

CWEMF

IWFM v4.0 Workshop

January 7-8, 2014

West Yost Associates, Davis, CA

Emin Can Dogrul

California Department of Water Resources

Session 6:

Stream Diversions and Groundwater

Pumping as Water Supply



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Agricultural and Urban Water Supply

- Stream flow diversions and groundwater pumping can be used as water supply to meet agricultural and urban demand
- Fractions of stream diversions and groundwater pumping to be used to meet agricultural water demand are defined by the user as a time-series data; the rest of the supply is used to meet the urban demand
- Actual water supply that is used to meet demand depends on the availability of stream flows and groundwater storage
- Water supply does not have to be equal to water demand; it can be less than the demand (e.g. not enough water in the modeled system) or greater than the demand (e.g. diversions part of which are being used for groundwater banking)



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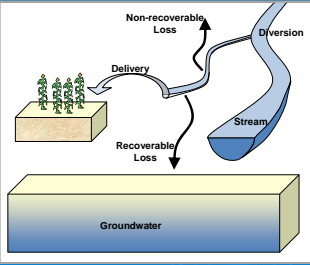
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Stream Flow Diversions

- Each stream flow diversion originates from a stream node and gets delivered to a sub-region, an element, a group of elements, or outside the modeled domain
- Diversions delivered to a subregion or a group of elements are distributed to individual cells with respect to the demand on each cell (if total demand is zero, with respect to cell area)
- Optionally, a time-series maximum diversion rate can be specified to represent diversion canal capacities





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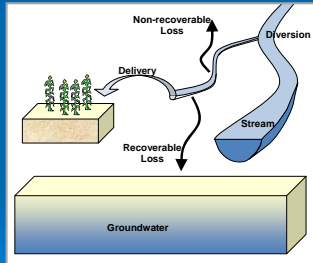
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## Stream Flow Diversions

- A portion of each diversion is lost as non-recoverable (evapotranspiration) and recoverable (seepage from diversion canals into groundwater) losses based on user-specified fractions
- Recoverable losses are distributed to user-specified cells as groundwater recharge
- Diversions can be exported out of the model area or imported from streams that are outside the model area

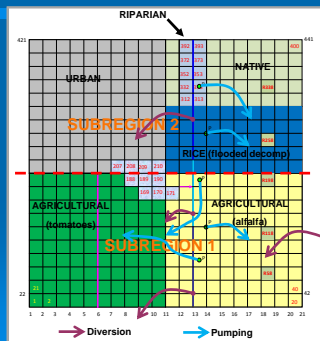


## Pumping

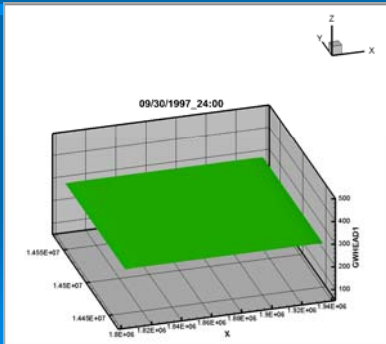
- Both well pumping and element pumping can be used to meet agricultural demand, urban demand or both
- Fraction of each well / element pumping that will be used to meet the agricultural pumping is specified by the user as a time-series data; the rest of the pumping is used to meet the urban demand
- Pumping can be delivered to the cell it occurs, to a different cell, to a group of cells, to a subregion, or to outside the model domain
- When pumping is delivered to a subregion or a group of elements, it is distributed to individual cells with respect to the demand on each cell (if total demand is zero, then with respect to cell area)
- Optionally, a time-series maximum pumping rate can be specified to represent pump capacity



## Example 6



### Example 6: Results




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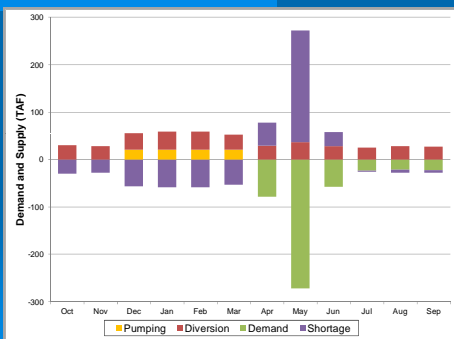
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### Example 6: Demand versus Supply for Tomatoes




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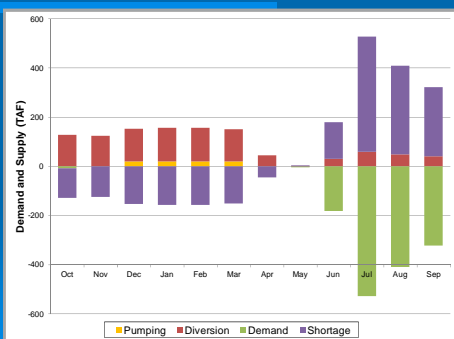
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### Example 6: Demand versus Supply for Alfalfa




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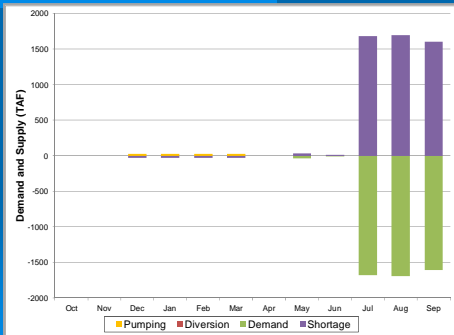
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Example 6:  
Demand versus Supply for Rice




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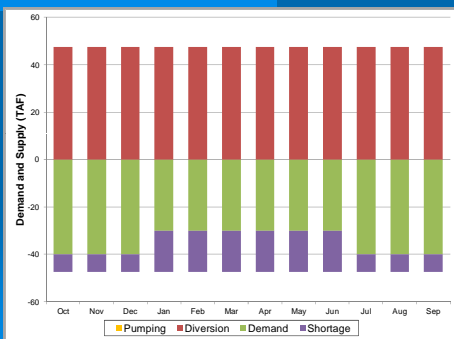
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Example 6:  
Demand versus Supply for Urban Area




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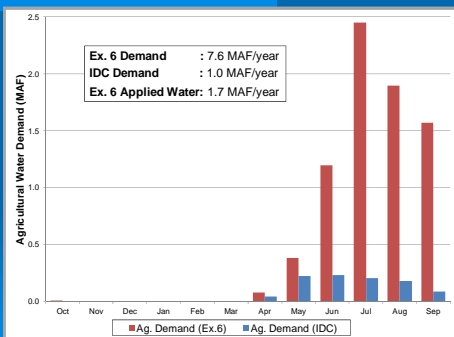
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Example 6:  
Ex.6 Demand versus IDC-Computed Demand




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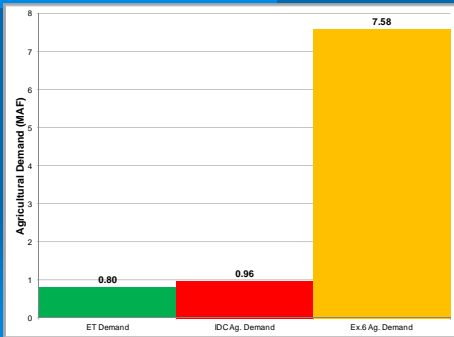
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Example 6:  
ET Demand versus Agricultural Water Demand




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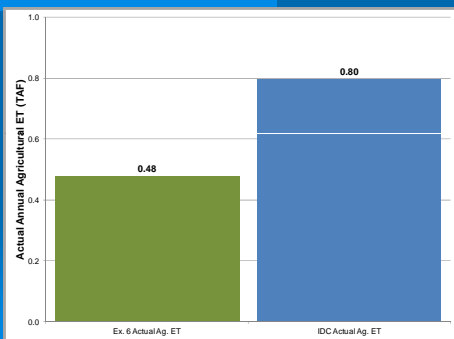
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Example 6:  
Actual ET versus IDC-Computed Actual ET




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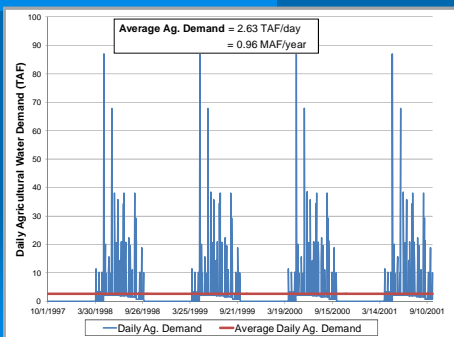
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Example 6:  
IDC-Computed Average Agricultural Water Demand




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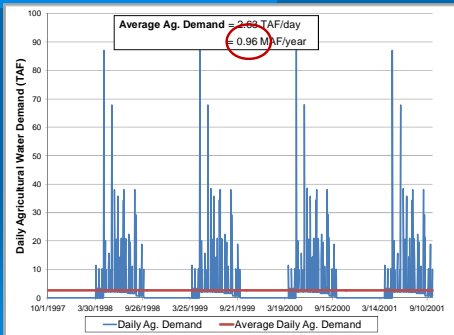
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Example 6:  
IDC-Computed Average Agricultural Water Demand




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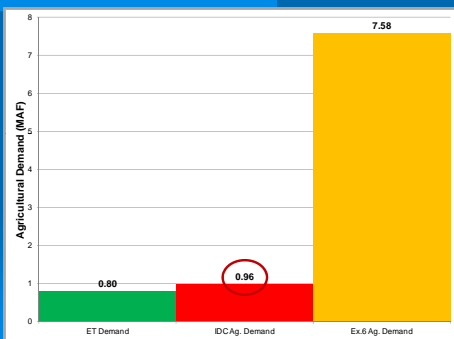
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Example 6:  
ET Demand versus Agricultural Water Demand




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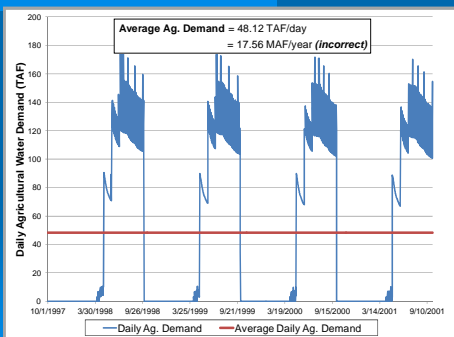
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Example 6:  
Must Use Budget Post-Processor for Aggregation




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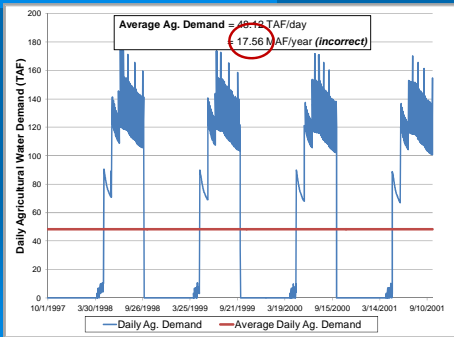
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Example 6:  
Must Use Budget Post-Processor for Aggregation




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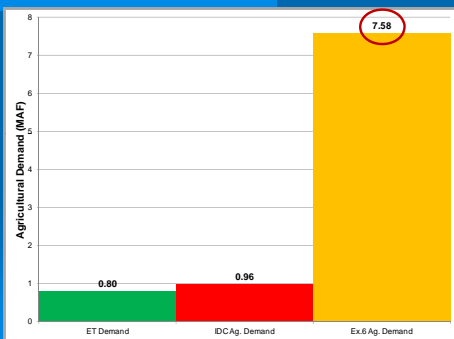
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Example 6:  
ET Demand versus Agricultural Water Demand




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