



INDEPENDENT SCIENCE ON A LARGE SCALE – A PANEL DISCUSSION



**Platte River Recovery Implementation Program
Independent Scientific Advisory Committee**

**National Conference on Ecosystem Restoration
August 1, 2013
Chicago, IL**

Objectives of Session

- Independent science in the PRRIP
- Panelist introductions – involvement with PRRIP, other systems, take-home lessons
- 2-3 “burning” questions
- Audience questions and interaction
- Summarize key take-home points in real time

CBS Sunday Morning

April 21, 2013

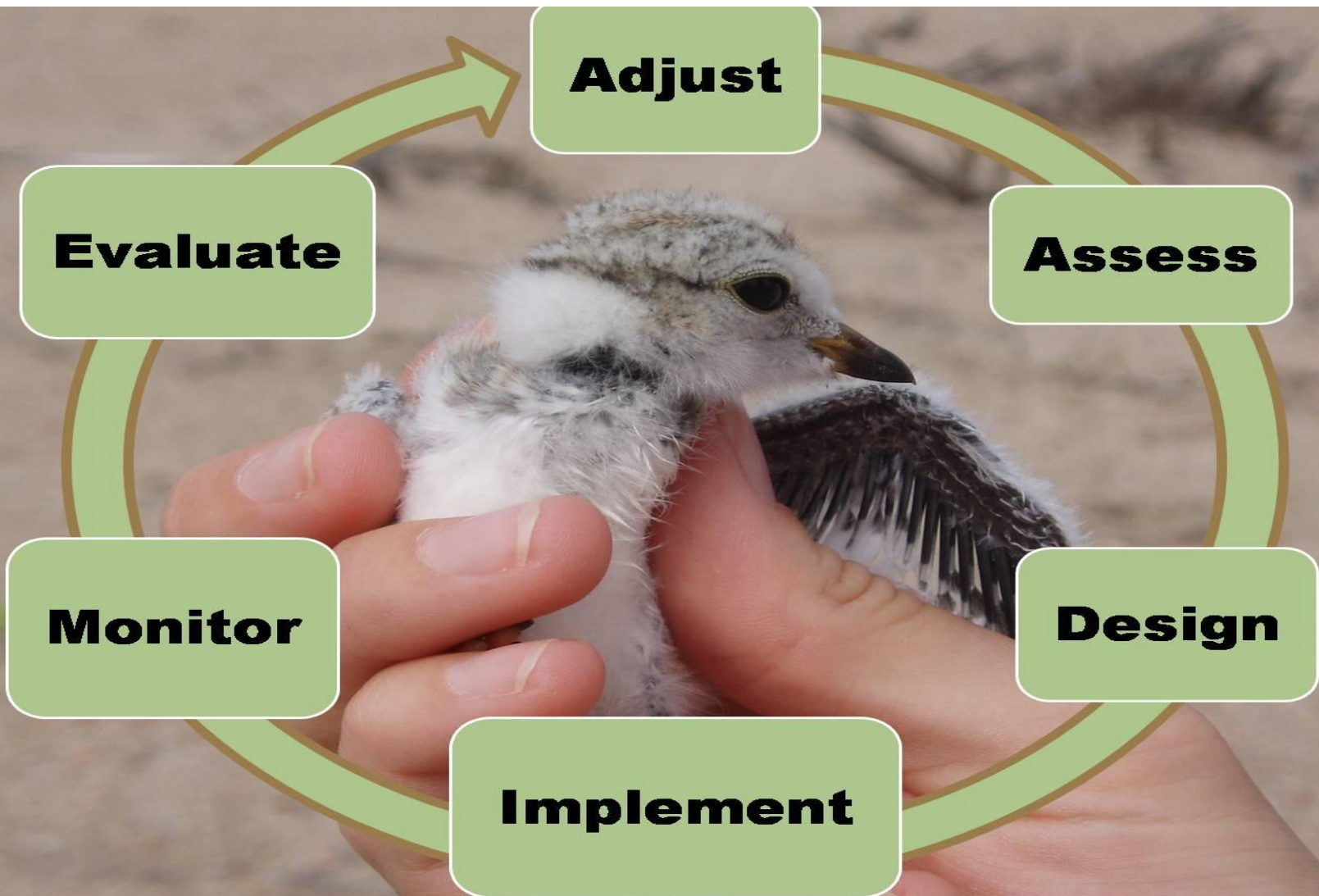
"You don't think of knowledge as a curse, but it's a curse if I think you know everything I know and I talk to you in ways [where] you can't understand me," Alda said. "So that's not only the public, that's policy makers like Congress, who have told me over and over again they cannot understand scientists who come in to talk to them."

"So a scientist comes in, testifies on Capitol Hill, Congress doesn't know what he or she's talking about?" said Smith.

"Why would you give money to somebody whose work you don't understand?" Alda asked.

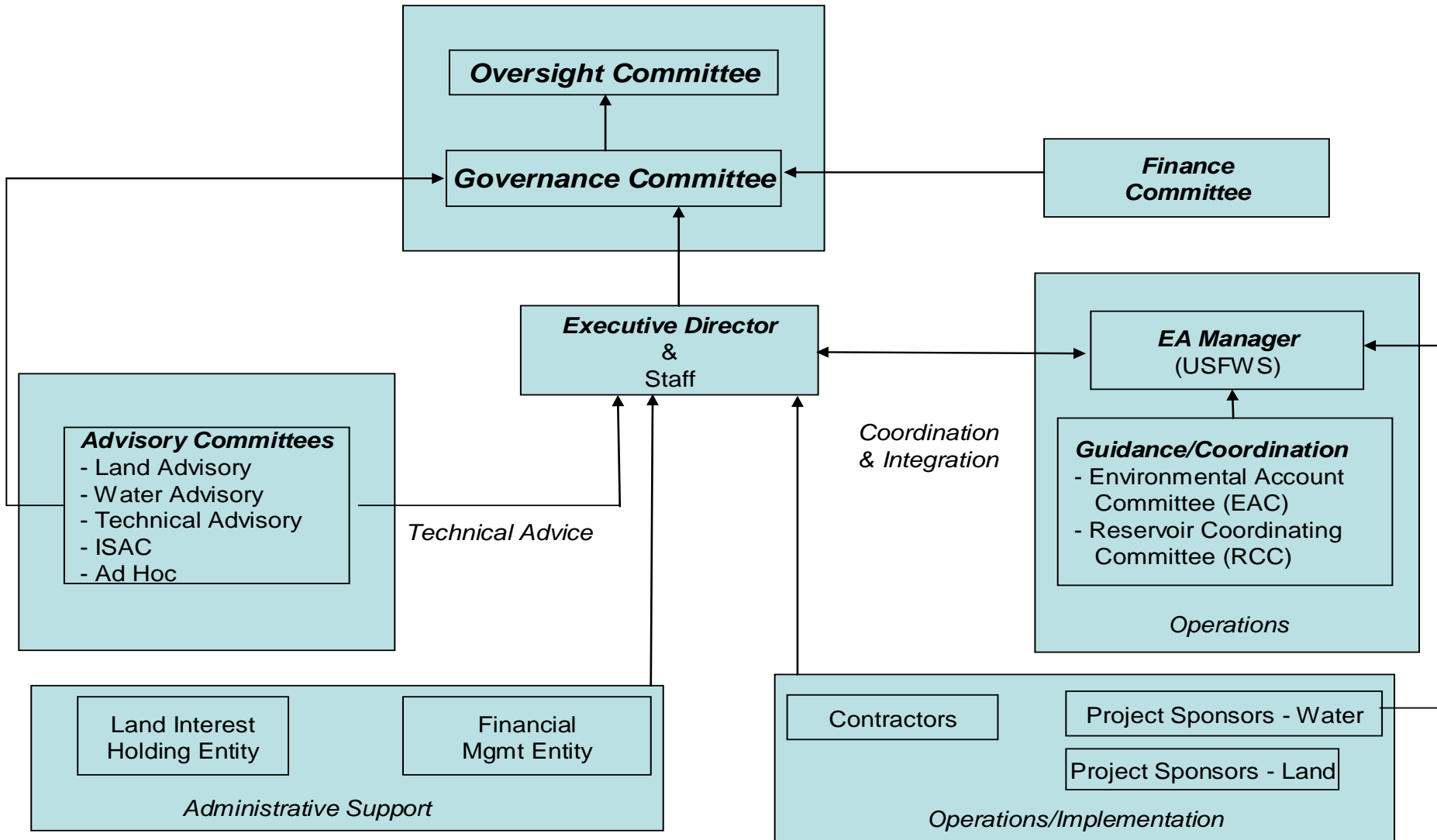


Adaptive Management – What is it?



Rigorous approach for designing and implementing **management actions** to maximize learning about **critical uncertainties** that affect **decisions**, while simultaneously striving to meet multiple management objectives.

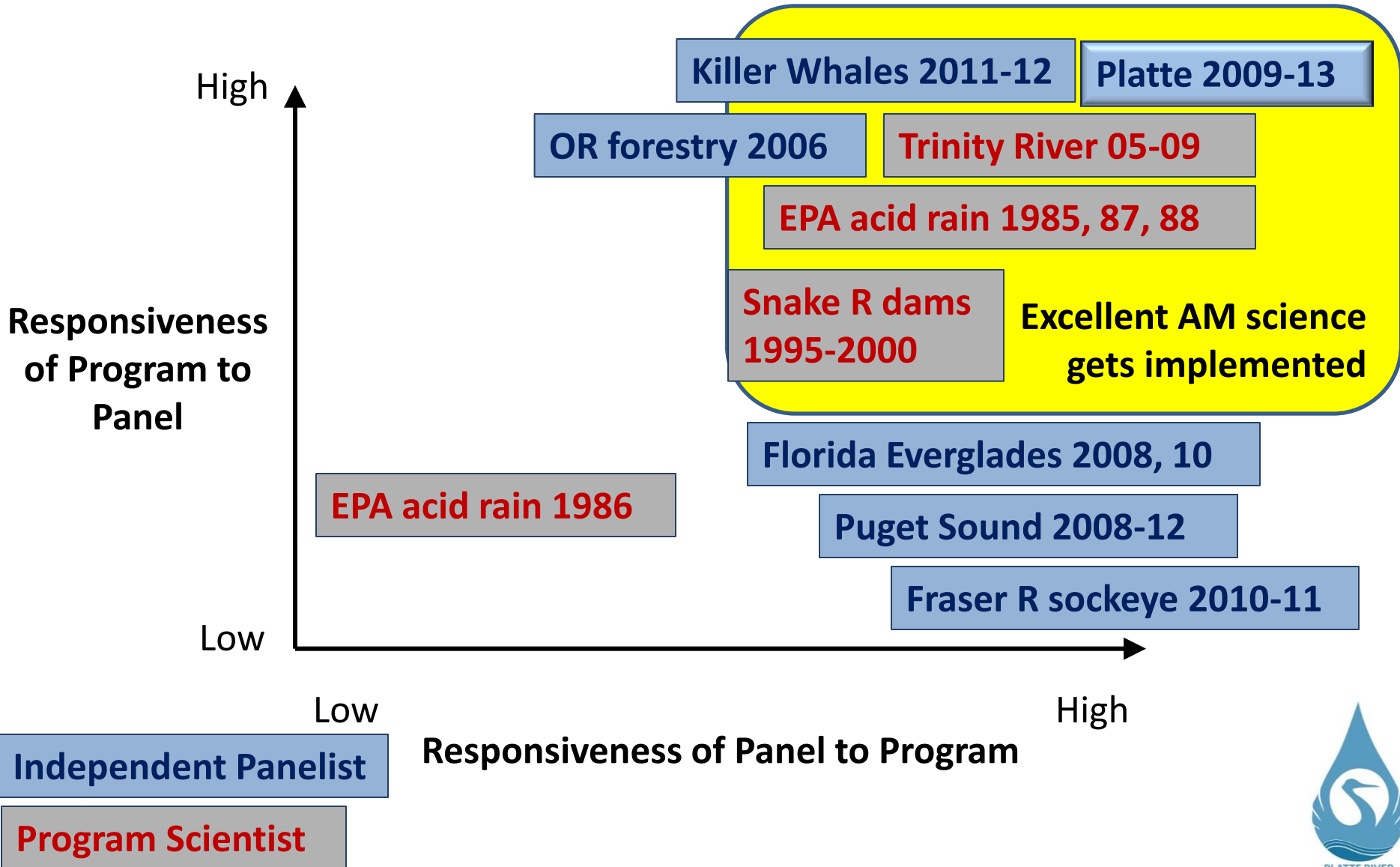
PRRIP Structure



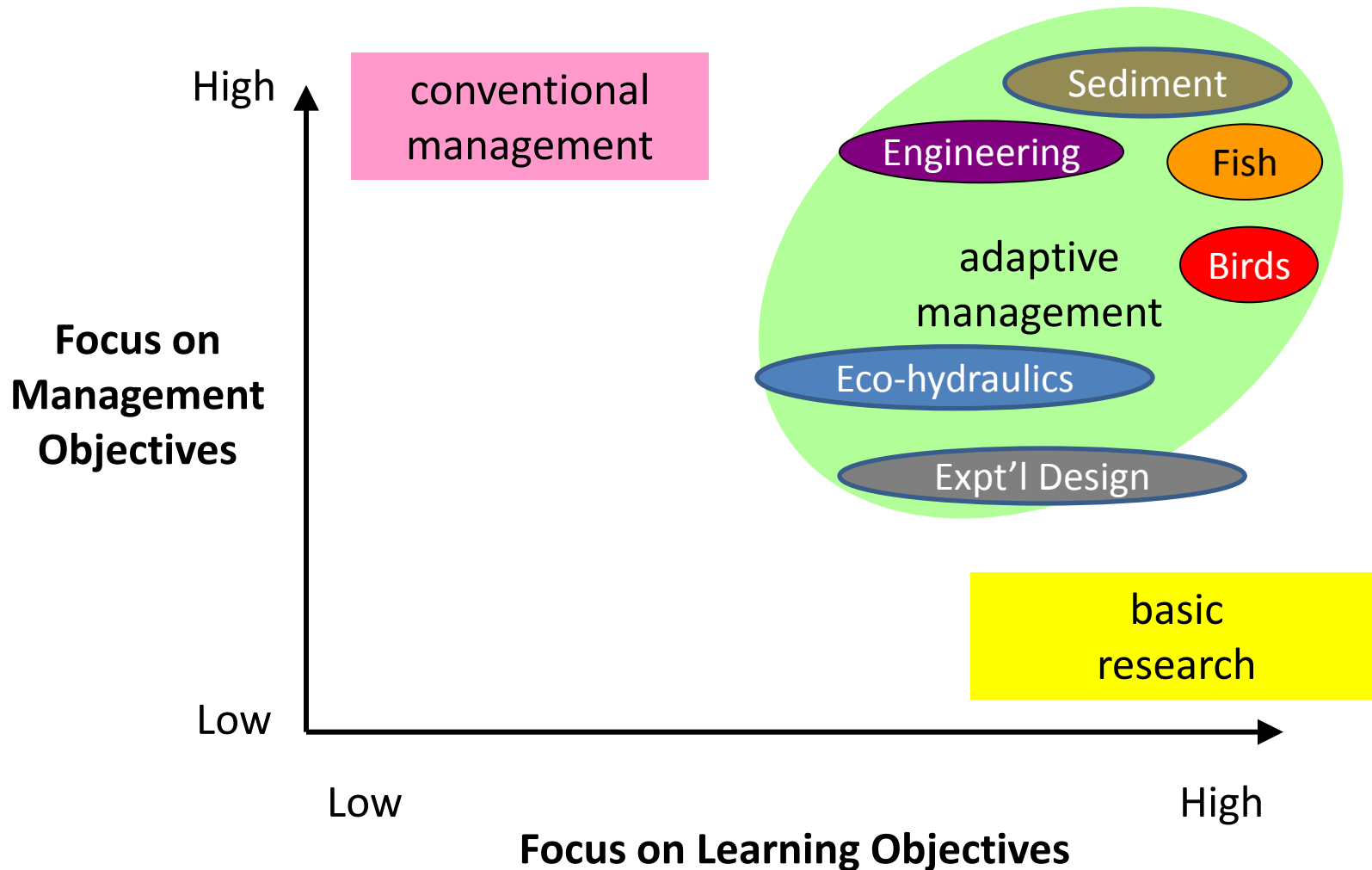
Platte River, July 2012



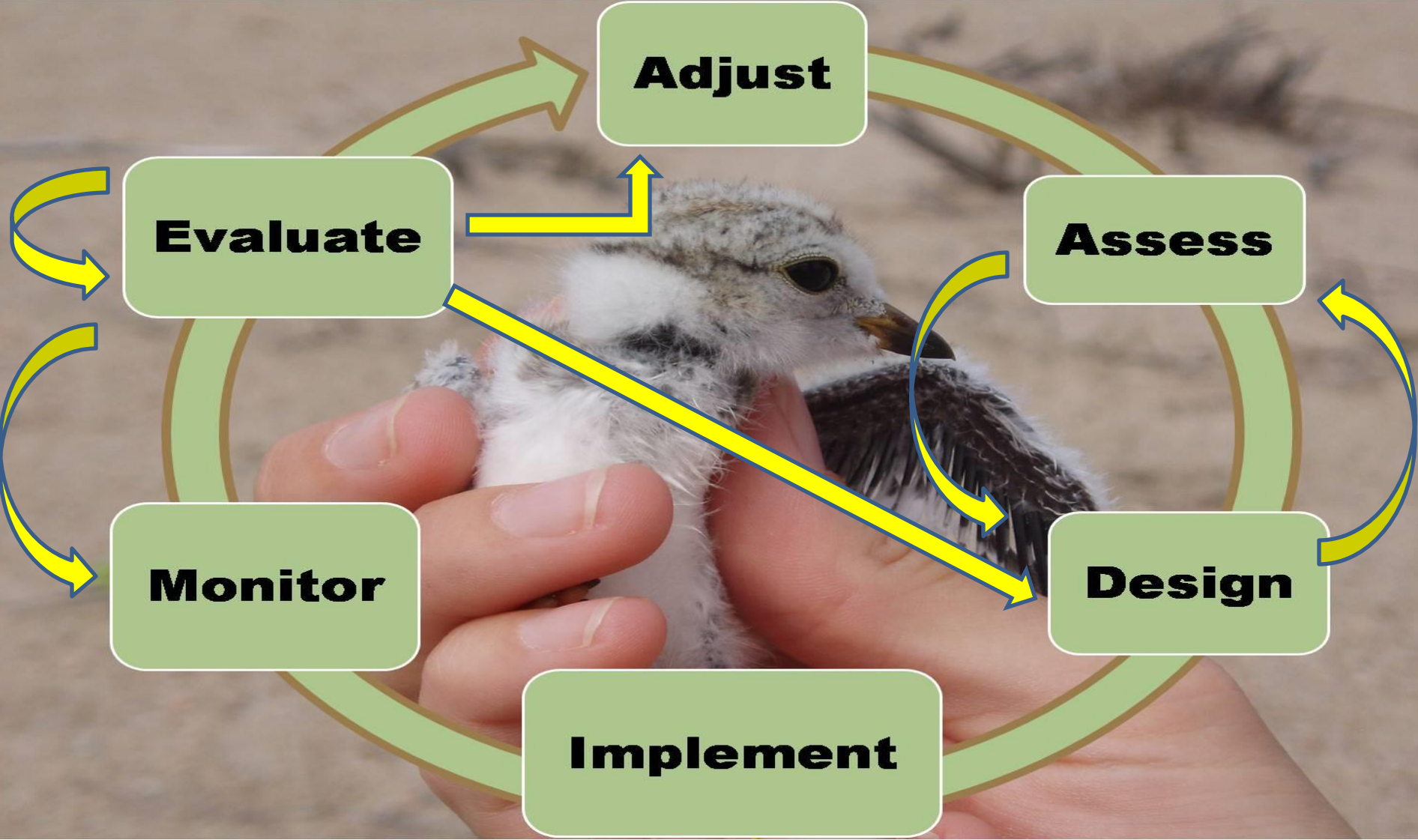
David Marmorek – my mixed experience with independent peer review panels



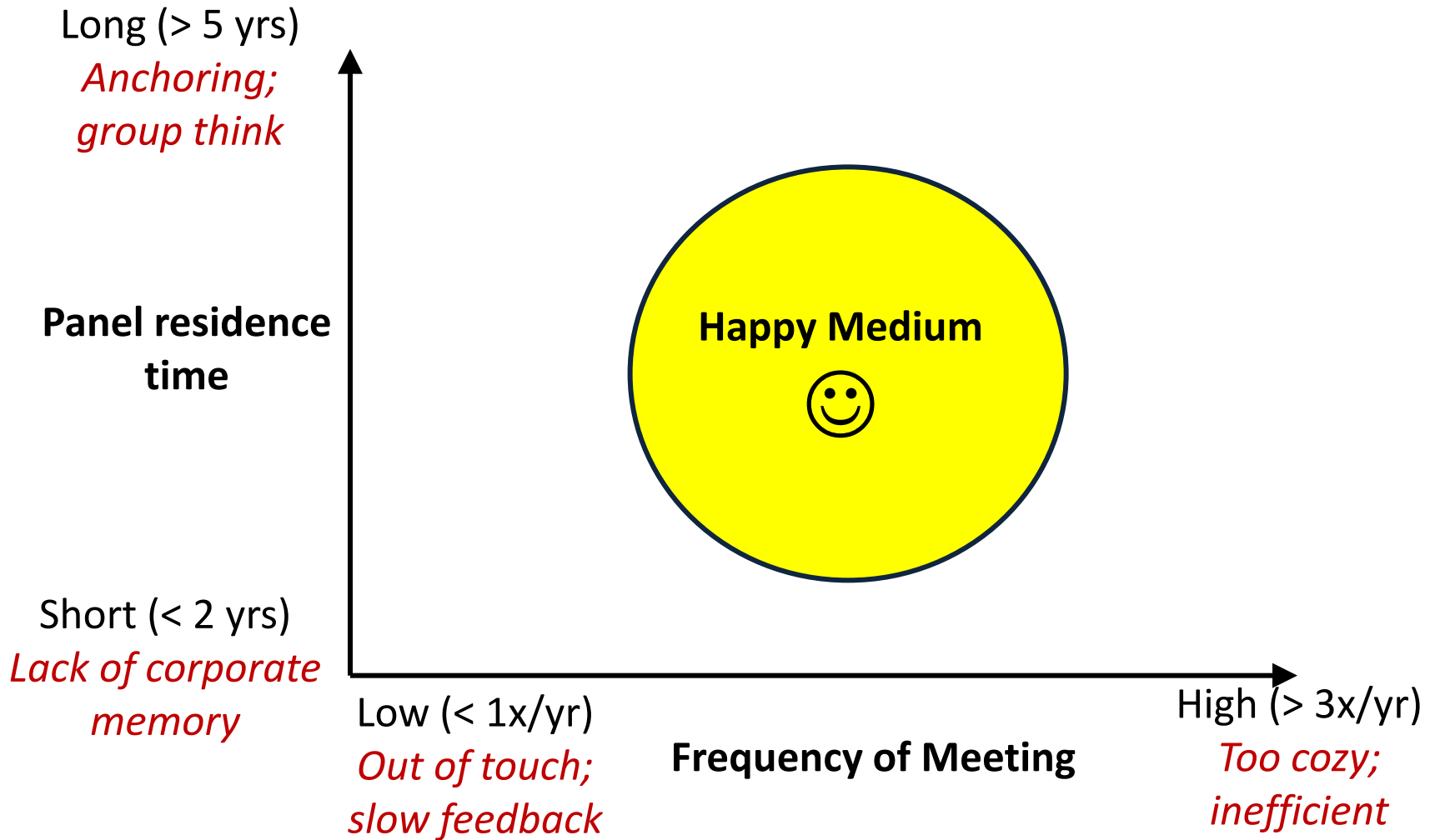
Get the right people on the Panel who understand restoration and AM



Focused Panel feedback accelerates AM learning, improves efficiency



Intermediate frequency of meeting and Panel residence time



Dave's take home messages

- Get right mix of disciplines, AM experience, personalities on the Panel
- Maximize Panel responsiveness to Program:
 - Extensive dialogue; not just arms length review
 - Dialogue in field >> Dialogue in a room
 - Program gives Panel focused questions to review
 - Intermediate meeting frequency, Panel residence time
- Maximize Program responsiveness to Panel:
 - Panel reports to the decision makers / bosses
 - Formal response to Panel's comments
 - Commitment and resources to act

David Galat

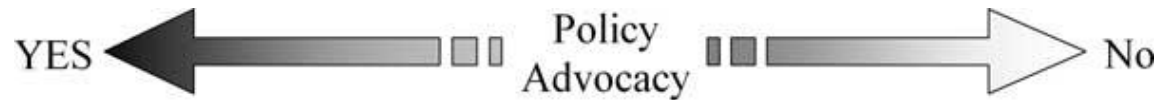
Myths of Independent Science

Science is all Knowing

"Carnac the Magnificent"



Myths of Independent Science



- Stipulating preferred policy decisions
- Supporting a class of policies based on general beliefs or values
- Conducting normative science
- Lobbying for specific policies or management outcomes
- Framing research questions or choosing study areas such that the outcome will support preferred policies

- Using language and words in ways that can be interpreted differently by different groups or stakeholders
- Failing to acknowledge the full range of potential consequences of scientific uncertainty on interpretation of research
- Sharing research results with one or a limited range of special-interest groups
- Providing advice to one stakeholder about a controversial issue

- Conducting research on policy-relevant issues
- Publishing results in scientific journals
- Publishing results in non-technical outlets
- Bringing relevant science to the attention of managers and policy makers
- Providing results of research to all stakeholders and the public
- Supporting use of the best available science in decision making
- Testifying before congressional committees
- Giving interviews to the press about research results
- Discussing conservation science on radio or television shows

Science is objective

Scott et al. 2007. Conservation Biology 21(1) Policy Advocacy in Science: Prevalence, Perspectives, and Implications for Conservation Biologists

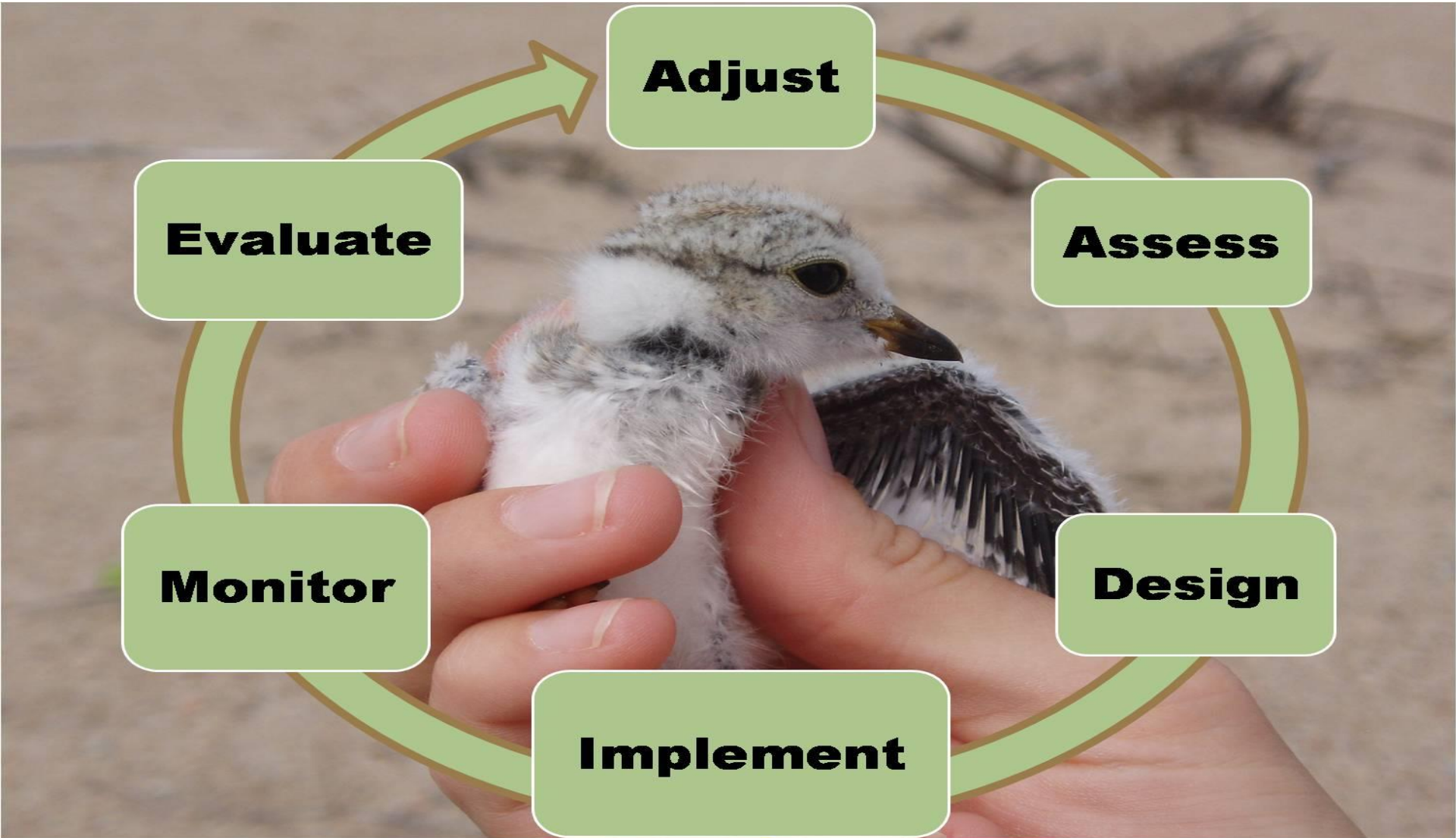
So, why have Science Panels?



Inform policy makers, stakeholders and the public of options using the best available knowledge that will contribute to their making effective environmental decisions

Philip Dixon

- University Professor of Statistics, Iowa State University
- Focus on ecological and environmental statistics, but overall program is to develop appropriate statistical methods to answer interesting biological questions. Work in many areas of biology and agriculture.
- Performing statistical review for NOAA on the Deepwater Horizon damage assessment.
- “Outside” independent scientist: PRIPP



Monitoring and Decision Making

- Some thoughts on increasing the usefulness of monitoring.
- Stimulated by Gitzen et al., 2012, *Design and Analysis of Long-Term Ecological Monitoring Studies*.
- Four roles (influenced by Kendall and Moore's chapter)
 - Assess state prior to a decision or action
 - After decision/action, to assess progress towards objectives
 - Learn about the system (how well did current models work?)
 - Revise or develop new system models

Monitoring and Decision Making

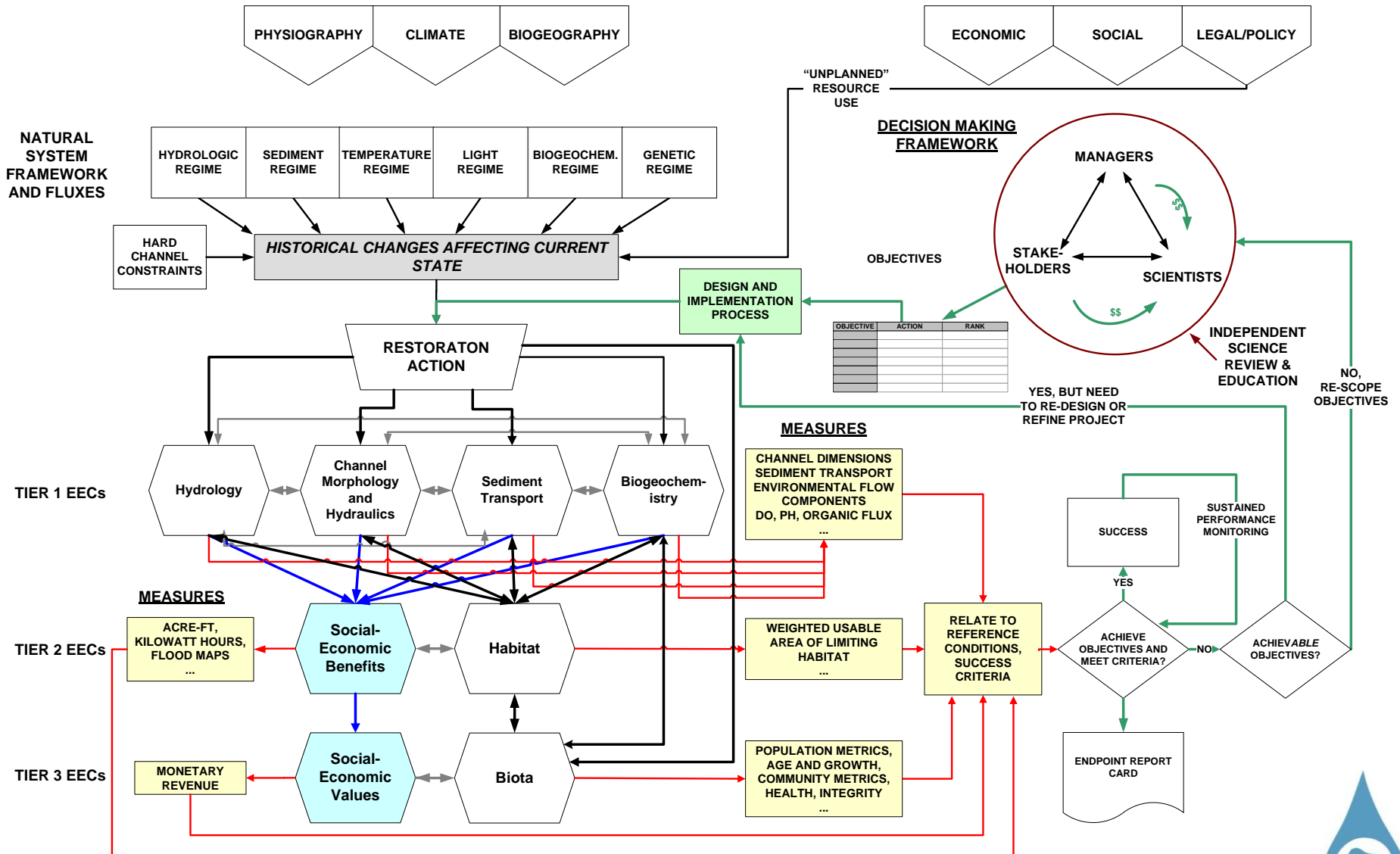
- More accurate (more precise and less biased) answers provide the opportunity for better decisions.
- Get more accurate answers by:
 - Larger sample size, especially at appropriate scales
 - Planning requires information on sources and magnitudes of variability.
 - Reducing partial observability
(imperfect detection or incomplete season)
 - Monitoring quantities that allow you to choose among competing models.
- Avoid the common “*too much*” or “*too little*” errors:
 - Too many questions, no focus
 - Insufficient sample size

Robb Jacobson

- Research hydrologist, branch chief of River Studies, with USGS, Columbia, Missouri.
- Background in geomorphology, habitat dynamics, river restoration, endangered and invasive species.
- “Inside scientist” on the Missouri River Restoration Program
- “Outside” independent scientist, Upper Mississippi River, Platte River Recovery Program, Hinkson Creek urban stream panel.

NATURAL DRIVERS

SOCIAL-ECONOMIC DRIVERS



NATURAL SYSTEM FRAMEWORK AND FLUXES

Natural Drivers, Fluxes, Regimes

Social-Economic, Legal Drivers

HYDROLOGIC REGIME SEDIMENT REGIME TEMPERATURE REGIME LIGHT REGIME BIOGEOCHEM. REGIME GENETIC REGIME

HARD CHANNEL CONSTRAINTS

Management Action

Governance, Decision Making, Design

Hydrology Channel Morphology and Hydraulics Sediment Transport Biogeochemistry

DESIGN AND IMPLEMENTATION PROCESS

MEASURES CHANNEL DIMENSIONS SEDIMENT TRANSPORT ENVIRONMENTAL FLOW COMPONENTS DO, PH, ORGANIC FLUX ...

Riverine Ecosystem

Assessment

MEASURES ACRE-FT, KILOWATT HOURS FLOOD MAPS ...

Performance Measures

Social-Economic Values Biota MONETARY REVENUE

TIER 1 EECs

TIER 2 EECs

TIER 3 EECs

"UNPLANNED" RESOURCE USE

DECISION MAKING FRAMEWORK

OBJECTIVE	ACT

YES, BUT TO RE-DESIGN REFINED PROJECT

REVIEW & EDUCATION

NO, RE-SCOPE OBJECTIVES

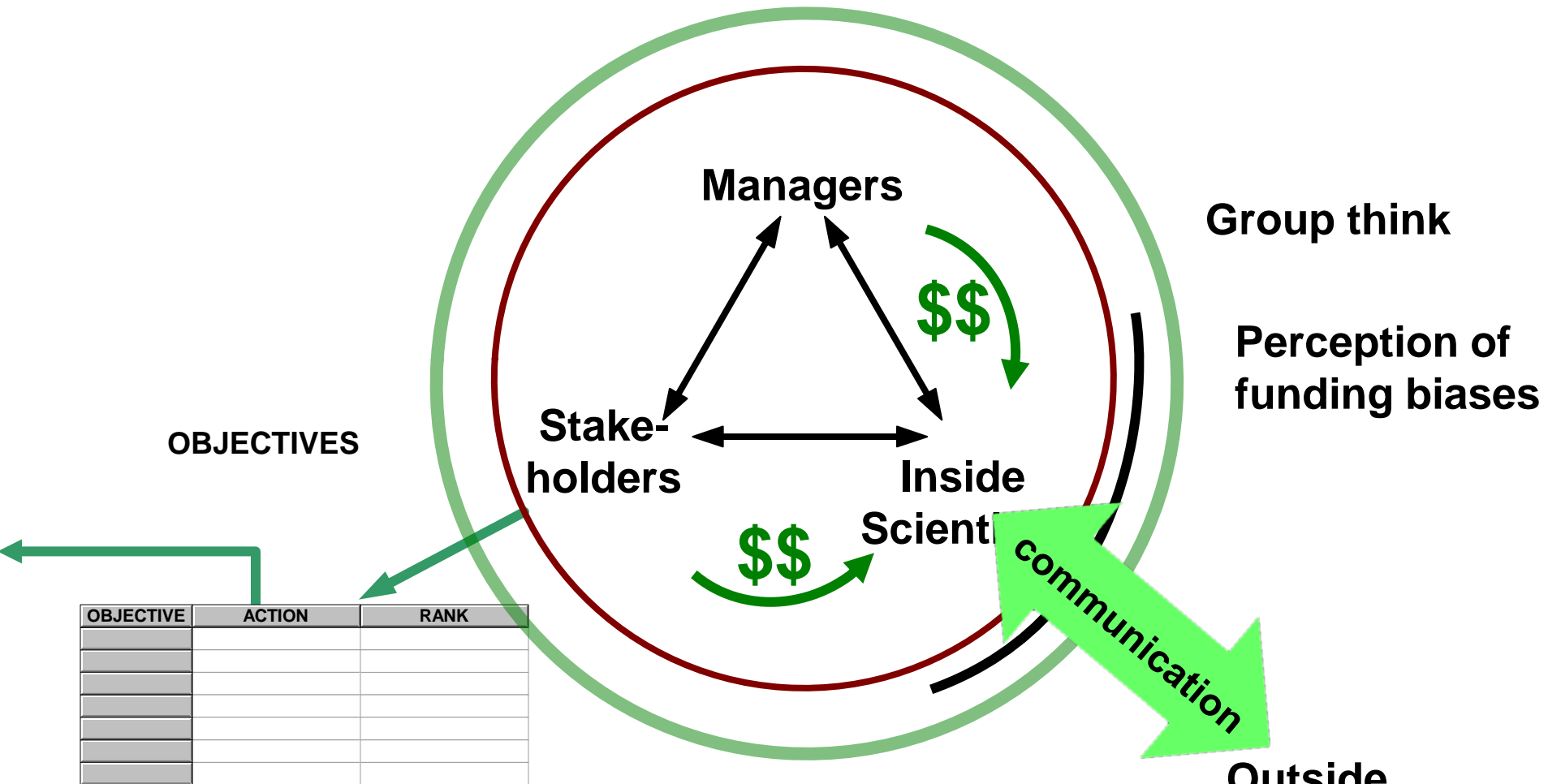
SUCCESS CRITERIA

SUSTAINED PERFORMANCE MONITORING

ENDPOINT REPORT CARD



(Ideal) Decision Making and Governance Framework



A Few Bullets:

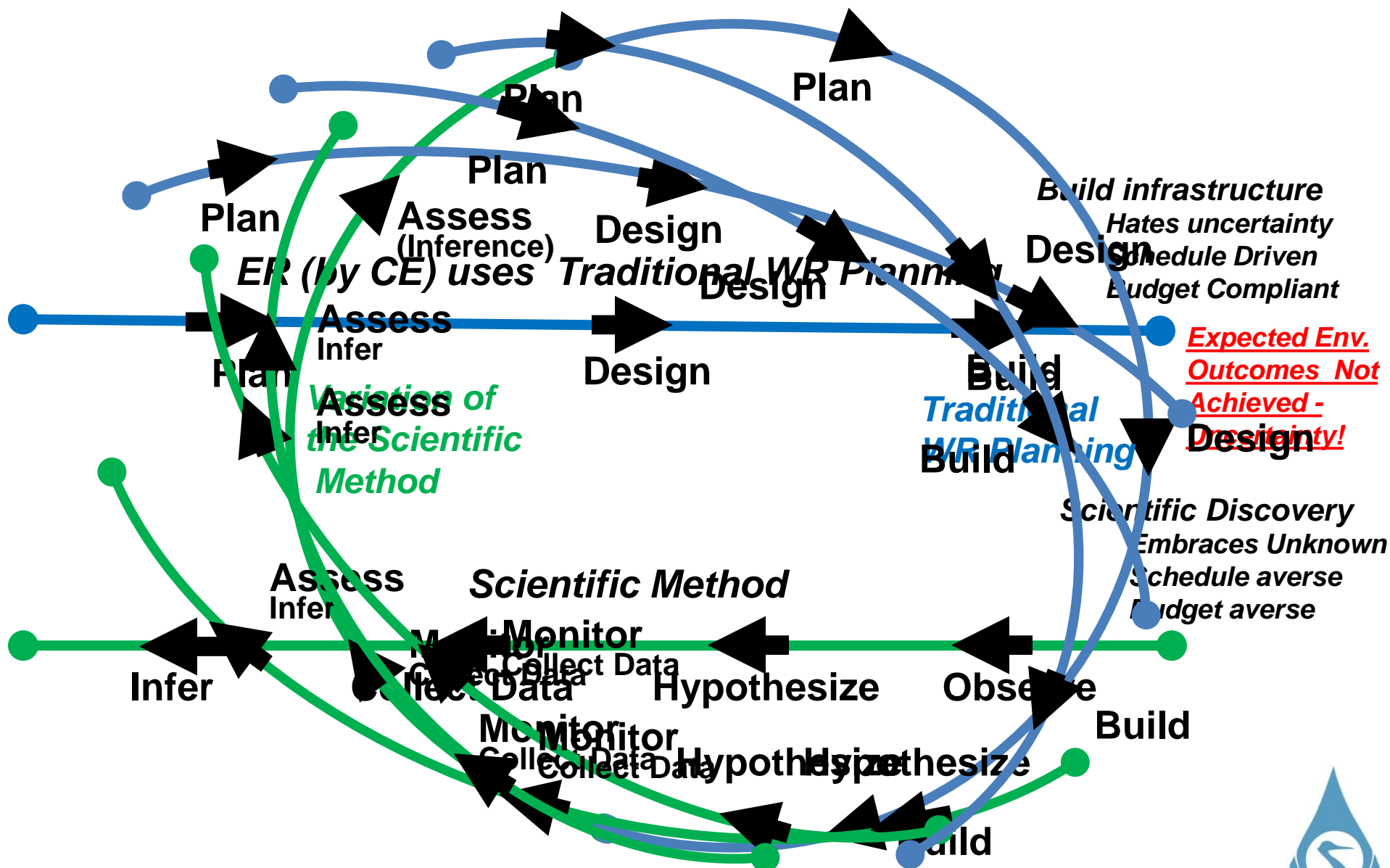
- Outside perspective is complementary to strong inside science expertise, especially when inside science is transparent, policy neutral, perceived as credible.
- Structure that encourages communication will get the most out of the independent review and vice versa => learning is one of the motivators of outside reviewers.
- Scope of independent science may extend beyond science review to broader aspects of how science interacts with program.

Who is John Nestler?

- **PhD, Research Ecologist – Corps – ERDC 27+ years (Retired)**
- **Independent Contractor – 3+ years**
- **Specialty – Ecohydraulics, 60 Peer Pubs + 100 professional Pubs**
- **Science Advisory / Review Panels Experience:**
 - 1) **Review Panel – Bay-Delta Program (2012-present)**
 - 2) **Independent Science Advisory Panel - Platte River Recovery Implementation Program (2009-2013)**
 - 3) **Review Panel – Chaglla Project – Huallaga River - Peru (2012)**
 - 4) **Science Panel - Upper Mississippi River System (2003-2010)**
 - 5) **Fish Passage & Hydropower Advisory Panel for the Mekong River Commission (2008), Vientiane, Lao Peoples Democratic Republic (2008)**
 - 6) **Scientific Review Panel, Central Valley Project Improvement Act Program (2008)**
 - 7) **Advisory Board National Science Foundation CLEANER Program (2006-2007)**
 - 8) **Science Advisory Panel, Interstate Commission, Potomac River Basin (2000-2002)**
 - 9) **Coastal Louisiana Ecosystem Assessment & Restoration, Louisiana Coastal Area (2004-2006)**
 - 10) **Protocol Evaluation Panel, Grand Canyon Monitoring and Research Center Integrated Water Quality Program (2000 –2001)**
 - 11) **Missouri River Consortium of Benthic Fishes (1995-1997)**
 - 12) **Technical Specialists Panel for the Hidrovia Navigation Project (Brazil, Argentina, Bolivia, Paraguay, and Uruguay) - Buenos Aires, Argentina (1996)**
 - 13) **Select Scientific Review Committee, Roanoke River-Albemarle Sound Striped Bass Restoration Program (1990-1991)**



Where Does AM Come from----Really?



Often a Passionate, but Dysfunctional Marriage



AM Component Legacies - Path Forward

**Scientific Method =
Empiricism**



**Goal – Discovery
Hypothesis
Statistical inference**



**Assume: Understanding
Important
Build knowledge**



**Traditional WR
Planning = Determinism**



**Goal – Infrastructure
Constructed
Natural**



**Assume: Understanding not
Important - *Performance Driven***



**Science Panel Job #1 – Optimally Assign &
Integrate Issues to Empiricism vs Determinism
-> Minimize Number of AM Loops:
Schedule & Budget
Scientific Understanding
Benefits to Society**

***I'm Just a Marriage Counselor –
Let's Work Together for the Kids!***

Kent Loftin

**“And, in the end, the love you take
is equal to the love you make.”**

Paul McCartney

**The answers you get are only as
good as the questions you ask.**

**The value you receive is proportional
to the investment you make.**



Kent Loftin

- If you create a science panel, make your commitment worthwhile...it is a lot of work and the effort should bring benefits.
- Be sure all parties are clear about the purpose of the panel.
- Ensure adequate funding and management commitment.
- Budget enough time to allow the panel to meet regularly and become familiar with each other, the project team, and management.
- Consider using a interdisciplinary mix of knowledgeable specialists and generalists.
- Provide time for the panel to work together but away from the project team.
- Require the panel to document its work and update its views over time.

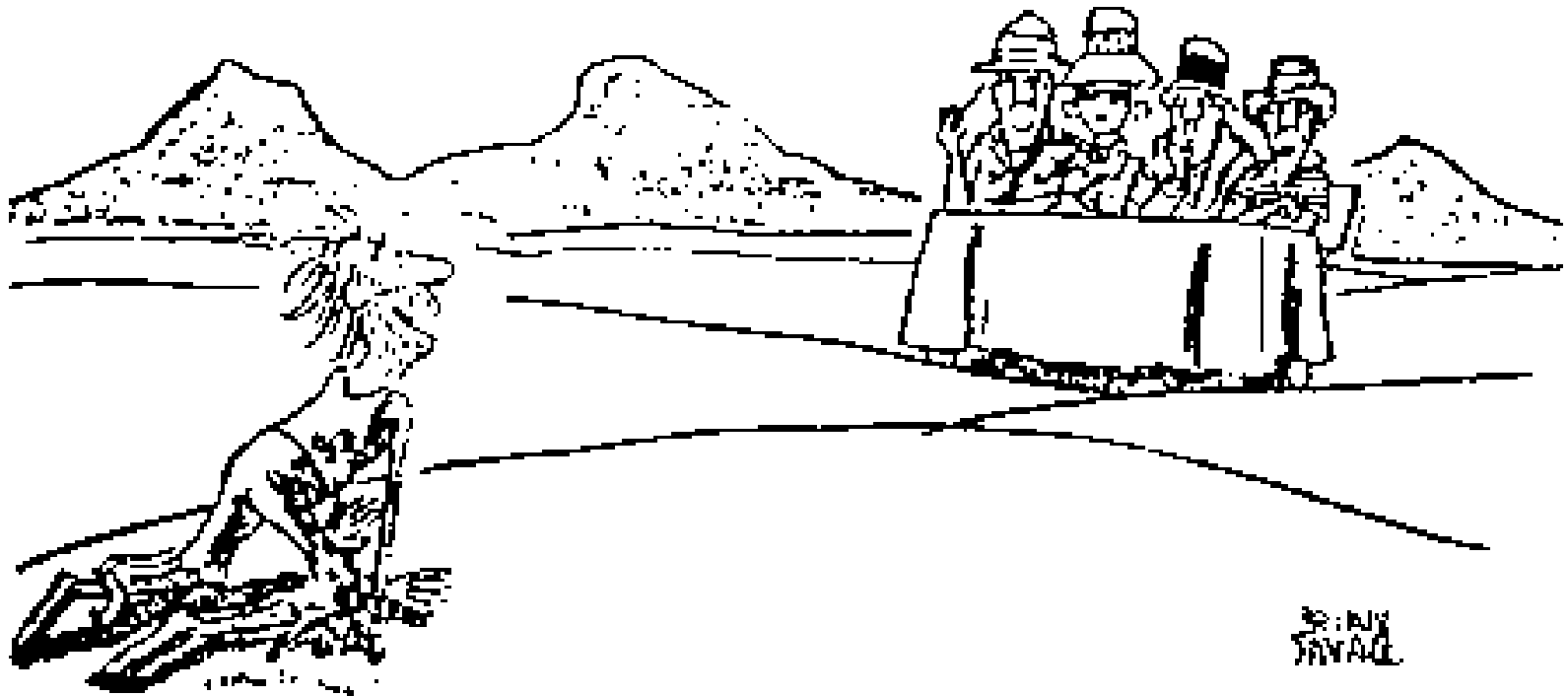


Kent Loftin

- Challenge the panel to address your concerns.
- Allow stakeholders some access to the panel.
- Learn from the experiences of the panelists.
- Install a strong leader of the panel or provide a facilitator as needed.
- Take the panel on field trips.
- Arrange that the panelist, the project staff, and management interact outside of formal meetings, even on unrelated coincidental events.
- Provide avenues for panel feedback to be promulgated.
- Clearly state whether panel findings and recommendations can or will be embraced or implemented or not.
- Foster two-way learning.
- Have fun!



Kent Loftin



Oh my god, this is the last thing I need, a panel of experts!



Burning Questions

- 1) What is the right approach – advisory, or review at arm’s length?
- 2) How often should an independent science panel engage with a program?
- 3) Thoughts on turnover and avoiding “group-think”.
- 4) Thoughts on responsiveness of a program to input from an independent science panel.
- 5) Thoughts on interacting with both the technical representatives of a program and the decision-makers.
- 6) What is the motivation for people to serve on a science panel, and how do you maintain that motivation and satisfaction?

Take-Home Messages – Audience Input

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Thanks!

