

Watershed Dynamics

Daniel Edelson
GEODE Initiative
Northwestern University

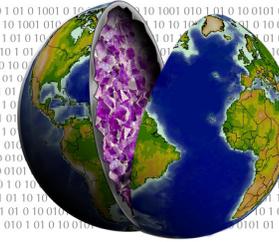


This work was supported in part by the National Science Foundation. However, any opinions, findings, conclusions, and/or recommendations herein are those of the authors and do not necessarily reflect the views of the Foundation. My World GIS and My World are trademarks of Northwestern University.



CUAHSI
universities allied for water research

**GEODE
INITIATIVE**

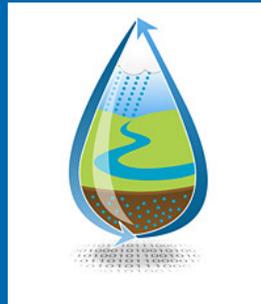


**Geographic Data
in Education**

- Hydrology research
- Data services
 - Science expertise

- Educational research & development
- Data analysis tools for education
 - Curriculum development

GLOBE Watershed



Dynamics Project

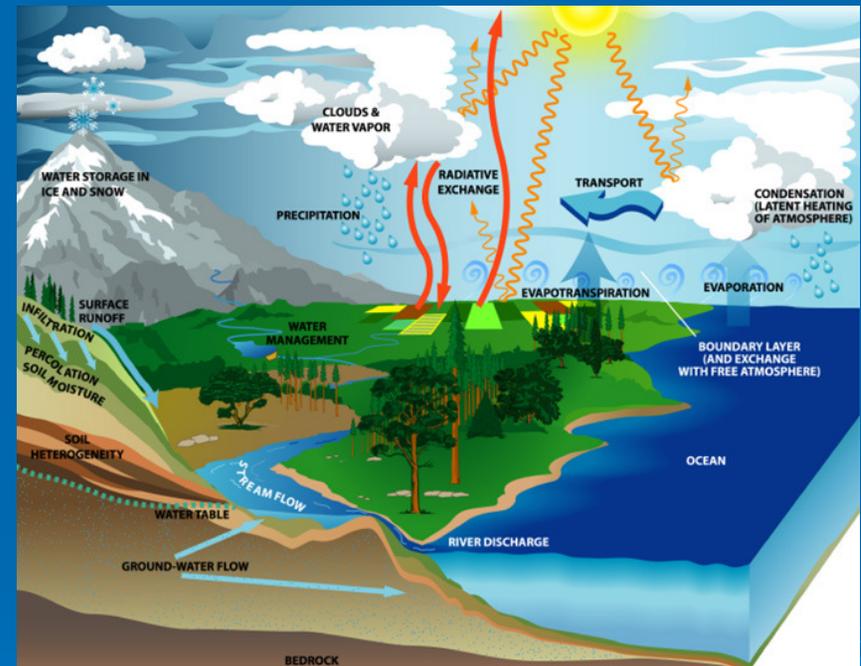


- Community
- Infrastructure
- Professional Development

Student Investigations

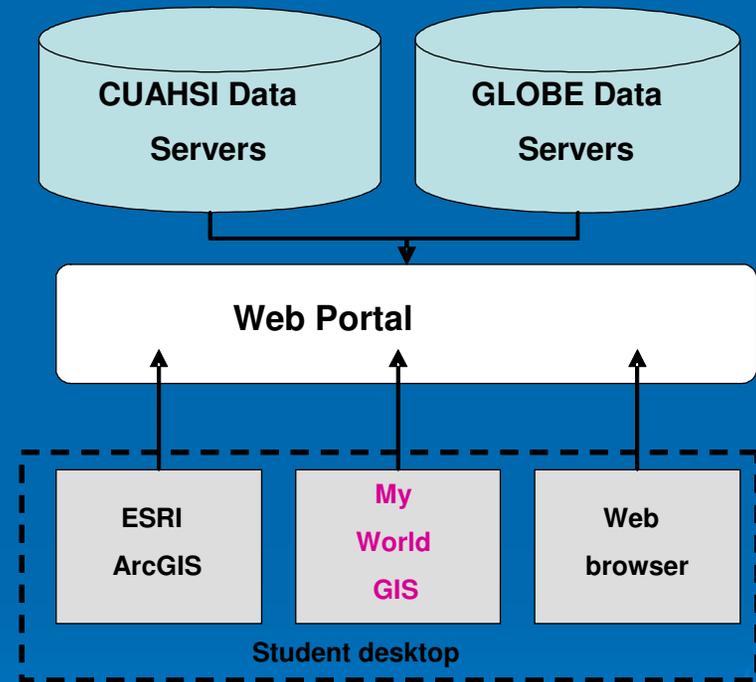
Students will engage in authentic scientific investigations of watershed dynamics

- using real-time and archival data sets
- at local, regional, and continental scales



Technology

- Visualization and analysis of data
- Desktop or browser-based GIS
- CUAHESI & GLOBE servers



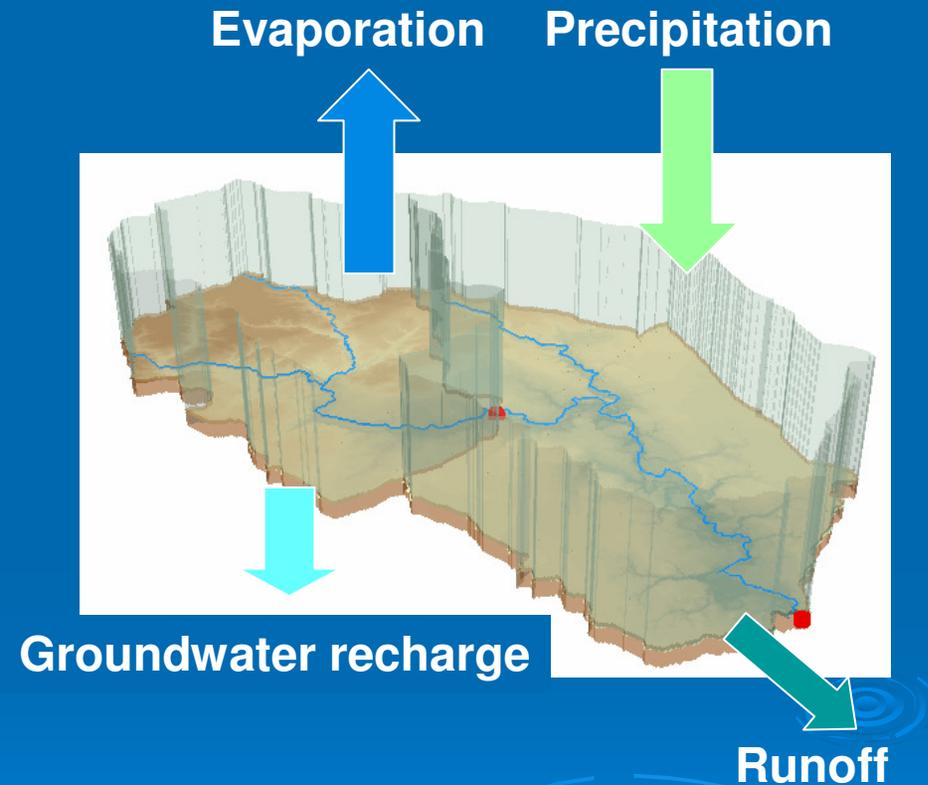
Investigations

	Investigation	Content	Data
Investigation 1	Analyze water budget at continental, regional, and local scales	Water cycle, precipitation, infiltration, run off, groundwater, evapotranspiration	Gridded precipitation, evaporation, runoff
Investigation 2	Analyze changes in watershed and stream dynamics	Watersheds, Stream dynamics and flow, human impacts, land use, water quality, flow control, withdrawals	Watershed boundaries, topography, stream course, land use, stream flow

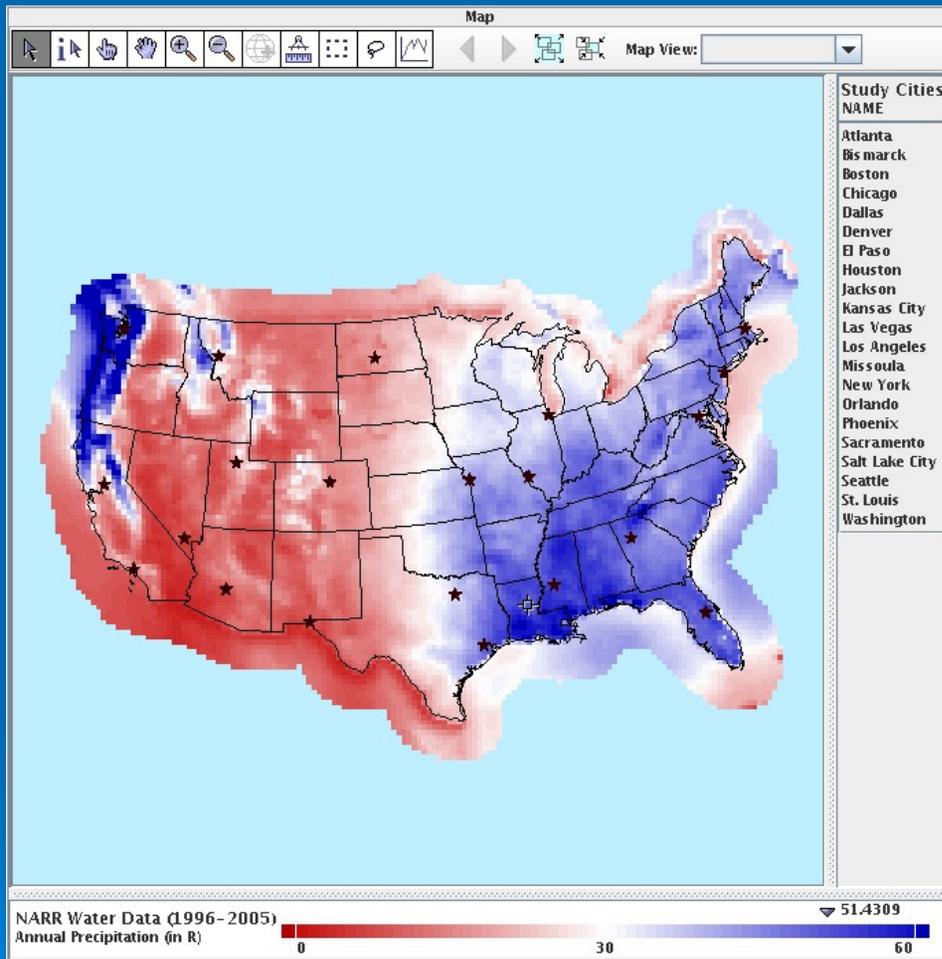
Investigation 1: Water Availability

Fresh water as a precious resource:

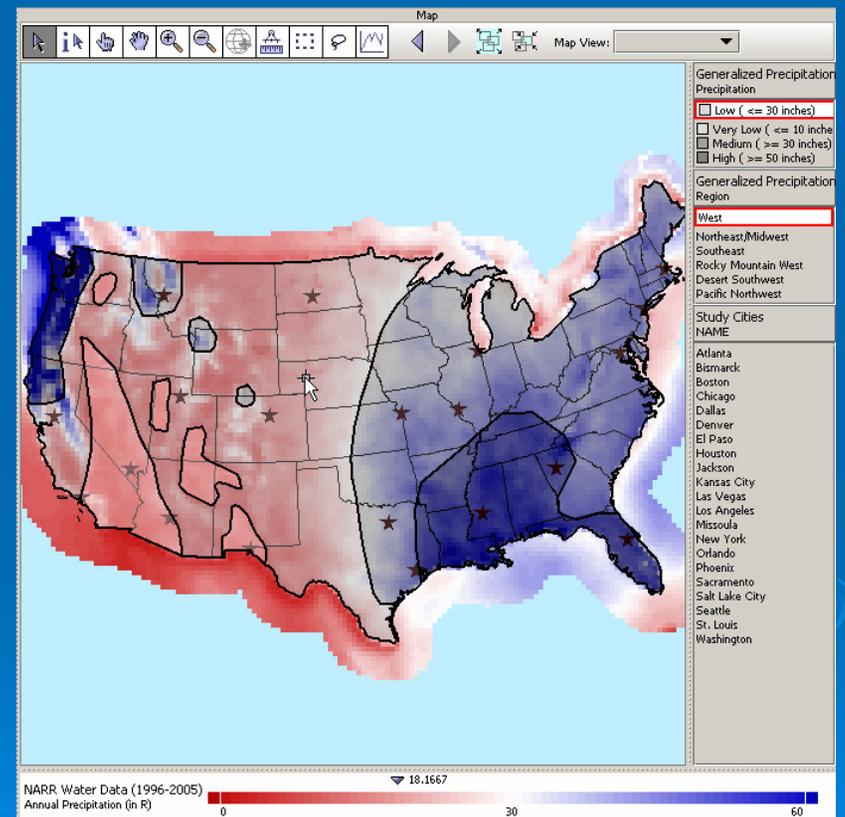
- How much precipitation do we get?
- Where does the water go?
- Where is it “stored”?
- How do water dynamics change over the course of the year?
- Can we balance the budget?
- Learning progression:
 - Continental U.S.
 - Case studies
 - Regions
 - Cities
 - Local area



Annual Precipitation - Continental U.S.

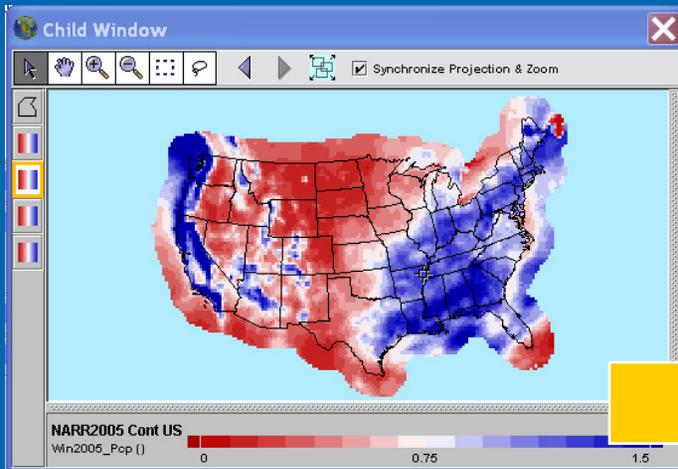


Defining regions

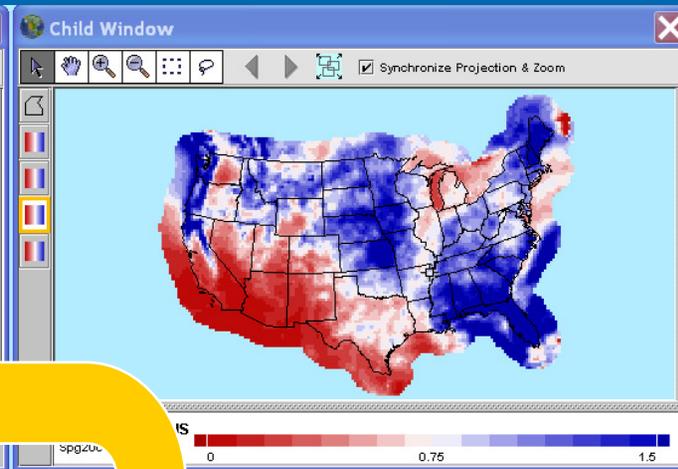


When does it come?

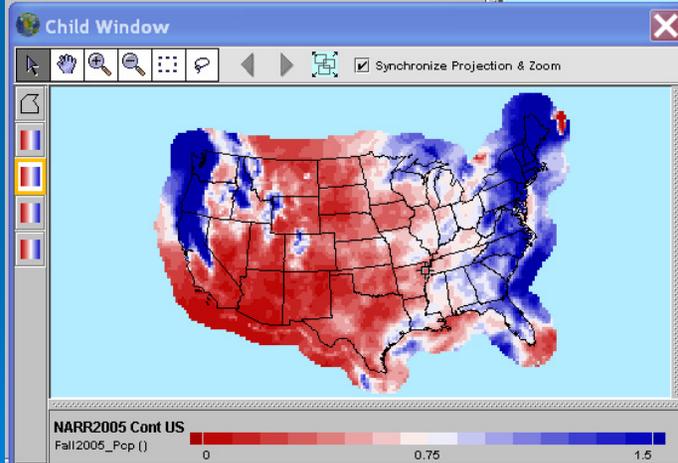
Winter



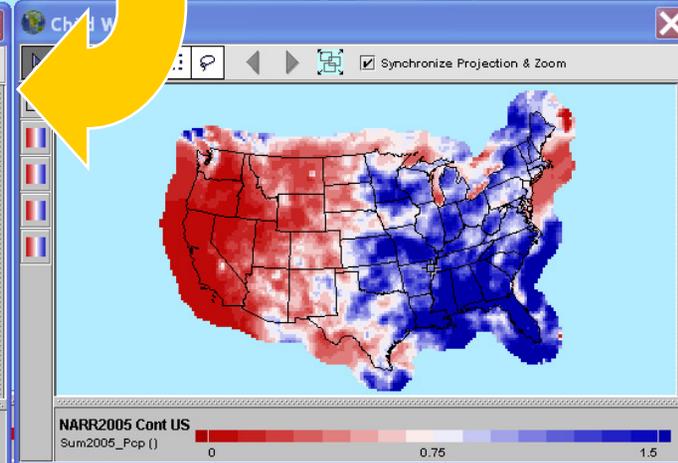
Spring



Fall



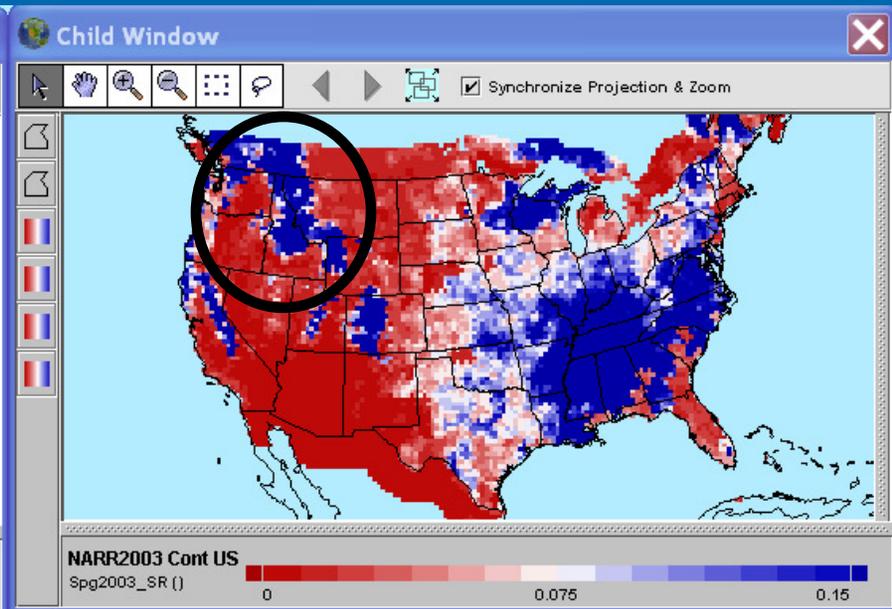
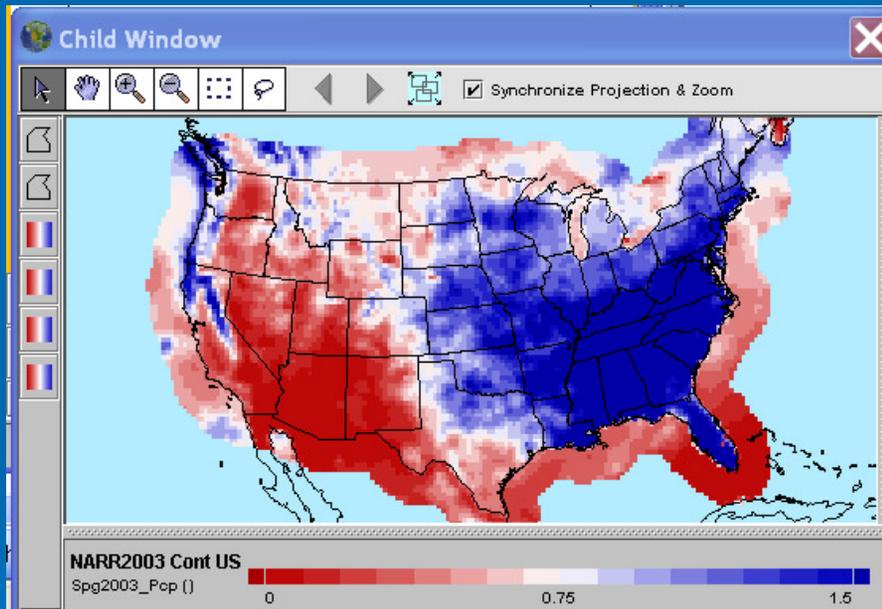
Summer



Where does it go?

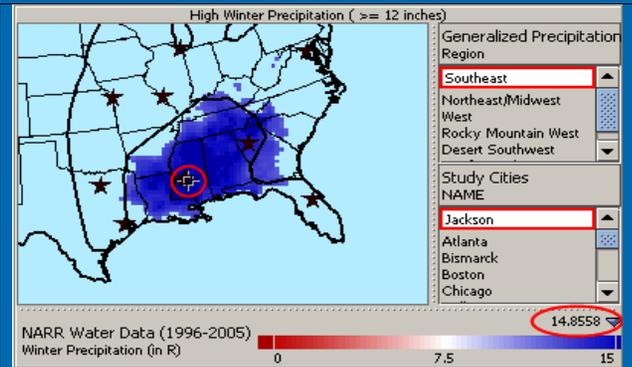
Spring Precipitation

Spring Runoff

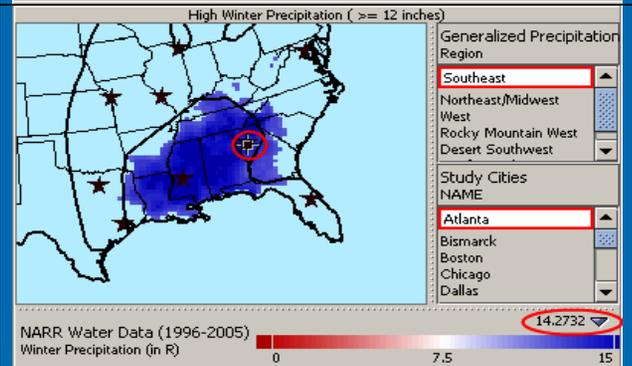


Case study cities

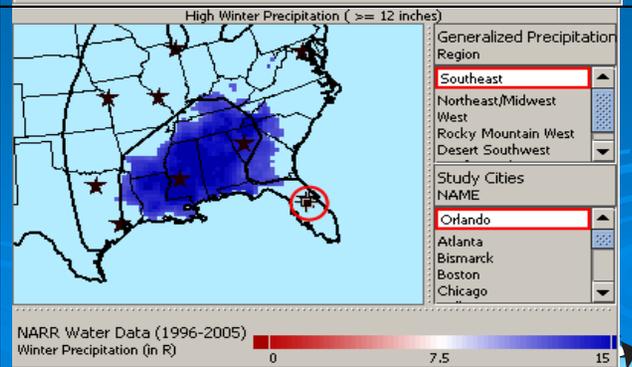
Jackson Mississippi
Southeast Region
High Winter
Precipitation (≥ 30 cm)



Atlanta Georgia
Southeast Region
High Winter
Precipitation (≥ 30 cm)

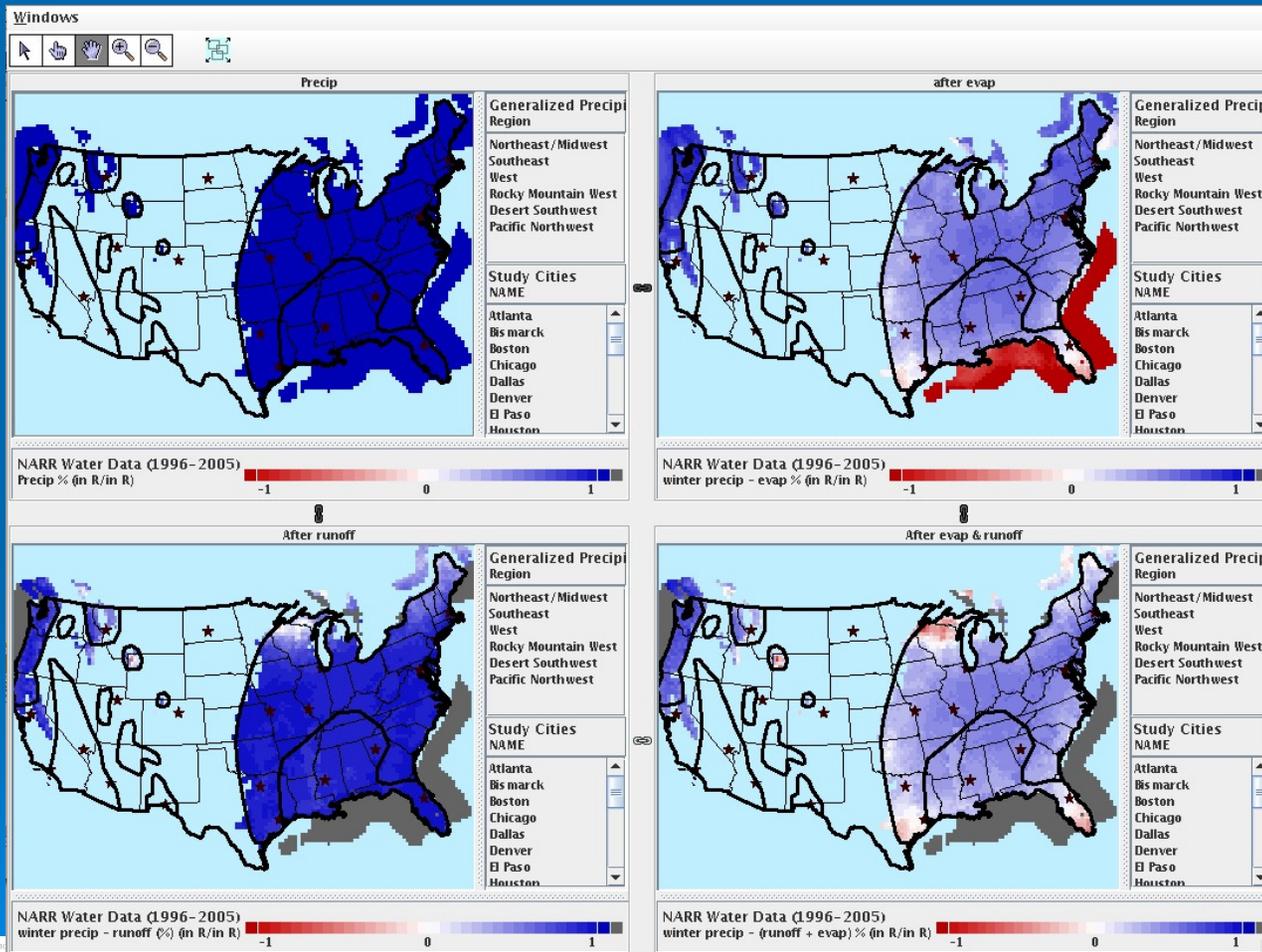


Orlando Florida
Southeast Region
Very Low Winter
Precipitation



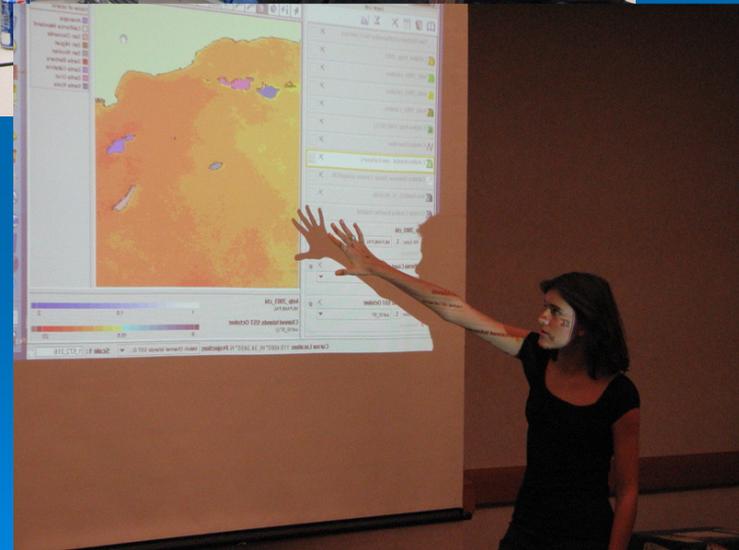
Can we balance the budget?

Winter evaporation and runoff as a percent of precipitation



Status

- Investigation 1
 - To be field tested this year (07-08)
 - Roll out next year (08-09)
 - Internationalization...
- Investigation 2
 - To be field tested next year (08-09)
 - Roll out 09-10
 - Internationalization...



Project Members at this Meeting

- Matthew Rossi, Northwestern University
- David Smith, GLOBE Program Office
- Martos Hoffman, GLOBE Program Office
- Rick Hooper, CUAHHSI

