2007 Lake Michigan Beach Report

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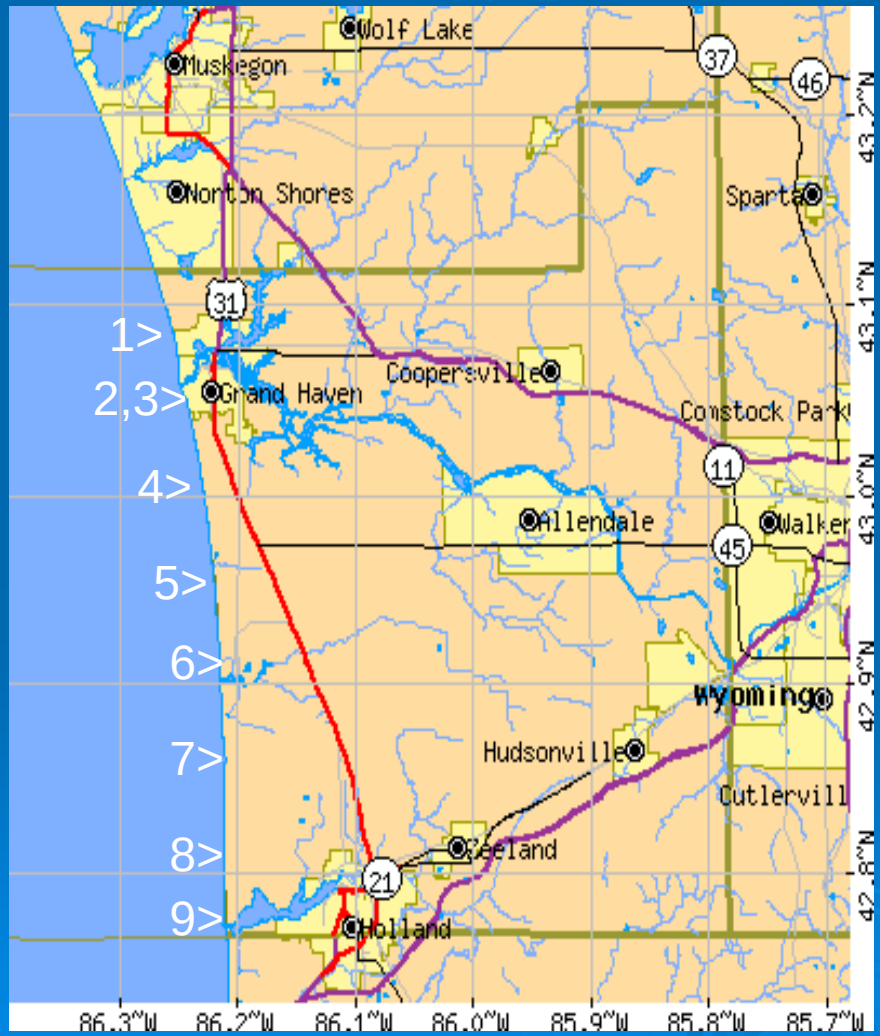
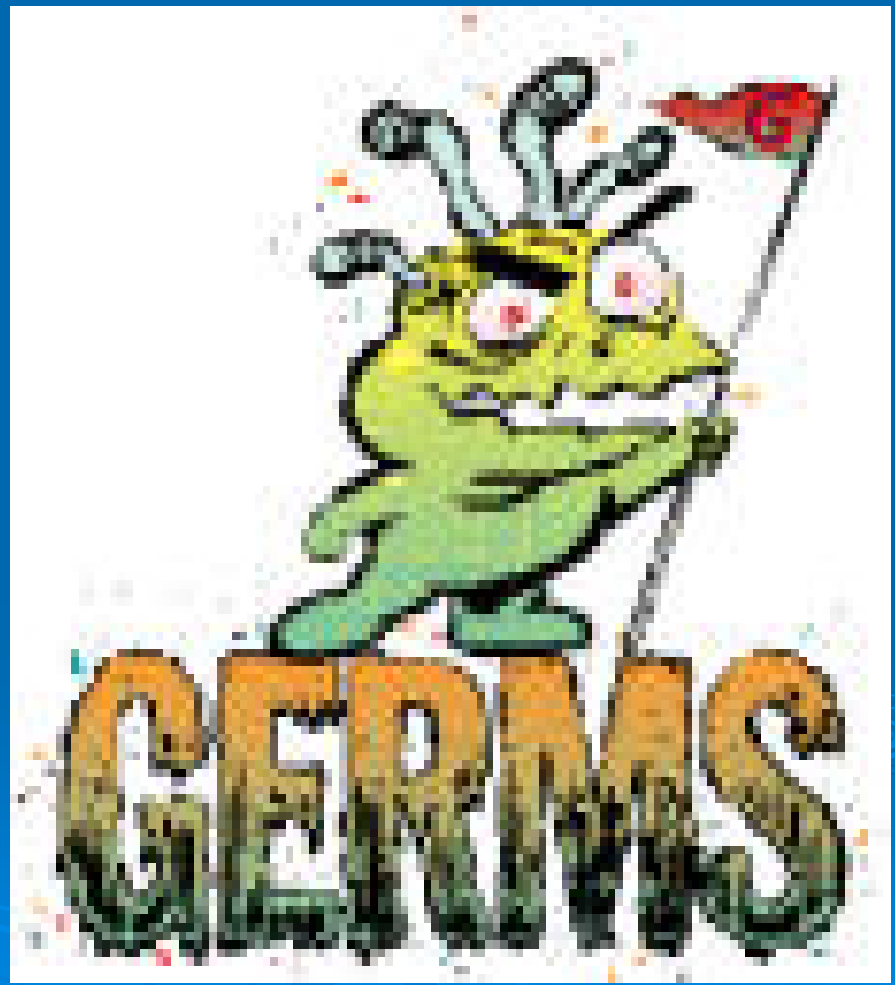
Ottawa County's LM Beaches



1. North Beach Park*
2. GH State Park
3. GH City Beach*
4. Rosy Mound*
5. Kirk Park
6. Windsnest Park
7. Kouw Park
8. Tunnel Park*
9. Holland State Park

What does E. coli tell us?

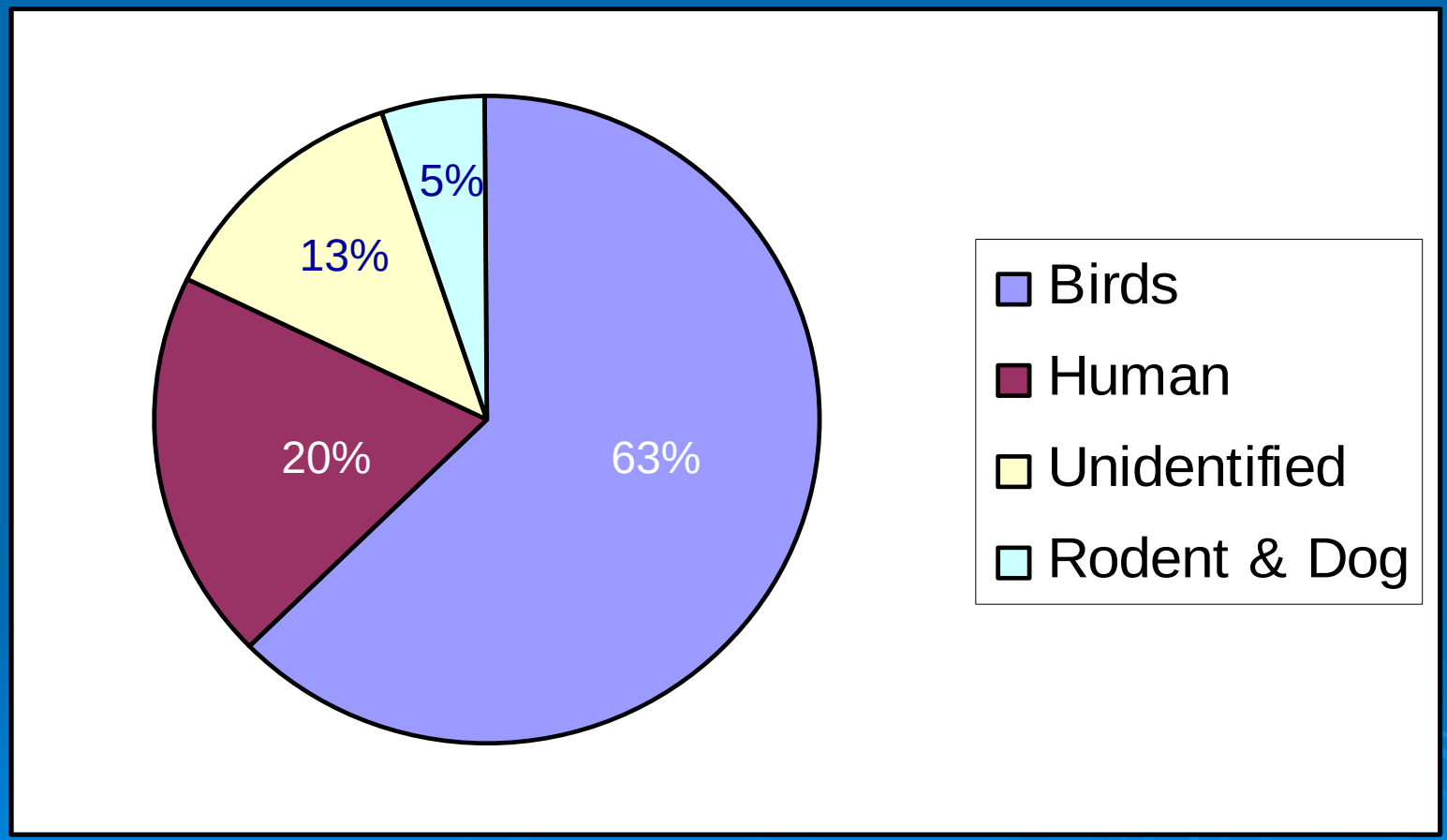
- Campylobacter
- E. coli O157:H7
- Legionellae
- Pseudomonas
- Shigellae
- Vibrio cholerae
- Hepatitis A virus
- Norovirus
- Rotavirus
- Giardia
- Cryptosporidium



Where does it come from?

- Over 1,082,395,000 gallons of combined sewage overflow (CSO) were released to the Grand River in 2005.
- Agricultural runoff
- Inadequate septic systems
- Natural sources
- Swimmers
- 1 gram of gull feces contains 325 million E. coli bacteria

E. Coli study in Lake County, IL

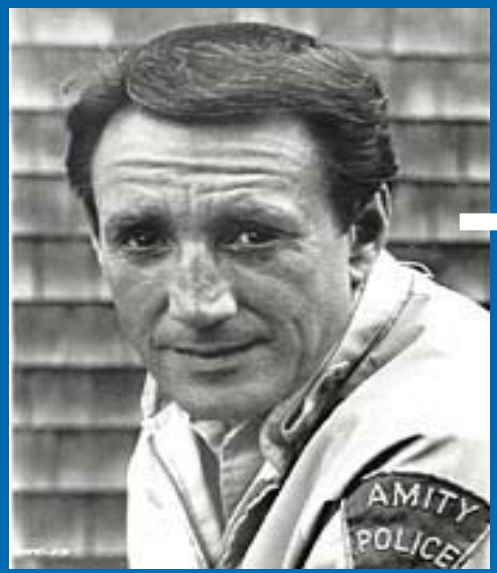


SOURCE: Lake County (Illinois) Health Department

Public Health in Recreational Waters - *Does it really matter?*

- 2005, EPA/CDC's National Epidemiological Environmental Assessment of Recreational (NEEAR) Water Study
  - Surveyed 5,667 individuals at two Great Lake beaches
  - 10% incidence rate of GI for swimmers at beach #1
  - 14% incidence rate of GI for swimmers at beach #2
  - Incidence rate for non-swimmers: 5%

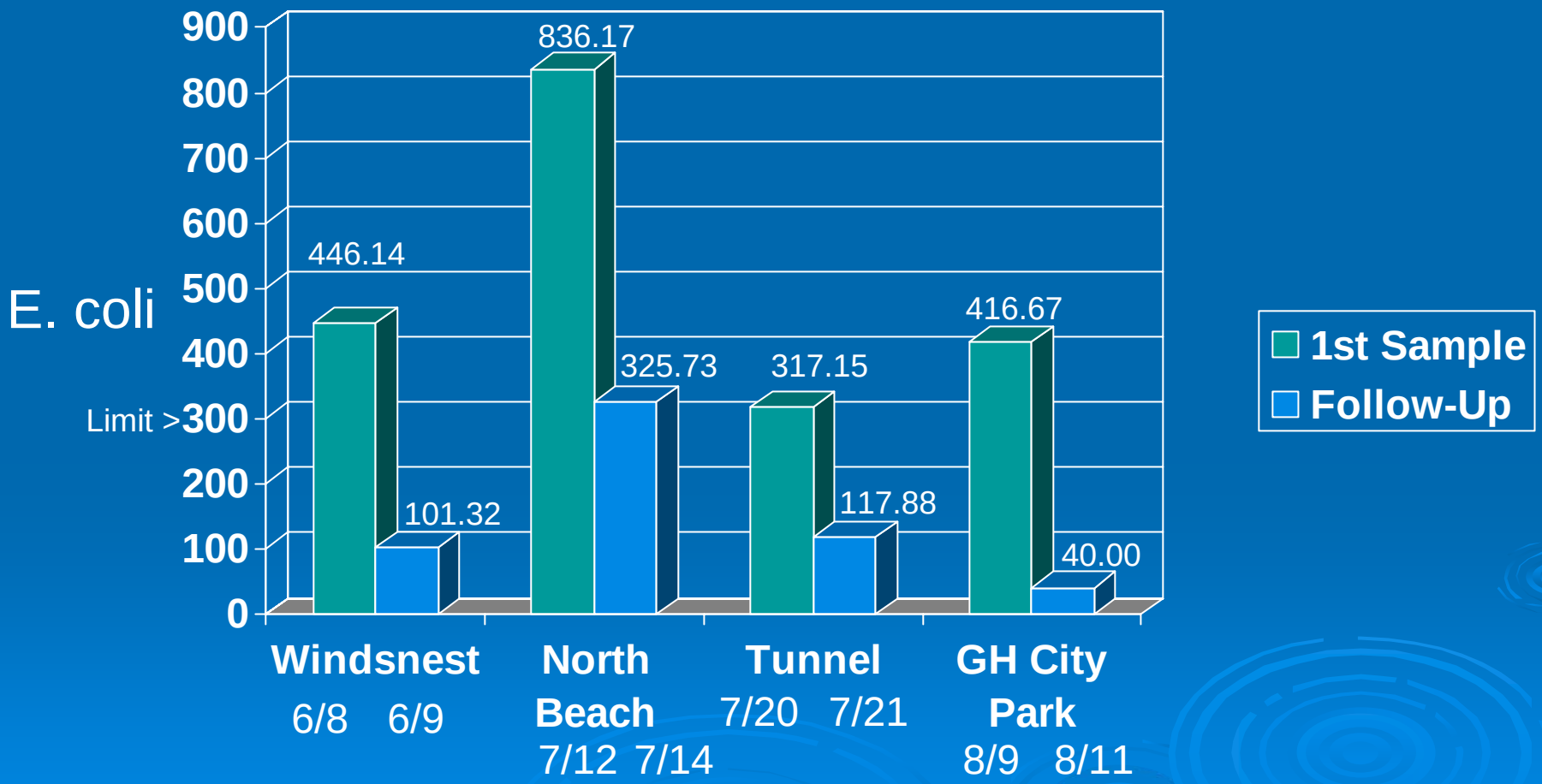
JAWS Paradigm of Public Health Risk Perception



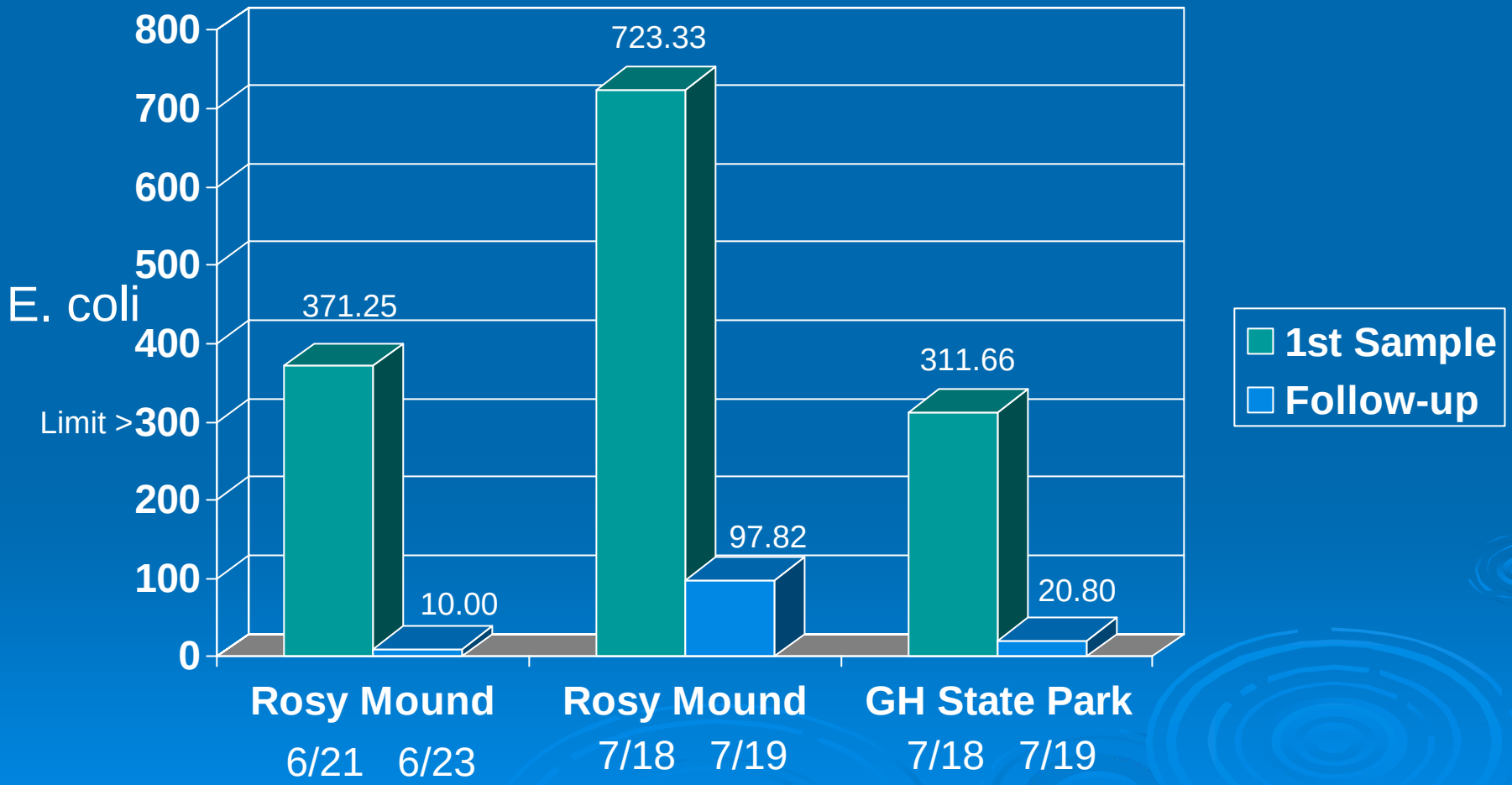
High Risk Perception

Low Risk Perception

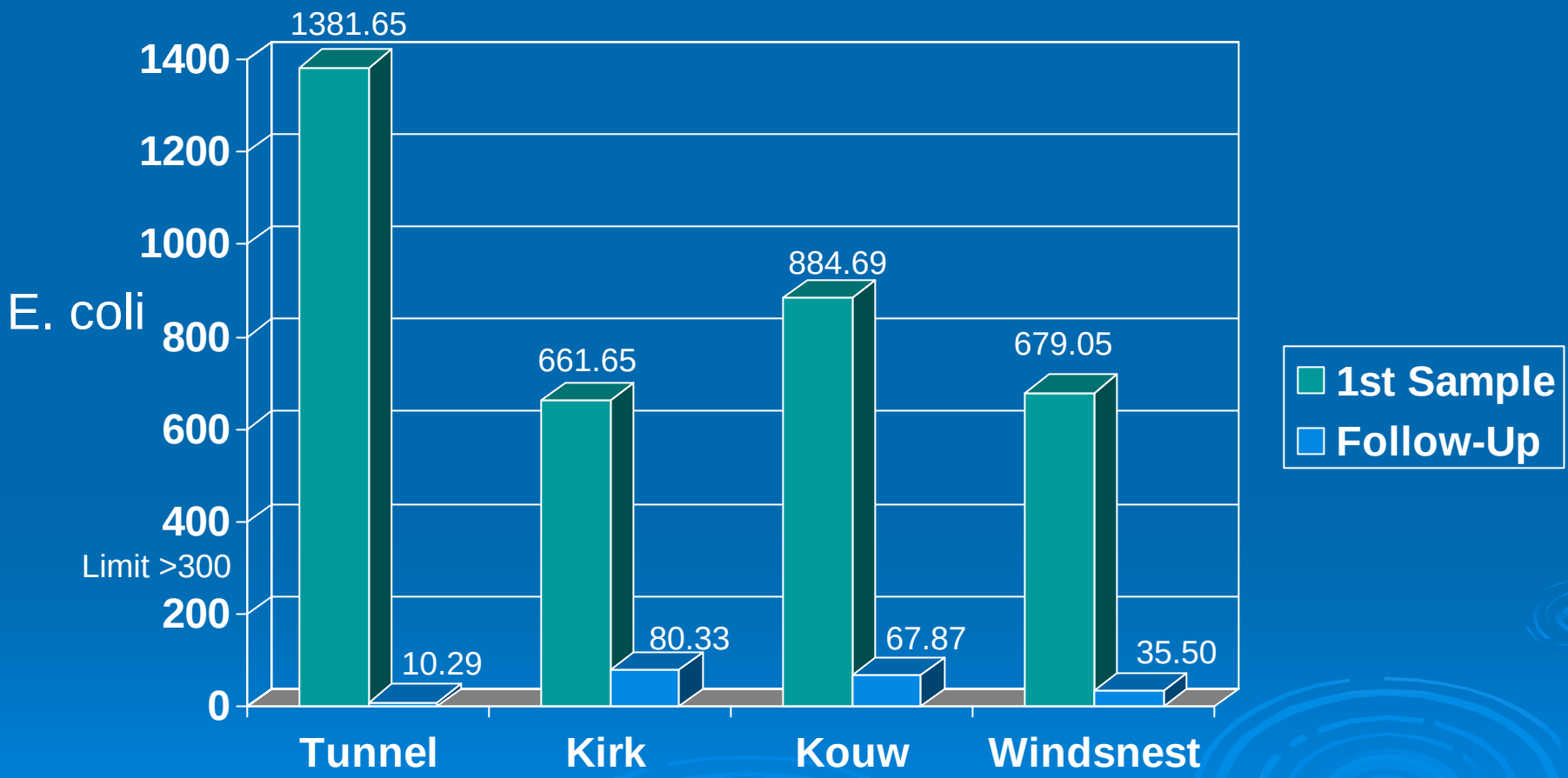
2004 LM Advisories



2005 LM Advisories

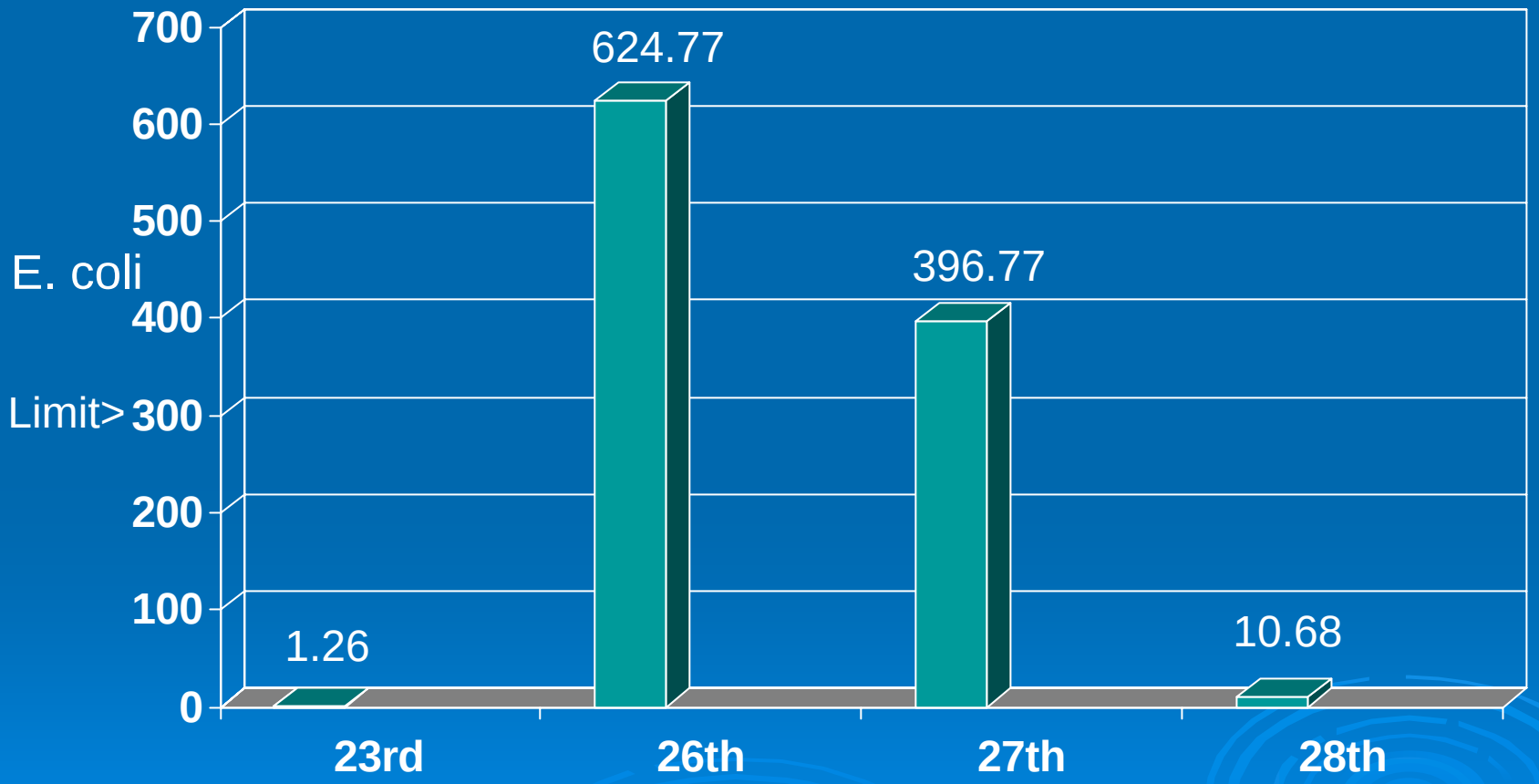


2006 LM Advisories



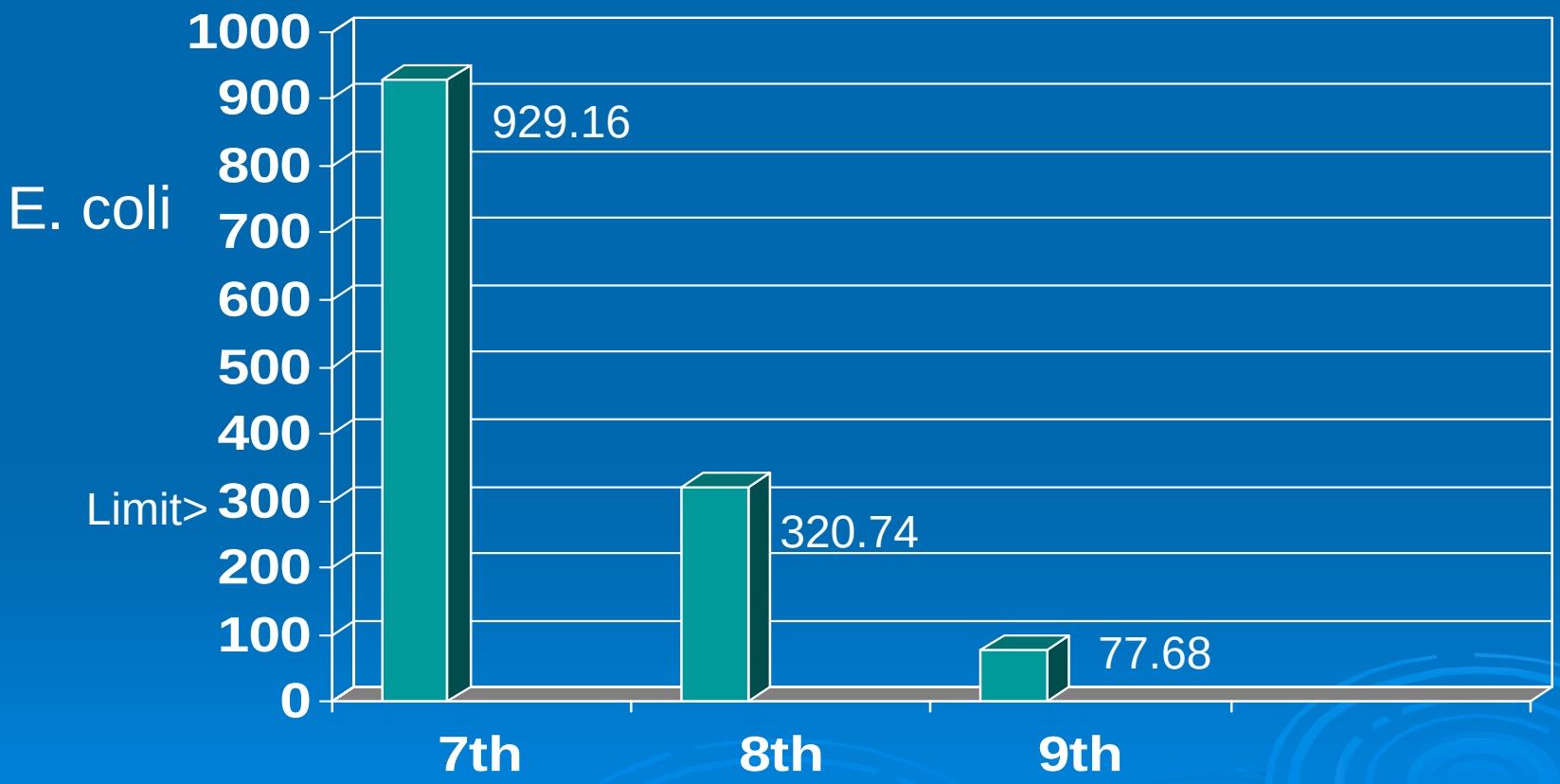
* All dates were 6/21 and 6/22.

Grand Haven Advisory



JULY 2007

Tunnel Park Advisory

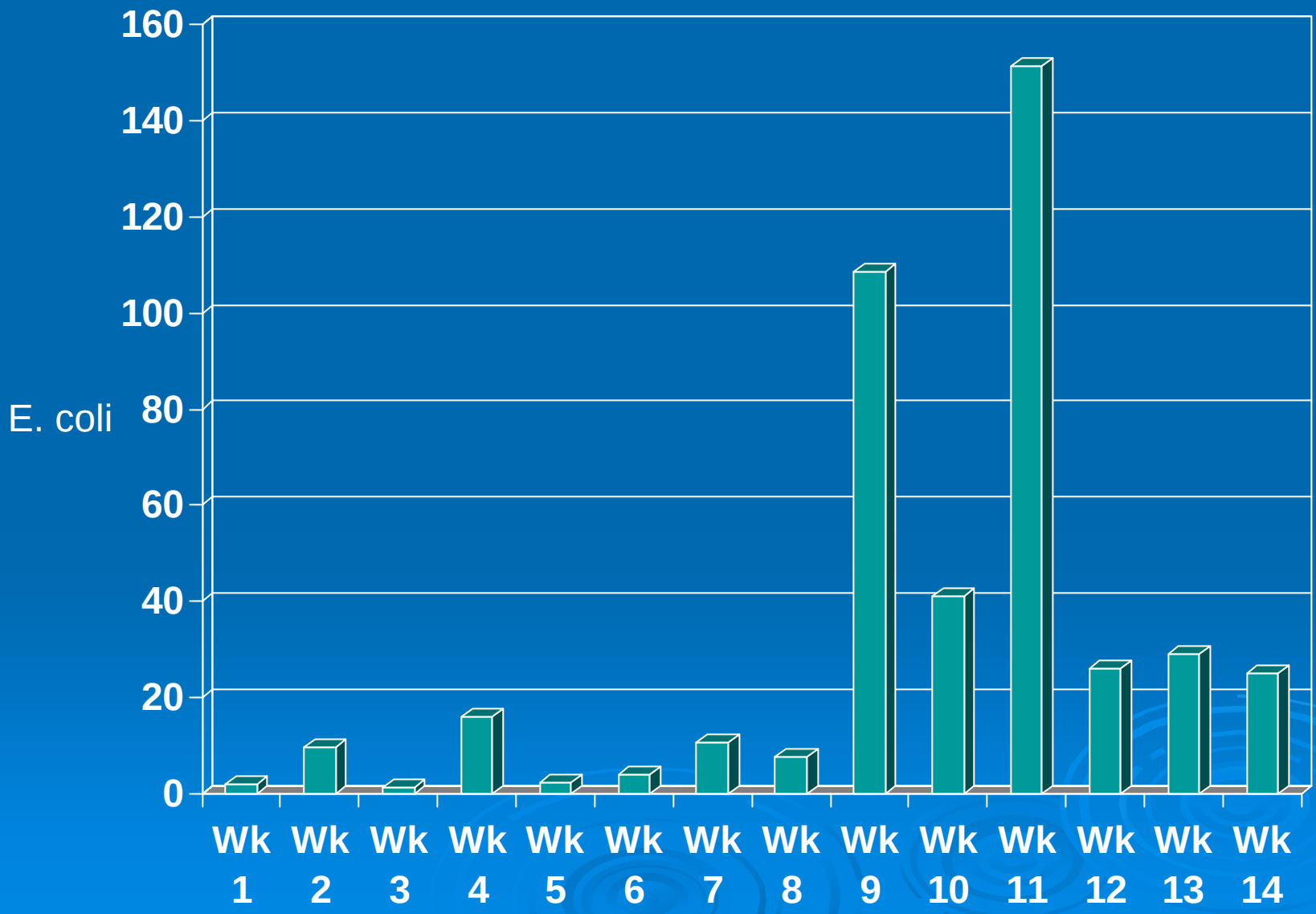


August 2007

2002-2007 Results

Location	# of Events	Exceedances	Percent
GH City	99	5	5.05%
GH State P	87	2	2.30%
Holland SP	85	1	1.18%
Kirk Park	86	2	2.33%
Kouw Park	56	1	1.79%
North Beach	96	2	2.08%
Rosy Mound	66	2	3.03%
Tunnel Park	97	5	5.15%
Windsnest	57	2	3.51%

2007 Weekly E. coli Averages



Lessons Learned

1. Lake Michigan Beaches show acceptable water quality 97% of the time
2. Correlations have been observed between environmental/meteorological variables and impaired water quality (precipitation, current, Grand River plume, algae, gulls, turbidity)
3. Beaches respond differently to variables
4. Water quality has been more susceptible later in the swimming season
5. Traditional water quality testing procedures have very limited public health use – public demands a better system

Predictive Modeling

- Identify statistically significant environmental/meteorological and seasonal relationships with water quality
- Each beach will have a location specific formula
- POOR Water Quality
- GOOD Water Quality
- Public will be notified via signs, miOttawa.org, and media outlets

Questions?

Thank You