Motivations for water indicators: You can't manage what you don't measure

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Motivations

- **Background for intelligent resource stewardship**
- **Tracking year-to-year changes important to resource management**
- **Tracking long-term indicators – relevant to national policy – showing progress or lack of progress**
- **A reminder of what we don't know**

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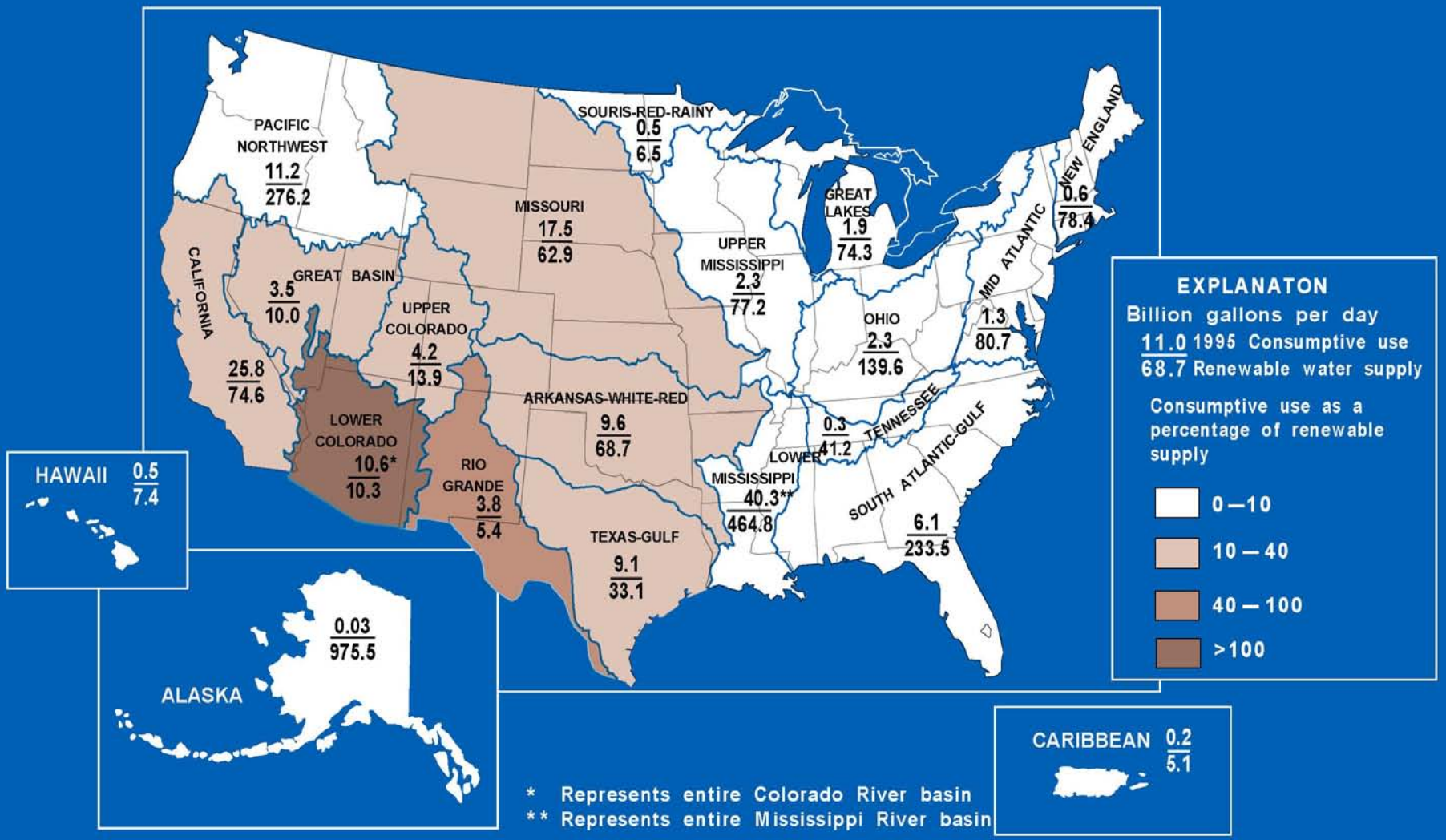
CONSUMPTIVE USE AND RENEWABLE WATER SUPPLY, BY WATER-RESOURCES REGION



* Represents entire Colorado River basin
** Represents entire Mississippi River basin

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WaterWatch -- *Current Water Resources Conditions*

Current Maps/Graphs:	Flood Watch:	Drought Watch:	Recent/Historical Maps/Graphs:
			Hydrologic Unit Runoff Maps and Graphs

Runoff Map

WaterWatch -- *Past streamflow conditions*

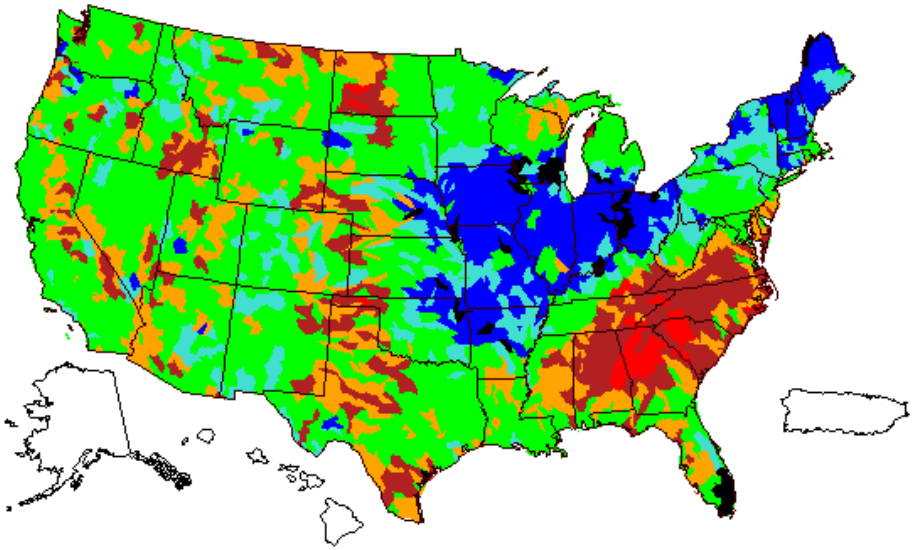
Computed runoff in hydrologic units

Time Period:	Map:	Year:	
Water Year	Runoff Percentile	< 2008 >	Go

|<< < 2008 > >>|

- Graphs and tables for individual hydrologic units
- Download runoff data

2008



Explanation -- Percentile Range							
Lowest	< 10	10 - 24	25 - 75	76 - 90	>90	Highest	No data

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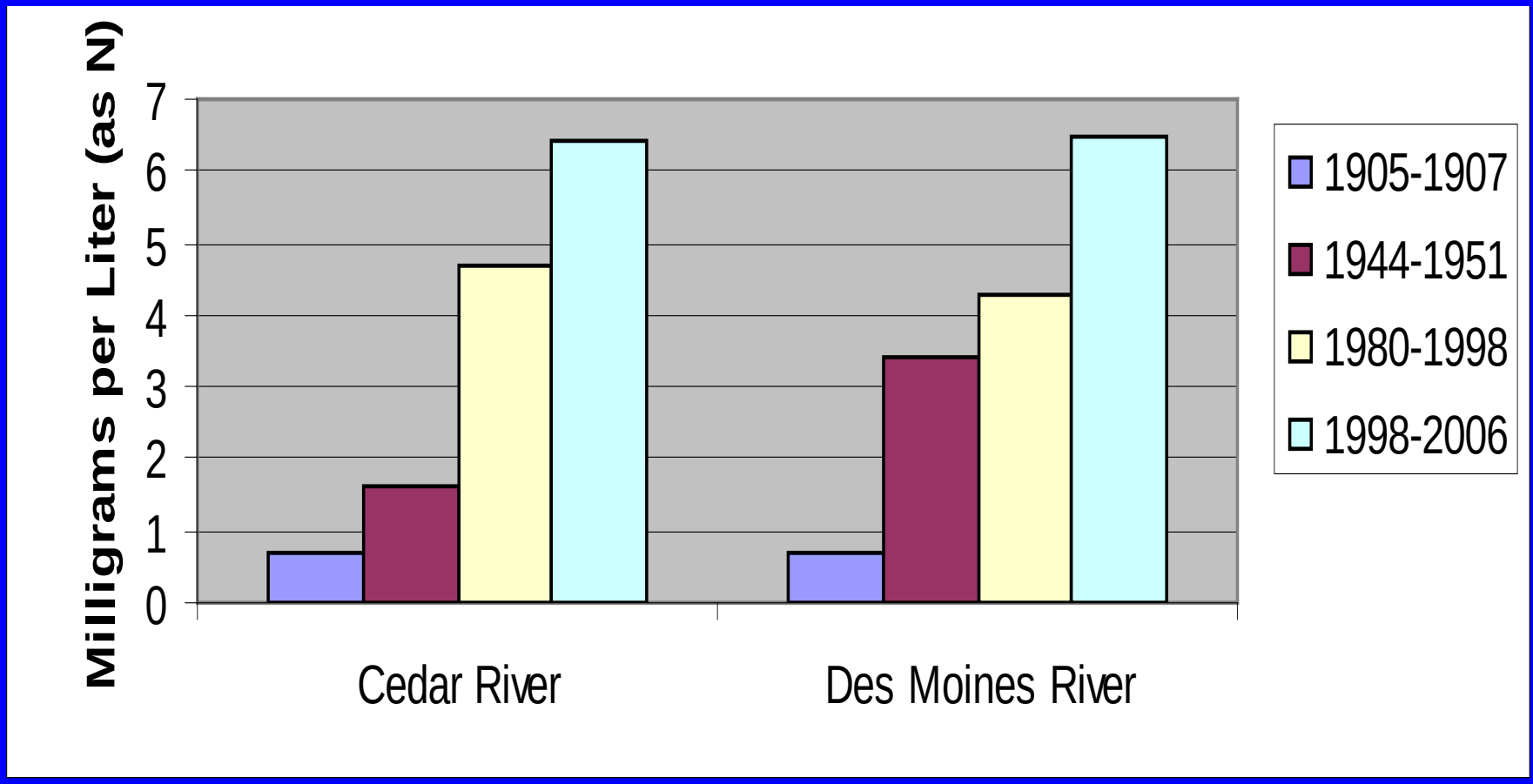
100-year Trends in Nitrate Concentrations in Two Iowa Streams



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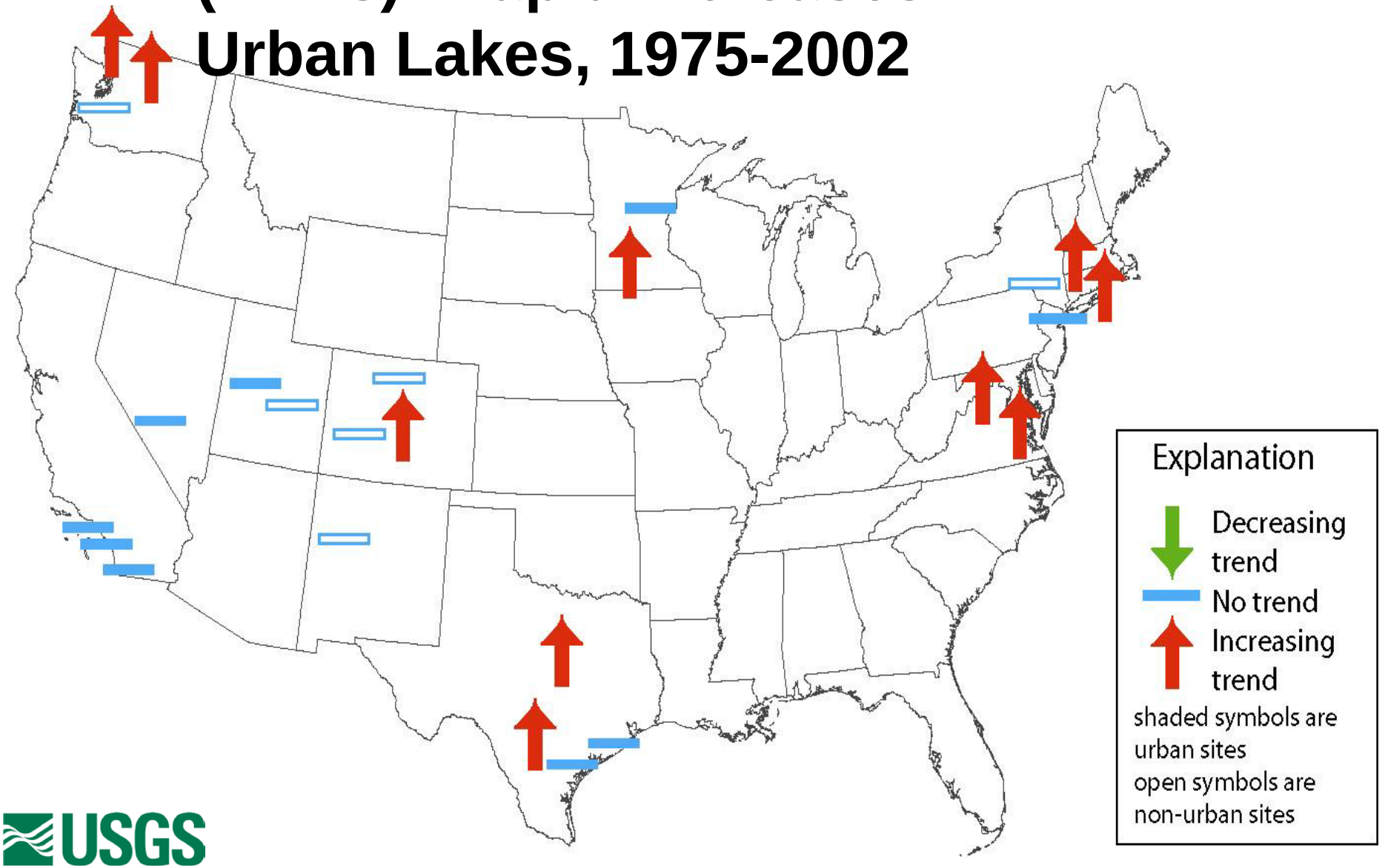
* Graph courtesy of John North, Cedar Rapids Water Department, Retired

Polycyclic Aromatic Hydrocarbons (PAHs)--Rapid Increases in Urban Lakes, 1975-2002



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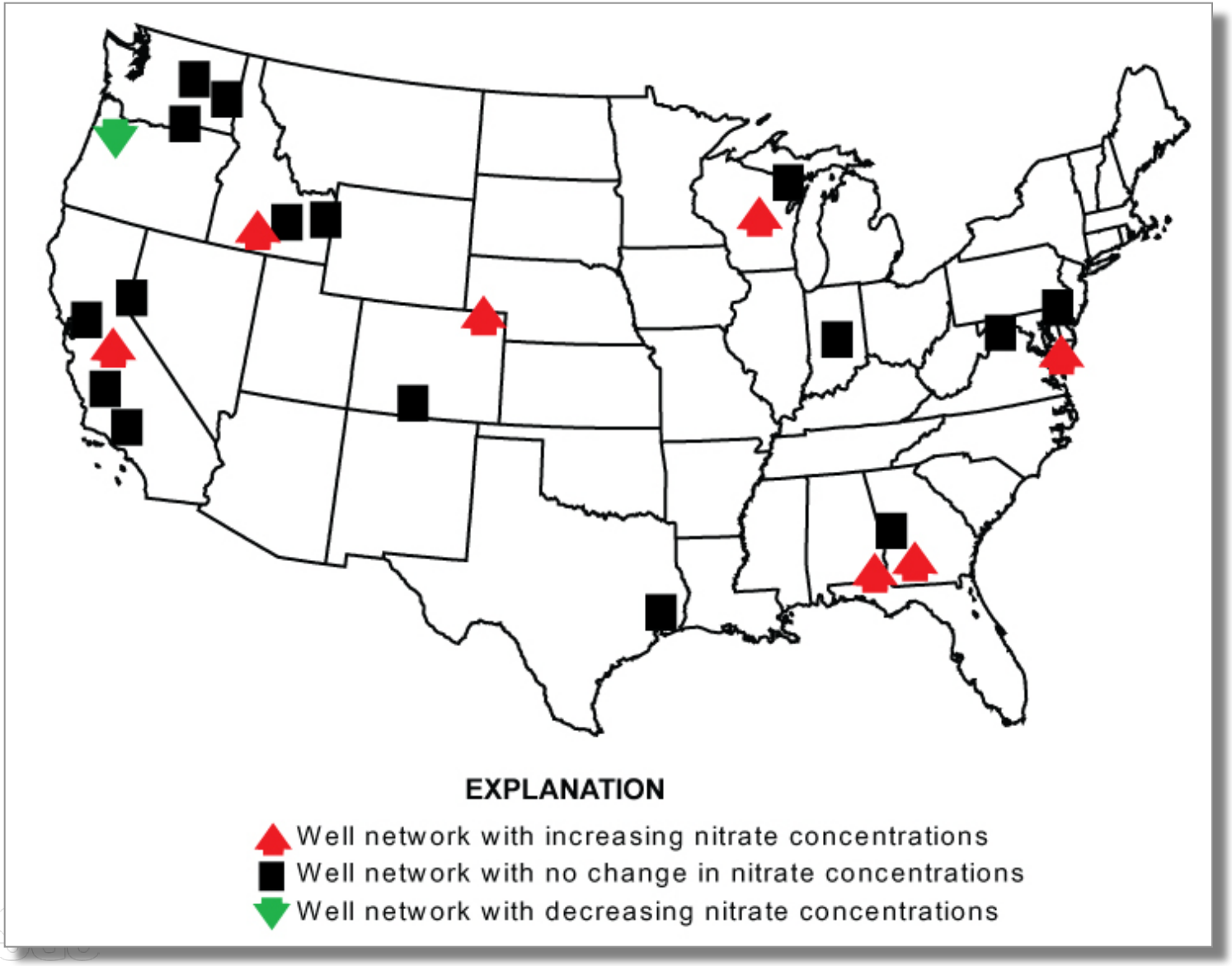
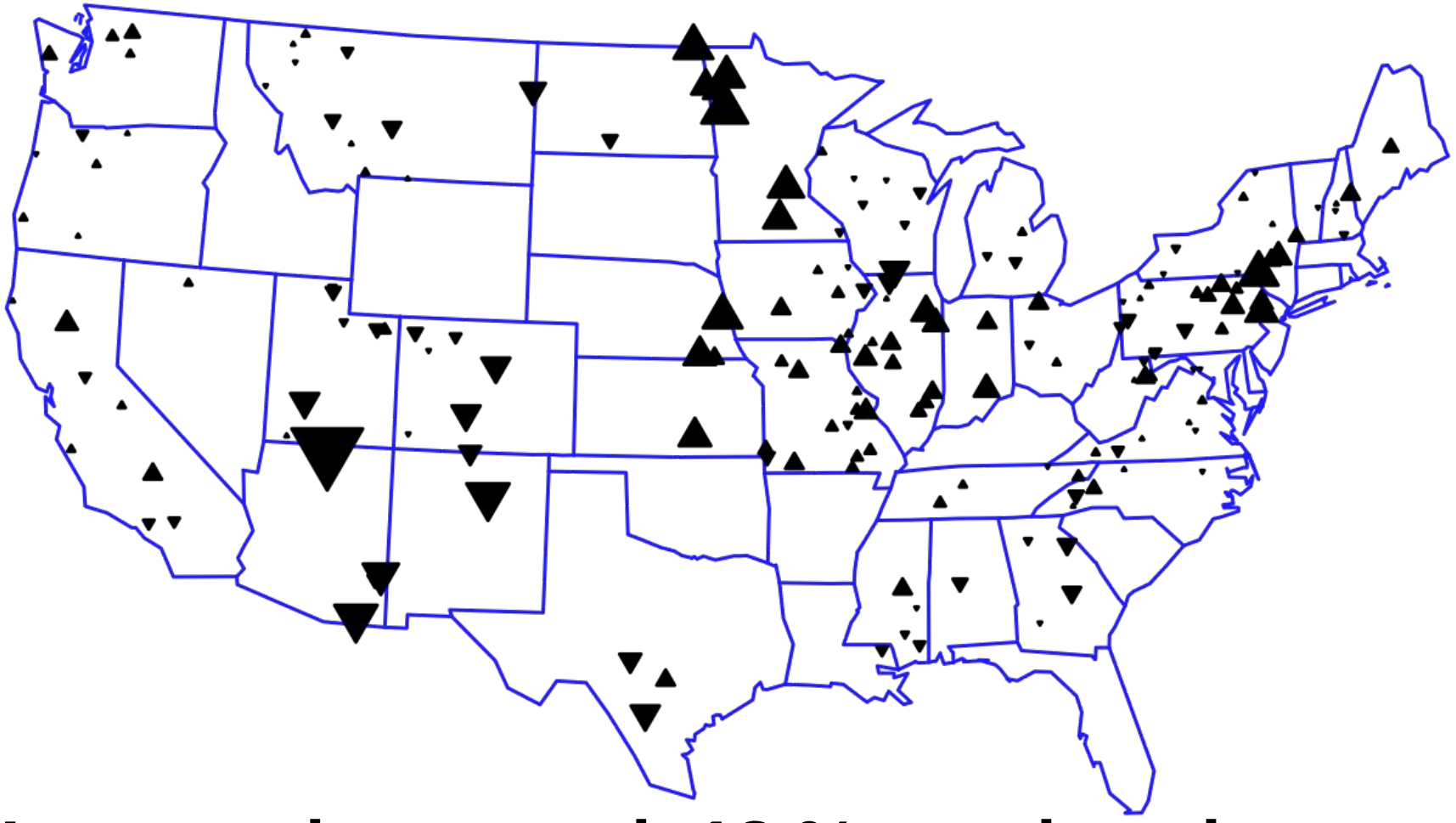
TRENDS: Nitrate in Shallow Groundwater



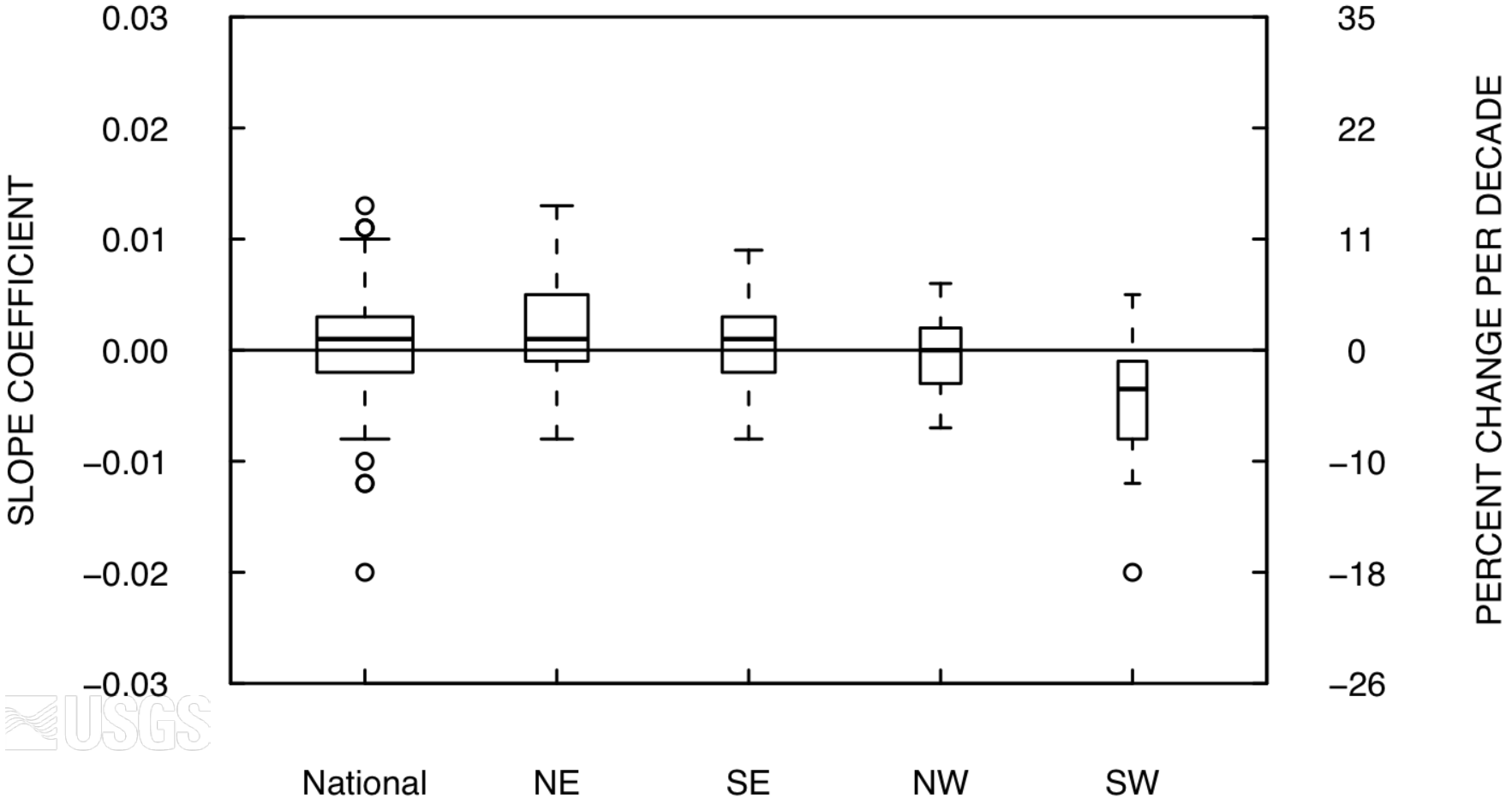
JEQ Special Issue: Sept-Oct 2008

Trends in size of the annual flood, records of 85-126 years duration

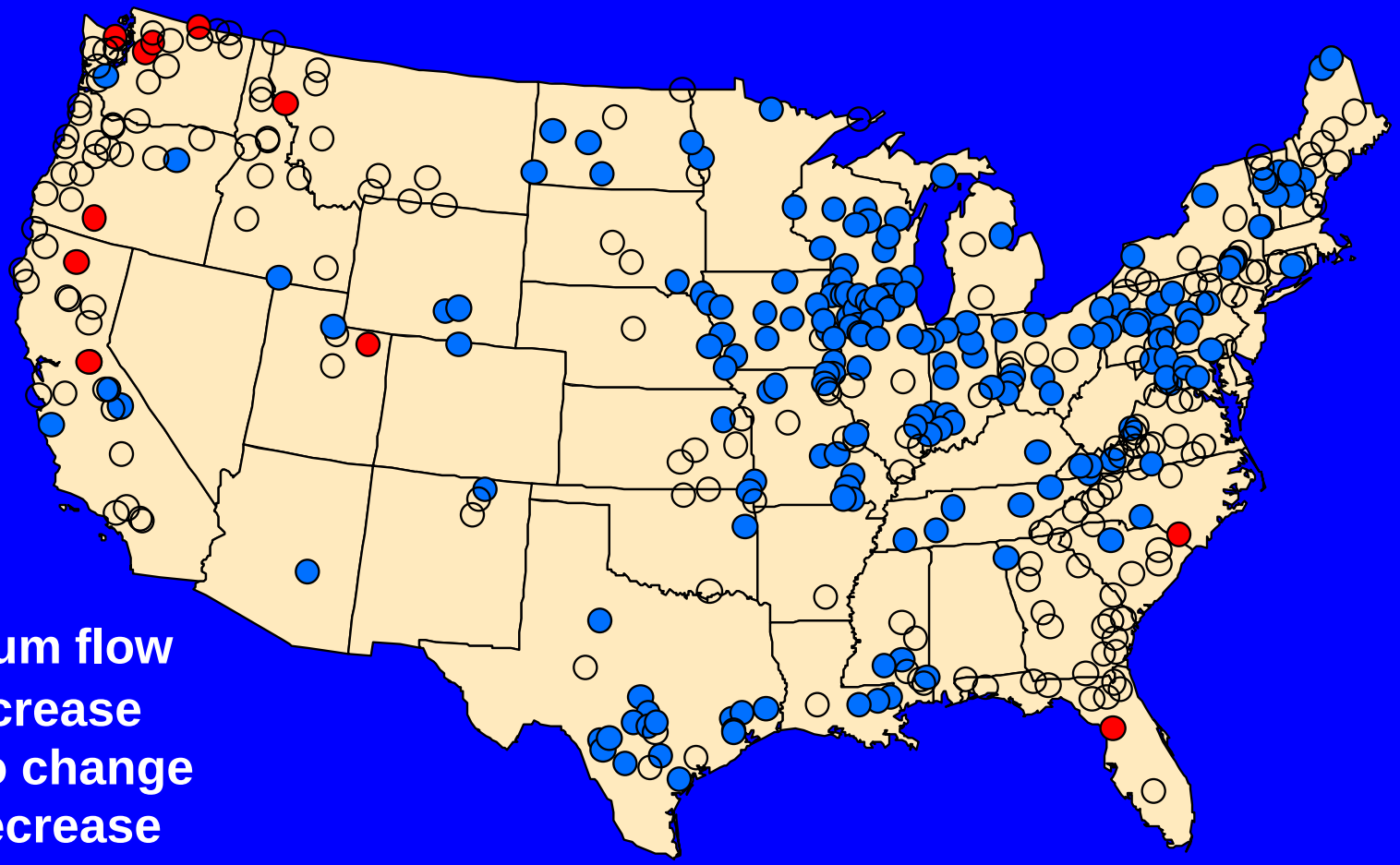


Largest downtrend -18 % per decade
Largest uptrend +14 % per decade

Boxplots of slopes of regressions of log(annual flood) versus water year at 200 long record streamgages



About 50% of the 400 sites show an increase in annual minimum flow from 1941-70 to 1971-99



Minimum flow

- Increase
- No change
- Decrease

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From McCabe & Wolock, Geophysical Research Letters, 2002

From Ralph Keeling

A continuing challenge to long-term Earth observations is the prejudice against science that is not directly aimed at hypothesis testing.

At a time when the planet is being propelled by human action …. We cannot afford such a rigid view of the scientific enterprise.

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From Ralph Keeling

The only way to figure out what is happening to our planet is to measure it,

and this means tracking changes decade after decade

and poring over the records.

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The reminders of what we don't know can lead to:

- Efforts at synthesis and indicator development
- Improved strategies for using data from diverse sources
- Development of plans and support for sustained data collection

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