Beach Closures, Pollution Sources, and Federal Government Response

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U.S. EPA

Great Lakes National Program Office

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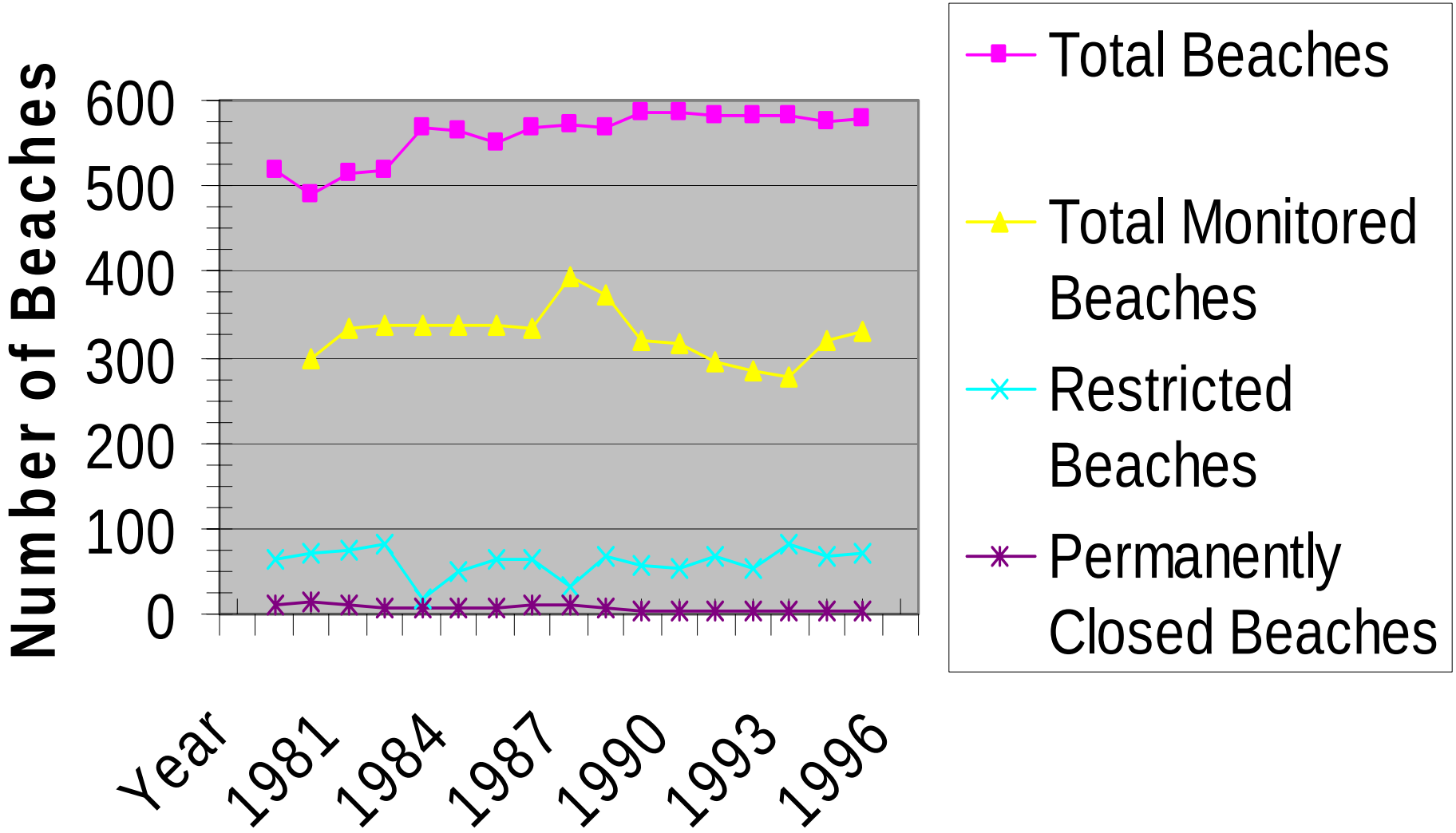
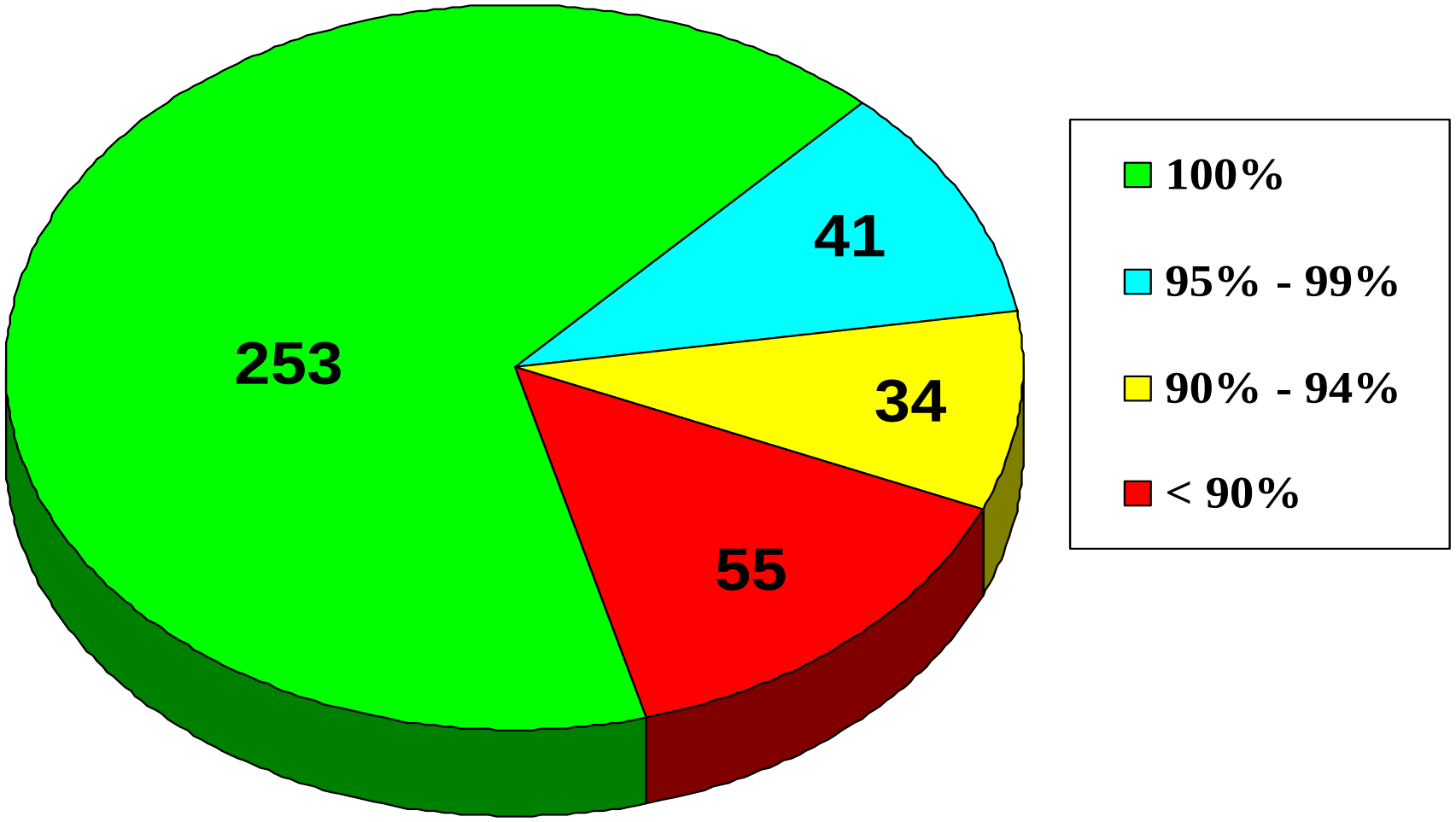
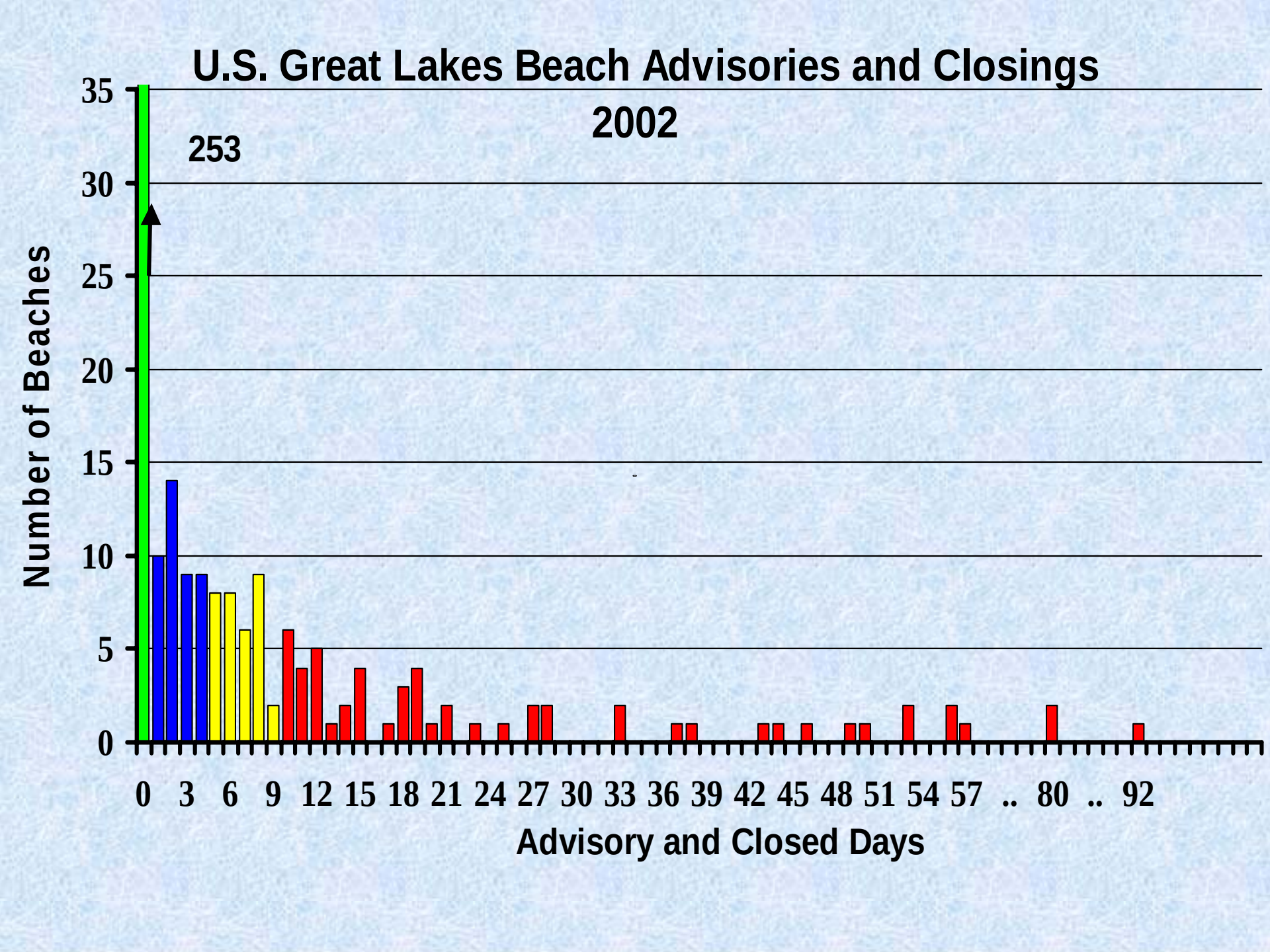
Status of U.S. Great Lakes Bathing Beaches, 1980-1996



U.S. Great Lakes Beaches Open for % of Season (June, July, August 2002) total number of beaches = 383



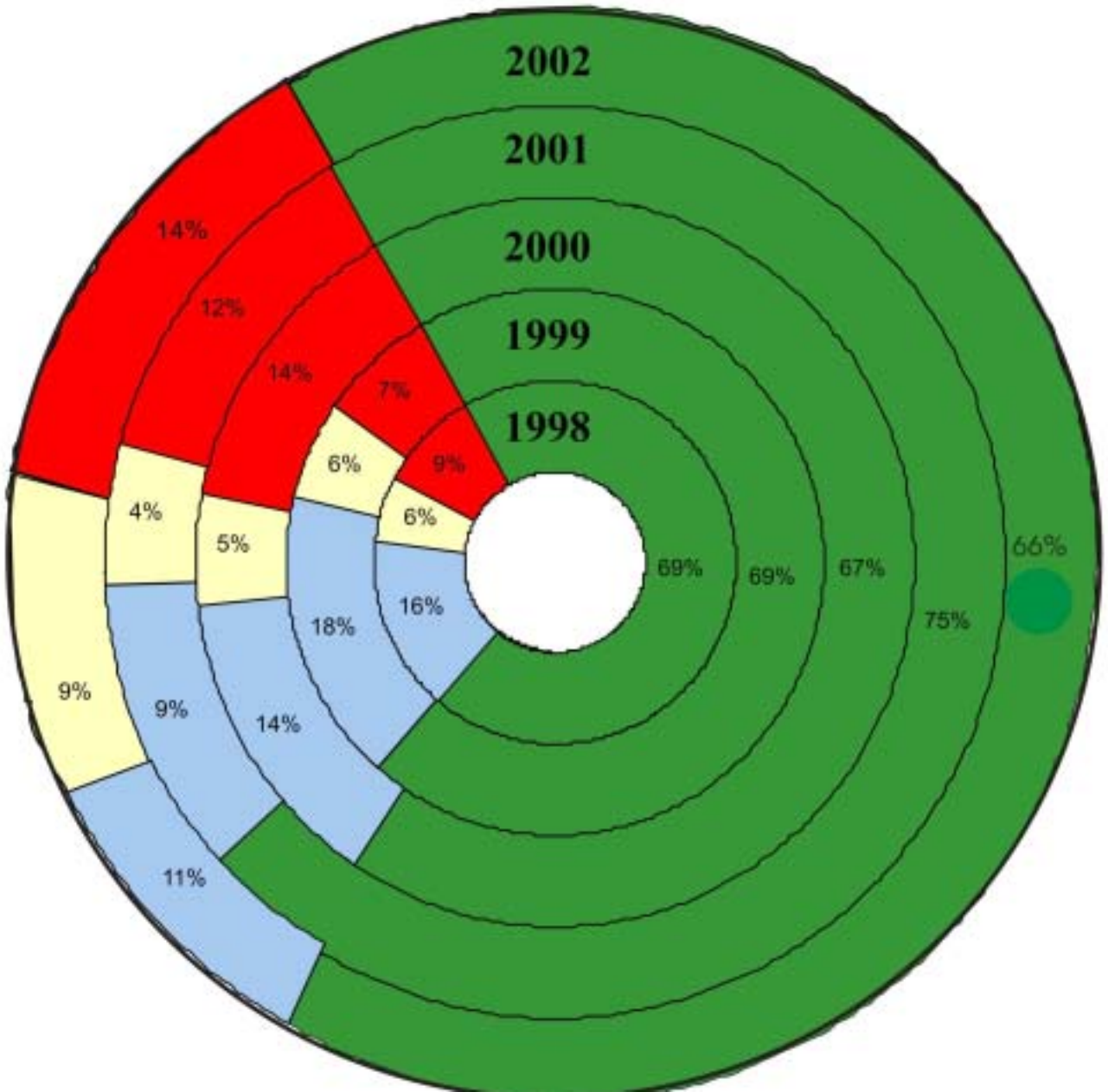

U.S. Great Lakes Beach Advisories and Closings
2002
253
Number of Beaches
35
30
25
20
15
10
5
0
0 3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 .. 80 .. 92
Advisory and Closed Days

MONITORING PRACTICE
VS
PERCENT OF SEASON OPEN
2002

Percent of season open	Monitored on a regular basis	Not monitored	Totals
100	176	77	253
96-99	39	2	41
90-95	33	1	34
< 90	53	2*	55
Totals	301	82	383

* Bay Beach, Brown County WI - not reported in the 2002 survey but included in this report summary for comparison with previous Beach surveys.

Proportion of U.S. Great Lakes Beaches with Beach Advisories For the 1998 – 2002 Bathing Seasons



% Time With Beach Advisories and Closures

- 0% Closed
- 1% - 4% Closed
- 5% - 9% Closed
- >10% Closed

Number of Great Lakes Beaches reported each year:

2002 - 383 beahes

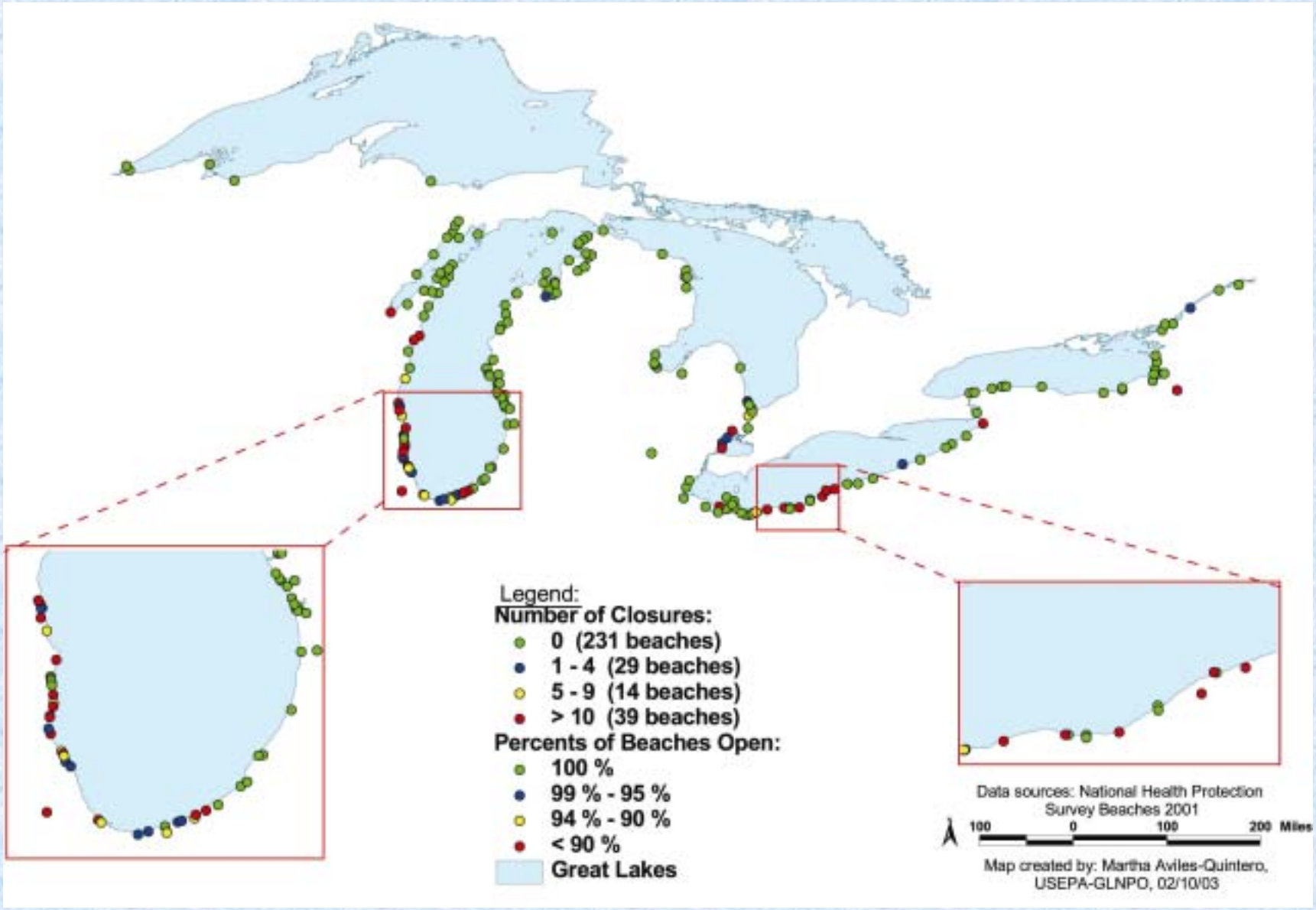
2001 - 313 beaches

2000 - 329 beaches

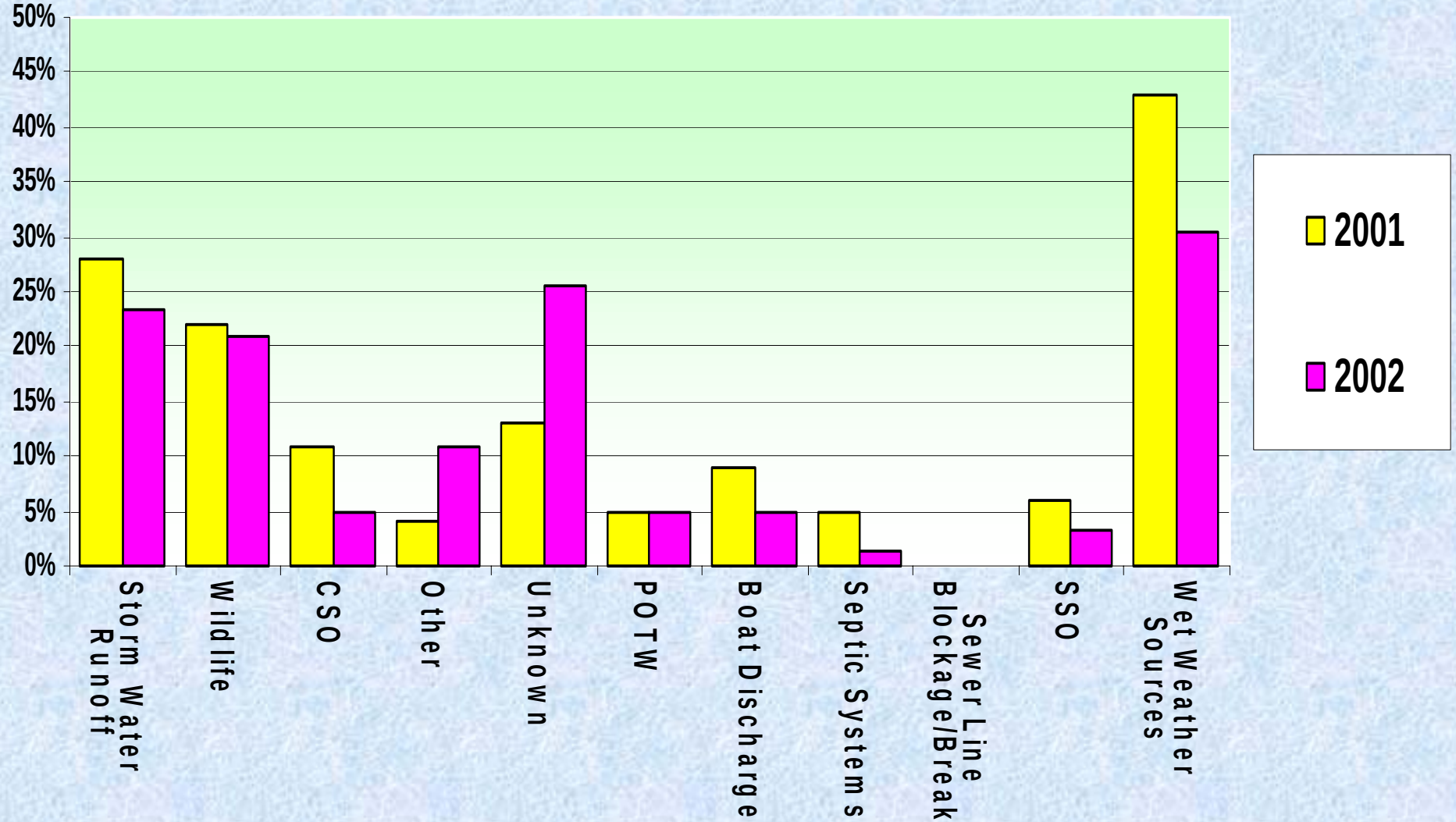
1999 - 316 beaches

1998 - 298 beaches

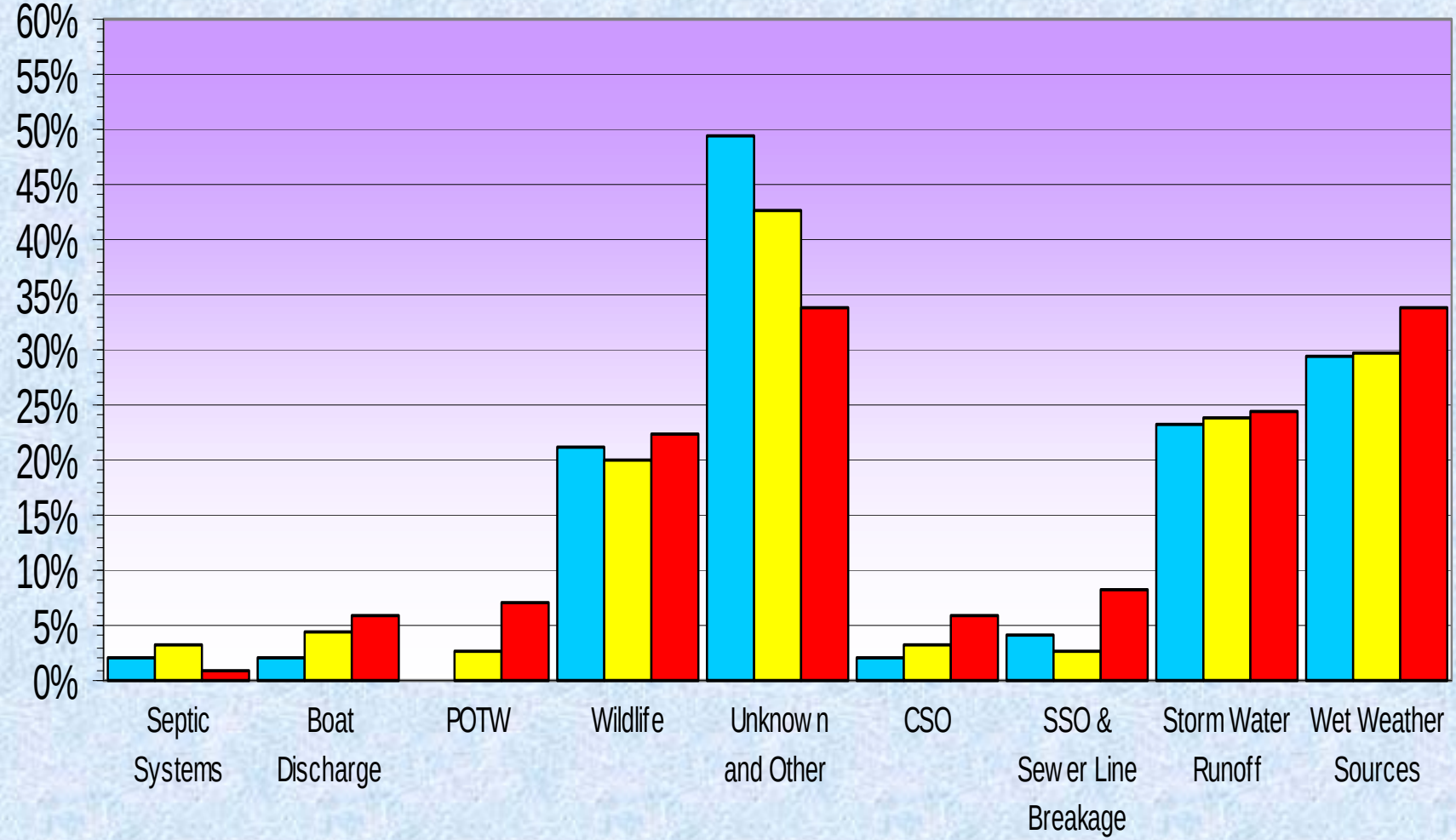
U.S. Great Lakes Coastal Beaches Open during Swimming Season 2001



2001-2002 Great Lakes Coastal Beaches
Sources that resulted in Beach closures/Advisories

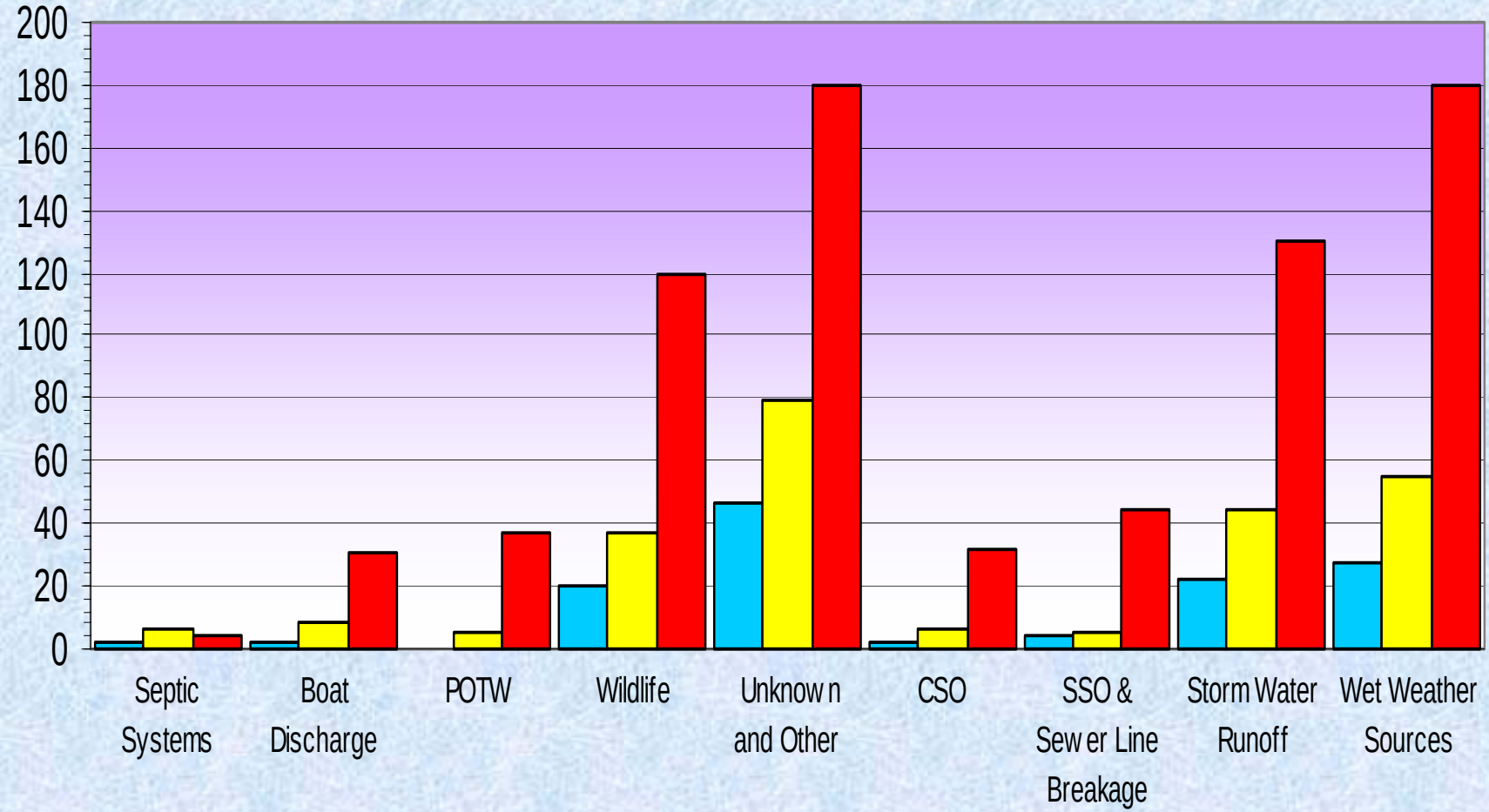


2002 Great Lakes Coastal Beaches Sources that Resulted in Beach Advisories/Closures (Percentage)



Total Occurances : Blue = 95 Yellow = 185 Red = 534

2002 Great Lakes Coastal Beaches Sources that Resulted in Beach Advisories/Closures (Occurances)



Total Occurances : Blue = 95 Yellow = 185 Red = 534

Great Lakes BeachCast: A Regional Beach Reporting System

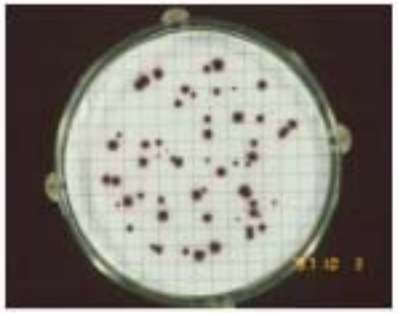
2nd Key Theme BEACH Program: Inform the Public about Water Quality

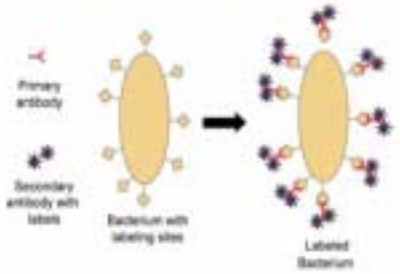
Multi-state development effort

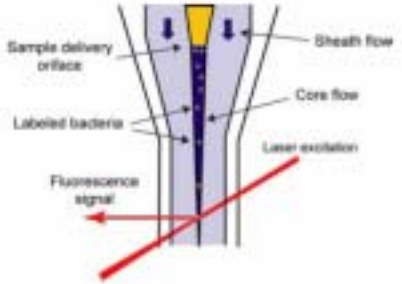
- Ongoing collaboration between beach program managers and the Great Lakes Commission to meet three goals:
  - real-time monitoring data collection and storage on the state level
  - a regional, public reporting system
  - streamlined data transfer to meet EPA's BEACH Program requirements
- Current prototype is being developed for Illinois, Indiana and Ohio
- Great Lakes states have partnered on this cost-effective solution, which should result in a more "robust" system for all
- Data will be housed on individual state "nodes" but mirrored for broad public access on the Great Lakes Information Network (GLIN): www.great-lakes.net

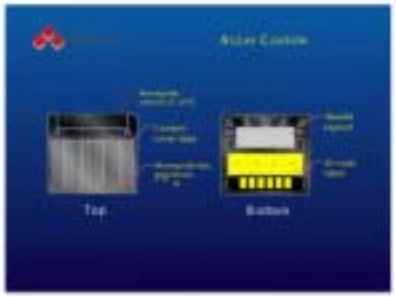
New Approaches to Rapid Testing For Indicators of Fecal Contamination

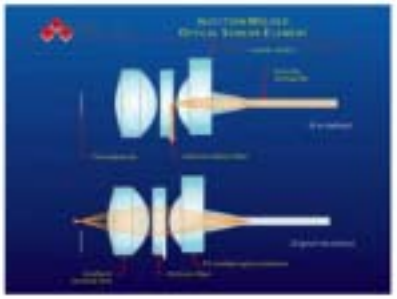
R. Whitman[1], G. Anderson[2], and A. Dufour[3]. [1]USGS, [2]US Navy, [3]US EPA

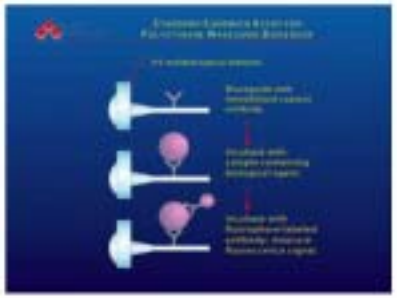


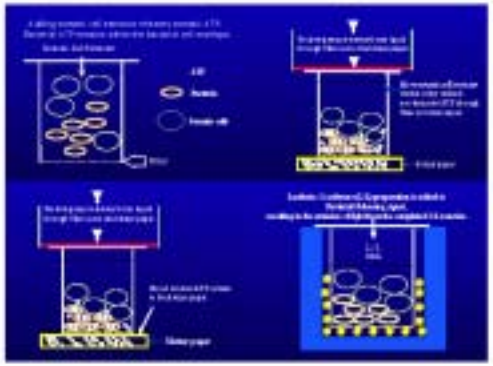


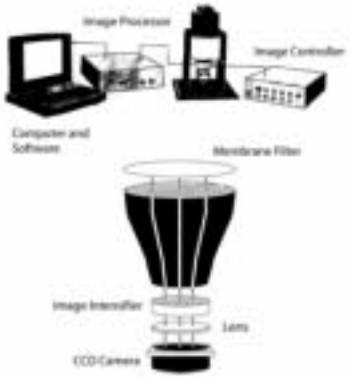


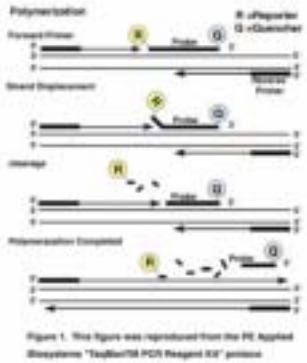


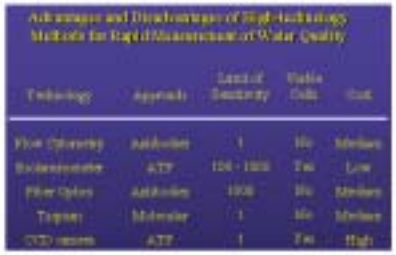






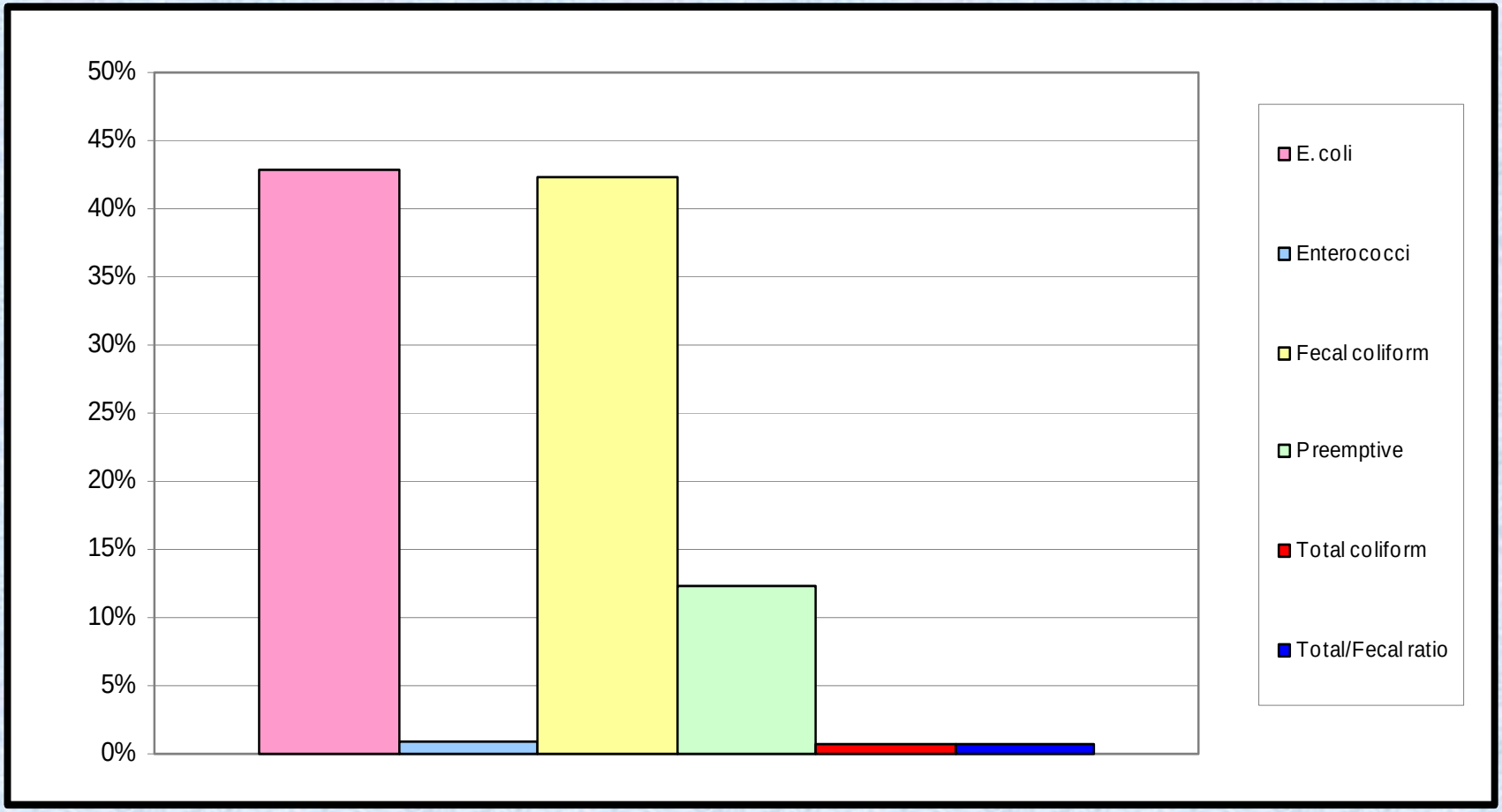






2001 Great Lakes Coastal Beaches Indicators Types Used to Issued Beach Advisories/Closures

Each Indicators reported per days – 81 Beaches



Indicators – 81 Beaches for 2001- 288 records

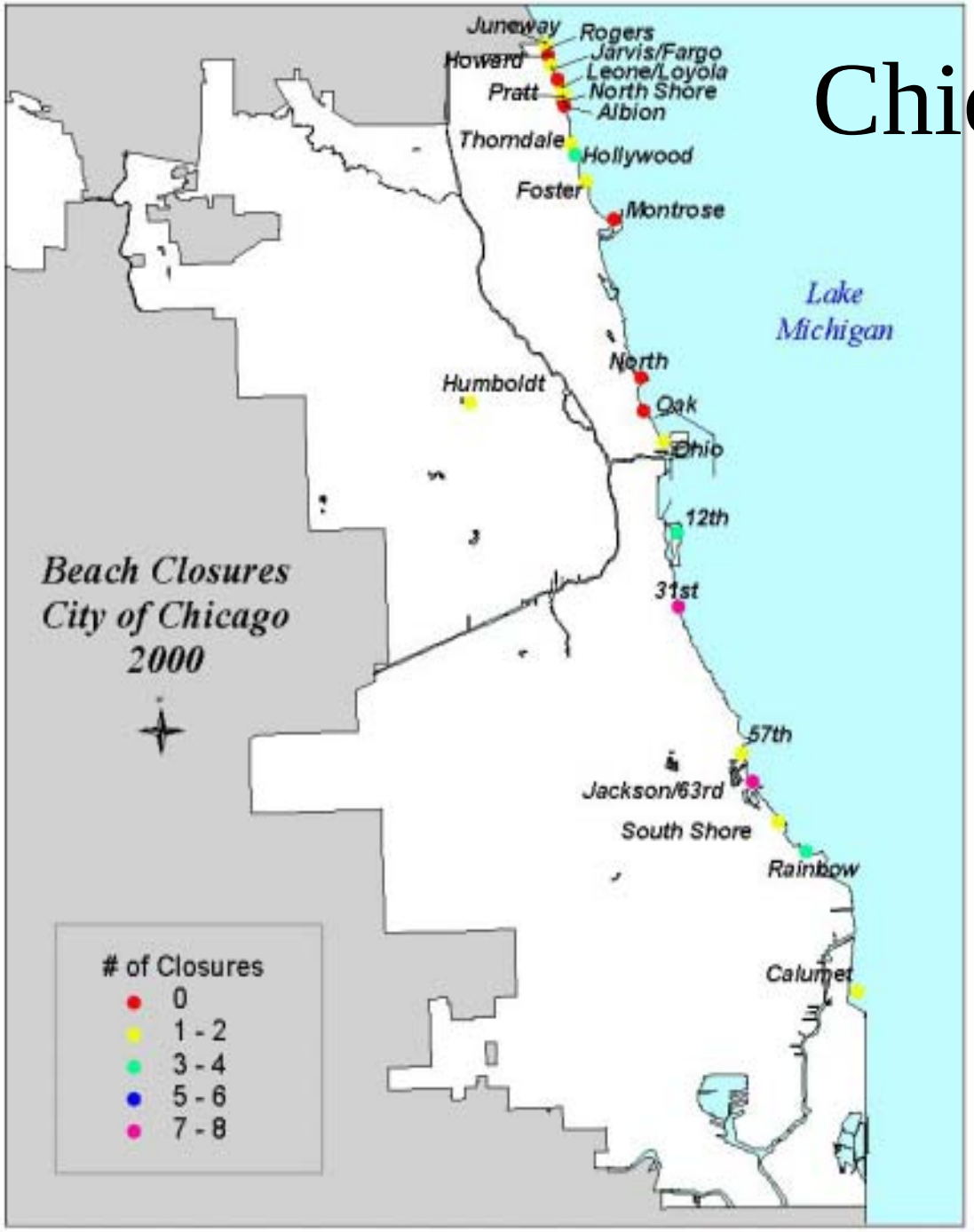
US EPA Beaches Program to Develop Risk-based Guidelines for Recreational Waters

Health Studies

- Freshwater beaches (4), marine beaches (5)
- Swimmers/non-swimmers contacted at beach on week-end days.
- 10-14 days follow-up to determine health status
- Water quality measured at time of swimming activity
- Swimming-associated illness rates related to water quality measurements

Water Quality Measurements

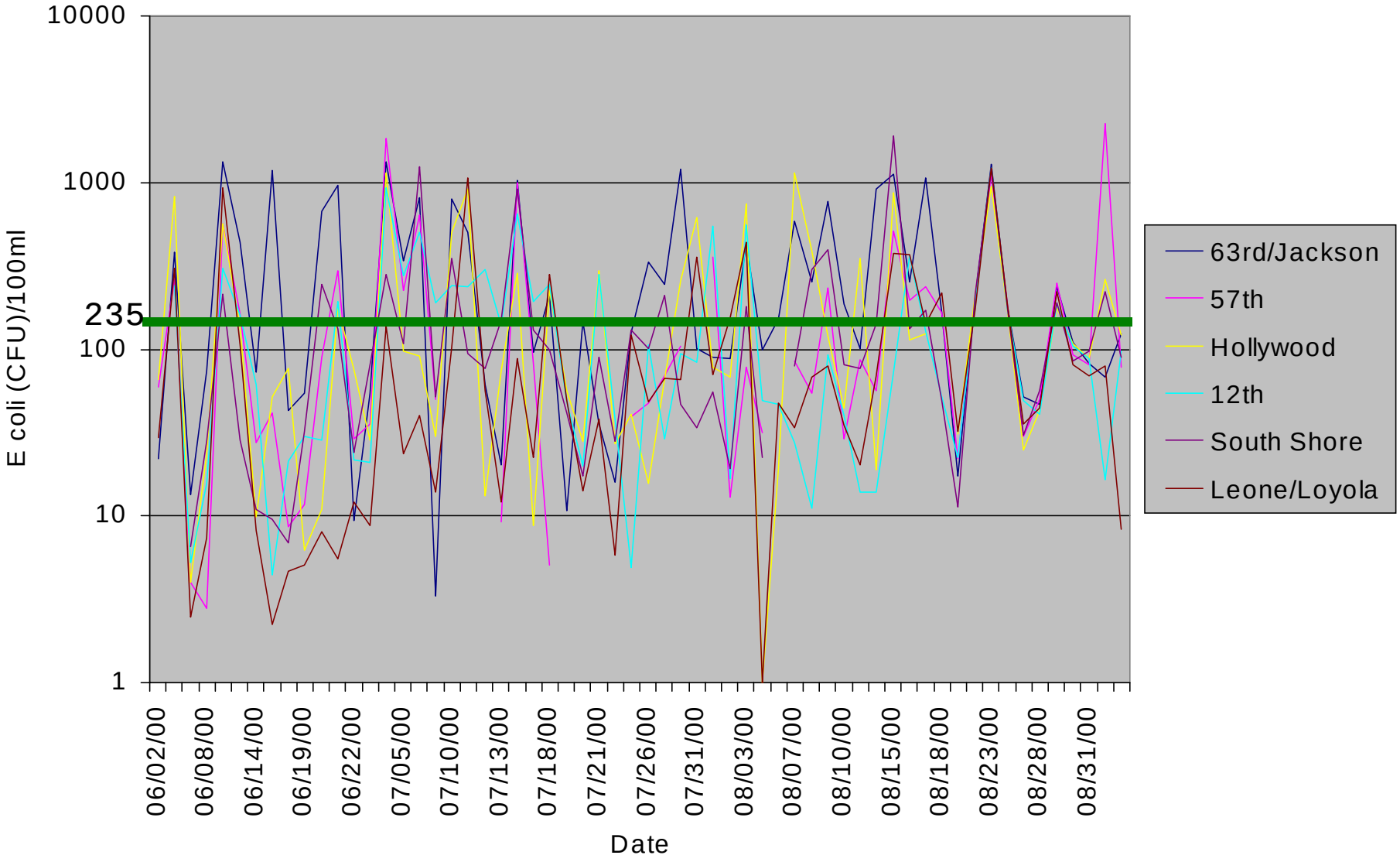
- Cultural Method (enterococci) 24 hours
- Quantitative PCR (enterococci, Bacteriodes) 2 hours
- Fiber Optic, fluoroimmunoassay (enterococci, Bacteriodes) 30 minutes
- Flowcytometry (enterococci) 30 minutes



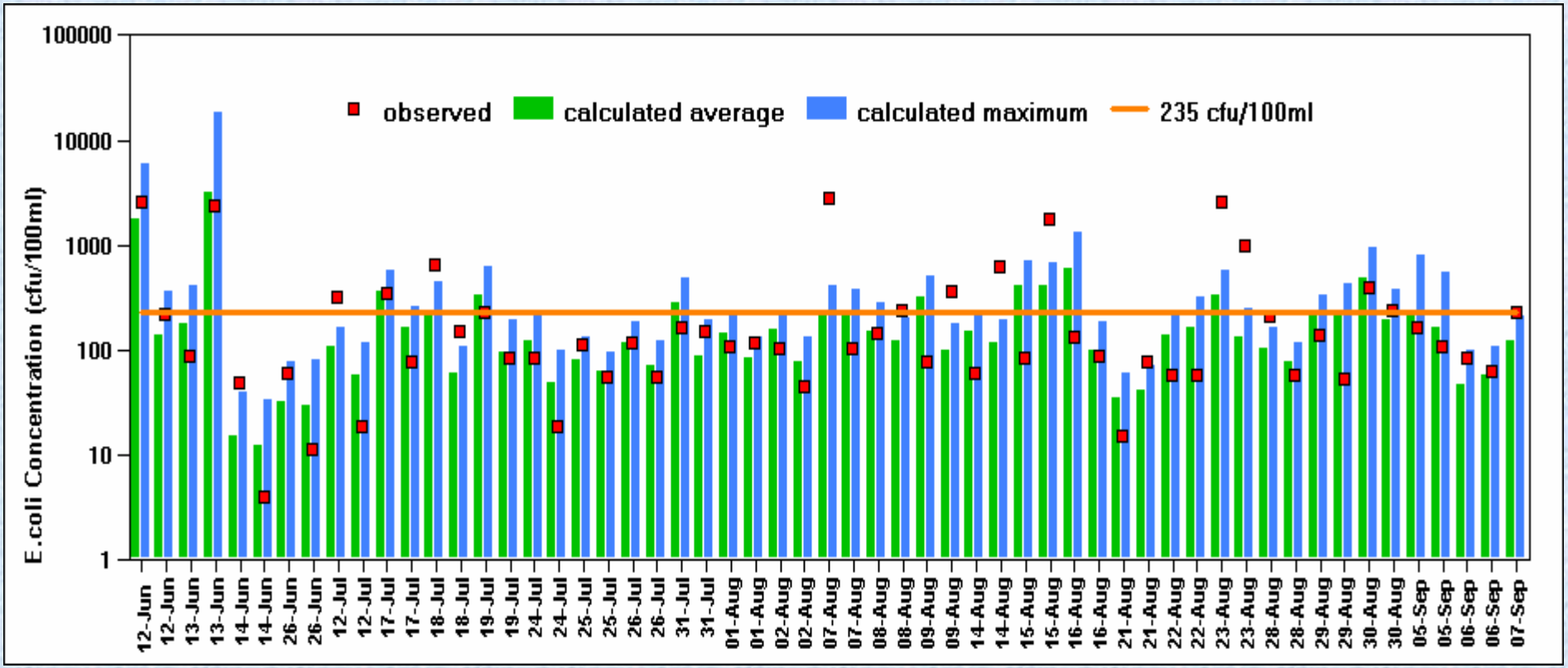
Chicago Lakefront

- 28 Miles of Lakefront
- 32 Public beaches
- 4 Lakefront designs
- Millions of Users
- $5 Billion in Annual Revenue

Summer 2000 *E. coli* Concentrations, Chicago Beaches



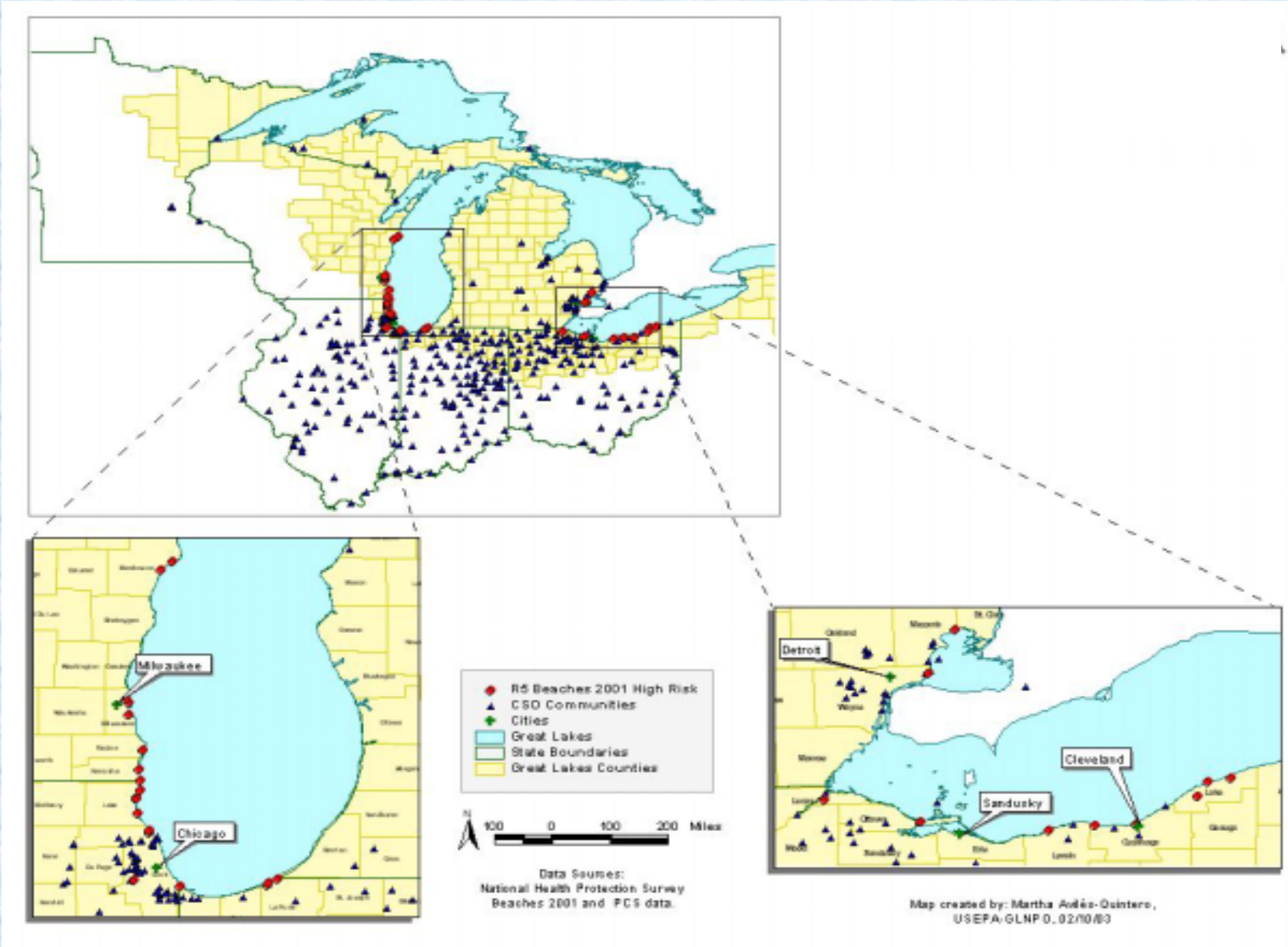
Predictive Model



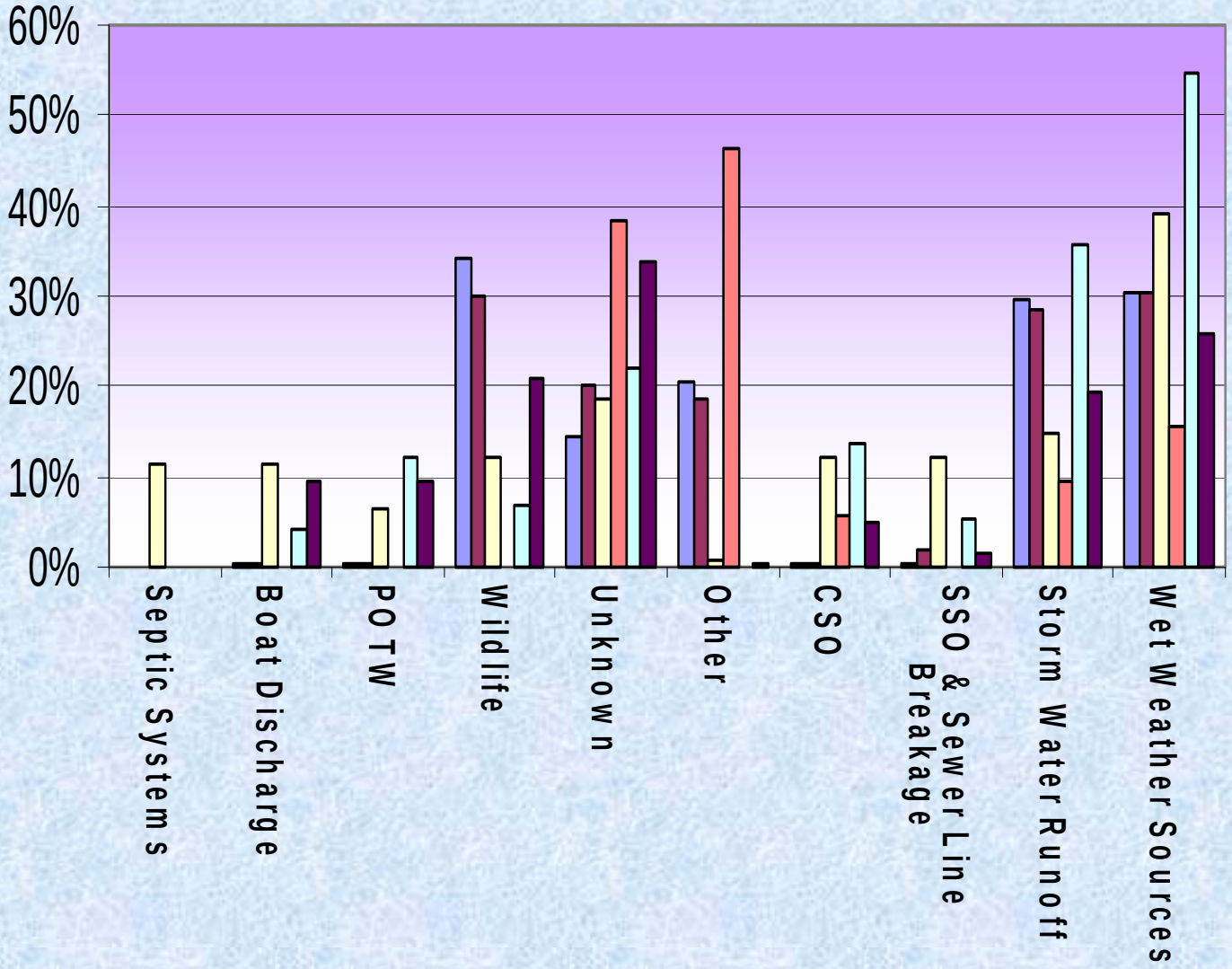
Best Prediction variable

1) North Wind Speed
2) Rainfall
3) Air Temperature
4) Solar Radiation
5) Lake Stage
6) Turbidity

Region 5 Beaches 2001 High Risk and CSO Communities



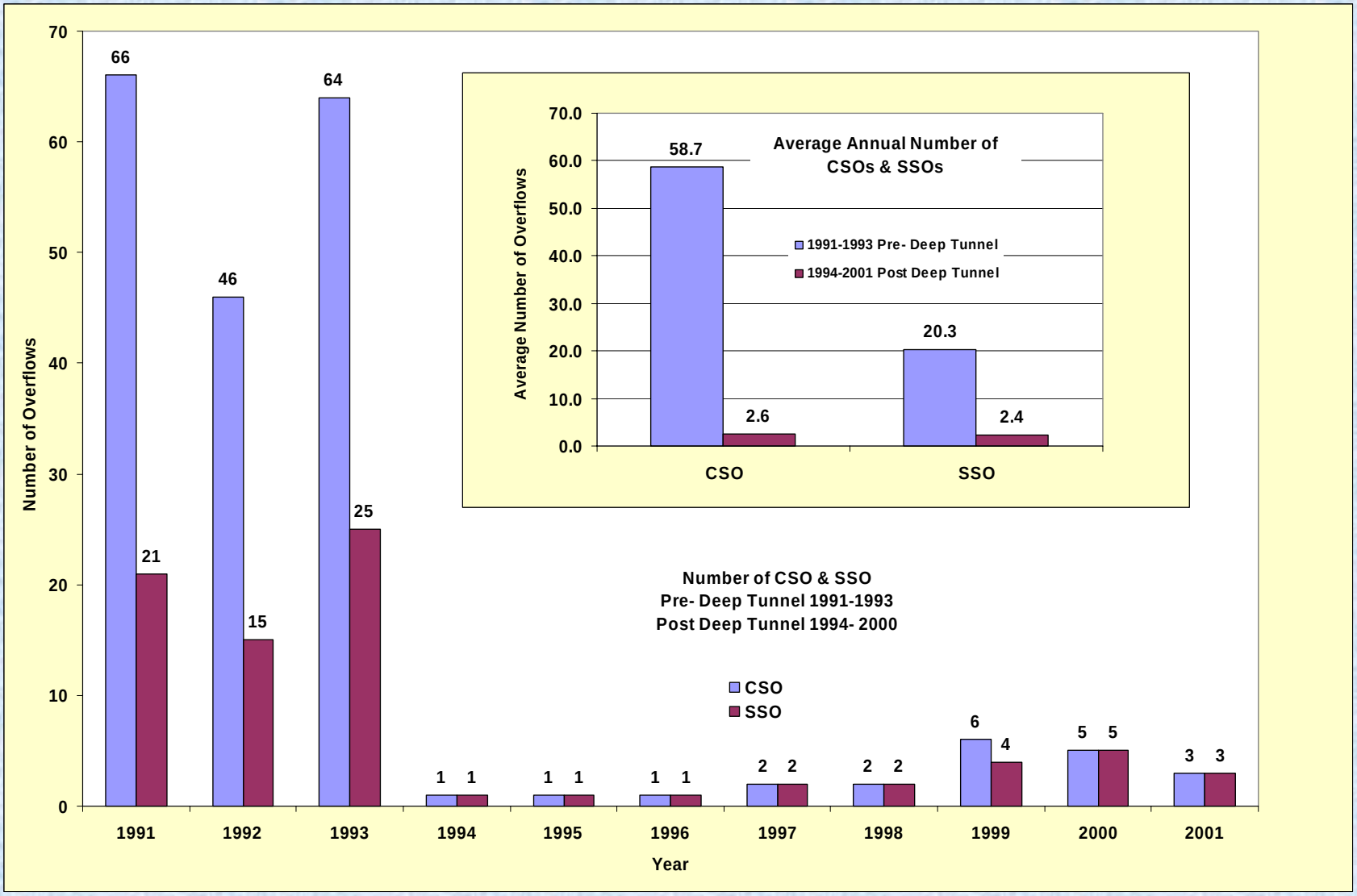
2002 Great Lakes Coastal Beaches Sources that Resulted in Beach Advisories/Closures in each State



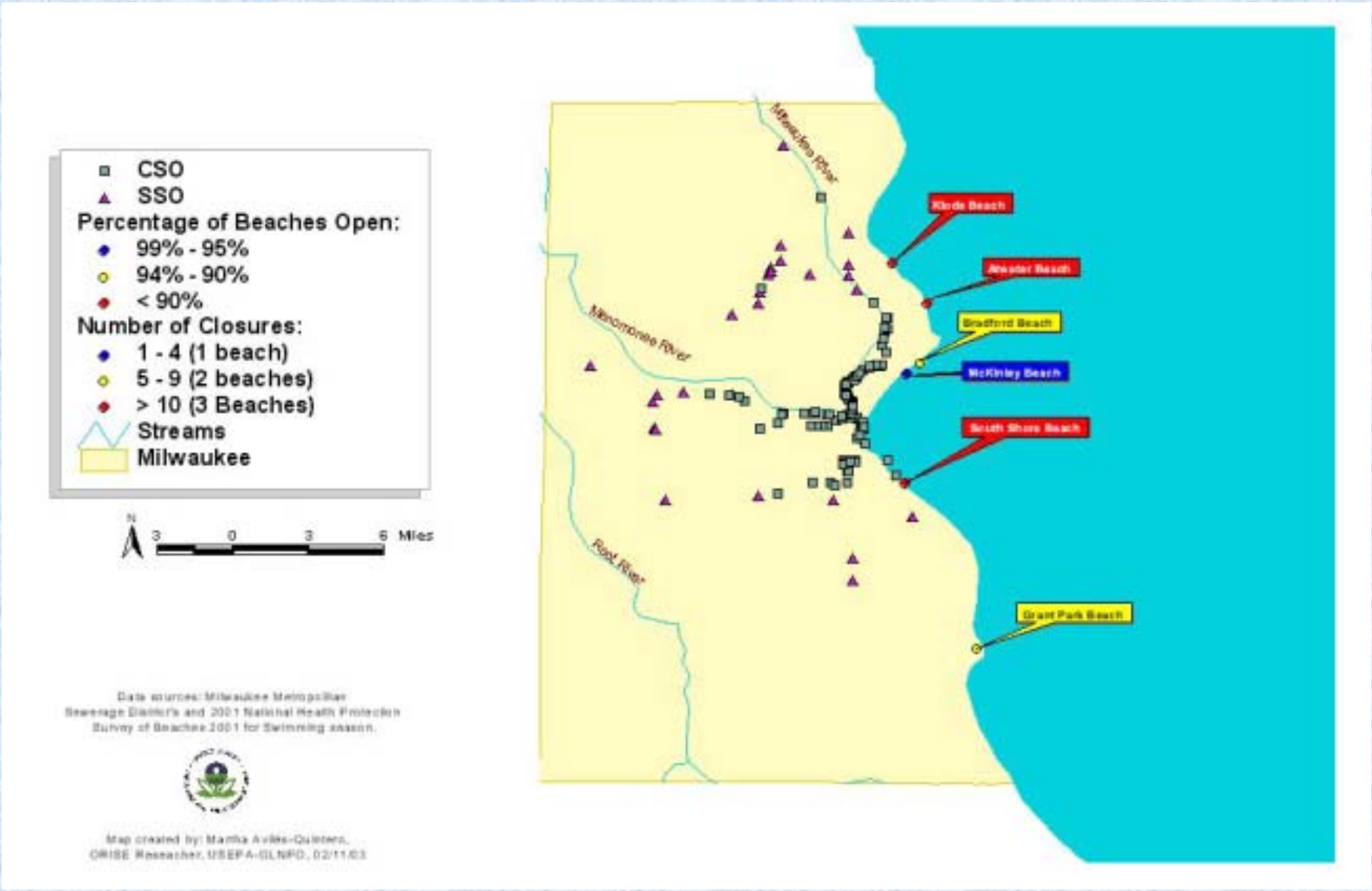
Milwaukee Deep Tunnel System

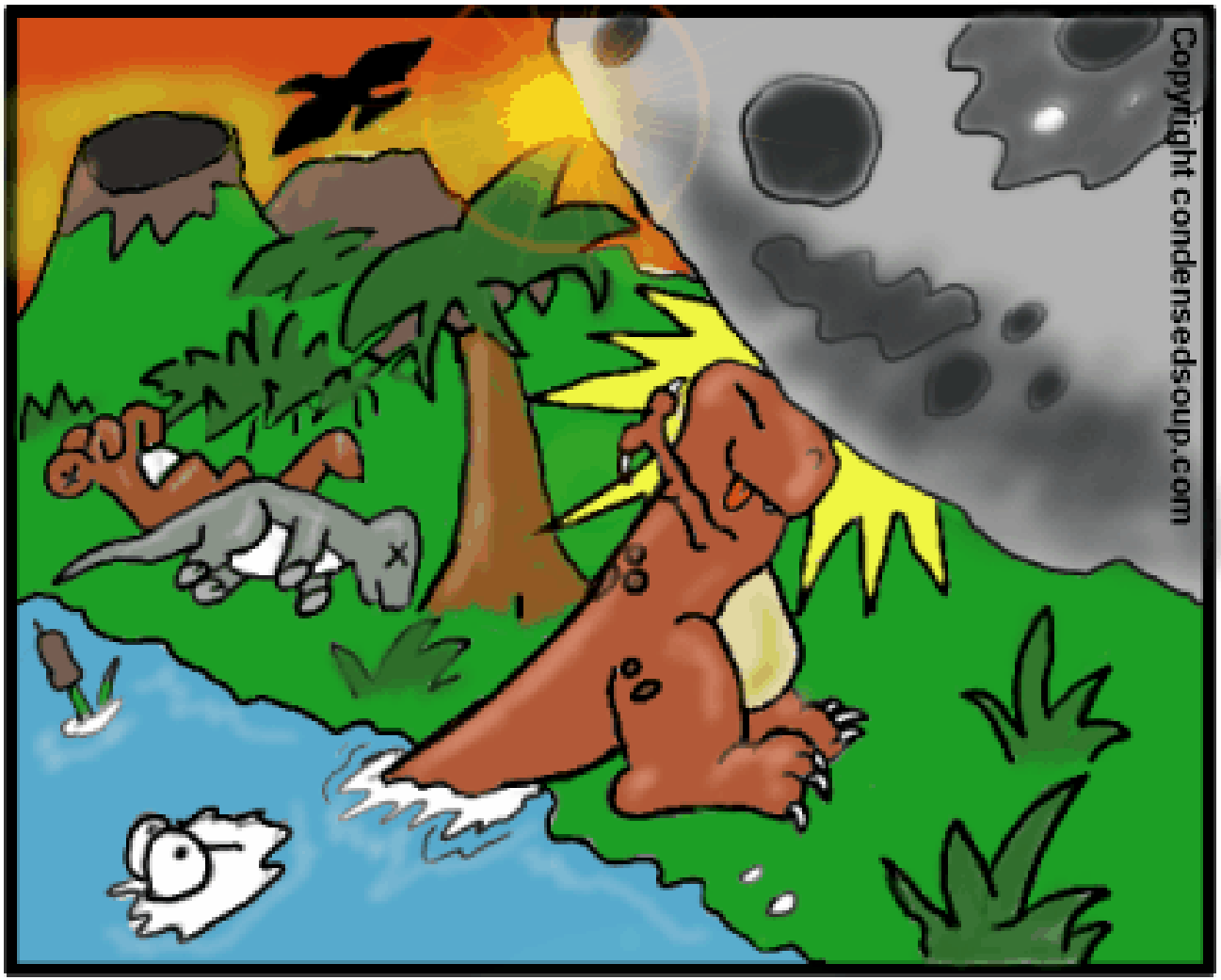
- 405 Million Gallons
- 300 feet below ground
- 19.4 miles long
- 12 to 32 foot diameter
- 24 Dropshafts
- 3 ~ 50 MGD dewatering pumps
- Design to overflow ~ 2 times/year

Reductions in Number of CSO's and SSO's



Milwaukee Metropolitan Sewer District's CSO, SSO and 2001 Beaches





Scientists have discovered that the moon is moving away from the earth at a tiny yet measurable distance every year. If you do the math, you can calculate that 85 million years ago the moon was orbiting the earth at a distance of about 35 feet from the earth's surface. This would explain the death of the dinosaurs. The tallest ones, anyway....

There's Science and There's Sound Science...


Keep 'Em Great!