

# CHPS OHD Core 4.1.a Release Notes

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## Introduction

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These **Release Notes** provide the latest information about the CHPS\_OHD\_CORE software system. The following topics are discussed:

- Overview
- What's New
- Resources / Documentation
- Known Issues and Limitations
- Detailed Description of Software Changes and Enhancements

## Overview

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This release provides several updates to the Graphgen software, as well as minor changes to the ofsde scripts, and a new directory location for the SSHPCHPS scripts. Additionally, the new CHPS Rating Curve Tool is included.

Henceforth removed from the delivery package are ens\_pre, ens\_post, and lagk (FORTRAN).

A complete list may be found below in the *What's New* section and further details are available in the *Detailed Description* section.

## What's New

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### Fixes

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FogBugz#	Reported By	Title
<a href="#">1215</a>	NERFC	SAC-SMA times out in historical runs with 1 hour timestep
<a href="#">1221</a>	NCRFC	Java Heap Space Errors Making ESP HS Runs
<a href="#">1241</a>	ABRFC	Graphgen central dir question
<a href="#">1266</a>	CNRFC	SACSMA 1 hour modules don't export UZFWC, LZFSC, LZFPC fully
<a href="#">1311</a>	APRFC	GraphGen Thresholds Not Displaying
<a href="#">1320</a>	NCRFC	OFSDE pc2pp not processing non-1200Z PCI data
<a href="#">1332</a>	NERFC	Scale of Y-Axis

<a href="#">1346</a>	OHRFC & OHD	Data Set Exception Occurs During GraphGen Initialization
<a href="#">1347</a>	NERFC	GraphGen Error loading Products and Settings
<a href="#">1389</a>	HSD	Updates and Clarifications to GraphGen Documentation
<a href="#">1422</a>	NWRFC	GraphGen: Multiple segments in single tabular output
<a href="#">1444</a>	CNRFC	Graphics Generator Ensemble Legend
<a href="#">1450</a>	NWRFC	SSARRESV adapter requires observed pool beyond T0
<a href="#">1457</a>	ABRFC	GraphGen thumbnails still appearing after turning them off.
<a href="#">1488</a>	WGRFC	Problem with RESSNGL in Historical ESP runs
NA	NA	Moved all SSHPCHPS/ofsde/nc2grib run scripts to new location

## Enhancements

FogBugz#	Requested By	Title
<a href="#">1148</a>	NWRFC	output ET demand and actual ET from SAC-SMA
<a href="#">1297</a>	All RFCs	Graphics Generator to Compute Exceedance Probabilities for Defined Thresholds
<a href="#">1309</a>	OHD	GraphGen changes for Aptima product in development
<a href="#">1362</a>	AP, MA,NCRFC	CHPS Rating Curve Tool (FCINIT replacement)
<a href="#">1403</a>	CNRFC	GraphGen BoxWhisker Plot location
<a href="#">1434</a>	OHD	Improve PI-service performance in GraphGen
<a href="#">1446</a>	OHD	GraphGen Need a History of Changes
<a href="#">1449</a>	OHD	GraphGen Behavior for Bad Thresholds
<a href="#">1461</a>	OHD	New AHPS Products
<a href="#">1491</a>	WGRFC	GraphGen Products/Settings - One to Many Association

## Resources / Documentation

### Installation Scripts

N/A

### Documentation

The following pieces of documentation have been modified since the last release and can be found in the directory at the root of the package. All the CHPS documentation may be found online at <http://www.nws.noaa.gov/oh/hrl/general/indexdoc.htm#core>.

- *Modified:*
  - Sacramento Soil Moisture Accounting
  - Single Reservoir Regulation
  - Graphics Generator Getting Started Guide
  - Graphics Generator Installation Guide
  - Graphics Generator Tips and Troubleshooting

- *New:*  
Rating Curve Tool Users Manual

## Known Issues and Limitations

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N/A

## Detailed Description of Software Changes and Enhancements

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*Fixes: FogBugz 1266 – SACSMA 1 hour modules don't export UZFWC, LZFC, LZFC fully*

### **Description**

CNRF noticed when they run 15-20 basins with one hour SACSMA modules, the SACSMA climatology plots have only 24 hours of current tank contents for three of the six tanks (the three truncated outputs are UZFWC, LZFC, and LZFC).

### **Cause**

For SACSMA model, there are 5 soil moisture storages (SMZC) variables, they are UZTWM-UZTWC, UZFWC, LZTWM-LZTWC, LZFC and LZFC. Their outputs time intervals are defined by parameter property "SMZC\_INTERVAL". If "SMZC\_INTERVAL" is not specified by user, its default value '24' will be used. However, UZFWC, LZFC and LZFC are also state variables, they inherit input data's timestep as well. So there are two sets of time series output for UZFWC, LZFC and LZFC, one with same interval as that of input data, the other with the interval defined in parameters.

It seems FEWS has an issue to display the scenario when output has 1 hour data and non 1 hour data. e.g.

- 1) if SMZC is defined 24 hour interval, FEWS fills first 23 hourly data, then the rest with daily data. So if not scrolling the page down, it can only display 24 hours of soil moisture contents;
- 2) if SMZC is defined 6 hour interval, FEWS fills first 5 hourly data, then the rest with 6 hour data;
- 3) if SMZC is defined 1 hour interval, FEWS displays all hourly data. That may be what user expected to see.

### **Fix**

Configure Module parameters to make the SMZC interval as '1'. Edit Config/ModuleParFiles/XXXX/SACSMA\_XXXX\_UpdateStates.xml, add:

```
<parameter id="SMZC_INTERVAL">  
  <intValue>1</intValue>  
</parameter>
```

### **Notes**

By changing default SMZC\_INTERVAL value, the time interval for UZTWM-UZTWC and LZTWM-LZTWC will be changed too.

## FogBugz 1221 - *Java Heap Space Errors Making ESP HS Runs*

### **Description**

While in the "GraphGen" mode of the SA, to re-run the ESP HS Workflows (1948-2009) and getting java heap OutOfMemoryErrors.

### **Cause**

In older version of FEWS, it may not handle the Java memory space well and causes the memory fault.

### **Fixed**

With the latest version of FEWS and patch, increase the `-Xmx` above 1024M in the start-up script, this will handle the Java memory space well.

## FogBugz 1488 - *Problem with RESSNGL in Historical ESP runs*

### **Description**

The WGRFC SanJacinto\_Hist\_Forecast workflow (Historical ESP run) will not run to completion for all 50 years on an FSS. It runs to completion on an SA. It will run for about 30 years (starting at the beginning of the 50 year period or starting midway and ending at the end of our 50 year period) on an FSS.

### **Cause**

When we solved the FB1199, we calculated the Ressngl array size for 6-hour time step for 50 years. Now, WGRFC has input data, it is 3-hour time step for 50 years, which requires double the array size. This will cause memory fault in Ressngl program.

### **Fixed**

Increase the array size in Ressngl NHRYP array size. Also changed the WARNING\_LEVEL log to FATAL\_LEVEL.

## *Enhancement: FogBugz 1148 – Output ET Demand and Actual ET from SAC-SMA*

### **Description**

NWRFC is experimenting with using MAPE in SAC-SMA to improve calibration statistics, and would like to see some of the ET time series.

### **Cause**

ET time series have not been implemented for outputs of SAC-SMA.

### **Fix**

Added ET demand and Actual ET time series as SAC-SMA output.

### **Notes**

For configurations in FEWS:

1. Edit Config/RegionConfigFiles/Parameters.xml, add new parameter ids 'ETDEMAND' and 'ETACTUAL' as following:

```
<parameter id="ETDEMAND" name="ET Demand">
  <shortName>ETDEMAND</shortName>
</parameter>
<parameter id="ETACTUAL" name="Actual ET">
  <shortName>ETACTUAL</shortName>
</parameter>
```

2. Edit Config/ModuleConfigFiles/XXXXX/SACSMA\_XXXXX\_XXXXX\_UpdateStates.xml, add these two output time series set within the <importTimeSeriesActivity>.

e.g.

```
.
.
<importTimeSeriesActivity>
.
.
<timeSeriesSet>
  <moduleInstanceId>SACSMA_LEDC2_LEDC2L_UpdateStates</moduleInstanceId>
  <valueType>scalar</valueType>
  <parameterId>ETDEMAND</parameterId>
  <locationId>LEDC2LWR</locationId>
  <timeSeriesType>simulated historical</timeSeriesType>
  <timeStep unit="hour" multiplier="6"/>
  <readWriteMode>add originals</readWriteMode>
</timeSeriesSet>
<timeSeriesSet>
  <moduleInstanceId>SACSMA_LEDC2_LEDC2L_UpdateStates</moduleInstanceId>
  <valueType>scalar</valueType>
  <parameterId>ETACTUAL</parameterId>
  <locationId>LEDC2LWR</locationId>
  <timeSeriesType>simulated historical</timeSeriesType>
  <timeStep unit="hour" multiplier="6"/>
  <readWriteMode>add originals</readWriteMode>
</timeSeriesSet>
```

</importTimeSeriesActivity>

### *Fix: FogBugz 1320 – ofsde pc2pp not processing non-1200Z PCI data*

#### **Description**

NCRFC reports that ofsde is not properly handling PCIR data with an obstime near but not exactly 12:00:00 UTC.

#### **Cause**

The pc2pp processing is not checking for PCIR values within the window around 1200z but AFTER 1200z.

#### **Fix**

Added check in pc2pp to check for PCIR values with obstimes after 1200z but within the allowable window.

Updated the run\_ofsde.template script to remove old OFS related references and added passing of directory names via command line args.

Updated the chpspst.template script to remove CHPS xfer logic and added passing of directory name via command line arg.

Updated ofsde doc. Removed references to vl2v5.buf, batchpst and many OFS references.

#### **Notes**

Tested fix at both NCRFC and MBRFC.

### *Fix: FogBugz 1241 – Graphgen central dir question*

#### **Description**

When we setup the ohdGraphgenCentralDir should it point to the same mounted directory on the OC/SA/FSS such as /awips/chps\_share/graphgen or should they all be local to each machine such as /awips/chps\_local/graphgen? If the latter then we would have to create than graphgen directory on every machine.

#### **Cause**

The documentation does not give a clear example or guidance on where the GraphGen products and setting “central area” (ohdGraphgenCentralDir) should be defined for the OC’s. There should be specific guidance for where the `oc_global.properties` **ohdGraphgenCentralDir** should be defined to point to.

#### **Fix**

Updated the *Graphics Generator Installation Guide*.

- Added sections 2.1.6 and 2.1.7 for creating new directories for the local and central area files.
- Provided specific suggestions on where to install the `<central_area_dir>` on SA’s, OC’s and FSS’s.
- Suggested who to modify the `sa_global.properties/oc_global.properties` file and SA and OC.

**Notes**

The suggestion is only one way to set up the central area. User can still use their own values as long as the requirements for central area dir are met.

***Fix: FogBugz 1311 – GraphGen Thresholds Not Displaying*****Description**

Flood stage thresholds are not displaying in the AHPS products of GraphGen.

**Cause**

The Add from Data Viewer Button creates an Input Series Provider with the name "SelectTimeSeries". This provider is tied to the Data Viewer Panel, which is tied to the Filters.xml configuration file. This particular type of provider includes a memory of past calls to the filters to acquire time series. In this case, it was remembering the previous call and applying the unit conversion, again, to the thresholds.

**Fix**

Fixed the data viewer input series provider so that it does not use its memory; it created a problem where the units were being converted multiple times for the thresholds; given the small benefit it provides and the added complexity to the code. The memory is removed.

**Notes**

None.

***Fix: FogBugz 1332 – Y-Axis Display Problems When Only One Range Value to Display*****Description**

There is a problem with the y-axis scale if the values of the plotted time series are pretty consistent. Depending on the tick spacing and precision of the time series, the tick marks on the y-axis may either show the same number repeatedly or the axis may display no number at all. I've attached a few graphics to better illustrate what I'm trying to explain.

**Cause**

The problem is that when the values are constant and the "Auto Range Calculation" is set to "Default(Auto)", the lower bound and upper bound calculated by GraphGen are the same value. The program will not add ticks or labels if the y-axis range is zero.

**Fix**

The upper and lower bounds is set to be +5% and -5% of the constant values when the auto calculated upper and lower bounds are equal.

**Notes**

If the tick spacing is set to be a very small value relative to the Y-axis range, the program will not draw any ticks and tick labels on the axis because there are too many of them. So using larger tick spacing should resolve the problem.

### *Fix: FogBugz 1346 – Data Set Exception Occurs During GraphGen Initialization*

#### **Description**

Software to load products for CHPS localDataStore still being called even though products are now on the file system.

#### **Cause**

The method `retrieveInitializedAllProductsInfo` is being called during initialization in order to read products from the CHPS database (via the PI-service) to store in memory, but those PI-service acquired products are not being used by Graphics Generator. It is a piece of code that was not properly removed from the software. With the new release, GraphGen reads in products from a file system file and stores those in memory for use.

#### **Fix**

Removed all usage of the old PI-service based product methods and objects.

#### **Notes**

This bug does not impact the performance of GraphGen, except that additional log messages (warnings/errors) will be generated.

### *Fix: FogBugz 1347 – GraphGen Error loading Products and Settings*

#### **Description**

CHPS threw a null-pointer error when loading the GraphGen Tree. The following error messages resulted:

02-21-2014 12:39:24 ERROR - Null pointer program error at  
ohd.hseb.graphgen.prodmgr.ProductDBManager.createDisplay:111

02-21-2014 12:39:24 ERROR - Unable to parse XML: Failed to read XML string: Unable to process XML element value t0: Element t0 is not a fixed or relative date string and is not systemTime and is therefore invalid.

Prior to this I had just got started with the GraphGen editor having the latest version installed and was attempting to edit one of the templates. But I did not want to save changes and when exiting CHPS, opted to NOT upload changes and NOT to save the products / settings files. However, apparently some invalid settings were saved when I attempted to change them in the editor.

#### **Cause**

The problem is that the timeSeriesSelection XML element for the product "MEFP Obs Flow/Stage Input" is invalid in the file attached by Erick. It uses a parameterId of "-none-" which should not be a popup menu option in the Time Series Selections Table (Chart Series Panel, Selected Time Series tab). Also, the 't0' XML element is set to this:

```
<t0 />
```

### **Fix**

Changes were made so that the "-none-" option is not available for parameterId via the popup options (they would have to manually type in '-none-'). It is so changed that cells in the selection table repaint themselves whenever the user modifies them, whether the change is valid or invalid (bad format). Previously they would only update if the cell entered value was valid, leaving the invalid value in place. Now if they are invalid, it will revert the cell to a default value of some kind.

The t0 problem (the GUI components for t0 in the table appear to work fine) could not be recreated.

### **Notes**

The reporter of this FogBugz tried to retrace his steps from the notes he has on this, but was not able to get this <t0/> written to the OHD\_GRAPHGEN\_PRODUCTS\_AND\_SETTINGS.xml file as happened originally.

## ***Fix: FogBugz 1389 – Updates and Clarifications to GraphGen Documentation***

### **Description**

Graphics Generator has been changed to read/write products and setting to file system instead of the FEWS PiService. However, some of the documents still reference this legacy PiService.

- 1) The troubleshooting doc has legacy reference to the PiService.
- 2) The installation doc reference to the legacy synchronization functionality.
- 3) In the installation doc, "all instances of CHPS/FEWS that need access to the products" means "all SA's, OC's, and FSS's." Additionally, it's never said that the central area must be the same for all instances of CHPS/FEWS. For those that aren't the same (such as for localized FSS's), you must manually update the files when necessary.

### **Cause**

The documentation was not updated completely after changing from PiService to file system for saving the GraphGen products and setting.

### **Fix**

For item 1), the sentence is changed. Now it reads as

“ If the changes are intended to be shared or permanent, you should upload the changes to the central area file.”

For item 2), it is legitimate for uploading CM. No change is made to the document.

For item (3), "(i.e., all SA's, OC's, and FSS's)" is included in the document. The recommended central area is,

/awips/chps\_share/ohd/graphgen.

## Notes

Selecting and setting up the central area directory is described in Section 2.1.7 of the GraphGen Installation Guide. Some of the new text in that Section is as shown below (formatting in Word will obviously be different).

...

Description: The central area is used to store products and settings that are considered ready for production. The products and settings are stored in an XML file named OHD\_GRAPHGEN\_PRODUCTS\_AND\_SETTINGS.xml. The products and settings in the central area file should never be edited directly by the user. The central area can be anywhere on the system depending on the installation environment, so long as these requirements are satisfied:

1. The user has read/write permissions on this directory.
2. It is not the same directory as the local area defined in Section 2.1.6.
3. The central area is visible to all instances of CHPS/FEWS (i.e., all SA's, OC's, and FSS's) that need access to the products, including that which executes a scheduled workflow and the stand-alone used for product editing.

On a machine that runs CHPS, the recommended <central\_area\_dir> directory is the following (be sure to create the directory!):

```
/awips/chps_share/ohd/graphgen
```

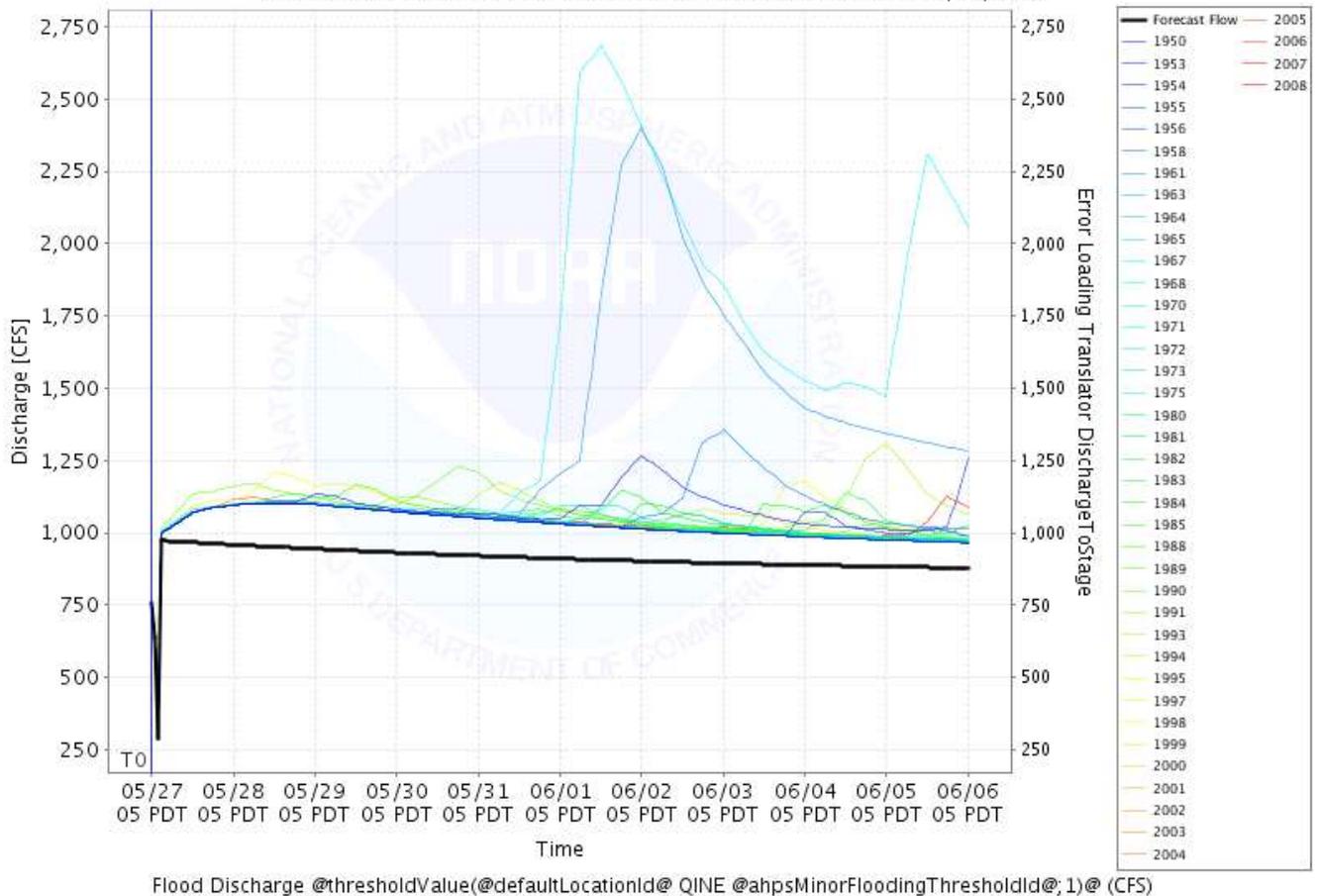
...

## *Fix: FogBugz 1444 – Graphics Generator Ensemble Legend*

### **Description**

We generate spaghetti plots for our HEFS runs using Graphics Generator. The legend for these plots includes every ensemble year. All years are listed in the legend for most locations, but there are some that have a subset of years. It looks like if the time series are exactly the same for two or more consecutive years, only one of the years shows up in the legend. Here is an example of a plot with a subset of years. Ensembles 1950, 1951, and 1952 all have the exact same values within the time window of the plot, so only 1950 shows up in the legend.

MEFP-based Traces with Deterministic Forecast for YUBA - ENGLEBRIGHT RESERVOIR  
 Latitude: 39.239445 Longitude: -121.26667  
 Forecast for the period 05/27/2014 - 06/06/2014  
 This is a conditional simulation based on the current conditions as of 05/27/2014



Flood Discharge @thresholdValue(@defaultLocationId@ QINE @ahpsMinorFloodingThresholdId@;1)@ (CFS)

**Cause**

When performing computations, the first step performed is to apply the settings in the Selected Time Series tabbed panel to determine which time series are selected. The selection process attempts to construct a list of the selected time series, avoiding adding the same time series multiple times. To determine if a time series is already in the list, it checks if a selected time series 'equals' one already added. The 'equals' check did not properly account for ensembleMemberIndex. Hence, when it saw member that 1951 matched 1950 in all ways except ensembleMemberIndex, it viewed that time series as already being in the list.

**Fix**

Fixed by adding a version of the called method that allows for a flexibly specified comparator and making the comparator check ensembleId and ensembleMemberIndex in addition to a standard equals check.

**Notes**

A unit test is created as well for this bug. Unit test data can be found in testdata/graphicsGenerator/inputs19.xml.

## *Fix: FogBugz 1457 – GraphGen thumbnails products still appearing after turning them off*

### **Description**

We have turned off some of the graphgen products for all points via the settings gui. However they still are appearing. I reopened the settings gui and they all say "yes" to view even though I set them to no previously. I saved and uploaded the settings and they still appear. I looked at both the central and oc products and settings file and they are labeled as false. I have attached the products and settings file.

### **Cause**

The visibility panel for "all segments" was not being initialized correctly.

### **Fix**

Fixed the initialization problem in the visibility panel for "all segments".

### **Notes**

None.

## *Enhancements: FogBugz 1297/1422 – Graphics Generator to Compute Exceedance Probabilities for Defined Thresholds*

### **Description**

1297: Work with Roham Abtahi to create text output capability in Graphics Generator which will replace ESPADP output being used by all RFCs to create long range forecast probabilities.

1422: Is it possible to create a single tabular output in GraphGen with multiple segments? I am trying to create the LRO text output in GraphGen. Specifically the SSTG 90-day exceedance probability. I can create the output for a single segment just fine, but I haven't been successful at trying to append multiple segments to the same output. I'm thinking I may be able to do this with subplots, but I don't see a way to reference multiple locationIds.

### **Cause**

GraphGen can only create the output one file per location and it requires the data being post-processed into the desired format later.

Currently, all RFCs run ESPADP to create their probabilities, then run a script (which we provided them) that does several post-processing actions on the data.

Since GG will retire ESPADP, we need it to create the above process, so that the processes in place at NIDS which create the national map remain unchanged. I have the old scripts, and promise to make it as easy as possible on you guys to make this happen.

### **Fix**

Added the capability for text outputs to be appended to a file. To prevent the appended file from continuing to grow in size, a checkbox is added to the GUI to set the flag 'appendToFile' to indicate whether to append the output to the tabular and ESPADPQuantiles output plug-ins.

## **Notes**

It is the RFCs responsibility to handle clearing out existing files as needed or naming them using T0 in the file name.

## ***Enhancements: FogBugz 1309 – GraphGen changes for Aptima product in development***

### **Description**

The latest version of the Aptima product in development uses the wrong fill colors for the legend. To fix the problem, the ability to reverse legend item order and a bug fix for the ability to reverse rendering order are required..

### **Cause**

The reason for this is that the fill color for an area between two lines is the fill color for the first of the two lines (according to the series order in the Series Parameters Table of the Calculator Panel). However, the Aptima product is constructed incorrectly assuming it is the second line that drives the fill color.

### **Fix**

1. Added the reverse rendering capability to reverse both the series and data set order (not just series).
2. Added a new ability to reverse legend order for a subplot.

## **Notes**

None.

## ***Enhancements: FogBugz 1403 – GraphGen BoxWhisker Plot location***

### **Description**

We're experimenting with different GraphGen products. For the XYBoxWhisker plots, we wanted to display 5 quantiles of the trace maximum for a 1 day aggregation period. When the box-whisker is plotted, the center of the box is at 12Z, which is the end of the 24 hour aggregation period. Thus visually the 24-hour aggregation period appears shifted to the right by 12 hours.

I've looked for a way to shift the plot and don't see one. The TimeHistograms of the 24-hour aggregations plot logically, but the boxWhisker plots don't. Is there a way to shift the box plot so that the center of the box is at the center of the aggregation period?

### **Cause**

GraphGen does not have the feature that is able to freeze the start time of the aggregation to T0 to do a running accumulated total/average/whatever. It also lacks the feature that allows the user to define a computation time steps for a moving window aggregation.

### **Fix**

Added the following parameters for defining an aggregation.

- Start date/time of aggregation. Identical to the current parameter.
- End date/time of aggregation. Identical to the current parameter.
- Time steps for which aggregated values will be computed, or the computation time step. Identical to the current parameter.
- Aggregation window width to use for each computation time step. Default value will be 'as Time Step', so that it behaves as previous release. The option 'Accumulative' will be added for the case where the start time for each aggregation window should always be the start date (above) with the end time being the current computation time step.
- Placement of an aggregation window relative to the associated computation time step; a flag indicating if the window will 'starting at', 'ending at', or be 'centered on' each computation time step. In general, 'ending at' would be used and it would be the default. However, 'centered on' could be useful for a running average time series (one type of smoothing), I think. I can't think of a reason for 'starting at', so I may not include that option.

### **Notes**

One additional change to GraphGen is made. The y-axis displays data in AC-FT, which is currently only capable in GraphGen through some trickery involving a translated axis and making the original axis not visible. To make it easier to handle this, unit conversion capabilities are added to the Calculator Panel (within the Chart Series tabbed panel).

In the Calculator Panel, a single line of components has been added showing the converted output unit and the base output unit (before conversion), and providing a button to allow for changing the conversion. The base output unit is determined from the input time series data combined with aggregations performed. The converted output unit is determined based on settings the user can provide when clicking on the Change Conversion Button.

## *Enhancements: FogBugz 1446 – GraphGen Need a History of Changes*

### **Description**

GraphGen does not provide a history of changes made to the central area, which would be good in case changes need to be backed out or are accidentally lost.

### **Cause**

The central area file will be overwritten if the user upload the changes.

### **Fix**

Added the code to copy the central area file OHD\_GRAPHGEN\_PRODUCTS\_AND\_SETTINGS.xml whenever a change is made to it. A date stamp is added to the filename.

Whenever the Upload Button in the GraphGen Tree Panel is clicked, immediately after copying the local area file to the central area file, a date-stamped copy of the central area file will be created and placed in the same directory:

OHD\_GRAPHGEN\_PRODUCTS\_AND\_SETTINGS.xml.yyyyMMdd-HHmss

For example:

OHD\_GRAPHGEN\_PRODUCTS\_AND\_SETTINGS.xml.20140602-122501

OHD\_GRAPHGEN\_PRODUCTS\_AND\_SETTINGS.xml.20140602-133523

OHD\_GRAPHGEN\_PRODUCTS\_AND\_SETTINGS.xml.20140604-131849

OHD\_GRAPHGEN\_PRODUCTS\_AND\_SETTINGS.xml.20140604-132008

The date-stamped files are will display in chronological order with a simple 'ls' command, as above. GraphGen will store up to 50 such files within that directory. When the number of date-stamped files exceeds 50, the oldest files will be removed, in order, until the number is reduced to 50.

#### **Notes**

GraphGen will not provide any tools to search these files and recover old products or settings. Such tools would have inevitably required a significant amount of time to implement; time which we do not have at the moment. Hence, it is up to the users to make use of these files. Tips for how to search the date-stamped files for old products and how to recover those files is provided in an updated tips and troubleshooting document.

### *Enhancements: FogBugz 1449 – GraphGen Behavior for Bad Thresholds*

#### **Description**

Currently, Graphics Generator is inconsistent in how it handles problems encountered when trying to process a threshold and add it to a chart. For example, if the threshold was intended to override one of the default thresholds (specified in ThresholdValueSets.xml and provided via input time series to GraphGen), then it can react in one of two ways if that default threshold cannot be found:

1. Skip the threshold if not all the "override" parameters for the threshold are provided. If the default threshold is not found, then a default parameter value will not be found and, without an override, GraphGen is incapable of plotting the threshold because one of the require parameters is missing.
2. Error out if all of the override parameters are provided, but the start/end values are invalid. This would be the case if every threshold parameter was manually specified by the user except the start and end values. Those values are supposed to be populated from the default threshold, but are not. Due to changes made for FogBugz 1046, GraphGen will not see unspecified start/end values as a problem (it

makes assumptions), and it will think that the user fully specified the threshold but made a mistake with a parameter. Viewing it as user error, it will error out preventing the chart/product from being created.

The feedback suggested that creating the product and giving a warning rather than erroring out and not creating the product is the preferred way of making Graphics Generator consistent.

**Cause**

Graphics Generator is inconsistent in how it handles problems encountered when trying to process a threshold and add it to a chart.

**Fix**

Make it so that GraphGen never fails when applying a threshold; rather exceptions will be caught and warning messages generated.

**Notes**

It will be up to the RFC users, then, to identify when a problem occurs and fix the template for that product.

*Enhancements: FogBugz 1434 – Improve PI-service performance in GraphGen*

**Description**

The amount of time spent acquiring time series from FEWS PI-service is too long. Thus it takes a long time to build the GraphGen products. Would like to improve performance of GraphGen by improving the Pi-service performance.

**Cause**

The main reason for the low PI-service performance is that the time series are retrieved in the XML format that uses more bandwidth than the binary format. Other reasons such as reading the same time series multiple times and unit conversion also contributed to the slowness of PI-service.

**Fix**

Chaned the code to read data from the PI-service via getTimeSeriesBytes(...) (i.e., binary data) to speed up processing. Additional changes were made to further speed up product generation by (1) making it so that when multiple templates read the same time series, they first check to see if its already been read (i.e., the same time series are not read more than once) and (2) unit conversion is now done internally instead of via PI-service.

**Notes**

- 1) Testing can be done through standard regression tests, but whenever data is acquired from the PI-service, check to see if the message "Unable to acquire time series data via binary reading (XML will be used instead)..." is seen... if it is, then the binary read failed and should be investigated
- 2) The log messages are improved. Now the log messages include the time series load times and chart preparation times for each referenced and product template involved.

*Enhancement: FogBugz 1461 – New AHPS Products*

**Description**

Based on the feedback of the AHPS web implementation team led by Donna Page, new products and changes to the AHPS products are needed. To reflected changes made by the request of the products team, new AHPS products are delivered with the release. Examples of the images for the flow, stage, and volume products can be found in the *Graphic Generator AHPS Products Installation Guide*.

**Cause**

N/A

**Fix**

N/A

**Notes**

1. For those who have already installed the AHPS products, please see the box at the beginning of Section 2 in the *Graphic Generator AHPS Products Installation Guide* for instructions on how to update those products.
2. The delivered AHPS products will no longer be delivered directly into the "all segments" product group. Rather, after importing the products, you will see the new products under the group "deliveredAHPSProducts" within the GraphGen Tree Panel. See Section 2.3 in the *Graphic Generator AHPS Products Installation Guide*.
3. A 5-quantile and 7-quantile version of the probability histogram product is included. You will need to choose which to use for your RFC. See Section 1 Probability Histogram subsection and Section 2.3 step #12 in the *Graphic Generator AHPS Products Installation Guide*.
4. All products implement a threshold "fix" described in Section 6.2 (item 3b) in the *Graphic Generator AHPS Products Installation Guide*.
5. The AHPS flow and stage products now make use of referenced templates in their design. See Section 1 Referenced Templates subsection in the *Graphic Generator AHPS Products Installation Guide* for details.

**Enhancements: FogBugz 1491 – GraphGen Products/Settings – One to Many Association**

**Description**

GraphGen currently requires the user to assign GraphGen products or a GraphGen group to each individual location where products will be created. This is very time consuming for a large number of locations. Please create a GraphGen option allowing a product group to be associated with a location list such that editing the settings for each location to assign a product group is not required.

**Cause**

GraphGen currently only allows one location to be associated with a product or a product group.

**Fix**

To resolve this issue, two features will be added to the Modify Settings Dialog:

1. An Add from Topology Button will be added below the Add/Copy/Remove buttons in the lower left side of the panel. Upon clicking, a file selection dialog will open allowing the user to select a properly structured/formatted Topology.xml file. GraphGen will then read that file, extract the segment ids, and add all of those ids to the Groups/Segs with Defined Settings List above those buttons.
2. In the Included Groups Tabbed Panel, which is available for any group or segment, a Select Groups/Segments Button will be added at the bottom within a subpanel with the following text border: "Specify Groups/Segments that Include <Current Group/Segment>". Clicking on that button will open a Select Groups/Segments Dialog that allows for checking each group or segment id that is to include the <Current Group/Segment>. The list of groups and segments is provided in a table that displays only the group or segment id (it does not display the forecast group, for now, due to time constraints... that can be added later if desired).

### **Notes**

Example of these two features...

Suppose an RFC needs to define products specific to reservoirs. The RFC user would do the following:

1. Create the product templates and, through the GraphGen Tree Panel, move those product templates to a group called "\_reservoirGroup" (the '\_' denotes a product group that is not a segment).
2. Open the Modify Settings Dialog.
3. Click on the Add from Topology Button and select an appropriate Topology.xml file. All found segments will be added to the list of groups and segments with defined settings.
4. Select the \_reservoirGroup from the list. The panel on the right will updated to reflect the selection.
5. Switch to the Included Groups tab and click on the new Select Groups/Segments Button. Select only those segments which must display reservoir products and click OK. All of the selected segments will be updated to include the group \_reservoirGroup.

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## ***Enhancement: FogBugz case 1362 – CHPS Rating Curve Tool (FCINIT replacement)***

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### **Description**

APRFC, MARFC, and NCRFC flagged OFS-FCINIT as an existing feature of NWSRFS still used at their RFCs. OFS-FCINIT is used to define CHPS rating curves. OHD will assist by writing a USGS-RDB to FEWS PI-XML translator.

### **Fix**

Release Date: 26 September 2014

Version: OHD-CORE-CHPS-4.1.a

A rating curve tool that converts the USGS-RDB files to CHPS rating curve xml format, was created. The initial rating curve tool includes:

1. A method to convert a completely updated USGS rating curve to FEWS PI-xml
2. A method to create a new rating curve into FEWS PI-xml from text
3. A way to communicate the success/failure of the conversion of the Rating Curve and Import into CHPS.

*Change: Move all SSHPCHPS/ofsde/nc2grib run scripts to new location (ohd/scripts directory)*

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#### **Description**

Adding a "scripts" directory to the OHD-CORE-CHPS package that is parallel to ohd/bin. The following existing scripts currently in ohd/bin

*run\_ofsde.template*

*run\_nc2grib*

*run\_SSHPCHPS\_data\_extract*

*run\_SSHPCHPS\_data\_send*

*run\_SSHPCHPS\_data\_transfer*

*run\_SSHPCHPS\_transfer\_send*

will be moved to ohd/scripts directory.

#### **Change Notes**

- The *run\_SSHPCHPS\_transfer\_send* and *run\_SSHPCHPS\_data\_transfer* scripts were modified to correct the new scripts path.
- To run SSHP Data Transfer application on **chps3-nhdr** machine, the installation scripts need to be done as following:

The *run\_SSHPCHPS\_transfer\_send* and *run\_SSHPCHPS\_data\_send* shell scripts need to be manually placed in the appropriate directory **/awips/hydroapps/whfs/bin**. They are included in the release tar file's **ohd/scripts** directory