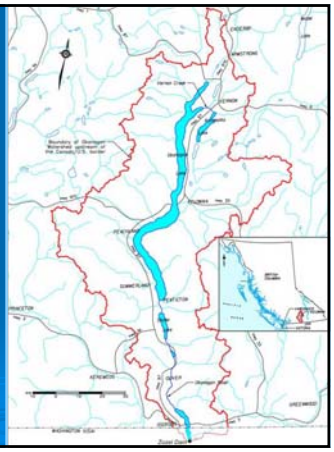
Using the Water Supply & Demand Project for Okanagan Drought Planning

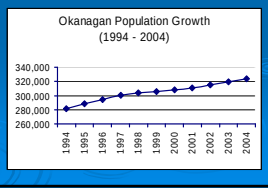
How much water do we have?

When will we run out?



Context

- Last assessment in 1974
- Population has dramatically increased
- Climate change heating up
- Need Basin-wide approach to water management
- Need better tools to get there



Climate Change: *less supply, more demand*

- More rain
- Less snow
- Earlier melt
- Hotter summers
- More evaporation

Fundamentals

- Everyone needs water
- We are all connected along the mainstem
- The lake may be 600 ft deep, but we can only use the surface
- The economy suffers even from patchy shortages
- We have to look at whole system and find ways to work together

Project Overview – Phase 2

January 2007 - December 2009

Providing science for…

- water management
- land use planning
- water allocation

High-level objectives:

- analyze water supply and use
- evaluate future climate
- guide adaptation

Project Partners

Okanagan Basin Water Board
Okanagan Nation Alliance
British Columbia – The Best Place on Earth
Ministry of Environment
Ministry of Agriculture and Lands
Ministry of Community Development
Canada
Fisheries and Oceans Canada / Pêches et Océans Canada
Environment Canada / Environnement Canada
BCAC BC Agriculture Council
UBC Okanagan
Water Supply Association of BC
SFU Department of Earth Sciences

Project Plan

Phase 2: Evaluate Current and Future Needs
- water supply and management, allocations, actual use
- models link lakes and river sub-basins
- water accounting to balance supply and demand
- scenarios of climate change and population growth

Phase 3: Develop Tools, Recommendations, Policy
- consultation with local & senior governments
- recommendations for policy changes
- support for local area studies

Water Budget Framework

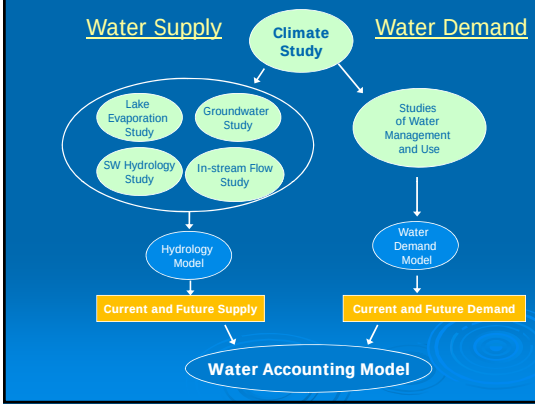
AVAILABLE WATER + INSTREAM NEEDS =

SUPPLY *MINUS* DEMAND

{Natural Groundwater Supply & Return Flows +
Natural Surface Supply & Reservoir Inflows +
Direct Precipitation on the Lakes +
Water Transferred from Other Basins}

MINUS

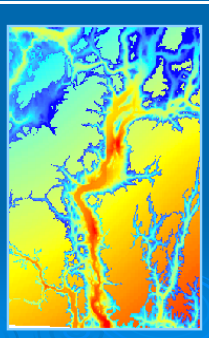
{Surface Intakes +
Groundwater Pumping +
Evaporation }



Climate Scenarios

Climate data:

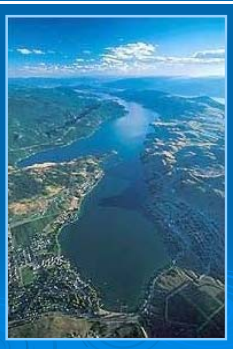
- Gridded 500 m x 500 m climate model
- Current climate information based on historical data
- Scenarios from scaled-down global models



BC Ministry of Agriculture and Lands, Environment Canada & Agriculture and Agri-Food Canada

Demand Model

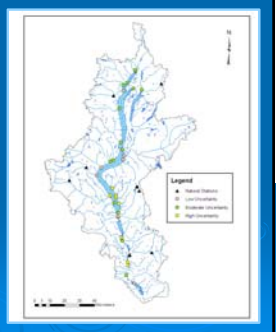
Property-by-Property water demand from agriculture, homes, industry, golf courses, parks



BC Ministry of Agriculture and Lands & Agriculture and Agri-Food Canada

Hydrology Model

- Climate
- Topography
- Land Cover
- Mountain Pine Beetle
- Streams & Lakes
- Control Structures
- Soils
- Snow
- Groundwater



Groundwater Model

320 aquifers

Basic Products

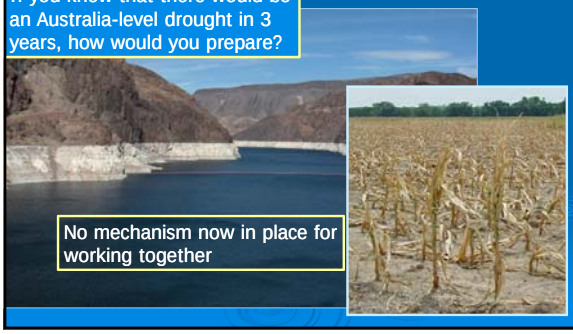
- Okanagan water database
- State-of-the-Basin reports
- Hydrologic models for surface and groundwater
- GIS irrigation and urban demand model
- Water accounting model with climate scenarios
- Water information reference library

How can we use this information?

- Decision-making, education, policy discussions, *etc.*
- Okanagan water management planning
- Coordinated Drought Planning?

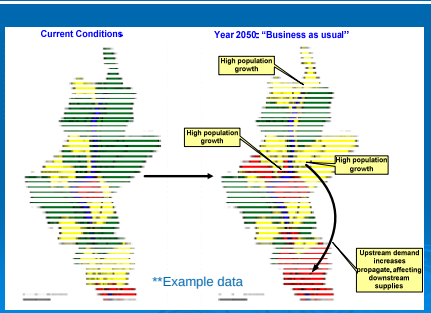
Coordinated Basin-wide Drought Planning

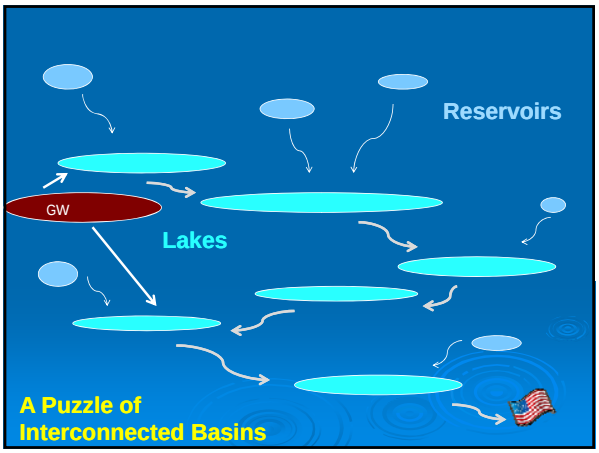
If you knew that there would be an Australia-level drought in 3 years, how would you prepare?

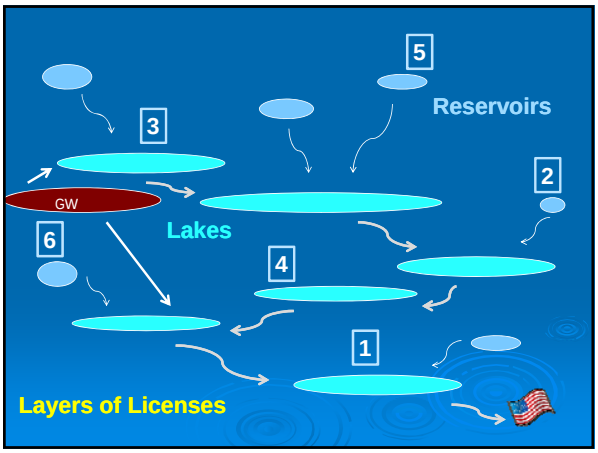


No mechanism now in place for working together

Does upstream use affect downstream supply?







Cooperative Agreements

- Default is priority-based regulation
- Possible to form other agreements
- Example: Summerland Water Use Plan
- Two Layers:
  - Technical Study of Hydrology
  - Cooperative Agreements

Technical & Policy Components of Coordinated Drought Planning

- How are sub-basins and reservoirs connected?
- Where is the greatest demand?
- Human vs. Environmental Needs
- Existing Allocations/Priority Rights

Technical

- Linked Utility Drought Plans, Water Use Plans
- Drought Response Agreements

Policy

Also Needed for Coordinated Drought Planning

- Better drought communication system
- Water Use Reporting of surface & groundwater
- All utilities need Drought Plans
- Water Use Plans for sensitive streams
- Commitment to working together
  - Within your utility area
  - With neighbouring water utilities
  - With other communities in the Basin

Better Drought Communication

- MoE Drought Website?
- Early warning on snow-pack, lake levels
- Water & meteorology data and interpretation
- Supports purveyor communication with customers
- Helps purveyors prepare in advance

Integrated Water Use Reporting

- Groundwater at risk
- Need to track all large water extractions
- Surface = Groundwater
- Web-based interface
- Replace current system

What the Water Supply & Demand Project can and can't do

- Provide Basin-Scale insight to overall water availability
- Gather and report water information
  - Groundwater, surface water, land cover, etc.
- Data on sub-basin scale is low-resolution
- Need local detail for drought plans, water use plans

Questions? Contact Anna.Warwick.Sears@OBWB.CA
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