Rethinking Water Policy Opportunities in Southern California

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MWD of Southern California

Inland Empire Utilities Agency

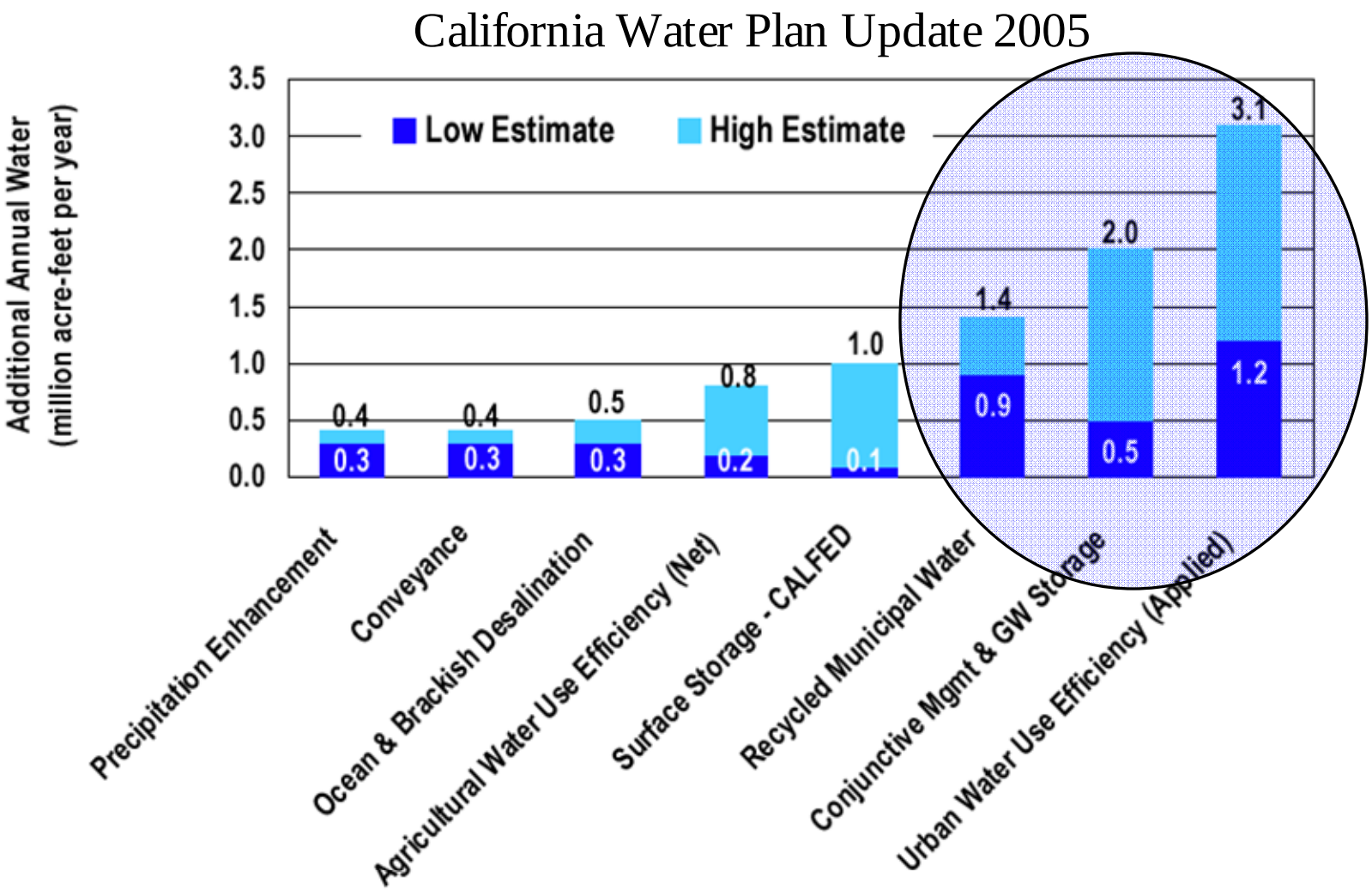
Outline

- Motivation
- Project Components
- Findings
- Conclusions

Water management at cross-roads in Southern California

- Increasing opportunities for greater regional self-reliance
- Continuing consideration of large intra-state water projects
- Uncertain but potentially problematic impacts of non-“historical” hydrologic conditions

California Water Plan Update 2005 emphasizes regional solutions



Urban Water Management Plans provide local and regional strategies

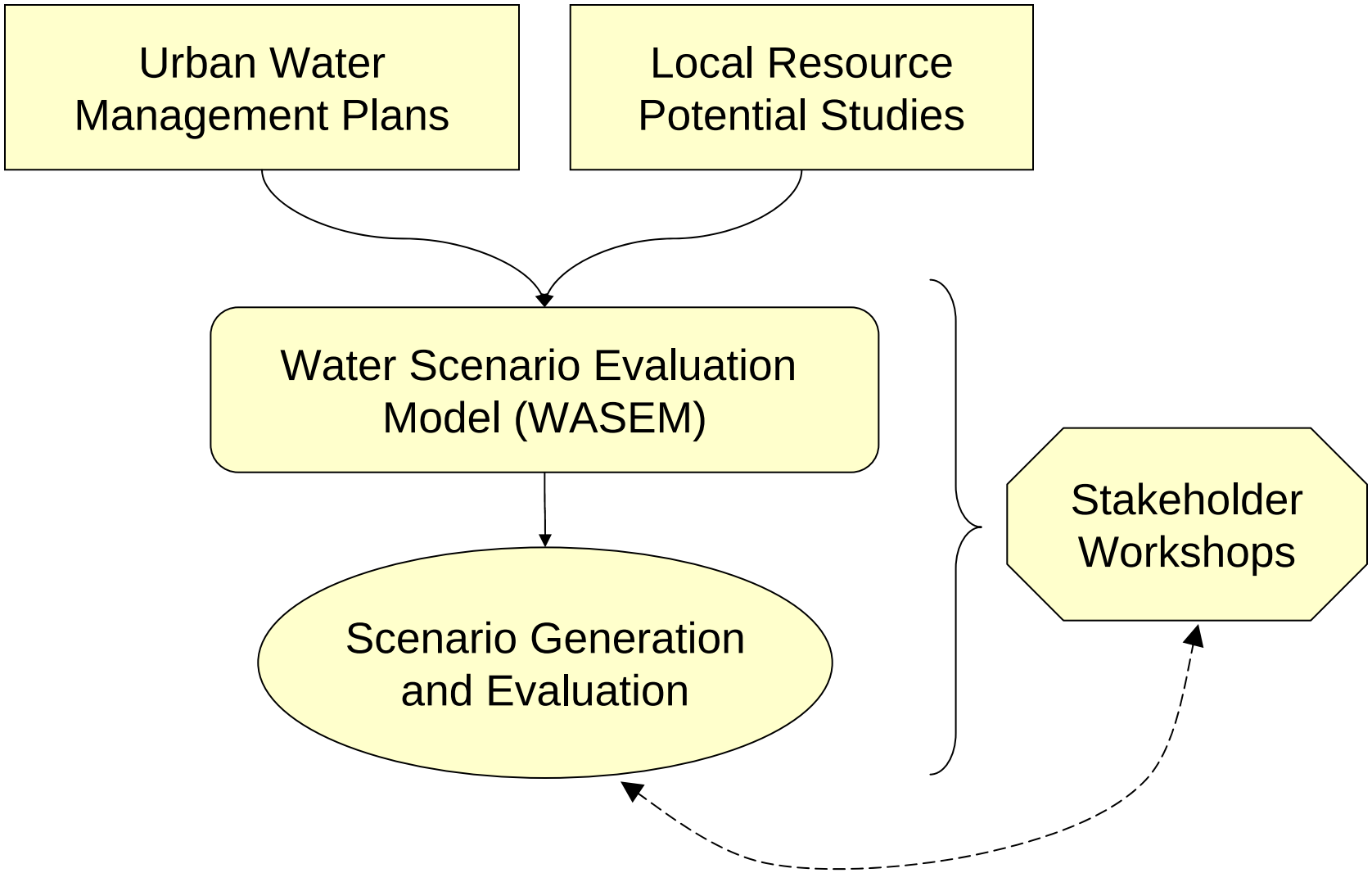
- Management plans based on strong assumptions
  - How might alternative population growth or demographic patterns impact demand?
  - What if imports into the region are restricted?

- Could alternative management strategies perform better under this uncertainty?

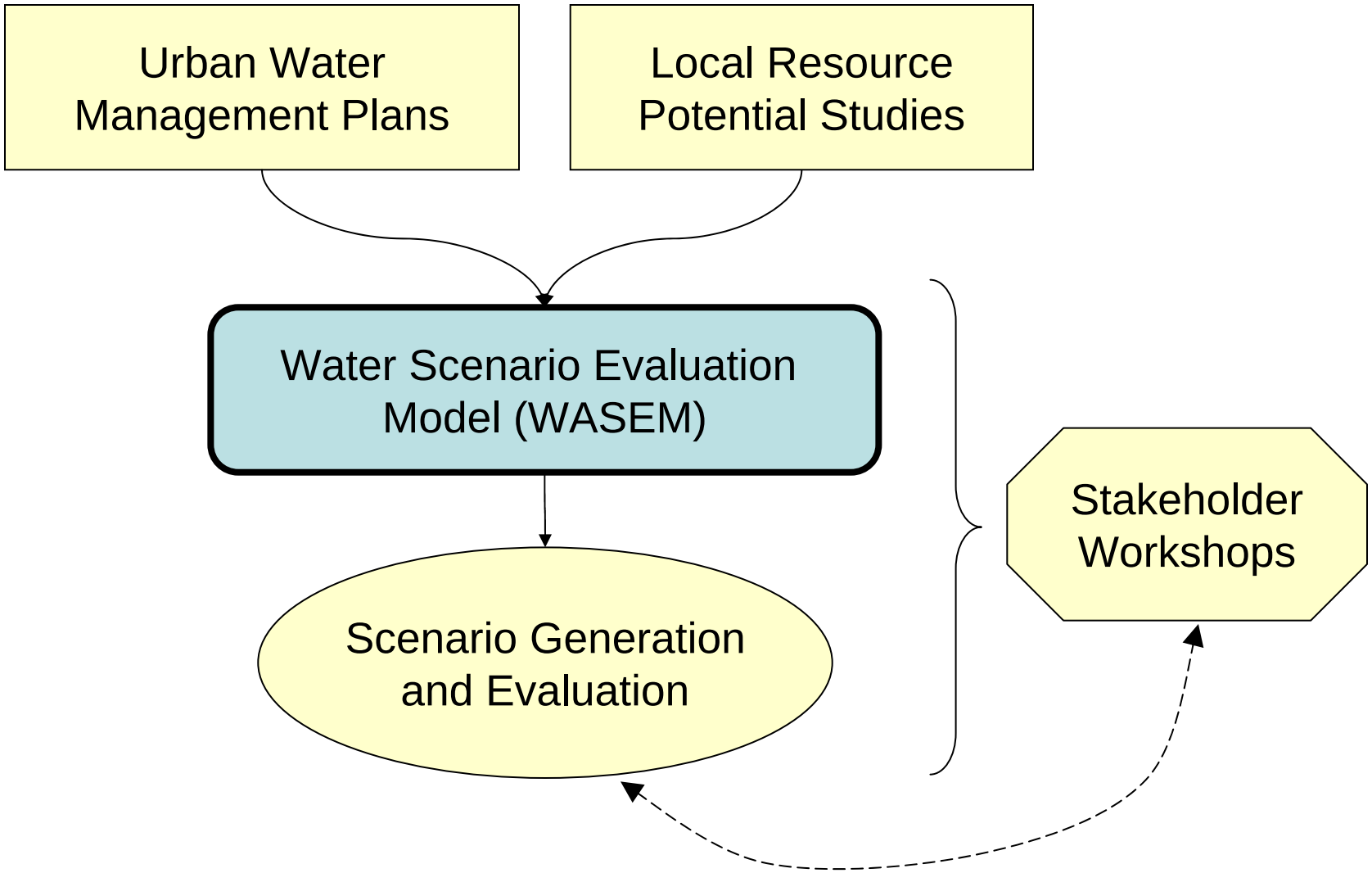
Overarching project objective

- Consider recently released information contained in
  - Southern California UWMPs
  - Independent studies of local resource potential
- Develop scenarios of future water supply and demand reflecting
  - Uncertainty about the future
  - Alternative long-term management approaches
- Gain insight into region's vulnerabilities and opportunities

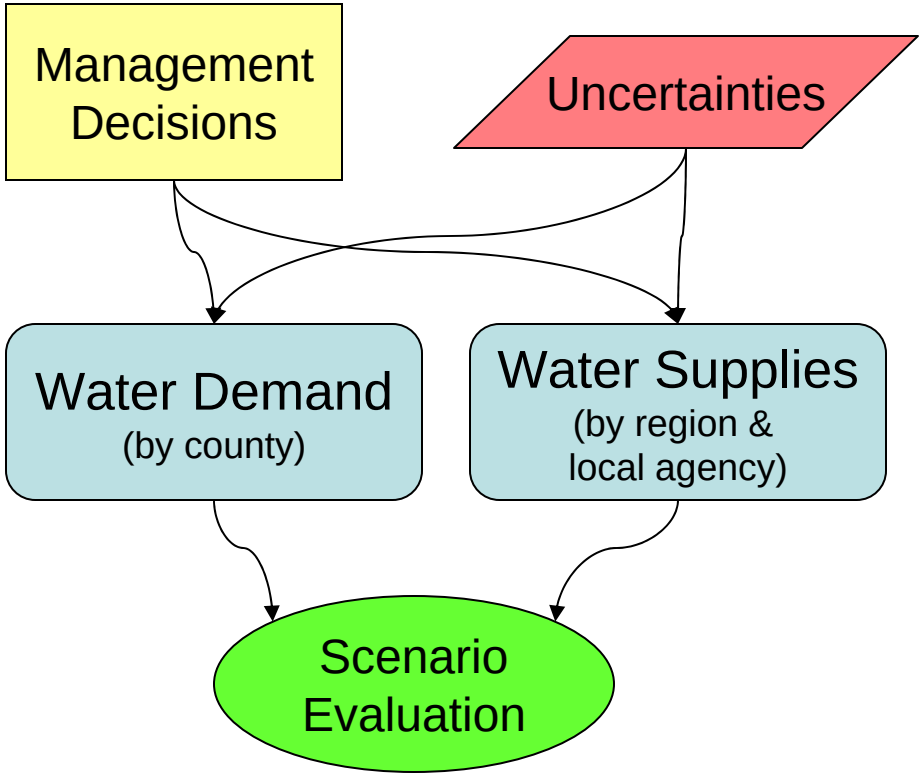
Project Overview



Project Overview



WASEM generates scenarios of water demand and supply in the Southland



Annual time-step from 2005 → 2030

WASEM forecasts demand using similar methodology to Urban Water Management Plans

- Urban demand based on projections of
  - Households, employees, population
  - Per unit water demand changes
    - demographics
    - income
  - Conservation at various levels of efficiency implementation
- Based on demand model used to quantify 2005 California Water Plan demand scenarios

Regional and local supplies based on specified goals for different sources

- Local supplies
  - Groundwater (including desalted brackish water)
  - Local rivers and streams
  - Recycled urban water
  - Desalinated sea water
- Imported supplies
  - State Water Project
  - Colorado River
  - Owens Valley

WASEM can quickly generate alternative and transparent scenarios

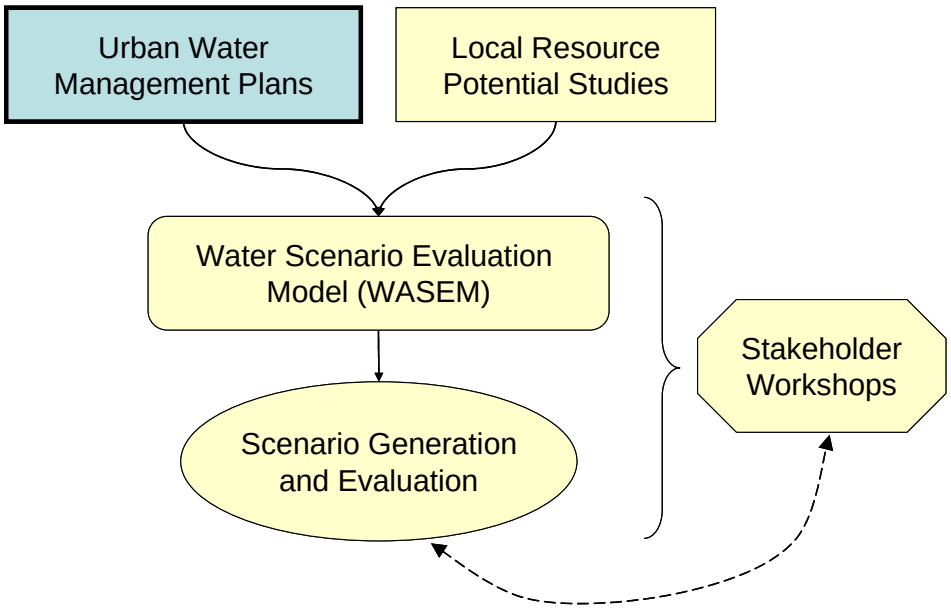
- Reference scenario(s) based on
  - MWD's 2005 Regional Urban Water Management Plan (RUWMP)
  - Local agency 2005 Urban Water Management Plans
- Key assumptions are explicitly defined and easily changed
  - Consider alternative management strategies
  - Reflect range of plausible future conditions
- Alternative assumptions suggested by
  - Other studies
  - Stakeholders and decision makers

Scenarios evaluated using familiar metrics

- Evaluation periods and hydrologic conditions required for all California UWMPs
  - Single average year
  - Single severely dry year
  - Multiple moderate dry years
  - Others of interest
- Level of regional self-sufficiency
- Cost of alternative management strategies*
- Others*

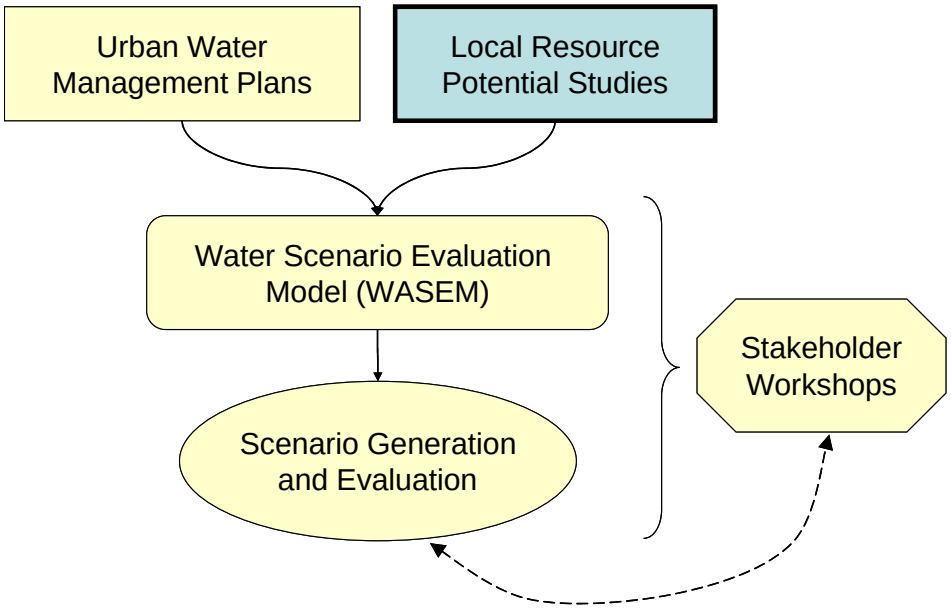
UWMPs inform reference scenarios

- MWD's Regional Urban Water Management Plan (RUWMP)
- Santa Ana Watershed Region
  - MWD of Orange County
  - Inland Empire Utilities Agency
  - Western
  - Eastern
  - City of Anaheim
  - City of Santa Ana
  - City of Fullerton



We considered key studies on local resource potential

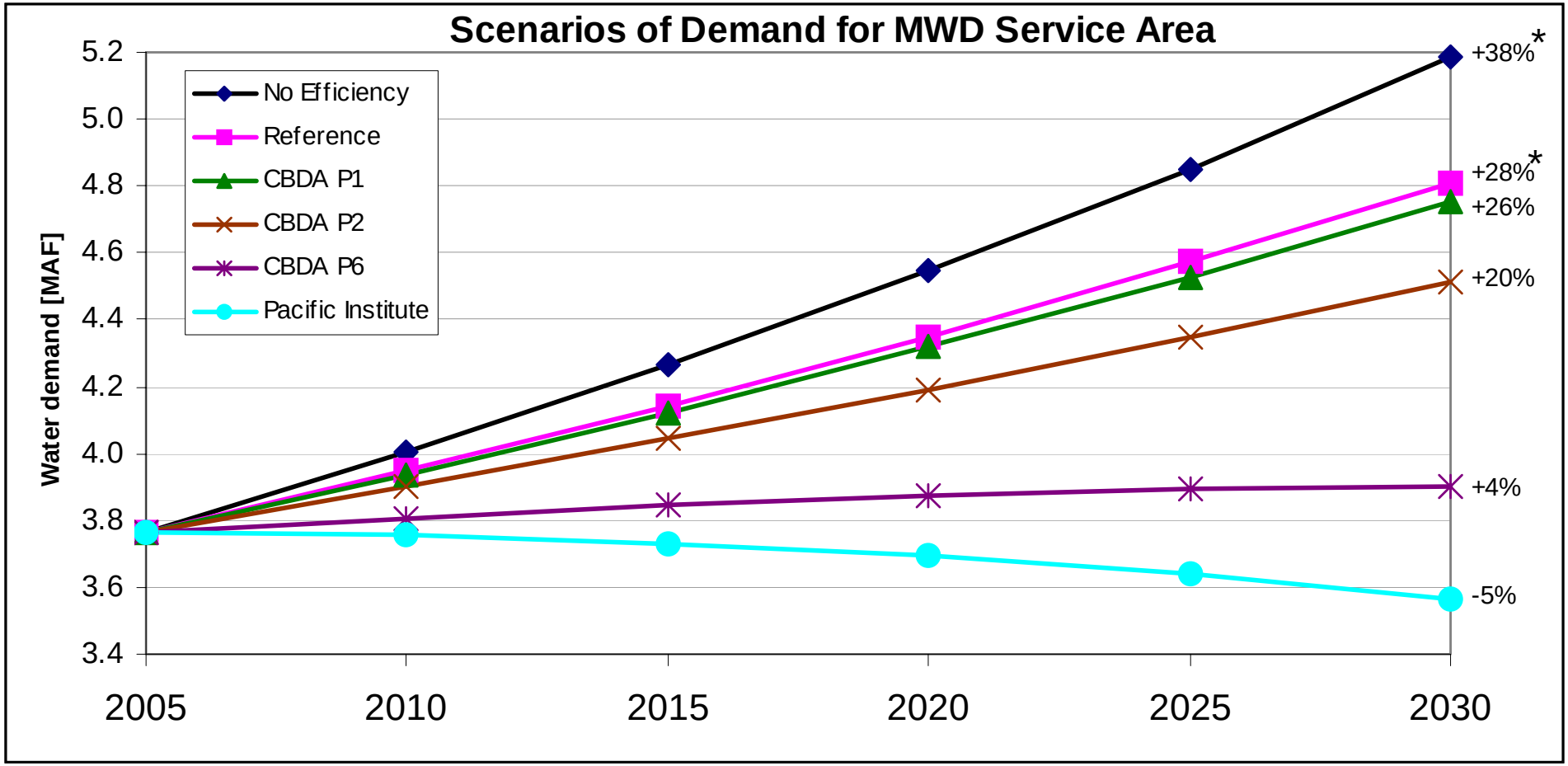
- Urban water use efficiency
  - CBDA “Comprehensive Review” (2005)
  - Pacific Institute’s “Waste Not, Want Not” report (2003)
- Groundwater
  - Association of Ground Water Agencies (AGWA) conjunctive use assessment (2000)
- Recycled municipal water
  - USBR’s Southern California Comprehensive Water Reclamation and Reuse Study (2002)



We consider several levels of urban water use efficiency implementation

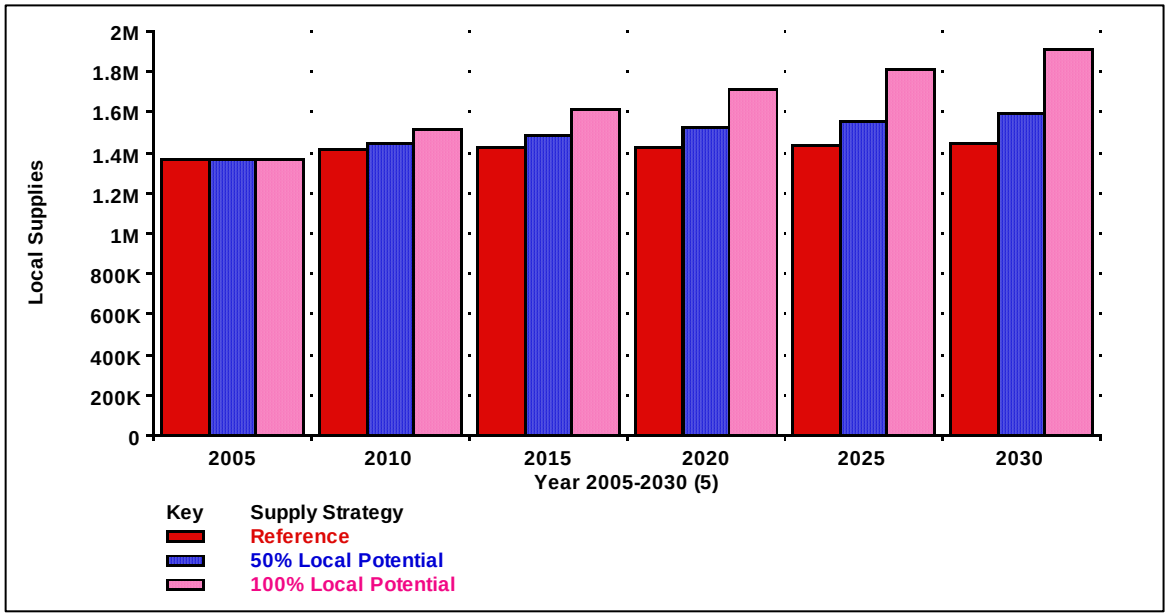
Efficiency Level	Interior household	Exterior household	CII sectors
Reference (RUWMP)	9% (SF) / 11.5% (MF)		6.5%
CBDA P1 (Reasonably Foreseeable)	14%	0%	4.9%
CBDA P2 (Locally Cost Effective)	13.2%	5.1%	20.4%
CBDA P6 (Technical potential)	28.3%	23.3%	18.6%
Pacific Institute (Cost effective, technically feasible)	32.5%	27.5%	32.5%

Application of feasible levels of efficiency leads to divergent demand projections



We consider two levels of groundwater use and urban water reuse

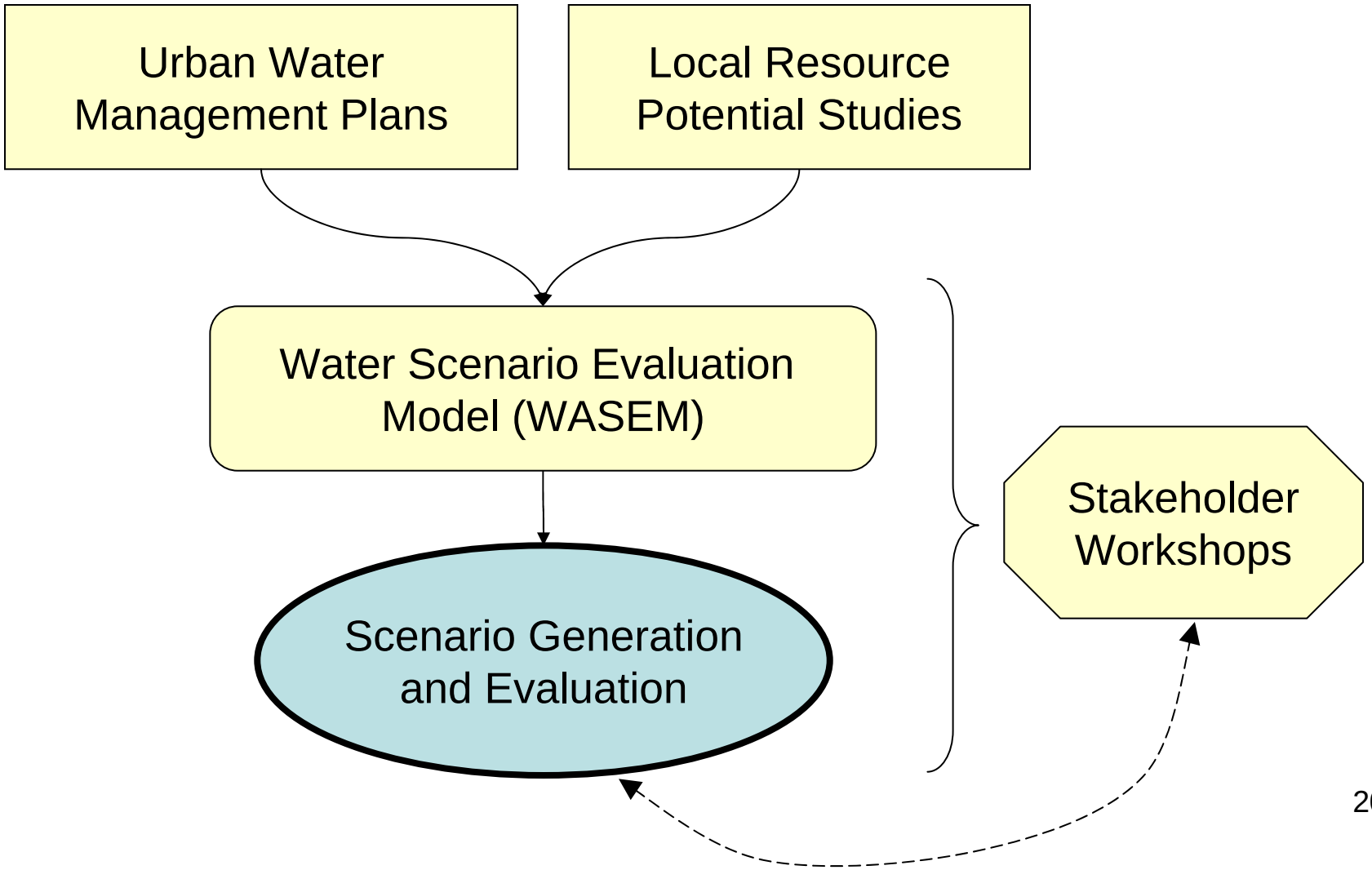
Resource	Reference Strategy	50% local potential	Full local potential
Groundwater supply	147 taf	300 taf	617 taf *
Recycled municipal water	199 taf	225 taf	452 taf **
Total	346 taf	525 taf	1,069 taf



* AGWA short-term yield increase potential

** SCCWRRS 2010 recycled potential supply

Scenarios and Results



Scenarios reflect alternative base assumptions & alternative management

Demand

Scenario component	Population growth
Reference	+21% (2005 → 2030)
High population growth	+31% (previous forecast)
Low population growth	+14% (another equivalent downward revision)

Supply

Scenario component	Supply parameter
Reference	As forecast in RUWMP
Reduced Imports	SWP: -25% LAA: -30%
Wet Socal	GW recharge: +20% Surface runoff: +20%
Dry Socal	GW replenishment & recharge: -20% Surface runoff: -20%

Long-term Supply and Demand Balance Under Current Plan

Scenarios	Reference Demand	High Pop	Low Pop
Reference Supply	1.08	0.98	1.14
Reduced Imports	0.97	0.89	1.03
Wet Socal	1.13	1.03	1.20
Wet Socal / Reduced Imports	1.04	0.95	1.10
Dry Socal	1.02	0.93	1.08
Dry Socal / Reduced Imports	0.91	0.83	0.97
Dry Socal / Increased Imports	1.09	0.99	1.15

Evaluation Metric: 2030 Supply / Demand ratio

Locally Cost Effective Conservation (CBDA P2)

Scenarios	Reference Demand	High Pop	Low Pop
Reference Supply	1.12	1.03	1.19
Reduced Imports	1.02	0.93	1.08
Wet Socal	1.18	1.08	1.25
Wet Socal / Reduced Imports	1.09	0.99	1.15
Dry Socal	1.06	0.97	1.13
Dry Socal / Reduced Imports	0.95	0.87	1.01
Dry Socal / Increased Imports	1.13	1.04	1.20

Evaluation Metric: 2030 Supply / Demand ratio

50% Local Resource Potential

Scenarios	Reference Demand	High Pop	Low Pop
Reference Supply	1.11	1.02	1.18
Reduced Imports	1.01	0.92	1.07
Wet Socal	1.16	1.06	1.23
Wet Socal / Reduced Imports	1.08	0.98	1.14
Dry Socal	1.05	0.96	1.12
Dry Socal / Reduced Imports	0.95	0.87	1.01
Dry Socal / Increased Imports	1.12	1.02	1.19

Evaluation Metric: 2030 Supply / Demand ratio

Locally Cost Effective Conservation and 50% Local Resource Potential

Scenarios	Reference Demand	High Pop	Low Pop
Reference Supply	1.16	1.06	1.23
Reduced Imports	1.05	0.96	1.12
Wet Socal	1.21	1.11	1.29
Wet Socal / Reduced Imports	1.12	1.03	1.19
Dry Socal	1.10	1.00	1.16
Dry Socal / Reduced Imports	0.99	0.91	1.05
Dry Socal / Increased Imports	1.17	1.07	1.24

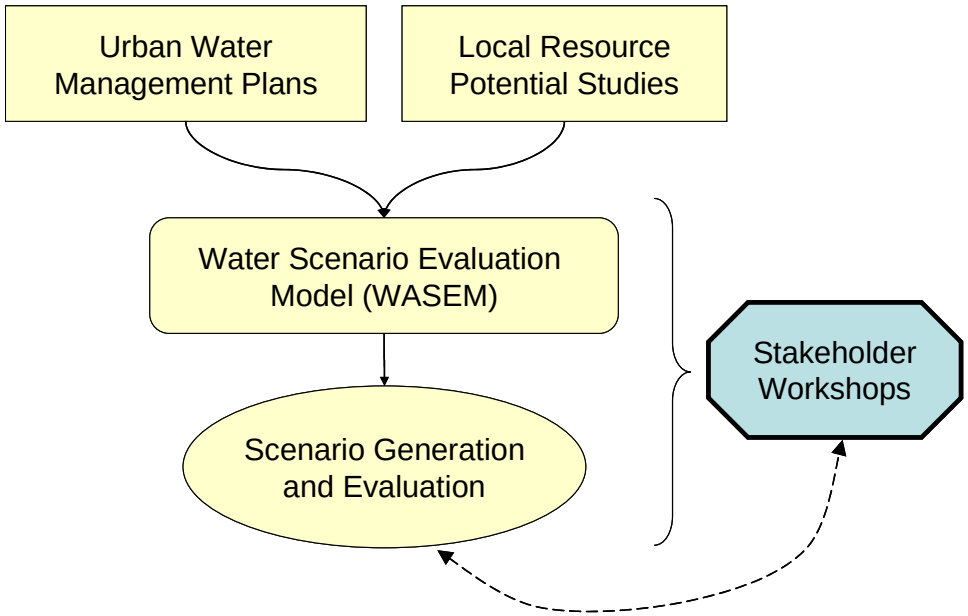
Evaluation Metric: 2030 Supply / Demand ratio

Two Southern California workshops validated approach and provided feedback

- Surveys revealed interest in approach and use of scenarios
- Appropriate modeling is critical – not there yet
- Revealed discrepancies between local and regional water plans

Nov. 2005 - Inland Empire Utilities Agency

Dec. 2005 - MWD of Southern California



Conclusions

- Scenarios reveal *ambiguity* about the management challenge in Southern California
- Increased local resource development may mitigate against some uncertainty
- Stakeholders desire participatory modeling approaches
  - Daylight key assumptions
  - Consider many management approaches
- Effort to characterize and reconcile local and regional UWMPs could provide valuable input for next Water Plan

Questions??

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