

APEC Climate Symposium 2013:  
Regional Cooperation on Drought Preparedness and Response  
Drought Information for Policy and Decision Making



# Outline

- Public official dilemma
  - Competing disasters
  - Scientific – local jurisdiction
  - Social – common bond
  - Attention span
    - Linkage through benefits – regional examples
- Organizational change management
- Northern CA success story
  - Five agencies, elected officials
  - Blend conceptual and quantitative info
  - Shared Vision Planning and Modeling – Officials and Public as Resources
- Success Factors
- Maintenance – involvement, transparency

# Everyone Talks About the Weather...



...but Movies are Made About Disasters



# “Earthquake” (1974)

“Earthquake”

Construction Engineer Stuart  
Graff is estranged from his  
wife with

Lew Slade is suspended from  
the L.A.P.D. punching an  
officer from another  
jurisdiction

All lives are devastated when an earthquake  
reduces Los Angeles to ruins!

tries to persuade  
Sam Royce, who  
employer, to v

the assistant to  
Miles Quade, an aspiring  
daredevil motor cyclist.

# “Volcano” (1997)

“Volcano”  
After a seemingly minor  
quake one night in 1  
they learn their lesson when  
lava begins to spill out into  
the streets and to destroy  
build

A giant burst of lava from the La Brea Tar Pits  
births a new volcano under Los Angeles!

early warning  
temperature of a  
or 4 degrees i  
plucky seismologist.  
from a

# "The Perfect Storm" (2000)

"The Perfect Storm"

Desperate for money, Captain

Billy Tyne convinces the

to join

head to the Flemish Cap. At  
the height of their fishing  
the ice machine breaks; the  
only way to

Between the *Andrea Gail* and shore is a powerful hurricane the boat's crew foolhardily underestimates!

fishing grounds,

developing thun

behind them.

storm or to wait it  
out, the crew decides to risk  
the storm.

# (Non-Movie) Drought Challenges for Decision Makers

- Drought sneaks up
- Impact not always immediately felt
- Competition for attention from other disasters
- Preparedness competes for planning \$
- Impact varies, unlike hurricane, earthquake, tornado
- Multi-year droughts often required
- But there *was* a movie, of sorts...

# “Breaking The Drought” (1920)

Silent film with superb footage of a drought-stricken Outback. Uses striking and indelible images of starving animals eating carcasses, a dust-storm, dry rivers, and cracked Earth.

## Weak Plot!

Not drought, but wayward son, causes farmer’s financial ruin  
Family’s farmhouse surrounded by lush lawns and gardens  
Murder, mayhem, and debauchery, but no effects of drought

**How much more interesting is a plot about the farmer's struggle with drought?**

# Climate Chg/Drought Challenges for Decision Makers

## Scientific

Global climate forces affecting weather over time - may lead to drought declarations

- Slow progressive flow of information
- Doesn't affect all the same way

## Social/Psychological

Prevailing psychological state - 'climate' affects decision making

- Climate of opinion, attitudes
- National mood changes near elections

## Attention Span

Have to get their attention early

- Drought doesn't have visibility of other disasters

# Best to Use Facilitated Decision Making Process, then...

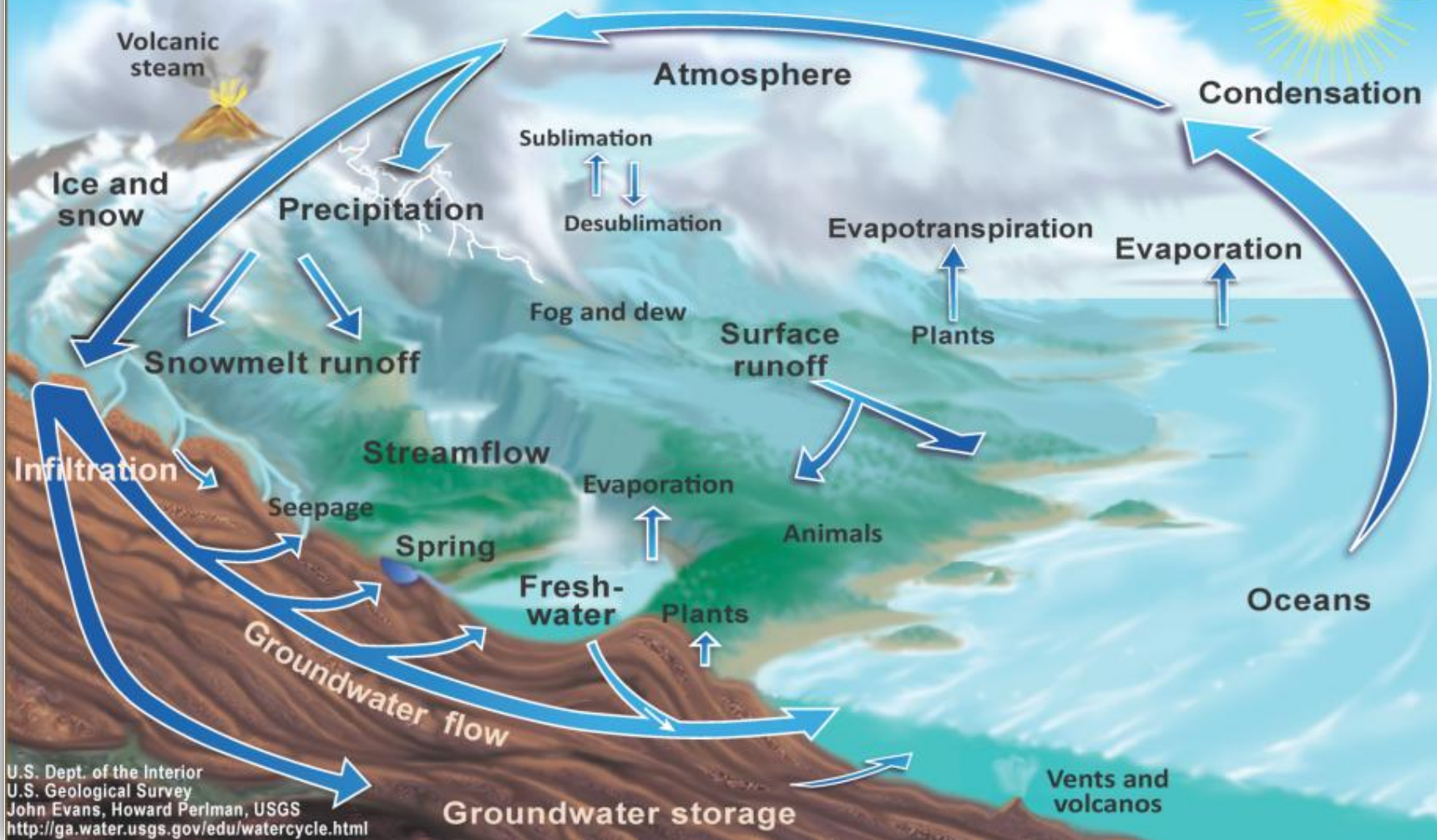
- Relate solid, technical information to decision makers' "jurisdiction"
- Address non-technical social pressures
- Explain community impact
- Validate regional approach

# Begin the 'socialization' tech integration process

- Relate solid, technical information to decision makers' "jurisdiction"



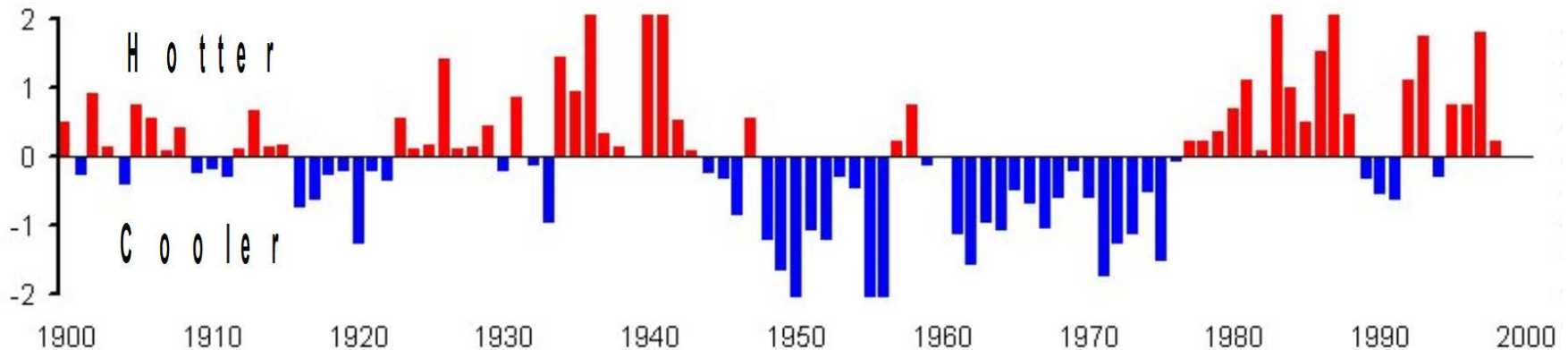
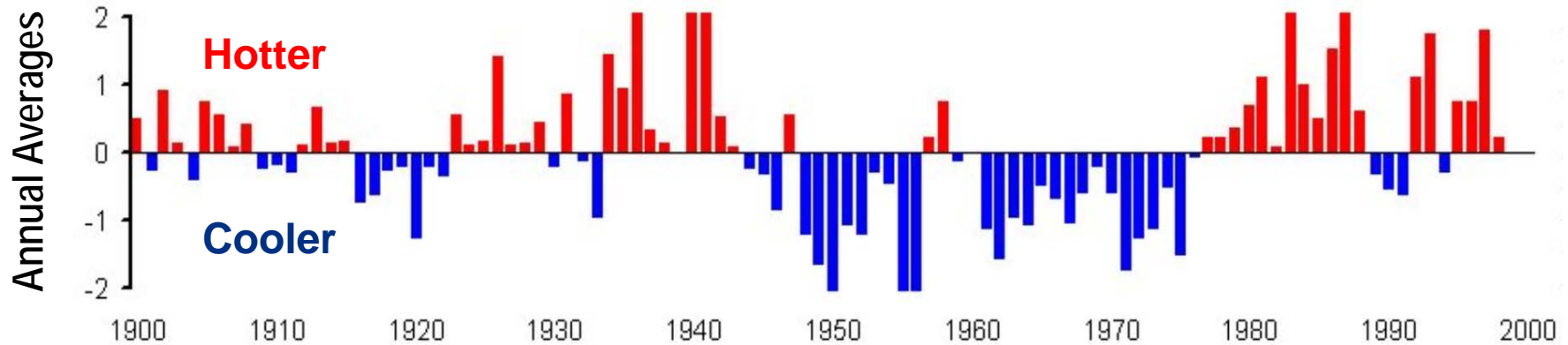
# The Water Cycle



U.S. Dept. of the Interior  
U.S. Geological Survey  
John Evans, Howard Perlman, USGS  
<http://ga.water.usgs.gov/edu/watercycle.html>

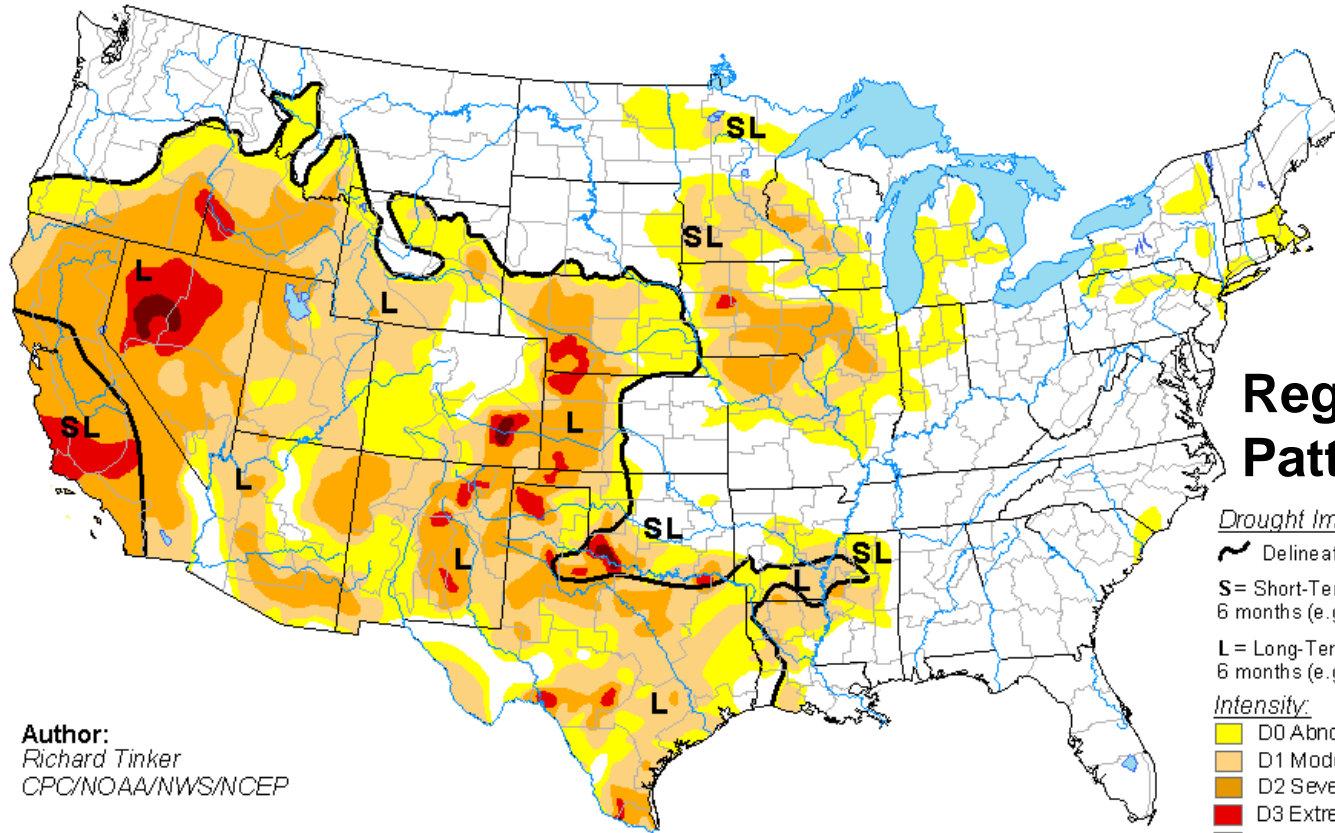
# Pacific Decadal Oscillation (PDO)

Not always understood (or believed)



Source: CalTech Jet Propulsion Laboratory (Dr. William Patzert)

# US Drought Monitor



## Regional Patterns

### Drought Impact Types:

~ Delineates dominant impacts

S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)

L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

### Intensity:

Yellow D0 Abnormally Dry

Light Orange D1 Moderate Drought

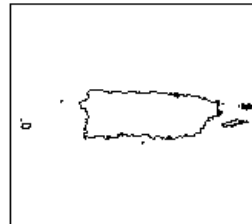
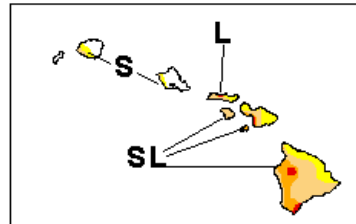
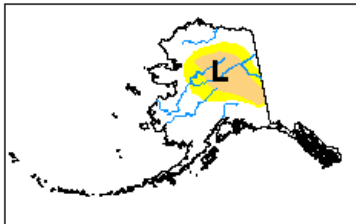
Dark Orange D2 Severe Drought

Red D3 Extreme Drought

Dark Red D4 Exceptional Drought

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

Author:  
Richard Tinker  
CPC/NOAA/NWS/NCEP



<http://droughtmonitor.unl.edu/>

# Move Integration Along

- Address non-technical social pressures
- Explain community impact

# Process Models Illustrate Benefits of Cooperation



Regional: Western Governors' Association

# Point Out Where it is Working and Can Work

- Validate regional approach

# National Policy Development Model

- National Drought Policy Commission
- Built on Western Gov's collaboration

## State and Regional Case Studies

- **Delaware River Basin Commission**  
Coordinated drought mitigation
- **Interstate Compact for the Potomac River**  
Brokered water supply agreements
- **Ohio River Basin Commission**  
Collaborative discussion around water conditions
- **Susquehanna River Basin Commission**  
Coordinated drought activities




Using climate change information to inform drought-related decision making requires change management in organizations and institutions

Resource managers and planners must **USE** the decision makers and the public as part of the decision making system



# Blending Conceptual and Quantitative Info for Success

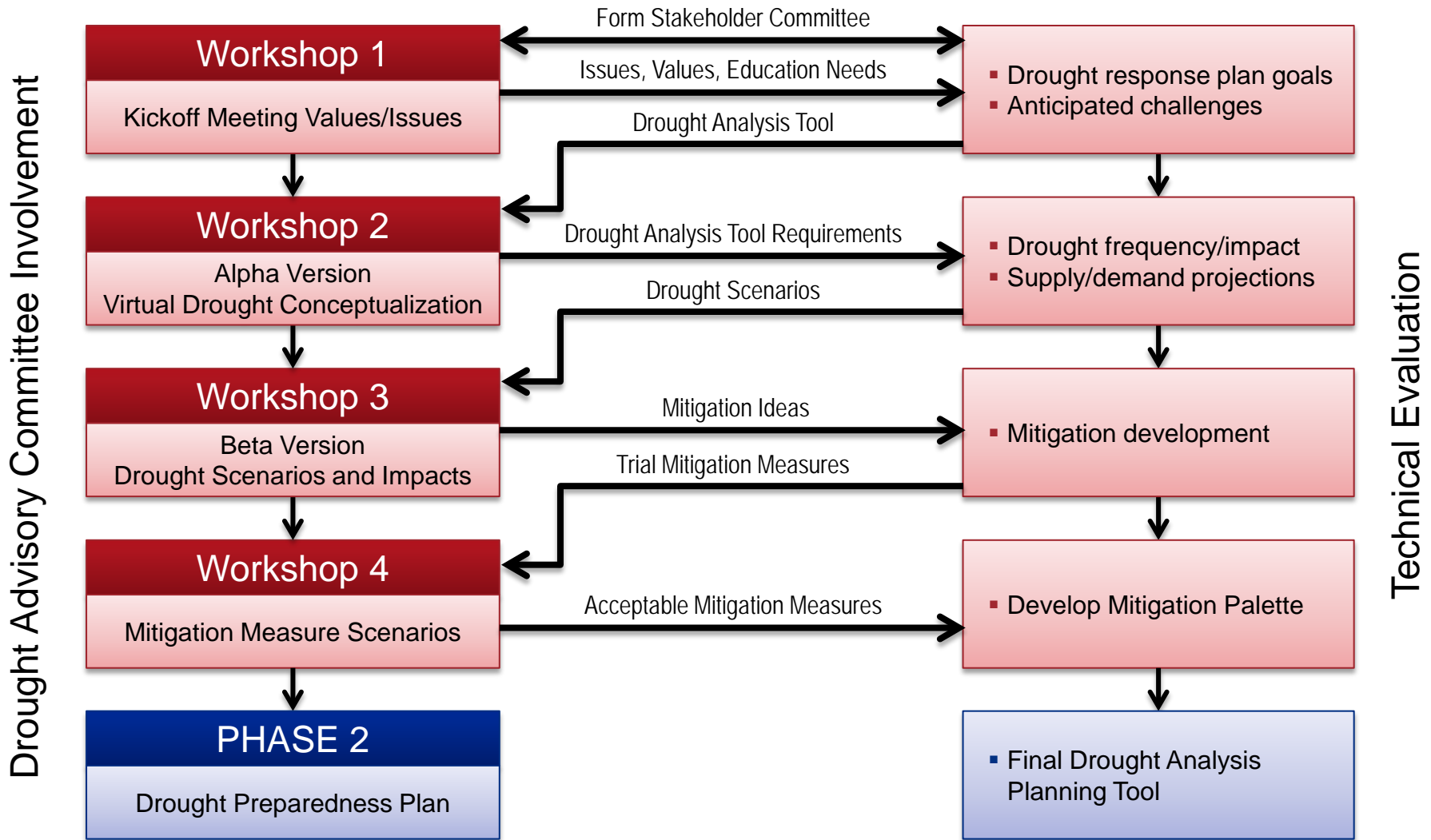
- Decision makers and public as **resources**
- El Dorado County CA politics – don't engage
- Two-year drought preparedness program
  - Year 1: Data
  - Year 2: Agreement data usage, results
- Elected boards – all voices heard, valued
- Environment, agriculture, and business focus
- Generational learning – be aware!

A hand is shown holding a large, clear sphere of water. Inside this sphere, a smaller globe of the Earth is visible, surrounded by green and brown textures. The background is dark with many small, sparkling water droplets, suggesting a dynamic and fluid environment. The overall image conveys themes of water, climate, and global impact.

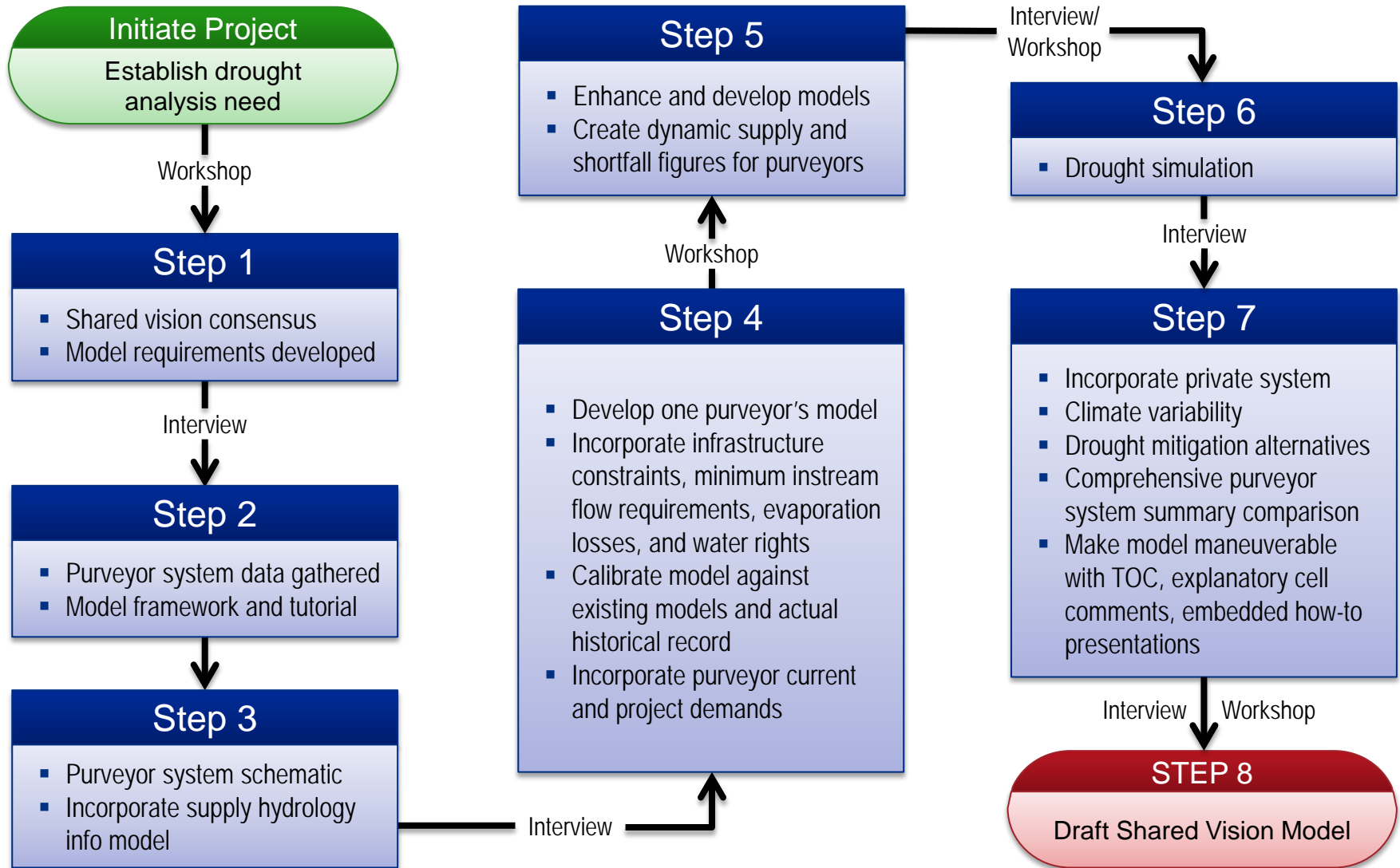
Calls for organizational change management  
about approaches to adapting to climate change  
impacts including drought preparedness/response

Shared Vision Planning and Modeling

# Decision Web: Experts, Policy Makers, Public, Interests



# 8 Steps to Reach Agreement and the Plan



# Celebrate Agreements, Publicize, Give Credit Away



# Causes of Success

- Transparency of diverse information, assumptions and decision factors
- Trust building and equal participation by technical and non-technical members
- Quantitative water supply shortfalls predictions
- Clear depiction and agreement on water suppliers' jurisdiction and surrounding geographic features
- Demonstrating how shortfalls could occur using actual impacts and lessons from past

## Success...

- Evaluating drought response effectiveness for basis of agreement on prevention/response
- Easy model tool updates
- Testing existing drought plans with proposed plans
- Integrating climate change impacts without politics
- Used Stockholm Institute climate models results as potential impact bookends, without debating “whys”

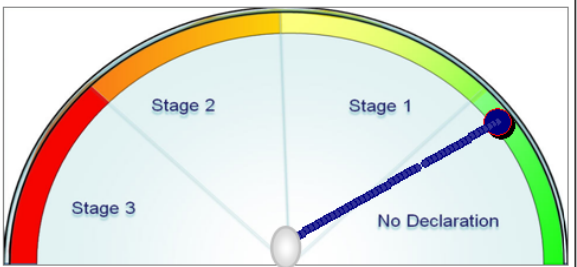
# Continue Communicating

Don't assume people won't want to join the dialog after the fact or disrupt agreement

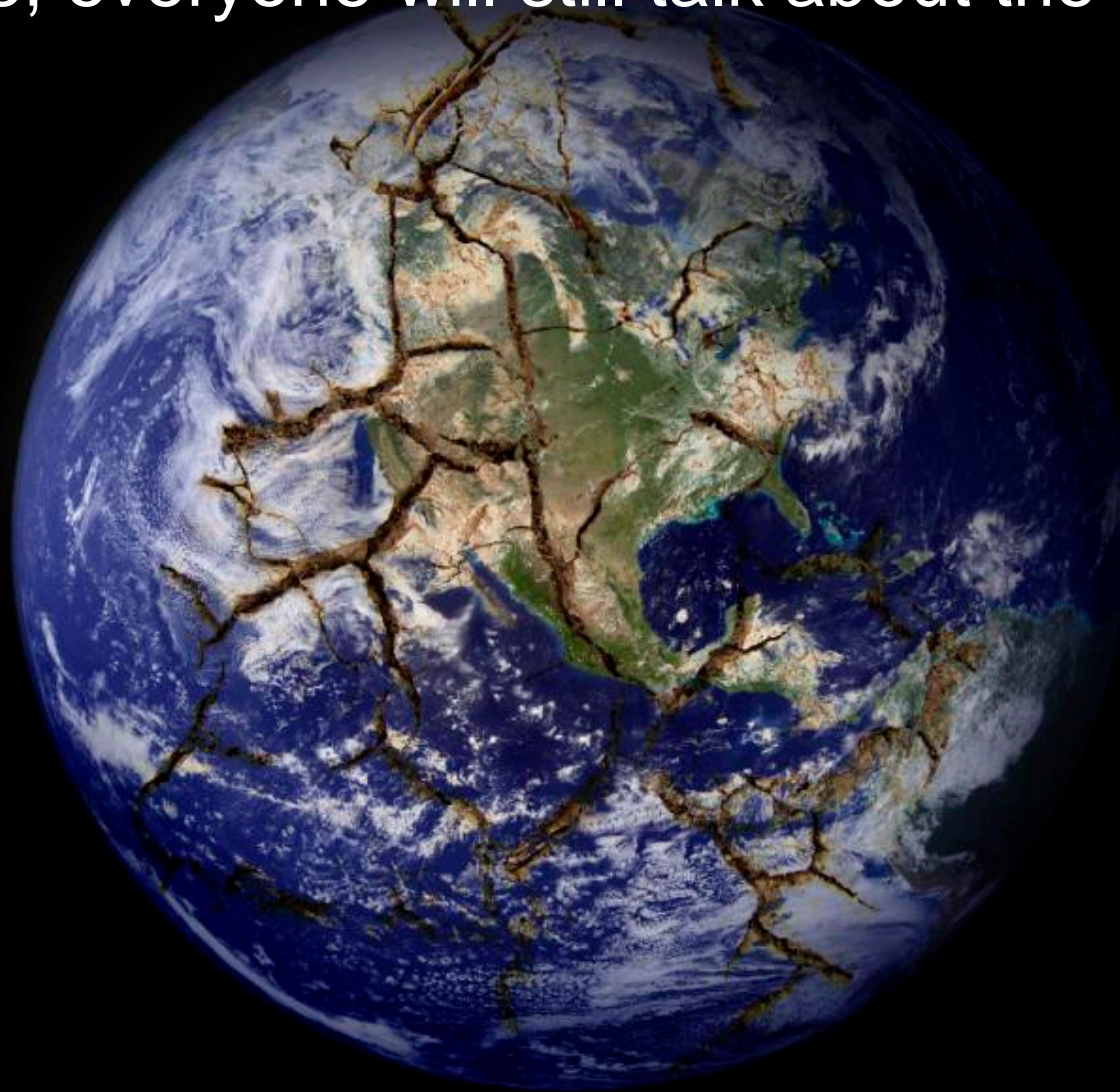


**Build learning bridges**  
**Empower participants to become ambassadors**

# Be transparent and make it easy to update, follow, drill down, and know when decisions are needed

	A	B	C	D	E	F	G	H	I	J	K	L
1	<b>Today's Drought Status in EID</b>						Type in date (XX/XX/XXXX):		4/5/2008		<a href="#">Help</a>	
2							<p>Under the terms of the Drought Status SRI plan, EID is not currently in drought. The current supply remaining index (SRI) is 0.24. Based on the simulation of the SRI plan using 1922-2002 supplies, there is a 100% chance that EID will go into a drought next month, and a 100% chance that EID will go into a drought sometime during the next five months.</p>					
3												
4												
5												
6												
7												
8												
9												
10												
11	<b>Drought Stage and Supply Remaining Index for May .</b>											
12	<b>Drought Stage NOW:</b>		No Drought		<b>Enter last month's stage:</b>		0		<a href="#">More details</a>			
13	<b>SRI:</b>		0.24		SRI ranges from 0-1 and is based on days supply remaining as a function of current storage, worst-case expected supplies, and normal (unconstrained) demand in the coming months. (go to HELP sheet for more info)							
14	<b>Climate Cycle Episode El Nino Southern Oscillation (ENSO) and DWR Water Year Type Data</b>											
15	<b>ENSO</b>		-0.4		Warm (positive value) and cold (negative value) episodes are based on a threshold of +/- 0.5 degrees Celcius for the Oceanic Niño Index (ONI), based on the 1971-2000 base period.							
16	<b>Current Water Year Type (1-5):</b>				Water Year Type is Critical. Water Year obtained from DWR Sacramento Valley Water Year Type Index. Final determination is based on the May 1 50% exceedence forecast.							
17	click to link to DWR website											
18	<b>Snow water content is not an indicator because analysis shows no consistent correlation with historical drought occurrences.</b>											
19	<b>Enter Current Reservoir Storage (acre-feet):</b> (click on underlined Lake name to link to online data source and update data manually)											
20	<b>Sly Park</b>		10,000		Sly Park is 24% full.							
21												
22												
23												
24												
25	<input type="checkbox"/> Check if the Board decides to add one stage to the SRI											

Meanwhile, everyone will still talk about the weather...





***The End.***