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PNSWSH

Technical Implementation Notice 16-08 Amended  
NOAA's National Ocean Service Headquarters Washington DC  
Relayed by National Weather Service Headquarters Washington DC  
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To:           Subscribers:  
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From:        Timothy McClung, Portfolio Manager  
              Office of Science and Technology Integration

Subject: Amended: Upgrading National Ocean Service's Lake Erie Operational  
Forecast System: Effective May 3, 2016

Amended to change the effective date to May 3, 2016.

Effective on or about May 3, 2016, beginning at 1200 Coordinated Universal  
Time (UTC) run, the National Centers for Environmental Prediction (NCEP)  
will be upgrading the National Ocean Service's (NOS') Lake Erie  
Operational Forecast System (LEOFS). The components of this upgrade are:

- Change the core numerical model
- Change the model setup
- Change the run schedule
- Change the output filenames
- More stations/points in the station output

#### 1. Core numerical model changes from POM to FVCOM

The core ocean model used for the present LEOFS is a customized version of  
the Princeton Ocean Model (POM), which is not a standard hydrodynamic  
model for NOS OFS. The upgraded LEOFS uses Finite Volume Community Ocean  
Model (FVCOM), one of standard core hydrodynamic models for NOS OFS  
development and implementation. FVCOM is a widely used, open-source,  
community supported model. The upgrade of LEOFS is a collaborative effort  
of NOAA's Great Lakes Environmental Laboratory, NOS/Coast Survey  
Development Laboratory, NOS/Center for Operational Products and Services,  
and NWS/NCEP Central Operations (NCO).

The present LEOFS uses a 81 x 24 regular horizontal grid with 5km  
resolution and 10 vertical layers, while the upgraded LEOFS uses an  
unstructured triangular grid of 6106 nodes and 11509 elements with grid  
size ranging from 400m to 3.5km and 20 vertical layers.

#### 2. Model setup Changes

The nowcast cycles of the present LEOFS are forced by surface  
meteorological analyses based on surface weather observations from land

stations and overwater platforms, while the forecast cycles are forced by surface weather forecasts from the National Weather Service's (NWS') National Digital Forecast Database (NDFD; 5-km spatial resolution). The nowcast cycles of the upgraded LEOFS is forced by the 2-hour forecast guidance from the NWS' High Resolution Rapid Refresh (HRRR) model while the forecast cycles are forced by forecasts from the NDFD (2.5km spatial resolution).

The present LEOFS has no lateral boundary conditions. The upgraded LEOFS has two open boundaries: one for the Detroit River and one for the Niagara River. For the nowcast cycle, near-real-time water level observations from nearby NOAA water level gauges at Gibraltar, MI and Buffalo, NY are used to specify water level open boundary conditions, respectively. An offset for each open boundary is applied to the observed water level to account for the rough river channel representation and/or distance between station and boundary location. The offset is adjusted each cycle based on the model observation discrepancy at Fermi Power Plant, MI and Buffalo, NY, respectively. Water temperature observations from the U.S. Geological Survey (USGS) station at Fort Wayne, MI are used to specify temperature along the open boundaries. For the forecast cycle, the open boundary conditions are persisted from nowcast cycle for both water levels and water temperature.

### 3. Cycle Changes

-Current:

The nowcast runs every hour, and forecast runs every 6-hours at 00, 06, 12, 18 UTC for 60-hour forecast.

-Upgraded:

Both nowcast and forecast will run every six hours at 01, 07, 13 and 19 UTC, and forecast runs for 120 hours. This is to be consistent with other OFS run schedules.

### 4. Model Output Change

The model output files available on NCEPs http and ftp servers:

nomads.ncep.noaa.gov/pub/data/nccf/com/nos/prod/  
ftpprd.ncep.noaa.gov/data/nccf/com/nos/prod  
<ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/nos/prod>

The LEOFS files will change in directory structure from:

/glofs.YYYMMDD -> /leofs.YYYYMMDD/ Where YYYYMMDD is Year, Month, Day.

The upgraded LEOFS will follow NOS OFS standard file name convention.

Only the first octet will change from: glofs.leofs.\*.YYYYMMDD.tCCz.nc -> nos.leofs.\*.YYYYMMDD.tCCz.nc Where CC is cycle time.

The field output is now hourly, so each file contains only one time record.

glofs.leofs.fields.forecast.YYYYMMDD.tCCz.nc ->  
nos.leofs.fields.fFFF.YYYYMMDD.tCCz.nc  
glofs.leofs.fields.nowcast.YYYYMMDD.tCCz.nc ->  
nos.leofs.fields.nNNN.YYYYMMDD.tCCz.nc Where FFF is from 000 to 120; Where

NNN is from 000 to 006.

The restart files will be changing both in name and format. This will more accurately follow the NOS OFS standards:

```
glofs.leofs.rst.nowcast.YYYYMMDD.tCCz.bin ->  
nos.leofs.rst.nowcast.YYYYMMDD.tCCz.nc
```

#### 5. Point/Station Output Changes

The file now contains a total of 28 stations. In addition to the 11 stations in the present LEOFS, four more buoy locations (Oregon, OH (45165), 2 near Cleveland, OH (45164 and 45169), Erie, PA (45167)), six water level stations on the Canadian coast (Bar Point, Kingsville, Erieau, Port Stanley, Port Dover and Port Colborne), five points for the Northeast River Forecast Center (NERFC) potential model use and two points on the open boundary are also included.

Gridded and point forecast guidance from parallel runs will be available in netCDF files on the NCEP NOMADS server in the directory:  
[para.nomads.ncep.noaa.gov/pub/data/nccf/com/nos/para/](http://para.nomads.ncep.noaa.gov/pub/data/nccf/com/nos/para/)

Graphics products are now displayed on the CO-OPS developmental web page at:

<http://tidesandcurrents.noaa.gov/ofs/dev/leofs/leofs.html>

Operational data are also available on CO-OPS thredds server:

<http://opendap.co-ops.nos.noaa.gov/thredds/catalog.html>

If you have any questions concerning these changes, please contact:

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National Technical Implementation Notices are online at:

<https://www.weather.gov/notification/archive>

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