



Irrigation Water Supply Forecast for 2010

January 12, 2010

Lloyd Healy
Alberta Agriculture

Why Farm Gate Allocation Forecast?

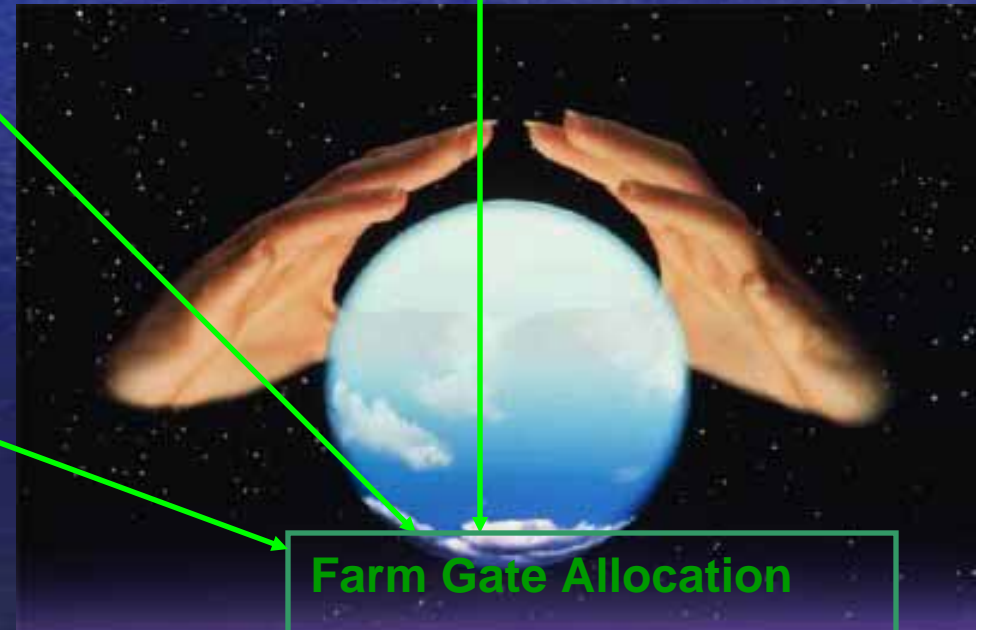
- Started with 2001 drought
- Ensured equal sharing of available water
- Today
 - Districts on Southern Tribs can forecast amount of water their users can expect.
 - Allows farmers with high use crops to access additional water

How is Farm Gate Water Allocation Forecast Determined

- Supply
 - Storage
 - Provincial
 - District
 - Snowpack (AENV)
 - Expected Rainfall (AENV)

- Delivery Efficiency
 - Canal Losses
 - Evaporation
 - Operational (Spill)

- Demand on Water Supply
 - U.S. Allocation
 - Saskatchewan Allocation
 - Other Licence Holders
 - Minimum Flow
 - Irrigation Needs
 - Spring Soil Moisture
 - Growing Season Rainfall



Farm Gate Allocation
Inches / Assessed Acre

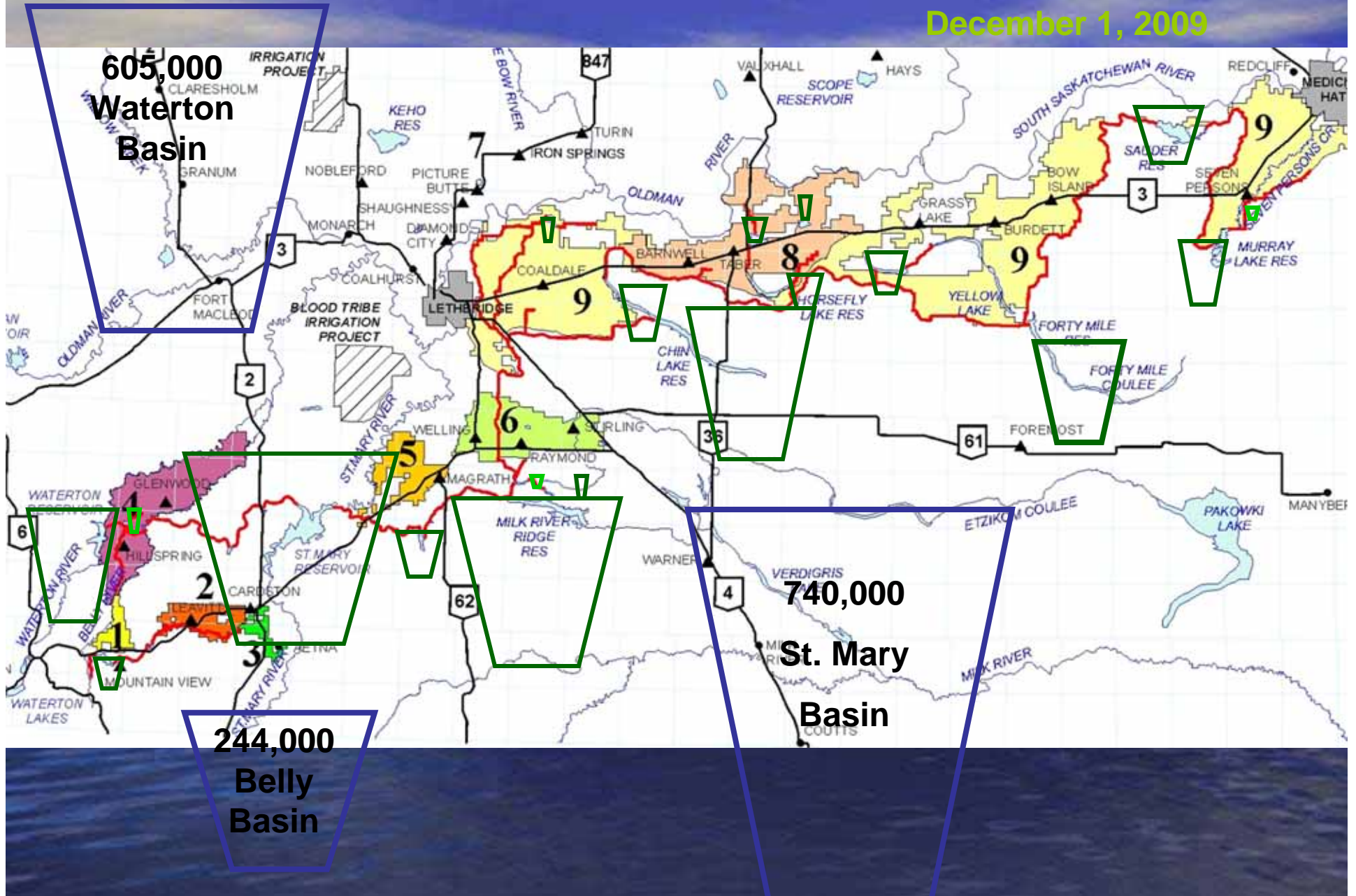
Storage – What have we got?



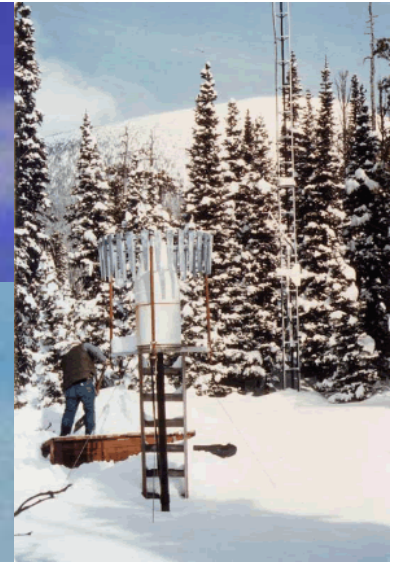
Storage

Reservoirs 87.5%
(738,000 ac-ft)

December 1, 2009



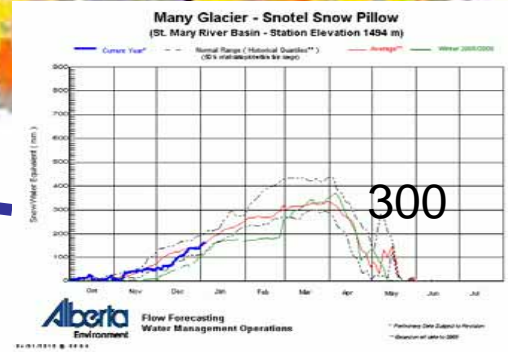
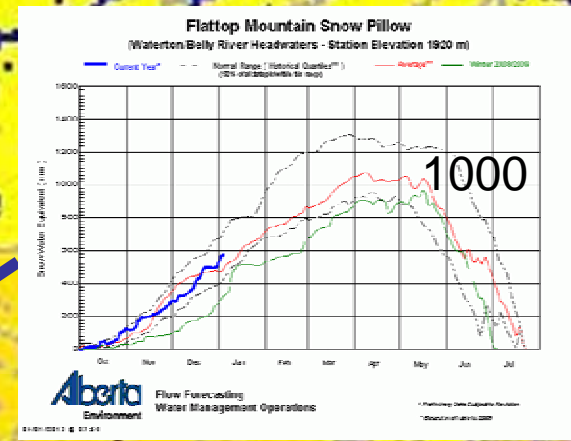
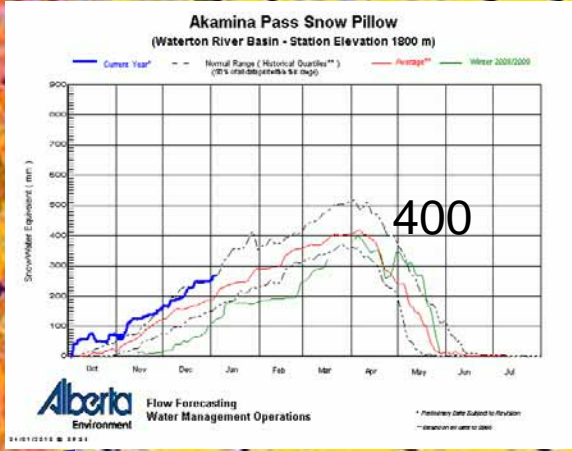
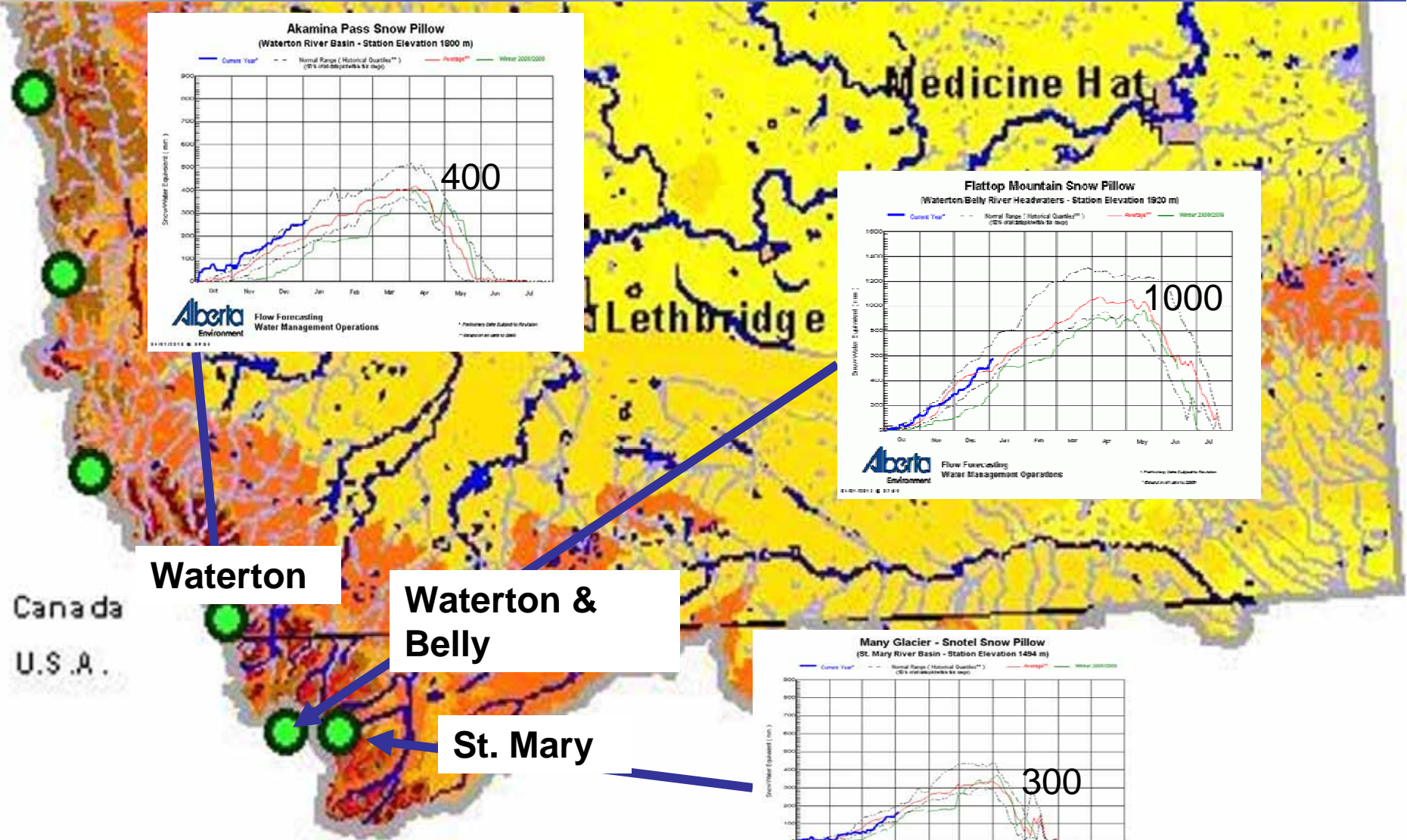
Snow Pack?



**Snow Pillows
above average
January 4, 2010**

Snow Pack – Southern Tribes

Snow Pillows as of January 4, 2010



Waterton

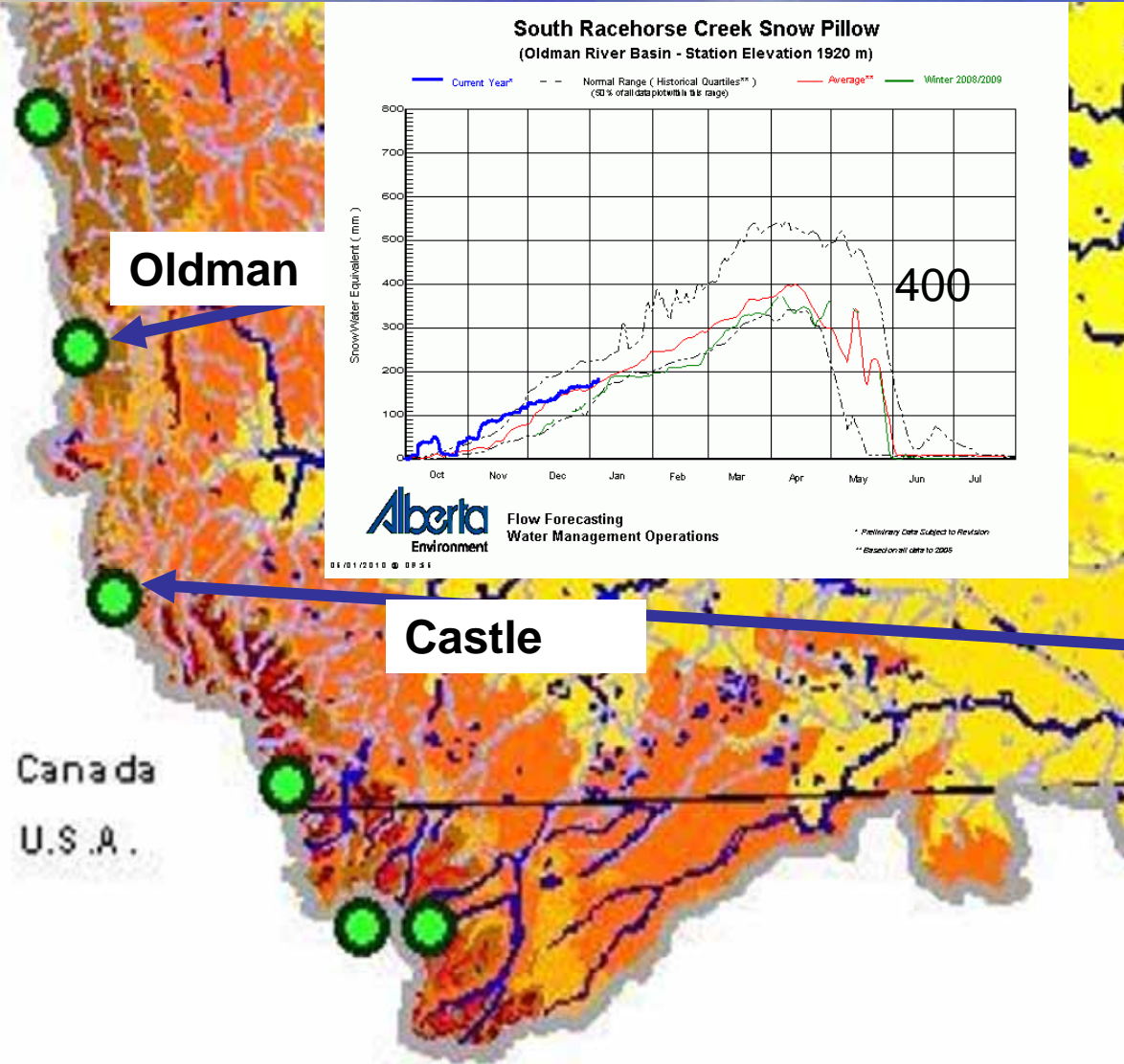
Waterton & Belly

St. Mary

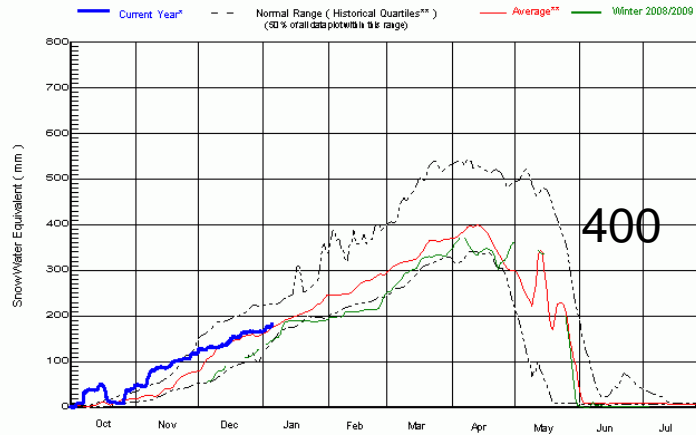
Canada
U.S.A.

Snow Pack – Oldman

Snow Pillows as of January 4, 2010



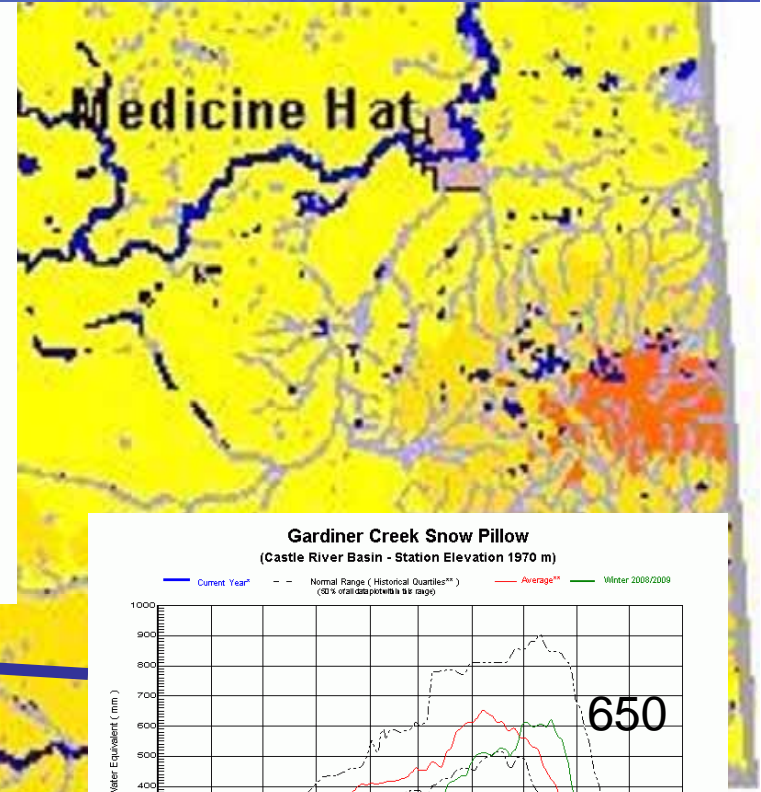
South Racehorse Creek Snow Pillow
(Oldman River Basin - Station Elevation 1920 m)



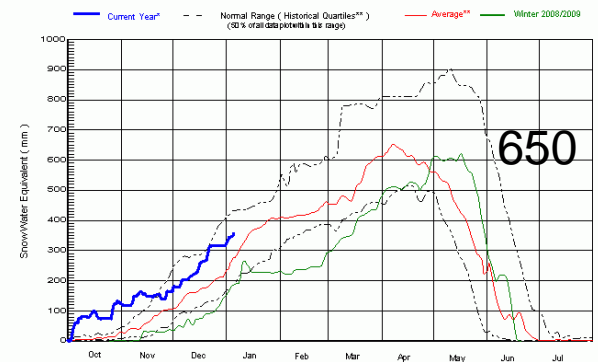
Flow Forecasting
Water Management Operations

* Preliminary data subject to revision
** Based on all data to 2005

01/01/2010 09:51



Gardiner Creek Snow Pillow
(Castle River Basin - Station Elevation 1970 m)



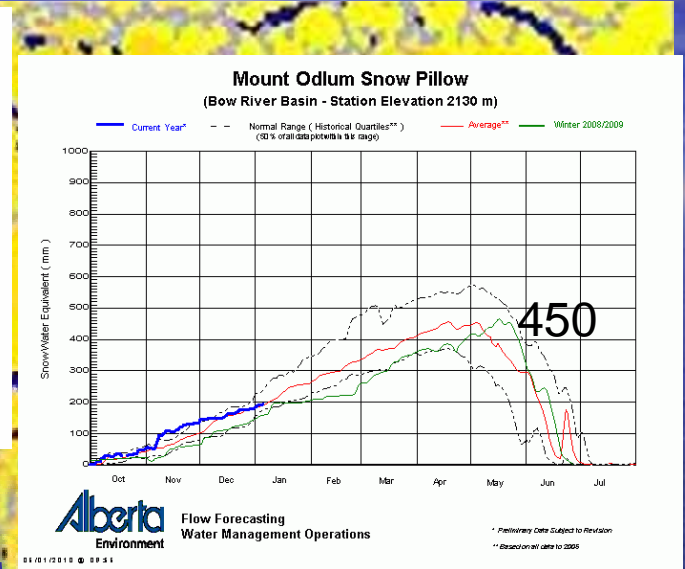
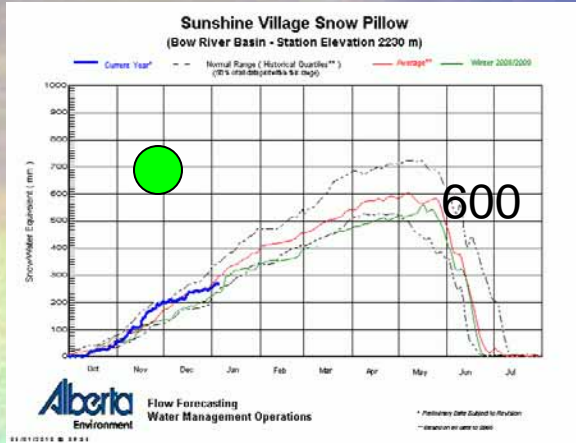
Flow Forecasting
Water Management Operations

* Preliminary data subject to revision
** Based on all data to 2005

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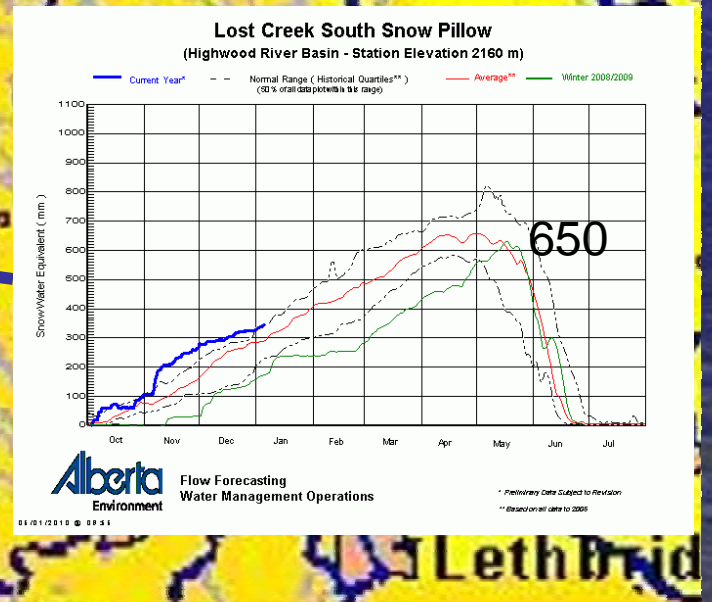
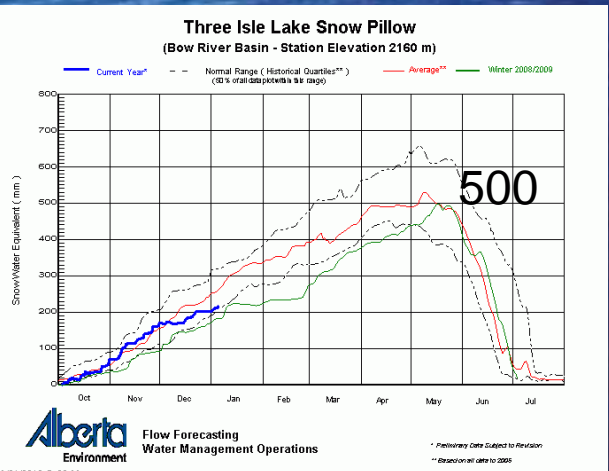
Snow Pack – Bow

Snow Pillows as of January 4, 2010



Bow

Highwood

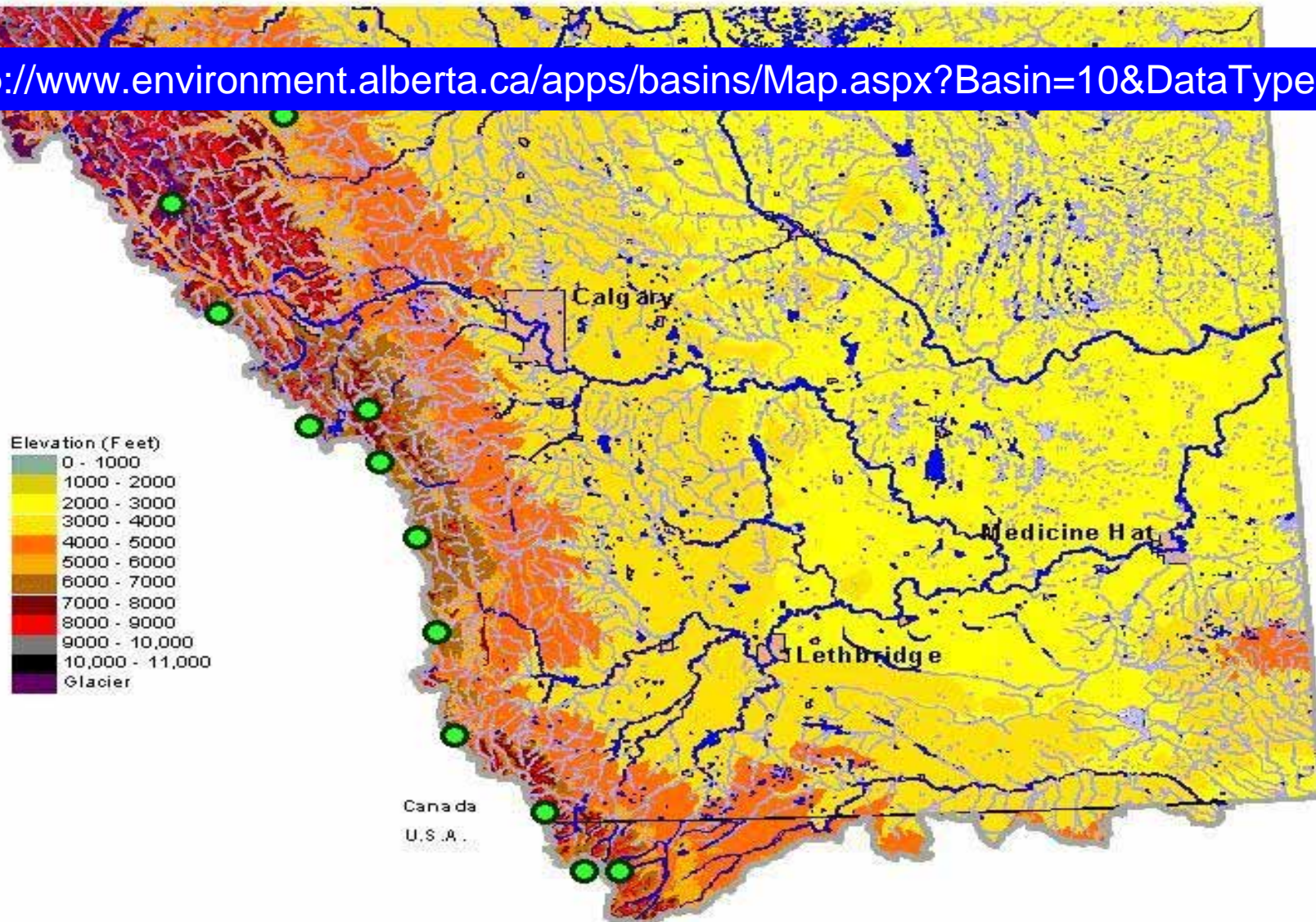


Lethbridge

Snow Pack Data

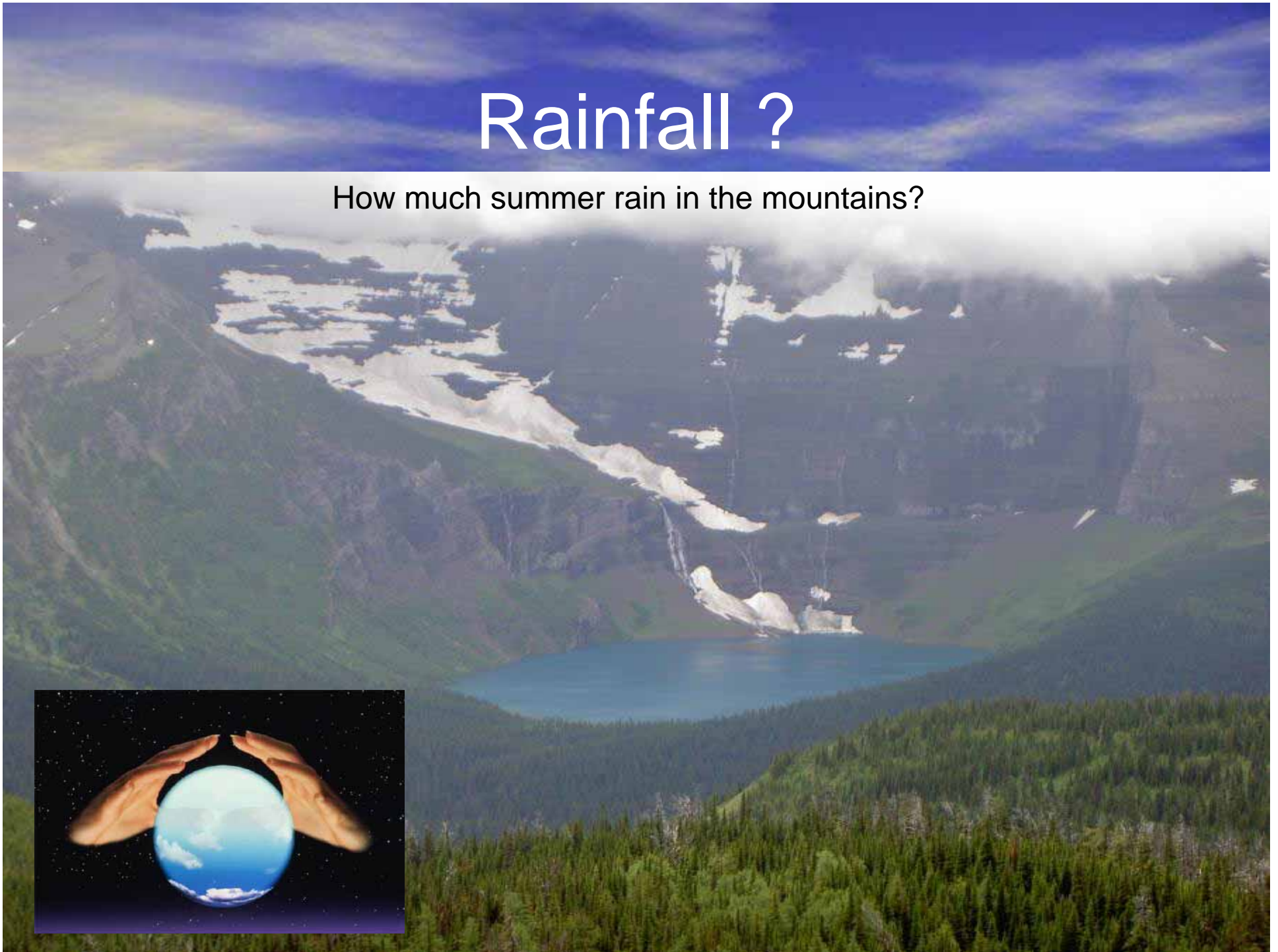
Where to find it

<http://www.environment.alberta.ca/apps/basins/Map.aspx?Basin=10&DataType=4>



Rainfall ?

How much summer rain in the mountains?



Demand - U.S. Allocation

- U. S. entitled to St. Mary River:
 - Irrigation Season
 - 25% of first 666 cfs
 - 50% over 666 cfs.
 - Non-Irrigation Season
 - 50% of flow
- We assume 30% in the Model
 - If U.S. could take all their entitlement, 40%
- AENV calculates actual volume on two weeks basis.

Demand - Saskatchewan Allocation

- $\frac{1}{2}$ of Natural Flow @ confluence of Red Deer and South Saskatchewan River.
- Annual Basis
- Usually not considered in Farm Gate Allocation in the Southern Tributaries
 - Waterton, Belly, and St. Mary Rivers

Demand - Other Licence Holders

- Municipalities
- Industry
- 53,000 ac-ft

Demand - Minimum Flow

- Waterton River
 - 80 cfs
- Belly River
 - 33 cfs
- St. Mary River
 - 97 cfs
- Total
 - 210 cfs, 420 ac-ft/day, 76,860 ac-ft/season

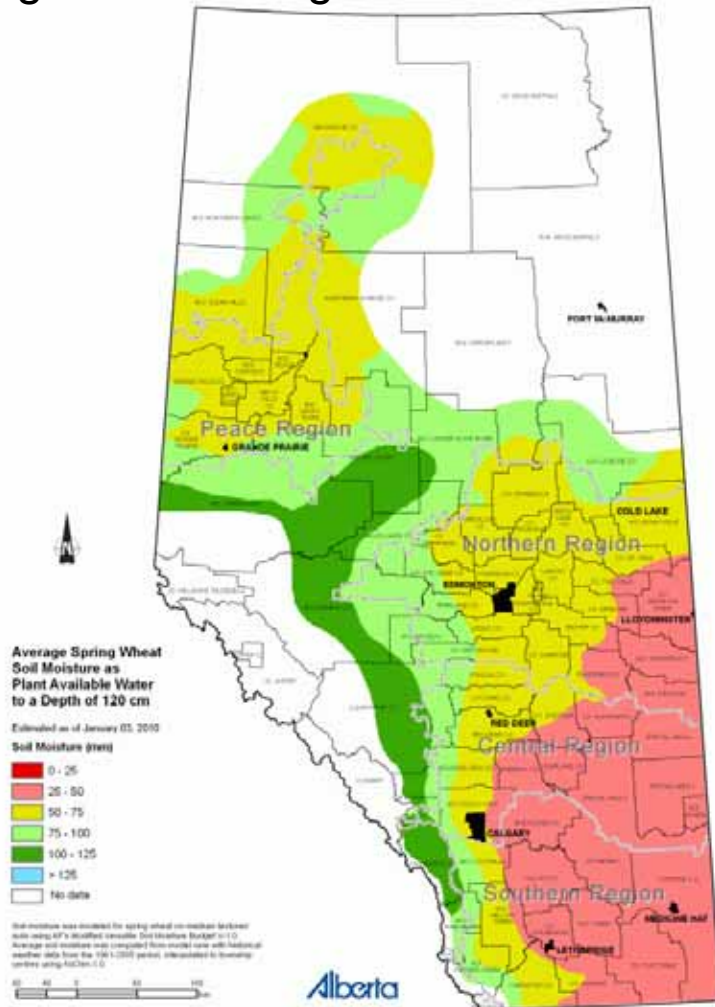
Demand - Irrigation Needs

Licence Holder	Assessed Acres		Licensed Volume (Acre – feet)
	2004	2008	
AID	3,611 /	3,699	9,000
LID	4,763 /	5,126	12,000
MID	18,300 /	18,300	34,000
MVID	3,712 /	3,700	8,000
RID	46,235 /	46,293	81,000
SMRID	370,925 /	373,162	722,000
TID	82,261 /	82,600	158,000
UID	34,329 /	34,069	66,210
BTIP	25,000 /	25,000	40,250
Private	21,155 /	21,155	26,618
Total	611,694 /	613,104	1,157,078*

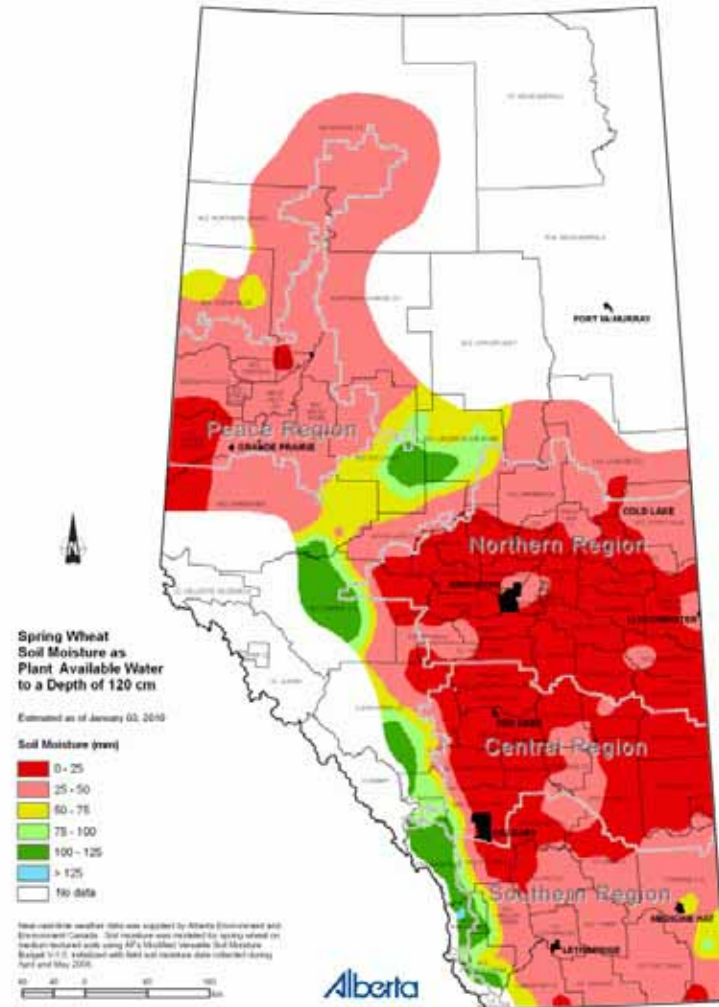
* Normally 700,000 to 800,000 ac-ft are diverted per year

Demand – Spring Soil Moisture

Long Term Average



Current



Demand – Growing Season Rainfall

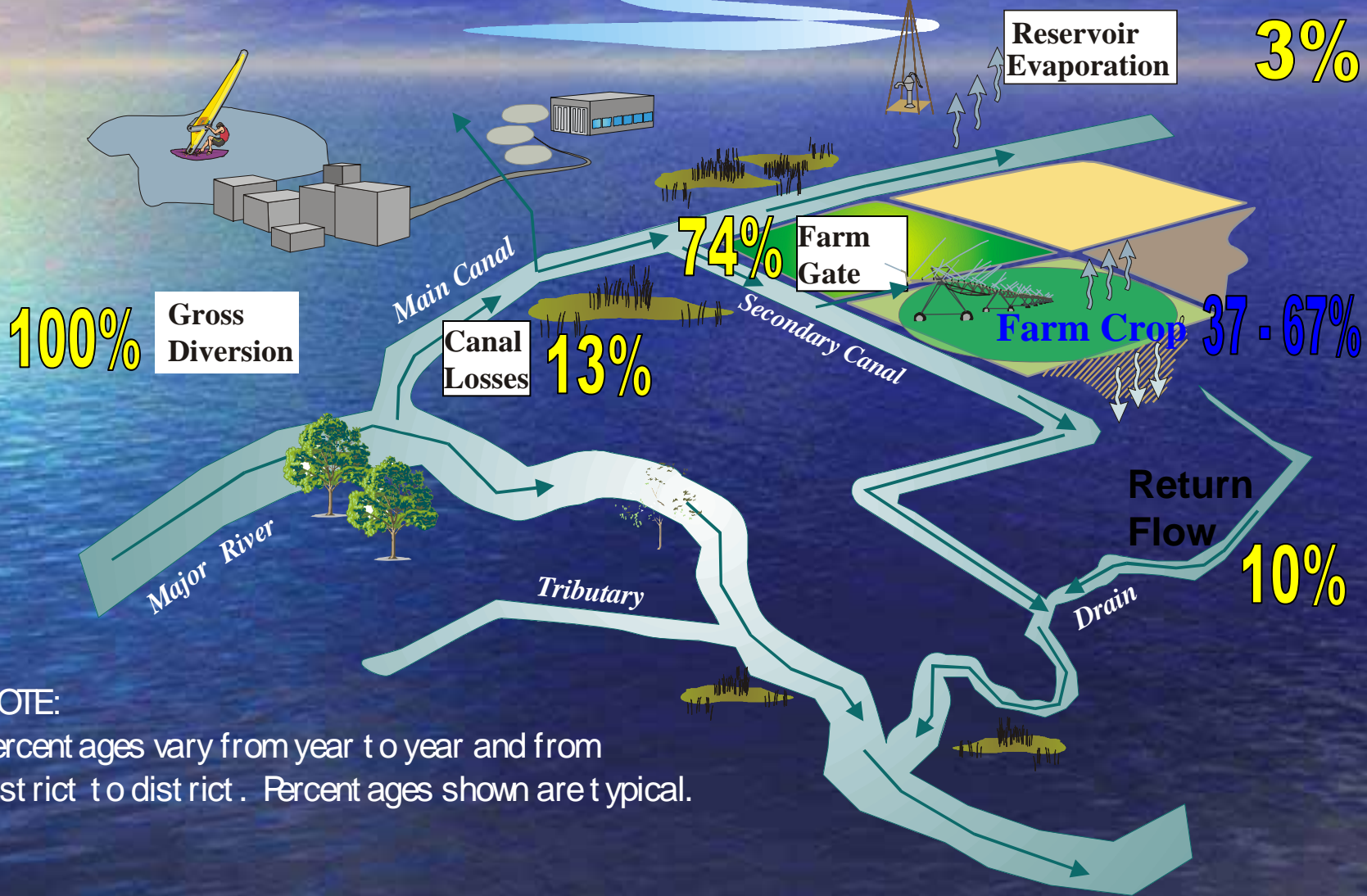
100 mm?

250 mm?

500 mm?



Delivery Efficiency



NOTE:
Percent ages vary from year to year and from district to district. Percent ages shown are typical.

Demand - District Allocation Based on Assessed Irrigated Area

Dist or Project	Assessed Acres	Available Water
AID	3,611	0.59%
LID	4,763	0.78%
MID	18,320	2.99%
MVID	3,712	0.61%
RID	46,304	7.57%
SMRID	372,114	60.81%
TID	82,562	13.49%
UID	34,423	5.63%
BTIP	25,000	4.09%
Private	21,155	3.46%
Total	611,964	100.00%

Water Supply Forecast Alberta Environment

Alberta Environment: Water Supply Outlook - Windows Internet Explorer

http://environment.alberta.ca/forecasting/WaterSupply/index.html

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Water Supply Outlook for Alberta

This report contains a summary of current snowpack, precipitation, river flows, reservoir storage and soil moisture and their impacts on potential runoff in two areas, the plains and the mountains. Plains area runoff is important for replenishing soil moisture and water storage in local storage facilities, such as dugouts. Runoff from the mountains is important for the major rivers in the province where reservoirs store water supplies for irrigation, hydroelectric and community/municipal purposes.

Current Report:

November 2009 Water Supply Outlook

Water Supply Outlooks are issued incrementally, as parts are completed, over the first one to two weeks of March, April, May and July. The February Water Supply Outlook is issued during the second or third week. August and September Outlooks are issued only during below normal runoff years. A year in review report is issued in November. No reports are issued in January, June, October, and December.

Data is published every month, and is made available first, through the [Maps and Data Summaries](#) webpage. Caution against using early season snow data (December and January) to make assessments, as neither is a full data set and typically over half the snow accumulation is yet to come.

Notification and the Overview summary are no longer faxed. Please check this website regularly during the times listed above for updates.

[Historical Water Supply Outlook for Alberta Reports](#)

For technical enquires about this web page please contact Alberta Environment - Environmental Management Water Management Operations Branch at AENV-WebWS@gov.ab.ca

Alberta Vancouver 2010

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<http://environment.alberta.ca/forecasting/WaterSupply/index.html>

Forecast – May 2001 Input

Water Supply Forecast as of May 1, 2001 - Oldman River Basin (Natural Flows)

Locations	Volume Forecast for March 1 to September 30, 2001					Recorded March-April 2001 Volume as a % of Average
	Volume in dam ³	Volume as a % of Average	Probable Range as a % of Average	Potential Minimum as % of Average	Forecast Ranking (lowest to highest)	
Probability		50%	75% - 25%	90%		
St. Mary River	433,000*	64	47 - 92	36	10 / 84	32
Belly River	170,000	76	65 - 97	53	16 / 84	64
Waterton River	436,000	73	60 - 98	43	12 / 84	40
Oldman River near Brocket	476,000	49	41 - 86	32	6 / 84	42
Oldman River at Lethbridge	1,551,000	75	55 - 101	47	12 / 84	40

Forecast – May 2001

SUMMARY TABLE OF 2001 WATER SHARING ALLOCATIONS				
With 40-Mile		May-01	<i>- At Reasonable Minimum Forecast</i>	
Irrigation	SSReg Licensed	Proportion of	Volume of	Farm Gate
District or	Volume	Available Water	Available Water	Allocation (in./ac)
Project	(ac-ft)		(ac-ft) *	for Assessed Acres
AID	9,000	0.78%	4,655.9	9.10
LID	12,000	1.04%	6,207.8	9.38
MID	34,000	2.94%	17,588.9	8.98
MVID	8,000	0.69%	4,138.6	9.47
RID	81,000	7.00%	41,902.9	8.92
SMRID	722,000	62.40%	416,305.0	10.52
TID	158,000	13.66%	81,736.6	9.71
UID	66,210	5.72%	34,251.8	8.96
BTIP	40,250	3.48%	20,822.1	8.75
Private	26,618	2.30%	13,770.0	7.81
TOTAL	1,157,078	100.00%	641,379.6	

Forecast – May 2001

SUMMARY TABLE OF 2001 WATER SHARING ALLOCATIONS				
Without 40-Mile		May 01	<i>- At Reasonable Minimum Forecast</i>	
Irrigation	SSReg Licensed	Proportion of	Volume of	Farm Gate
District or	Volume	Available Water	Available Water	Allocation (in./ac)
Project	(ac-ft)		(ac-ft) *	for Assessed Acres
AID	9,000	0.78%	4,655.9	9.10
LID	12,000	1.04%	6,207.8	9.38
MID	34,000	2.94%	17,588.9	8.98
MVID	8,000	0.69%	4,138.6	9.47
RID	81,000	7.00%	41,902.9	8.92
SMRID	722,000	62.40%	373,505.0	9.44
TID	158,000	13.66%	81,736.6	9.71
UID	66,210	5.72%	34,251.8	8.96
BTIP	40,250	3.48%	20,822.1	8.75
Private	26,618	2.30%	13,770.0	7.81
TOTAL	1,157,078	100.00%	598,579.6	

Forecast – March 2009 Input

Water Supply Forecast as of March 1, 2009 - Oldman River Basin (Natural Flows)

Locations	Volume Forecast for March 1 to September 30, 2009					Recorded March- September 2008 Volume as a % of Average
	Volume in dam ³	Volume as a % of Average	Probable Range as a % of Average	Potential Minimum as % of Average	Forecast Ranking (lowest to highest)	
Probability		50%	75% - 25%	90%		
St. Mary River	572,000*	77	64 - 101	53	17 / 91	111
Belly River	202,000	83	70 - 100	61	22 / 91	96
Waterton River	453,000	75	60 - 101	51	19 / 91	108
Oldman River near Brocket	827,000	76	57 - 105	49	23 / 91	97
Oldman River at Lethbridge	2,227,000	75	55 - 101	47	22 / 91	102

Forecast – March 2009

SUMMARY TABLE OF 2009 WATER SHARING ALLOCATIONS				
With 40-Mile		Mar-09	<i>- At Reasonable Minimum Forecast</i>	
Irrigation	SSReg Licensed	Proportion of	Volume of	Farm Gate
District or	Volume	Available Water	Available Water	Allocation (in./ac)
Project	(ac-ft)		(ac-ft) *	for Assessed Acres
AID	9,000	0.78%	8,214.5	16.06
LID	12,000	1.04%	10,952.7	16.56
MID	34,000	2.94%	31,032.6	15.85
MVID	8,000	0.69%	7,301.8	16.70
RID	81,000	7.00%	73,930.6	15.75
SMRID	722,000	62.40%	726,491.9	18.36
TID	158,000	13.66%	144,210.2	17.14
UID	66,210	5.72%	60,431.4	15.80
BTIP	40,250	3.48%	36,737.1	15.44
Private	26,618	2.30%	24,294.9	13.78
TOTAL	1,157,078	100.00%	1,123,597.6	

Forecast – March 2010 Input

Water Supply Forecast as of **March 1, 2010** - Oldman River Basin (Natural Flows)

Volume Forecast for March 1 to September 30, 2009

Locations	Volume in dam ³	Volume as a % of Average	Probable Range as a % of Average	Potential Minimum as % of Average	Forecast Ranking (lowest to highest)	Recorded March-September 2008 Volume as a % of Average
Probability		50%	75% - 25%	90%		
St. Mary River	570,000?	77	64 - 101	53	? / 92	???
Belly River	200,000?	83	70 - 100	61	? / 92	???
Waterton River	450,000?	75	60 - 101	51	? / 92	???

Forecast – March 2010

SUMMARY TABLE OF 2010 WATER SHARING ALLOCATIONS				
Based on Water in Storage as of December 1, 2009				
Average potential runoff in 2010				
With 40-Mile		Dec-09	- At Reasonable Minimum Forecast	
Irrigation	SSReg Licensed	Proportion of	Volume of	Farm Gate
District or	Volume	Available Water	Available Water	Allocation (in./ac)
Project	(ac-ft)		(ac-ft) *	for Assessed Acres no runoff / Ave Runoff
AID	9,000	0.78%	4,332.4	8.47 / 16?
LID	12,000	1.04%	5,776.5	8.73 / 17?
MID	34,000	2.94%	16,366.7	8.36 / 16?
MVID	8,000	0.69%	3,851.0	8.81 / 17?
RID	81,000	7.00%	38,991.3	8.30 / 16?
SMRID	722,000	62.40%	416,740.4	10.53 / 19?
TID	158,000	13.66%	76,057.2	9.04 / 17?
UID	66,210	5.72%	31,871.8	8.33 / 16?
BTIP	40,250	3.48%	19,375.3	8.14 / 16?
Private	26,618	2.30%	12,813.2	7.27 / 14?
TOTAL	1,157,078	100.00%	626,175.8	

Note - Other use licences and river allocation receive their water

- 75% Probability 18+", 50% Probability 24+", 25% Probability 26+"

Forecast – March 2010

Irrigation District	No Runoff	Reasonable Minimum	75%	50%	25%
AID	8.47	14.75	17.0	21.2	24.7
LID	8.73	15.21	17.6	21.9	25.5
MID	8.36	14.55	16.8	21.0	24.4
MVID	8.81	15.34	17.7	22.1	25.7
RID	8.30	14.46	16.7	20.8	24.3
SMRID	10.53	15.29	17.7	22.0	25.7
TID	9.04	15.74	18.2	22.7	26.4
UID	8.33	14.51	16.8	20.9	24.3
BTIP	8.14	14.18	16.4	20.4	23.8
Private	7.27	12.66	14.6	18.2	21.2

Note - Other use licences and river allocation receive their water

- based on water in storage as of December 1, 2009 and average runoff forecast

Summary

- We've never lost a crop in January
- 2010 Shaping up like a normal year
 - Reservoirs are full
 - Snow Pack developing normally so far
 - But still four months remaining
- Time will tell
- First Official Forecast in March

- Questions