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U.S. Geological Survey



Saline Valley,
California

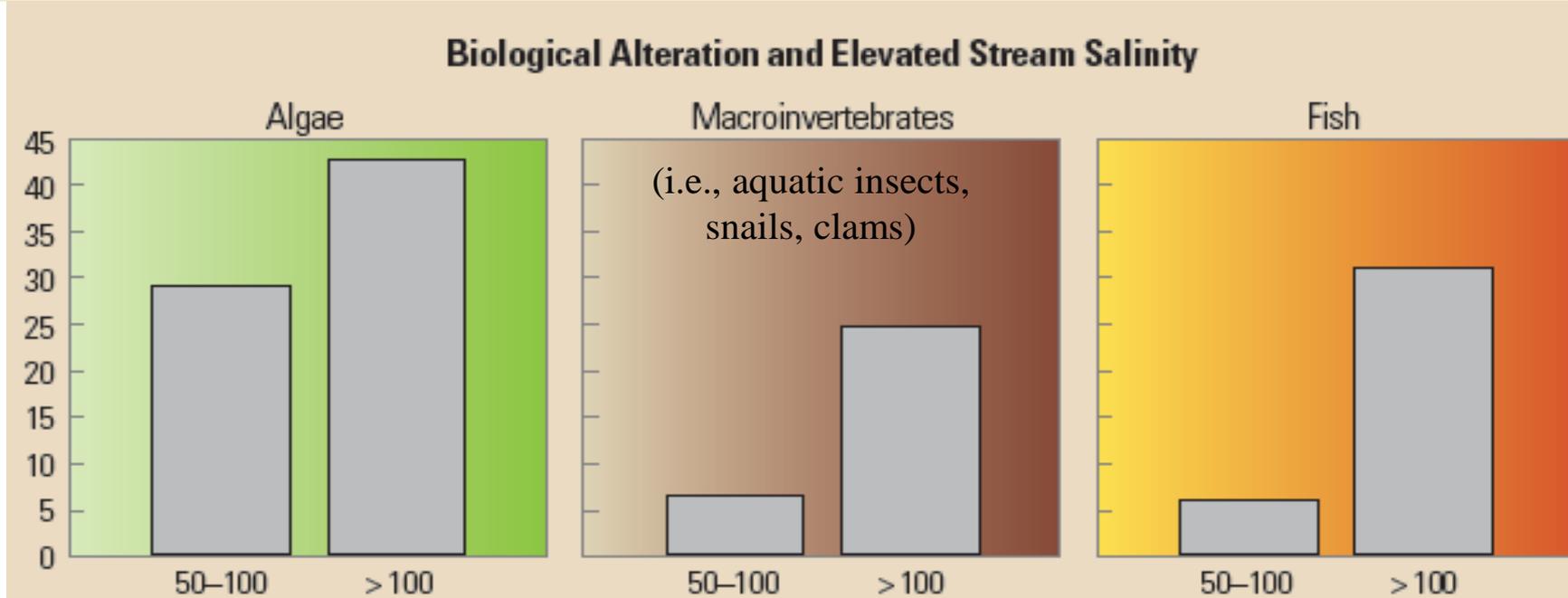


New Science to Help Managers Prioritize Actions for Reducing Stream Salinity

National Water-Quality Assessment

Why Study Stream Salinity?

Biotic community alteration,
increased % above baseline

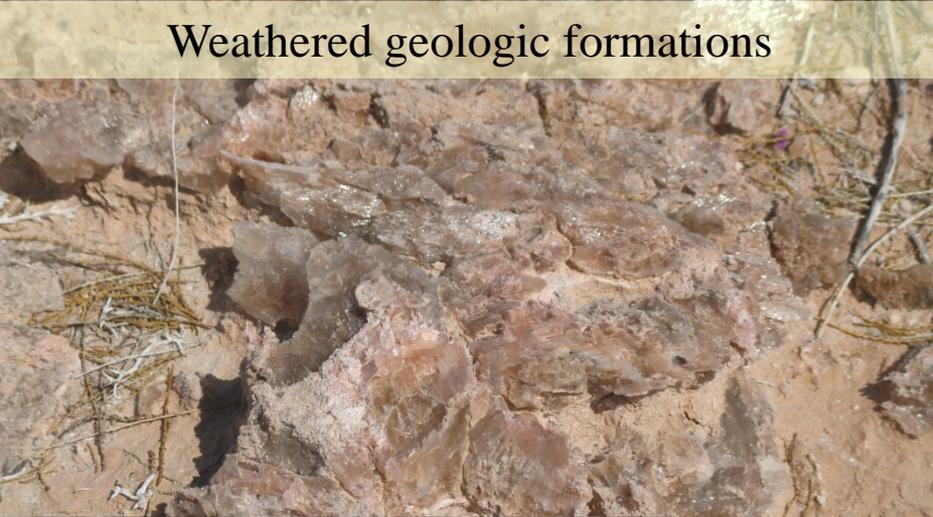


Stream salinity, percent of regional background level

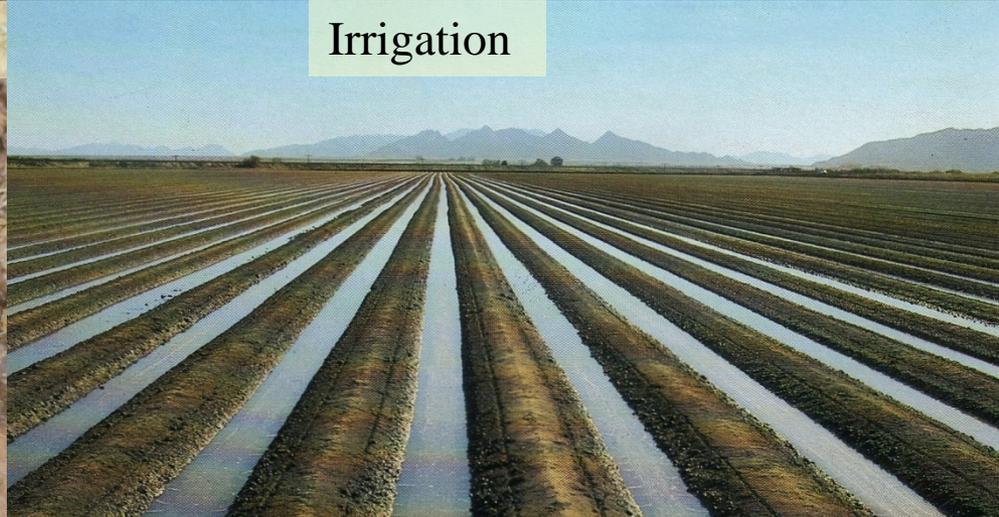
Damages to U.S. Agriculture: \$2.8 Billion

Salinity Sources...Some Examples

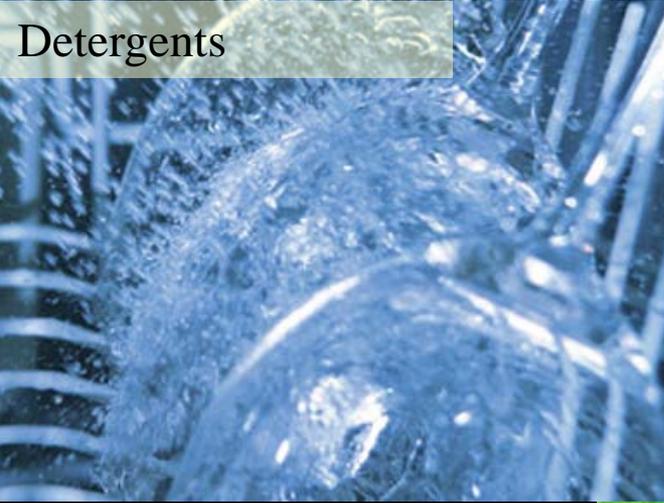
Weathered geologic formations



Irrigation



Detergents



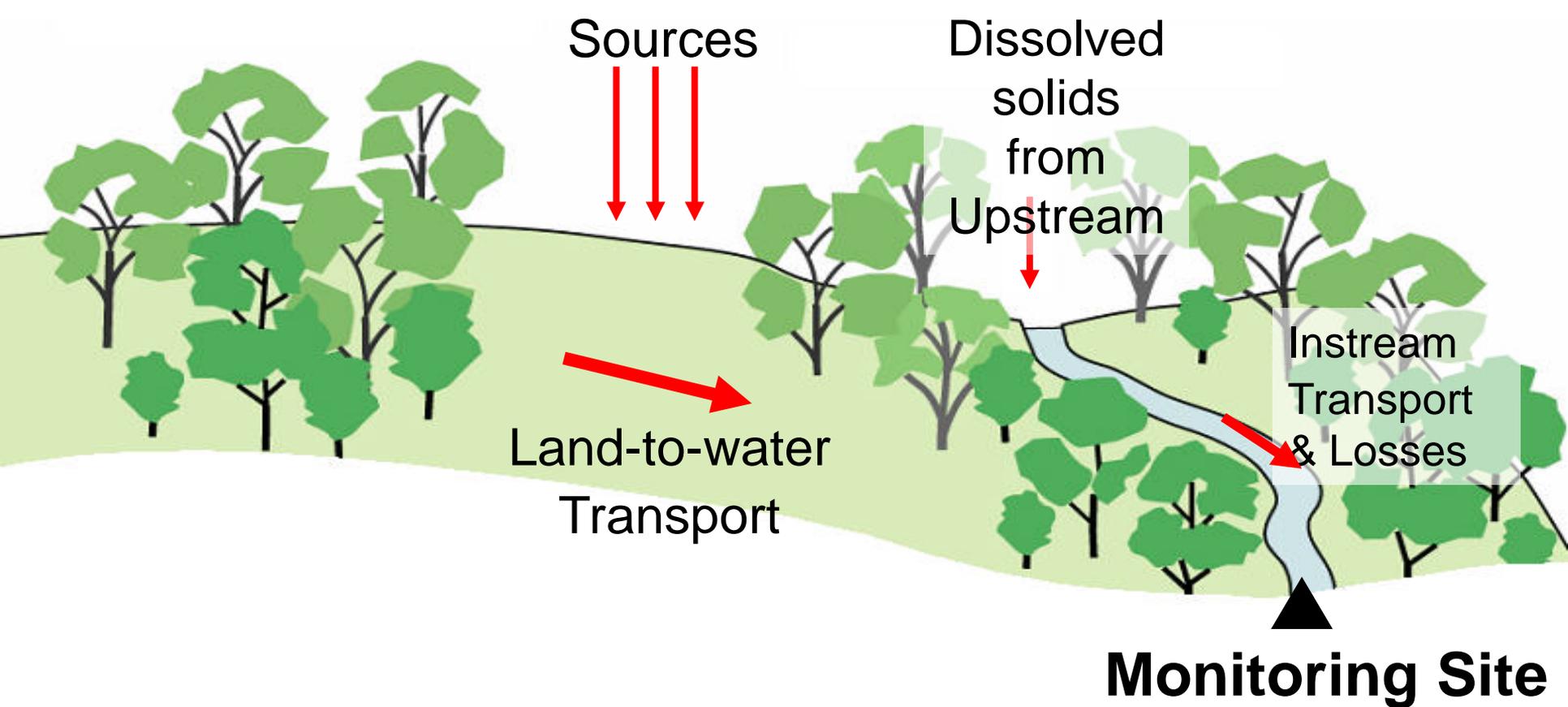
Fertilizers



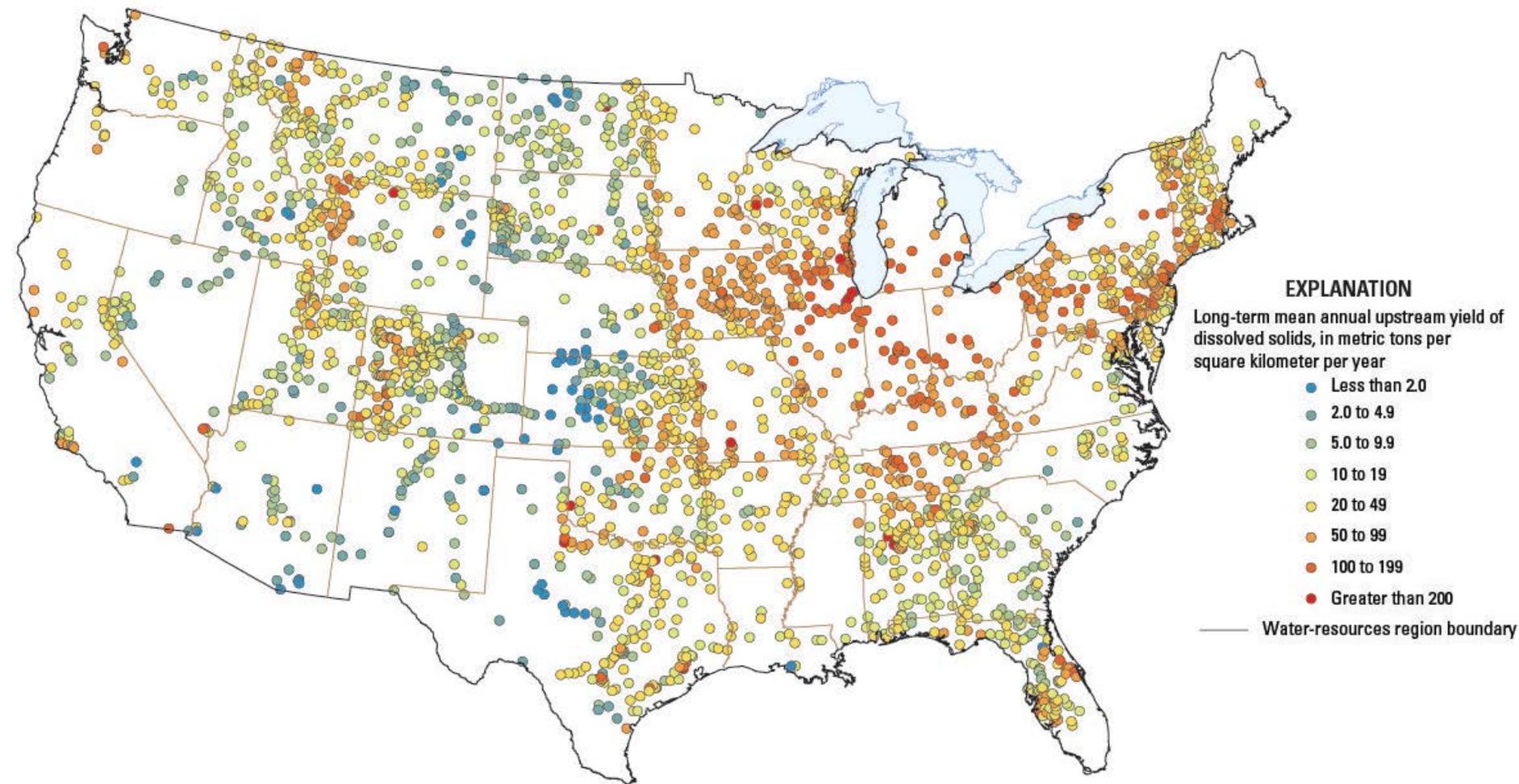
Road deicing



Integration of Monitoring Data with Information on Watershed Characteristics and Dissolved-Solids Sources



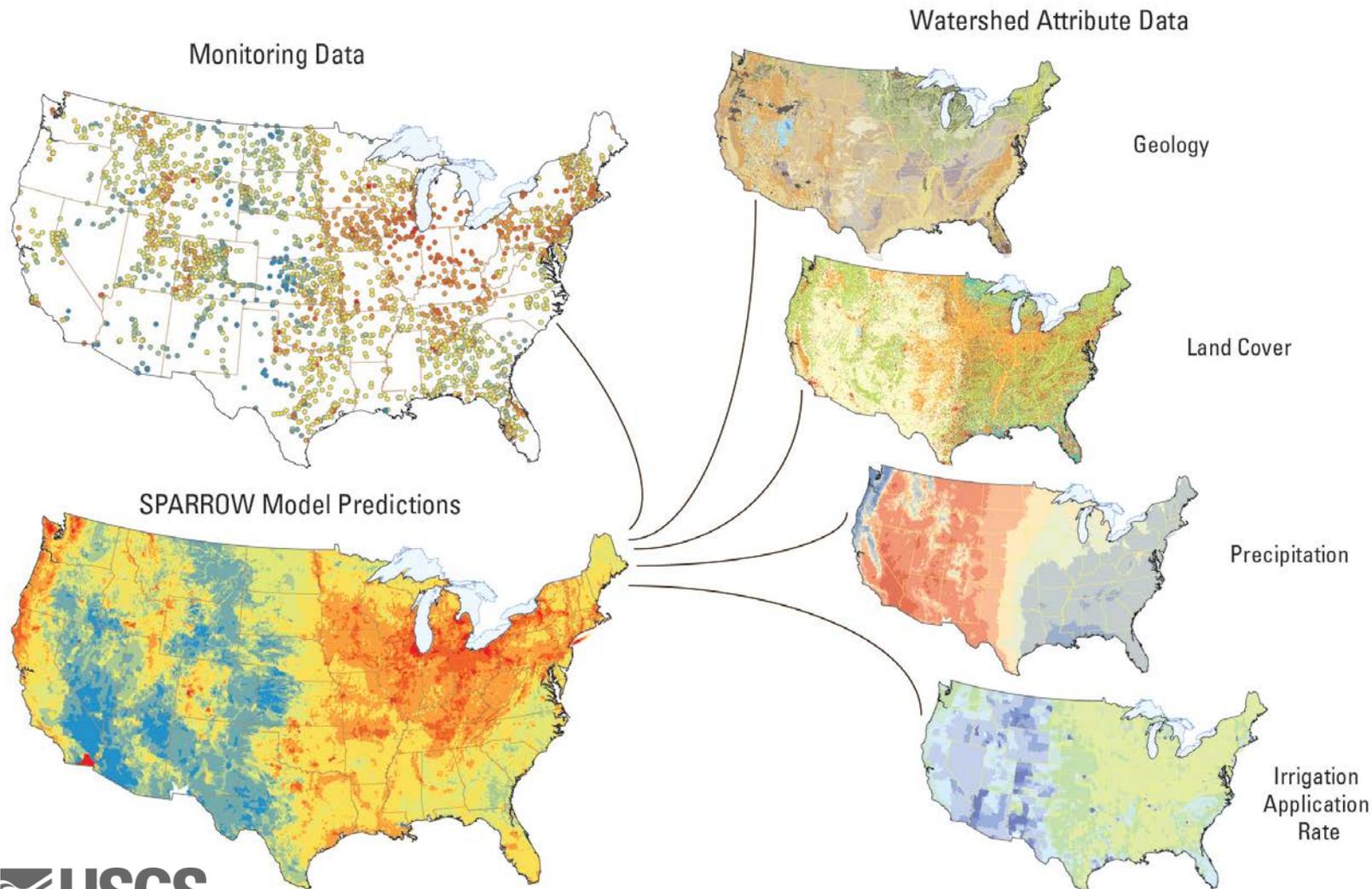
Monitoring Data Are Critical for Modeling



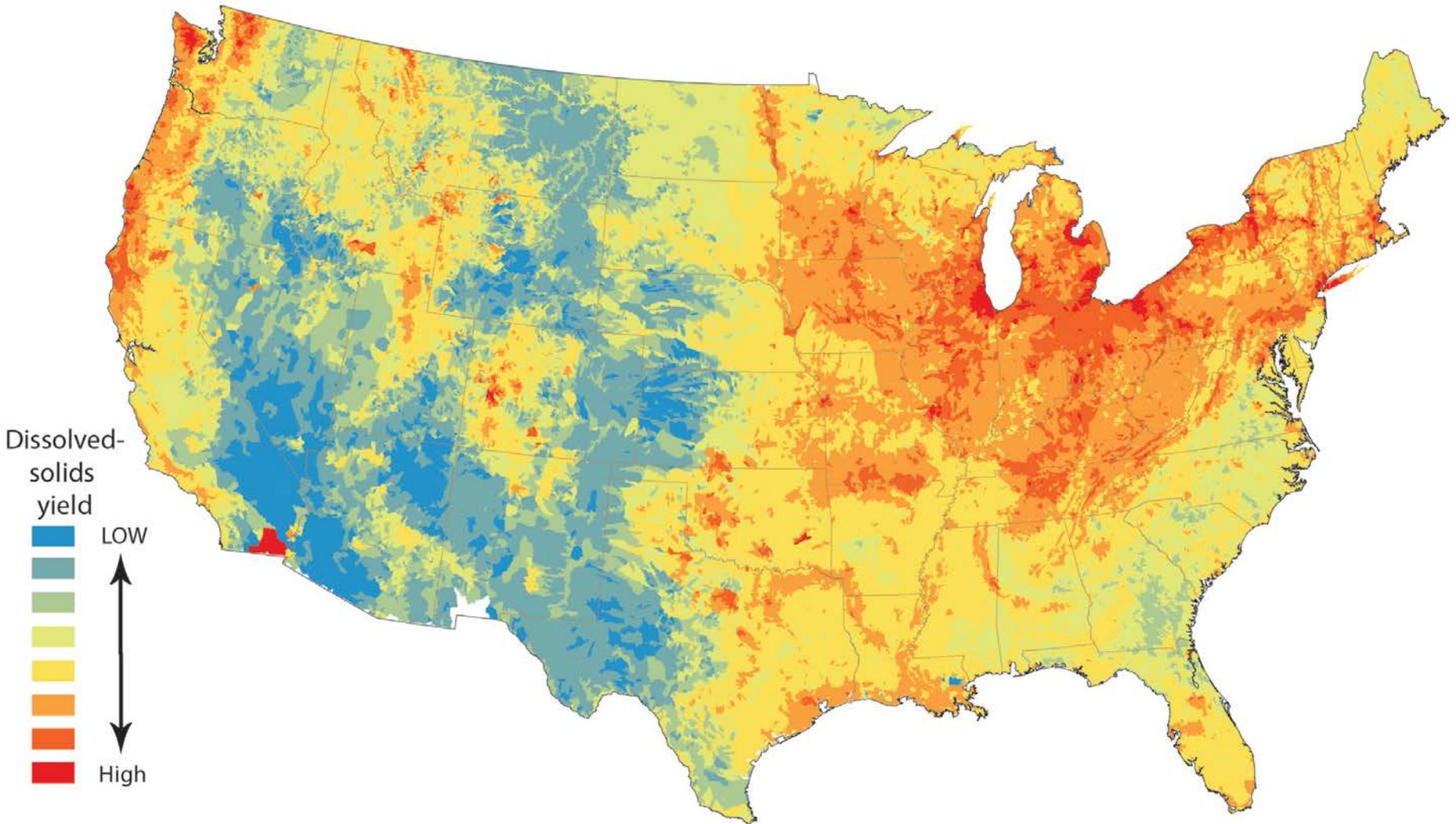
**2,560 calibration sites from USGS NWIS
and EPA STORET databases**

Integration of Monitoring Data with Watershed Attribute Data: SPARROW

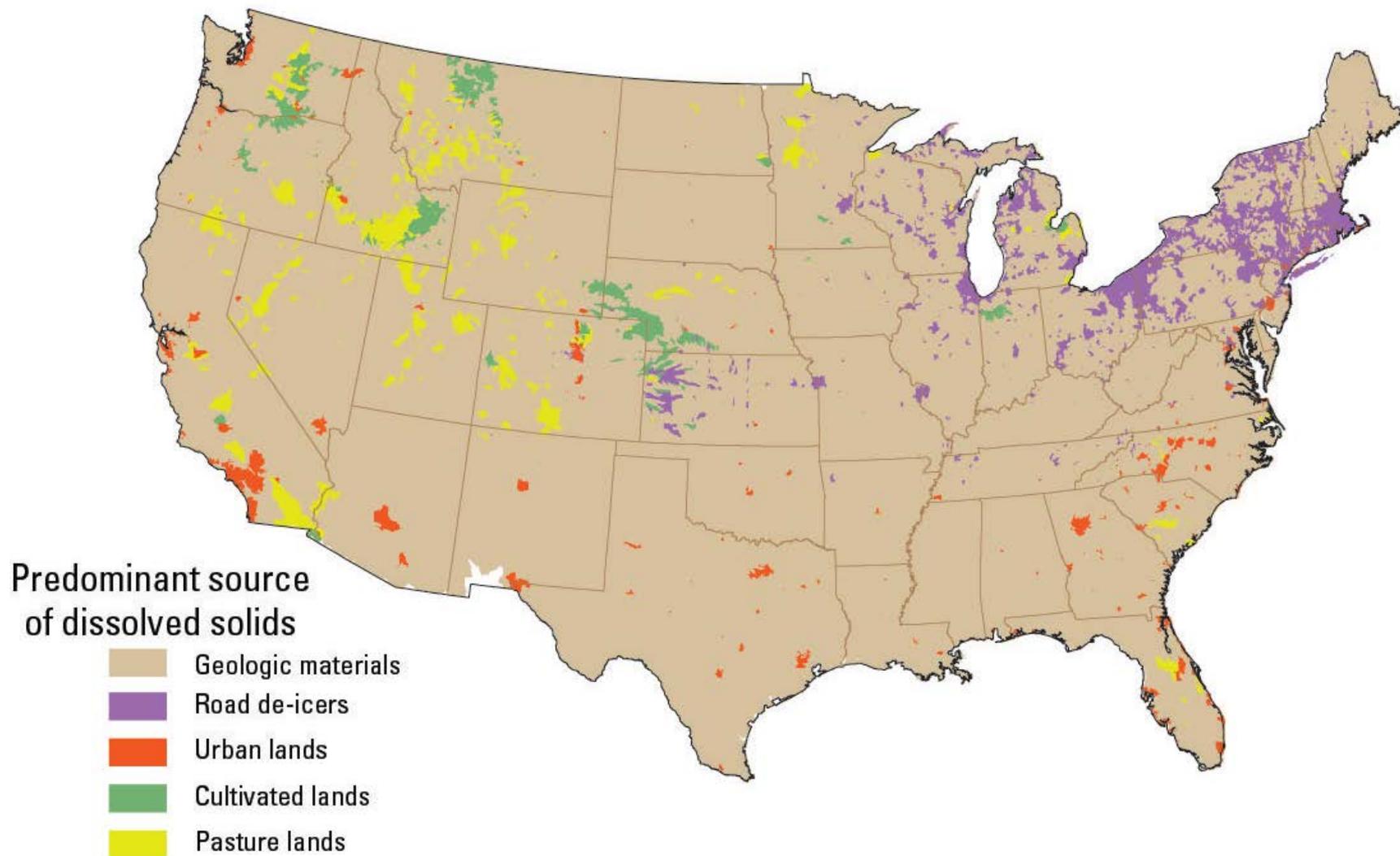
SPatially Referenced Regressions On Watershed Attributes



Dissolved-Solids Yields

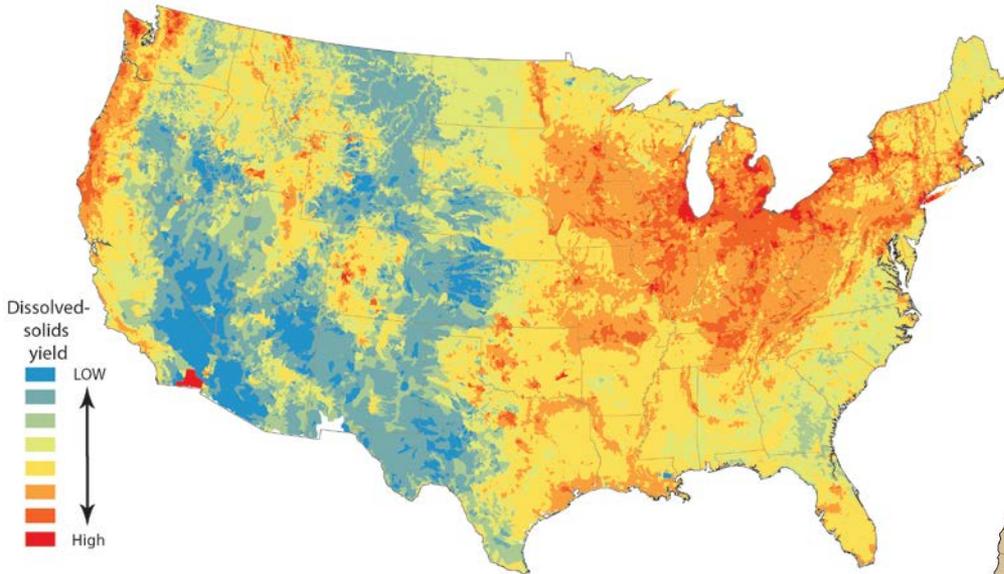


Largest Dissolved-Solids Sources

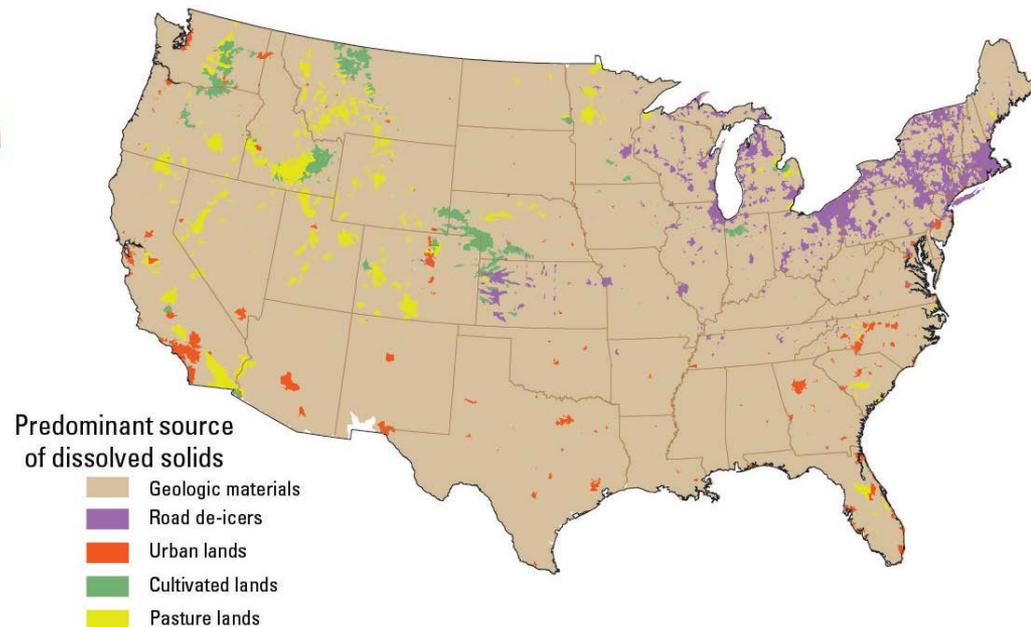


Dissolved Solids Yields and Sources

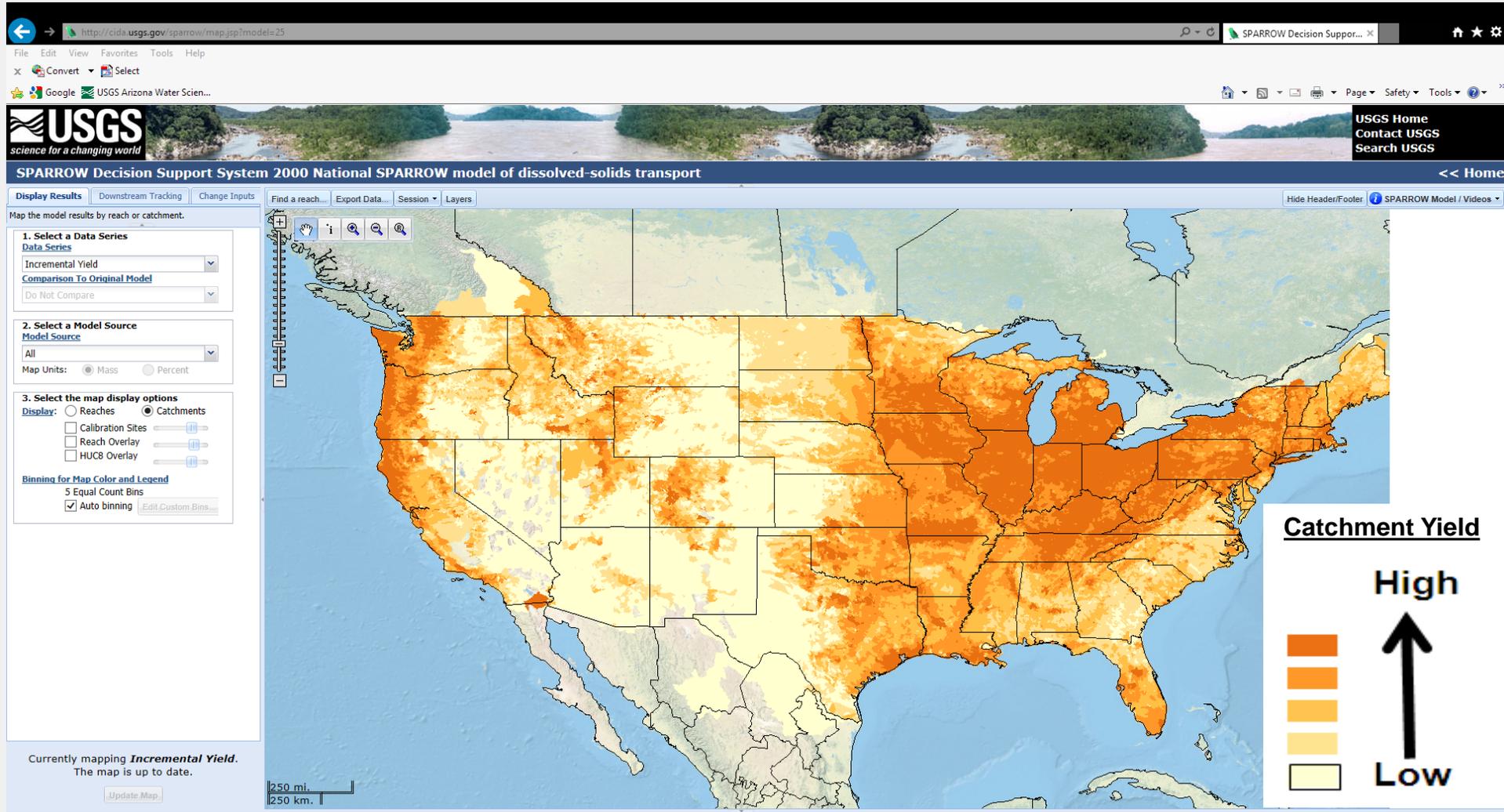
Yields



Largest Sources

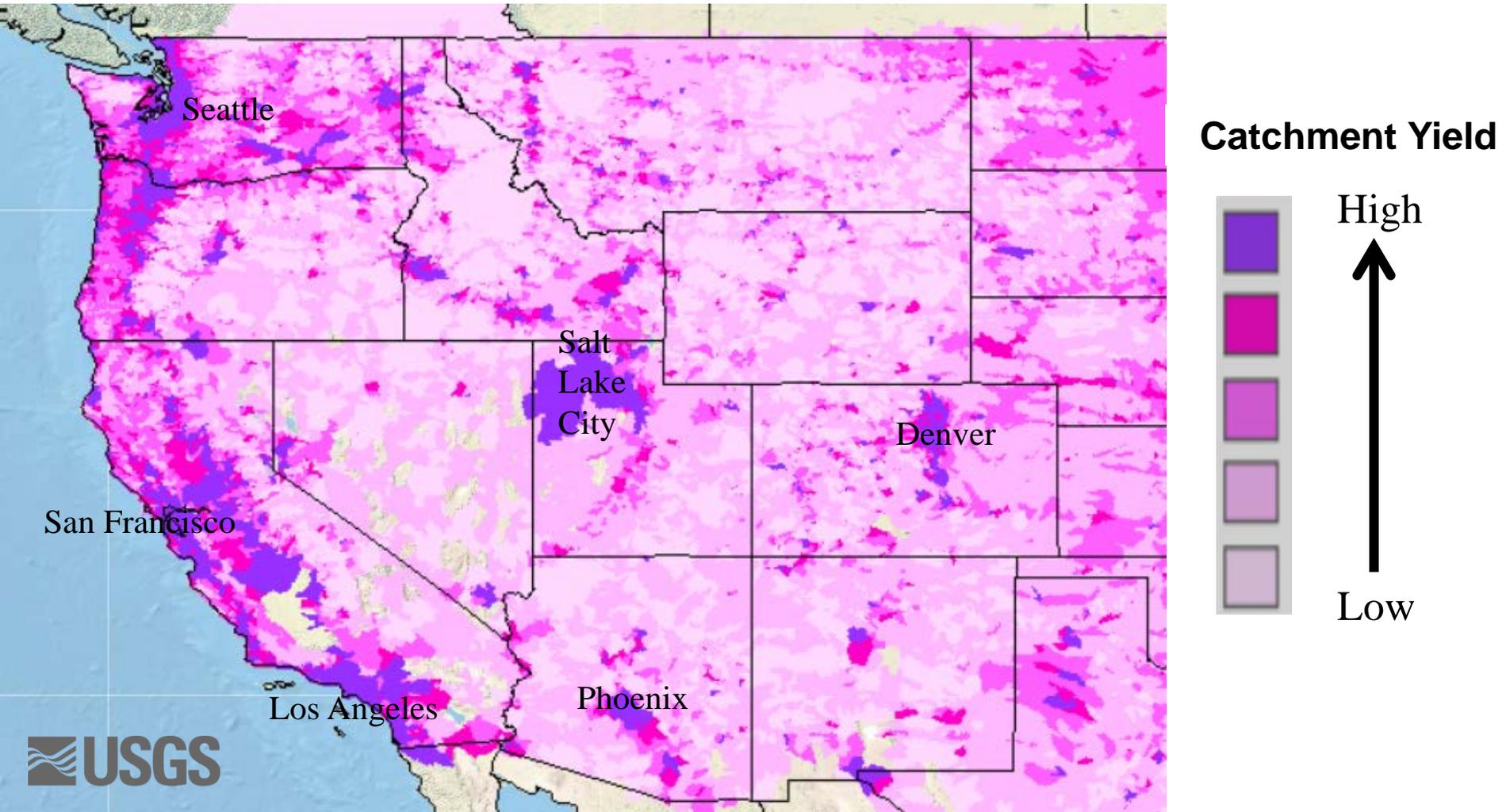


SPARROW Decision Support System



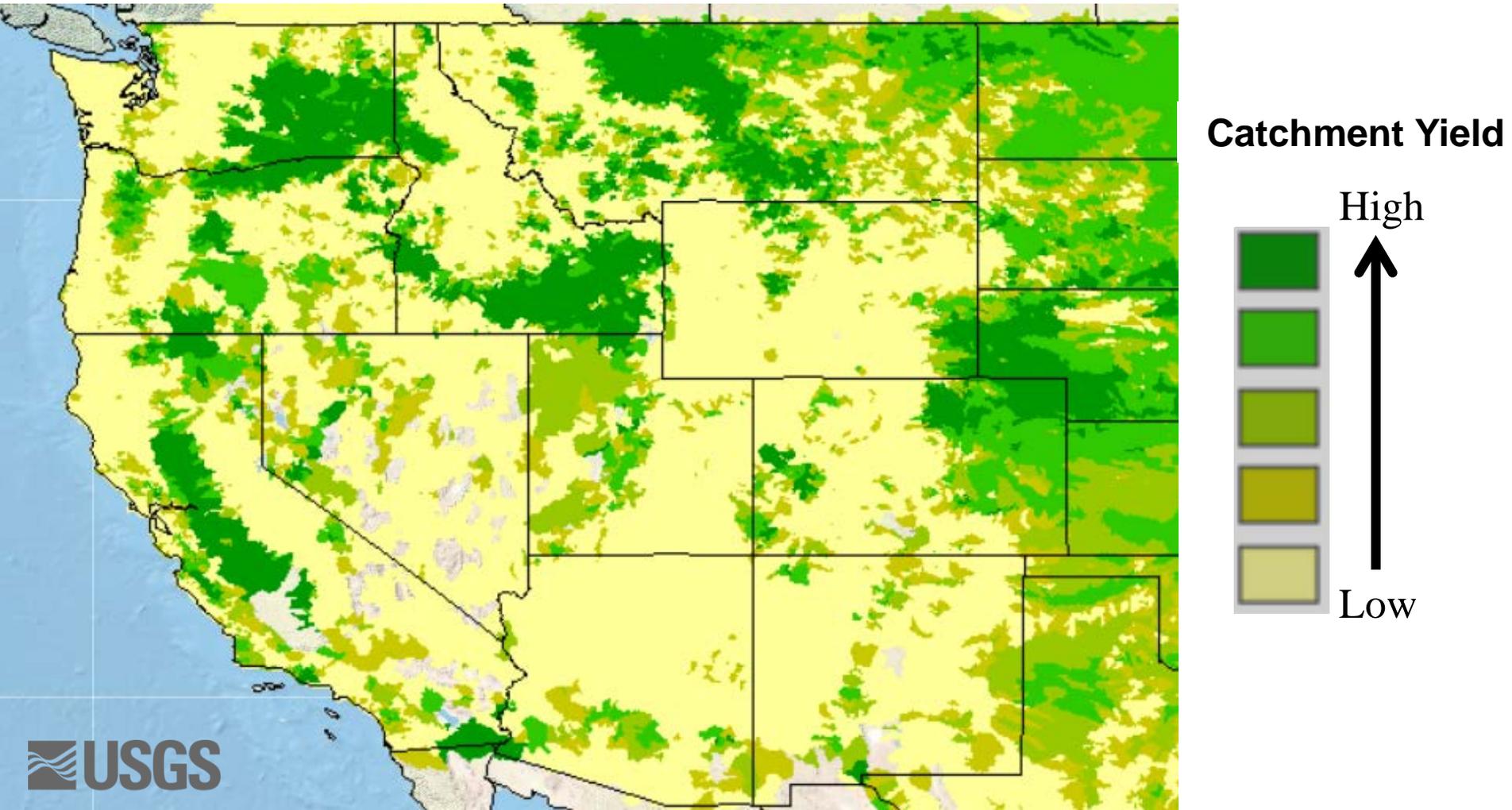
Catchment Yields of Dissolved Solids to Streams in the Western United States

Urban Lands



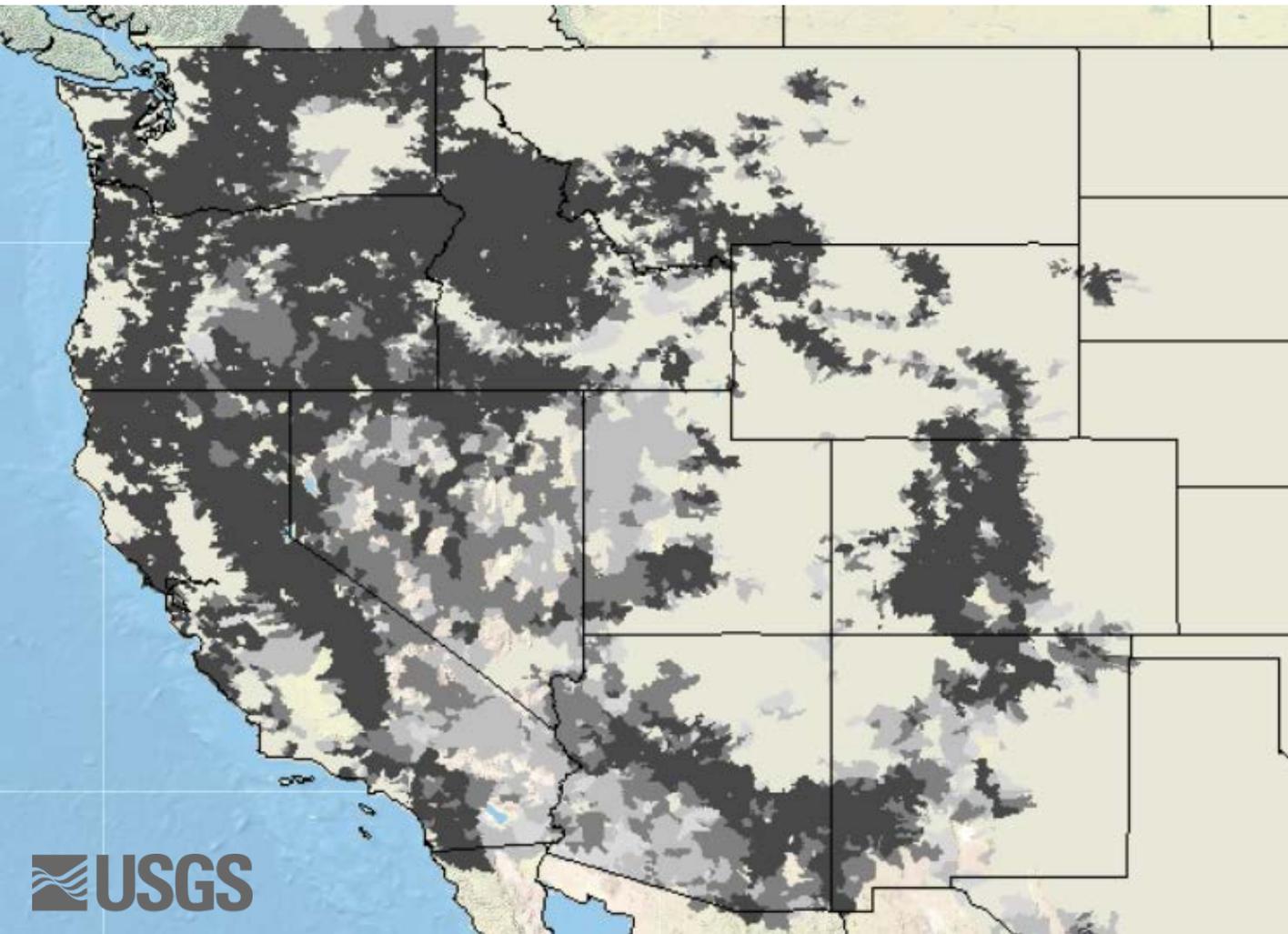
Catchment Yields of Dissolved Solids to Streams in the Western United States

Cultivated Lands

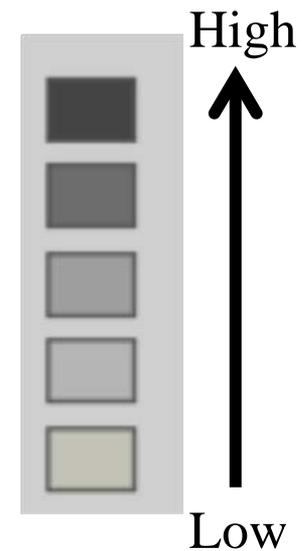


Catchment Yields of Dissolved Solids to Streams in the Western United States

Silica-Rich Plutonic & Volcanic Rocks

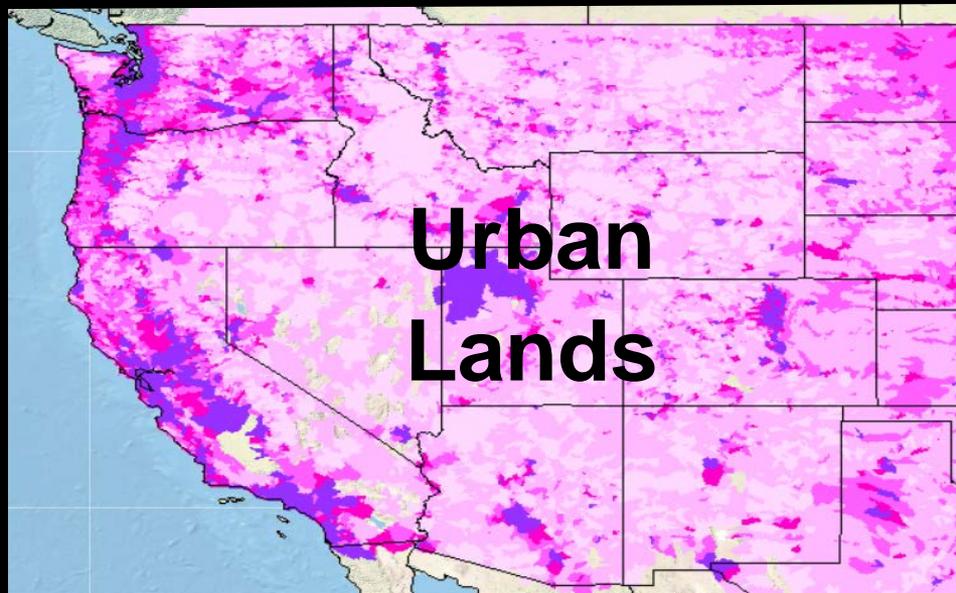
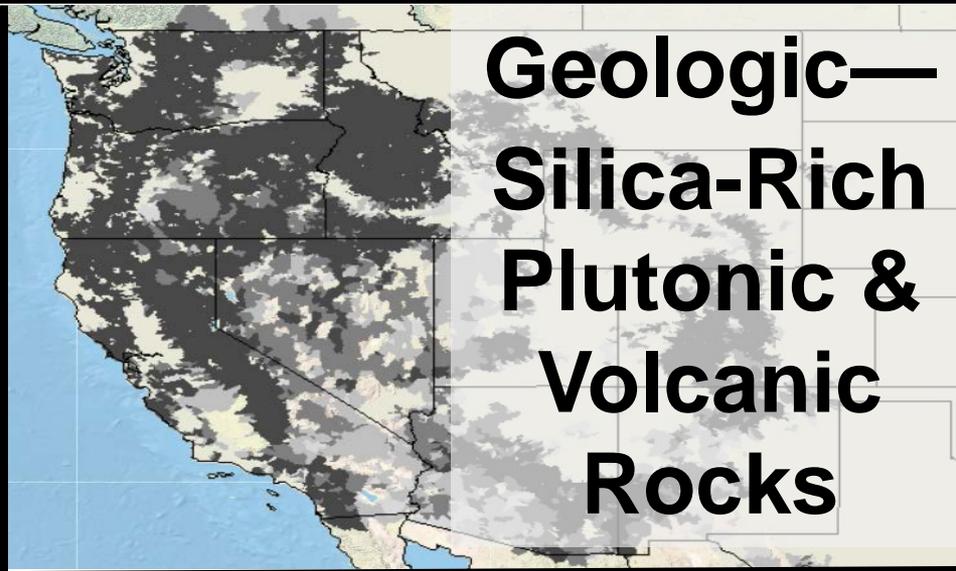
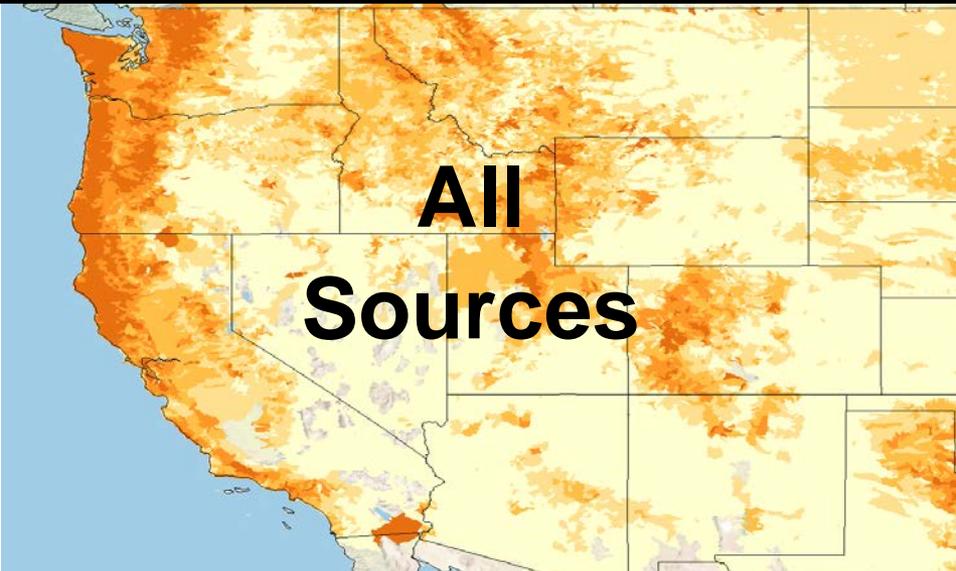


Catchment Yield



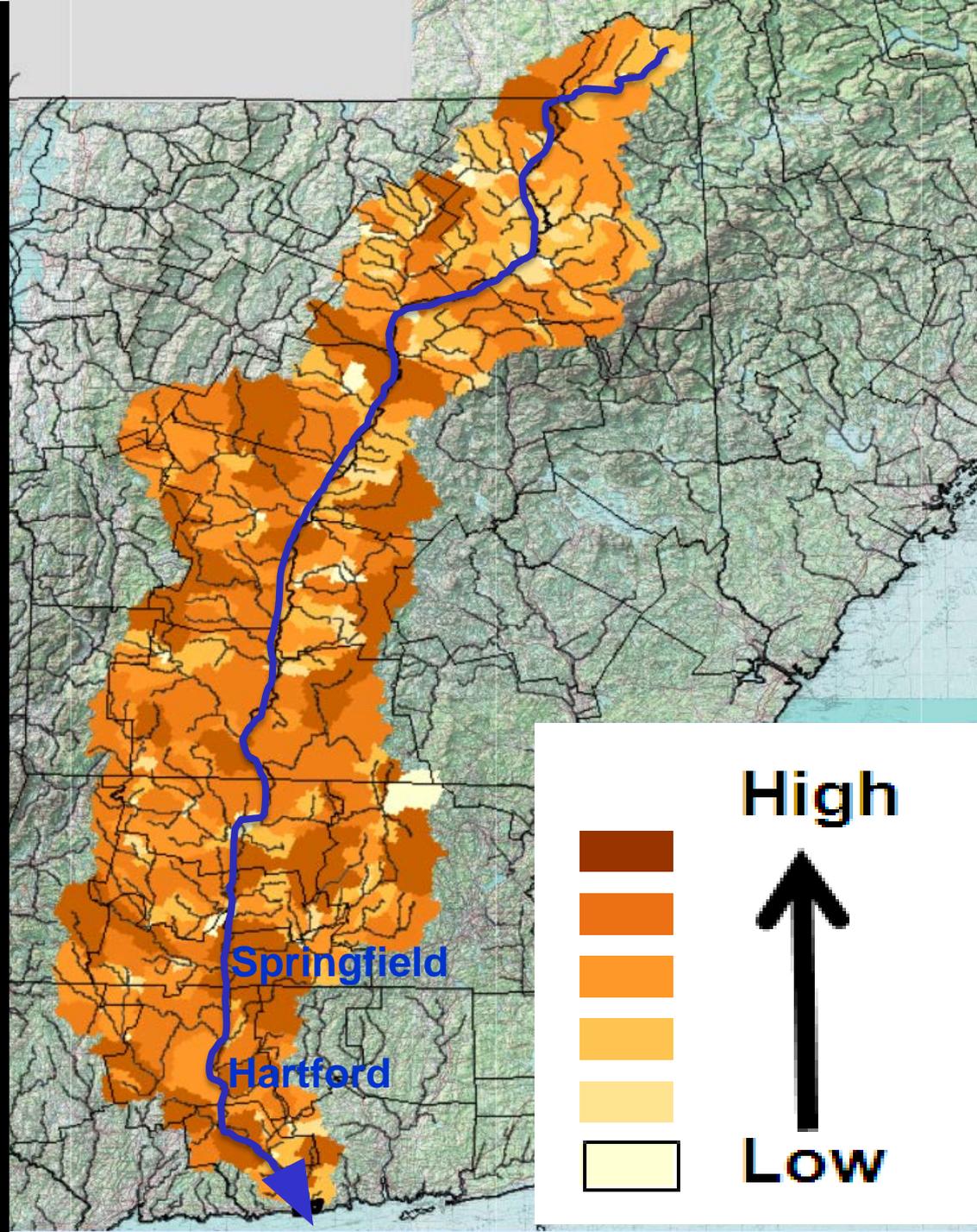


Catchment Yields of Dissolved Solids to Streams in the Western United States



Connecticut River Example:

Catchment Yields, All Sources

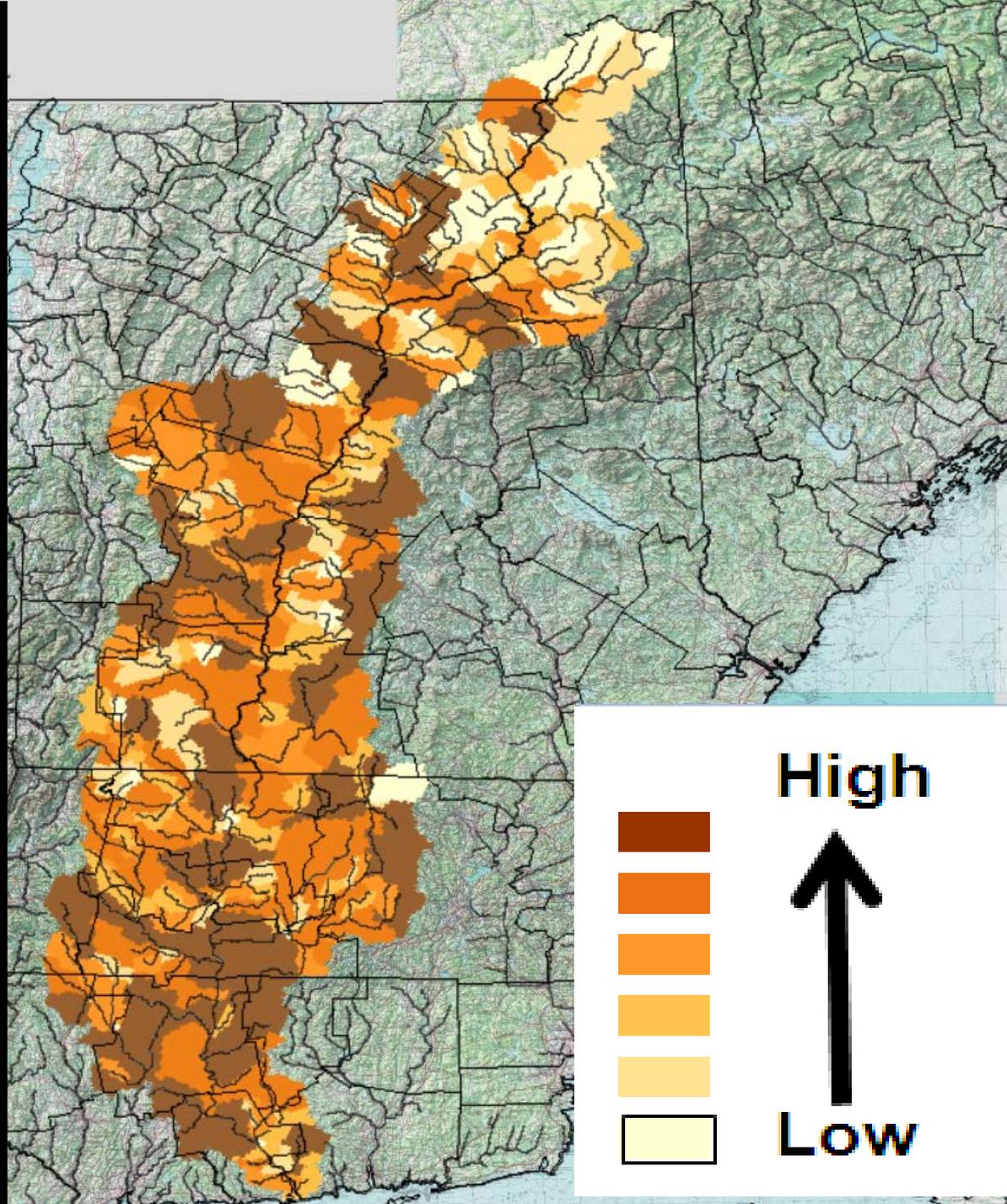


Connecticut River Example: Sources

Sources of dissolved solids at the river's mouth:	Percent
Geologic materials	50.0
Cultivated Lands	0.1
Pasture Lands	1.3
Urban Lands	7.8
Road Deicers	39.0
Inflow at boundary with Canada	1.6

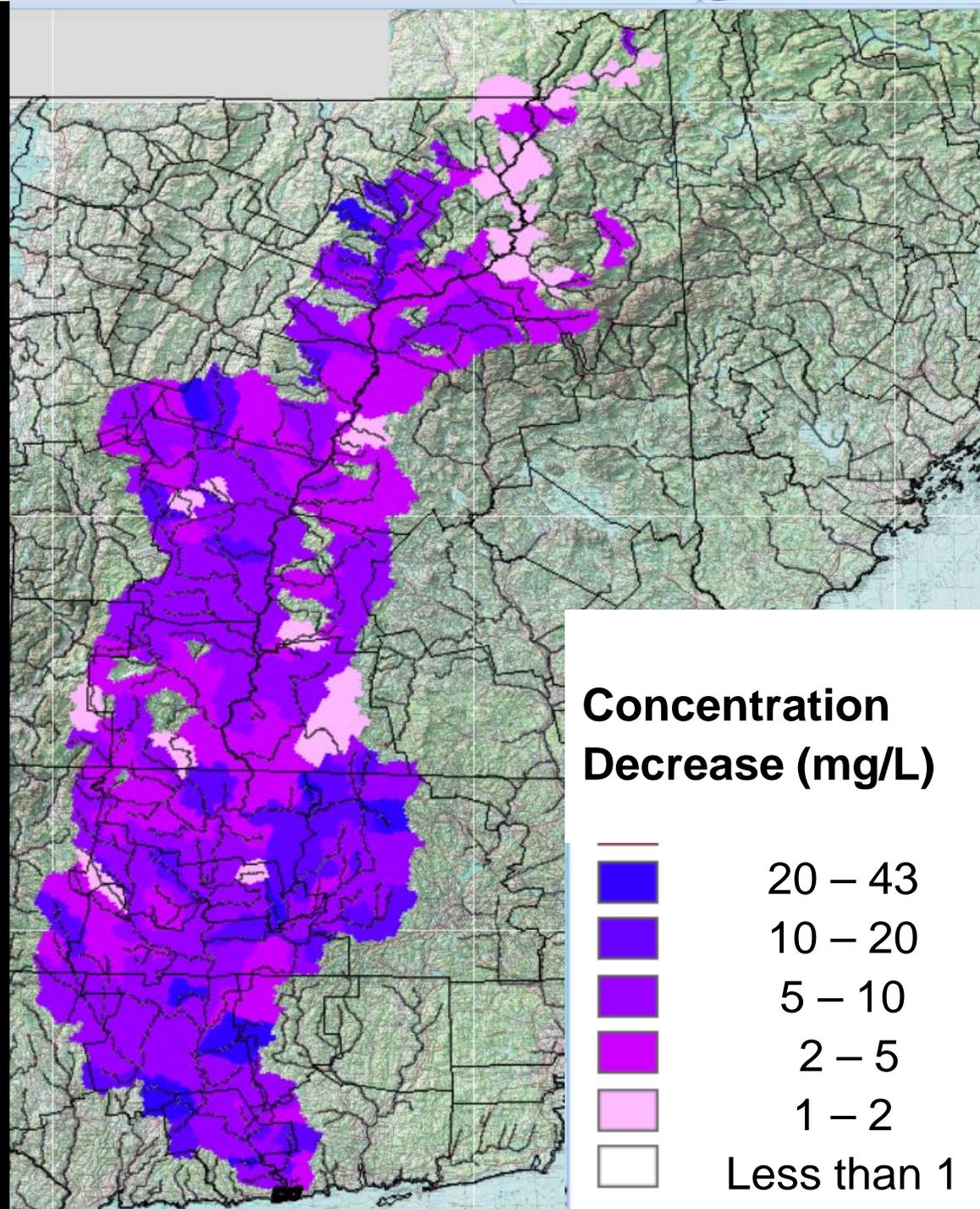
Connecticut River Example:

Catchment Yields—Road Deicers



Connecticut River Example:

Concentration
decrease from
25% Reduction of
Inputs from Road
Deicers



Connecticut River Example: Delivery Reports

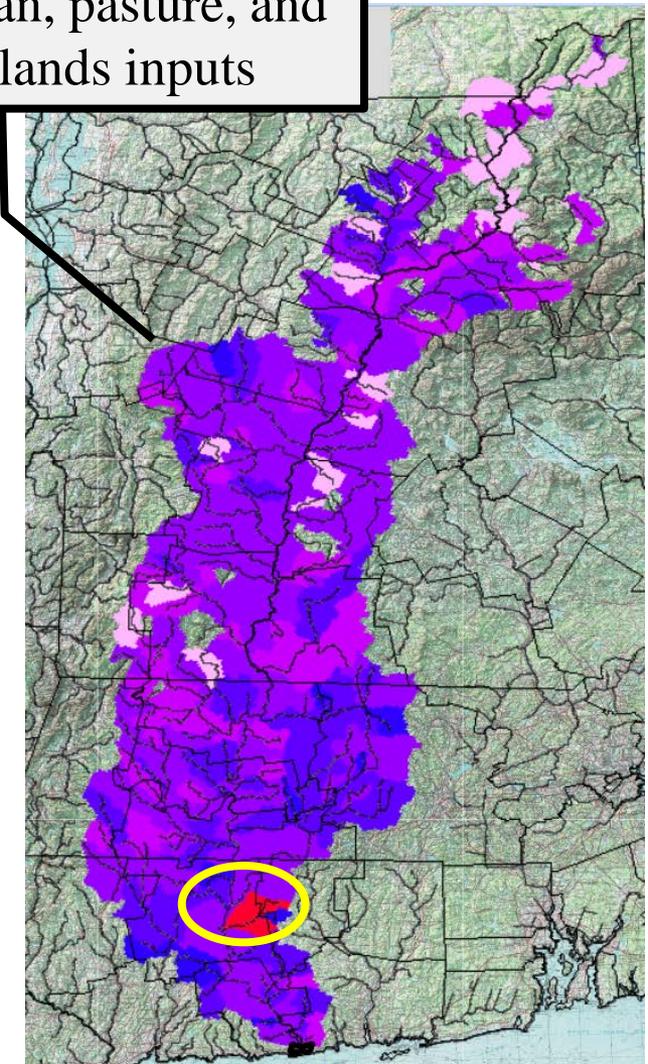
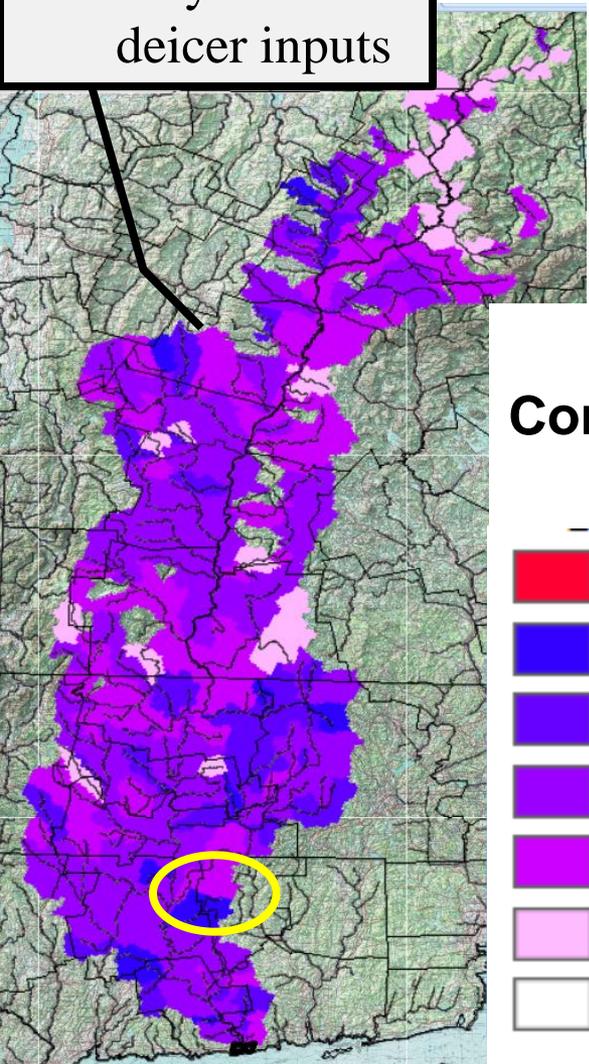
State*	Deliveries from Deicers, metric tons	Share of total deicer deliveries by state, percent
Connecticut	96,000	23
Massachusetts	136,000	33
New Hampshire	56,000	13
Vermont	129,000	31
Total	417,000	100

*Minimal drainage areas & deliveries from Canada and Maine neglected here for simplification

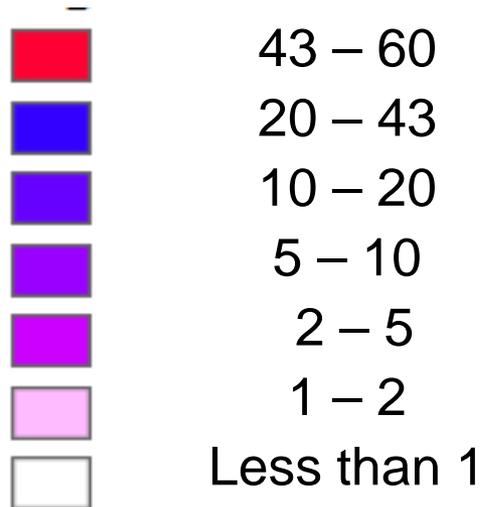
Connecticut River Example—Comparison of concentration decreases for two different 25% reduction scenarios

25% Reduction only in road deicer inputs

25% Reduction in road deicer and in urban, pasture, and cultivated lands inputs



Concentration Decrease:
(mg/L)





How Can This Information Be Used?

- Prioritize Areas for Dissolved-Solids Reduction
- Better Understand Dissolved-Solids Sources
- Test Long-Term Benefits of Reductions

For more information:

- Access to the Report and Decision Support System:

http://water.usgs.gov/nawqa/home_maps/dissolved_solids.html

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