DEALING WITH DROUGHT

Presentation to:

Okanagan Water Stewardship Council

14 December 2006

Wenda Mason

Water Stewardship Division

Ministry of Environment

OVERVIEW

- What is Drought?
- Provincial Response
- Lessons Learned
- Some suggestions for OWSC

Concept of “Drought”

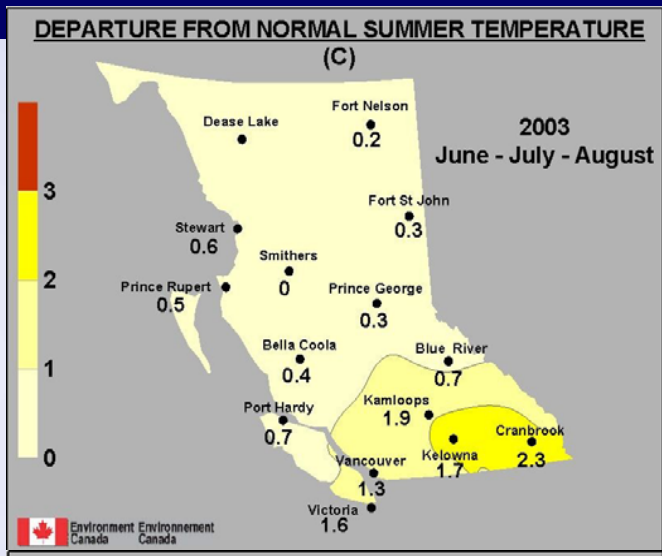
- A normal, recurrent feature of climate
- Caused by a lack of precipitation resulting in a water shortage that has impacts
- Humans can exacerbate drought by increasing demands during dry periods
- Vulnerability due to drought may increase with time if demand increases

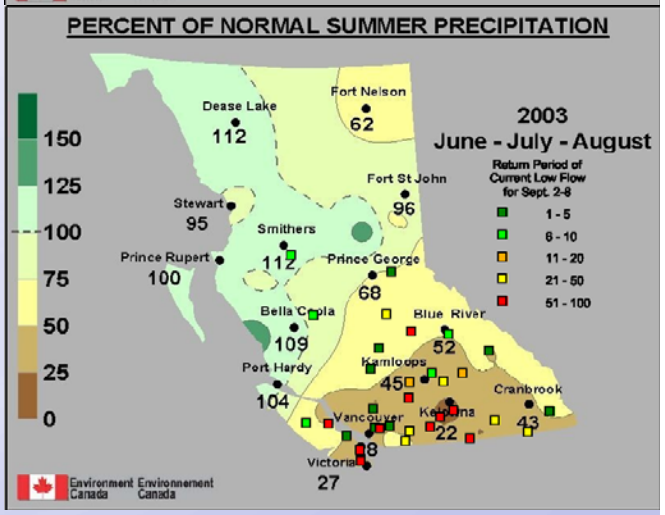
Kinds of “Drought”

- Meterological – dryness vs normal
- Agricultural – low precipitation linked to ag impacts
- Hydrological – streamflows compared to “normal”

What is “Drought”?

- ↓ Precipitation
- ↑ Evapotranspiration
- ↓ Streamflows
- ➢ Health, socio-economic & aquatic ecosystem impacts



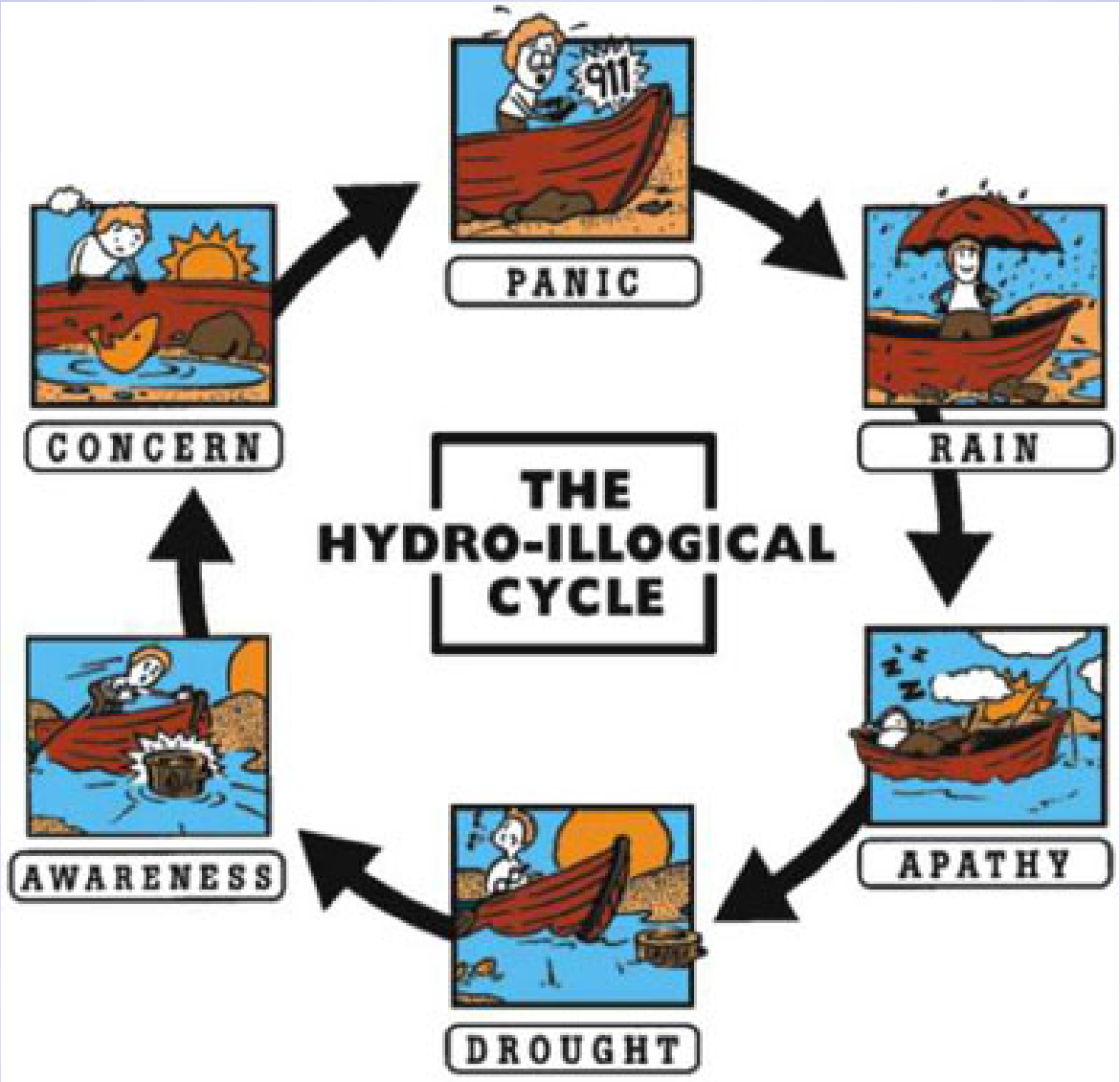


Drought Indices

- U.S. Drought Mitigation Centre
  - www.drought.unl.edu/
- In BC, we use
  - Standardized Precipitation Index
  - Snow Water Equivalency
  - Streamflows
  - Groundwater levels

Predicting Drought In BC

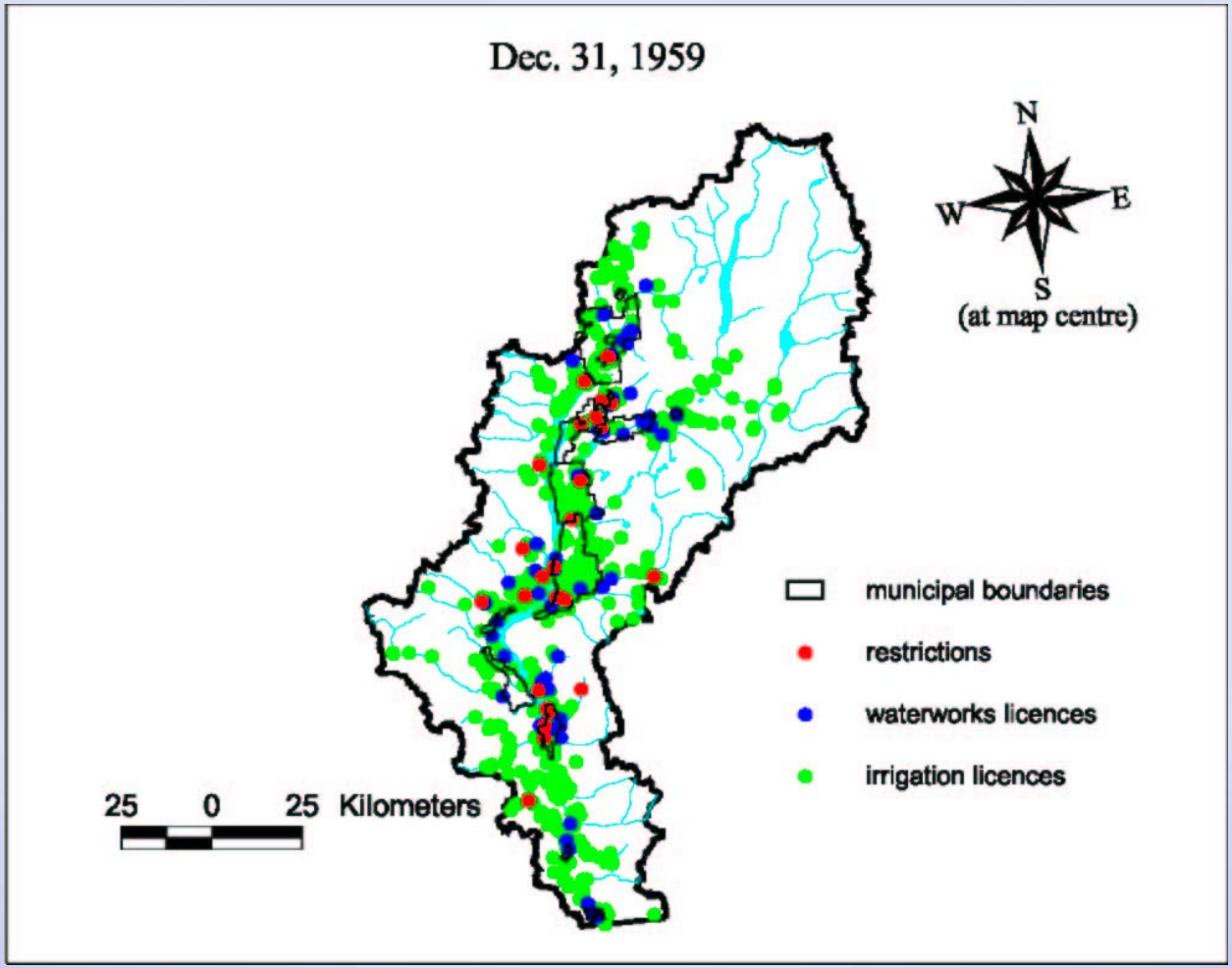
- Prolonged high pressure ridge
  - Ocean conditions & circulation
  - Atmospheric dynamics
  - Atmosphere-ocean interactions
- El Nino often brings persistent, dry weather
- Prediction depends on ability to predict precipitation and temperature months in advance…



Reference: I.R. Tannehill, *Drought: Its Causes and Effects*, Princeton University Press, Princeton, New Jersey, 1947

CONSEQUENCES OF DROUGHT

- Water Supply
- Non-irrigated agriculture
- Irrigated agriculture
- Forestry
- Fish & other aquatic resources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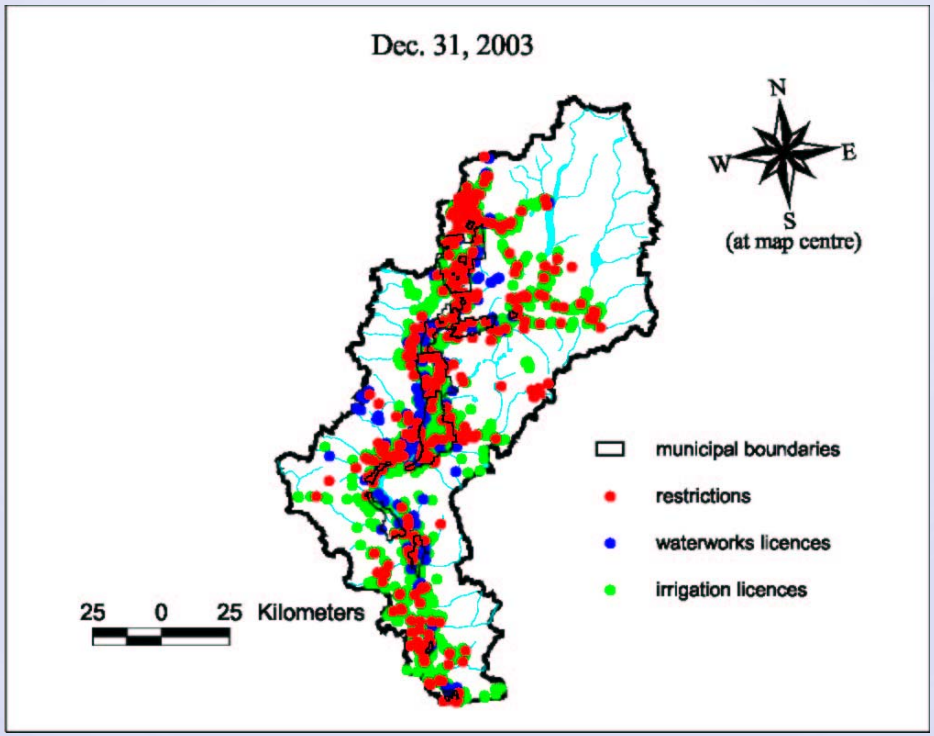
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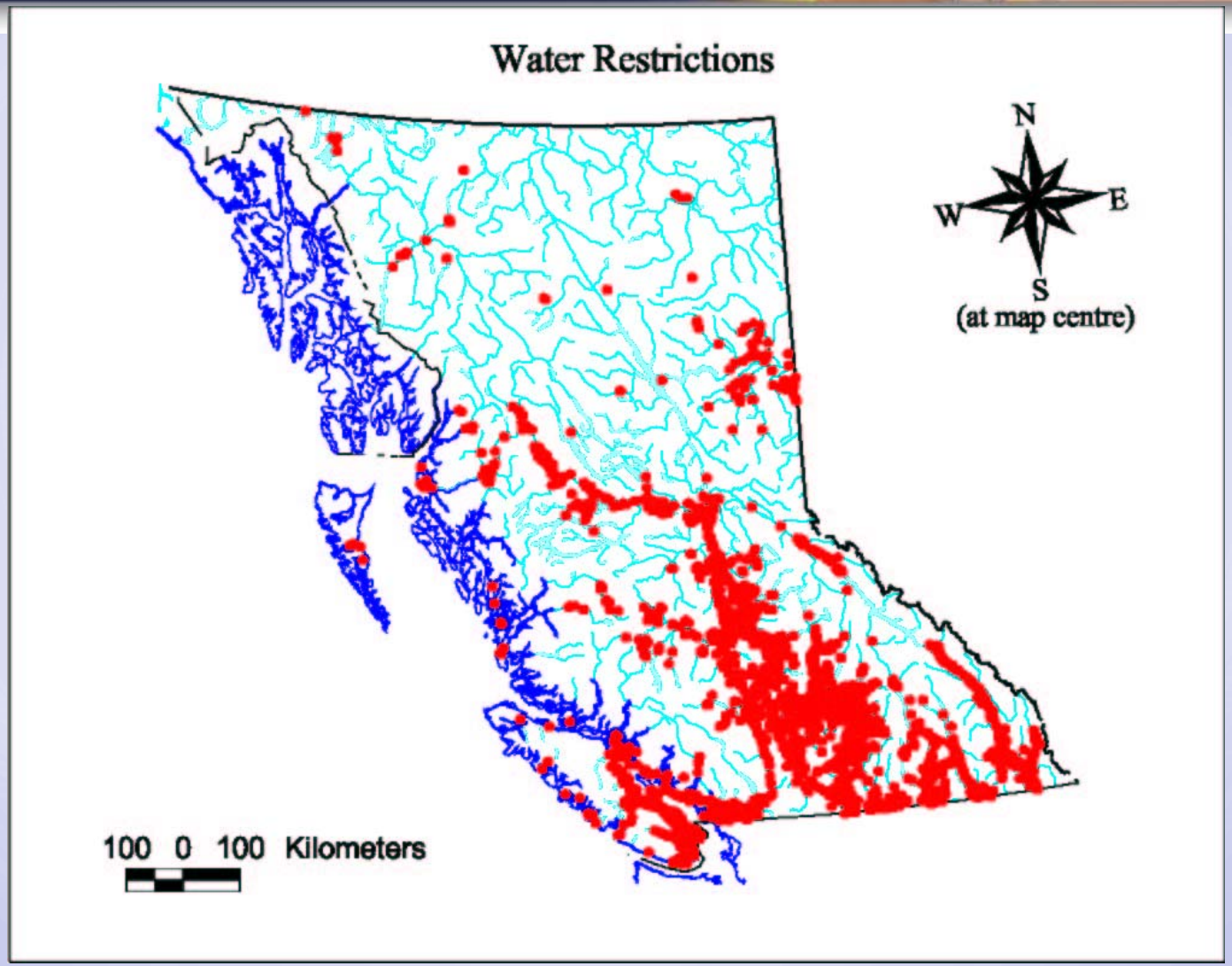


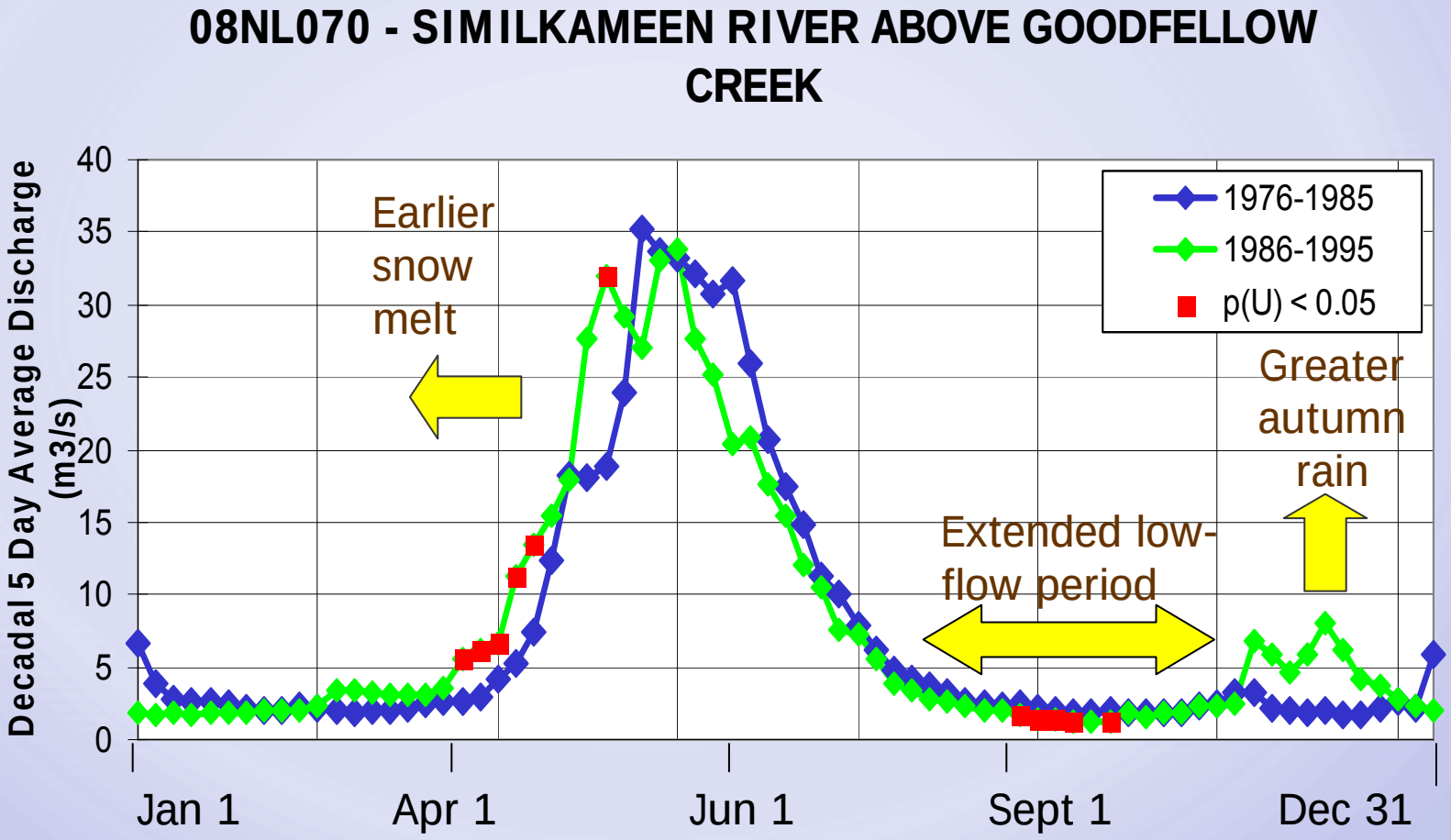


Figure: P. Whitfield, Environment Canada

Gundaroo, Australia

Water bandits strike drought-hit farmers

October 25, 2006

PROVINCIAL RESPONSE

- Establish Drought Task Force
- Assess the preparedness of water suppliers to deal with drought & provincial ability to respond
- Develop an Action Plan
- Implement the Plan
- Apply lessons learned
- Communications throughout

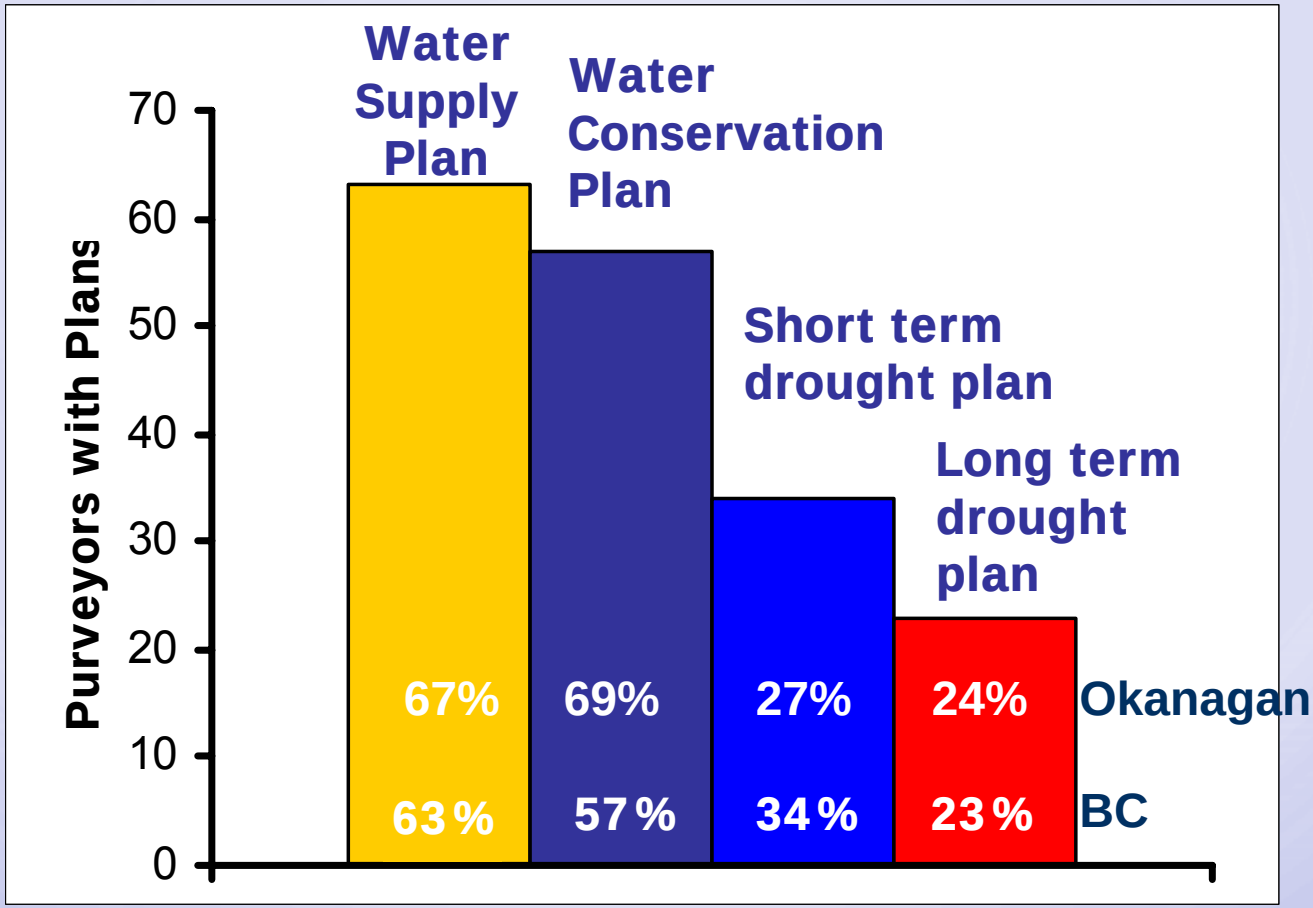
ASSESS

OBJECTIVES

- Protect drinking water supplies
- Limit adverse economic impacts
- Protect fish & fisheries
- Increase awareness to the ongoing need for water conservation

  …developing the “water ethic”

ASSESS

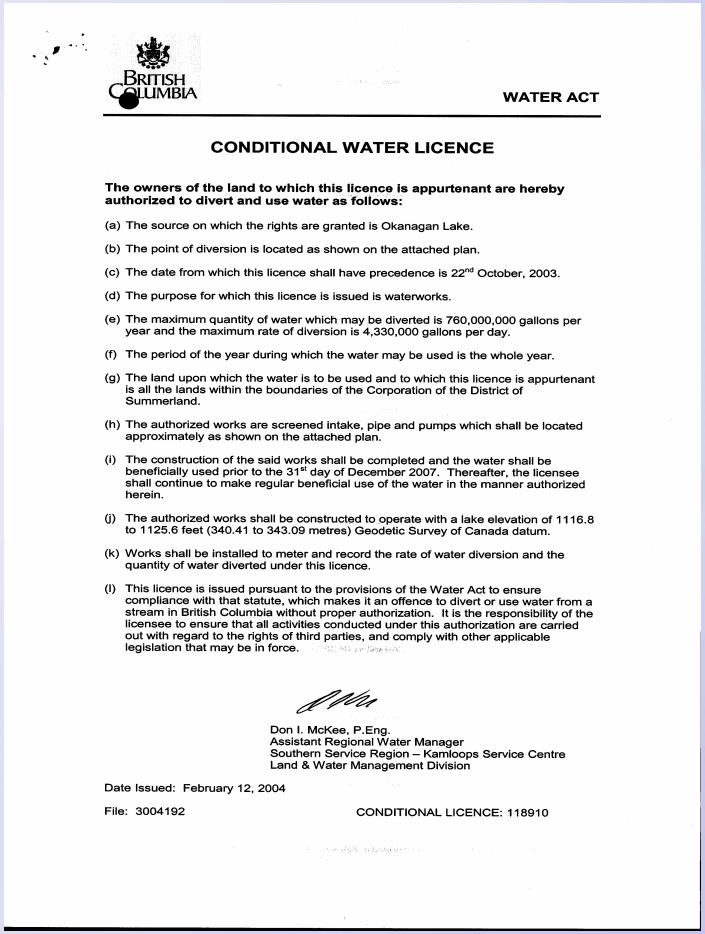

Purveyors with Plans
70
60
50
40
30
20
10
0
Water Supply Plan
Water Conservation Plan
Short term drought plan
Long term drought plan
67%
69%
27%
24%
Okanagan
63%
57%
34%
23%
BC

GOVERNANCE

- **Priority date**
- ***Environment Management Act* (1981) – Environmental Appeal Board**
- **Regional Water Managers**
- **Fish Protection Act (1997)**

MANAGEMENT CHALLENGES

- "Stop diversion orders"
- Licensee conflicts
- Instream demands
- Monitoring
- Compliance



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WATER ACT

CONDITIONAL WATER LICENCE

The owners of the land to which this licence is appurtenant are hereby authorized to divert and use water as follows:

(a) The source on which the rights are granted is Okanagan Lake.

(b) The point of diversion is located as shown on the attached plan.

(c) The date from which this licence shall have precedence is 22nd October, 2003.

(d) The purpose for which this licence is issued is waterworks.

(e) The maximum quantity of water which may be diverted is 760,000,000 gallons per year and the maximum rate of diversion is 4,330,000 gallons per day.

(f) The period of the year during which the water may be used is the whole year.

(g) The land upon which the water is to be used and to which this licence is appurtenant is all the lands within the boundaries of the Corporation of the District of Summerland.

(h) The authorized works are screened intake, pipe and pumps which shall be located approximately as shown on the attached plan.

(i) The construction of the said works shall be completed and the water shall be beneficially used prior to the 31st day of December 2007. Thereafter, the licensee shall continue to make regular beneficial use of the water in the manner authorized herein.

(j) The authorized works shall be constructed to operate with a lake elevation of 1116.8 to 1125.6 feet (340.41 to 343.09 metres) Geodetic Survey of Canada datum.

(k) Works shall be installed to meter and record the rate of water diversion and the quantity of water diverted under this licence.

(l) This licence is issued pursuant to the provisions of the Water Act to ensure compliance with that statute, which makes it an offence to divert or use water from a stream in British Columbia without proper authorization. It is the responsibility of the licensee to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties, and comply with other applicable legislation that may be in force.

Don I. McKee, P.Eng.
Assistant Regional Water Manager
Southern Service Region – Kamloops Service Centre
Land & Water Management Division

Date Issued: February 12, 2004

File: 3004192 CONDITIONAL LICENCE: 118910

ROLES & RESPONSIBILITIES

- Identified Ministry/Agency roles & responsibilities
- Identified local experts in “hot” areas
- Identified “elevation” process within Provincial & Federal government
- Identified local water suppliers role

Provincial Drought Management Action Plan

Objectives

- Protect drinking water supplies
- Limit adverse economic impacts
- Protect fish and fisheries
- Sensitize British Columbians to the ongoing need for water conservation

Medium Term Actions	*Long Term Actions*
•Develop emergency supply/response plan template •Publish "Dealing with Drought" Handbook •$2M grant program for planning/preparedness •Support water planning (e.g. Summerland) •Monitor surface & ground water conditions •Integrate water supply / demand management into risk assessments •Develop Water $ave Tool Kit – Waterbucket.ca •Update Okanagan water supply study •Communicate, communicate, communicate	•Review policy on water allocation & use •Continue watershed-fish sustainability planning •Develop flow agreements with major water licensees •Examine feasibility of new infrastructure to move water users off streams to lakes •Link water availability to land use planning / growth management •Assess hydrometric and climate networks

COMMUNICATION PLAN

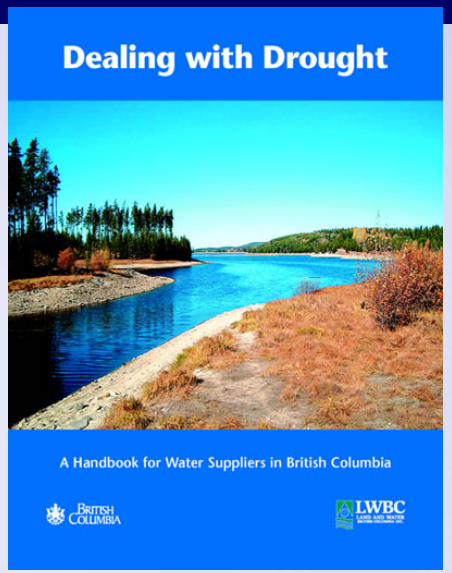
Purpose: To build public understanding

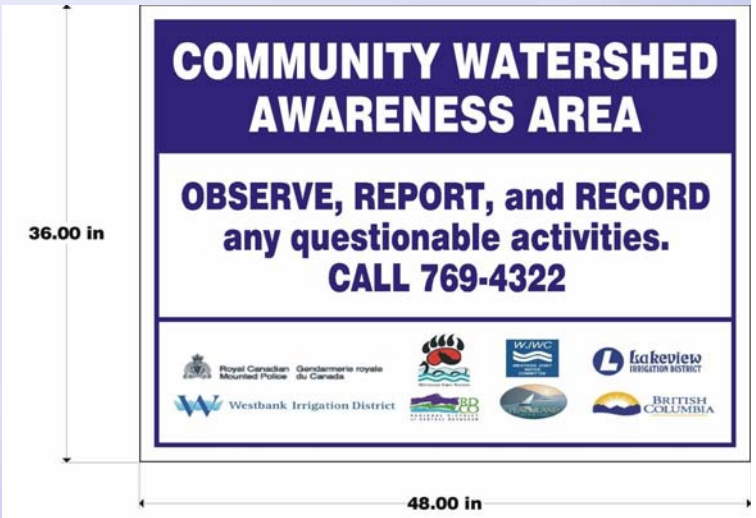
Key Messages:

- **Abundance is a myth**
- **Individuals can make a difference**
- **Communities need to conserve**
- **Province will provide support**
- **Even if rains, conservation steps are prudent**

$2M GRANT PROGRAM & TRAINING WORKSHOPS

- Supply & demand studies
- Plans for Drought Management, Water Conservation, Contingencies, and Emergencies
- Staff training and set-up of drought management teams
- Draft Bylaws to regulate water use
- Educational Materials for water conservation





OKANAGAN COMMUNITIES WITH FUNDING

- Westbank Irrigation District
- Lakeview Irrigation District
- District of Peachland
- District of Summerland
- City of Penticton
- Town of Oliver
- Osoyoos Irrigation District
- City of Kelowna
- Kaleden Irrigation District
- District of Lake Country
- Village of Lumby
- Black Mountain Irrigation District
- Glenmore Ellison Improvement District
- Rutland Waterworks District
- South East Kelowna Irrigation District
- South Okanagan Mission Improvement District
- RD Central Okanagan
- RD North Okanagan
- RD Okanagan-Similkameen
- Okanagan Falls Irrigation District
- West Bench Irrigation District

OKANAGAN SUPPLY & DEMAND STUDY

Best estimate of the current and future available water supply and demand in the Okanagan Basin

Phase 2 Objectives:

- Determine existing water supplies in tributaries, groundwater & lakes
- Quantify current water demand
- Estimate future supply & demand under a range of possible conditions
- Recommend an approach to future allocation decision making

►Must be scientifically defensible & credible with public

OKANAGAN SUPPLY & DEMAND STUDY

Challenges:

- **Getting momentum & keeping it**
- **Filling the critical data gaps**
- **Not getting hung-up on insatiable data gathering**
- **Linking all of the pieces to produce a credible product**
- **Multiple stakeholder interests**
- **Staying focused on the end goal**

LONGER TERM INITIATIVES

- Review policy on allocation & use
- Continue watershed-fish sustainability planning
- Develop flow agreements with major licensees
- Feasibility of new infrastructure to move users off streams to lakes
- Link water availability to land/growth planning
- Assess hydrometric & climate networks

LESSONS LEARNED

- Every drought is different
- Every community responds to drought differently
- Drought Management Plans must be specific to the community
- Local Drought Management Team is key
- Drought Management Plans must contain sufficient detail that anyone can follow it
- Drought Management Plans must be practiced to find the flaws

PROVINCIAL RESPONSE

- Provide information
- Proactive planning templates & tools
- Broad communication
- Funding & in-kind support
- Legislative, Regulatory & Policy support

IDEAS FOR THE OWSC

- Build broad-based support across all sectors
- Cultivate basin-wide thinking & culture
- Instil the water ethic – everyone has a stake, responsibilities & accountabilities for their actions
- Link grants to specific conditions
- Hold a “Drill Day” – challenge all water suppliers to test their Drought Management Plan…find the flaws
- Explore opportunities for basin-wide water management planning

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Water for BC; Safe, sustainable & valued by all.

www.env.gov.bc.ca/wsd/public_safety/drought_info/index.html

Adopting [a water ethic] would represent a historic philosophical shift away from the strictly utilitarian, divide and conquer approach to water management and toward an integrated, holistic approach that views people and water as related parts of a greater whole.

It would make us stop asking how we can further manipulate rivers, lakes and streams to meet our insatiable demand, and instead to ask how we can best satisfy human needs while accommodating the ecological requirements of healthy water systems.

Sandra Postel
Director of the Global Water Policy Project
"The Last Oasis – Facing Water Scarcity"
1997

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