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The CALFED Experience: Integrating scientific review and advice into water management and ecosystem restoration programs

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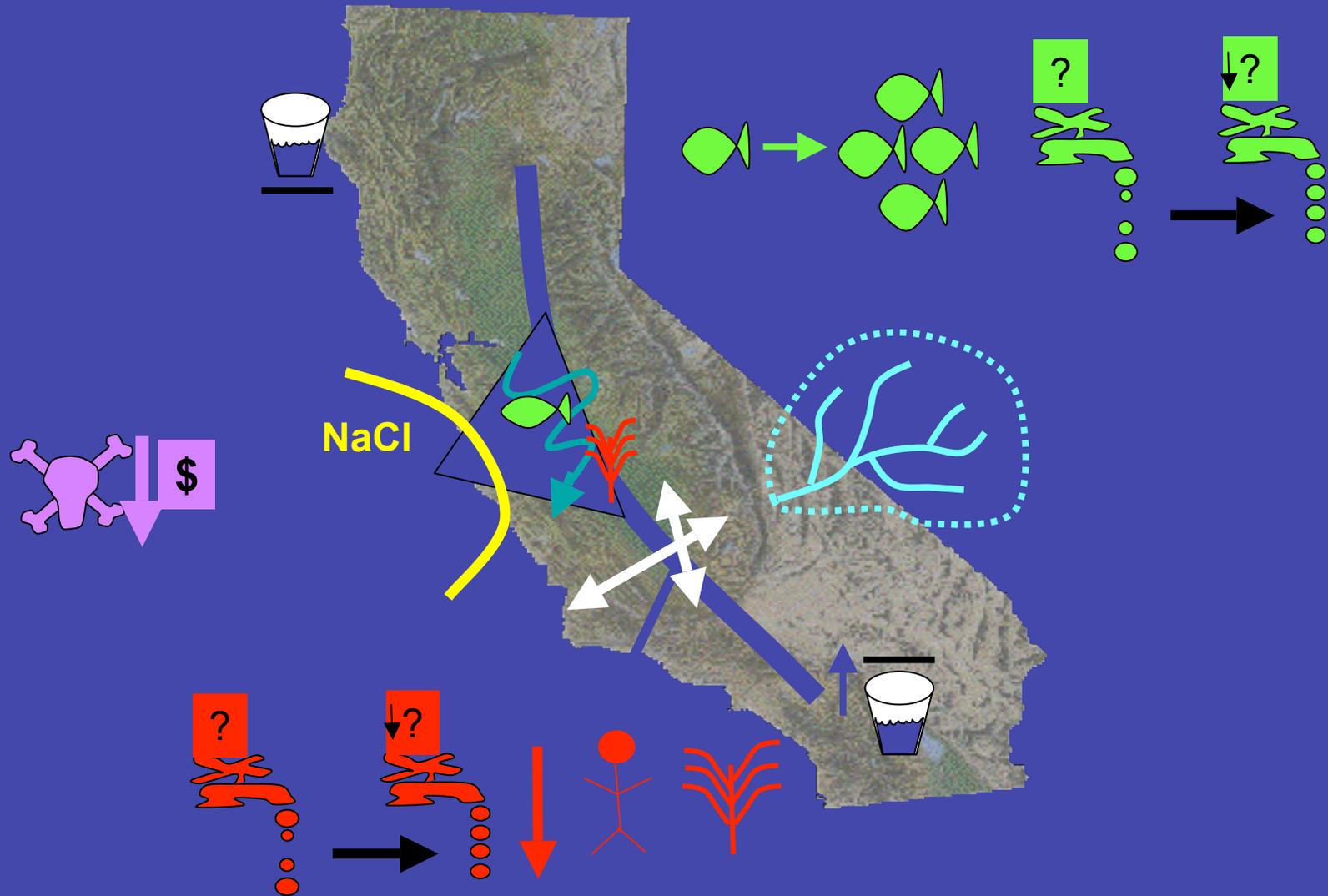
“Learning from Regions: A Comparative Appraisal of Climate, Water, and Human Interactions in the Colorado and Columbia River Systems”



CALFED Focal Points

- Integration of scientists into CALFED Program
- Adaptation
 - Significant changes in plans
 - Revisions to “master stories”

Conceptual Model of CALFED Plan



Science in the Record of Decision

- Independent, authoritative voice on technical issues
- Independent review of progress
 - Funded separate science program
- “Adaptive Management “ written into ROD, MOUs, EIS/Rs

Science Program Approach

- Engaged outside experts in new forum for discussing technical issues
- Integrate scientific practices
- Establish expectations of systematic performance assessment
- Invest in new knowledge

Integrating Scientists

- Outside experts charged with defining state of knowledge
- Participants in new public forum for discussing technical issues
- Peer reviewers
- Science Advisors
- Researchers

Science & Policy Issues: Approach

Describe the Management Issue

Identify scientific questions within management approach

Identify Alternative Interpretations:
Balance analysis & participants

~~Resolve differences among interpretations~~

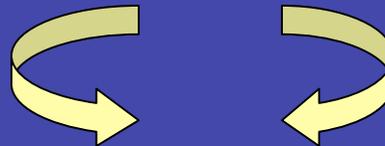
Clarify Assumptions, Uncertainties & Policy Implications

Identify Next Steps

New Science

Science & Mgt Workshops

Policy



Standing
Cross-Program
Board

Executive Science Board

Lead Scientist
Science Program

CALFED Programs

Standing
Boards

Water Operations
& Biology
(EWA Review Panel)

ERP Independent
Science Board

WUE Science
Panel

Drinking Water

Storage & Water
Management

Issue-Based
Review
Panels

DCC

Splittail

Stockton
DO

Delta
Wetland
Restoration

Hydrodynamics & Levee
Breaches

CalSimII

Revision to a “Master Story”

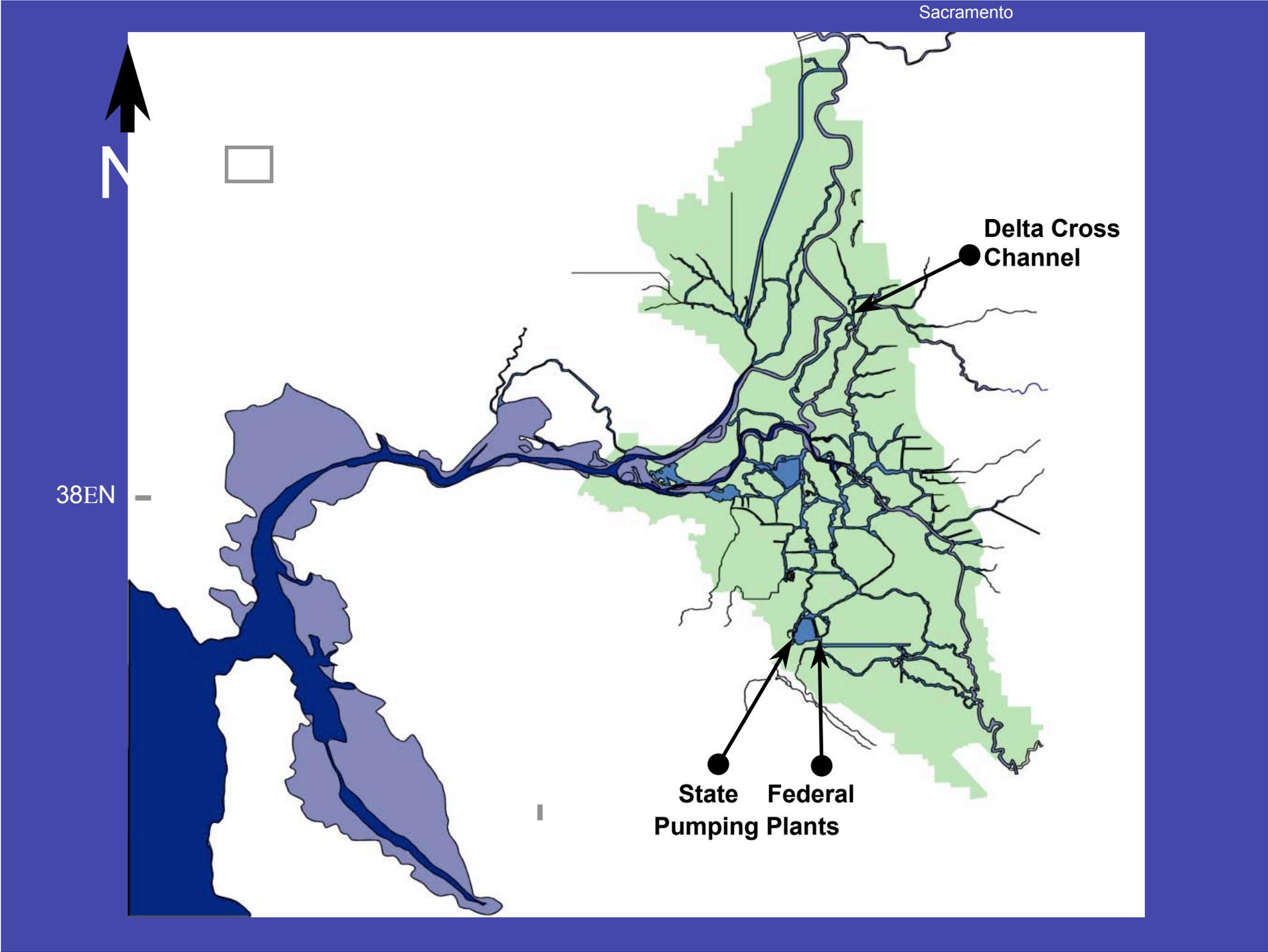
Delta Cross Channel Example

Delta Cross Channel



Major Adaptation in Plans

South Delta Facilities



SDFP Story

- Adaptation after sealed deal
- Took projects off table
- Open to population based management and cost-bene assessment
- Want IRM
- Need to build and test new shared model...no one to do this
- Time pressure

Reflections

- Increasing involvement of scientists in processes of mapping and articulating shared conceptual models/ “master stories”
- Willingness to change on part of stakeholders & agencies
 - We need to start managing for population-level impacts
 - We don’t want to strand billions in assets

Reflections cont'd

- Peer review and external synthesis of knowledge have served to break up agency control of information
- Peer reviewers get roped into more work...capacity a big problem
- Political will hard to translate into performance assessment
 - EIR mentality; lack of talent to synthesize, strategize on large scale

Reflections

- Agencies have adopted some technical recommendations
- Increasing willingness to discuss uncertainties and develop more robust decision making tools
- Everyone wants us to be involved
- ?Sustainable amount of work per issue
- ?Political timeline vs synthesis time line

Integrating Peer Review

- Gradual incorporation of peer review throughout program
 - Revamping RFPs
 - Review of core models and uses
- ? Capability to respond

Performance Assessment

- Science program has overarching authority for all CALFED activities
- Currently getting agencies to take up task as part of program activities
 - Programs have range of experience; seem to learn by doing
 - Struggle to get analyses of data and scheduled reflections/ assessments
 - Struggle to get past decision points and include operations in engineering programs

Reflections on the CALFED Political Community

- Incredibly open to more robust decision tools & information
 - BUT lacking the talent to take scientific advice and do agency work to build them
- Remarkable shift in tenor of the forum
- Inherent tension between political & scientific timelines
- No complaints we've stepped over policy line
- Several big shifts in plan of action based on technical information and concerns (Tracy, DCC)

Reflections on the CALFED Agency Community

- Engineering agencies generally follow direction
- Agency scientists will shift to new tools and information if it doesn't take too much capitol to produce them
- Remaining turf tensions with funding of external researchers
- State system seriously undermines support for internal science efforts

What's needed to integrate scientific knowledge

- Receptiveness..political decision structure needs some kind of “in”
- Lots of work to develop shared conceptual models about how the systems work, pressure points, and potential actions—ongoing syntheses, written and graphical material for diff audiences
- Need to keep a balance between big picture processes and questions and specific projects...need to keep building process knowledge and challenge importance of/ put smaller pieces into overall context
 - Fit specific projects into overall conceptual models
 - Regulatory targets set into system wide context
 - Need large scale information to evaluate specific projects
 - Need capacity to carry bifurcated system out (review, capability to synthesize, program capability to design meso-scale M&E, etc.)
- Need sci capacity to translate research knowledge into agency/ management decision systems

• Trickle down: Academic model

- Deliver science like a pizza (Ruckleshaus, 2002)
- Benefits are slow to arrive

• Advocacy science: That which occurs when value choices need to be made, and science is used to advocate various positions of value. In each of these situations, science can promote deadlock as each advocate promotes their own science (Ingram, 2002).

• “Good science determines the decision”

- Confuse policy and science
- Abandon science when uncertainties become evident

Traditional: Science & Policy

(H. Ingram, 2002, CALFED Workshop on Water Operations: Science Issues).

- 1) Science conducted by agencies, stakeholders and in academia: process differed, limited collaboration**
- 2) Science generally took a back seat in the decision process (no time, not relevant),**
- 3) Not all parties were represented in the debates**
- 4) The public was often excluded from the process and did not always have its own science representatives.**

Science & Policy: Goals of good science?

- Credibility
 - Peer Review, experts from “outside”, balance, avoid scientific deadlock
- Clarity
 - Make state of knowledge clear, communicate uncertainties
- Collaboration
 - Public, private, academia, agency
- Communicate
 - Public forums, written products for all audiences
- Advance the debate
 - New work is essential

How to implement good science?

- Top Down?

- Limited peer review, little use of outside experts, credibility in question, scientific deadlock is common

- Bottom Up?

- Delivery of science to policy makers is not systematic
- No one responsible for setting framework for communication, clarity, peer review, use of outside experts.

- Science Program/Lead Scientist!

- Executive director implements the science process

Direct link to policy makers and to scientists