APEC Climate Symposium 2013: Regional Cooperation on Drought Preparedness and Response

Drought Information for Policy and Decision Making

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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)

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

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

Construction Engineer Stuart Graff is estranged from his wife. He tries to persuade Sam Royce, who is his employer, to drive with him to Hollywood to save his family. Miles Quade, an aspiring daredevil motorcyclist.
“Volcano” (1997)

A giant burst of lava from the La Brea Tar Pits births a new volcano under Los Angeles!
“The Perfect Storm” (2000)

Between the *Andrea Gail* and shore is a powerful hurricane the boat’s crew foolhardily underestimates!
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…
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”
Pacific Decadal Oscillation (PDO)
Not always understood (or believed)
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.
Sweet Success
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!
Calls for organizational change management about approaches to adapting to climate change impacts including drought preparedness/response
Decision Web: Experts, Policy Makers, Public, Interests

Workshop 1
Kickoff Meeting Values/Issues

Workshop 2
Alpha Version Virtual Drought Conceptualization

Workshop 3
Beta Version Drought Scenarios and Impacts

Workshop 4
Mitigation Measure Scenarios

PHASE 2
Drought Preparedness Plan

Form Stakeholder Committee
Issues, Values, Education Needs

Drought Analysis Tool

Drought Analysis Tool Requirements

Drought Scenarios

Mitigation Ideas

Trial Mitigation Measures

Acceptable Mitigation Measures

Drought response plan goals
Anticipated challenges

Drought frequency/impact
Supply/demand projections

Mitigation development

Develop Mitigation Palette

Final Drought Analysis Planning Tool

Technical Evaluation

Drought Advisory Committee Involvement
8 Steps to Reach Agreement and the Plan

Initiate Project
- Establish drought analysis need

Step 1
- Shared vision consensus
- Model requirements developed

Step 2
- Purveyor system data gathered
- Model framework and tutorial

Step 3
- Purveyor system schematic
- Incorporate supply hydrology info model

Step 4
- Develop one purveyor’s model
- Incorporate infrastructure constraints, minimum instream flow requirements, evaporation losses, and water rights
- Calibrate model against existing models and actual historical record
- Incorporate purveyor current and project demands

Step 5
- Enhance and develop models
- Create dynamic supply and shortfall figures for purveyors

Step 6
- Drought simulation

Step 7
- Incorporate private system
- Climate variability
- Drought mitigation alternatives
- Comprehensive purveyor system summary comparison
- Make model maneuverable with TOC, explanatory cell comments, embedded how-to presentations

STEP 8
- Draft Shared Vision Model
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.

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.

### Drought Stage and Supply Remaining Index for May

<table>
<thead>
<tr>
<th>Drought Stage NOW:</th>
<th>No Drought</th>
<th>Enter last month's stage:</th>
<th>0</th>
<th>More details</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRI:</td>
<td>0.24</td>
<td></td>
<td></td>
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</tbody>
</table>

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)

### Climate Cycle Episode El Niño Southern Oscillation (ENSO) and DWR Water Year Type Data

**ENSO**

-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.

**Current Water Year Type (1-5):**

5

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.

Snow water content is not an indicator because analysis shows no consistent correlation with historical drought occurrences.

Enter Current Reservoir Storage (acre-feet): (click on underlined Lake name to link to online data source and update data manually)

| Sly Park | 10,000 | Sly Park is 24% full. |

Check if the Board decides to add one stage to the SRI
Meanwhile, everyone will still talk about the weather...
The End.