MACKENZIE DELTA AND BEAUFORT COAST SPRING BREAKUP NEWSLETTER

Report 2017-04
May 12, 2017 at 17:00 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

Temperatures continue to rise in the central Mackenzie Valley. Norman Wells is sunny and expected to reach 20 °C by Saturday. See photos provided by Jennifer Waterhouse below (Figure 1a, b, c). In the delta and at the coast, temperatures are cooler but still above zero. Kristen Binder provided a nice photo of current conditions near Inuvik (Figure 2).

Figure 1a. 2017 May 12. Rising Mackenzie waters at Norman Wells. In the last 24 hours the outer spit is now covered in water. Thanks to Jennifer Waterhouse for posting on the Facebook group.

Figure 1b. 2017 May 12, Norman Wells with mountain backdrop. Photo highlights the quantity of driftwood logs coming down the Mackenzie at this time of year. Note the geese. Courtesy of Jennifer Waterhouse.
Figure 1c. 2017 May 12. Broken ice in the Mackenzie River at Norman Wells. Thanks to Jennifer Waterhouse for posting on the Facebook group.

Figure 2. 2017 May 11. Aerial shot of East Channel near Inuvik, note the beginnings of melt pools forming along the edge of the ice road. Photo courtesy of Kristen Binder.
**Water levels**

The water level at Norman Wells (10KA001) has continued rising at an accelerating pace, up 60 cm over 24 hours (Figure 3). The gauge on the Mackenzie at Tsiigehtchic (Arctic Red River) (10LC014) is back on-line and shows water levels rising at accelerating pace (Figure 4). The rise exceeded 5 cm in 24 hours for the first time on May 9, and was almost 17 cm over 24 hours yesterday (May 11). The water level as of 10:00 MDT this morning (May 12) was 4.434 m and the provisional discharge was almost 6000 m$^3$/s.

In both East Channel at Inuvik (10LC002) and Peel Channel above Aklavik (10MC003), the water continues to rise slowly with both gauges showing an increase of 2.2 cm in 24 hours (Figures 5 and 6). East Channel stood at 11.822 m as of 10:00 MDT this morning.

In the outer delta, Reindeer Channel at Ellice Island (10MC011) is rising more slowly still with a 24 hour increase less than 1 cm (Figure 7). Plots of daily mean water level at Inuvik, Aklavik, and Reindeer Channel all show the same slow rise and remain below all previous years shown (2006 and 2008-2016) apart from 2011 (Figures 8-10).

![Figure 3. Water level (secondary) in Mackenzie River at Norman Wells (WSC 10KA001) since May 1, 2017 (courtesy Water Survey of Canada).](image-url)
Figure 4. Water level and discharge in Mackenzie River at Tsiigehtchic (Arctic Red River) (WSC 10LC014) from May 6, 2017 (courtesy Water Survey of Canada).

Figure 5. Water level in East Channel at Inuvik (WSC 10LC002) since May 1, showing a continued slow rise (courtesy Water Survey of Canada).
Figure 6. Water level in Peel Channel above Aklavik (WSC 10MC003) since May 1 (courtesy Water Survey of Canada).

Figure 7. Water level in Reindeer Channel at Ellice Island (10MC011) since May 1 2017 showing a very slow rise; note different scale (courtesy Water Survey of Canada).
Figure 8. Daily mean water levels in East Channel at Inuvik (10LC002) from May 1 this year (black) with equivalent data from the past 9 years and the record year of 2006 (derived from data courtesy of Water Survey of Canada).

Figure 9. Daily mean water levels in Peel Channel above Aklavik (10MC003) from May 1 this year (black) with equivalent data from the past 9 years and the record year of 2006 (derived from data courtesy of Water Survey of Canada).
Figure 10. Daily mean water levels in Reindeer Channel at Ellice Island (10MC011) from May 1 this year (black) with equivalent data from the past 9 years (derived from data courtesy of Water Survey of Canada).

**Satellite imagery**

The region was partially obscured by cloud yesterday, but we can see enough in the Terra MODIS imagery to note few changes (Fig. 11). Winds appear to have shifted to the west and the ice has moved back in against the coast of Banks Island near Sachs Harbour. Elsewhere, apart from mobile ice off the Delta, it is difficult to detect any notable changes. The river leading into the Delta and the channels in the area of the ‘Turtle’ are all still ice-covered as of May 11. There is some darkening of the channel at the far lower right of Figure 11, which may be cloud shadows or may possibly represent water. We’ll have to await developments there.
Figure 11. MODIS corrected Land Surface Reflectance (true colour) from the Terra (MOD05) satellite acquired 11 May 2017, showing ice conditions from the western Yukon coast to Cape Bathurst (courtesy NASA Worldview).