

July 11, 2013

Watershed Evaluation and Planning (WEAP)

Water Budget Model



Ventura River Watershed Council
Watershed Stewardship and Enhancement

Water Budget

Inflow – Outflow = Change in storage

For a reach or a watershed...a defined boundary

Check book wisdom:

If your outflow exceeds your intake, then your upkeep will be your downfall



WEAP Water Budget Model

Bren School Study:

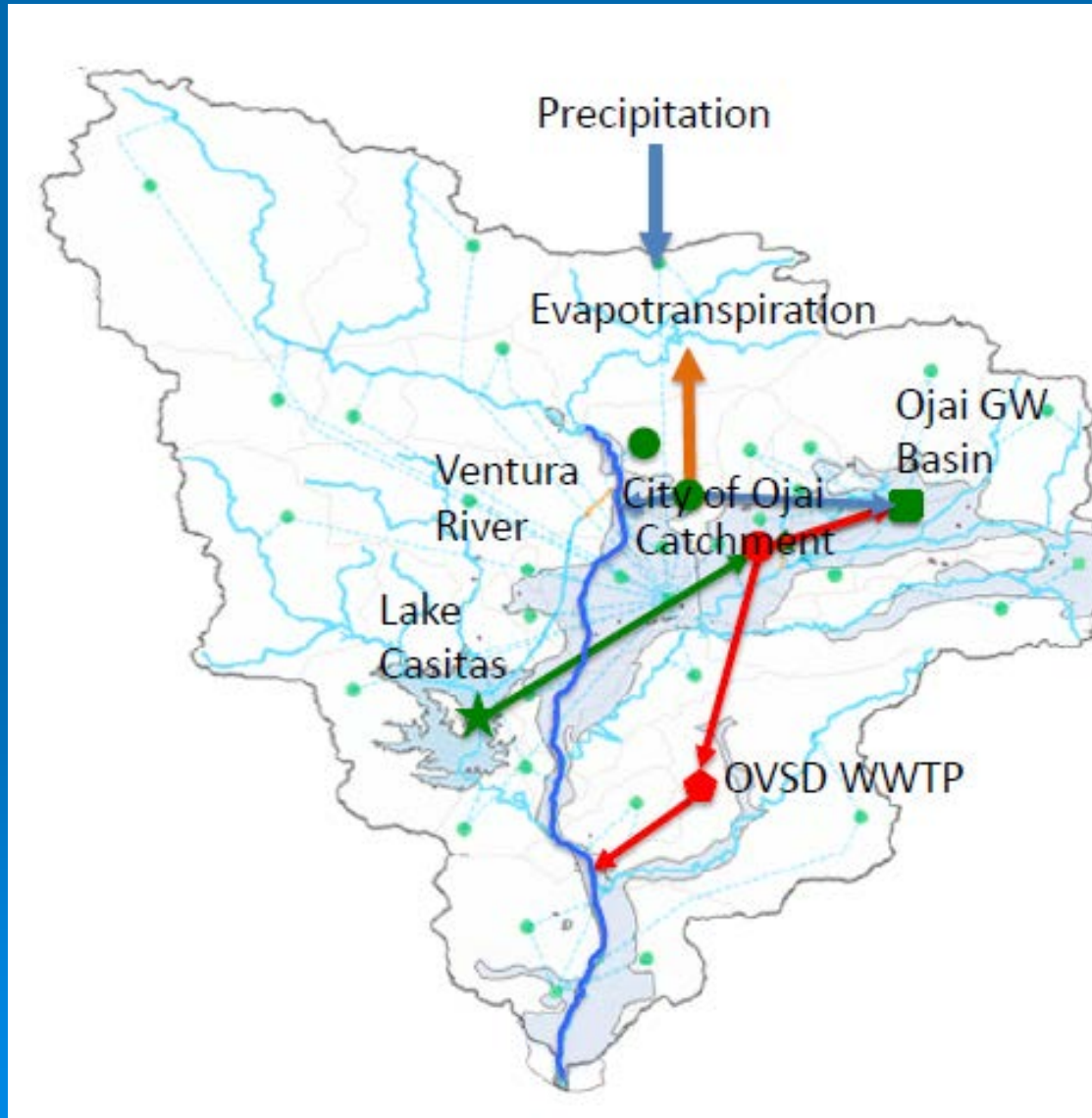
Sustainable Water Use in the Ventura River

Watershed

- Watershed water budget: $In - Out = Change\ in\ storage$
- Surface water, groundwater
- Includes Cost data
- Calibrated period years 2004-9
- Tested scenarios

WEAP Water Budget Model

- Spacial (GIS) data sets
- Schematic water travel relationships



WEAP Results

Best options for sustainability:

- Ocean Friendly Gardens
- Grey Water
- Infiltration (Recharge) Basins
- Residential Water rates

WEAP Workshops

More detailed review for Council

- **May 16 - Model overview**

 - Sub-areas

 - Schematics

 - Capabilities

 - Limitations

- **May 23 - How to's**

 - Import Bren Model

 - Make a scenario

WEAP Model Strengths and Weaknesses

➤ Strengths

- Integrated supply and demand model
- Evaluating scenarios and combinations of scenarios
- Ability to connect to other models (e.g. MODFLOW)

Weaknesses

- Bren Model used Monthly time step
- Groundwater simplified
- Combining cost with physical changes


Workshops Summary

1. We R Learning Modeling, Water Budgets, Watershed level models. This is NOT TurboTax
2. Questions determine how to find the appropriate model. Data and staff availability, cost, schedule constrain choice.
3. Bren contribution – Comprehensive Watershed model, GIS data, first use of 2008-2012 special studies
4. Stakeholder data checking for confidence of results

Workshops Summary

5. Trust Results – based on quality of technical team, data and model assumptions
6. Technical staffing abilities and cost, WEAP needs license
7. Bren data sets available free
8. WEAP (or other model) could be used to rank or compare projects or give estimates of impacts for grant applications.

Workshops Follow-up

1. Summary of Workshops
 2. Comparison of Watershed Models
 - Spreadsheet
 - WEAP
 - WMS
 - SWMM
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Planning Tools – Alternatives Analysis

Model	Uses		1D/2D	Ground -water storage	Cost Estim ates	Time- step	Staff team abilities	Cost of model
Spread- sheet	Initial water budgets, storage estimates	Planning, Alts	1D	Yes	Yes	Day, Month, or Year	Excel and Water Budget Model exp.,	Usually on local computer
WEAP	What-if analysis of various policy scenarios and long-range planning studies. Adaptive agriculture practices such as changes in crop mix, crop water requirements, canal linings; changes in reservoir operations; water conservation strategies; water use efficiency programs; changes of in-stream flow requirements; implications of new infrastructure development or programs. Climate change.	Planning, Alts	1D	Yes	Yes	Day, Month, or Year	General Hydrology, Water Budget Model exp., GIS	Two Year License which varies based on user Students: \$250 Accredited Educational Institutions: \$1000 Other users (non-consulting): \$3000 Other users (consulting): contact WEAP

Operation and Design Level Tools

Model	Uses		1D/2D	Ground-water storage	Cost Estimates.	Time-step	Staff team abilities	Cost of model
WMS	Watershed characterization, Stormdrain hydrology, floodplain, climate change scenarios, integrates other models, such as HSPF, SWMM	Alts, Design	1D/2D	No – interface only	No	Multiple can be as small as minutes	Detailed Water Budget exp., GIS	Hydrology: \$399/yr Floodplain: \$479/yr Storm Drain: \$679/yr Premium: \$5600
SWMM	Applicable to Urban areas, Green infrastructure design; integrated modeling; dual drainage modeling; remediation; water quality; drainage design; detention storage; flood mapping/risk analysis, climate change scenarios.	Alts Design	1D/2D	No – interface only	No	Multiple can be as small as minutes	Detailed Water Budget exp., GIS	PCSWMM Professional: \$120/user/mo Professional 2D: \$180/user month Enterprise: \$4000/yr

Action Questions ...



1. What are our burning water quantity or quality questions that need to be modeled?
2. Make your own model or use a common watershed model?
3. Watershed Model Committee - pick appropriate model(s) for the questions, weigh scale, data, costs, funding?

Questions ...

