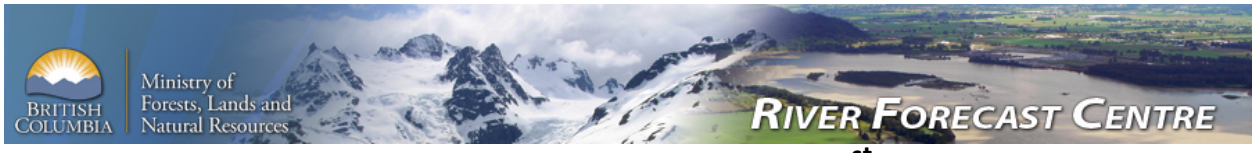


Snow Survey and Water Supply Bulletin – May 1st, 2013

The May 1st snow survey is now complete. Data from 135 snow courses and 53 snow pillows around the province and out-of-province sampling locations, and climate data from Environment Canada, have been used to form the basis for the following reports[1].

Weather

Weather was mixed through the month of April. A hot, dry spell over the Easter long weekend had record or near record temperatures in many regions of the province. The weather then transitioned into more unsettled weather patterns which persisted through the remainder of the month. This led to wetter than normal conditions for most of the province, and slightly below normal temperatures. In the northern part of the province, temperatures through April were well below normal.

Snowpack

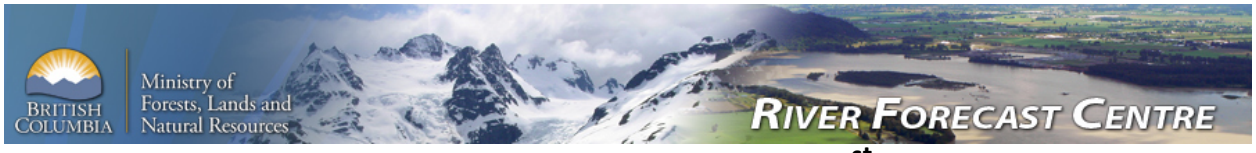
The heat spell in early April led to the onset of snowmelt in some locations of the province, particularly low to mid elevations areas. This trend was reversed with more unsettled weather through the remainder of the month. With cooler and wetter conditions, continued snow accumulation occurred for most areas up until the end of April. Typically snow packs transition from accumulating snow to melting snow around the middle of April, however this transition was delayed this season by one to two weeks. The combination of modest growth in snow packs and the delay in the melt season has led to modest increases in snow basin indices since April 1st for most areas of the province. Snow basin indices, however, remain near normal (90-100%) for most of British Columbia (Table 1, Map 1, and Snow Basin Graphs). Below normal basin indices (<90%) are present in the Nechako and on Vancouver Island. Snow basin indices are moderately elevated (110-120%) in the North Thompson, South Thompson, Okanagan-Kettle and Stikine, and high (>120%) in the Upper Fraser. The Liard has a snow basin index of 236%, however this is largely reflective of the delay in snowmelt in that watershed rather than exceptional amounts in comparison to a normal annual maximum amount of snow.

Snow water-equivalent data is currently being estimated at four automated snow pillow sites (Table 2). Detailed Snow Survey Data are available at http://bcrfc.env.gov.bc.ca/data/survey/.

Table 1: BC Snow Basin Indices – May 1, 2013

Basin	% of Normal	Basin	% of Normal
Upper Fraser	129%	Kootenay	101%
Nechako	82%	Okanagan-Kettle	115%
Middle Fraser	103%	Similkameen	100%
Lower Fraser	103%	South Coast	104%
North Thompson	111%	Vancouver Island	85%
South Thompson	120%	Peace	100%
Nicola	105%	Skeena-Nass	94%
Fraser River – All Basins	107%	Stikine	111%
Columbia	106%	Liard	236%

1. Every effort is made to ensure that data reported on these pages are accurate. However, in order to update the graphs and indices as quickly as possible, some data may have been estimated. Please note that data provided on these pages are preliminary and subject to revision upon review.



Snow Survey and Water Supply Bulletin – May 1st, 2013

Outlook

With a slight delay in the onset of the snow melt season, and small increases in the size of the snow pack in some regions, there have been small increases in the seasonal flood risk across the province. Seasonal flood risk is moderately elevated in the North Thompson, South Thompson, Okanagan-Kettle and Liard Rivers. Seasonal flood risk is high in the Upper Fraser basin. Elsewhere in the province, seasonal flood risk is considered to be normal.

The May 1st Fraser Basin index is 107% and normal seasonal flood risk is expected on the lower Fraser River through the Fraser Valley. The revised May estimate for the most likely (i.e. a 50% chance of occurrence) peak flow on the Fraser River at Hope is 9100 m^3/s or less. There is approximately a 5% chance of a peak flow of 11,500 m^3/s (slightly below peak levels that were experienced in 2012) and less than a 1% chance of a peak flow of 15,200 m^3/s (similar flows to the 1948 flood).

It is important to note that snow pack is only one element that influences whether flooding occurs during the spring freshet. Of critical importance are how the snow melts and how much, and when, precipitation is received during the snow melt period. While there an increased likelihood of flooding in areas with higher than normal snow packs, flooding is possible in any region given adverse weather conditions (prolonged heat and/or heavy precipitation).

Seasonal flows are expected to be near normal throughout most of the province. Lower than normal spring-summer flows are expected in the Nechako basin and on Vancouver Island. Current seasonal forecasts for select watersheds are given in Table 3.

As of May 1st, weather has transitioned into persistent high pressure systems with temperatures that have been well above normal, and in some cases reaching new record levels. This has lead to the onset of the snowmelt season across BC, with the highest rates of melt occurring in the southern half of the province. The current weather forecasts from Environment Canada are indicating hot temperatures through to May 10th or 11th for most of the province, with a slight cooling and chance of wet weather towards the end of the weekend and into early next week (May 12-13th). The current NAEFS (North American Ensemble Forecast System) 8-14 day temperature anomaly probabilistic forecast is for a high likelihood of above normal temperatures through the May 15th-22nd period. The current 30-day temperature anomaly outlook (issued April 30th, 2013 for the month of May) from Environment Canada indicates an increased likelihood for above normal temperature for southern British Columbia. Longer-range (3-month) seasonal forecasts from Environment Canada are also suggesting a higher likelihood of above normal temperature and below normal precipitation over the May-July period, specifically in the southern half of the province.

Currently most rivers are well below flood stage, but hot weather through the first week in May has led to rapidly rising river levels across most of the province. With an increased likelihood of warmer weather over the next 1-3 weeks, continued rapid snow melt is expected. Flooding is possible during this window of time if temperatures remain high, or if there are any significant rainstorms that accompany the hot weather.

The River Forecast Centre is currently publishing information on the 2013 year's freshet season including a table and map of daily river flows at various Water Survey of Canada hydrometric gauges across the

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Snow Survey and Water Supply Bulletin – May 1st, 2013

province, 5-day flow forecasts for the Fraser River and major tributaries, and a weekly Provincial River Outlook Summary. This can be found at: http://bcrfc.env.gov.bc.ca/bulletins/freshet.htm, and additional information will be added as it becomes available.

The next snow bulletin will be released on May 22nd, 2013.

Produced by: BC River Forecast Centre
May 8, 2013

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Snow Survey and Water Supply Bulletin – May 1st, 2013

Map 1: Basin Snow Water Index - May 1st, 2013

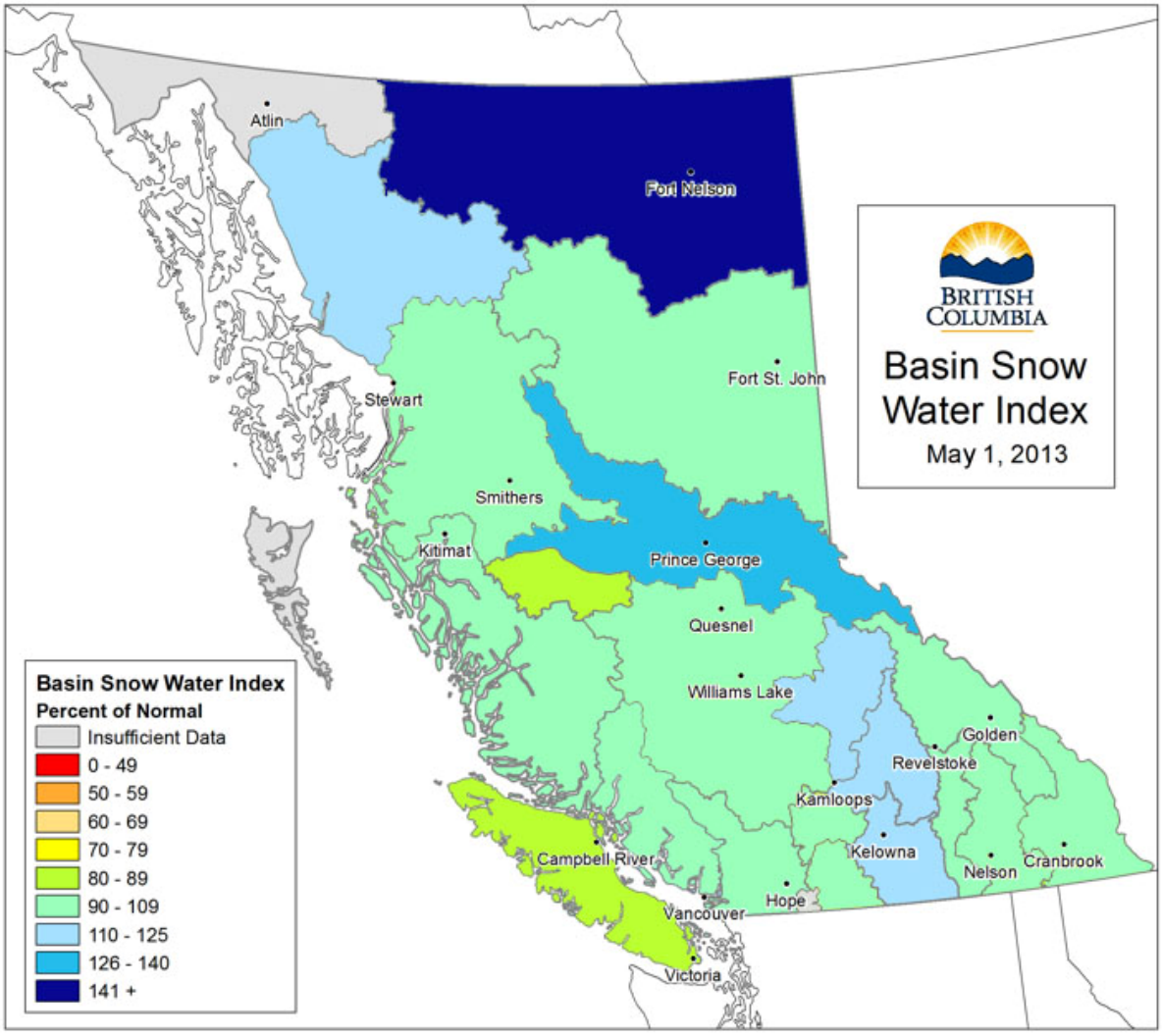

Table 2: May 1st Automated Snow Pillow Estimates

SNOW PILLOW ID	SNOW PILLOW NAME	OBSERVATION DATE	ESTIMATED Snow Water Equivalent (mm)
1E02P	MOUNT COOK	01-May	1462
2C09Q	MORRISSEY RIDGE	01-May	600
2D08P	EAST CREEK	01-May	976

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TABLE 3
Ministry of Forests, Lands and Natural Resource Operations
River Forecast Centre
Volume Runoff Forecast May 2013

Location		May - Jun Runoff				May - Jul Runoff				May - Sep Runoff			
		Forecast ($kdam^3$)	Normal (1981-2010) ($kdam^3$)	% of Normal	Std. Error ($kdam^3$)	Forecast ($kdam^3$)	Normal (1981-2010) ($kdam^3$)	% of Normal	Std. Error ($kdam^3$)	Forecast ($kdam^3$)	Normal (1981-2010) ($kdam^3$)	% of Normal	Std. Error ($kdam^3$)
Upper Fraser Basin	Fraser at McBride	3470	3534	98%	297					4934	5000	99%	373
	McGregor at Lower Canyon	4382	3552	123%	376					4802	4598	104%	563
	Fraser at Shelley	16508	13672	121%	1070					18675	17732	105%	1657
Middle Fraser Basin	Quesnel River at Quesnel	4375	4117	106%	419					5813	5448	107%	574
Thompson Basin	N. Thompson at McLure	8934	8209	109%	425					11389	10379	110%	785
	S. Thompson at Chase	5956	5298	112%	403					7789	6866	113%	659
	Thompson at Spences Bridge	15643	13923	112%	825					20369	17903	114%	1510
Bulkley and Skeena	Bulkley at Quick	2157	2383	91%	185					2741	2980	92%	220
	Skeena at Usk	15979	17317	92%	964					20657	21661	95%	1463
Nicola Lake	Inflows	129	105	123%	28	155	122	128%	33				
Nicola River	at Spences Bridge	469	409	115%	76	552	477	116%	103				
Okanagan and Kalamalka-Wood Lake	Okanagan Lake Inflow	496	349	142%	81	548	376	146%	103				
	Kalamalka-Wood Lake Inflow	27.5	21.5	145%	8.2	30.7	23.7	150%	10.7				
Similkameen River	Similkameen at Nighthawk	1202	1101	109%	152					1556	1411	110%	193
	Similkameen at Hedley	861	827	104%	91					1061	1015	105%	105
Cowichan River	Cowichan Lake Inflows	118	130	91%	45					160	174	92%	45

1 $kdam^3$=1,000,000 m^3

Note that missing values reflect that forecasts were not made for that time interval

Disclaimer: Seasonal forecasts were developed using a Principle Component Analysis of snow pack, climate and streamflow data.

Cowichan Lake Inflows are based on a multi-variate regression analysis and reflects a normal scenario for summer weather conditions

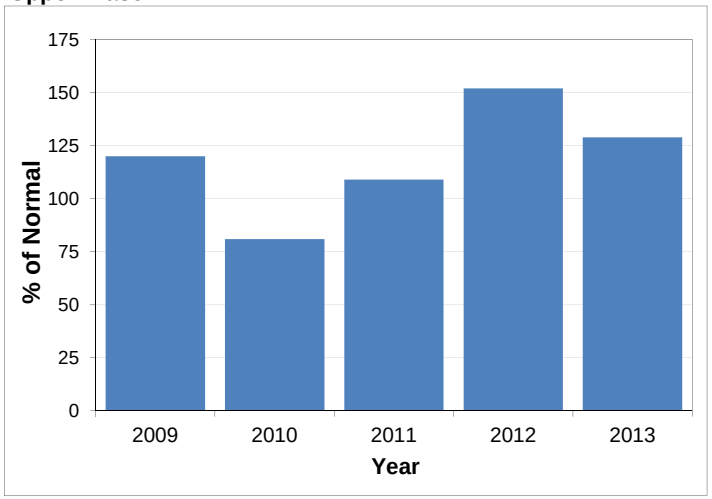
The Standard Error in the Cowichan forecast reflects model error, and does not capture uncertainty over seasonal weather

There is inherent uncertainty in runoff forecasts including potential errors in data and the unpredictable nature of seasonal weather

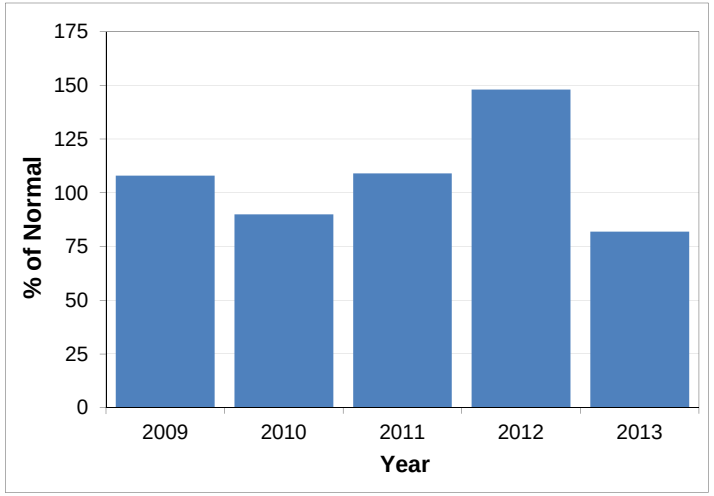
Use at your own risk

Snow Basin Index Graphs - May 1, 2013

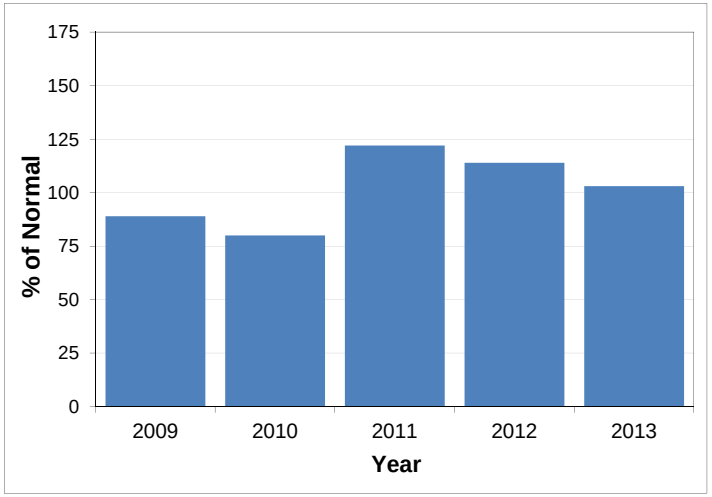
Upper Fraser



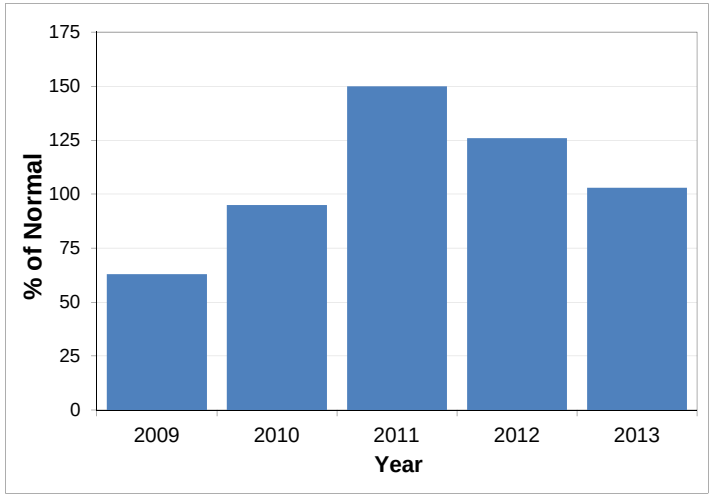
Nechako



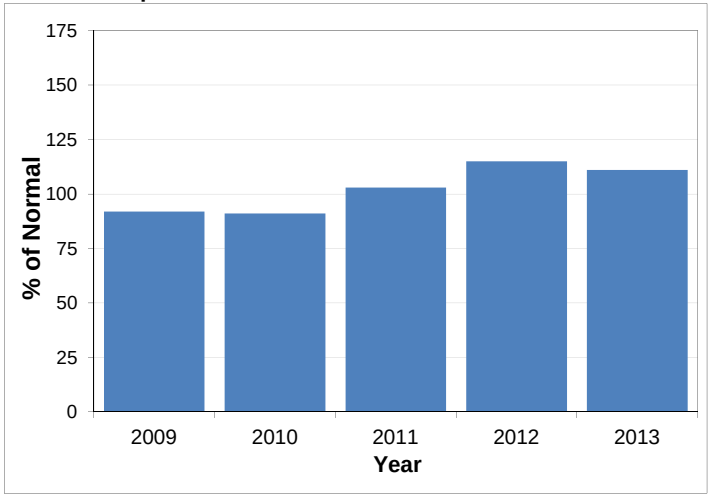
Middle Fraser



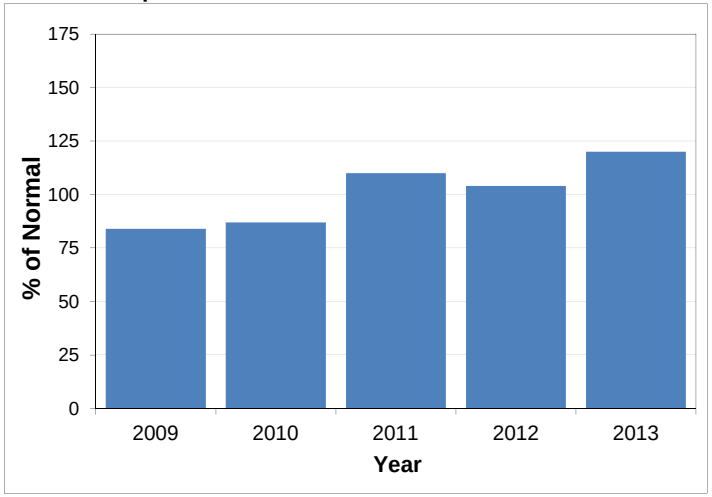
Lower Fraser



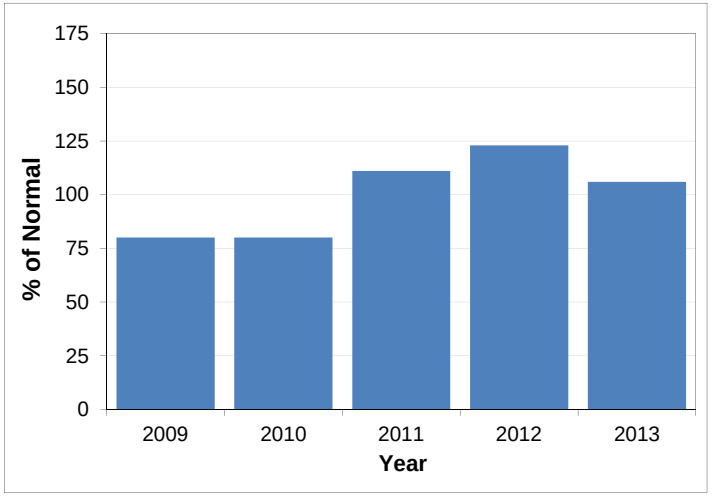
North Thompson



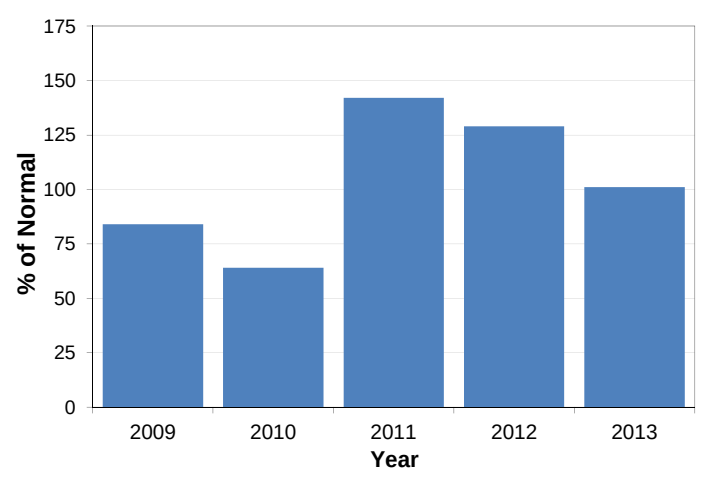
South Thompson



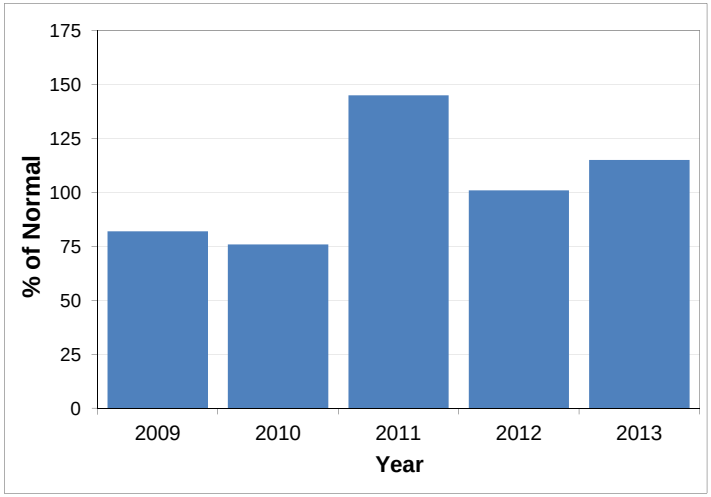
Columbia



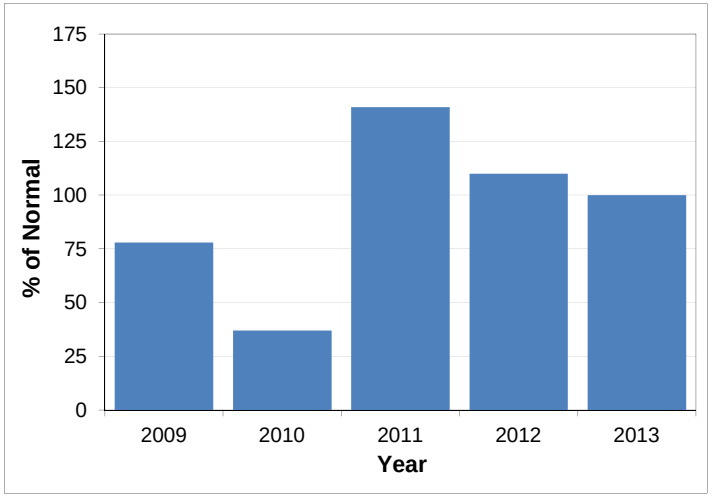
Kootenay



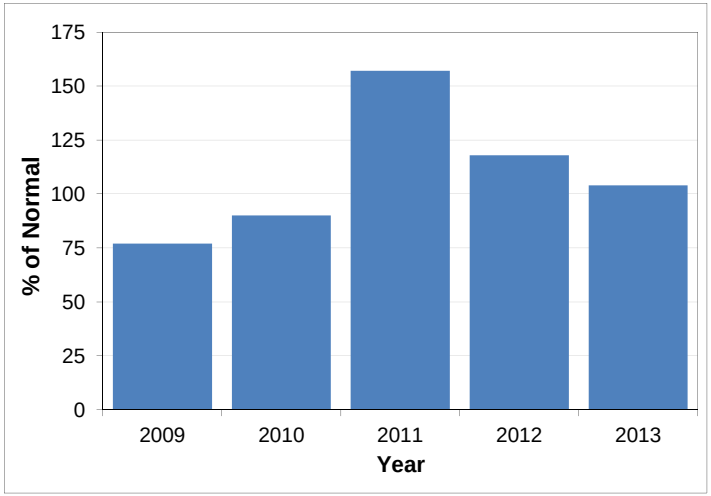
Okanagan-Kettle



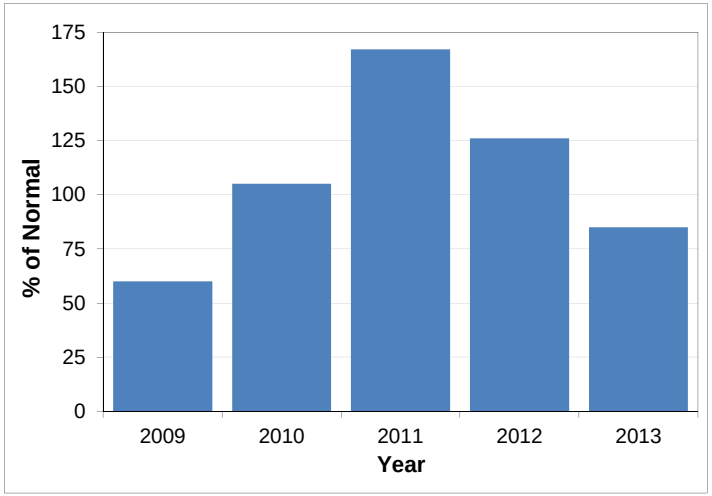
Similkameen



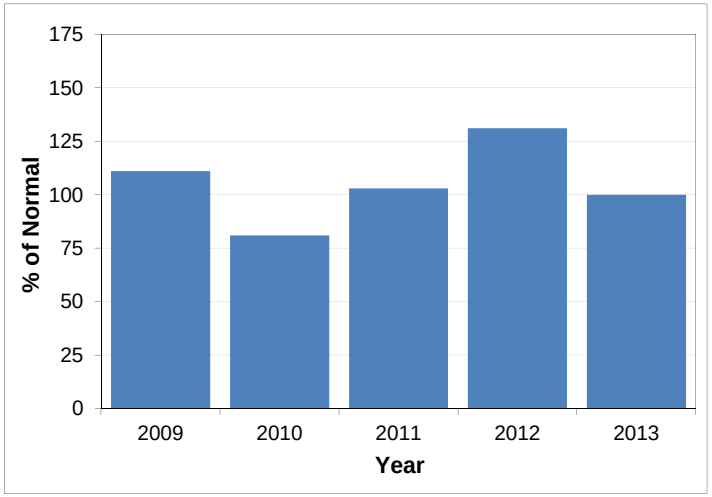
South Coast



Vancouver Island



Peace



Skeena-Nass