The ASGS Interface Guide

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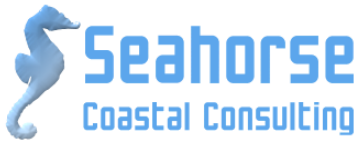
Contents



1 Executive Summary

The ADCIRC Surge Guidance System (ASGS) provides real time output from the ADCIRC or ADCIRC+SWAN models for analysis and interpretation by downstream applications. An interface specification is an invaluable tool that facilitates reliable coordination between the ASGS and downstream applications while enabling independent development processes.

As a result, this guide was created as a living document to detail the interface contract the ASGS and its downstream applications. This contract consists of the following three components: (1) the run.properties files for each forecast ensemble member; (2) the opendap server configuration; and (3) the format of the results files themselves.

Not all downstream applications will rely on every aspect of the interface described herein. Rather, each downstream application will use only a subset of this specification. However, all instances of the ASGS are required to adhere to all aspects of specification in order to provide assurance of compatibility to all downstream application developers.

2 Run Properties

A run.properties file is produced for each forecast ensemble run from the ASGS, and placed in the same results directory as the output files for the forecast run.

A sample of the run.properties file is shown below, organized into document subsections according to the nature of various properties. Definitions of these properties will be added later.

2.1 Input

The following properties describe the type of input that was used to generate the results.

```
storm class : TS
storm name : KAREN
track_raw_dat : bal122013.dat
track_raw_fst : al122013.fst
year : 2013
storm : 12
modified : n
mesh : sl15_2010_HSDRRS_2012_v9
RunType : Forecast
ADCIRCgrid : sl15_2010_HSDRRS_2012_v9
stormnumber : 12
stormname : KAREN
advisory : 10
```

2.2 Output

The following properties indicate the presence, name, and format of the output (results) files.

```
Water Surface Elevation Stations File Name : fort.61.nc
Water Surface Elevation Stations Format : netcdf
Water Surface Elevation File Name : fort.63.nc
```

```
Water Surface Elevation Format : netcdf
Barometric Pressure Stations File Name : fort.71.nc
Barometric Pressure Stations Format : netcdf
Wind Velocity Stations File Name : fort.72.nc
Wind Velocity Stations Format : netcdf
Barometric Pressure File Name : fort.73.nc
Barometric Pressure Format : netcdf
Wind Velocity File Name : fort.74.nc
Wind Velocity Format : netcdf
Maximum Water Surface Elevation File Name : maxele.63.nc
Maximum Water Surface Elevation Format : netcdf
Maximum Current Speed File Name : maxvel.63
Maximum Current Speed Format : ascii
Maximum Wind Speed File Name : maxwvel.63.nc
Maximum Wind Speed Format : netcdf
Minimum Barometric Pressure File Name : minpr.63.nc
Minimum Barometric Pressure Format : netcdf
```

2.3 Downstream

The following properties provide information for use by particular downstream applications for uses ranging from load balancing, presentation to different audiences, labeling results, etc.

```
ceraServer : cera0
asgs : nc
intendedAudience :
downloadurl :
prodID : SADCsl15_2010_HSDRRS_2012_v9-UNC_vortex-nws19_20131005T1200_20131005T1200_2013100
```

2.4 Analysis

The following properties provide key bits of data that describe how the results were generated.

```
InitialHotStartTime : 4276800.00000000
RunStartTime : 2013100512
RunEndTime : 2013100712
ColdStartTime : 2013081700
WindModel : vortex-nws19
Model : PADCIRC
```

2.5 HPC Resources

The following properties provide data about the High Performance Computing (HPC) resources that were involved in the production of results, which may be used in troubleshooting or performance analysis.

```
directory storm : /projects/ncfs/data/asgs15784/10/nhcConsensus
hostname : hatteras.renci.org
instance : corpsbackup3
forecastEnsembleMemberNumber : 0
cpurequest : 480
ncpu : 480
numwriters : 0
```

3 OPeNDAP Service

OPeNDAP is the middleware between the ASGS instance that is generating results and any downstream applications that provide further analysis and visualization. As such, the configuration details of this service are critical to reliable compatibility with downstream applications.

There are three subcomponents to the setup of OPeNDAP for ASGS: (1) the XML configuration file for the server; (2) the directory hierarchy used to post the results; and (3) the catalog generation script. Each of these aspects are described more fully in the following sections.

3.1 OPeNDAP Configuration

The server itself runs inside Tomcat and has an XML configuration file whose content we will specify in this section.

3.2 Directory Hierarchy

The results files from the ASGS are posted in a particular directory hierarchy that enables us to have multiple instances of the ASGS on multiple machines producing results for multiple ensemble members on multiple meshes. The details of this directory hierarchy are specified in this section.

3.3 Catalog

RENCI has developed an automated cataloging script whose configuration and operation will be briefly described here with pointers to relevant publications containing further details. The contents of the resulting catalogs and their pertinence to downstream applications will also be provided here.

4 Output Files

The output files from the ASGS should be compressed NetCDF4, produced according to CF standards, including a time stamp showing the cold start date. This section can also describe any particular piece of NetCDF metadata that must be included for compatibility with downstream applications.

4.1 Climate and Forecast Standards

Description of the relevant parts of the CF standards that must be implemented in the ADCIRC and ADCIRC+SWAN NetCDF4 output files for compatibility with downstream applications.

4.2 NetCDF Metadata

Any other key pieces of NetCDF metadata that are used by downstream applications and must be provided for compatibility.

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