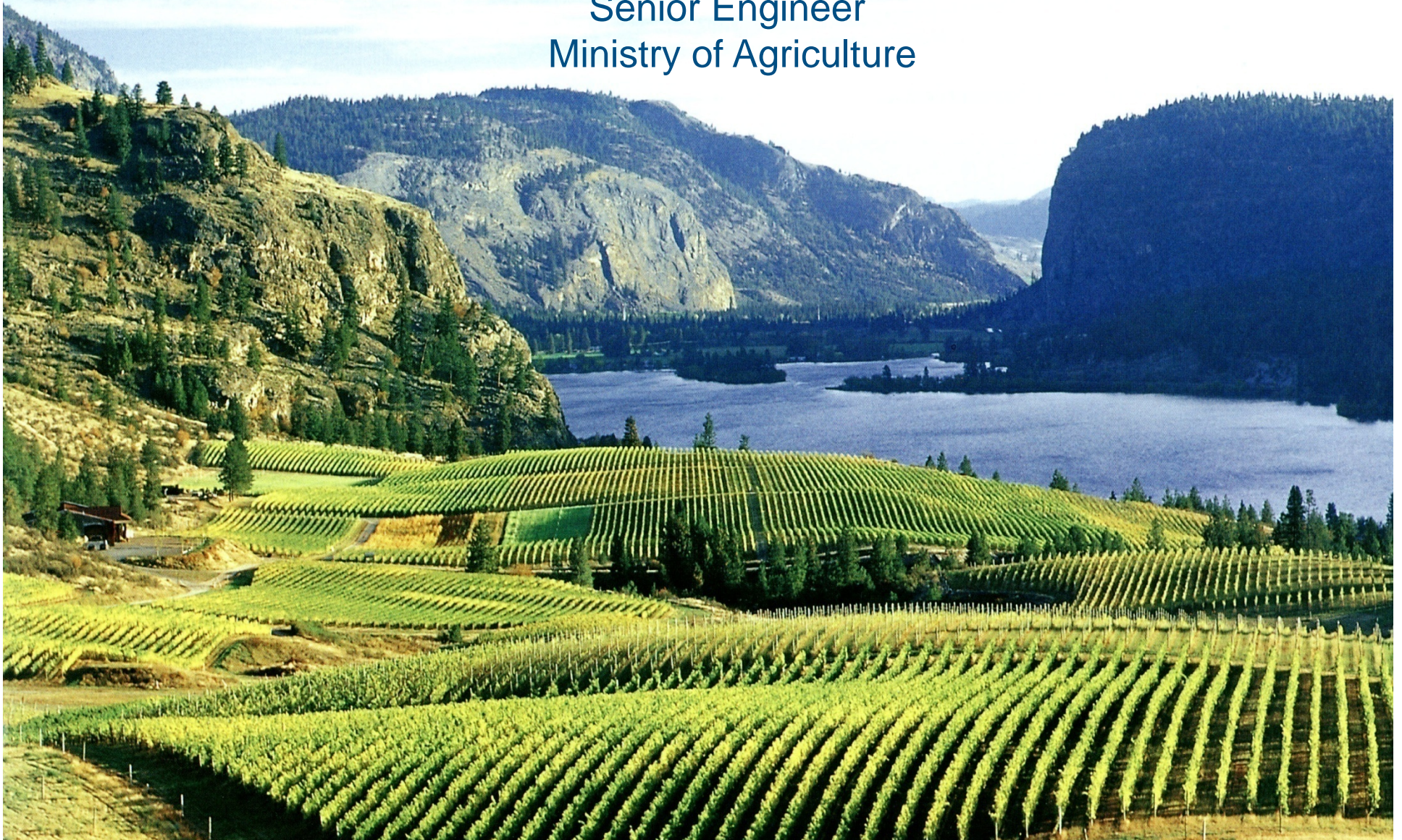


Improving Irrigation Management

T.W. van der Gulik

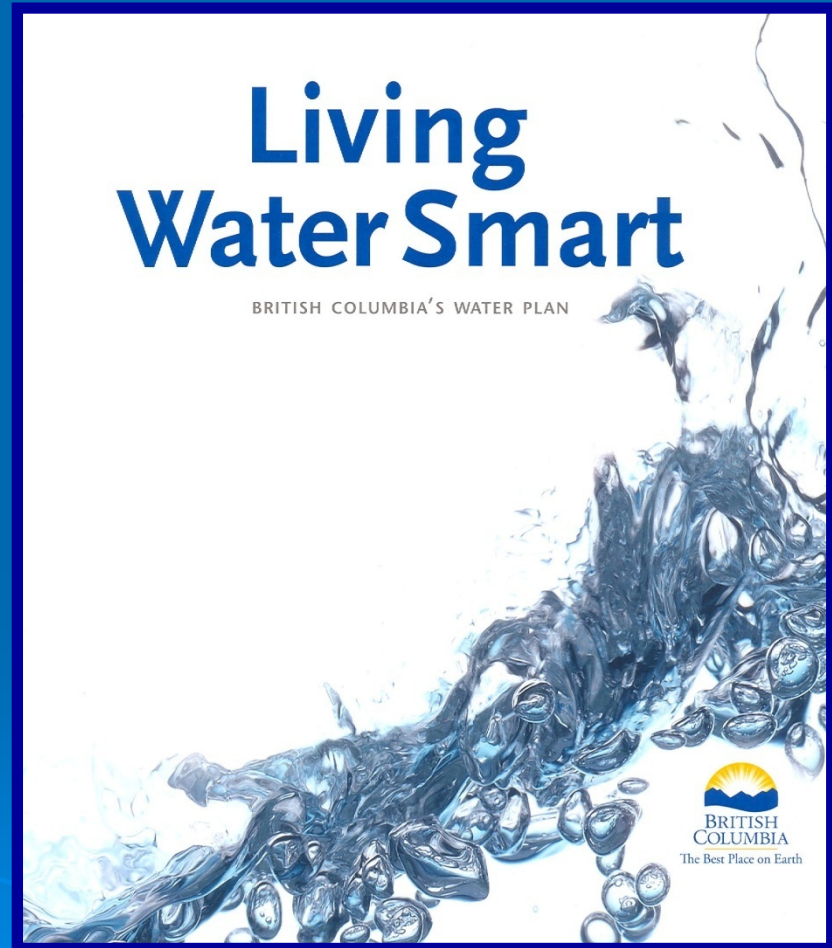
Senior Engineer

Ministry of Agriculture

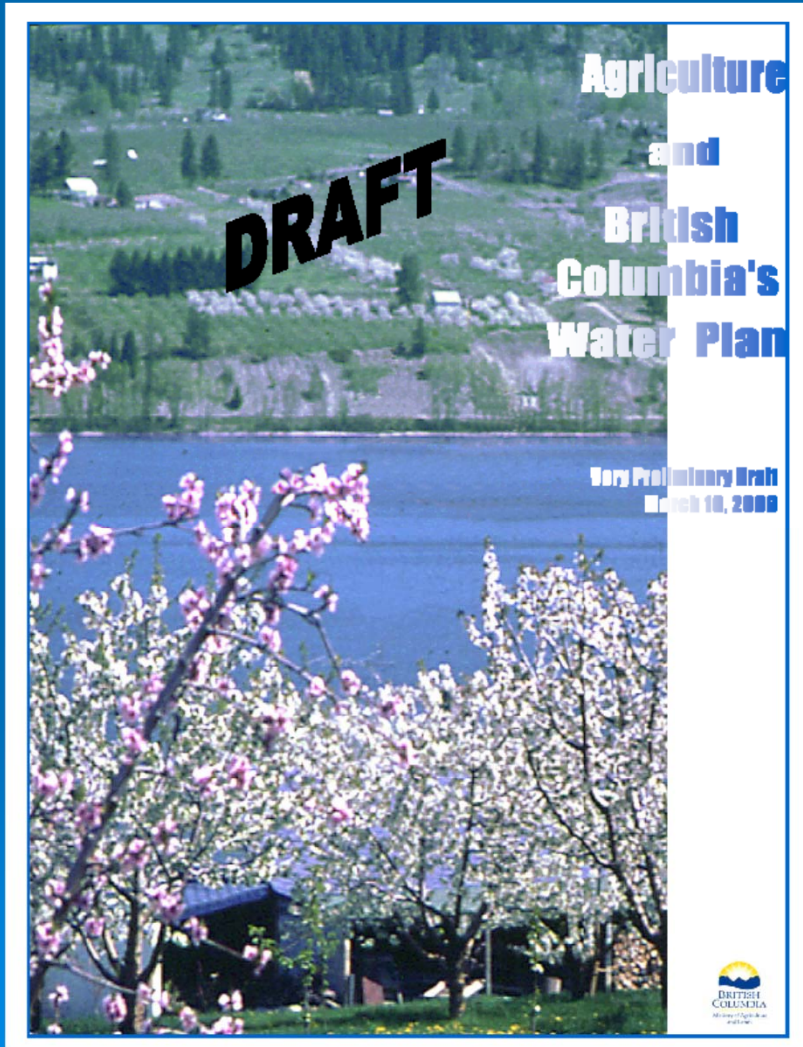


Province's Water Plan

- Plan requires increase in efficiency of 33% by 2020.
- Reserve water for agriculture
- Measure and report large water use by 2012



Agriculture Water Strategy



Water Strategy Issue Summary				
#	Category	Description of Issue	Rating	Implication
1	Securing Water	Reserve Water for Agricultural Lands	EXTREME	Legislation
2	Securing Water	Water Purveyors Secure Water to ALR Lands	EXTREME	Bylaws
3	Securing Water	Expansion of Water Storage Facilities	EXTREME	Policy
4	Securing Water	Planning for Climate Change Adaptation	MEDIUM	Policy
5	Securing Water	Secure Access for Livestock Water	HIGH	Licensing
6	Securing Water	Agriculture Water for First Nations	EXTREME	Policy
7	Securing Water	Encourage Use of Reclaimed Water	LOW	Policy
8	Water Governance	Do Not Support Unauthorized Use of Water	LOW	Licensing
9	Water Governance	Users Adhere to Annual Use and Peak Withdrawal	MEDIUM	Licensing
10	Water Governance	Area Based Regulation of Groundwater Use Supported	EXTREME	Licensing
11	Water Governance	Agricultural Water Purveyors Have Ag Representation	EXTREME	Policy
12	Water Governance	Transfer or Trading of Water Rights Remain Within Ag Sector	EXTREME	Legislation
13	Pricing	Water Pricing Will Consider Agriculture's Ability to Pay	HIGH	Bylaws
14	Pricing	Industry Support Pricing Structure that Promoting Beneficial Mgmt	HIGH	Policy
15	Pricing	Societal Benefits of Ag Storage Facilities Recognized	LOW	Policy
16	Water Use	Establish a Policy for Part Season Licensing	MEDIUM	Licensing
17	Water Use	Extend Irrigation Season Licences	HIGH	Licensing
18	Water Use	Maximize Beneficial Acreage Supplied by Licence	HIGH	Policy
19	Water Use	Monitor Water Use on Purveyed Systems and Large Users	MEDIUM	Funding
20	Water Use	Promote Certified Agricultural Irrigation Designs	EXTREME	Policy
21	Water Use	Encourage Irrigation Scheduling to Improve Efficiency	EXTREME	Extension
22	Water Use	Improve Irrigation System Efficiencies	HIGH	Funding
23	Water Use	Develop Equitable Drought Management Planning Process	HIGH	Policy
24	Water Use	Water Conservation Incentives	MEDIUM	Funding
25	Water Use	Water Use Related Carbon Offsets	LOW	Policy
26	Water Quality	Agriculture Has Suitable Water Quality for Use	MEDIUM	Funding
27	Water Quality	Reduce Agriculture's Impact on Water Quality	HIGH	Funding
28	Water Quality	Balance Fish and Agriculture's Needs	MEDIUM	Policy
29	Water Quality	Funding Infrastructure for Irrigation Districts	HIGH	Funding
30	Flood and Drainage	Master Drainage Plans Consider Agriculture	EXTREME	Policy
31	Flood and Drainage	Farmland Not Used for Stormwater Retention	HIGH	Policy
32	Flood and Drainage	Urban Developments Increase Flooding of Agricultural Lowlands	HIGH	Bylaws
33	Flood and Drainage	Obtain Funding for Drainage Infrastructure	EXTREME	Funding
34	Extension	Educate Public on Agriculture and Water Issues	HIGH	Extension

Agriculture Water Strategy

Irrigation Scheduling

21	Water Use	Encourage Irrigation Scheduling to Improve Efficiency	EXTREME	Extension
----	-----------	---	----------------	-----------

- Efficiency:** Select the most efficient type of irrigation system possible
- Uniformity:** Design the system to obtain the best uniformity
- Scheduling:** Schedule irrigation timing according to soil moisture or climate data

Water Strategy Issue Summary

#	Category	Description of Issue	Rating	Implication
1	Accounting Water	Revenue Water for Agriculture Losses	2.0 (High)	Legislation
2	Accounting Water	Water Transfers Between Water to A/L/L Levels	2.0 (High)	Policy
3	Accounting Water	Expansion of Water Storage Facilities	2.0 (High)	Policy
4	Accounting Water	Planning for Greater Storage Allocation	2.0 (High)	Policy
5	Accounting Water	Block Access for Central Water	2.0 (High)	Policy
6	Accounting Water	Agriculture Water for First Nations	2.0 (High)	Policy
7	Accounting Water	Encourage Use of Recycled Water	2.0 (High)	Policy
8	Water Governance	Do Not Support Unilateral Use of Water	2.0 (High)	Legislation
9	Water Governance	Clear Rules for Access, Use and Trade of Water	2.0 (High)	Legislation
10	Water Governance	Clear Scaled Regulation of Conveyance Use Supported	2.0 (High)	Legislation
11	Water Governance	Agriculture Water Programs Have to be Reexamined	2.0 (High)	Policy
12	Water Governance	Transfer or Trading of Water Rights Between Water Users	2.0 (High)	Legislation
13	Pricing	Water Pricing Will Consider Agriculture's Ability to Pay	2.0 (High)	Policy
14	Pricing	Water Pricing Structure Will Promote Sustainable Mgmt.	2.0 (High)	Policy
15	Pricing	Consider Benefits of Ag Storage Facilities Recognized	2.0 (High)	Policy
16	Water Use	Establish a Pump for Fall Season Learning	2.0 (High)	Legislation
17	Water Use	Expand Irrigation System Licenses	2.0 (High)	Legislation
18	Water Use	Maximize Beneficial Storage Support by License	2.0 (High)	Policy
19	Water Use	Maximize Water Use in Permanent Systems and Long Term	2.0 (High)	Legislation
20	Water Use	Promote Certified Agricultural Irrigation Designs	2.0 (High)	Policy
21	Water Use	Encourage Irrigation Scheduling to Improve Efficiency	2.0 (High)	Extension
22	Water Use	Encourage Irrigation Scheduling	2.0 (High)	Policy
23	Water Use	Enable Irrigation Scheduling Planning Process	2.0 (High)	Policy
24	Water Use	Water Use Reduced Carbon Offset	2.0 (High)	Policy
25	Water Use	Water Use Reduced Carbon Offset	2.0 (High)	Policy
26	Water Quality	Agriculture Has Suitable Water Quality for Use	2.0 (High)	Policy
27	Water Quality	Reduce Agriculture's Impact on Water Quality	2.0 (High)	Policy
28	Water Quality	Balance Farm and Agriculture's Needs	2.0 (High)	Policy
29	Water Quality	Watering Infrastructure for Irrigation Districts	2.0 (High)	Policy
30	Water Quality	Water Drainage Plans Consider Agriculture	2.0 (High)	Policy
31	Water Quality	Farmland Not Used for Stormwater Retention	2.0 (High)	Policy
32	Water Quality	Other Developments Increase Frequency of Agricultural Landfills	2.0 (High)	Policy
33	Water Quality	Other Developments Increase Frequency of Agricultural Landfills	2.0 (High)	Policy
34	Water Quality	Other Developments Increase Frequency of Agricultural Landfills	2.0 (High)	Policy
35	Water Quality	Other Developments Increase Frequency of Agricultural Landfills	2.0 (High)	Policy
36	Water Quality	Other Developments Increase Frequency of Agricultural Landfills	2.0 (High)	Policy
37	Water Quality	Other Developments Increase Frequency of Agricultural Landfills	2.0 (High)	Policy
38	Water Quality	Other Developments Increase Frequency of Agricultural Landfills	2.0 (High)	Policy
39	Water Quality	Other Developments Increase Frequency of Agricultural Landfills	2.0 (High)	Policy
40	Water Quality	Other Developments Increase Frequency of Agricultural Landfills	2.0 (High)	Policy



B.C. Irrigation Management Guide





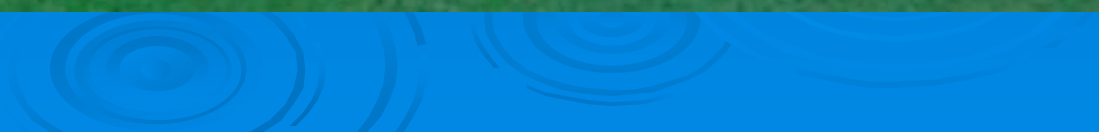




Irrigation System Uniformity



Efficient Irrigation or Not?



Benefits of Automatic Irrigation Systems

- Better water efficiency (proper design)
- Improved uniformity (proper design)
- Can irrigate during low use demand
- Savings in time and effort
- Improvement in landscape look (hidden sprinklers)
- Property value increase



Automatic Irrigation Systems

- An automated system does **NOT** necessarily mean improved efficiency and or water savings.



Design is critical

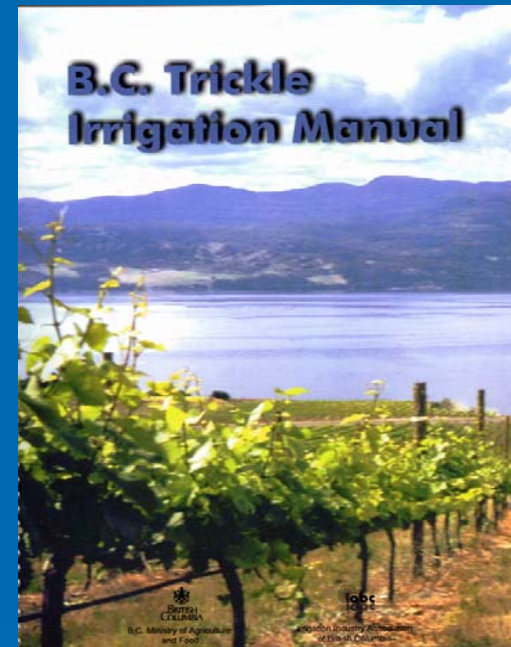
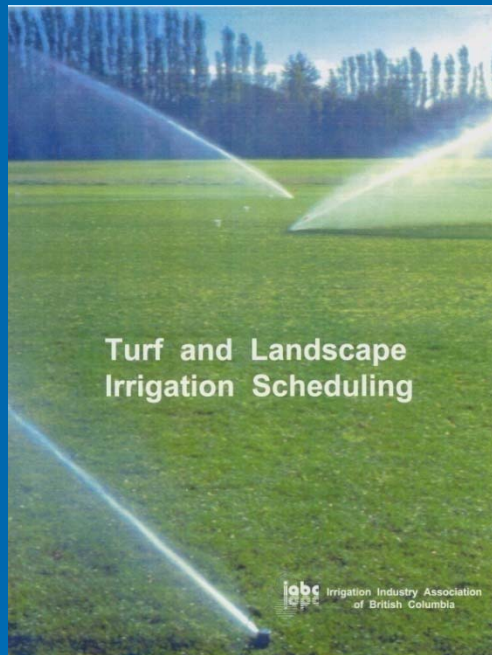


Steps to Proper Design

- Collect site information and prepare an accurate plan.
- Follow approved design principles
- Space sprinklers to appropriate spacings
- Ensure uniform pressure is achieved for each zone
- Zone similar areas together



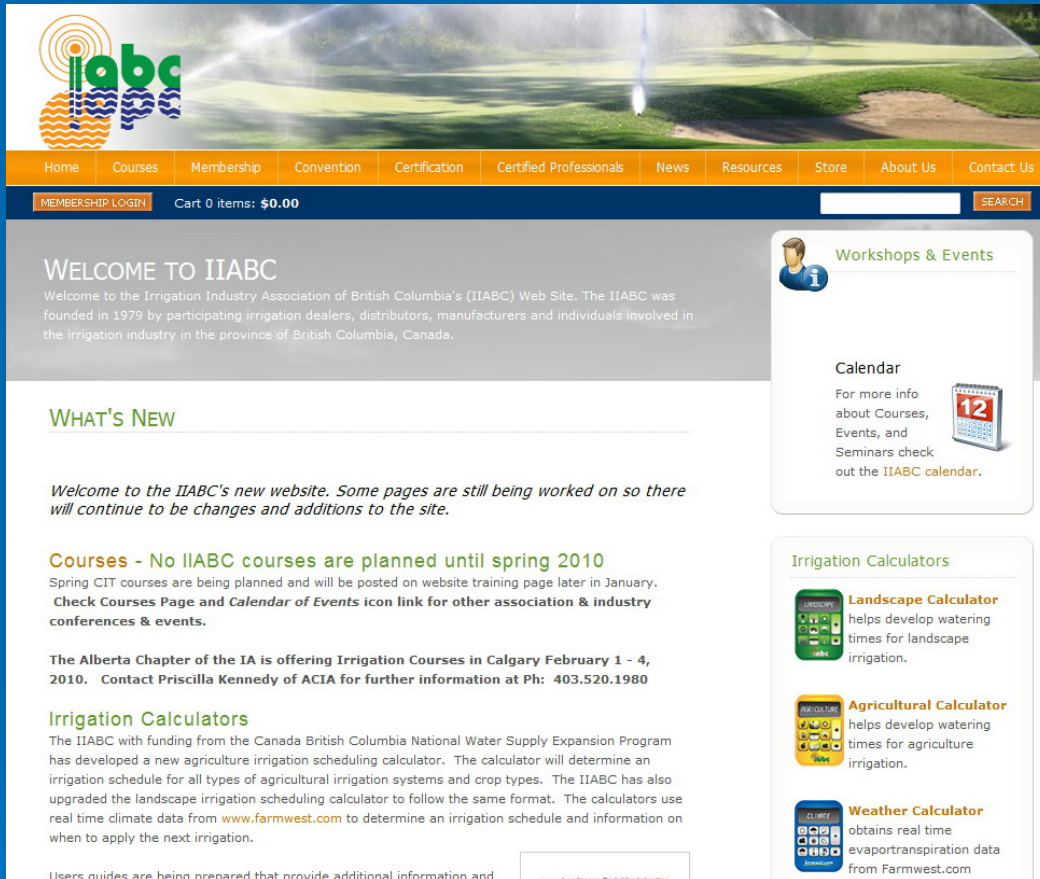
Irrigation Design Standards



Available from
**Irrigation Industry Association of B.C.
(IIABC)**

www.irrigationbc.com

Certified Irrigation Technician (CIT)



The screenshot shows the IIABC website interface. At the top is a navigation menu with links for Home, Courses, Membership, Convention, Certification, Certified Professionals, News, Resources, Store, About Us, and Contact Us. Below the menu is a search bar and a cart icon showing 0 items for \$0.00. The main content area features a 'WELCOME TO IIABC' section with a brief history of the organization. A 'WHAT'S NEW' section contains three items: a notice about website updates, a course announcement for spring 2010, and information about irrigation courses in Calgary. To the right, there are three utility boxes: 'Workshops & Events' with a calendar icon, 'Irrigation Calculators' listing Landscape, Agricultural, and Weather calculators, and a partially visible 'Users guides' section.

Certified installation and maintenance of irrigation systems is available for Agriculture and Landscape in 2 levels.

Level 1:

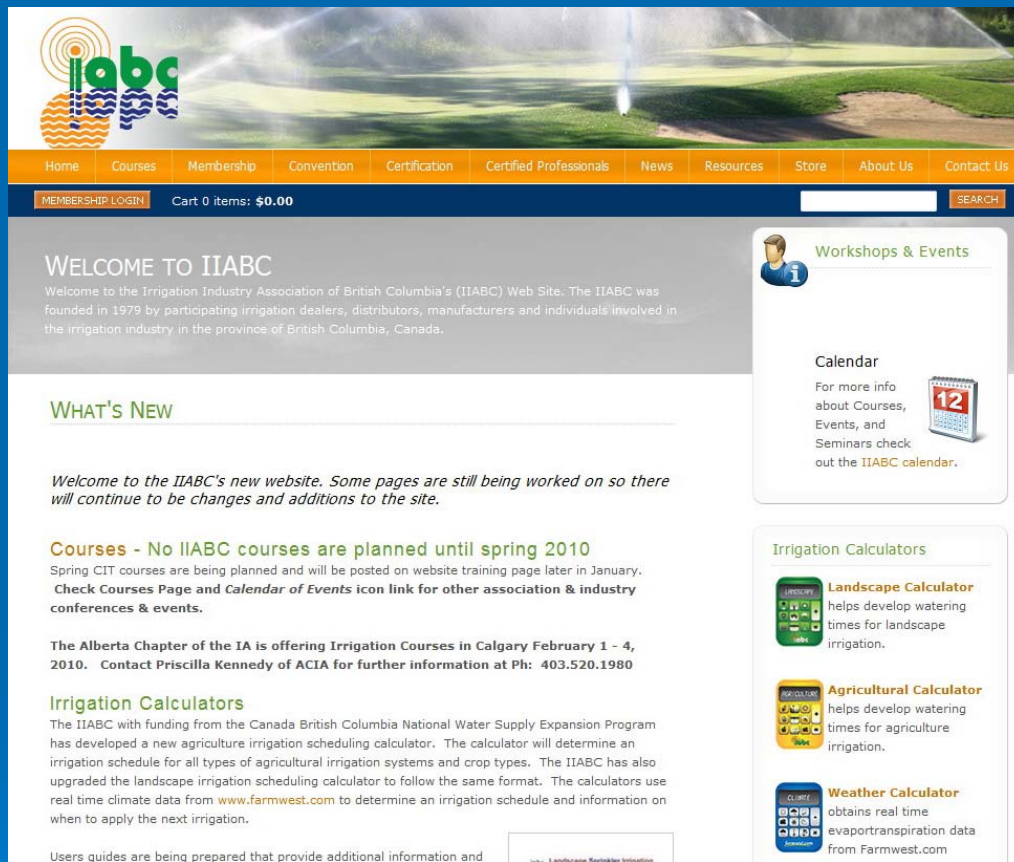
One-day training
Pass a written exam

Level 2:

Two-day training
Pass a written exam

www.irrigationbc.com

Certified Irrigation Designers (CID)



WELCOME TO IIABC
Welcome to the Irrigation Industry Association of British Columbia's (IIABC) Web Site. The IIABC was founded in 1979 by participating irrigation dealers, distributors, manufacturers and individuals involved in the irrigation industry in the province of British Columbia, Canada.

WHAT'S NEW

Welcome to the IIABC's new website. Some pages are still being worked on so there will continue to be changes and additions to the site.

Courses - No IIABC courses are planned until spring 2010
Spring CIT courses are being planned and will be posted on website training page later in January. Check Courses Page and Calendar of Events icon link for other association & industry conferences & events.

The Alberta Chapter of the IA is offering Irrigation Courses in Calgary February 1 - 4, 2010. Contact Priscilla Kennedy of ACIA for further information at Ph: 403.520.1980

Irrigation Calculators
The IIABC with funding from the Canada British Columbia National Water Supply Expansion Program has developed a new agriculture irrigation scheduling calculator. The calculator will determine an irrigation schedule for all types of agricultural irrigation systems and crop types. The IIABC has also upgraded the landscape irrigation scheduling calculator to follow the same format. The calculators use real time climate data from www.farmwest.com to determine an irrigation schedule and information on when to apply the next irrigation.

Users guides are being prepared that provide additional information and

Workshops & Events

Calendar
For more info about Courses, Events, and Seminars check out the IIABC calendar.

Irrigation Calculators

- Landscape Calculator**
helps develop watering times for landscape irrigation.
- Agricultural Calculator**
helps develop watering times for agriculture irrigation.
- Weather Calculator**
obtains real time evapotranspiration data from Farmwest.com

Design Certification is available in:

1. Residential
2. Commercial
3. Golf Course
4. Landscape Drip

Requirements:

1. Field Experience
2. Pass a written exam



www.irrigationbc.com

Certified Irrigation Scheduler / Auditor

An Auditor:

- Investigates local site conditions
- Identifies and correct system deficiencies where possible
- Determines system weak spots
- Develops an irrigation schedule



Irrigation Audit

- Nozzle size and wear
- Nozzle flow rate
- Nozzle pressure
- Sprinkler spacing
- System application rate



Correct System Deficiencies

- Fix broken heads
- Check sprinkler performance
- Take into account wind effects



Correct System Deficiencies

- Irrigate only the target area
- Check for poor distribution
- Eliminate runoff



Reduce Water Use

Develop an Irrigation Schedule

Smart Controllers

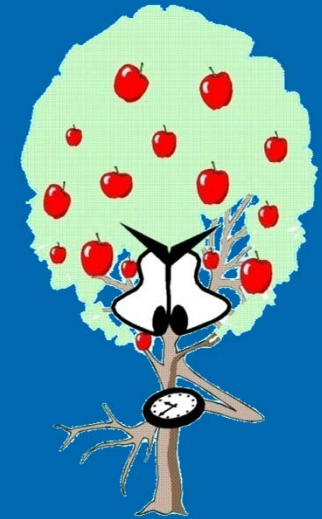
- Adjust schedule by using climate parameters to calculate a schedule
- Climate station can be hooked in directly or remotely



Irrigation Scheduling

Requires knowledge on:

- Soils
- Climate
- Irrigation System





Landscape Irrigation SCHEDULING CALCULATOR



Is this your first visit to the Calculator?

This Irrigation Scheduling Calculator uses real-time daily evapotranspiration (ET) rates determined from climate stations that are linked to www.Farmwest.com. All Farmwest stations are located within British Columbia.

For case studies outside BC, the Calculator allows users to input local ET data that reflects the climate conditions at their specific location.

[Register New Account](#)

Also Available:

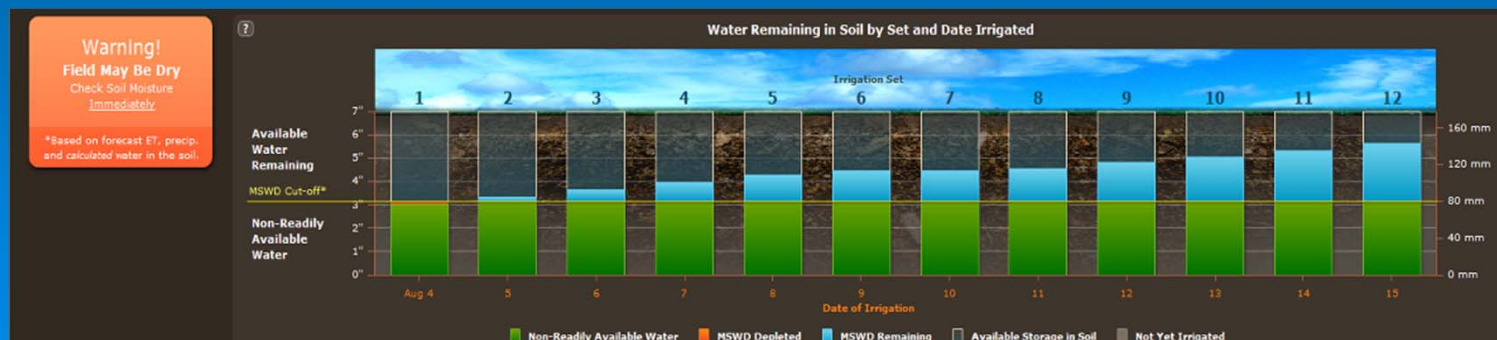
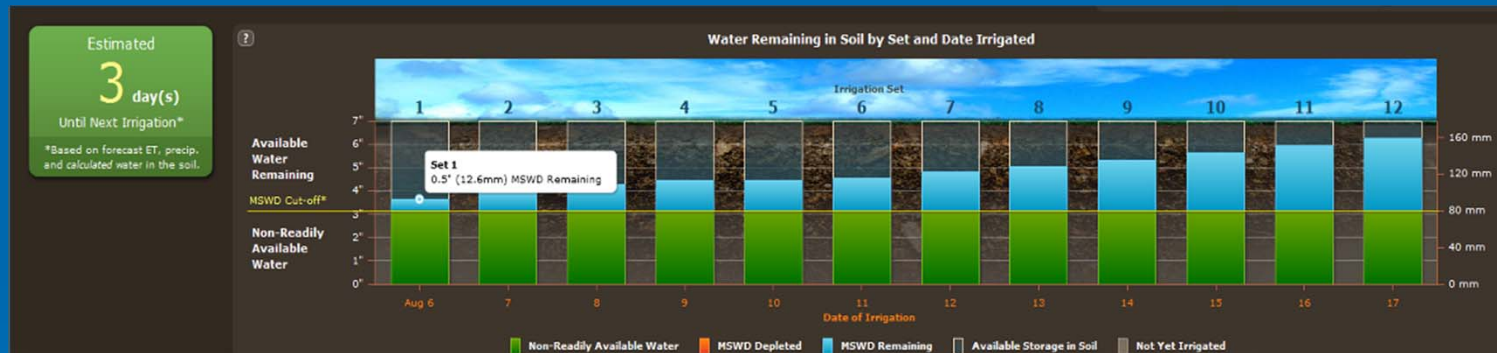
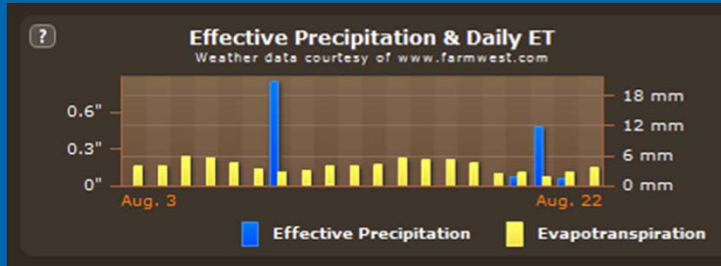
Agricultural Irrigation
Scheduling Calculator



[Click to Switch!](#)

www.irrigationbc.com

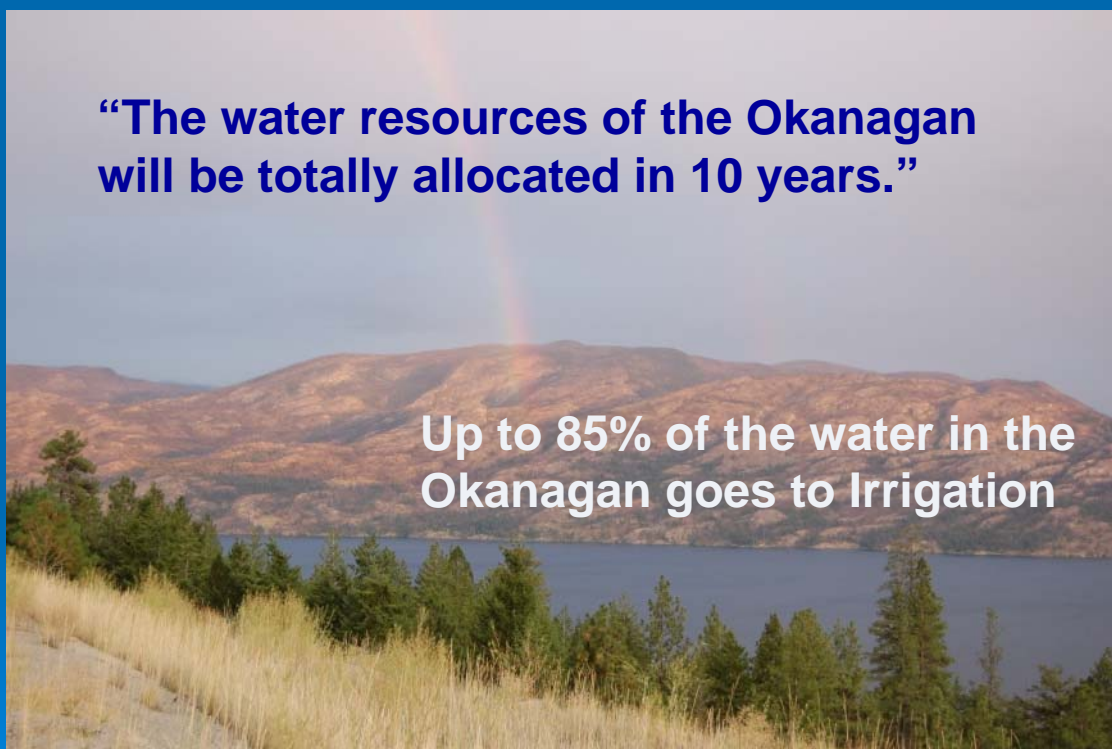
Irrigation Scheduling Calculator



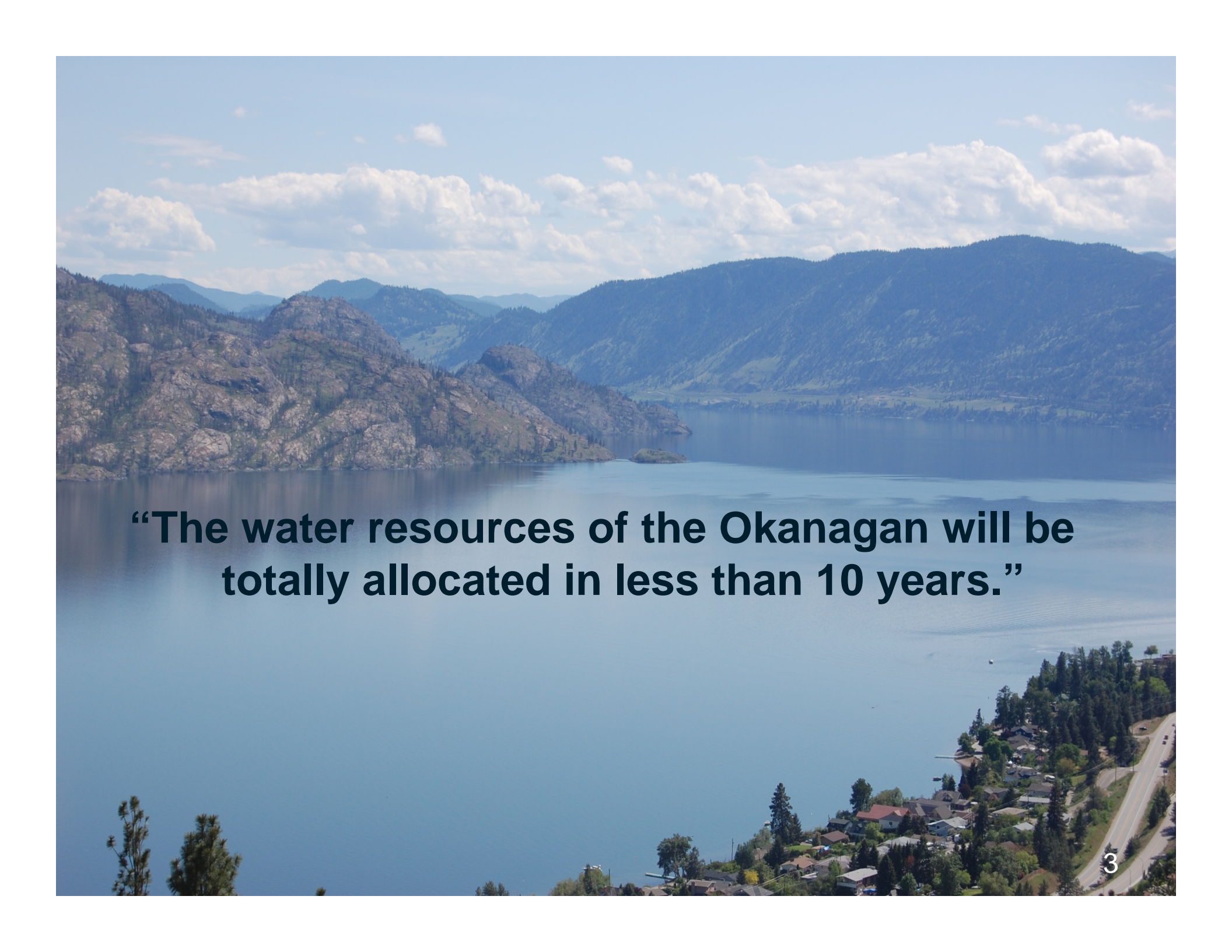
Agriculture Water Strategy

Reserving Water

1	Securing Water	Reserve Water for Agricultural Lands	EXTREME	Legislation
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Water Strategy Issue Summary				
#	Category	Description of Issue	Rating	Implication
1	Securing Water	Reserve Water for Agricultural Lands	EXTREME	Legislation
2	Securing Water	Water Purveyors Secure Water to A/LR Lands	EXTREME	System
3	Securing Water	Expansion of Water Storage Facilities	EXTREME	Policy
4	Securing Water	Planning for Climate Change Adaptation	MEDIUM	Policy
5	Securing Water	Secure Access for Livestock Water	EXTREME	Policy
6	Securing Water	Agriculture Water for First Nations	EXTREME	Policy
7	Securing Water	Encourage Use of Recaptured Water	LOW	Policy
8	Water Governance	Do Not Support Unauthorised Use of Water	LOW	Legislation
9	Water Governance	Users Adhere to Annual Use and Peak Withdrawal	MEDIUM	Legislation
10	Water Governance	Area Based Regulation of Groundwater Use Supported	EXTREME	Legislation
11	Water Governance	Agricultural Water Purveyors Have Ag Representation	EXTREME	Policy
12	Water Governance	Transfer or Trading of Water Rights Requires Water Ag Sector	EXTREME	Legislation
13	Pricing	Water Pricing Will Consider Agriculture's Ability to Pay	LOW	System
14	Pricing	Industry Support Pricing Structure that Promoting Beneficial Mgmt	LOW	Policy
15	Pricing	Societal Benefits of Ag Storage Facilities Recognized	LOW	Policy
16	Water Use	Establish a Pricing for Peak Season Licensing	MEDIUM	Legislation
17	Water Use	Extend Irrigation Season Licences	LOW	Legislation
18	Water Use	Maximize Beneficial Acreage Suggested by Licence	LOW	Policy
19	Water Use	Monitor Water Use on Reservoir Systems and Large Users	MEDIUM	Funding
20	Water Use	Promote Certified Agricultural Irrigation Designs	EXTREME	Policy
21	Water Use	Encourage Irrigation Scheduling to Improve Efficiency	EXTREME	Extension
22	Water Use	Improve Irrigation System Efficiencies	LOW	Funding
23	Water Use	Develop Sustainable Design Management Planning Process	LOW	Policy
24	Water Use	Water Conservation Incentives	MEDIUM	Funding
25	Water Use	Water Use Related Carbon Offsets	LOW	Policy
26	Water Quality	Agriculture Has Sustainable Water Quality for Use	MEDIUM	Funding
27	Water Quality	Reduce Agriculture's Impact on Water Quality	LOW	Funding
28	Water Quality	Balance Fish and Agriculture's Needs	MEDIUM	Policy
29	Water Quality	Funding Infrastructure for Irrigation Districts	LOW	Funding
30	Water Quality	Monitor Storage Plans Consider Agriculture	EXTREME	Policy
31	Rural and Inuitation	Farmland Not Used for Stormwater Retention	LOW	Policy
32	Rural and Inuitation	Urban Developments Increase Flooding of Agricultural Lowlands	LOW	System
33	Rural and Inuitation	Obtain Funding for Climate Infrastructure	EXTREME	Funding
34	Extension	Enable Public on Agriculture and Water Issues	LOW	Extension



“The water resources of the Okanagan will be totally allocated in less than 10 years.”

Agriculture Water Reserve

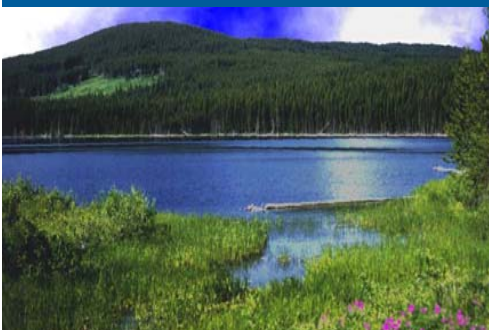
Process

Must consider:

- Environmental needs
- Domestic
- Other resource needs
- Water sources and supply capability

Should include:

- Current irrigation licences for agriculture
- Historical Livestock Use
- Future possible demand - climate and area
- Water sources and supply capability



Agriculture Water Reserve

Methodology to Calculate Needs

Ag Water Demand Model

- Determines theoretical requirements including climate change
- Current and future water demand
- Water demand for ALR lands that currently are not irrigated
- Can assess groundwater demand



Irrigation Demand Model

AAFC – Denise Neilsen
Agri – Ted van der Gulik

Objective:

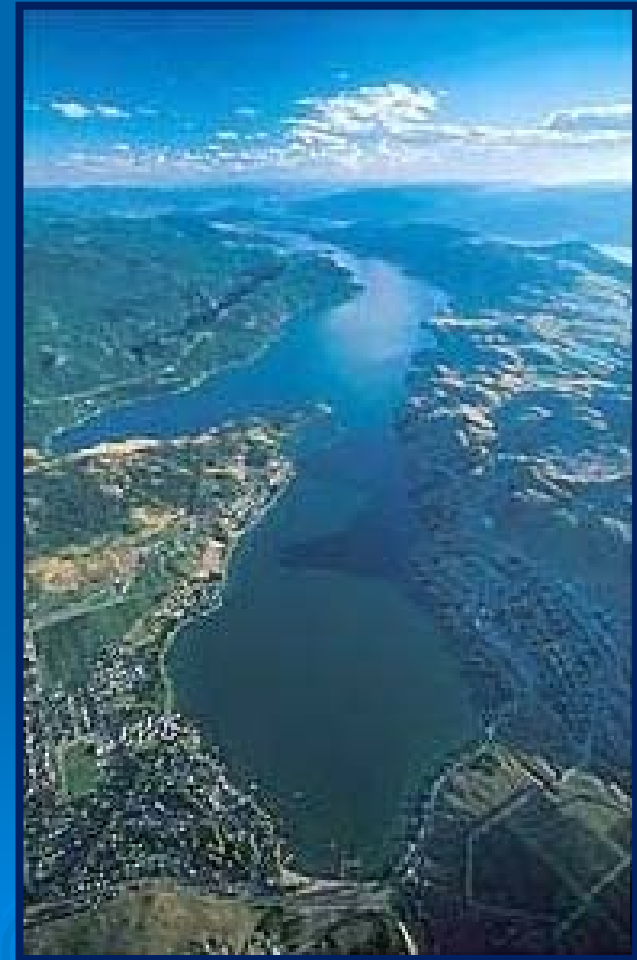
Develop a model that calculates agriculture's irrigation needs by purveyor, municipality, district and sub-watershed.

Methodology:

Determine Property-by-Property water use

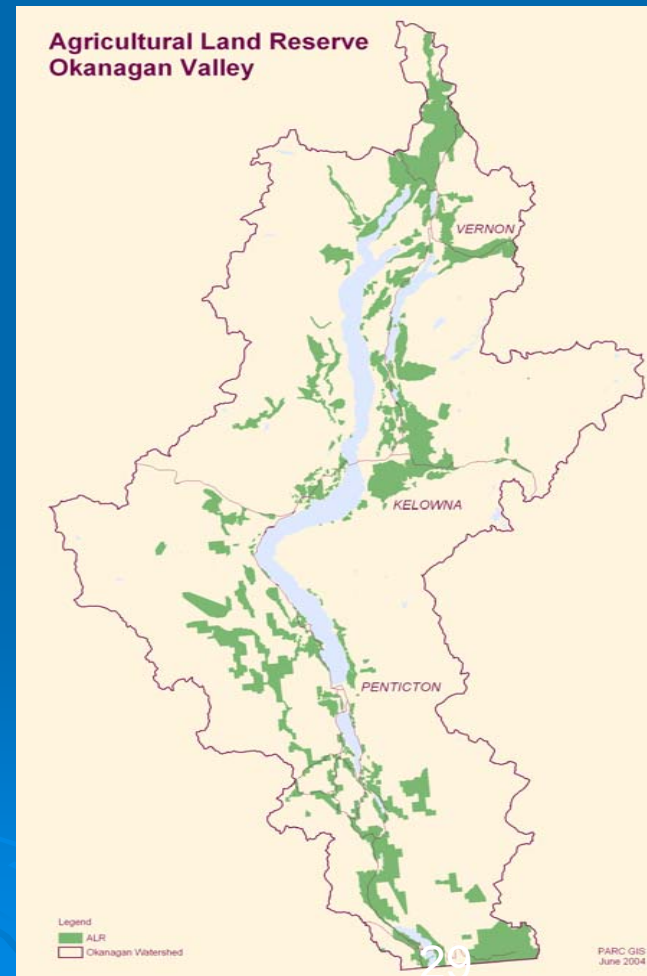
Result:

Planning Tools that secure water for current and future agricultural needs



Irrigation Water Demand Model

- MAL and AAFC have developed a GIS-based irrigation water demand model
- Originally developed for the Okanagan Basin



Land Use Inventories: Data Collection

DATA COLLECTED ON

- General Land Use
- Land Cover
- Agricultural Activities
(ex. Livestock)
- Agricultural Practices
(ex. Wind machine)
- Irrigation Systems

FOR ALL PARCELS:

In the ALR

In an Agricultural Zone

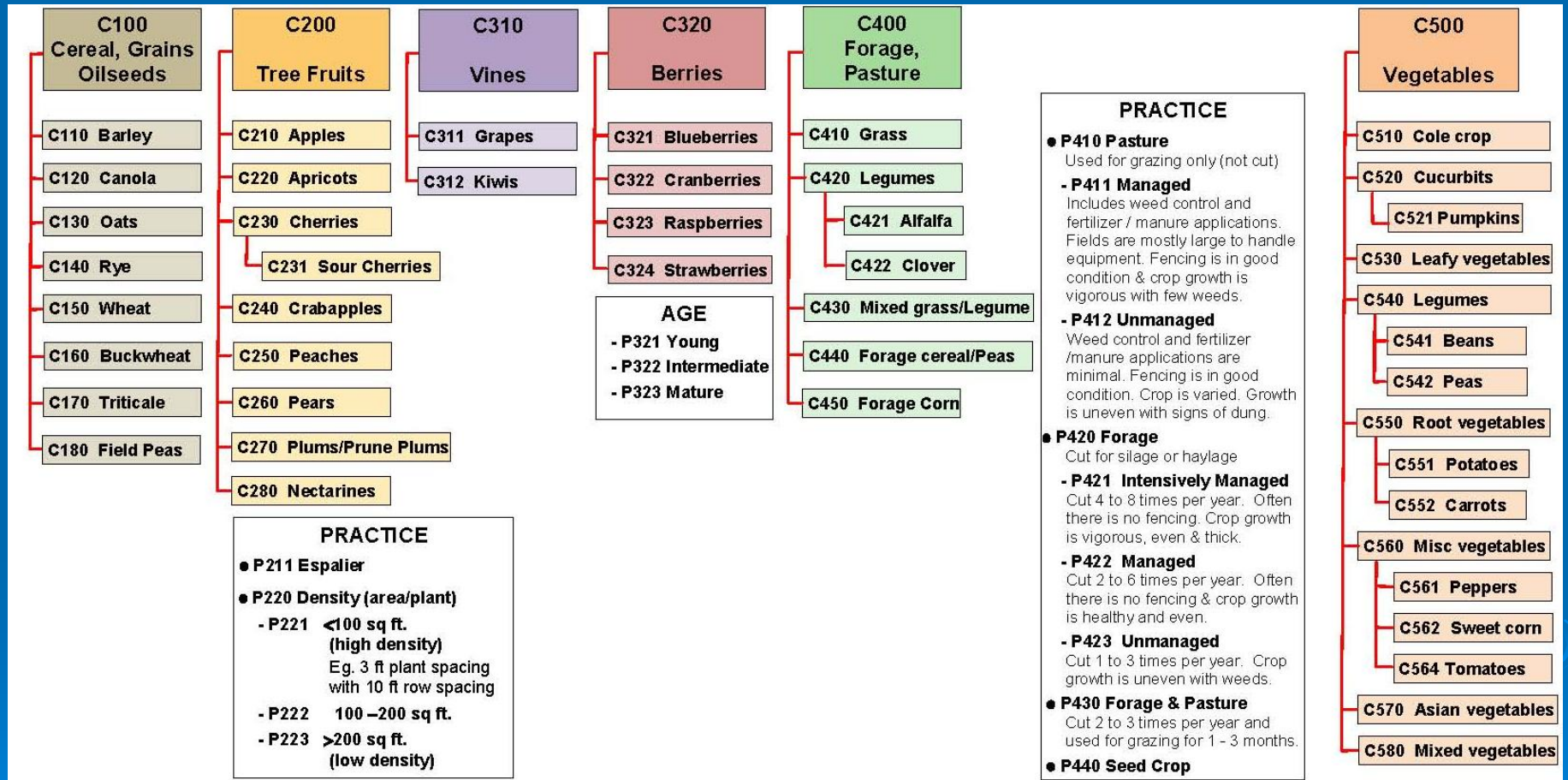
With Farm Class

With agricultural use

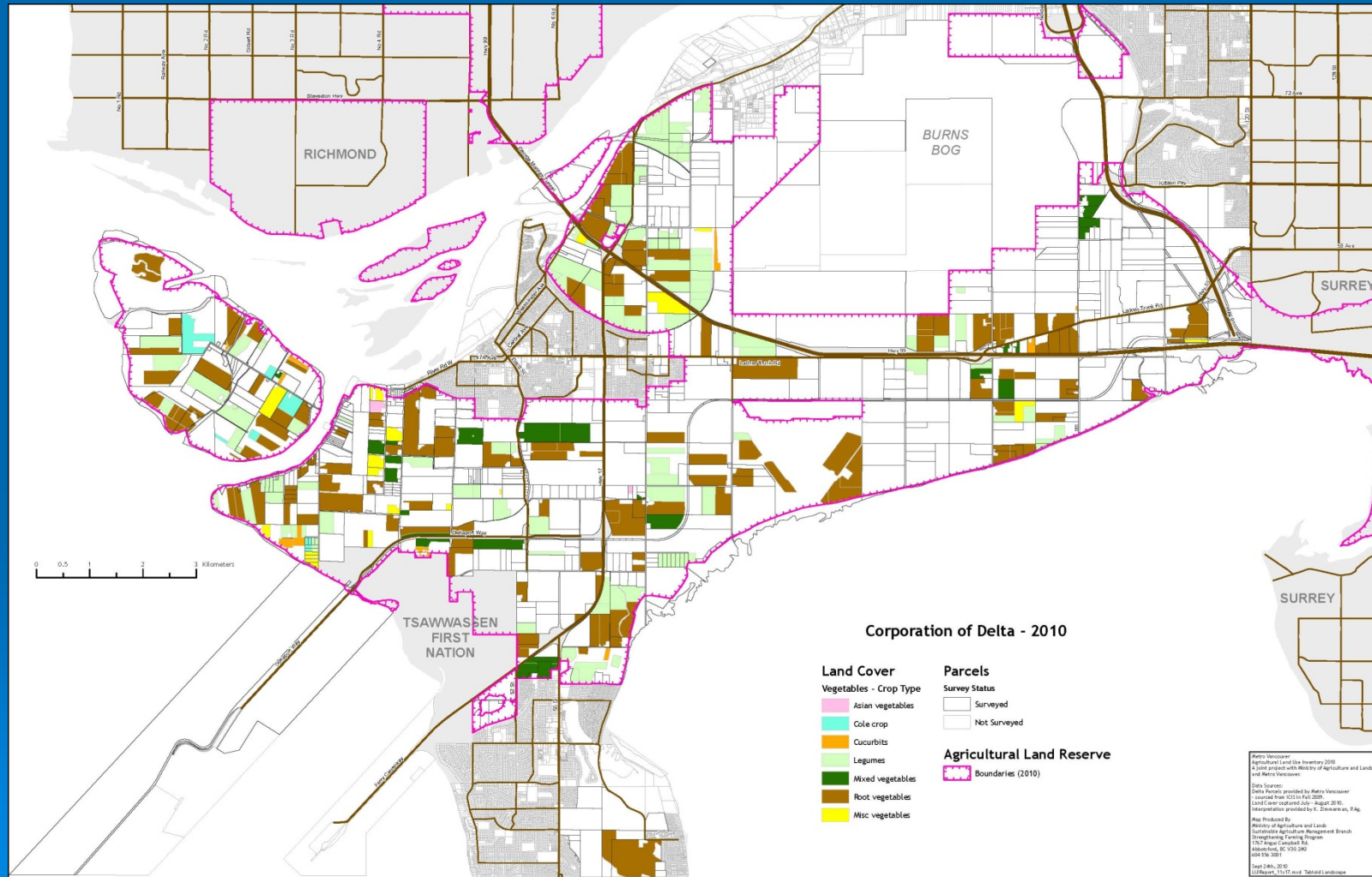


Land Cover – Crop Type

An Example Classification:

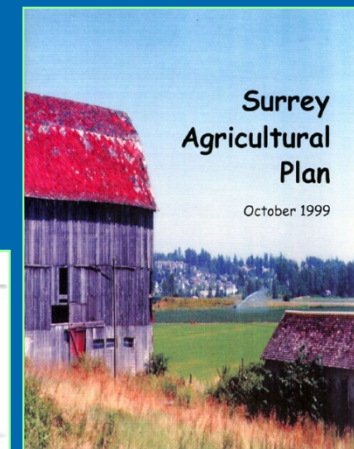


Land Use Inventories: Results



Agricultural Area Plan

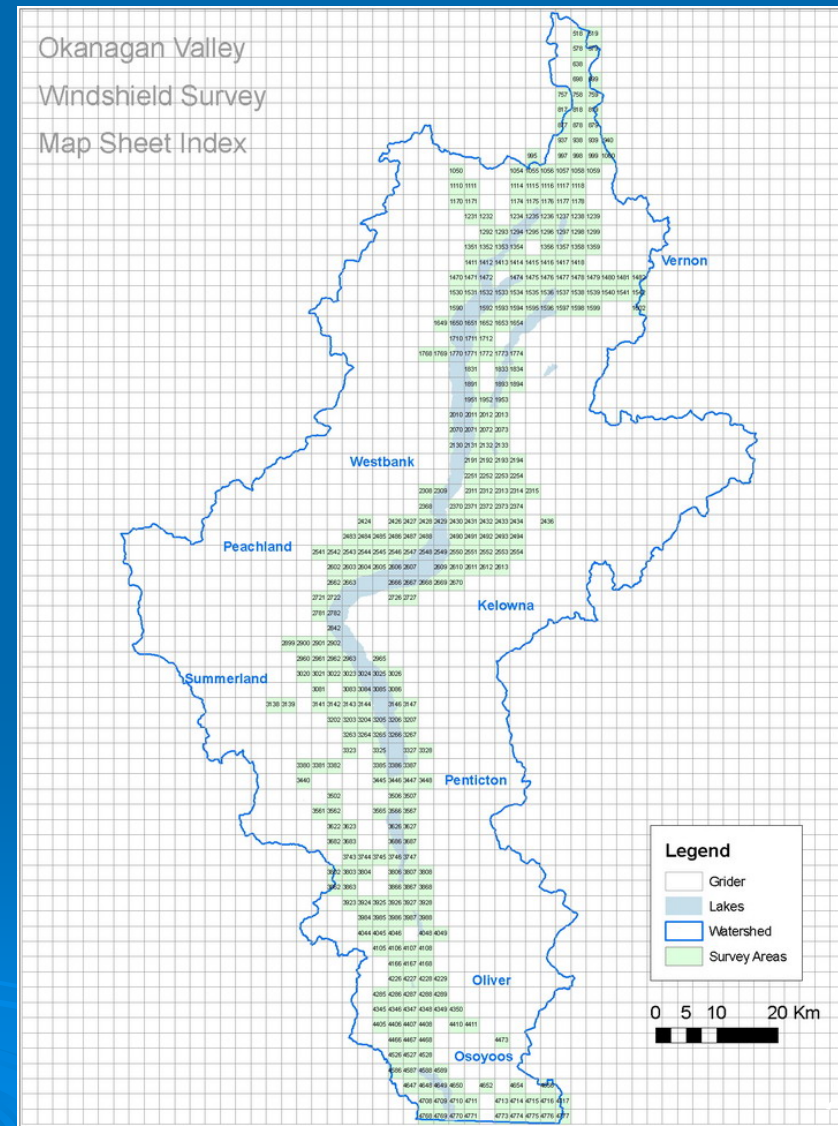
- Raise awareness of agriculture
- Build community support for farming
- Identify opportunities to support and expand farming
- Resolve limitations for agriculture
- Promote land use compatibility - urban-rural



Irrigation Water Demand Model

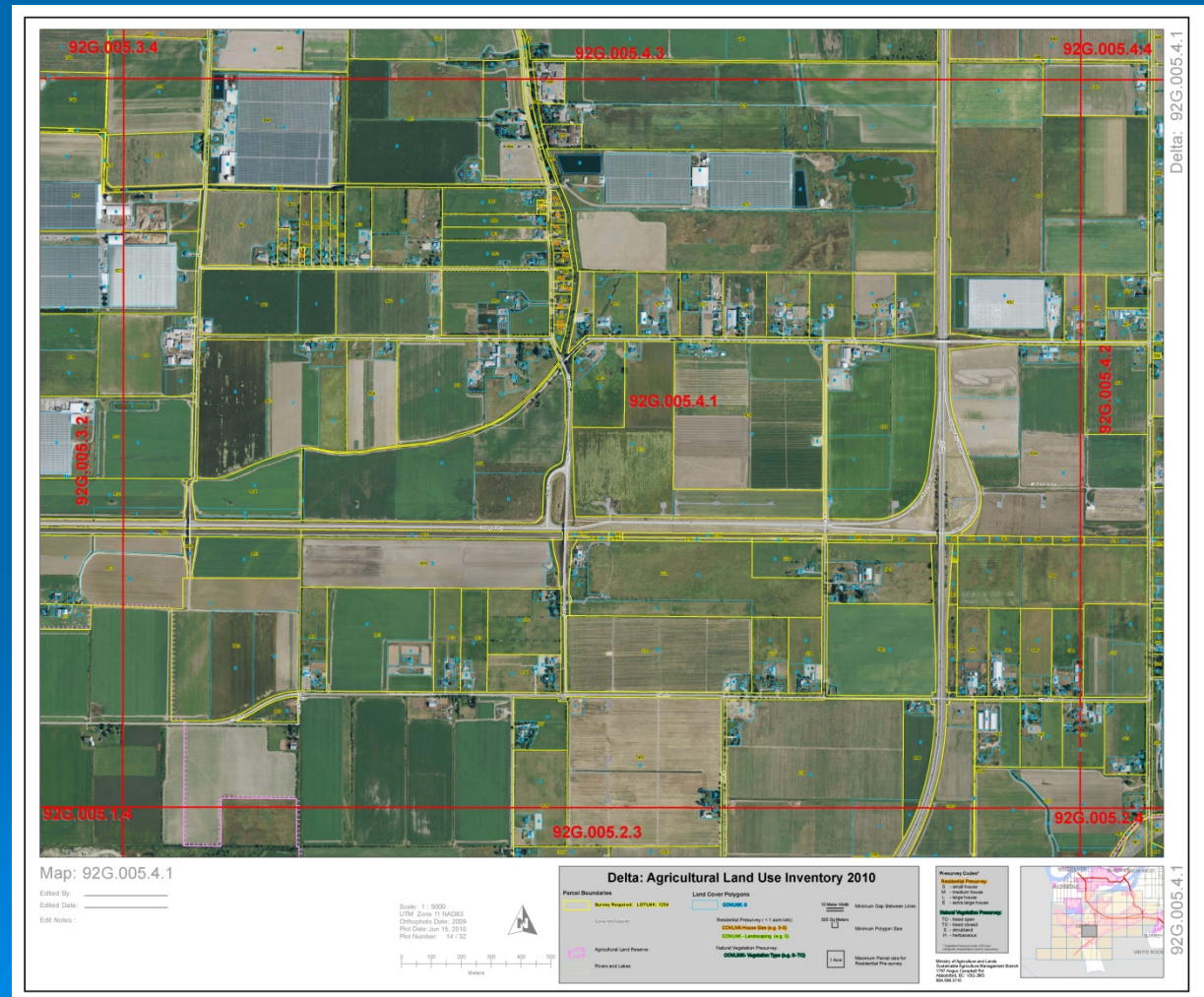
Unified Cadastre

- The agricultural area is divided into 398 map sheets



Land Use Inventories: Methodology

Maps are created using aerial photography and GIS



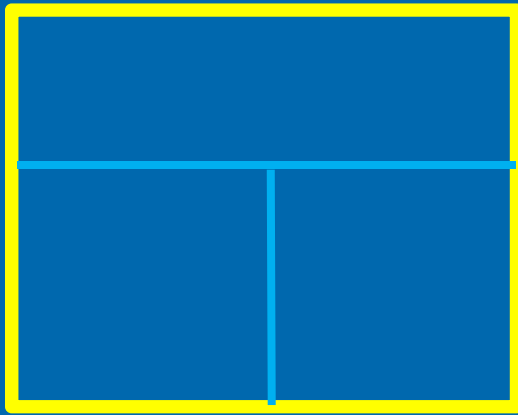
Land Use Inventories: Methodology

Cadaastre



Land Use Inventories: Methodology

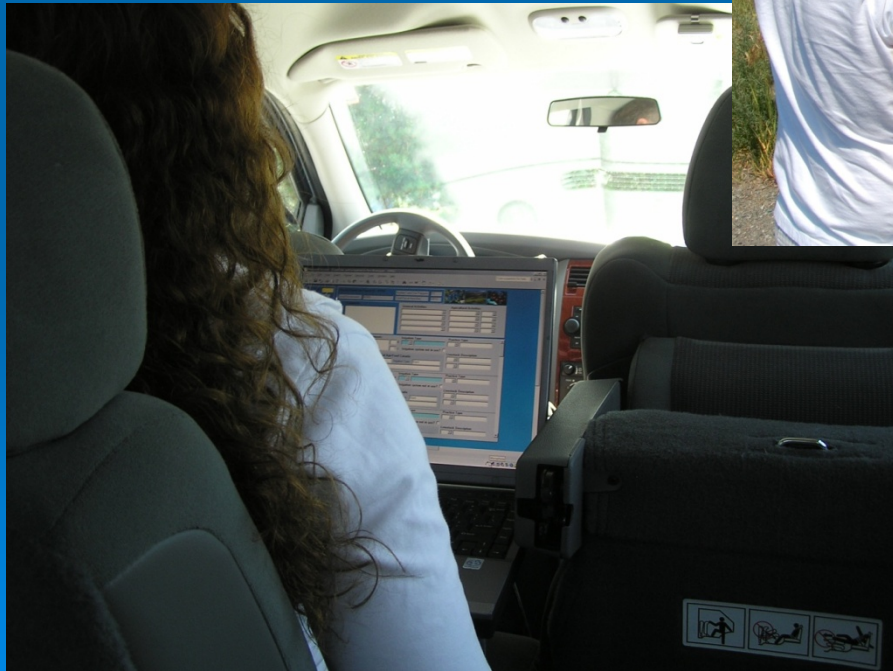
Cadastral



Land Cover is first digitized in GIS



Land Use Inventories: Methodology



Windshield survey

Each parcel is visited and the land cover and land use is classified and recorded.

Land Use Inventories: Results

Crop Type:



Apple



Pasture

Irrigation System Type:



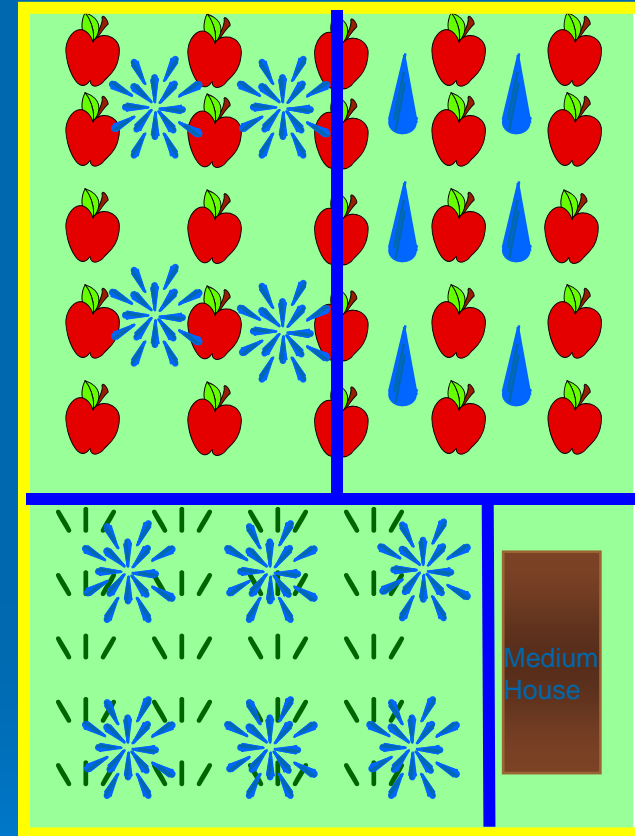
Sprinkler



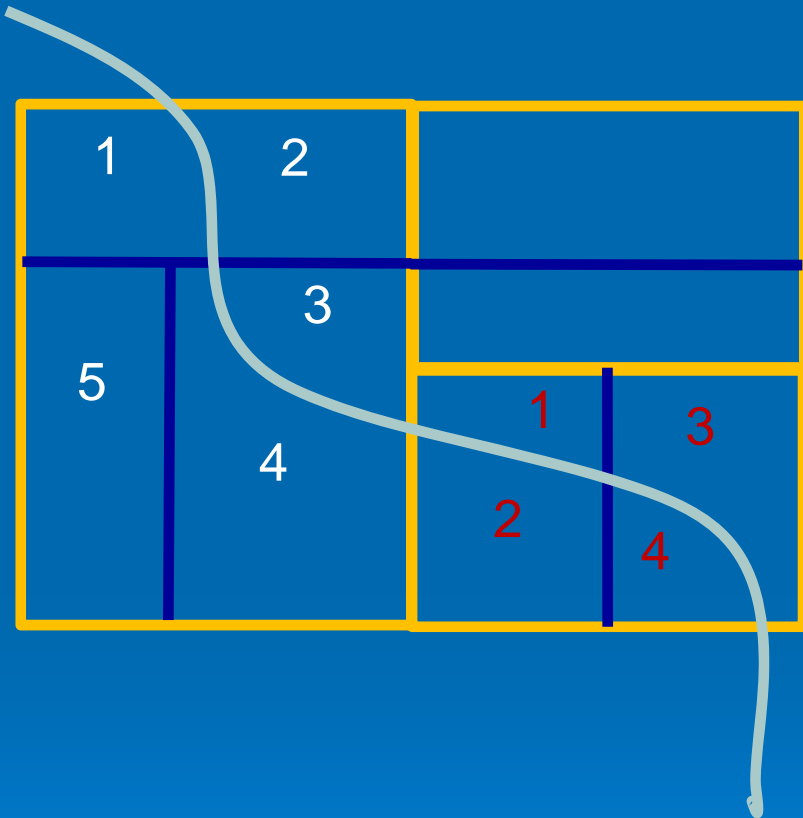
Drip

Building Type:

Medium sized House



Soils Boundary



There are 132,000 polygons generated for the Okanagan in the farming areas

Cadastre

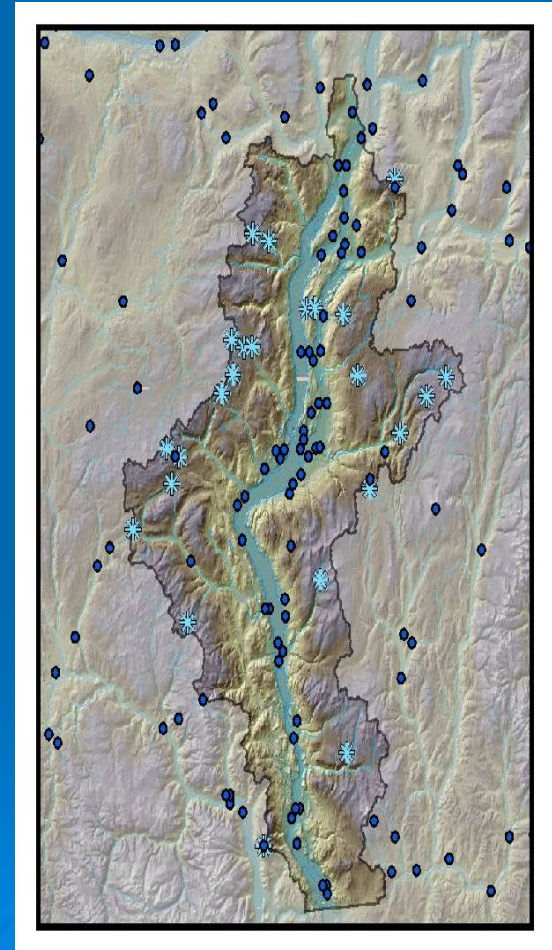
Land and Crop Polygon

Soil Boundary

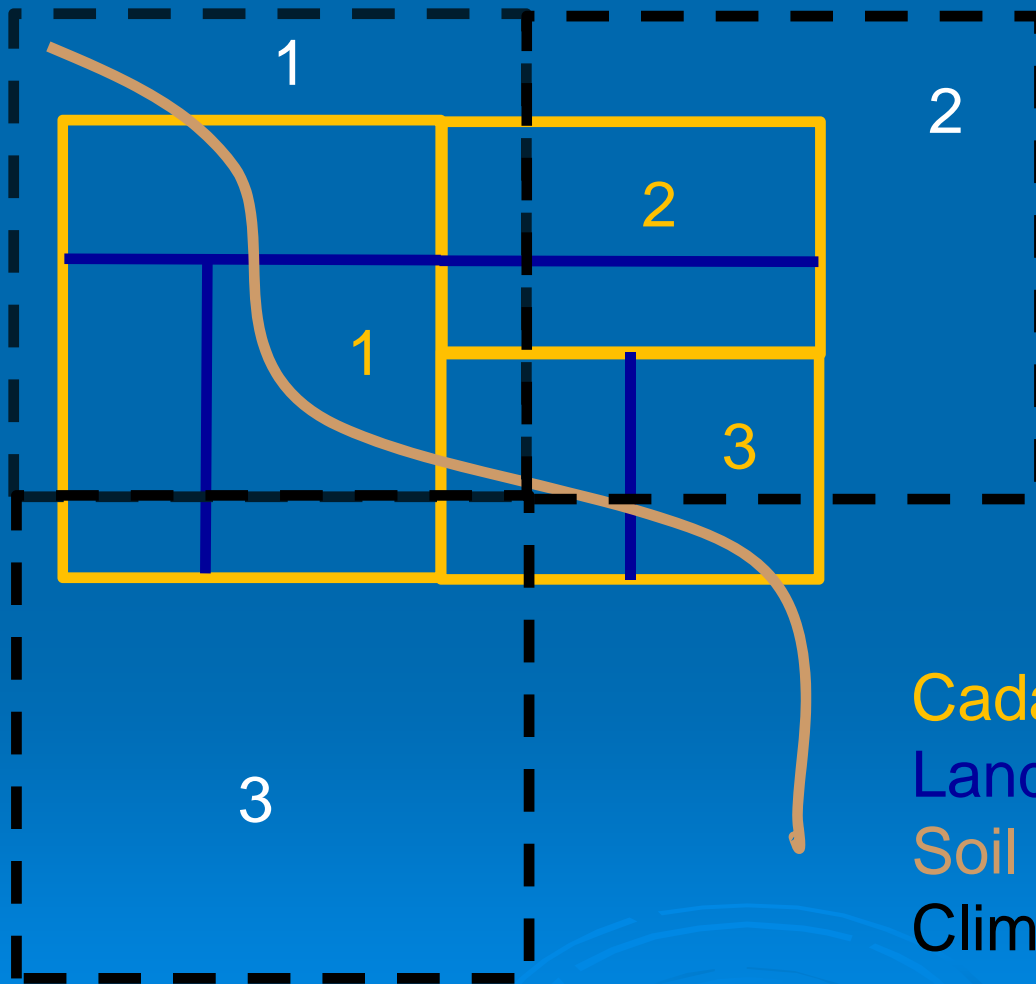
Irrigation Water Demand Model

Climate data:

- A climate model has been developed on a 500 m x 500 m grid
- Provide current climate data based on historical and current information
- Climate change scenarios have been developed



Climate Data



2 A climate cell gets assigned to each cadastre

Climate grid linked to Cadastre 1

Climate grid linked to Cadastre 2 and 3

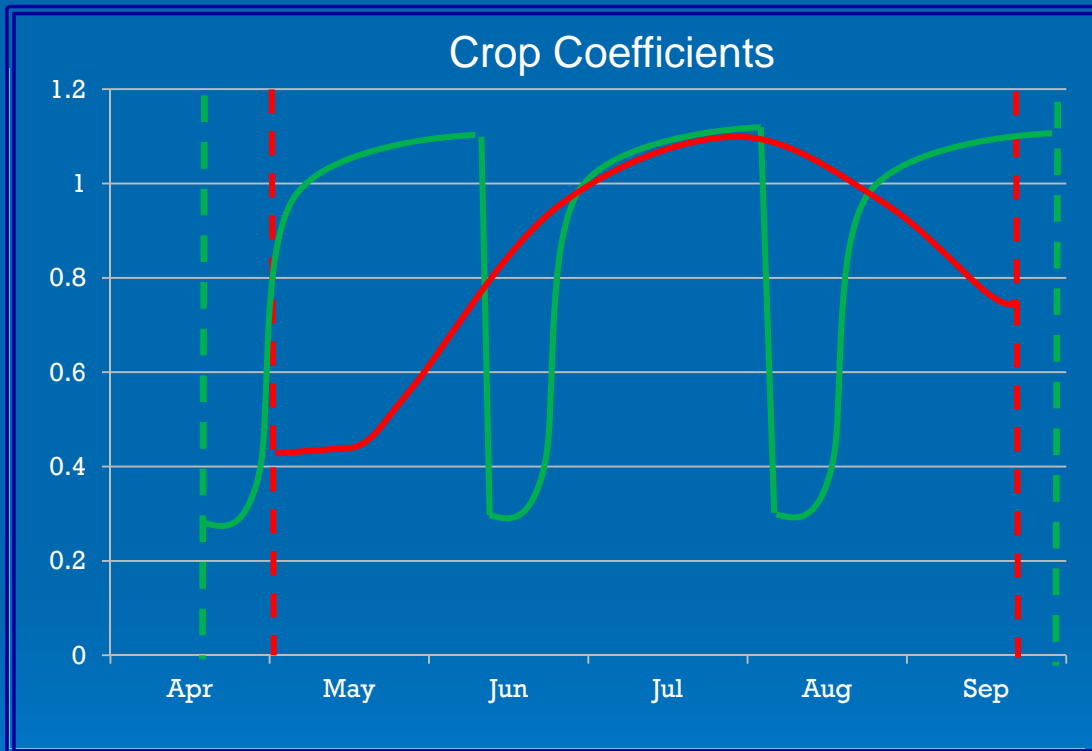
Cadastre

Land and Crop Polygon

Soil Boundary

Climate Grid

Model Calculations



--- Apples
--- Alfalfa

Algorithm calculates water demand from:

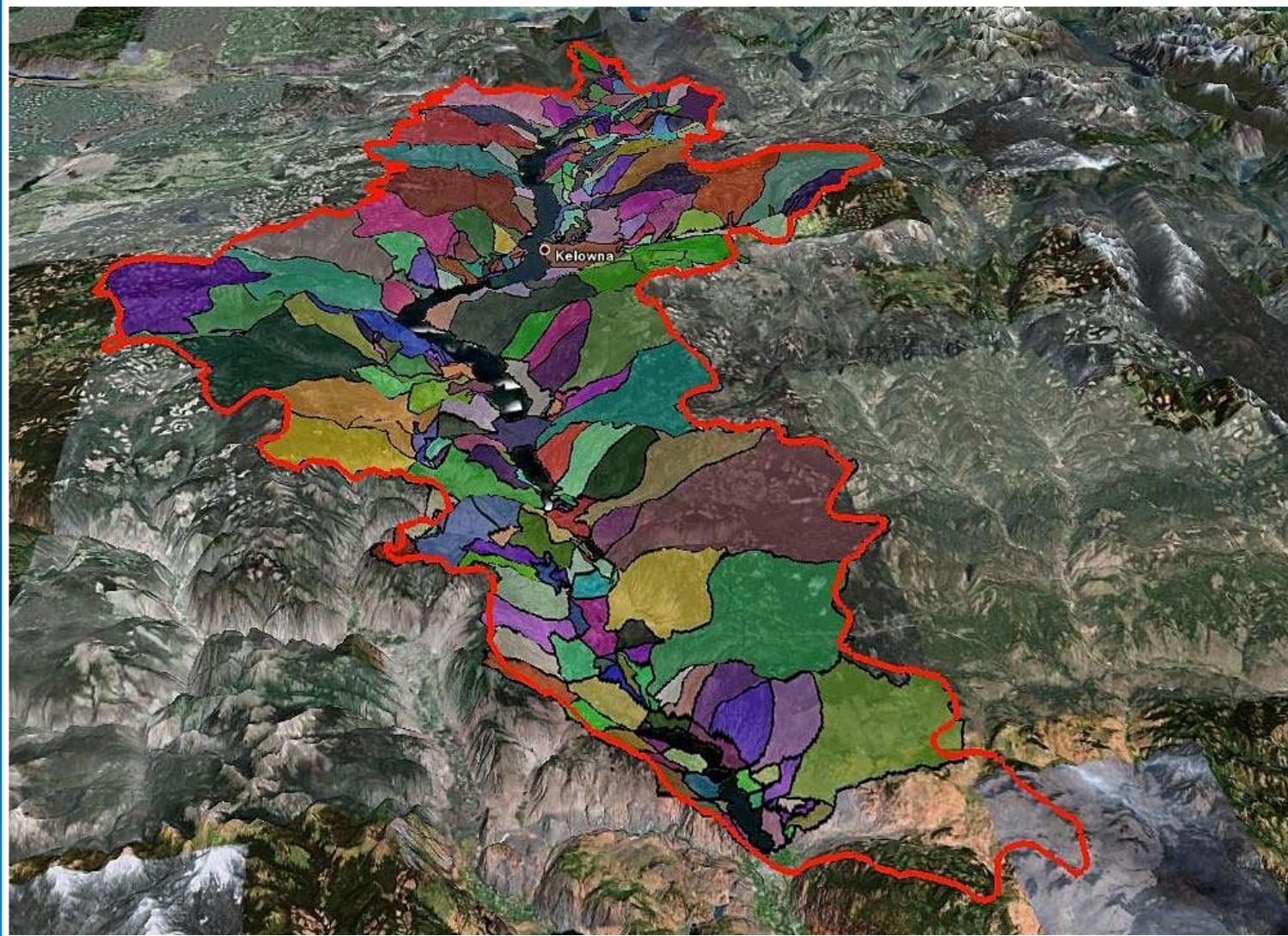
- **ET_o** calculated daily from climate data.
- Climate data to determine **start** and **end** of growing season.
- **Crop coefficients** to adjust daily E_{to}
- Soil and rooting depth information to calculate soil water storage, **percolation** rates and determine soil factors
- Irrigation system **efficiencies**

Results by Crop



Crop Group	Irrigated Area (ha)	Irrigation Demand (mm)
Apple	4,292	693
Berry	62	633
Cherry	1,121	733
Forage	8,520	755
Fruit	898	793
Golf	1,048	992
Grape	2,734	413
Landscape Turf	126	1,009
Nursery	385	909
Turf Farm	120	959
Vegetables	531	692
Total =	20,033	704

Groundwater Layer



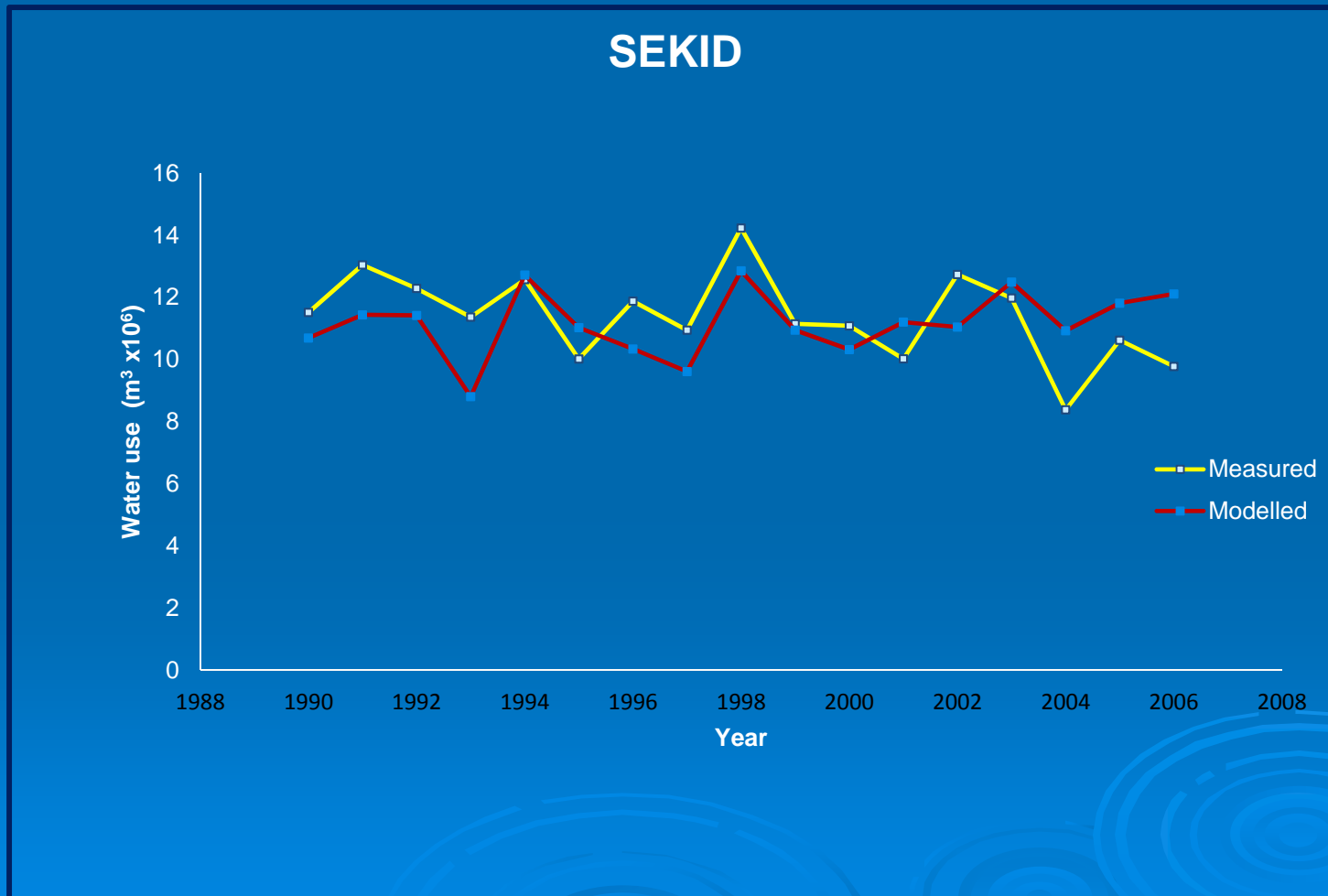
Results by Water Source

Water Source	Irrigated Area (ha)	Irrigation Demand (m ³)
Water License	1,672	11,455,582
Water Purveyor	14,966	107,930,320
Groundwater	3,394	21,695,142
Total	20,033	141,081,043

Assuming good management



Result Comparison



Irrigation Demand Model - Current

Okanagan Basin - Average Irrigation Management											
Year: 2003											
Water Source	Water Licence			Reclaimed Water			Groundwater			Total	
Agriculture	Irrigated	Irrigation	Average	Irrigated	Irrigation	Average	Irrigated	Irrigation	Average	Irrigated	Irrigation
Crop Group	Area	Demand	Req.	Area	Demand	Req.	Area	Demand	Req.	Area	Demand
	(ha)	(m3)	(mm)	(ha)	(m3)	(mm)	(ha)	(m3)	(mm)	(ha)	(m3)
Alfalfa	1,275	9,010,934	707	96	647,964	677	852	5,767,594	677	2,222	15,426,491
Apple	4,070	29,174,202	717	-	-	-	211	1,511,750	717	4,281	30,685,952
Berry	44	291,916	672	-	-	-	18	110,656	603	62	402,572
Cherry	1,074	8,120,474	756	-	-	-	45	367,359	819	1,119	8,487,833
Corn	409	1,956,321	479	23	120,830	525	189	821,606	436	620	2,898,757
Forage	2,964	27,446,657	926	429	4,132,948	964	1,703	13,877,787	815	5,096	45,457,392
Fruit	792	6,576,735	830	-	-	-	102	771,618	759	894	7,348,354
Grape	2,290	9,780,281	427	6	15,923	250	436	1,863,362	427	2,733	11,659,566
Nursery	253	2,543,339	1,006	185	1,263,641	684	127	1,047,376	823	565	4,854,356
Turf Farm	60	606,512	1,008	-	-	-	46	414,190	911	106	1,020,702
Vegetable	370	2,732,012	739	-	-	-	137	845,546	618	507	3,577,558
Inactive	190	-	-	0	-	-	23	-	-	213	-
	13,790	98,239,383		739	6,181,306		3,887	27,398,844		18,416	131,819,533
Turf											
Golf	446	4,471,113	1,002	298	3,095,884	1,041	317	3,095,360	977	1,061	10,662,357
Landscape Turf	488	4,779,235	980	17	172,714	1,004	101	973,438	960	607	5,925,388
Domestic Outdoor	5,169	50,987,109	986	0	1,312	1,006	741	7,578,839	1,023	5,910	58,567,260
	6,104	60,237,457		315	3,269,910		1,159	11,647,637		7,577	75,155,005
Total	19,893	158,476,840	797	1,054	9,451,216	897	5,046	39,046,481	774	25,993	206,974,538

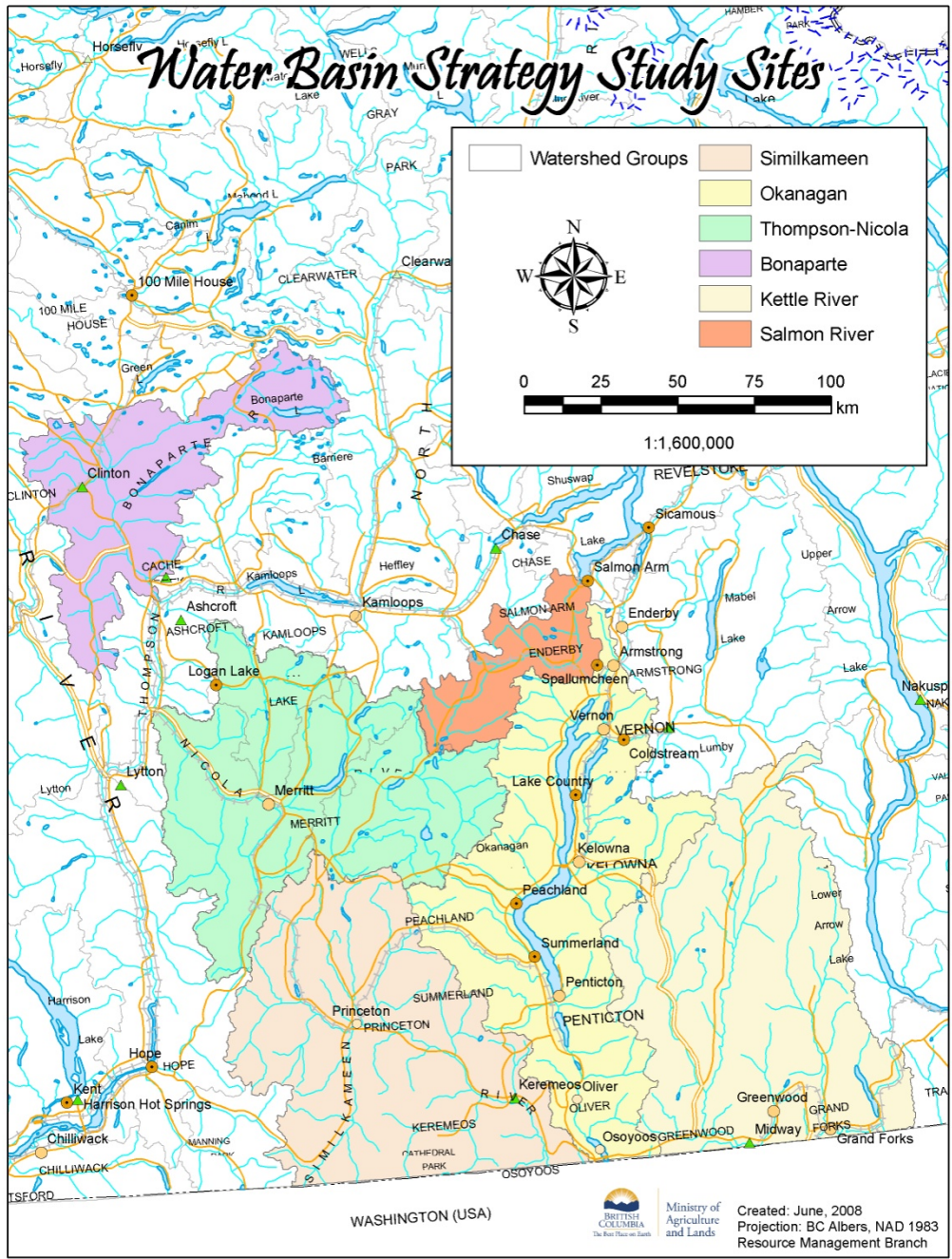
Current Agriculture Irrigated Demand 132,000,000 m3 – 64% of total demand

Irrigation Demand Model - Future

Table A11 Crop Water Demand - Increased Agricultural Acreage and Domestic Buildout to 2040

Okanagan Basin - Average Irrigation Management												
Year: 2003	Water Licence			Reclaimed Water			Groundwater			Total		
Water Source	Irrigated Area	Irrigation Demand	Average Req.	Irrigated Area	Irrigation Demand	Average Req.	Irrigated Area	Irrigation Demand	Average Req.	Irrigated Area	Irrigation Demand	Average Req.
Agriculture	(ha)	(m3)	(mm)	(ha)	(m3)	(mm)	(ha)	(m3)	(mm)	(ha)	(m3)	(mm)
Crop Group												
Alfalfa	4,469	27,733,769	621	94	635,746	679	1,159	7,841,402	676	5,722	36,210,918	633
Apple	7,088	46,353,895	654	42	263,067	625	974	5,907,341	607	8,104	52,524,303	648
Berry	43	291,674	672	-	-	-	18	107,125	604	61	398,799	652
Cherry	1,024	7,730,498	755	-	-	-	54	430,617	802	1,078	8,161,115	757
Corn	411	1,967,680	479	20	105,718	530	182	792,486	435	613	2,865,883	468
Forage	3,446	32,443,771	941	407	3,965,771	974	2,086	17,503,189	839	5,939	53,912,731	908
Fruit	763	6,337,478	831	-	-	-	101	763,842	758	864	7,101,320	822
Grape	2,158	9,257,317	429	6	14,317	252	415	1,777,314	428	2,579	11,048,948	428
Nursery	241	2,442,916	1,015	185	1,263,704	684	127	1,047,811	823	553	4,754,431	860
Turf Farm	52	529,111	1,019	-	-	-	36	330,022	918	88	859,133	978
Vegetable	368	2,723,014	740	-	-	-	136	842,391	619	504	3,565,405	707
	20,062	137,811,123		753	6,248,323		5,288	37,343,540		26,103	181,402,986	
Turf												
Golf	443	4,435,377	1,002	293	3,045,970	1,041	284	2,792,974	985	1,019	10,274,321	1,008
Landscape Turf	471	4,616,938	981	17	172,756	1,004	102	978,823	962	590	5,768,517	978
Domestic Outdoor	4,826	47,618,401	987	156	1,497,405	959	1,266	12,719,155	1,004	6,249	61,834,962	990
	5,740	56,670,716		466	4,716,131		1,652	16,490,952		7,857	77,877,800	
Total	25,802	194,481,839	780	1,219	10,964,454	885	6,939	53,834,492	786	33,961	259,280,786	786

Future Agriculture Irrigated Demand **181,500,000** m3 – **70%** of total demand
 Total irrigated demand for basin increased by **25%** (207 – 260 million m3)



Irrigation Demand Model Applications

Reports can be found at:
www.waterbucket.ca

Canberra Australia



Water Metering Australia

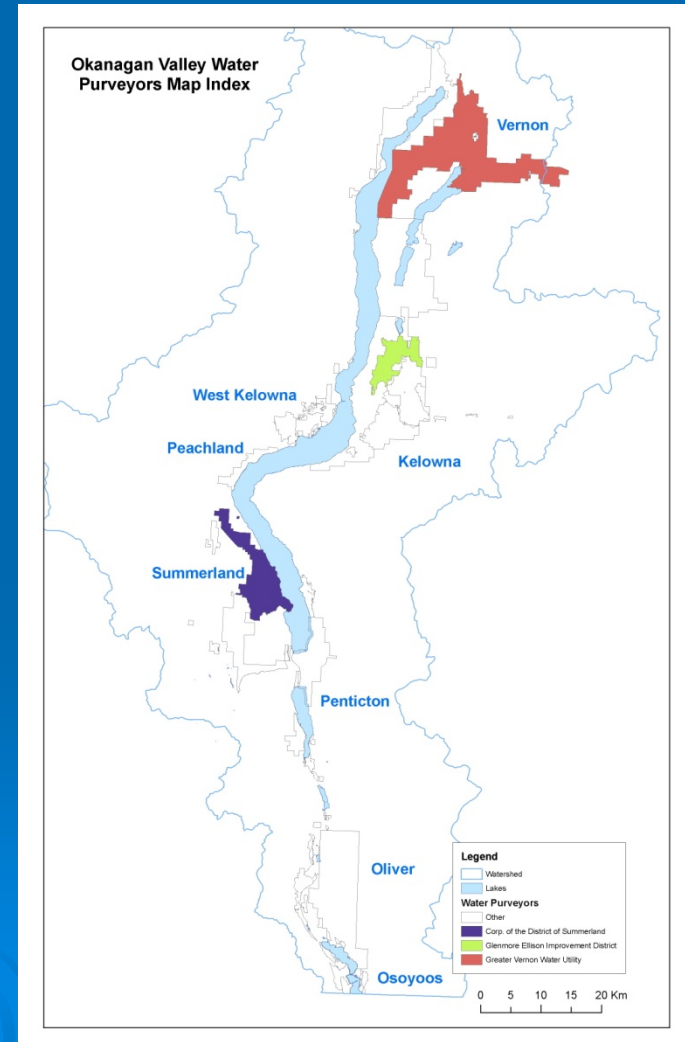


Okanagan Irrigation Management (OKIM)

Demonstrated in the Summer of 2010 – 2011

Water purveyors that are part of OKIM are:

- Glenmore Irrigation District
- Vernon Water District
- Municipality of Summerland



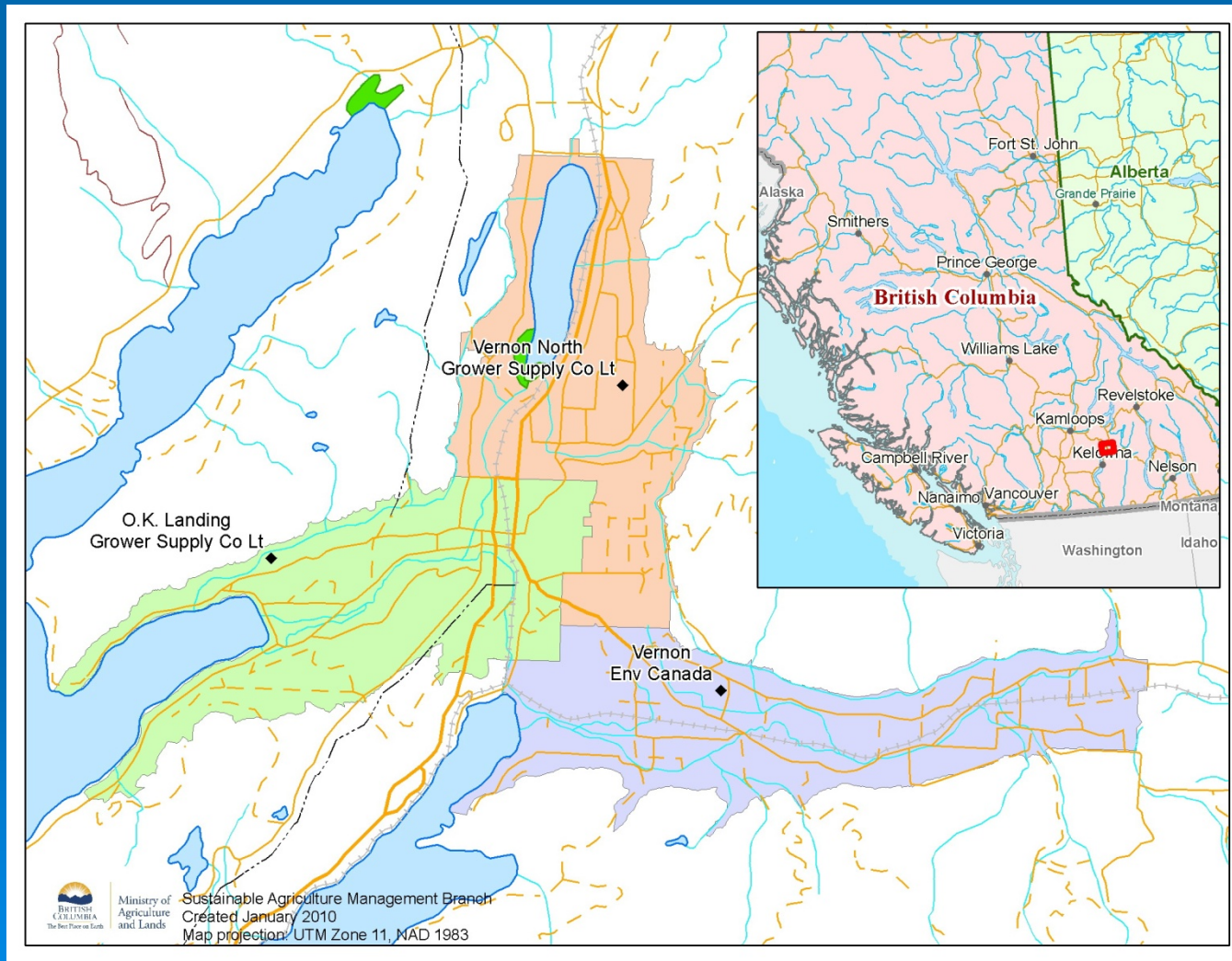
OKIM – Real time climate

The screenshot shows the farmwest.com website interface. At the top, the logo "farmwest.com" is displayed next to a cow icon. A navigation menu includes "Ask A Question", "Buy & Sell", "Events", "Forum", "Interviews", "Industry Directory", "Islands", "Library", "Links", "Climate", "Environment", "Dairy", "Forage", "Fruit", "Variety Testing", "Photos", and "Buy & Sell Hay". Below the navigation, a "CLIMATE" sidebar lists various tools: "Weather Forecast", "Evapotranspiration", "Corn Heat Units", "Temperature Monitor", "Growing Degree Days", "T-Sum Calculator", "Ammonia Loss From Manure", and "Expanding The Farmwest Climate Station Network". The main content area is titled "Okanagan North" and includes a breadcrumb trail: "Homepage » Climate » Evapotranspiration » BC Map ». Below this, it says "Select a station on the map below." A map of the Okanagan region is shown with various locations marked, including Salmon Arm, Deep Creek, Grindrod, Silver Creek, Westwold, Mable Lake, O.K. Landing, Vernon North, Vernon, Oyama, Winfield North, Winfield South, Kelowna Airport, Ellision, Glenmore, Kelowna East, Belgo, Westbank, and Kelowna South. A legend on the right side of the map defines symbols for different station types and features, and provides an elevation scale from 0 to 3600 feet.

Real time climate
obtained from
Farmwest.com



OKIM – Real time climate



OKIM | Home - Windows Internet Explorer

http://24.67.33.19/OKIM2/


OKIM | Home

WELCOME GUEST
LOGIN


HOME MY CONSUMPTION REPORTS LOGIN APPLY FOR PROPERTY ACCESS

Tools

farmwest.com
waterbucket



AGRICULTURE



CLIMATE

OKIM HOME

Welcome to the Okanagan Irrigation Management (OKIM) website. This website provides irrigation customers in the Okanagan basin online access to their water consumption information. This service is currently available to the following purveyors:

- Greater Vernon Water Utility (North Okanagan Regional District)
- District of Summerland
- Glenmore-Ellison Improvement District

If you are an irrigation customer of one of the water purveyors above and wish to access your latest information, click **here** to register.

Register

If you are an irrigation customer at Greater Vernon Water Utility (Regional District of North Okanagan), the District of Summerland or Glenmore-Ellison Improvement District, click **here** to register and access your information.

Done Internet | Protected Mode: On 100%



OKIM

Okanagan Irrigation Management



WELCOME GUEST

LOGIN

- OKIM is a purveyor's tool to allow users (agricultural customers) access to water meter readings
- Farmers are able to:
 - read land use and current water meter reading
 - compare their actual water usage with the theoretical usage
 - compare their usage with other users with similar conditions