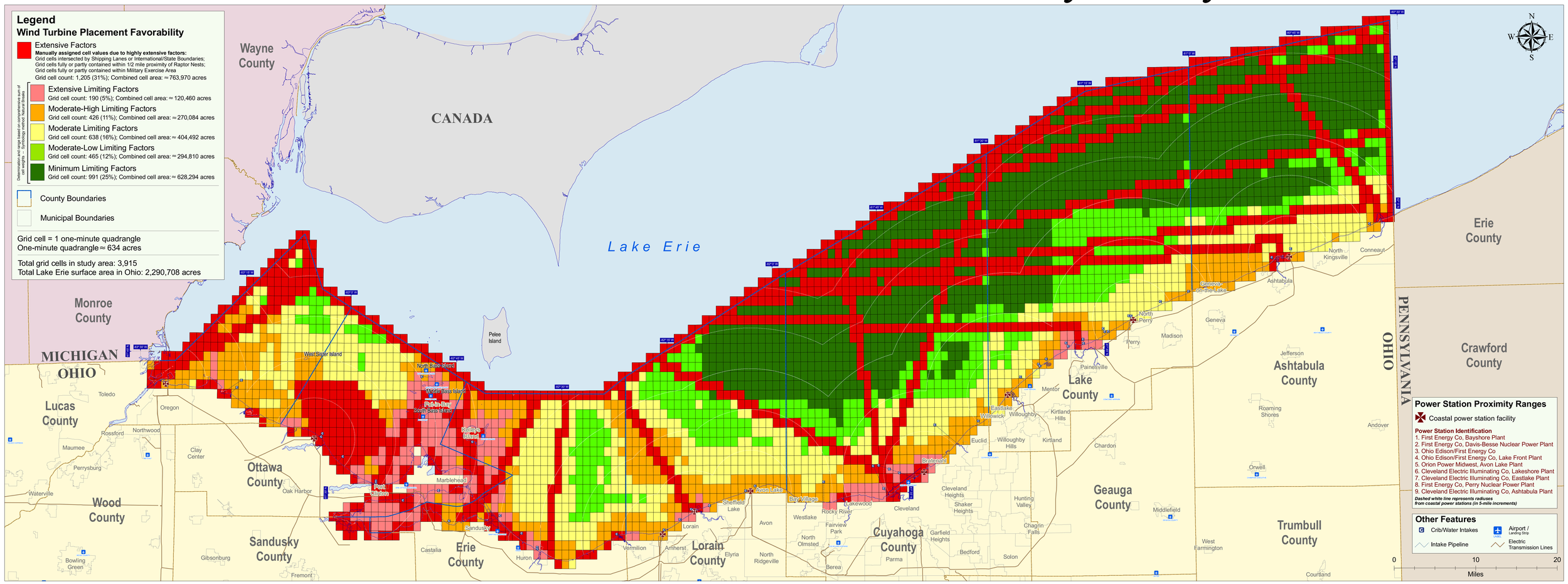
Wind Turbine Placement Favorability Analysis



Explanation of Notable Limiting Factors and Weighting

Shipping Lanes and Navigable Waterways

The location of shipping lanes, navigable waterways and harbors are identified as limiting factors due to the potential obstruction with large vessel/freighter transportation routes. The shipping lane and navigable waterway data was obtained from NOAA's navigational charts.

- Grid cells intersected by a shipping lane or navigable waterway are identified as extensive, and highly unfavorable wind turbine placement sites (in direct line with a shipping lane).

- Buffer areas of 1-, 2- and 3-miles were applied to shipping lanes and ferry routes to identify zones that may potentially impact wind turbine placement and weighted accordingly.

- Grid cells that are not in direct line of a shipping lane and not intersected by the one-nautical mile buffer are identified as the most favorable wind turbine placement sites.

Fish Habitat / Community

Fish habitat is broken into four classes based upon previously defined depth strata and extant data the Division of Wildlife has collected.

- Walleye Larval/Juvenile Production Areas: Defined by delineating where juvenile walleye were collected in bottom trawls conducted in June 2008 in the Western and Central basins and then relating physical characteristics (least favorable).

- Adult Walleye Habitat: Defined by delineating the 7 fathom bank which is currently used by the Lake Erie Commission for defining adult walleye habitat and for quota allocation purposes.

- Walleye/Perch Habitat: Defined by delineating the 55-foot depth contour which is generally the area where the thermocline intersects the bottom of Lake Erie and is generally the extent of influence of the Dead Zone.

- Dead Zone: Defined as bathymetry greater than 55 feet which is generally the area affected by bottom hypoxia (most favorable).

Lakebed Substrates

Lakebed substrates are broken into four classes based upon currently available, coarse level sub-strate mapping of Lake Erie (Haltuch et al), with wind power development having higher potential impact on coarse substrates, such as bedrock reefs and sand/gravel resources relative to finer materials, such as mud and glacial till.

- Bedrock and Sand/Gravel (least favorable)

- Sand/Mud

- Glacial Till

- Mud (most favorable)

Proximity to Raptor Nests

The proximity to protected raptor species nests was identified as a potential limiting factor. Raptor species include: bald eagle, osprey and peregrine falcon.

As a result of onshore monitoring protocols conducted by the Division of Wildlife, the following designations were applied to the weighting:

- Prohibition of wind turbine placement within a one-half mile radius of any raptor nest *[Weight of "0" applied to any grid cell completely or partially contained by this buffer]*.

- Further monitoring of raptor pairs if a wind turbine is proposed within a two mile radius of any raptor nest *[Weight of "1" applied]*.

- Grid cells completely located beyond the two mile radius were designated a more favorable weight.

Other Limiting Factors

Other limiting factors used to determine favorable and non-favorable locations for wind turbine placement in Lake Erie include the locations of:

- Reefs, shoals and artificial reefs

- Confirmed shipwrecks (as identified by Ohio Sea Grant)

- Underground salt mines, and open-lake areas permitted for sand & gravel extraction

- Federal, state and county boundaries

- Submerged land lease boundaries

- Natural heritage observances

- Military Exercise Zone and Dredge Disposal Areas

Distance from Shore

The distance from shore buffer-lines factored Ohio's mainland shoreline, all Lake Erie islands (including Canada), and out-of-state mainland shore (including Michigan, New York, Pennsylvania and Canada)

Areas between the shoreline and a the 3-mile buffer line are identified as impact zones due to aesthetic and habitat concerns. Locations within the 0-3 mile range are weighted into two categories: "0" for mainland and inhabited islands, and: "1" for uninhabited islands.

Locations beyond the 3-mile buffer are weighted into three categories (2 through 4) based on aesthetic preference (10 miles or farther, most favorable).

Sport Fishery Effort

This variable factors the average sport fishery effort of targeted walleye and perch from 2000-2006 by 10-minute grid.

- 106,000-700,000 hours of targeted percid effort (least favorable)

- 25,000-106,000 hours of targeted percid effort

- 4,000-25,000 hours of targeted percid effort

- 0-4,000 hours of targeted percid effort (most favorable)

Commercial Fishery Effort

This variable factors the average targeted commercial fishery trapnet lifts from 2000-2006 by 10-minute grid.

- 600-2,900 targeted trapnet lifts (least favorable)

- 250-600 targeted trapnet lifts

- 32-250 targeted trapnet lifts

- 0-32 targeted trapnet lifts (most favorable)

Important Bird Areas

Located at the intersection of the Atlantic and Mississippi flyways, Lake Erie is an important destination and stopover site for many migratory birds. Consequently, many areas along Ohio's shore have been designated as Important Bird Areas (IBA) by the Ohio Audubon Society.

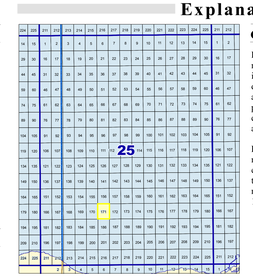
- Grid cells that are completely or partially contained by an IBA are given a lower weight *[Lowest value not given a weight of "0" due to the subjectivity of the areas]* (least favorable).

- Grid cells that are not completely or partially contained by an IBA are given a higher weight (more favorable).

GIS Data Sources

Bathymetry - National Oceanic and Atmospheric Administration, 2004
Confirmed Shipwrecks - Ohio Sea Grant, 2007
Fish Habitat - ODNR Division of Wildlife
Important Bird Areas - Ohio Audubon Society, 2005
Lakebed Substrates - Ohio Sea Grant, 1999
Military Exercise Zone - ODNR Office of Coastal Management, 2006 (from NOAA Navigation Charts)
Natural Heritage - ODNR Division of Natural Areas and Preserves, 2005
Raptor Nests - ODNR Division of Wildlife, 2008
Reefs and Shoals - ODNR Office of Coastal Management, 2006
Salt Mines - ODNR Division of Geological Survey, 2003
Shipping Lanes - ODNR Office of Coastal Management, 2008 (from NOAA Navigation Charts)
Submerged Land Leases - ODNR Office of Coastal Management, 2004-2008
Water Intake/Crib Facilities and Pipelines - ODNR Office of Coastal Management, 2009

Explanation of Grid System



Grid System

Each grid cell represents a geographic extent that is equal to one minute of latitude by one minute of longitude, or a "one-minute quadrangle." The four corners of each quadrangle can be individually identified with lat/long coordinates, to the minute. On the ground, one minute of distance is equal to one nautical mile. Although the angular dimensions of each grid cell are identical, they do not represent a square nautical mile. This is due to Lake Erie's mid-latitude position on Earth where quadrangles are taller than they are wide. The area of a one-minute quadrangle is approximately equal to 634 acres, whereas the area of one square nautical mile is approximately equal to 847 acres.

For identification purposes, the one minute quadrangle cells were grouped into 15 minute by 15 minute quadrangles (225 one-minute quadrangles, or cells, per 15-minute quadrangle). Within each 15-minute quadrangle, the one-minute cells were numbered 1 through 225 (from upper-left to lower-right). Each 15-minute quadrangle was also given a number from 1 through 34. As a result, each one minute grid cell can be identified with a unique indexing number by listing the 15-minute quadrangle number followed by the one minute grid cell number, i.e. "25-171."

Ohio Department of Natural Resources
Office of Coastal Management
105 West Shoreline Drive
Sandusky, Ohio 44870
(419) 626-7980

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