Irrigation Water Supply Forecast for 2010

January 12, 2010

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Alberta Agriculture

Why Farm Gate Allocation Forecast?

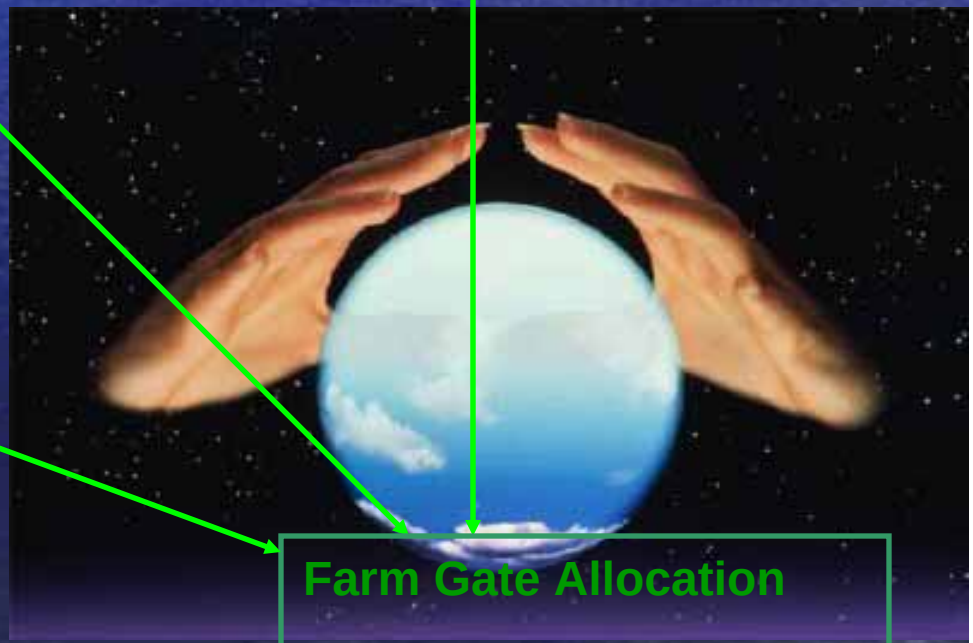
- Started with 2001 drought
- Ensured equal sharing of available water
- Today
  - Districts on Southern Tribs can forecast amount of water their users can expect.
  - Allows farmers with high use crops to access additional water

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

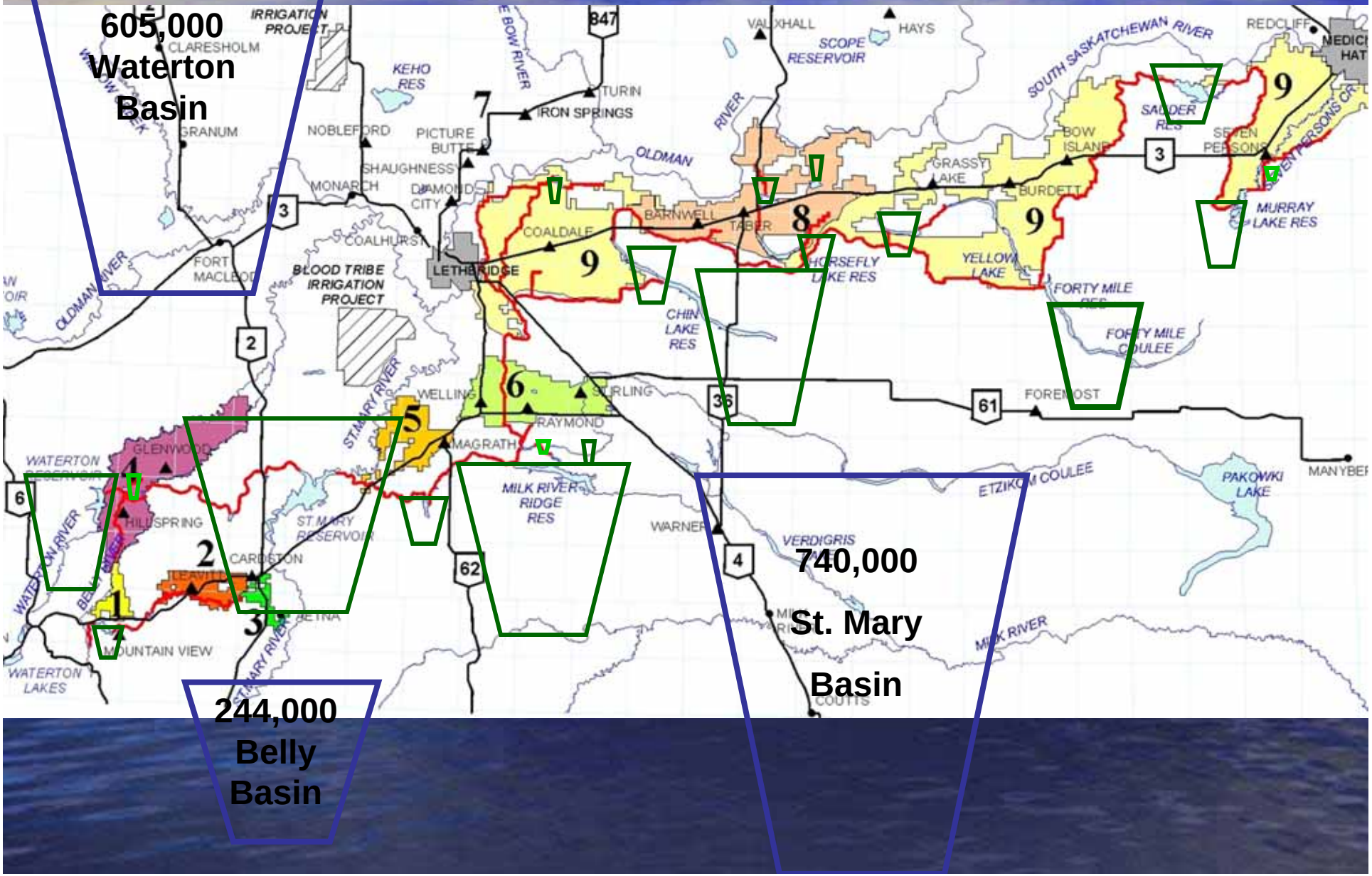
Inches / Assessed Acre

Storage – What have we got?

Storage

Reservoirs 87.5%
(738,000 ac-ft)

December 1, 2009

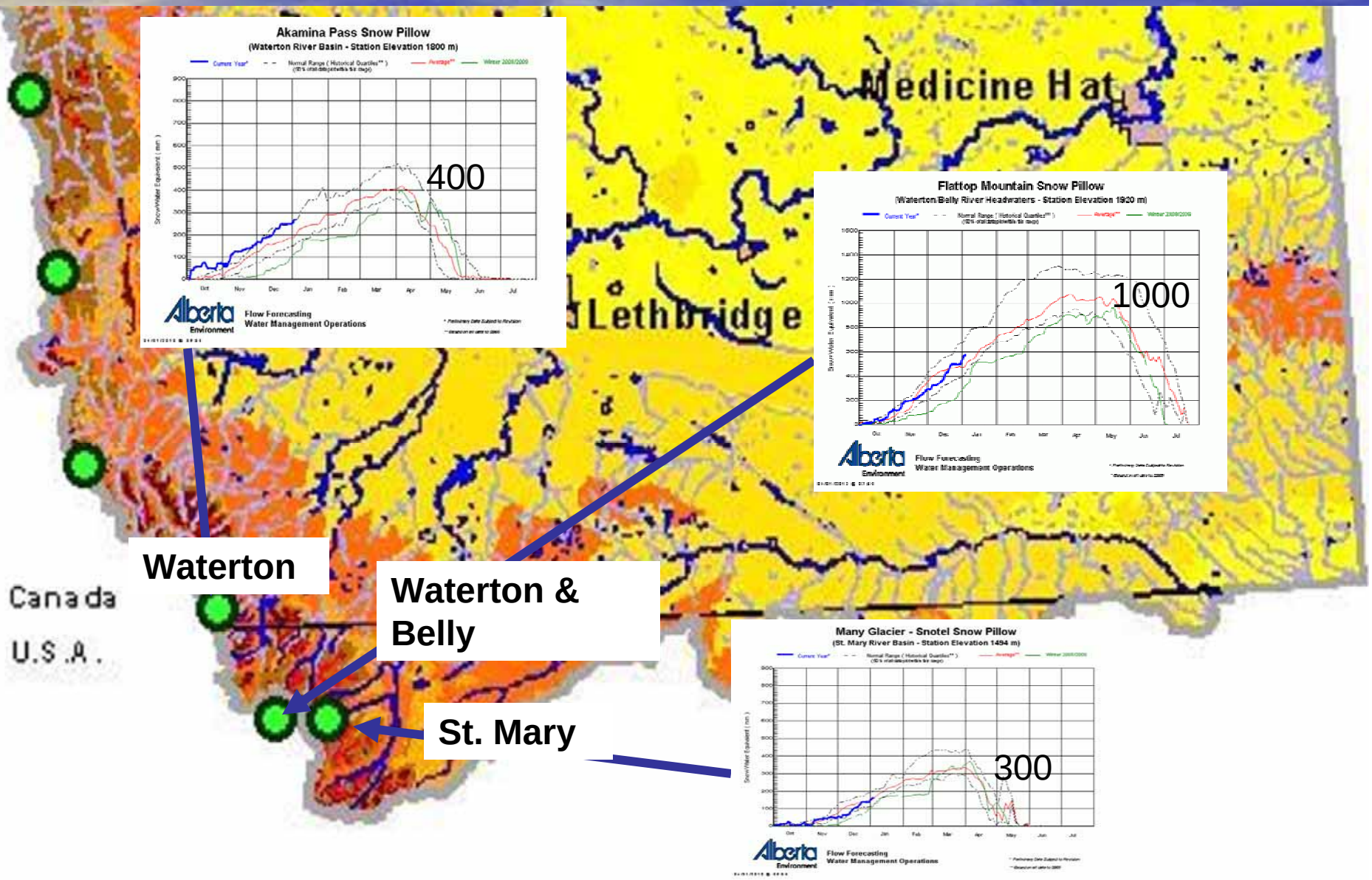


Snow Pack?

Snow Pillows above average January 4, 2010

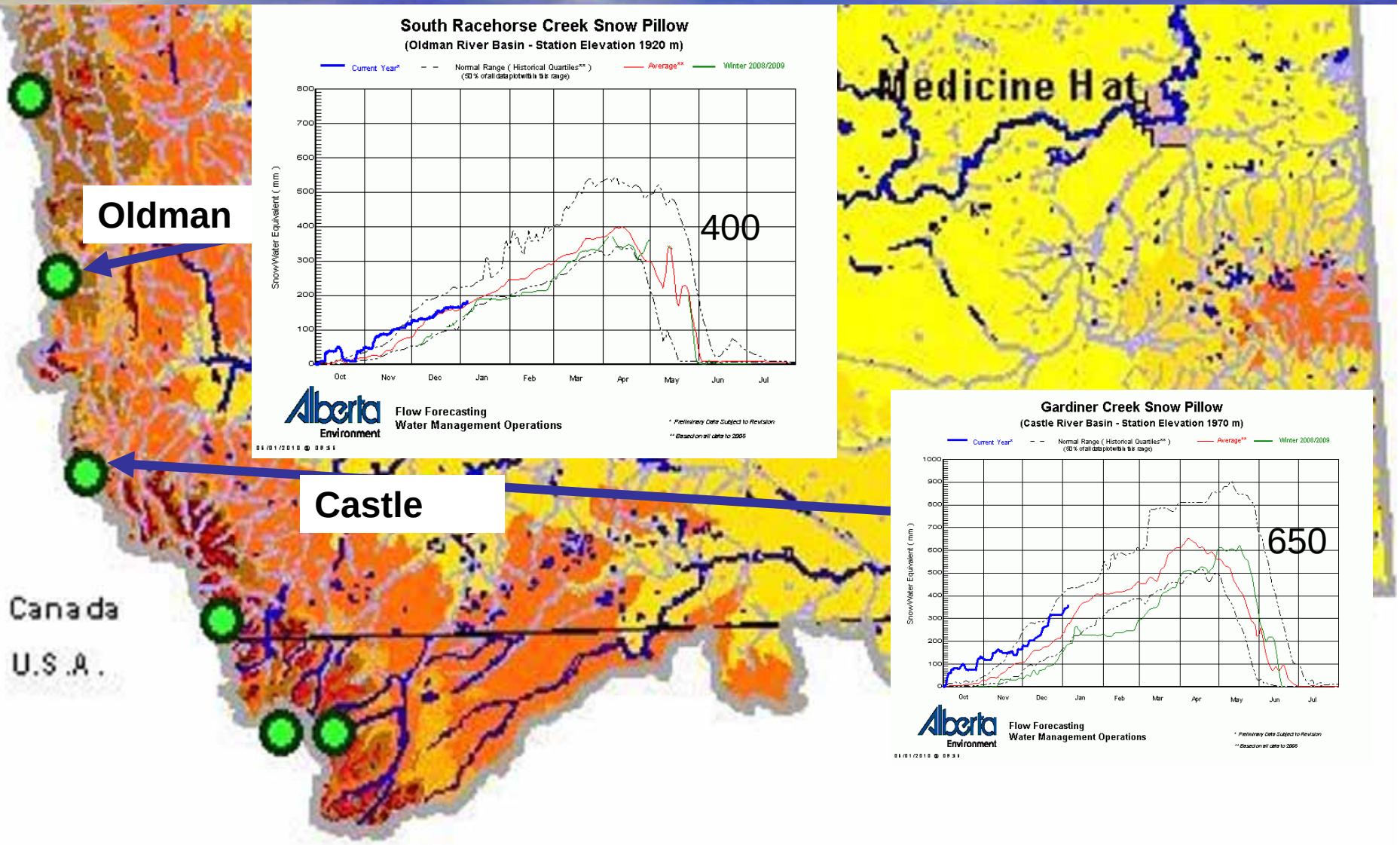
Snow Pack – Southern Tribs

Snow Pillows as of January 4, 2010



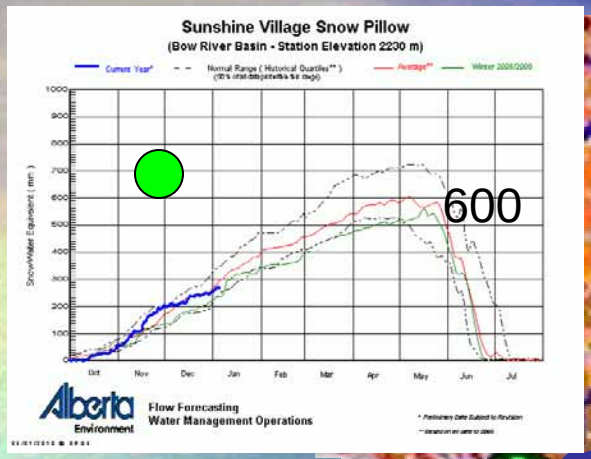
Snow Pack – Oldman

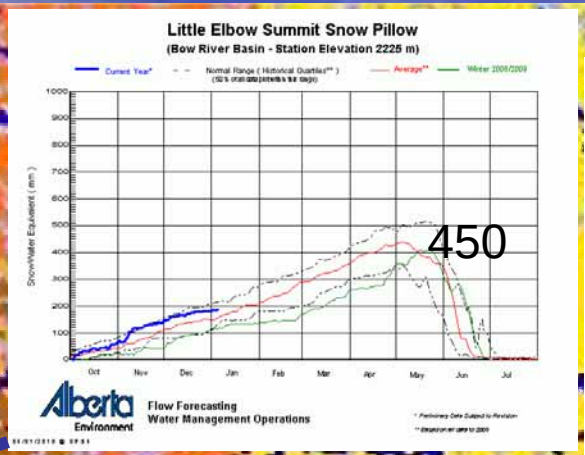
Snow Pillows as of January 4, 2010

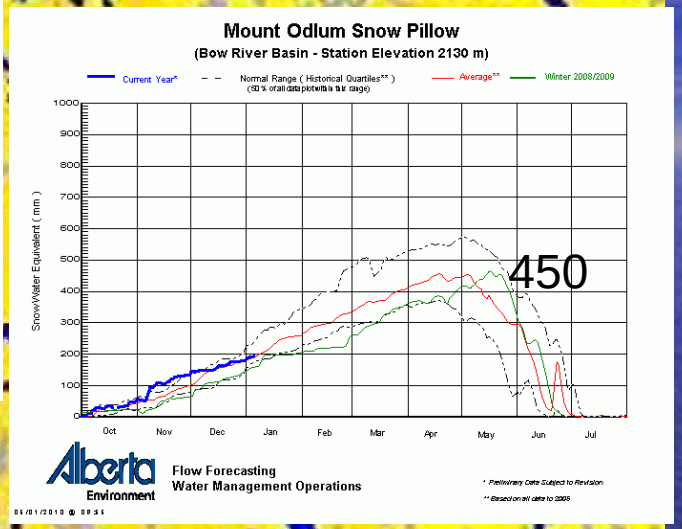


Snow Pack – Bow

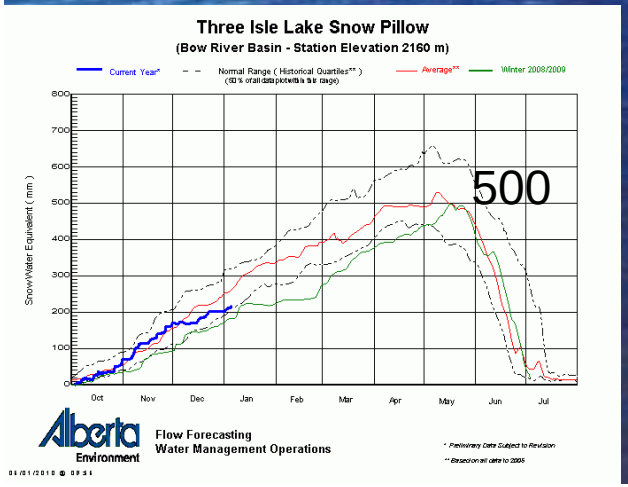
Snow Pillows as of January 4, 2010



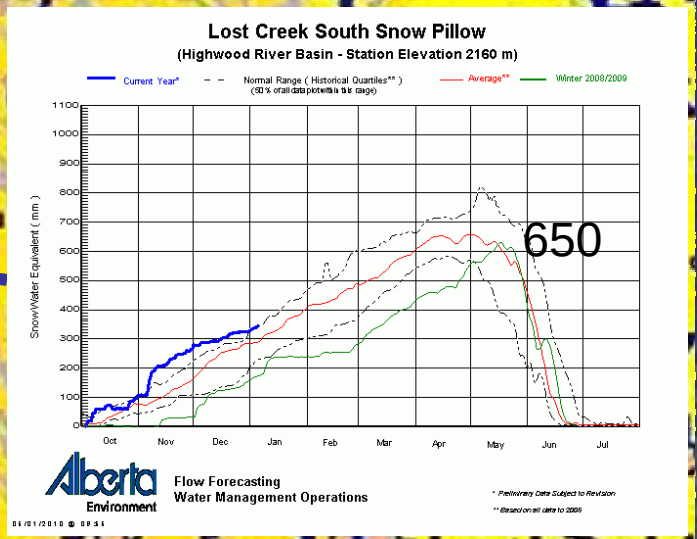




Bow



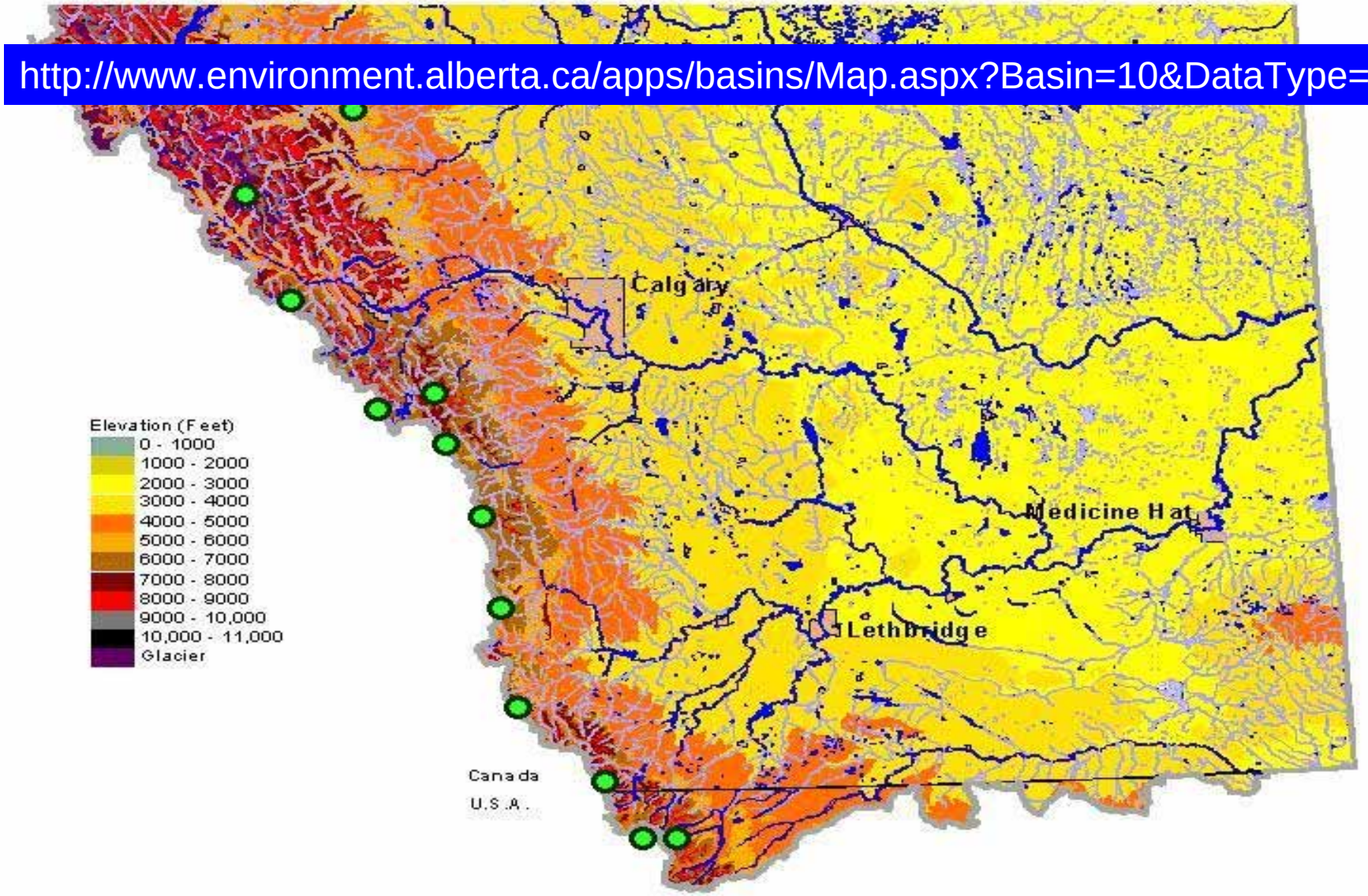
Highwood



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

- ½ 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

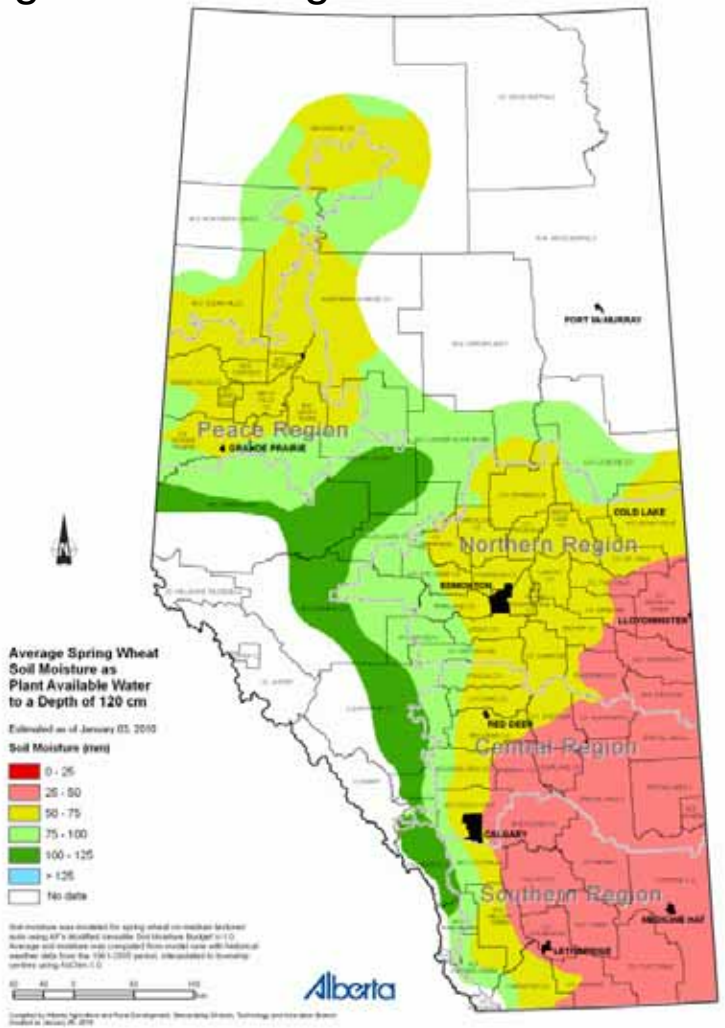
Demand - Irrigation Needs

Licence Holder	Assessed Acres 2004 / 2008	Licensed Volume (Acre – feet)
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*

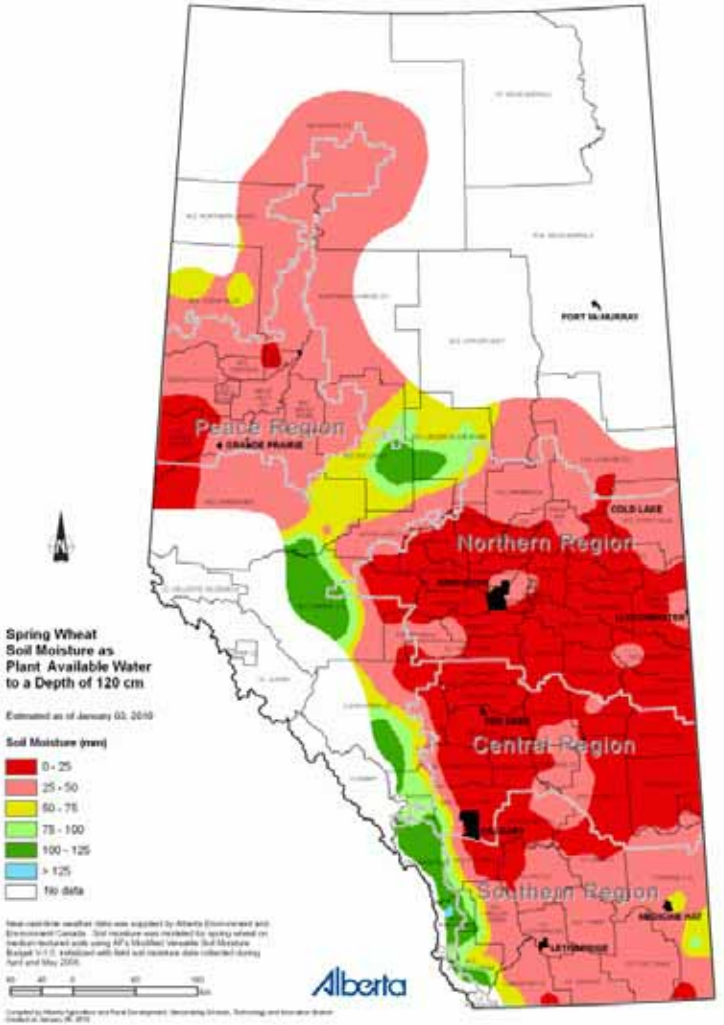
* Normally 700,000 to 800,000 ac-ft are diverted per year

Demand – Spring Soil Moisture

Long Term Average



Current



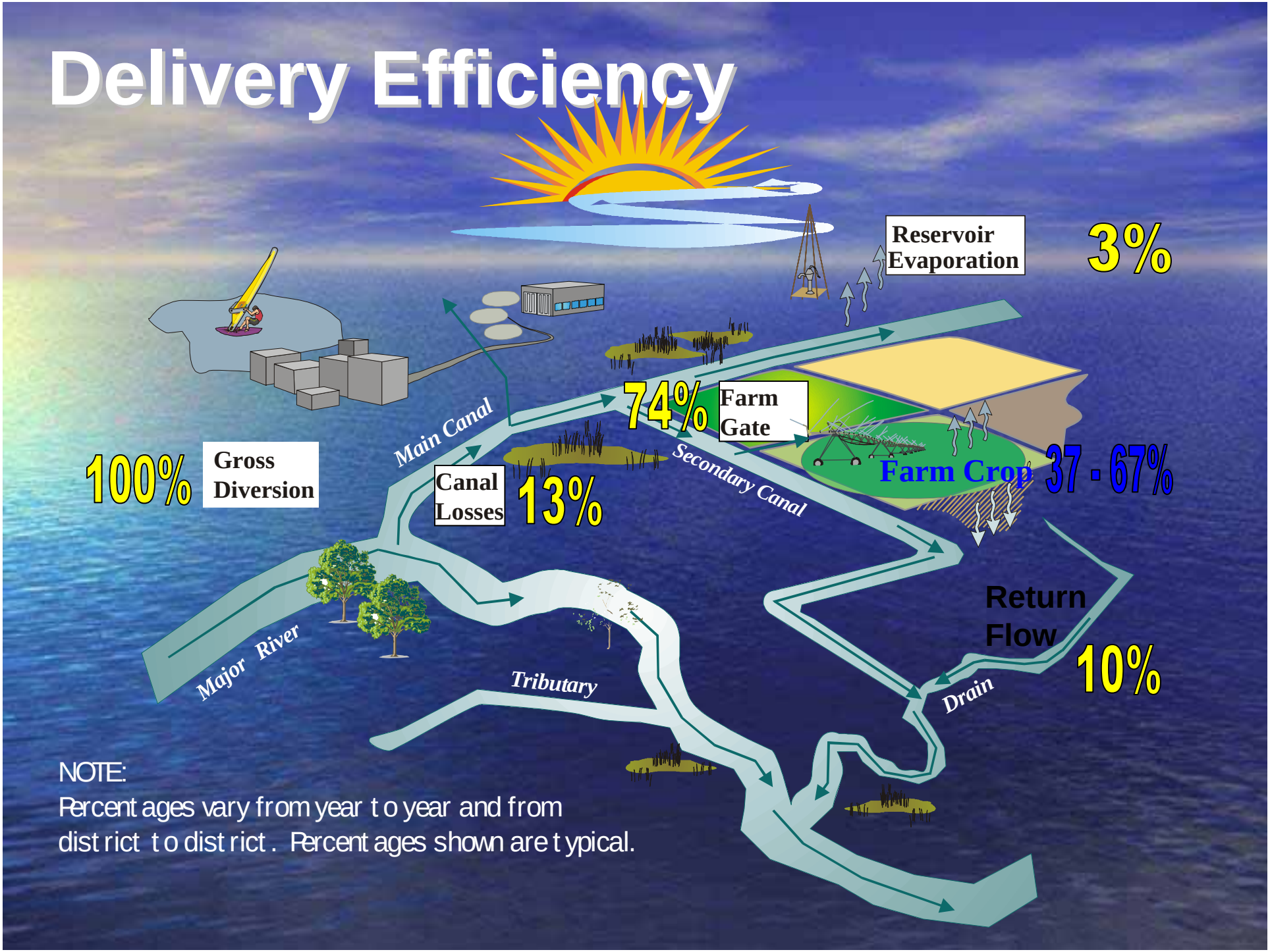
Demand – Growing Season Rainfall

100 mm?

250 mm?

500 mm?

Delivery Efficiency

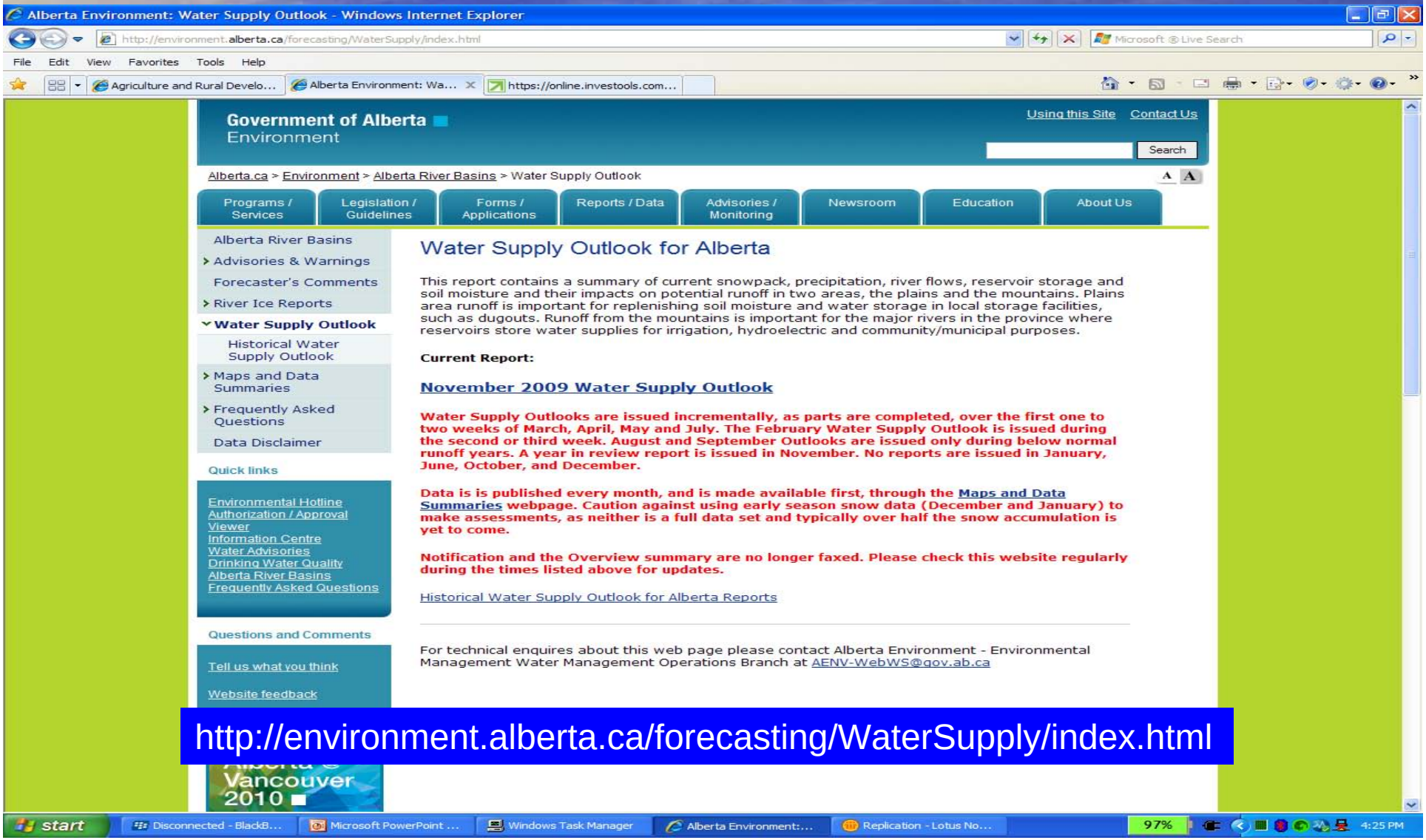


NOTE:
Percentages vary from year to year and from district to district. Percentages shown are typical.

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



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)

	Volume Forecast for March 1 to September 30, 2001					
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-April 2001 Volume as a % of Average**
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**	***- At Reasonable Minimum Forecast***	
Irrigation District or Project	**SSReg Licensed Volume (ac-ft)**	**Proportion of Available Water**	**Volume of Available Water (ac-ft) ***	**Farm Gate Allocation (in./ac) 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	*- At Reasonable Minimum Forecast*	
Irrigation District or Project	**SSReg Licensed Volume (ac-ft)**	**Proportion of Available Water**	**Volume of Available Water (ac-ft) ***	**Farm Gate Allocation (in./ac) 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)

	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	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**	***- 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**
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 District or Project	**SSReg Licensed Volume (ac-ft)**	**Proportion of Available Water**	**Volume of Available Water (ac-ft) ***	**Farm Gate Allocation (in./ac) 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