Data Resources Through the US Integrated Earth and Ocean Observing Systems

Freshwater Spills Symposium 2009

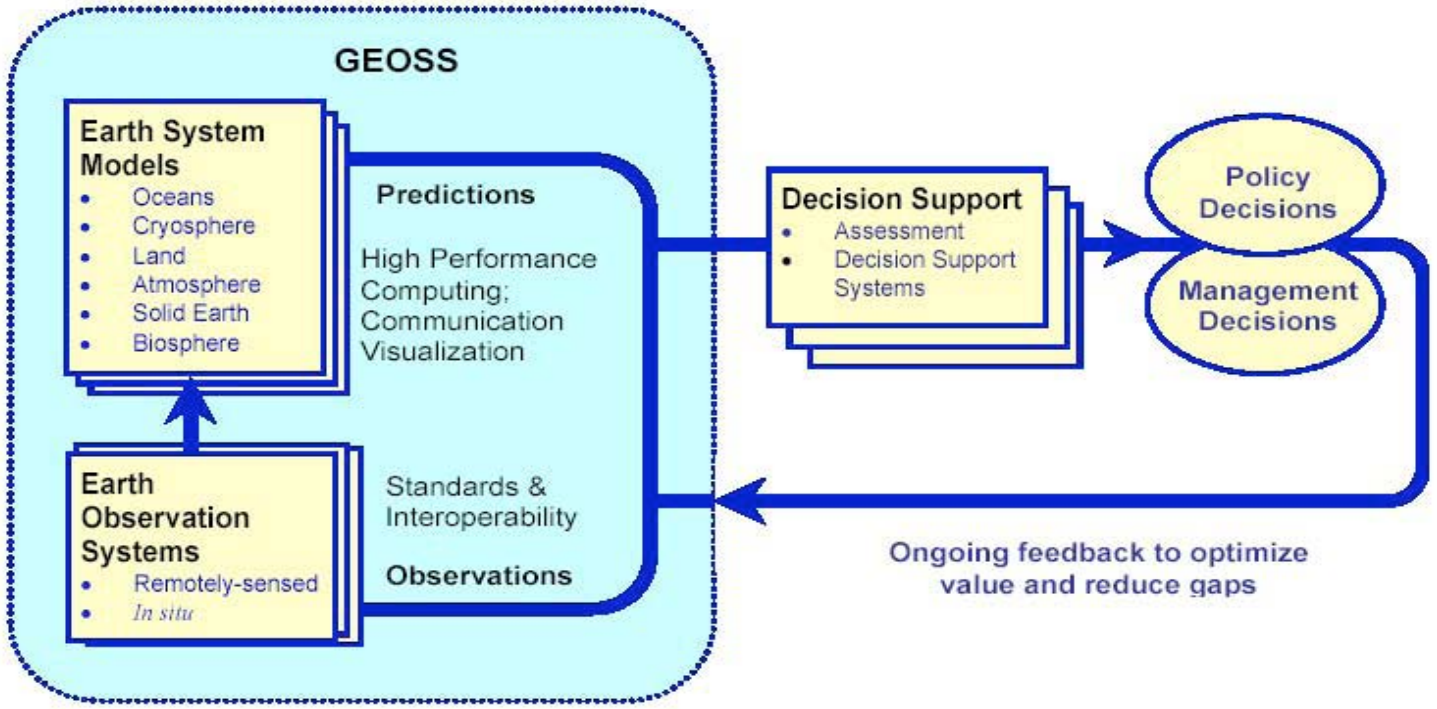
28-30 April, 2009

GLOS
Great Lakes Observing System

Global System

- Global Earth Observing System of Systems (GEOSS)

  Global Earth Observing System, Global Ocean Observing System



US components: Integrated Ocean Observing System (IOOS)

Integrated Earth Observing System (IEOS)

Integrated Ocean Observing System (IOOS)

- Global component: U.S. contribution to GOOS
- National component: Coastal ocean observations
  - Federal agencies – Backbone observations, products and services
  - Regional Associations – Enhanced observation resources, attention based on geographic areas
- Subsystems
  - Measurements – Collected data
  - Data Management and Communications (DMAC)
    - Integration of data collected by different methods and systems
    - Distribution of data
  - Modeling and Analysis – Derived products and services

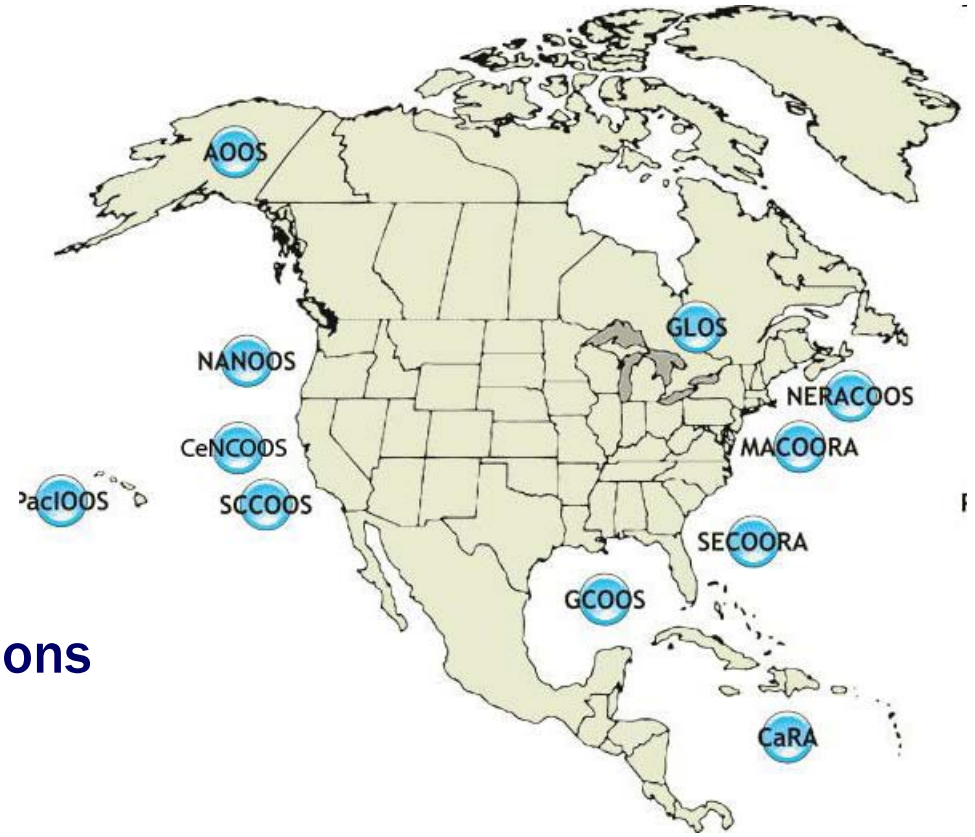
Integrated Ocean Observing System (IOOS)

- Seven "Societal Goals" focused on
  - Analysis of climate change, weather and associated effects
  - Safety and efficiency of maritime operations
  - Mitigation of the effects of natural hazards
  - National and homeland security
  - Public health risks
  - Protection and restoration of healthy coastal ecosystems
  - Sustainable use of ocean and coastal resources

Interest growing as data creation and handling capacity grow

Regional Coastal Ocean Observing Systems

- 11 Regional Associations
  - Non-Federal
  - Regional priorities
  - Varying data needs
  - Varying approaches
  - Different mixes of entities
    - State agencies
    - Research institutions
    - Commercial organizations
    - Interest groups



Great Lakes Observing System

- Involves eight states, all five Great Lakes
  - Numerous agencies and institutions a challenge
  - Freshwater system means unique issues and parameters
- Integrating Canadian observation data
- Stakeholders include
  - Research scientists
  - Commercial and shipping interests
  - Local, State and Federal agencies
  - Coastal property owners
  - General public

Data Integration

Observations

DMAC

Raw Data

Data Integration via DIF

Input tools

Conversion tools

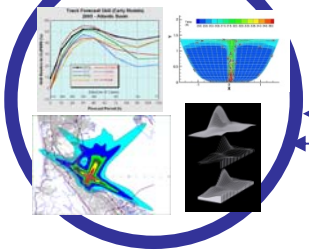
Cataloging tools

Model Results

Standardized Data

Tools and Services – Public and Other Users

Computer Models



Current Data Storage/Access

Long-term Archives

Data Analysis - Processors and Applications

Data Integration

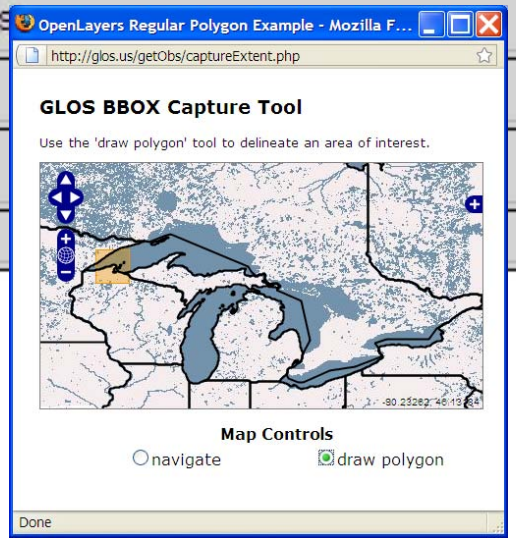
- Data formatting varies depending on instruments
- OPeNDAP allows conversion of in-situ sensors
- KML and NetCDF are used for many processed outputs
- IOOS next step: Data Integration Framework
- Broader interoperability being explored
  - OOSTethys Ocean Science Interoperability Experiment
  - IOOS Data Information Framework

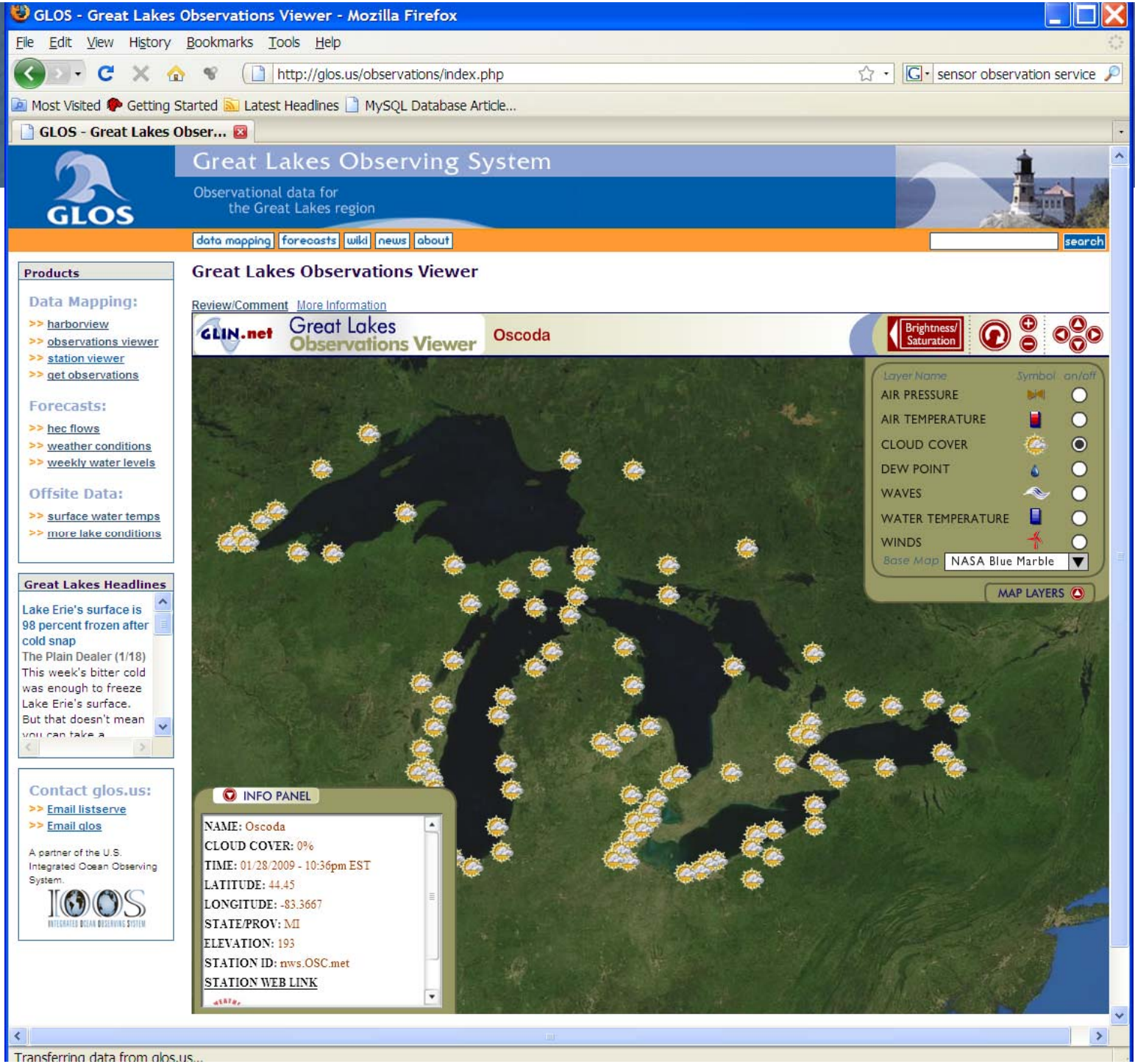
Data Integration

- Observation data retrieval
  - Access to the numbers
- Observation viewers
  - Great Lakes Station Viewer
  - HarborView
- Model interfaces
  - Huron to Erie Corridor Waterways Forecasting System

Data Integration

GLOS Latest Observations	
-72.00,41.00,-97.00,49.00 Find BBOX coordinates from map	BBOX: (max lon, min lat, min lon, max lat) in decimal degrees
ObsKML (Google Earth)	Select Output Format
All Stations	Select Station Type
All Observations	Observed Property
English	Select Measurement Units
GMT	Select Timezone
Submit Query	
Link to results: Link	

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>> station viewer
>> get observations
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>> weather conditions
>> weekly water levels
Offsite Data:
>> surface water temps
>> more lake conditions
Great Lakes Headlines
Lake Erie's surface is 98 percent frozen after cold snap
The Plain Dealer (1/18)
This week's bitter cold was enough to freeze Lake Erie's surface. But that doesn't mean
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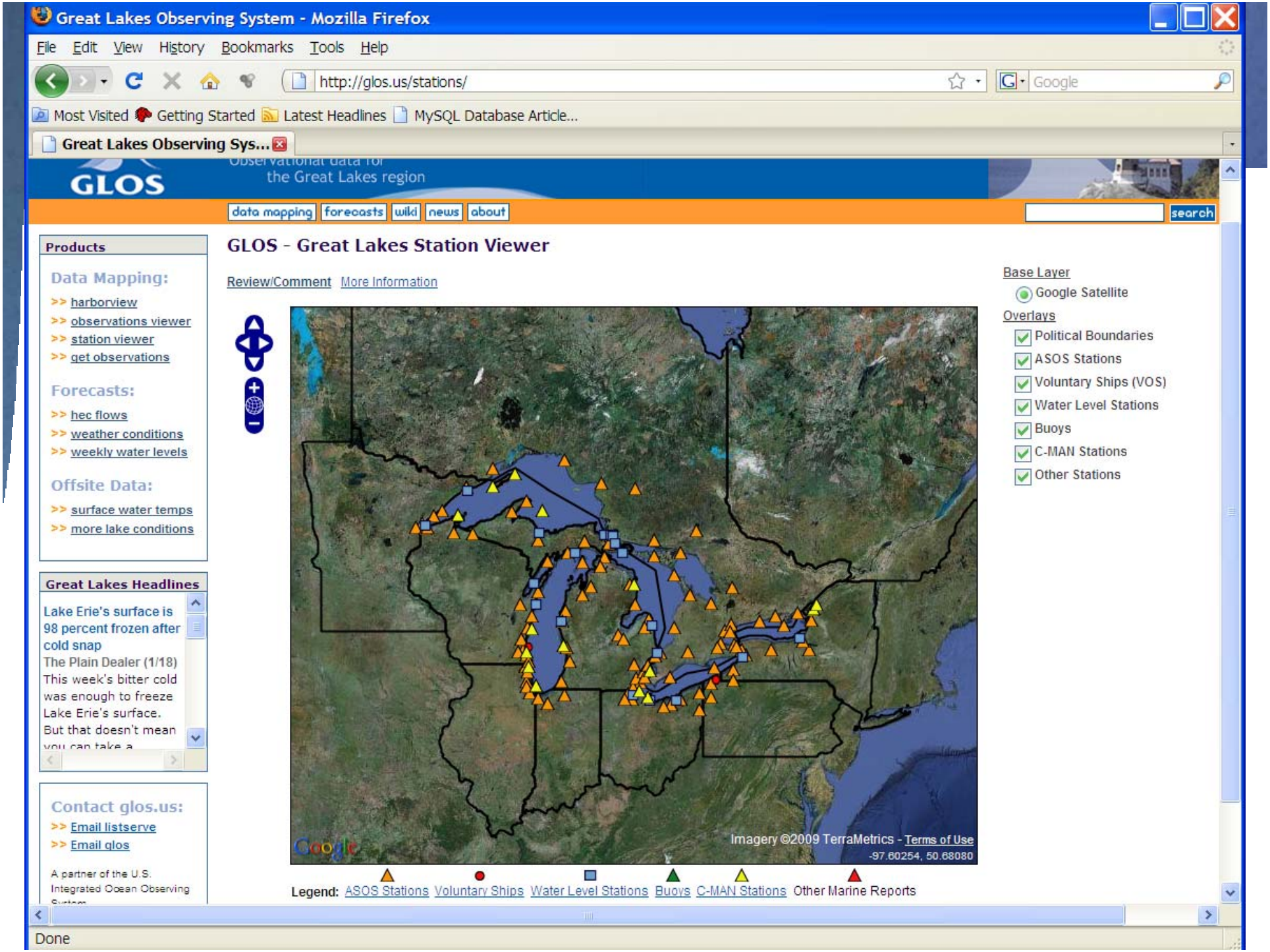
GLIN.net Great Lakes Observations Viewer Oscoda
Brightness/ Saturation
Layer Name Symbol on/off
AIR PRESSURE
AIR TEMPERATURE
CLOUD COVER
DEW POINT
WAVES
WATER TEMPERATURE
WINDS
Base Map NASA Blue Marble
MAP LAYERS
INFO PANEL
NAME: Oscoda
CLOUD COVER: 0%
TIME: 01/28/2009 - 10:36pm EST
LATITUDE: 44.45
LONGITUDE: -83.3667
STATE/PROV: MI
ELEVATION: 193
STATION ID: nws.OSC.met
STATION WEB LINK
Transferring data from glos.us...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ASOS Stations
Voluntary Ships (VOS)
Water Level Stations
Buoys
C-MAN Stations
Other Stations
Google
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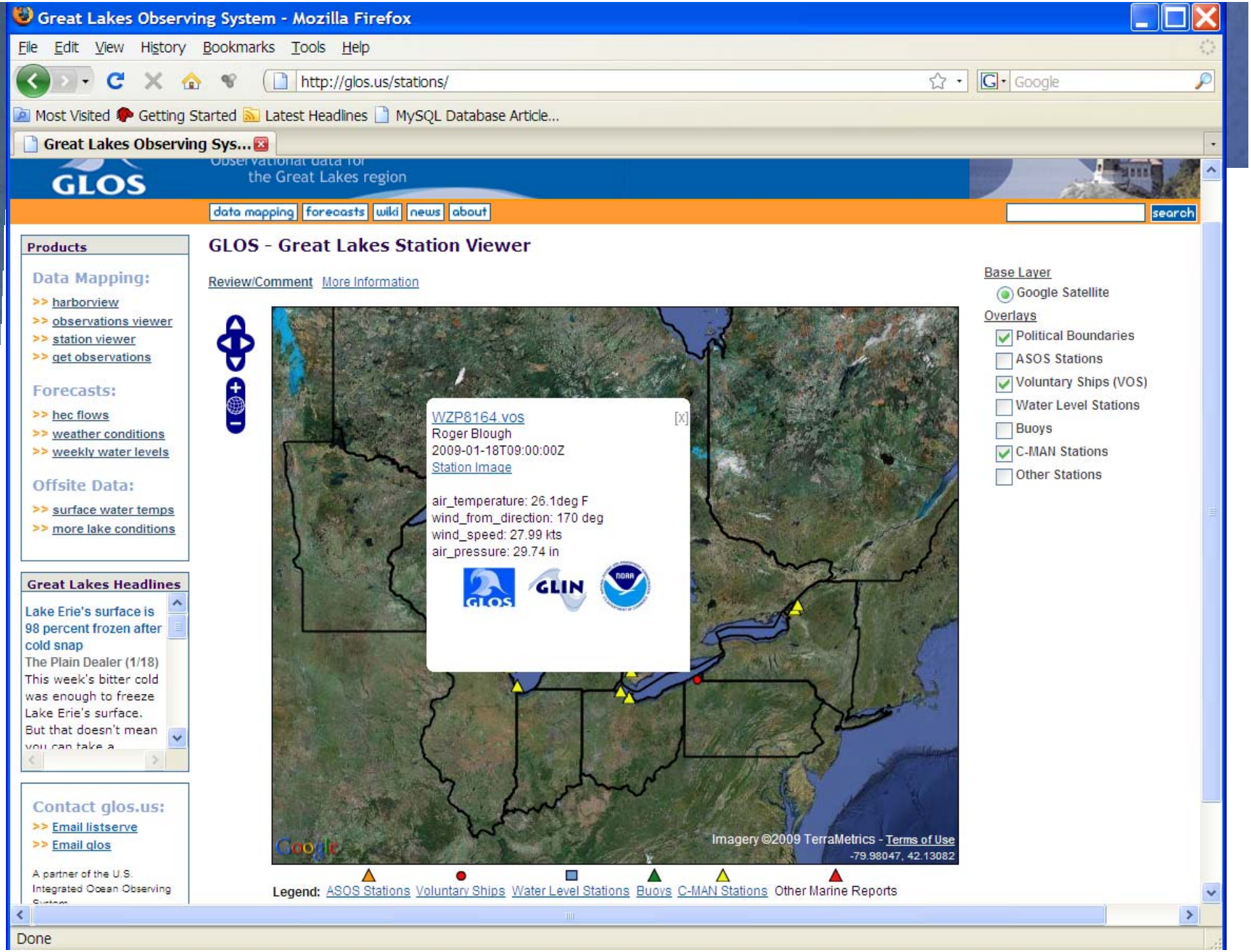
Legend: ASOS Stations Voluntary Ships Water Level Stations Buoys C-MAN Stations Other Marine Reports
Done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Review/Comment More Information
WZP8164 vos [X]
Roger Blough
2009-01-18T09:00:00Z
Station Image
air_temperature: 26.1deg F
wind_from_direction: 170 deg
wind_speed: 27.99 kts
air_pressure: 29.74 in
GLOS GLIN NOAA
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-79.98047, 42.13082
Base Layer
Google Satellite
Overlays
Political Boundaries
ASOS Stations
Voluntary Ships (VOS)
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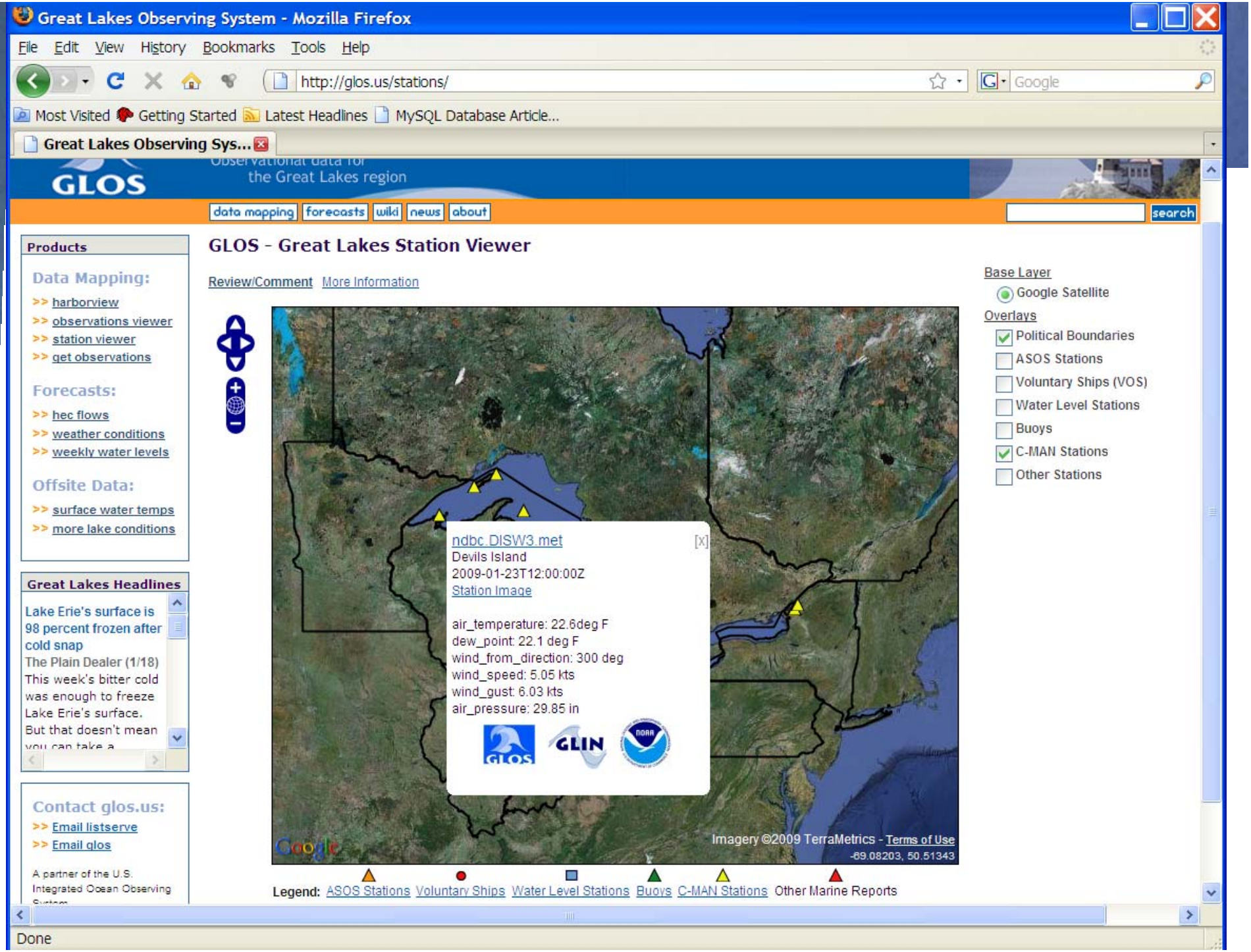
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ndbc.DISW3.met [x]
Devils Island
2009-01-23T12:00:00Z
Station Image
air_temperature: 22.6deg F
dew_point: 22.1 deg F
wind_from_direction: 300 deg
wind_speed: 5.05 kts
wind_gust: 6.03 kts
air_pressure: 29.85 in
GLOS GLIN NOAA
Google
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-69.08203, 50.51343
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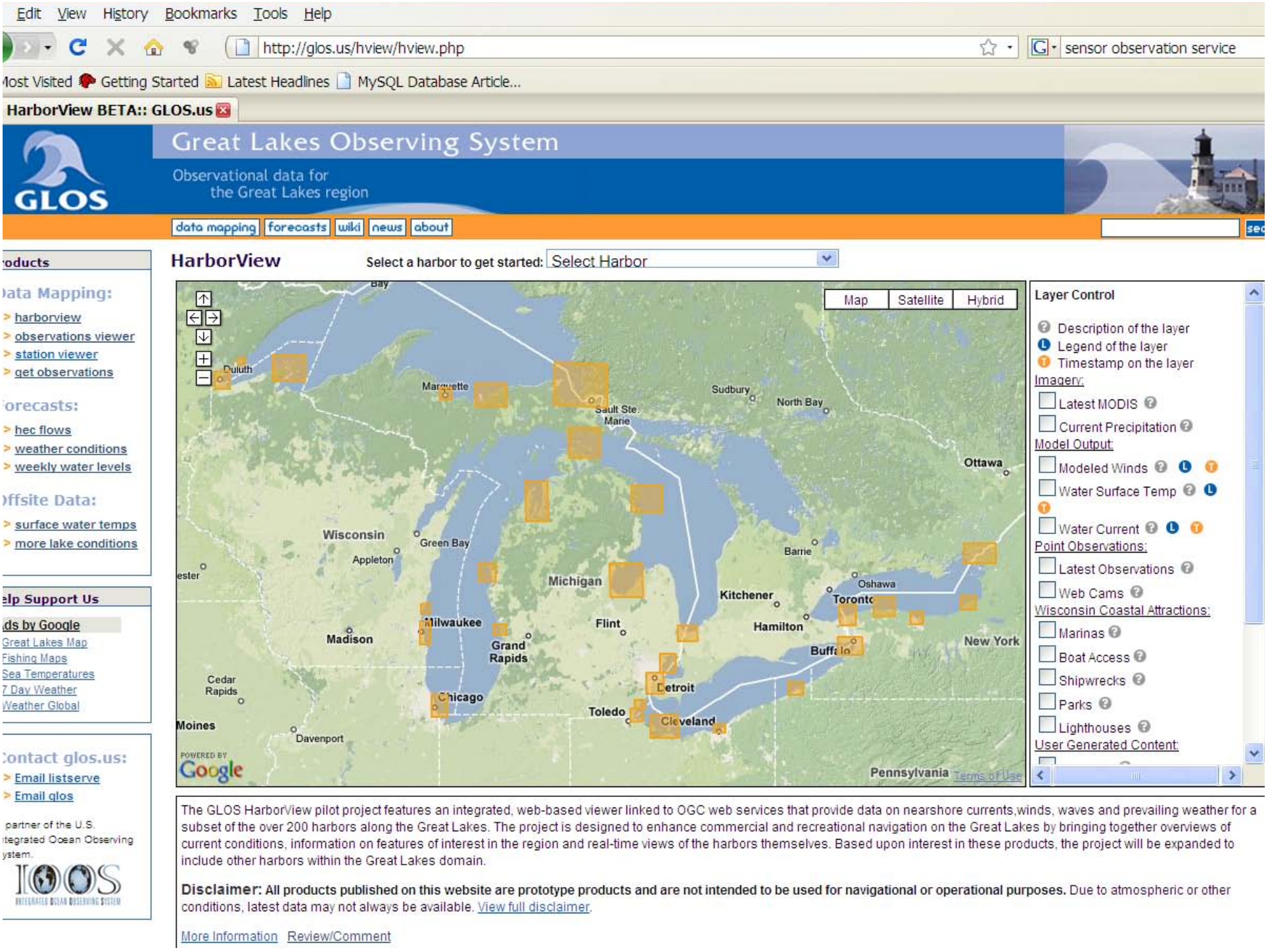

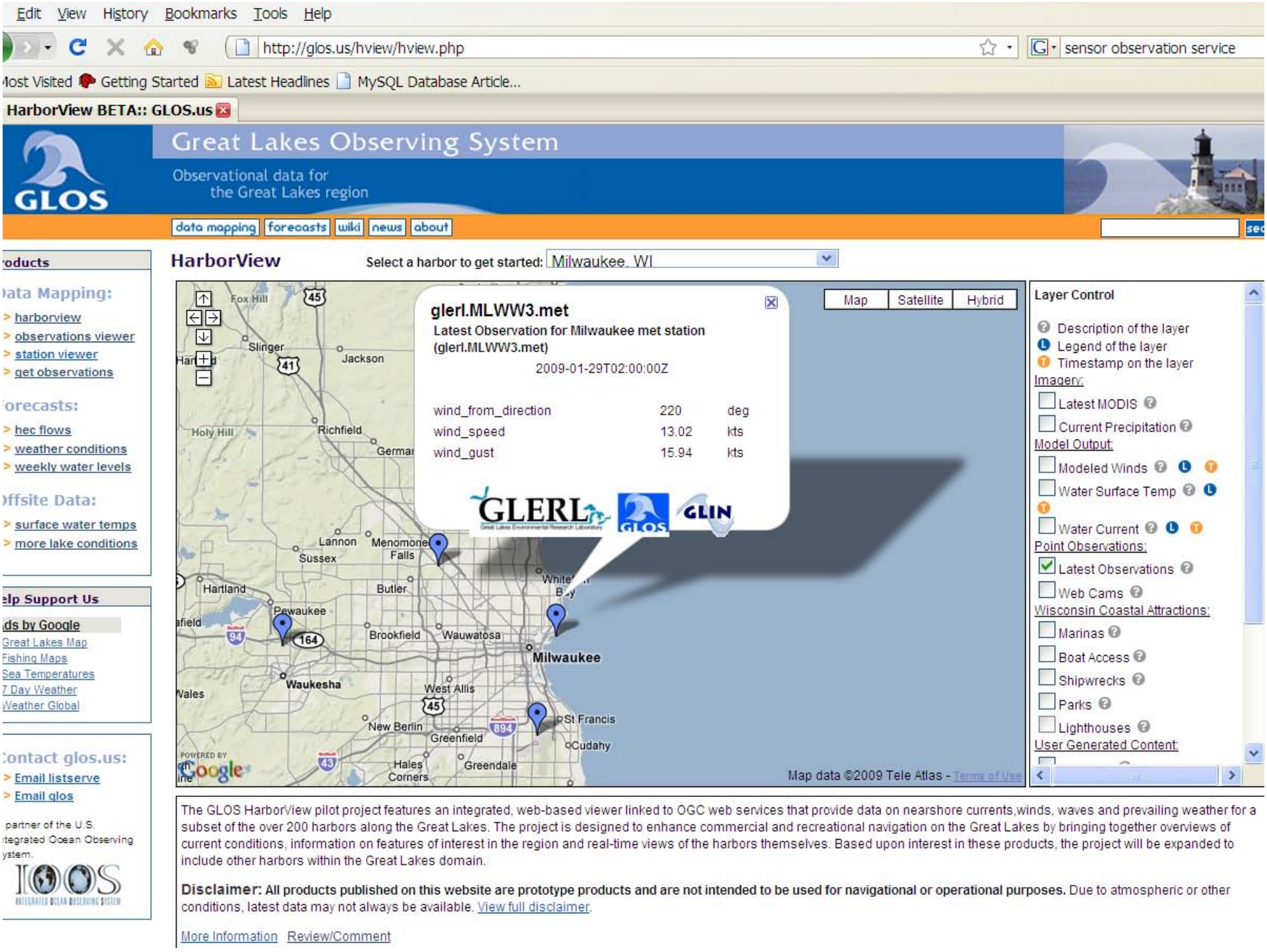
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IOOS
HarborView
Select a harbor to get started: Milwaukee, WI
Map Satellite Hybrid
glerl.MLWW3.met
Latest Observation for Milwaukee met station (glerl.MLWW3.met)
2009-01-29T02:00:00Z
wind_from_direction 220 deg
wind_speed 13.02 kts
wind_gust 15.94 kts
GLERL
GLOS
GLIN
Fox Hill
Slinger
Jackson
Richfield
Holy Hill
Lannon
Menomonee Falls
Sussex
Hartland
Butler
Pewaukee
Brookfield
Wauwatosa
Milwaukee
Waukesha
West Allis
New Berlin
Greenfield
St Francis
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Wisconsin Coastal Attractions:
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Boat Access
Shipwrecks
Parks
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The GLOS HarborView pilot project features an integrated, web-based viewer linked to OGC web services that provide data on nearshore currents,winds, waves and prevailing weather for a subset of the over 200 harbors along the Great Lakes. The project is designed to enhance commercial and recreational navigation on the Great Lakes by bringing together overviews of current conditions, information on features of interest in the region and real-time views of the harbors themselves. Based upon interest in these products, the project will be expanded to include other harbors within the Great Lakes domain.
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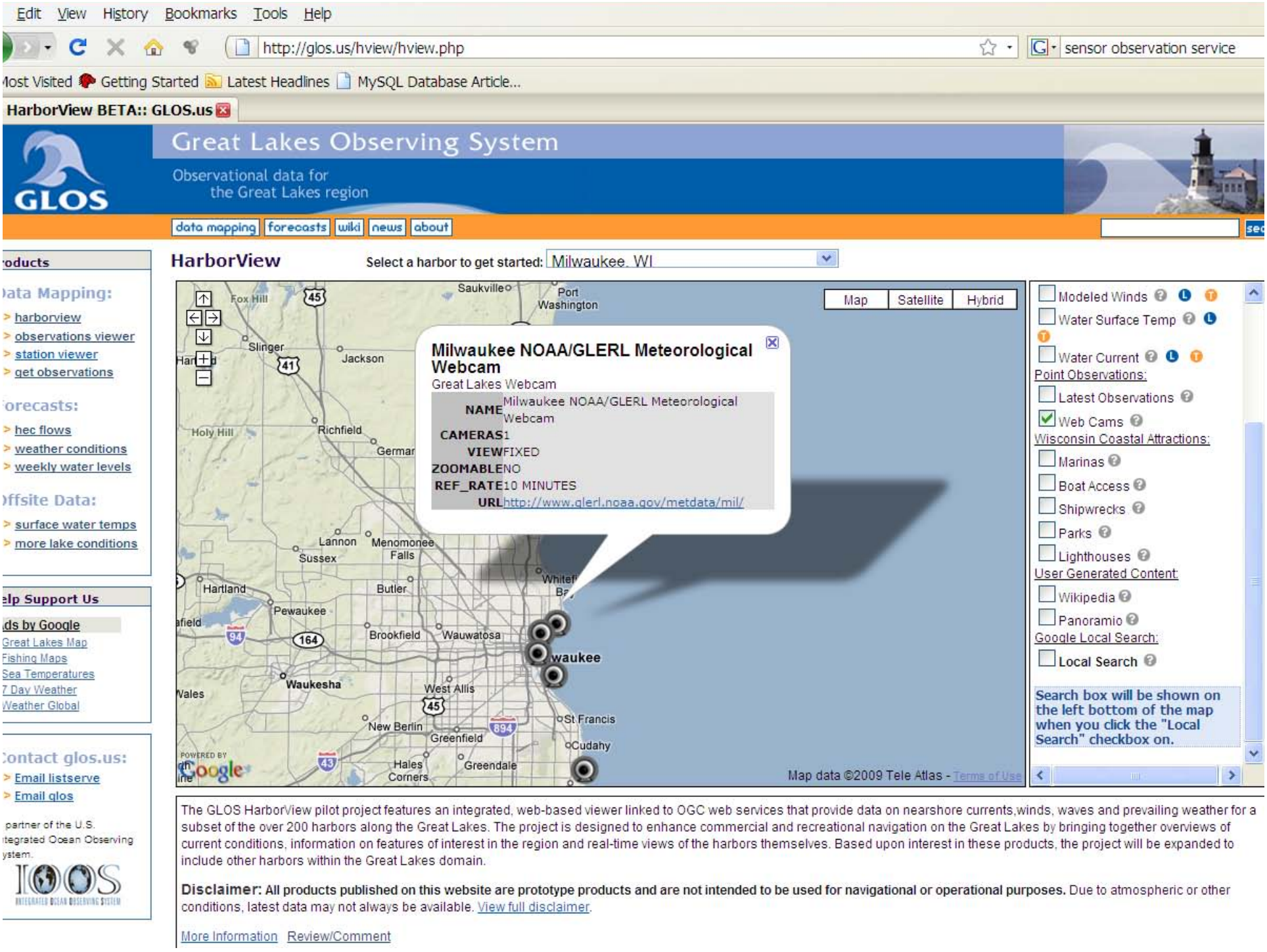
More Information Review/Comment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7 Day Weather
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IOOS
HarborView
Select a harbor to get started: Milwaukee, WI
Map Satellite Hybrid
Milwaukee NOAA/GLERL Meteorological Webcam
Great Lakes Webcam
NAME Milwaukee NOAA/GLERL Meteorological Webcam
CAMERAS 1
VIEW FIXED
ZOOMABLE NO
REF_RATE 10 MINUTES
URL http://www.glerl.noaa.gov/metdata/mil/
Saukville
Port Washington
Fox Hill
Slinger
Jackson
Richfield
Holy Hill
Lannon
Menomonee Falls
Sussex
Hartland
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Local Search
Search box will be shown on the left bottom of the map when you click the "Local Search" checkbox on.
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http://www.glwi.uwm.edu/features/webcam/

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GLWI | Webcam

Great Lakes WATER Institute

Wisconsin Aquatic Technology and Environmental Research

UNIVERSITY of WISCONSIN UWMILWAUKEE

Videos

- Diver & Mussels
- Sample Lake Bottom

GLWI Webcam

Looking north into the Milwaukee Inner Harbor

Time-lapse last 10 days

NEW RSS feed of Full Day timelapses

2009-04-19: 00 01 02 03 04 05 06 07 08 09 10 11

Huron to Erie Connecting Waterways Forecasting System (HECWFS)

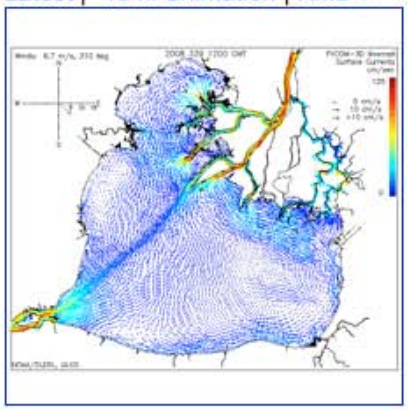
UNDER DEVELOPMENT USING 3D FVCOM

See also Forecast

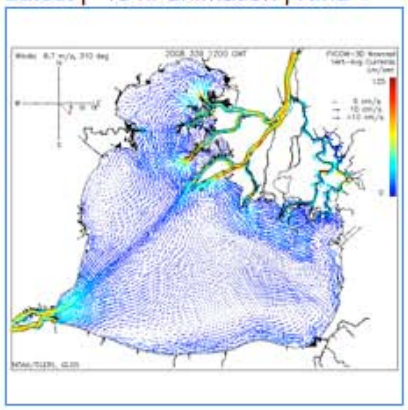
NOWCAST **Timestamp: 12/04/2008 (DOY 339) 12:00 GMT**

The products on this page are updated 8x per day at about 0034, 0334, 0634, 0934, 1234, 1534, 1834, and 2135 GMT (subtract 5 for EST)

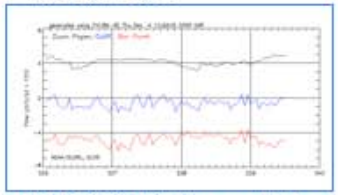
Surface Currents:
Latest | -48 hr animation | KML



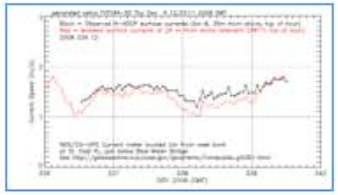
Vertically-Averaged Currents:
Latest | -48 hr animation | KML



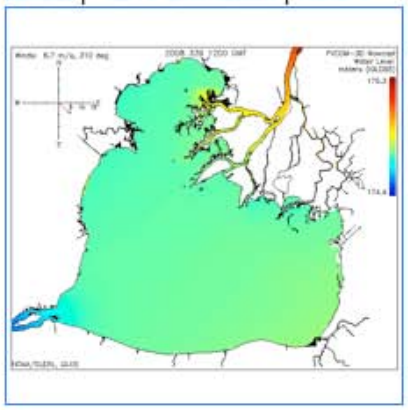
FVCOM Flows:



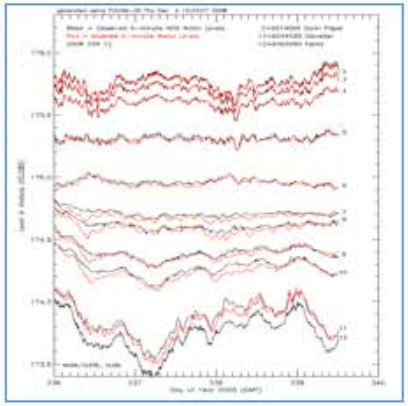
NOS/CO-OPS Current Meter:



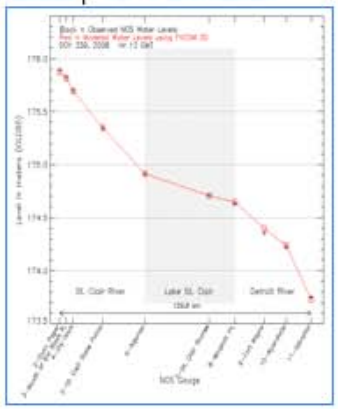
Water Levels:
Latest | -48 hr animation | KML



Water Level at NOS Gauges:
Timeseries



Water Level at NOS Gauges:
Latest | -48 hr animation



See also: St. Clair River & Detroit River Page

Grid Information: grid1 | grid2 | grid3 | grid4 (KML)
NOS Water Level Gauge Locations: jpg | KML

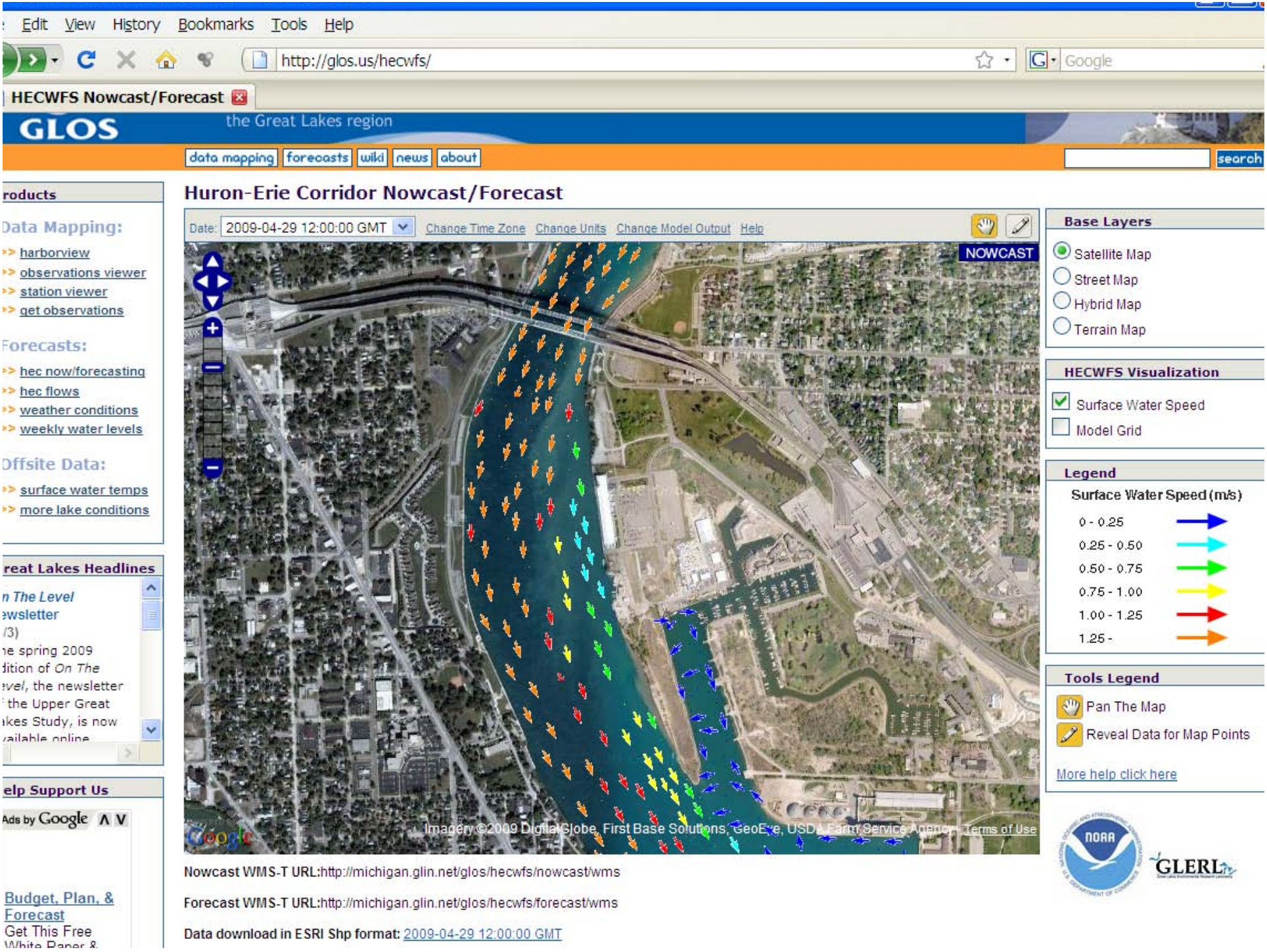
Sponsors:

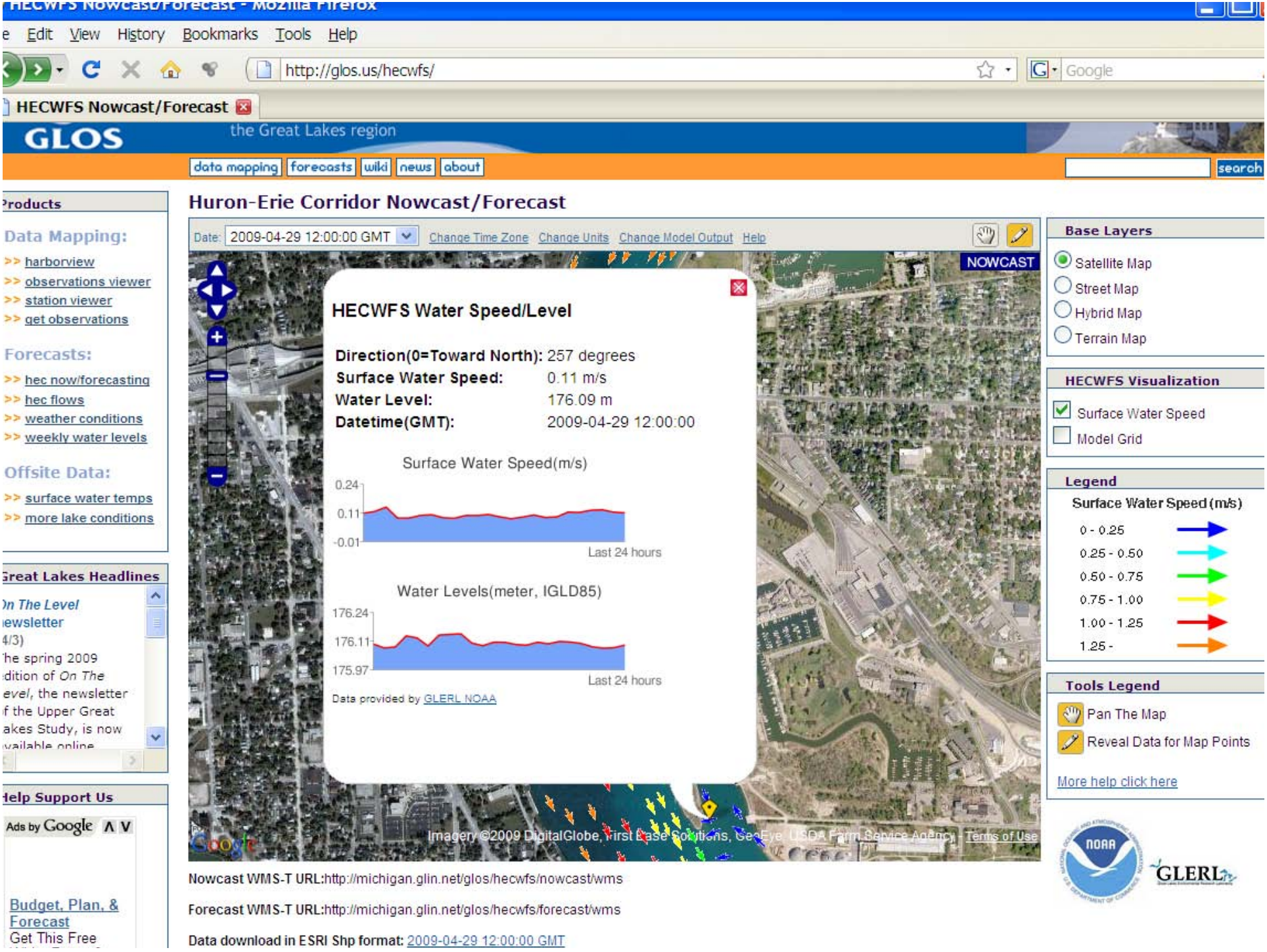
- NOAA/GLERL
- GLOS

Links:

- GLCFS
- GLERL AHPS
- Current Conditions
  (Courtesy of GLIN)
- St. Clair River WebCams
  (Courtesy of USACE/CRREL)
- Connecting Channels
  2-Week Forecasts
  (Courtesy of USACE Detroit)
- St. Clair River Currents
  (Courtesy of NOAA/CO-OPS)

Log
Notes
Schedule
FVCOM Documentation
FLC Players
What is GMT?
What is KML?

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On The Level
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4/3)
he spring 2009
dition of On The
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f the Upper Great
akes Study, is now
vailable online
Help Support Us
Ads by Google
Budget, Plan, &
Forecast
Get This Free
Huron-Erie Corridor Nowcast/Forecast
Date: 2009-04-29 12:00:00 GMT
Change Time Zone
Change Units
Change Model Output
Help
NOWCAST
HECWFS Water Speed/Level
Direction(0=Toward North): 257 degrees
Surface Water Speed: 0.11 m/s
Water Level: 176.09 m
Datetime(GMT): 2009-04-29 12:00:00
Surface Water Speed(m/s)
0.24
0.11
-0.01
Last 24 hours
Water Levels(meter, IGLD85)
176.24
176.11
175.97
Last 24 hours
Data provided by GLERL NOAA
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Base Layers
Satellite Map
Street Map
Hybrid Map
Terrain Map
HECWFS Visualization
Surface Water Speed
Model Grid
Legend
Surface Water Speed (m/s)
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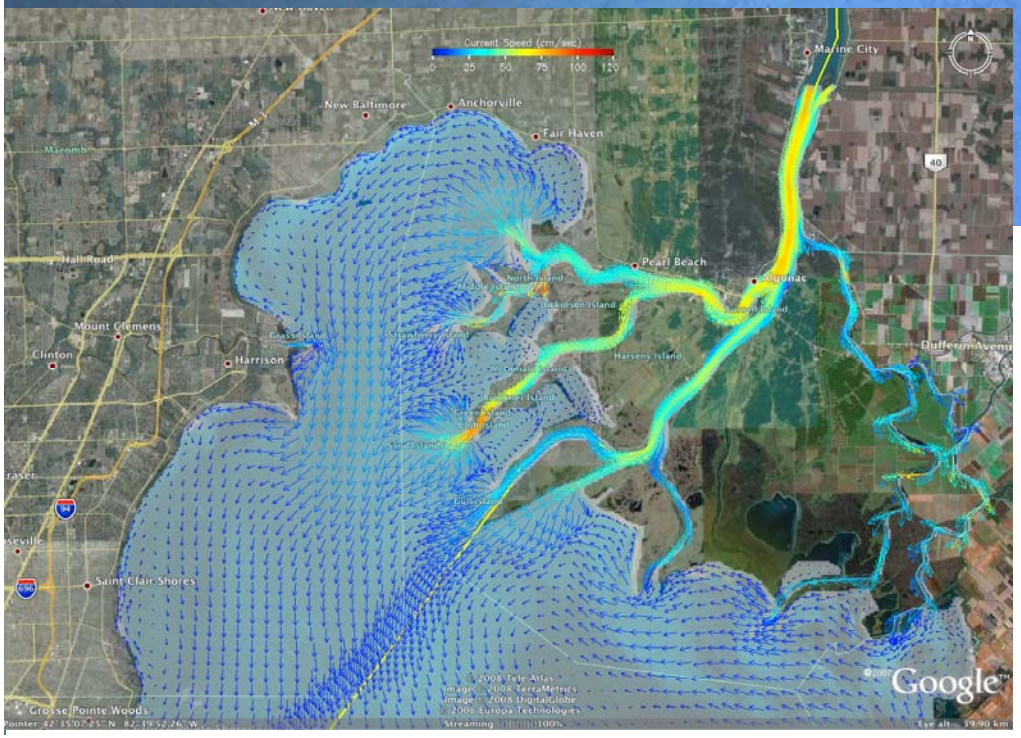
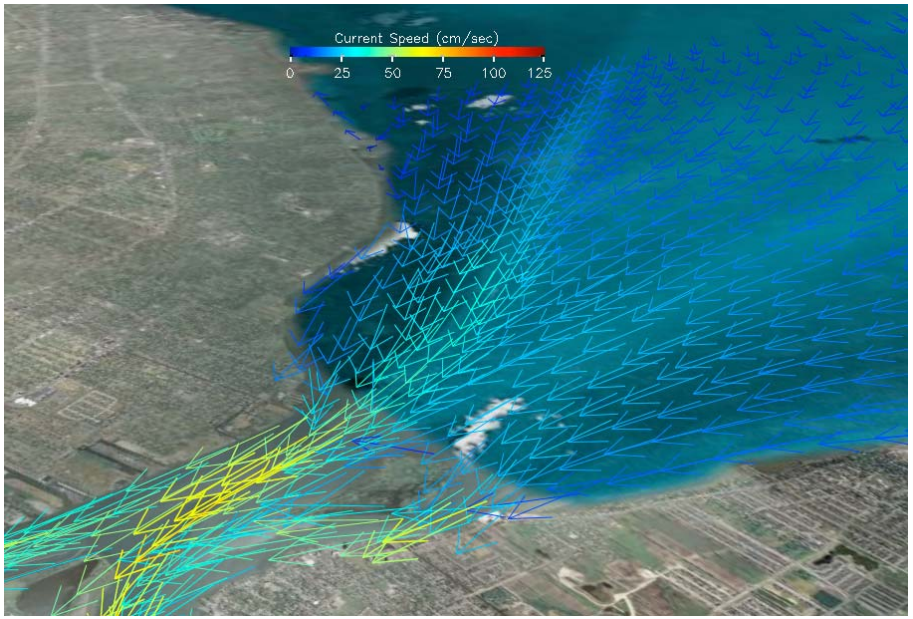
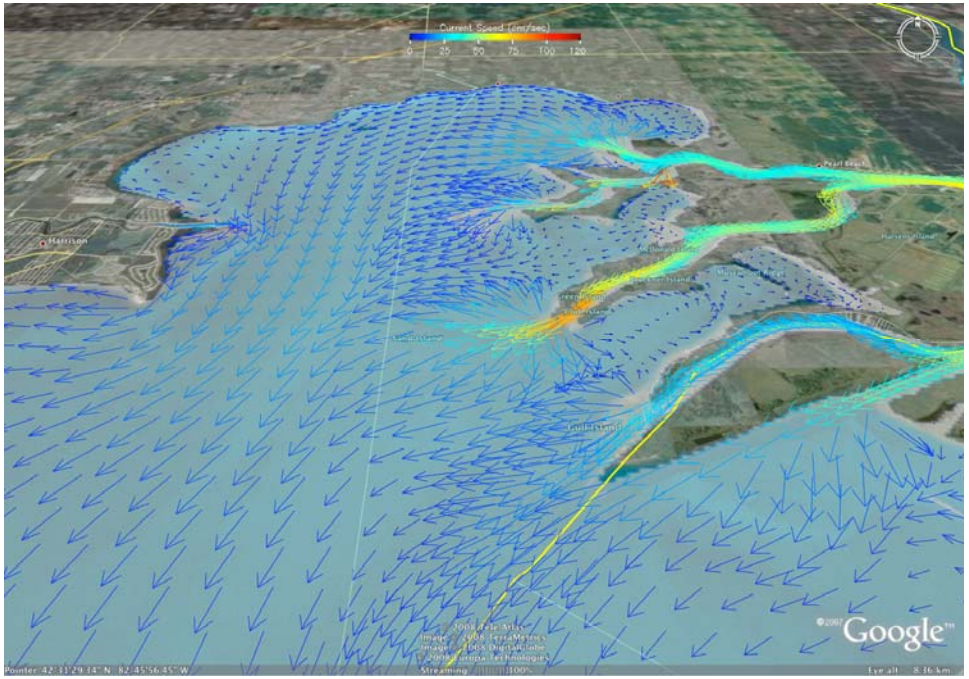
0.25 - 0.50
0.50 - 0.75
0.75 - 1.00
1.00 - 1.25
1.25 -
Tools Legend
Pan The Map
Reveal Data for Map Points
More help click here
NOAA
GLERL
Nowcast WMS-T URL:http://michigan.glin.net/glos/hecwfs/nowcast/wms
Forecast WMS-T URL:http://michigan.glin.net/glos/hecwfs/forecast/wms
Data download in ESRI Shp format: 2009-04-29 12:00:00 GMT



Google Earth views of HECWFS output.





Conclusion

- Next steps
  - Data Information Framework
  - National-Regional DMAC schema coordination
  - Observation infrastructure (ongoing)
  - Testing for response scenarios
- Further information
  - ioos.noaa.gov
  - www.usnfra.org
  - www.glos.us