



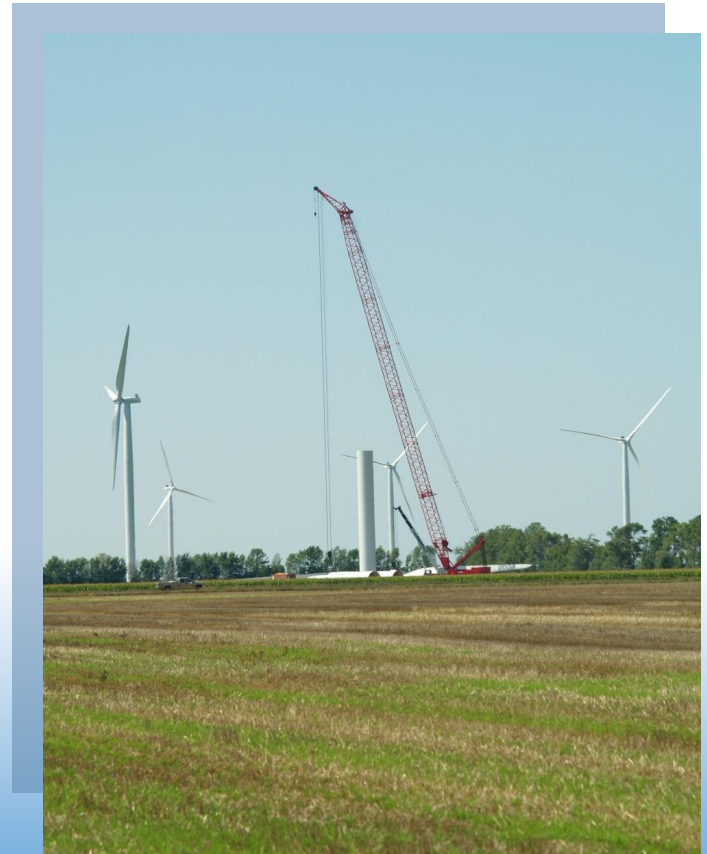
# Why Offshore Wind?

March 25, 2010

Bay City Coastal Community Meeting

# Why Clean Energy Technology

- Create jobs, secure new investment, diversify Michigan's economy
- Energy security
- Environmentally benign power
- Balance Michigan's energy portfolio



# Huge Global Opportunity

- International Energy Agency- \$20 trillion by 2030; \$45 trillion by 2050
- ASES - \$4.5 trillion in economic benefit to U.S. by 2030
- 37 Million jobs by 2030
- By 2030, 1 in 4 jobs will involve clean energy technology



# Wind Power

## High Growth:

- Capital investment flowing in
- Generation capacity
  - 2004 - 2% of new capacity
  - 2008 - 42% of new capacity
- 2009 added 9,800 MW (39% increase in national capacity)



# Michigan's Strengths

- Advanced manufacturing and robotics expertise
- Superior supply chain capacity
- Available skilled, labor force
- Outstanding universities
- Excellent community college system
- Deep water ports
- Outstanding wind power assets



# Energy Security

## US

- US uses 19.5 million barrels per day – 25% of global consumption
- Import 13 million barrels per day
- Cost: \$380 billion per year (@\$80 pb)

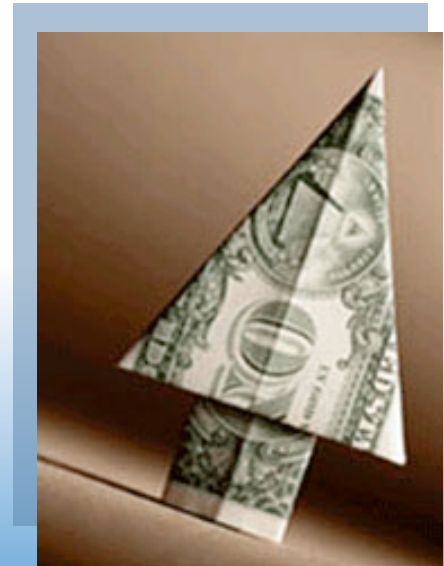
## Michigan

- \$24+ billion per year
- 100% of coal used for power generation
- 96% of transportation fuels
- 75% of natural gas



# Cost of fuels will increase

- Increasing demand – China and India
- Rising costs of extraction and transportation
- Diminishing supply
- Carbon regulation



# Evolving Climate Consensus

- 194 Countries will ultimately reach agreement on reducing GHG emissions
- 80% GHG reduction by 2050 in industrialized countries
- 50% GHG reduction in non-industrialized countries





# Solar

- Dow Chemical
- GlobalWatt
- Clairvoyant Energy  
Solar Panel Mfg., Inc.
- Suniva
- Evergreen Solar
- Hemlock  
Semiconductor
- United Solar Ovonic



**Investment:  
\$3,734,500,000**

# Advanced Energy Storage Investments

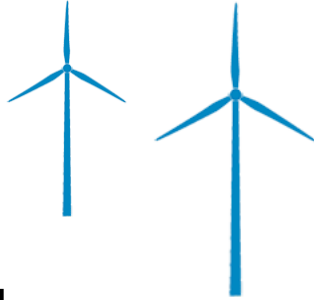
- A123 Systems
- Sakti3
- Dow Kokam
- Johnson Control Saft
- LG Chem
- Fortu Power
- GM
- Ford Battery/Vehicle Engineering
- Xtreme Power
- Toda America
- Azure Dynamics
- Techno Semi Che
- Magna Electronics



**Investment:**  
**\$9,142,600,000**

# Wind

- Energetx
- Ven Towers
- Astraeus Wind Energy
- LOC Performance Products
- Merrill Technologies Group



- Energy Components Group
- MasTech/Mariah Power
- Danotek
- Dowding Industries
- ATI Casting Services

**Investment:  
\$229,100,000**

# Our Competition

- Ontario proposed:
  - 20,790 MW
  - \$83.2 billion investment
  - \$233.5 billion in added GDP
  - 66,300 jobs
- New York
- Ohio
- Wisconsin





# How Has the Council Done Its Work?

March 25, 2010

# Council's Process 2009

- Formed three work groups
  1. Mapping the “best and worst” places
  2. Bottomland leasing, permitting, and legislation
  3. Public engagement
- Council discussed the work group recommendations
- Adopted recommendations and reported to the governor September 1, 2009

# September 1, 2009 Report:

## *Key Findings*

- Existing Michigan bottomland leasing and permitting statute was not designed to address offshore wind
- Comprehensive legislation for leasing and permitting should be enacted
- Need agreed-upon criteria among agencies for mapping least/most favorable areas
  - Most favorable (green)
  - Conditional (yellow)
  - Categorical exclusion (red)

# Council's Process 2010

- Mapping work group identified most favorable areas to lease
- Outreach work group created plans to inform, engage, and solicit feedback on those locations
- Permitting and legislation work group advised on:
  - Proposed legislation and rule making
  - Compensation for leasing of bottomlands
- Report to the governor by November 15, 2010



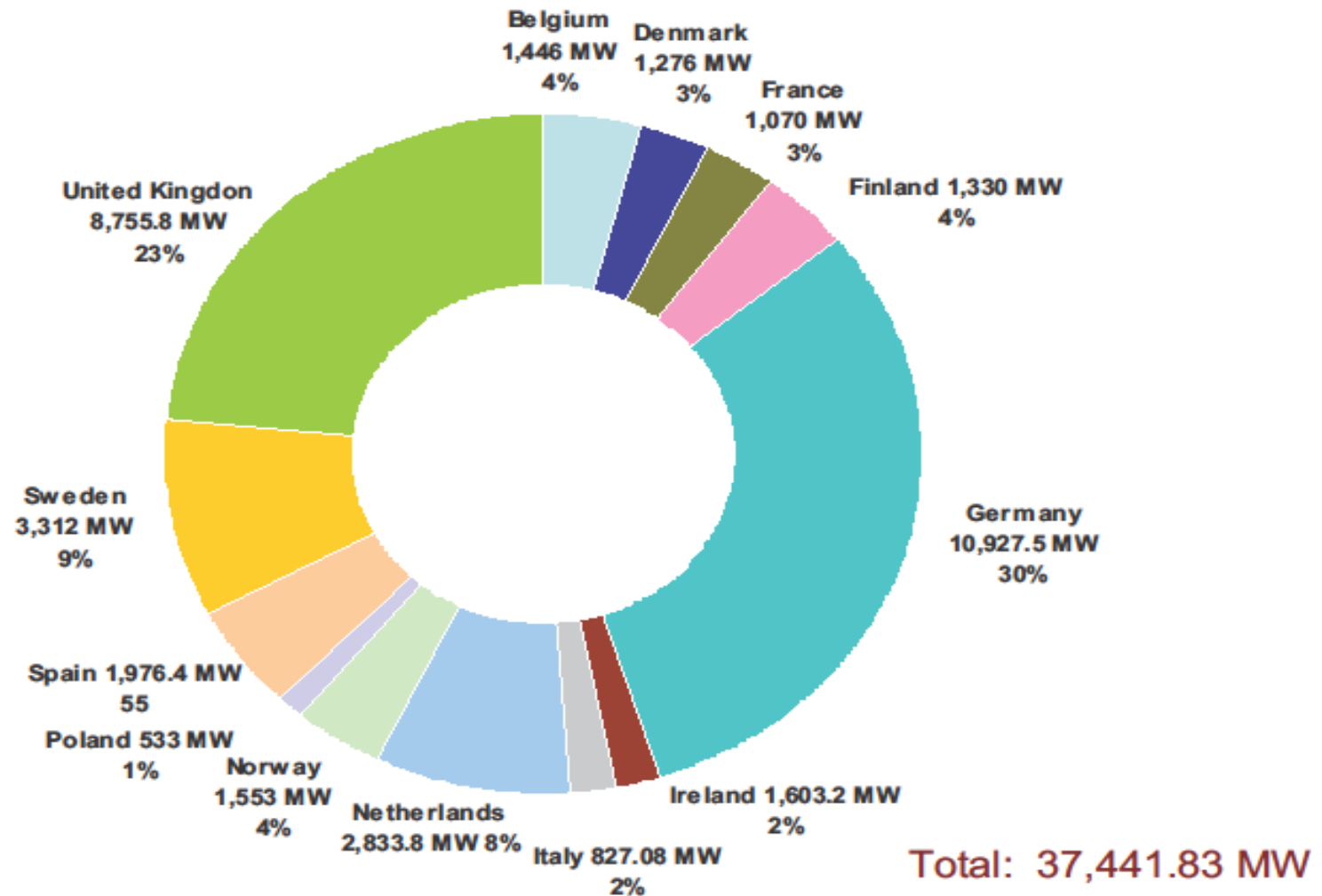
# Learning from Experience of Others

- Listen to expert testimony
- Learn from Europe and East Coast
  - Environmental study results
  - Risk assessment
  - Wind resource planning
  - Public acceptance
  - Compensation, royalty ideas
- Apply Michigan experience

# European Offshore Wind Experience

- 18 years experience with offshore wind projects
  - 30 wind parks totaling 1,500 megawatts in 8 countries
  - Tens of thousands of megawatts now in development and construction
- Leaders: Denmark, UK, Netherlands, Sweden
  - Over 2,000 megawatts permitted in the UK; 25,000-megawatt goal in Germany
- 37,000 megawatts planned to be built by 2015

# Offshore Wind Farms, Europe 2015



Source: Energetics

# Environmental Risk Assessments

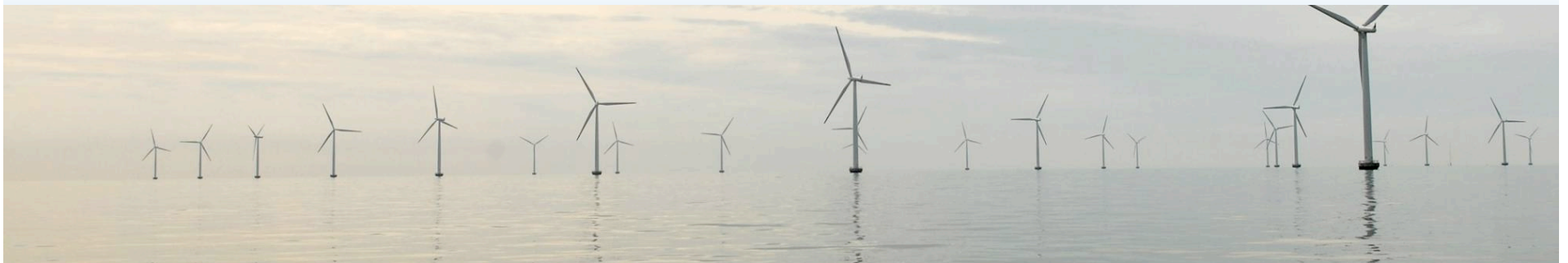
- Seabed sediments
- Scour pits
- Riparian and coastal processes
- Seabed contamination
- Water and air quality
- Protected sites and species
- Benthic ecology
- Fish and shellfish/fisheries
- Birds
- Marine mammals and bats
- Cables and pipelines
- Military activities
- Disposal areas
- Electronic and magnetic fields
- Onshore grid connection
- Noise and vibrations
- Cumulative risks
- Climate change
- Decommissioning

Source: Energetics

# Human Activity Impact Assessments

- Worker health and safety
- Integrity of shoreline communities
- Tourism and recreation
- Aesthetics
- Cultural/historic views
- Property values
- Conflicting uses
- Accidents
- Shipping and navigation
- Noise
- Radar/radio disturbances (military/commercial uses)
- Transmission lines
- Electromagnetic fields
- Marine archeology
- Cumulative risks (e.g., air quality)

Source: Energetics



# 18 Years and 350 Studies:

## *No Signs of “Unacceptable” Risks*

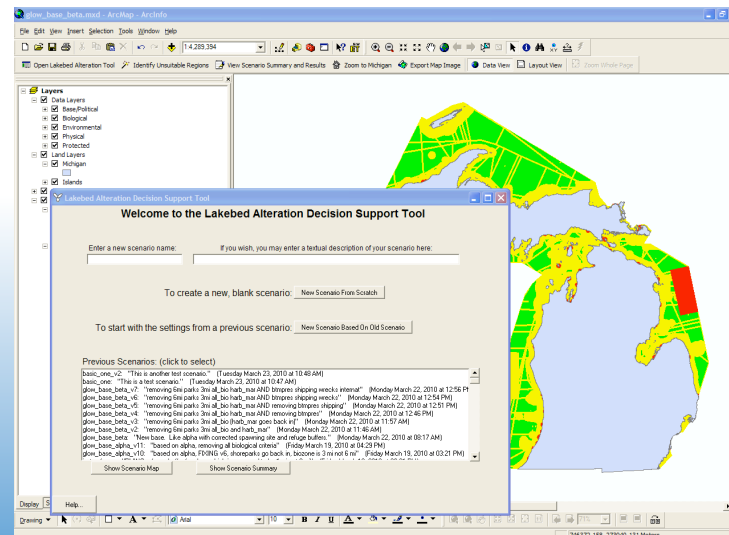
- Danish Offshore Monitoring Program for Nysted and Horns Rev projects
- U.K. Strategic Zones and competitive rounds of projects
- Beatrice Wind Farm Demonstration, Scotland
- German research platforms in the North and Baltic Seas
- Netherlands – We@Sea
- IEA Annex XXIII

Source: Energetics, a subsidiary of VSE Corporation

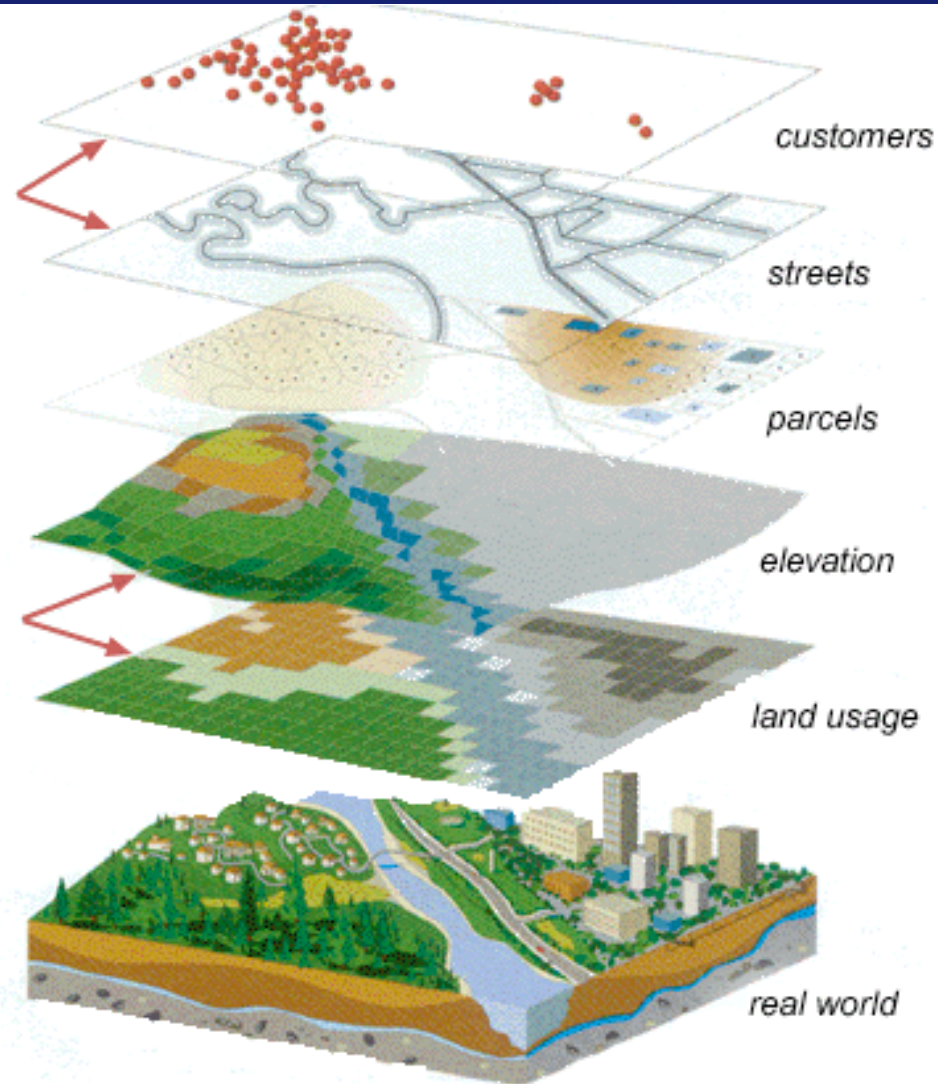


# Institute for Fisheries Research (IFR) Supported the Council's Mapping Work

- Computerized data layers were applied by council and allow us to see the cumulative effect of multiple factors. These things should be considered during permitting and siting of offshore wind energy systems.

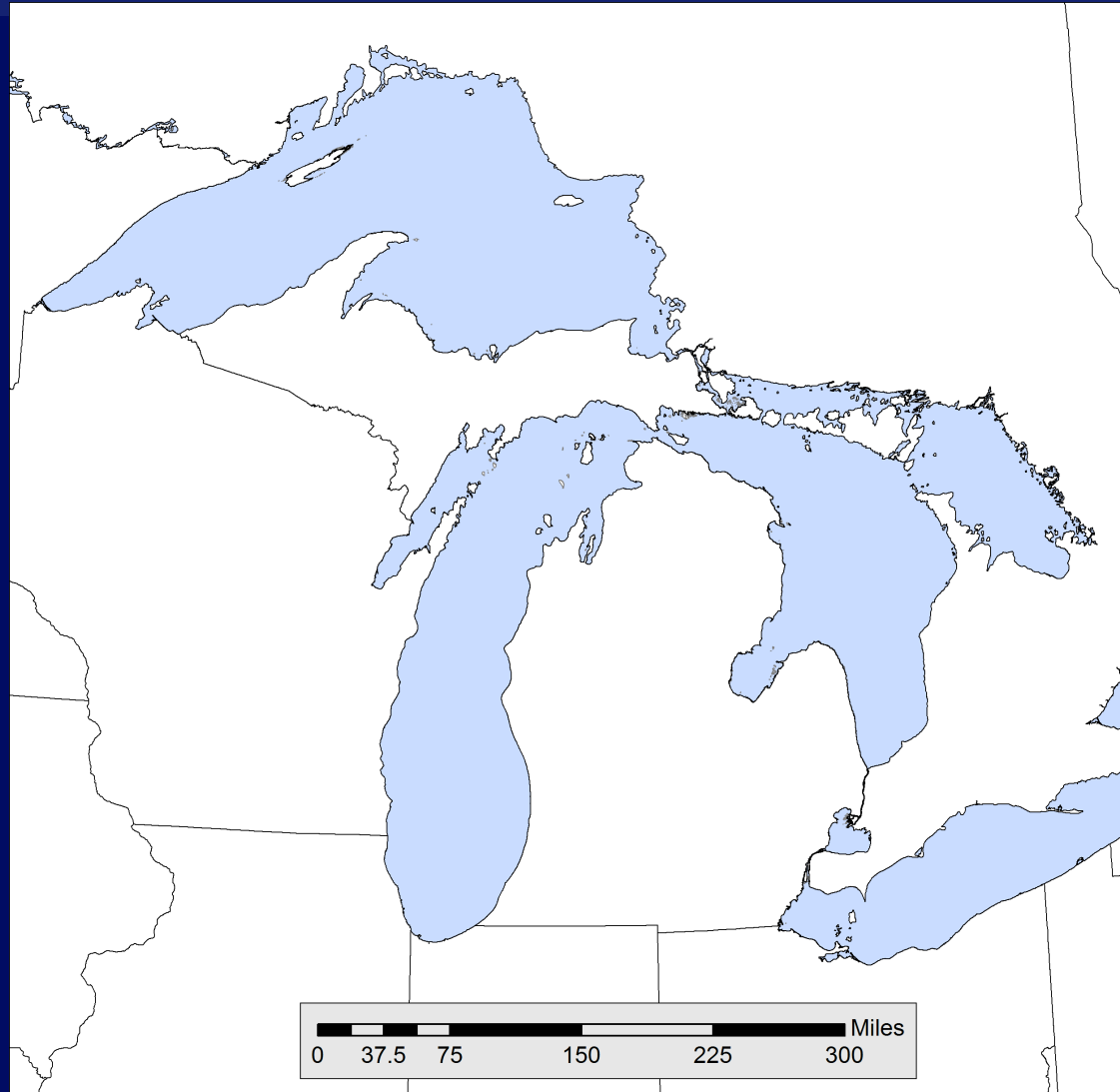


# How the IFR Software Works

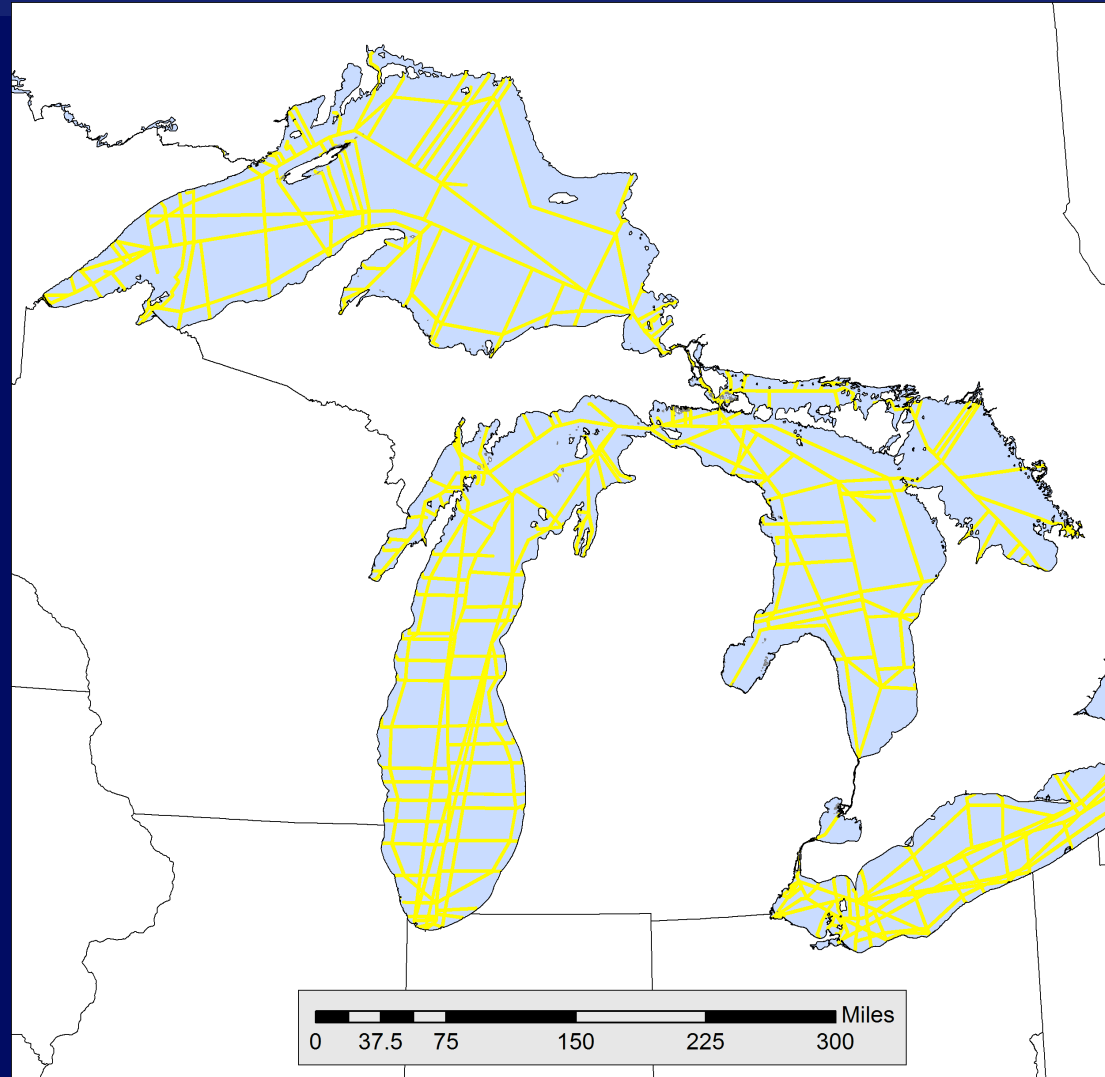




# How the IFR Software Works – *Base Map* (cont.)

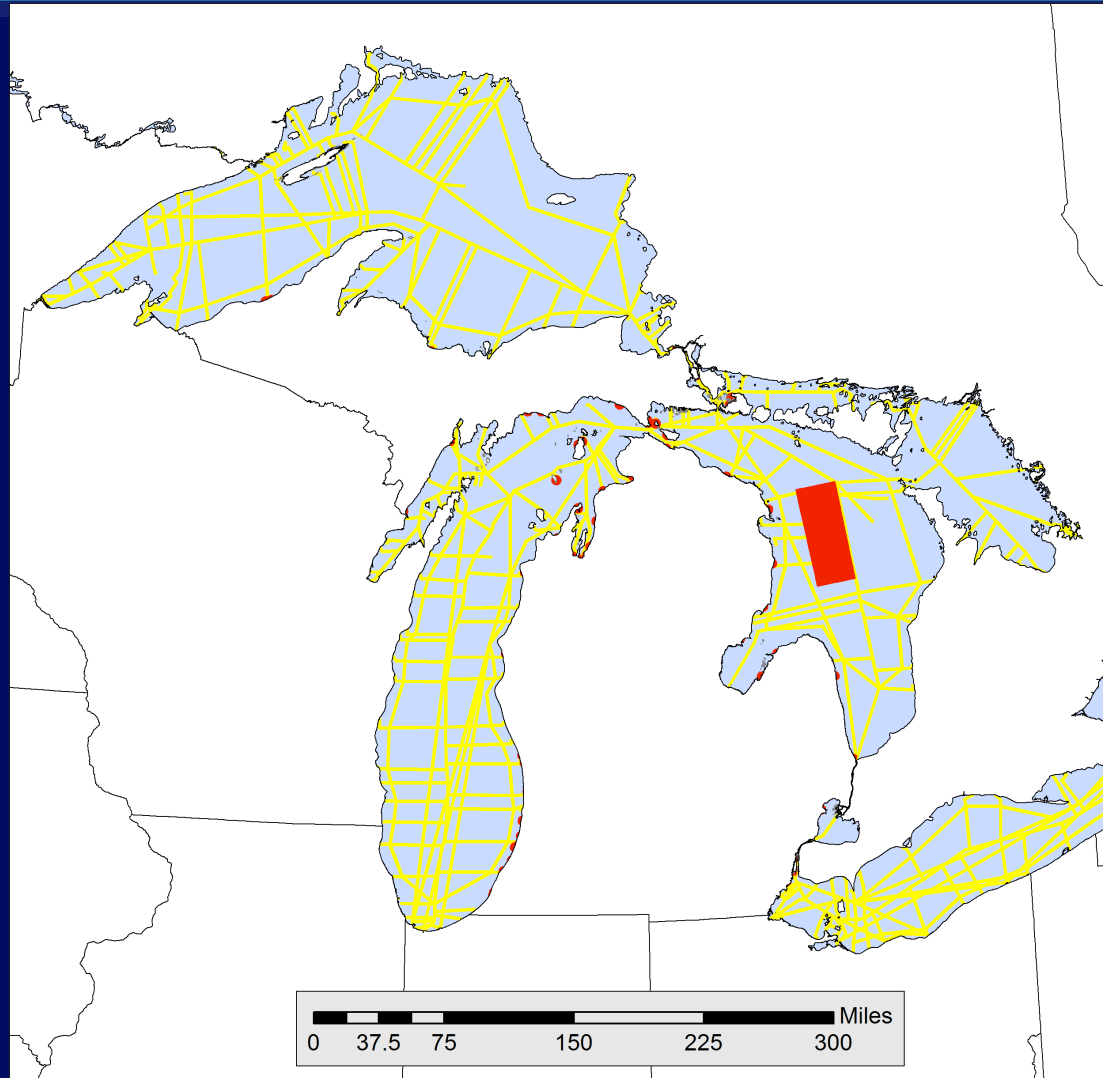


# How the IFC Software Works – *Shipping Lanes* (cont.)



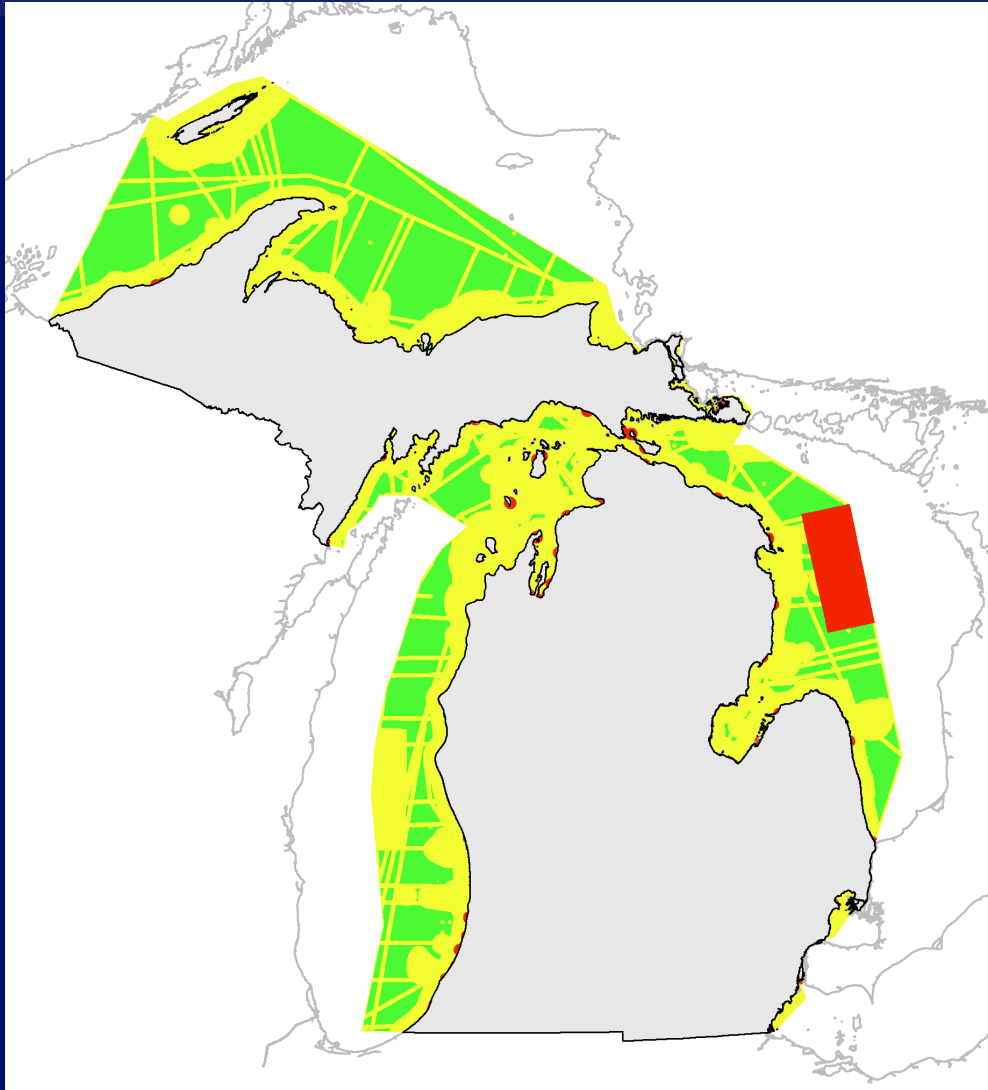
This representation of shipping lanes is known to be inaccurate as of 03/2010.

# How the IFR Software Works – *Council's Exclusion Areas* (cont.)



# Statewide Results of Council's Mapping Criteria

SOURCE: UM/MDNRE Institute for Fisheries Research. Data for some criteria not reflected.



# Council's Criteria

- Aids to navigation
- Buoyed navigation channels
- Coastal airports
- Military operation areas
- Submerged transmission lines
- Habitat/biological (5 criteria)
- Disposal sites
- Harbors/marinas
- Large river mouths
- Shoreline (6-mile nearshore view buffer)
- National park lakeshores
- Shoreline parks and wilderness
- Shipwrecks
- State bottomland preserves
- Underwater archeological sites
- Commercial fishing areas
- International and state boundaries
- Shipping lanes

*Criteria are applied to mapping tool, or "decision support tool," developed by UM/DNRE Institute for Fisheries Research (IFR).*

# Square Miles at Water of Different Depths

- Total state-owned bottomlands: 38,448 square miles

<b>Council category</b>	<b>No depth restrictions (sq. mi.)</b>	<b>Depth of area ≤ 45m (sq. mi.)</b>	<b>Depth of area ≤ 30m (sq. mi.)</b>
<b>Categorical exclusion (red)</b>	<b>1,717</b>	<b>528</b>	<b>356</b>
<b>Conditional (yellow)</b>	<b>21,704</b>	<b>9,282</b>	<b>7,195</b>
<b>Most favorable (green)</b>	<b>15,027</b>	<b>838</b>	<b>323</b>
<b>Total area sq. miles</b>	<b>38,448</b>	<b>10,648</b>	<b>7,874</b>

SOURCE: Institute for Fisheries Research, UM/MDNRE, January 2010.

- Offshore wind development of just 2% of “most favorable” and “conditional” areas (no depth restrictions) could supply 30% of total annual electrical energy use in Michigan.



**How were the “most favorable”  
wind areas identified?**

March 25, 2010

# Outline

- **Development of mapping criteria**
  - Mapping work group comprised of council members
  - Review of other state and federal siting activities (e.g., State of Ohio)
  - MDNRE Institute of Fisheries Research (GIS mapping tool)
- **Available square miles**
  - Most favorable, categorical exclusions, conditional
  - Depth restrictions
- **5 Wind Resource Areas (most favorable areas in shallow water  $\geq 20$  square miles)**
- **Mapping results for Saginaw Bay and Lake Huron**
- **Conclusion**

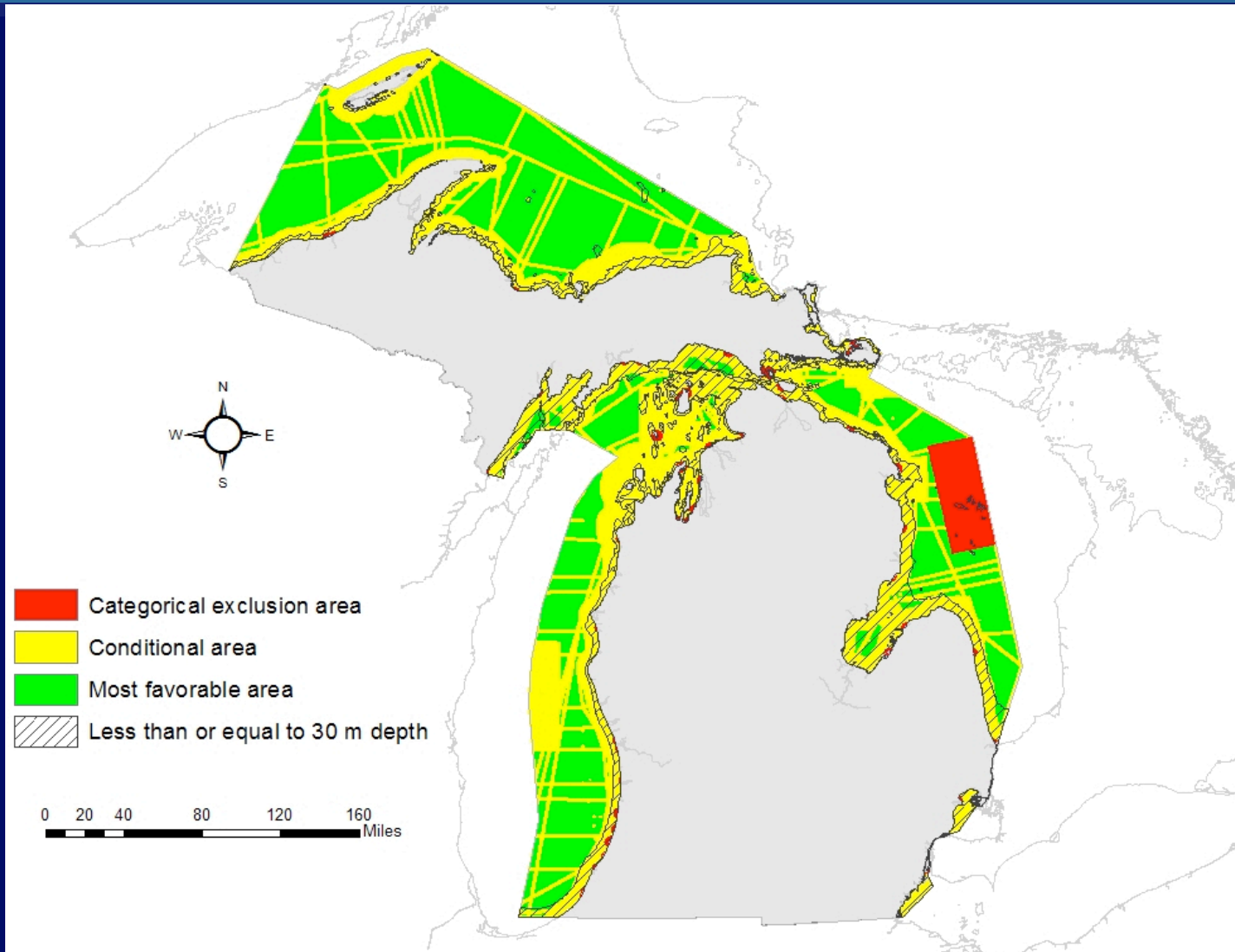


# Development of Mapping Criteria

- Aids to navigation
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- Military operation areas
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- Shipping lanes

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# Application of Criteria Using IFR Mapping Tool



# Square Miles at Water of Different Depths

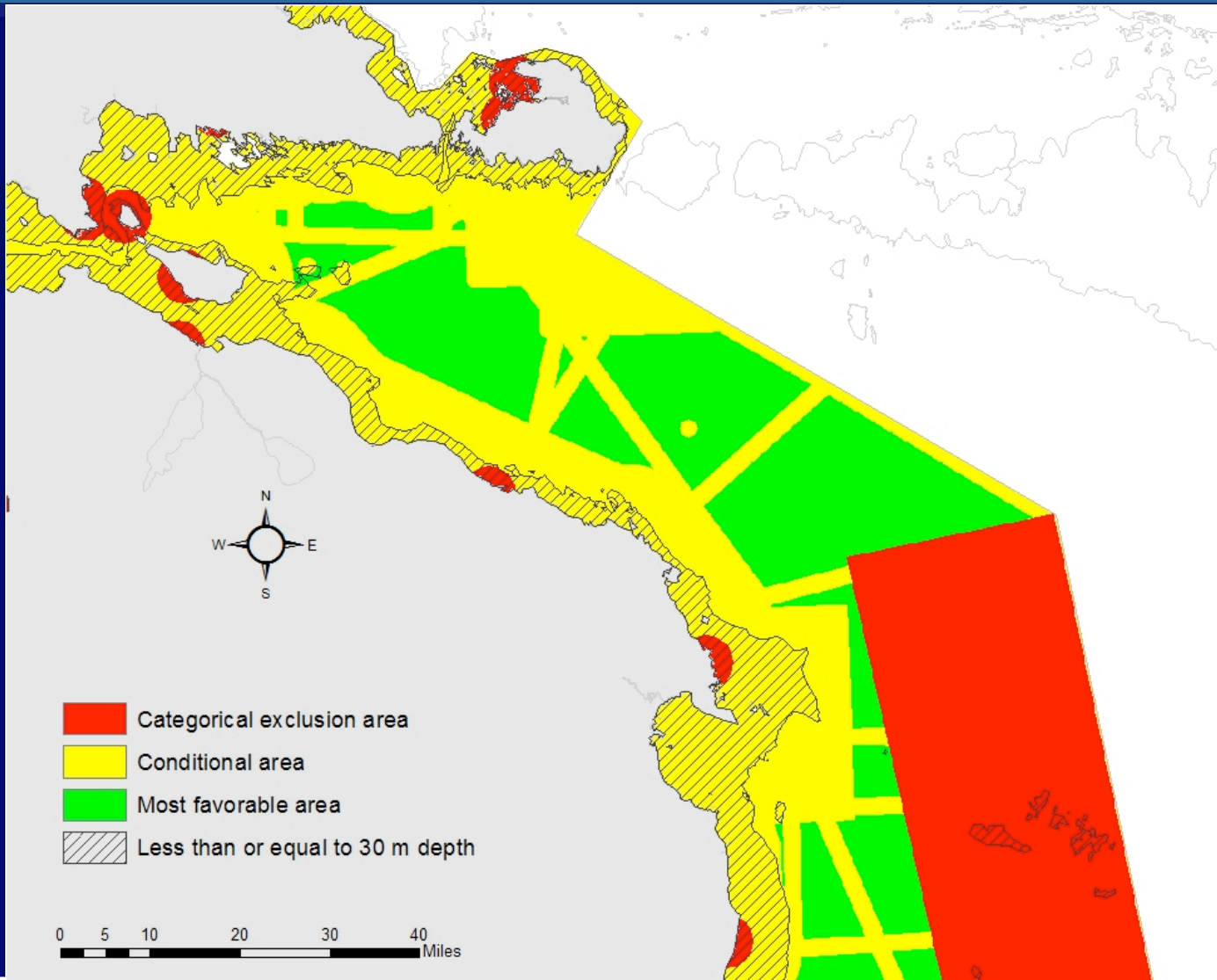
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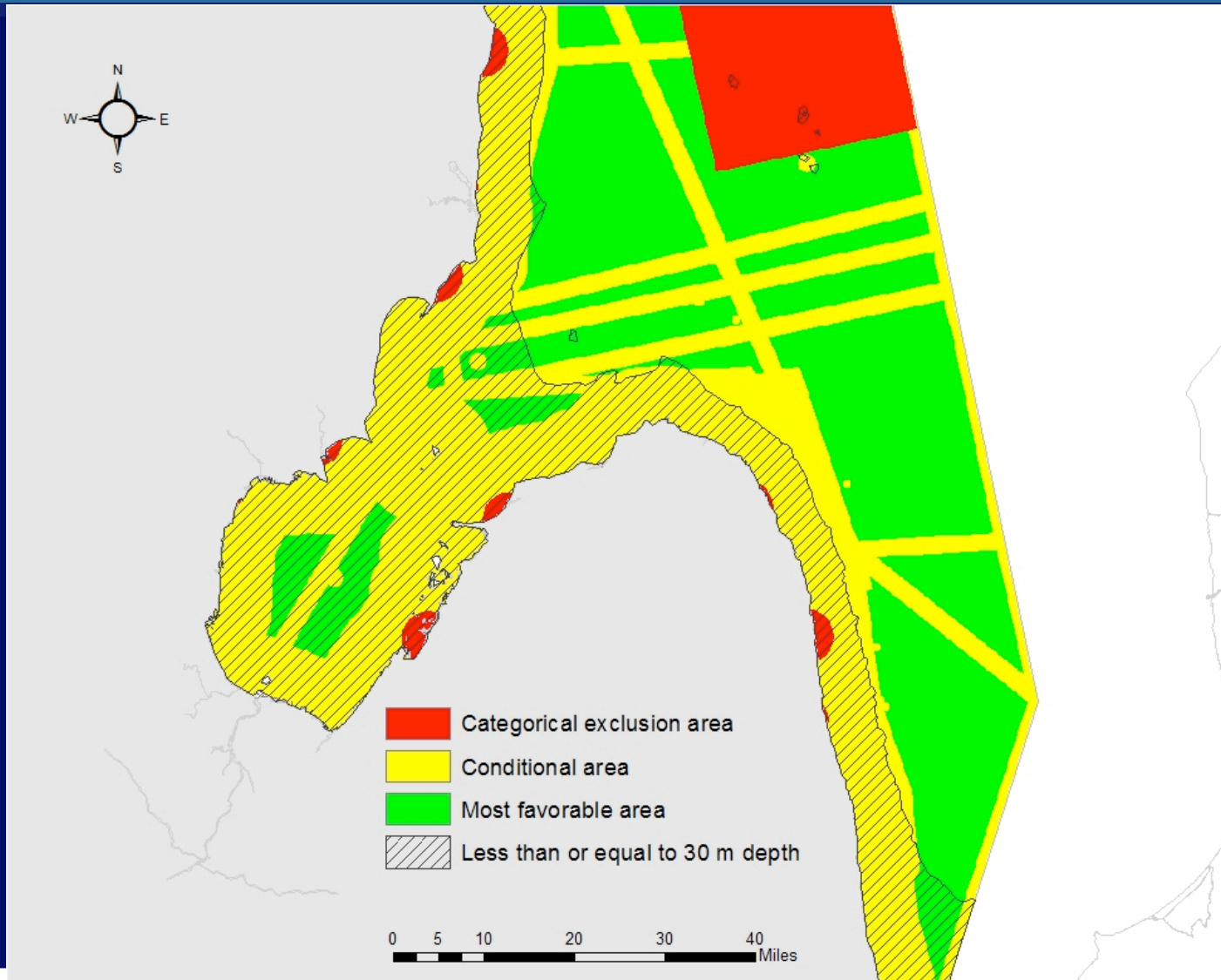
SOURCE: Institute for Fisheries Research, UM/MDNRE, January 2010.

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# Close-up of Northern Lake Huron

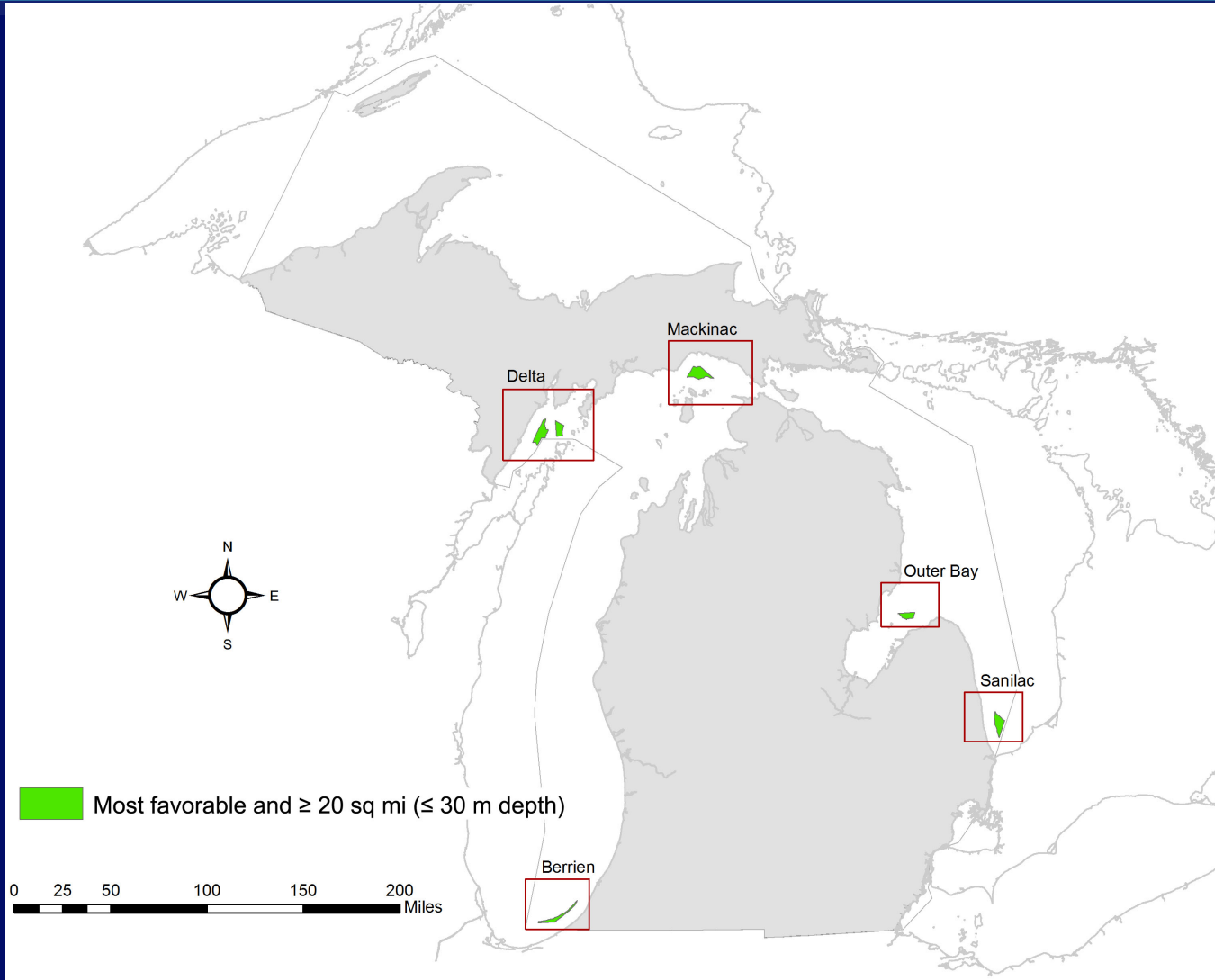


# Close-up of Southern Lake Huron



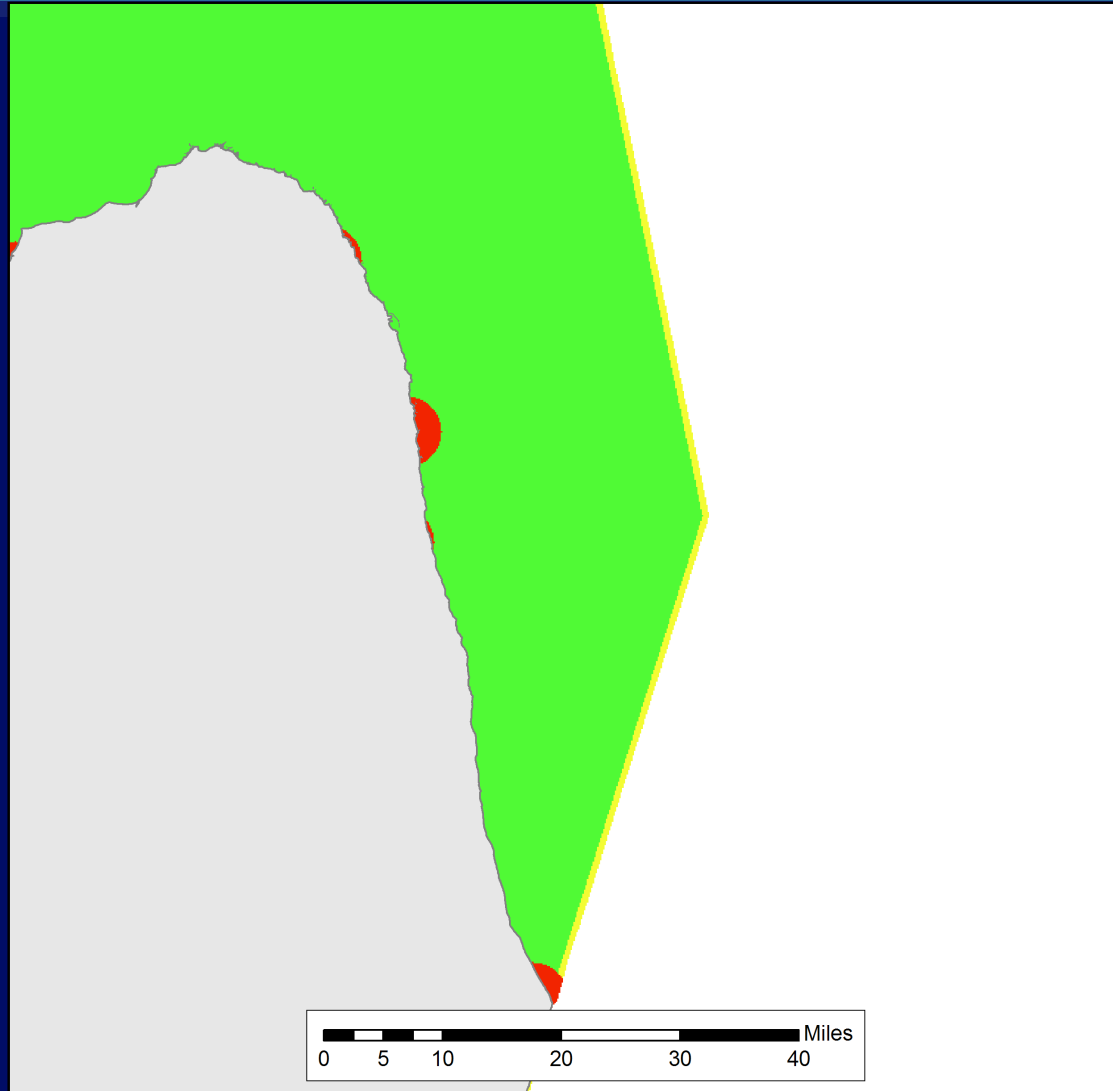
# Most Favorable Areas at Least 20 Square Miles: *Five Wind Resource Areas (WRAs)* (as of January 2010)

SOURCE: Institute for Fisheries Research, UMMMDNR, January 2010.



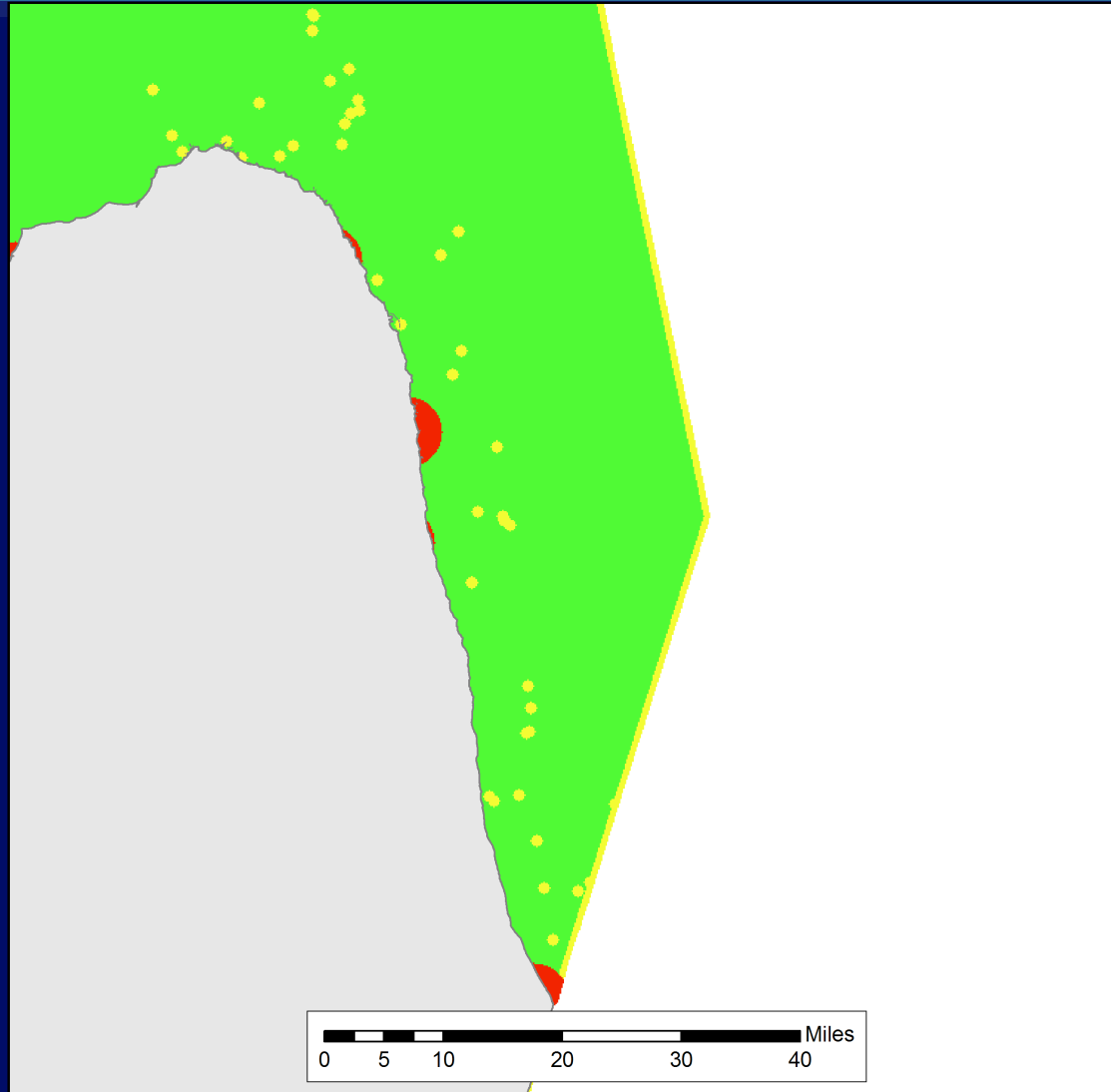
# Sanilac Wind Resource Area (2)

*with International Line & Coastal Airport Buffers Added*



# Sanilac Wind Resource Area (3)

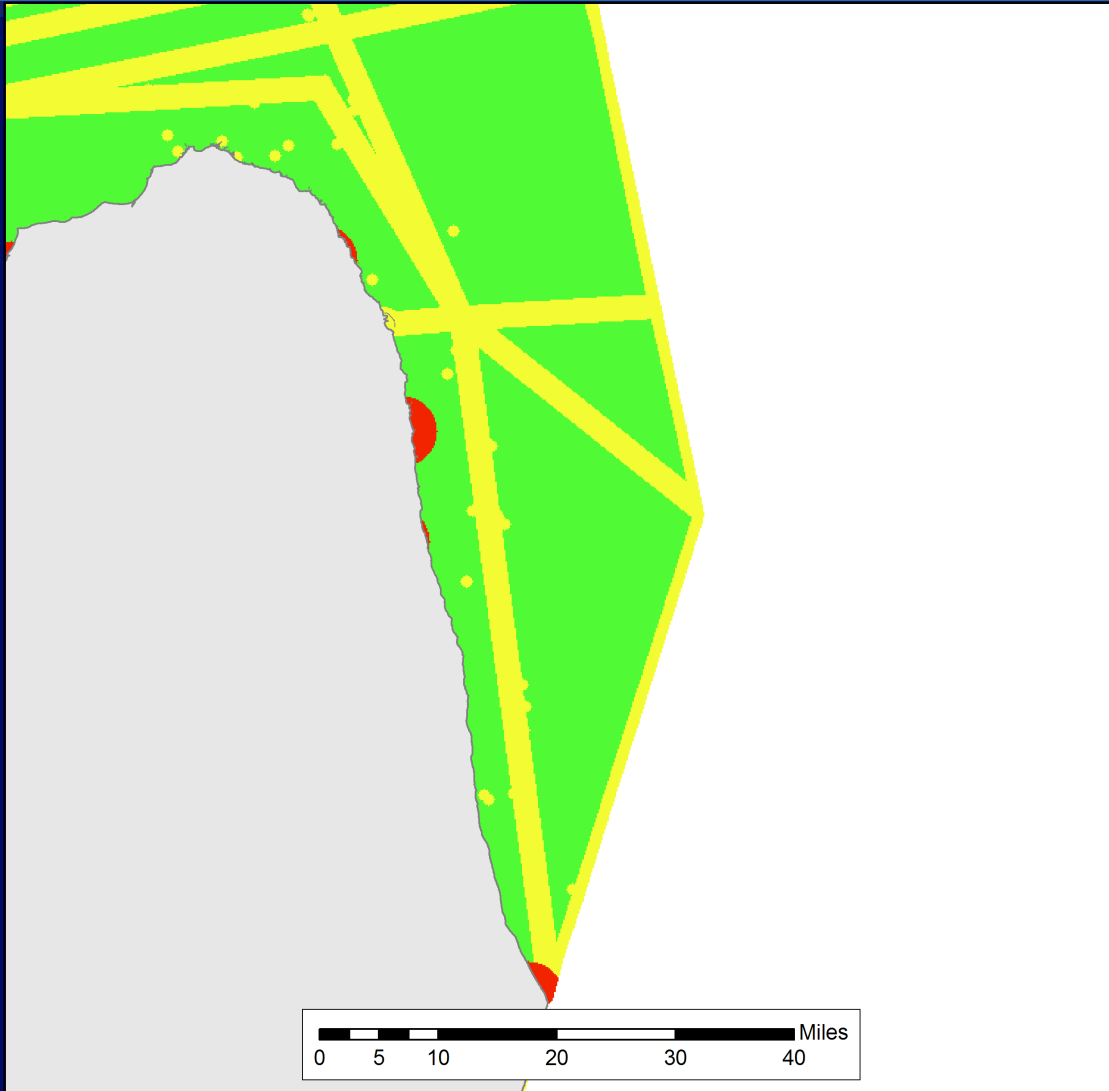
*with Shipwrecks Added*





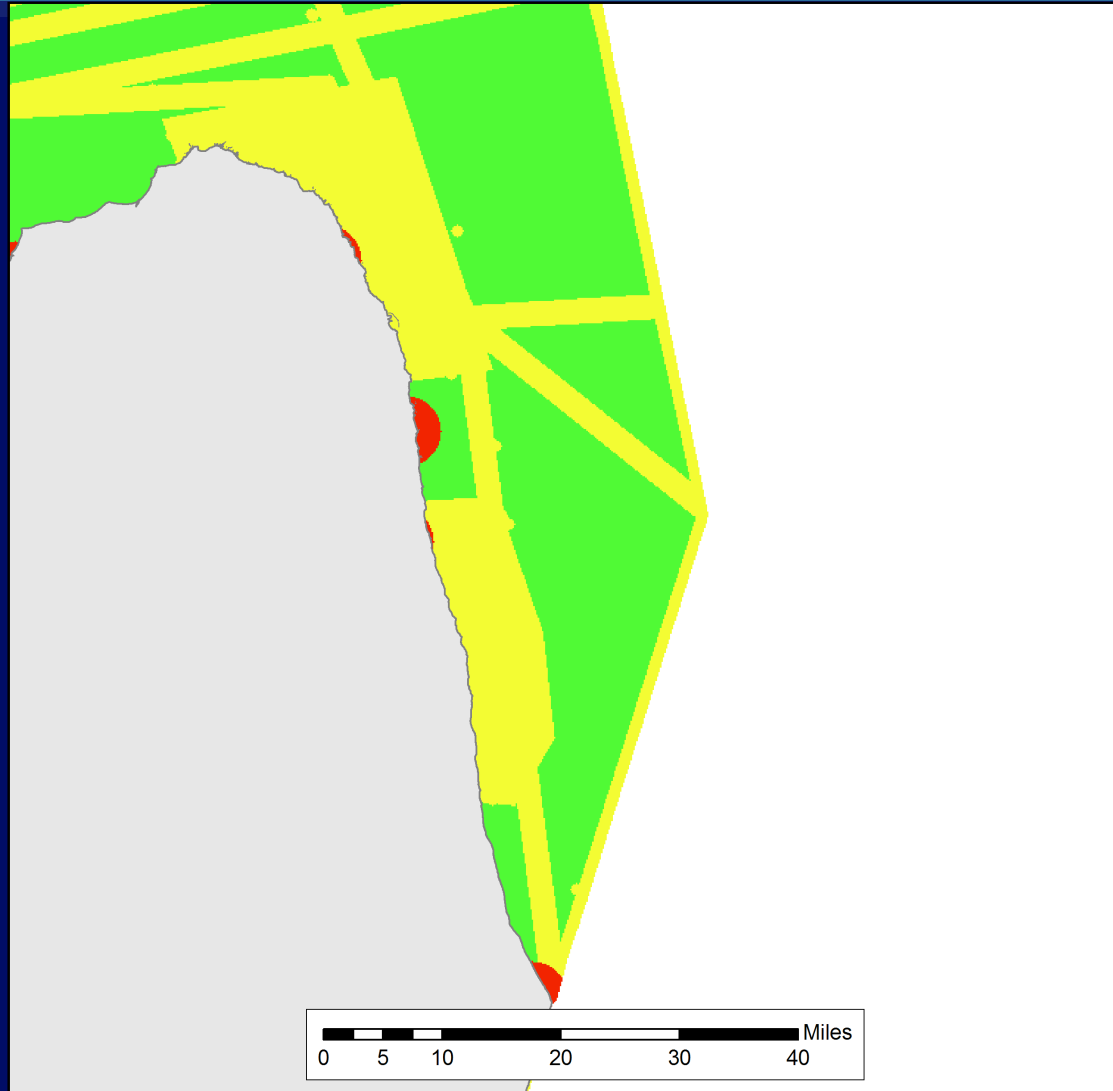
# Sanilac Wind Resource Area (4)

*with Shipping Lanes Added*



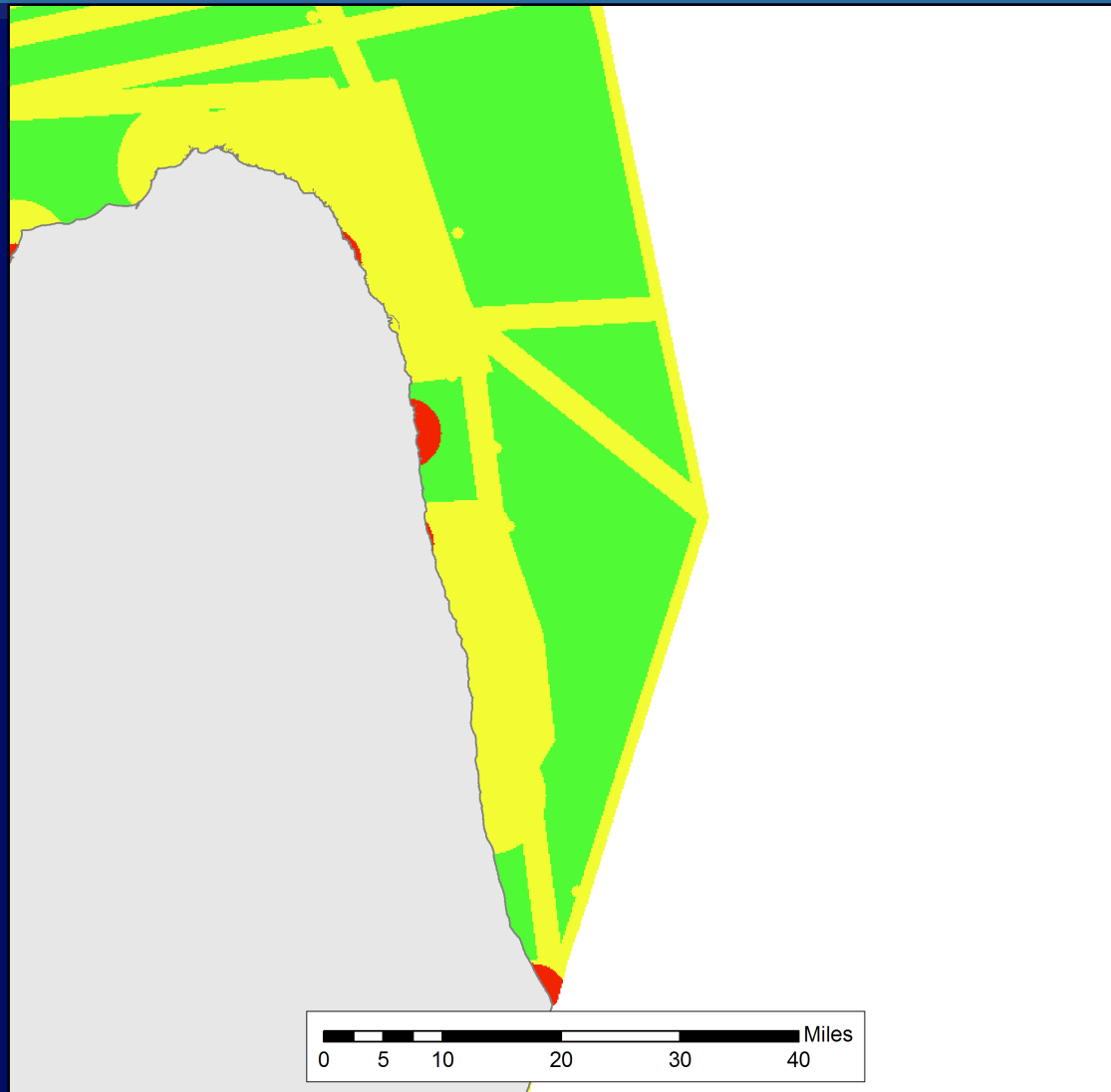
# Sanilac Wind Resource Area (5)

*with Bottomland Preserves Added*



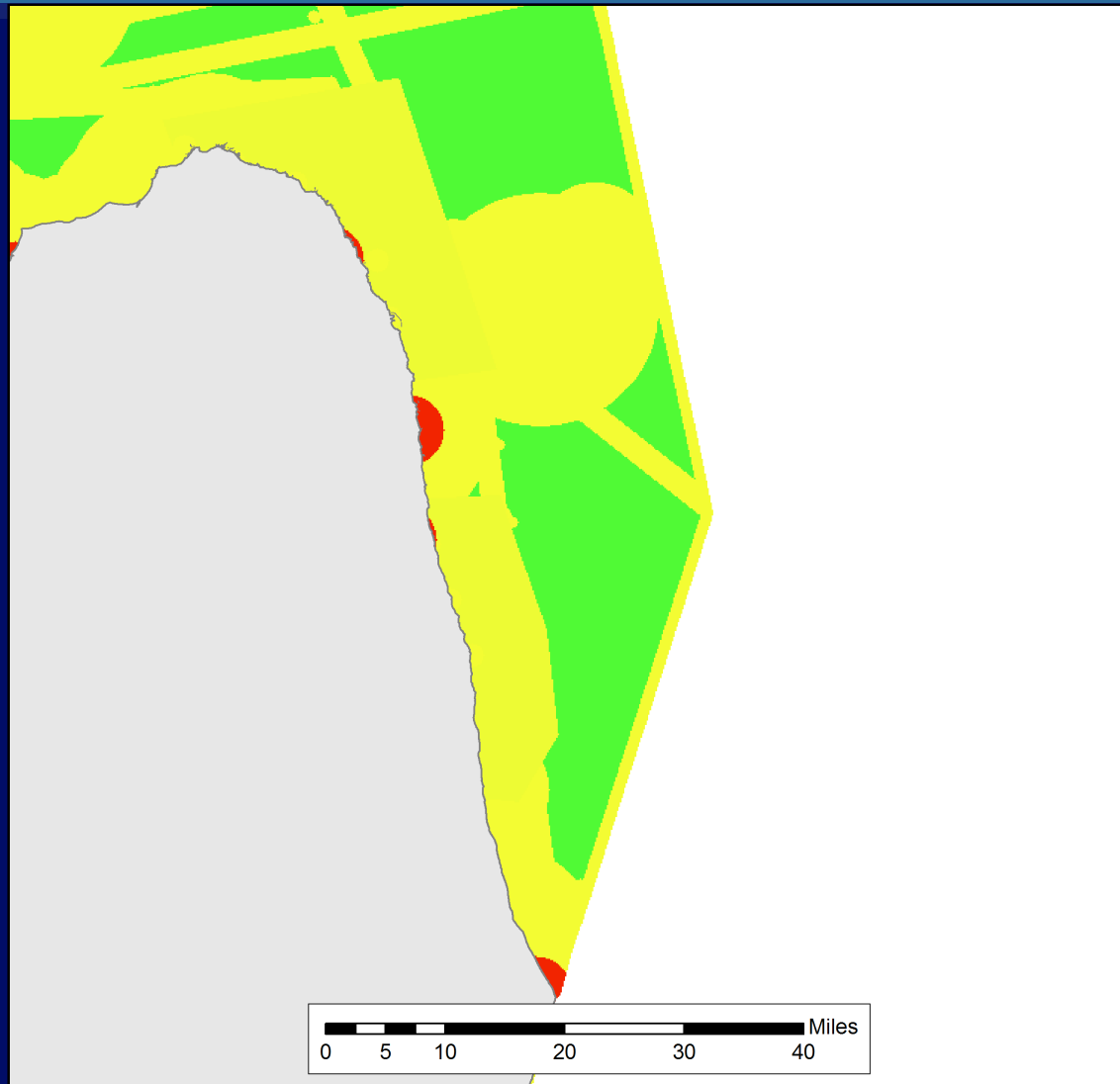
# Sanilac Wind Resource Area (6)

*with Harbors & Marinas Added*



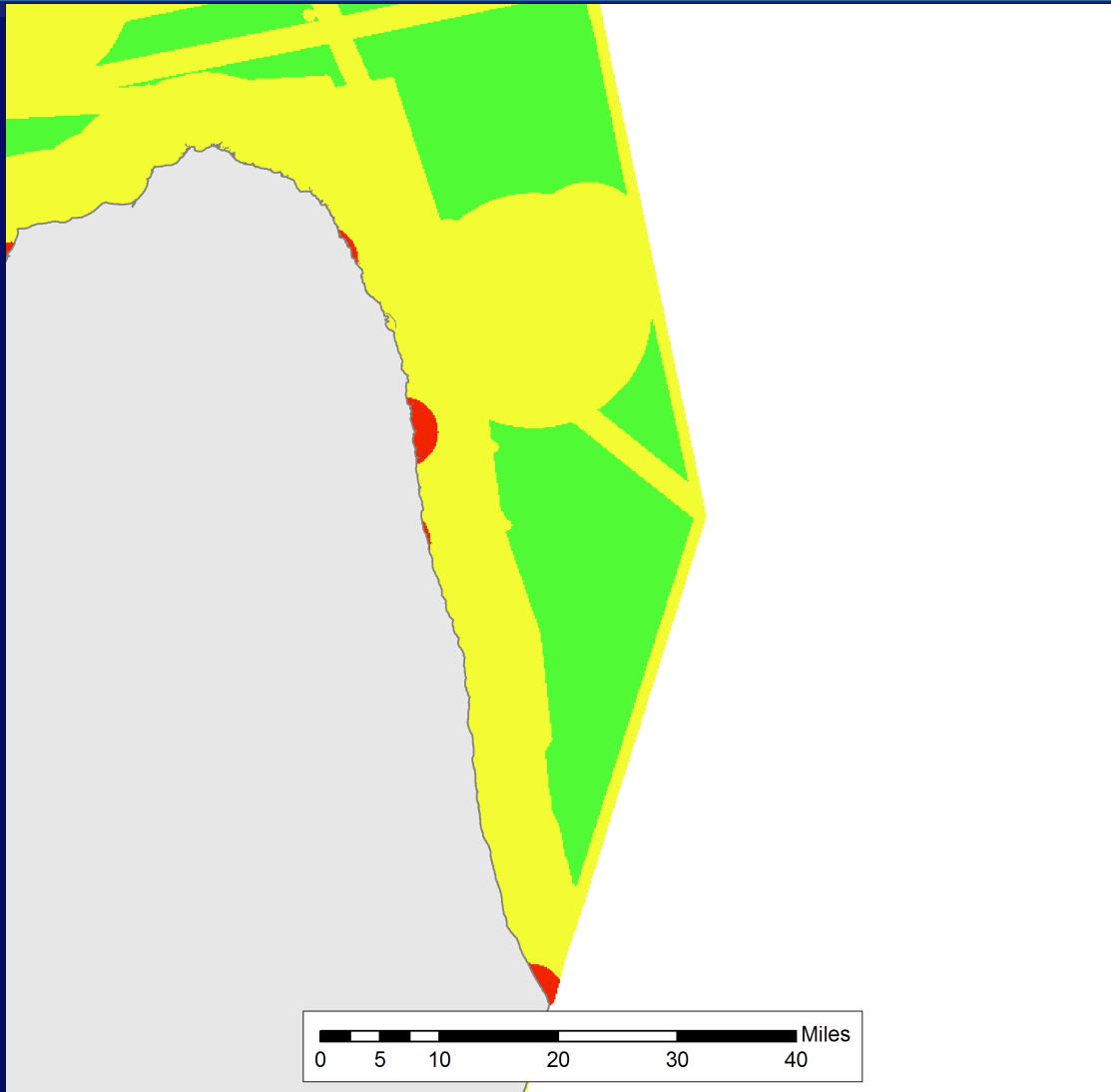
# Sanilac Wind Resource Area (7)

*with 3-Mile Biological Productivity Zone Added*

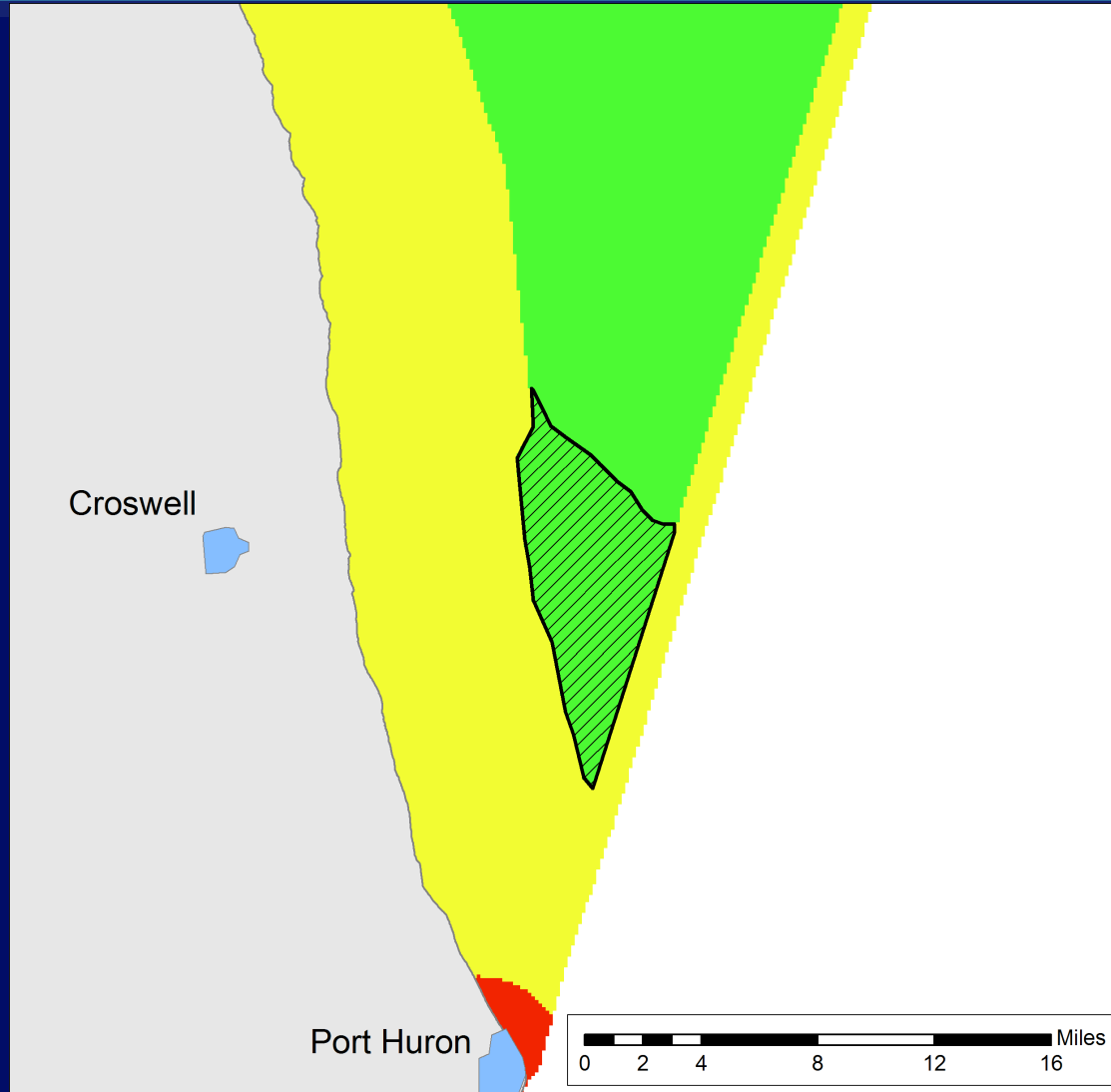


# Sanilac Wind Resource Area (8)

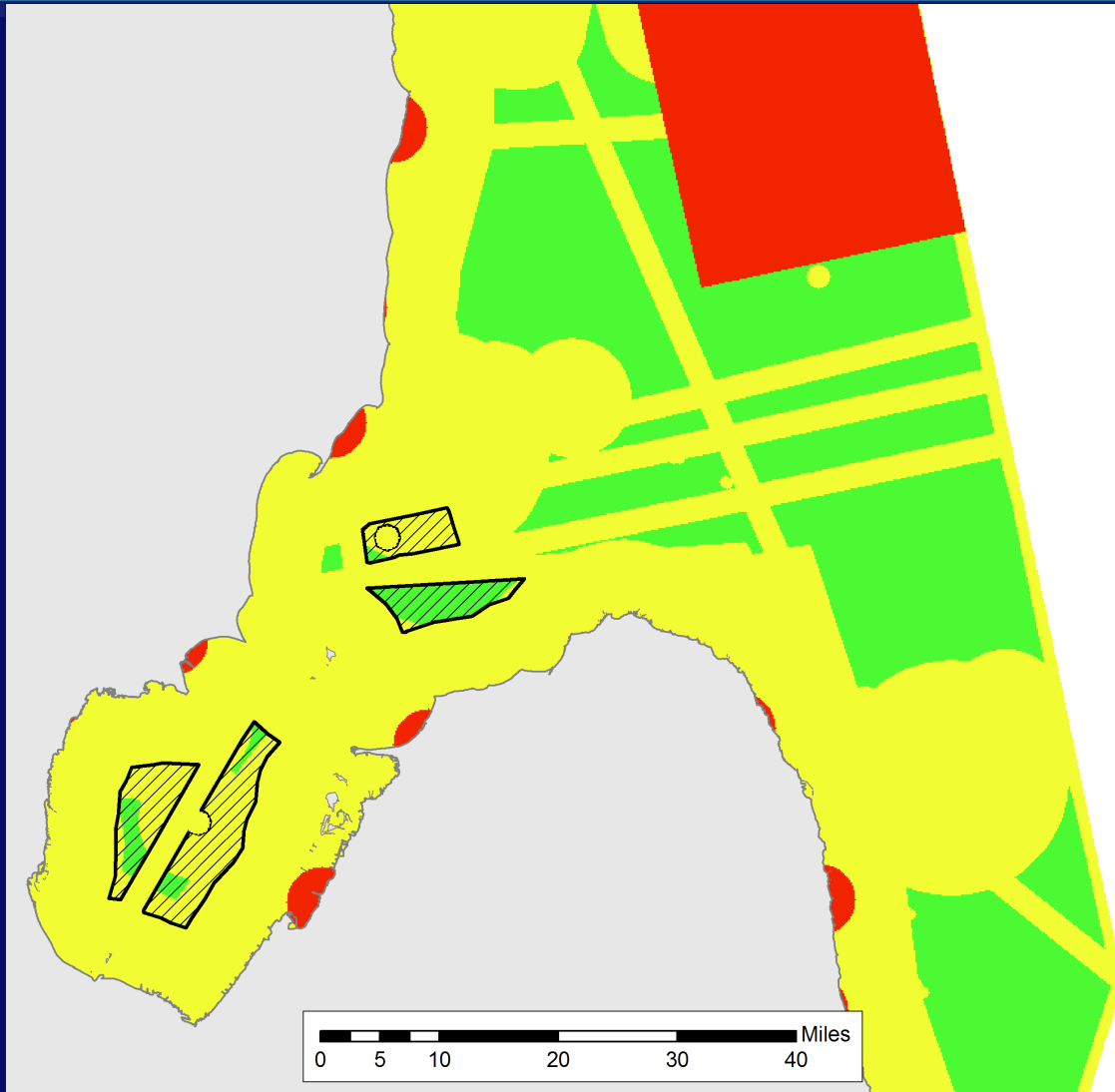
*with 6-Mile Viewshed Buffer Added*



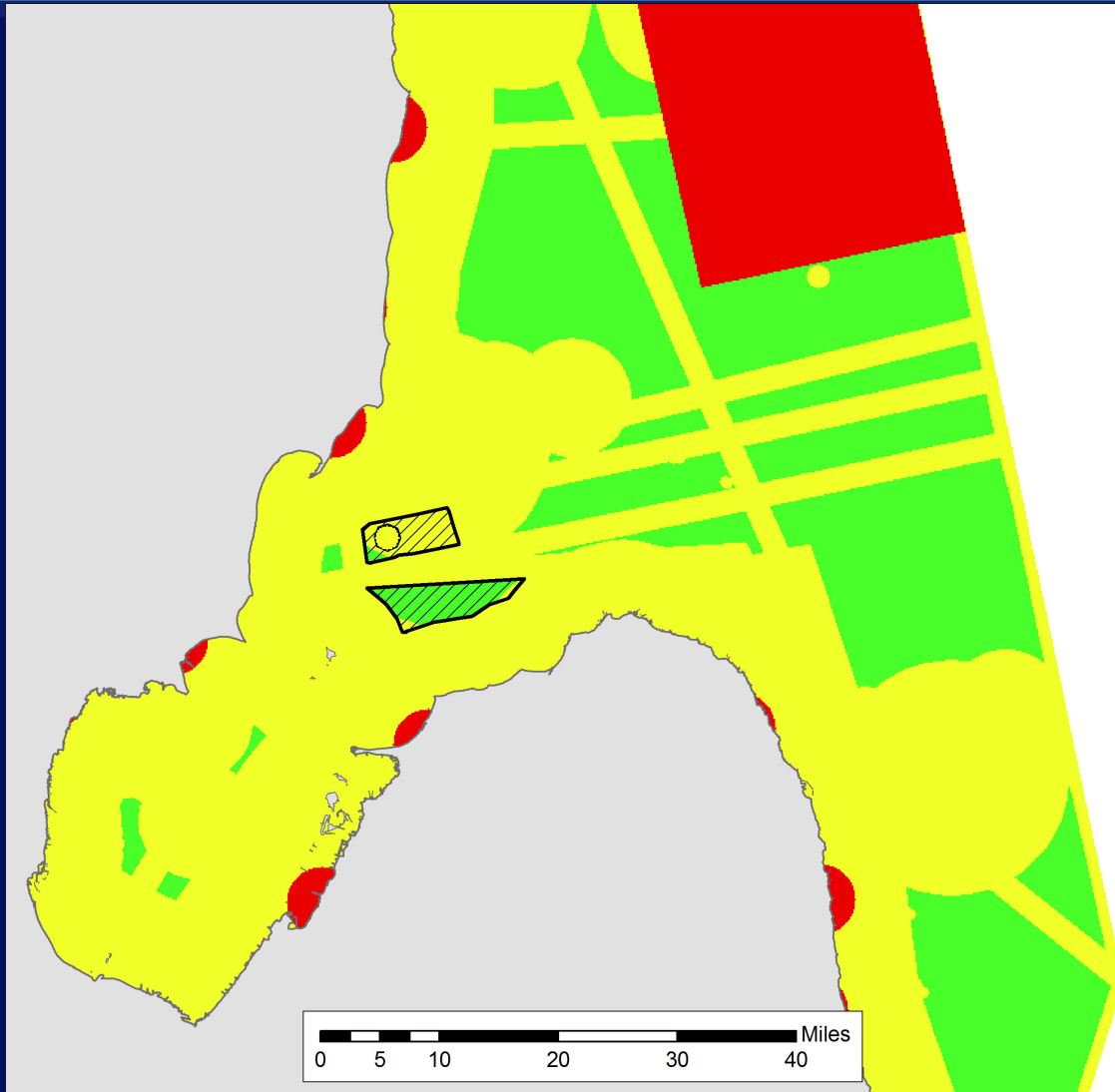
# Sanilac Wind Resource Area Close-up



# Inner Saginaw Bay & Outer Saginaw Bay

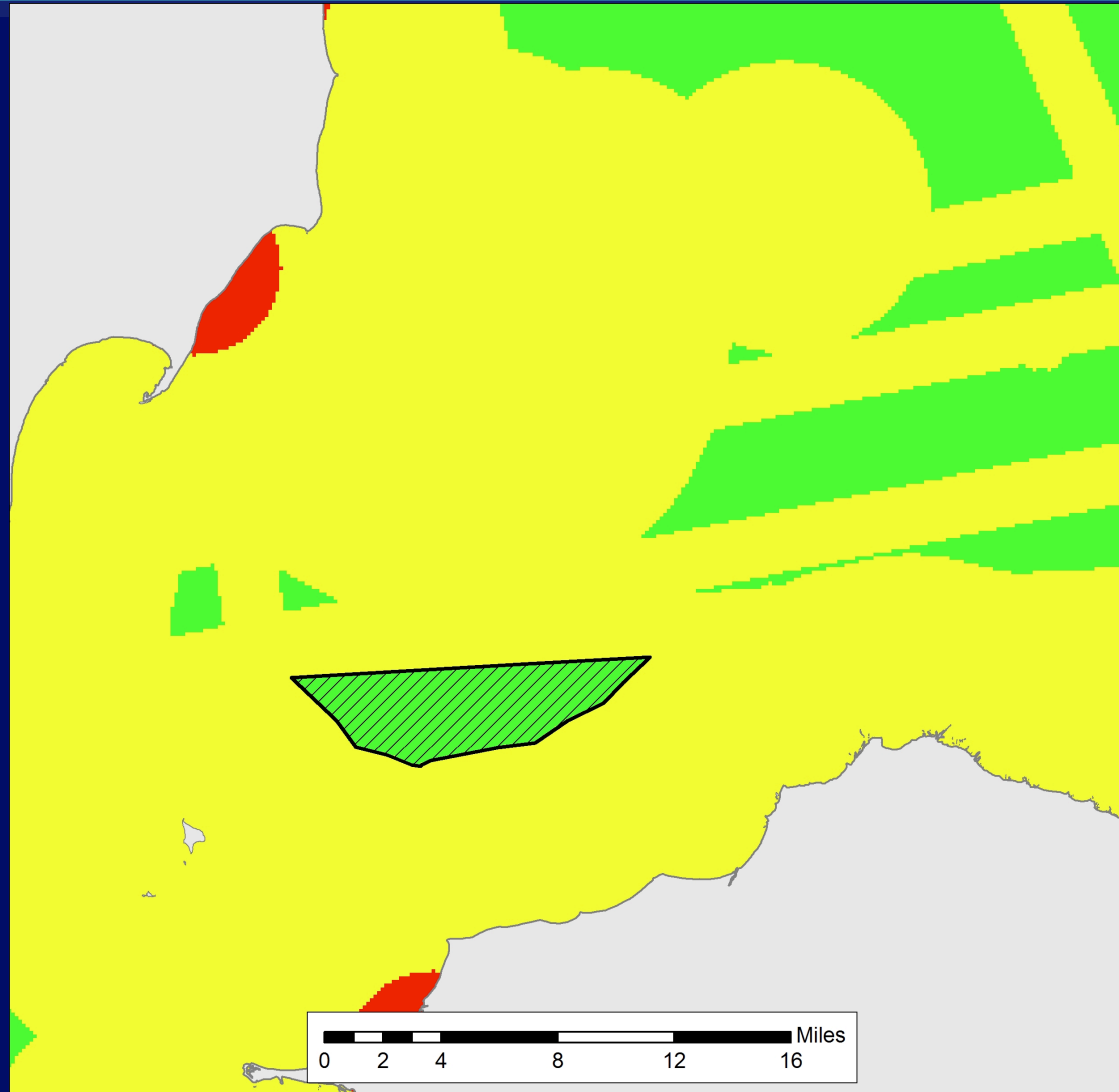


# Refined Outer Saginaw Bay

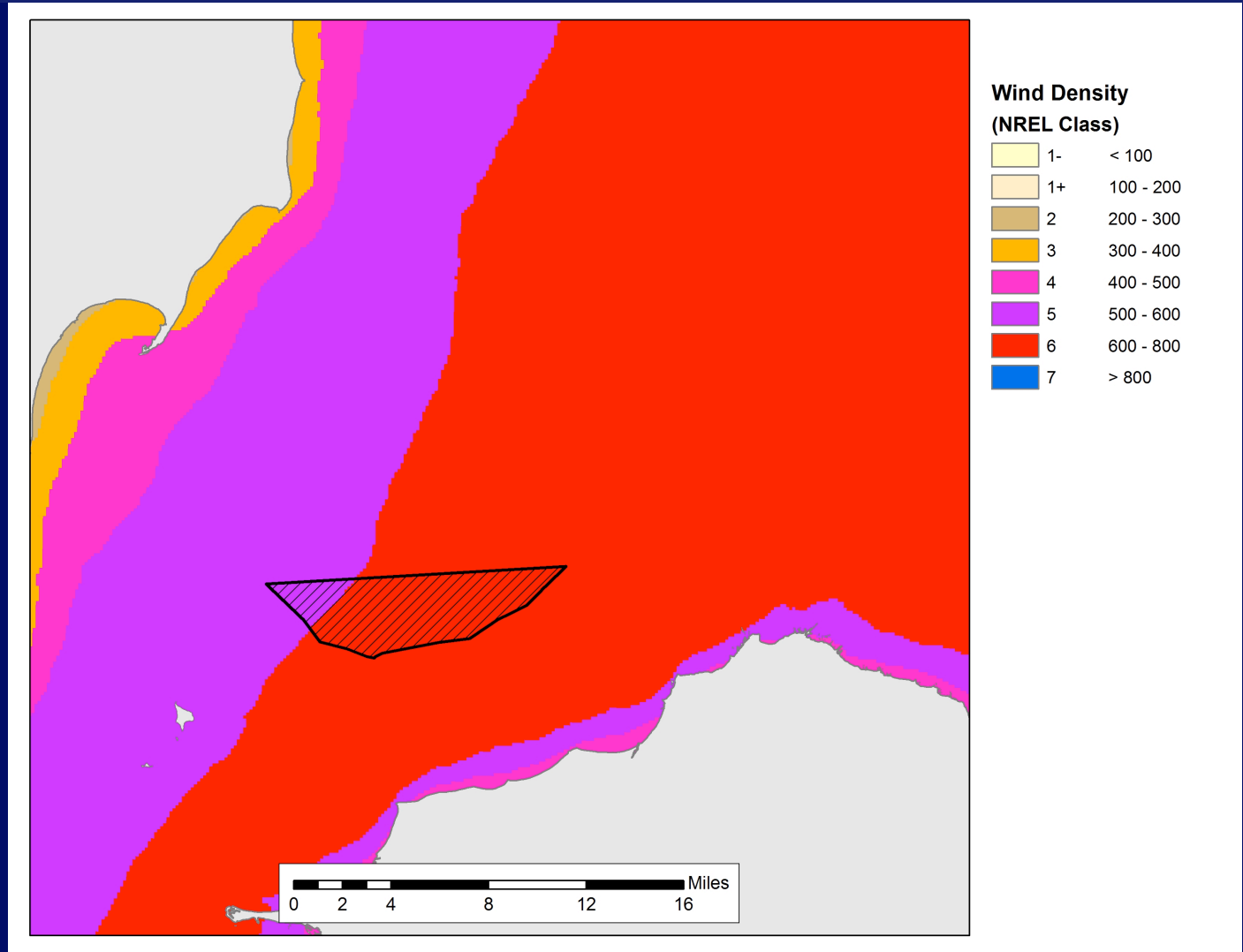




# Outer Saginaw Bay WRA



# Outer Saginaw Bay WRA



# Conclusion

- Mapping tool continues to evolve
- Additional data layers added over time
- Dynamic tool to view multiple scenarios during a permitting process
- Helps future decision-makers



# Legislative Recommendations

March 25, 2010

# Offshore Wind Legislation

- Council's September 2009 report recommended a package of legislative changes
- Goal was to help guide the development of offshore wind energy going forward and to establish a clear, transparent process

# Offshore Wind Legislation

Offshore wind legislation is needed:

- 1) to protect Michigan citizens from misguided development proposals, and
- 2) to ensure public engagement in siting and leasing decisions

# Council's Input on Legislation – Highlights

- An acknowledgement that current law (Part 325 Great Lakes Submerged Lands Act) would not regulate offshore wind energy facilities
- A process for identifying potential sites for offshore wind energy development

# Council's Input on Legislation – Highlights (cont.)

- An **auction process** for assigning development rights to the identified sites
- A **detailed set of requirements** for required plans:
  - Site assessment
  - Development
  - Construction
  - Operation
  - Decommissioning
- A process for **public involvement** in decision making, including notice and comment opportunities throughout the auction, site assessment, and development process



# Council's Input on Legislation – Compensation to the State for Leasing

- Requirement that lease payments and operation royalties will be collected
- Funds will:
  - 1) Monitor the impacts of offshore wind facilities and offset any impacts through habitat protection and improvement in the Great Lakes,
  - 2) Foster renewable energy and energy efficiency, and
  - 3) Administer the regulatory program.

# Process Moving Forward

- Council provided input on legislation to House and Senate (available on council's website)
- Legislature is now revising and will hold hearings on bills



# What about public input during offshore wind permitting?

March 25, 2010

# A Reminder...

- This 29-member council has a very specific job description from the governor.
  - The council does not review applications or make recommendations related to site-specific development proposals.
  - Site review is going to be conducted by the Michigan Department of Natural Resources and Environment (MDNRE) in tandem with federal agencies.
- The permitting and related public engagement processes outlined here are proposed by the council.

# Public Engagement in Siting of Offshore Wind Energy Systems

- Coordinated/concurrent with other state/federal reviews
- Public will be asked to contribute to both:
  - Permitting (what is allowed)
  - Leasing process (where it is allowed)

# Coordination with Other Reviews

- The state public engagement process shall be coordinated and, where practical, concurrent with:
  - Michigan Public Service Commission
  - Federal Aviation Administration
  - Federal Communications Commission
  - U.S. Coast Guard
  - U.S. Department of Homeland Security
  - U.S. Army Corps of Engineers.

# Overview of Input Opportunities Proposed by Council

- Pre-leasing
  - MDNRE-public hearing, fact finding
- MDNRE Lease Auction Notice
  - Proposed Lease – 60 days for comment
  - Final Notice – 21 days before lease
- Site Assessment Plan
  - Applicant-informational meeting with public input
- Permit and Lease
  - MDNRE public hearing + 30 days for comment
- Construction and Operation Permit
  - MDNRE public hearing + 30 days for comment

# Pre-Leasing

- Prior to offering parcels for lease, the department shall hold a public hearing and conduct fact-finding in the county nearest to the wind resource area or proposed offshore wind development parcel(s)



# Proposed Lease Auction Notice

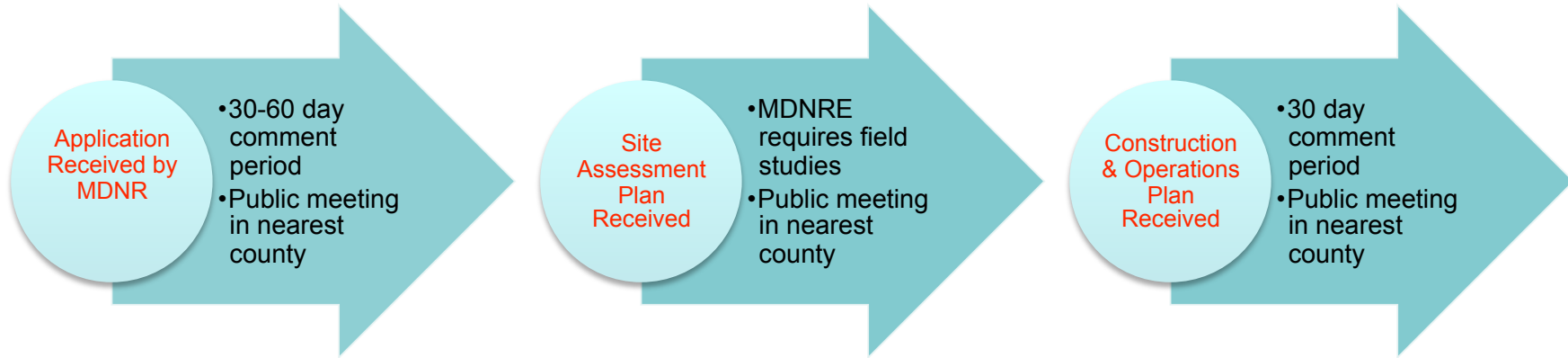
- **Proposed Lease Auction Notice issued with 60-day comment period, followed by Final Lease Auction Notice**
- **Notice includes:**
  - Area available for leasing
  - Proposed and final lease provisions and conditions, including, but not limited to size, term, payment and performance requirements, and site-specific lease stipulations
  - Auction details, including bidding procedures, deposit amounts, lease award method, etc.
  - Bidding or application instructions
  - Lease form
  - Criteria to evaluate competing bids or applications
  - Award procedures

# Lease Issuance

MDNRE shall

- Issue for public comment a notice of draft permit and lease that contains:
  - How site assessment activities are to be conducted and the presentation of results
  - Information on compensation to the state for the use and occupation of the bottomlands
- Hold at least one public hearing in the county nearest the proposed offshore site(s)
  - Comment period extends 30 days after the public hearing

# Public Engagement—Council's Recommended Permitting Process



# Agency Response to Comments

- MDNRE summarizes all comments received and provides agency response, including changes that were accepted and rejected

# Site Assessment Plan

- Applicant holds at least one informational meeting in the county nearest the proposed site(s)
  - Open to local, Tribal, state, and federal officials and the general public
  - Provides a mechanism to solicit public input

# Construction and Operation Permit

MDNRE shall

- Issue for public comment a notice of draft permit and lease containing:
  - Proposed terms and conditions for activities
  - Proposed compensation to the state
- Hold at least one public hearing in the county nearest the proposed site(s)
  - Comment period extends 30 days beyond the public hearing

# Expected Timeline

- Could take several years for developer to conduct the necessary studies and work through state and federal permitting processes
- Lease terms:
  - Site Assessment Lease: 3–5-year term
  - Construction and Operation Lease: 25-year term with 10-year extensions for the operational life of the facility