoyaktuk today is overcast with drizzle, a high of 2°C, wind light NW. In Sachs Harbour, it is mostly cloudy with a high of -1°C, chance of flurries, and forecast wind NW at 20 km/h. Ulukhaktok has light snow at 1°C, with a forecast high of 3°C, chance of showers or flurries, wind light SW veering to NW this afternoon. It is also snowing lightly in Paulatuk, where the forecast is cloudy with a high of 2°C, wind light NW, veering to N and then NE through the day.

In the Delta, at Aklavik it is mostly cloudy with a forecast high of 10°C and clearing. In Inuvik, there is a chance of showers, mostly cloudy with a forecast high of 8°C, clearing by evening.

We have aerial photos of the ice in the head of Darnley Bay yesterday, courtesy of Jen Lam and Chuck Gruben (Figures 1-2).

Figure 1. Ice in Darnley Bay near Paulatuk on June 12 (courtesy of Jen Lam). Note the well-developed meltwater drainage networks on the ice.
Figure 2. Ice in the head of Darnley Bay at Paulatuk, yesterday, 12 June; note hamlet beyond air strip and radial drainage network in foreground (courtesy of Chuck Gruben).

We also have a number of photos contributed from Tuktoyaktuk and vicinity, courtesy of Cheeta Charlie, Sonja Ostertag, and Dustin Whalen (Figures 3-8).

Figure 3. Nearshore ice, looking west along the south coast of Kugmallit Bay yesterday (courtesy of Sonja Ostertag).
Figure 4. Tuk on final approach, June 12. Open water on the western shore of Tuk, with ice in the harbour and from North Spit across the harbour mouth (courtesy of Cheeta Charlie).

Figure 5. Looking southwest to the pingos from Tuk yesterday (June 12), showing open water on the west side of town, with ice still in place near the point (photo by Dustin Whalen).
Figure 6. Looking north from the point at Tuk yesterday (June 12), showing ice remaining in place across the front of Tuk Island and the harbour entrance (photo by Dustin Whalen).

Figure 7. Tuktoyaktuk on June 12, looking west across Pokiak Lake at the mostly open water of Kugmallit Bay in the background (courtesy of Cheeta Charlie).
Water Levels

Water levels have begun to stabilize in the Mackenzie Delta. East Channel at Inuvik (WSC 10LC002) has settled at about 12.84 m since noon yesterday (Figure 8).

![Figure 8. Water level in East Channel at Inuvik (WSC 10LC002) since May 10, showing levelling out since midday June 12; range of vertical scale is 5 m (courtesy Water Survey of Canada).](image)

Napoiak Channel above Shallow Bay (10MC023) is down 2 m from its peak on May 28-30 (Figure 9). It is now showing a drop of 10.5 cm in the last 24 hours to 11.6 m at 06:25 MDT.

![Figure 9. Water level in Napoiak Channel (WSC 10MC023) since May 10, showing a recent slowdown in the rate of decline; range of vertical scale is 5 m (courtesy Water Survey of Canada).](image)
**Satellite imagery**

A MODIS-Aqua image on June 11 (Figure 10) shows the ice bridge across Mackenzie Bay still intact but fragile, as high discharge continues from the Delta. The landfast ice is fraying on the outer edge and eaten into by melt embayments off Shallow Bay, the Olivier Islands, and on each side of Garry Island. One part of the Mackenzie River plume is drawn out to the northwest, >60 km beyond Herschel Island. Ice remains in Herschel Basin and alongshore west of Herschel Island.

![MODIS - Aqua True Colour 11-June-2017](image)

**Figure 10.** NASA Worldview Corrected Reflectance from the Aqua satellite for 11 June 2017, showing the mainland coast from the Yukon-Alaska border to the eastern end of the Tuk Peninsula (Cape Dalhousie); shoreline and some channels shown in yellow.

A beautiful Landsat image from Kugmallit Bay yesterday (Figure 11) shows more detail, with open water extending to the western shore of Tuktoyaktuk, but nearshore ice remaining along the coast to the west (compare Figure 3) and extensive landfast ice to the north (compare Figure 6). Although Tuktoyaktuk Harbour is still mostly ice-covered, some open water has developed in the tidal inlets and in the narrow neck of the harbour to the south. A large piece of landfast ice has broken loose and rotated on the west side of Hendrickson Island. The southern and western shores of the island are now ice-free, as is the entire coast in Kittigazuit Bay. The ice in many of the lakes is rotting rapidly.
Figure 11. Landsat 8 natural colour (Landsat Look) imagery of Kugmallit Bay on June 12, 2017 (courtesy US Geological Survey).