

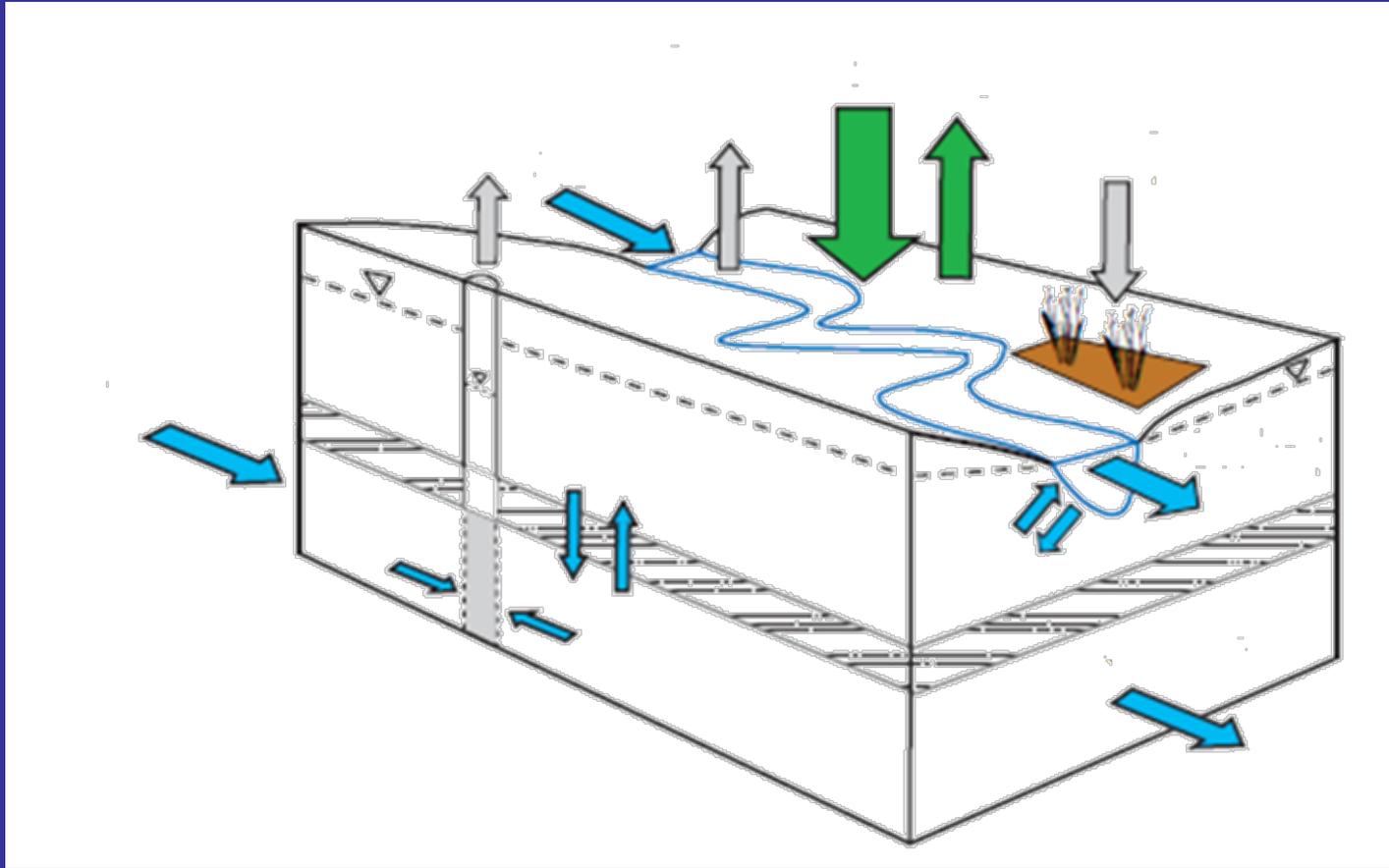


The National Water Census

* Part of the  Initiative

The "water: SMART" logo consists of a blue water drop icon with white wavy lines inside, followed by the word "water:" in a light blue, lowercase, sans-serif font, and the word "SMART" in a bold, green, uppercase, sans-serif font.

Account for water with a “budget”



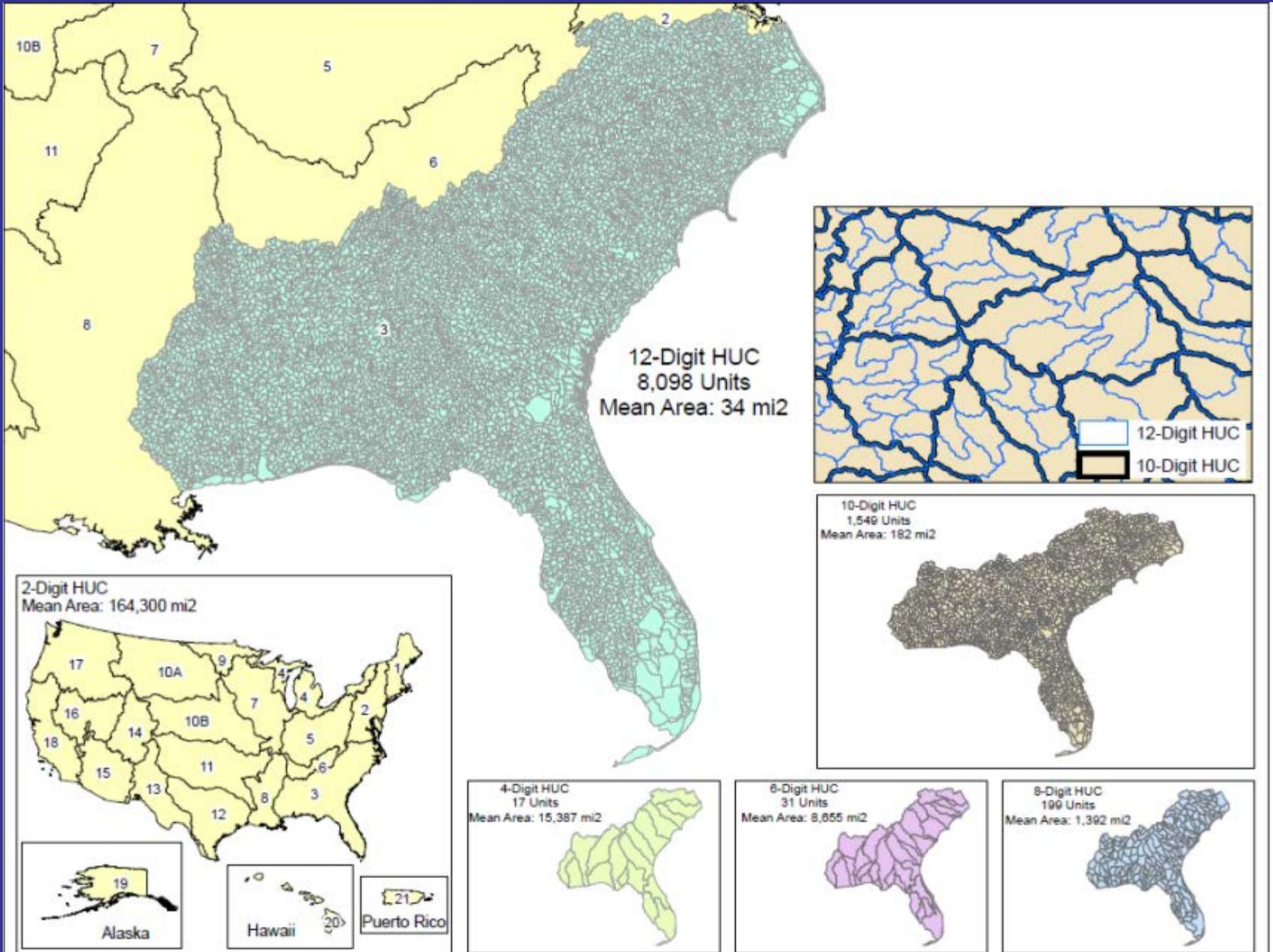
$$P + Q_{in} = ET + \Delta S + Q_{out}$$

$$P + Q_{swin} + Q_{gwin} = ET_{sw} + ET_{gw} + ET_{uz} + \Delta S_{sw} + \Delta S_{snow} + \Delta S_{uz} + \Delta S_{gw} + Q_{gwout} + RO + Q_{bf}$$

A Nationwide System to deliver water accounting information addressing

- Precipitation
- Evapotranspiration
- Storage in Reservoirs, Lakes, Snow and Ice
- Surface Water
- Groundwater
 - Recharge rates
 - Water level in aquifers
- Ecological Needs
- Water Withdrawals
- Return Flows
- Consumptive Uses
- Run-of-the-River Uses

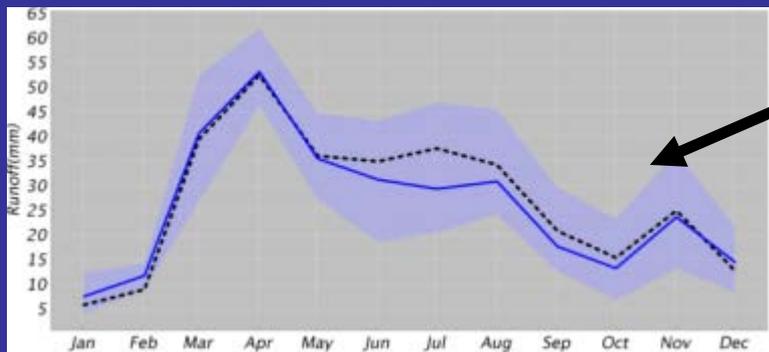
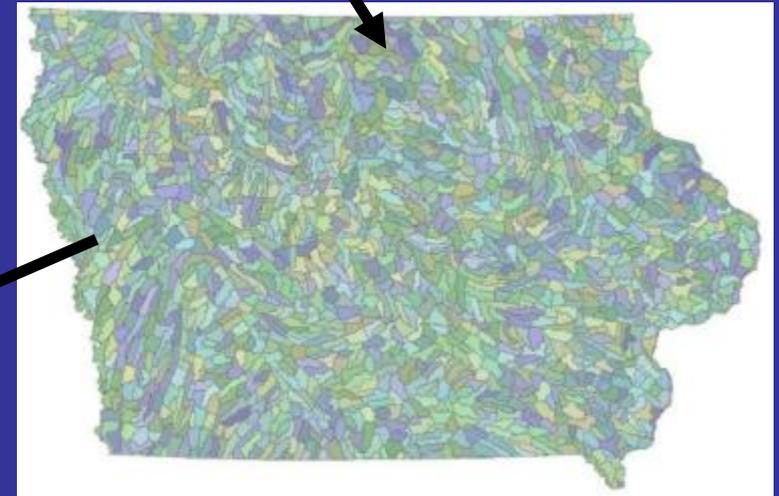
Scale Matters



Surface Water Models

Estimating Flows at Ungaged Locations

Models provide us a means of estimating streamflow for time periods where we don't have record or places where we don't have monitoring capabilities.



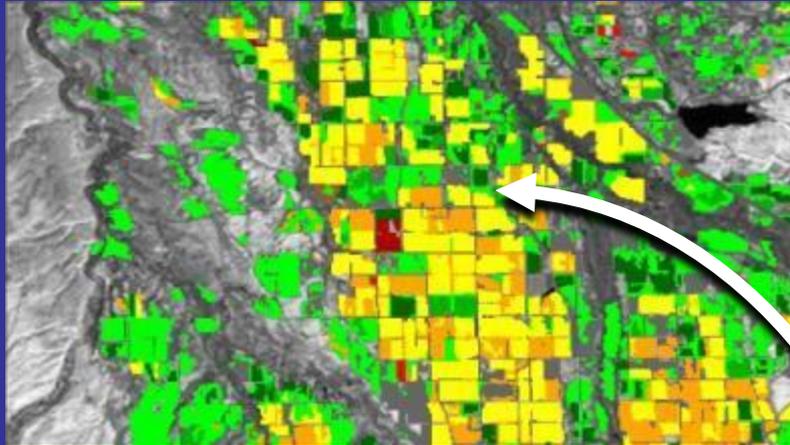
Estimating Flows at Ungaged Areas

– Selection of models

Locations of Model Comparison Tests:

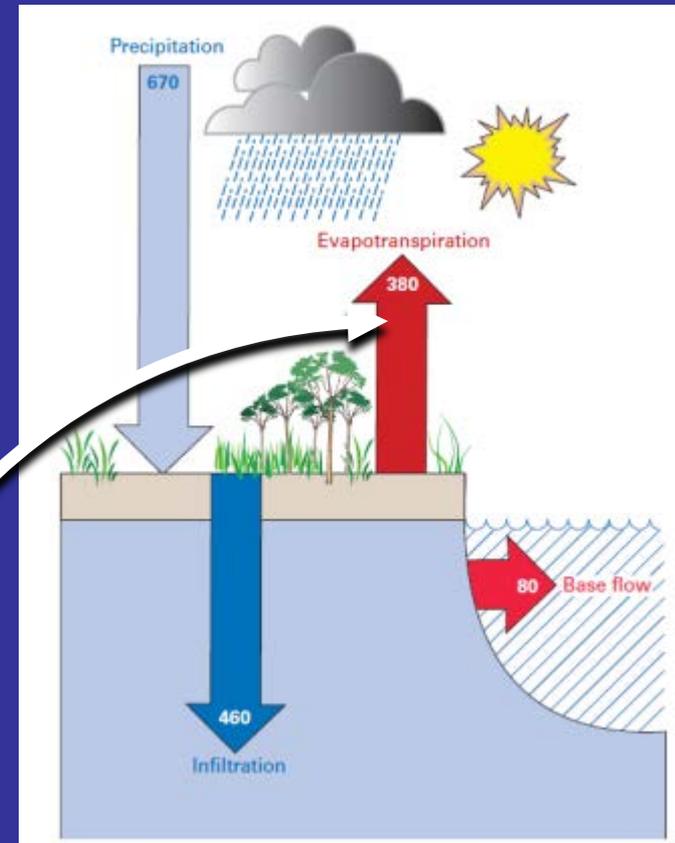
- SE Basins including ACF, ACT, Tennessee
- Midwest – Iowa
- Rocky Mountains
- Desert Southwest
- Pacific Northwest

Testing to be completed by end of 2014 and models selected.



ET

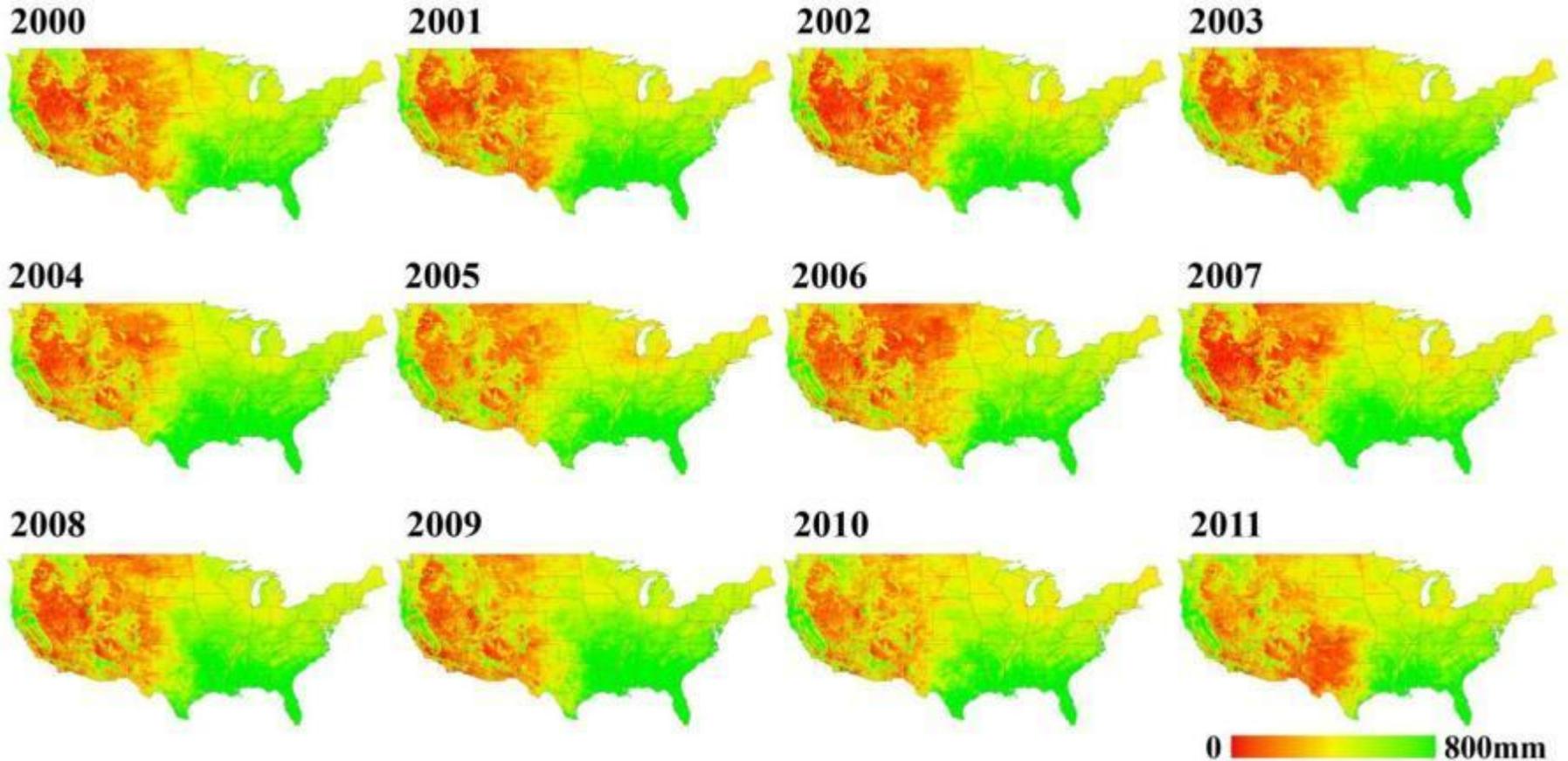
Water Use Effort:
For irrigation water use to
estimate consumptive use.



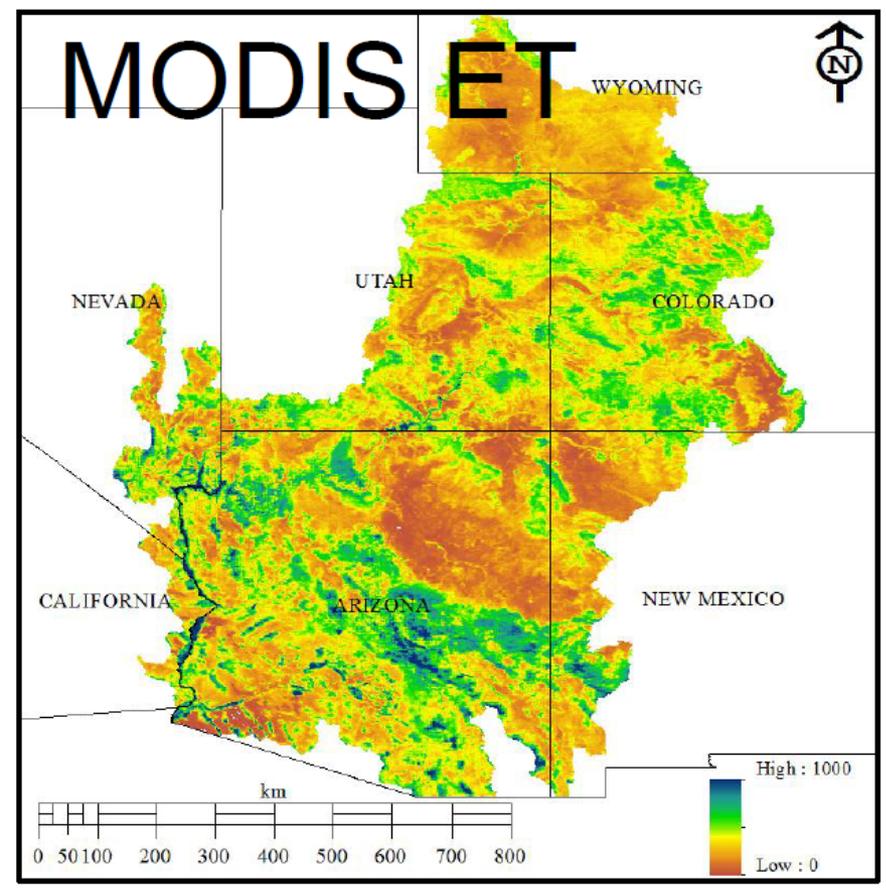
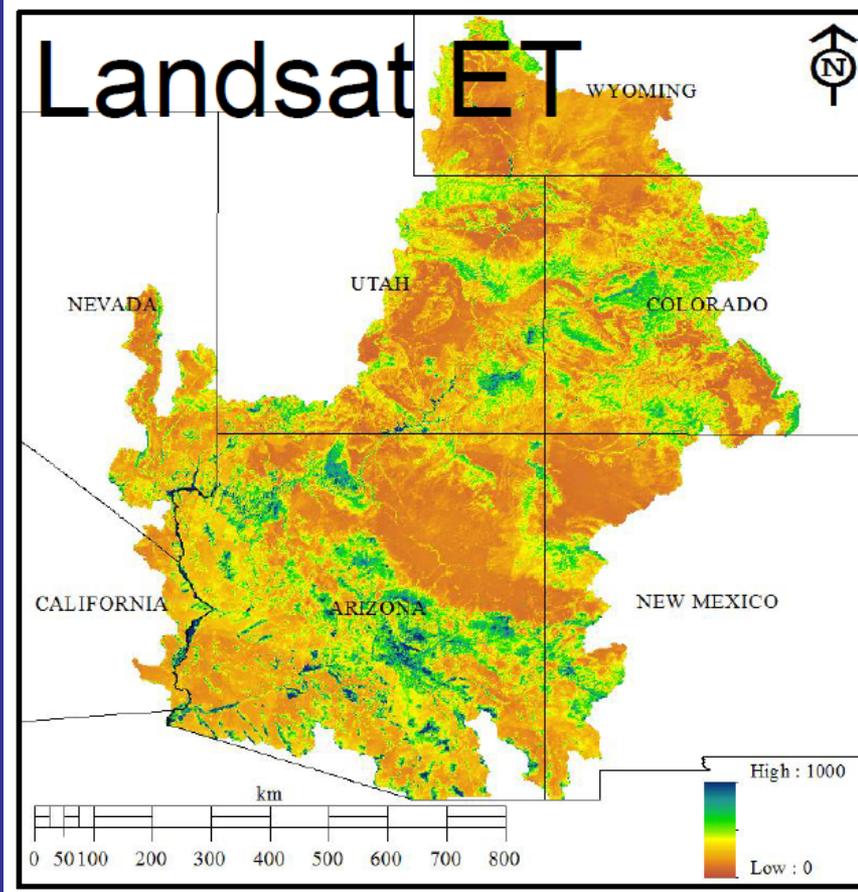
Water Budget Effort:
Total ET as a component of
the water budget.

Small Watershed Scale

Annual ET Totals from MODIS



Comparison of Annual ET for 2010



NW Phoenix, Arizona Area Golf Courses

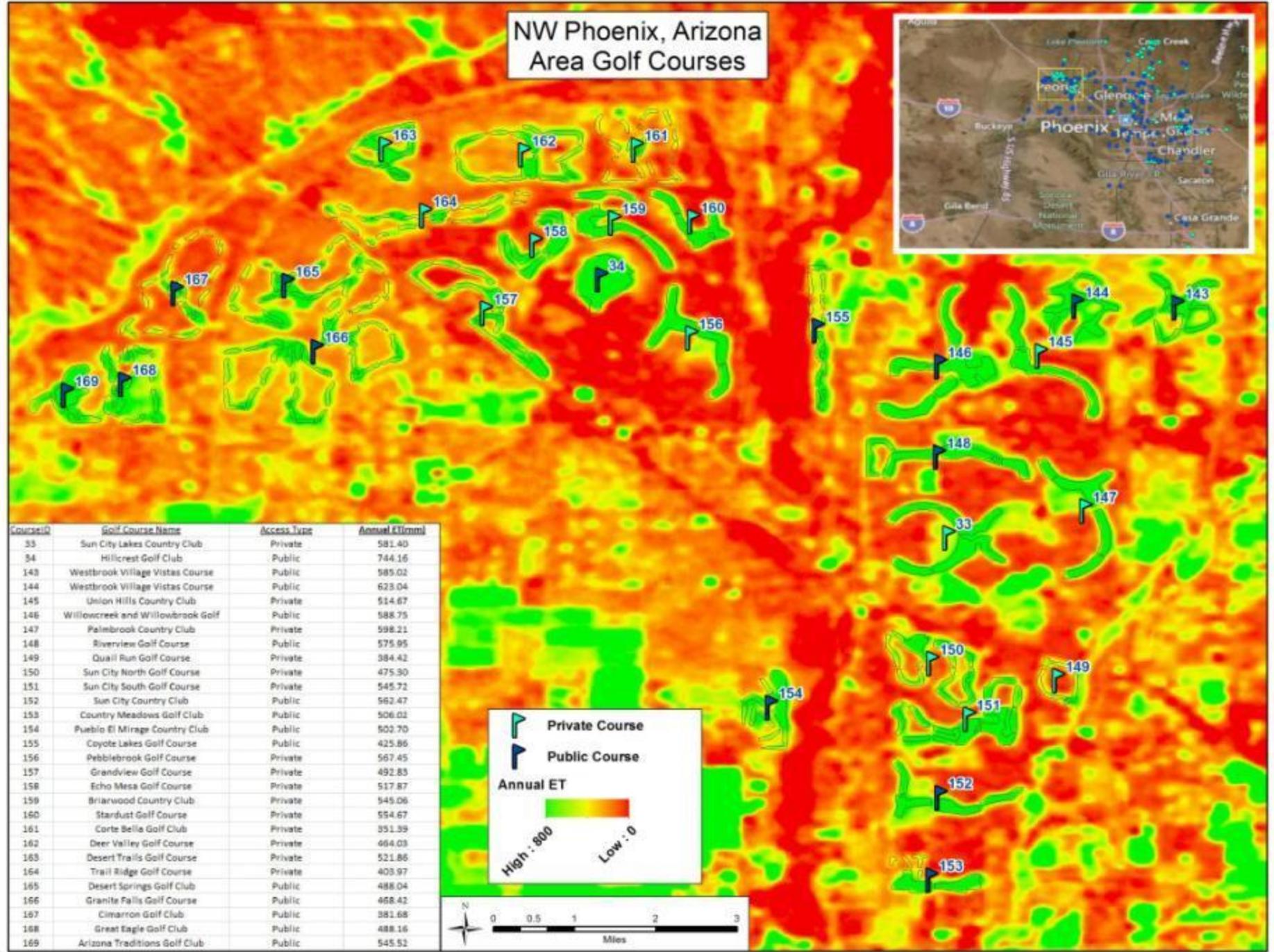


Course ID	Golf Course Name	Access Type	Annual \$ (18mm)
33	Sun City Lakes Country Club	Private	581.40
34	Hillicrest Golf Club	Public	744.16
143	Westbrook Village Vistas Course	Public	585.02
144	Westbrook Village Vistas Course	Public	623.04
145	Union Hills Country Club	Private	514.67
146	Willowcreek and Willowbrook Golf	Public	588.75
147	Palmbrook Country Club	Private	598.21
148	Riverview Golf Course	Public	575.95
149	Quail Run Golf Course	Private	384.42
150	Sun City North Golf Course	Private	475.30
151	Sun City South Golf Course	Private	545.72
152	Sun City Country Club	Public	562.47
153	Country Meadows Golf Club	Public	506.02
154	Pueblo El Mirage Country Club	Public	502.70
155	Coyote Lakes Golf Course	Public	425.86
156	Pebblebrook Golf Course	Private	567.45
157	Grandview Golf Course	Private	492.83
158	Echo Mesa Golf Course	Private	517.87
159	Briarwood Country Club	Private	545.06
160	Stardust Golf Course	Private	554.67
161	Corte Bella Golf Club	Private	351.39
162	Deer Valley Golf Course	Private	664.03
163	Desert Trails Golf Course	Private	521.86
164	Trial Ridge Golf Course	Private	403.97
165	Desert Springs Golf Club	Public	488.04
166	Granite Falls Golf Course	Public	668.42
167	Cimarron Golf Club	Public	381.68
168	Great Eagle Golf Club	Public	488.16
169	Arizona Traditions Golf Club	Public	545.52

 Private Course
 Public Course



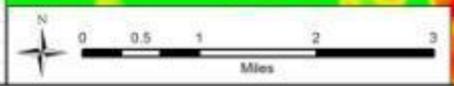
NW Phoenix, Arizona Area Golf Courses



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 Private Course
 Public Course
Annual ET

 High : 800
 Low : 0



Water Use

Livestock



Less than 1 percent

Self-Supplied Domestic



1 percent

Public Supply

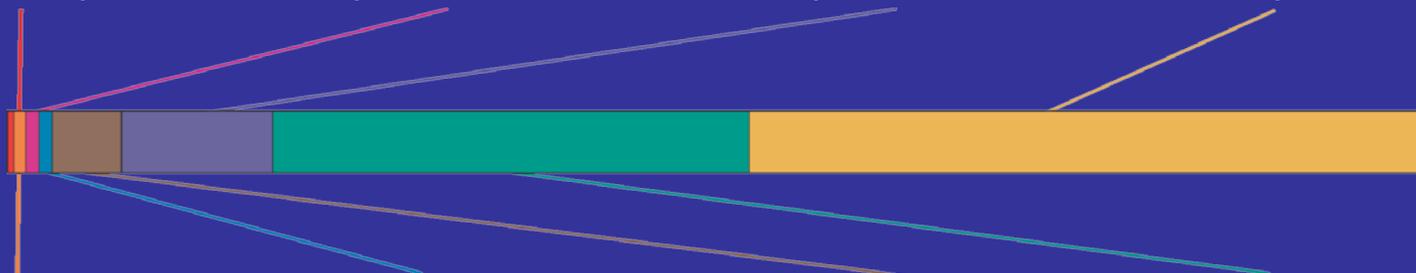


11 percent

Thermoelectric Power



49 percent



1 percent



Mining

2 percent



Aquaculture

4 percent

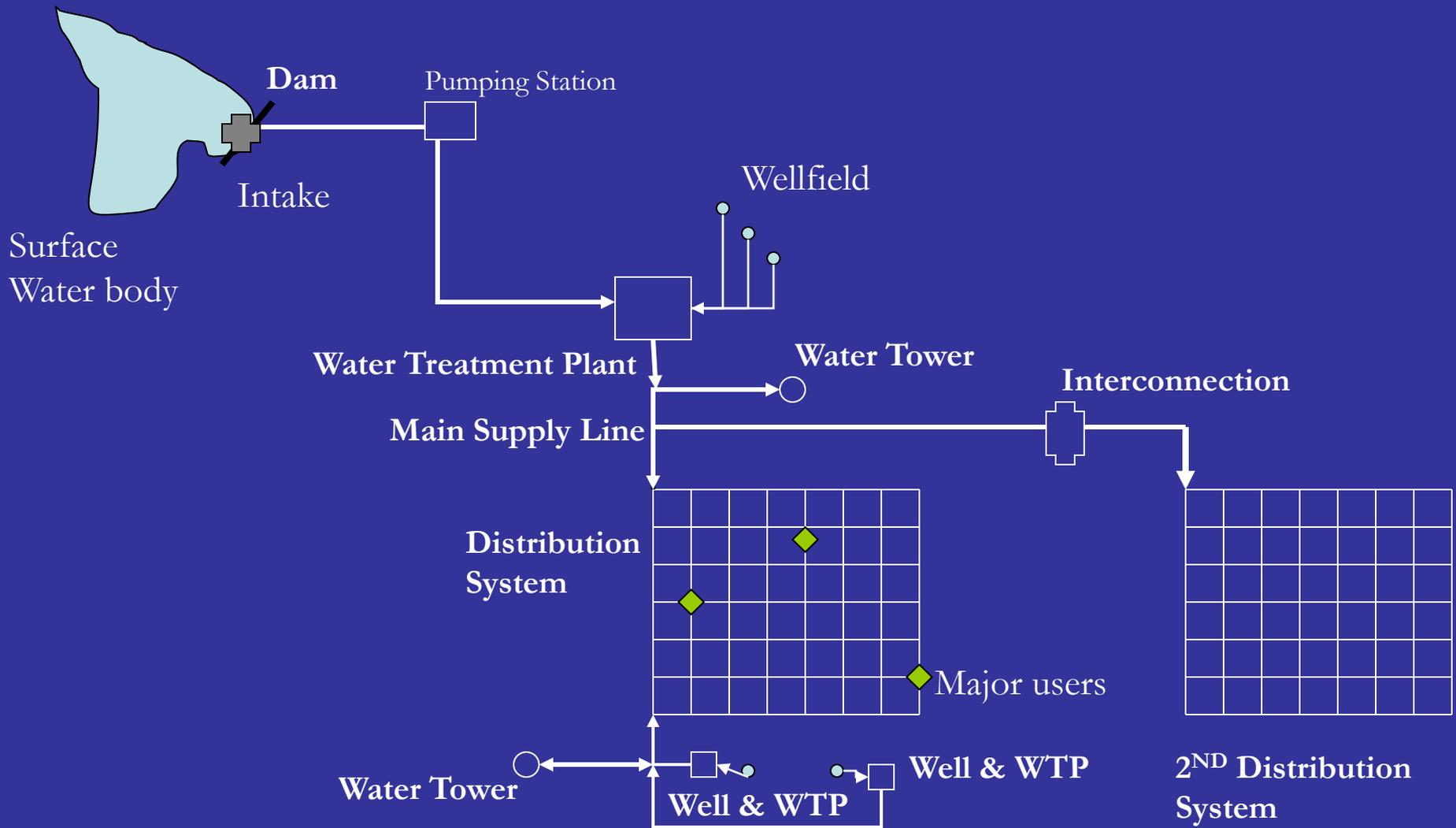


Self-Supplied Industrial

31 percent



Irrigation



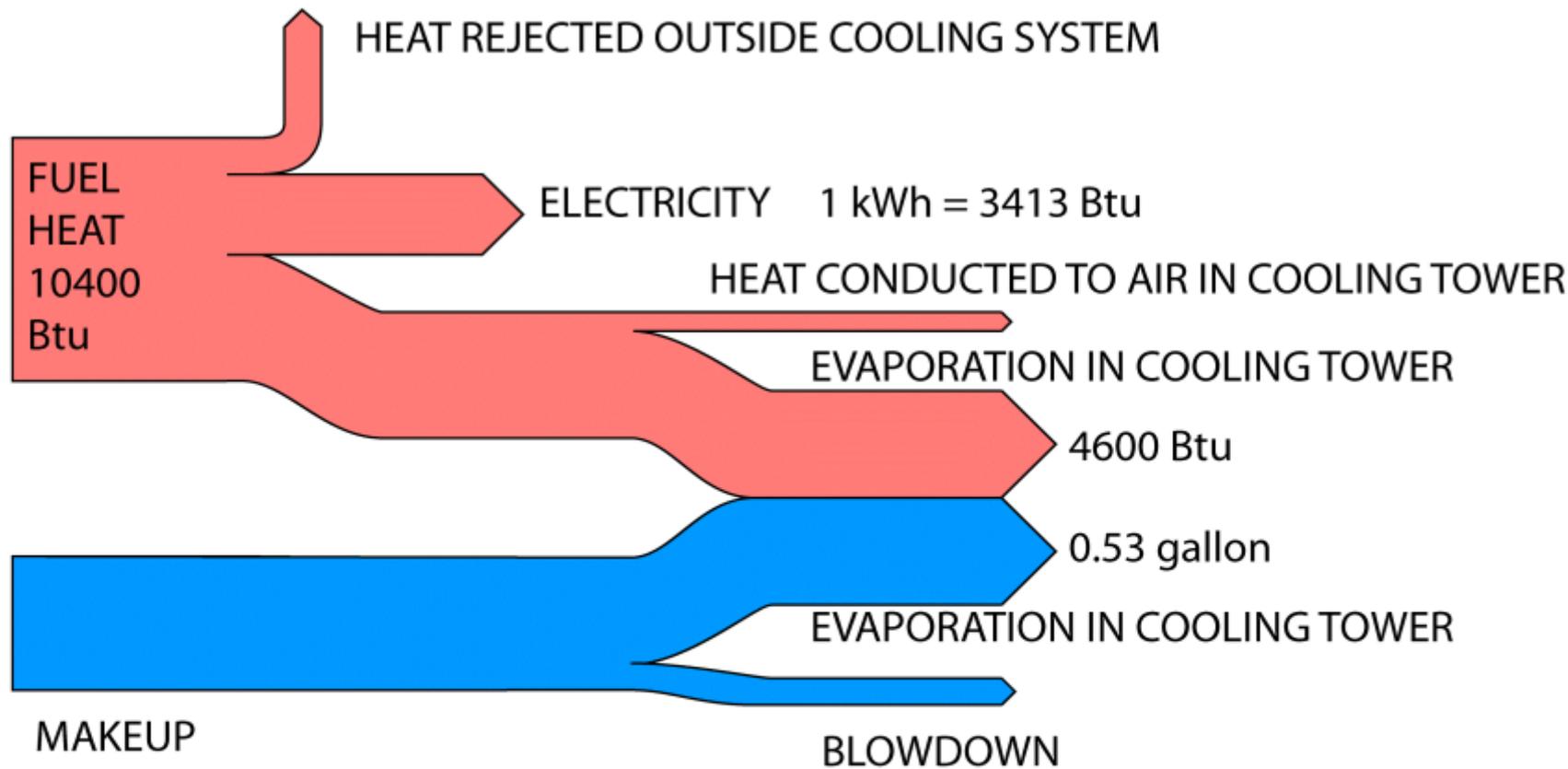
**FIVE YEAR-\$5M EFFORT ON
PUBLIC WATER SUPPLY SYSTEMS**

Thermoelectric Withdrawals

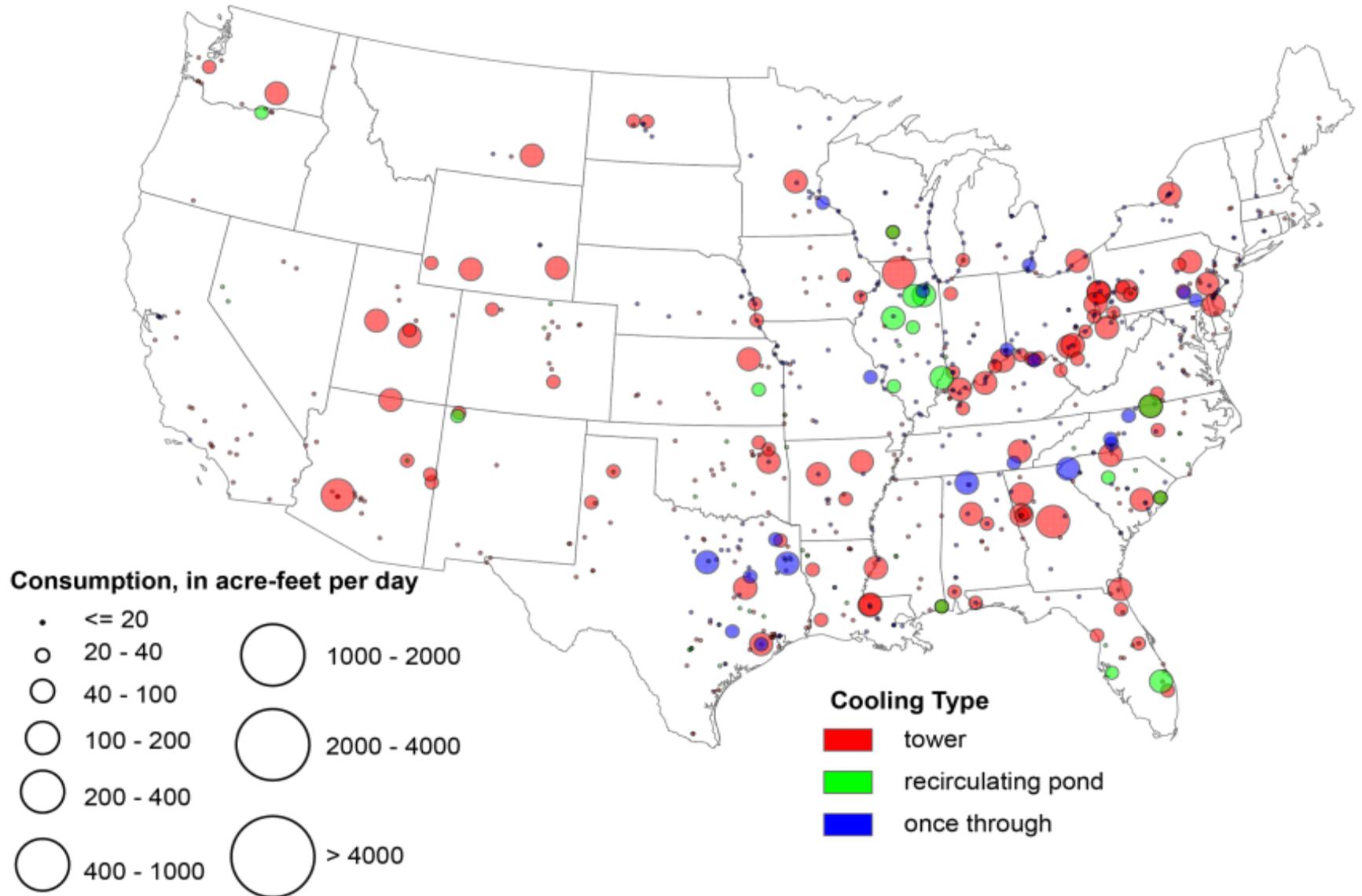




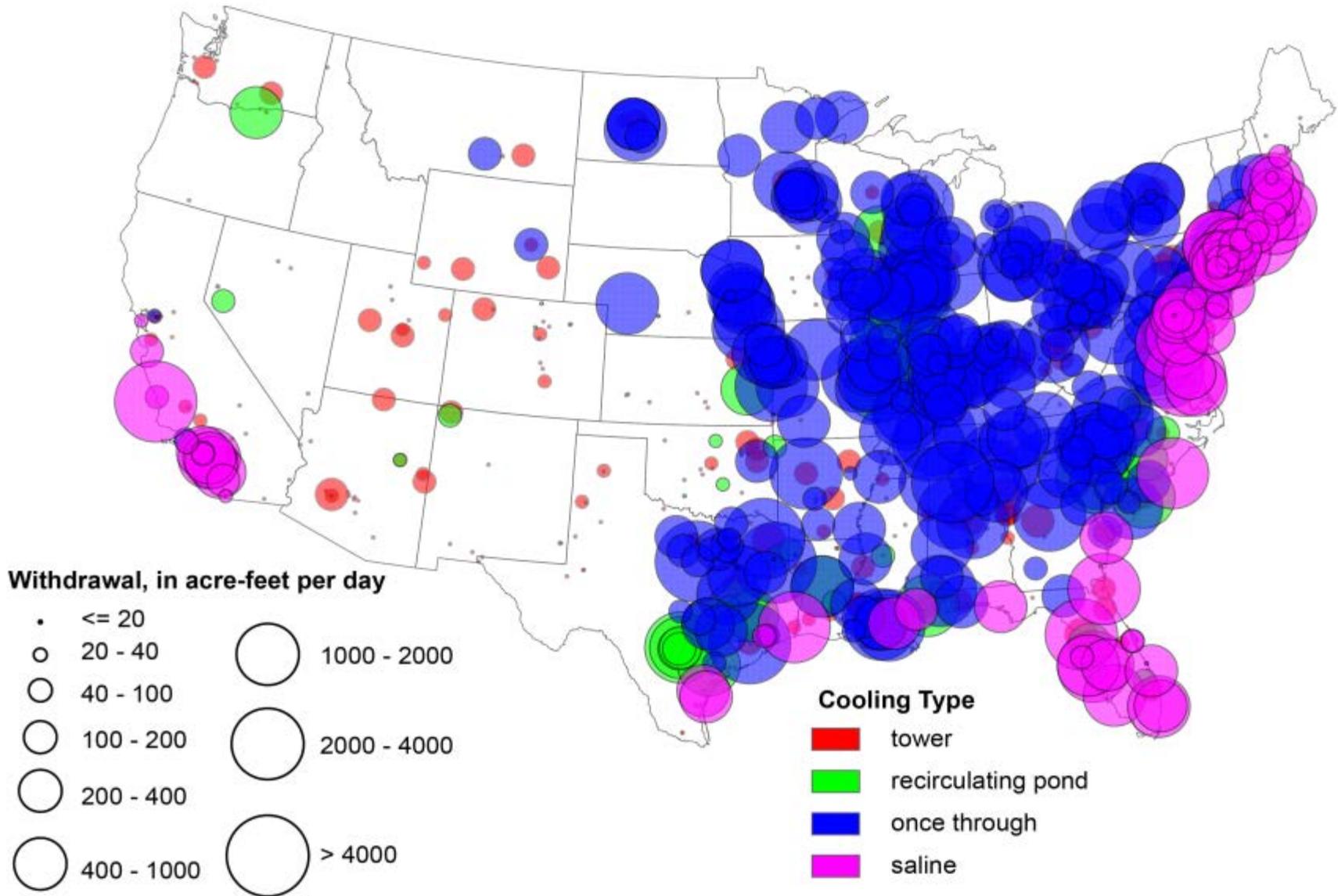
The new frontier -
CONSUMPTION



Consumption



Withdrawal



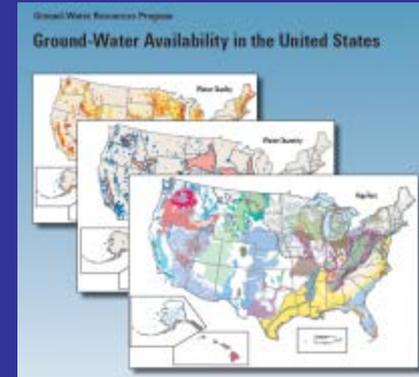
Flows Needs for Wildlife and Habitat

Publishing, this year, a Classification System for Streams –
hydro-ecological type



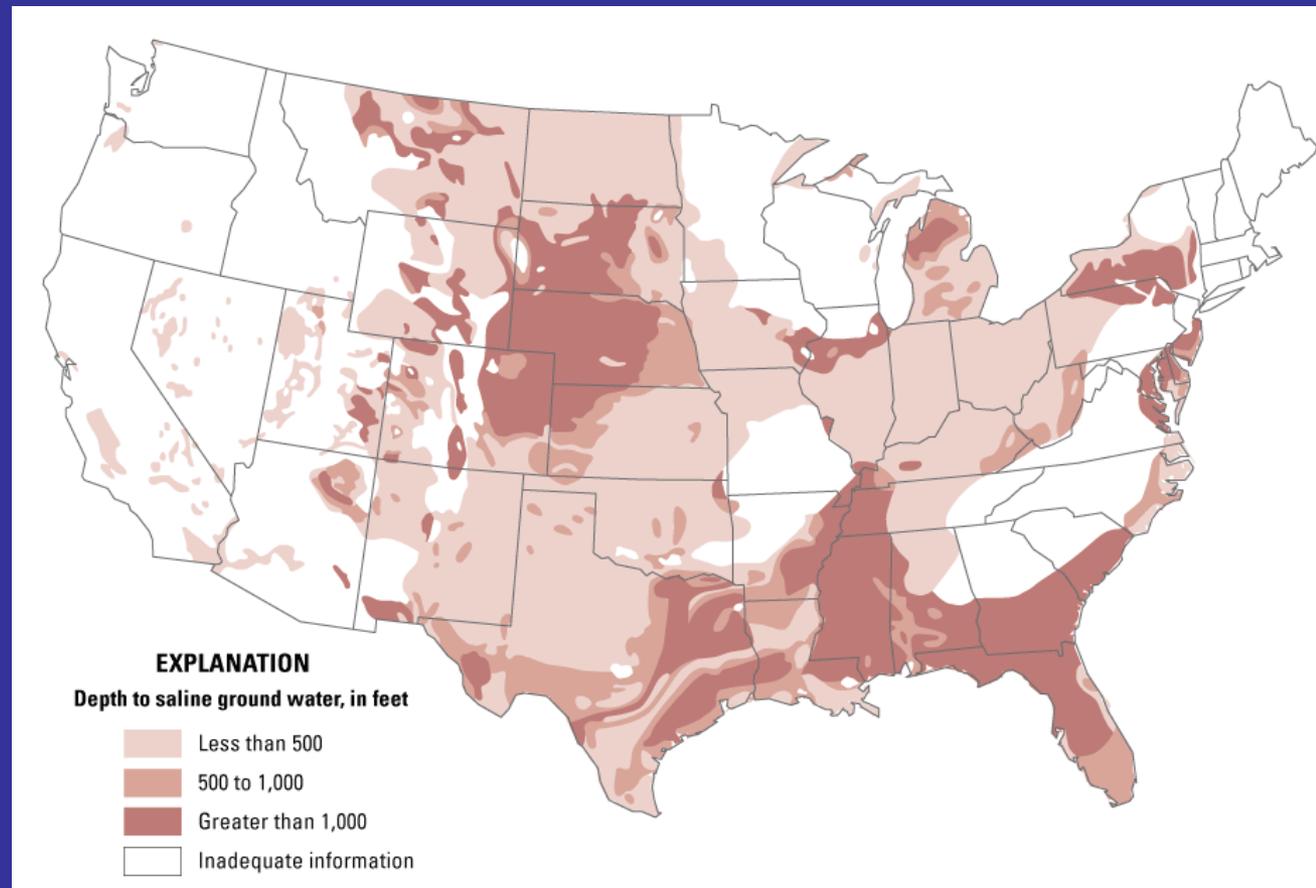
Assess Groundwater's role in Water Availability

Study of the Glacial System



Assess the Nation's Brackish Resources

- Locations of the res.
- Hydrologic properties
- Water quality properties
- Current uses

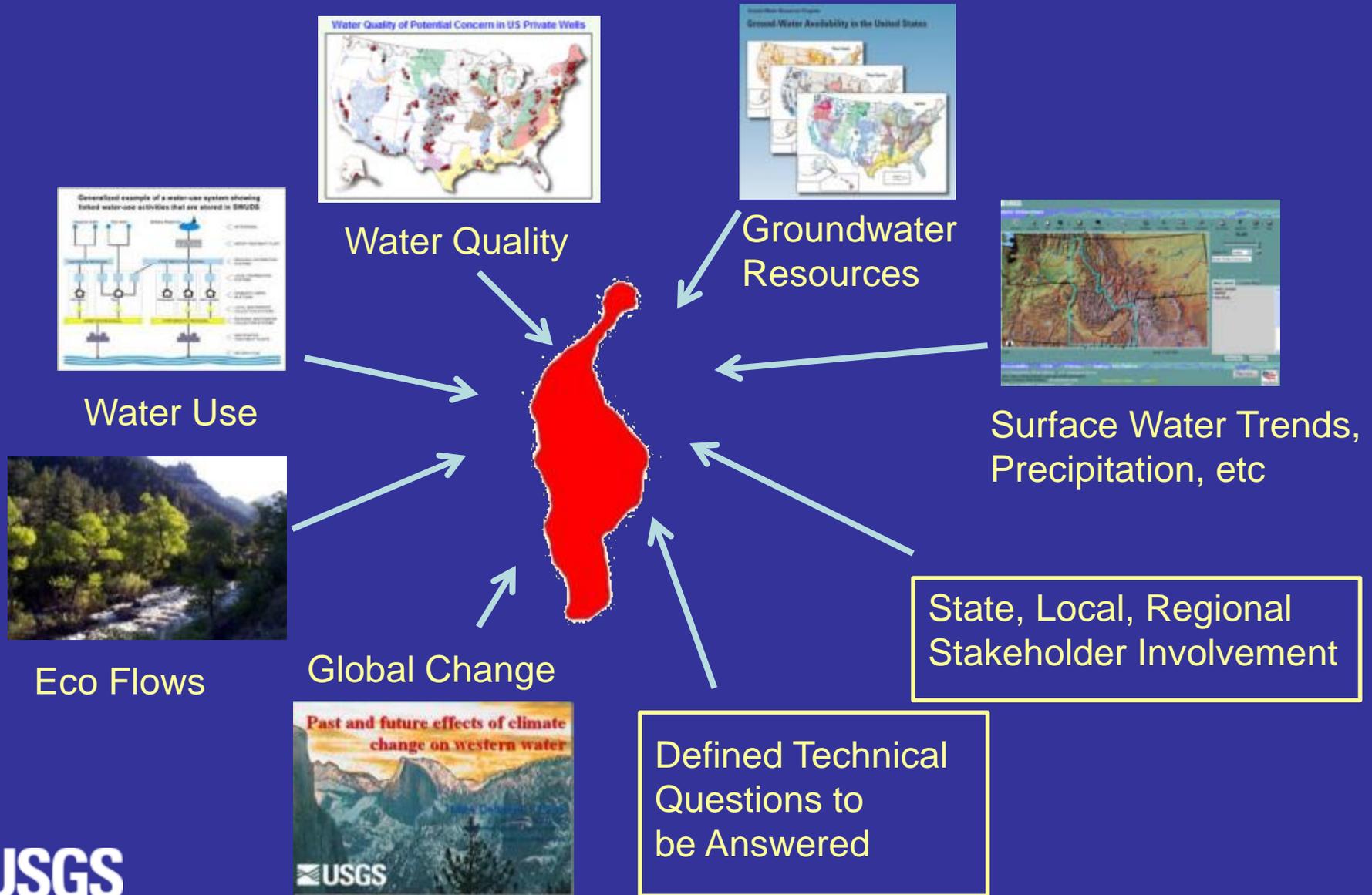


Finally, three studies focused on selected watersheds: the Colorado River, the Delaware River, and the ACF Rivers - where there is significant competition over water resources. Here, the USGS will work collaboratively with stakeholders to comprehensively assess the technical aspects of water availability.

Water Resource Regions



Focused Water Availability Assessments

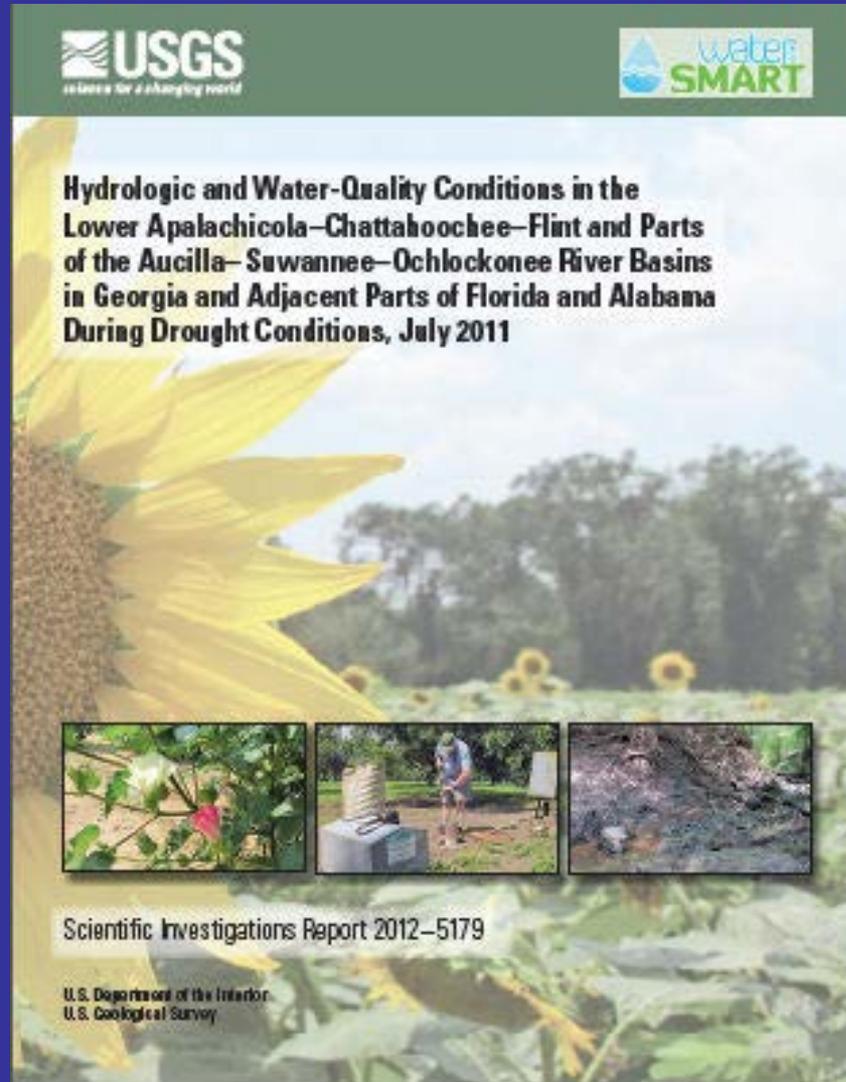


Areas of Focus for the ACF Study

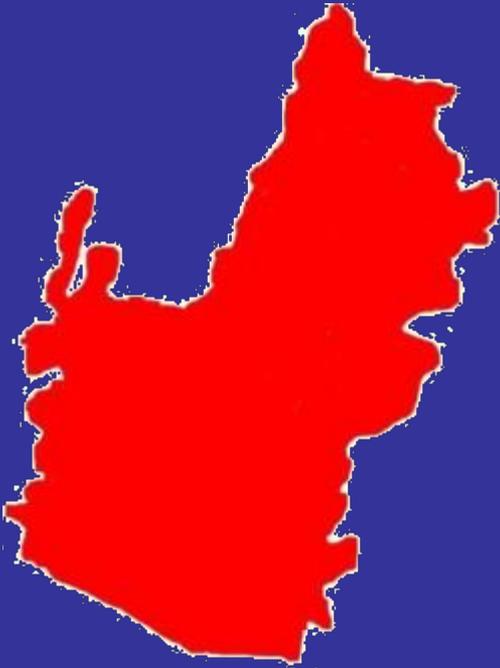


- Water Use
- Groundwater/Surface Water Interactions – Couple Existing Models
- Ecological Flow Assessment

Areas of Focus for the ACF Study

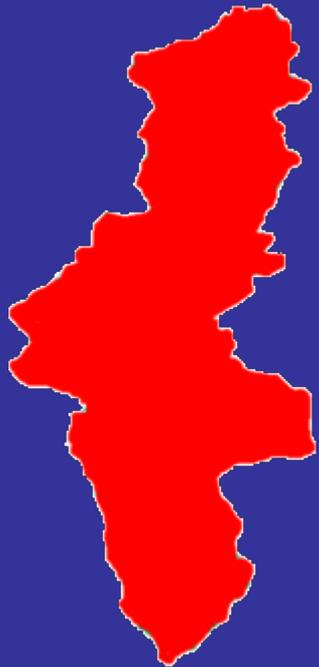


Areas of Focus for the Colorado Study



- Water Use
- Hydroclimatic Variables – ET, Snowpack, Sublimation
- Groundwater Assessment – Baseflow to Mainstem

Areas of Focus for the Delaware Study



- Water Use / Water Tracking
- Robust Hydrologic Model of basin
- Evaluation of Ecological Water Needs of Tributaries



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