Overview

- Agricultural land use
- Water Portfolio Components
- Process map
- California Agricultural Water Use Model
- Water Plan activities
- Analytical tool development
- Parking lot issues
- Data needs
- Potential partnerships
Land Use

- Crop Type by Field
- Aggregated by DAU-County
- Determine Water Portfolio parameters
Components of Ag Water Use

- Evapotranspiration (ET)
- Evapotranspiration of Applied Water (ETAW)
- Effective Precipitation (EP)
- Applied Water
  - Total Water Use
  - Use by Water Source type (e.g., surface water, groundwater) if available
California Agricultural Water Use Model

- Monthly time-step model using rootzone soil moisture storage methodology
- Daily precipitation/infiltration preprocessor
  - Uses SCS Method to estimate infiltration vs. runoff
- Rootzone storage defined by effective rooting and available soil moisture storage
  - Based on NRCS Soil Survey data
- Computes ET, EP, ETAW, and deep percolation from precipitation
California Agricultural Water Use Model

• Applied Water determined from farm data input
  – Application fractions
    • Estimated from Irrigation Method mapping
  – Cultural practices
    • Rice ponding
    • Leaching Requirements
    • Pre-irrigation
    • Frost protection
    • Other ET and non-ET cultural practices

• Compute consumed fraction or irrigation efficiency as ETAW / AW
California Agricultural Water Use Model

- Input ...
- Reports ...
- Calculate ETAW ...
- Calculate Ag Water Use ...
- Maintenance ...
- About this model
- Exit
Model Input

Input

- DAU-Counties ...
- Farm Data ...
- Soil Data ...
- Crop Data ...
- Evaporation ...
- Precipitation ...
- Infiltration Curves ...
- Infiltration override values ...
- Quality Assurance Checks...
## Farm Data Input

<table>
<thead>
<tr>
<th>Crop</th>
<th>Surface</th>
<th>Mixed</th>
<th>Ground</th>
<th>Total</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa</td>
<td>7,705</td>
<td>0</td>
<td>1,210</td>
<td>9,015</td>
<td></td>
</tr>
<tr>
<td>Grain</td>
<td>21,334</td>
<td>0</td>
<td>1,079</td>
<td>22,413</td>
<td></td>
</tr>
<tr>
<td>Meadow Pasture</td>
<td>3,376</td>
<td>0</td>
<td>0</td>
<td>3,376</td>
<td></td>
</tr>
<tr>
<td>Meadow Pasture - X</td>
<td>1,810</td>
<td>0</td>
<td>0</td>
<td>1,810</td>
<td></td>
</tr>
<tr>
<td>Onions &amp; Garlic</td>
<td>1,608</td>
<td>0</td>
<td>227</td>
<td>1,835</td>
<td></td>
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<tr>
<td>Other Field</td>
<td>336</td>
<td>0</td>
<td>164</td>
<td>490</td>
<td></td>
</tr>
<tr>
<td>Other Truck</td>
<td>1,298</td>
<td>0</td>
<td>97</td>
<td>1,395</td>
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<tr>
<td>Pasture</td>
<td>1,328</td>
<td>0</td>
<td>84</td>
<td>1,412</td>
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<tr>
<td>Pasture - X</td>
<td>75</td>
<td>0</td>
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<td>47</td>
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<td>Potatoes</td>
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<td>0</td>
<td>194</td>
<td>5,380</td>
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<tr>
<td>Sugar Beets</td>
<td>3,688</td>
<td>0</td>
<td>171</td>
<td>3,859</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td>47,924</td>
<td>0</td>
<td>3,258</td>
<td>51,282</td>
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</tbody>
</table>

**Notes:** Farm data note - 2000 1-M doc applies to all crops.
# Annual Ag Water Use by DAU County

## Model Output

### State of California, Department of Water Resources

#### 9/17/2007

#### Statewide Water Analysis Network

#### Model Output

### 2000 Water Year

#### 167 - Butte

<table>
<thead>
<tr>
<th>Crops</th>
<th>Area (Acres x 1,000)</th>
<th>ET (Acre-feet x 1,000)</th>
<th>ET (Acre-feet x 1,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SW</td>
<td>GW</td>
<td>Total</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>0.0</td>
<td>0.1</td>
<td>0.1</td>
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<tr>
<td>Almonds</td>
<td>0.3</td>
<td>1.8</td>
<td>2.1</td>
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<tr>
<td>Cucurbits</td>
<td>0.2</td>
<td>0.0</td>
<td>0.2</td>
</tr>
<tr>
<td>Grain</td>
<td>0.3</td>
<td>2.3</td>
<td>2.6</td>
</tr>
<tr>
<td>Meadow Pasture</td>
<td>0.6</td>
<td>0.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Other Truck</td>
<td>0.8</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Pasture</td>
<td>0.0</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>Rice</td>
<td>0.9</td>
<td>0.0</td>
<td>0.9</td>
</tr>
<tr>
<td>Safflower</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Sugar Beets</td>
<td>0.9</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Sunflower</td>
<td>0.5</td>
<td>0.3</td>
<td>0.8</td>
</tr>
<tr>
<td>Walnuts</td>
<td>0.4</td>
<td>1.4</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3.7</td>
<td>7.1</td>
<td>10.8</td>
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</table>

#### 167 - Butte Double Crop Acreage

<table>
<thead>
<tr>
<th>Area (Acres x 1,000)</th>
<th>ET (Acre-feet x 1,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.7</td>
<td>10.8 1.7 7.5 11.1</td>
</tr>
<tr>
<td>1.9</td>
<td>1.1 Double Crop Acreage</td>
</tr>
<tr>
<td>1.7</td>
<td>9.7 Irrig. Land Area</td>
</tr>
</tbody>
</table>

#### 2000 Total

<table>
<thead>
<tr>
<th>Area (Acres x 1,000)</th>
<th>ET (Acre-feet x 1,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.7</td>
<td>10.8 1.7 7.5 11.1</td>
</tr>
<tr>
<td>1.7</td>
<td>1.1 Double Crop Acreage</td>
</tr>
<tr>
<td>1.7</td>
<td>9.7 Irrig. Land Area</td>
</tr>
</tbody>
</table>

### Water Year Summary

- **SW Total Water**: 3.7
- **GW Total Water**: 7.1
- **Total Water**: 10.8
- **ET Total Water**: 1.7
- **Irrig. Land Area**: 7.5
- **Double Crop Acreage**: 11.1
Water Plan Activities

• Deliverables
  – Irrigated Acreage
    • In some areas, by water source
  – Applied Water
    • In some areas, by water source
  – ETAW, ET, and EP
  – Consumed Fraction (Irrigation Efficiency)
• Update 2005 accomplishments
  – 1998, 2000, and 2001 water portfolio data
• Update 2009 planned activities
Analytical Tool Development

• Incorporate cultural practices of rice into Model
  – Rice Decomposition
  – Rice Duck Clubs

• Analyze smaller units than a DAU/County
  – Cover water districts, grouping of water service areas or unorganized areas, etc.
Update 2005 Parking Lot Issues

- Comprehensive analytical framework
- Gap analysis
- Additional annual water portfolio data
- QA/QC for Water Plan data
- Improved data transparency
- Climate change impacts
Data needs

• Increased accuracy in determining annual land use patterns
• Water source mapping by field
  – Identification of surface and ground water infrastructure
• Irrigation method data by field
• Measured on-farm/field applied water data
• Improved crop coefficient data for computing ET
Potential partnerships

• UC Cooperative Extension
• Department of Conservation
• County Agricultural Commissioners
• Water Districts/Agencies
• ???
Agricultural Water Use
In the California Water Plan Update

Questions?