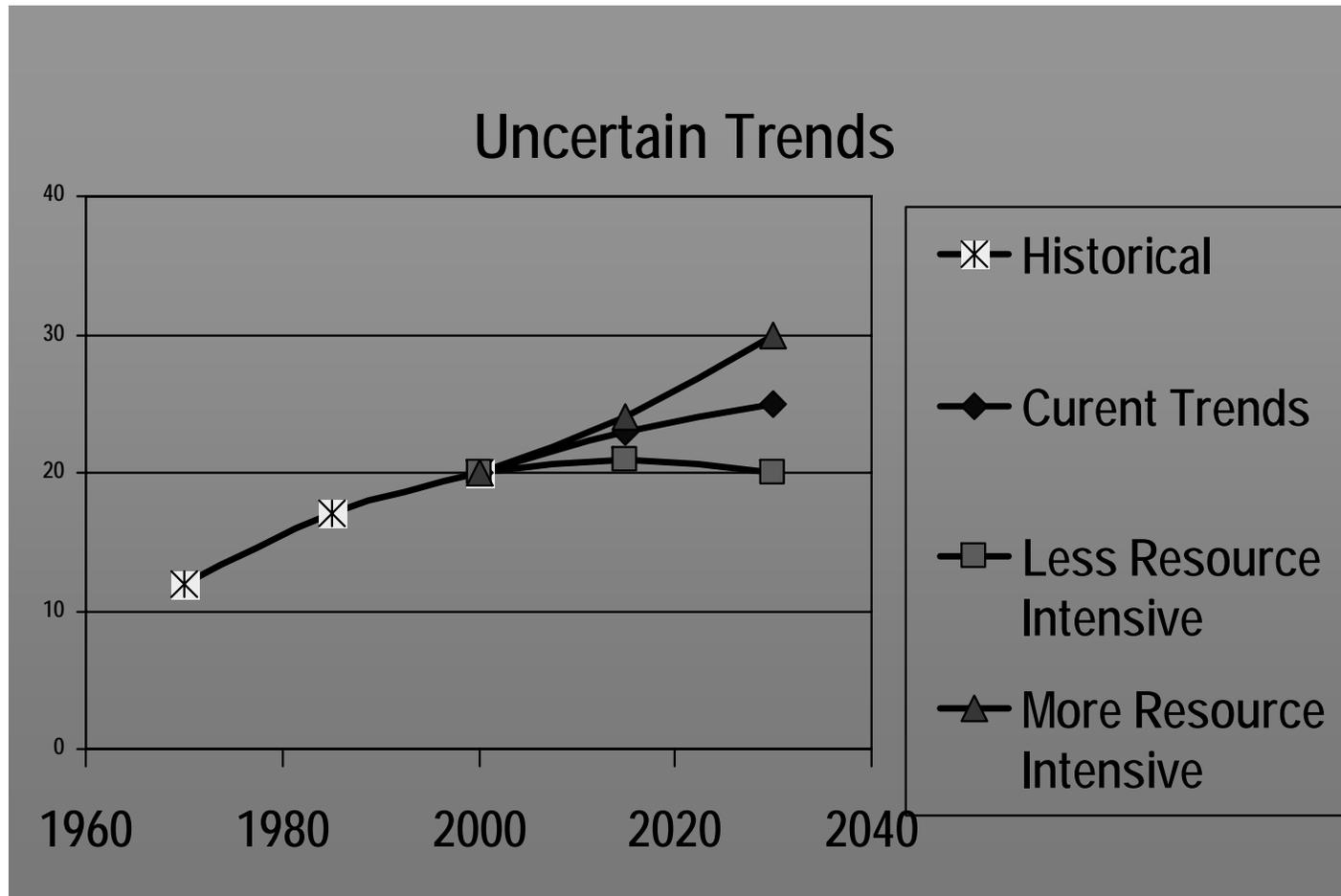


Using Scenarios in the California Water Plan



Goal for this presentation

- Set context for some key Update 2009 quantitative deliverables:
 - ◆ Scenario narratives
 - ◆ Quantifying scenarios
 - ◆ Evaluating water management responses



Overview

- Strategy for Water Plan analysis
- Background on scenarios
- Update 2005 narratives
- Suggestions for Update 2009



Strategy for Water Plan Analysis



Multiple Views of the System

- ***Water Portfolios***

- Describe where water originates, where it flows, and what it is used for based on recent data

- ***Future Baseline Scenarios***

- Describe expected future changes if water managers do not take additional action

- ***Alternative Response Packages***

- Describe packages of promising actions, predict expected outcomes, and compare performance under each scenario



Analysis in Phases

Update 2005

- Water portfolios of current conditions
- Describe quantitative approach
- Illustrate part of the approach – future scenarios

Future Updates

- Refine quantitative approach
- Refine future scenarios
- Quantify response packages
- Compare performance



Objectives for Water Plan Analysis From Update 2005

- How does water scarcity affect the economy and all beneficial uses?
- How does water quality affect water management and vice versa?
- How does land use affect water management?



Objectives Continued

From Update 2005

- How should local, regional, and state agencies manage water during multiple year droughts?
- How will climate change affect water management?
- What are some of the costs, benefits, and tradeoffs between different water management strategies?

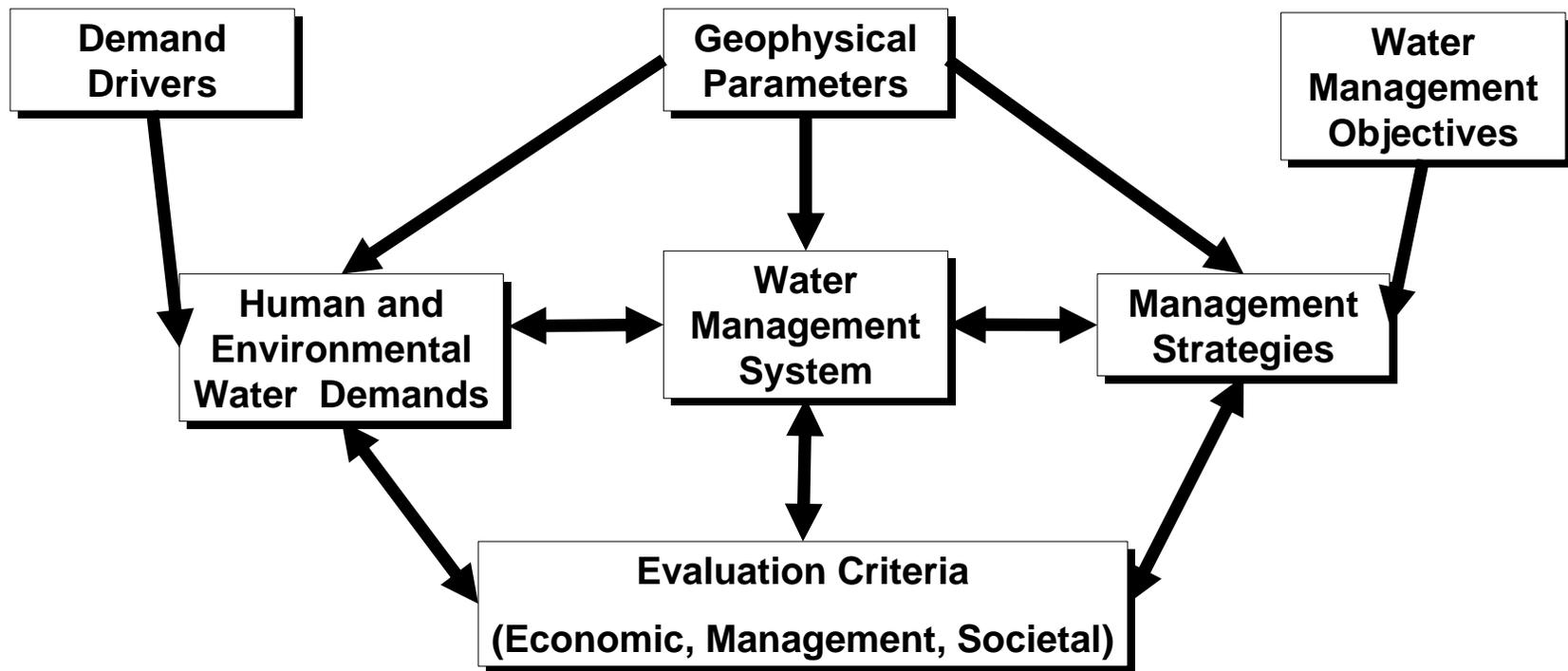


Key Uncertainties Affecting California Water Management

- Adapting to future climate change
- Improving the state's flood management system
- Preparing for the next drought
- Restoring the Delta



Conceptual Framework for Assessing Water Resources and Management

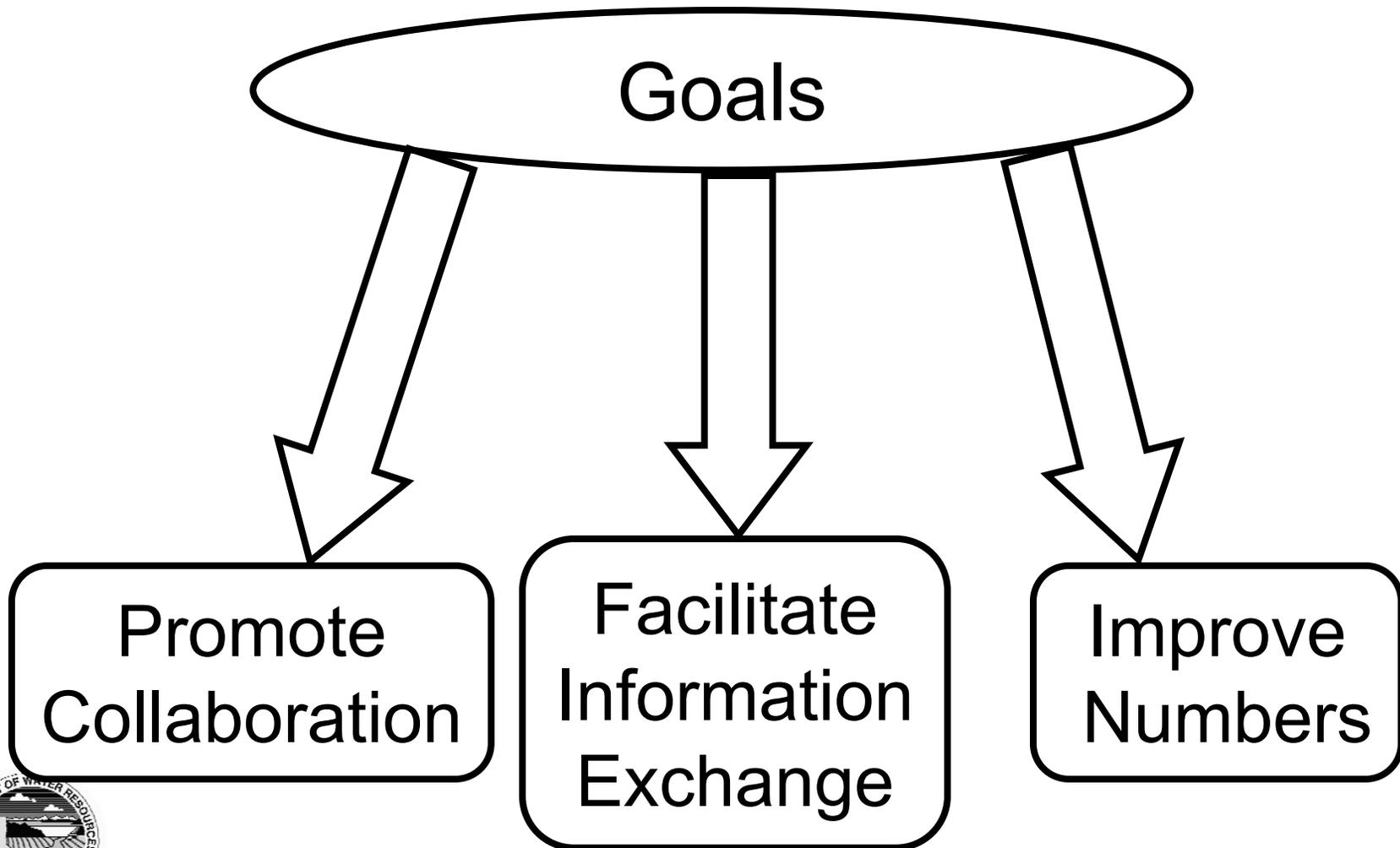


Using a Strategic Analysis Framework

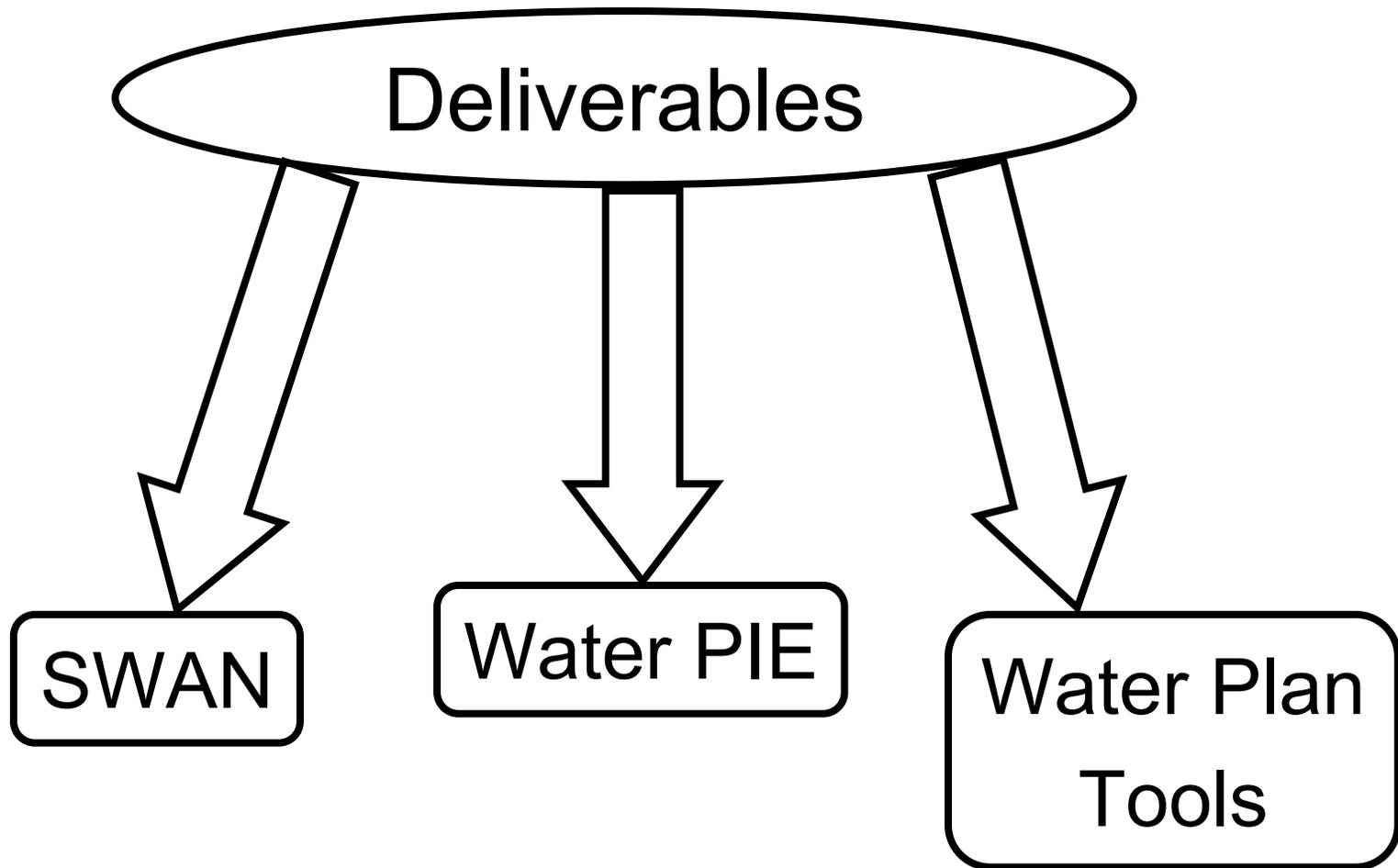
- Strategy
 - Transparency
 - Technical sustainability
 - Coverage
 - Accountability and quality control
-
- ◆ California Water and Environmental Modeling Forum - 2005



Next Steps for Quantitative Information



Next Steps for Quantitative Information



Related Pilot Studies

- Southern California Water Demand Study
 - RAND/UCSB (Completed June 2006)
- WEAP Climate Change and Decision Making Under Uncertainty - IEUA / RAND (June 2007)
- WEAP Climate Change Sac Valley
 - SEI / NCAR / USEPA / DWR (June 2007)
- MOA with Army Corps (April 2007)
- WEAP Scenario Application - DWR 2007



Recent Activities

- September –SWAN workshops
 - Highlighted SWAN Pilot Studies
 - Described Water Portfolios
- October – Plenary meeting
 - Resource management strategies
- November – Scenario narratives
 - Organized scenarios around uncertainty
- December – SWAN scenario quantification
 - Short and long term deliverables



December SWAN Meeting

Short Term Deliverables (Update 2009)

- High level analysis of hydrologic region demands, supplies, and responses
- Joint proposal to quantify scenarios in a few planning areas
- Synthesis of existing local, regional and statewide studies



December SWAN Meeting

Longer Term Deliverables (Update 2013?)

- Statewide and regional system schematics
- Framework for integrating DWR and regional efforts for water planning and policy
- Documented databases on common technical issues
- Visualization displays for policy folks
- Survey of how others do technical & collaborative work for regional and state planning (TX, S. Fla., MWD, etc.)
- Excerpted from Dr. Jay Lund's presentation



December SWAN Meeting

Longer Term Deliverables (Update 2013?)

- SWAN Pilot study to Integrate UWMP's with regional plans and the Water Plan
- Use of Shared Vision Planning for technical and policy collaboration
 - ◆ <http://www.svp.iwr.usace.army.mil/>



And Now, Back to Scenarios ...



Background on Scenarios

“In a scenario process, managers invent and then consider, in depth, several varied stories of equally plausible futures. The stories are carefully researched, full of relevant detail, oriented towards real-life decisions, and designed (one hopes) to bring forward surprises and unexpected leaps of understanding”

Peter Schwartz, “The Art of the Long View, Planning for the Future in an Uncertain World”



Schwartz' View of Scenarios

- Serve as a tool for ordering one's perceptions
- Evaluate different actions or responses based on different plausible futures
- Do not want to pick one preferred future or the most likely future
- Make strategic decisions that will be sound for all plausible futures



Water Plan Scenarios Represent Baseline Conditions

- Plausible during planning horizon under consideration
- Influence future water management decisions
- The water community has little control over



Scenario Narratives Used in Update 2005

- Scenario 1 – Current Trends
- Scenario 2 – Less Resources Intensive
- Scenario 3 – More Resources Intensive



Scenario 1

Current Trends

- Recent trends continue for the following:
 - ◆ Population growth and development patterns
 - ◆ Agricultural and industrial production
 - ◆ Environmental water dedication
 - ◆ Naturally occurring conservation (like plumbing code changes, natural replacement, actions water users implement on their own)



Scenario 2

Less Resource Intensive

- Includes the following:
 - ◆ Recent trends for population growth
 - ◆ Higher housing density
 - ◆ Higher agricultural and industrial production
 - ◆ More environmental water dedication
 - ◆ Higher naturally occurring conservation than Current Trends (but less than full implementation of all cost-effective conservation measures available)



Scenario 3

More Resource Intensive

- Includes the following:
 - ◆ Higher population growth rate
 - ◆ Lower housing density
 - ◆ Higher agricultural and industrial production
 - ◆ No additional environmental water dedication (year 2000 level)
 - ◆ Lower naturally occurring conservation than Current Trends



Suggestions for Update 2009

- Planning horizon / Time step
- Geographic scale
- Climate change
- Drought conditions
- Flood management
- Catastrophic events
- Other considerations?



Next Steps on Scenarios

- Refine scenario framework
- Update list of scenario factors and establish ranges
- Develop narrative scenarios
- Identify options for quantifying scenarios and performance of response packages
- Include scenario narratives and factors in Assumptions and Estimates Report



Reference Information

- <http://www.waterplan.water.ca.gov>
 - ◆ Chapter 4, Volume 1, Update 2005
 - ◆ Volume 4 Article, “Quantified Scenarios of 2030 Water Demand”
 - ◆ Volume 4 Article, “Future Scenarios Presented in Water Plan Update 2005”

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Questions?