

# Persistent wind fields over the Great Lakes, 2002-2013



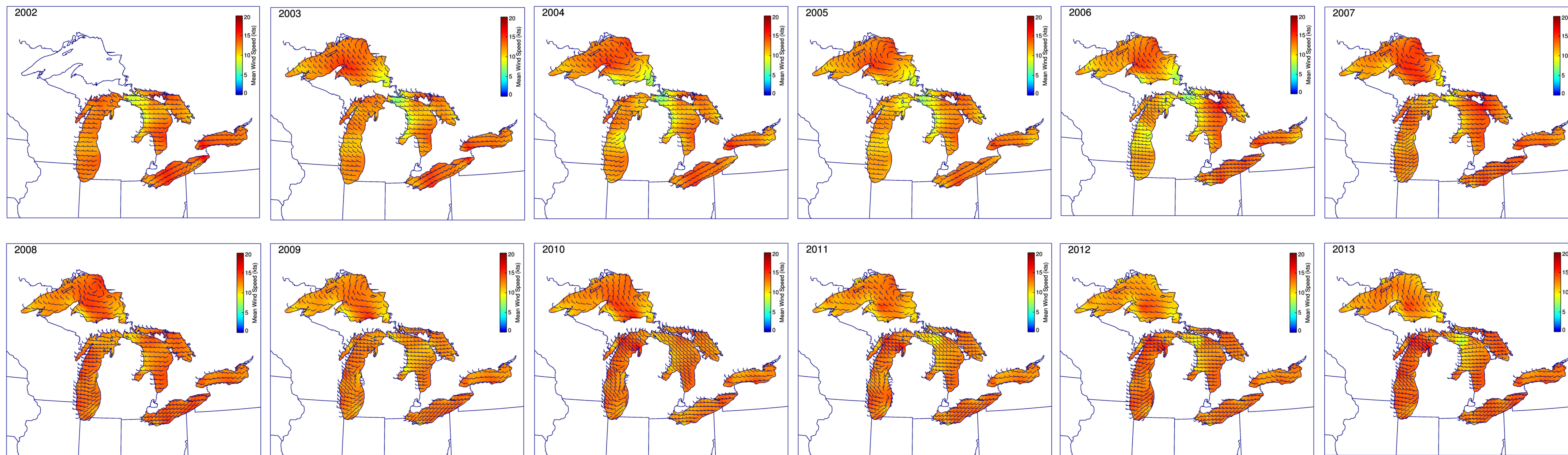
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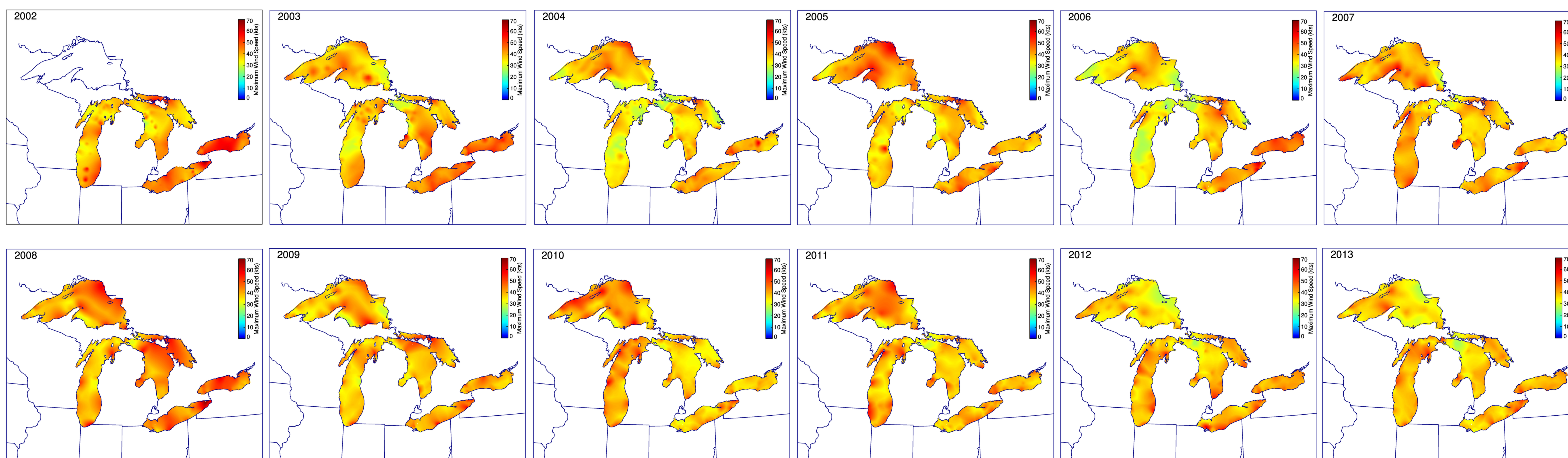
Hourly analyzed gridded wind fields over the Great Lakes produced by the Great Lakes Coastal Forecasting System (GLCFS, [www.glerl.noaa.gov/res/glcfs/](http://www.glerl.noaa.gov/res/glcfs/)) have been averaged for each year for years 2002 to 2013. Observed wind speeds are interpolated from hourly measurements made at buoys, CMAN stations, and shore stations. The observed winds were first normalized to 10-m anemometer height and then converted from over-land to over-water where necessary, using a method described in Schwab and Morton (1984). These resultant winds were then mapped to the GLCFS bathymetric grids using a natural neighbor technique and saved in compressed netCDF format. Annual averages and maxima were generated using Unidata's NCO tools. Mean annual winds speeds over the whole lake ranged from 11 to 13.6 kts. Prevailing wind directions tended to be from the SW, W, and NW. Maximum annual winds speeds over the whole lake ranged from 32.9 to 51.4 kts.

In addition to hourly 10-m wind speeds and directions, these netCDF files also contain 2-m air temperatures, dew point temperatures, and cloud cover, and are available back to 2006 on the Great Lakes Observing System (GLOS) Thredds Server: [http://tds.glos.us/thredds/glcfs/glcfs\\_forcing.html](http://tds.glos.us/thredds/glcfs/glcfs_forcing.html). Prior year's netCDF files are available upon request from the authors.

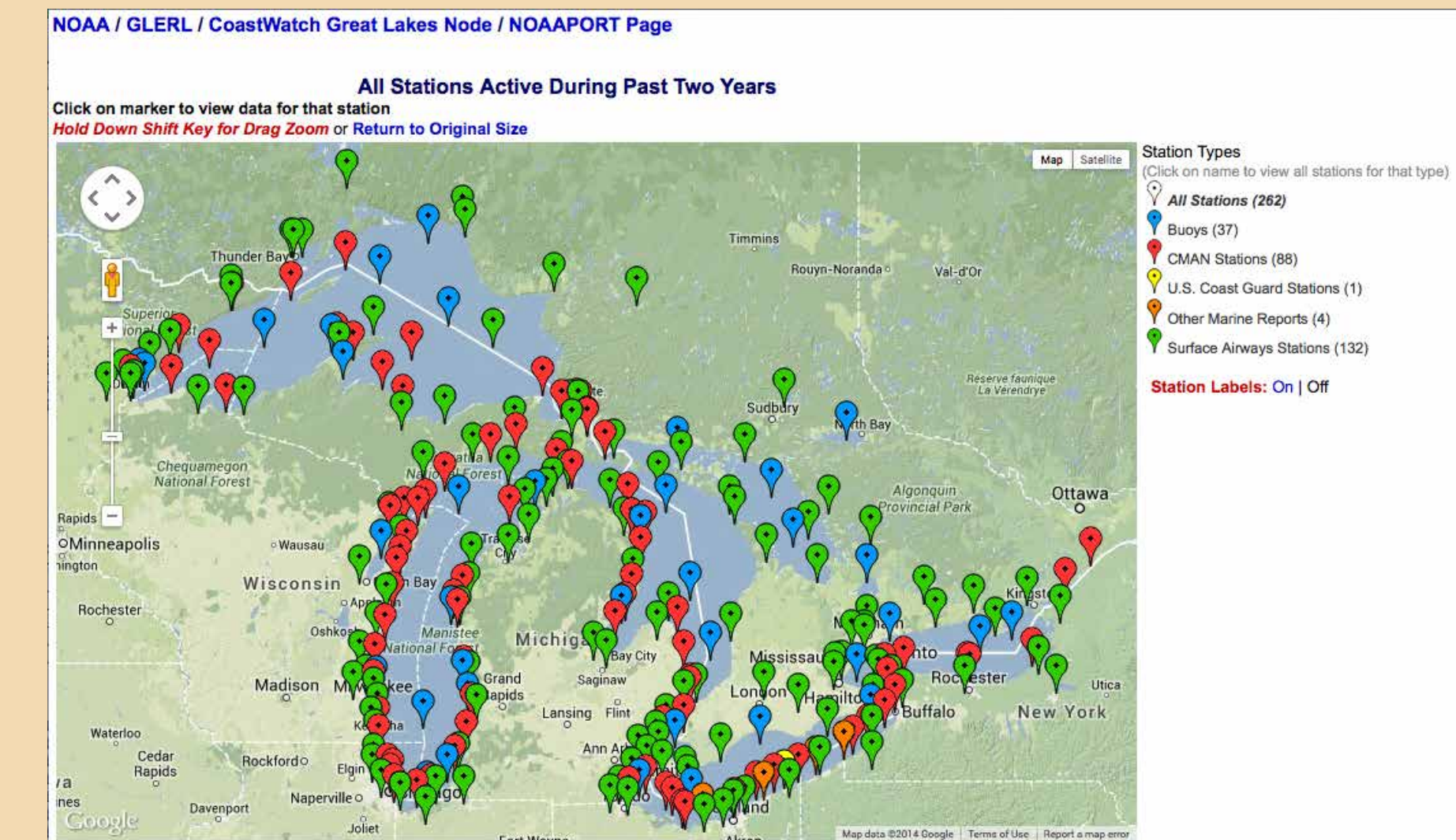
## MEAN ANNUAL WINDS - 2002-2013



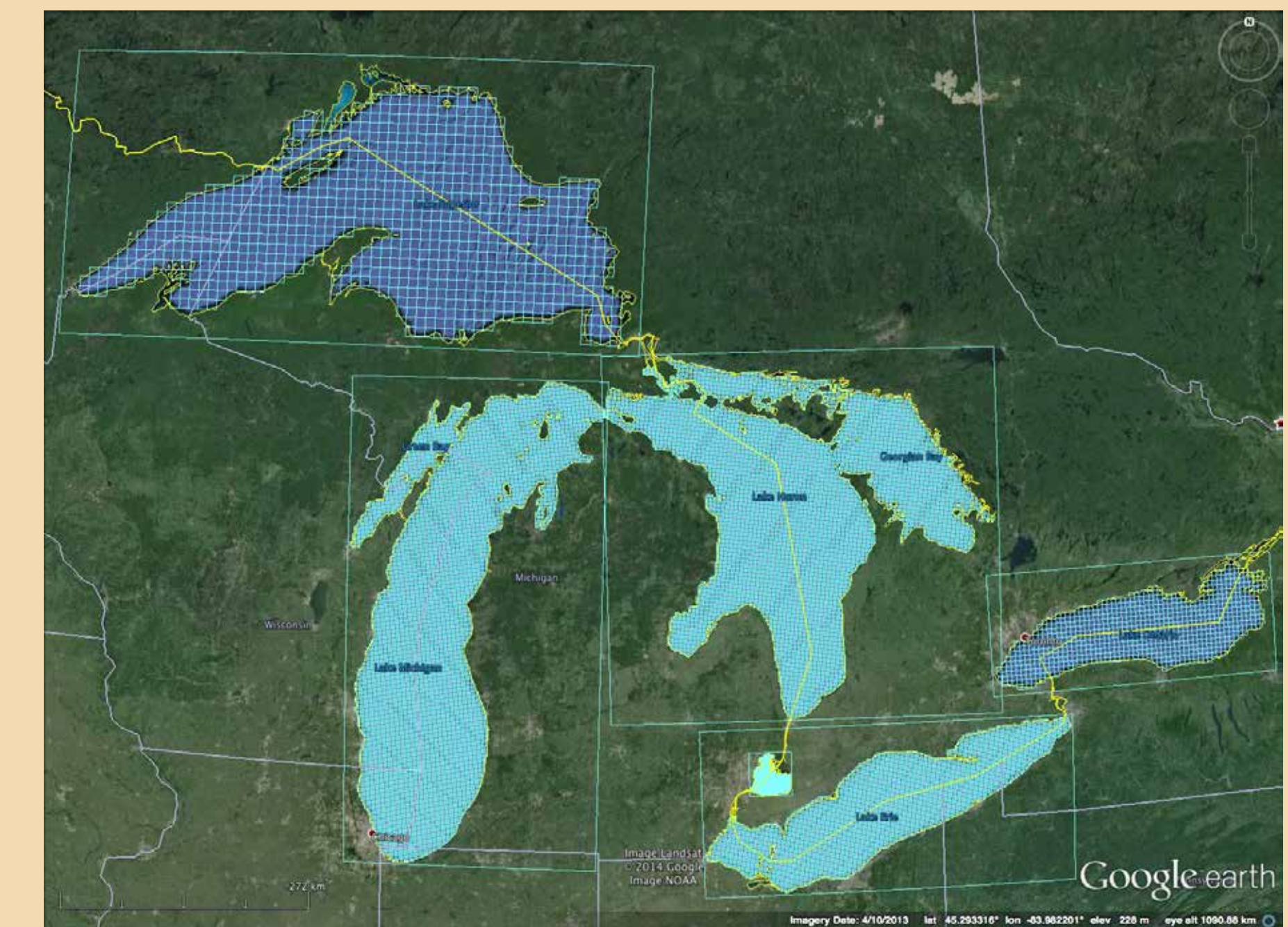
## MAXIMUM ANNUAL WINDS - 2002-2013



## NOAAPORT Sites



## GLCFS Grids



Mean Lake-Wide Wind Speeds (kts)

Year	Superior	Michigan	Huron	Erie	Ontario
2002	N/A	12.6	11.9	13.6	13.4
2003	12.5	12.1	11.3	13.2	12.9
2004	12.2	11.8	11.3	13.1	12.6
2005	12.2	11.3	11.5	12.6	12.4
2006	11.9	11.0	11.9	12.9	12.6
2007	12.9	12.2	12.7	13.2	12.8
2008	12.8	12.7	12.7	13.4	12.8
2009	12.1	12.4	11.9	12.9	12.4
2010	12.5	12.9	12.3	12.5	12.5
2011	12.1	12.8	12.0	12.9	12.3
2012	11.8	13.1	12.2	12.7	12.5
2013	11.9	13.4	12.3	13.2	12.9
All Years	12.3	12.3	12.0	13.0	12.7

Maximum Lake-Wide Wind Speeds (kts)

Year	Superior	Michigan	Huron	Erie	Ontario
2002	N/A	39.1	38.8	45.2	51.4
2003	38.4	37.8	39.5	44.9	46.9
2004	38.4	33.9	35.4	40.2	40.5
2005	43.0	37.2	38.2	41.9	38.9
2006	36.1	32.9	37.4	42.5	46.4
2007	40.1	40.7	37.9	41.2	38.3
2008	42.6	39.0	44.6	45.9	47.4
2009	38.9	38.0	39.8	41.2	40.3
2010	41.8	41.5	36.2	38.2	37.3
2011	41.4	40.2	37.3	39.3	39.6
2012	35.3	39.7	38.0	41.3	41.2
2013	35.9	39.8	36.9	39.1	40.0
All Years	39.3	38.3	38.3	41.7	42.4