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MACKENZIE DELTA AND BEAUFORT COAST SPRING BREAKUP NEWSLETTER

Report **2018-03**

May 16, 2018 (Wednesday)

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Welcome to Breakup 2018

Welcome to the 2018 Mackenzie and Beaufort breakup season! We are now into our 13th season of the breakup newsletter, which was started by Steve Solomon in 2006. Each year we think will be the last, but the feedback is positive and the annual spectacle of breakup is hard to resist. We hope this year will be good to everyone, without too much flooding. We will try to keep you posted on events as they unfold. As always, photos and on-the-ground reports are the really interesting pieces and we'll try to pass on any you can send us as we watch the gauges and the satellite imagery.

This year will be the third breakup season for the Mackenzie-Beaufort Breakup group on Facebook <https://www.facebook.com/groups/1745524288993851/>. Over time we hope this forum hosted in the ISR will take over as the main place to share observations and experience during breakup in the Delta and the coastal communities of the region. We need to start thinking about how observations can be archived to add to our collective knowledge of breakup timing and processes and there may be roles for many partners in doing this.

Mackenzie -
Beaufort Break-Up
Public Group

Discussion

Members

Events

Videos

Photos



The original purpose of the newsletter was to document flooding over the outer Mackenzie Delta in support of various research programs. Over recent years, we have expanded the scope to consider all aspects of breakup and spring flooding in the ISR region and Gwich'in communities in and near the Delta. Funding for our current breakup monitoring activity is

from the Climate Change Geoscience Program of the Geological Survey of Canada, Natural Resources Canada.

This year, in addition to sharing the newsletter to our mailing list of 390 addresses, we expect to post the newsletters on the CACCON (Circum-Arctic Coastal Communities Knowledge Network) and will provide further details shortly.

Please let us know if you do not wish to receive these reports (contact info above) and we will take you off the list. Also, if you have a change of e-mail address and can let us know, we will be pleased to adjust our mailing list. We hope you will feel free to pass this on to others and if they contact us we can add them to 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://earthdatnasa.gov/labs/worldview/>.

Current Conditions

Today's forecast calls for primarily a mix of sun and cloud, no precipitation, and cooling temperatures moving north through the region. Forecast highs of 15 °C and 13 °C are expected in Fort McPherson and Norman Wells (lows 0 °C). Cooler temperatures are expected in Inuvik (High 5 °C, Low 0 °C) and Aklavik (High 4 °C, Low -3 °C). Out on the coast, Tuktoyaktuk can expect cloud and fog with a high of 1 °C and an overnight low of -8 °C.

Water levels

At Norman Wells, where the rate of decline has slowed, the water level fell 12 cm over the last 24 hours to 6.2 m at 08:35 MDT and is down 4 m in total since its peak on May 12 (Figure 1).

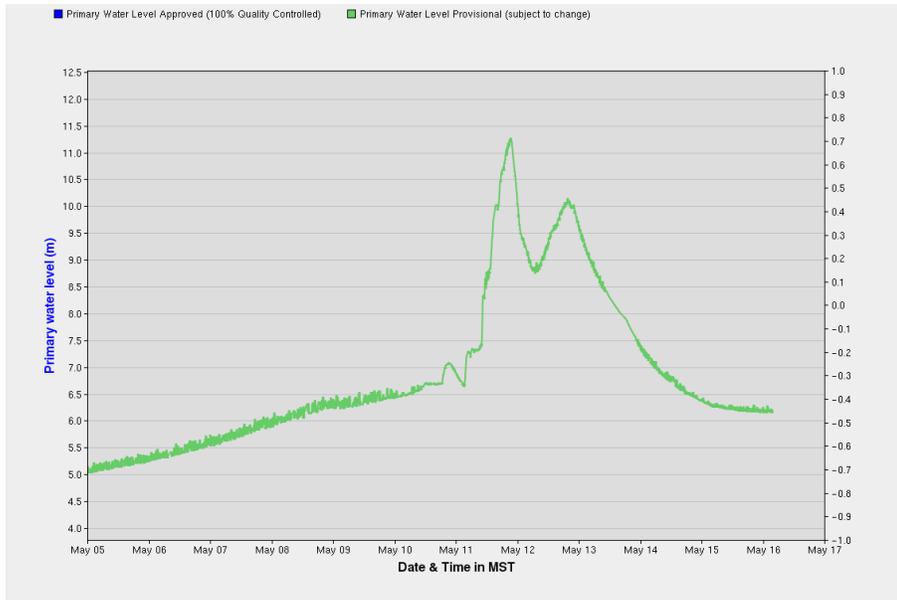


Figure 1. Provisional water level for Mackenzie River at Norman Wells (10KA001) since May 5 (courtesy Water Survey of Canada). Note ice jam peak late on May 11, probably discharge peak late on May 12, and recession underway since then.

Downriver at Tsiigehtchic, the gauge in the Mackenzie River is up 1.5 m over the last 24 hours (Figure 2). In today's High Water Report (May 16, 2018), Angus Pippy reports the ice is broken and running bank to bank.

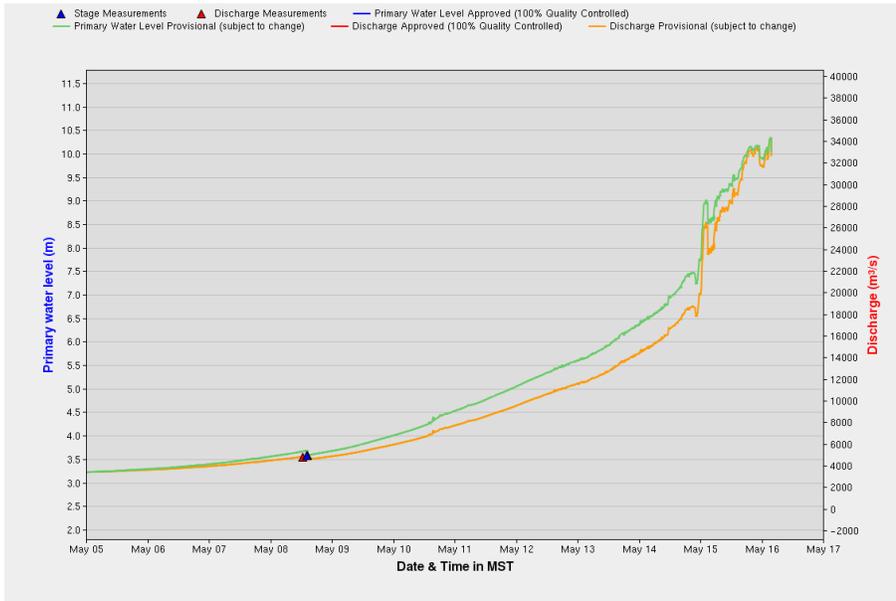


Figure 2. Provisional water level and discharge data for Mackenzie River at Tsiieghtchic (10LC014) since May 5 (courtesy Water Survey of Canada).

Within the delta, the water levels in both Peel Channel above Aklavik and East Channel at Inuvik show an acceleration in the rate of rise beginning on May 15 (Figures 3 and 4). At Aklavik, the gauge may not be recording on the correct datum but is showing an increase of 53 cm in the last 24 hours (Figure 3). At Inuvik, the water is rising even faster, showing a 79 cm increase in the last 24 hours to 13.5 m at 03:35 MDT (Figure 4).

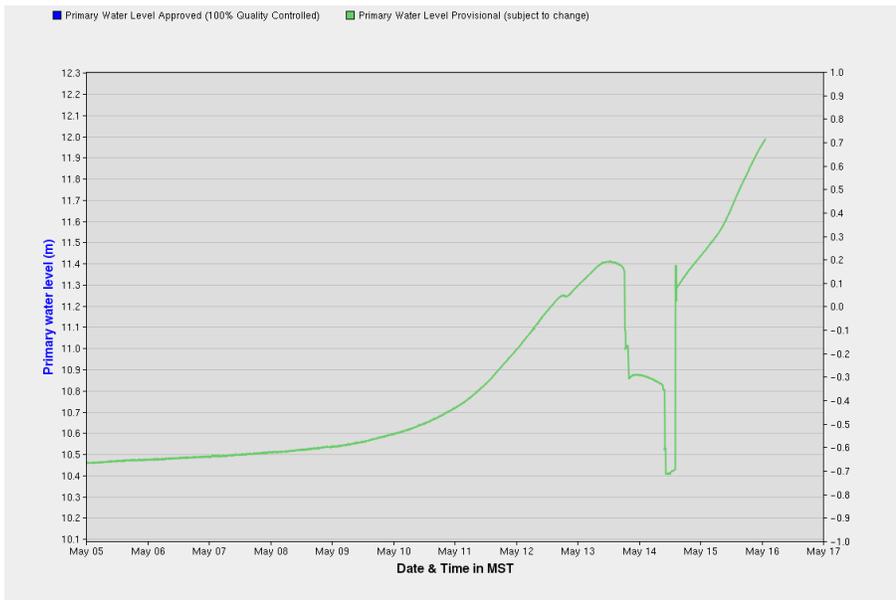


Figure 3. Provisional water level in Peel Channel at Aklavik (10MC003) since May 5 (courtesy Water Survey of Canada).

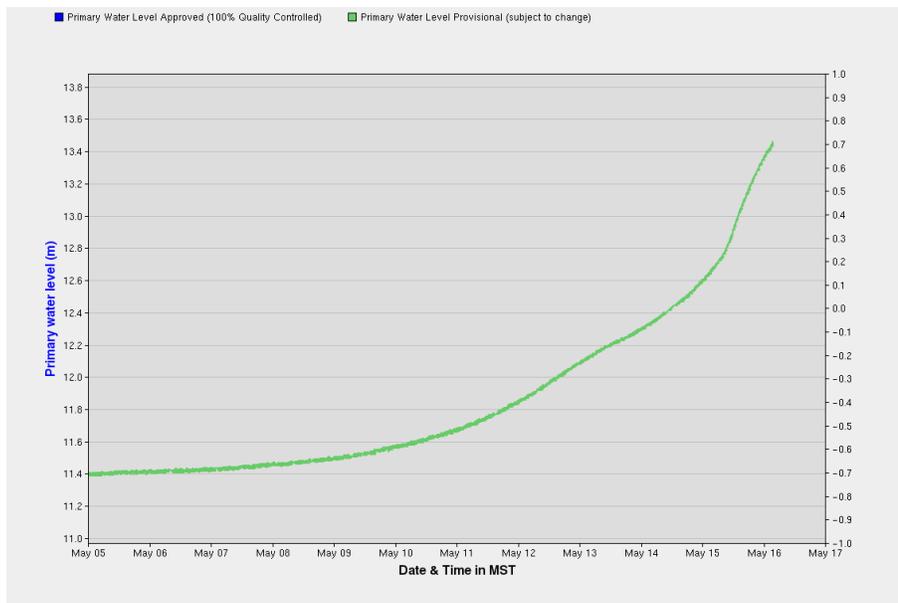


Figure 4. Provisional water level in East Channel at Inuvik (10LC002) since May 5 (courtesy Water Survey of Canada).

In the outer Delta, the gauge in Napoiak Channel above Shallow Bay shows an acceleration in the rate of rise beginning on May 15 with a 24-hour increase of 22 cm to 11.7 m at 05:25 MDT today (Figure 5). Moving north, Reindeer Channel at Ellice Island also shows an acceleration on May 15 and shows a similar, 24-hour rise of 23 cm (Figure 6).

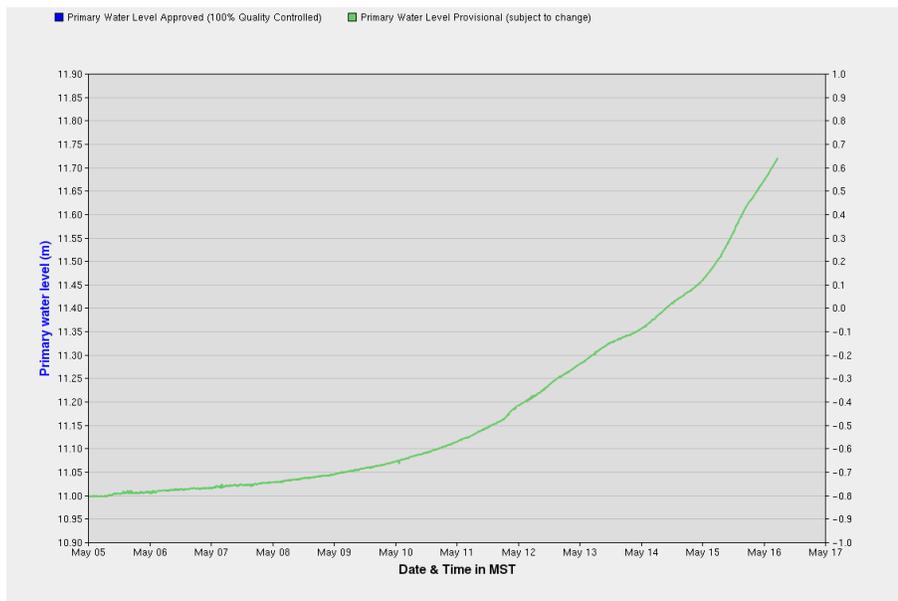


Figure 5. Provisional water level in Napoiak Channel above Shallow Bay (10MC023) since May 5 (courtesy Water Survey of Canada).

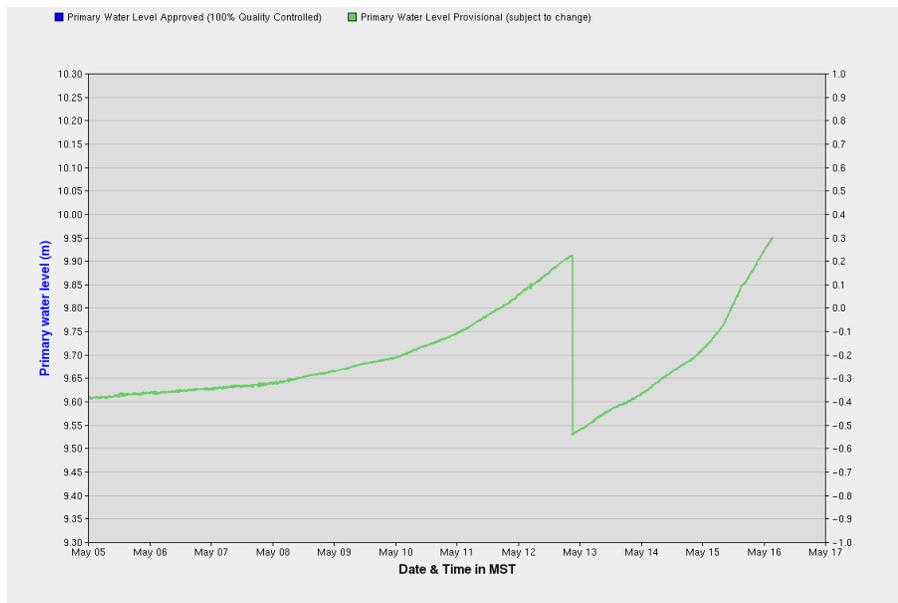


Figure 6. Provisional water level in Reindeer Channel at Ellice Island (10MC011) since May 5 (courtesy Water Survey of Canada).

The water is rising more slowly in the more northerly areas of the delta with the water in Kuluarpak Channel up only 8 cm in the last 24 (9.7 m at 04:25 MDT) while also showing a slight acceleration in the rate of rise beginning on May 15 (Figure 7).

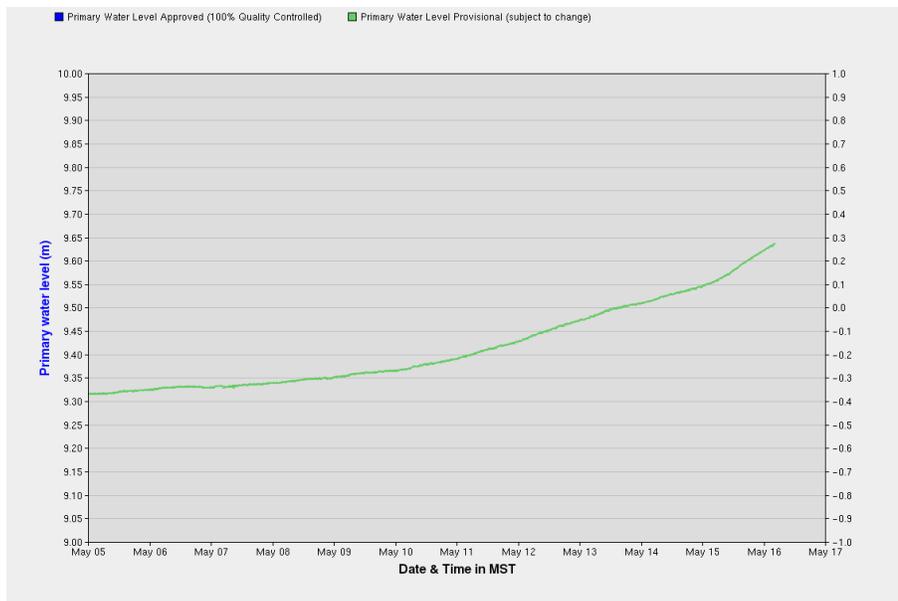


Figure 7. Provisional water level in Kuluarpak Channel (10LC021) since May 5 (courtesy Water Survey of Canada).

The multi-year graph of daily mean water level in the Mackenzie River at Tsiigehtchic (Figure 8) shows this seasons level is now tracking above all plotted years with the exception of the flood year in 2006 and the very early breakup of 2016.

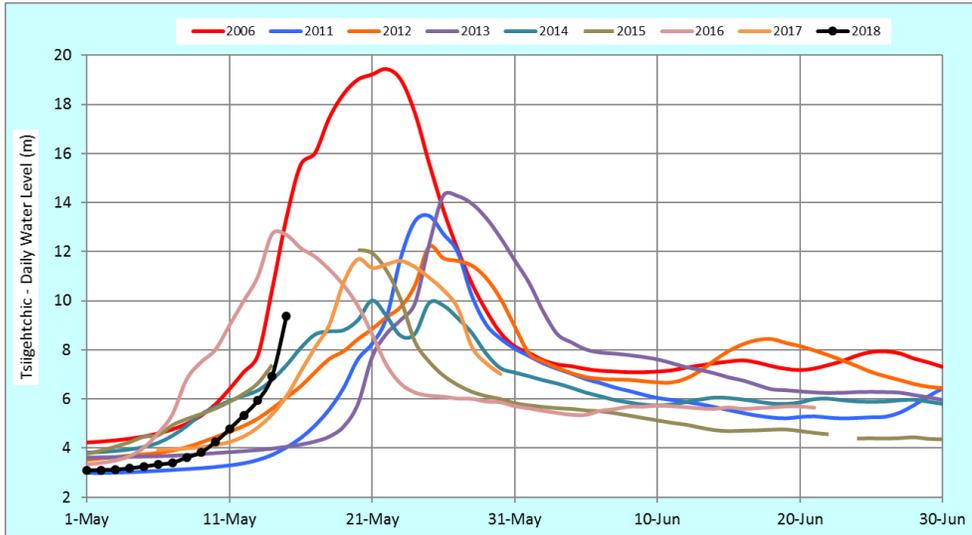


Figure 8. Daily mean water levels in Mackenzie River at Tsiigehtchic (10LC014) in 2006 and years this decade, with 2018 levels in black.

The multi-year graph of daily mean levels for Inuvik shows this seasons level about to surpass the level from the low water year of 2014 while remaining below the levels from 2015, 2016, and 2006 (Figure 9).

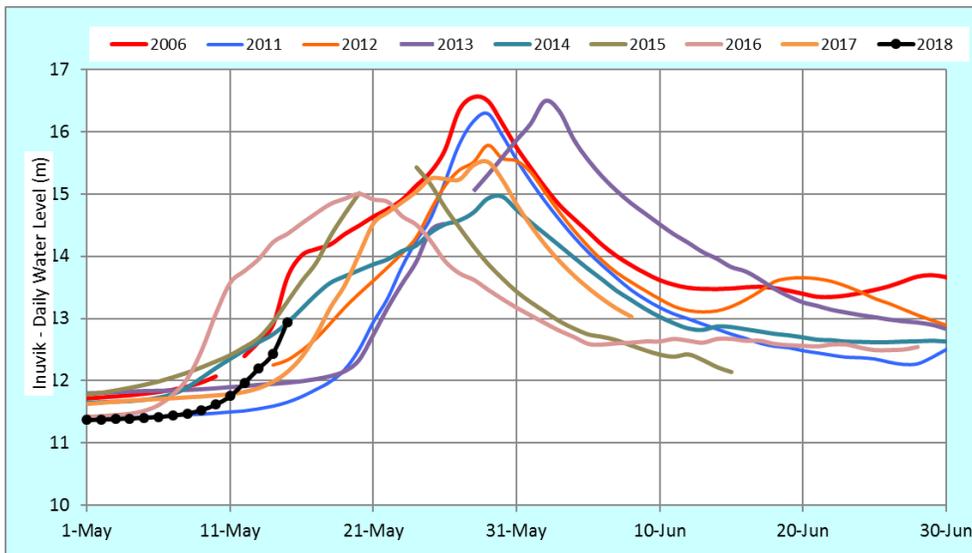


Figure 9. Daily mean water levels in East Channel at Inuvik (10LC002) in 2006 and years this decade, with 2018 levels in black.



Figure 10. May 15th pictures from Christian Binder posted on the FB site.

Satellite Imagery

Yesterday's Terra imagery (courtesy NASA) shows extensive overflow in Shallow Bay off the southern outlet of Reindeer Channel (Figure 11). Areas of bottomfast ice along the margins of outer (northern) Reindeer Channel appear to have some overflow, and there is a small patch near the head of Nonsuch Channel (between the Olivier Islands and Ellice Island). The northern progression of snowmelt is very evident in this image, with the outer delta north of Reindeer Channel and from Langley Island north still snow-covered.

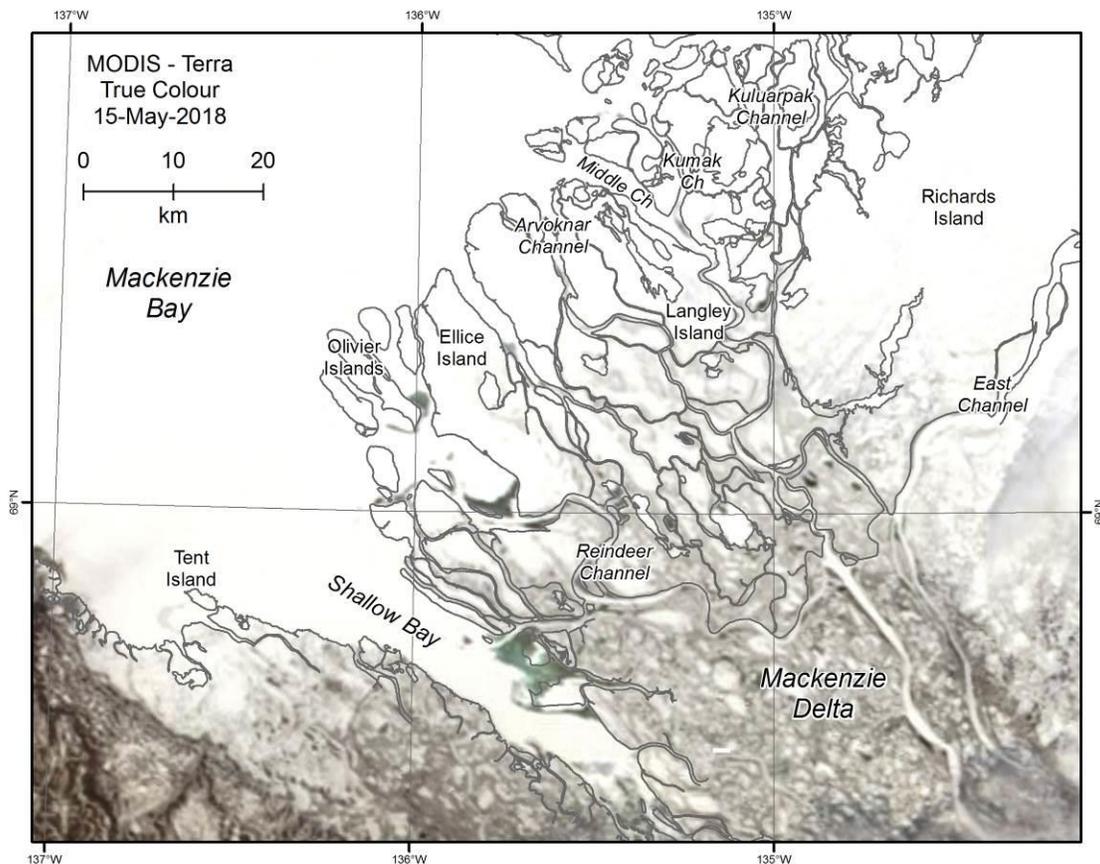


Figure 11. NASA Worldview Corrected Reflectance from the Terra satellite for 15 May 2018, showing the outer Mackenzie Delta with overflow off some channel mouths.