Drought risk management: being proactive in a time of crisis

Roger S. Pulwarty

NOAA

Eight actions recommended by Western Progress and numerous other academic sorts:

- Strengthen and expand water conservation and efficiency programs
- Integrate water planning with growth management and land use planning
- Adopt integrated strategies at the federal level
- Assess impacts of transferring water from agricultural to urban and environmental uses
- Enhance and expand state instream flow programs
- Promote local watershed efforts
- Establish and strengthen statewide and local water trusts
- Improve ground water management strategies

Eric Kuhn's Laws of hydrologic planning

We assume that:

"The future will look like the recent past"

However,

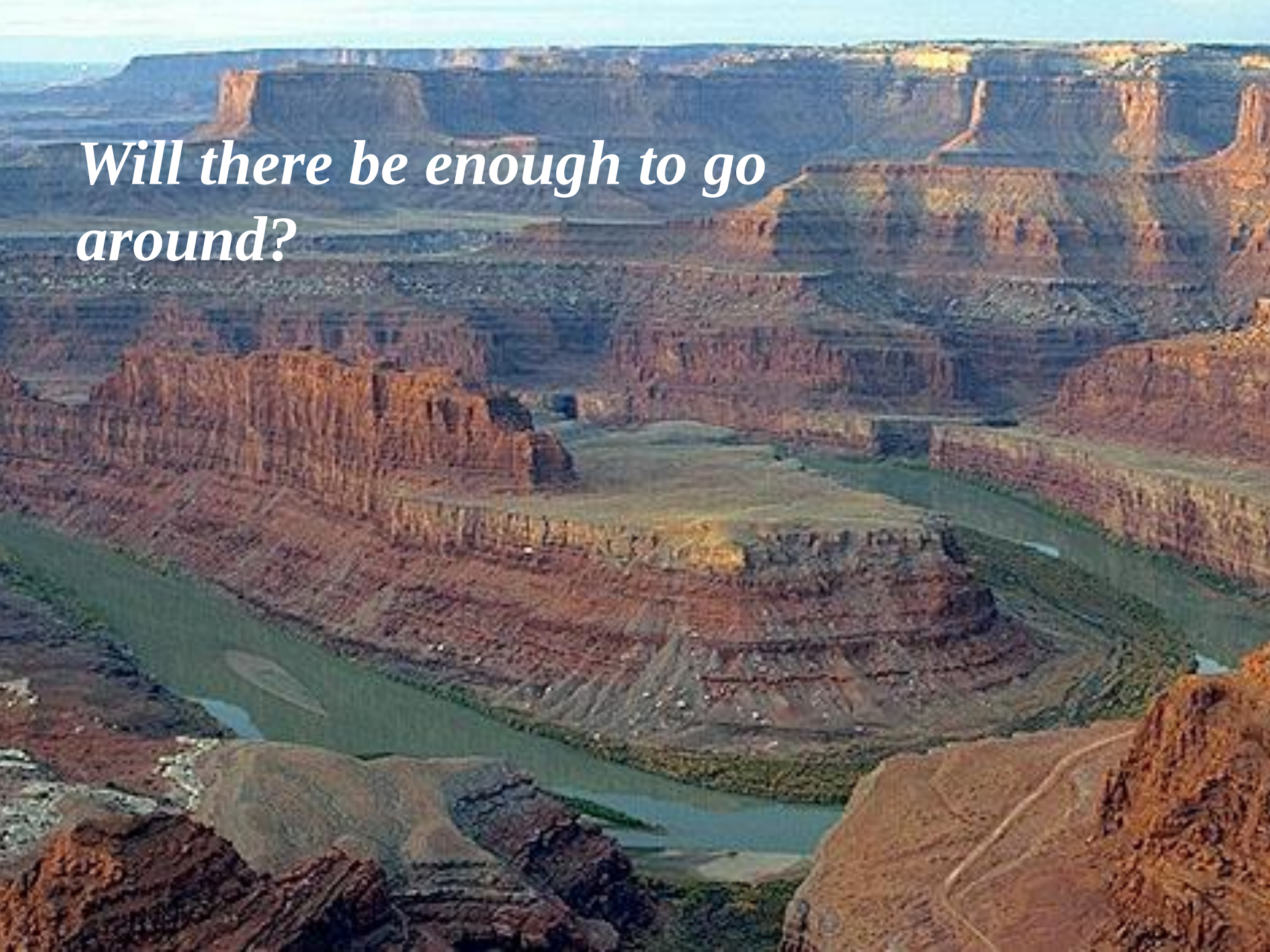
"No two hydrologists use the same recent past"

So neither the future nor the past are what they used to be

- The Colorado River District Uses 1953-2004 for water marketing decisions

Reclamation is using 1906-2000 for the development of shortage criteria for Lake Mead

- Reclamation Western Colorado Area Office is using 1975-2004 for the development of operating criteria for Blue Mesa Reservoir
- Denver Water uses 1947-1991 for its planning decisions

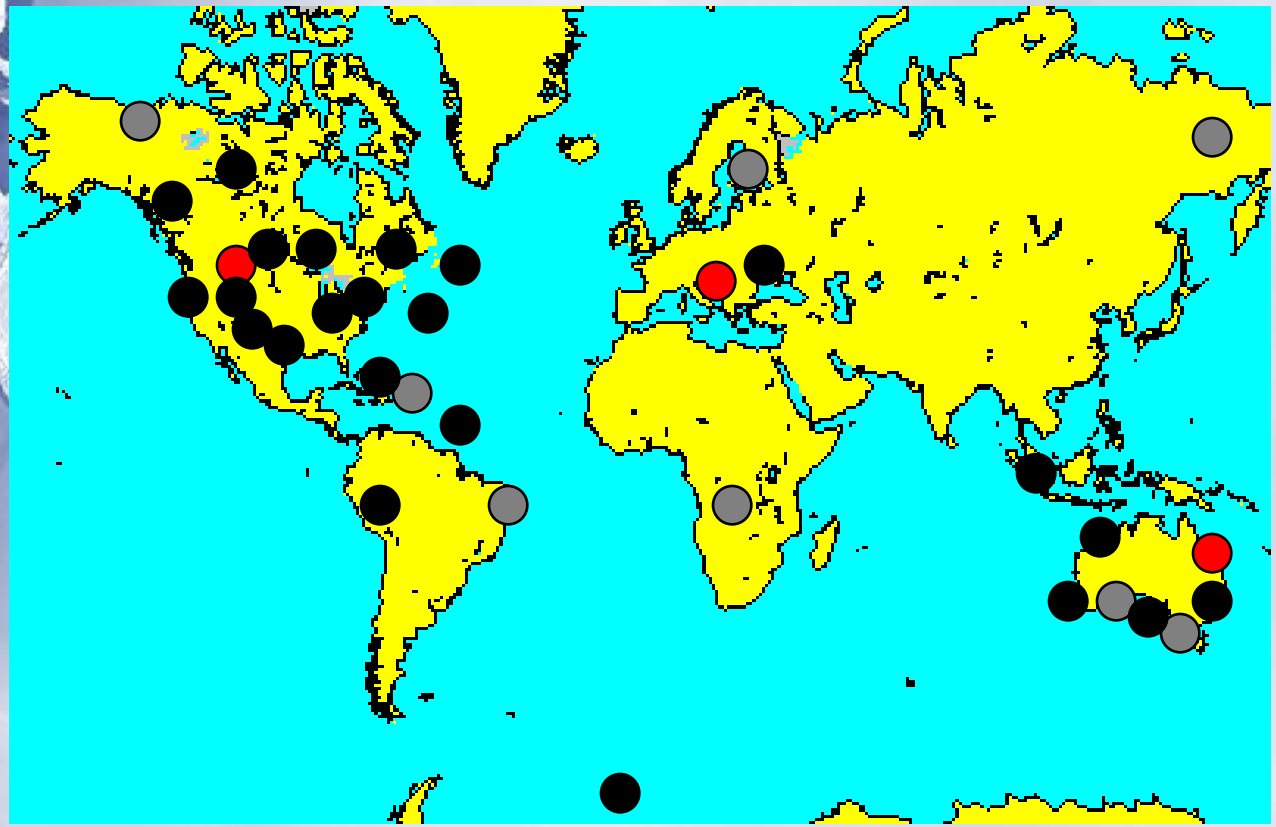

Will there be enough to go around?

Track record on implementing adaptive management

Successful

Modeling failure

Implementation failure



(after Walters et al.)

Agreements in the West I

- Strong focusing events
- Significant public interest
- Personal attention of key leaders

What is "seen" through the post-or mid-drought policy-window?

- *New awareness of risk during/after a disaster leads to broad consensus (for a brief time)*
- *"Reminded" of past drought risks*
- *Fault lines in development and planning policies revealed: Institutional/infrastructural weaknesses exposed*

- ***Enhanced will to act***
- ***Money available "to do things better"***

Agreements in the West II

- Strong support for collaboration between research and management
- Meaningful Stakeholder involvement
- Close Federal/State/local partnerships

Hayes, Pulwarty, Miles others

Paradoxes?

- Decentralization….. better coordination/integrated data
- Cumulative reduction of smaller scale risks…… may increase vulnerability to large events
- Planning…….“action” only after crisis or focusing event. Lessons available on particular events but not to gradual changes (or abrupt regime shifts)

- Integrated River Basin management….National vs. States vs. borderlands priorities

- Develop procedural/participatory mechanisms: Coalitions of local stakeholders need to be inclusive and transparent……. but this can lead to power struggles/robustness under stress

- Keep the water flowing for my needs…and, oh yeah ……protect that environment thing (Limerick)

Research-based knowledge
(Climate extremes, variability and change)

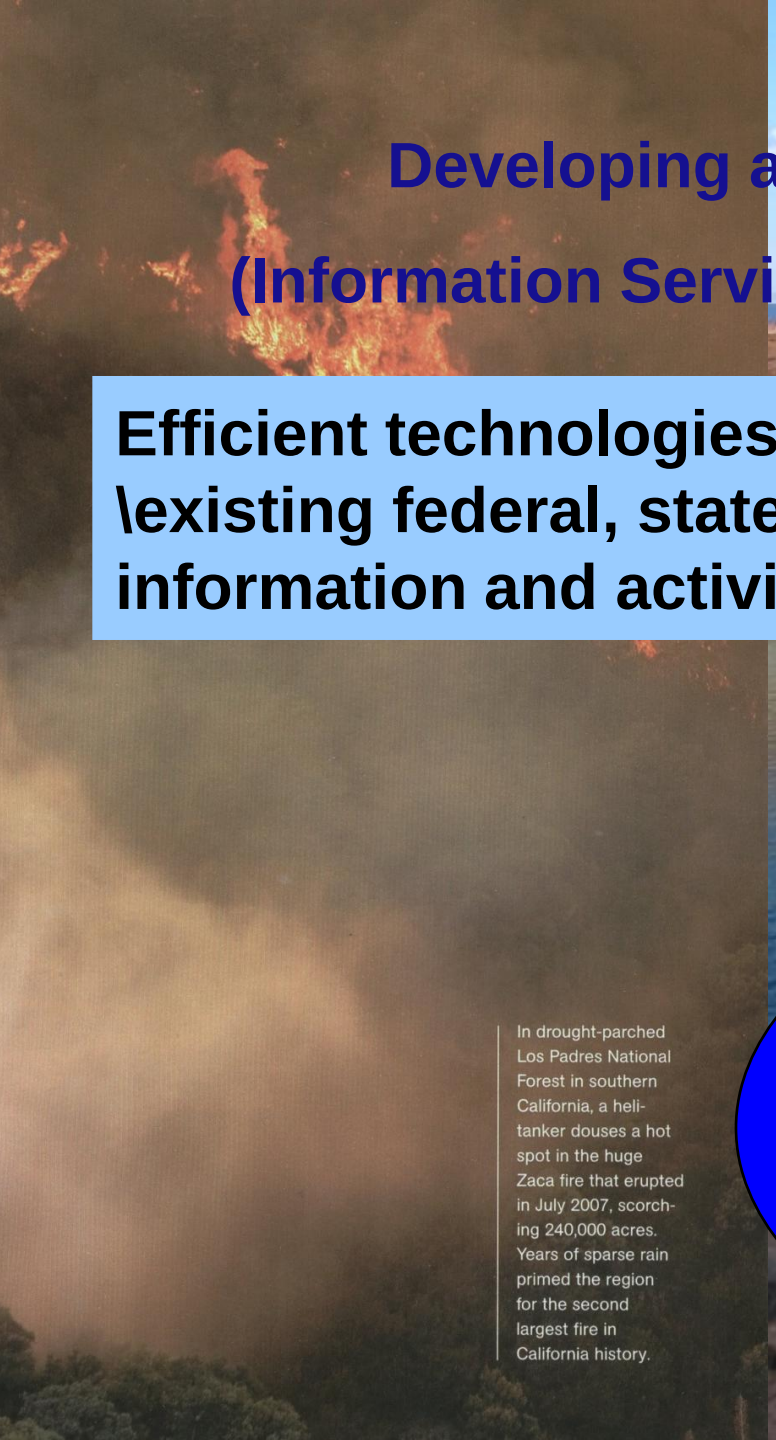
- Lacking or inadequate, Available but not used
- Used ineffectively or producing unintended consequences
- *Available, but if used effectively: Takes time to learn appropriate applications and take effect*
- ***Available, used effectively, can produce positive results but overwhelmed by rates and magnitudes of social, economic and environmental changes***

Gilbert White and many others

Developing an Adaptation Framework

(Information Services in Support of Adaptation):

Efficient technologies AND anticipatory coordination \existing federal, state, tribal and local drought-related information and activities:Monitoring-Response-Planning



In drought-parched Los Padres National Forest in southern California, a heli-tanker douses a hot spot in the huge Zaca fire that erupted in July 2007, scorching 240,000 acres. Years of sparse rain primed the region for the second largest fire in California history.

Engaging in Preparedness

:early warning systems,scenarios, information portals, flexibility within watersheds, states, communities Learn from other states

Let's be proactive……

You first!

Given your experience: How do/can we conduct effective proactive planning and implementation?

(data, information, securing partnerships, procedures for interaction-acceptable outcomes, decision quality)

Early Warning (sub)Systems

- **Monitoring and forecasting**
  National, regional and local levels
- **Risk assessment**
  Enable planning and management authorities to generate risk and impact scenarios on an ongoing basis
- **Communication and public awareness**
  Communication/delivery of timely information on impending events, potential risk scenarios and preparedness strategies to at-risk groups A|and sectors
- **Preparedness**
  Outline, inform and coordinate actions required to reduce the loss and damage expected from an impending event and for post-event planning

Image courtesy of Seattle-King County Convention and Visitors Bureau

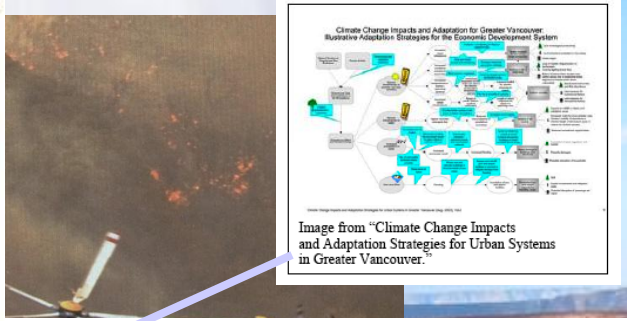


Image from "Climate Change Impacts and Adaptation Strategies for Urban Systems in Greater Vancouver."

Image courtesy of J. Crocker.

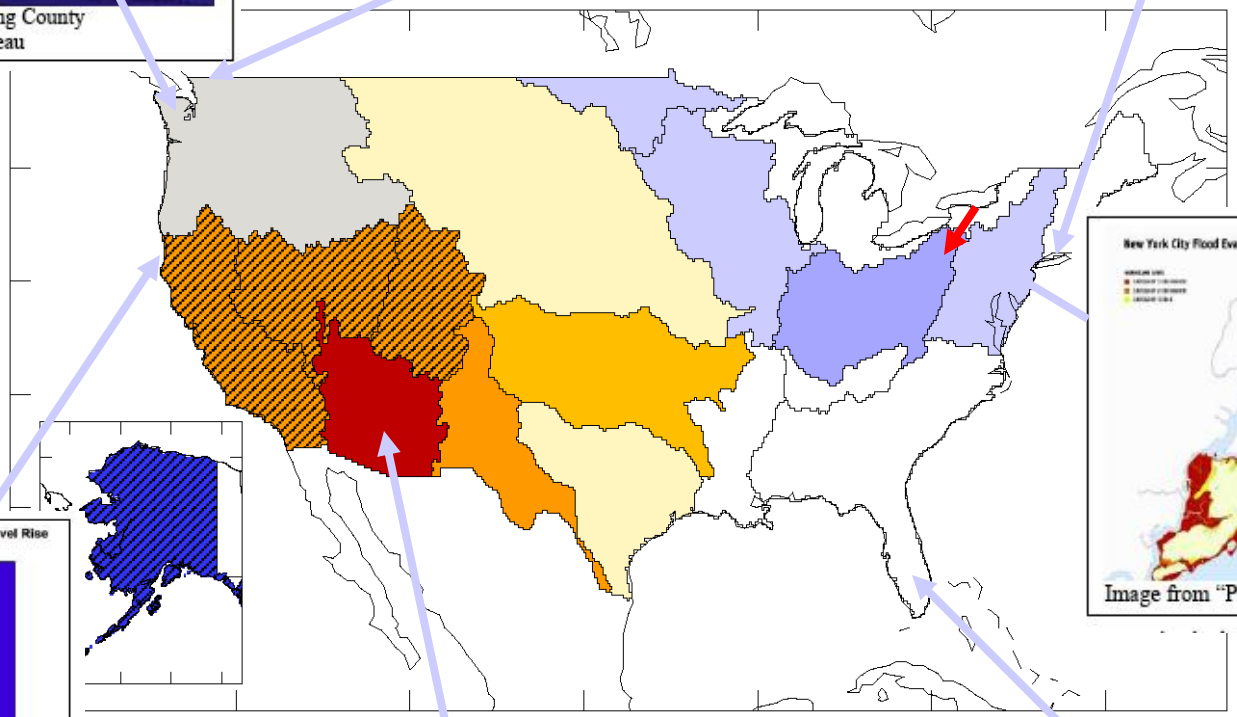


Image from "Plan NYC 2030."

Image courtesy of San Francisco BCDC*.

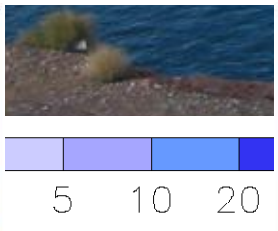
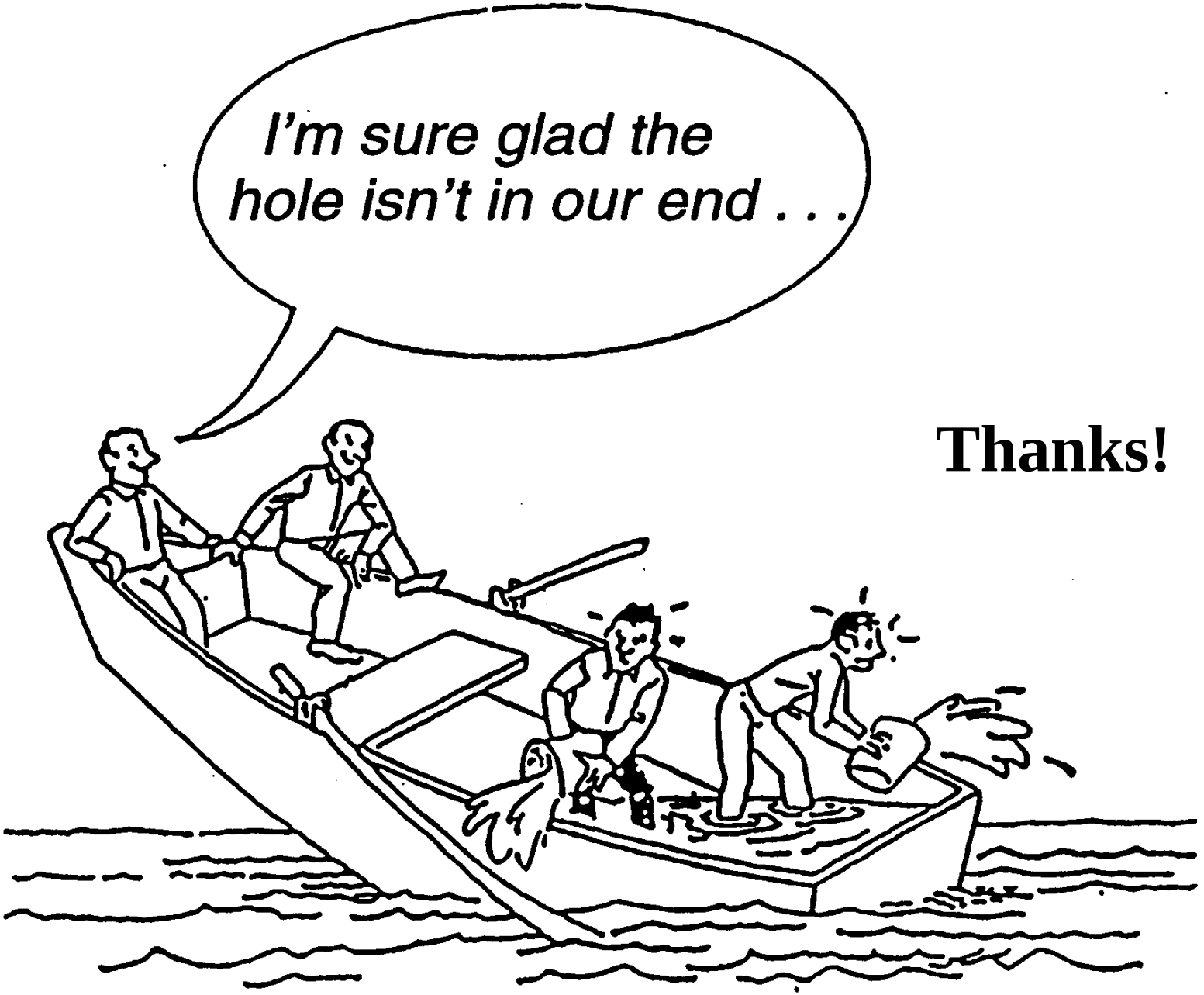


Image courtesy of stock.xchng



Thanks!

Shutters on the "policy-window"

- ***Recovery vs. adaptation requires weighing, prioritizing and sequencing of policies and programming***
- *Heroes and villains: Images of "who is to blame?" discourages empirical understanding of risks and vulnerabilities*
- ***Institutions may matter, but they are often simply not there***

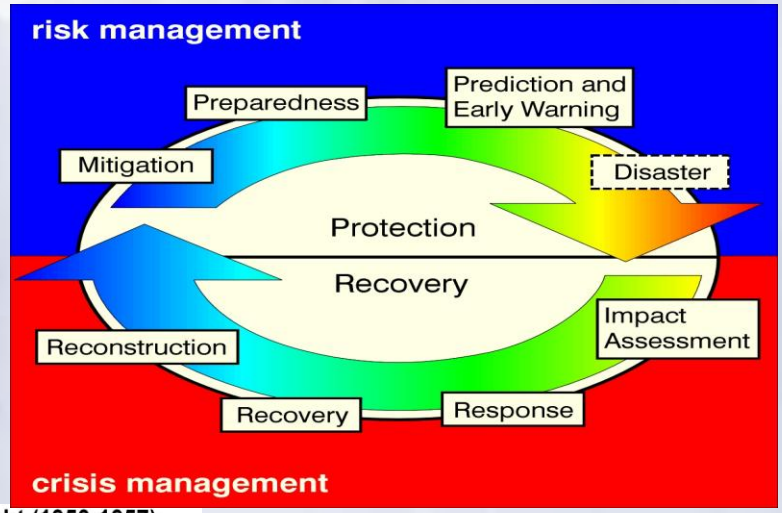
(For some reason, recommendations post-2002 look strangely like those post-1977)

Expectation

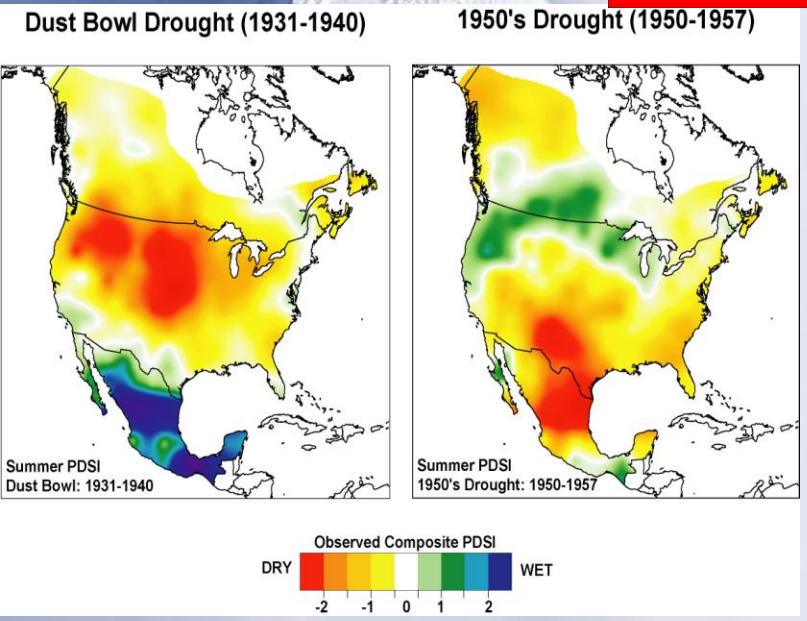
Better integrated understanding of the multiple functions of climate, socio-economic systems will lead to greater focus on balanced conservation as a subject of policy and to more coherent support among policy makers and stakeholders

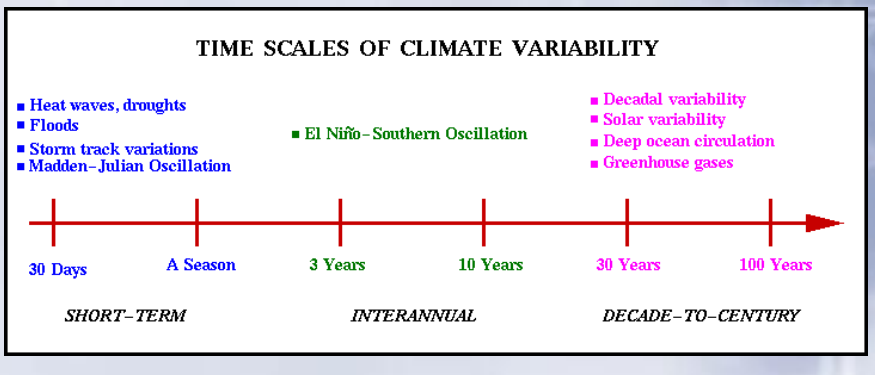
What has been the experience post 1950s, 1976-77 and 2002?

The nature and characteristics of adaptation as climate changes



The Hydro-Illogical Cycle





Problems:

- The "push" supply of new information by would-be providers of information/technology , and the "pull" demand for new information from would-be learners
- More difficult is understanding the socialization of lessons learned by particular individuals and organizations through their own, direct trial and error experiences

"War Over Water: Crisis of the 1980s"

U.S. News and World Report 31 Oct., 1983

"Today's water utility manager must operate effectively in a highly politicized setting and be acutely aware of the public policy, social, environmental, political and economical aspects of meeting customers needs"

R. Binney 2006 Director, Aurora Water

Examples

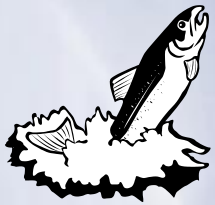
- International U.S/Mexico: Salinity
- Arizona and California: Interstate issues in the Lower Basin
- *Quantification Settlement Agreement (QSA)*
- Native American Water Rights
- Conjunctive Use and Management: Groundwater and surface water in Arizona
- Shortage Criteria

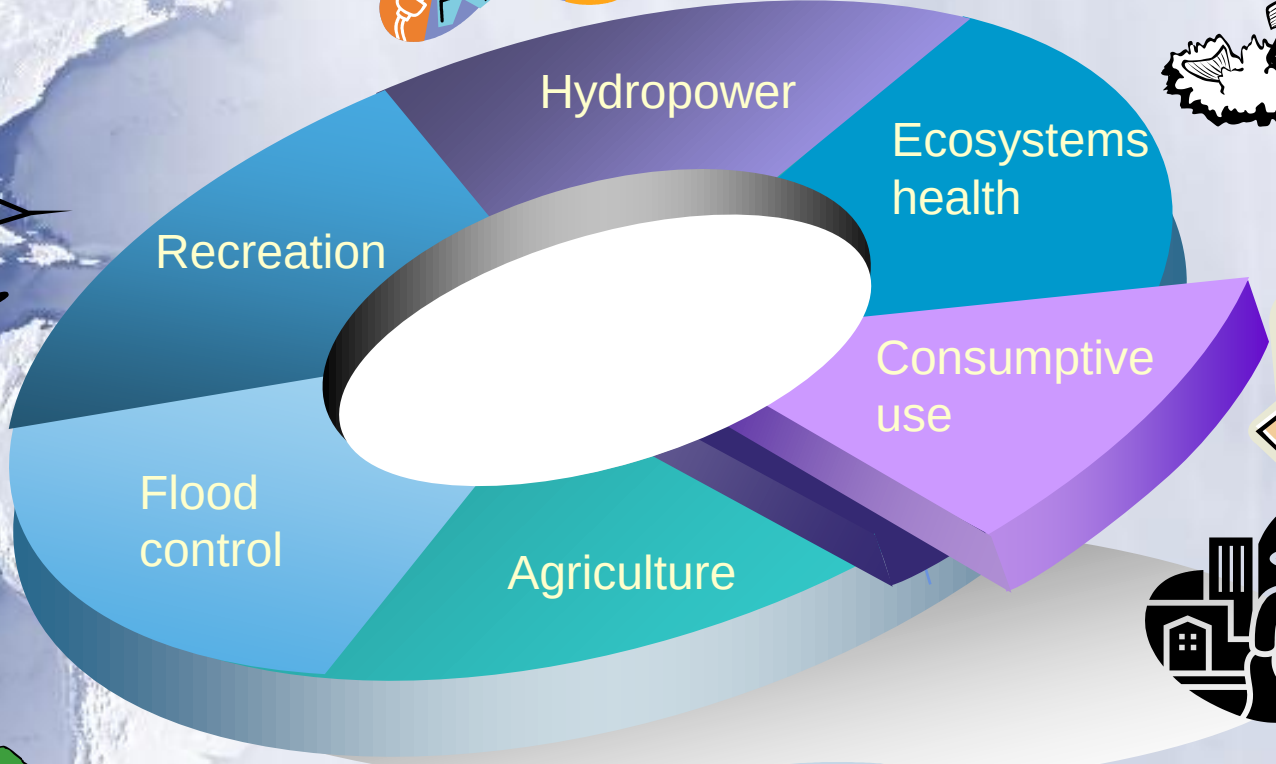
Partnerships: Beyond "communication"

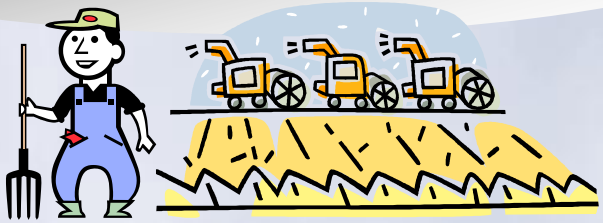
- Share the burdens
- Assume responsibilities
- Leverage resources
- Cooperation in implementation
- As brokers/facilitators between government-private sector

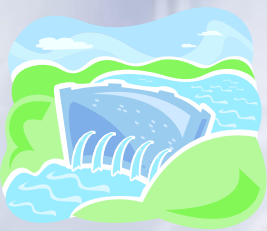
Linder, Bardach others

Multiple competing values
Multiple, competing objectives









Early Warning (sub)Systems

- **Preparedness**

  Outline and inform and coordinate actions required to reduce the loss and damage expected from an impending event and for post-event planning

- **Evaluation and feedback**

Scale: Who are the actors? What are their perspectives and needs? What are the entry points for decision-making? What decisions are made? How can this process be improved

Usual stakeholder interaction

–Concentrates on the incorporation of new knowledge or experience into existing models, decision processes and practices

Needed

–The most important learning involves values, norms, goals, and the basic "framing" of issues in terms of the drivers and importance

–Innovative partnerships incl.joint research

Where do science and policy speak to each other?

- Workshops and meetings (shared scenario construction; shared model building?)
- Presentations and briefings (incl. locally organized events, e.g. hearings)
- One-on-one technical assistance
- Coordination with other ongoing projects
- Work with the local media
- Web site development and maintenance
- Graduate-level courses on climate impacts & adaptation

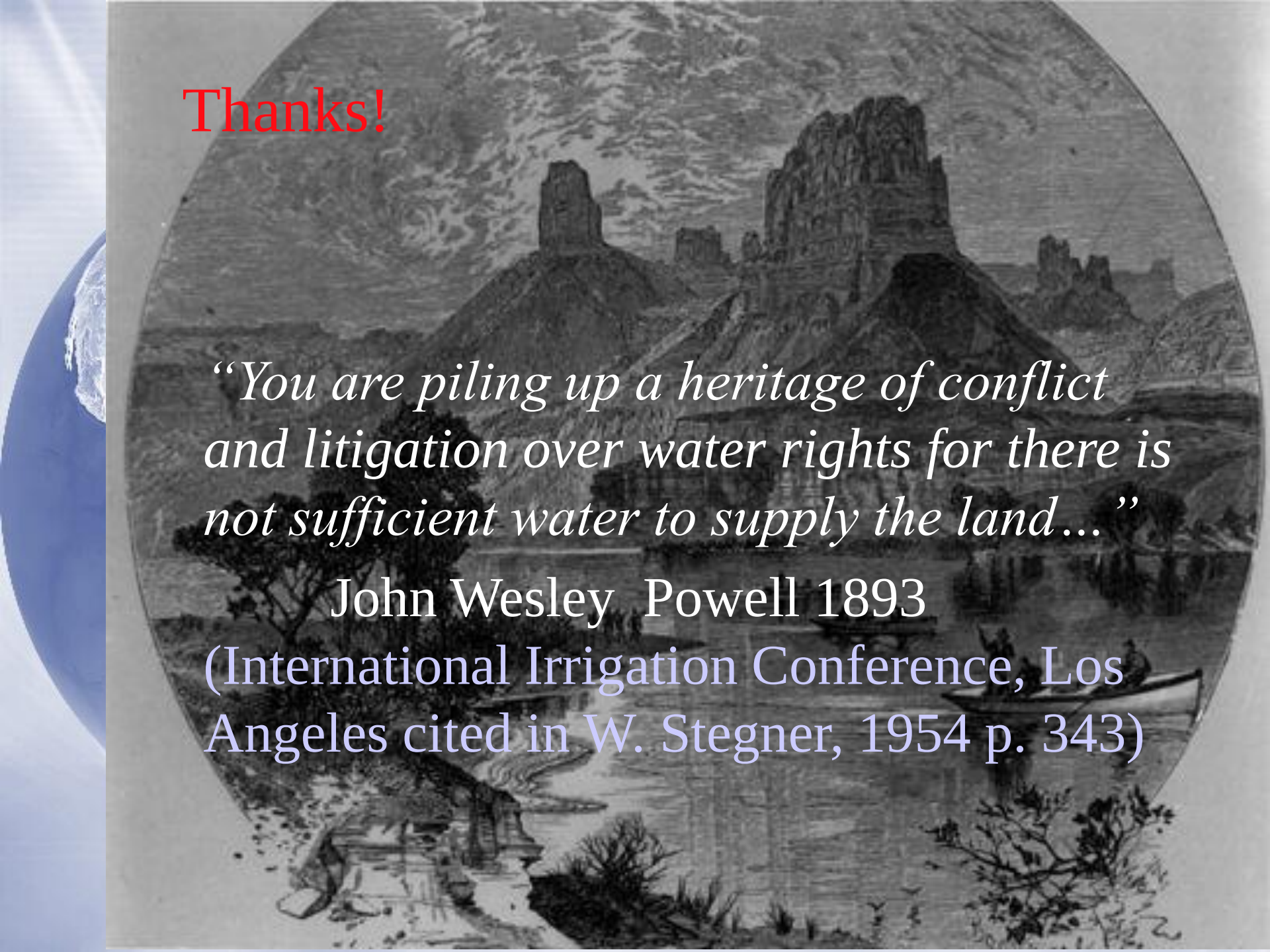
(1) Clarification of goals at the human-environment interface

Awareness of the role of climate, demand-side needs

(2) Distillation of lessons from appraisals of current and past practices: What has happened in your state, community?

"foresight ≠ hindsight"

(3) Construction of **and support** for a solid cooperative foundation for monitoring,research, management and education

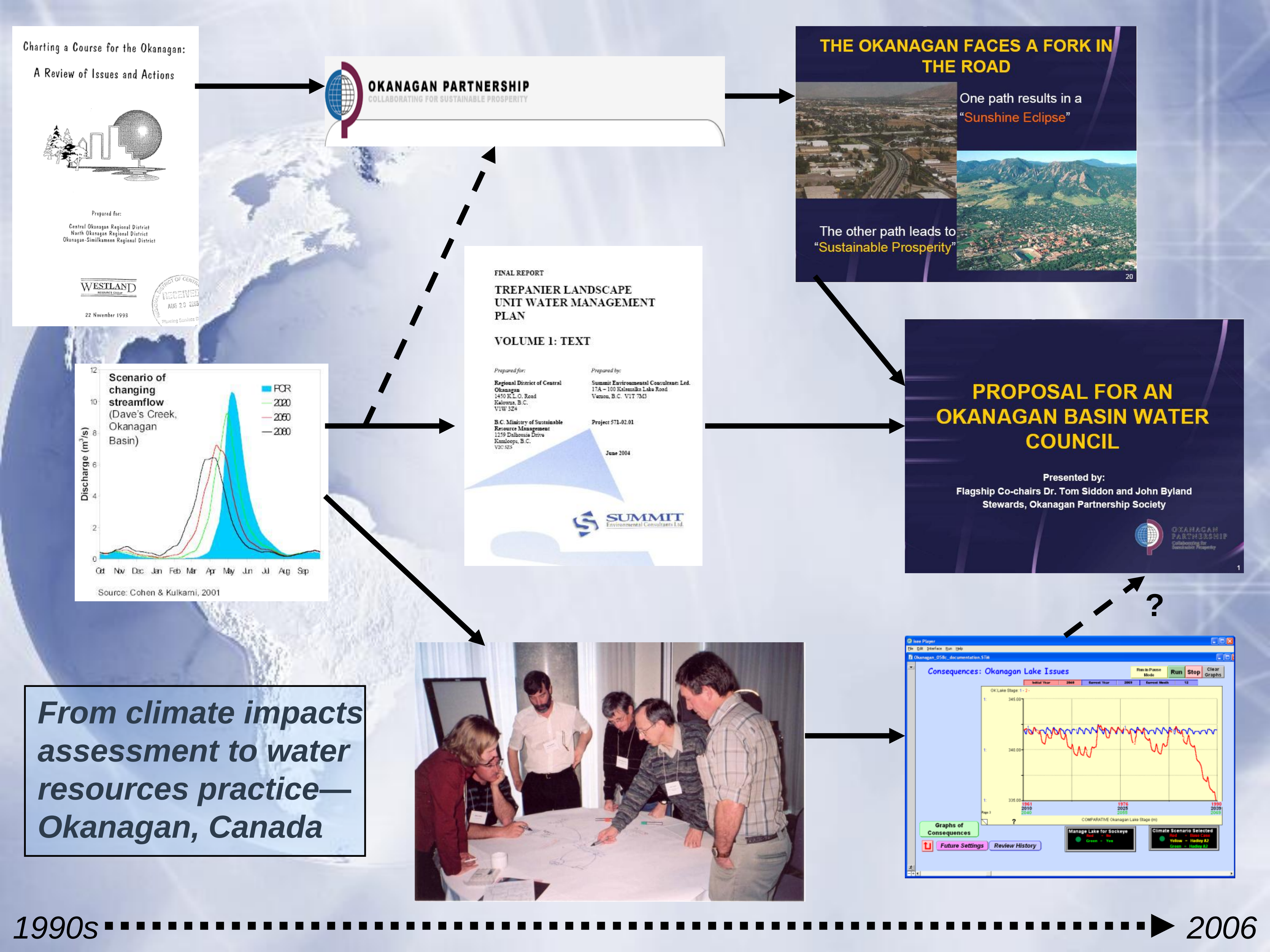


Thanks!

"You are piling up a heritage of conflict and litigation over water rights for there is not sufficient water to supply the land…"

John Wesley Powell 1893

(International Irrigation Conference, Los Angeles cited in W. Stegner, 1954 p. 343)


Charting a Course for the Okanagan:
A Review of Issues and Actions
Prepared for:
Central Okanagan Regional District
North Okanagan Regional District
Okanagan-Similkameen Regional District
WESTLAND
22 November 1993
OKANAGAN PARTNERSHIP
COLLABORATING FOR SUSTAINABLE PROSPERITY
THE OKANAGAN FACES A FORK IN THE ROAD
One path results in a "Sunshine Eclipse"
The other path leads to "Sustainable Prosperity"
20
FINAL REPORT
TREPANIER LANDSCAPE UNIT WATER MANAGEMENT PLAN
VOLUME 1: TEXT
Prepared for:
Regional District of Central Okanagan
B.C. Ministry of Sustainable Resource Management
Prepared by:
Summit Environmental Consultants Ltd.
Project 571-02.01
June 2004
SUMMIT
Environmental Consultants Ltd.
Scenario of changing streamflow (Dave's Creek, Okanagan Basin)
PCR
2020
2050
2080
Discharge (m³/s)
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Source: Cohen & Kulkarni, 2001
PROPOSAL FOR AN OKANAGAN BASIN WATER COUNCIL
Presented by:
Flagship Co-chairs Dr. Tom Siddon and John Byland
Stewards, Okanagan Partnership Society
?
Consequences: Okanagan Lake Issues
Run
Stop
Graphs of Consequences
Future Settings
Review History
From climate impacts assessment to water resources practice—Okanagan, Canada
1990s
2006

Roger S. Pulwarty is a climate scientist and the Director of the National Integrated Drought Information System (NIDIS, www.drought.gov) at the National Oceanic and Atmospheric Administration (NOAA) in Boulder, Colorado. His interests and publications are on climate variability and change, assessing social and environmental vulnerability, and on developing climate information and services for risk management. Dr. Pulwarty's work focuses on the Western U.S., Latin America and the Caribbean. From 1998 to 2002 he directed the Regional Integrated Sciences and Assessments (RISA) Program at NOAA. He also leads the Vulnerability and Capacity Assessments component of the World Bank/GEF-funded project on "Mainstreaming Adaptation to Climate Change in the Caribbean."

Roger is a lead author on Vulnerability, Adaptation and Impacts in the 2007 UN Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, the IPCC Technical Report on Climate and Water Resources, and on the multi-agency U.S. Climate Change Science Program Synthesis and Assessments Reports including Climate Extremes. Roger has acted in advisory capacities on climate and natural resources management to several U.S. and international agencies including the Western States Water Council, the Environmental Protection Agency, the Department of the Interior, the Governments of CARICOM (the Caribbean Economic Community), Venezuela, Chile, the Organization of American States, the UNDP, UNEP and the World Bank. He is Professor-adjunct at the University of Colorado and University of the West Indies. Roger has served on Committees of the U.S. National Academy of Sciences, has testified before the U.S. Congress on climate, water resources and adaptation most recently on "Water Supply Challenges in the 21st Century", and featured in several media communications, including the New York Times Magazine article "The Future is Drying Up" (NYT, October 2007). He is a co-recipient of the 2008 NOAA Administrator's award for outstanding achievements in integrating climate research into decision making.