Nutrients: A National Overview
Need for Strong Partnerships & Joint Accountability

The Problem……

FRRCC FACA Meeting
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Outline

- Overview of the Problem
- Nutrient Impacts
- N & P Sources
- Nutrient Innovation Task Group Analysis
- Growing Pressure & Stakeholder Demands
- Looking Forward

Science and Analysis to Date

- **National Oceanic and Atmospheric Administration**
  - Effects of Nutrient Enrichment in the Nation's Estuaries (Bricker et al 2007)
- **National Research Council**
  - Mississippi River Water Quality – Challenges & Opportunities (NRC 2008)
  - Urban Stormwater Management (NRC 2008)
- **EPA Science Advisory Board**
  - Reactive Nitrogen in the United States (USEPA 2009)
  - Hypoxia in the Northern Gulf of Mexico (USEPA 2007)
- **USEPA**
  - National Coastal Condition Report III ((USEPA 2008)
  - Wadeable Streams Assessment (USEPA 2006)
- **Nutrients Innovations Task Group Report (2009)**
- **Numerous Articles, State Reports, and University Studies**

National & State Efforts to Date

- Investment in Research and Science
- Commitment to Development of Guidance, Technical Asst. and Information Transfer
- Number of State and Local BMP Pilots and Technology Demonstration Projects
- Continued State Innovation, Testing, and Exploration of Incentive, Cost-share, Limit of Technology, Trading, and Collaborative Approaches
- State Oversight and Regulatory Models

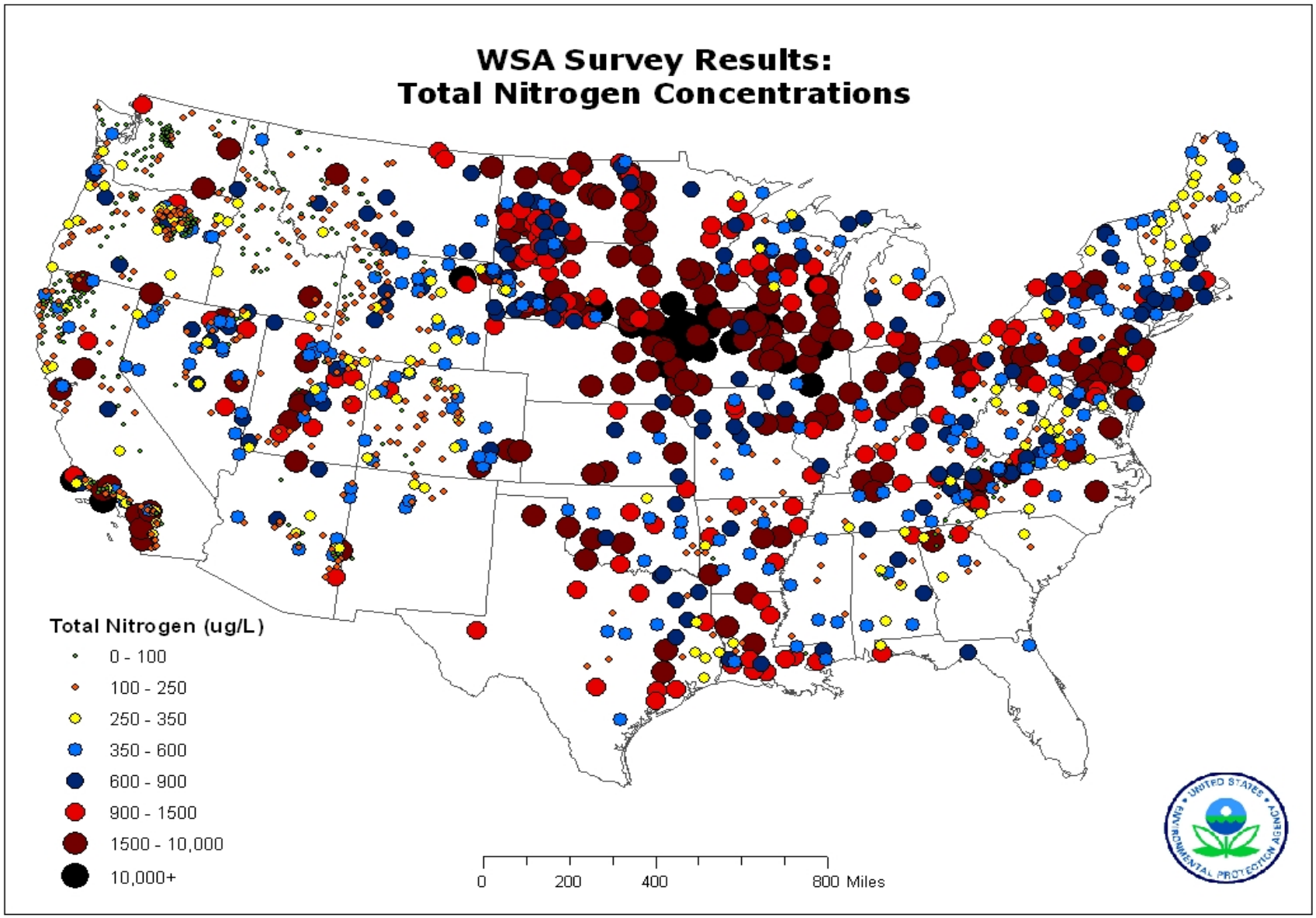
Progress in 2009/2010

- **Chesapeake Bay**
  - Executive Order, Strengthened State/Federal Partnerships, Stakeholder Action
  - TMDL Developed
- **Florida**
  - Final inland flowing water standards – Fall 2010
  - Final coastal waters and estuarine standards - August 2012
- **Water Quality Standards Program**
  - State-EPA Nutrients Innovation Task Group Report – August 2009
  - IG State Numeric Standards Report – August 2009
  - Support for State Numeric Nutrient Standards & Accountability Frameworks
- **Rulemakings**
  - CAFO regulatory revisions initiated
  - Post-Construction proposal begun with ICRs and listening sessions
- **Guidance**
  - Final POTW Nutrient Treatment Effectiveness Manual – Winter 2009
  - Chesapeake Bay 502 Non Point Source BMPs – Summer 2010

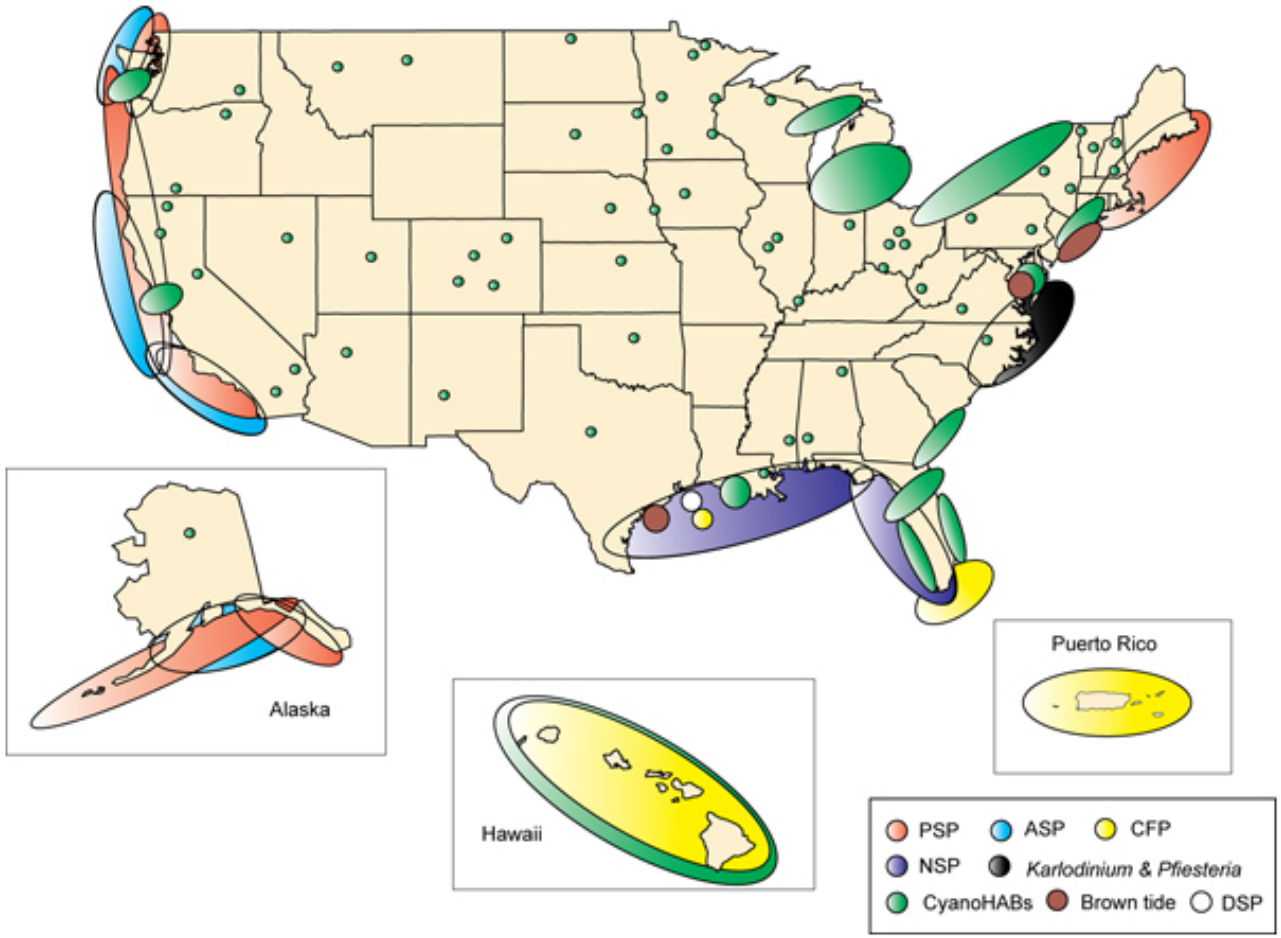
National Scope of Nutrient Problem

- **14,000 Nutrient-related Impairment Listings in 49 States**
  - **2.5 Million Acres of Lakes and Reservoirs**
  - **80,000 Miles of Rivers and Streams**
  - **And This is an Underestimate . . .**
- **Over 47% of Streams Have Medium to High Levels of Phosphorus and Over 53% Have Medium to High Levels of Nitrogen**
- **78% of Assessed Continental U.S. Coastal Waters Exhibit Eutrophication**
- **Drinking Water Public Health Risks Increasing**

Concentrations of Nitrogen Nationally

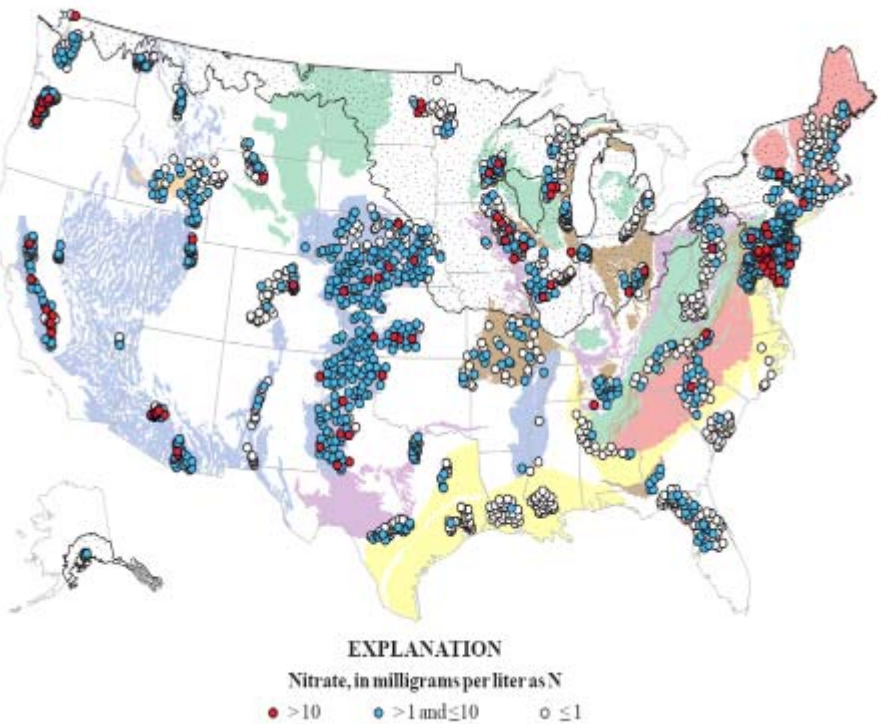


Algal Bloom Occurrences in the United States (WHOI 2007).



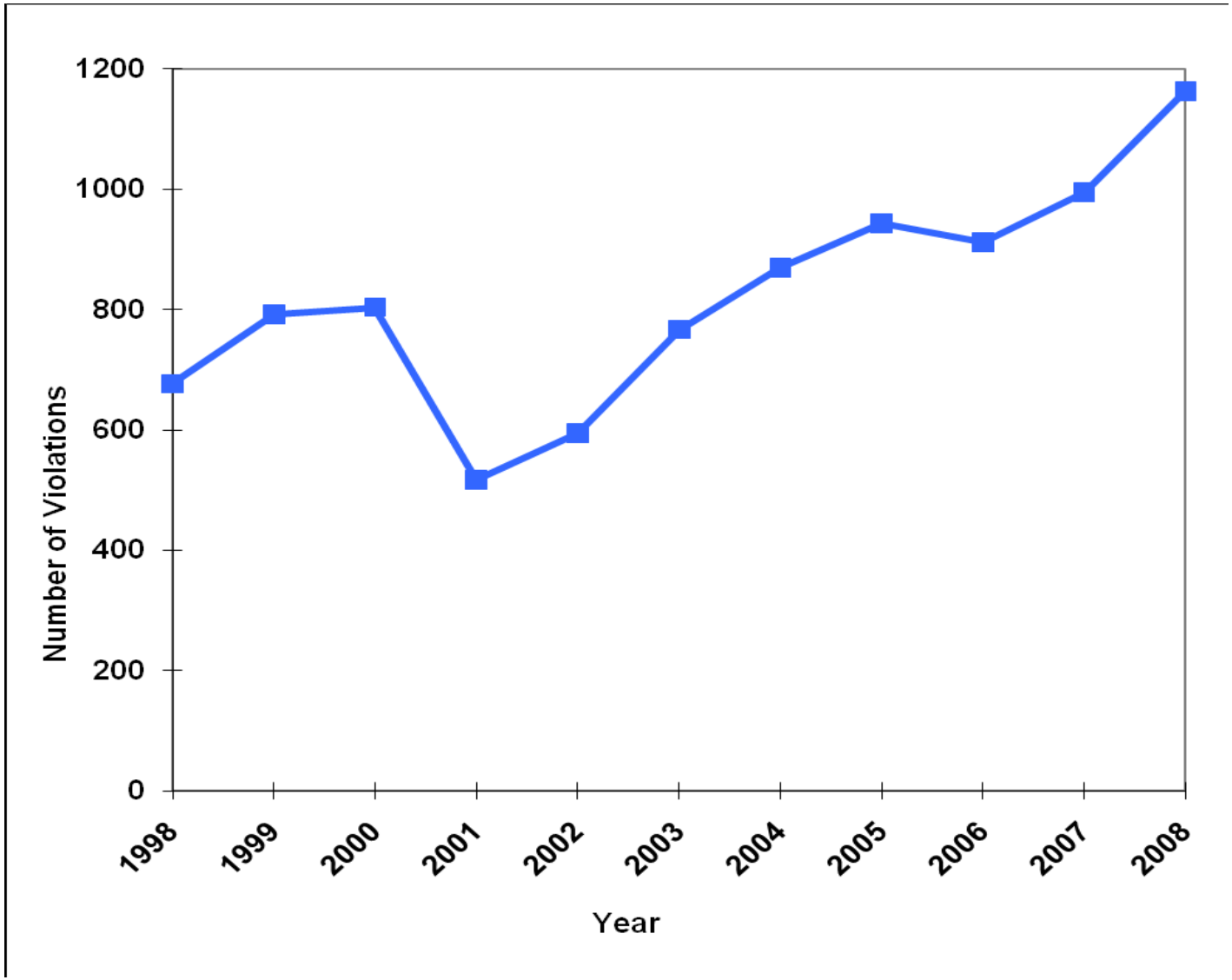
National Drinking Water Impacts

- **Public Health Risks:**
  - Disinfectant by-products; significant & costly
  - Contaminated drinking water supplies
  - Rate of nitrate violations in community water systems has doubled over past 7 years
  - Harmful algal blooms
  - Increased treatment costs
    - Large Systems
    - Small Systems
    - Private Wells



(MCL of 10 mg/l exceeded as N in 4.4 percent of the wells)

Community Water System (CWS) Drinking Water Nitrate Violations



National Population Growth

- **Nutrient Impacts Reflect Doubling of U.S. Population Over Past 50 Years**
- **Additional 135 Million People by 2050**
- **Nutrient Pollution Expected to Accelerate**

Year	U.S. Population
1950	152 million
2008	304 million
2050	439 million

Microcystis bloom - August 2003

Toledo Water Intake

Impaired Reservoirs – Examples

Impaired Streams – Examples

Wisconsin DNR

Impacts on Downstream Waters

Microcystis Bloom – Goodby's Creek at the St. Johns River, Jacksonville, FL – September 14, 2005

Sources of Nutrient Pollution

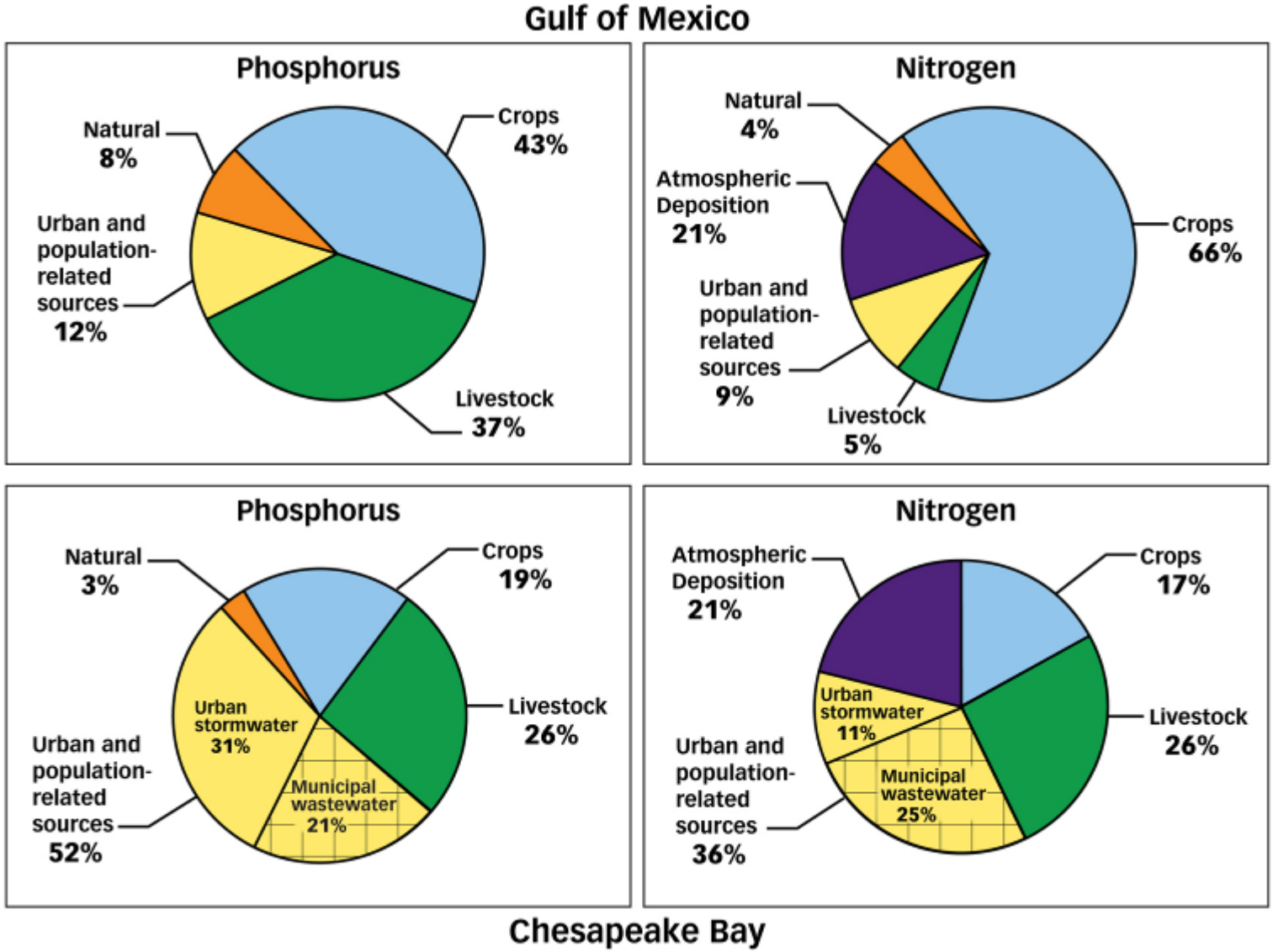
- **Urban Stormwater**
  - 80% of U.S. Population on 10% of Land
  - 50% of Urban Areas Will be Redeveloped by 2030
  - 30% of Additional Needed Housing Stock Not Yet Built
  - Expected to Grow Dramatically With Increased Urbanization
- **Municipal Wastewater Treatment**
  - Among Most Heavily Regulated Sectors
  - Treat over ***18 million tons*** of human solids annually
  - About 4% with numeric limits for N and 10% for P
- **Air Deposition**
  - Approx 20% of Nitrogen Loadings in Chesapeake and Gulf

Sources of Nutrient Pollution

- **Livestock Production Activities**
  - **$130 billion industry for farmers**
  - ***1 billion tons*** **of manure annually**
  - **Substantial portion not covered by CAFO rule**

- **Agricultural Row Crops**
  - **$120 billion industry for farmers**
  - **Inefficient fertilizer utilization – about 30% of applied N**
  - **Stormwater runoff and irrigation return flows exempt under CWA with highly variable controls at State levels**

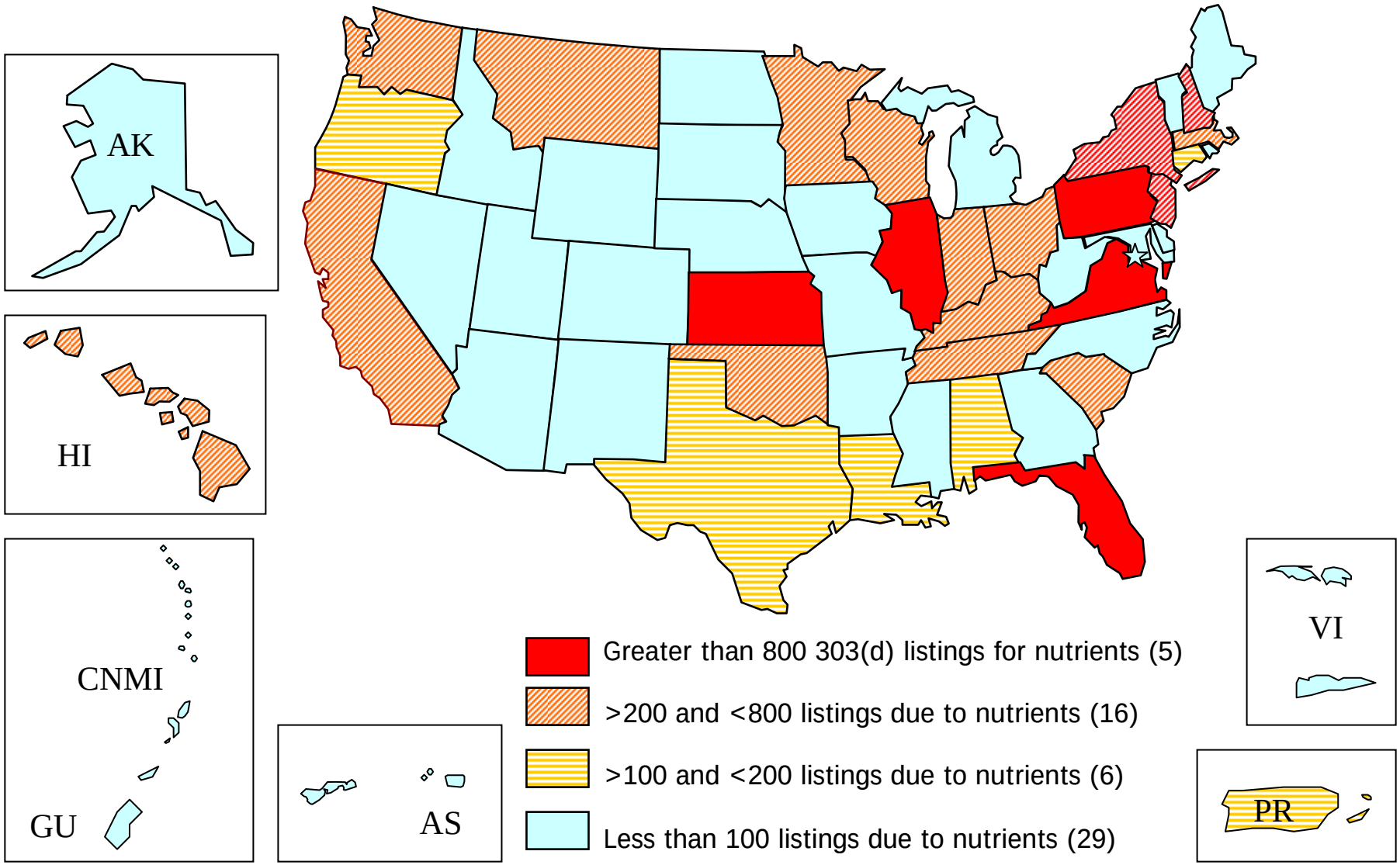
Relative Nutrient Source Contributions



Tools and Authorities

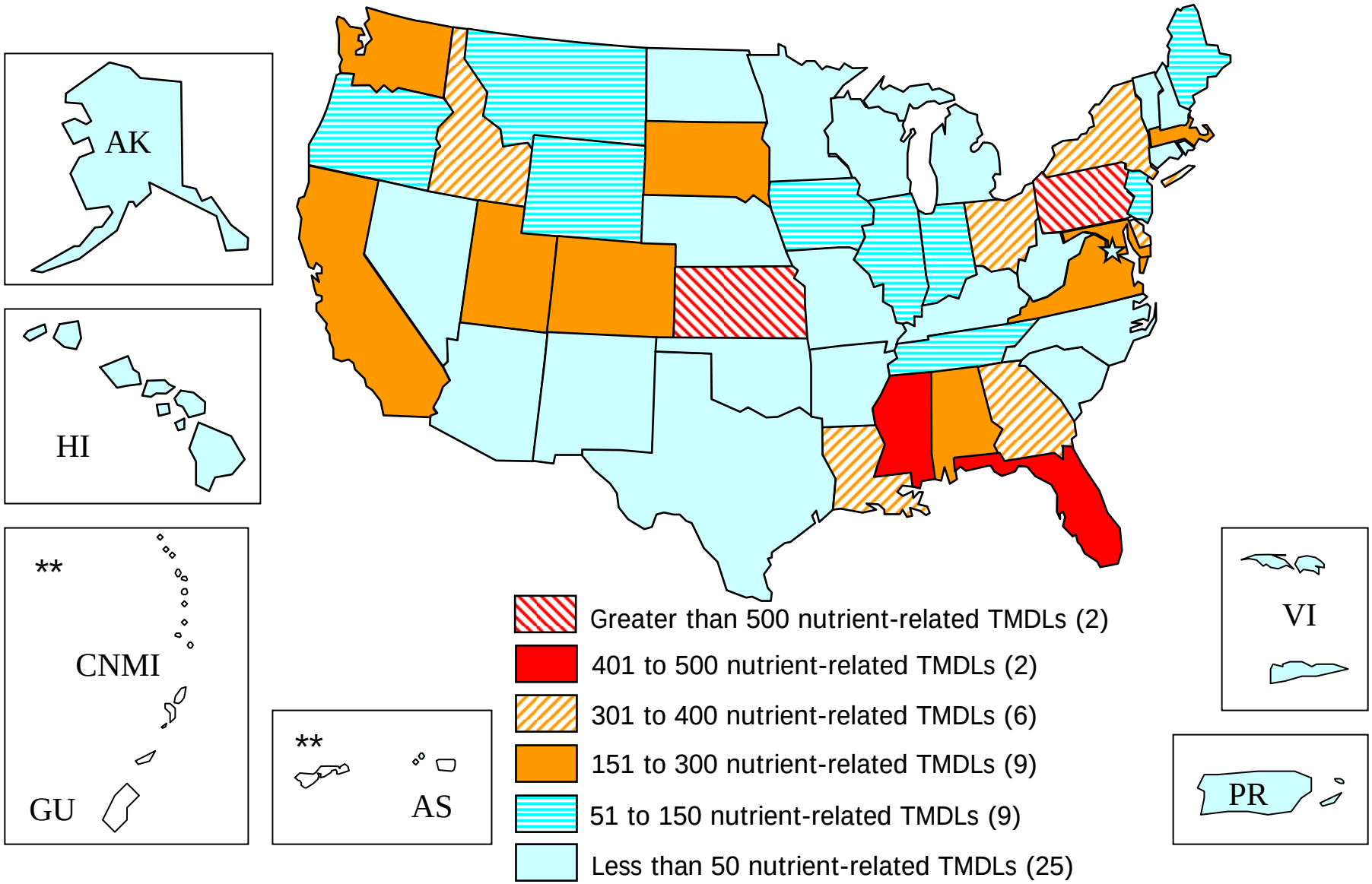
- **Incentives: voluntary agreements, corporate stewardship, trading**
- **Non-regulatory: volunteer monitoring, nutrient load reduction strategies, tracking of implementation plans**
- **Existing & Alternative Regulatory: point source caps, NPDES & WQS regulations, NPS regulations**
- **Legislative: Federal & State**

States' 303(d) Listed Water Quality 'Nutrient-related' Impairments are inconsistent (e.g., see MRB mainstem)



Based on the most recent available information in Expert Query (ATTAINS).

The number of Nutrient-related' TMDLs completed is very inconsistent from state to state



Based on information in Expert Query (ATTAINS) as of 01/14/2010. 7,261 TMDLs were nutrient-related. Nutrient-related is defined as 'nutrients, organic enrichment/oxygen depletion, noxious plants, algal growth, and ammonia'. ** CNMI, GU, and AS have no nutrient-related TMDLs

Progress Toward State Development of Numeric Nutrient Criteria

including lawsuits, petitions, and alternative accountability frameworks

Tools and Authorities

Partially Utilized	Under Utilized
NPDES	Urban Stormwater Controls
Numeric Nutrient Criteria	Technology-based Requirements
303 Assessments & listings	CZARA section 6217 Implementation Reqs
TMDLs	Limits on Discharges to Impaired Waters
Livestock	Antidegradation

Key NITG Findings

- **Knowledge, Collaboration, and Incentives Will Fail Absent Joint Accountability**
- **Current CWA Tools Underused; Additional Tools Rarely Used**
- **Current Regs Disproportionately Address Certain Sources to the Exclusion of Others**
- **Parts of State Nonpoint Source Programs Highly Successful, But Broader Application Undercut by Absence of a Common Multi-State Framework of Mandatory Point and Nonpoint Source Accountability**

Need for More Effective Action

- **Joint Accountability**
  - All Major Sources of Nutrients Must be Held Accountable for their Contribution to the Problem
- **Fuller Use of Existing Tools**
  - Supporting and Requiring a More Consistent and Full Use of Existing Tools from State to State & Source to Source is Essential
- **Profound Change**
  - Succeeding Against the Challenge of Nutrient Pollution Will Require a Profound Change in **How We Partner** and **How We Share Accountability** Between Sources, Within Watersheds, and Across State Lines
- **National & State Leadership**

Larger Context:

Litigation, Petitions, and Environmental Reports

- **NRDC Secondary Treatment Petition – Nov. 2007**
- **Mississippi River Watershed Petition – July 2008**
  - **EPA Numeric Standards for MN, WI, IL, IA, MO, AR, KY, TN, MS, LA**
  - **Sierra Club Petition in Support – 40,000 Signatures**
- **Florida Wildlife Federation's Lawsuit - July 2008**
- **PA TMDL Nutrients Litigation – Summer 2009**
- **Wisconsin Notice of Intent to Sue – November 2009**
- **Kansas Notice of Intent to Sue – Spring 2010**
- **Missouri Notice of Intent to Sue – Summer 2010**
- **Possible LA Litigation to Force Listing of Coastal Waters**
- **EPA I.G. Numeric Nutrient Standards Report (August 2009)**

Looking Ahead – Key Priorities

- **Nutrient Accountability Frameworks**
- **State Numeric Nutrient Standards**
- **Drinking Water Risks and Economic Impacts**
- **Stronger State & Federal Partnerships to Engage a Broad Set of Stakeholders and Secure Greater Results**
- **Broader EPA–USDA Coordination**
- **Continued Commitment to Science**

For More Information:

www.epa.gov/waterscience/criteria/nutrient