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PNSWSH

Technical Implementation Notice 15-36 Amended
National Weather Service Headquarters Washington DC
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From: Timothy McClung
 Chief Operating Officer
 NWS Office of Science and Technology Integration

Subject: Amended: Upgrade to Global-Real Time Ocean Forecast
System (RTOFS) on October 17, 2015

Amended to change the implementation date from October 6, 2015
to October 17, 2015.

Effective October 17, 2015, beginning with the 0000 Coordinated
Universal Time (UTC) run, NCEP will upgrade the Global-RTOFS.

The system changes include:

- An increase in the number of vertical layers from 32 to 41 hybrid layers with additional iso-level coordinate layers in the upper ~200m.
- The coupling of the ocean component Hybrid Coordinate Ocean Model (HYCOM) to Los Alamos National Laboratory's Community Sea Ice (CICE) model using v4.0 of Earth System Modeling Framework (ESMF).
- Updated bathymetry, which improves representation of grid points in shallow regions where minimum depth is set to 5m.
- An update of the climatology from the U.S. Navy's Generalized Digital Environmental Model (GDEM) v3.0 to v4.2.
- An equation of state, which is updated from 9 terms to 17 terms.

Benefits of the system changes include:

- Fine vertical resolution in the oceanic mixed layer with 9 additional near surface layers.

- Anticipated improvement to air-sea boundary flux for future coupled applications (including hurricanes).
- Improved vertical coastal ocean resolution for downstream applications, such as the National Ocean Service Operational Forecast System (NOS-OFS) and Ecological forecasting.
- Planned addition of Sea Ice products.

Product Additions:

The following NetCDF files will be made available on the NCEP server:

rtofs_glo_sst_YYYYMMDD_hcasts.nc.gz
 rtofs_glo_uv_YYYYMMDD_hcasts.nc.gz
 Sea Surface Temperature (SST) and Surface current components U, V time series for the last day of nowcast/hindcast

rtofs_glo_sst_YYYYMMDD_day#.nc.gz
 rtofs_glo_uv_YYYYMMDD_day#.nc.gz
 SST and Surface current components U, V time series where "#" equals day 4 or 5 of forecast

rtofs_glo_sst_YYYYMMDD.tar.gz rtofs_glo_uv_YYYYMMDD.tar.gz
 SST and Surface current components U, V time series for days 1-3 of forecast

rtofs_glo_2ds_X000_1hrly_?????.nc
 rtofs_glo_2ds_X000_3hrly_?????.nc
 rtofs_glo_2ds_X000_daily_?????.nc
 Where "?????" is either "prog" (Prognostic) or "diag" (Diagnostic)
 Where "X" is either "f" (Forecast) or "n" (Nowcast)

The following surface files will now be available on the NCEP server:

rtofs_glo.t00z.FFF.archs.a.tgz rtofs_glo.t00z.FFF.archs.b
 Where FFF is either hourly "f00"- "f192" or "n00" or hourly "n-01"- "n-48"

The following ice files will now be available on the NCEP server:

rtofs_glo.???.t00z.cice.*.r rtofs_glo.t00z.n00.restart_cice.tgz
 Where ??? is either "anal" or "fcst1" or "fcst2" Details on the contents of these files are available at:

http://polar.ncep.noaa.gov/global/about/product_description.shtml
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http://polar.ncep.noaa.gov/global/about/regional_description.shtml

Product Changes:

The high vertical resolution (hvr) regional NetCDF files will be renamed on the NCEP server. The file name changes reflect more descriptive region names. The file name changes are as follows:

```
rtofs_glo_3dz_nHHH_6hrly_hvr_reg1.nc -->
rtofs_glo_3dz_nHHH_6hrly_hvr_US_east.nc
```

```
rtofs_glo_3dz_nHHH_6hrly_hvr_reg2.nc -->
rtofs_glo_3dz_nHHH_6hrly_hvr_US_west.nc
```

```
rtofs_glo_3dz_nHHH_6hrly_hvr_reg3.nc -->
rtofs_glo_3dz_nHHH_6hrly_hvr_alaska.nc
```

Where "HHH" is from 000-048

```
rtofs_glo_3dz_fHHH_6hrly_hvr_reg1.nc -->
rtofs_glo_3dz_fHHH_6hrly_hvr_US_east.nc
```

```
rtofs_glo_3dz_fHHH_6hrly_hvr_reg2.nc -->
rtofs_glo_3dz_fHHH_6hrly_hvr_US_west.nc
```

```
rtofs_glo_3dz_fHHH_6hrly_hvr_reg3.nc -->
rtofs_glo_3dz_fHHH_6hrly_hvr_alaska.nc
```

Where "HHH" is from 001-192

The current 3d archive files will now be available every 6 hours for both forecast and nowcast and the "a" files will become compressed:

```
rtofs_glo.t00z.*.archv.b
rtofs_glo.t00z.*.archv.a -> rtofs_glo.t00z.*archv.a.tgz
```

A consistent parallel feed of data will be made available on the NCEP HTTP server once the model is running in parallel on the NCEP Weather and Climate Operational Supercomputing System (WCOSS) on or around July 21. The data will be available at the following URL:

<http://para.nomads.ncep.noaa.gov/pub/data/nccf/com/rtofs/para>

No changes are expected to products over NOAAPORT. Users can find the data via the NCEP ftp and HTTP servers at:

<http://nomads.ncep.noaa.gov/pub/data/nccf/com/rtofs/prod/>
<ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/rtofs/prod/>

Users can find additional information about the RTOFS at the following Environmental Modeling Center website:

<http://polar.ncep.noaa.gov/global>

The original design of the Global RTOFS was that the model would run throughout the day with all products being available by 00 UTC the following day. With any upgrade, it is possible that delivery times during the day may change either earlier or later, but the final products will still always be available by 00 UTC the following day.

With this upgrade, certain analysis products will be available earlier, and certain forecast products will be available up to 90 minutes later than current production. NCEP is also removing the contingency that could have caused the last two days of the forecast to be canceled due to resource constraints. This means that no part of the Global RTOFS will be pre-emptively canceled.

NCEP encourages all users to ensure their decoders are flexible and are able to adequately handle changes in content order, changes in the scaling factor component within the product definition section (PDS) of the GRIB files, and also any volume changes which may be forthcoming. These elements may change with future NCEP model implementations. NCEP will make every attempt to alert users to these changes prior to any implementations.

For questions regarding the changes to this model, such as timing, please contact:

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For questions regarding the dataflow aspects of these data sets, please contact:

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Phone: 301-683-0567

Email: ncep.list.pmb-dataflow@noaa.gov

NWS National Technical Implementation Notices are online at:

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

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