

WaterSim: a brief history

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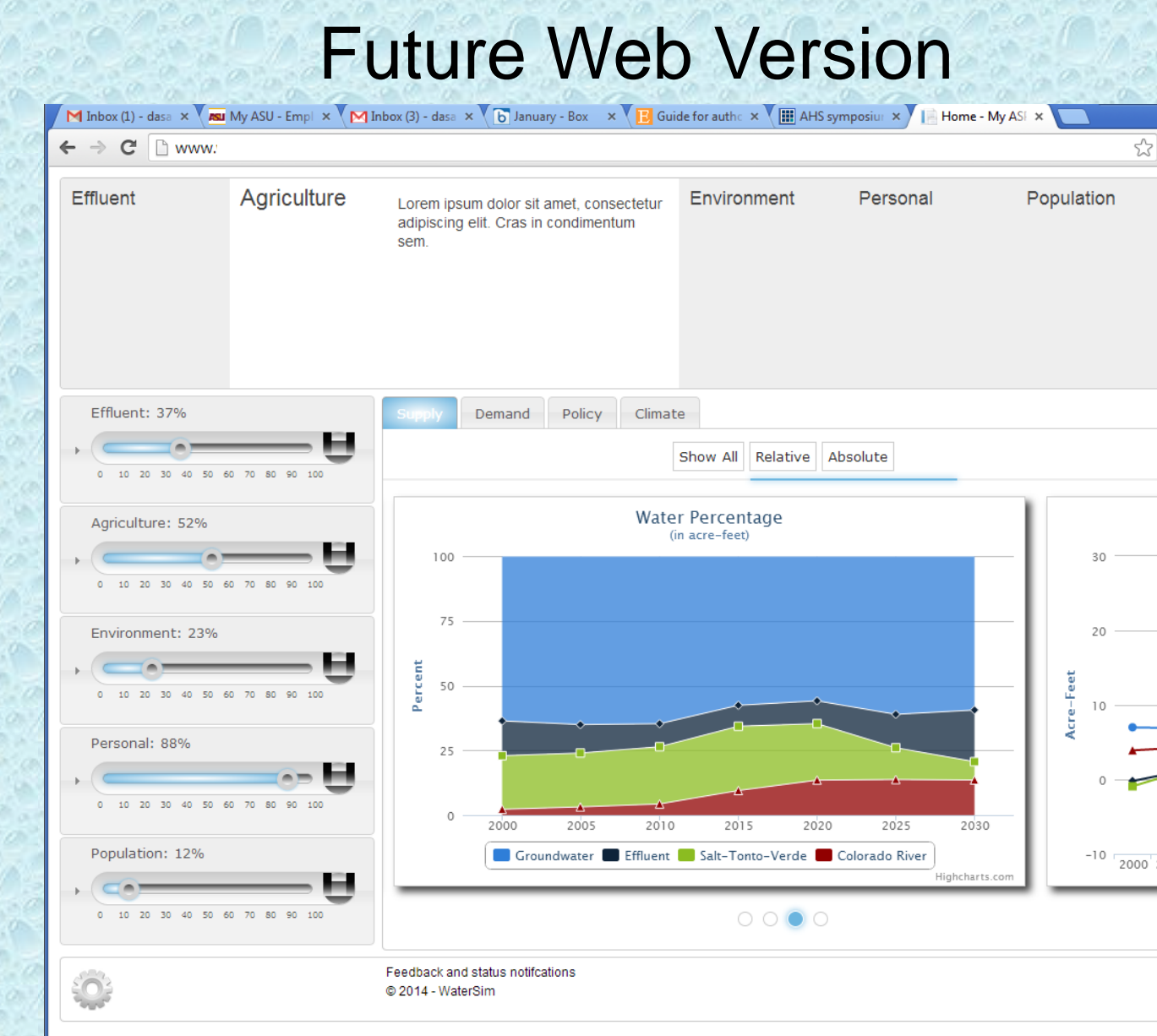
Background

- The Decision Center for a Desert City (DCDC) has developed a water policy and management model termed WaterSim. We refer to it as DCDC_WaterSim
- 2005-2008: Dr. Tim Lant began what can be called version 1
- 2008: Mike Tschudi and David Sampson began work on the model- a county-scale systems dynamics model written in an object-oriented program termed Powersim® (ver. 2)

- ❑ Four policy options: 1) no overdraft, 2) satisfy demand, 3) 5-year sustainability, 4) fixed GPCD.
- ❑ Water demand was modulated by: 1) population growth rate, 2) water from Agriculture, and 3) housing density
- ❑ Climate factors and drought factors reduced surface water supplies

- 2009: A C# interface enabled the model to be visualized in the Decision Theater (ver. 3)
- 2010: The model was converted to FORTRAN to permit interruption in the simulation cycle (ver. 3.5)
- 2011: The provider-scale water supply model (ver. 4)
- 2012-2013: The provider-scale water demand model (ver. 5)
- 2014: Web interface to version 5.0

Highlights
Our water policy and management model, WaterSim version 5, has a new look! We are developing a web interface to the model!

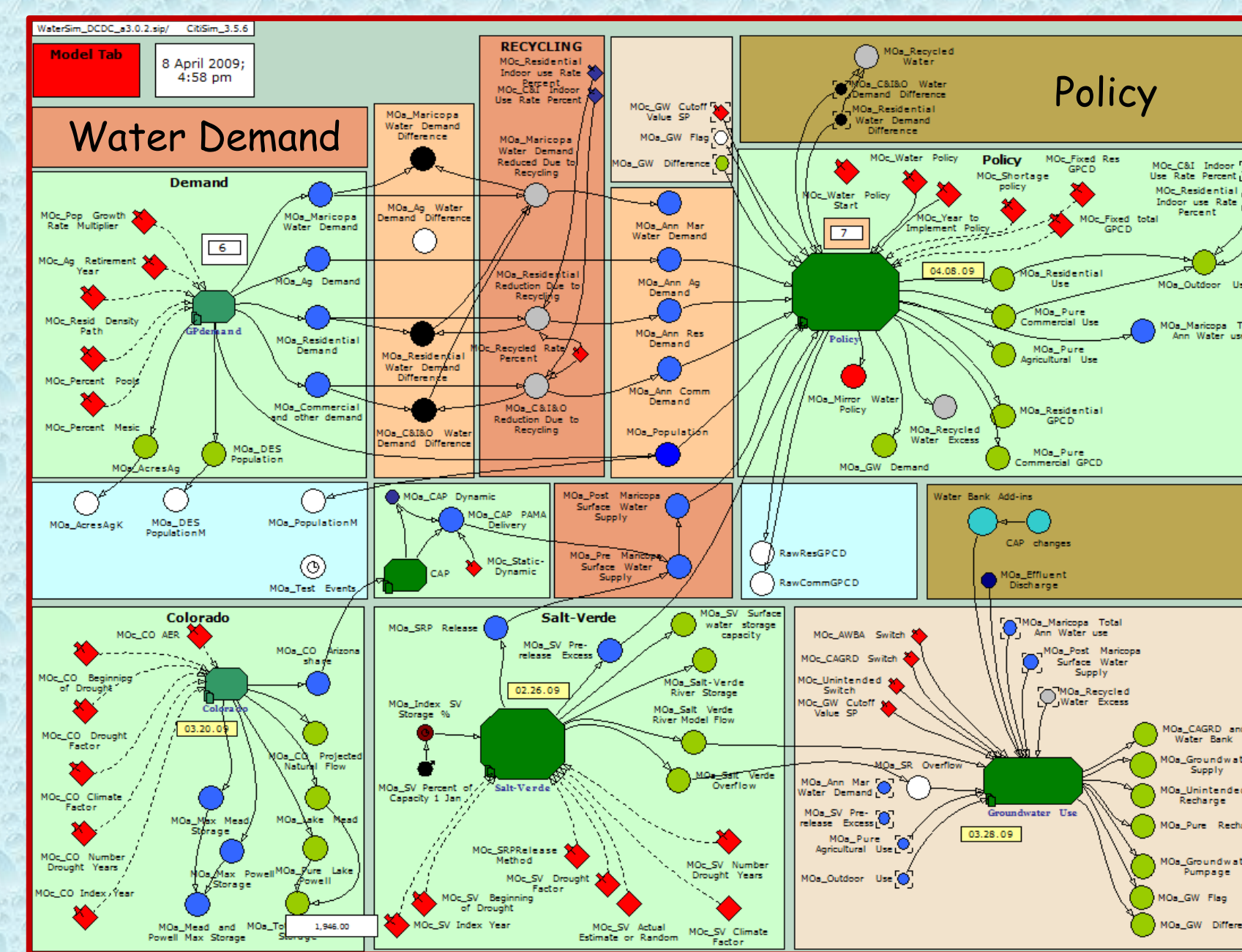


Gober, P., E.A. Wentz, T. Lant, M.K. Tschudi, and C.W. Kirkwood. 2011. WaterSim: A simulation model for urban water planning in Phoenix, Arizona, USA. *Environment and Planning B* 38(2):197-215. DOI: 10.1068/b36075.

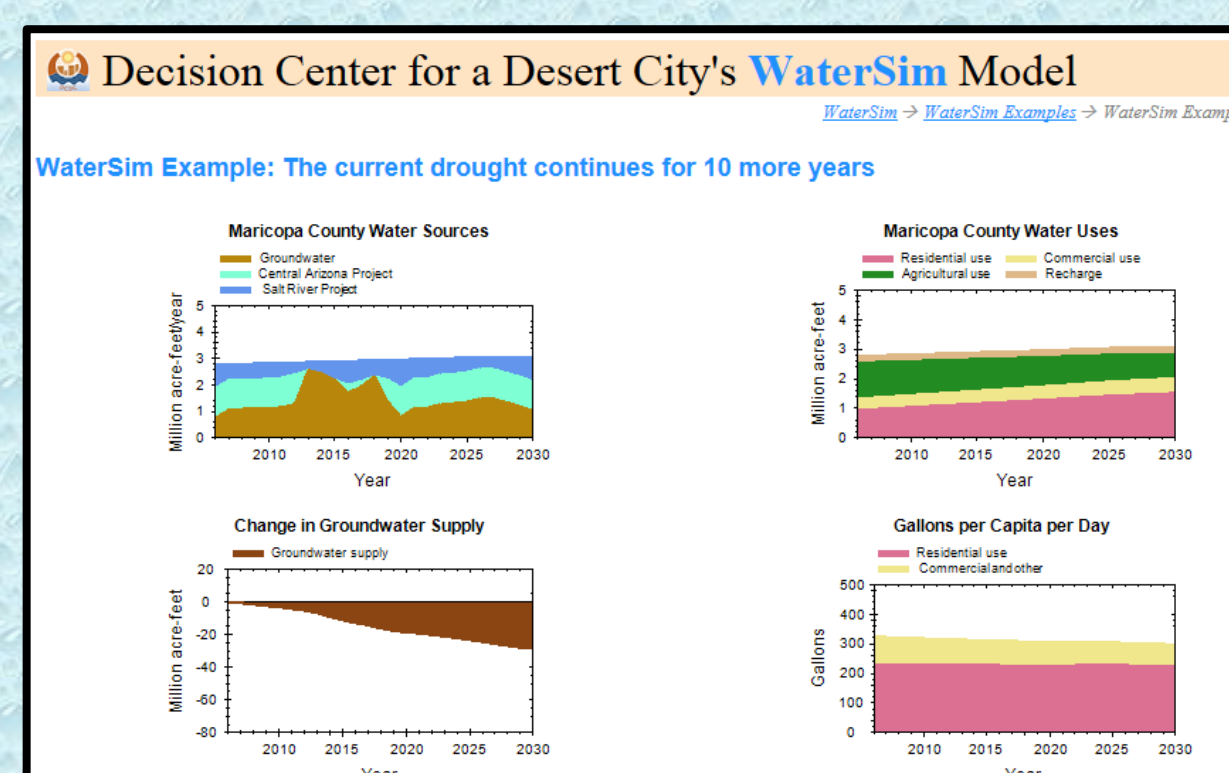
Gober, P., and C.W. Kirkwood. 2010. Vulnerability assessment of climate-induced water shortage in Phoenix. *Proceedings of the National Academy of Sciences USA* 107(50):21295-21299.

White, D. D., A. Y. Wutich, K. L. Larson, P. Gober, T. Lant, and C. Senneville. 2010. Credibility, salience, and legitimacy of boundary objects: water managers' assessment of a simulation model in an immersive decision theater. *Science & Public Policy* 37(3):219-232.

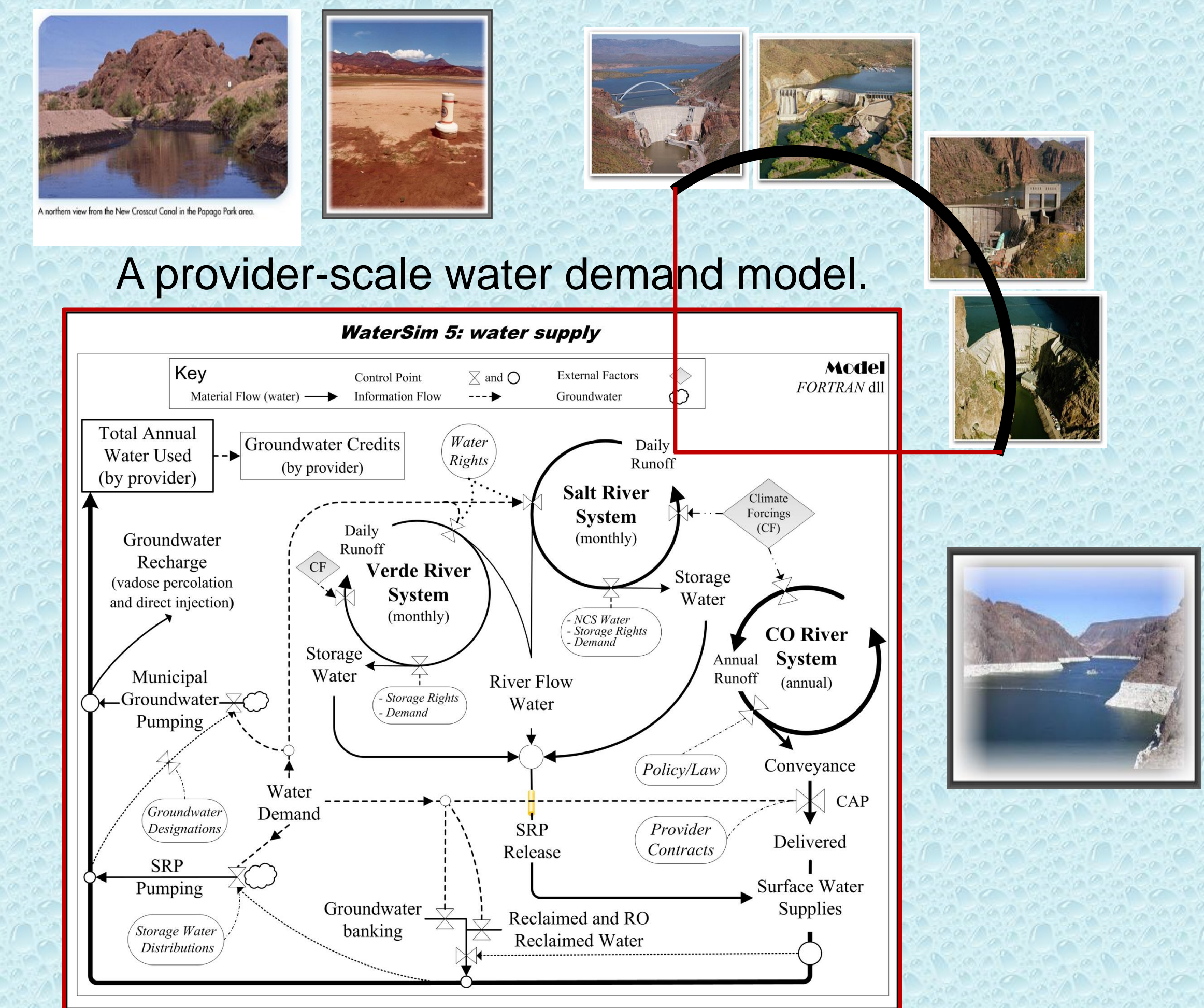
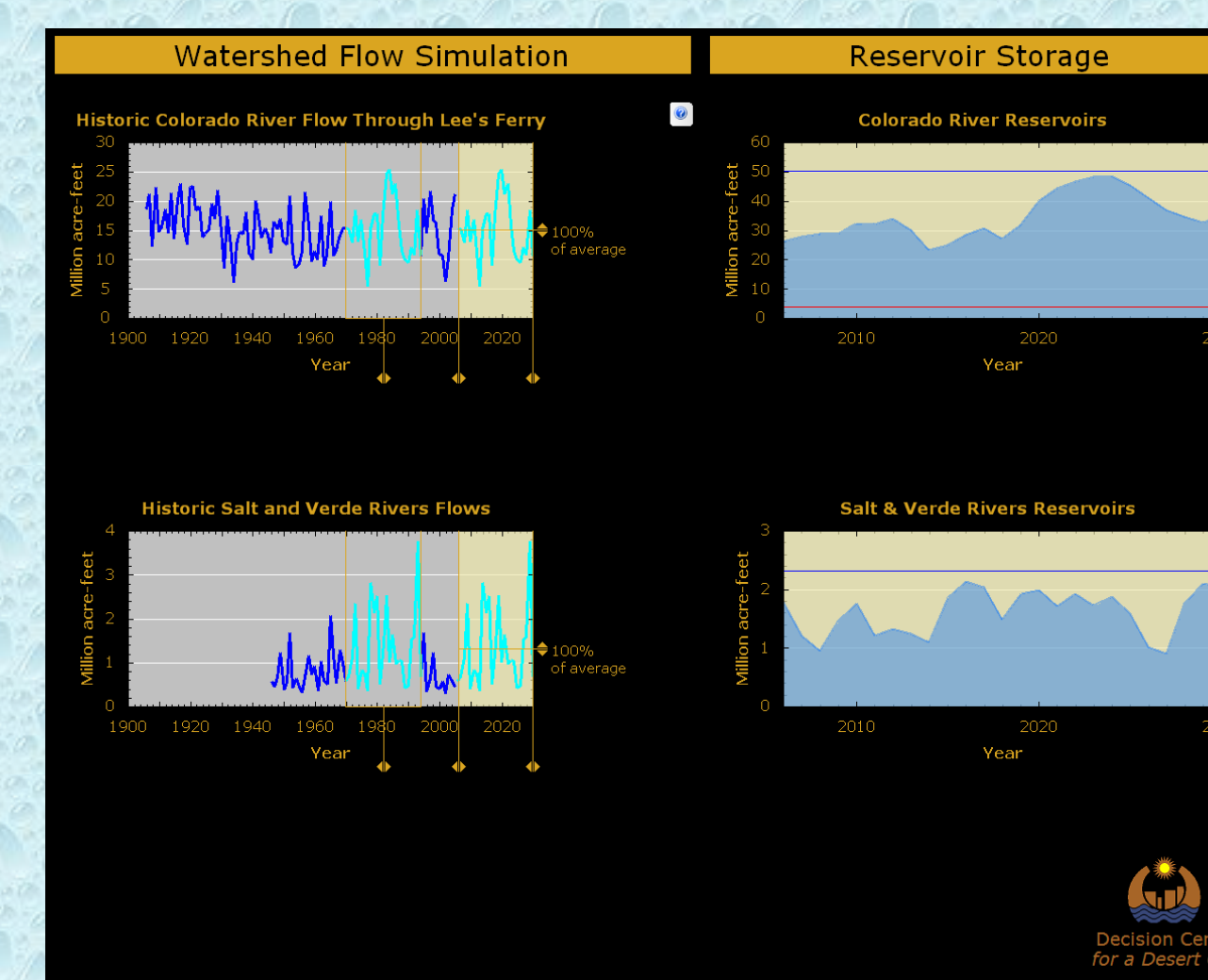
Version 3
“Enhanced” county-scale model.



Current Web Version

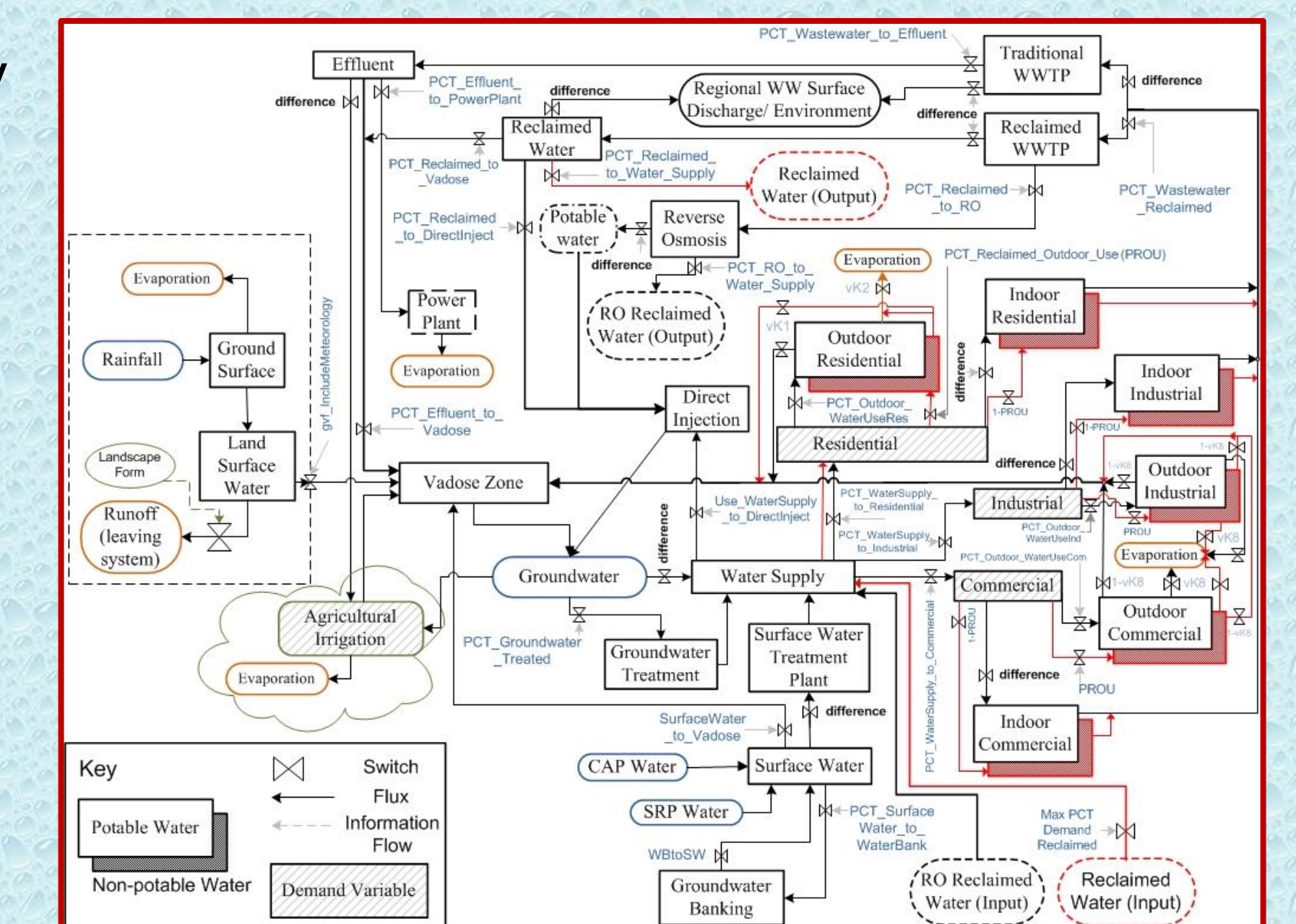


Current Decision Theater version (sample graphic)



Version 5

A water supply network. Each water provider has a unique configuration.



Gober, P., D.D. White, R. Quay, D.A. Sampson, and C.W. Kirkwood. In review. Socio-hydrology modelling for an uncertain future, with examples from the USA and Canada. In: *Model Fusion: Integrating Environmental Models to Solve Real World Problems*. Geological Society of London, Special Publications.

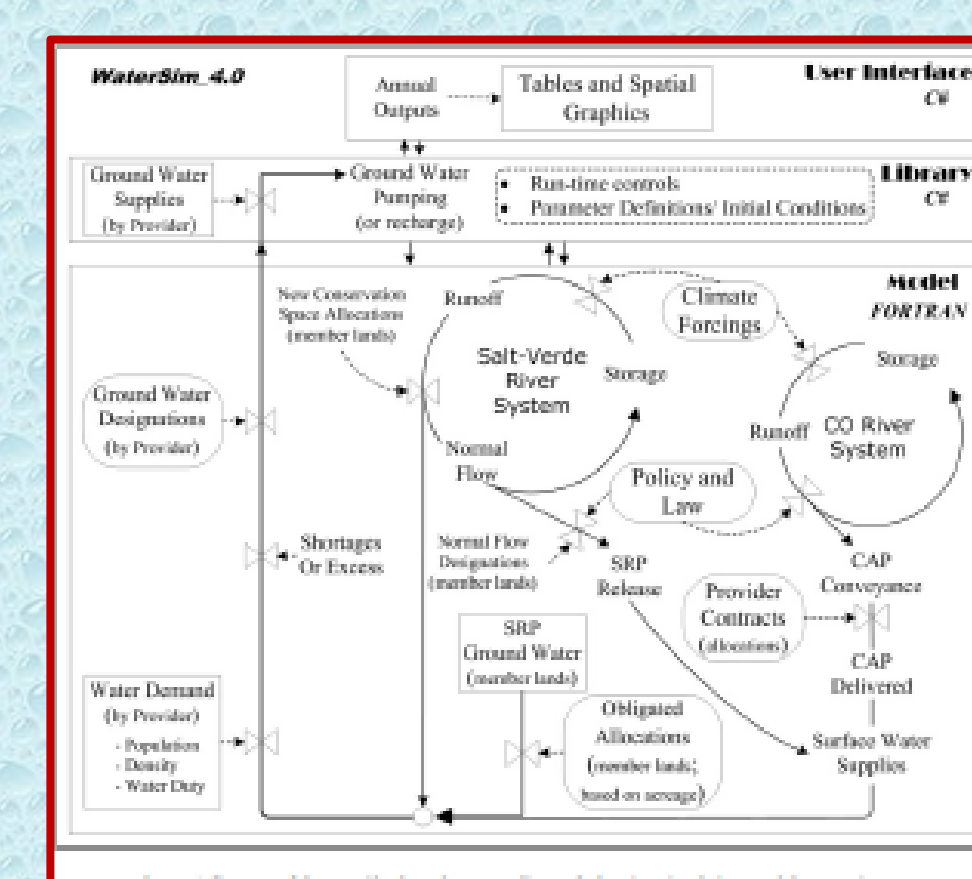
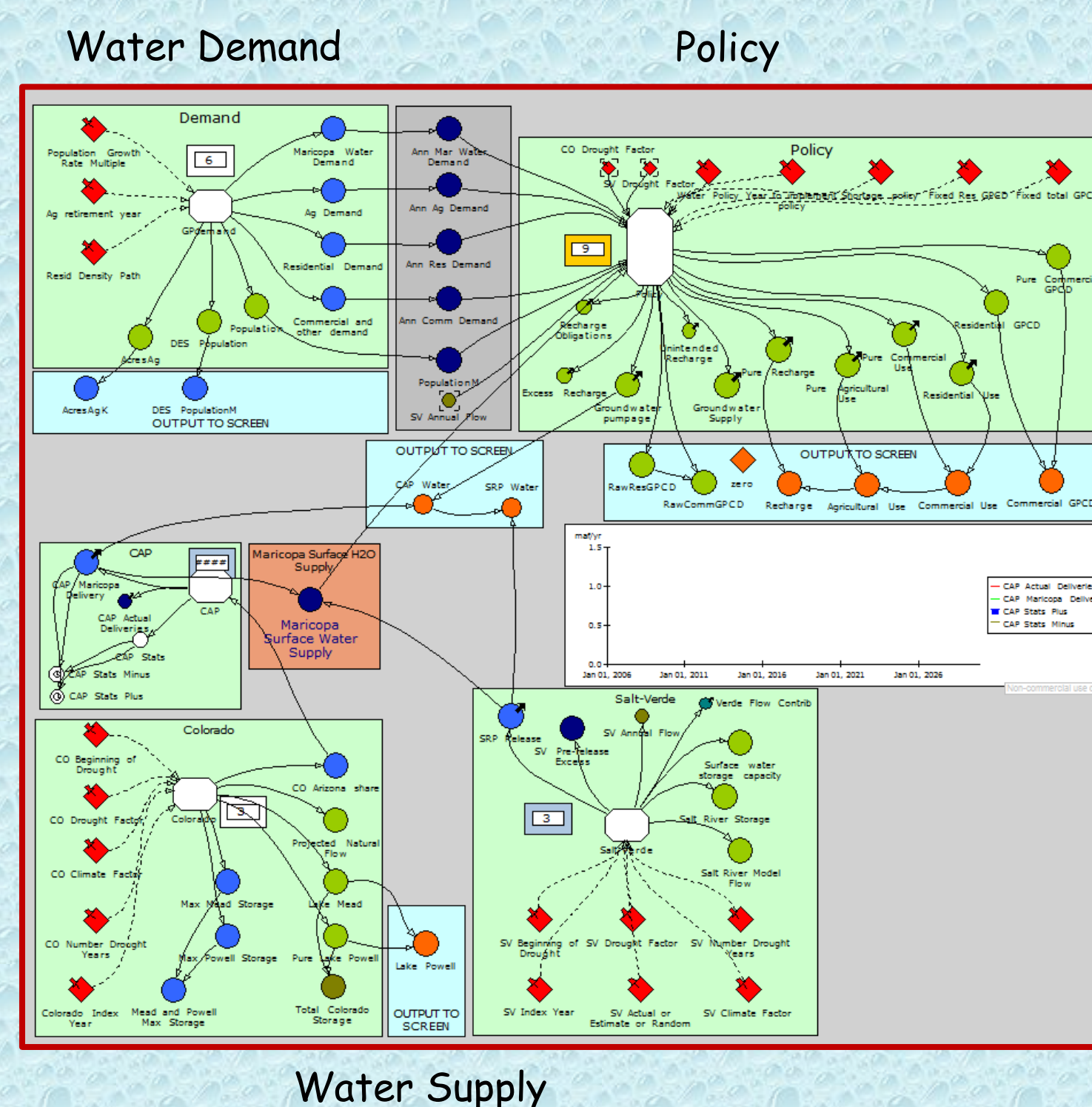
We could use your Help!

We need:

- Graphic design ideas
- Beta testers/ classroom evaluation
- Relevant storylines for different audiences
- Ideas on different advanced methods to display temporal and spatial data

Version 2

A county-scale model; the Powersim® objects and their relationships.



Sampson, D.A., V. Escobar, M.K. Tschudi, T. Lant and P. Gober. 2011. A provider-based water planning and management model—WaterSim 4.0—for the Phoenix Metropolitan Area. *Journal of Environmental Management* 92: 2596-2610.

Murray, A.T., P.D. Padegimas, P. Gober, L. Anselin, R.J. Sergio, D.A. Sampson. 2012. Spatial optimization models for water supply allocation. *Water Resources Management* 26(8): 2243-2257. DOI: 10.1007/s11269-012-0013-5.

Version 4

A provider-scale water supply model.

Acknowledgment

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