



Inland Waterways Spill Response Mapping Project



Risk Assessment of Sensitive Resources to Oil Spills within U.S. EPA Region 5

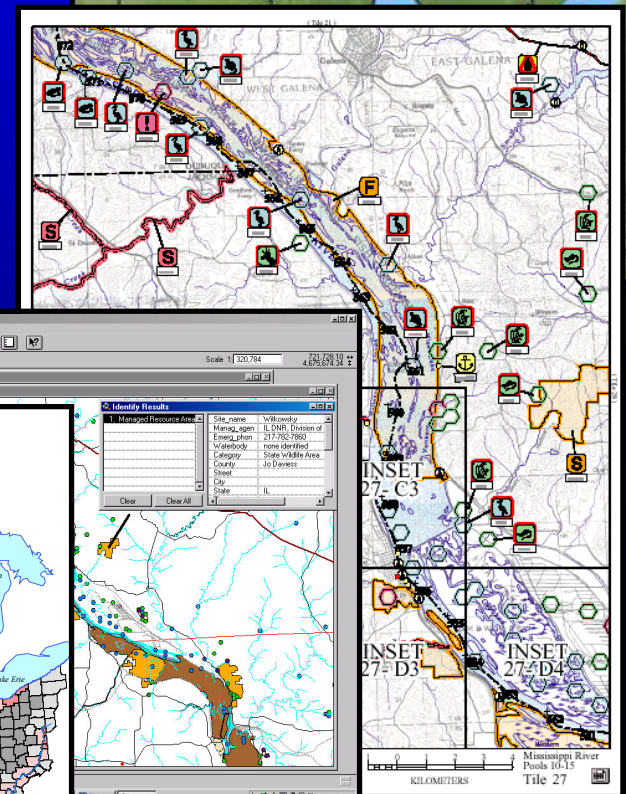
Inland Waterways Spill Response Mapping Project

- Exxon Valdez oil spill
- 1990 Oil Pollution Act
- Multi-agency collaboration
- Partner since 1994
- Documentation of spill-sensitive resources
 - Threatened and endangered species
- Documentation of spill threats
 - Oil pipelines and storage facilities



Inland Waterways Spill Response Mapping Project

- 6 states, 35 mapping areas
- Interactive maps and GIS data
- Oil spill risk assessment
- Contingency planning / training
- Emergency response



Inland Spill Response Project Partners

- U.S. Environmental Protection Agency, Region 5
- U.S. Geological Survey
Upper Midwest Environmental Sciences Center
- Great Lakes Commission
- Upper Mississippi River Basin Association



Risk Assessment Overview

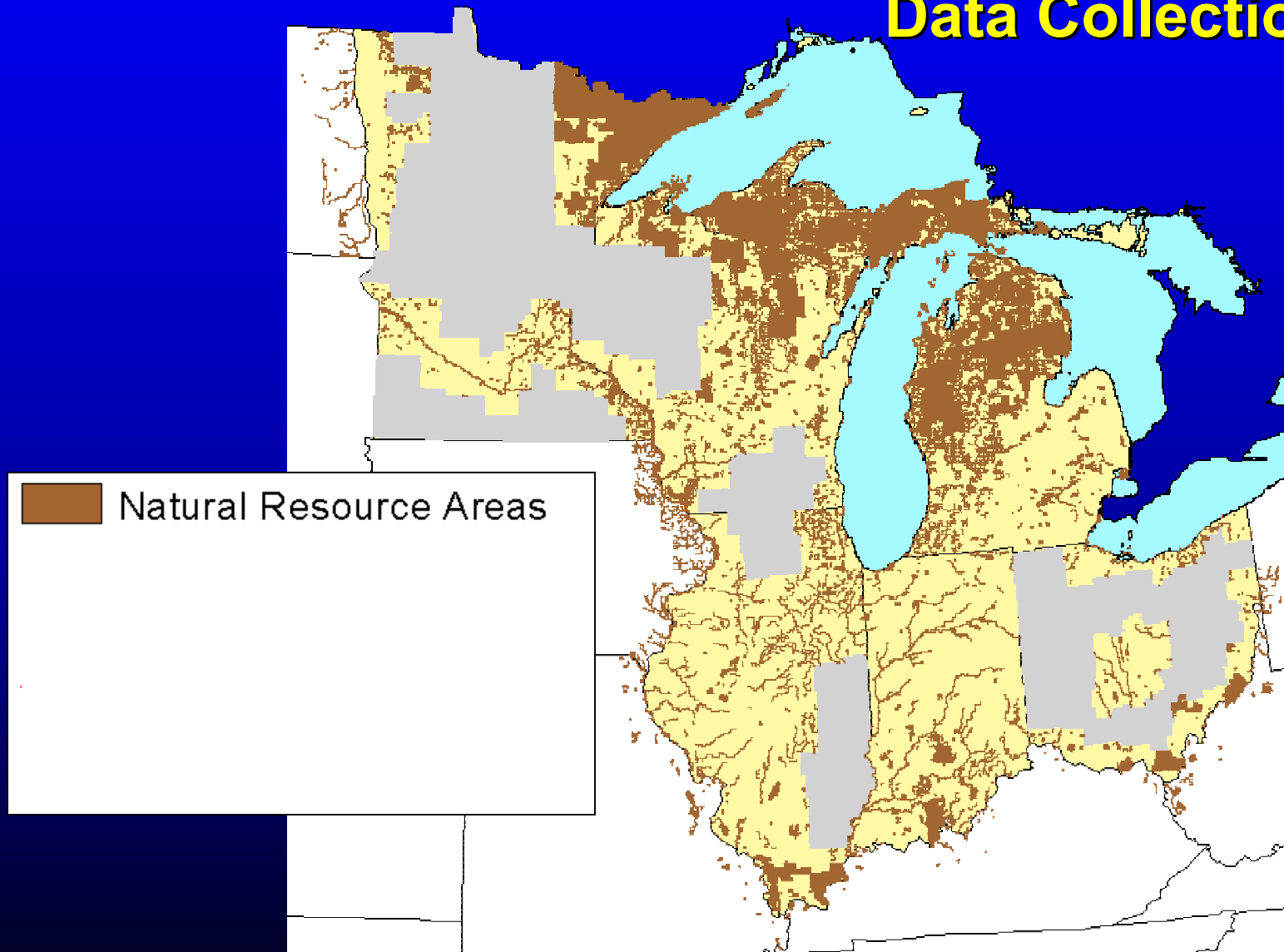
- GIS was used to spatially assess the risk of oil spills and their impacts in EPA Region 5
- Why?
 - Extensive regional database
 - Enhance emergency response
- What?
 - Assess sources of risk
 - Assess resources at risk
 - Perform assessment at two spatial scales
 - Examine normalized and non-normalized data

Risk Assessment Procedure

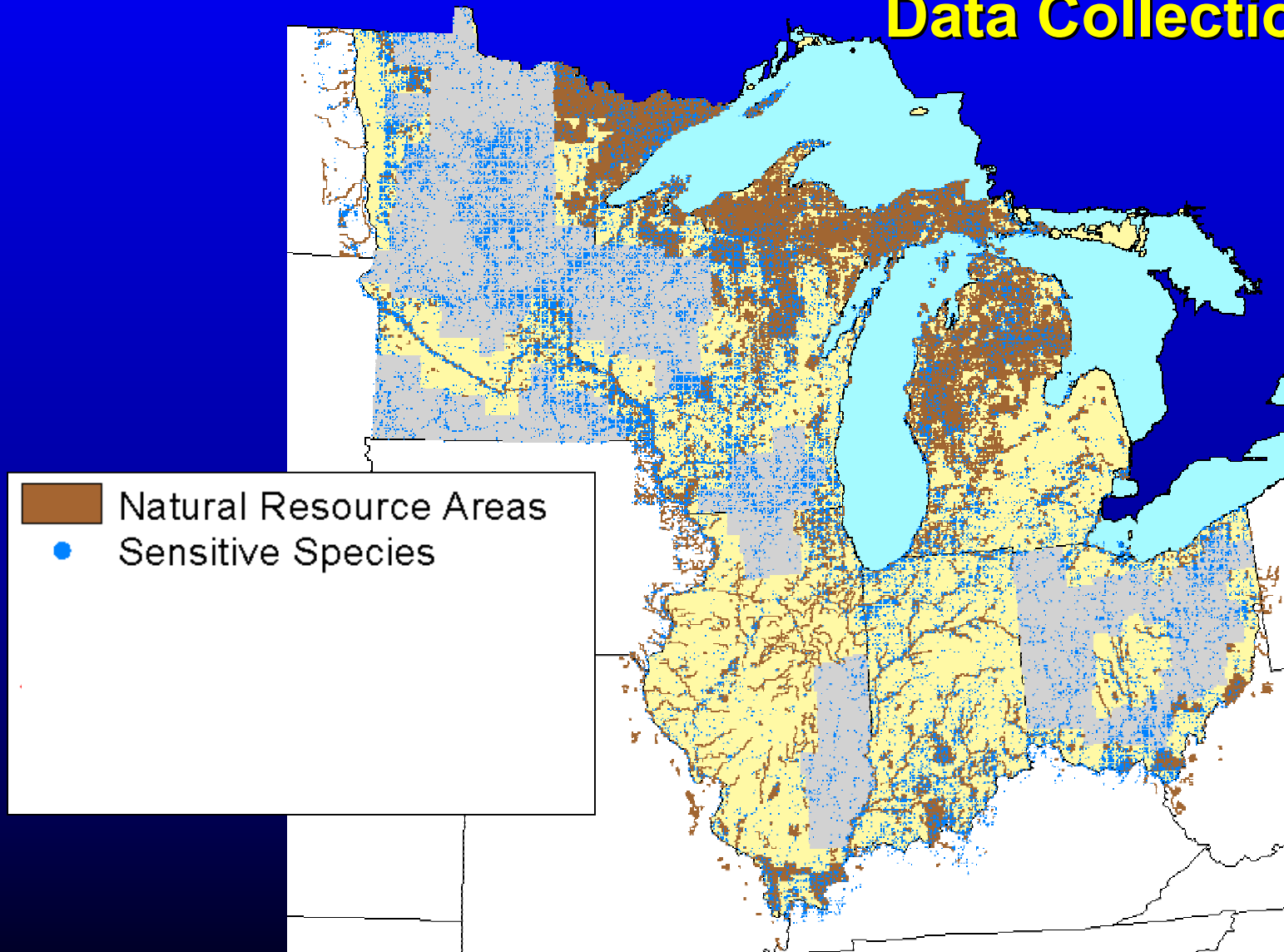
1. Determine risks
2. Assemble regional database
3. Summarize data by county
4. Group summary values into four rankings
5. Combine county rankings of risk
6. Generate final composite ranking of overall risk

7. Visually assess data by state

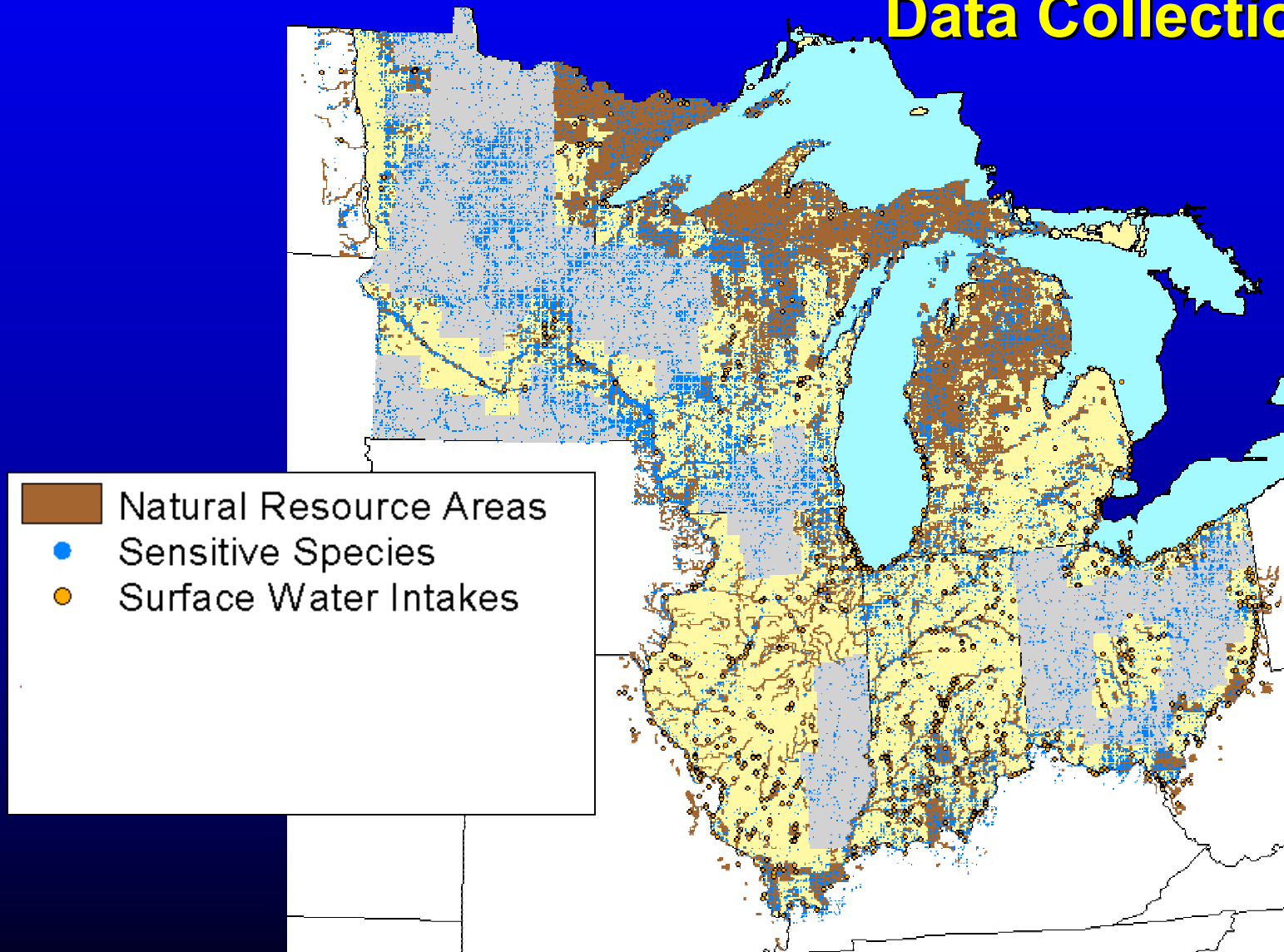
Inland Spill Response Project Data Collection



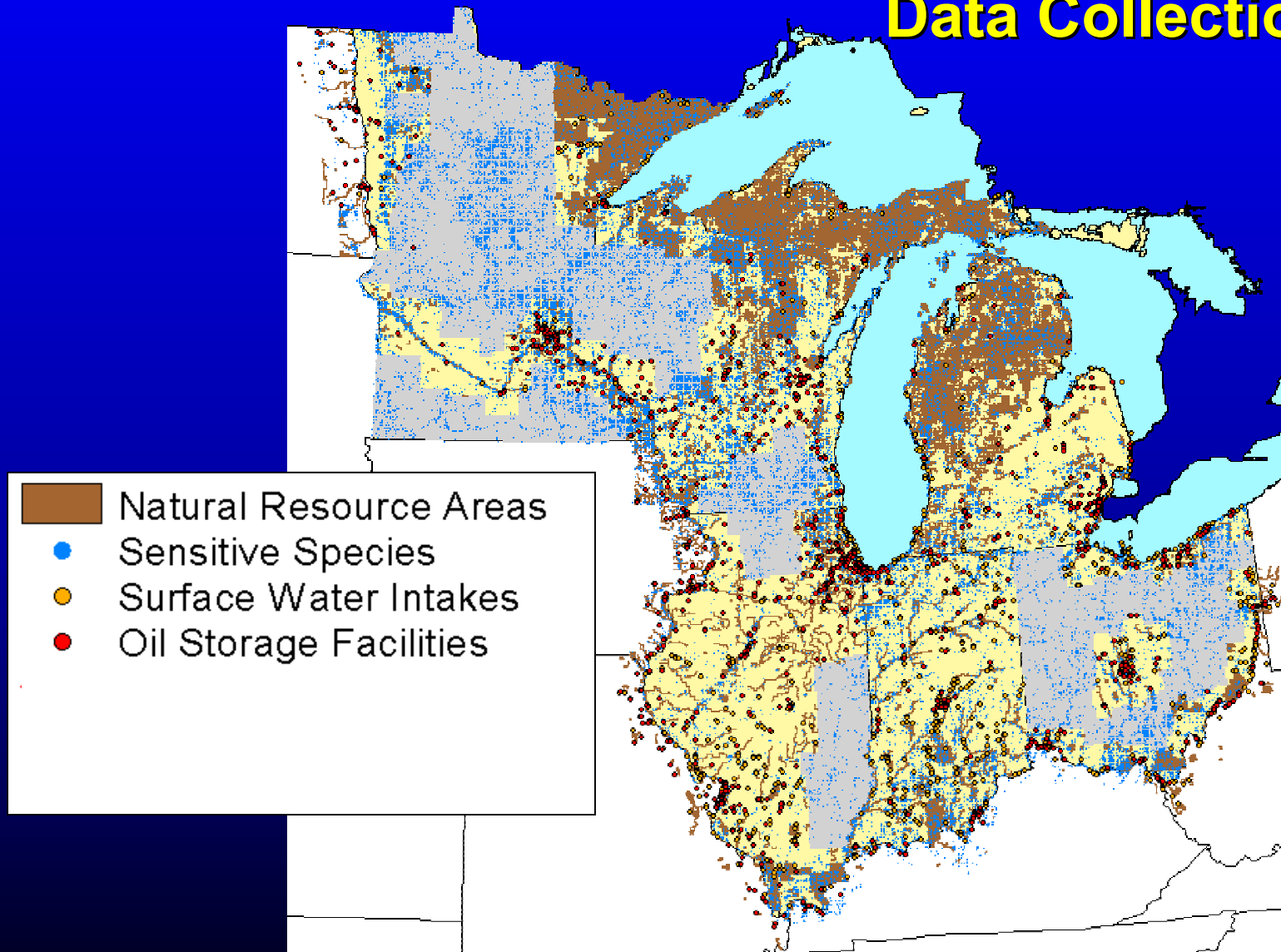
Inland Spill Response Project Data Collection



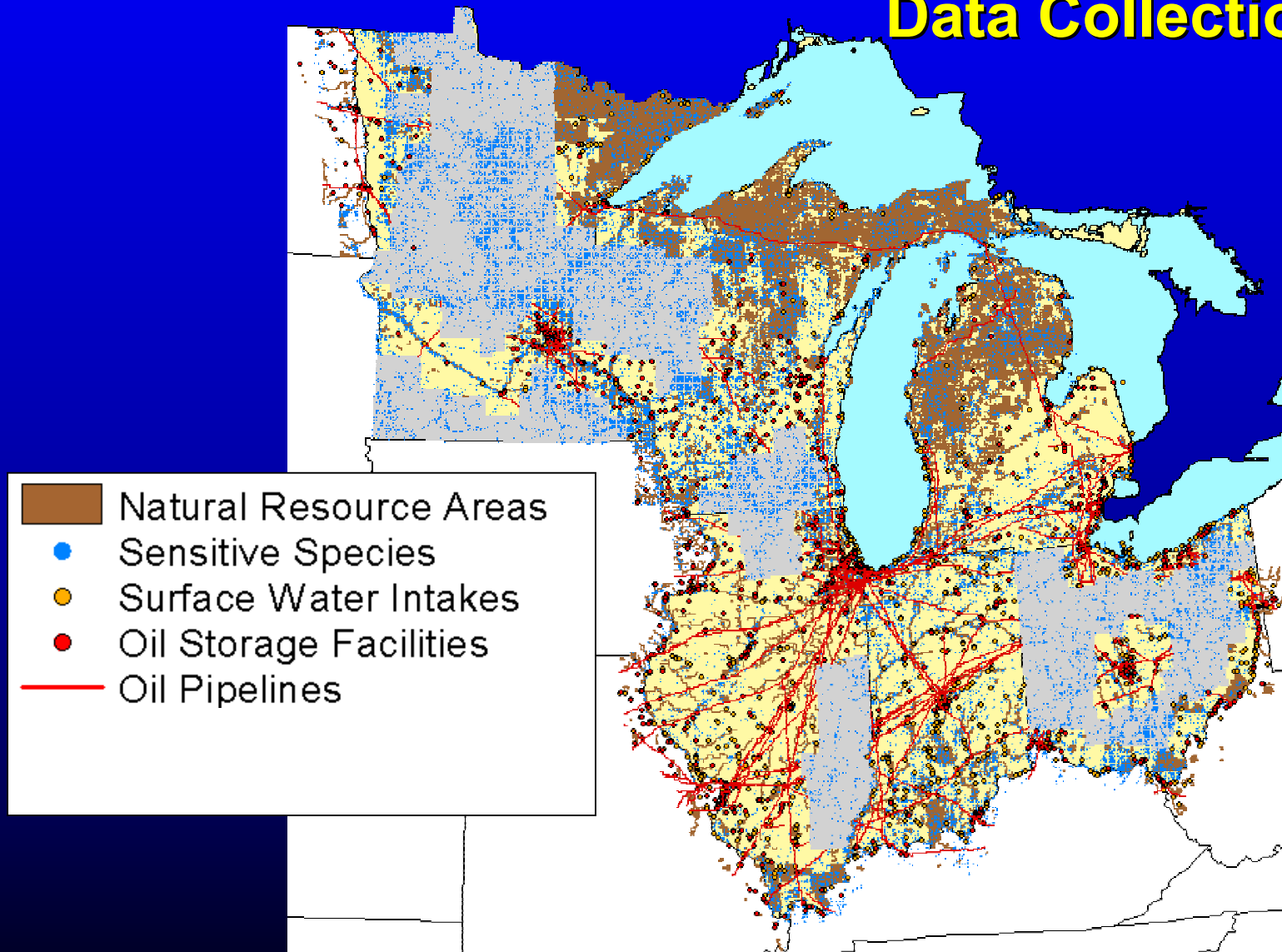
Inland Spill Response Project Data Collection



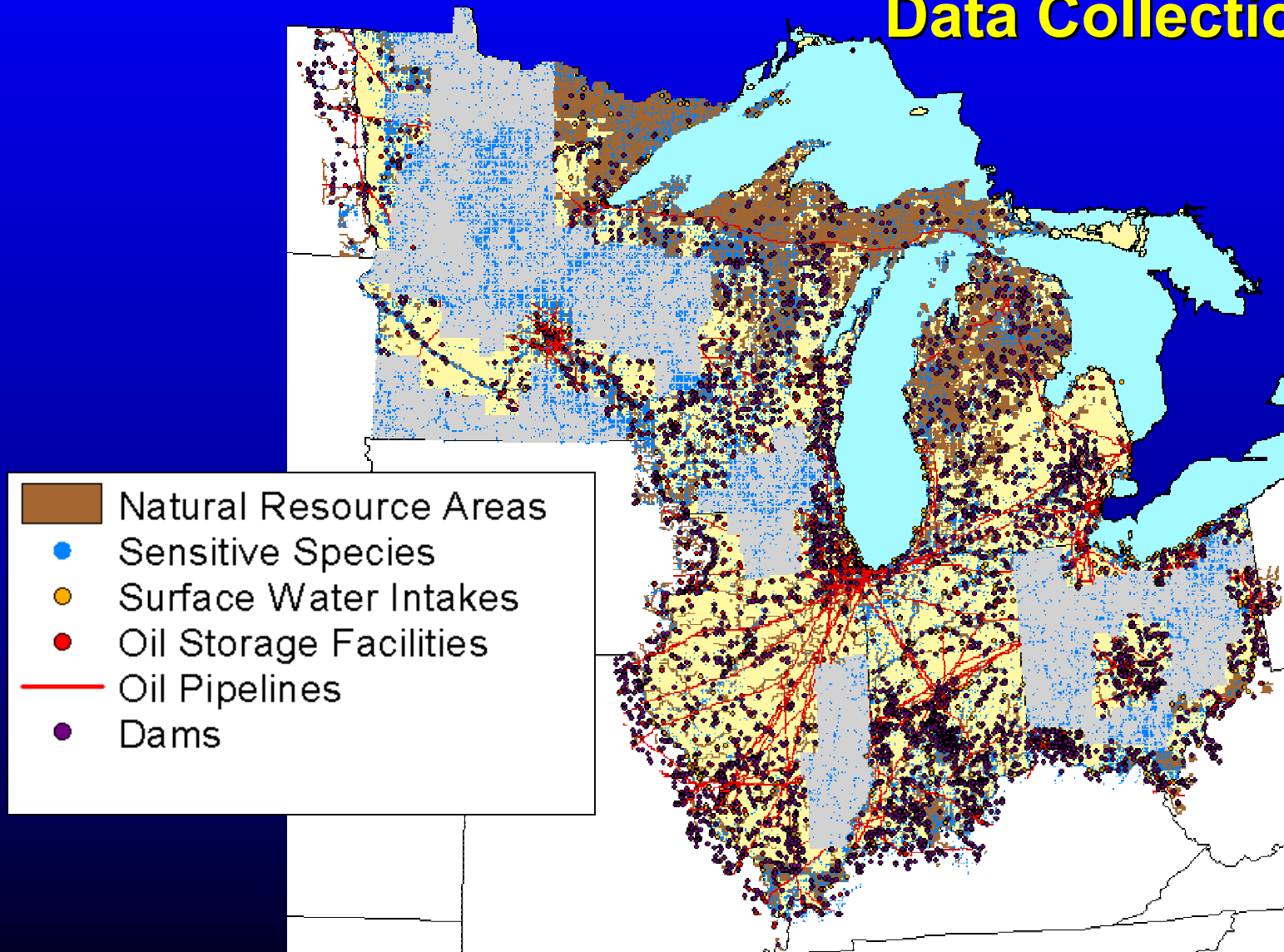
Inland Spill Response Project Data Collection



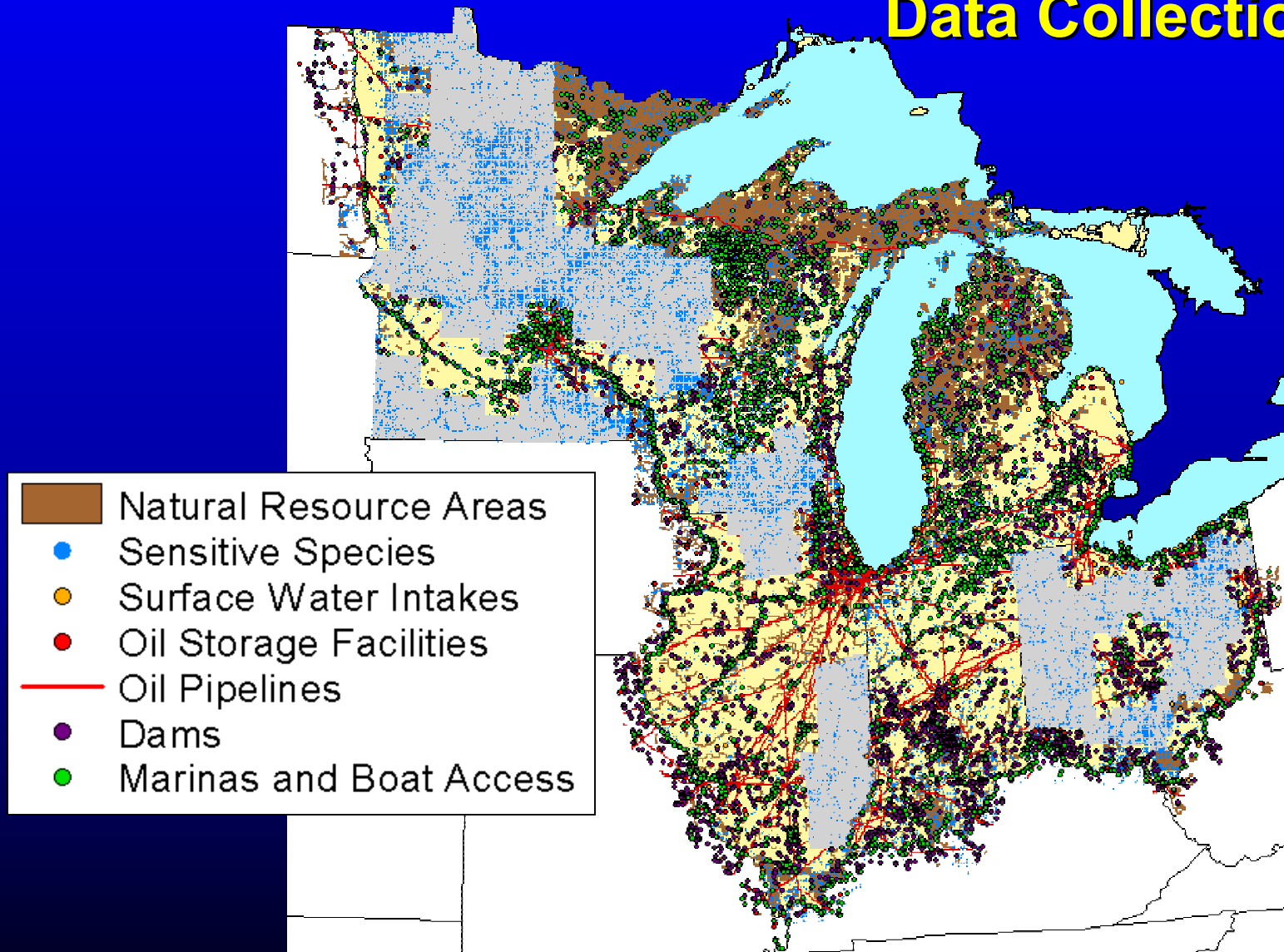
Inland Spill Response Project Data Collection



Inland Spill Response Project Data Collection



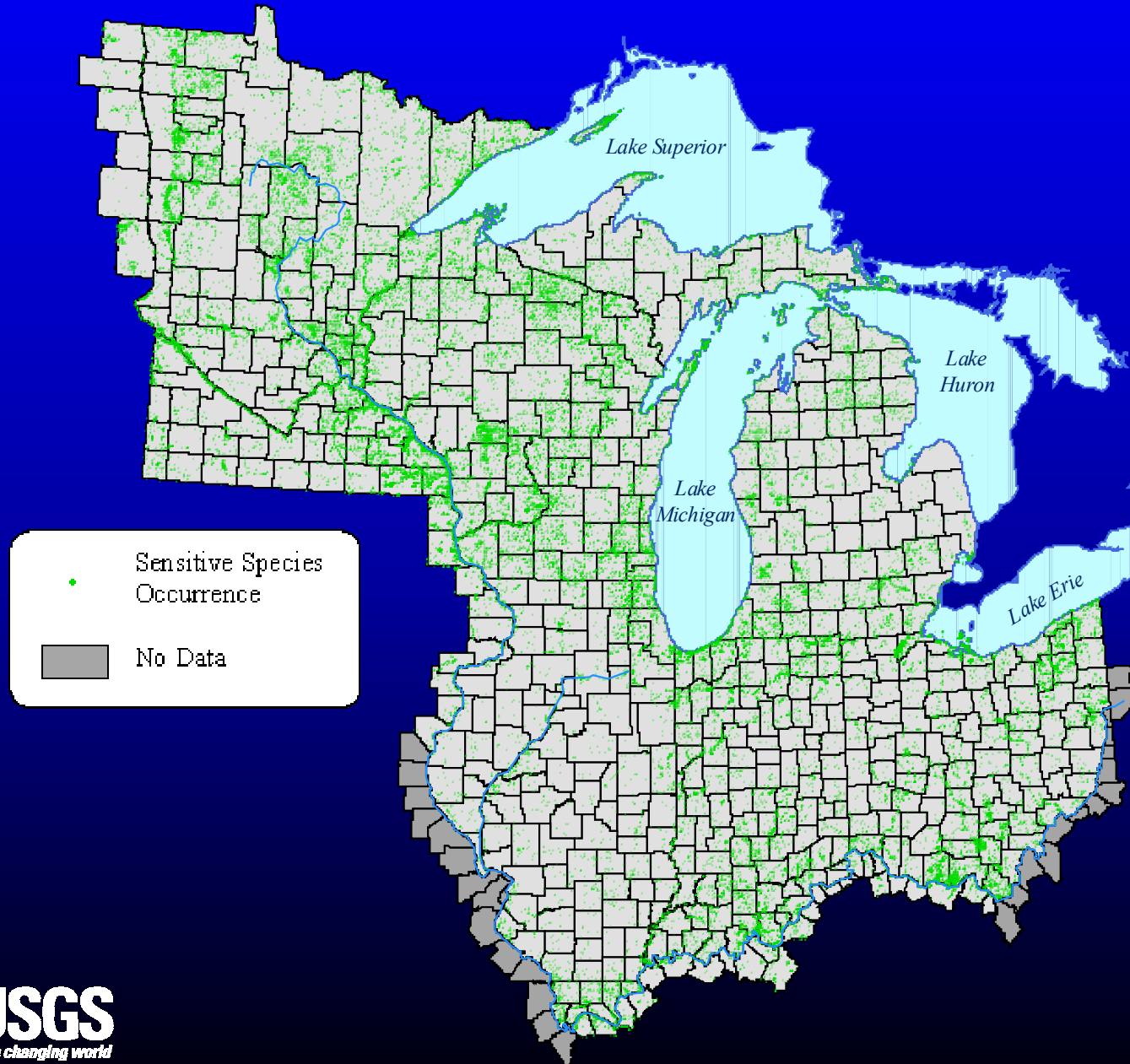
Inland Spill Response Project Data Collection



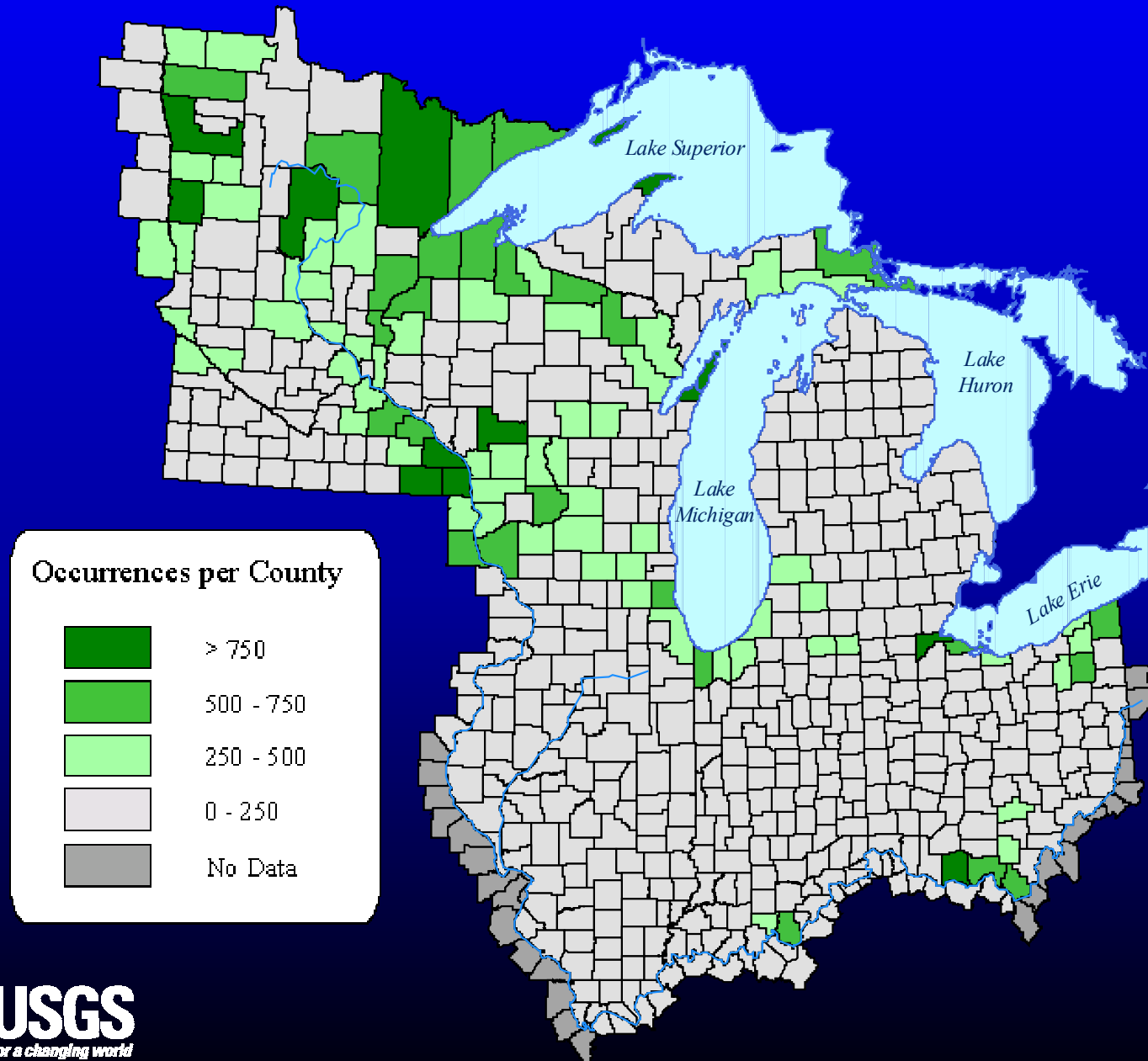
Inland Spill Response Project Data Collection Totals (as of 2-1-02)

<i>Data</i>	<i>Total</i>
Sensitive species	86,559
Managed resource areas	7,020
Special designated resource areas	9,875
Other sensitive resource areas	372
Tribal lands	178
Surface water intakes	1,468
Fixed oil storage facilities	1,353
Oil and oil product pipelines	587
Dams (navigational and non-nav.)	4,430
Marinas and boat access ramps	6,156
<i>Total</i>	<u>117,998</u>

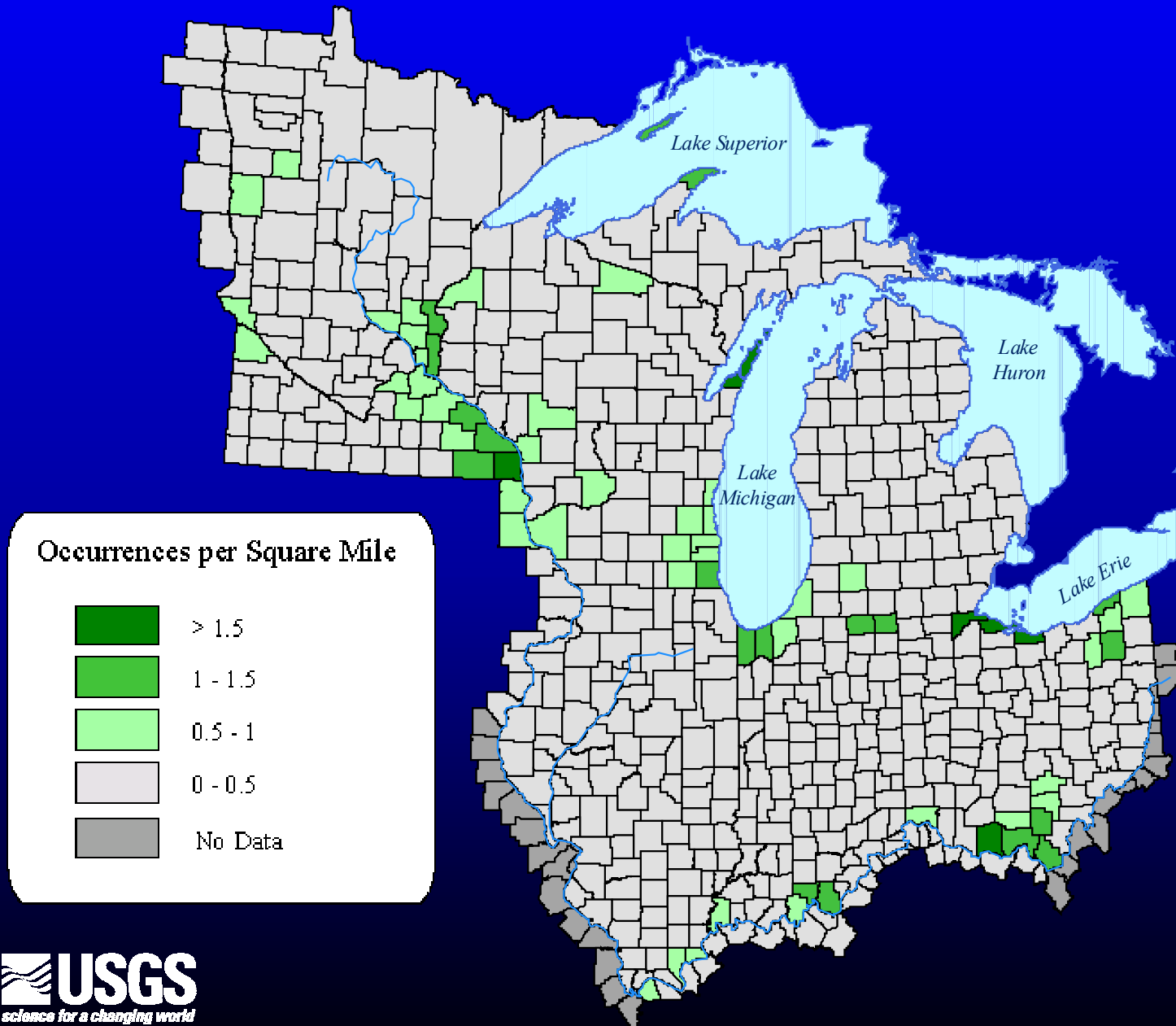
Species at Risk



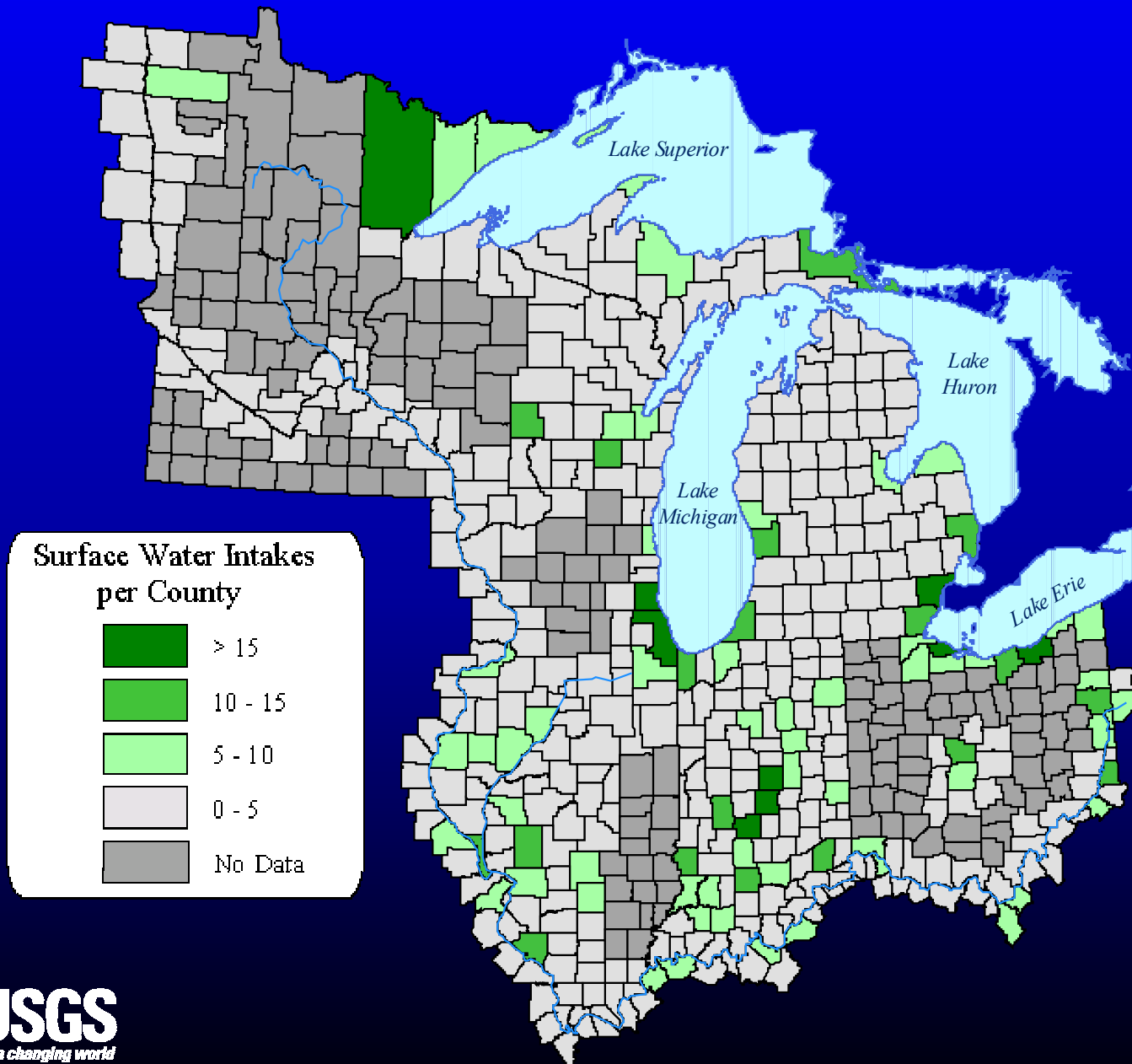
Species at Risk



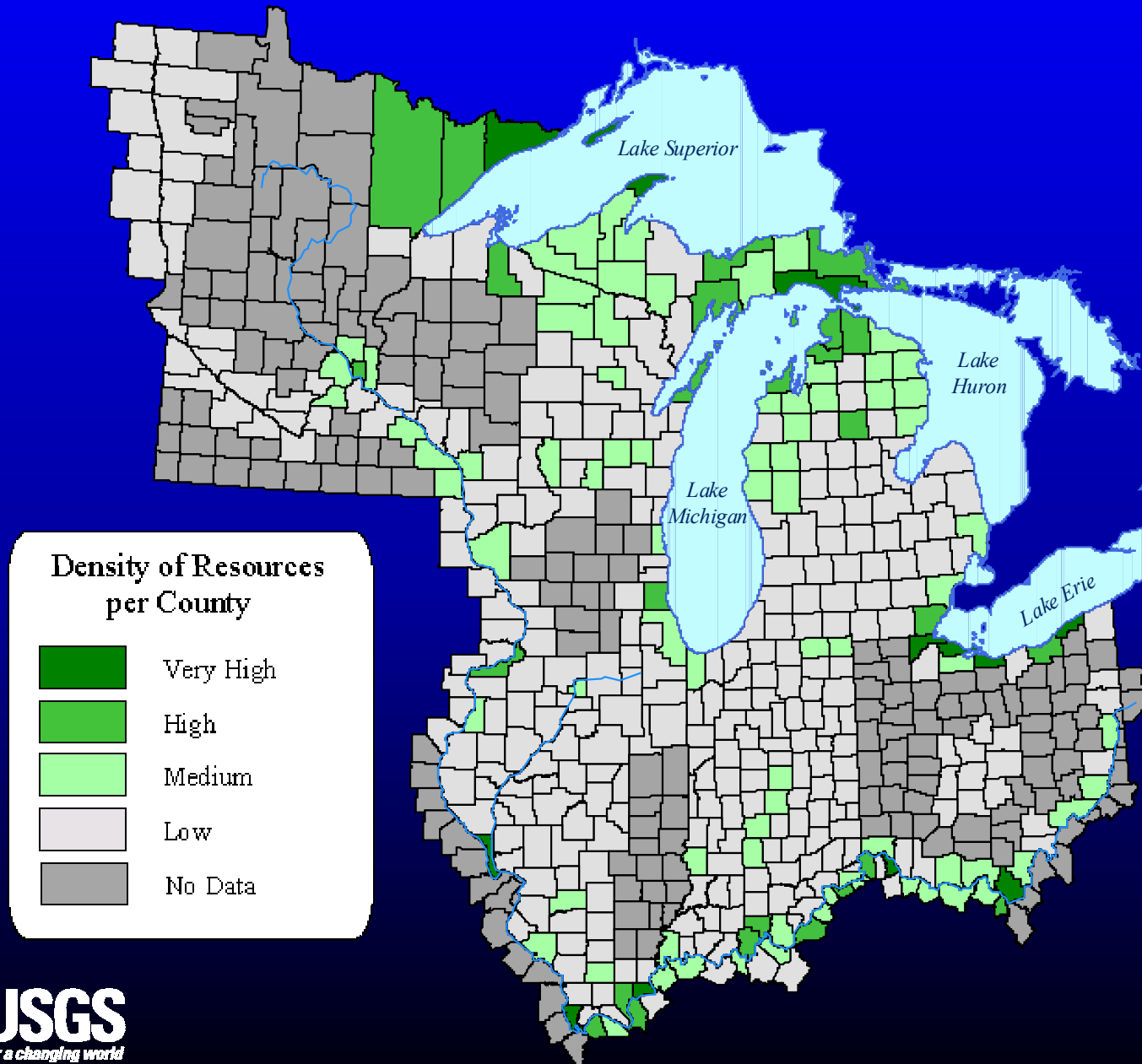
Species at Risk (Normalized)



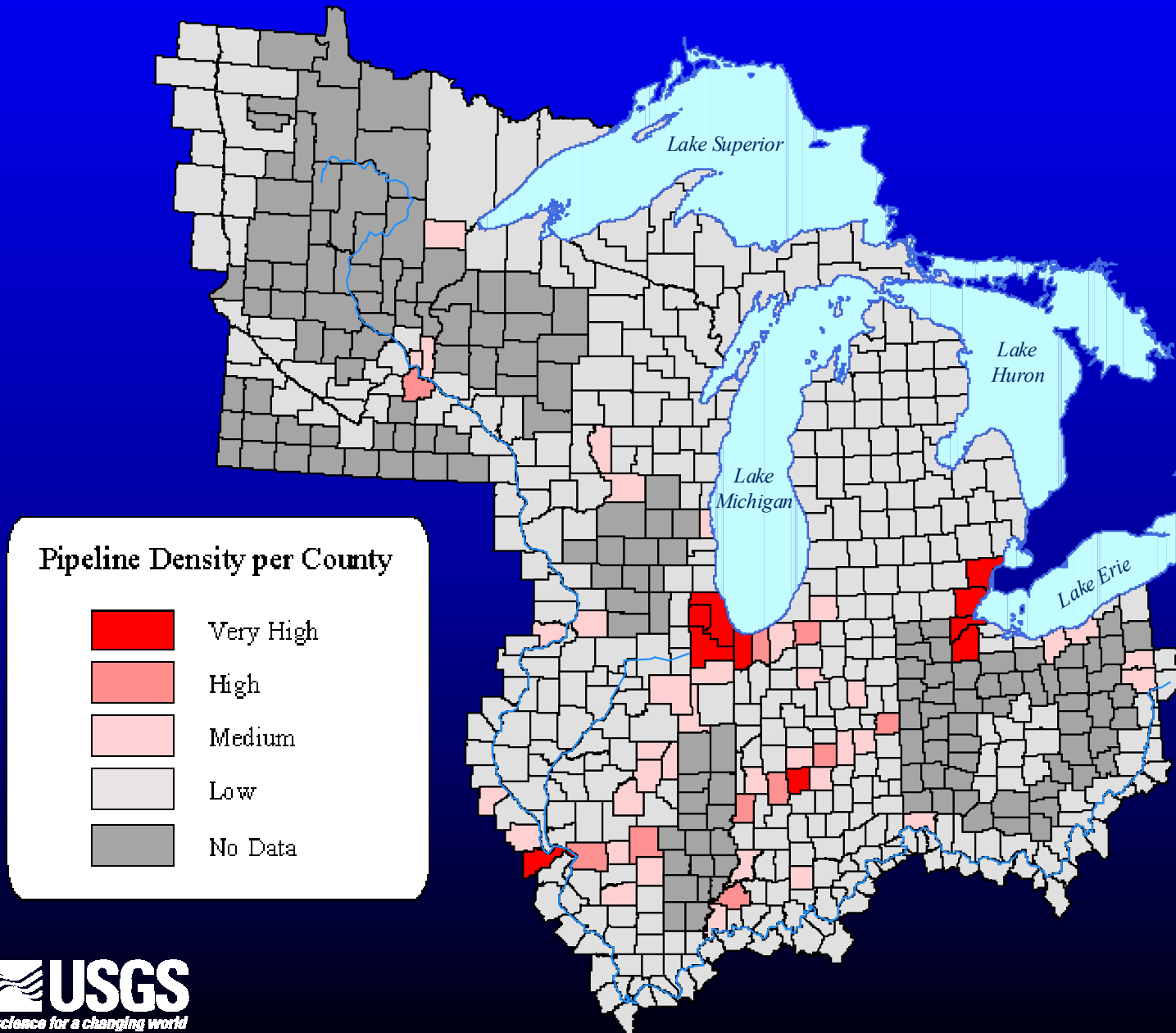
Surface Water Intakes



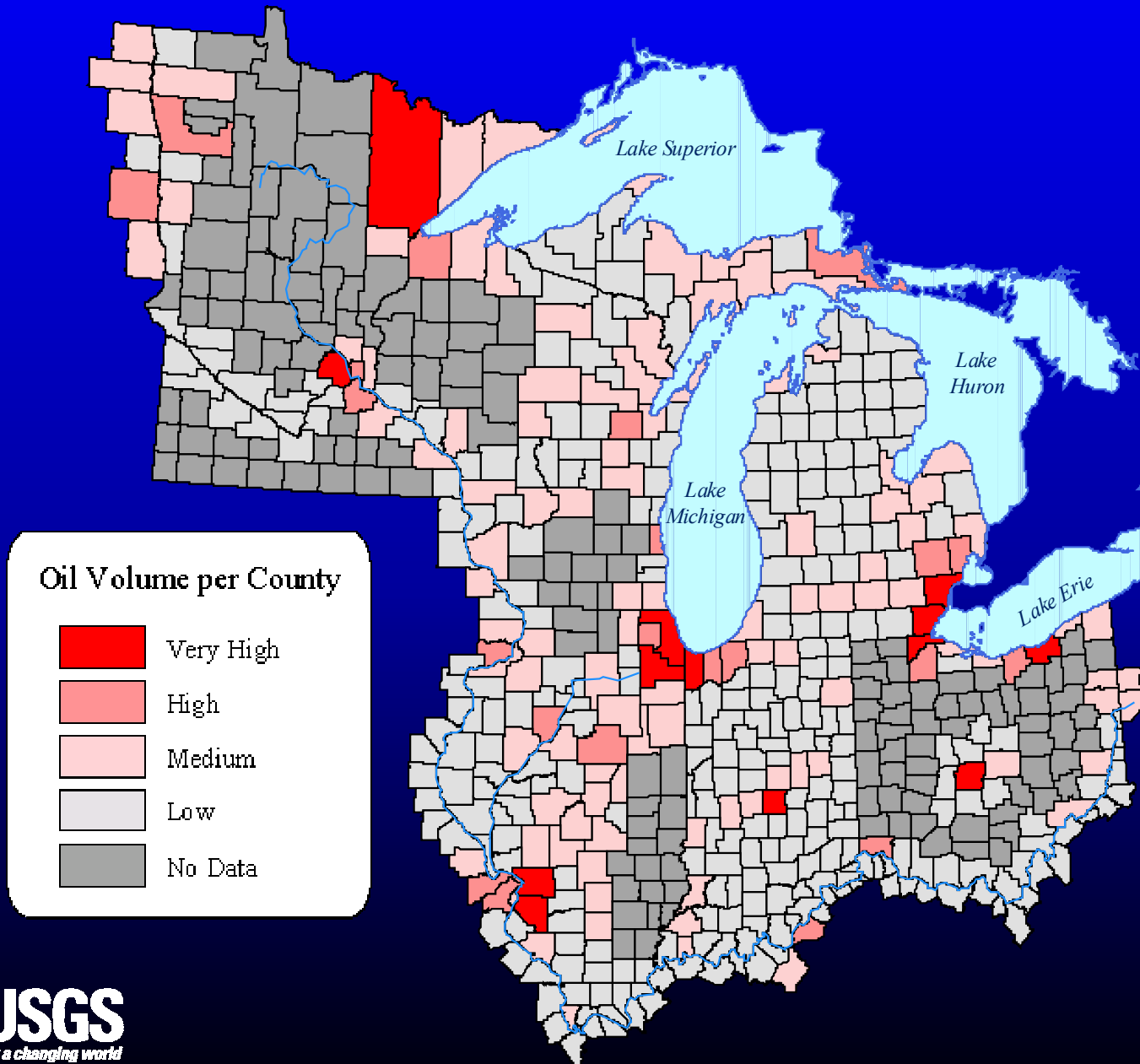
Resources at Risk (Normalized)



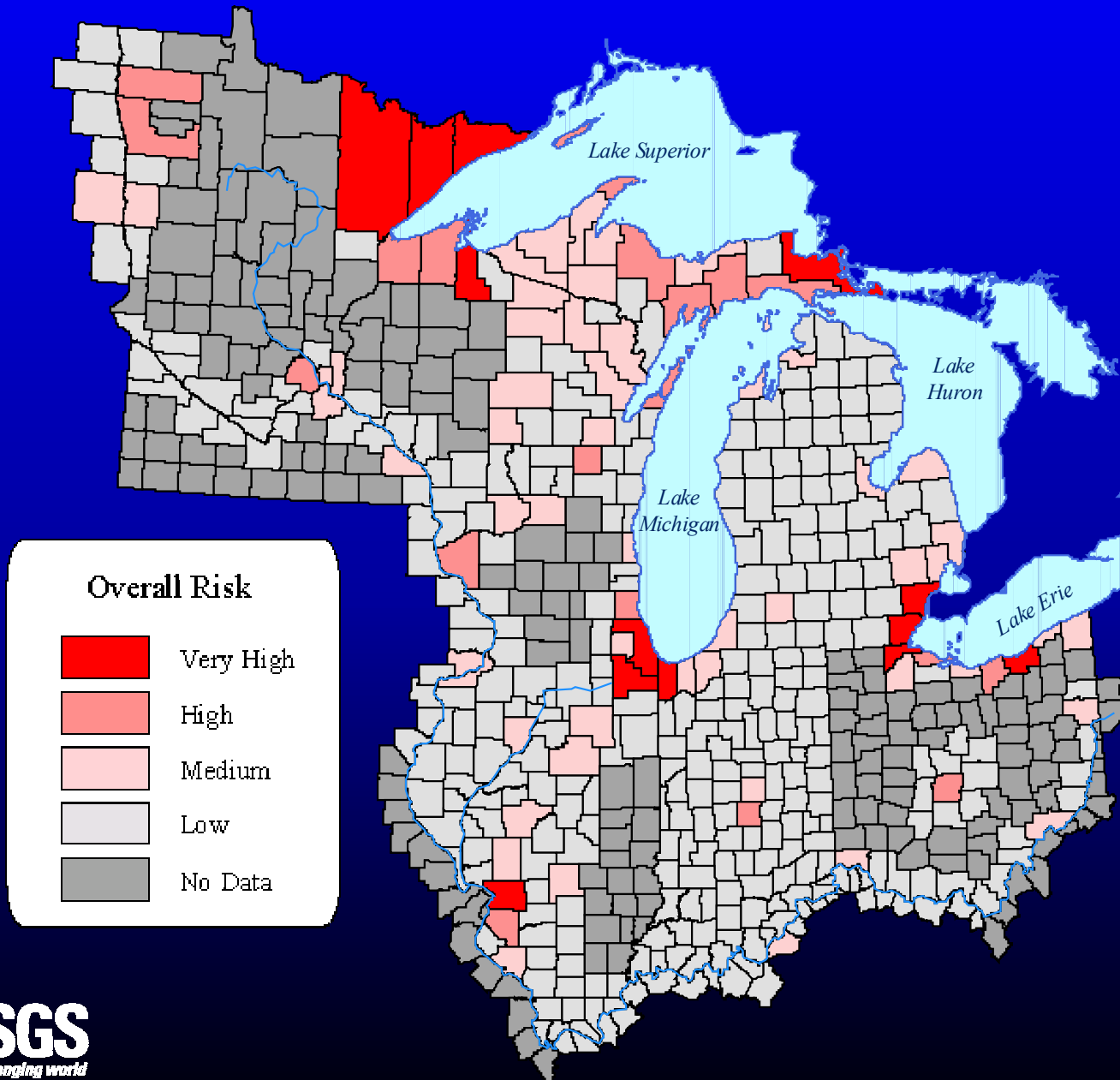
Pipeline Density (Normalized)



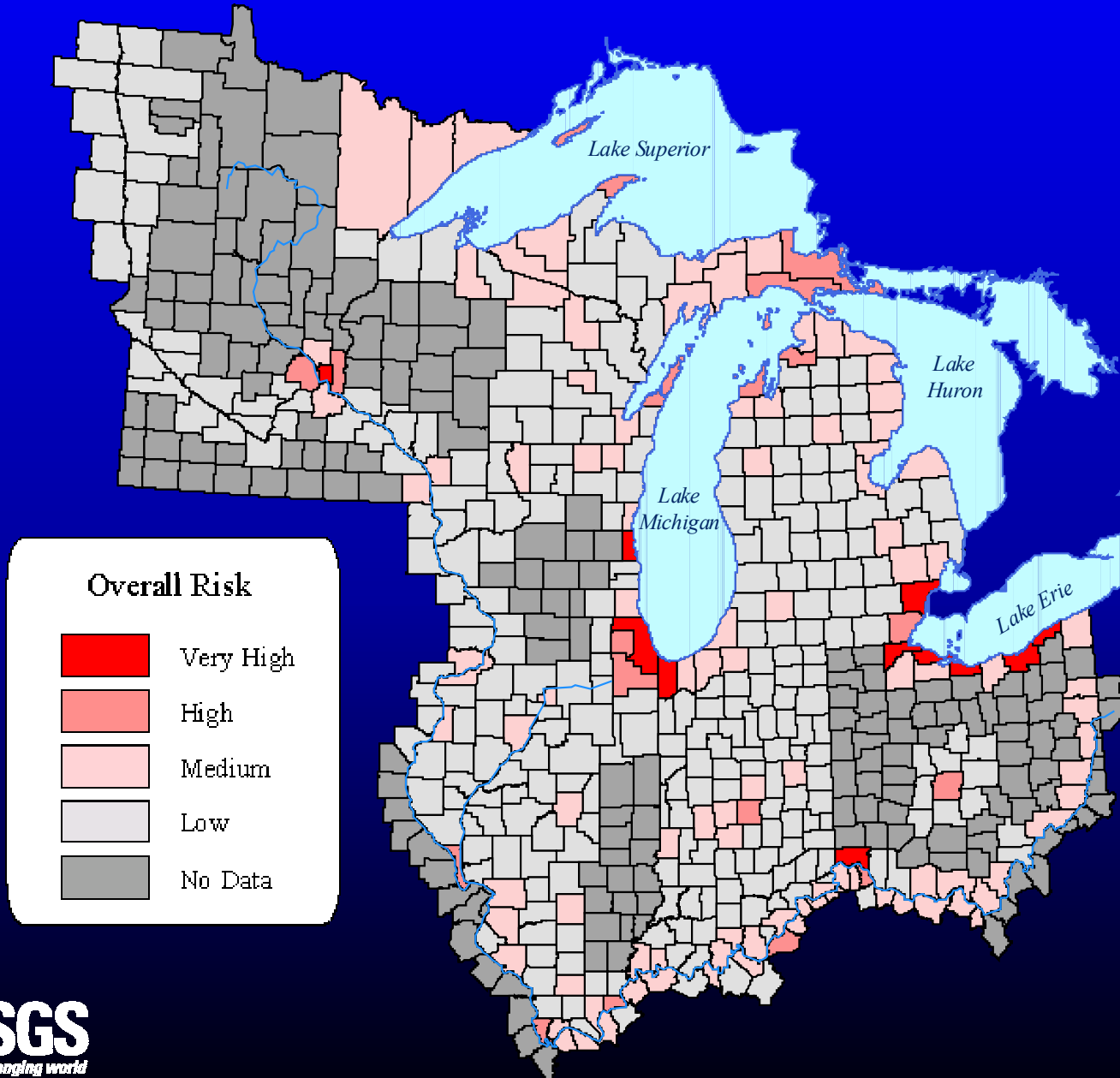
High Oil Volume Areas (Sources of Risk)



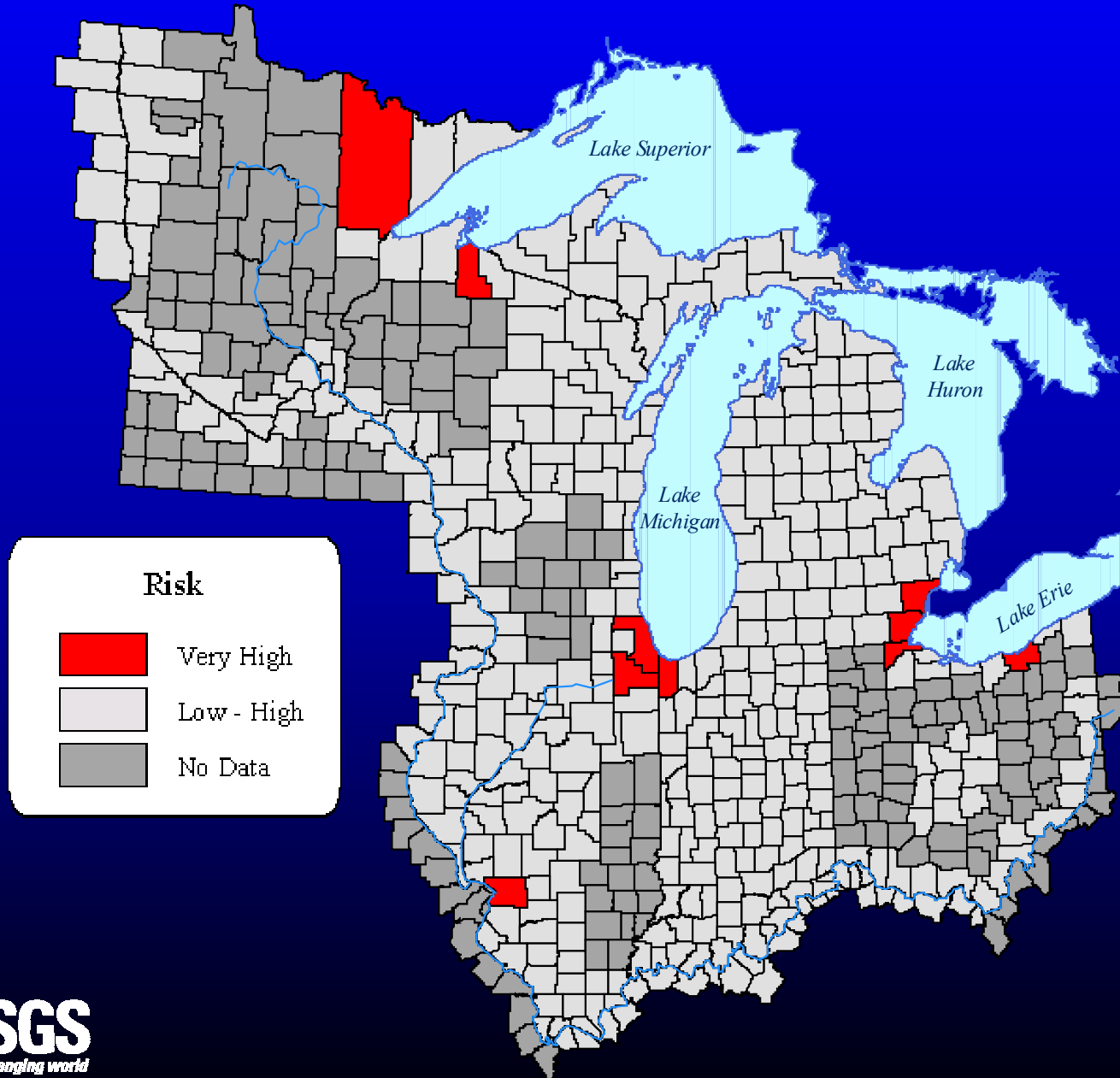
Overall Risk Assessment



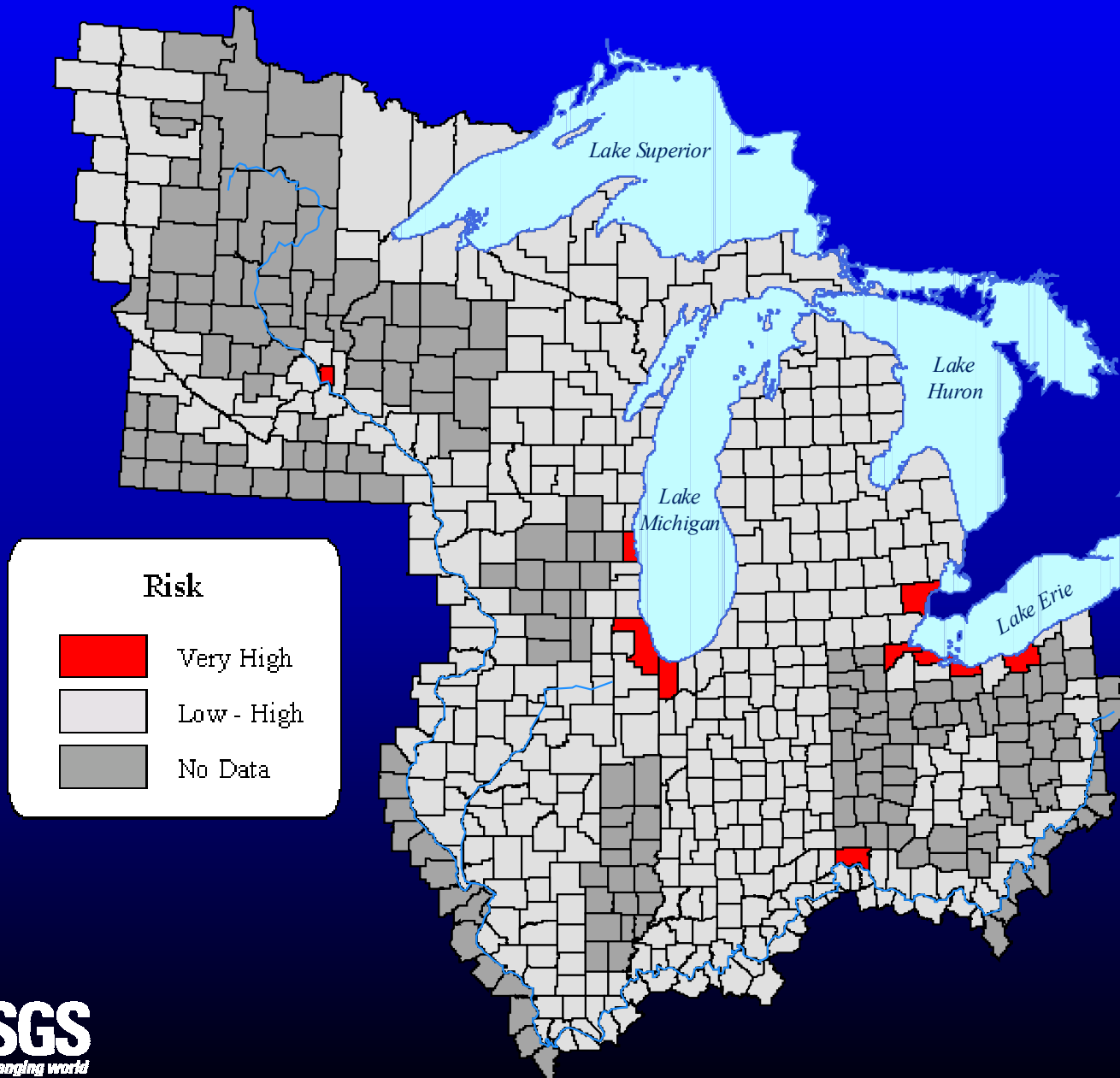
Overall Risk Assessment (Normalized)



Top 10 Areas at Risk



Top 10 Areas at Risk (Normalized)



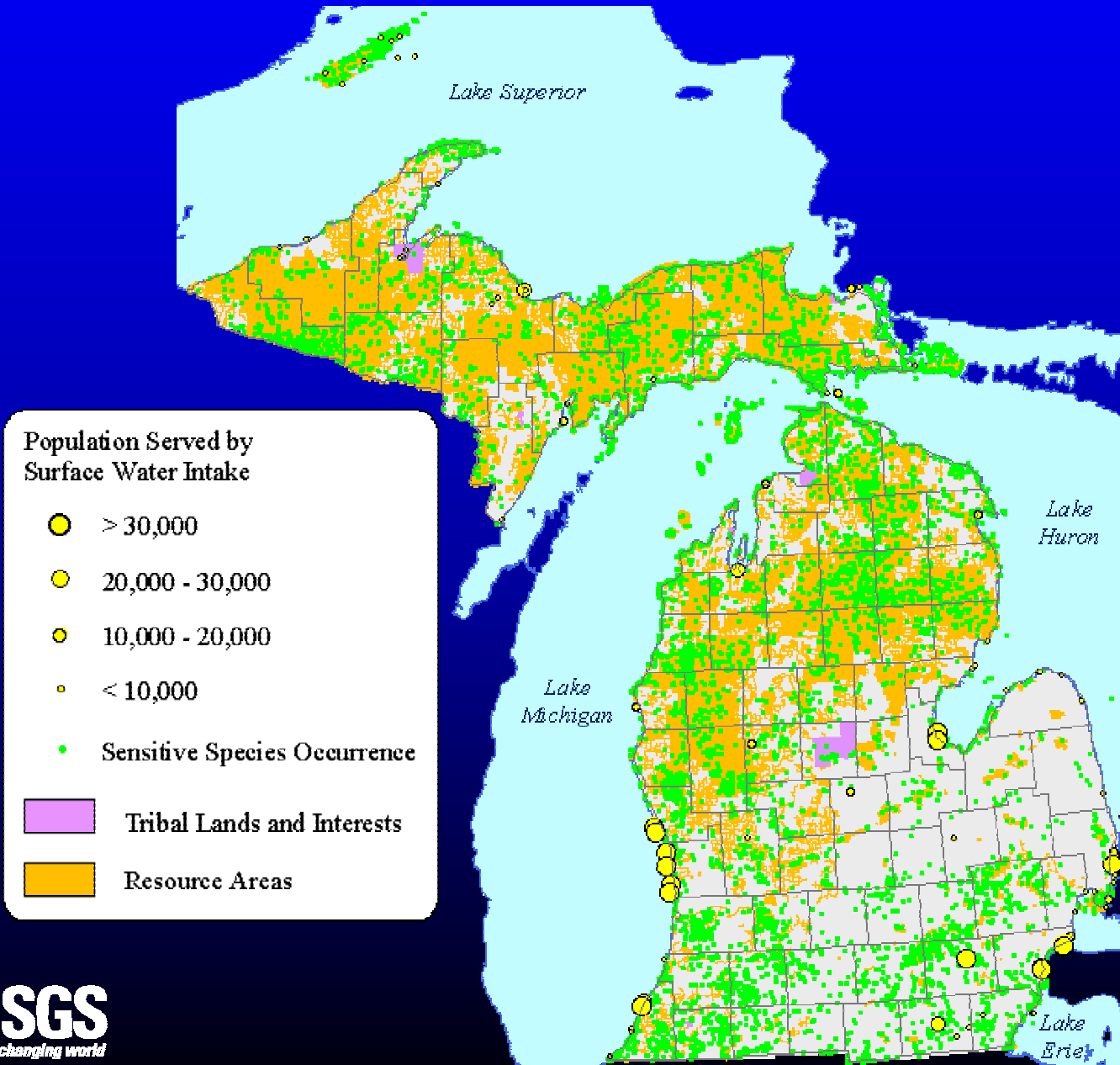
Top 5 Michigan Counties at Risk



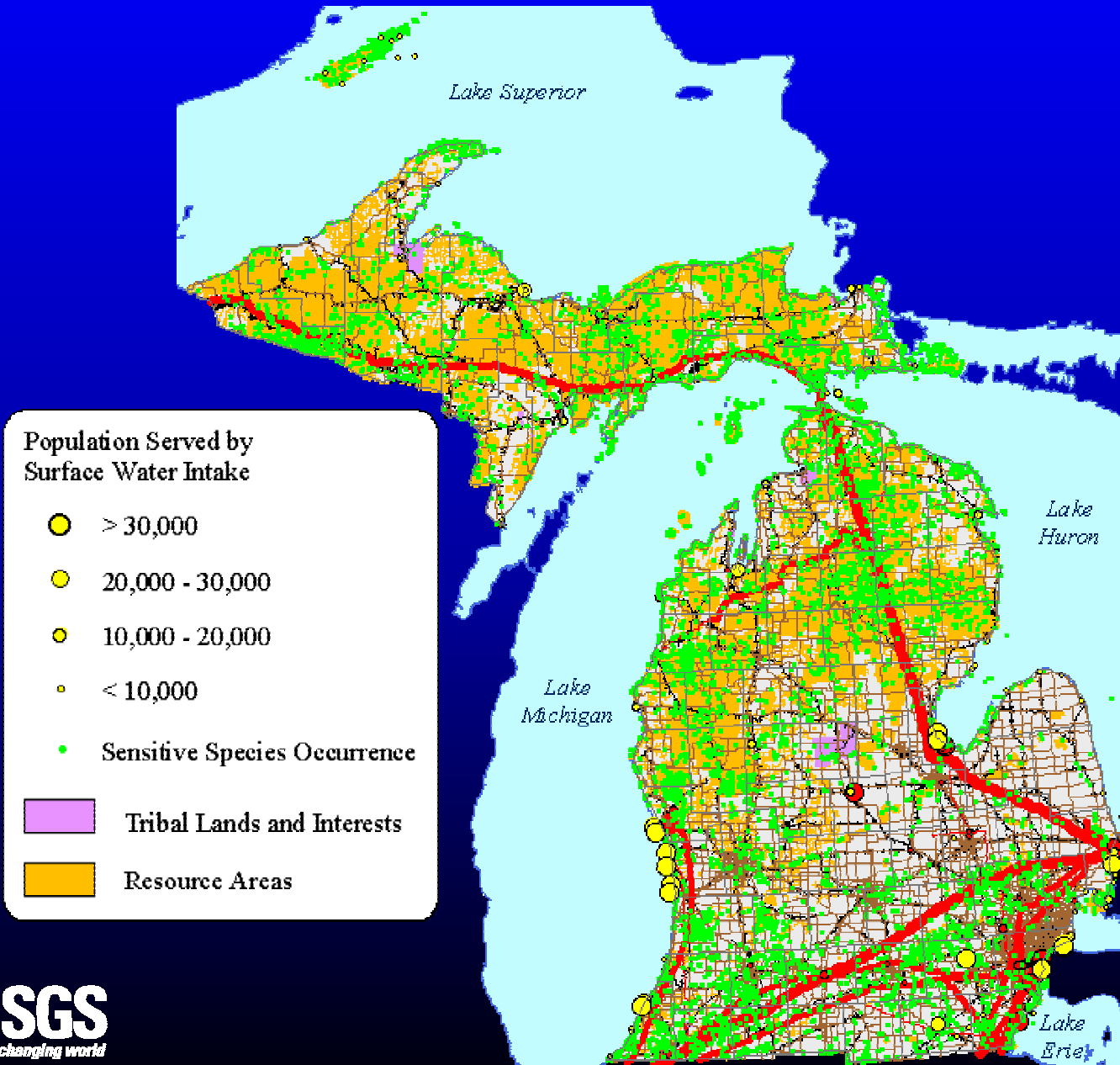
Michigan Sources of Risk



Michigan Resources at Risk



Michigan Overall Risk



Risk Assessment Conclusion

- Areas of concern were identified
 - Urban areas – Minneapolis and Cleveland
 - Rural areas – Northern Michigan and Minnesota
- Advantages in assessing risk at two spatial scales
 - Regional – multi-state comparative assessment
 - State – further refine areas of concern
- Examining two types of data proved useful
 - Non-normalized – identify risk in larger rural counties
 - Normalized – equally assess counties

Spill Risk Assessment

- **Uses of results**
 - **Identify areas that require increased protection**
 - **Locate emergency response equipment**
 - **Select future training sites**
 - **Improve planning and emergency response**
- **Future risk assessment**
 - **Enhanced regional analysis**
 - **Proximity analysis**
 - **Routing analysis**
 - **User assessment tools**