

2010: Okanagan Water Supply

Water Management Support

Review #1

18 February 2010

9:00am – 10:00am

2010 Schedule

#1 – 18 February (8)

#2 – 18 March (12)

#3 – 15 April (16)

#4 – 6 May (18)

#5 – 24 May (21)

#6 – 17 June (25)



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Current State of Basin Hydrology

Decision Support for Okanagan Water Management



Palmer Drought Severity Index

- The Palmer Drought Severity Index is a measure of "the relative dryness or wetness effecting water sensitive communities".

FLOW

- Snow Pack (Storage)
- Okanagan Lake (River)

GROUNDWATER

- One Water
- Sensitivity to Mining

PRECIPITATION

- Climate information
- Temperature profile



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2010 Okanagan Water Supply: February 18th Updates

OKANAGAN WATERSHED

- Okanagan Basin Water Board [**Warwick Sears**]

Context

FLOW

- BC MOE [**Chapman / Ivanov**]
- Okanagan Basin Technical Working Group [**Ivanov**]
- International Osoyoos Lake Board of Control [**Millar**]

Snow Pillow / Okanagan Lake (River)

OKFWM

Osoyoos Lake

GROUNDWATER

- BC MOE [**Chapman / Ivanov**]

Okanagan Groundwater

PRECIPITATION / CLIMATE

- Environment Canada [**Lundquist**]
- Agri-Food Canada - NAIS [**Hadwen**]

Okanagan Climate

Drought Watch Canada

Okanagan Basin Water Board [**Jatel**]

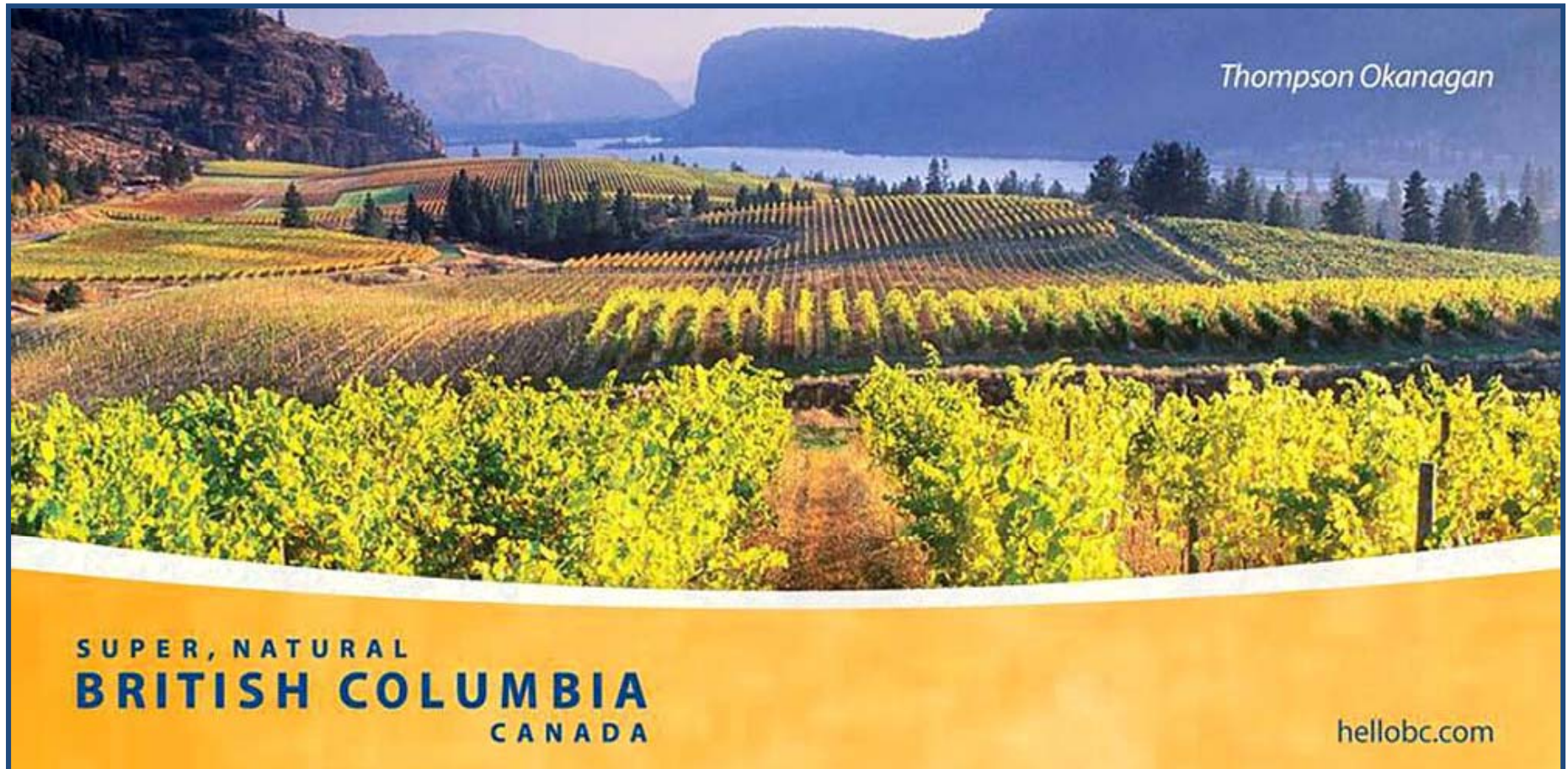
Host



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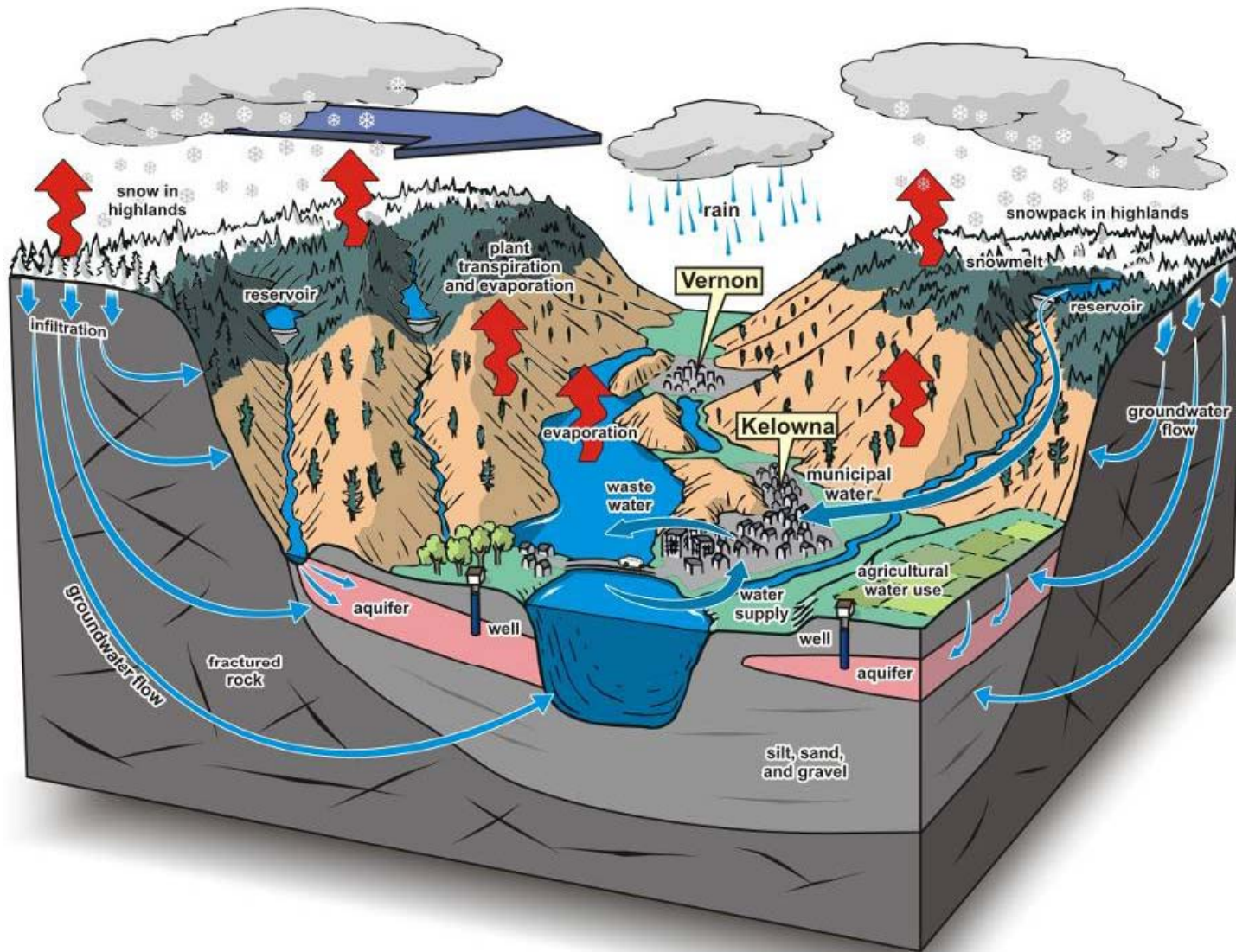
Okanagan Water



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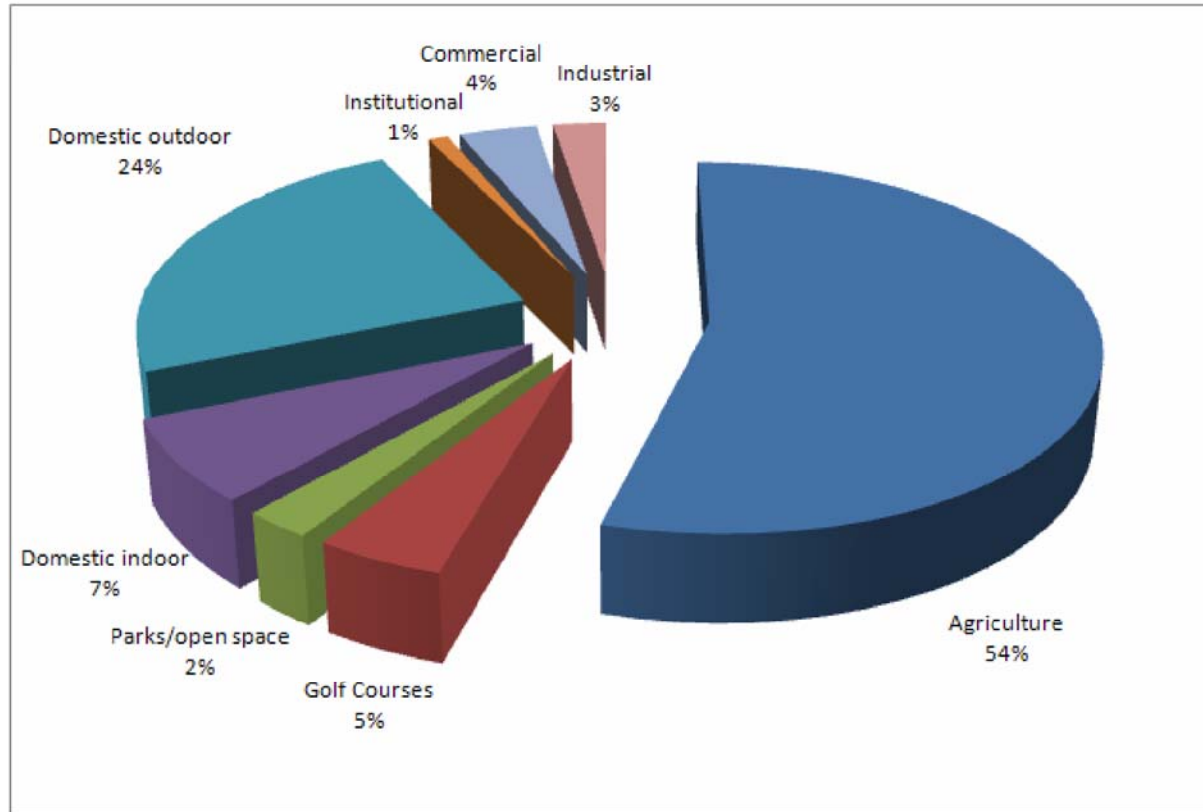
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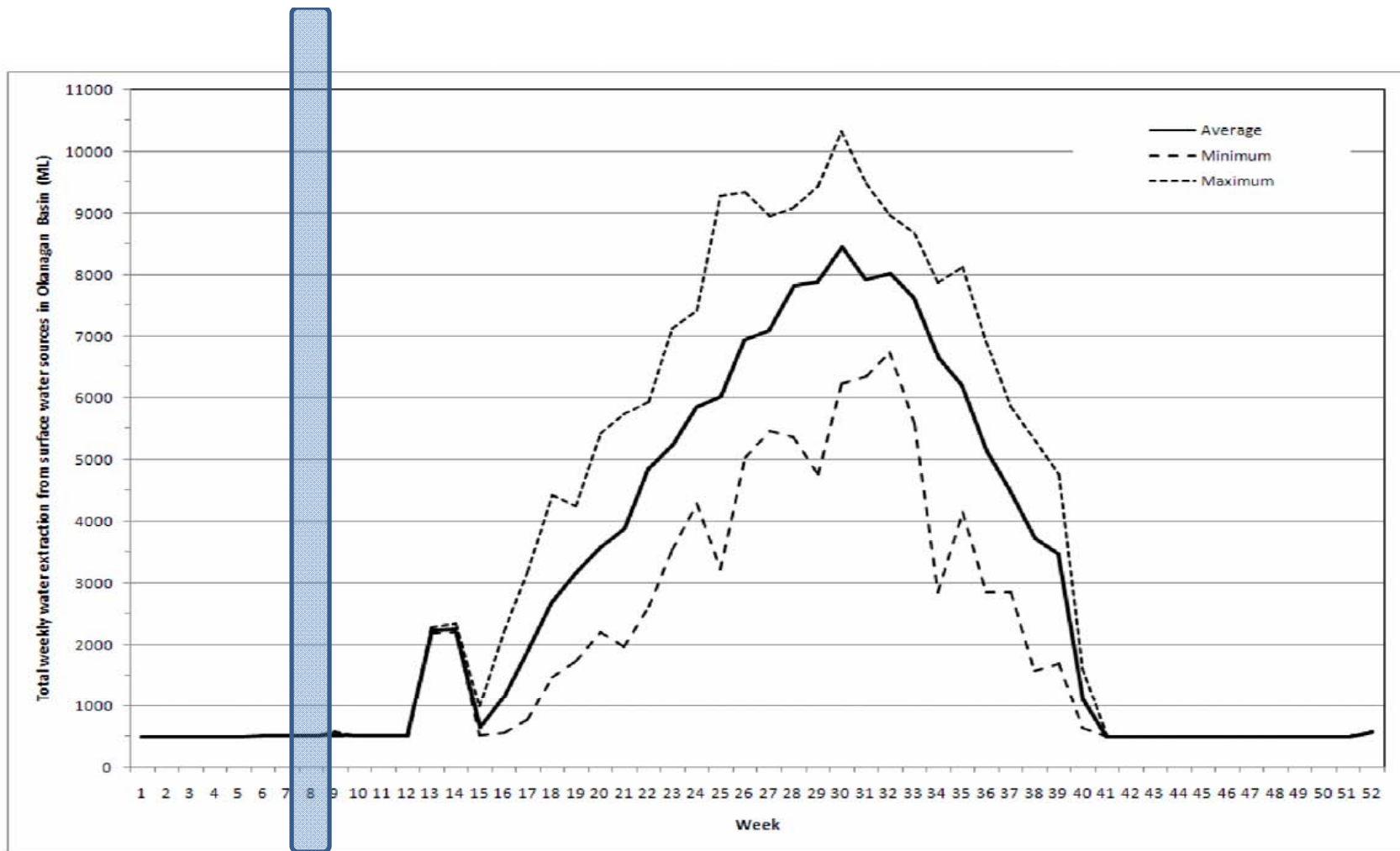






Note that losses associated with each end-use are included within each category.

Figure 6.3 Typical (1996-2006 average) distribution of total water use by end-uses in the Okanagan Basin



Note: Average, minimum, and maximum weekly totals over the 1996 to 2006 period are shown. Weeks 1-12 and 41-52 are periods when little to no irrigation occurs. The assumption of constant indoor water use is the reason for no variability during these weeks.

Figure 6.5 Total weekly water extraction from surface sources in the Okanagan Basin



Climate Change

- More rain
- Less snow
- Earlier melt
- Hotter summers
- More evaporation

Higher demand, less supply

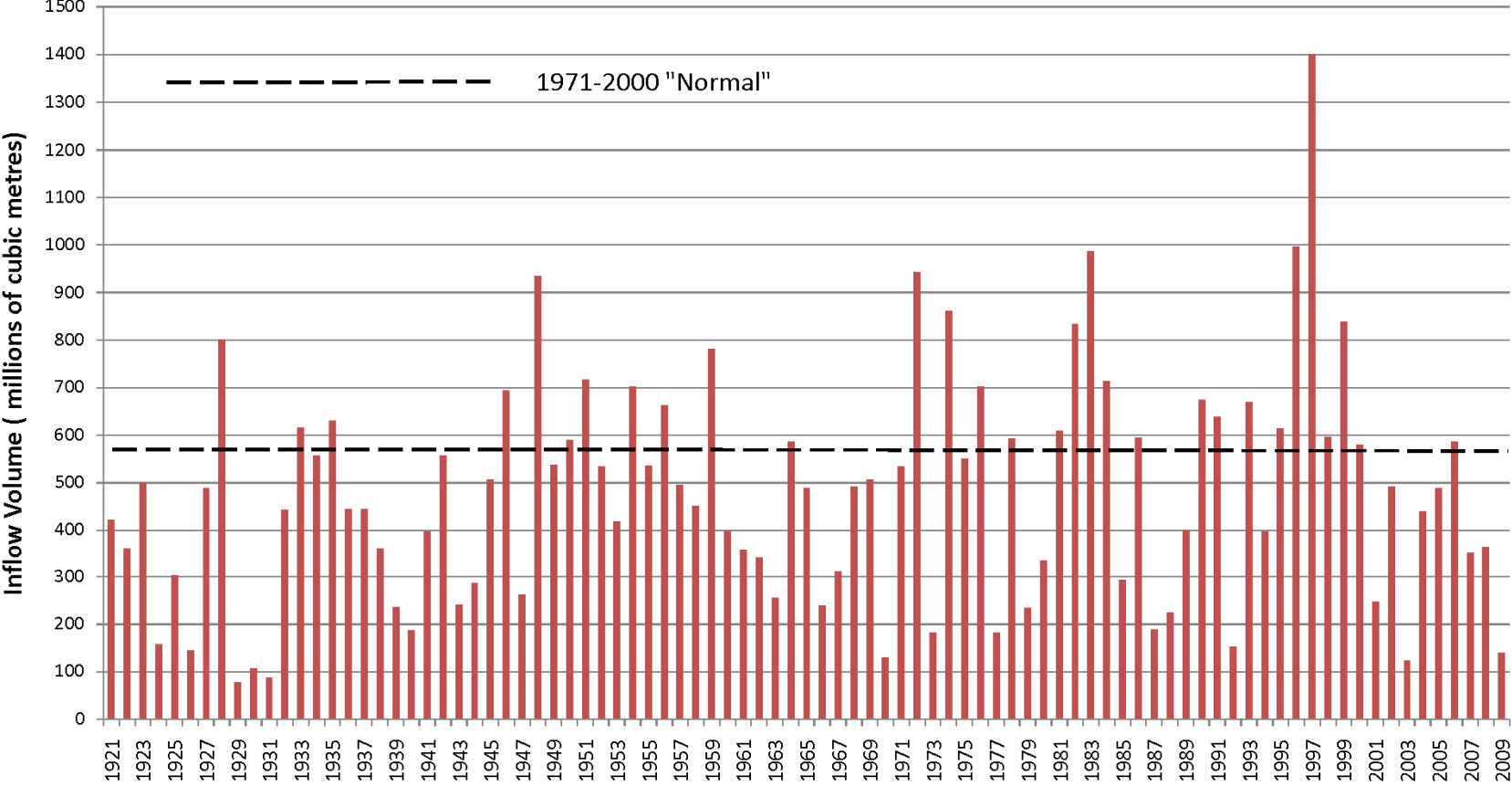


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Okanagan Lake - Annual Net Inflow Volume (1921 - 2009)



Source: BC River Forecast Centre, Ministry of Environment



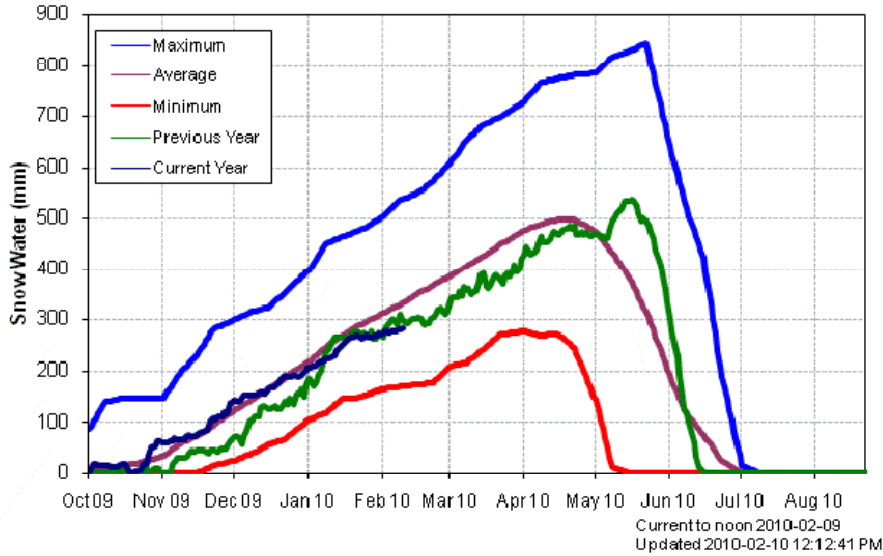
California



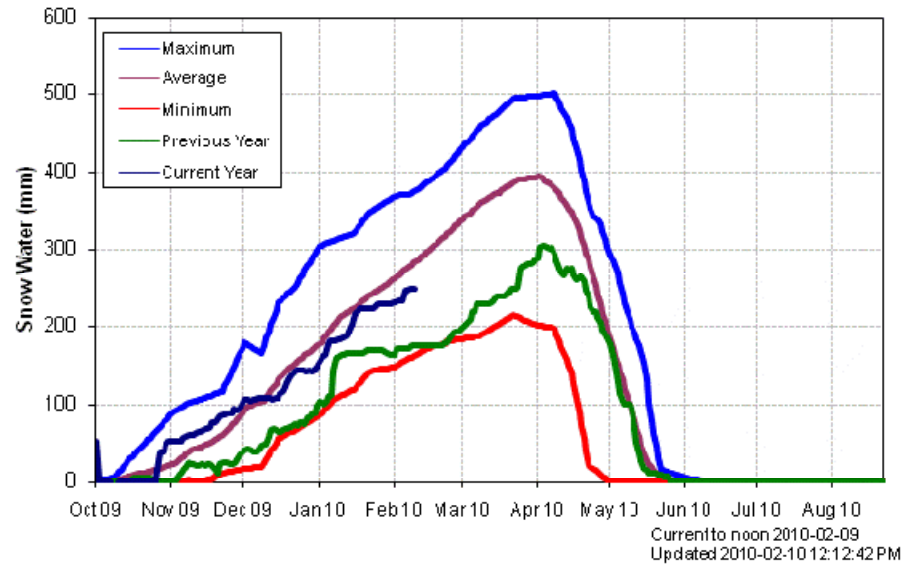
Lake Mead, Nevada



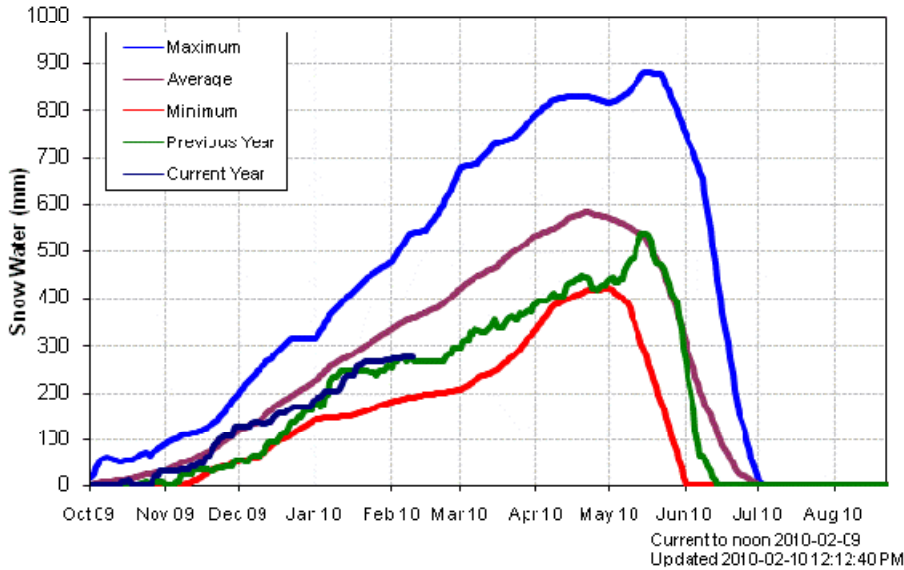
Mission Creek Snow Pillow



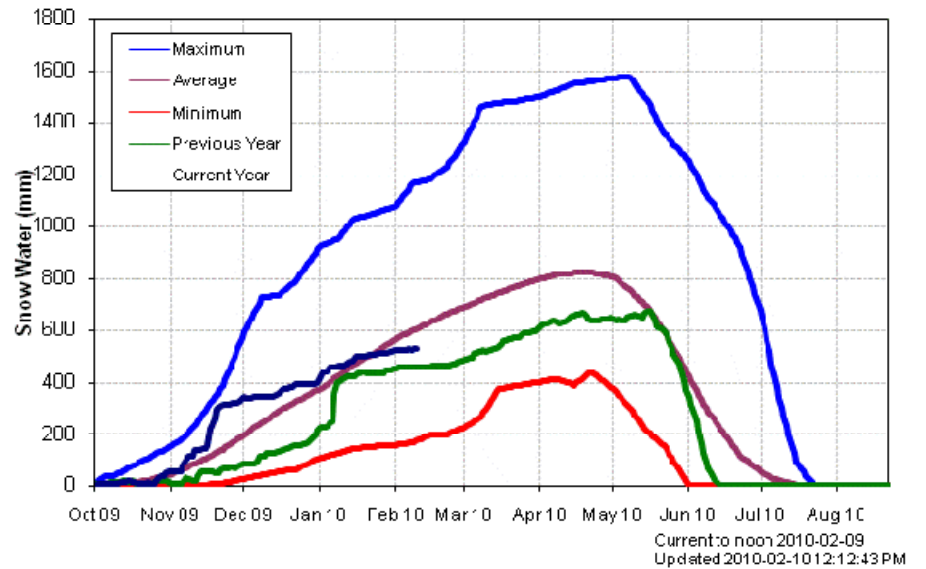
Brenda Mine Snow Pillow



Grano Creek Snow Pillow (Kettle)



Blackwall Peak Snow Pillow (Similkameen)



OKANAGAN Drainage Basin

| Snow Course Name and Number | Elev. metres | Feb 2010 | | Historic, Water Equivalent (mm) | | | | Yrs of Record |
|-----------------------------|-----------------|-----------------------------|----------------|---------------------------------|------------|------------|------------|---------------------|
| | | Snow Water Equivalent mm | % of Normal | 2009 mm | 2008 mm | Max. mm | Min. mm | |
| SUMMERLAND RESERVOIR :2F02 | 1280 | 148 | 85 | 130 | 146 | 307 | 65 | 45 |
| MC CULLOCH :2F03 | 1280 | 99 | 79 | 113 | 90 | 196 | 63 | 73 |
| OYAMA LAKE :2F19 | 1340 | 86 | 67 | 113 | 83 | 193 | 31 | 41 |
| POSTILL LAKE :2F07 | 1370 | 99 | 67 | 135 | 93 | 243 | 73 | 59 |
| TROUT CREEK (WEST) :2F01A | 1430 | 147 | 104 | N/A | N/A | N/A | N/A | 23 |
| BRENDA MINE :2F18 | 1460 | 183 | 83 | | | 386 | 84 | 23 |
| BRENDA MINE :2F18P | 1460 | 230 | 87 | 162 | 247 | 368 | 148 | 28 |
| ISLAHT LAKE :2F24 | 1480 | 200 | 85 | 134 | 230 | 364 | 124 | 28 |
| GREYBACK RESERVOIR :2F08 | 1550 | 173 | 108 | 165 | 114A | 269 | 60 | 39 |
| ISINTOK LAKE :2F11 | 1680 | 102 | 77 | 90 | 79 | 307 | 26 | 44 |
| MACDONALD LAKE :2F23 | 1740 | 290 | 91 | | | 411 | 132 | 14 |
| MISSION CREEK :2F05P | 1780 | 271 | 87 | 266 | 248 | 495 | 152 | 38 |
| GRAYSTOKE LAKE :2F04 | 1810 | 200 | 87 | | 178Z | 324 | 128 | 10 |
| MOUNT KOBAU :2F12 | 1810 | 242 | 120 | 121 | 154 | 373 | 43 | 43 |
| SILVER STAR MOUNTAIN :2F10 | 1840 | 466 | 92 | 448 | 547 | 229 | 721 | 51 |

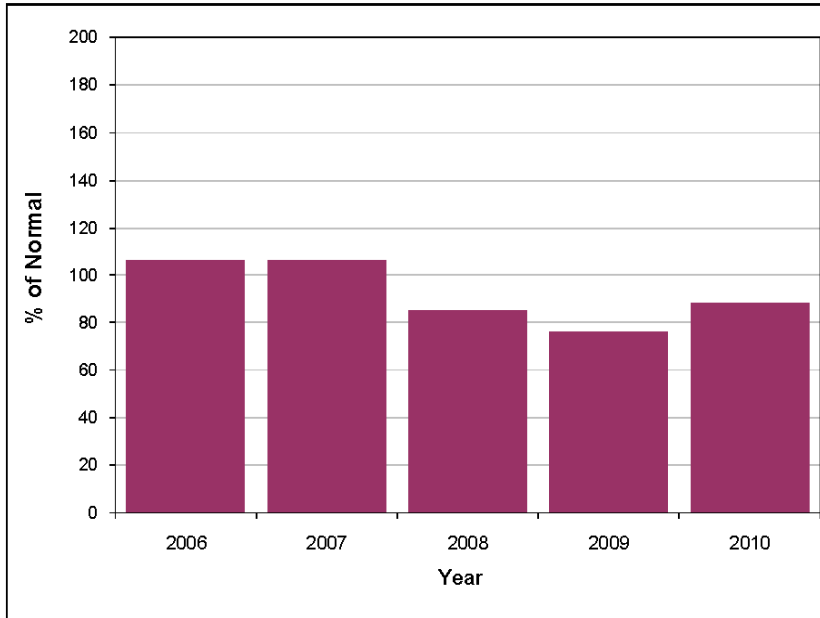
KETTLE Drainage Basin

| Snow Course Name and Number | Elev. metres | Feb 2010 | | Historic, Water Equivalent (mm) | | | | Yrs of Record |
|-----------------------------|-----------------|-----------------------------|----------------|---------------------------------|------------|------------|------------|---------------------|
| | | Snow Water Equivalent mm | % of Normal | 2009 mm | 2008 mm | Max. mm | Min. mm | |
| FARRON :2B02A | 1220 | 184 | 79 | 204 | 183 | 346 | 63 | 36 |
| MONASHEE PASS :2E01 | 1370 | 185 | 76 | 282 | 194 | 364 | 122 | 50 |
| GRANO CREEK :2E07P | 1860 | 266 | 76 | 251 | 293 | 465 | 180 | 12 |

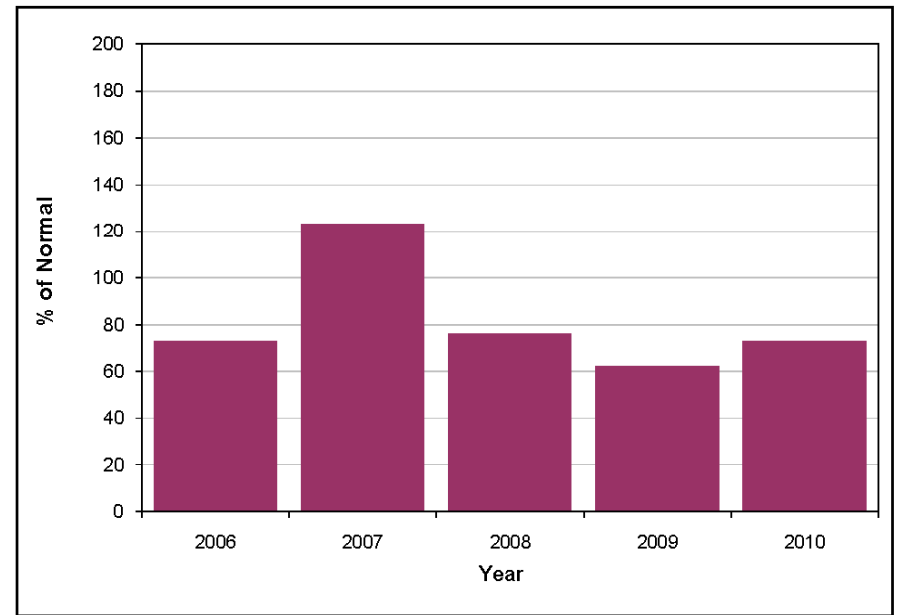
SIMILKAMEEN Drainage Basin

| Snow Course Name and Number | Elev. metres | Feb 2010 | | Historic, Water Equivalent (mm) | | | | Yrs of Record |
|-----------------------------|-----------------|-----------------------------|----------------|---------------------------------|------------|------------|------------|---------------------|
| | | Snow Water Equivalent mm | % of Normal | 2009 mm | 2008 mm | Max. mm | Min. mm | |
| FREEZEOUT CREEK TRAIL :WA11 | 1070 | 152 | 68 | 251 | 274 | 462 | 13 | 39 |
| HAMILTON HILL :2G06 | 1490 | 158 | 61 | 108 | 167 | 411 | 91 | 46 |
| MISSEZULA MOUNTAIN :2G05 | 1550 | 110 | 63 | 65 | 120 | 284 | 60 | 43 |
| ISINTOK LAKE :2F11 | 1680 | 102 | 77 | 90 | 79 | 307 | 26 | 44 |
| LOST HORSE MOUNTAIN :2G04 | 1920 | 122 | 74 | | 76A | 335 | 70 | 48 |
| BLACKWALL PEAK :2G03P | 1940 | 525 | 88 | 454 | 563 | 1076 | 159 | 42 |

Okanagan - Kettle

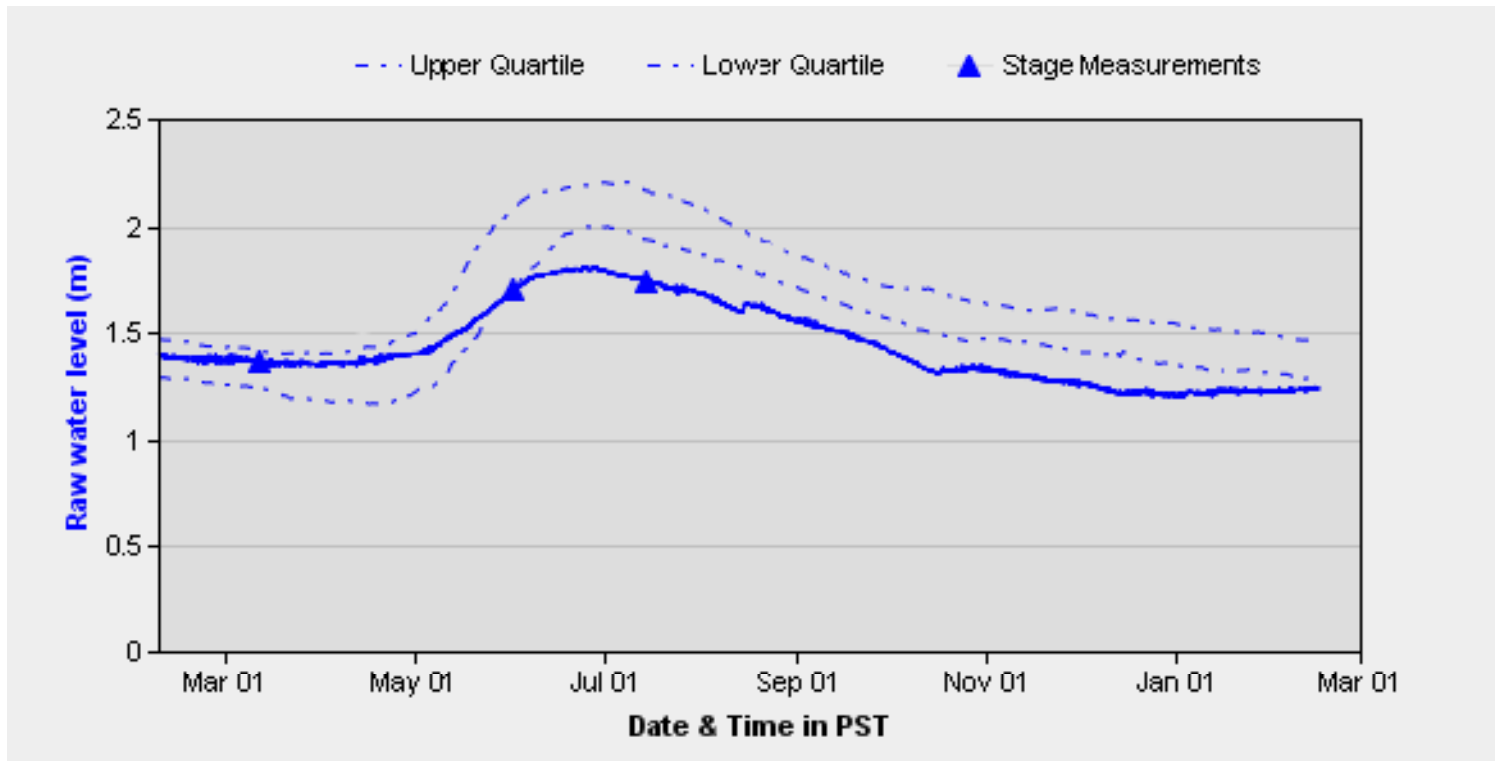


Similkameen



- Values for Feb 2010 are misleading
- Due to lack of low and mid elevation snow

Okanagan Lake Levels @ Kelowna (08NM083)



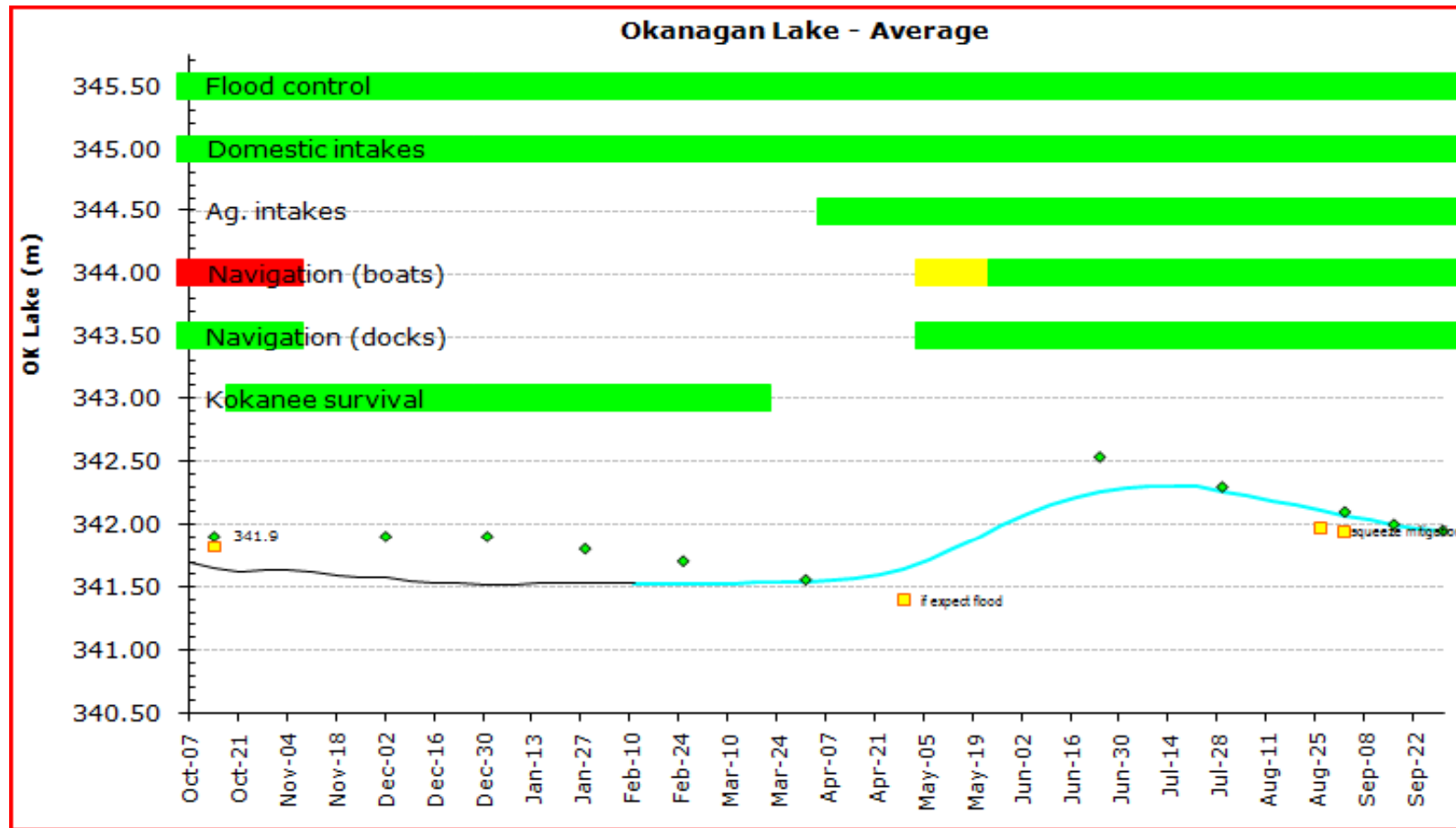
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Fish Water Management Tool Projections : 2009-2010 Water Year

(Based on Okanagan Lake Inflow Estimates (February-July) of 371 million m³)



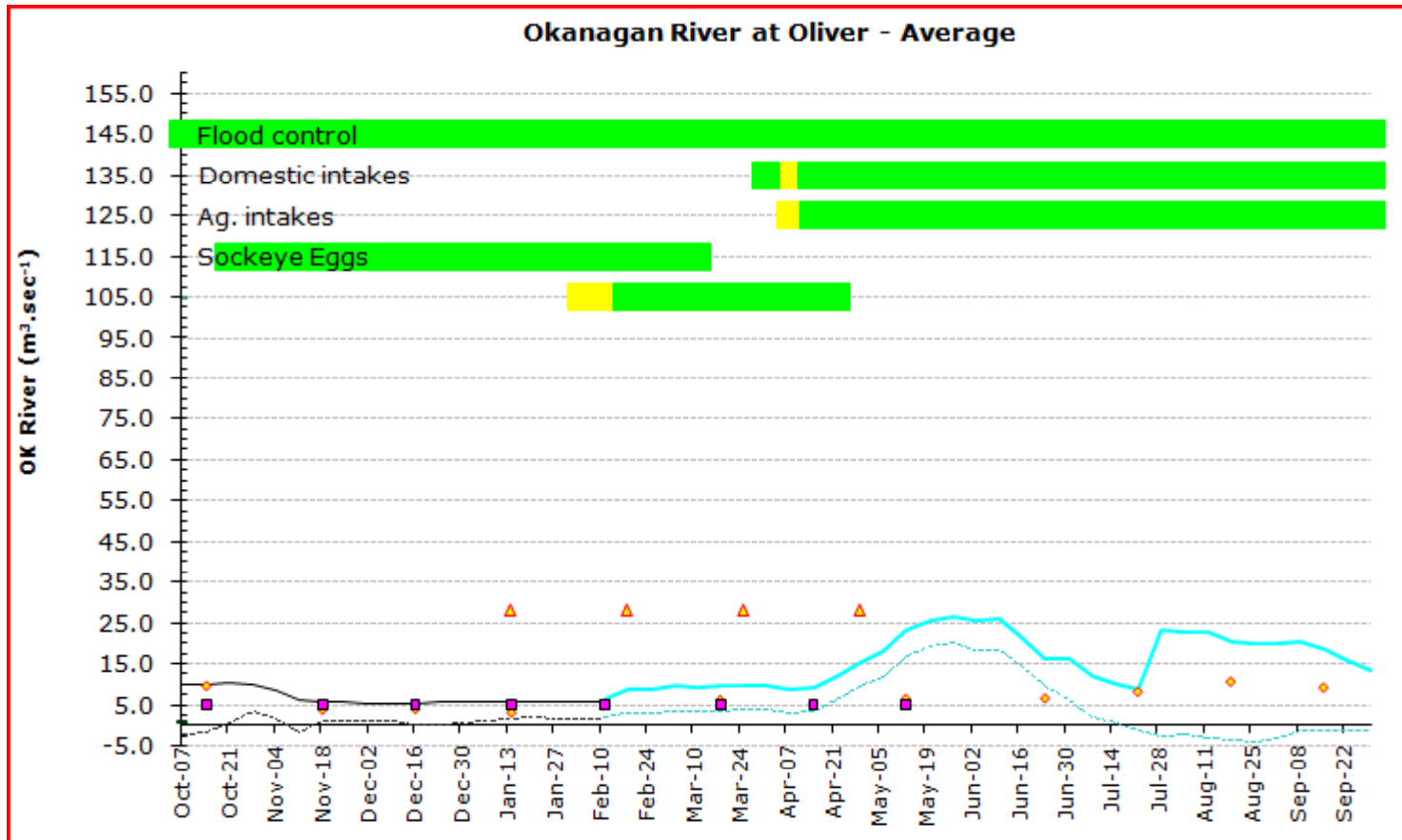
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Fish Water Management Tool Projections: 2009-2010 Water Year

Based on Okanagan Lake Inflow Estimates (February-July) of 371 million m³



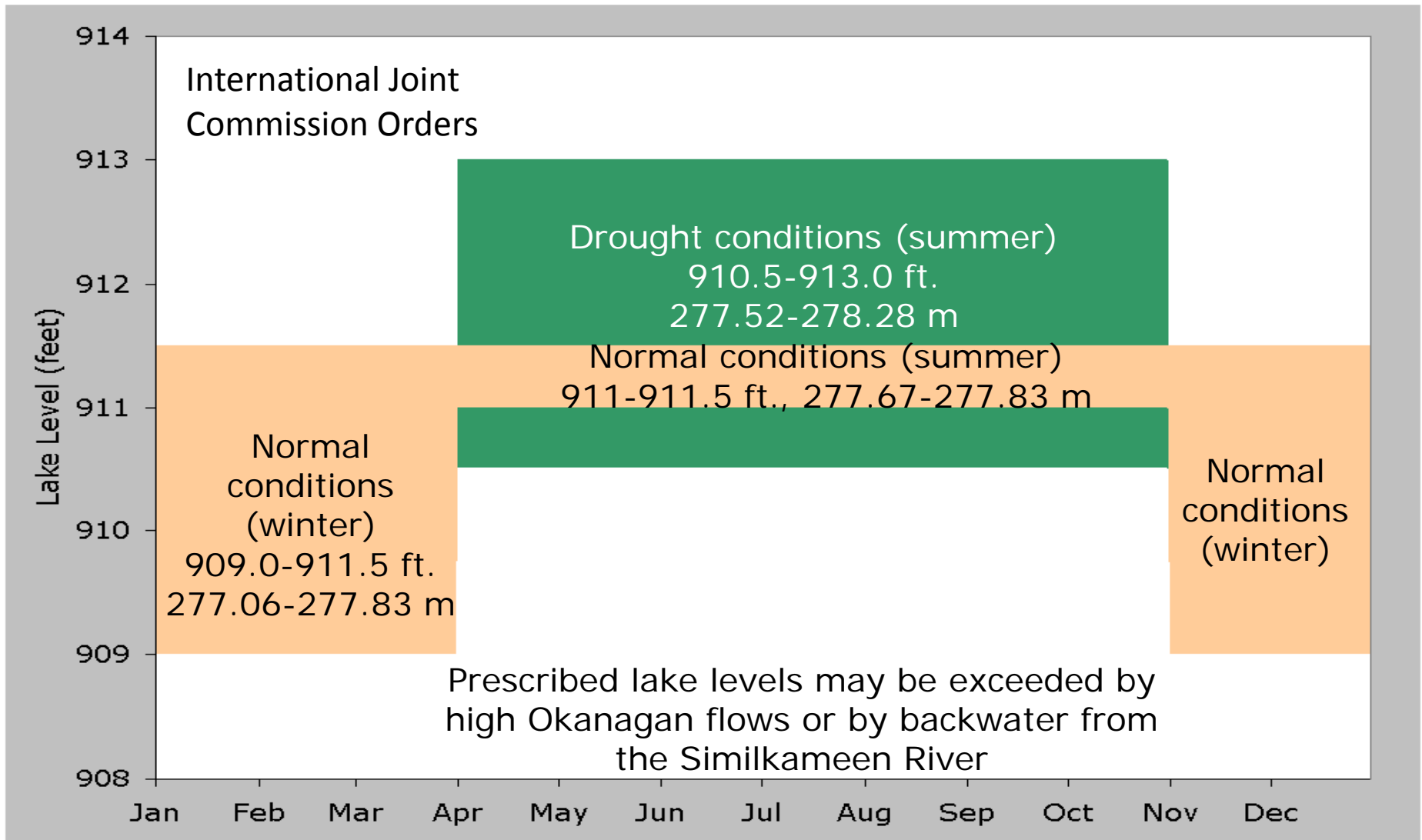
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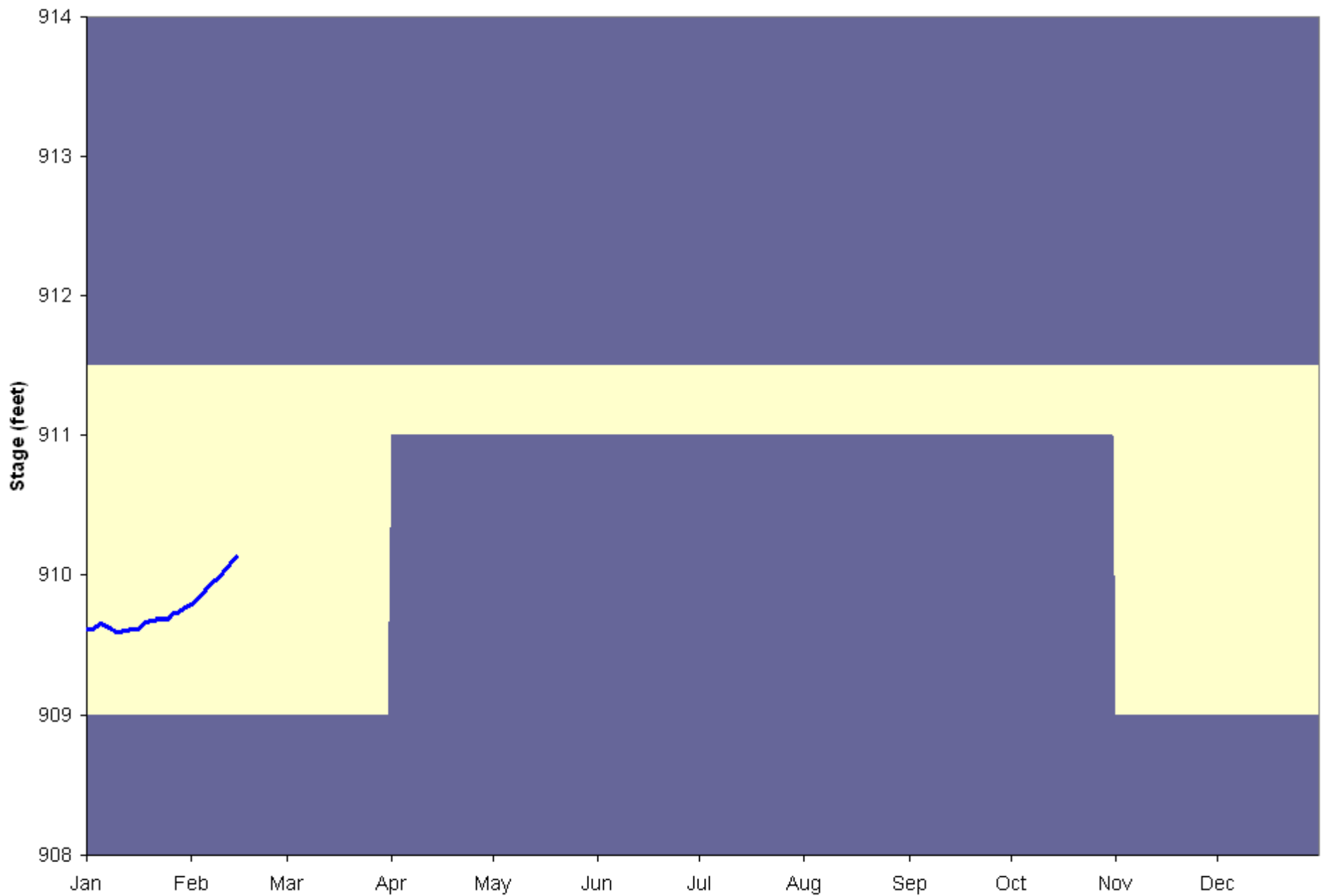
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Prescribed Osoyoos Lake Levels

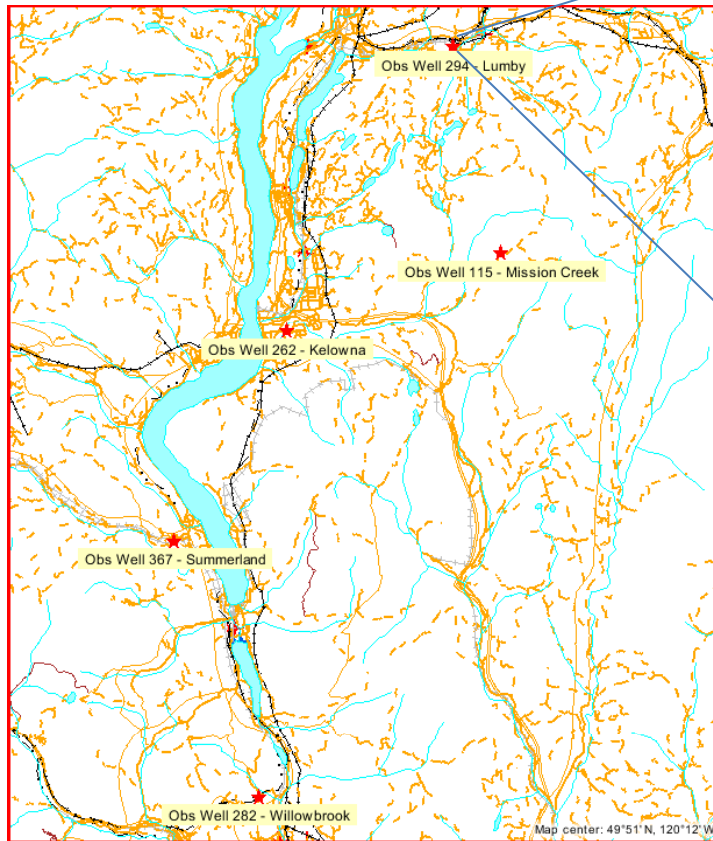


Osoyoos Lake 2010

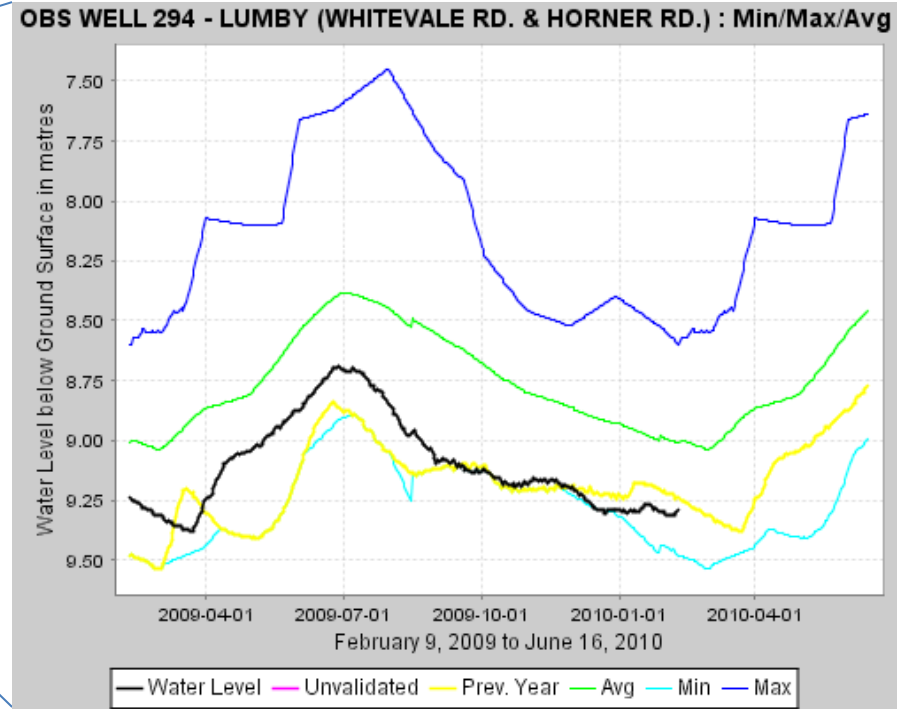


Okanagan Groundwater: MoE Observation Wells

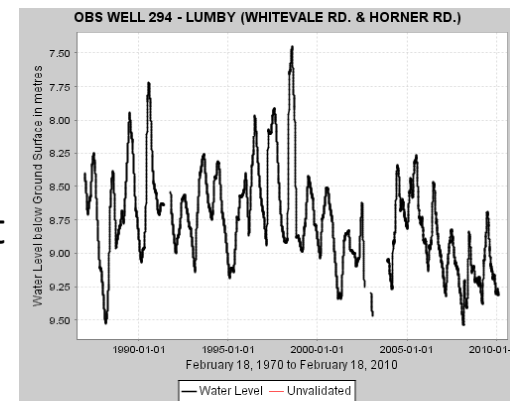
Lumby (294)



2009-10

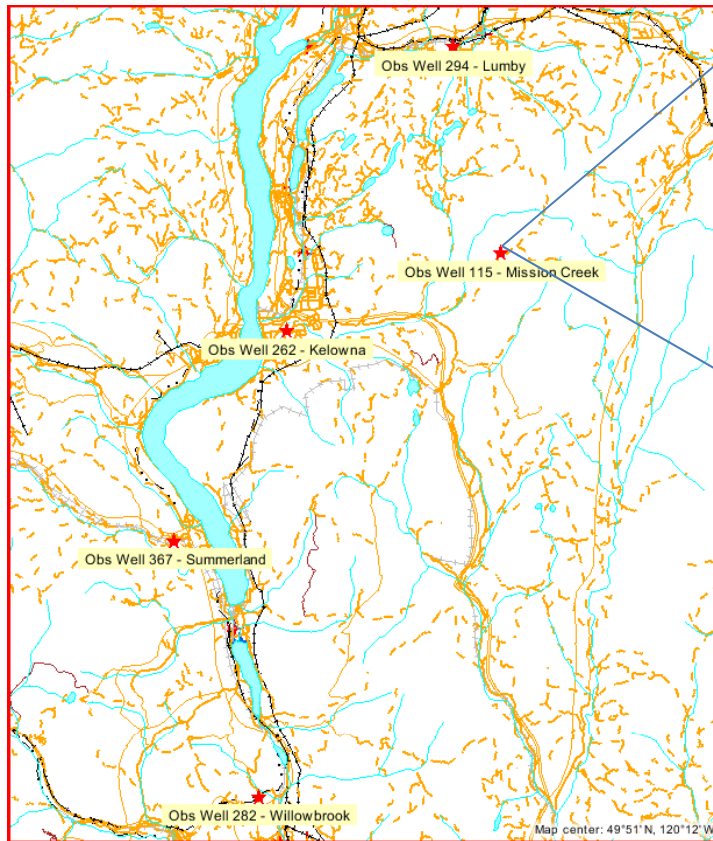


1970 - present

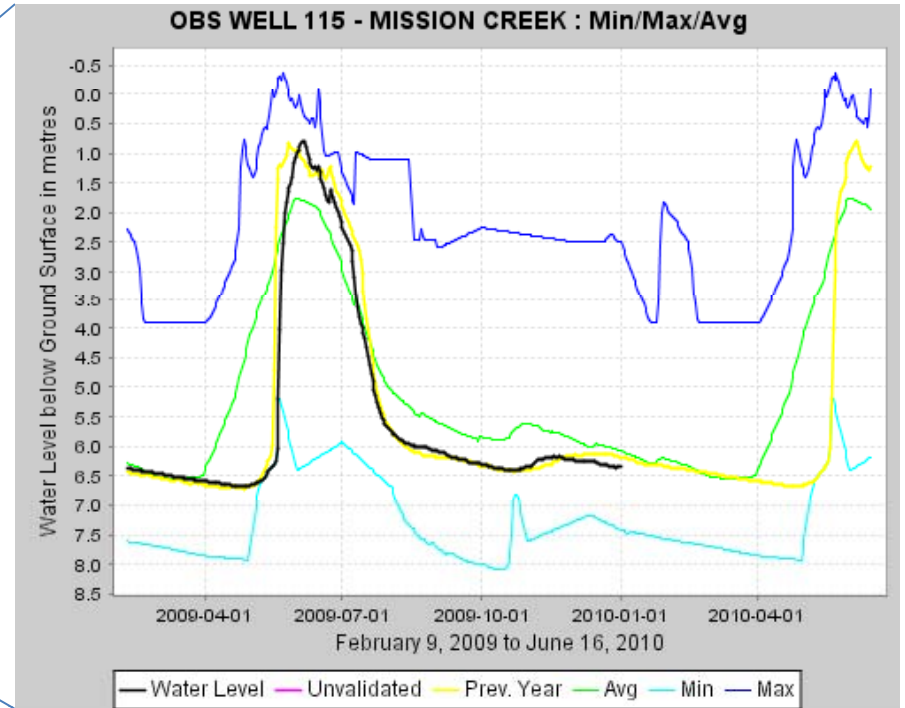


Okanagan Groundwater: MoE Observation Wells

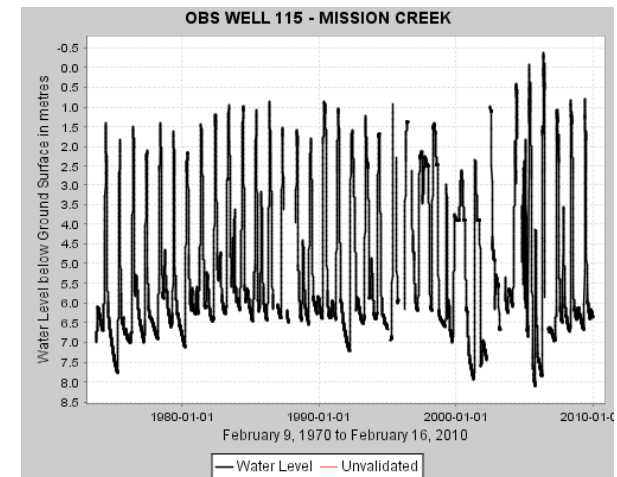
Mission Creek (115)



2009-10

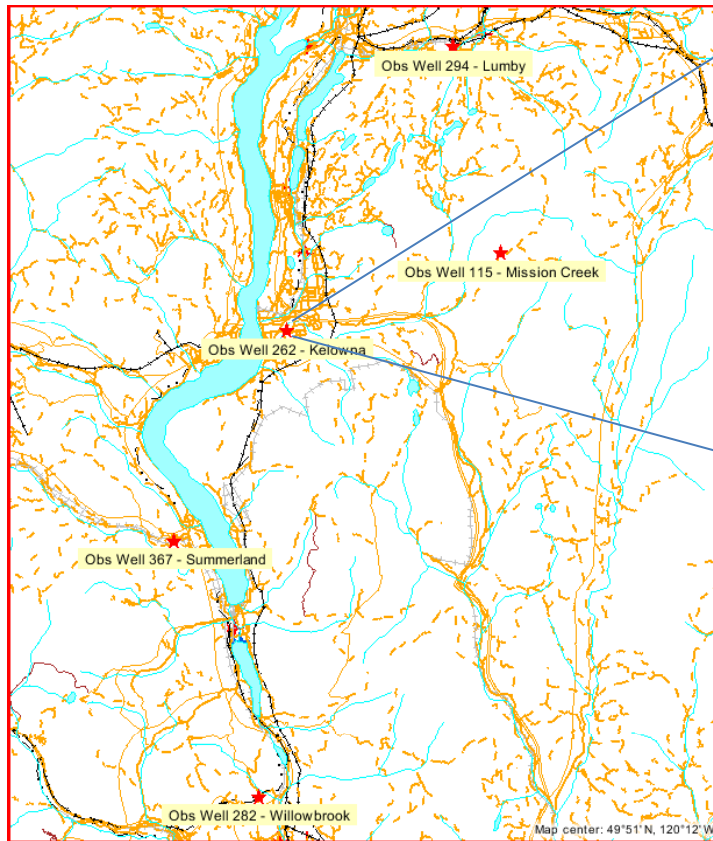


1970 - present

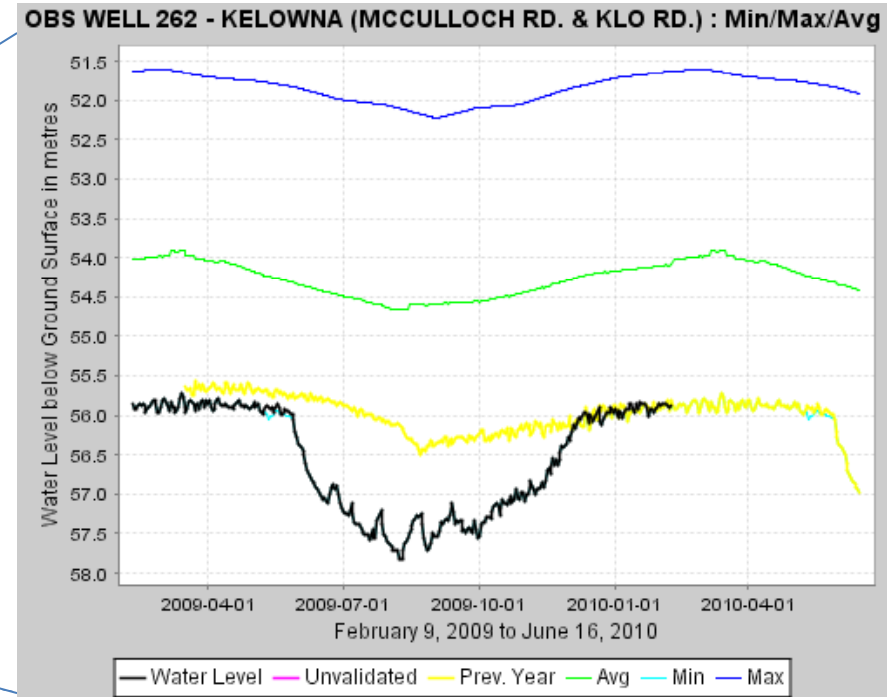


Okanagan Groundwater: MoE Observation Wells

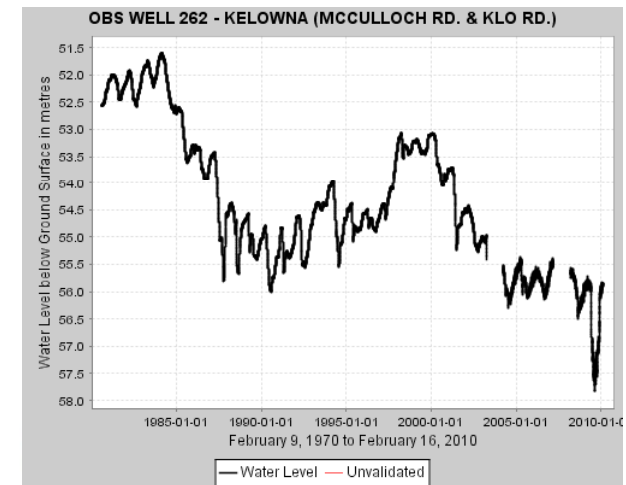
Kelowna (262)



2009-10



1970 - present

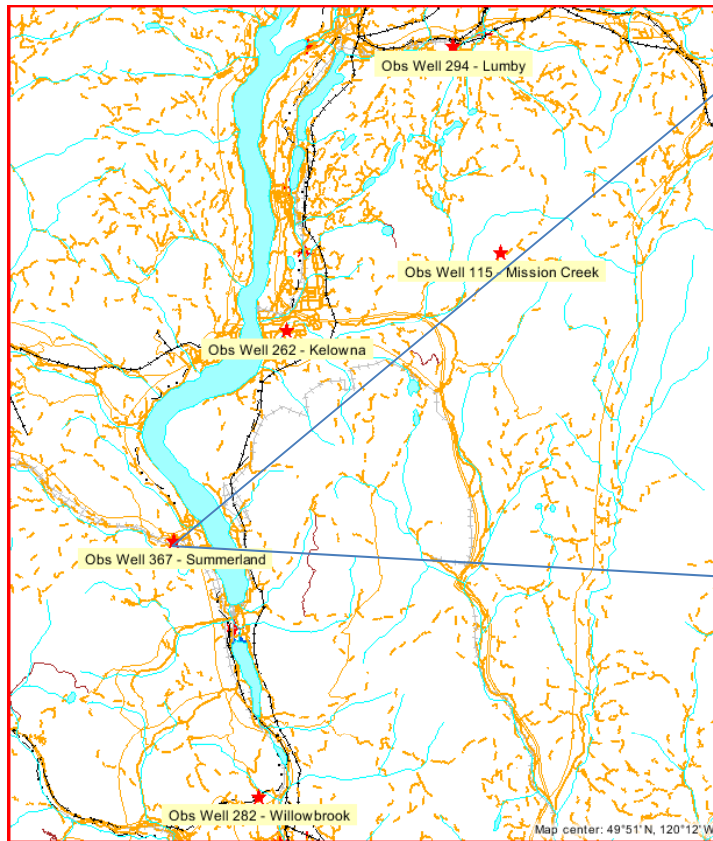


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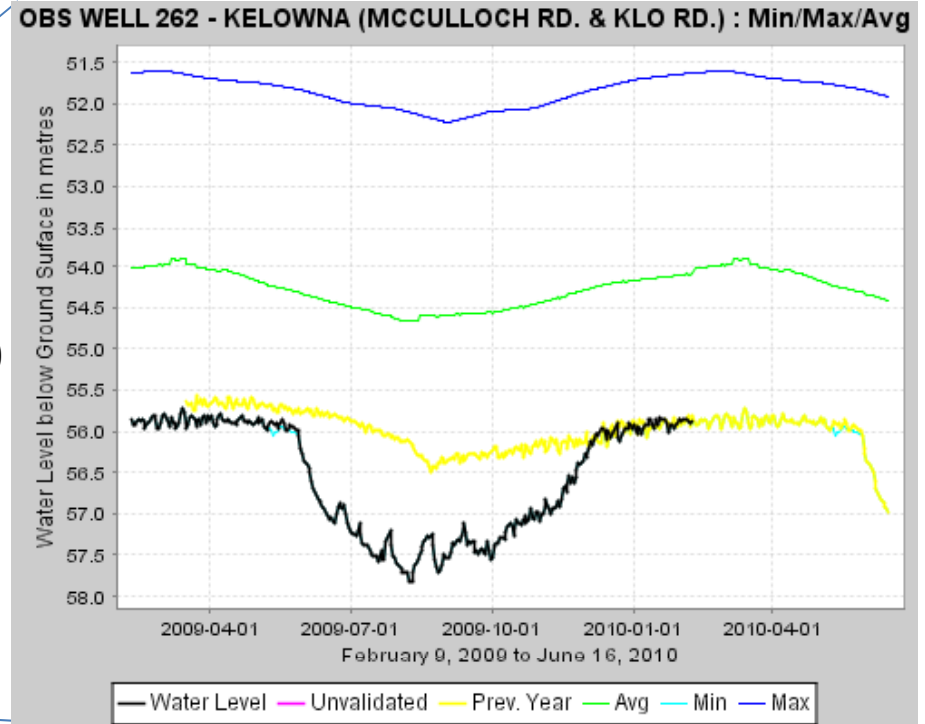
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Okanagan Groundwater: MoE Observation Wells

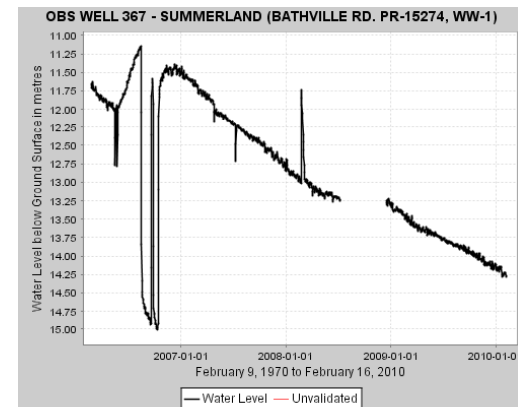
Summerland (367)



2009-10



2006 - present

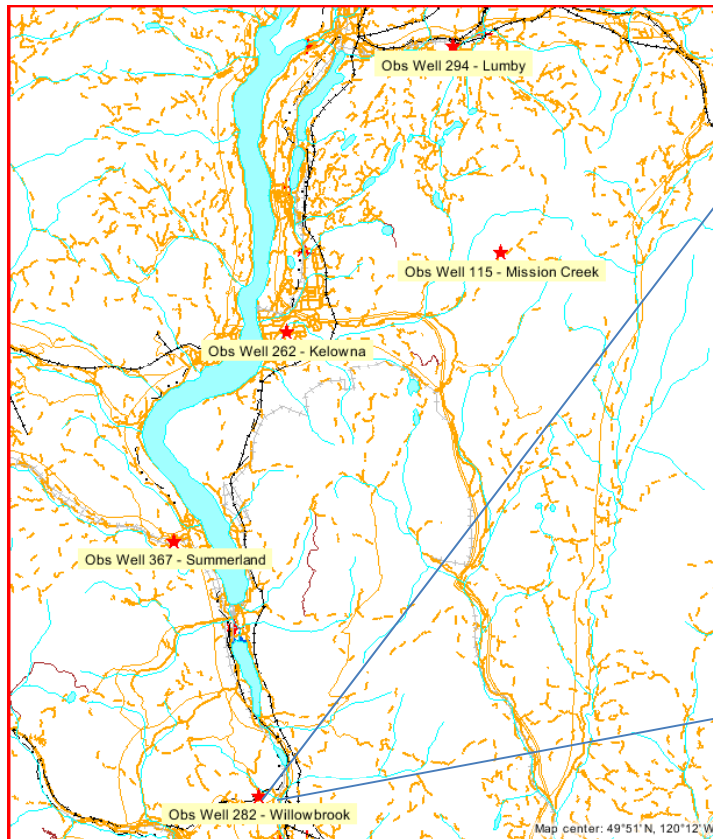


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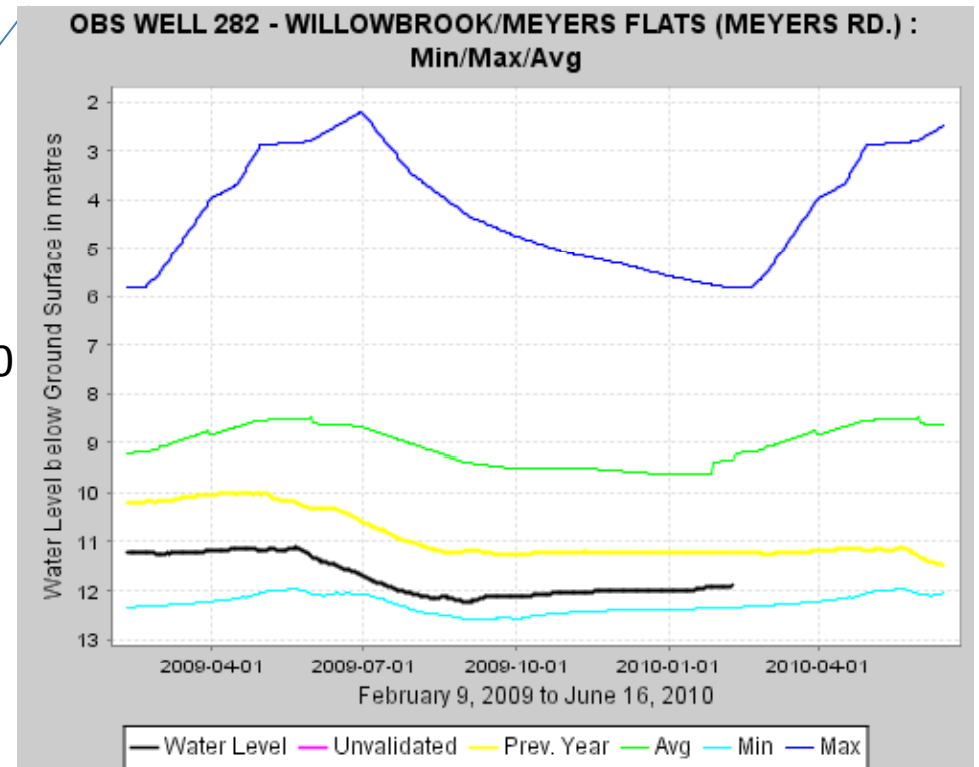
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Okanagan Groundwater: MoE Observation Wells

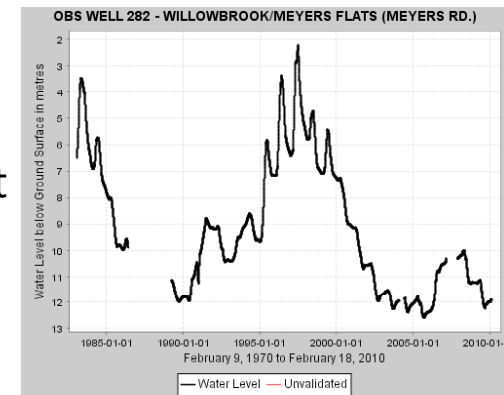
Oliver – Willowbrook (282)



2009-10



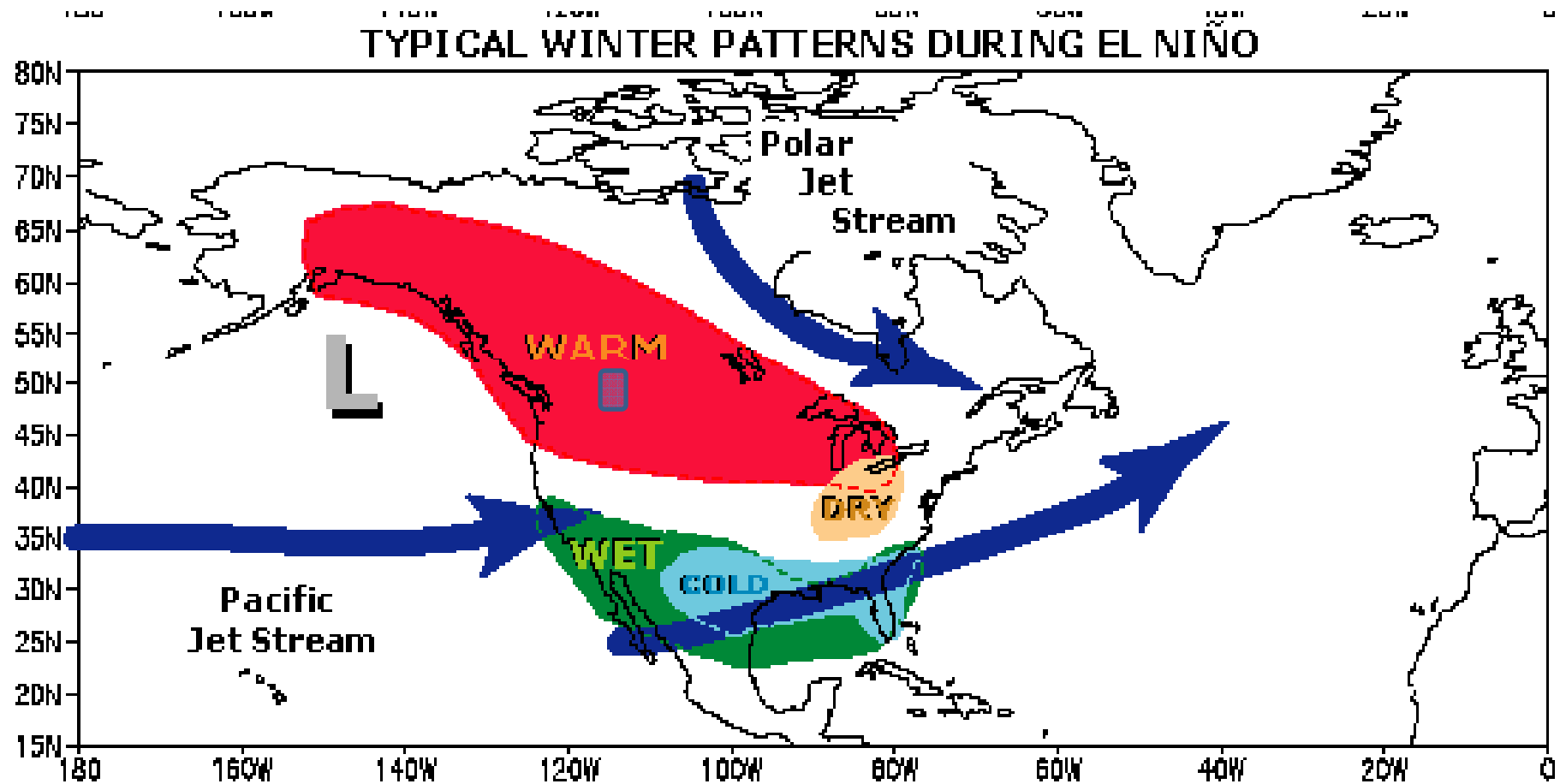
1970 - present



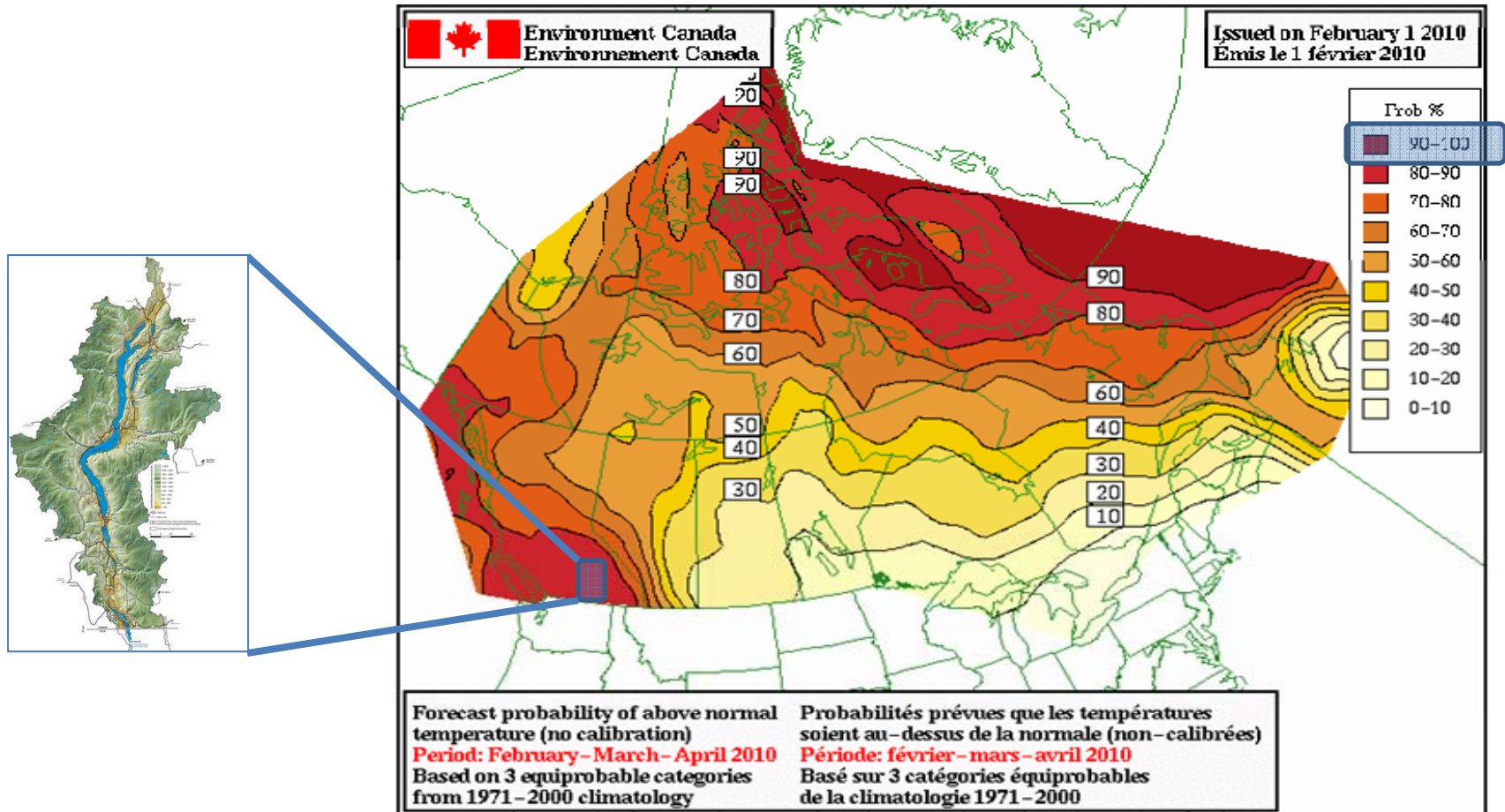
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2010: El Niño Summary



Temperature Profile: February 1st



2010 Temperature Profile (valley bottom)



Vernon

- 2.6 degrees above (Winter)
- Precipitation 67mm/100mm (67%)

Kelowna

- 1.8 degrees above (Winter)
- Precipitation 57mm/82mm (70%)

Summerland

- 1.7 degrees above (Winter)

Penticton

- 1.5 degrees above (Winter)
- Precipitation 89mm normal 67mm (133%)

Osoyoos

- 2.8 degrees above (Winter)

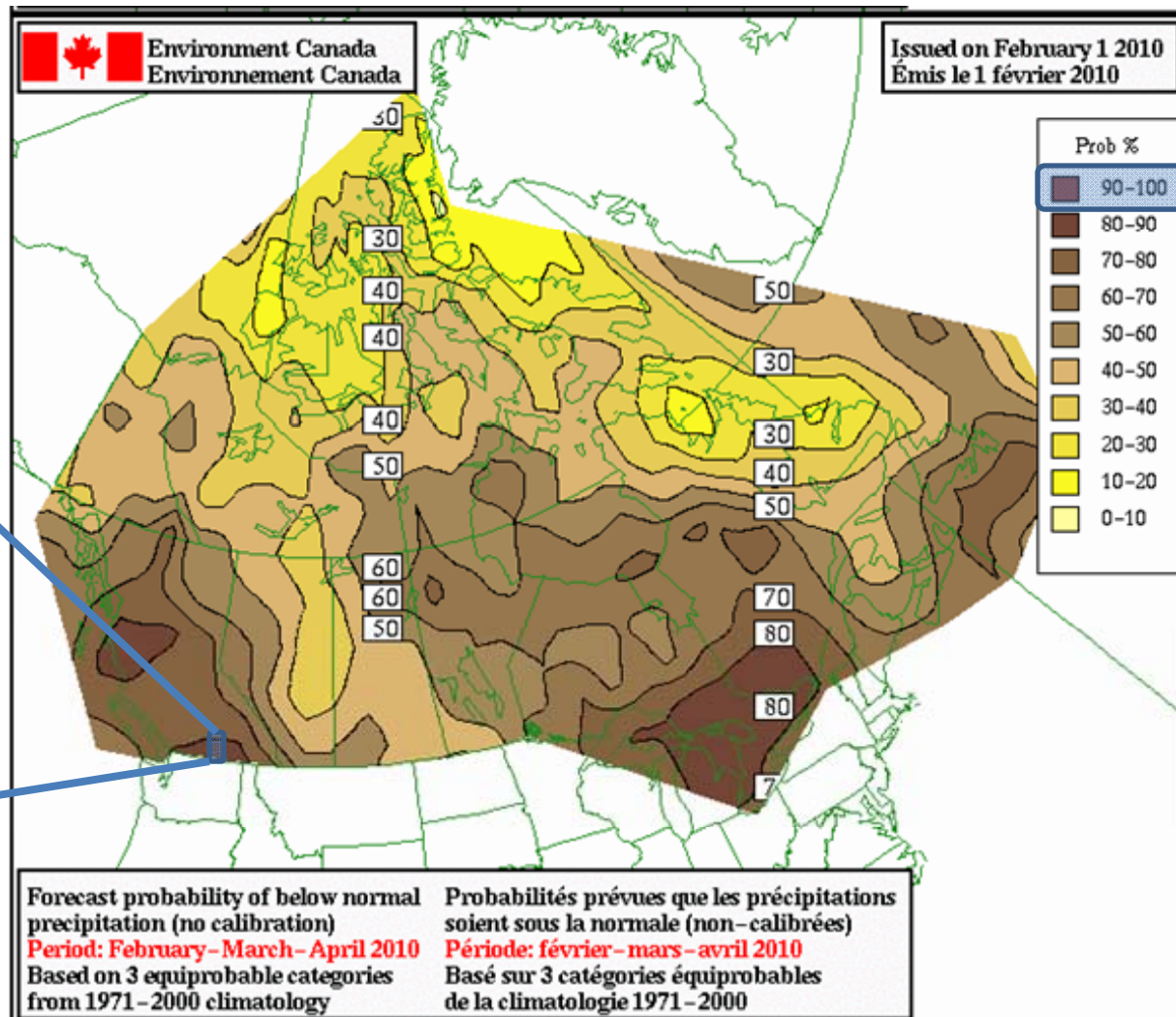
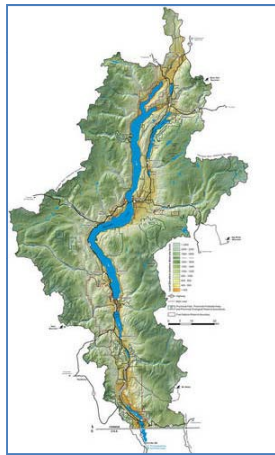


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Precipitation Profile: February 1st



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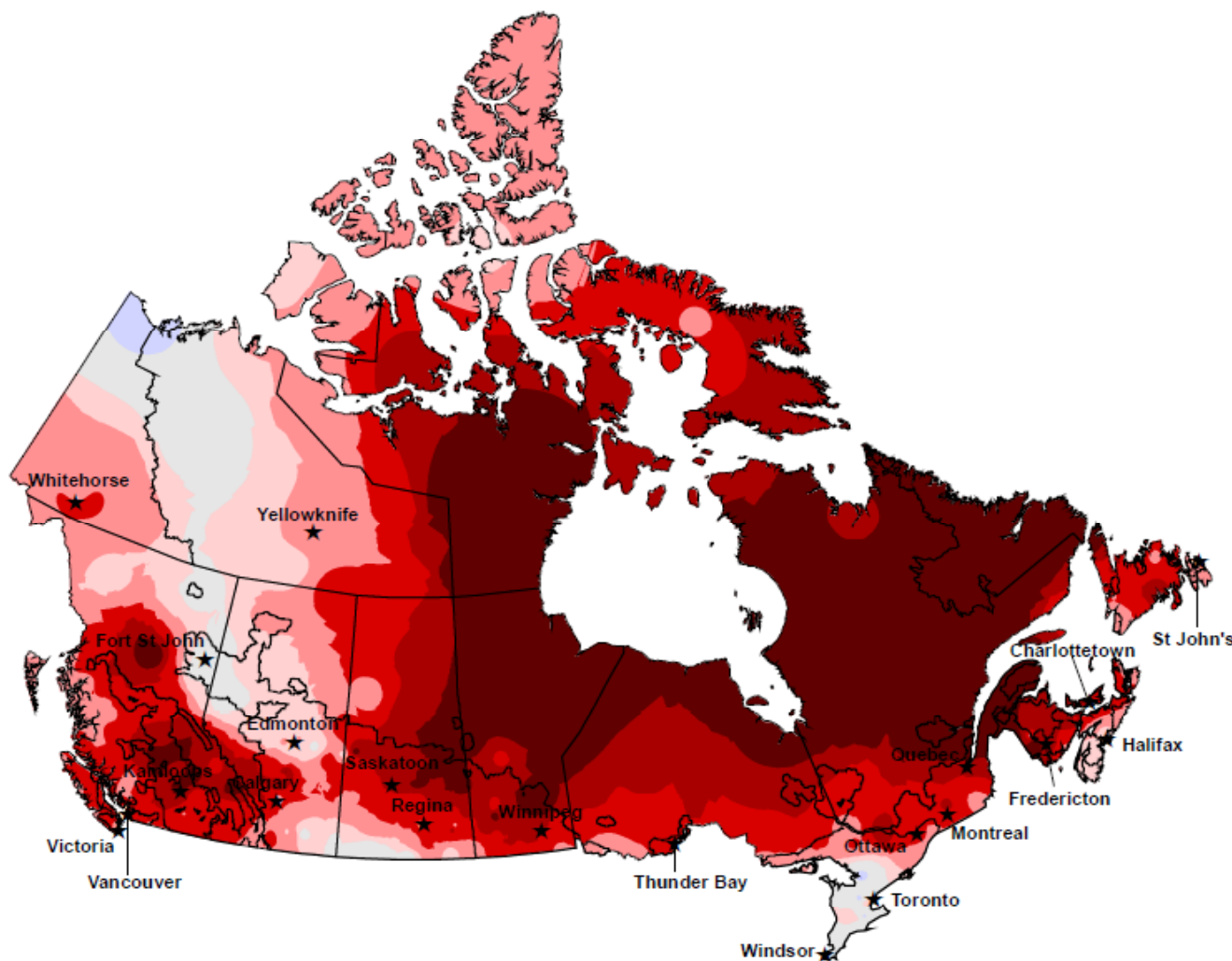
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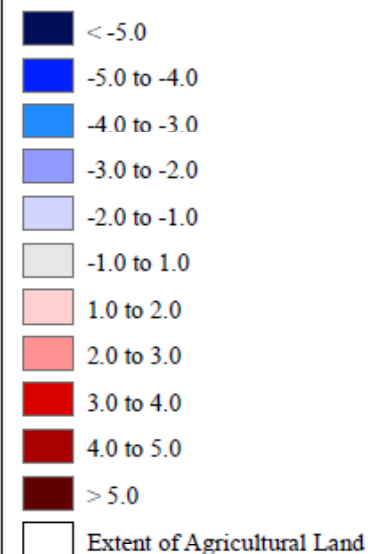


Monthly Mean Temperature Difference from Normal (National)

January 2010



Temperature (°C)



The map may not be accurate for all regions due to data availability and data errors.



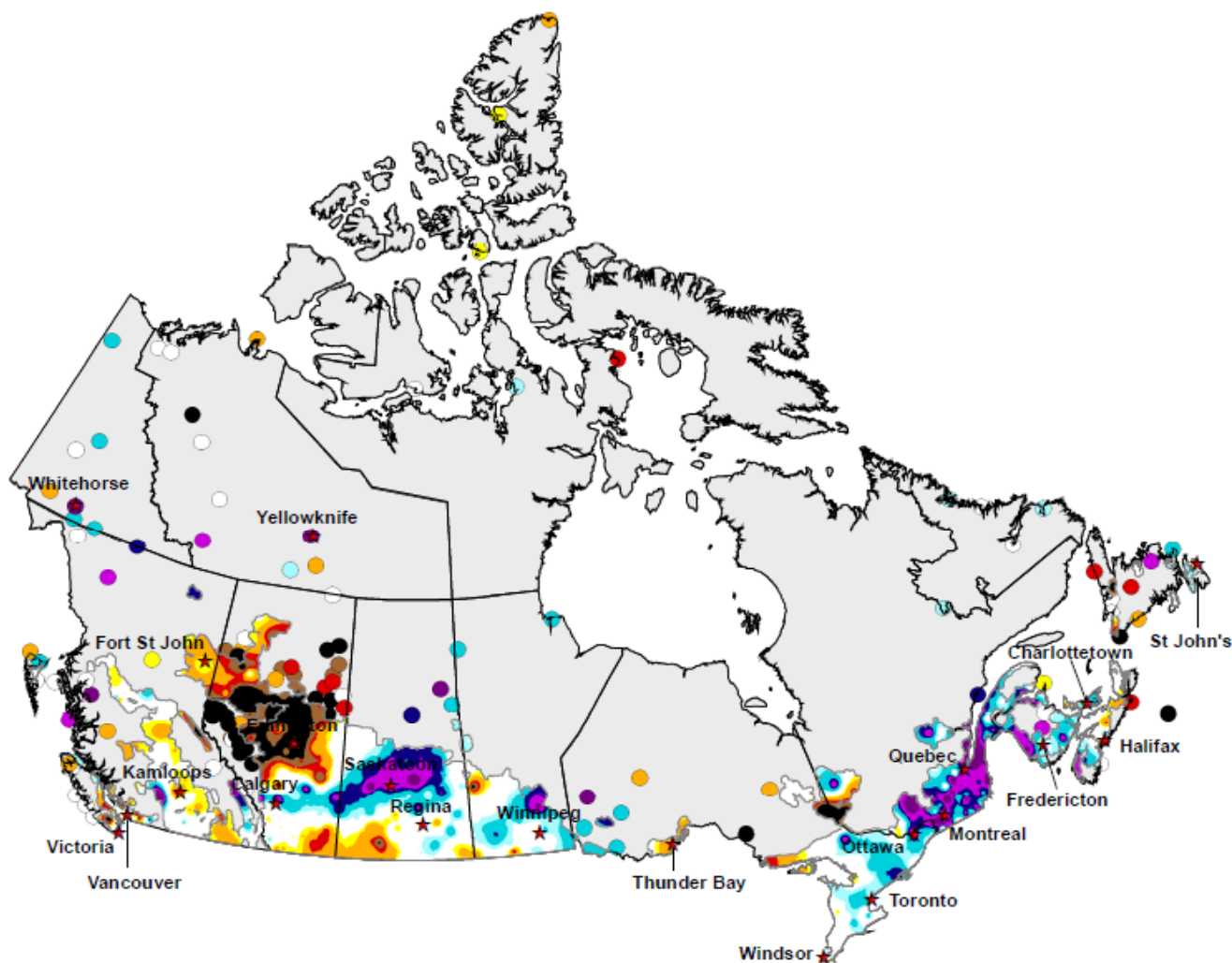
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Agriculture et
Agroalimentaire Canada

Canada

60 - Month Standardized Precipitation Index (SPI)

December 2009



SPI

- ≤ -2.00
- $-1.99 - -1.60$
- $-1.59 - -1.30$
- $-1.29 - -0.80$
- $-0.79 - -0.51$
- $-0.50 - 0.50$
- $0.51 - 0.79$
- $0.80 - 1.29$
- $1.30 - 1.59$
- $1.60 - 1.99$
- > 2.00

□ Extent of Agricultural Land

Produced using near real-time data that has undergone initial quality control. The map may not be accurate for all regions due to data availability and data errors.

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Prepared by Agriculture and Agri-Food Canada's National Agroclimate Information Service (NAIS). Data is provided through partnership with Environment Canada. The original version of the NAIS Drought Model was supplied by Alberta Agriculture and Food which partners with NAIS to foster ongoing development.

Created: 01/06/10
www.agr.gc.ca/drought



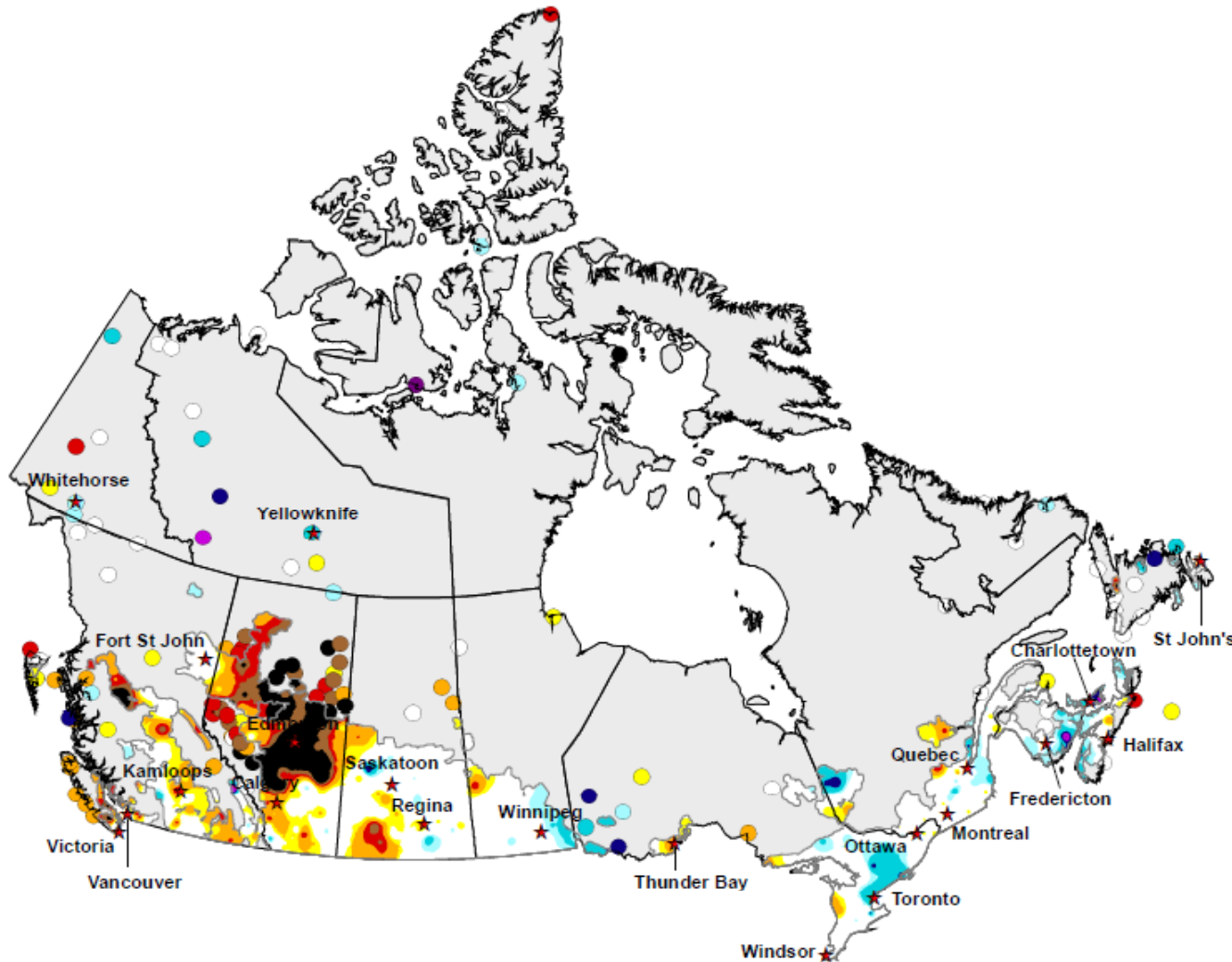
Agriculture and Agri-Food Canada

Agriculture et Agroalimentaire Canada

Canada

12 - Month Standardized Precipitation Index (SPI)

December 2009



SPI

- ≤ -2.00
- -1.99 - -1.60
- -1.59 - -1.30
- -1.29 - -0.80
- -0.79 - -0.51
- -0.50 - 0.50
- 0.51 - 0.79
- 0.80 - 1.29
- 1.30 - 1.59
- 1.60 - 1.99
- > 2.00

□ Extent of Agricultural Land

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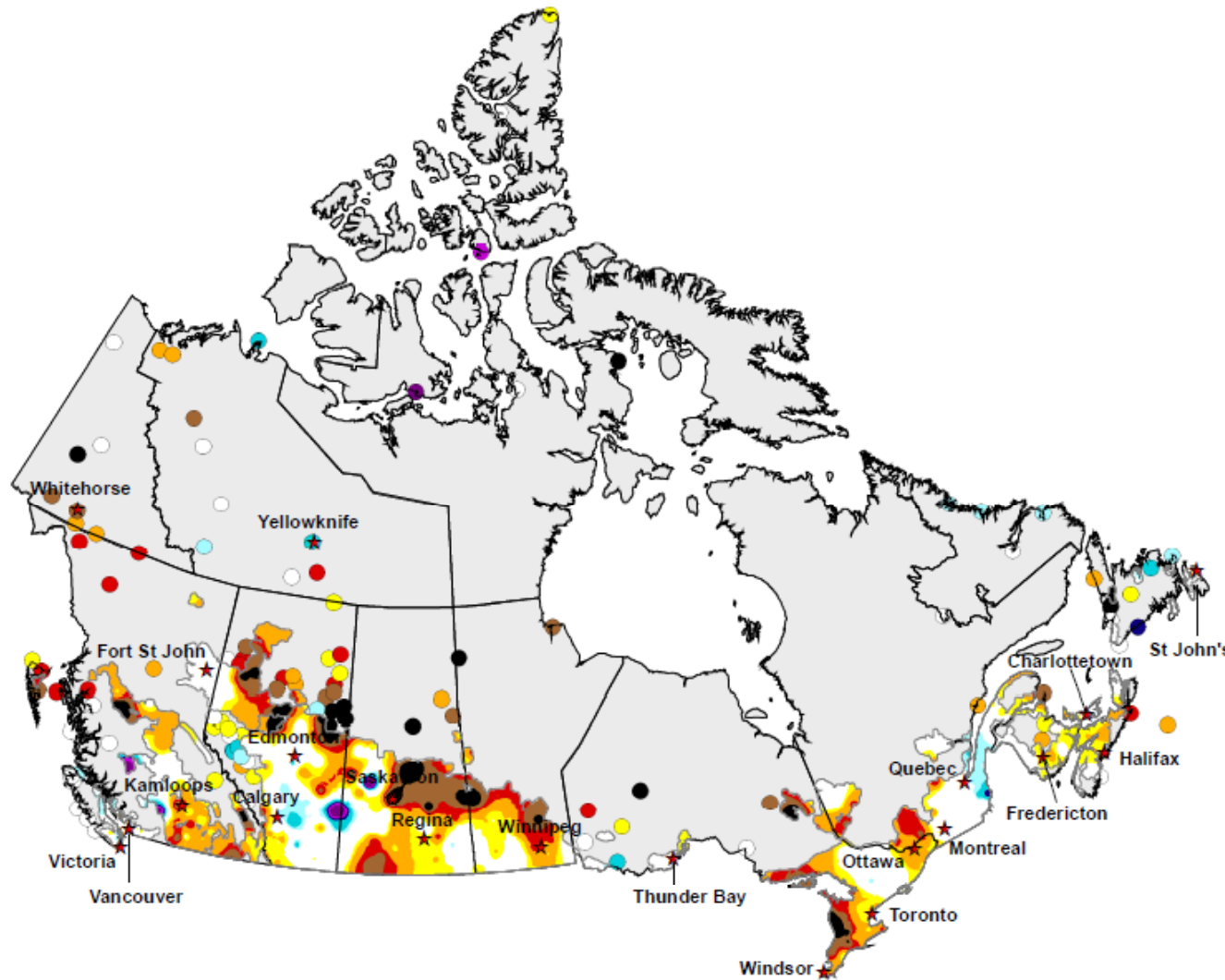
Prepared by Agriculture and Agri-Food Canada's National Agroclimate Information Service (NAIS). Data is provided through partnership with Environment Canada. The original version of the NAIS Drought Model was supplied by Alberta Agriculture and Food which partners with NAIS to foster ongoing development.

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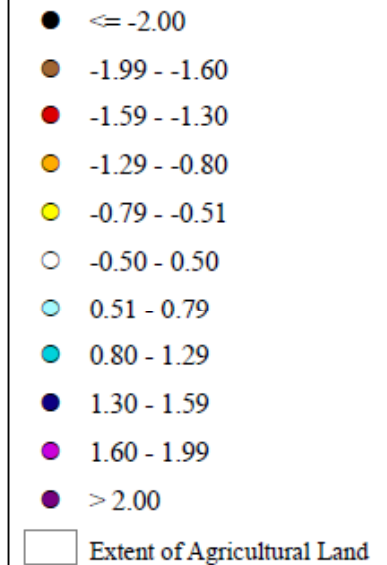


2 - Month Standardized Precipitation Index (SPI)

December 2009



SPI

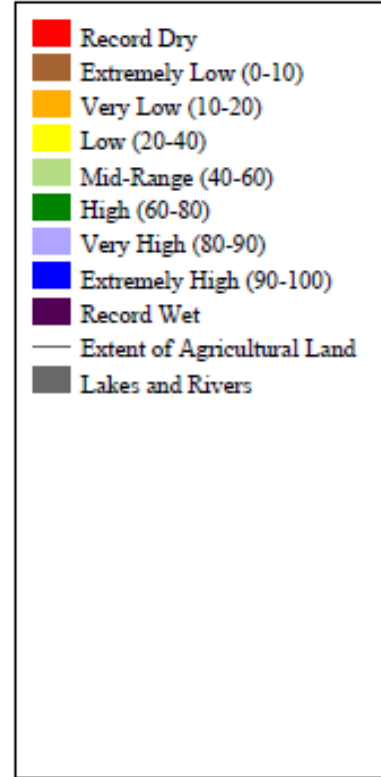
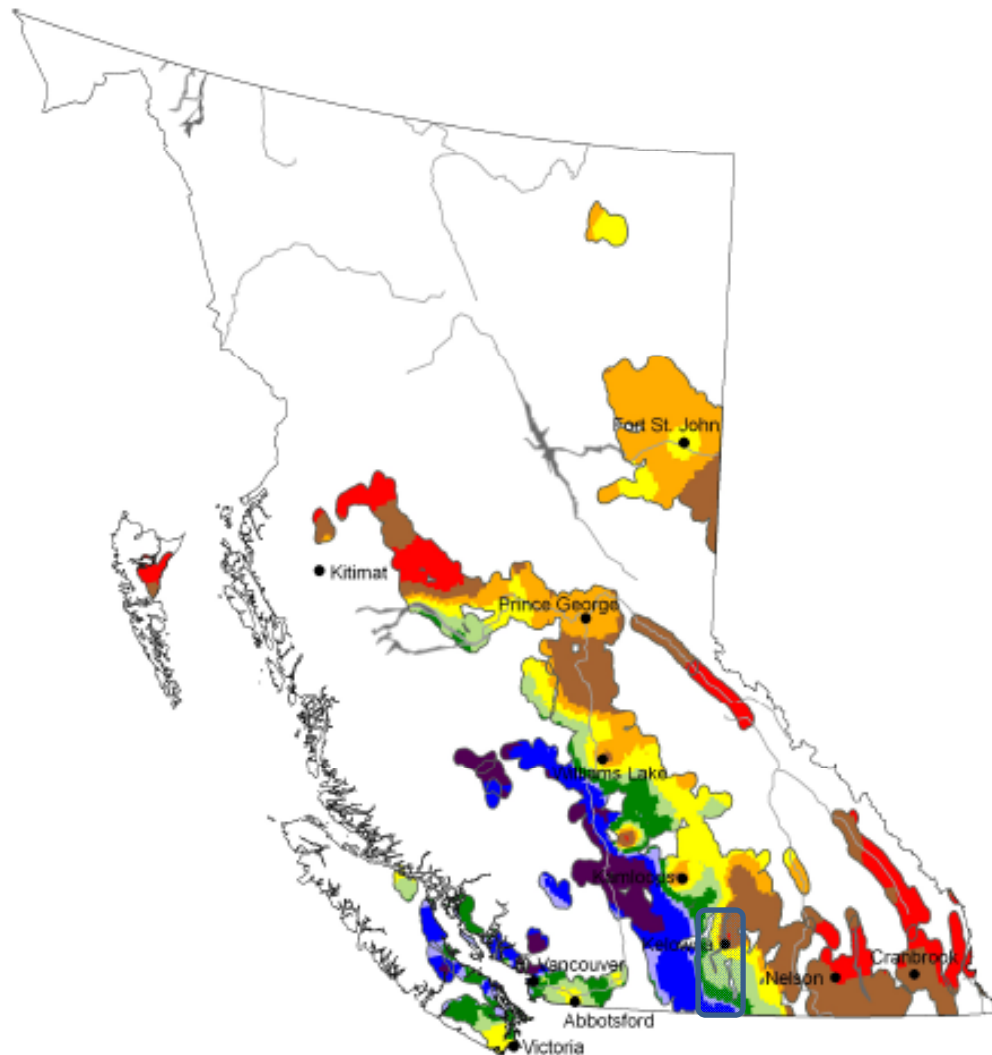


Produced using near real-time data that has undergone initial quality control. The map may not be accurate for all regions due to data availability and data errors.



Precipitation Compared to Historical Distribution (Pacific Region)

November 1, 2009 to February 15, 2010



Produced using near real-time data that has undergone initial quality control. The map may not be accurate for all regions due to data availability and data errors.

Thank you



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