CoastWatch

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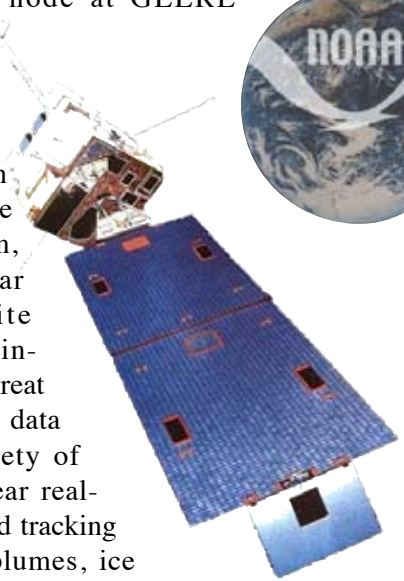**CoastWatch is a nationwide National Oceanic and Atmospheric Administration (NOAA) program within which the Great Lakes Environmental Research Laboratory (GLERL) functions as the Great Lakes regional node. In this capacity, GLERL obtains, produces, and delivers environmental data and products for near real-time observation of the Great Lakes to support environmental science, decision making, and supporting research. This is achieved by providing access to near real-time and retrospective satellite observations and in-situ Great Lakes data. Clients include Federal, state, and local agencies, academic institutions, and the public. The goals and objectives of the CoastWatch Great Lakes Program directly support NOAA's statutory responsibilities in estuarine and marine science, living marine resource protection, and ecosystem monitoring and management.**

The CoastWatch node at GLERL provides Federal, state, and local agencies, academic institutions, and the public, both within and outside of the Great Lakes region, with access to near real-time satellite observations and in-situ data for the Great Lakes. CoastWatch data are used in a variety of ways, including near real-time observation and tracking of algal blooms, plumes, ice cover, water intake temperatures at fish hatcheries, etc., two and three dimensional modeling of Great Lakes physical parameters such as wave height and currents damage assessment modeling, research, and educational and recreational activities. In addition, through a cooperative project with Michigan Sea Grant, Great Lakes CoastWatch satellite-derived surface temperature imagery is contoured and made available via Michigan State Sea Grant's web site. Great Lakes CoastWatch data and products benefit riparians as well as commercial and recreational users.
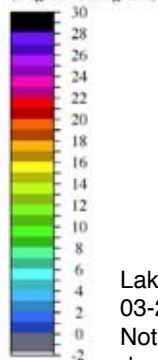
GLERL is currently receiving a product suite of 33 enhanced digital images including satellite-derived surface temperature, visible and near-infrared reflectance, brightness temperatures, cloud masks, and satellite/solar zenith angle data from the NOAA/AVHRR (Advanced Very High Resolution Radiometer) series of satellites as well as GOES (Geostationary Operational Environmental Satellites) visible, near infrared, and water vapor data. These products are acquired by GLERL from NOAA's National Environmental Satellite, Data, and Information Service on a daily schedule via Internet. In addition, in-situ and modeled data, including marine and meteorological observations, buoy observations, water level gauge measurements
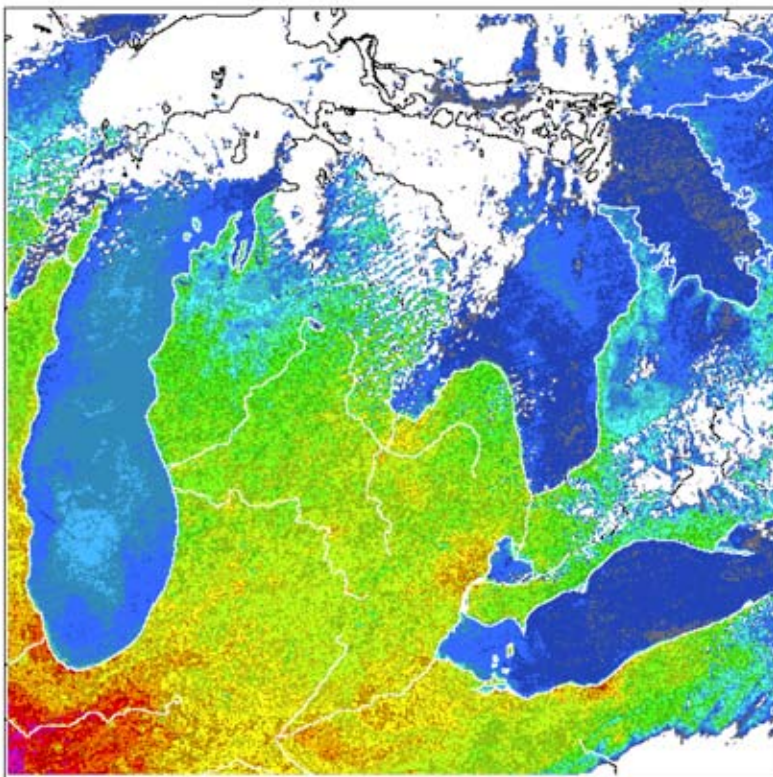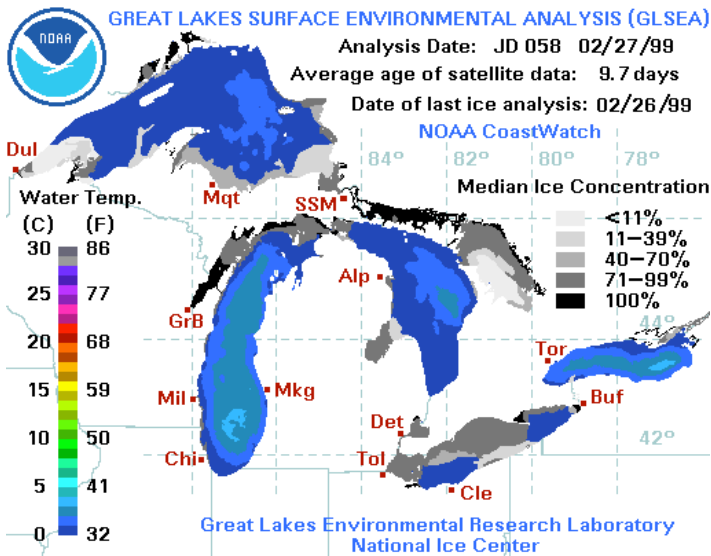

CoastWatch
Water Surface Temperature
G99082I9.MD1
NOAA 14 Orbit: 21790
3/23/1999   19.49 GMT
Geocorrection factors: 2, -4

Water Temperature
(Degrees Centigrade)

Lake Michigan-Huron Water Surface Temperature
03-29-1999 20:00 GMT [NOAA-14]
Notice the high land temperatures in this daytime image.

GREAT LAKES SURFACE ENVIRONMENTAL ANALYSIS (GLSEA)

Analysis Date: JD 058 02/27/99
Average age of satellite data: 9.7 days
Date of last ice analysis: 02/26/99

NOAA CoastWatch

Great Lakes Environmental Research Laboratory
National Ice Center

The Great Lakes Surface Environmental Analysis is a daily, cloud-free composite water surface temperature chart produced from near real-time NOAA/AVHRR satellite temperature imagery. As new imagery is acquired, cloud cover is masked and the valid overwater temperatures are composited with the previous four daily composite charts to create a 5-day composite. The composited temperatures have been validated using in situ water temperatures from buoy measurements. Starting in February 1999, the most recent ice cover concentration obtained from the Great Lakes Ice Analysis produced by the National Ice Center has been overlaid on the GLSEA.

from NOAA's National Ocean Service, and Great Lakes Surface Environmental Analysis (GLSEA) composite charts, are routinely acquired or produced, stored, and made available to Great Lakes CoastWatch data users. Great Lakes Forecasting System (nowcast and forecast) products are also available to CoastWatch data users. Near real-time AVHRR satellite data for the past 2 weeks are available at GLERL, and access to a retrospective archive that begins in 1990 is available via an internet link to the NOAA CoastWatch Active Access System. Additional retrospective satellite data is available from the NESDIS Satellite Active Archive.

JAVA GIS

A new utility, based on a JAVA applet, allows interactive retrieval of physical parameters such as surface temperature, ice cover, winds, and bottom depth at a given location in an image, which enhances the accessibility and utility of Great Lakes CoastWatch data. The applet is initiated using the JAVA GIS buttom on the Great Lakes CoastWatch home page. A window will appear in which you can select an image type and date, overlay (shapefile) data, or the URL of a custom shapefile to be viewed. Current image data includes near real-time NOAA AVHRR surface temperature data, Channel 1 visible reflectance data, GLSEA cloud-free composited surface temperature data and Great Lakes bathymetry. Ice cover concentration data is available during the winter season. Shapefiles includes shoreline, bathymetry, and land mask overlays. Once the image type and date are chosen, select and load desired shapefiles, then press the start button. Two new windows (panner window and image window) and a control panel window will appear on your screen (Fig. 1).

Scroll and zoom options are available using the panner and image window. Overlays (shapefiles) are turned on and off using the control panel (Fig. 2). Overlay colors can be changed to enhance visibility. In addition, near real-time NOAAPort marine observation data at buoy, CMAN, and Coast Guard shore station locations and/or nowcast gridded winds (at the hour of the displayed satellite image) can be displayed and observed values obtained by moving the cursor over the station or wind vector of interest (Fig. 3).
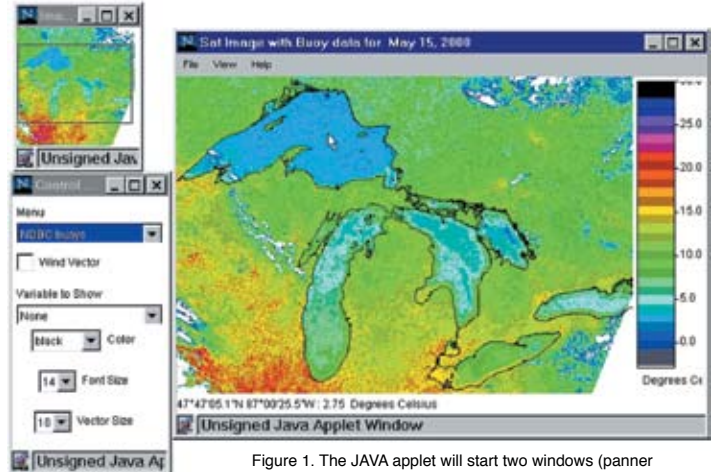

Figure 1. The JAVA applet will start two windows (panner window and image window) and a control panel. The file name will appear in the upper left corner of the image and contains the year, julian day, and hour (GMT) of the image.

Figure 2. Water surface temperature image of southern Lake Michigan (May 15, 2000) with bathymetry shapefile overlay.
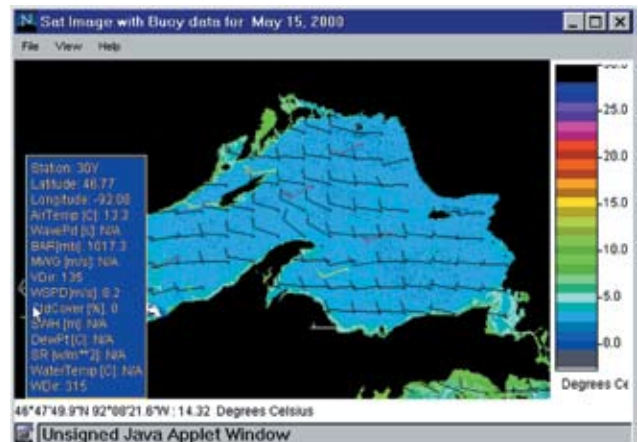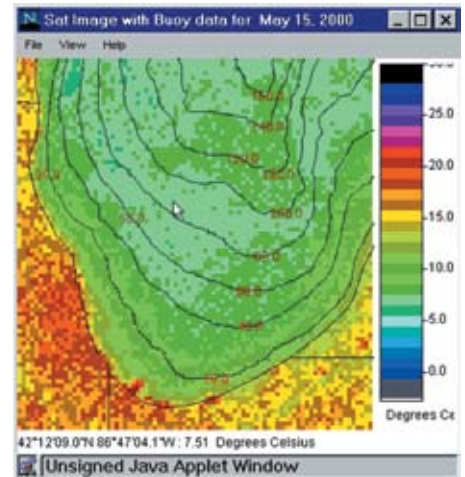

Figure 3. Example of NOAA AVHRR surface temperature image of May 15, 2000 zoomed to show Lake Superior. In addition to the shoreline, overlays shown include nowcast gridded winds (red), buoy (yellow), and CMAN (white) marine observation data for the hour of the image.