California Water Plan Update 2009

Scenarios
South Lahontan HR

2009 Regional Workshops

California Water Plan Update 2009

INTEGRATED WATER MANAGEMENT

Bulletin 160-09 • Department of Water Resources

Public Review Draft
January 2009
Water Plan Scenarios Used To Consider Future Uncertainty

- Three plausible yet very different conditions during 2050 planning horizon
- Explore key uncertainties facing water community
- Factors water community has little control over
- Not predictions ---- used to evaluate water management responses
Quantifying Future Scenarios for Update 2009

- Using WEAP analytical tool to quantify water demand and supplies for future scenarios and water management responses

- WEAP Hydrologic Region analysis being done for all regions --- high level, coarse representation

- WEAP Planning Area analysis for Sacramento and San Joaquin regions --- more physically based

- Each scenario evaluated with 12 climate sequences (climate change, multiple year droughts, wet years)
Hydrologic Region Analysis

- Monthly, climate-driven demands to 2050
  - reflect global climate change projections
- Inventory current supplies by source
- Coarse representation of response packages

All 10 Hydrologic Regions
Planning Area Analysis
Sacramento and San Joaquin River Regions

- Hydrologically-based water system simulation by month to 2050
  - reflect global climate change projections
- Estimate environmental flows, system operations, deliveries, and reliability
- More direct representation of response packages
3 Baseline Scenarios for 2050
Plausible Yet Different Futures

- **Current Trends**
  - Recent trends continue into the future for population, agricultural production, environmental water, and background water conservation

- **Blueprint Growth**
  - More coordinated planning & infill
  - Lower population growth
  - More agricultural prod. -- 2000 level
  - New environment water -- High
  - More background water conservation

- **Expansive Growth**
  - Less coordinated planning & sprawl
  - Higher population growth
  - More agricultural prod. -- 2000 level
  - New environment water -- Low
  - Less background water conservation
## Scenario Assumptions for Key Factors

**South Lahontan Hydrologic Region**

<table>
<thead>
<tr>
<th>Scenario Factors Affecting Water Demand</th>
<th>Year 2005 Observed</th>
<th>2050 Current Trends</th>
<th>2050 Blueprint Growth</th>
<th>2050 Expansive Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (millions)</td>
<td>1.1</td>
<td>2.4</td>
<td>1.4</td>
<td>3.4</td>
</tr>
<tr>
<td>Irrigated Crop Area (thousand acre)</td>
<td>65.8</td>
<td>59.1</td>
<td>61.9</td>
<td>56.1</td>
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<tr>
<td>Environmental Water</td>
<td>2005 Level</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
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<td>Environmental Water</td>
<td>2005 Level</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Background Water Conservation (% Incr.)</td>
<td>----</td>
<td>10%</td>
<td>15%</td>
<td>5%</td>
</tr>
</tbody>
</table>
Scenario Water Demand Changes

HR Results for 1 Climate Sequence

- Change in urban water demand
- Change in irrigated agriculture water demand
- Change in environmental water
- Net Change in regional water demand
Urban Water Demand Changes – 2005 to 2050

South Lahontan HR

Change in 2041-2050 Average Applied Urban Water Demand from 1998-2002 Historical Average by Scenario

South Lahontan Region, Climate Sequence 1

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Change in Demand (TAF)</th>
<th>Population (2005)</th>
<th>Population (2050)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Trends</td>
<td>600</td>
<td>1.0 Million</td>
<td>2.4 Million</td>
</tr>
<tr>
<td>Blueprint Growth</td>
<td>300</td>
<td>1.4 Million</td>
<td></td>
</tr>
<tr>
<td>Expansive Growth</td>
<td>1200</td>
<td>3.4 Million</td>
<td></td>
</tr>
</tbody>
</table>

Expansive Growth

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Farm Water Demand Changes – 2005 to 2050
South Lahontan HR

Change in 2041-2050 Average On Farm Applied Water Demand from 1998-2002 Historical Average by Scenario
South Lahontan Region, Climate Sequence 1

- Change in Demand (TAF)

Current Trends:
- 2005 Irrigated Crop Area = 65,840 Acres
- 2050 Irrigated Crop Area = 61,870 Acres

Blueprint Growth:
- 2050 Irrigated Crop Area = 59,150 Acres

Expansive Growth:
- 2050 Irrigated Crop Area = 56,090 Acres
Environment Water Demand Changes – 2005 to 2050
South Lahontan HR

No environmental water changes for all scenarios.
Net Water Demand Changes – 2005 to 2050
South Lahontan HR

Change in 2041-2050 Average Applied Water Demand from 1998-2002 Historical Average by Scenario
South Lahontan Region, Climate Sequence 1

Current Trends
2050 Irrigated Crop Area = 59,150 Acres
2050 Population = 2.4 Million

2050 Irrigated Crop Area = 61,870 Acres
2050 Population = 1.4 Million

Expansive Growth
2050 Irrigated Crop Area = 56,090 Acres
2050 Population = 3.4 Million

Blueprint Growth
Technical Outreach for Scenario Work

- December 2007 – Scenario proposal
- April 2008 – Shared Vision Planning
- June 2008 – Refinement of scenario proposal
  - Climate change
  - Environmental water
  - Flood management
  - Water quality
- February 2009 – Review of preliminary demands
Steps for Scenario Work

- **December 2008 – February 2009**
  - Develop scenario water demands

- **February – May 2009**
  - Develop scenario water supplies
  - Test future water management responses

- **Mid-June 2009**
  - Workshop on Regional and Planning Area results