



Panel Discussion: Water Conservation as an Alternative Water Supply

The Role of the Demand Side Planning and
Management Process

Jack C. Kiefer, Ph.D.
Hazen and Sawyer, P.C.

Analogy??

- Is water conservation an alternative water supply?
- Are hybrid cars an alternative source of fuel?

Water Conservation Must Be Considered

- Conservation must now be a serious consideration for water management
 - Economic costs of water supply development are rising
 - Environmental trade-off's are more important
 - Institutions and regulators require more alternatives
- Water supply planning must pay more attention to demand

Demand Management as a Planning Process

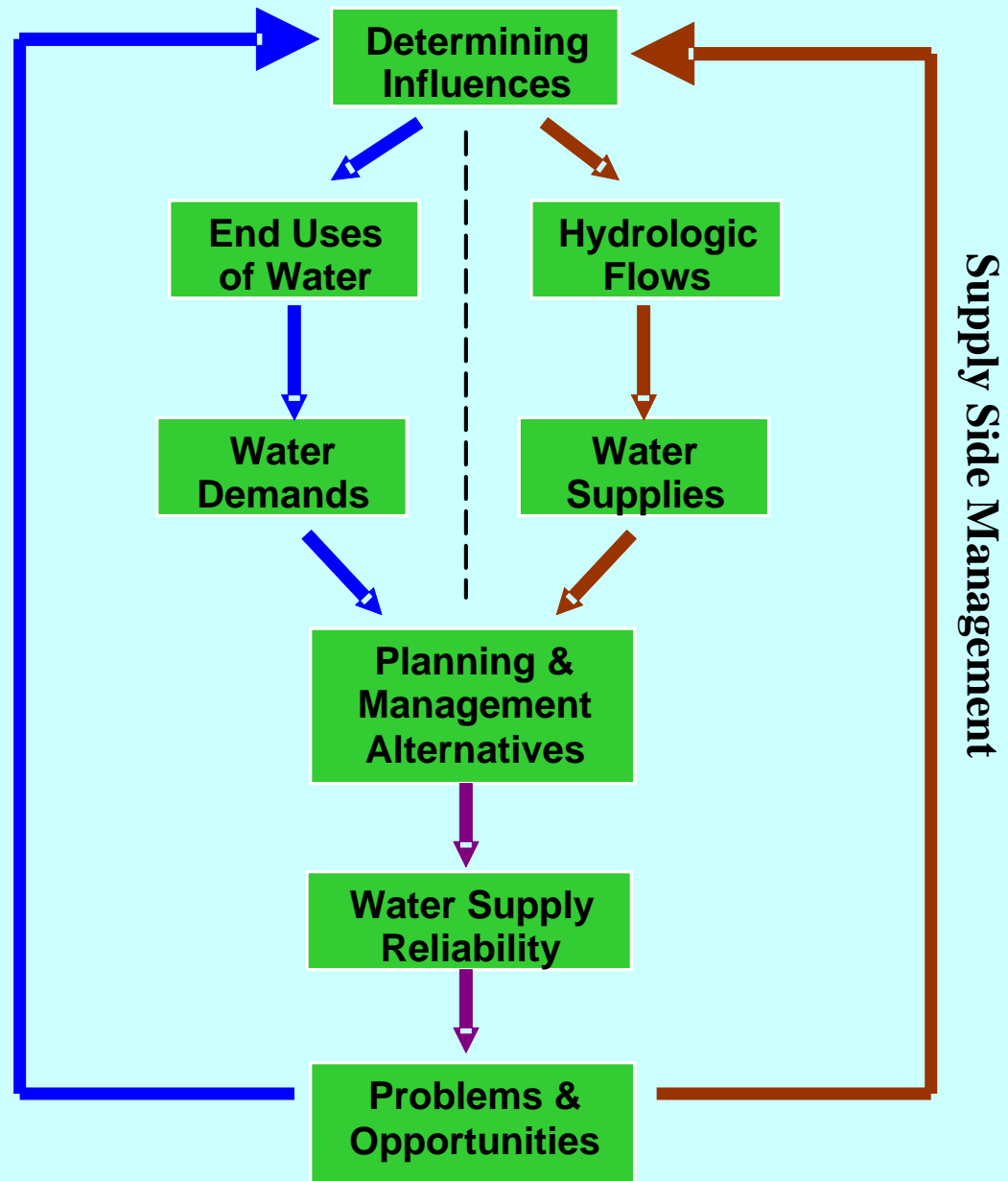
- Demand-side planning and management (DSPM) is a set of activities designed to
 - Provide a better understanding of how and why water is used
 - Forecast human demands for water supplies
 - Develop prospective water-using efficiency (demand reduction) measures
 - Evaluate the benefits and costs of efficiency measures as an alternative or complement to supply development

DSMP and Reliability

Demand Side

- *How is water used?*
- *What are future needs?*
- *Are there beneficial measures to suppress demand?*

Demand Side Management

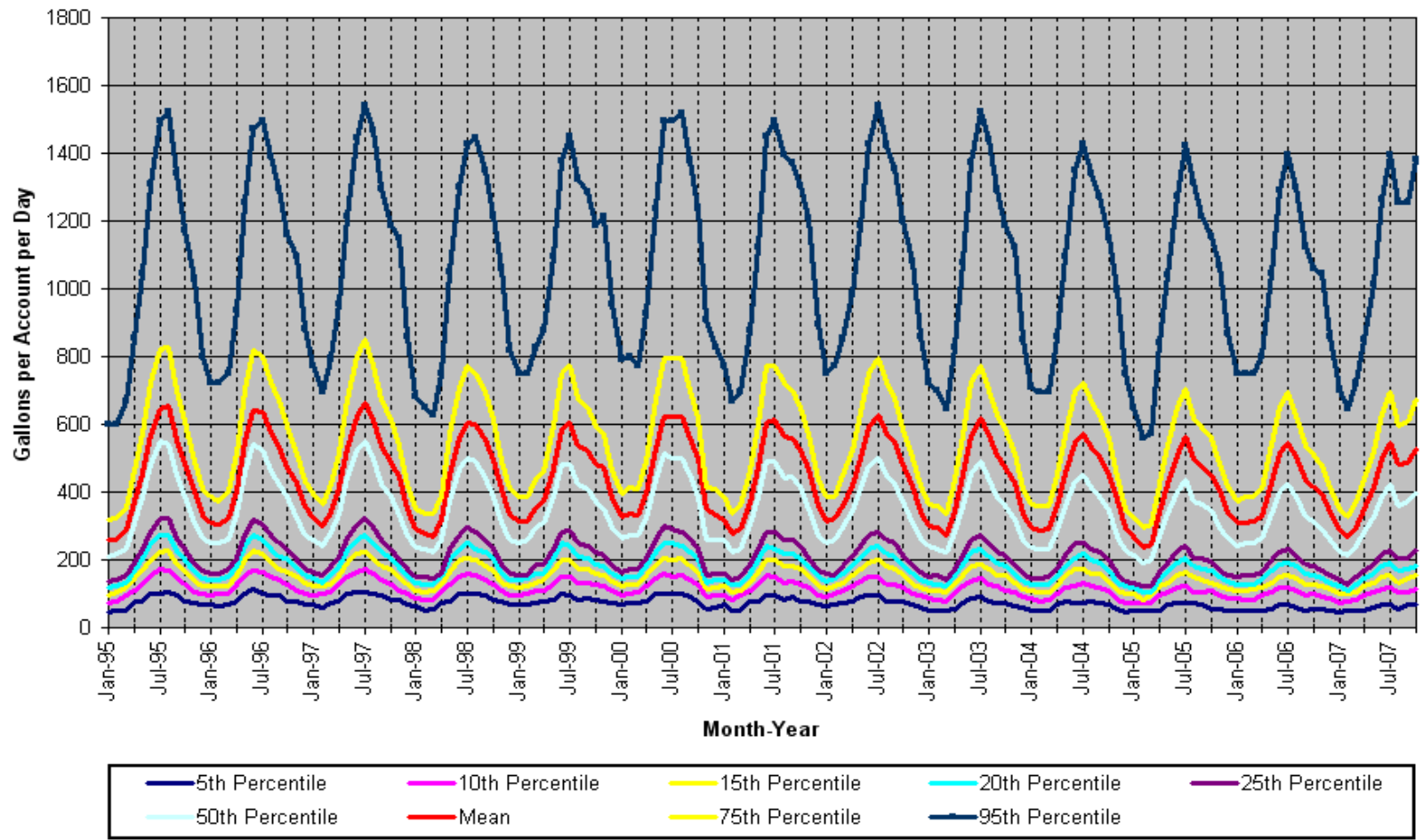


The Basic Building Blocks

- Baseline Studies and Demand Profiling
- Water Demand Forecasts
- Formulation of Efficiency Measures
- Program Evaluation
- Program Implementation
- Water Use Monitoring

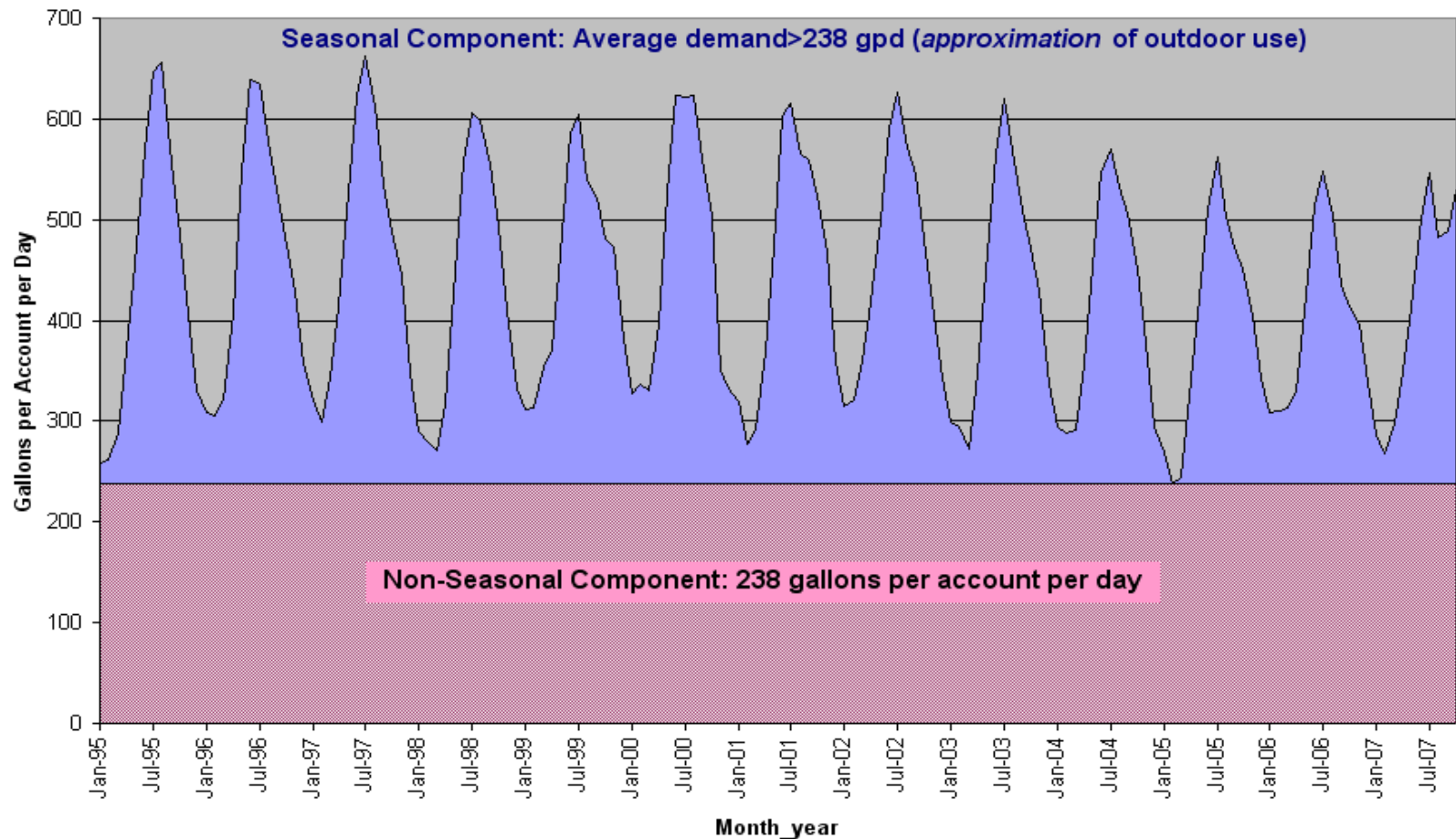
How and Why Does Water Use Vary

Distribution of Per Account Water Use for Single Family Accounts



What is the indoor/outdoor split

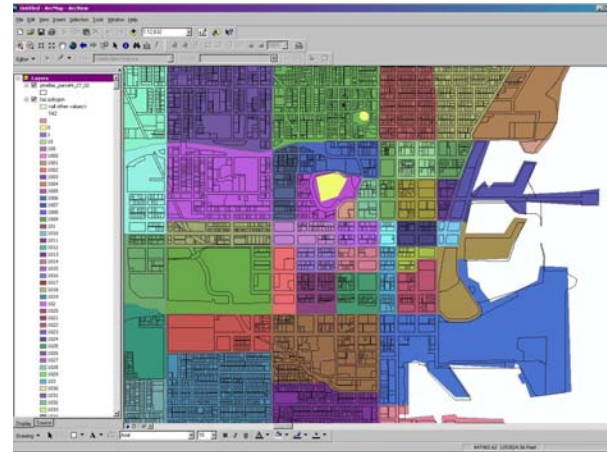
Single-Family Seasonal Use



Supporting Databases

■ Geospatial data linkages

- Water use
- Property characteristics
- Weather reporting stations



■ Customer surveys

- Pre-program
- Post-program
- Direct information
- Supports both process and impact evaluations



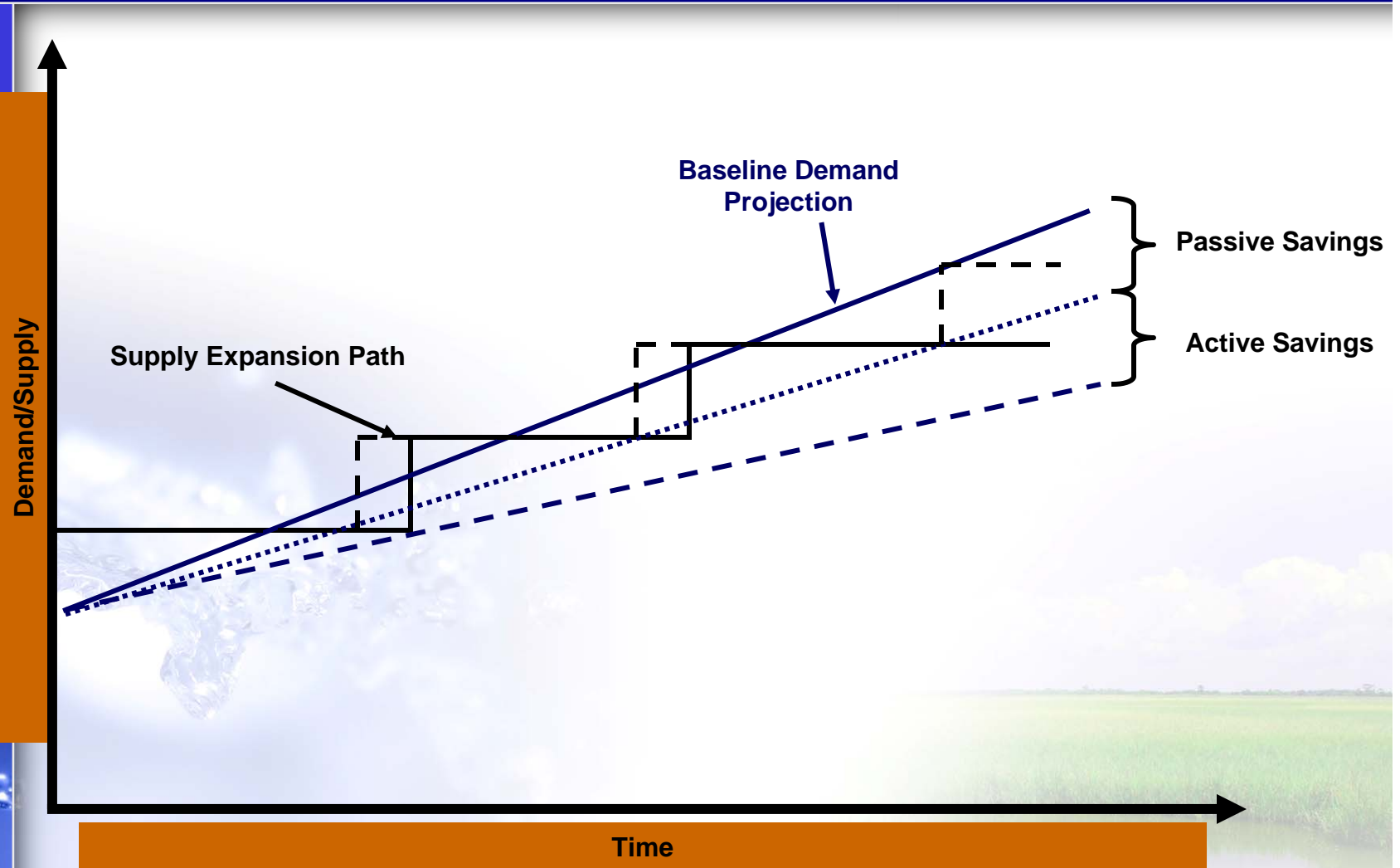
What Influences Demand Over Time?

- Demand Drivers
 - Population
 - Housing
 - Employment and Economic Activity
- Unit rates of consumption
 - Income
 - Price
 - Weather
 - Efficiency
 - ▶ Passive
 - ▶ Active

Forecasting is Fundamental to Evaluating Needs

- Baseline forecast gives “without-project” future scenario(s)
- Alternative “with-project” forecasts
 - Effects of passive conservation
 - Incremental effects of active conservation
- In conjunction with current and planned supplies, presents a set of conditions against which one can assess benefits of conservation

Demand Forecast as Organizing Framework



Net Economic Benefit Criterion

**Discounted Benefits
from Conservation**

vs.

**Discounted Costs
from Conservation**

- Lower variable costs
 - Chemicals
 - Energy
- Deferred capital costs

>

- Implementation costs
 - Hardware
 - Labor
- Customer costs

**Net economic
benefits**

Cost-effectiveness Criterion

Conservation Savings

**\$ per
1000 gallon**

vs.

Additional Supply

**\$ per
1000 gallon**

X

<

Y

Cost-Effective Program

Evaluation Emphasis and Orientation

<i>Orientation</i> <i>Emphasis</i>	<i>Orientation</i>	
	Ex Ante	Ex Post
Process	Plan/Formulate Implementation	Measure & Verify Participation
Impact	Forecast Water Savings	Measure & Verify Water Savings

Formulated vs. Realized

Closing Comments and Observations

- Is water conservation worth investing in?
 - Depends on your current and long-term outlook
 - Answer requires considerable amount of evaluation work
- Water conservation can be “purchased” in smaller chunks
- Supply additions are typically lumpy (big chunks)
- Augmenting supplies requires a lot of lead time
- Demand management as a risk reduction measure

Some Outstanding Questions for the Panel and Audience

- Does long-term efficiency reduce ability to respond to acute water shortages?
- Can consumer preferences be accommodated or must we inevitably restrict certain “non-essential” uses of water?
- How do water pricing strategies best fit into demand management?
- What are the benefits and costs of regulating water withdrawals?
- How are environmental benefits of water efficiency best communicated and integrated into evaluating programs?