



Improving Water Management for BC Agriculture

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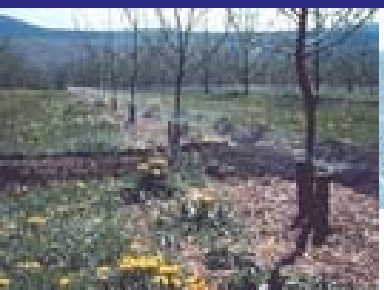
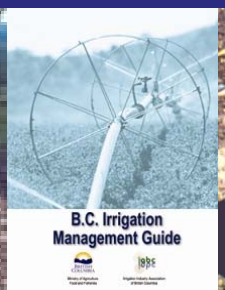
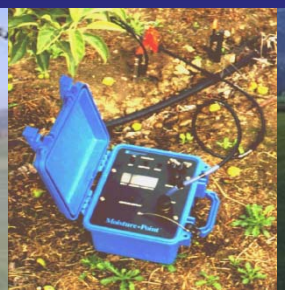
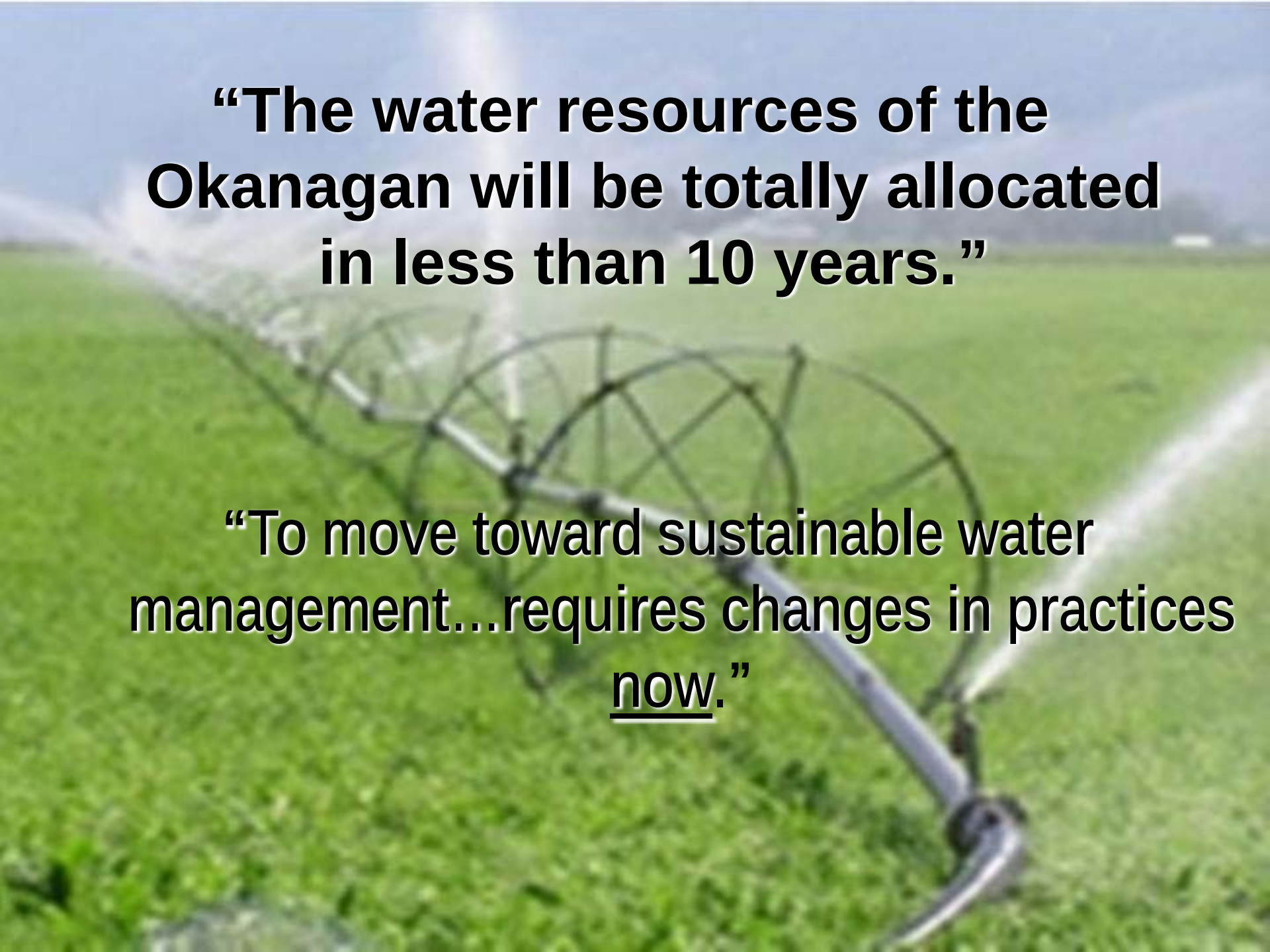





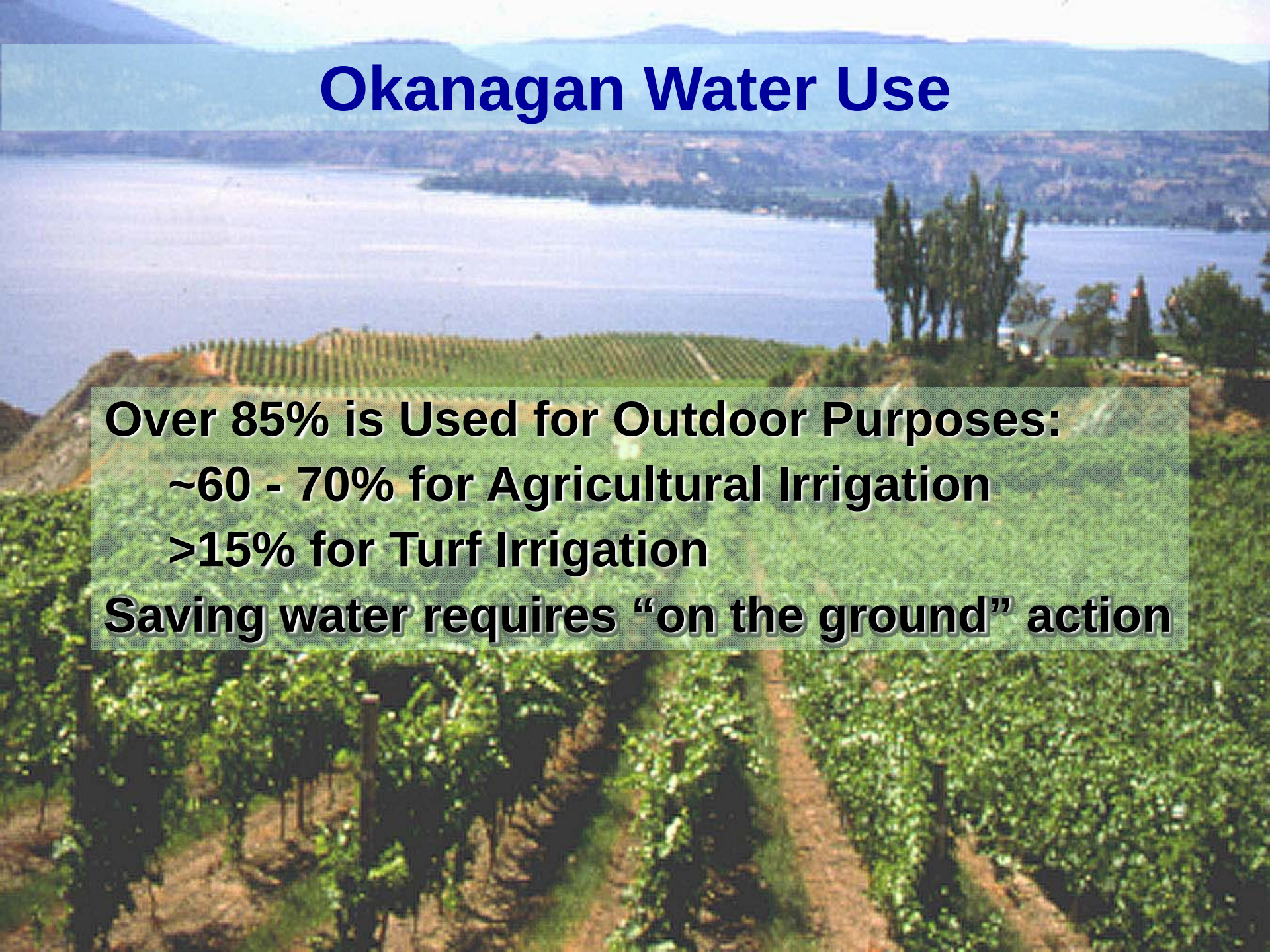


“The water resources of the Okanagan will be totally allocated in less than 10 years.”

“To move toward sustainable water management…requires changes in practices now.”

Okanagan Water Use



Over 85% is Used for Outdoor Purposes:

~60 - 70% for Agricultural Irrigation

>15% for Turf Irrigation

Saving water requires “on the ground” action

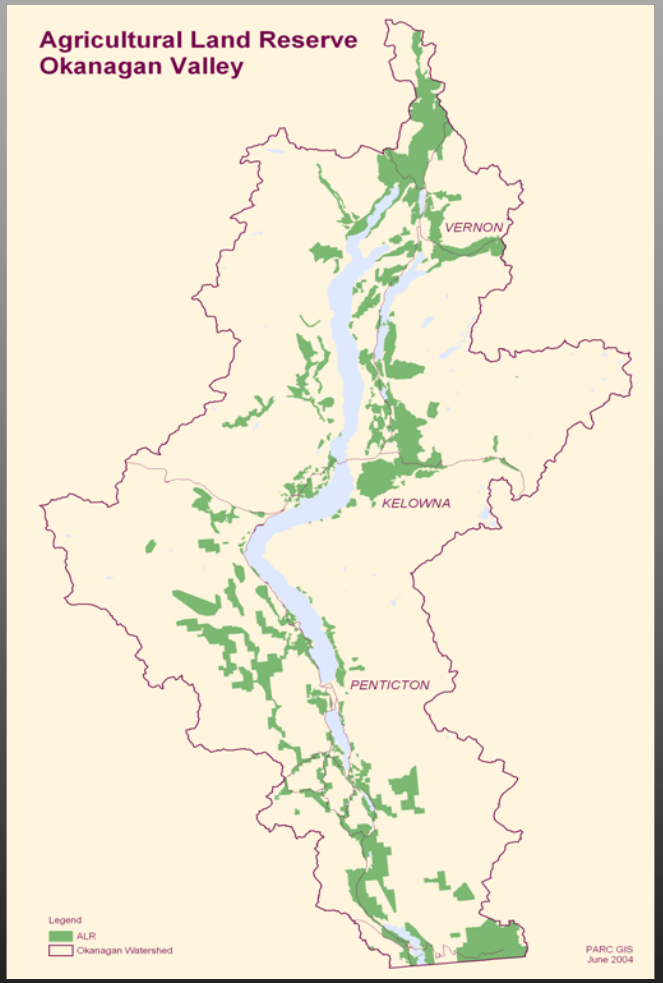
Why Develop a Model

- Agricultural irrigation is the largest water user in many basins in British Columbia
- Agriculture is a consumptive user, unlike other sectors
- Competition between urban, fisheries, recreation and agriculture for water will increase
- Climate change will drive the need to be more efficient

Irrigation Demand Model

Model calculates:

- Farm irrigation water use
- Landscape irrigation water use
- Golf course irrigation water use



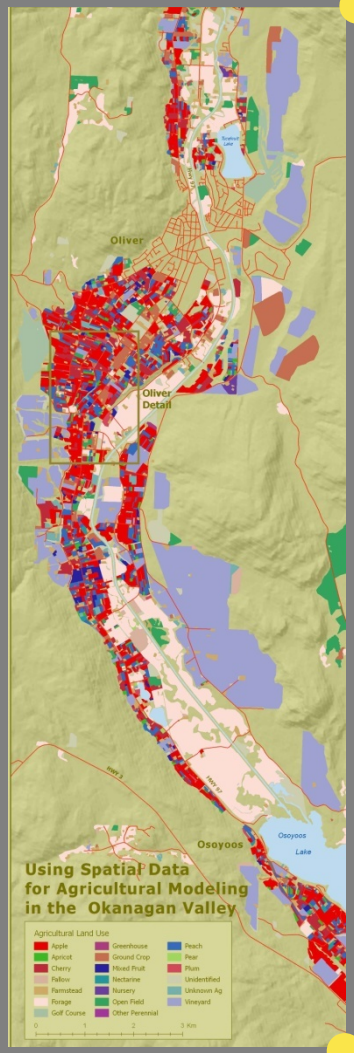
Irrigation Demand Model

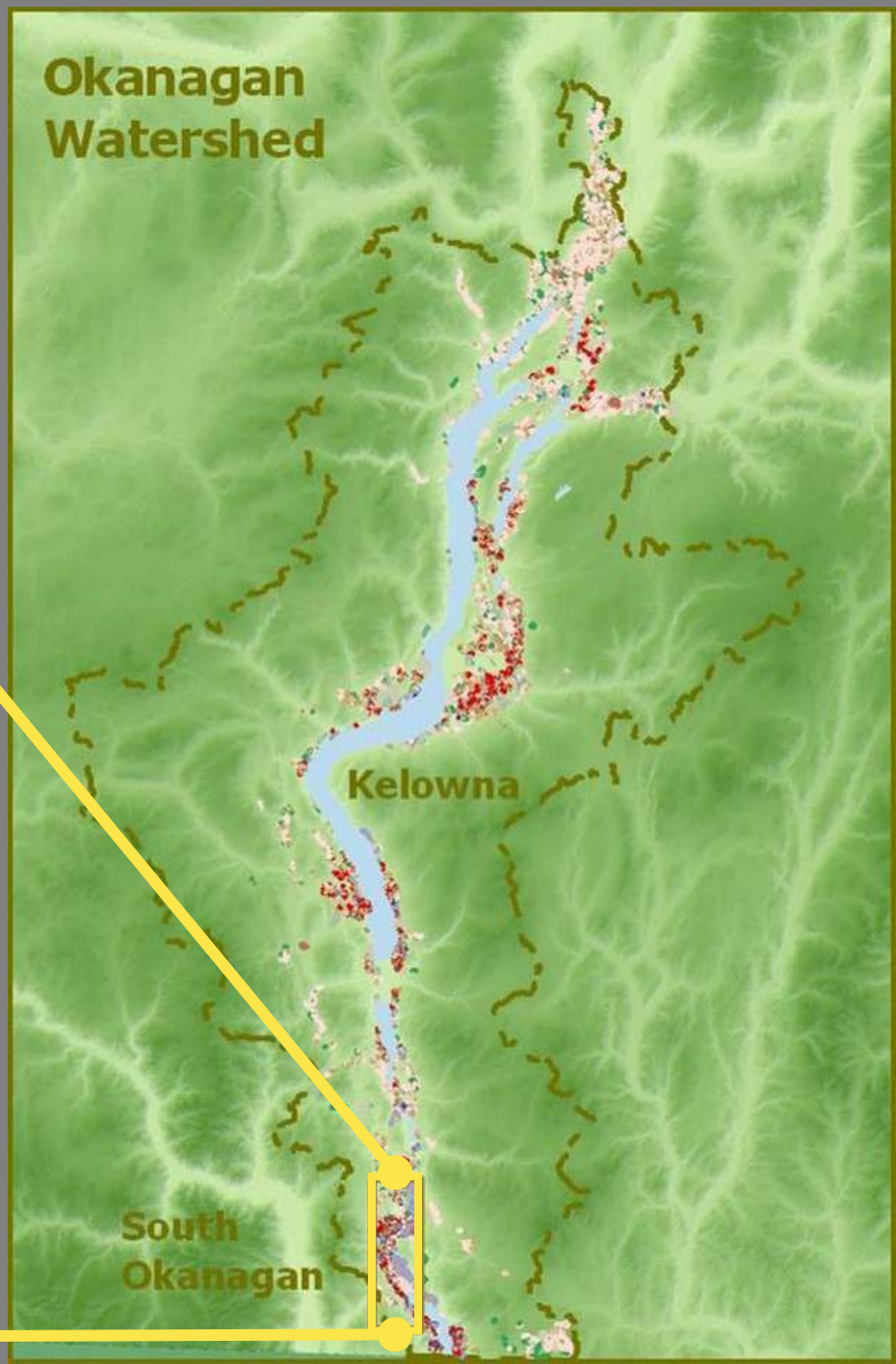
Objective:
Develop a model that calculates agriculture's irrigation needs by purveyor, municipality, district and sub-watershed.

Methodology:
Determine Property-by-Property water use

Result:
Planning Tools that secure water for current and future agricultural needs

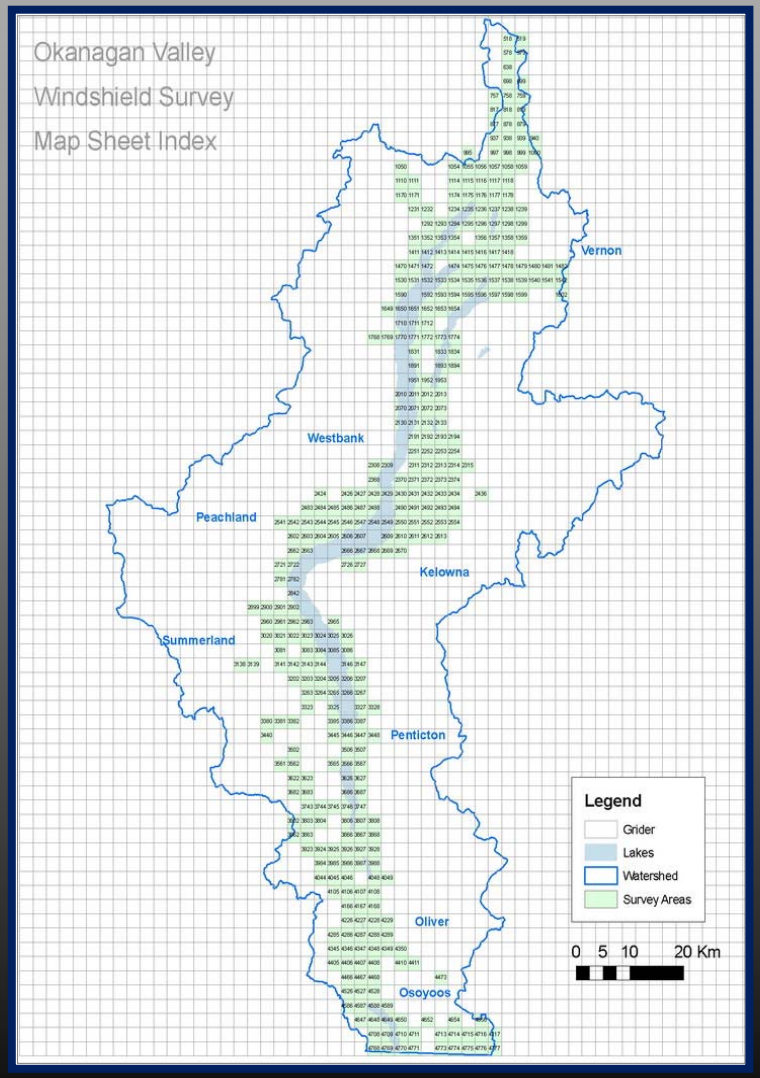
Example area





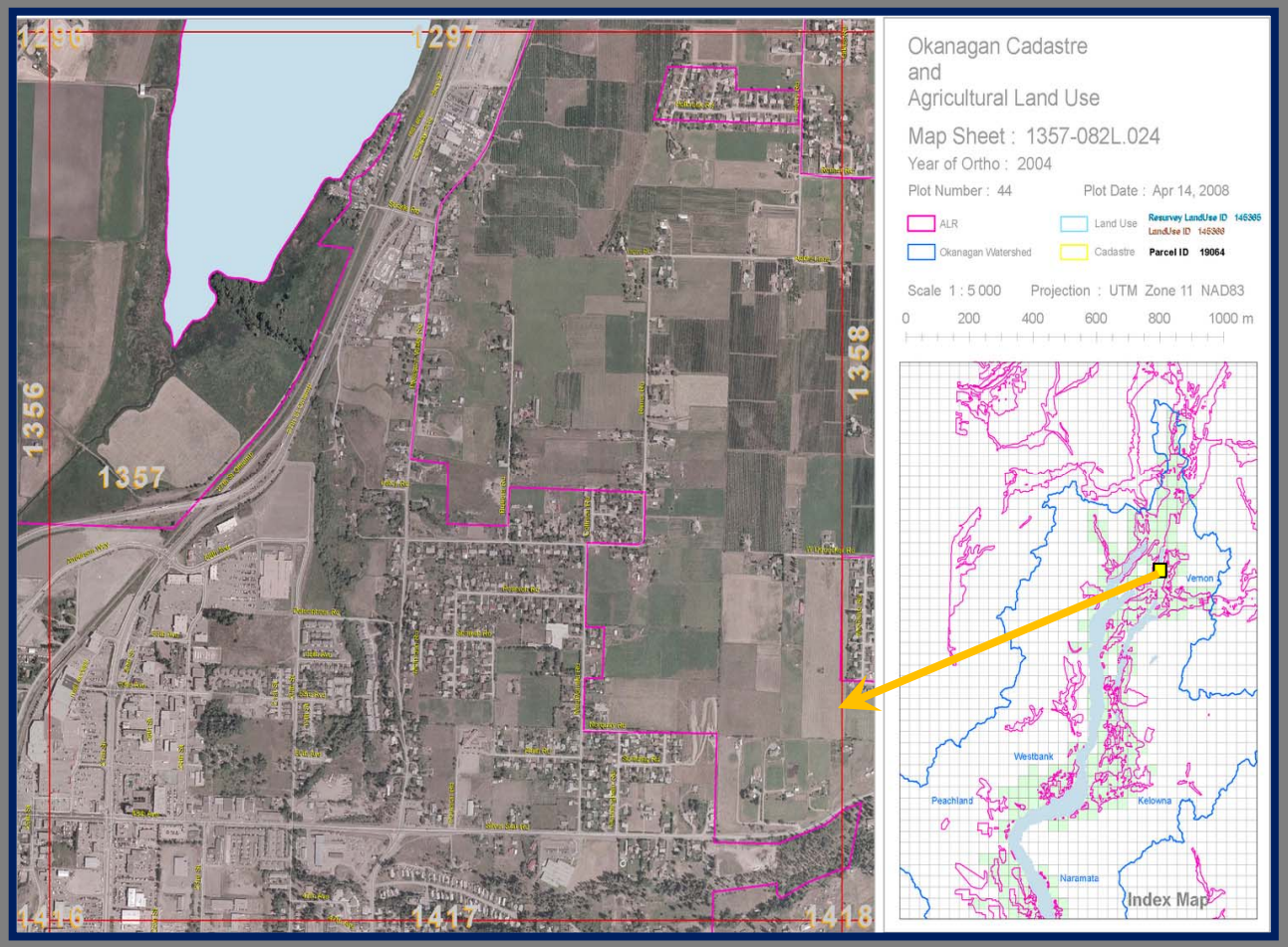
Unified Cadastre

The Okanagan Basin developed area is divided into 398 map sheets



Land Use Data

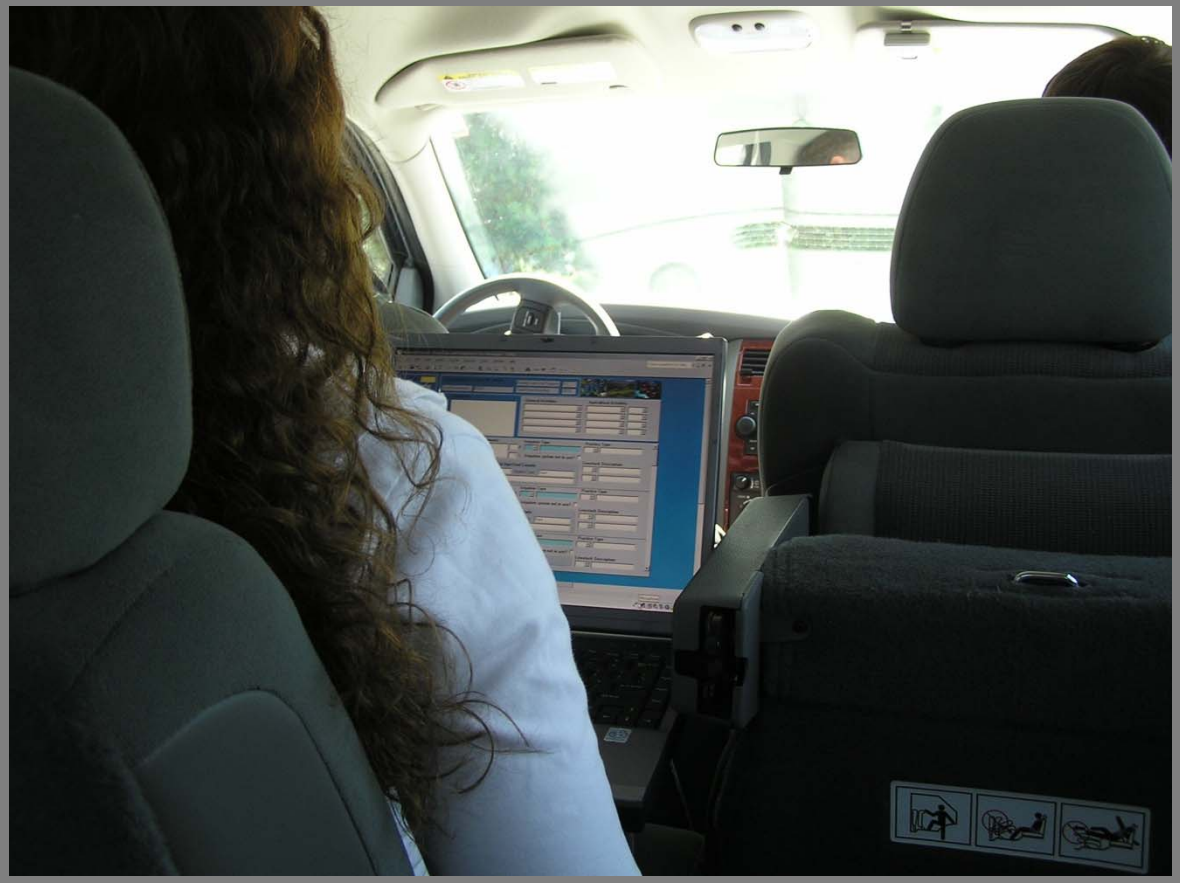
Map sheets were developed using GIS and aerial photography. Cadastre and land use polygons were added by technicians.



Land Use Data

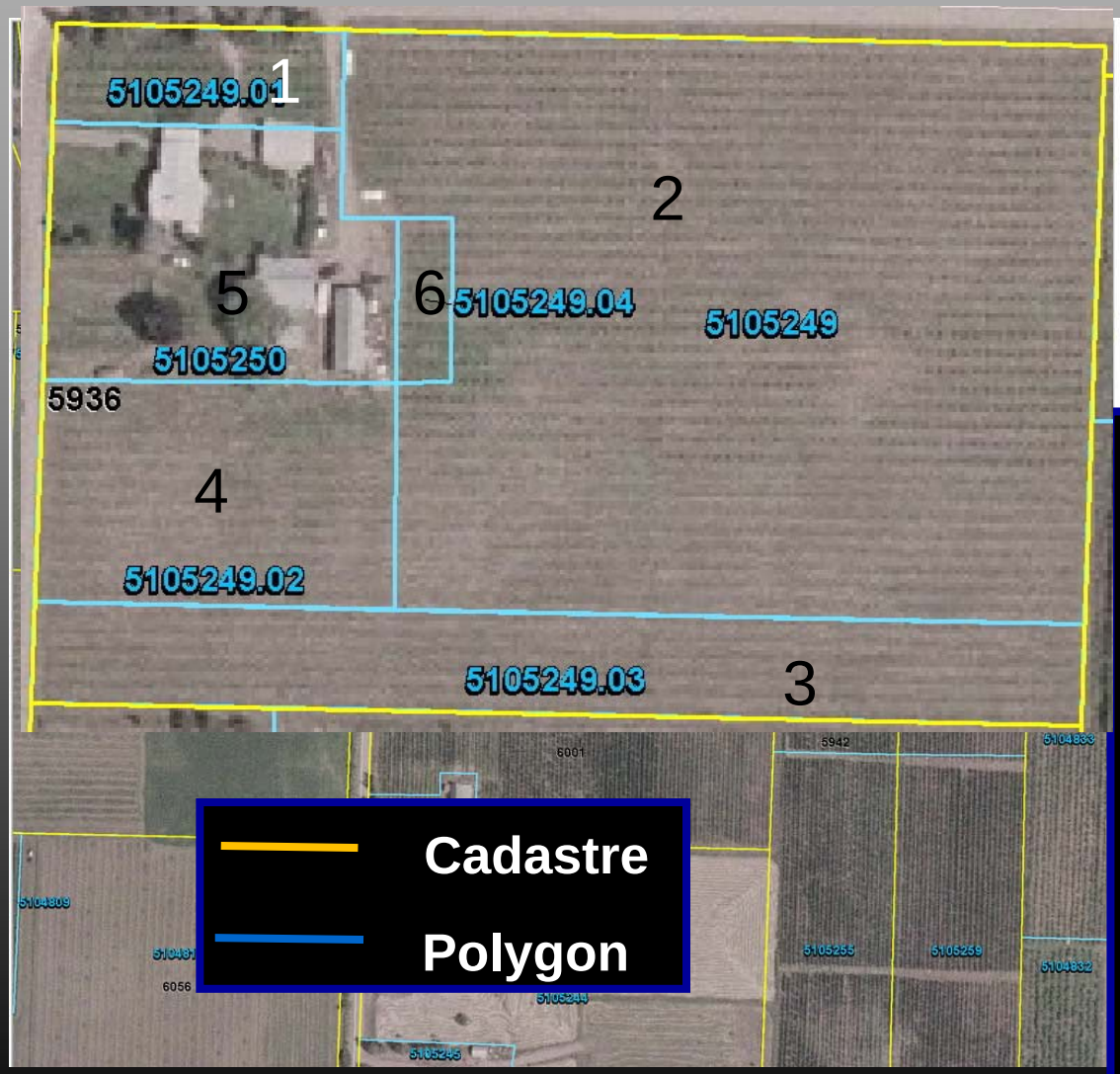
The GIS data was verified by a windshield survey of every property

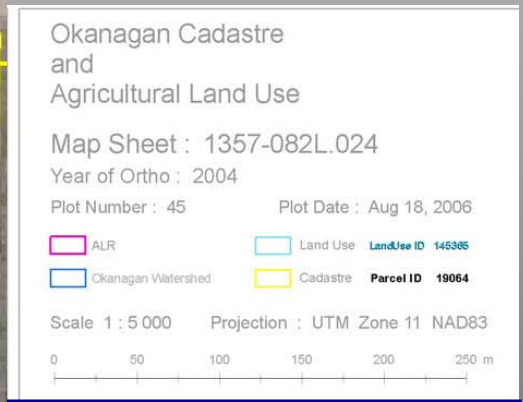
Land Use Data



Data was entered into the database in the field. Where polygon changes were required notes are made on the map sheet and sent back to the GIS technician for updating

Land Use Polygons





1. Microsprinkler on peaches
2. Microsprinkler on cherries
3. Microsprinkler on pears
4. Drip on pears
5. Residential
6. Bee hives

Land Use

Crop Type:

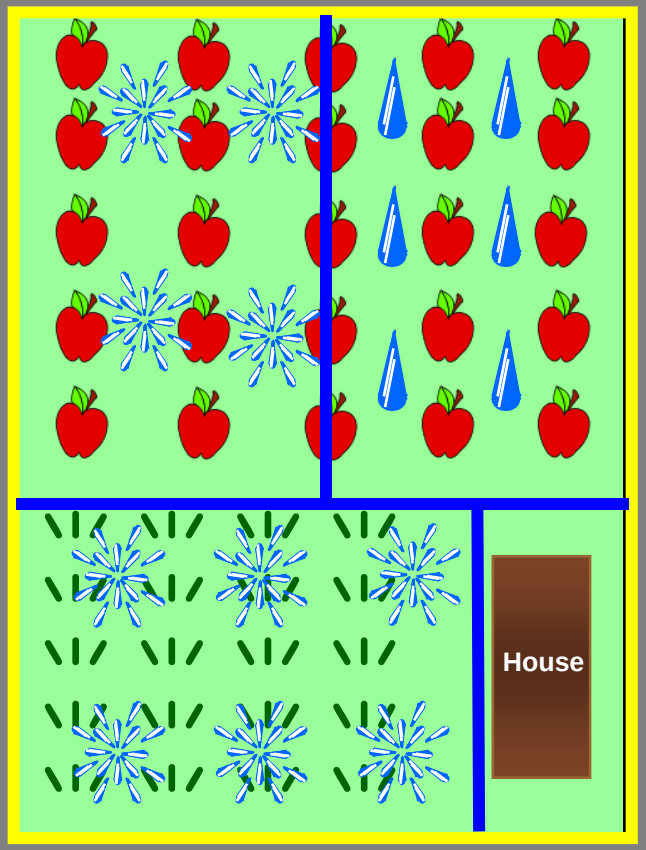
Apple

Pasture

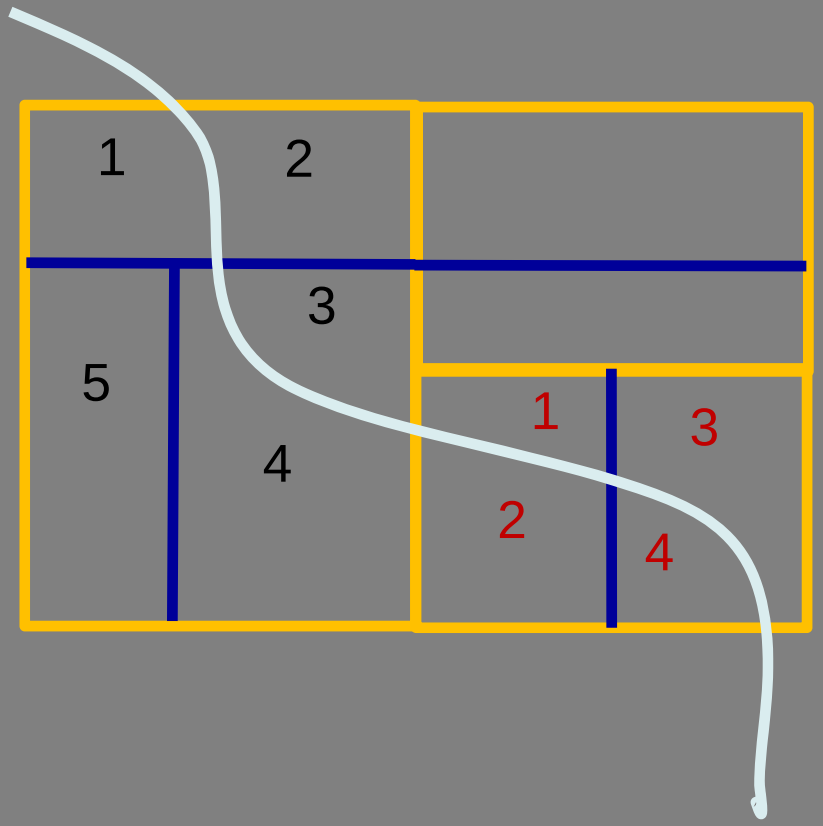
Irrigation System Type:

Sprinkler

Drip



Soil Boundary



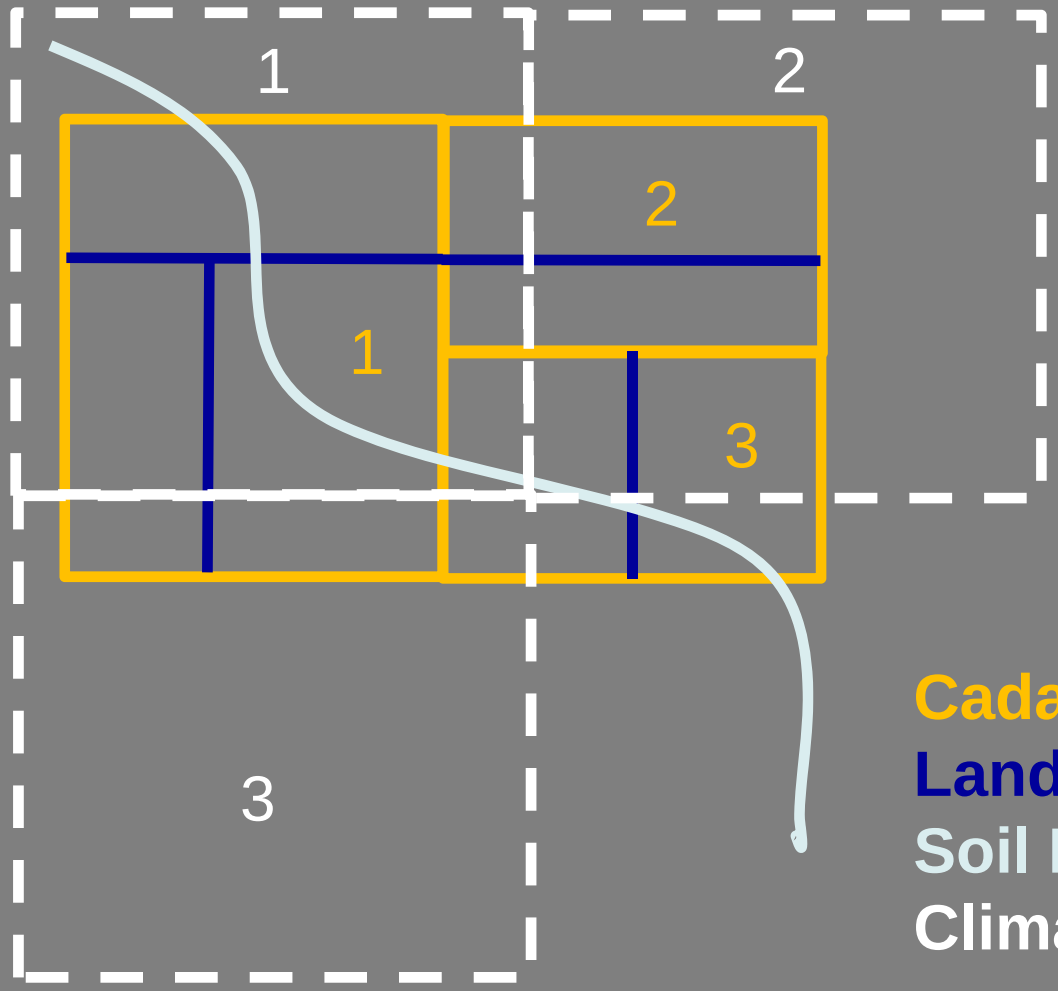
There are 130,000 polygons generated for the Okanagan in the farming areas

Cadastre

Land and Crop Polygon

Soil Boundary

Climate Data

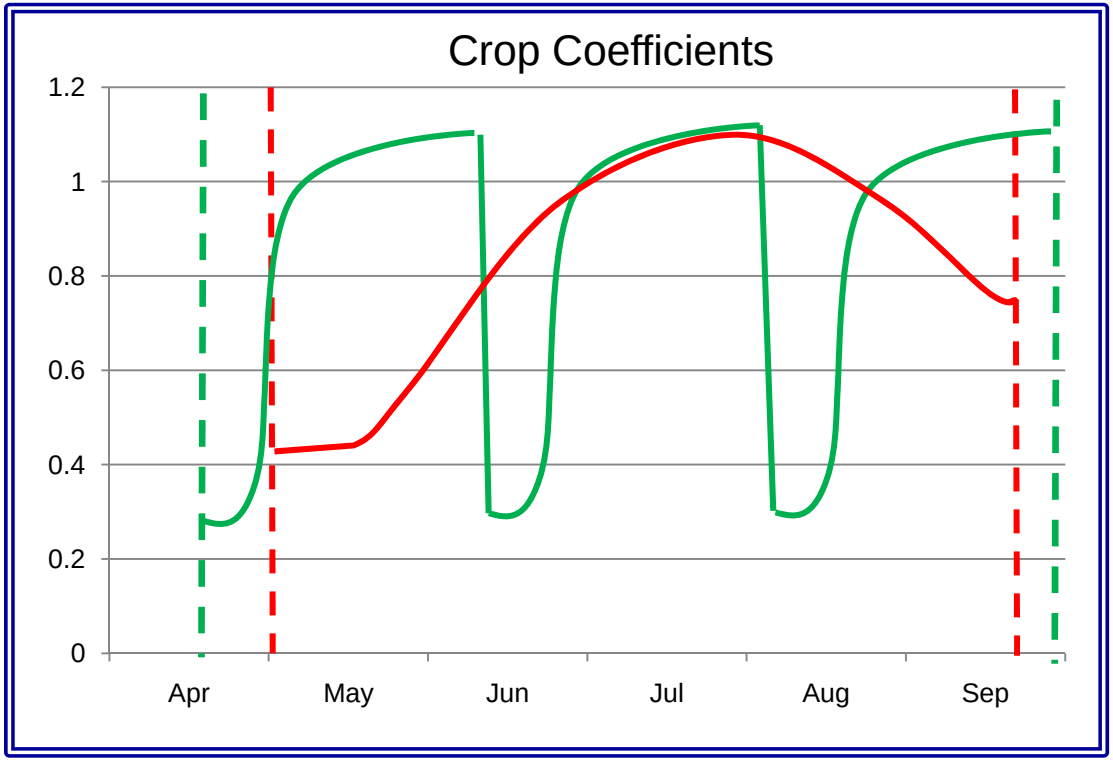


A climate cell gets assigned to each cadastre

Climate grid **1** linked to Cadastre **1**
Climate grid **2** linked to Cadastre **2** and **3**

Cadastre
Land and Crop Polygon
Soil Boundary
Climate Grid

Crop Coefficient



Algorithm calculates water demand from:

- ETo calculated daily from climate data.
- Climate data to determine start and end of growing season.
- Crop coefficients to adjust daily Eto
- 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**

Results by Irrigation System

Irrigation System	Irrigated Area (ha)	Irrigation Demand (mm)
Drip	1,490	415
Golfsprinkler	1,045	992
Gun	308	1,118
Handline	1,390	792
Landscape Sprinkler	383	674
Microspray	466	661
Microsprinkler	1,548	674
Overtree Drip	220	447
Overtree Microsprinkler	16	737
Pivot	555	536
Pivot – Low Pressure	20	543
SDI	42	548
Sprinkler	3,602	739
Solid Set Gun	12	772
Solid Set Over tree	3,073	604
Solid Set Sprinkler	134	709
Solid Set Undertree	1,790	791
Travelling gun	2,079	751
Wheelline	1,661	751
Total =	**20,033**	**704**

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

Steps to Improving Irrigation Management

- **Efficiency:** select the most efficient system possible
- **Uniformity:** design the system to achieve the best uniformity
- **Scheduling:** apply irrigation to match crop and soil conditions





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Irrigation Calculators

Landscape Calculator helps you find your ideal watering windows.

Soil Calculator helps you find your ideal watering windows.

Agricultural Calculator helps you find your ideal watering windows.

Irrigation Calculators

CERTIFIED PROFESSIONALS

Search below for a Certified Professional near you.

Note: Non Member Affiliates are denoted with an asterick * beside their name on the search (CIT only).

Search For A Certified Professional

(Only complete the fields applicable to your search)

Classifaction: Certified Contactor **Sub Category:** CIC - Commercial

Company: **Last Name:**

Area: All Areas Search

1. Certified Irrigation Contractors (CIC) - a) Turf-Residential b) Turf-Commercial

For more information on CIC required credentials go to: Certified Irrigation Contractors

2. a) Certified Irrigation Designers (CID)

Done Internet

Certification is available in: Agriculture Sprinkler

Agriculture Drip

Irrigation Scheduling Techniques

1. Soil Moisture Monitoring
2. Climate Monitoring

Soil Moisture Monitoring

Electrical Resistance Block
Watermark

Tensiometer

TDR/TDT

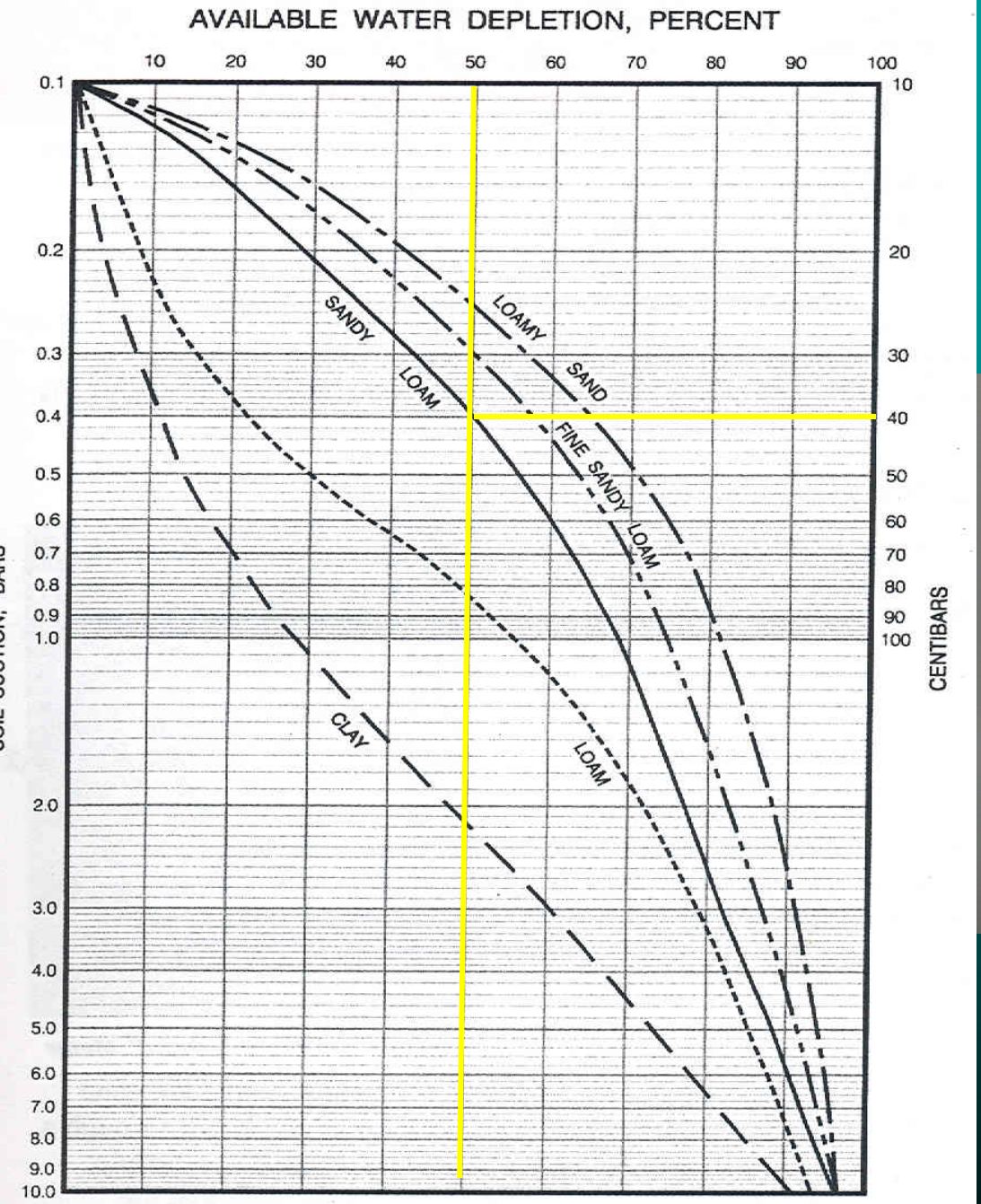

Figure 7.1 Soil Moisture Tension and Available Water

When To Irrigate?

An irrigation system in a sandy loam soil with a root depth of 1 m.
Is scheduled to begin irrigation when the available water has been depleted by 50%
Irrigation should start when the sensor Reaches 40 centibars

Climate Monitoring

www.irrigationbc.com

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Address http://hblanarc.ca/IrrigationCalc/main.html Go Links

Agricultural Irrigation
SCHEDULING CALCULATOR

Returning Users

Username

Password

Login!

Forgotten Username/Password? Help

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:

Landscape Irrigation Scheduling Calculator

Click to Switch!

User Guide | 1. Users Guide | 2. Practical Workshops | 3. Background Science | 4. Case Studies | 5. Questions and Answers

Done Internet

The calculator links to climate stations on www.Farmwest.com

Previous Step: Add Irrigation System Design

1 **Closest Weather Station** ?

Kelowna East

2 **Field Irrigation Started On** ?

Click to Select a Starting Date 07/07/2008

3 **Explore Historical Weather Data?*** ?

If you would like to view and produce schedules based on data from previous growing seasons, alter this date. By default, it is set to today's date. Changing it to an older date will shift the data used to that point.

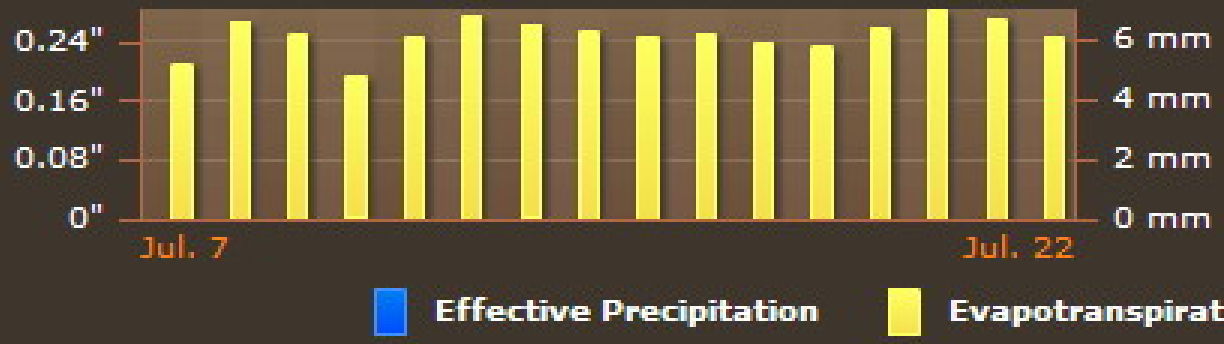
*Optional

07/17/2008

?

Effective Precipitation & Daily ET

Weather data courtesy of www.farmwest.com



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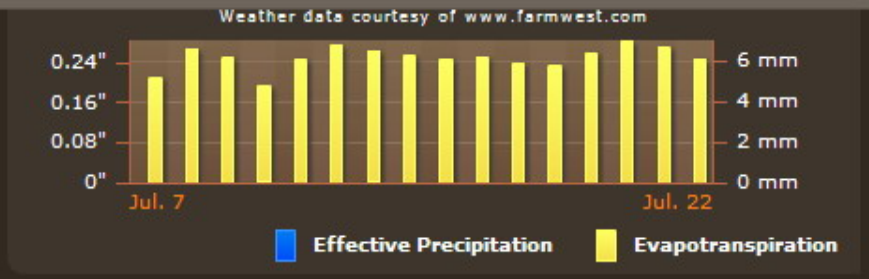
Crop Type

Soil Cross-Section

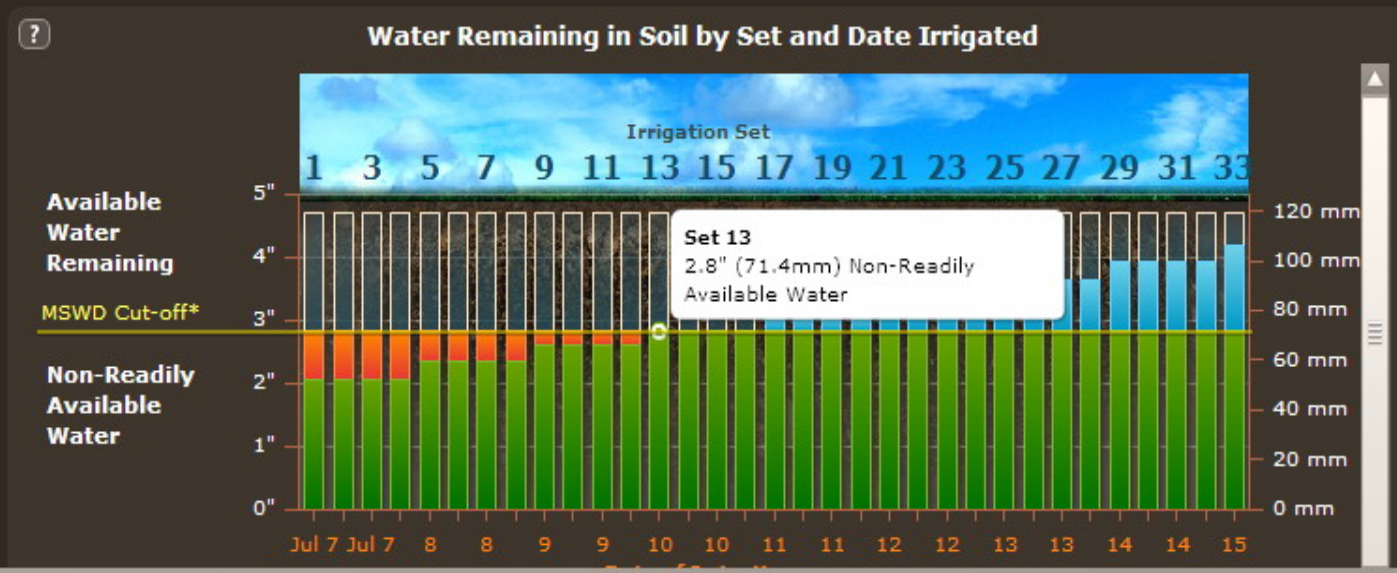
Irrigation System Design

Irrigation Scheduling



Warning!
Field May Be Dry
Check Soil Moisture Immediately

*Based on forecast ET, precip. and *calculated* water in the soil.



Save View and Print Irrigation Report

Project Solid Set Sprinkler (Kelowna East) **Irrigation System** Solidset Undertree **Field** Cherries - Medium Density 1320ft x (Open Project Browser

User Guide | 1. Users Guide | 2. Practical Workshops | 3. Background Science | 4. Case Studies | 5. Questions and Answers | Log Out

Done Internet

Managing Agricultural Water Use

- Meters provide a tool to help manage water
- Ag Water Demand Model can be used to assess water use through OKIM (Okanagan Irrigation Management program)
- There are six water purveyors that are now metering agricultural connections

Objective of OKIM

- Improve Water Demand Side Management for irrigation customers by comparing and analyzing:
  - Existing consumption (Obtain from Meter readings)
  - Anticipated demand (Calculated by the AWDM)

OKIM

Okanagan Irrigation Management

summerlanduser@okim.ca

Tools

Landscape Irrigation Scheduling Calculator

EVAPOTRANSPIRATION
schedule your irrigation

OKIM

This website is designed for agricultural property landowners within the Greater Vernon Services and the District of Summerland to obtain information on metered water use, calculated theoretical water demand, and land use data for their properties.

If you are a water purveyor or you reside in areas where agricultural water use is metered by a water purveyor, and would like to be part of the OKIM, please email info@Okim.ca.

Log-in
For existing users, click here to log-in.

New User
To register as a new user, you must own an agricultural property in Vernon or Summerland, and have an email address. Click here to register.

About OKIM

This website is designed for agricultural property landowners within the Greater Vernon Services and the District of Summerland to obtain information on metered water use, calculated theoretical water demand, and land use data for their properties.

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