

2011: Okanagan Water Supply

Water Management Support

Review #1

15 March 2011

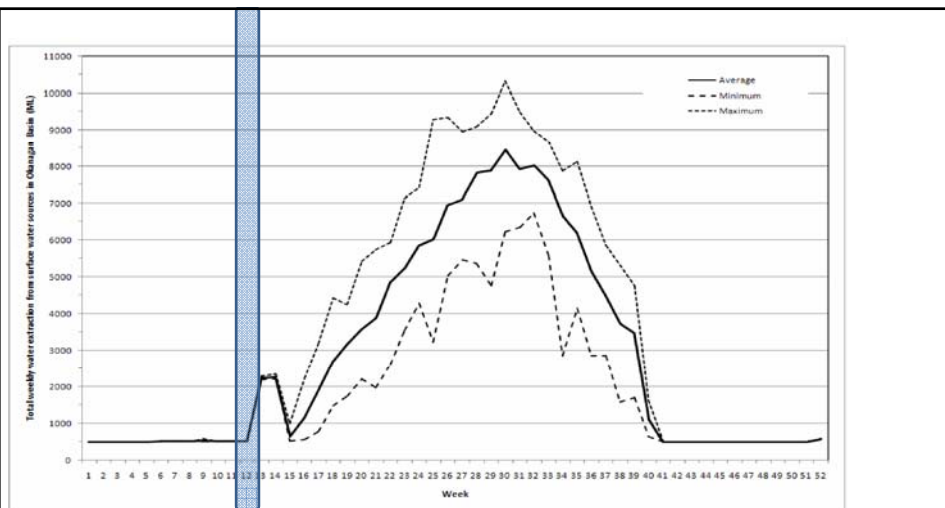
10:00am – 11:00am

2011 Tentative Schedule

#1 – 15 March	(12)
#2 – week of April 11 th	(17)
#3 – 06 June	(24)



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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



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2011 Okanagan Water Supply: March 15th Updates (Week 12)

OKANAGAN WATERSHED	
• Okanagan Basin Water Board [Sears]	Context
FLOW	
• BC FLNRO [Campbell]	Snow Pack
• BC FLNRO [Anderson]	Okanagan Lake (River)
• International Osoyoos Lake Board of Control [Millar]	Osoyoos Lake
STORAGE	
• Okanagan reservoir levels [Jatel]	
GROUNDWATER	
• BC MOE [Ivanov]	Okanagan Groundwater
PRECIPITATION / CLIMATE	
• Environment Canada [Lundquist]	Okanagan Climate
Okanagan Basin Water Board [Jatel]	Host




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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

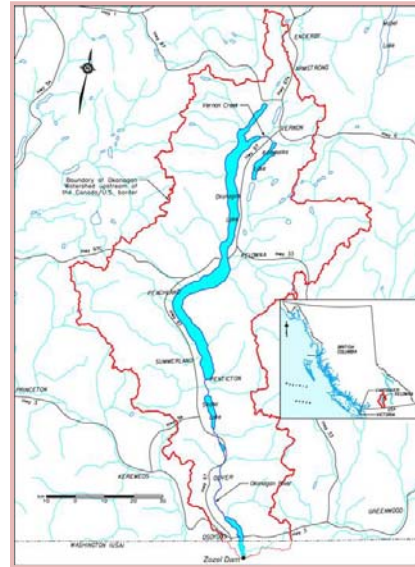


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Collaborative Governance and Okanagan Water



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OBWB background

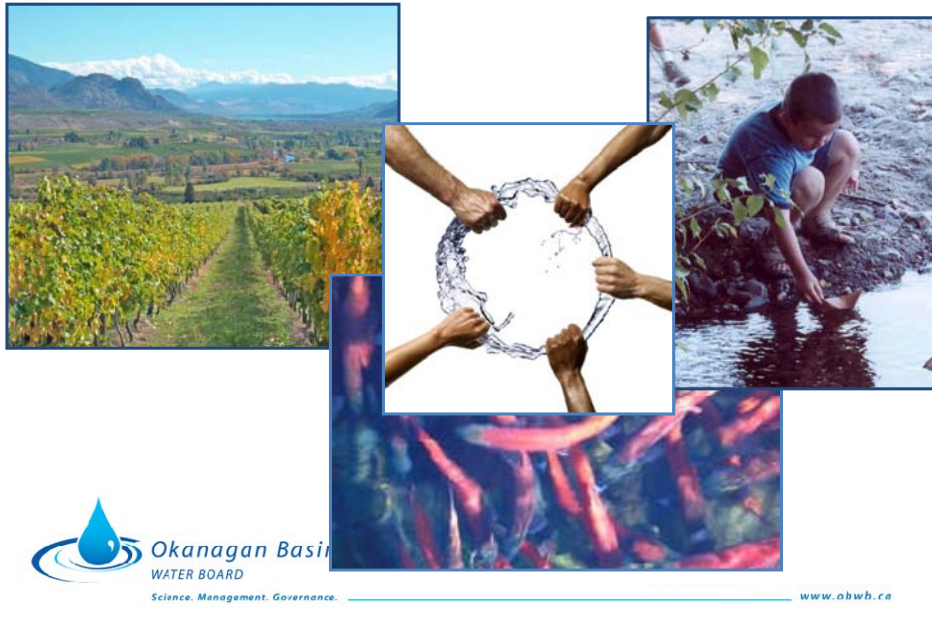
- Established 1970
- Water governance mandate
- Water management role
- Does not “govern” or “manage”
- Operates community-to-community
- Mechanism to share resources, identify problems, suggest solutions, improve communication



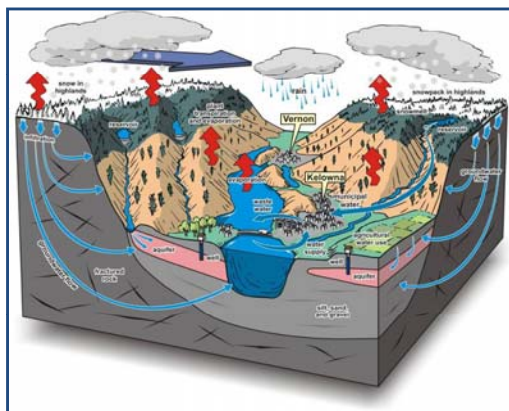
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One water, one community, many needs



Regional approaches to practical water management issues



Variation in supply means each water source needs its own drought plan

Valley-wide patterns call for a valley-wide plan

OBWB is doing the science for the Basin plan



Okanagan Lake inflows 1922-2006

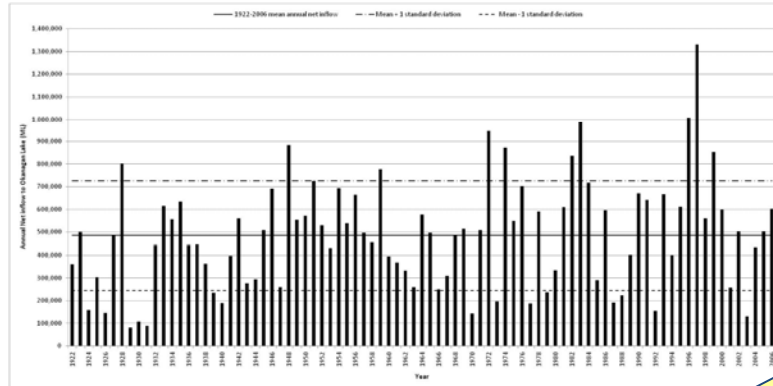
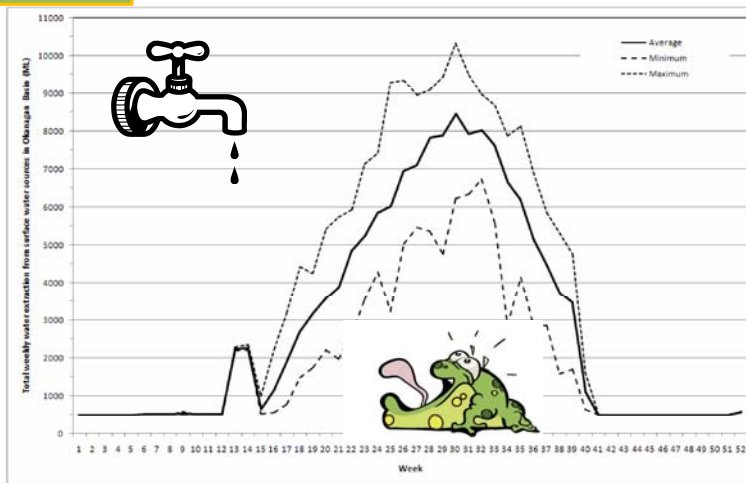


Figure 3.7 Annual net inflows to Okanagan Lake between 1922 and 2006. The solid line indicates the 1922-2006 average annual net inflow of 484,000 ML.

Arid + Variable

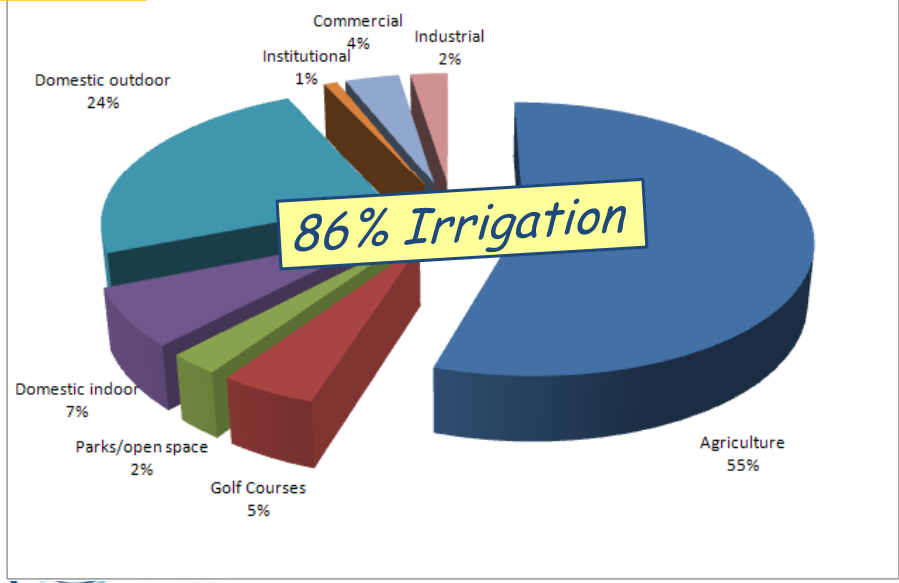
Current



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.

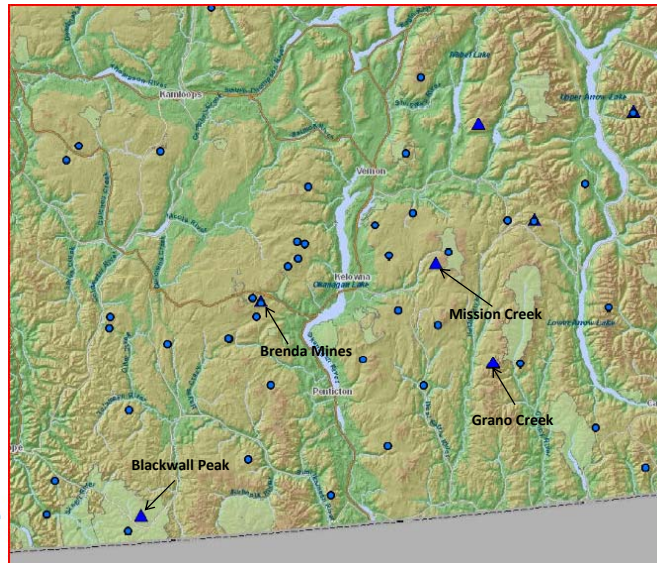
Figure 6.5 Total weekly water extraction from surface sources in the Okanagan Basin

Current



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ASP and MSS Network



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OKANAGAN Drainage Basin

Snow Course Name and Number	Elev. metres	Date of Survey	Mar 2011			Historic, Water Equivalent (mm)					Yrs of Record	
			Snow Depth cm	Water Equiv. mm	% of Normal	2010 mm	2009 mm	Max. mm	Min. mm	Normal mm		
SUMMERLAND RESERVOIR	1280	25-Feb	87	216	101	174	128	381	97	214	50	
MC CULLOCH	1280	28-Feb	72	155	105	127	223	240	71	157	71	
ABERDEEN LAKE	1101A	1310		Not Sampled				231	51	145	56	
OYAMA LAKE	2F19	1340	01-Mar	57	88	56	110	135	241	73	157	41
POSTILL LAKE	2F07	1370	28-Feb	67	170	91	116	152	274	98	186	61
VASEUX CREEK	2F20	1400		Not Sampled			60	86	264	52	139	40
BOULEAU LAKE	2F21	1400	27-Feb	85	208	71	190	186	432A	165	295	40
TROUT CREEK	2F01	1430	27-Feb	83	191	113	172	141	335	55	169	71
TROUT CREEK (WEST)	2F01A	1430	27-Feb	93	176	N/A	196					
BRENDA MINE	2F18	1460	01-Mar	108	239	83	256	160	495	130	287	42
ISLAH LAKE	2F24	1480	01-Mar	109	264	83	230	163	457	161	317	28
GREYBACK RESERVOIR	2F08	1550		Not Sampled			192	184	312	91	198	44
ESPERON CR (UPPER)	2F13	1650	28-Feb	112	276	74	260	206	635	157	371	42
ISINTOK LAKE	2F11	1680	25-Feb	67	154	94	116	92	358	53	164	46
MACDONALD LAKE	2F23	1740	01-Mar	145	406	103	346	225	583	170	394	34
MUTTON CREEK NO. 1	WA07	1740		Not Sampled			320		589	0	307*	66
MISSION CREEK	2F05P	1780	01-Mar	N/A	N/A	85	308	330	610	206	388	39
GRAYSTOCK LAKE	2F04	1810		Not Sampled				205	128	220	30	
MOUNT KOBAU	2F12	1810	27-Feb	89	216	83	308	164	486	61	259	45
WHITEROCKS MOUNTAIN	2F09	1830	28-Feb	144	436	87	746	245	809	180	499	55
SILVER STAR MOUNTAIN	2F10	1840	27-Feb	187	614	97	562	502	912	347	636	52

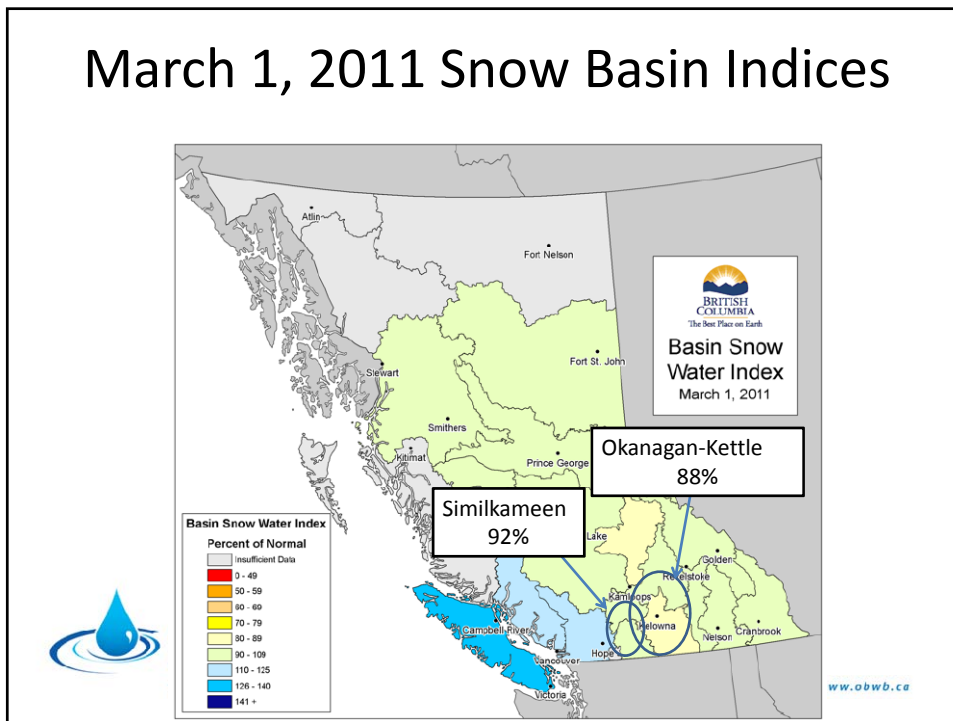
SIMILKAMEEN Drainage Basin

Snow Course Name and Number	Elev. metres	Date of Survey	Mar 2011			Historic, Water Equivalent (mm)					Yrs of Record		
			Snow Depth cm	Water Equiv. mm	% of Normal	2010 mm	2009 mm	Max. mm	Min. mm	Normal mm			
BROOKMERE	1C01	980	27-Feb	71	179	92	109	64	351	53	194	86	
FREEZEOUT CREEK TRAIL	WA11	1070		Not Sampled				132	225	615	15	260	57
LIGHTNING LAKE	3D02	1220	27-Feb	95	252	89	184	201	497	36	282	27	
HAMILTON HILL	2G06	1490	27-Feb	98	224	69	166	149	678	102	326	49	
MISSEZULA MOUNTAIN	2G05	1550	28-Feb	85	201	91	128	88	363	76	221	47	
ISINTOK LAKE	2F11	1680	25-Feb	67	154	94	116	92	358	53	164	46	
LOST HORSE MOUNTAIN	2G04	1920	04-Mar	68	213	104	158	154	508	92	204	48	
BLACKWALL PEAK	2G03P	1940	01-Mar	246	754	104	566	454	1323	213	728	43	
HARTS PASS	WA03	1960		Not Sampled			746	657	1120	312	931*	60	
HARTS PASS	WA03P	1960	01-Mar	N/A	N/A	N/A	674	620	1320A	356	805*	13	

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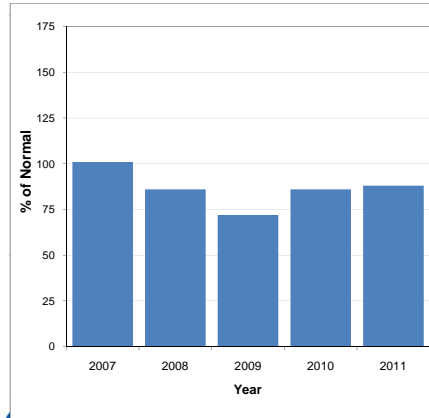
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March 1, 2011 Snow Basin Indices

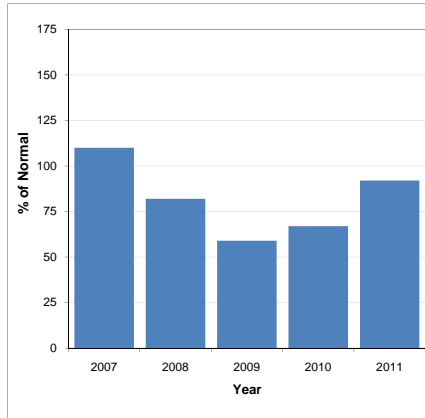


Snow Basin March. 1st Indices 2007-2011

Okanagan-Kettle



Similkameen

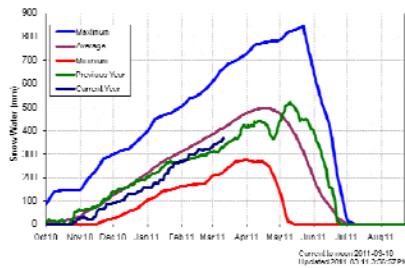


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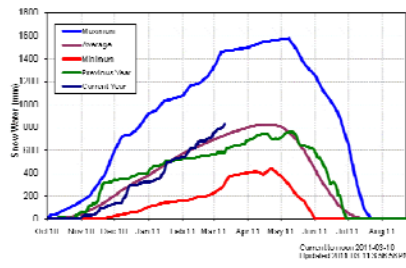
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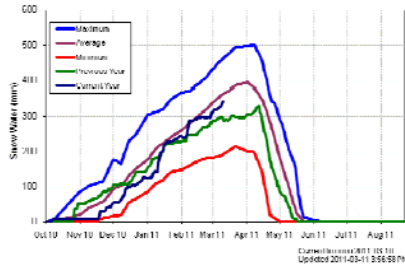
Mission Creek Snow Pillow



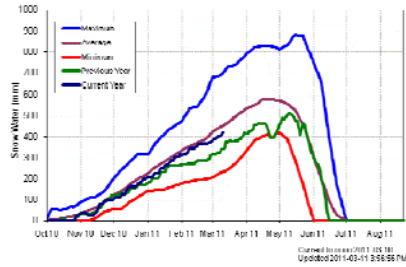
Blackwall Snow Pillow (Similkameen)



Brenda Mines Snow Pillow

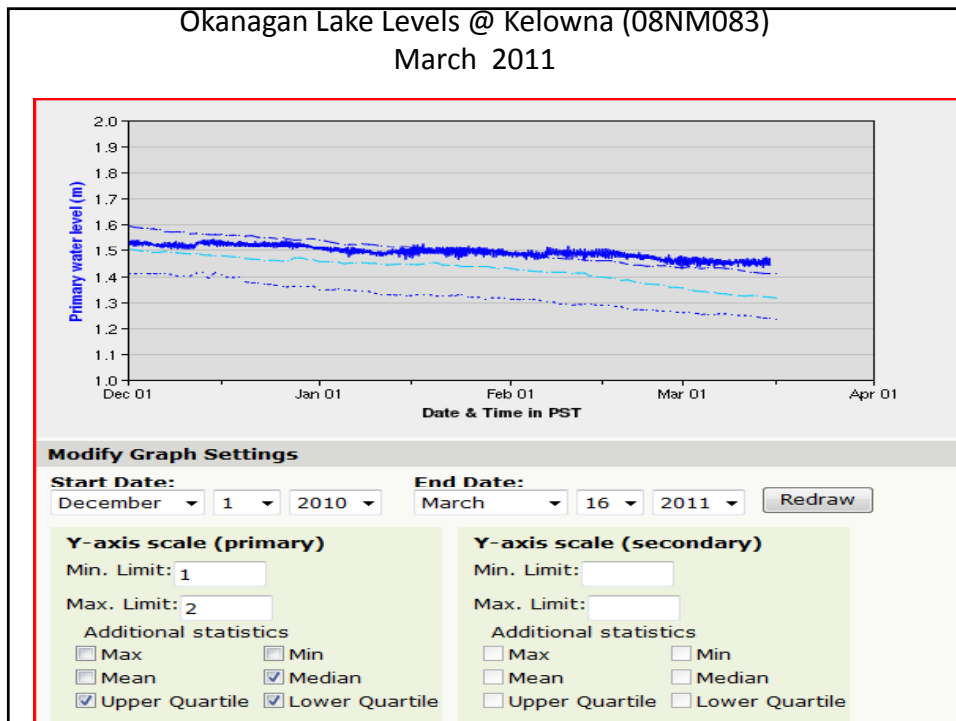
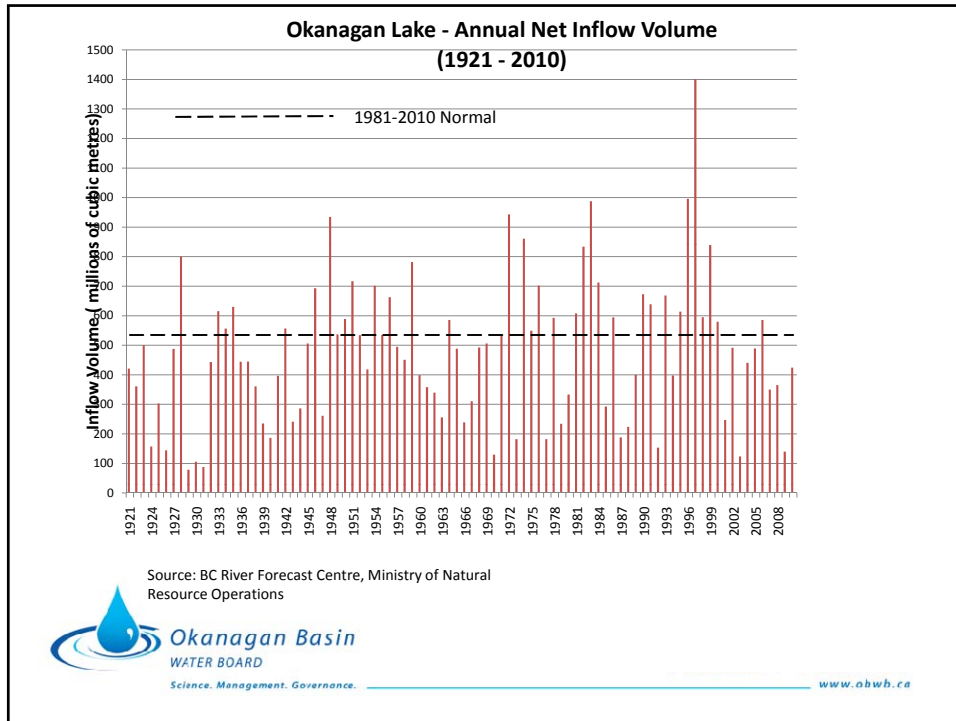


Grano Creek Snow Pillow (Kettle)

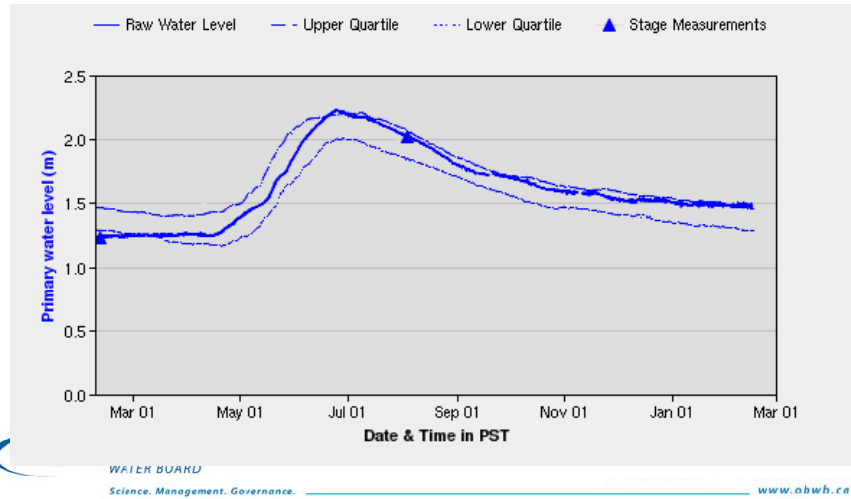


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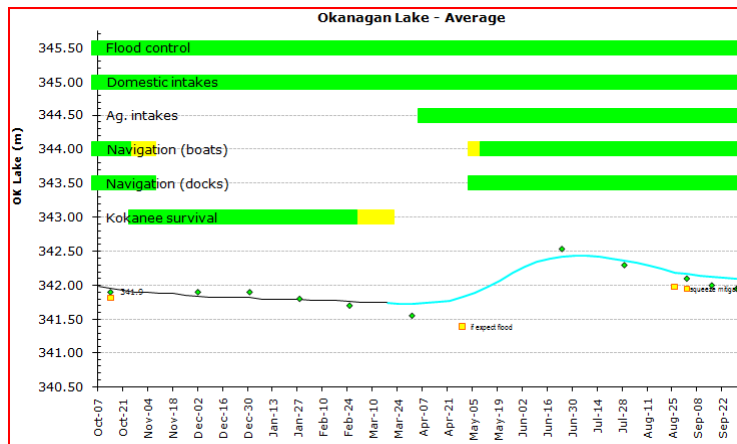


Okanagan Lake Water Levels at Kelowna (08NM083)



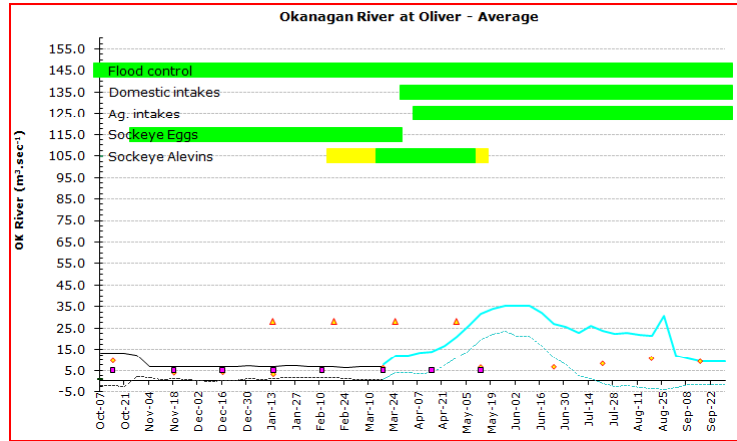
Fish Water Management Tool Projections : 2010-2011 Water Year

Based on Okanagan Lake Inflow Estimates (March-July) of 395 million m³



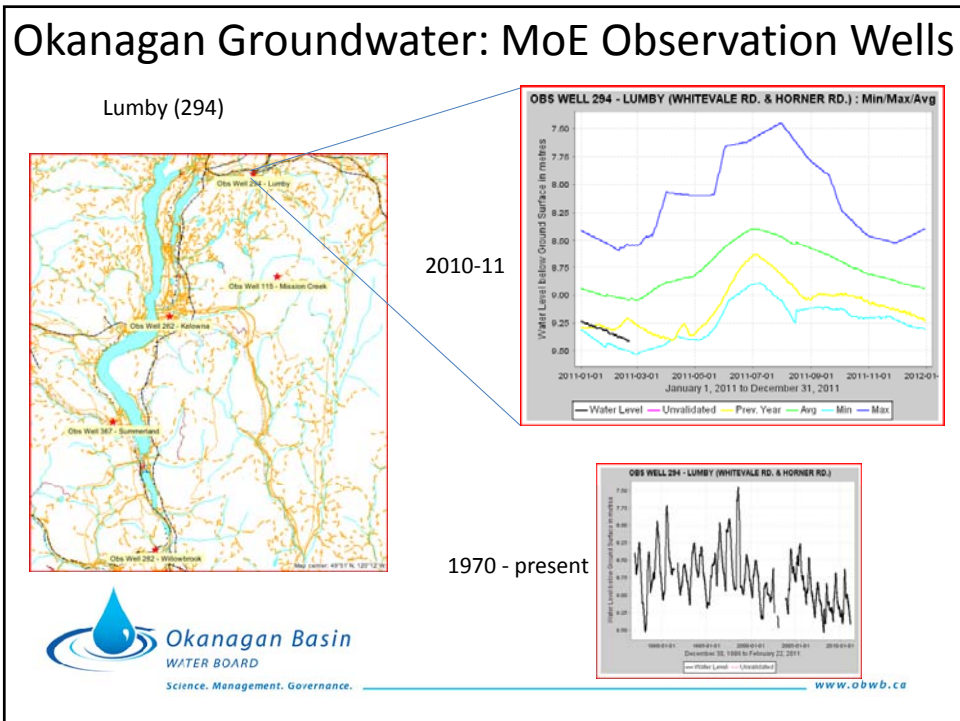
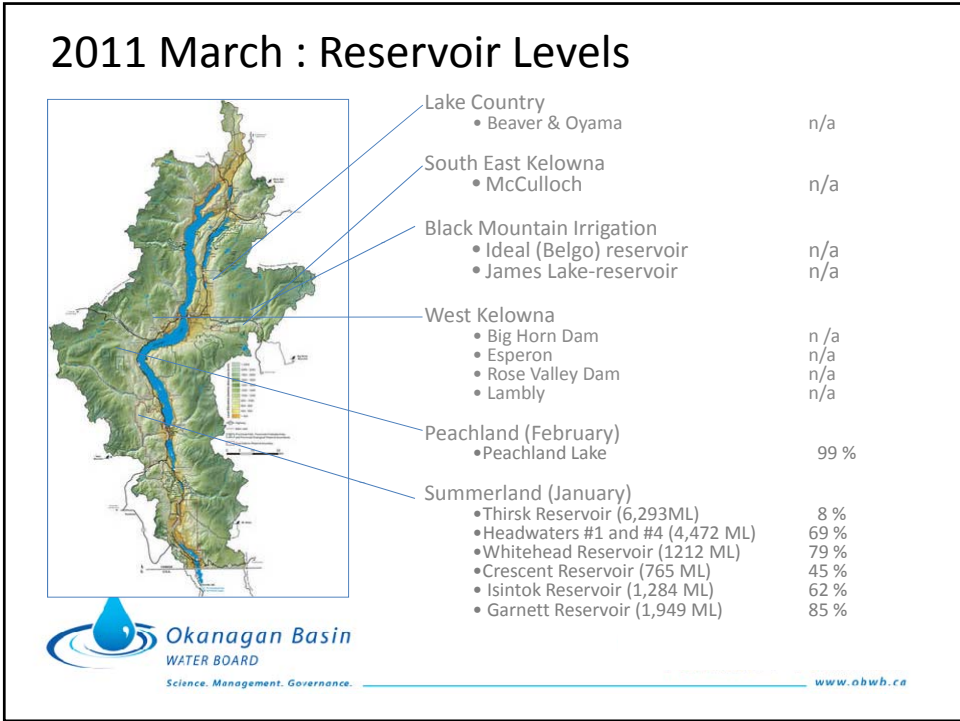
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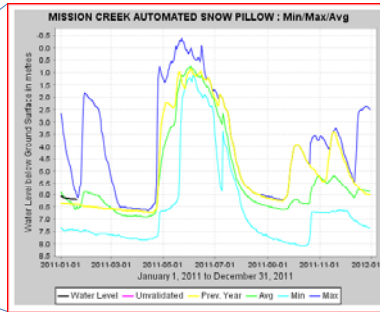


Okanagan Groundwater: MoE Observation Wells

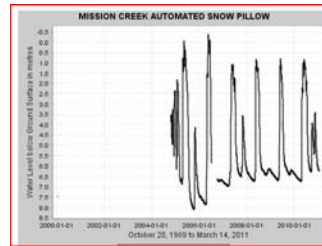
Mission Creek (115)



2010-11



2005 - present



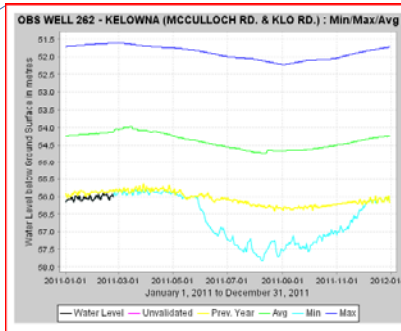
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Okanagan Groundwater: MoE Observation Wells

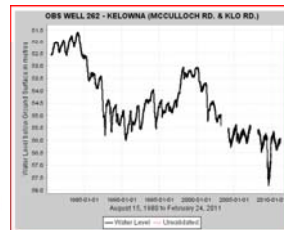
Kelowna (262)



2010-11



1970 - present



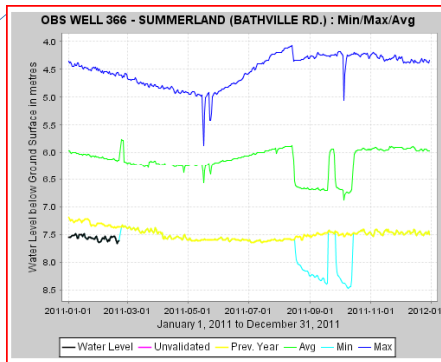
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Okanagan Groundwater: MoE Observation Wells

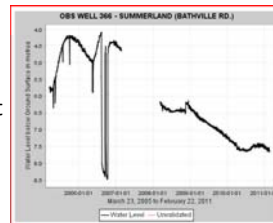
Summerland (366)



2010-11



2005 - present



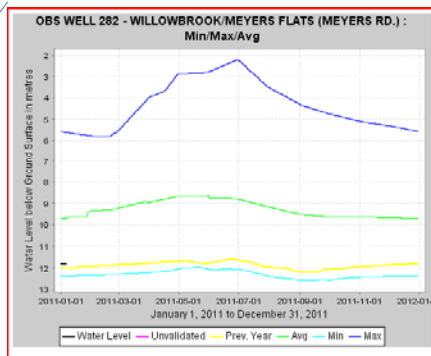
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Okanagan Groundwater: MoE Observation Wells

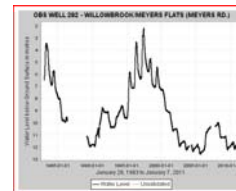
Oliver – Willowbrook (282)



2010-11



1970 - present



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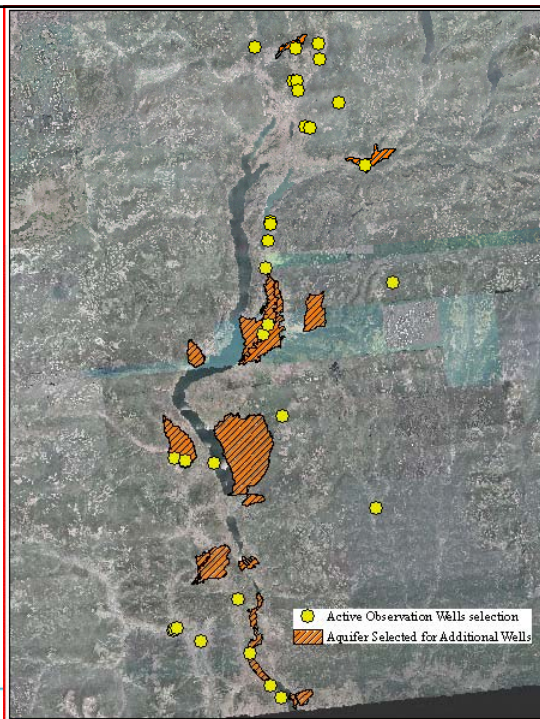
Sensitive Aquifers in the Okanagan

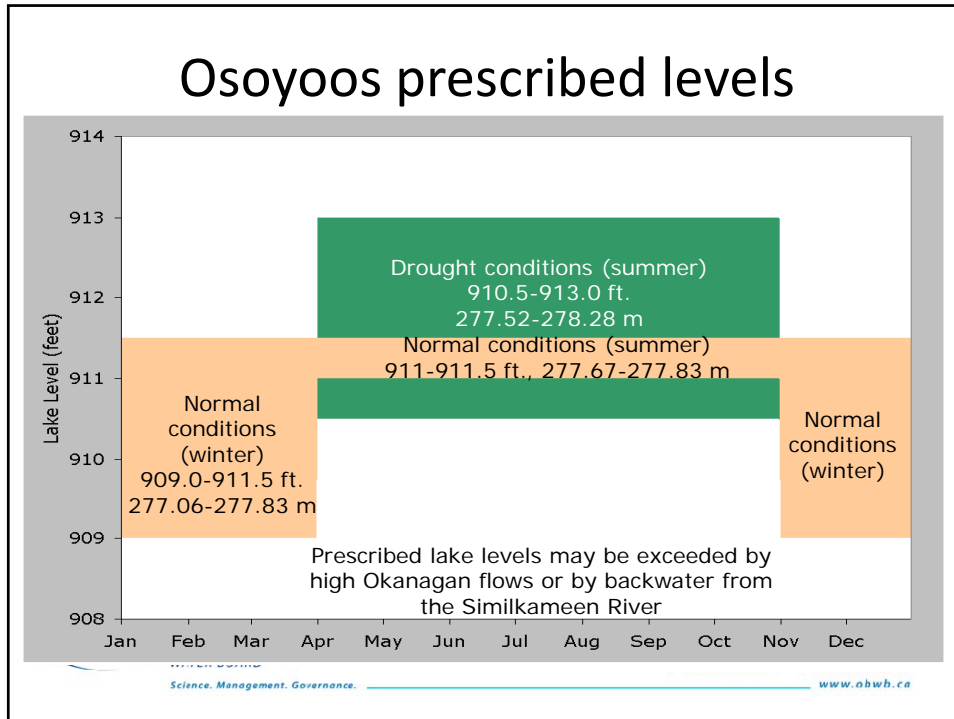
Priority Aquifer Identification in the Okanagan

- Provincial Observation Well Network Review BC (Hy-Geo Consulting, Hodge Hydrogeology Consulting, Azar & Associates, 2009)
- Phase 2 Okanagan Water Supply and Demand Project: Recommended establishment of new observation wells (Golder and Summit)
- MOE Recommendations: Local Groundwater Team

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Which sensitive Okanagan aquifers require monitoring and why?






Osoyoos drought criteria

The Orders provide 3 criteria for defining a drought year

- Flow in the Similkameen River, April-July
- Inflow to Okanagan Lake, April-July
- Water level in Okanagan Lake, June-July



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Osoyoos drought?

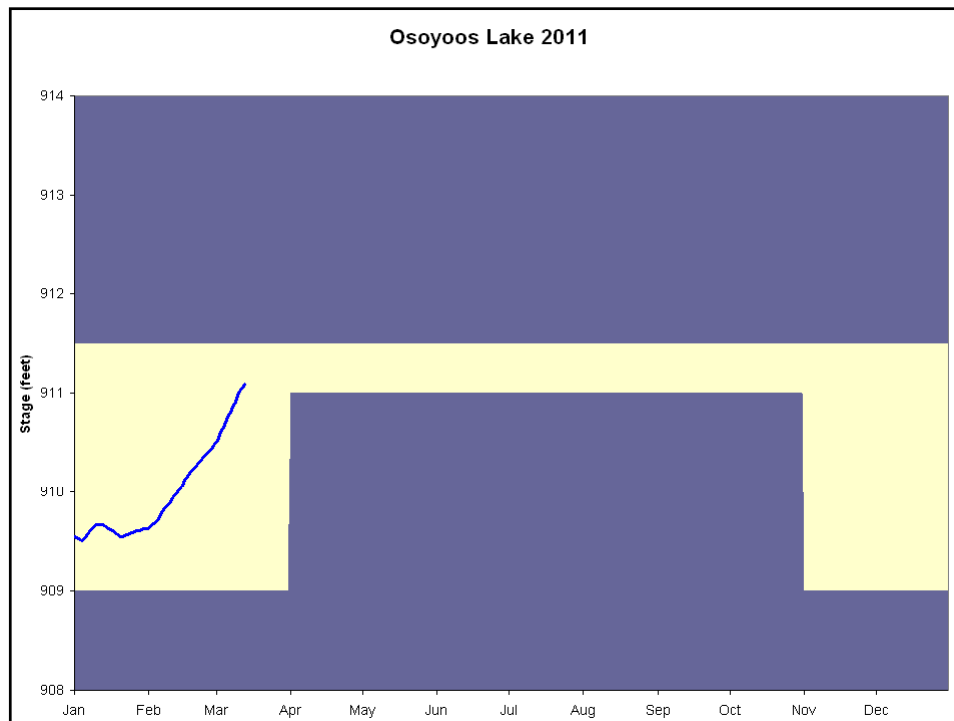
- Similkameen forecast
 - US flow forecast: 1,290,000 ac-ft
 - Drought criteria: below 1,000,000 ac-ft Apr – Jul
 - BC snowpack: 92% normal (March 1)
- Okanagan
 - BC snowpack: 88% normal (March 1)
 - Drought criteria: inflow below 195,000 ac-ft Apr – Jul; lake level fails to reach 1122.8 ft Jun – Jul



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Weather – Environment Canada

- La Niña changed the winter flow pattern as expected. Temperature and precipitation in the valley bottom were near normal.
- La Niña is weakening but its effects can persist another couple months
- La Nada (neutral) by June



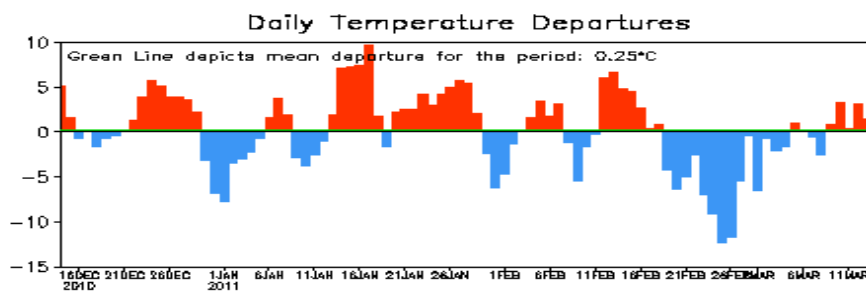
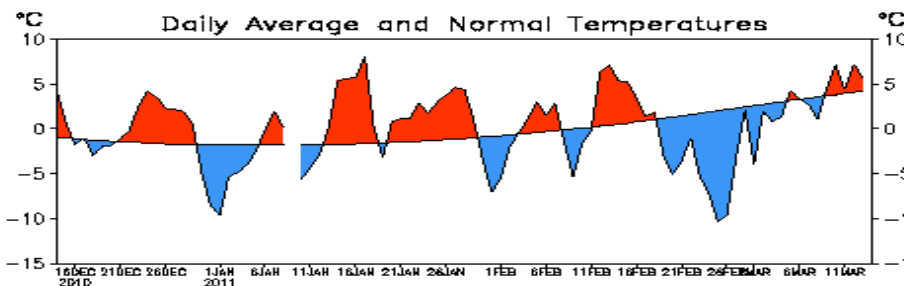
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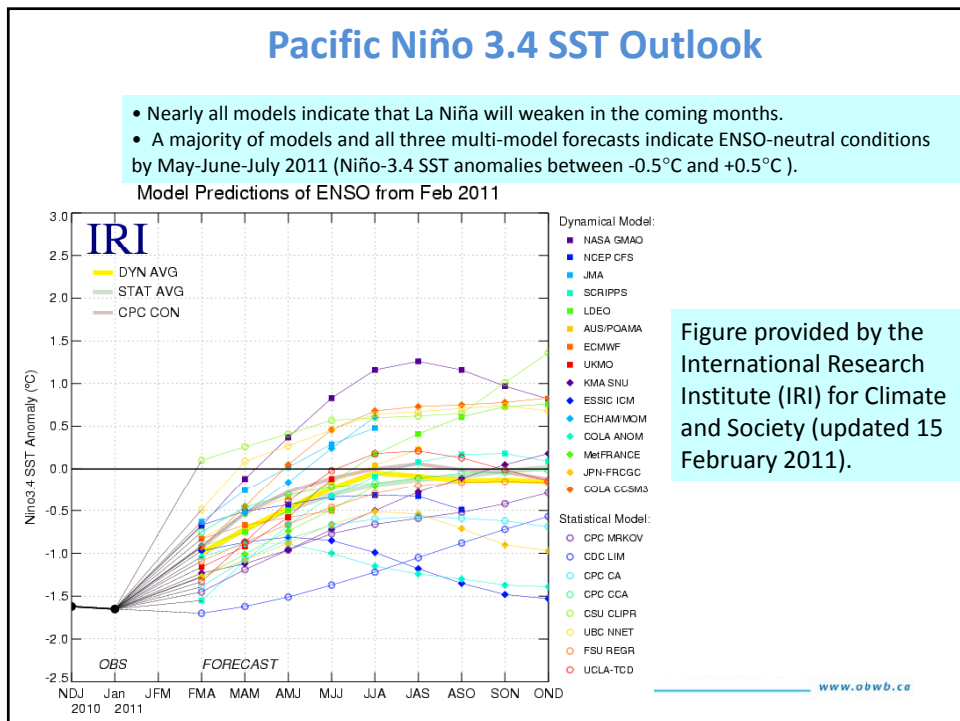
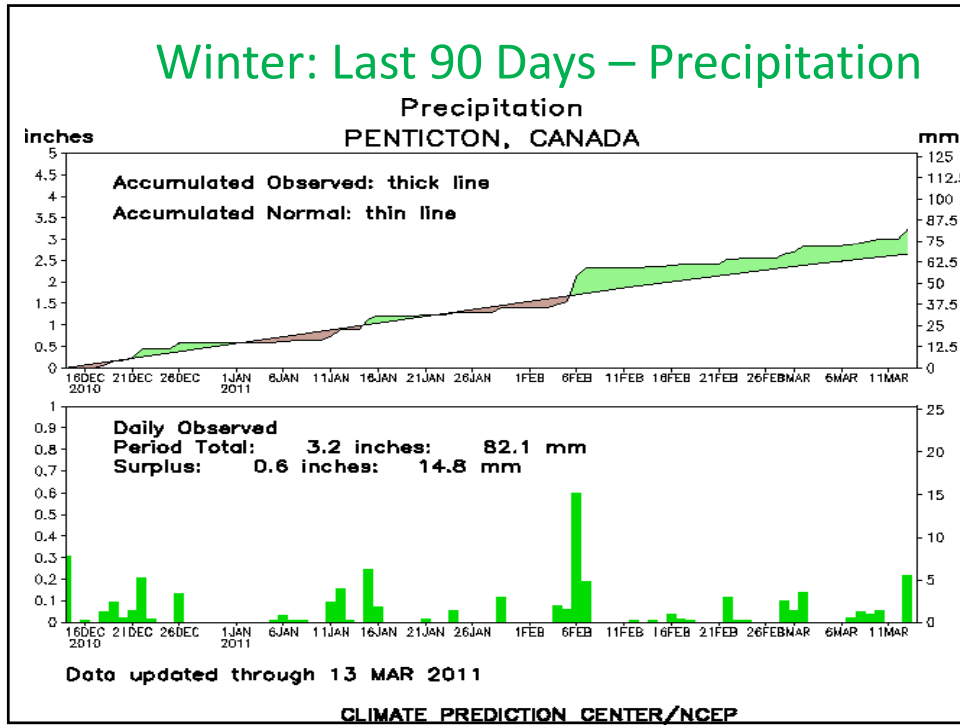
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Winter: Last 90 Days – Temperature

PENTICTON, CANADA





Winter Weather (Dec. 2010 – Feb. 2011)



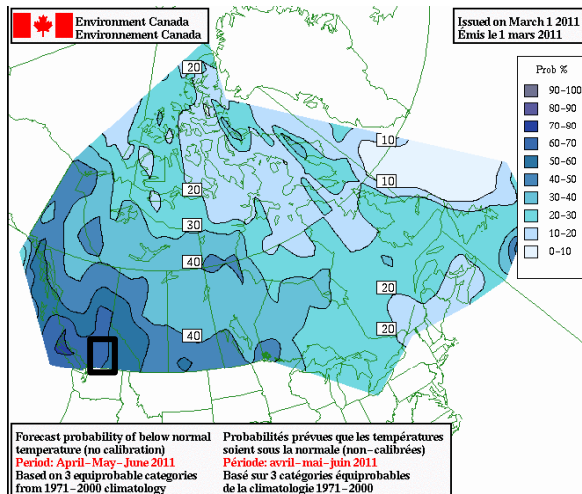
- Vernon
 - **-3.4 degrees (normal -3.7)**
 - **Precipitation 151 mm (normal 127 mm)**
- Kelowna
 - **-2.3 degrees (normal -2.6)**
 - **Precipitation 80 mm (normal 90 mm)**
- Summerland
 - **-1.0 degree (normal -1.4)**
- Penticton
 - **-0.3 degrees (normal -0.7)**
 - **Precipitation 94 mm (normal 78 mm)**
- Osoyoos
 - **-0.6 degrees (normal -0.7)**



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Temperature April, May and June

Issued 1 March
 ~ 60% chance colder than average – that means only 40% chance of near or above



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Summary

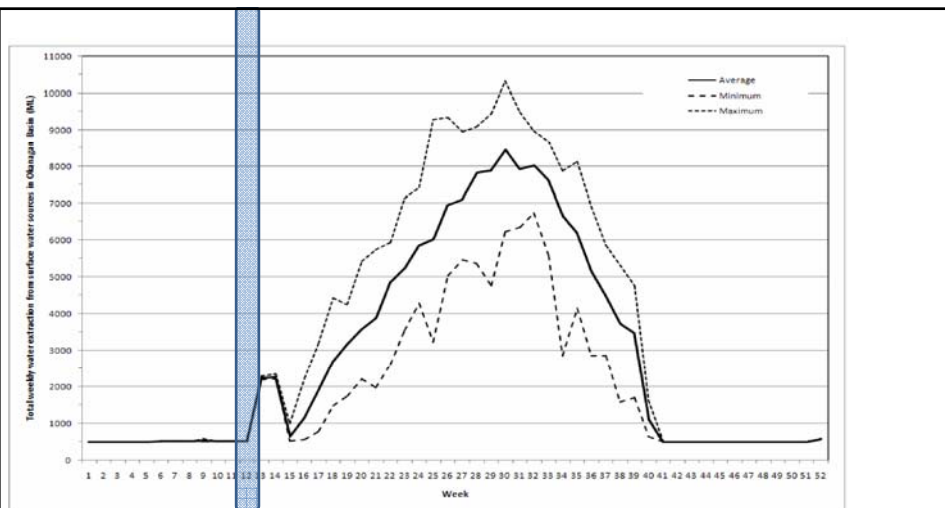
- Winter weather provided near normal valley bottom temperatures and precipitation
- La Niña is weakening but should persist enough to provide a cooler than normal spring (or a least normal)
- Possibly wetter than normal – typical in cooler springs
- Cooler and wetter than last year



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Thank you



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