

What Factors Affect Bacteria Levels?

The 2003-2004 data indicate a number of factors and their relationship – or lack of a relationship – to high bacteria levels at the Lake Erie beaches of Maumee Bay State Park.

Related to E. coli

- Turbidity and rainfall (24 hours)
- Wave height
- Wind direction— northerly winds are associated with higher E. coli levels

Not Significantly Related

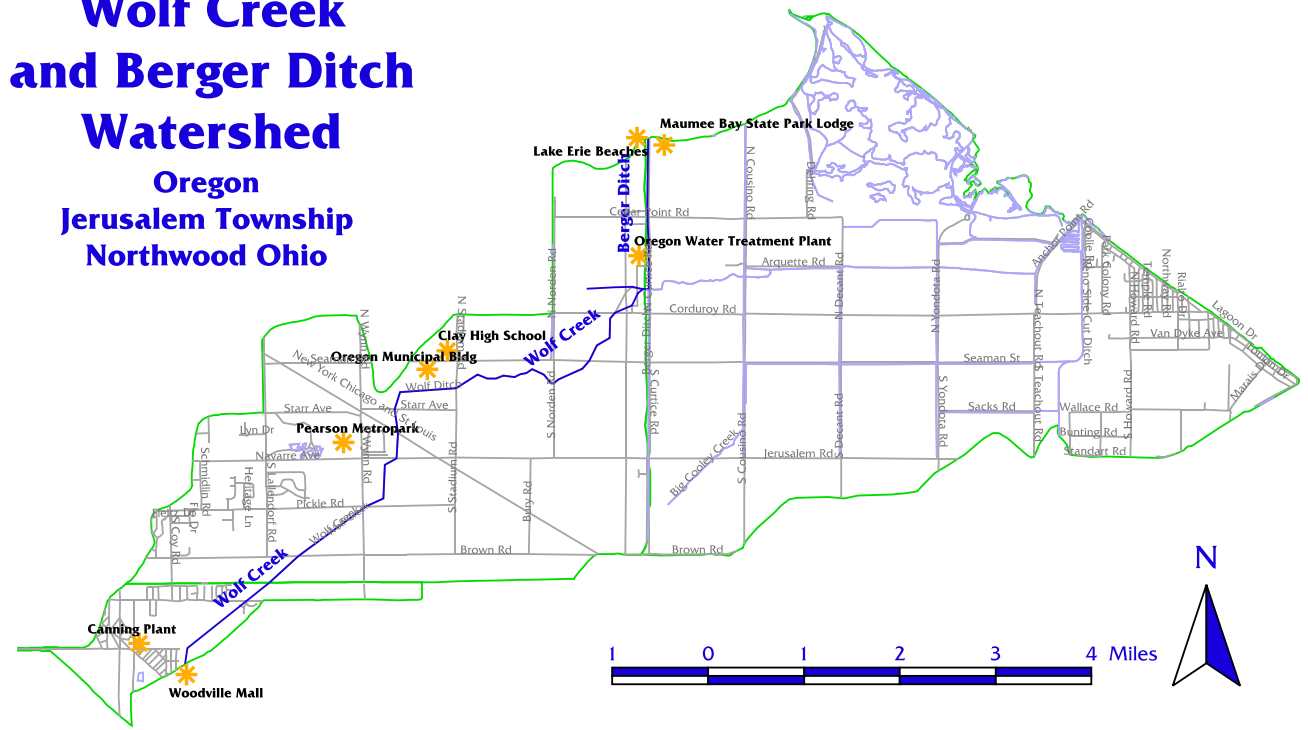
- Number of birds
- Number of bathers
- Water temperature

Where Is Wolf Creek?

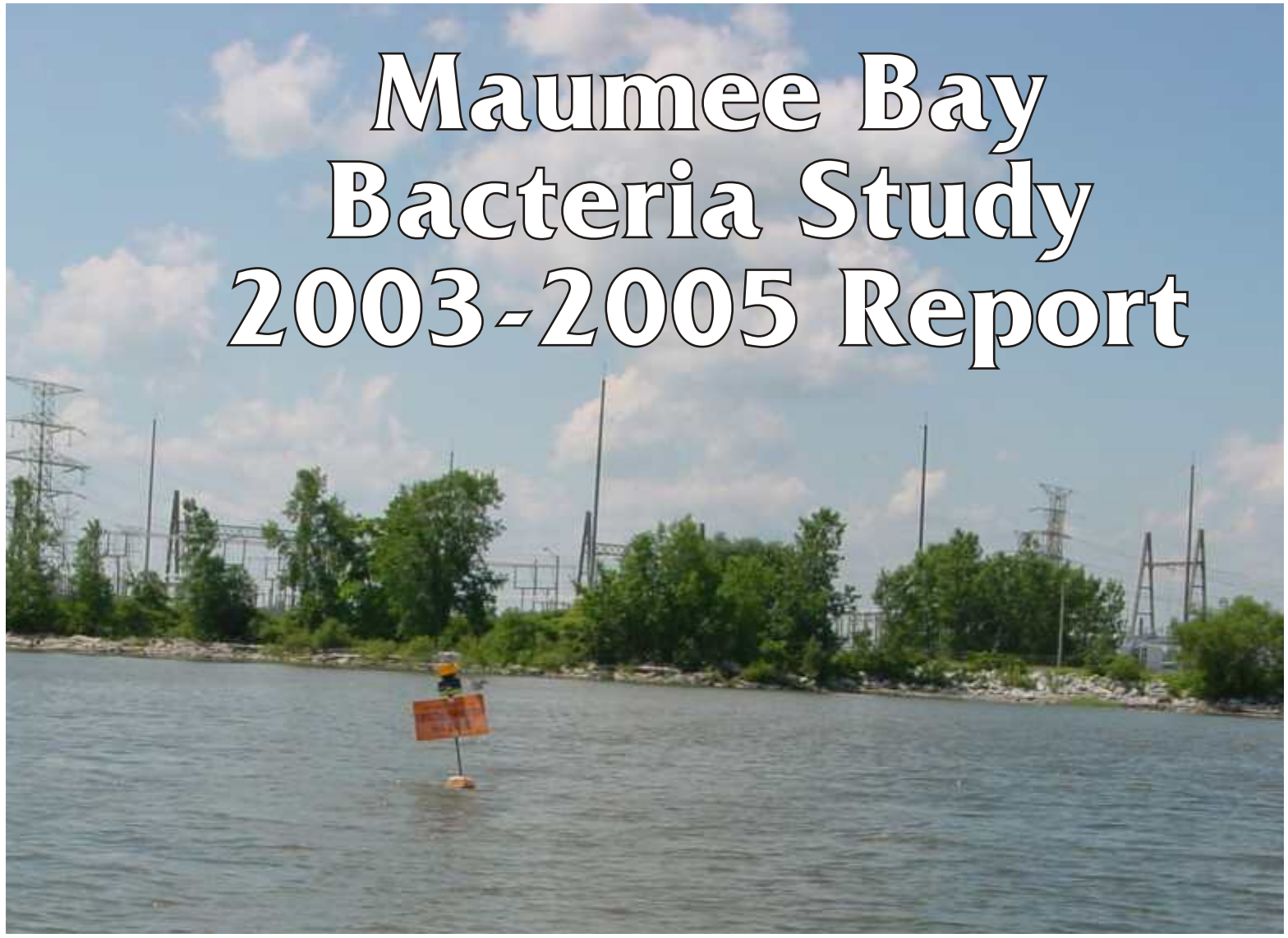
- Wolf Creek flows from Northwood, through Oregon, and is cut off from the bay at North Curtice Road. From there it flows north, as Berger Ditch, to Maumee Bay State Park.
- Potential bacteria sources from the watershed include home sewage systems, private sewage treatment plants, and warm-blooded animals.
- Many septic systems have been repaired in recent years, following Health Department inspections. The City of Oregon has eliminated hundreds of septic systems with the construction of new sewers.

Wolf Creek and Berger Ditch Watershed

Oregon
Jerusalem Township
Northwood Ohio



Maumee Bay Bacteria Study 2003-2005 Report



University of Toledo Lake Erie Center
US Geological Survey
Toledo Metropolitan Area Council of Governments

- 2003 – Identify E. coli hot spots**
- 2004 – Investigate hot spots**
- 2005 – Analyze data & report findings**

What Do We Know and Where Do We Go From Here?

- While many sources of bacteria impact the bay, Wolf Creek appears to be a principal source of bacteria impacting the Lake Erie Beaches at Maumee Bay State Park.
- Analyze the 2003-2004 water and sediment data for factors that affect bacteria transport and survival.
- Elimination of bacteria sources by repairing septic systems and installing sewers should continue.
- The next project to reduce bacteria levels at the Lake Erie beaches should be construction of wetland(s) along Wolf/Berger. Such a system will settle and filter out sediment and bacteria. The wetland ecosystem will capture bacteria before they can get to the bay.

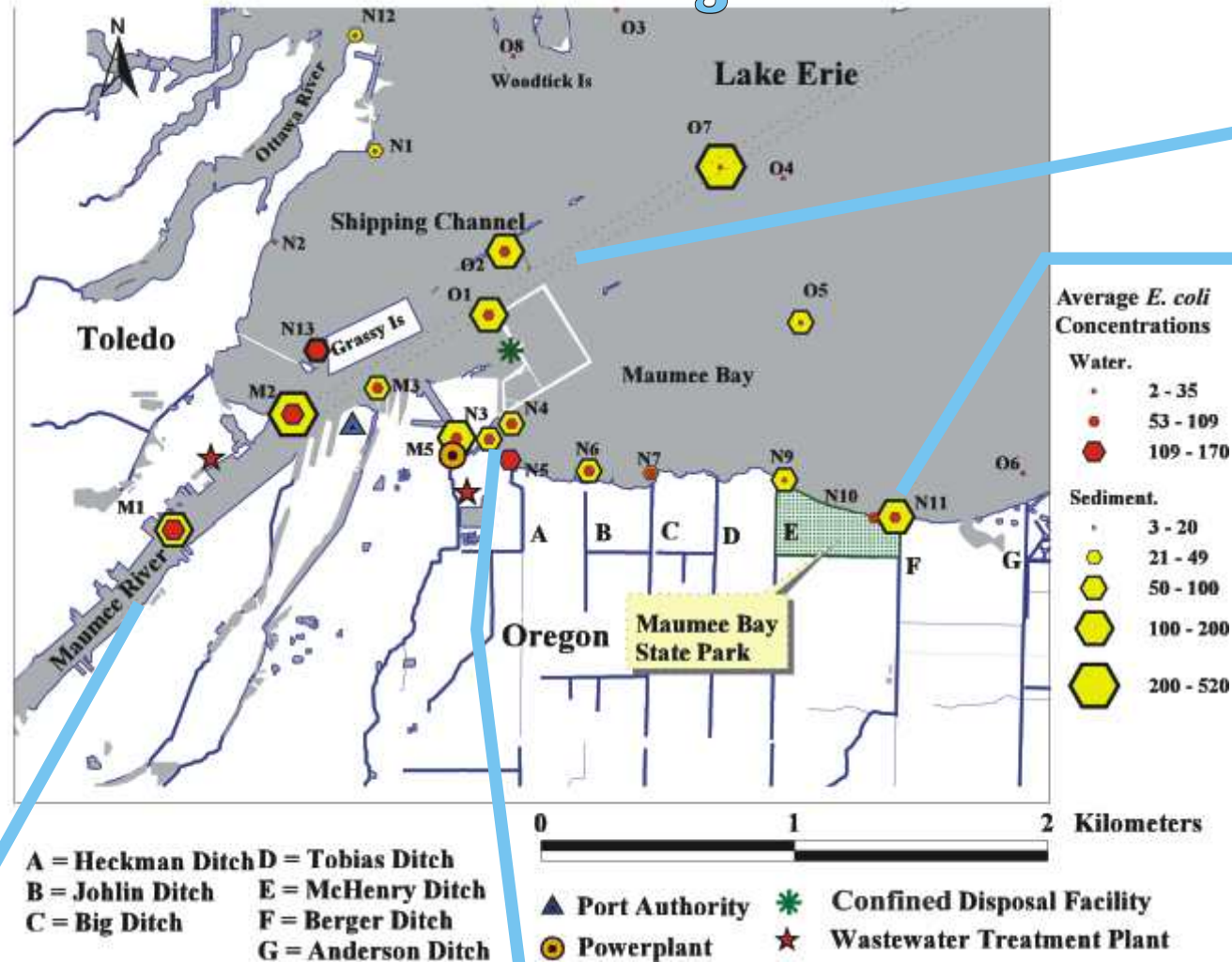
The Maumee Bay Bacteria Study is being conducted by the University of Toledo Lake Erie Center, the US Geological Survey, and the Toledo Metropolitan Area Council of Governments (TMACOG). It is a three-year study (2003-2005) to improve our understanding of the sources of E. coli bacteria impacting Maumee Bay, their movement, and survival.

The study is funded by the Ohio Water Development Authority (OWDA), the City of Oregon, and the City of Toledo; with matching funds provided by the partner agencies.

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Maumee Bay Bacteria Study 2003-2005

Water and Sediment Averages 2003



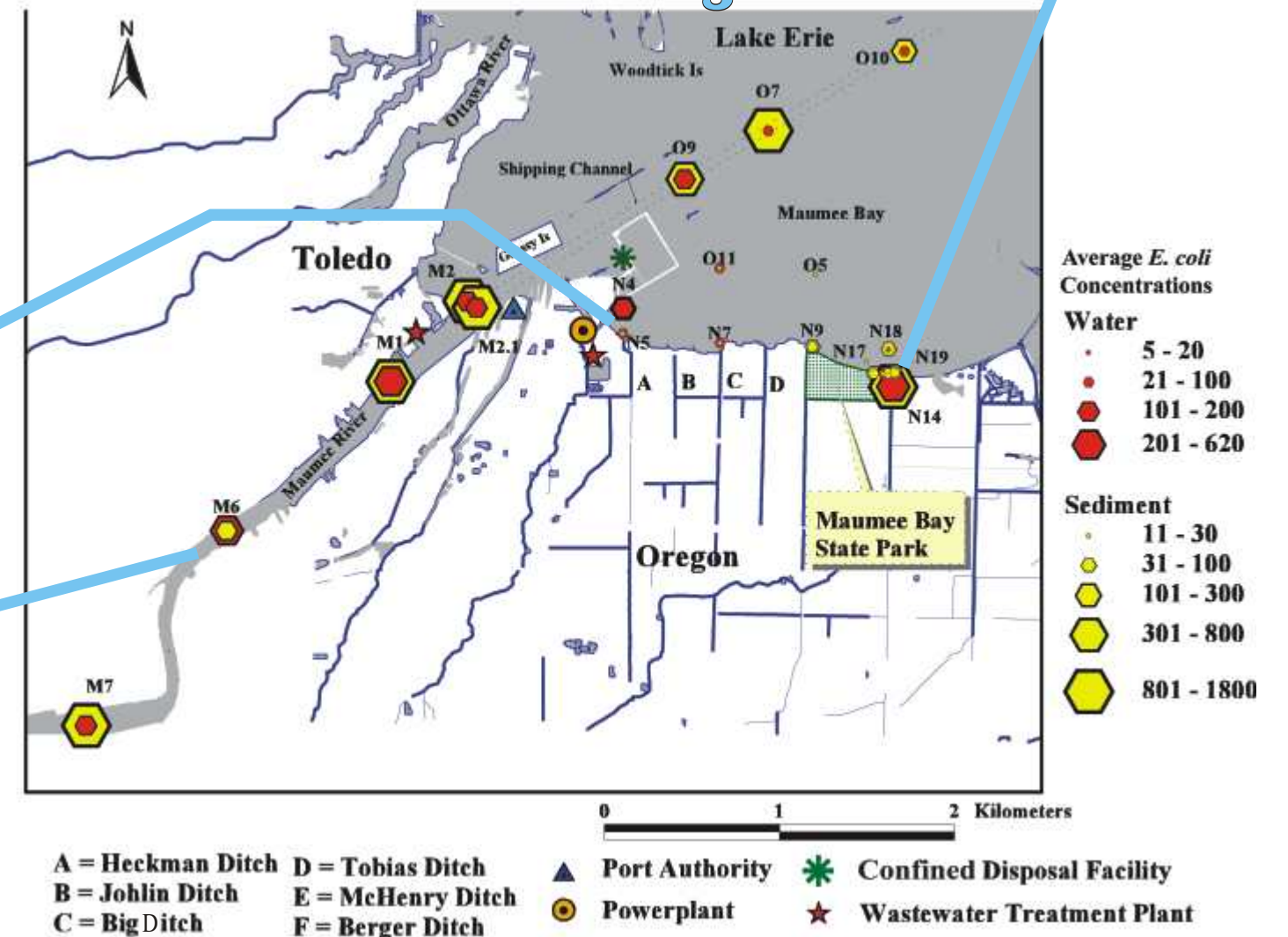
Shipping Channel

- Bacteria levels were high in sediments, but not in the water
- Elevated bacteria levels were consistently found in water deeper than 10 feet.
- Bacteria appear to settle in the sediment of the channel.

Wolf Creek/Berger Ditch

- 2003 and 2004 data show high bacteria levels at the mouth of Berger Ditch. This stream flows into the Boat Basin at Maumee Bay State Park.
- Surrounding sites (N6, N7, N8, O5, O6) have lower levels

Water and Sediment Averages 2004



Driftmeyer Embayment

- Bacteria levels coming out of the powerplant channel are about the same or lower than levels entering it.
- Water temperature changes due to the powerplant discharge had no apparent effect on bacteria levels.

Maumee River

- Maumee River downstream sites (M1, M2) and nearshore sites near the river (N13, N5) had highest bacteria levels in 2003 and 2004.
- Bacteria levels continued high as far upstream at the study went, to river mile 8
- There are many potential bacteria sources for the Maumee. Some are upstream of RM 8. Others could be in the lower 8 miles of the river.