# *Agricultural Chemicals in Wisconsin Groundwater*

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# *Objectives*

- Obtain a current picture of agricultural chemicals in Wisconsin's groundwater
- Compare levels of agricultural chemicals in groundwater in 2000 to levels found in 1994

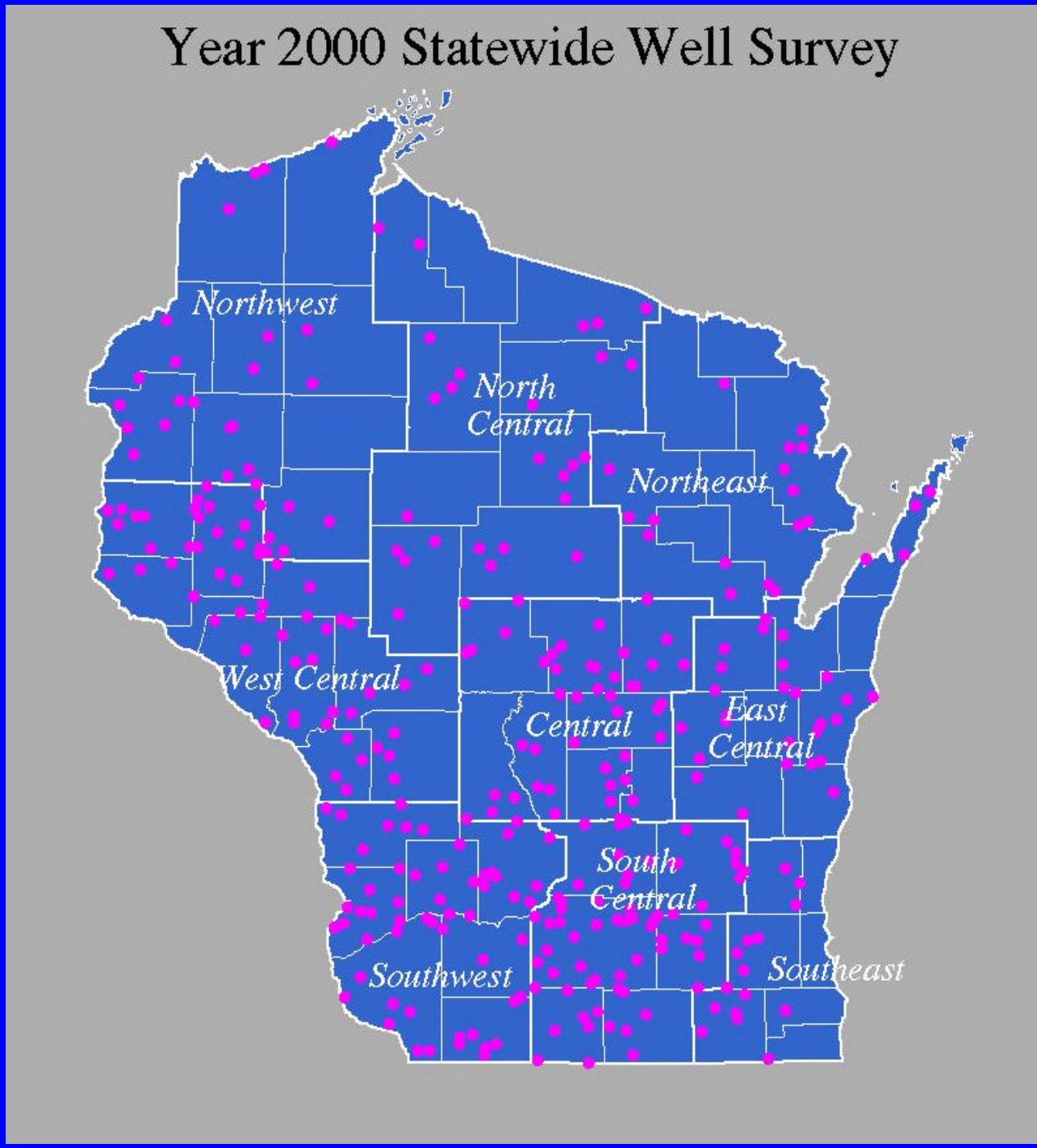
# *Study Design*

- Sampled groundwater in Wisconsin using existing private water supply wells
- Collected 336 samples
  - stratified random sampling design based on Agricultural Statistics Districts
  - number of samples per district proportional to acres of agriculture in each district

# *Sample Analysis*

- Each sample analyzed for 18 compounds
  - 7 herbicide active ingredients
  - 10 herbicide metabolites
  - nitrate-N
- Survey included 5 “new” metabolites of Acetochlor, Alachlor and Metolachlor
- 8 compounds do not have a groundwater standard

# *Well Locations and Agricultural Statistics District Boundaries*



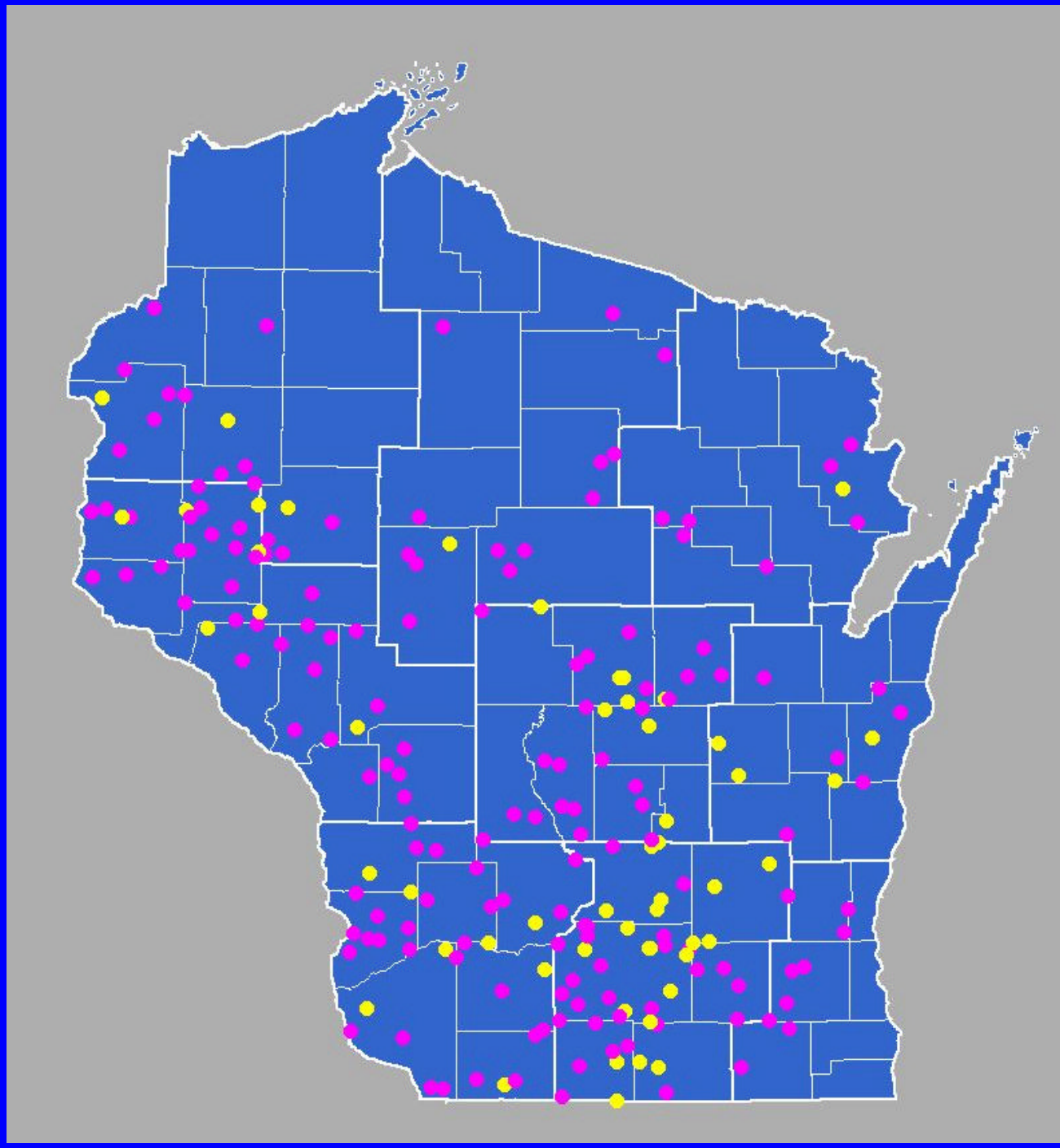
# *2000 Survey Results*

- Estimates of statewide proportion of detections
- Estimates of mean concentrations
- Geographic distribution of selected compounds

# *Statewide Estimates of Proportion of Detections*

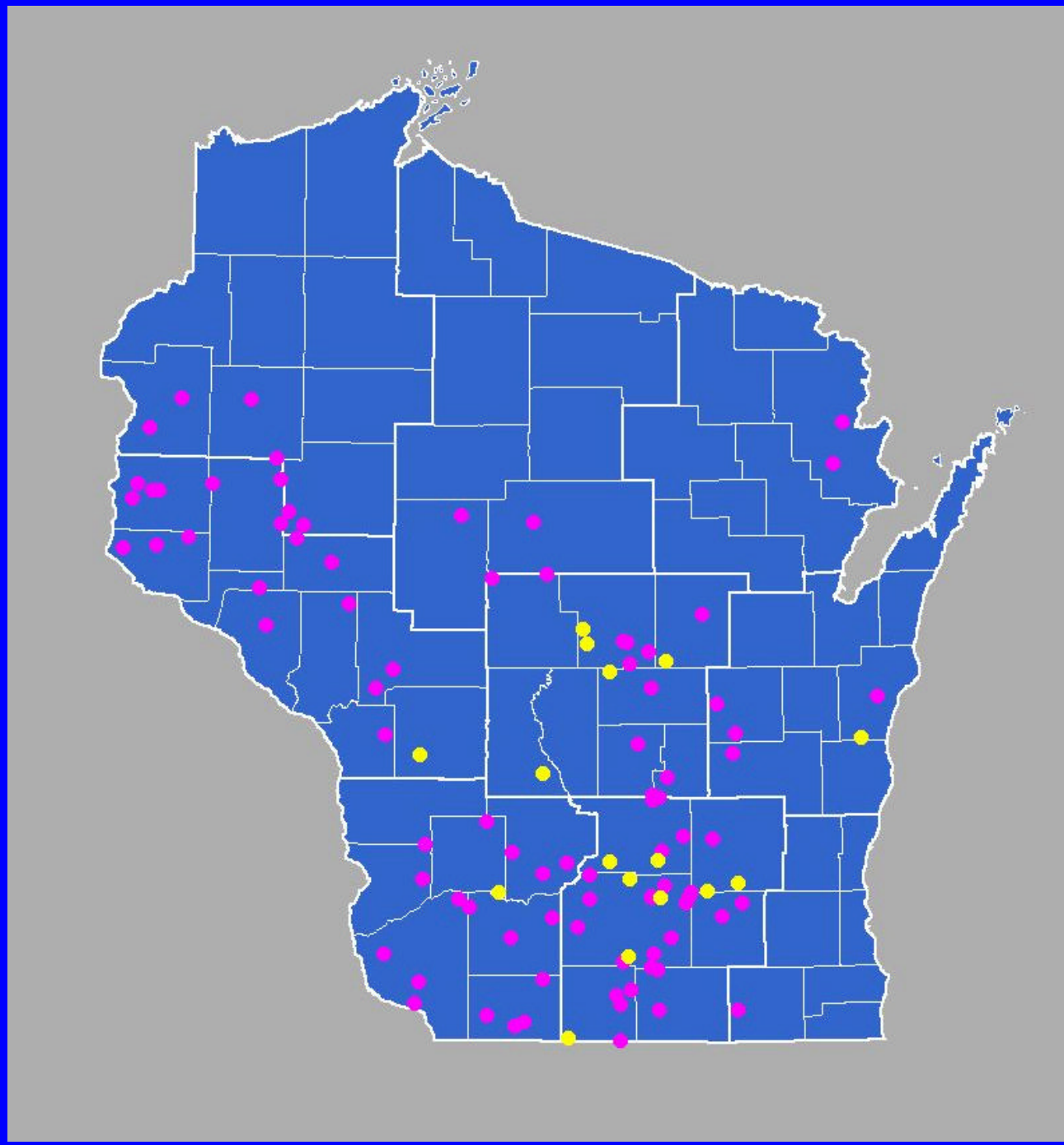
| Compound | Number of Detects | Proportion Estimate (%) | 95% CI (%) |
|---|---|---|---|
| Nitrate | 216 | 61.7 | 56.5-67.0 |
| Any Herbicide | 135 | 37.7 | 32.7-42.8 |
| Alachlor ESA | 103 | 27.8 | 23.2-32.3 |
| Metolachlor ESA | 88 | 25.2 | 20.6-29.8 |
| Nitrate > 10 mg/l | 53 | 14.1 | 10.5-17.7 |
| Total Atrazine | 48 | 11.6 | 8.6-14.7 |

# *Nitrate-N Results from the 2000 Survey*



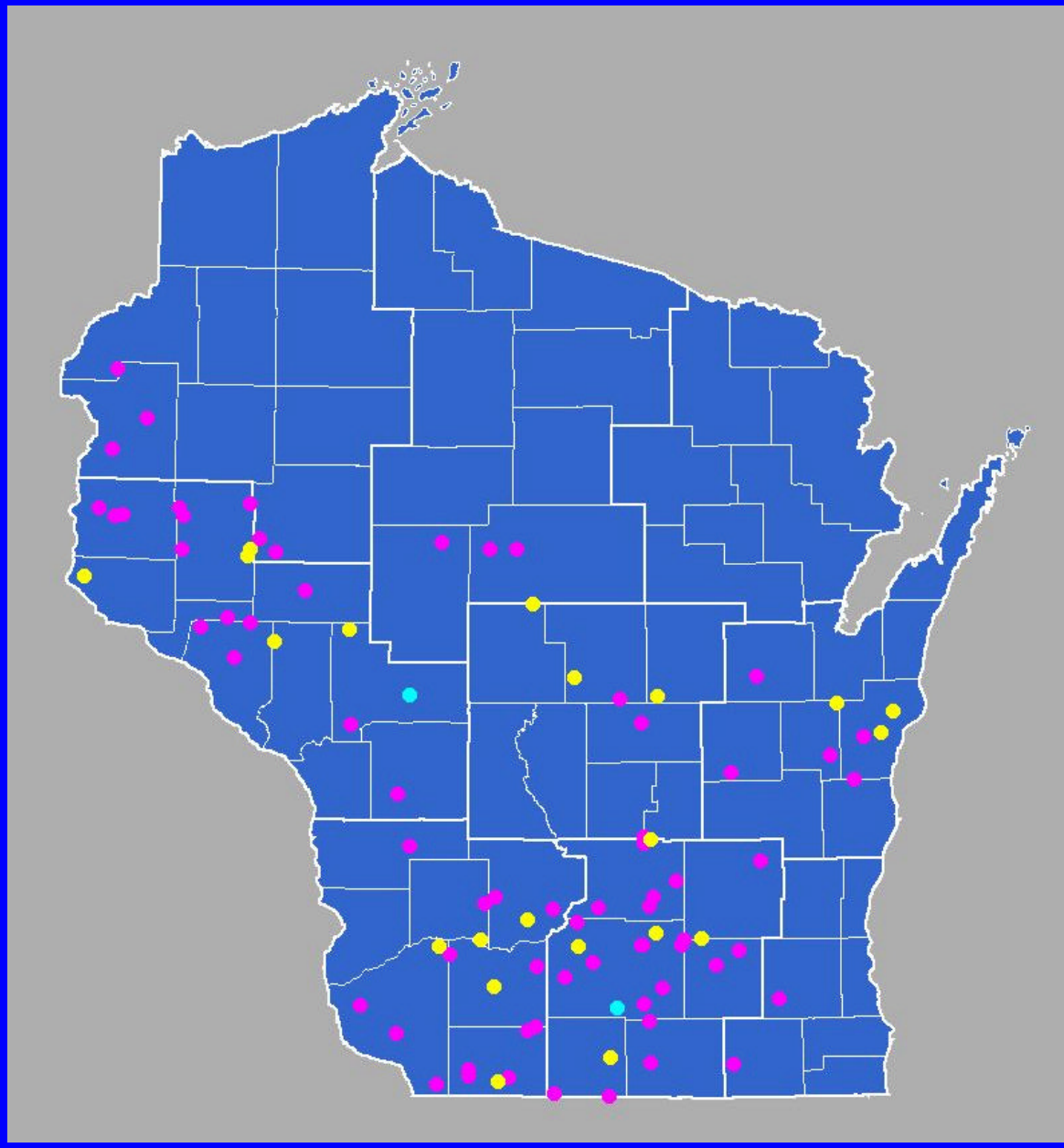
- Exceeds 10 mg/l
- Less than 10 mg/l

# *Alachlor ESA and OA Results from the 2000 Survey*



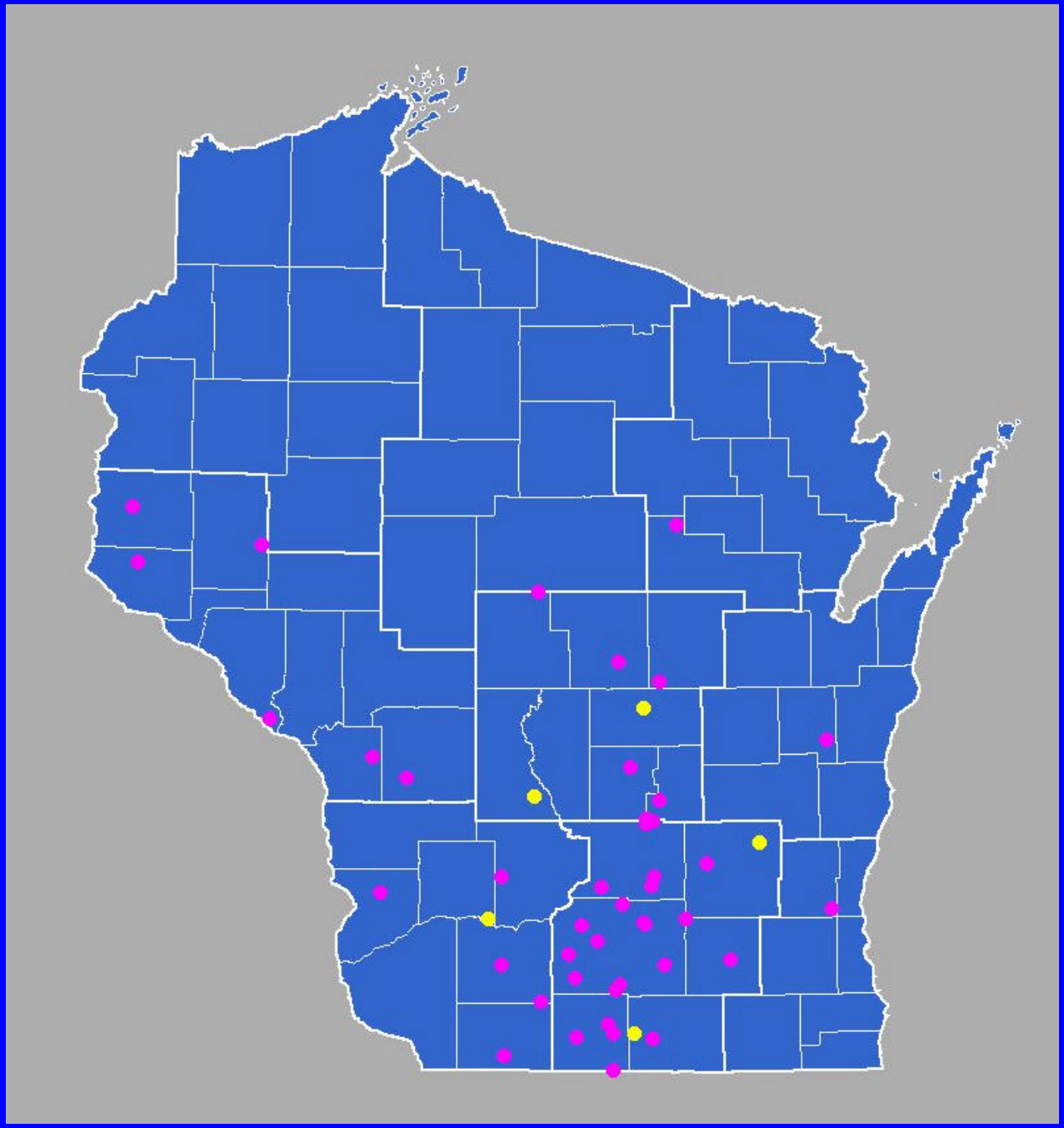
- ESA and OA
- ESA

# *Metolachlor ESA and OA Results from the 2000 Survey*



- ESA and OA
- ESA
- OA

# *Total Atrazine results from the 2000 Survey*

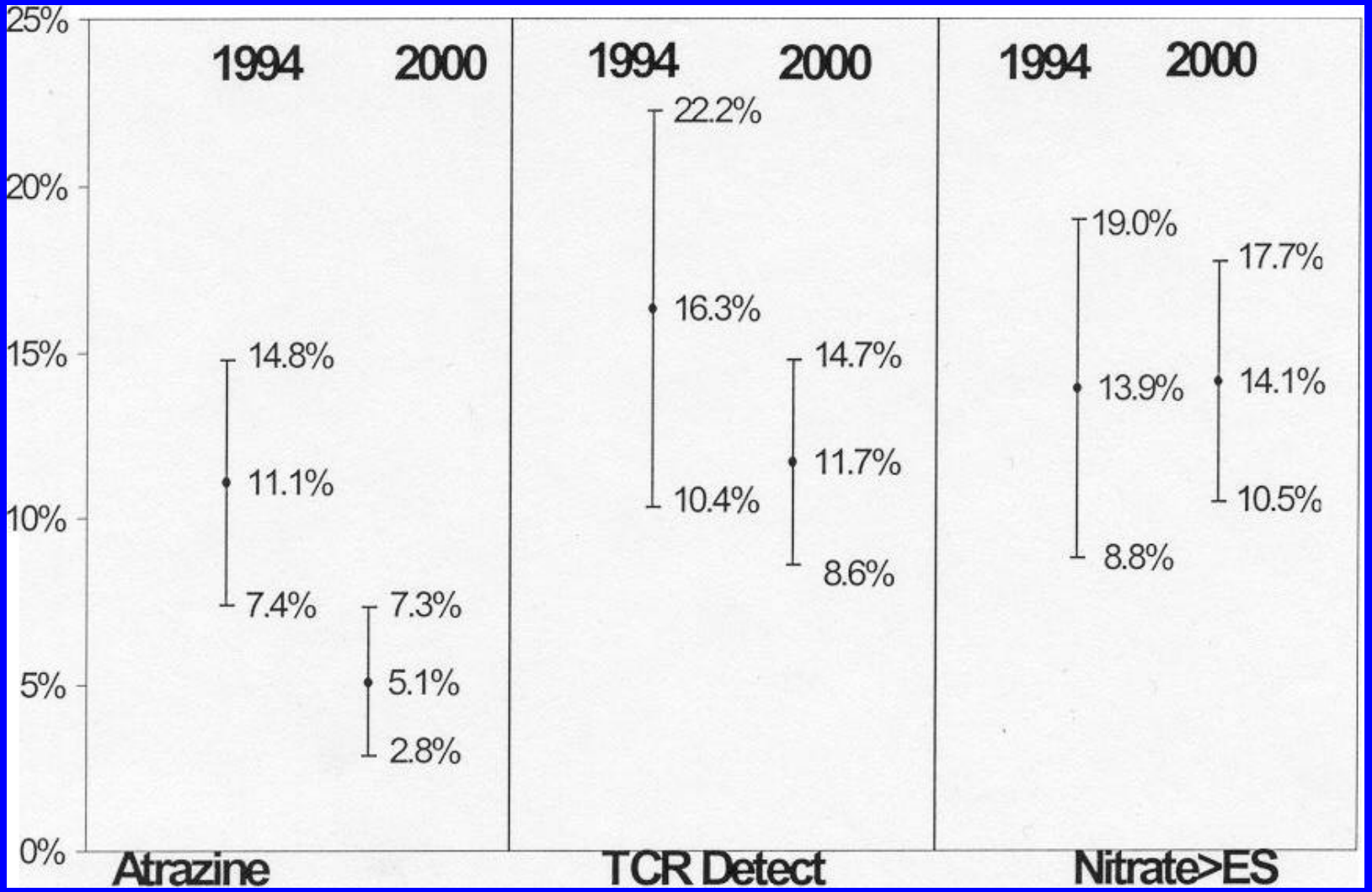


- Exceeds 3 ug/l
- Less than 3 ug/l

# *Estimates of Mean Concentrations of Detections*

| Compound | Number of detects | Mean detect concentration (ug/l) | 95% confidence interval (ug/l) |
|---|---|---|---|
| Nitrate | 216 | 6.9 mg/l | 5.9-7.9 |
| Alachlor ESA | 103 | 1.0 | 0.76-1.3 |
| Metolachor ESA | 88 | 0.79 | 0.53-1.0 |
| Total Atrazine | 48 | 0.97 | 0.59-1.4 |

# *Comparison of Proportion Estimates & 95% confidence intervals for 1994 and 2000*



# *Summary of Findings*

- The estimate of the proportion of wells that contained a detectable level of any herbicide or herbicide metabolite was 37.7%
- Alachlor ESA and metolachlor ESA were the most commonly detected herbicide compounds with proportion estimates of 27.8 and 25.2%, respectively
- The estimate of the proportion of wells that contained Total Atrazine was 11.6%

# *Summary of Findings*

- The estimate for the proportion of wells that exceeded the 10 mg/l enforcement standard for nitrate-nitrogen was 14.1%
- The statewide proportion of wells that contained parent atrazine showed a statistically significant decline between 1994 and 2000
- The statewide proportion of wells containing Total Atrazine did not show a statistically significant decline between 1994 and 2000