



## Applying Geospacial Technology to Oil Spill Response Planning

### APPLICATIONS IN WESTERN LAKE ERIE AND BEYOND

Oil spill responders require accurate, up-to-date information to ensure a rapid, coordinated, and effective response to a spill. However, current response plans are static, paper documents that do not account for dynamic conditions, such as shifting weather, spreading oil, and coordinating multiple response teams. New spatial technologies and digital interfaces present an opportunity for responders to possess real-time information about a spill and the conditions affecting it. Electronic maps can be used to create dynamic oil spill response plans, allowing responders to react immediately to changing conditions in the field. These electronic plans can be accessed in the field using a tablet, cellphone, or computer, or may be printed and carried along. The goal is for electronic maps to improve oil spill response times in order to keep a small spill from becoming larger or limit damage while a larger response is initiated.

Creating electronic plans with ERMA software provides a number of advantages over paper versions

- Electronic plans integrate multiple data layers allowing oil responders to see current weather conditions, the extent of the oil slick, and locations of sensitive habitats simultaneously.
- Are quicker to update, easier to share, and resistant to degrading over time.

### CREATING ELECTRONIC PLANS FOR LAKE ERIE & BEYOND

Area Contingency Plans (ACPs) and their associated Geographic Response Plans (GRPs) are site-specific documents that outline steps for responding to an oil or chemical spill. Area Committees (representatives of federal, state, and local agencies) prepare and design them to improve the speed and efficiency of a response during the first few hours after a spill incident. This is a critical time when quick action on the part of first responders can play the biggest role in limiting the environmental and economic damage of a spill.

The research team piloted geospatial technology to systematically improve and update GRPs in Western Lake Erie. The team used new spatial software, called the Great Lakes Environmental Response Management Application (ERMA), developed by the National Oceanic and Atmospheric Administration (NOAA), to translate Western Lake Erie basin oil spill plans from paper to electronic maps. The ERMA software allows new electronic GRPs to:

- Map natural and built features at risk
- Show first priority response locations
- Integrate up-to-date weather conditions
- Provide photographs of site locations, including landmarks, obstructions, and natural areas
- Provide directions for quick response times in the event of an oil spill
- Display other data as needed by the Area Committees and other stakeholders
- Map boom configuration, access areas, location of staging areas, containment points, utilities, and collection points

#### Research Team

The research team worked with the Western Lake Erie Area Committee, U.S. Coast Guard Marine (USCG) Safety Unit Toledo, Ohio EPA, and oil spill response organizations to inform the maps and pilot offshore and shoreline (USCG) and inland (EPA) GRPs.

#### Read More:

- Full Project Report

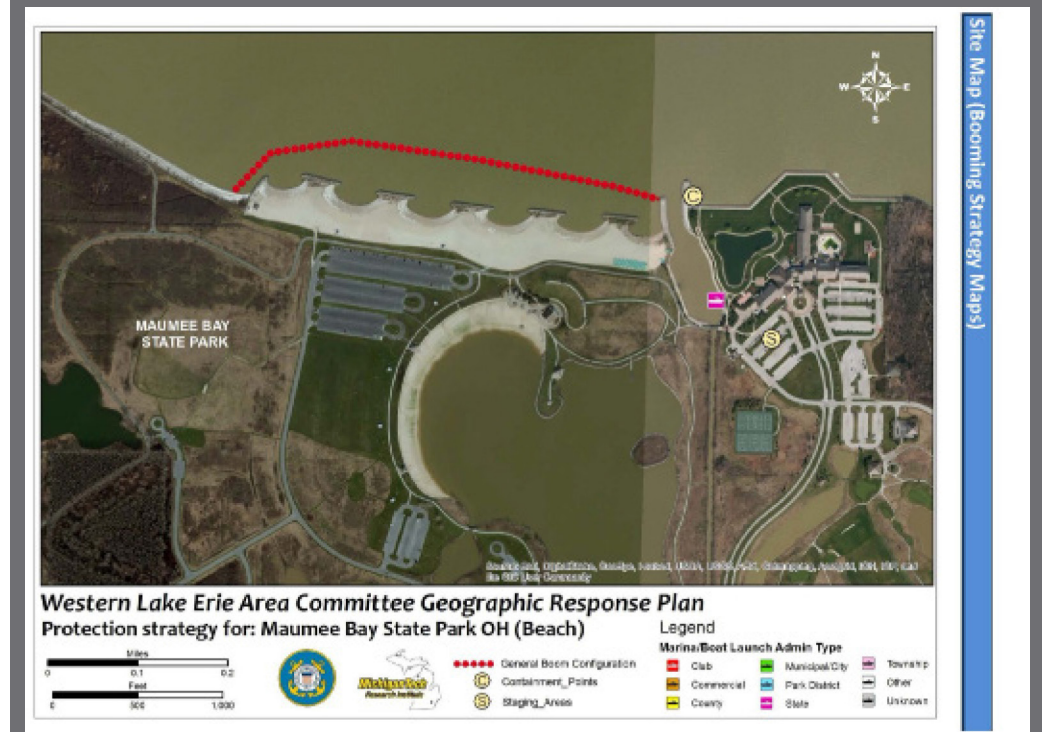
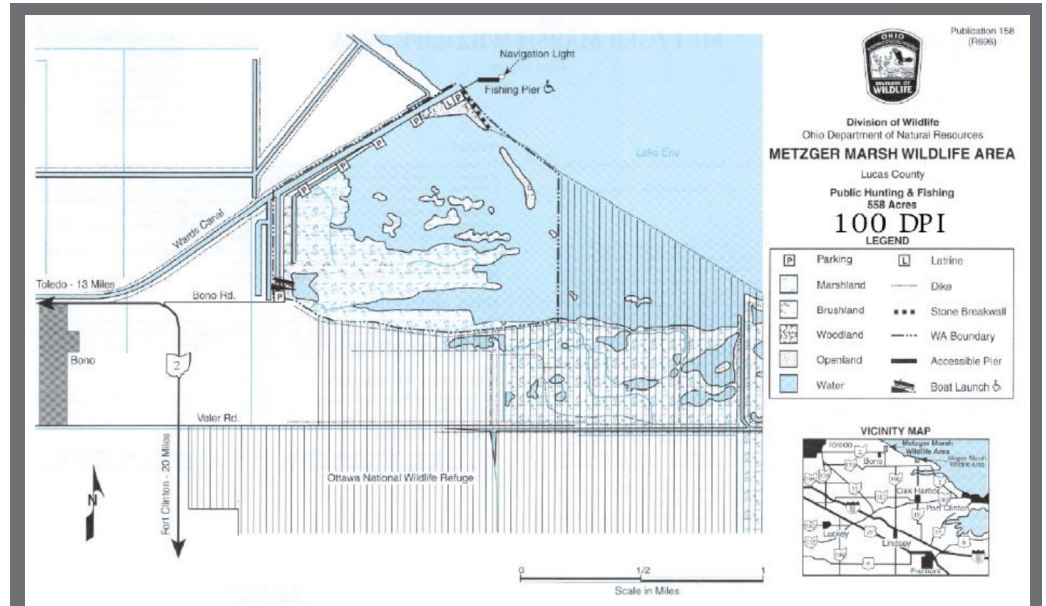
## GREAT LAKES-WIDE APPLICATION

The project team's pilot work in the Western Lake Erie Basin demonstrates the potential for electronic GRPs to be applied throughout the Great Lakes region. Piloting electronic GRPs in Lake Erie enabled the project team to recognize two challenges that must be addressed before wider adoption is possible:

- GRPs, Environmental Sensitivity Indices (ESIs), and other relevant data sets need to be standardized and updated; and
- The oil response community needs to test electronic GRPs against current paper versions, in order to assess the value of the required investment to update the oil spill response process.

This project provides a template for oil spill response teams to make and use Area Contingency Plan updates for oil spills. While most oil responders are aware of electronic GRPs, few have engaged with them in the field to become familiar with their capabilities and refine their usage. To begin this process, the research team worked with the U.S. Coast Guard (USCG) to use electronic GRPs in an oil response exercise. The USCG used electronic GRPs to familiarize the team with the oil spill and surrounding conditions in their Operations Center, in advance of the exercise. As a next step, oil response teams will need to engage with the electronic GRPs in the field.

## COMPARING GEOGRAPHIC RESPONSE PLANS



A comparison of paper Geographic Response Plans (top) and digital GRPs (bottom) for Maumee Bay State Park. Digital GRPs can display multiple layers and real-time weather conditions, allowing responders to deploy their response tools in a way that fits the current conditions and context.

## ABOUT THE WATER CENTER

The U-M Water Center addresses critical and emerging water resource challenges through collaborative research projects. We believe that diversity is key to individual empowerment, and the advancement of sustainability knowledge, learning and leadership. The Center is part of the Graham Sustainability Institute, which integrates faculty and student talent across U-M, and partners with external stakeholders to foster collaborative sustainability solutions at all scales.

See: [www.graham.umich.edu/water](http://www.graham.umich.edu/water)