

Flow forecasting in the Northwest Territories

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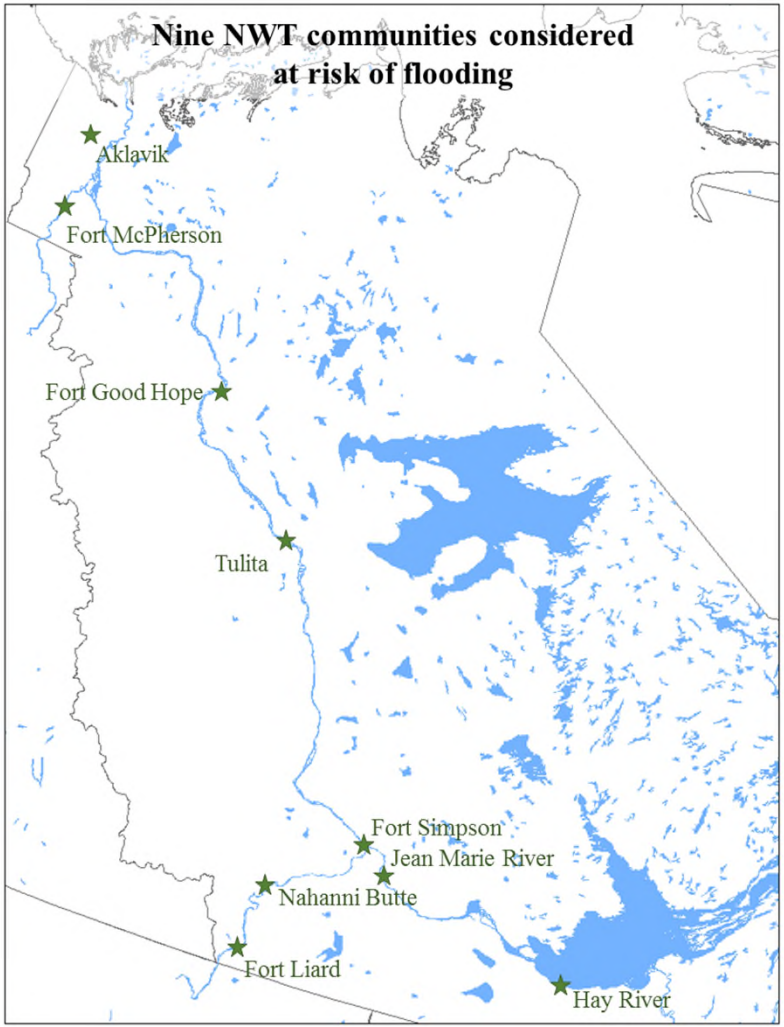
Watershed Management and Monitoring, Environment and Natural Resources

Government of
Northwest Territories

Why we care about NWT flow forecasting

- Flood forecasting (during breakup and open water)
  - for community safety and preparedness
- Low and high flows during summer
  - primarily for river transportation and navigation





But…

- The GNWT is not currently **doing** any flow forecasting



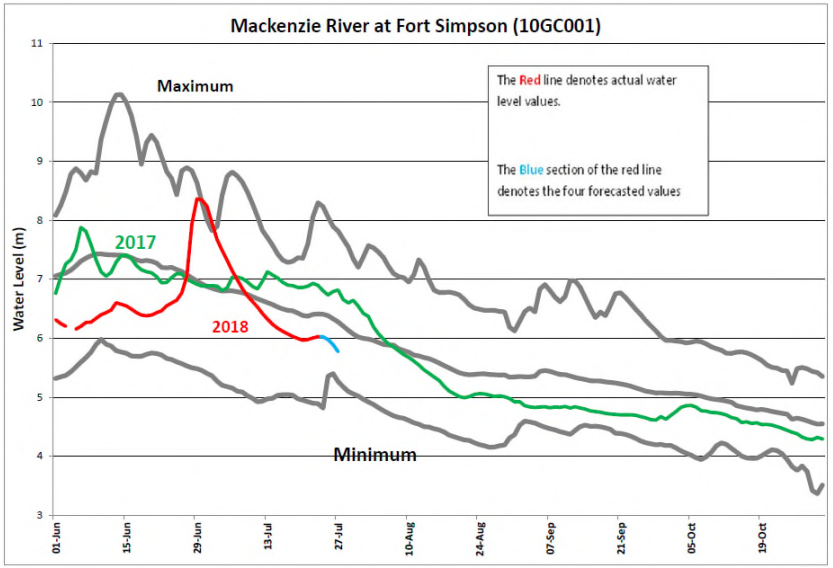
There are a few unofficial tools that we have at our disposal

1. WSC open water flow forecast – Mackenzie River Basin
2. WSC breakup and high flow reports – Mackenzie River
3. NRCan breakup reports – Mackenzie Delta



1. WSC open water flow forecast – Mackenzie River Basin

- 4-day forecast; 3 times per week in open water season
- Operated by WSC & paid for by Coastguard and Imperial Oil



Mackenzie River Forecast Report - 2018 Season
CANADIAN COAST GUARD / GARDE CÔTIÈRE CANADIENNE

Report / Rapport R-17 - July 23, 2018

WATER LEVELS are stated in metres (m) above assumed gauge datum, except Great Slave Lake & Mackenzie River near Fort Providence which is metres above sea level. Contact Water Survey of Canada for conversion to GSC elevations

Weather Météo	Temps Max / Min	Precip. Pluie
North Slave	23/14	N/A
Deh Cho	24/13	N/A
Sahtu	29/ 16	N/A
Delta	29/14	30%

Location	Real-Time Data Jul 22 (m)	Jul 23 (m)	Time / Heure (MT)	Forecast at 5:00 AM (MT) Jul 24 (m)	Jul 25 (m)	Jul 26 (m)	Jul 27 (m)
Mackenzie Above the Liard							
Great Slave Lake at Hay River	156.886	156.793	5:50 AM	-	-	-	-
Mackenzie River Near Fort Providence	151.184	151.220	6:15 AM	-	-	-	-
Mackenzie River at Strong Point	7.678	7.678	5:45 AM	-	-	-	-
Liard Basin							
Liard River at Fort Liard	3.941	3.949	4:45 AM	-	-	-	-
Mackenzie River at Fort Simpson	6.006	6.027	6:30 AM	6.025	5.981	5.893	5.774
Blackstone River at Highway No. 7	3.696	3.683	4:45 AM	-	-	-	-
South Nahanni River Above Virginia Falls	2.726	2.760	5:15 AM	-	-	-	-
Flat River Near the Mouth	1.820	1.801	6:45 AM	-	-	-	-
Liard River at the Mouth	3.474	3.531	7:00 AM	3.549	3.555	3.565	3.579

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2. WSC breakup and high flow – Mackenzie River

- Follows ice front
- Report every 1-2 days
- Uses satellite imagery, water levels, historic info, personal observations, photos

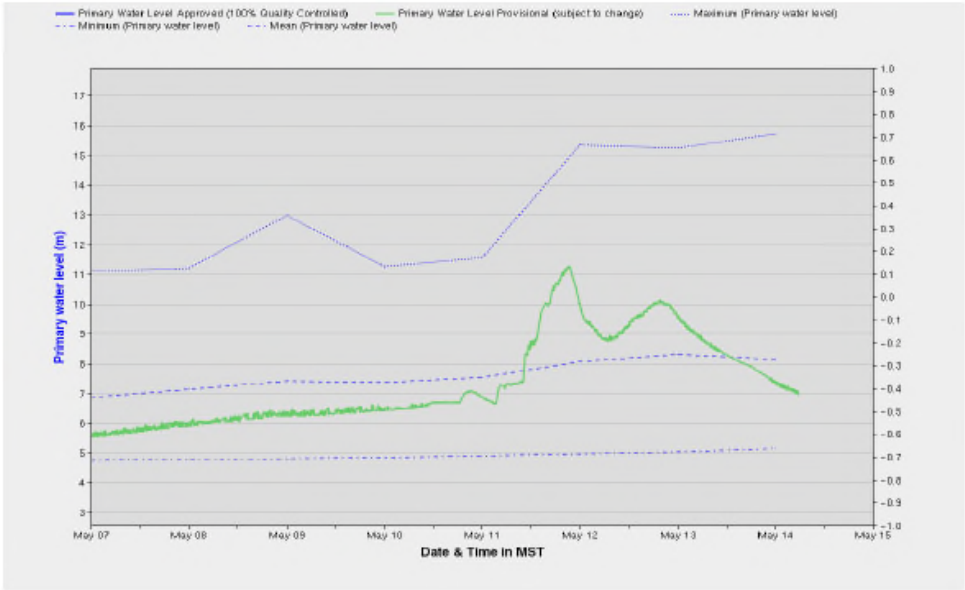


Environment Canada
Environnement

Water Survey of Canada
Suite 400, 5019 – 52 Street
Yellowknife, NWT
X1A 2P7

Report for May 14th, 2018

Mackenzie River at Norman Wells (10KA001) – Current water level is 6.976m. Average breakup level is around 9m with breakup occurring between May 10th- 15th. Latest report is that the ice broke up over the weekend. Please check out the Facebook link provided at the beginning of this report for a little video of ice conditions of Norman Wells from Saturday.



3. NRCan breakup – Mackenzie Delta

- Follows ice front
- Report every ~2 days
- Uses satellite imagery, water levels, historic info, personal observations, photos
- Similar to WSC report for the Mackenzie River



Natural Resources Canada | Ressources naturelles Canada

CACCON catch·on

futureearth coasts

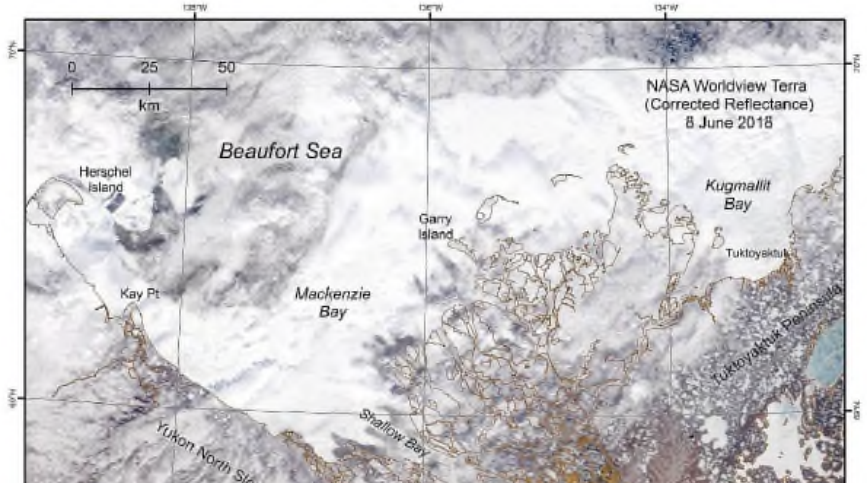
land-ocean interactions in the coastal zone

MACKENZIE DELTA AND BEAUFORT COAST SPRING BREAKUP NEWSLETTER

Report **2018-13**
June 11, 2018

Friends of Steven Solomon (Dustin Whalen, Paul Fraser, Don Forbes)
Geological Survey of Canada, Bedford Institute of Oceanography

The June 9th image to the East (Figure 8), still shows ice in Darnley Bay, with the ice broken away from the landfast slowly continuing to move west in Amundsen Gulf away from Ulukhaktok, as shown on June 10th despite the limited visibility (Figure 9).

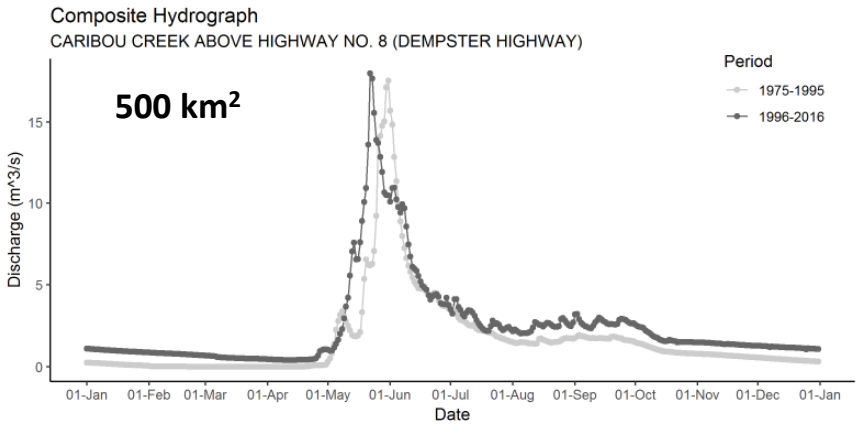


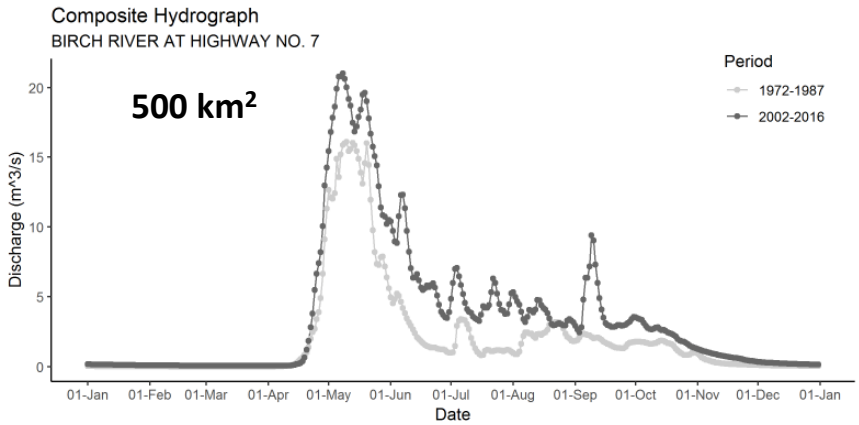
We want to forecast flow… that's why we're here!

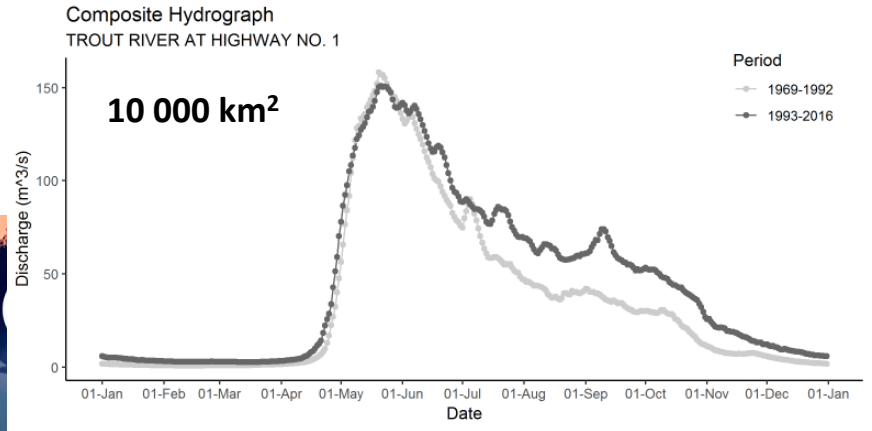
- Especially important now that we are observing regime shifts and unprecedented events.

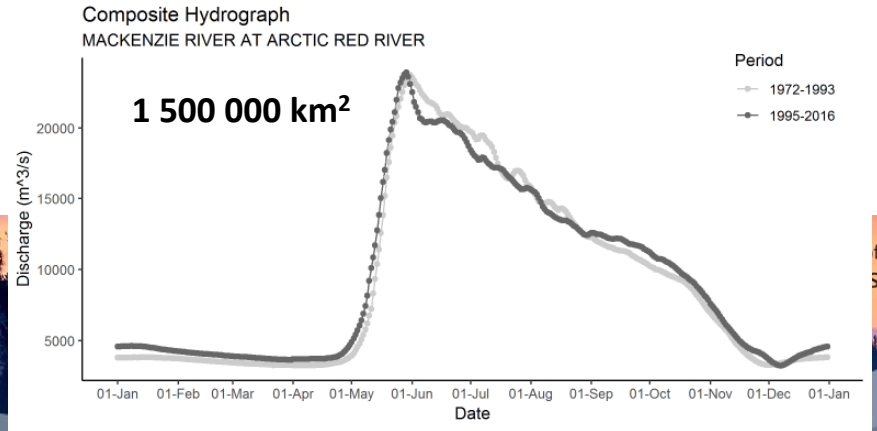


- Basin hydrographs are changing in response to climate warming
- Changes are most noticeable in small basins, not yet obvious on large systems

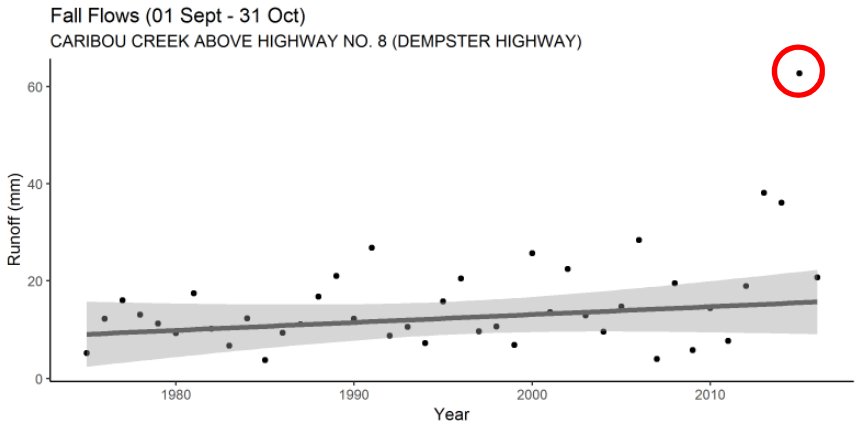


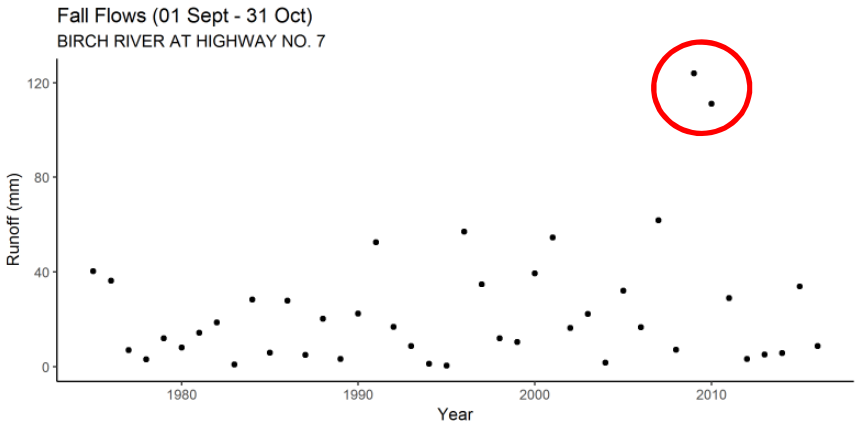


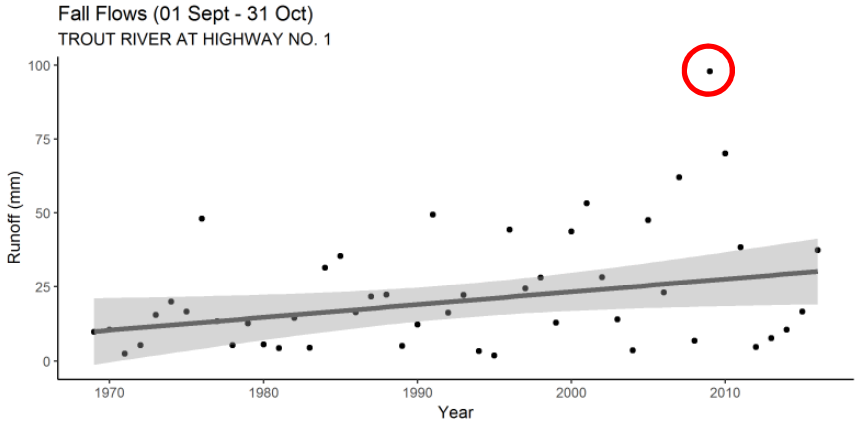


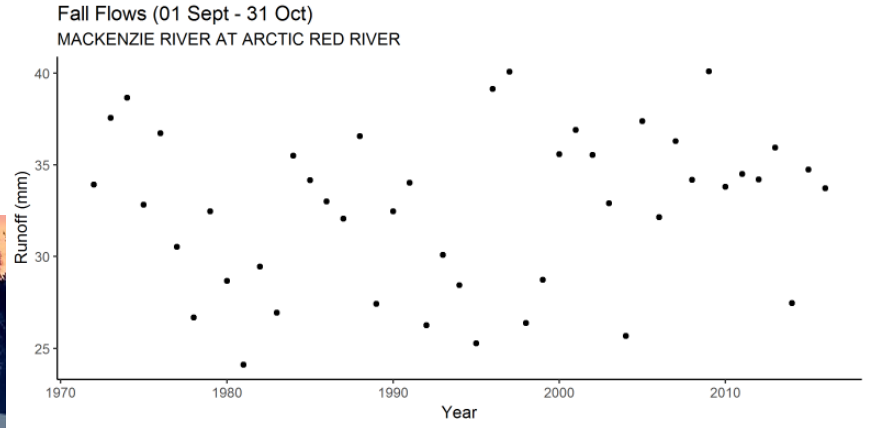


- Increasing fall precipitation patterns are causing high late-season runoff events
- These runoff events are flashy and difficult to predict

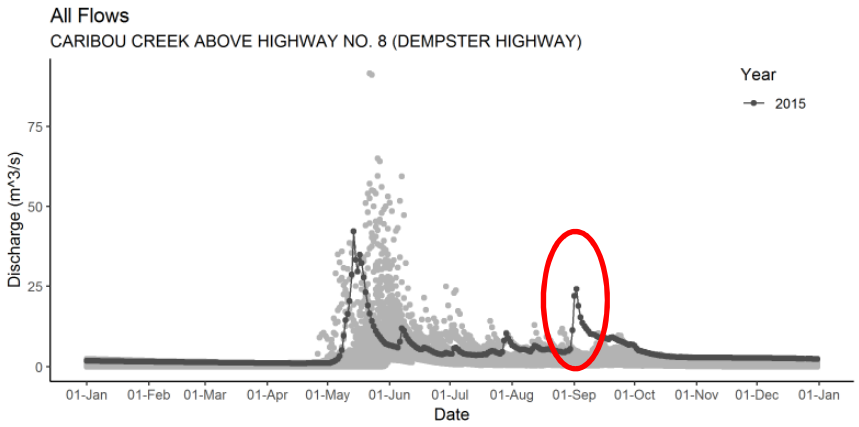


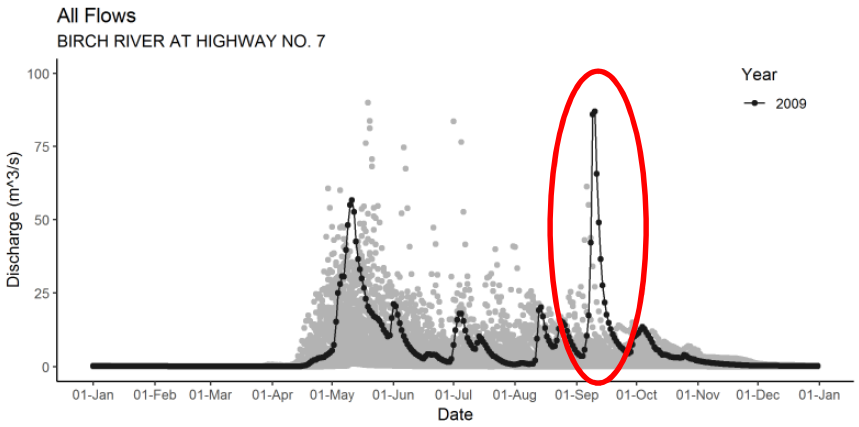


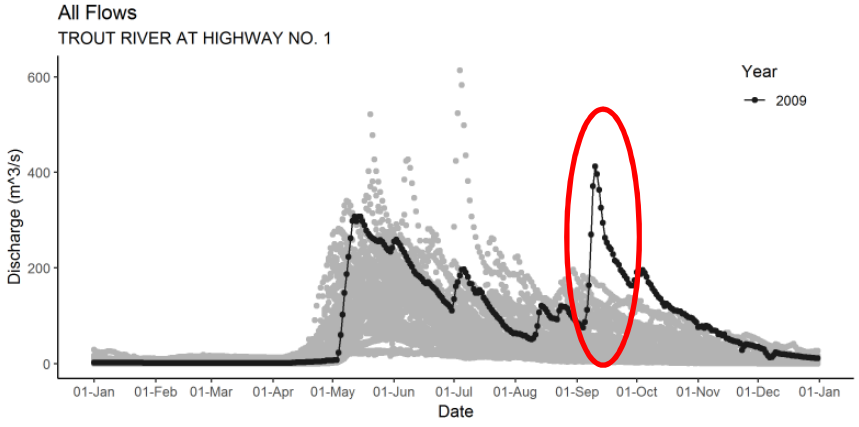


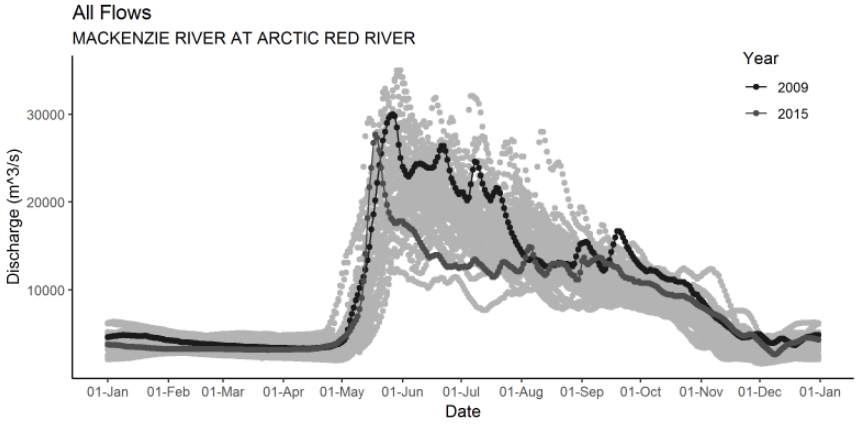


- Increasing fall precipitation patterns are causing high late-season runoff events
- Magnitude can rival or exceed spring freshet volumes









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