San Diego County Water Authority
Long-Range Demand Forecast

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Urban Water Demand Roundtable – Session V
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Agency Background

- Wholesale water agency created by State Legislature in 1944
- Service Area ~ 951,000 acres
- 24 member agencies
- 36-member board of directors
Agency Background (cont.)

- Serve over 3 million people and region’s $188 billion economy

- Major Infrastructure
  - 300-miles of pipelines
  - Reservoir
  - Water Treatment Plant
  - Hydroelectric Generation

- $3.5 billion Capital Improvement Program
2012 Water Supply Portfolio

- MWD: 45%
- IID Transfers: 14%
- Canal Lining Transfers: 13%
- Conservation: 11%
- Recycled Water: 10%
- Groundwater: 10%
- Surface Water: 4%

San Diego County Water Authority
Historic Total Demands

Total Demand
(Thousands of Acre-Feet)
Forecast Schedule and Horizon

- Updated every 5 years
  - coincides with State mandated Urban Water Management Plan updates

- 25-year planning horizon
  - currently extends through 2035

- Based on official demographic and economic projections from the San Diego Association of Governments
  - principal land use planning agency for the region
Demand Forecast Model

- Econometric model (CWA-MAIN)
- Water Authority forecast = sum of member agency level projections
- Forecast generated by major sector
  - Single-family
  - Multi-family
  - Non-residential
  - Agriculture
Modeling Approach

- Models use a “rate of use x driver variable” approach

- Rate of use factors
  - Income
  - Price
  - Weather

- Predictive drivers of demand
  - Housing units
  - Employment counts
  - Agricultural acres

\[
Q_{SDCWA} = \sum_j Q_{MA}
\]

\[
Q_{MA} = \sum_i N_i \cdot q_i
\]

\[
q_i = f(x)
\]
Forecast Development Process

Member Water Use Survey → Historic SANDAG Demographics → Historic Price and Weather

Water Use Modeling Database

Development of Predictive Models

Testing and Calibration of Predictive Models

SANDAG Forecast

Preliminary Baseline Water Demand Forecast
## SANDAG Demographic & Economic Growth between 2015 and 2035

<table>
<thead>
<tr>
<th>Forecast Variable</th>
<th>Growth - Water Authority Service Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>+634,945</td>
</tr>
<tr>
<td>Single-Family Housing Units</td>
<td>+34,960</td>
</tr>
<tr>
<td>Multi-Family Housing Units</td>
<td>+175,315</td>
</tr>
<tr>
<td>Employment Counts</td>
<td>+277,648</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>+$14,417</td>
</tr>
</tbody>
</table>
Influence of SANDAG Projections on Demands

<table>
<thead>
<tr>
<th>Variable</th>
<th>Direction of SANDAG Projections</th>
<th>Influence on Demand Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupied Housing Units</td>
<td>$\uparrow$</td>
<td>$\uparrow$</td>
</tr>
<tr>
<td>Household Income</td>
<td>$\uparrow$</td>
<td>$\uparrow$</td>
</tr>
<tr>
<td>MF Housing Density</td>
<td>$\uparrow$</td>
<td>$\downarrow$</td>
</tr>
<tr>
<td>SF Housing Density</td>
<td>$\downarrow$</td>
<td>$\uparrow$</td>
</tr>
<tr>
<td>Total Employment</td>
<td>$\uparrow$</td>
<td>$\uparrow$</td>
</tr>
</tbody>
</table>
Normal Year Total Baseline Demand Forecast (AF)

![Graph showing Normal Year Total Baseline Demand Forecast (AF)]
Added Forecast Challenges

- Prolonged effects of recession
- “New Normal” - post allocation
- Water rate escalation
What Does the Future Look Like...Now?

Normal Year Demand (TAF)

- 2000 UWMP
- 2005 UWMP
- 2010 UWMP

2015 UWMP
Demand Forecast

2010  2015  2020  2025  2030  2035