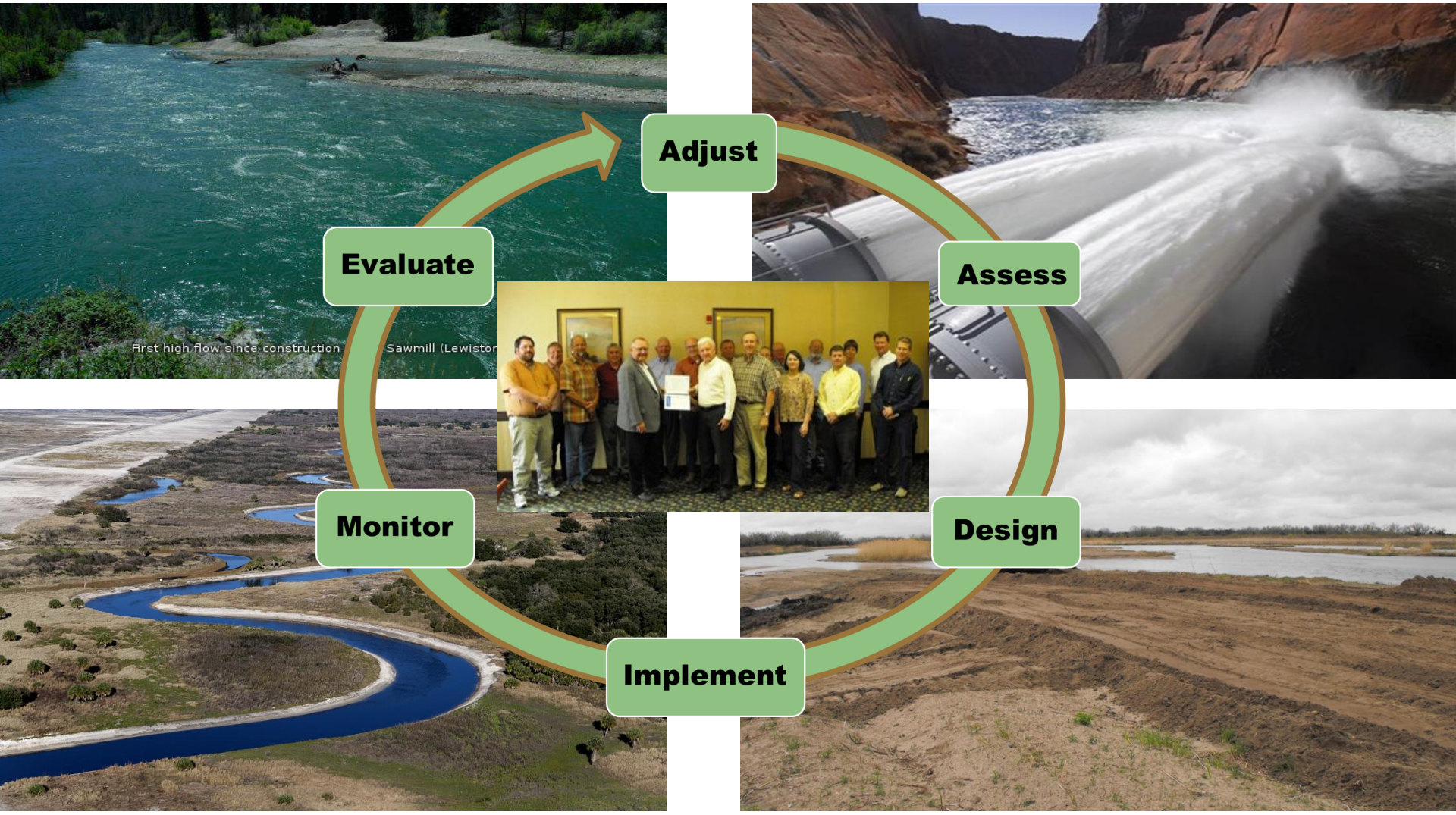
Making Adaptive Management Meaningful – Bridging the Science / Decision-Making Gap



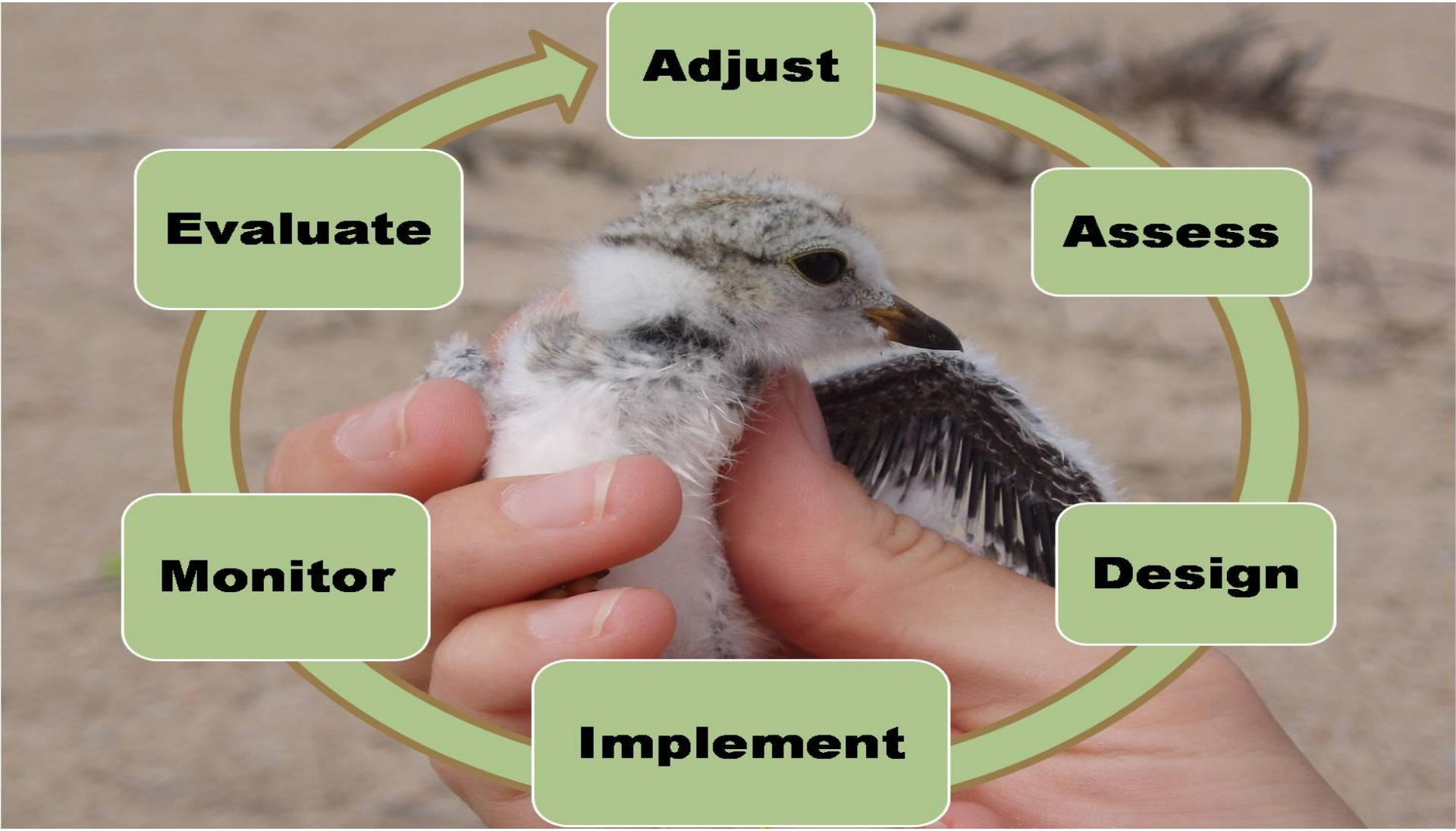
4th National Conference on Ecosystem Restoration – Baltimore, MD

August 4, 2011

Chad Smith – Director of Natural Resources

Headwaters CORPORATION

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.

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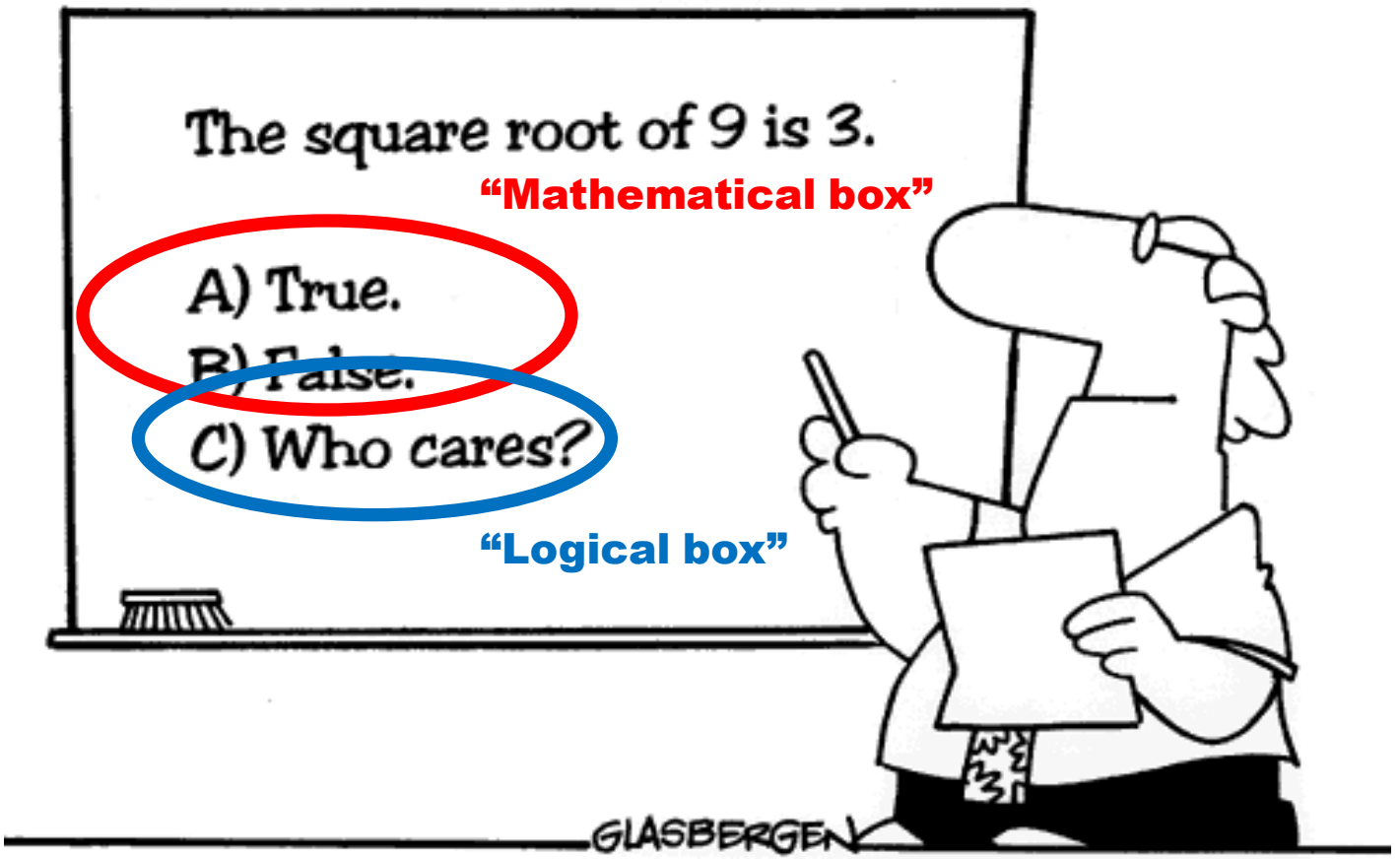
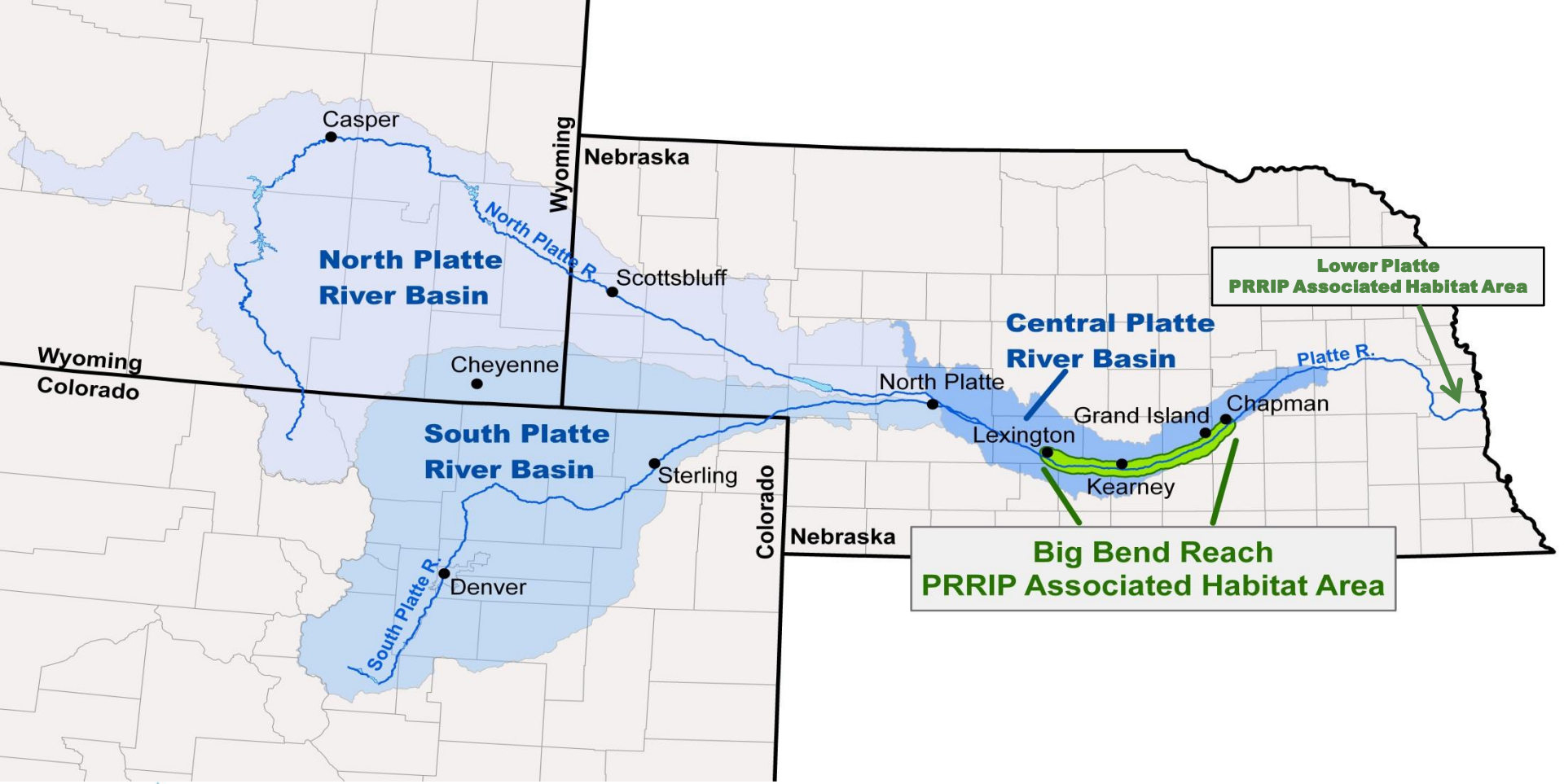
WHY???



Many students actually look forward to Mr. Atwadder's math tests.

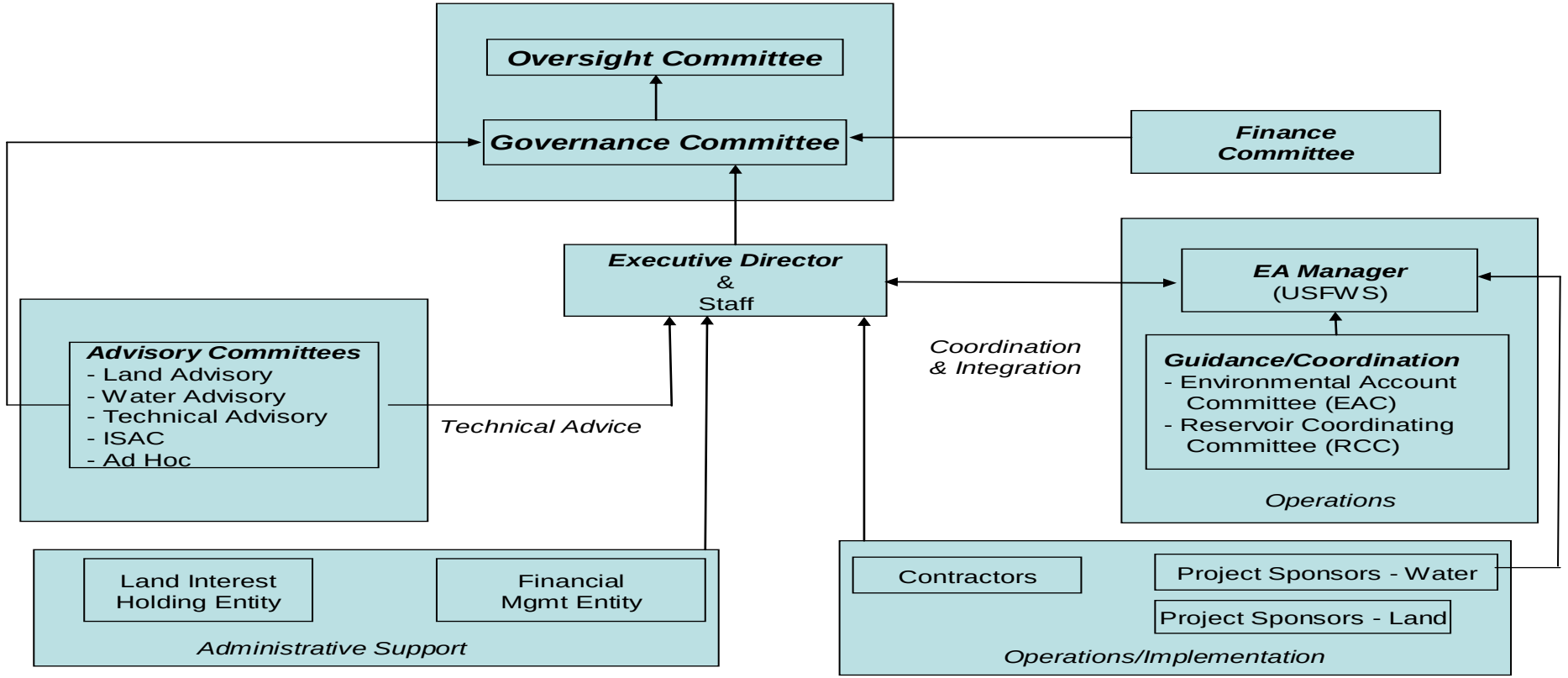
Purpose of Session

- **What are the decisions?**
- **How are decisions made? Who makes them?**
- **How is AM applied?**
- **How is learning related to key scientific and technical uncertainties relayed to decision-makers?**



Platte River Recovery Implementation Program Scale

- **Cooperative effort between Department of Interior, Colorado, Wyoming, & Nebraska**
- **Initiated on January 1, 2007**
- **$325 million First Increment (2007-2019)**



Program Structure

Big Questions = What we don't know but want to learn

	Target Species Use
1)	Do terns, plovers, and whooping cranes use Program habitat complexes and/or habitat meeting Program minimum criteria in proportions greater than their availability?
2)	What is the relationship between concurrently available riverine and sandpit nesting habitat and tern and plover use and productivity?
3)	What is the relationship between availability of riverine nesting habitat meeting Program minimum criteria and tern and plover use and reproductive success?
4)	What is the relationship between availability of whooping crane roosting habitat meeting Program minimum criteria and whooping crane use?
5)	How does tern, plover, and whooping crane use of the central Platte River relate to overall population recovery objectives?
	Physical Processes, Management Actions, & Species Response
6)	How do short-duration high flows (SDHF), restoring sediment balance, and mechanical channel alterations contribute to the maintenance of channel width and creation of a braided river channel?
7)	What is the relationship between SDHF, sediment balance, and tern and plover riverine nesting habitat meeting Program minimum criteria?
8)	What is the relationship between SDHF, sediment balance, and whooping crane habitat meeting Program minimum criteria?
9)	Have Program water-related activities avoided adverse impacts to pallid sturgeon in the lower Platte River?
	Next Steps
10)	What uncertainties exist at the end of the First Increment, and how might the Program address those uncertainties in the Second Increment?

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM

"Big Questions" = Data Synthesis

- **Utilize "weight of evidence" or "strong inference" approach – the logical box!**
- **Performance measures from monitoring and research that pertain to specific PRRIP hypotheses**
- **Data visualizations – graphs / tables / charts / others**

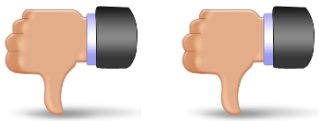



PLATTE RIVER
RECOVERY IMPLEMENTATION PROGRAM

Management Decisions - Flow

Critical management decisions	Relationship to target species on the central Platte	Questions decision-makers have	Management flexibility	Time to implement	Time to evaluate and adjust	Reversibility
Flow Frequency, magnitude, and duration of SDHF	Flow expected to build and/or maintain riverine nesting islands, maintain channel width, limit vegetation growth, and affect other channel features; relationship between flow and availability of tern forage (fish); maintenance of wetted foraging habitat for plovers (insects); maintenance of wetted width and unobstructed width for whooping cranes	Given Program constraints, how much water is necessary in a SDHF to achieve expected results? How do target species respond to flow releases?	**Medium** Program can set a schedule for SDHF and future Program water projects should be able to make water available for delivery. Current water operations are limited by conveyance restrictions, travel time, and climatic patterns.	**Long** Current operations require several months of planning and coordination to ensure SDHF and other water commitments can be met simultaneously the following year (Rereg reservoir schedule – completion in 2016)	**Variable** Moating of riverine habitat occurs quickly, but trends in bird reproductive response and channel features (including vegetation) take longer.	**Variable** Actions are completely reversible in the subsequent year (don't have to release flows again). Within a year, actions are not reversible (i.e. once releases made they cannot be pulled back).

Summary of evidence – What does it mean?

	• Question/hypothesis **answered conclusively** in the **affirmative** • Consider adjustments in actions or influence on decision-making
	• Affirmative answer or trend, but question/hypothesis **NOT answered conclusively**
	• Evidence thus far is inconclusive; no affirmative or negative answer to question/hypothesis
	• Negative answer or trend, but question/hypothesis **NOT answered conclusively**
	• Question/hypothesis **answered conclusively** in the **negative** • Consider adjustments in actions or influence on decision-making

Questions/Discussion