MEFP Configuration Guide

Data Ingest Components

Last Updated: December 3, 2013

Change History

Date	Version	Description	Author
Aug 19, 2013	1.0.1	Initial version.	Hank Herr
Nov 27, 2013	1.0.2	No change for 1.0.2	Shaif Hussain

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1 Overview

Generating MEFP operational ensemble forecasts requires the execution of two types of component workflows: (1) data ingest workflows to prepare gridded forecast inputs to MEFP; and (2) a forecast workflow that generates the forecasts ensembles. For more information, see the *HEFS Software Getting Started Manual*.

Presented here are instructions for configuring and executing the data ingest components. In addition to installing software, adding the MEFP data ingest components to CHPS requires adding and updating FEWS configuration files and using the FEWS GUI to verify the installation is successful. Execution of the data ingest components should take place within scheduled workflows, as the gridded forecasts required for MEFP are generated on a daily or sub-daily basis. This guide provides instructions for configuring CHPS to ingest data required for MEFP and setting up scheduled workflows for execution of the data ingest components.

In cases where a configuration file is new and generic (valid for all RFCs), the file is included in the release-package and added to the configuration. For cases where a configuration change contains text that is specific to an RFC (new or existing file) a description of the text and/or a sample file is provided.

1.1 *Notation*

Within this document, the following notation is used:

- All graphical interface components are **Capitalized and in Bold**.
- All XML snippets are in this font.
- All command line entries are in this font.
- All important terms defined in the Section 1.2, Terminology, are *italicized*.

1.2 *Terminology*

- *installation standalone*: The standalone in which the MEFP data ingest components will be installed, setup in Section 1.4.
- *installation forecast group* –or– *fgroup*: The forecast group determined in Step 1.4. It will be denoted <*fgroup*> below when used in the name of a directory or file, except when referred to within a snippet of XML, in which case it will be referred to as *fgroup*; this is to avoid confusion with other uses of '<' and '>' in the XML syntax.
- *installation segment*: The id of the first segment for which MEFP is to execute, identified in Step 1.4.
- *installation catchments*: The locationIds of all of the catchments for which MEFP must generate ensembles of FMAP and FMAT, identified in Step 1.4.

1.3 *Directories of Note*

The following directories will be referred to in the instructions provided below:

- <*region_dir*>: The *installation standalone* region home directory, typically "##rfc_sa".
- <*configuration_dir*>: The standalone Config directory, typically <*region_dir*>/Config.
- <*tar_root_dir*>: The directory where the release package was untarred.
- <*mefp_root_dir*>: The directory selected to hold CFSv2 location time series files and MEFP parameter files; see Section 2.2.

Additional directories important to the automated FTPing of operational gridded forecast files are listed in Section 2.7.1.

1.4 *Pre-installation Steps*

1. Install the HEFS release as described in the *HEFS Install Notes*.

2. Create an *installation standalone* for initial installation of the MEFP data ingest components. Configuration changes made here will later be ported to an OC for synchronization to the central server, but only after installation is successful on a standalone.

3. Identify the following:

   a. The first forecast segment for which HEFS forecasts are to be generated. For simplicity, this should be a head-water segment. This is referred to as the *installation segment*.
   b. The CHPS locationId for all catchments in that segment which MEFP will need to generate forecast ensembles of FMAP and FMAT. These are referred to as the *installation catchments*.
   c. The name of the forecast group containing that segment, referred to as the *installation forecast group*. This name should match that used in the names of other forecast group-specific configuration files, such as pre-processing configuration files. For example, at ABRFC, "WKANSAS" is a forecast group and is used in the name of all Merge modules, such as WKANSAS_MergeMAP, included in the WKANSAS_PreProcessing workflows.

   Installation instructions below will be based upon the segment, catchments, and group identified here. Instructions for extrapolating to other segments, catchments, and groups will be provided.

1.5 *Release Package*

As part of installing the HEFS release as described in the *HEFS Install Notes*, the release package was acquired and untarred in a directory as <*tar_root_dir*>. Within this document, only

the contents of the subdirectory dataIngest are used. The dataIngest subdirectory contents are as follows, with a description of each subdirectory:

<*tar_root_dir*>/dataIngest/…

Config – Configuration files to be copied to the installation standalone.

Import – Import directory structure to be copied to the installation standalone.

ftpDir – Directory containing scripts that use FTP to acquire GFS, GEFS, and CFSv2 operational gridded forecast files and directories to store the acquired files and log files.

mefpRootDir – Directory structure to put in place for the directory denoted below as <*mefp_root_dir*>.

samples – Sample files referred to in the instructions below as needed.

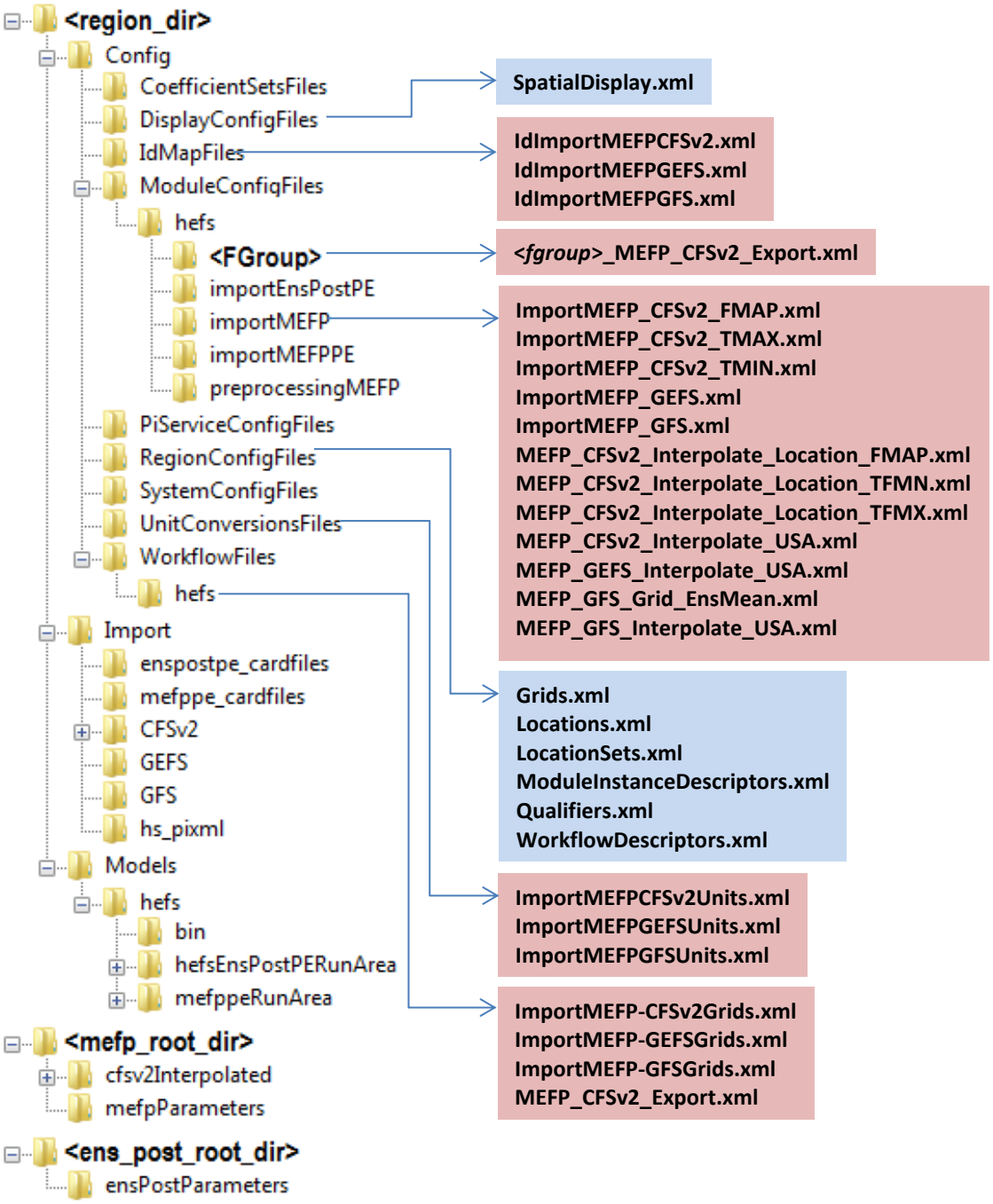
importTestData.tgz – Grid files to use for testing the configuration.

1.6 *Affected Configuration Files*

The diagram in Figure 1 summarizes all configuration files created or modified by the installation steps provided in this document. The directory structure shown includes all directories affected by any HEFS component. Files with a light red background are general across all RFCs, while those with a light blue background are specific to each RFC and require editing. Note the following:

- The directory "**<FGroup>**" will be renamed during installation to match the first forecast group for which MEFP will execute.
- The directory corresponding to **<mefp_root_dir>** will be created during installation and pointed to by a global property.
- The directory corresponding to **<ens_post_root_dir>** is used by the EnsPost and EnsPostPE application and will not be used herein.
- The directories shown under **<region_dir>**/Import will be created during installation.

Figure 1: Configuration files created or modified during installation.



2 Configuring MEFP Data Ingest Components

This section provides instructions for the following:

- Setting up needed directories
- Making needed additions and changes to configuration files in the installation standalone
- Verifying the installation of the MEFP data ingest components in the standalone
- Synchronizing those changes with the central server
- Setting up automated FTP of forecast grid files
- Scheduling the import workflows to run automatically
- Confirming that the automated FTP and scheduled workflows ran successfully

By the end of this section, all data flows necessary for the MEFP to execute will be put in place and verified.

NOTE: In all sections that follow, changes that must be made to allow for additional segments and forecast groups to be added will be marked by the following: **TO ADD NEW SEGMENT** or **FORECAST GROUP**. The list of those tasks will be summarized in Section 3.

2.1 *Copy New Files and Directories (Required)*

Action: Execute the following command to copy *all* new files and directories that are necessary for running the MEFP data ingest components into the installation standalone directory structure

```
cd <tar_root_dir>/dataIngest
cp –r Config <region_dir>/.
cp –r Import <region_dir>/.
```

Most of the files and directories just copied will not be modified further. However, the directory and files under <*configuration_dir*>/ModuleConfigFiles/hefs/FGroup will need to be changed; see Section 2.4.1.

2.2 *Create <mefp_root_dir> (Required)*

Action: Select a directory to host the MEFP root directory. This directory will store two types of files:

- 30 days of CFSv2 spatially-interpolated, location-specific time series files (PI-timeseries XML or FastInfoset format)
- MEFP location-specific and data type-specific (precipitation and temperature) parameter files

The directory must not be specific to the installation standalone. Rather, it must be a central shared directory as it will be referenced by all standalones and other instances of CHPS (e.g. Forecast Shell Servers – fss) that execute the MEFPPE for parameter estimation or MEFP for operational forecasting. For example, the directory referenced by $EXPORT_FOLDER in the fss

global properties file is a commonly used central directory for storing data generated by executing CHPS. The disk will need to be able to store about 30 MB per MEFP forecast location. This directory is denoted <*mefp_root_dir*> throughout this document.

Action: Do the following:

```
mkdir <mefp_root_dir>
cd <mefp_root_dir>
cp  -r <tar_root_dir>/dataIngest/mefpRootDir/* .
```

2.3 *Modify Global Properties (Required)*

Action: Modify the global properties file:

<*region_dir*>/sa_global.properties

Add the following properties:

```
MEFP_ROOT_DIR=<mefp_root_dir>
IMPORT_FOLDER_CFSv2=$IMPORT_FOLDER_ROOT$/CFSv2
IMPORT_FOLDER_GEFS=$IMPORT_FOLDER_ROOT$/GEFS
IMPORT_FOLDER_GFS=$IMPORT_FOLDER_ROOT$/GFS
```

2.4 *Configuration File Changes (All Steps Required)*

Described in the following sections are changes that must be made to the configuration files to setup the MEFP data ingest.

2.4.1 Move and Modify Files Added in Step 2.1: FGroup files

Action: Rename the FGroup directory and its contents to use the *installation forecast group* name identified in Step 1.1 instead of "FGroup". The *installation forecast group* is denoted below as <*fgroup*>:

```
cd <configuration_dir>/ModuleConfigFiles/hefs
mv FGroup <fgroup>
cd <fgroup>
mv FGroup_MEFP_CFSv2_Export.xml  <fgroup>_MEFP_CFSv2_Export.xml
```

Action: Modify all of the files within the directory <*configuration_dir*>/ModuleConfigFiles/hefs/<*fgroup*> as follows:

Replace ALL instances of "FGroup" with the installation forecast group name, <*fgroup*>

The following file must be modified:

<*fgroup*>_MEFP_CFSv2_Export.xml

This modification will affect all locationSetId elements used within the module configuration file (i.e., it affects all location sets referred to in the configuration file).

Upon completion, no reference to "FGroup" should exist in any directory name or XML file under <*configuration_dir*>/ModuleConfigFiles/hefs.

Description: Certain model adapters must be executed by forecast group due to memory limitations. The files provided with the installation serve as a template.

TO ADD A NEW FORECAST GROUP: The actions above must be performed to add a new forecast group with the following changes:

1. Do a cp instead of mv in the first **Action** above (skip the directory move), and the file to be copied is the <*fgroup*>_MEFP_CFSv2_Export.xml file while the target file has the same name except that it starts with the name of the new forecast group.
2. Do the same replacement in the second **Action** above, but do the replacement in the just created file, replacing the original <*fgroup*> with the name of the new forecast group.

2.4.2 Modify File Added in Step 2.1: MEFP_CFSv2_Export.xml

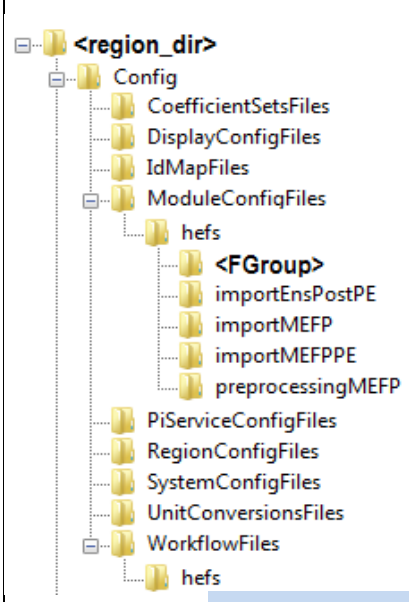
Action: Modify the workflow file for exporting CFSv2 time series files

<*configuration_dir*>/WorkflowFiles/hefs/MEFP_CFSv2_Export.xml

Replace "FGroup" with the name of the installation forecast group, <*fgroup*>. See the example below for how the file should appear after making changes (the affected line is in **bold**).

Description: This workflow is executed to create CFSv2 time series files by location under the <*mefp_root_dir*>/cfsv2Interpolated directory. It must include one module execution per forecast group.

<u>TO ADD A NEW FORECAST GROUP</u>: After creating a new export module in Step 2.4.1, add an activity XML element to call that module in this workflow.

Standard Location: <*configuration_dir*>**/WorkflowFiles/hefs/**	**Contents:** ***MEFP_CFSv2_Export.xml***
	<?xml version="1.0" encoding="UTF-8"?> <workflow xmlns="http://www.wldelft.nl/fews" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.wldelft.nl/fews http://chps1/schemas/workflow.xsd" version="1.1"> <!-- The modules below export the CFSv2 files one group at a time. Add one entry per forecast group. NOTE: Group specific exporting is required due to memory limitations in how a general adapter run is handled. --> <activity> <runIndependent>true</runIndependent> **<moduleInstanceId>*fgroup*_MEFP_CFSv2_Export</moduleInstanceId>** </activity> </workflow>

2.4.3 Modify Existing File: Grids.xml

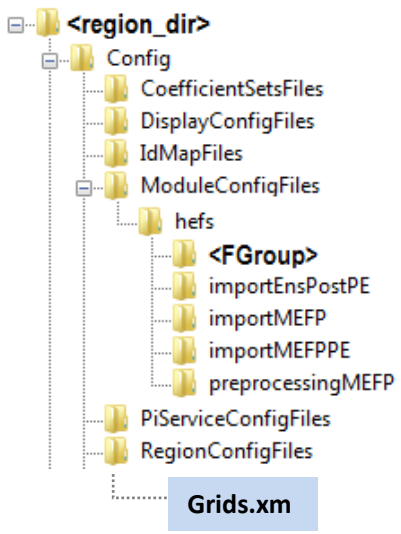
Action: Define grids for the GFS, GEFS, and CFSv2 files in the file

<configuration_dir>/RegionConfigFiles/Grids.xml

See the example below for the exact text to add immediately before the closing "</grids>" at the end of the file. A sample is provided in the following file:

<tar_root_dir>/dataIngest/samples/Config/RegionConfigFiles/Grids.xml

Description: MEFP allows for GFS (1998 frozen version), GEFS, and CFSv2 to be used as forecast sources. Each provides forecasts in the form of GRIB2 files. For CHPS to ingest those files, appropriate grids must be defined, as is done in this step.

Standard Location: *<configuration_dir>*/**RegionConfigFiles/**	**Contents:** ***Grids.xml***
	<?xml version="1.0" encoding="UTF-8"?> <grids xmlns="http://www.wldelft.nl/fews" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.wldelft.nl/fews http://chps1/schemas/grids.xsd"> … **<!-- ADDED FOR MEFP DATA INGEST ========== -->** **<regular locationId="HEFS_CFSv2_USA">** **<description>grid def. for imported CFSv2 data</description>** **<rows>38</rows>** **<columns>92</columns>** **<geoDatum>WGS 1984</geoDatum>** **<firstCellCenter>** **<x>-130.3125</x>** **<y>55.275311</y>** **<z>0</z>** **</firstCellCenter>** **<xCellSize>0.9375</xCellSize>** **<yCellSize>0.944877</yCellSize>** **</regular>** **<regular locationId="HEFS_CFSv2">** **<description>grid def. for imported CFSv2 data</description>** **<rows>190</rows>** **<columns>384</columns>** **<geoDatum>WGS 1984</geoDatum>** **<firstCellCenter>** **<x>0.0</x>** **<y>89.290860</y>** **<z>0</z>** **</firstCellCenter>** **<xCellSize>0.9375</xCellSize>** **<yCellSize>0.944877</yCellSize>** **</regular>** **<regular locationId="HEFS_GFS">** **<description>grid def. for imported GFS data</description>** **<rows>73</rows>**

Standard Location: <*configuration_dir*>**/RegionConfigFiles/**	**Contents:** ***Grids.xml***
	<columns>144</columns> <geoDatum>WGS 1984</geoDatum> <firstCellCenter> <x>0.0</x> <y>90</y> <z>0</z> </firstCellCenter> <xCellSize>2.5</xCellSize> <yCellSize>2.5</yCellSize> </regular> <regular locationId="HEFS_GFS_USA"> <description>grid def. for imported GFS data</description> <rows>12</rows> <columns>25</columns> <geoDatum>WGS 1984</geoDatum> <firstCellCenter> <x>-125</x> <y>52.5</y> <z>0</z> </firstCellCenter> <xCellSize>2.5</xCellSize> <yCellSize>2.5</yCellSize> </regular> <regular locationId="HEFS_GEFS_USA"> <description>grid def. for imported HEFS GEFS data</description> <rows>27</rows> <columns>76</columns> <geoDatum>WGS 1984</geoDatum> <firstCellCenter> <x>-131</x> <y>56</y> <z>0</z> </firstCellCenter> <xCellSize>1.0</xCellSize> <yCellSize>1.0</yCellSize> </regular> <regular locationId="HEFS_GEFS"> <description>grid def. for imported HEFS GEFS data</description> <rows>181</rows> <columns>360</columns> <geoDatum>WGS 1984</geoDatum> <firstCellCenter> <x>0</x> <y>90.0</y> <z>0</z> </firstCellCenter> <xCellSize>1.0</xCellSize> <yCellSize>1.0</yCellSize> </regular> <!-- END MEFP DATA INGEST ========== --> </grids>

2.4.4 Modify Existing File: Locations.xml

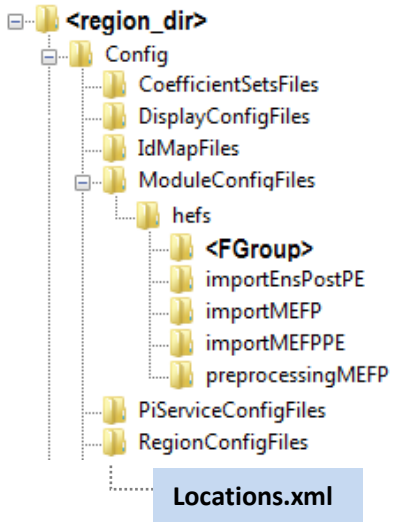
Action: Define locations used to import GFS, GEFS, and CFSv2 grids in the file

<configuration_dir>/RegionConfigFiles/Locations.xml

See the example below for the exact text to add immediately before the closing "</locations>" at the end of the file. A sample is provided in the following file:

<tar_root_dir>/dataIngest/samples/Config/RegionConfigFiles/Locations.xml

Description: In order to import and interpolate gridded data in CHPS for GFS, GEFS, and CFSv2, these locations must be defined.

Standard Location: *<configuration_dir>*/**RegionConfigFiles/**	**Contents:** ***Locations.xml***
	<?xml version="1.0" encoding="UTF-8"?> <locations version="1.1" xmlns="http://www.wldelft.nl/fews" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.wldelft.nl/fews http://chps1/schemas/locations.xsd"> … **<!-- ADDED FOR MEFP DATA INGEST ========== -->** **<location id="HEFS_GFS" name="GFS Location">** **<description> HEFS_GFS </description>** **<shortName> HEFS_GFS </shortName>** **<x>0</x>** **<y>0</y>** **</location>** **<location id="HEFS_GFS_USA" name="GFS_USA Location">** **<description> HEFS_GFS_USA </description>** **<shortName> HEFS_GFS_USA </shortName>** **<x>0</x>** **<y>0</y>** **</location>** **<location id="HEFS_CFSv2" name="CFSv2 Location">** **<description> HEFS_CFSv2</description>** **<shortName> HEFS_CFSv2</shortName>** **<x>0</x>** **<y>0</y>** **</location>** **<location id="HEFS_CFSv2_USA" name="CFSv2_USA Location">** **<description> HEFS_CFSv2_USA </description>** **<shortName> HEFS_CFSv2_USA </shortName>** **<x>0</x>** **<y>0</y>** **</location>** **<location id="HEFS_GEFS" name="GEFS Location">** **<description> HEFS_GEFS</description>** **<shortName> HEFS_GEFS</shortName>** **<x>0</x>** **<y>0</y>** **</location>**

Standard Location: <*configuration_dir*>**/RegionConfigFiles/**	**Contents:** ***Locations.xml***
	<location id="HEFS_GEFS_USA" name="GEFS_USA Location"> **<description> HEFS_GEFS_USA </description>** **<shortName> HEFS_GEFS_USA </shortName>** **<x>0</x>** **<y>0</y>** **</location>** **<!-- END MEFP DATA INGEST ========== -->** </locations>

2.4.5 Modify Existing File: LocationSets.xml

Action: Define the following three location sets:

- Catchments_HEFS_<*fgroup*>: All catchments for which MEFP must execute for the forecast group.
- Catchments_HEFS: All catchments for which MEFP must execute over the entire RFC; this is typically constructed by including the Catchments_HEFS_<*fgroup*> location sets for all forecast groups, such as the one in the previous bullet.
- Catchments_HEFS_<*fgroup*>_Export: The catchments for which CFSv2 location-specific time series files must be exported. By making this a different location set from the first one above, it allows for CFSv2 time series to be exported, and an archive built up, before the forecast group or catchments are used in executing MEFP.

Add them to this file:

<*configuration_dir*>/RegionConfigFiles/LocationSets.xml

See the example below for text to use replacing *fgroup* with the name of the *installation forecast group* and *catchmentId#* with the *installation catchments* (one line must be added per catchment). The new XML should be added before the closing "</locationSets>" at the end of the file. A sample is provided in the following file (the sample is for NERFC and requires modification if used):

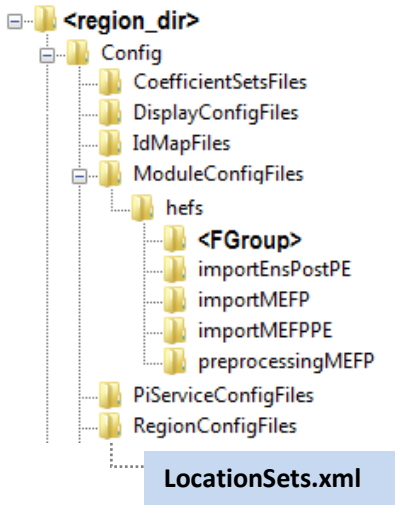
<*tar_root_dir*>/dataIngest/samples/Config/RegionConfigFiles/LocationSets.xml

Description: The Catchments_HEFS_* location sets specify locations where we spatially interpolate time series and export CFSv2 time series files.

NOTE: All catchments defined in one of these location sets must be included in the file <*configuration_dir*>/RegionConfigFiles/Locations.xml and have appropriate coordinates defined.

<u>TO ADD NEW SEGMENTS AND FORECAST GROUPS</u>: Identify the segments to add, their catchments, and forecast groups. Then do the following:

1. To add additional segments for an existing forecast group, add the corresponding catchment ids for each segment to the location sets Catchment_HEFS_*fgroup* and Catchments_HEFS_*fgroup*_Export.
2. To add additional forecast groups, add appropriate locations sets Catchments_HEFS_*newgroup* and Catchments_HEFS_*newgroup*_Export, where *newgroup* is the name of the new forecast group. The contents of those location sets must be set to include all appropriate catchments. Then add the location set Catchments_HEFS_*newgroup* to the Catchments_HEFS location set.

Standard Location: <*configuration_dir*>/**RegionConfigFiles/**	**Contents:** ***LocationSets.xml***
	<?xml version="1.0" encoding="UTF-8"?> <locationSets version="1.1" xmlns="http://www.wldelft.nl/fews" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.wldelft.nl/fews http://chps1/schemas/locationSets.xsd"> … **<!-- ADDED FOR MEFP DATA INGEST ========== -->** **<!-- Define forecast group specific catchments for HEFS. Some adapters must be run for each group separately to avoid memory issues. -->** **<locationSet id="Catchments_HEFS_*fgroup*">** **<locationId>*catchmentId1*</locationId>** **<locationId>*catchmentId2*</locationId>** **…** **</locationSet>** **<!-- Build a full list from the forecast group specific. -->** **<locationSet id="Catchments_HEFS">** **<locationSetId>Catchments_HEFS_*fgroup*</locationSetId>** **</locationSet>** **<!-- Define forecast group specific catchments for exporting CFSv2 time series to location specific files.->** **<locationSet id="Catchments_HEFS_*fgroup*_Export">** **<locationId>*catchmentId1*</locationId>** **<locationId>*catchmentId2*</locationId>** **…** **</locationSet>** **<!-- END MEFP DATA INGEST ========== -->** </locationSets>

2.4.6 Modify Existing File: ModuleInstanceDescriptors.xml

Action: Define new module instance descriptors in the file

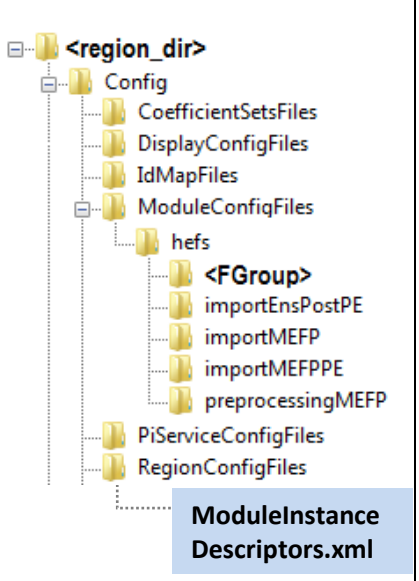
<configuration_dir>/RegionConfigFiles/ModuleInstanceDescriptors.xml

See the example below for text to add immediately before the closing "</moduleInstanceDescriptors>" at the end of the file, replacing *fgroup* with the name of the *installation forecast group*. A sample is provided in the following file (the sample is for NERFC and requires modification if used, changing "Hudson" to the appropriate group name)

<tar_root_dir>/dataIngest/samples/Config/RegionConfigFiles/ModuleInstanceDescriptors.xml

Description: The added modules are used to import the gridded GFS, GEFS, and CFSv2 data and export the CFSv2 time series files.

TO ADD NEW FORECAST GROUP: After creating the *newgroup*_MEFP_CFSv2_Export.xml module configuration file for the new forecast group (Section 2.4.1), to the ModuleInstanceDescriptors.xml file, add a copy of the existing descriptor for the module *fgroup*_MEFP_CFSv2_Export, and change *fgroup* to the name of the new forecast group.

Standard Location: *<configuration_dir>*/**RegionConfigFiles/**	**Contents:** ***ModuleInstanceDescriptors.xml***
	<?xml version="1.0" encoding="UTF-8"?> <moduleInstanceDescriptors xmlns="http://www.wldelft.nl/fews" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.wldelft.nl/fews http://chps1/schemas/moduleInstanceDescriptors.xsd" version="1.0"> … **<!-- ADDED FOR MEFP DATA INGEST ========== -->** **<!-- Import and Interpolate Grids for MEFP. -->** **<moduleInstanceGroup id="MEFP_Imports">** **<!-- Import modules and GFS ensemble mean module. -->** **<moduleInstanceDescriptor id="ImportMEFP_CFSv2_FMAP">** **<description>Imports CFSv2 Grib Precip Forecasts</description>** **<moduleId>TimeSeriesImportRun</moduleId>** **</moduleInstanceDescriptor>** **<moduleInstanceDescriptor id="ImportMEFP_CFSv2_TMIN">** **<description>Imports CFSv2 Grib Tmin Forecasts</description>** **<moduleId>TimeSeriesImportRun</moduleId>** **</moduleInstanceDescriptor>** **<moduleInstanceDescriptor id="ImportMEFP_CFSv2_TMAX">** **<description>Imports CFSv2 Grib Tmax Forecasts</description>** **<moduleId>TimeSeriesImportRun</moduleId>** **</moduleInstanceDescriptor>** **<moduleInstanceDescriptor id="ImportMEFP_GFS">** **<description>Imports GFS Grib Forecasts</description>** **<moduleId>TimeSeriesImportRun</moduleId>**

Standard Location: <*configuration_dir*>**/RegionConfigFiles/**	**Contents:** ***ModuleInstanceDescriptors.xml***

	``
	  </moduleInstanceDescriptor>
	  <moduleInstanceDescriptor id="MEFP_GFS_Grid_EnsMean">
	  <moduleId>TransformationModule</moduleId>
	  </moduleInstanceDescriptor>
	  <moduleInstanceDescriptor id="ImportMEFP_GEFS">
	  <description>Imports GEFS Grib2 Forecasts</description>
	  <moduleId>TimeSeriesImportRun</moduleId>
	  </moduleInstanceDescriptor>
	
	  <!-- Interpolate grids to the USA grid. -->
	  <moduleInstanceDescriptor id="MEFP_CFSv2_Interpolate_USA">
	  <moduleId>Interpolation</moduleId>
	  </moduleInstanceDescriptor>
	  <moduleInstanceDescriptor id="MEFP_GFS_Interpolate_USA">
	  <moduleId>Interpolation</moduleId>
	  </moduleInstanceDescriptor>
	  <moduleInstanceDescriptor id="MEFP_GEFS_Interpolate_USA">
	  <moduleId>Interpolation</moduleId>
	  </moduleInstanceDescriptor>
	
	  </moduleInstanceGroup>
	
	  <!—Modules associated with exporting CFSv2 time series files. -->
	  <moduleInstanceGroup id="MEFP_CFSv2_Exports">
	
	  <!—Interpolate CFSv2 grids by location. -->
	  <moduleInstanceDescriptor
	  id="MEFP_CFSv2_Interpolate_Location_FMAP">
	  <moduleId>TransformationModule</moduleId>
	  </moduleInstanceDescriptor>
	  <moduleInstanceDescriptor
	  id="MEFP_CFSv2_Interpolate_Location_TFMX">
	  <moduleId>TransformationModule</moduleId>
	  </moduleInstanceDescriptor>
	  <moduleInstanceDescriptor
	  id="MEFP_CFSv2_Interpolate_Location_TFMN">
	  <moduleId>TransformationModule</moduleId>
	  </moduleInstanceDescriptor>
	
	  <!—Export CFSv2 time series files. -->
	  <moduleInstanceDescriptor id="*fgroup*_MEFP_CFSv2_Export">
	  <moduleId>GeneralAdapter</moduleId>
	  </moduleInstanceDescriptor>
	
	  </moduleInstanceGroup>
	
	  <!-- END MEFP DATA INGEST ======================== -->
	</moduleInstanceDescriptors>
	``

2.4.7 Modify Existing File: Qualifiers.xml

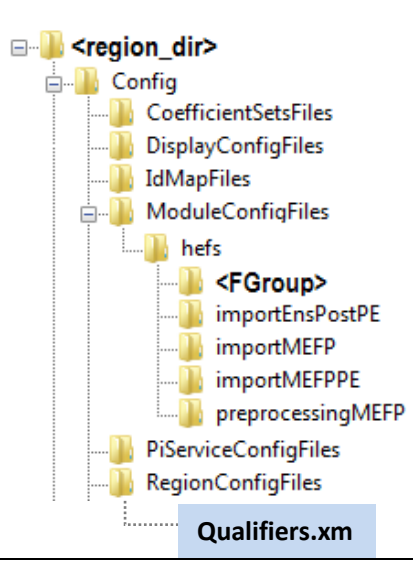
Action: If not already present, add the allowReferencingUndefinedQualifiers XML element with a value of true as the first element within the qualifiers XML element inside this file:

<configuration_dir>/RegionConfigFiles/Qualifiers.xml

See the example below for exact text to add **immediately after the "<qualifiers>" at the top of the file (it must be the first element after it)**. Note that the allowReferencingUndefinedQualifiers line is wrapped in the text shown below; it should be on one line in the XML file. A sample is provided in the following file:

<tar_root_dir>/dataIngest/samples/Config/RegionConfigFiles/Qualifiers.xml

Description: Qualifiers are used to distinguish time series in some modules. It is simplest to setup this flag to allow for referencing undefined qualifiers instead of defining all used qualifiers.

Standard Location: *<configuration_dir>*/**RegionConfigFiles/**	**Contents:** ***Qualifiers.xml***
	<?xml version="1.0" encoding="UTF-8"?> <qualifiers xmlns="http://www.wldelft.nl/fews" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.wldelft.nl/fews http://chps1/schemas/qualifiers.xsd"> **<!-- ADDED FOR MEFP DATA INGEST ========== -->** **<allowReferencingUndefinedQualifiers>true</allowReferencingUndefinedQualifiers>** **<!-- END MEFP DATA INGEST ========== -->** … </qualifiers>

2.4.8 Modify Existing File: WorkflowDescriptors.xml

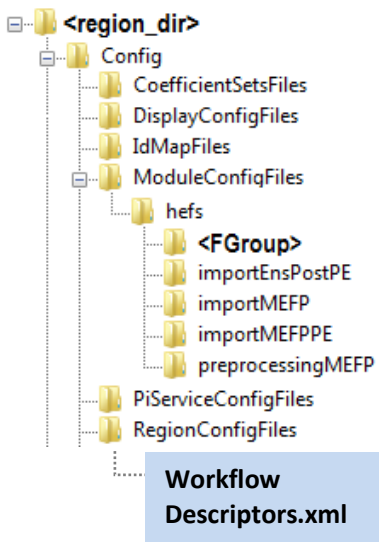
Action: Define new workflow descriptors in the file

<configuration_dir>/RegionConfigFiles/WorkflowDescriptors.xml

See the example below for text to add immediately before the closing "</workflowDescriptors>" at the end of the file. A sample is provided here:

<tar_root_dir>/dataIngest/samples/Config/RegionConfigFiles/WorkflowDescriptors.xml

Description: The added workflows are used to import the gridded GFS, GEFS, and CFSv2 data and export the CFSv2 time series files.

Standard Location: *<configuration_dir>*/**RegionConfigFiles/**	**Contents:** ***WorkflowDescriptors.xml***
	<?xml version="1.0" encoding="UTF-8"?> <workflowDescriptors xmlns="http://www.wldelft.nl/fews" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.wldelft.nl/fews http://chps1/schemas/workflowDescriptors.xsd" version="1.0"> … **<!-- ADDED FOR MEFP DATA INGEST ========== -->** **<!-- MEFP-specific operational imports -->** **<workflowDescriptor id="ImportMEFP-CFSv2Grids" forecast="false"** **visible="true" name="ImportMEFP-CFSv2Grids" allowApprove="false">** **<description>Import CFSv2 grids for MEFP from the Import directory and delete the files after importing</description>** **</workflowDescriptor>** **<workflowDescriptor id="ImportMEFP-GFSGrids" forecast="false"** **visible="true" name="ImportMEFP-GFSGrids" allowApprove="false">** **<description>Import GFS grids for MEFP the Import directory and delete the files after importing</description>** **</workflowDescriptor>** **<workflowDescriptor id="ImportMEFP-GEFSGrids" forecast="false"** **visible="true" name="ImportMEFP-GEFSGrids" allowApprove="false">** **<description>Import GEFS grids for MEFP the Import directory and delete the files after importing</description>** **</workflowDescriptor>** **<!-- MEFP-specific workflows -->** **<workflowDescriptor id="MEFP_CFSv2_Export" forecast="false"** **visible="false" name="MEFP_CFSv2_Export" allowApprove="false">** **<description>Export location interpolated CFSv2 time series for use in lagged ensemble construction.</description>** **</workflowDescriptor>** **<!-- END MEFP DATA INGEST ========== -->** </workflowDescriptors>

2.4.9 Modify Existing File: SpatialDisplay.xml

Action: Define new spatial displays in the file

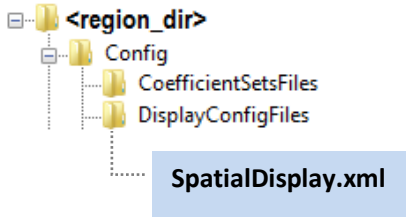
<*configuration_dir*>/DisplayConfigFiles/SpatialDisplay.xml

See the example below for exact text to add immediately before the closing "</gridDisplay>" at the end of the file (some lines of XML are long so that it spans multiple lines in the text below). A sample is provided in this file:

<*tar_root_dir*>/dataIngest/samples/Config/DisplayConfigFiles/SpatialDisplay.xml

Description: Add selections in the **Spatial Display Panel** of the CHPS interface that allow for viewing the GFS ensemble mean, GEFS ensemble mean, and CFSv2 gridded forecasts of precipitation and temperature.

NOTE: The grid scale and colors specified in the XML classBreaks elements was copied from an ABRFC configuration. Modify as desired for your RFC.

Standard Location: <*configuration_dir*>/**DisplayConfigFiles/**	**Contents:** ***SpatialDisplay.xml***
	<?xml version="1.0" encoding="UTF-8"?> <gridDisplay xmlns="http://www.wldelft.nl/fews" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.wldelft.nl/fews http://chps1/schemas/gridDisplay.xsd"> … **<!-- ADDED FOR MEFP DATA INGEST ========== -->** **<!-- MEFP GFS ensemble mean plots. -->** **<gridPlotGroup id="MEFP" name="MEFP GFS EnsMean">** **<gridPlot id="Precip">** **<timeSeriesSet>** **<moduleInstanceId>MEFP_GFS_Grid_EnsMean</moduleInstanceId>** **<valueType>grid</valueType>** **<parameterId>FMAP</parameterId>** **<locationId>HEFS_GFS_USA</locationId>** **<timeSeriesType>external forecasting</timeSeriesType>** **<timeStep unit="hour" multiplier="12"/>** **<relativeViewPeriod unit="day" start="0" end="15"/>** **<readWriteMode>read complete forecast</readWriteMode>** **</timeSeriesSet>** **<movingAccumulationTimeSpan unit="hour" multiplier="3"/>** **<movingAccumulationTimeSpan unit="hour" multiplier="6"/>** **<movingAccumulationTimeSpan unit="hour" multiplier="12"/>** **<movingAccumulationTimeSpan unit="hour" multiplier="24"/>** **<movingAccumulationTimeSpan unit="hour" multiplier="48"/>** **<movingAccumulationTimeSpan unit="hour" multiplier="120"/>** **<classBreaks>** **<color color="gray60" opaquenessPercentage="50" lowerValue="0"** **label="Zero"/>** **<color opaquenessPercentage="80" lowerValue="0.00001"** **color="0402CC" label="Trace"/>**

Standard Location: <*configuration_dir*>/**DisplayConfigFiles/**	**Contents:** ***SpatialDisplay.xml***

```
            <color opaquenessPercentage="80" lowerValue="0.001"
                color="1C92FC" label="0 to 0.01"/>
            <color opaquenessPercentage="80" lowerValue="0.01"
                color="04FEFC" label="0.01 to 0.1"/>
            <color opaquenessPercentage="80" lowerValue="0.1" color="046604"
                label="0.1 to 0.2"/>
            <color opaquenessPercentage="80" lowerValue="0.2"
                color="04FE04" label="0.2 to 0.3"/>
            <color opaquenessPercentage="80" lowerValue="0.3"
                color="ACFE2C" label="0.3 to 0.4"/>
            <color opaquenessPercentage="80" lowerValue="0.4"
                color="FCFE04" label="0.4 to 0.5"/>
            <color opaquenessPercentage="80" lowerValue="0.5"
                color="ECCA04" label="0.5 to 0.75"/>
            <color opaquenessPercentage="80" lowerValue="0.75"
                color="FC7E04" label="0.75 to 1"/>
            <color opaquenessPercentage="80" lowerValue="1" color="FC0204"
                label="1 to 1.25"/>
            <color opaquenessPercentage="80" lowerValue="1.25"
                color="CC0204" label="1.25 to 1.5"/>
            <color opaquenessPercentage="80" lowerValue="1.50"
                color="8C0204" label="1.5 to 1.75"/>
            <color opaquenessPercentage="80" lowerValue="1.75"
                color="FC02FC" label="1.75 to 2"/>
            <color opaquenessPercentage="80" lowerValue="2" color="9C32CC"
                label="2 to 2.5"/>
            <color opaquenessPercentage="80" lowerValue="2.5"
                color="541ACC" label="2.5 to 3"/>
            <color opaquenessPercentage="80" lowerValue="3" color="B1B8C8"
                label="Above 3 Inches"/>
        </classBreaks>
    </gridPlot>
    <gridPlot id="Temperature">
        <timeSeriesSet>
            <moduleInstanceId>MEFP_GFS_Grid_EnsMean</moduleInstanceId>
            <valueType>grid</valueType>
            <parameterId>FMAT</parameterId>
            <locationId>HEFS_GFS_USA</locationId>
            <timeSeriesType>external forecasting</timeSeriesType>
            <timeStep unit="hour" multiplier="12"/>
            <relativeViewPeriod unit="day" start="0" end="15"/>
            <readWriteMode>read complete forecast</readWriteMode>
        </timeSeriesSet>
        <movingAccumulationTimeSpan unit="hour" multiplier="3"/>
        <movingAccumulationTimeSpan unit="hour" multiplier="6"/>
        <movingAccumulationTimeSpan unit="hour" multiplier="12"/>
        <movingAccumulationTimeSpan unit="hour" multiplier="24"/>
        <movingAccumulationTimeSpan unit="hour" multiplier="48"/>
        <movingAccumulationTimeSpan unit="hour" multiplier="120"/>
        <classBreaks>
            <lowerColor>blue3</lowerColor>
            <upperColor>light blue1</upperColor>
            <lowerValue>-15</lowerValue>
            <lowerValue>15</lowerValue>
```

Standard Location: <*configuration_dir*>/**DisplayConfigFiles/**	**Contents:** ***SpatialDisplay.xml***

```
            <lowerValue>25</lowerValue>
            <lowerValue>32</lowerValue>
            <lowerColor>pale green1</lowerColor>
            <upperColor>red</upperColor>
            <lowerValue>32.1</lowerValue>
            <lowerValue>40</lowerValue>
            <lowerValue>50</lowerValue>
            <lowerValue>60</lowerValue>
            <lowerValue>70</lowerValue>
            <lowerValue>80</lowerValue>
            <lowerValue>90</lowerValue>
          </classBreaks>
        </gridPlot>
      </gridPlotGroup>
      <!--  MEFP GEFS ensemble mean plots. -->
      <gridPlotGroup id="MEFP" name="MEFP GEFS">
        <gridPlot id="Precip">
          <timeSeriesSet>

<moduleInstanceId>MEFP_GEFS_Interpolate_USA</moduleInstanceId>
            <valueType>grid</valueType>
            <parameterId>FMAP</parameterId>
            <locationId>HEFS_GEFS_USA</locationId>
            <timeSeriesType>external forecasting</timeSeriesType>
            <timeStep unit="hour" multiplier="6"/>
            <relativeViewPeriod unit="day" start="0" end="16"/>
            <readWriteMode>read complete forecast</readWriteMode>
          </timeSeriesSet>
          <movingAccumulationTimeSpan unit="hour" multiplier="3"/>
          <movingAccumulationTimeSpan unit="hour" multiplier="6"/>
          <movingAccumulationTimeSpan unit="hour" multiplier="12"/>
          <movingAccumulationTimeSpan unit="hour" multiplier="24"/>
          <movingAccumulationTimeSpan unit="hour" multiplier="48"/>
          <movingAccumulationTimeSpan unit="hour" multiplier="120"/>
          <classBreaks>
            <color color="gray60" opaquenessPercentage="50" lowerValue="0"
                label="Zero"/>
            <color opaquenessPercentage="80" lowerValue="0.00001"
                color="0402CC" label="Trace"/>
            <color opaquenessPercentage="80" lowerValue="0.001"
                color="1C92FC" label="0 to 0.01"/>
            <color opaquenessPercentage="80" lowerValue="0.01"
                color="04FEFC" label="0.01 to 0.1"/>
            <color opaquenessPercentage="80" lowerValue="0.1" color="046604"
                label="0.1 to 0.2"/>
            <color opaquenessPercentage="80" lowerValue="0.2"
                color="04FE04" label="0.2 to 0.3"/>
            <color opaquenessPercentage="80" lowerValue="0.3"
                color="ACFE2C" label="0.3 to 0.4"/>
            <color opaquenessPercentage="80" lowerValue="0.4"
                color="FCFE04" label="0.4 to 0.5"/>
            <color opaquenessPercentage="80" lowerValue="0.5"
                color="ECCA04" label="0.5 to 0.75"/>
            <color opaquenessPercentage="80" lowerValue="0.75"
```

Standard Location: <*configuration_dir*>/**DisplayConfigFiles/**	**Contents:** ***SpatialDisplay.xml***

```
                color="FC7E04" label="0.75 to 1"/>
            <color opaquenessPercentage="80" lowerValue="1" color="FC0204"
                label="1 to 1.25"/>
            <color opaquenessPercentage="80" lowerValue="1.25"
                color="CC0204" label="1.25 to 1.5"/>
            <color opaquenessPercentage="80" lowerValue="1.50"
                color="8C0204" label="1.5 to 1.75"/>
            <color opaquenessPercentage="80" lowerValue="1.75"
                color="FC02FC" label="1.75 to 2"/>
            <color opaquenessPercentage="80" lowerValue="2" color="9C32CC"
                label="2 to 2.5"/>
            <color opaquenessPercentage="80" lowerValue="2.5"
                color="541ACC" label="2.5 to 3"/>
            <color opaquenessPercentage="80" lowerValue="3" color="B1B8C8"
                label="Above 3 Inches"/>
          </classBreaks>
        </gridPlot>
        <gridPlot id="Temperature Max">
          <timeSeriesSet>

<moduleInstanceId>MEFP_GEFS_Interpolate_USA</moduleInstanceId>
            <valueType>grid</valueType>
            <parameterId>TFMX</parameterId>
            <locationId>HEFS_GEFS_USA</locationId>
            <timeSeriesType>external forecasting</timeSeriesType>
            <timeStep unit="hour" multiplier="6"/>
            <relativeViewPeriod unit="day" start="0" end="16"/>
            <readWriteMode>read complete forecast</readWriteMode>
          </timeSeriesSet>
          <movingAccumulationTimeSpan unit="hour" multiplier="3"/>
          <movingAccumulationTimeSpan unit="hour" multiplier="6"/>
          <movingAccumulationTimeSpan unit="hour" multiplier="12"/>
          <movingAccumulationTimeSpan unit="hour" multiplier="24"/>
          <movingAccumulationTimeSpan unit="hour" multiplier="48"/>
          <movingAccumulationTimeSpan unit="hour" multiplier="120"/>
          <classBreaks>
            <lowerColor>blue3</lowerColor>
            <upperColor>light blue1</upperColor>
            <lowerValue>-15</lowerValue>
            <lowerValue>15</lowerValue>
            <lowerValue>25</lowerValue>
            <lowerValue>32</lowerValue>
            <lowerColor>pale green1</lowerColor>
            <upperColor>red</upperColor>
            <lowerValue>32.1</lowerValue>
            <lowerValue>40</lowerValue>
            <lowerValue>50</lowerValue>
            <lowerValue>60</lowerValue>
            <lowerValue>70</lowerValue>
            <lowerValue>80</lowerValue>
            <lowerValue>90</lowerValue>
          </classBreaks>
        </gridPlot>
        <gridPlot id="Temperature Min">
```

Standard Location: <*configuration_dir*>/**DisplayConfigFiles/**	**Contents:** ***SpatialDisplay.xml***
	<timeSeriesSet> <moduleInstanceId>MEFP_GEFS_Interpolate_USA</moduleInstanceId> <valueType>grid</valueType> <parameterId>TFMN</parameterId> <locationId>HEFS_GEFS_USA</locationId> <timeSeriesType>external forecasting</timeSeriesType> <timeStep unit="hour" multiplier="6"/> <relativeViewPeriod unit="day" start="0" end="16"/> <readWriteMode>read complete forecast</readWriteMode> </timeSeriesSet> <movingAccumulationTimeSpan unit="hour" multiplier="3"/> <movingAccumulationTimeSpan unit="hour" multiplier="6"/> <movingAccumulationTimeSpan unit="hour" multiplier="12"/> <movingAccumulationTimeSpan unit="hour" multiplier="24"/> <movingAccumulationTimeSpan unit="hour" multiplier="48"/> <movingAccumulationTimeSpan unit="hour" multiplier="120"/> <classBreaks> <lowerColor>blue3</lowerColor> <upperColor>light blue1</upperColor> <lowerValue>-15</lowerValue> <lowerValue>15</lowerValue> <lowerValue>25</lowerValue> <lowerValue>32</lowerValue> <lowerColor>pale green1</lowerColor> <upperColor>red</upperColor> <lowerValue>32.1</lowerValue> <lowerValue>40</lowerValue> <lowerValue>50</lowerValue> <lowerValue>60</lowerValue> <lowerValue>70</lowerValue> <lowerValue>80</lowerValue> <lowerValue>90</lowerValue> </classBreaks> </gridPlot> </gridPlotGroup> <!-- MEFP CFSv2 single-valued forecast plots. --> <gridPlotGroup id="MEFP" name="MEFP CFSv2"> <gridPlot id="Precip"> <timeSeriesSet> <moduleInstanceId>MEFP_CFSv2_Interpolate_USA</moduleInstanceId> <valueType>grid</valueType> <parameterId>FMAP</parameterId> <locationId>HEFS_CFSv2_USA</locationId> <timeSeriesType>external forecasting</timeSeriesType> <timeStep unit="hour" multiplier="6"/> <relativeViewPeriod unit="day" start="0" end="330"/> <readWriteMode>read complete forecast</readWriteMode> </timeSeriesSet> <movingAccumulationTimeSpan unit="hour" multiplier="3"/> <movingAccumulationTimeSpan unit="hour" multiplier="6"/> <movingAccumulationTimeSpan unit="hour" multiplier="12"/> <movingAccumulationTimeSpan unit="hour" multiplier="24"/>

Standard Location: <*configuration_dir*>/**DisplayConfigFiles/**	**Contents:** ***SpatialDisplay.xml***
	<movingAccumulationTimeSpan unit="hour" multiplier="48"/> <movingAccumulationTimeSpan unit="hour" multiplier="120"/> <classBreaks> <color color="gray60" opaquenessPercentage="50" lowerValue="0" label="Zero"/> <color opaquenessPercentage="80" lowerValue="0.00001" color="0402CC" label="Trace"/> <color opaquenessPercentage="80" lowerValue="0.001" color="1C92FC" label="0 to 0.01"/> <color opaquenessPercentage="80" lowerValue="0.01" color="04FEFC" label="0.01 to 0.1"/> <color opaquenessPercentage="80" lowerValue="0.1" color="046604" label="0.1 to 0.2"/> <color opaquenessPercentage="80" lowerValue="0.2" color="04FE04" label="0.2 to 0.3"/> <color opaquenessPercentage="80" lowerValue="0.3" color="ACFE2C" label="0.3 to 0.4"/> <color opaquenessPercentage="80" lowerValue="0.4" color="FCFE04" label="0.4 to 0.5"/> <color opaquenessPercentage="80" lowerValue="0.5" color="ECCA04" label="0.5 to 0.75"/> <color opaquenessPercentage="80" lowerValue="0.75" color="FC7E04" label="0.75 to 1"/> <color opaquenessPercentage="80" lowerValue="1" color="FC0204" label="1 to 1.25"/> <color opaquenessPercentage="80" lowerValue="1.25" color="CC0204" label="1.25 to 1.5"/> <color opaquenessPercentage="80" lowerValue="1.50" color="8C0204" label="1.5 to 1.75"/> <color opaquenessPercentage="80" lowerValue="1.75" color="FC02FC" label="1.75 to 2"/> <color opaquenessPercentage="80" lowerValue="2" color="9C32CC" label="2 to 2.5"/> <color opaquenessPercentage="80" lowerValue="2.5" color="541ACC" label="2.5 to 3"/> <color opaquenessPercentage="80" lowerValue="3" color="B1B8C8" label="Above 3 Inches"/> </classBreaks> </gridPlot> <gridPlot id="Temperature Max"> <timeSeriesSet> <moduleInstanceId>MEFP_CFSv2_Interpolate_USA</moduleInstanceId> <valueType>grid</valueType> <parameterId>TFMX</parameterId> <locationId>HEFS_CFSv2_USA</locationId> <timeSeriesType>external forecasting</timeSeriesType> <timeStep unit="hour" multiplier="6"/> <relativeViewPeriod unit="day" start="0" end="330"/> <readWriteMode>read complete forecast</readWriteMode> </timeSeriesSet> <movingAccumulationTimeSpan unit="hour" multiplier="3"/> <movingAccumulationTimeSpan unit="hour" multiplier="6"/> <movingAccumulationTimeSpan unit="hour" multiplier="12"/>

Standard Location: <*configuration_dir*>/**DisplayConfigFiles/**	**Contents:** ***SpatialDisplay.xml***
	<movingAccumulationTimeSpan unit="hour" multiplier="24"/> <movingAccumulationTimeSpan unit="hour" multiplier="48"/> <movingAccumulationTimeSpan unit="hour" multiplier="120"/> <classBreaks> <lowerColor>blue3</lowerColor> <upperColor>light blue1</upperColor> <lowerValue>-15</lowerValue> <lowerValue>15</lowerValue> <lowerValue>25</lowerValue> <lowerValue>32</lowerValue> <lowerColor>pale green1</lowerColor> <upperColor>red</upperColor> <lowerValue>32.1</lowerValue> <lowerValue>40</lowerValue> <lowerValue>50</lowerValue> <lowerValue>60</lowerValue> <lowerValue>70</lowerValue> <lowerValue>80</lowerValue> <lowerValue>90</lowerValue> </classBreaks> </gridPlot> <gridPlot id="Temperature Min"> <timeSeriesSet> <moduleInstanceId>MEFP_CFSv2_Interpolate_USA</moduleInstanceId> <valueType>grid</valueType> <parameterId>TFMN</parameterId> <locationId>HEFS_CFSv2_USA</locationId> <timeSeriesType>external forecasting</timeSeriesType> <timeStep unit="hour" multiplier="6"/> <relativeViewPeriod unit="day" start="0" end="330"/> <readWriteMode>read complete forecast</readWriteMode> </timeSeriesSet> <movingAccumulationTimeSpan unit="hour" multiplier="3"/> <movingAccumulationTimeSpan unit="hour" multiplier="6"/> <movingAccumulationTimeSpan unit="hour" multiplier="12"/> <movingAccumulationTimeSpan unit="hour" multiplier="24"/> <movingAccumulationTimeSpan unit="hour" multiplier="48"/> <movingAccumulationTimeSpan unit="hour" multiplier="120"/> <classBreaks> <lowerColor>blue3</lowerColor> <upperColor>light blue1</upperColor> <lowerValue>-15</lowerValue> <lowerValue>15</lowerValue> <lowerValue>25</lowerValue> <lowerValue>32</lowerValue> <lowerColor>pale green1</lowerColor> <upperColor>red</upperColor> <lowerValue>32.1</lowerValue> <lowerValue>40</lowerValue> <lowerValue>50</lowerValue> <lowerValue>60</lowerValue> <lowerValue>70</lowerValue> <lowerValue>80</lowerValue>

Standard Location: <*configuration_dir*>/**DisplayConfigFiles/**	**Contents:** ***SpatialDisplay.xml***
	<lowerValue>90</lowerValue> **</classBreaks>** **</gridPlot>** **</gridPlotGroup>** **<!-- END MEFP DATA INGEST ========== -->** </gridDisplay>

2.5 *Confirm Installation*

Described below are steps to perform to test that the installation was successful. This test is designed to replicate exactly how the grid files will be imported when configured to run as an automated workflow. The data represents that which is available for an MEFP run on Jan 31, 2013 at 12Z. The grids are imported by system times (T0) as follows:

- GFS: 1/31/13 00Z
- GEFS: 1/31/13 00Z
- CFSv2: 1/31/13 12Z (the data is 24-hours old: 1/30/13 12Z)

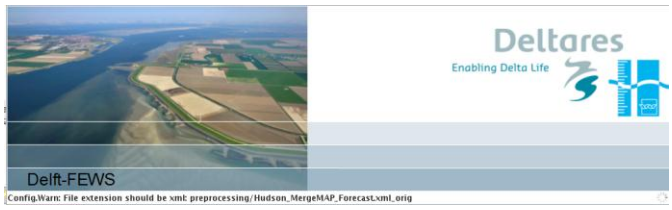
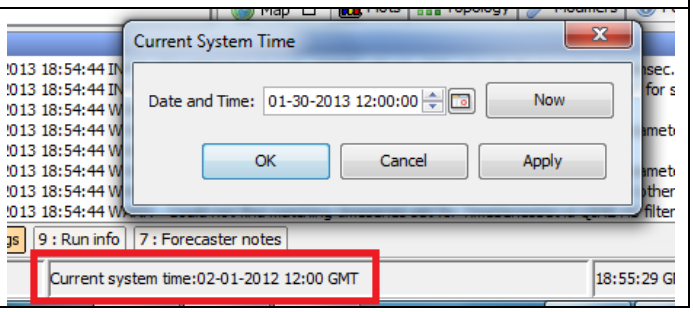
The test steps below describe how to view the gridded forecasts through the **Spatial Display Panel** of the CHPS interface.

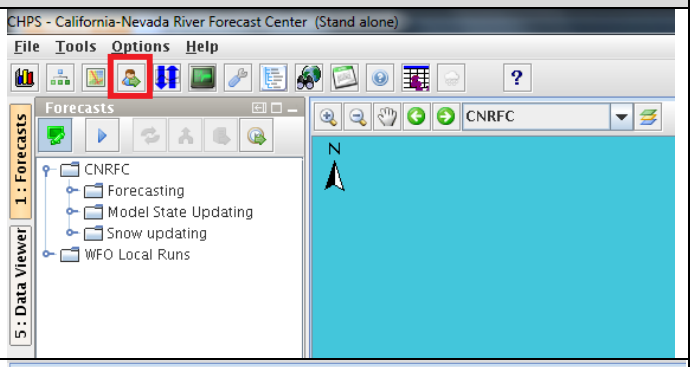
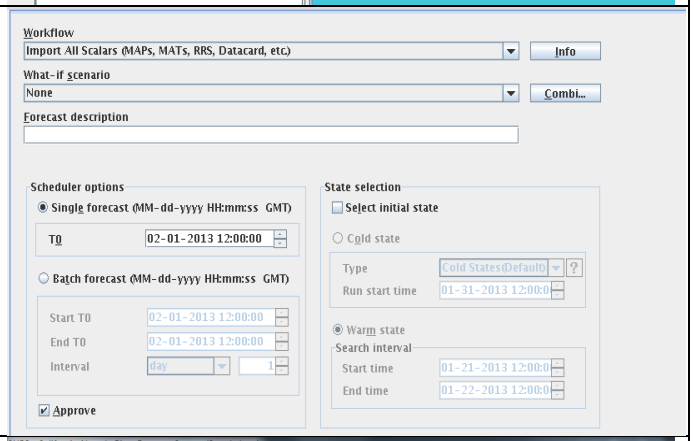
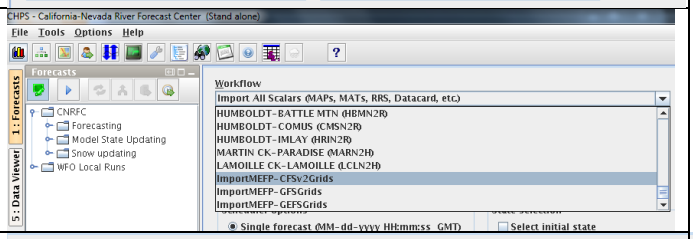
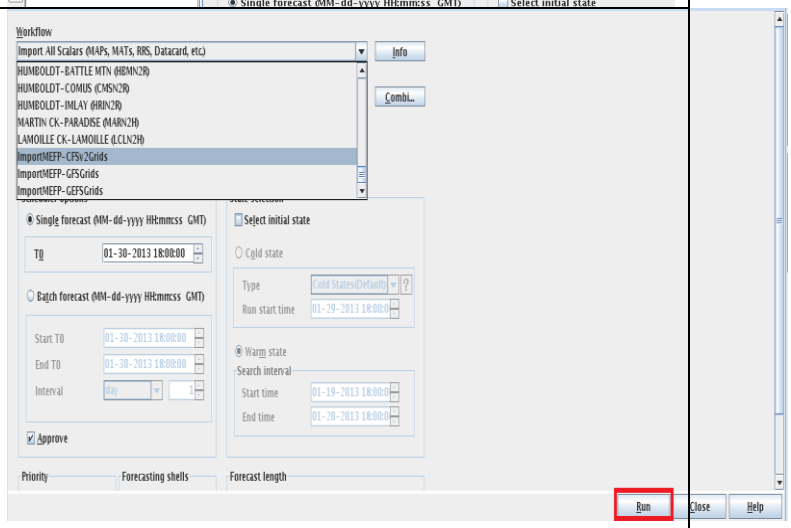
Prior to running the test, prepare the data for import as follows:

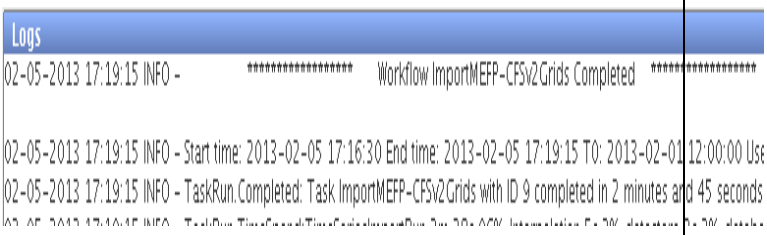
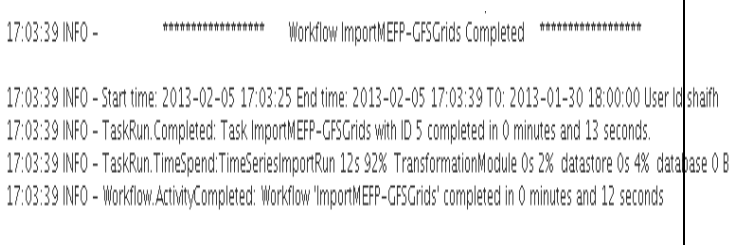
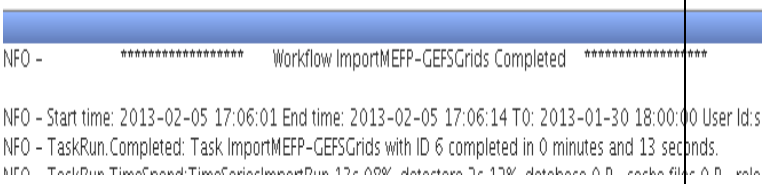
Action: Populate the <*region_dir*>/Import directory with grid data for testing. Do the following:

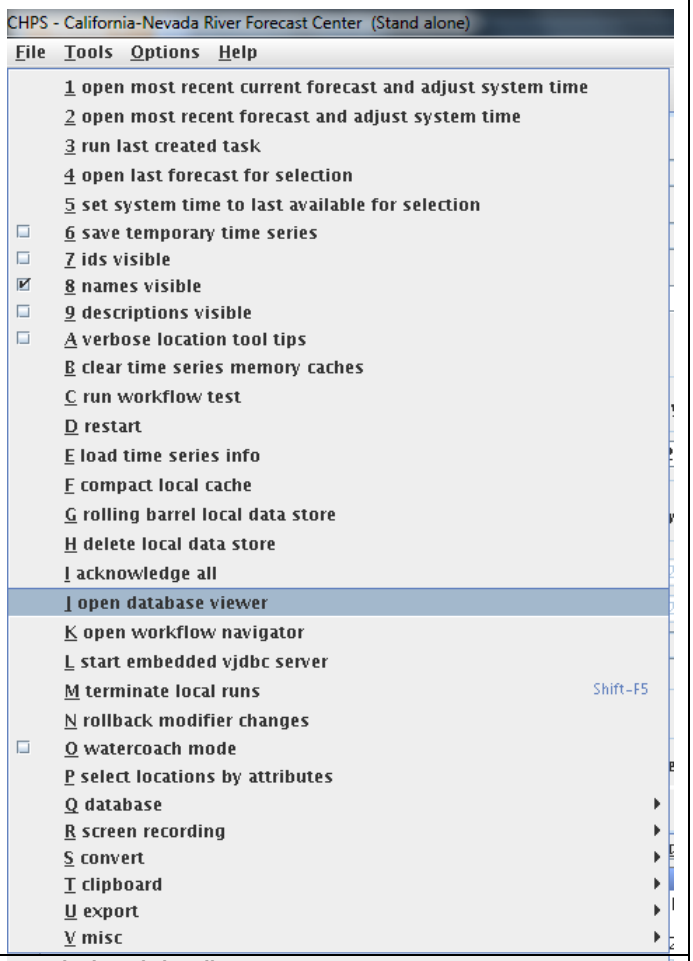
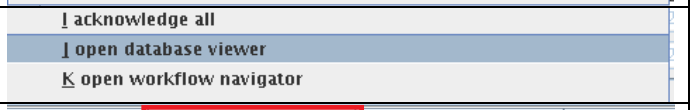
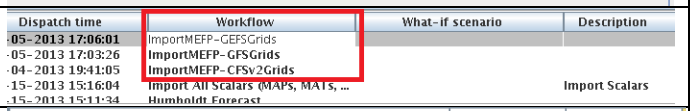
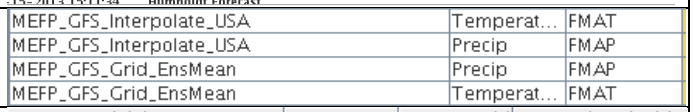
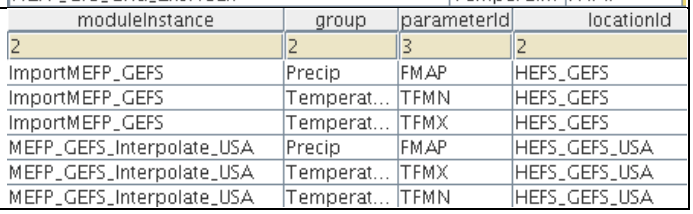
cd <*region_dir*>
tar –zxvf <*tar_root_dir*>/dataIngest/importTestData.tgz

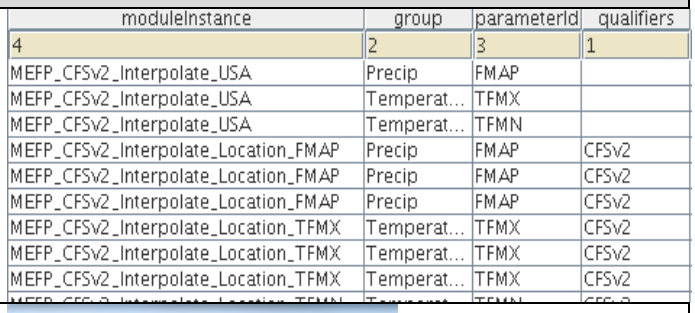
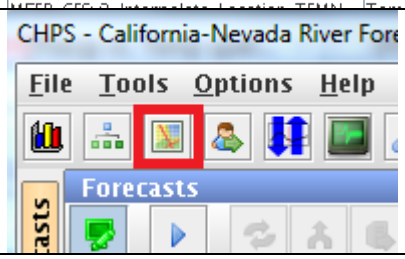
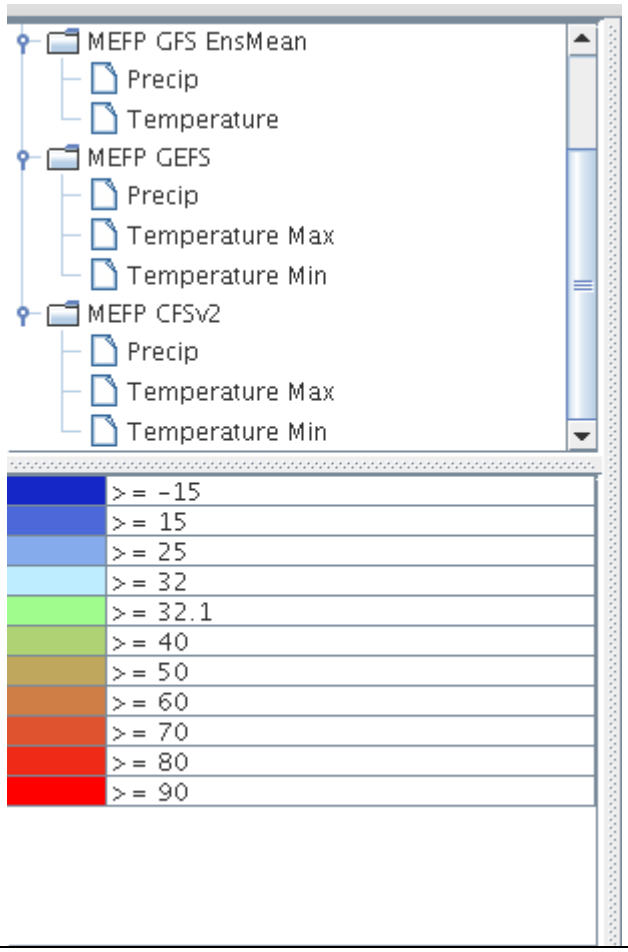
Perform the following steps and confirm the expected results:

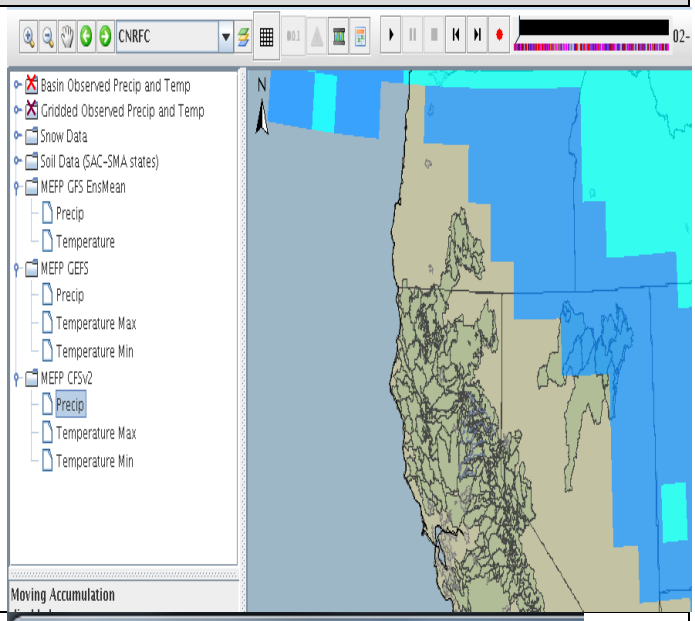
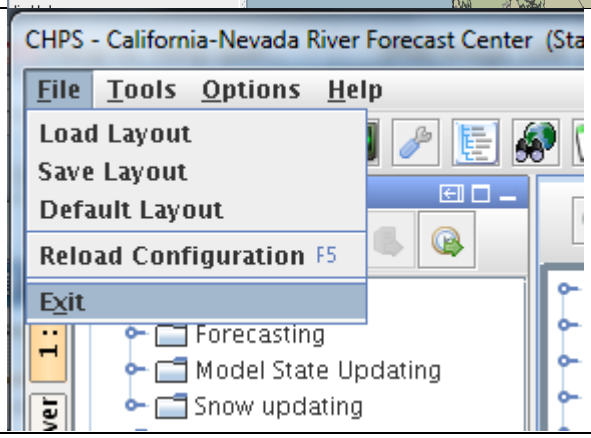
#	Action	Expected Results
1	Start FEWS using the installation standalone: ***cd*** *<region_dir>* ***cd ..*** ***./hefsPlugins/fews_hefsPlugins.sh ##rfc_sa &***	FEWS will be started. The splash screen displayed will vary by RFC. The default splash screen is:  After a short time, the CHPS interface will open.
2	Click on the **Current system time Label** at the bottom of the CHPS interface so that the **Current System Time** dialog opens. Set the system time to 01-30-2013 12:00:00.	

#	Action	Expected Results
3	Click on **Manual Forecast Button**.	
4	The **Manual Forecast Panel** will open allowing you to select the workflow to run.	
5	In the **Workflow List**, select the ImportMEFP-CFSv2Grids workflow.	
6	Click **Run.**	

#	Action	Expected Results
7	Wait for run to complete (up to 5 minutes)	We can see this in the Logs once run is complete:  Logs 02-05-2013 17:19:15 INFO - ********** Workflow ImportMEFP-CFSv2Grids Completed ********** 02-05-2013 17:19:15 INFO - Start time: 2013-02-05 17:16:30 End time: 2013-02-05 17:19:15 T0: 2013-02-01 12:00:00 Use 02-05-2013 17:19:15 INFO - TaskRun.Completed: Task ImportMEFP-CFSv2Grids with ID 9 completed in 2 minutes and 45 seconds
8	Verify that appropriate directories and files for each *installation catchment* were created under the directory <*mefp_root_dir*>/cfsv2Interpolated/archive.	If they were not created, then the module that exports the location-specific CFSv2 forecast time series file, or one of the preceding modules, failed to execute.
8	Perform Step 2, again, but set the system time to be 01-31-2013 00:00:00.	
9	In the **Workflow List**, select the ImportMEFP-GFSGrids workflow.	
10	Click **Run.**	
10	Wait for run to complete (< 1 minute).	We can see this in Logs once run is complete:  17:03:39 INFO - ********** Workflow ImportMEFP-GFSGrids Completed ********** 17:03:39 INFO - Start time: 2013-02-05 17:03:25 End time: 2013-02-05 17:03:39 T0: 2013-01-30 18:00:00 User Id:shaifh 17:03:39 INFO - TaskRun.Completed: Task ImportMEFP-GFSGrids with ID 5 completed in 0 minutes and 13 seconds. 17:03:39 INFO - TaskRun.TimeSpend:TimeSeriesImportRun 12s 92% TransformationModule 0s 2% datastore 0s 4% database 0 B 17:03:39 INFO - Workflow.ActivityCompleted: Workflow 'ImportMEFP-GFSGrids' completed in 0 minutes and 12 seconds
12	In the **Workflow List**, select the ImportMEFP-GEFSGrids workflow.	
13	Click **Run.**	
14	Wait for run to complete (< 1 minute)	We can see this in Logs once run is complete:  NFO - ********** Workflow ImportMEFP-GEFSGrids Completed ********** NFO - Start time: 2013-02-05 17:06:01 End time: 2013-02-05 17:06:14 T0: 2013-01-30 18:00:00 User Id:s NFO - TaskRun.Completed: Task ImportMEFP-GEFSGrids with ID 6 completed in 0 minutes and 13 seconds.

#	Action	Expected Results
15	Click on the **Logs Panel** (to make it active) and press the F12 key.	A menu will appear: 
16	Select "open database viewer" (shortcut key: j).	
17	In the **Database Viewer Panel** that opens, select each workflow to verify there is data in the database.	
18	You should be able to see EnsMean being calculated for GFS Workflow.	
19	Here is a snippet of the GEFS workflow.	

#	Action	Expected Results
20	Here is a snippet of the CFSV2 workflow.	 moduleInstance, group, parameterId, qualifiers 4, 2, 3, 1 MEFP_CFSv2_Interpolate_USA, Precip, FMAP MEFP_CFSv2_Interpolate_USA, Temperat..., TFMX MEFP_CFSv2_Interpolate_USA, Temperat..., TFMN MEFP_CFSv2_Interpolate_Location_FMAP, Precip, FMAP, CFSv2 MEFP_CFSv2_Interpolate_Location_FMAP, Precip, FMAP, CFSv2 MEFP_CFSv2_Interpolate_Location_FMAP, Precip, FMAP, CFSv2 MEFP_CFSv2_Interpolate_Location_TFMX, Temperat..., TFMX, CFSv2 MEFP_CFSv2_Interpolate_Location_TFMX, Temperat..., TFMX, CFSv2 MEFP_CFSv2_Interpolate_Location_TFMX, Temperat..., TFMX, CFSv2
21	Click **Spatial Button** in the toolbar of the CHPS interface.	
22	When the **Spatial Display Panel** opens, in the on the left, expand all three of the following: "MEFP GFS EnsMean", "MEFP GEFS" and "MEFP CFSv2".	There should no red X on any of the expanded nodes (a red X indicates missing data) and the tree should appear similar to the screen shot below: 

#	Action	Expected Results
23	Select each of the “Precip”, “Temperature”, and “Temperature Max/Min” nodes made visible in the last step and confirm that gridded data is displayed on the map to the right.	
24	From the **File Menu**, select “Exit” to close the standalone.	

2.6 *Synchronize Changes to the Central Server (Required)*

First, the global properties have been modified in Section 2.3; these modifications must be made to the central server version of the global properties. Specifically each fss global property file needs to be modified. For each FSS##, open the following file for editing (replace ?? with the 2-letter RFC abbreviation):

/awips/chps_local/fss/??rfc/FSS##/FewsShell/??rfc/fss_global.properties

Add the following properties:

MEFP_ROOT_DIR=<*mefp_root_dir*>
IMPORT_FOLDER_CFSv2=$IMPORT_FOLDER_ROOT$/CFSv2
IMPORT_FOLDER_GEFS=$IMPORT_FOLDER_ROOT$/GEFS
IMPORT_FOLDER_GFS=$IMPORT_FOLDER_ROOT$/GFS

Second, transfer all of the configuration changes made in earlier steps to the central server. Seven files were modified while all others were new; see Figure 1 in Section 1.6 for a list (files in blue boxes are modified and those in red boxes are new). Use the FEWS configuration manager (cm) tool for installing the files in the central server (i.e., place the changes in the FEWS OC, validate, and synchronize/upload the changes).

TO ADD NEW SEGMENTS OR FORECAST GROUPS: Repeat this synchronization step for any new created or modified files.

2.7 *Setup Acquisition of Operational Forecast Grids (All Steps Required)*

With the import workflows configured and synchronized with the central server, the next step is to setup automated daily and 6-hourly acquisitions of GFS, GEFS, and CFSv2 operational gridded forecasts. The forecasts are located on FTP servers and contained in GRIB2 format files. The steps below describe how to install scripts that are delivered as part of this release and that perform the required FTP, and how to schedule those scripts for automated execution on a cron.

2.7.1 Identify systems and directories

Identify the following directories and systems:

- <*ftp_system*>: The system on which the FTP scripts will be executed. For example, “chps3-nhdr”.
- <*ftp_dir*>: The directory that will contain the FTP scripts, generated log files, and the operational GRIB2 forecast files.
- <*CHPS_import_system*>: The system on which the CHPS import workflows will be executed. For example, “chps3-nhdr”.

- <*CHPS_import_dir*>: The import directory employed by scheduled import workflows. This should be a subdirectory of the directory pointed to by the global property IMPORT_FOLDER_ROOT used by scheduled workflows. For example, /awips/chps_data/toCHPS/nerfc/grib2/CFSv2.

2.7.2 Prepare directories

Using directories provided with the release, the following commands will create the ftp directory structure, putting the FTP scripts in place, as well as create the CHPS import directory structures:

```
mkdir <ftp_dir>
cd <ftp_dir>
cp –r <tar_root_dir>/dataIngest/ftpDir/* .
cd <CHPS_import_dir>
cp –r <tar_root_dir>/dataIngest/Import/* .
```

2.7.3 Schedule FTP runs as cron jobs

Add the following lines to the cron for user fews on the system <*ftp_system*>. To avoid confusion with too many '>', the directories noted in Section 2.7.1 are shown in <*italics and red*>

```
00 04 * * * <ftp_dir>/scripts/cfs_data.sh 00 <ftp_dir>/CFSv2 <CHPS_import_system>
        <CHPS_import_dir>/CFSv2 > <ftp_dir>/logs/cfs_00zdata.log

00 10 * * * <ftp_dir>/scripts/cfs_data.sh 06 <ftp_dir>/CFSv2 <CHPS_import_system>
        <CHPS_import_dir>/CFSv2 > <ftp_dir>/logs/cfs_06zdata.log

00 16 * * * <ftp_dir>/scripts/cfs_data.sh 12 <ftp_dir>/CFSv2 <CHPS_import_system>
        <CHPS_import_dir>/CFSv2 > <ftp_dir>/logs/cfs_12zdata.log

00 22 * * * <ftp_dir>/scripts/cfs_data.sh 18 <ftp_dir>/CFSv2 <CHPS_import_system>
        <CHPS_import_dir>/CFSv2 > <ftp_dir>/logs/cfs_18zdata.log

00 08 * * * <ftp_dir>/scripts/gefs_data.sh 00 <ftp_dir>/GEFS <CHPS_import_system>
        <CHPS_import_dir>/GEFS > <ftp_dir>/logs/gefs_00zdata.log

00 08 * * * <ftp_dir>/scripts/gfs_data.sh <ftp_dir>/GFS <CHPS_import_system>
        <CHPS_import_dir>/GFS > <ftp_dir>/logs/gfs_00zdata.log

00 01 * * * <ftp_dir>/scripts/purge_cfsv2_gfs_gefs.sh <ftp_dir> <mefp_root_dir> >
        <ftp_dir>/logs/purge_cfsv2_gfs_gefs.log 2>&1
```

NOTE: The data is currently grabbed from NCEP FTP sites via the internet. You should use your existing mechanisms for bringing data from the internet onto your AWIPS machines (e.g. Local Data Acquisition and Dissemination (LDAD)):

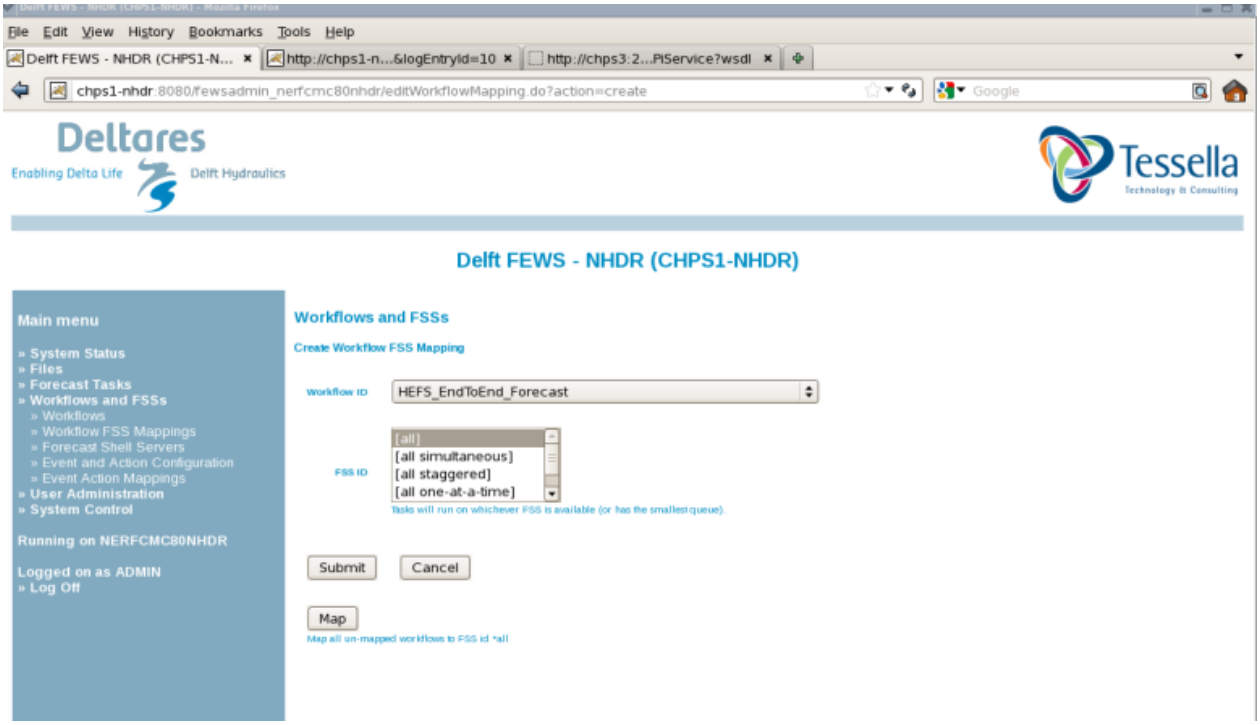
2.8 *Schedule Import Workflows (All Steps Required)*

Three workflows must be scheduled through the standard FEWS-AI mechanism. Screenshots for each scheduled workflow are provided in the following sections.

2.8.1 Add a workflow mapping for each workflow to schedule.

To add a workflow mapping for the Forecast Shell Servers, start the FEWS admin tool and do the following:

1. Click on “Workflows and FSSs”.
2. Click on “Workflows and FSS Mappings”.
3. Click on “Create New Workflow FSS Mapping”.
4. From the **workflow ID** list Choose the workflow with the desired id from the list provided.
5. From the **FSS ID** list, choose the default selection, “(all)”.
6. Click on the **Submit Button**.



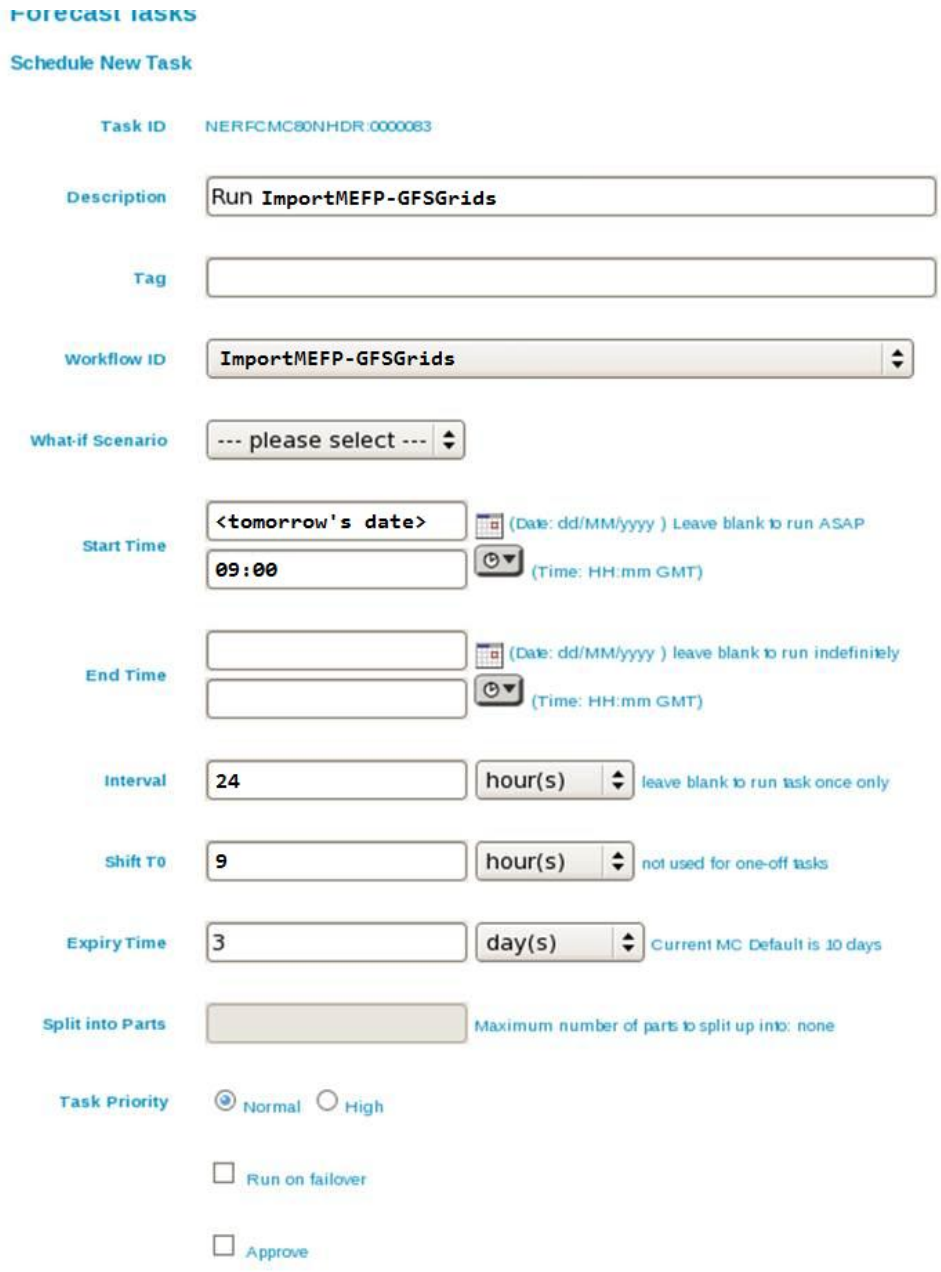
Repeat the above process for each of the following workflows:

- ImportMEFP-GFSGrids
- ImportMEFP-GEFSGrids
- ImportMEFP-CFSv2Grids

2.8.2 Schedule the ImportMEFP-GFSGrids Workflow

The scheduled job will execute once a day at 9 GMT. This is one hour after the ftp script used to grab data from the NCEP FTP site is executed (i.e. 8 GMT). The observation time (T0) is set to 0Z by shifting the time back 8 hours relative to the workflow execution time.

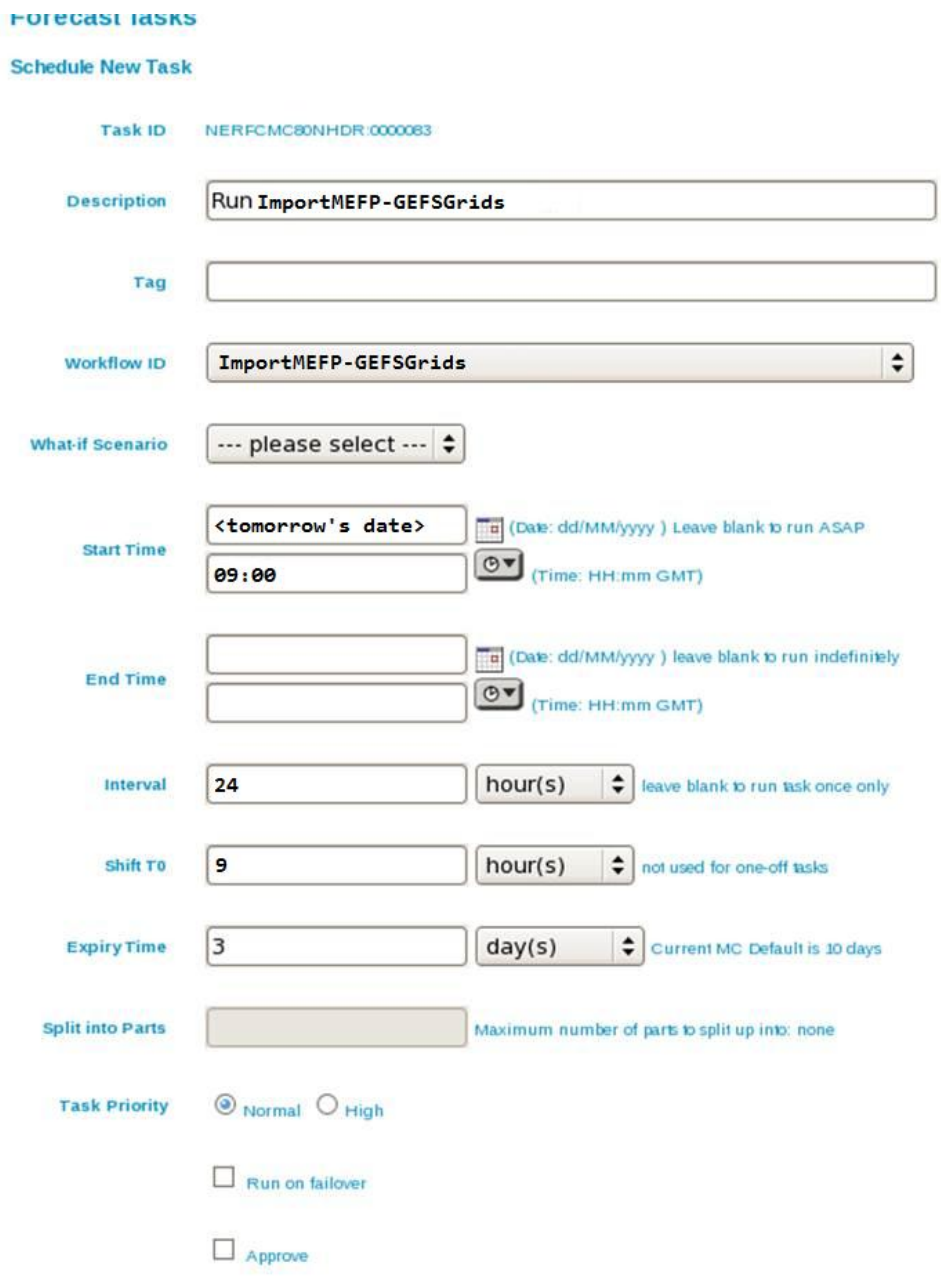
The data associated with each import is deleted after 3 days.



2.8.3 Schedule the ImportMEFP-GEFSGrids Workflow

The scheduled job will execute once a day at 9 GMT. This is one hour after the ftp script used to grab data from the NCEP ftp site is executed (i.e. 8 GMT). The observation time (T0) is set to 0Z by shifting the time back 8 hours relative to the workflow execution time.

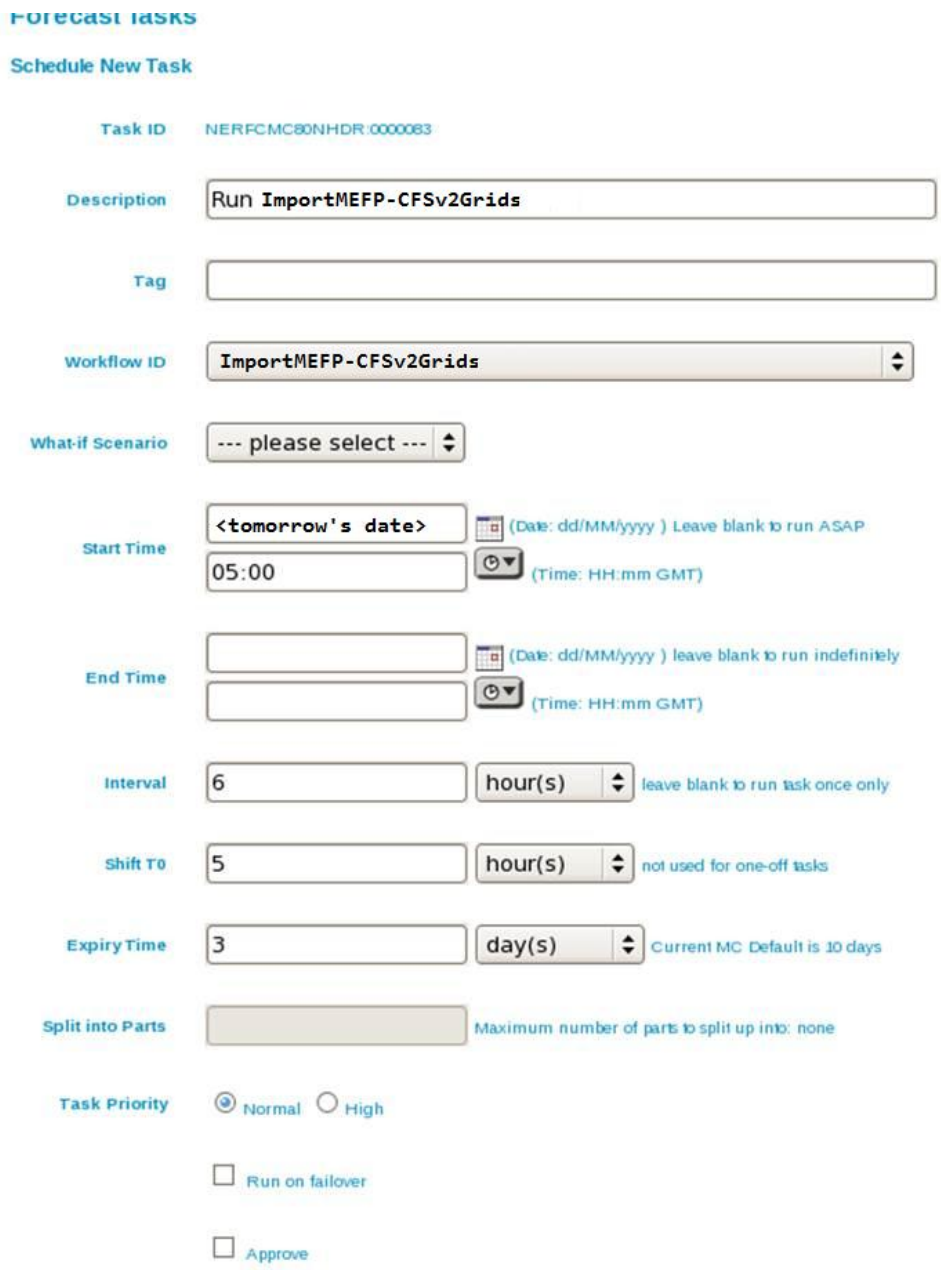
The data associated with each import is deleted after 3 days.



2.8.4 Schedule the ImportMEFP-CFSv2Grids Workflow

The scheduled job will execute four times a day (5, 11, 17, and 23 GMT). This is one hour after the ftp script used to grab data from the NCEP ftp site is executed (i.e. 4, 10, 16, and 22 GMT). The observation time (T0) is set to 0, 6, 12, and 18Z respectively by shifting the time back 5 hours relative to the workflow execution time.

The data associated with each import is deleted after 3 days.



2.9 *Confirm Grid Acquisition and Import*

The following steps should be performed 24-hours after performing Steps 2.7 and 2.8.

Action: To confirm the acquisition of the GRIB2 gridded forecast files, check that files with an appropriate date were created under the directories <*ftp_dir*>/GFS, <*ftp_dir*>/GEFS, and <*ftp_dir*>/CFSv2.

NOTE: The GFS and GEFS acquired files are always those associated with hour 0 Z.

NOTE: The CFSv2 files will always be 24-hours delayed, so that those acquired for a specific date will be labeled with the previous day.

Action: To confirm that the CFSv2 location-specific time series files were generated, look in the directory <*mefp_root_dir*>/cfsv2Interpolated/archive and confirm that subdirectories were created for the *installation catchments* in Section 1.1.

Action: Open up an operator client with access to data imported via scheduled workflows. Use the **Database Viewer** to determine if the workflows scheduled in Step 2.8 executed and successfully imported the gridded forecast data.

For example, the GEFS import should appear as 6 database entries, 3 under the GEFS_Location, and 3 under the GEFS_USA_Location:

			T0	Dispatch time	Workflow	What-if scenario	Descript...	FDO
			02-01-2013 12:0...	02-12-2013 19:0...	ImportMEFP-GEFSGrids			wardj

moduleInst...	group	parameterId	locationId	locationNa...	x	y	timeSeries...	valueType	timeStep	externalFo...
2	2	3	2	2			1	1	1	2
ImportME...	Precip	FMAP	HEFS_GEFS	GEFS Loca...	0	0	external f...	grid	6 hour	01-31-2...
ImportME...	Temperat...	TFMN	HEFS_GEFS	GEFS Loca...	0	0	external f...	grid	6 hour	01-31-2...
ImportME...	Temperat...	TFMX	HEFS_GEFS	GEFS Loca...	0	0	external f...	grid	6 hour	01-31-2...
MEFP_GEF...	Precip	FMAP	HEFS_GEF...	GEFS_USA ...	0	0	external f...	grid	6 hour	01-31-2...
MEFP_GEF...	Temperat...	TFMX	HEFS_GEF...	GEFS_USA ...	0	0	external f...	grid	6 hour	01-31-2...
MEFP_GEF...	Temperat...	TFMN	HEFS_GEF...	GEFS_USA ...	0	0	external f...	grid	6 hour	01-31-2...

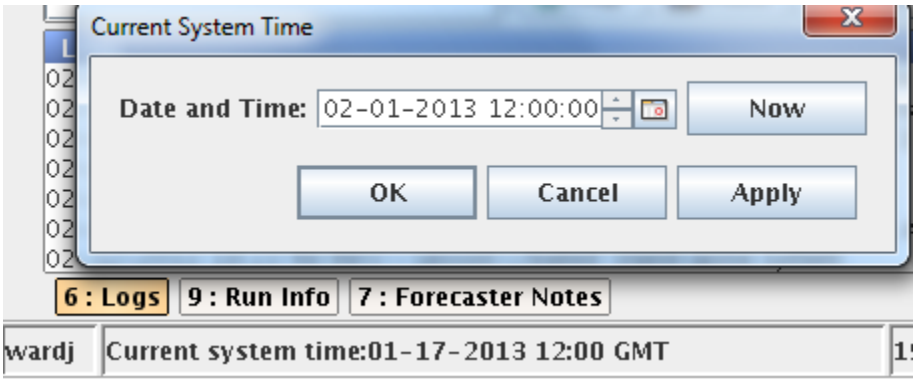
If the 3 GEFS_USA_Locations are missing,

			T0	Dispatch time	Workflow	What-if scenario	Descript...	FDO
			01-17-2013 12:0...	02-12-2013 19:0...	ImportMEFP-GEFSGrids			wardj

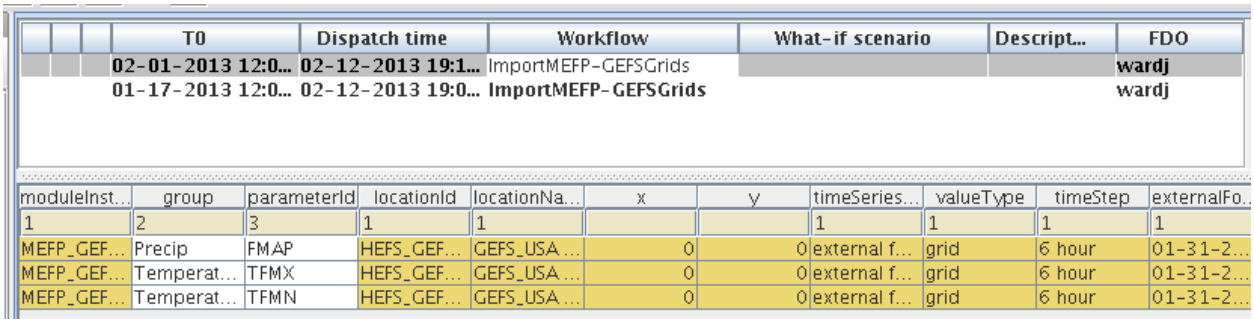
moduleInst...	group	parameterId	locationId	locationNa...	x	y	timeSeries...	valueType	timeStep	externalFo...
1	2	3	1	1			1	1	1	1
ImportME...	Precip	FMAP	HEFS_GEFS	GEFS Loca...	0	0	external f...	grid	6 hour	01-31-2...
ImportME...	Temperat...	TFMN	HEFS_GEFS	GEFS Loca...	0	0	external f...	grid	6 hour	01-31-2...
ImportME...	Temperat...	TFMX	HEFS_GEFS	GEFS Loca...	0	0	external f...	grid	6 hour	01-31-2...

then check that the day of the **Current system time** matches the import data day. The Current System Time is set in the lower left hand corner:

If the days do not match, click in the **Current system time** and set it to the import data day. Click **OK** when done:



Re-run the GEFS import workflow and the 3 GEFS_USA_Locations should appear:



T0	Dispatch time	Workflow	What-if scenario	Descript...	FDO
02-01-2013 12:0...	02-12-2013 19:1...	ImportMEFP-GEFSGrids			wardj
01-17-2013 12:0...	02-12-2013 19:0...	ImportMEFP-GEFSGrids			wardj

moduleInst...	group	parameterId	locationId	locationNa...	x	y	timeSeries...	valueType	timeStep	externalFo...
1	2	3	1	1			1	1	1	1
MEFP_GEF...	Precip	FMAP	HEFS_GEF...	GEFS_USA ...	0	0	external f...	grid	6 hour	01-31-2...
MEFP_GEF...	Temperat...	TFMX	HEFS_GEF...	GEFS_USA ...	0	0	external f...	grid	6 hour	01-31-2...
MEFP_GEF...	Temperat...	TFMN	HEFS_GEF...	GEFS_USA ...	0	0	external f...	grid	6 hour	01-31-2...

After all the imports are confirmed in the **Database Viewer**, repeat the steps in Section 2.5 starting with Step 16 to view the gridded forecasts via the **Spatial Display Panel** in CHPS.

<u>TO ADD NEW SEGMENTS OR FORECAST GROUPS</u>: After completing all other steps to add the new forecast group and/or segments, perform the second action above after waiting 24-hours to confirm that CFSv2 location-specific time series files were created for the new catchments.

3 Adding Segments and Forecast Groups

3.1 *Adding a New Segment*

To add a new segment for an existing forecast group, first identify the locationIds for any catchments for which MEFP must generate FMAP and FMAT forecast ensembles. Then, the actions described in the following sections must be repeated in order (see the **TO ADD NEW…** descriptions in each section):

- Section 2.4.5 – Add the catchments to the location set defined for the forecast group.
- Section 2.6 – Synchronize changes to the central server.
- Section 2.9 – Confirm that CFSv2 location-specific time series files are being generated for the new catchments.

3.2 *Adding a New Forecast Group*

To add a new forecast group:

- Identify the segments for which the MEFP will be executed within that group
- Identify the locationIds for any catchments used in those segments for which MEFP must generate FMAP and FMAT forecast ensembles.

The actions described in the following sections must be repeated in order (see the **TO ADD NEW…** descriptions in each section):

- Section 2.4.1 – Create copies of an existing forecast group's module configuration directory and files.
- Section 2.4.2 – Modify the MEFP_CFSv2_Export workflow to execute the new forecast group's module.
- Section 2.4.5 – Add the catchments to the location set defined for the forecast group.
- Section 2.4.6 – Add the created module to the ModuleInstanceDescriptors.xml file.
- Section 2.6 – Synchronize changes to the central server.
- Section 2.9 – Confirm that CFSv2 location-specific time series files are being generated for all new catchments.

4 Troubleshooting

4.1 *Imported Grids are Not Visible in the Database Viewer*

This problem occurs most often when confirming the installation by importing test grids (see Section 2.5). If the import workflows appear to run without errors but no new entry is created in the **Database Viewer Panel** of the CHPS interface, then the most likely cause is that the same grids are being imported a second time in the CHPS database. If the same grids are imported multiple times, only the first import job will include an entry in the table of the **Database Viewer**. To see a new entry, restore the original localDataStore before the first import was done, or delete the localDataStore.

This may also indicate problems in the configuration of the import modules. Check the configuration against the instructions provided in Section 2. If no problems are found, report this as an issue via the usual means (FogBugz).

4.2 *XML Format is Preferred for CFSv2 Time Series Files*

By default, all CFSv2 location specific time series files are exported in FastInfoset, .fi, format. That format is binary, making it so that the files are not human readable without first converting them using tools in the FEWS interface to XML format. If an ASCII XML format is preferred, make the changes described in the action below.

NOTE: Making this change increases the amount of space required per location in the *<mefp_root_dir>* to approximately 55 MB per location (see Section 2.2).

Action: Open this file in your editor of choice:

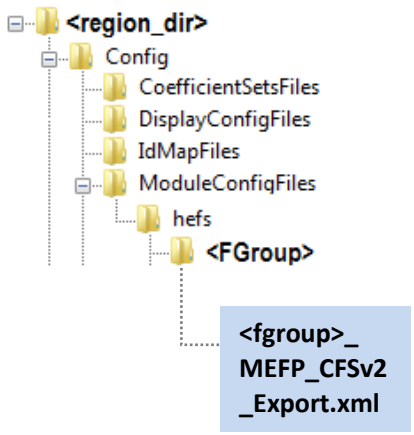
<configuration_dir>/ModuleConfigFiles/hefs/*<fgroup>*/*<fgroup>*_MEFP_CFSv2_Export.xml

Change the "fileNamePattern" property value specified in the exportRunFileActivity element to end in .xml (highlighted in green):

```
<string key="fileNamePattern"
    value="@locationId@/@locationId@.@parameterId@.@forecastDateT0(yyyyMMddHH;GMT)@.xml"/>
```

See the example below to see the change in the context of the exportRunFileActivity XML element within the file (the affected line is **bold**; some lines of XML are long so that it spans multiple lines in the text below).

Description: The TimeSeriesExporterModelAdapter determines the format of the file based on the extension. Changing it to "xml" will cause the adapter to output an ASCII XML file. The exported files will now be human readable, but the estimated space required per location will increase.

Standard Location: *<configuration_dir>*/**ModuleConfigFiles/ hefs/***<fgroup>/*	**Contents:** ***<fgroup>*_MEFP_CFSv2_Export*.xml***
	<?xml version="1.0" encoding="UTF-8"?> <generalAdapterRun xmlns="http://www.wldelft.nl/fews" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.wldelft.nl/fews http://fews.wldelft.nl/schemas/version1.0/generalAdapterRun.xsd"> … <exportRunFileActivity> <exportFile>%ROOT_DIR%/run_info.xml</exportFile> <properties> <!-- Valid arguments to put within '@' symbols are locationId, parameterId, ensembleId, handbook5Id, and the forecastDateT0 argument function which takes two parameters: date format and time zone. This uses standard Graphics Generator arguments syntax, so refer to its documentation for more information. --> <!-- DO NOT CHANGE THE FILE NAME: only the extension can be

Standard Location: <*configuration_dir*>/**ModuleConfigFiles/hefs/**<*fgroup*>/	**Contents:** <***fgroup***>**_MEFP_CFSv2_Export.*xml***
	changed (either .xml or .fi is valid). The CFSv2LaggedEnsembleModelAdapter model assumes the file name matches this pattern. --> **<string key="fileNamePattern" value="@locationId@/@locationId@.@parameterId@.@forecastDateT0(yyyyMMddHH;GMT)@.xml"/>** <!-- The base directory for output files. Subdirectories based on the file names are created as needed. --> <string key="exportDir" value="$MEFP_ROOT_DIR$/cfsv2Interpolated/archive"/> <!-- For CFSv2, the forecast time is part of the file name. That time must be computed from the data, as the forecast time CHPS associates with the time series when imported may not match the required time. This field instructs the TimeSeriesExportAdapter to compute the forecast time for a time series as being 6-hours BEFORE the time of the first data value, instead. --> <!-- DO NOT CHANGE THE FIELD BELOW! --> <int key="t0ComputationAdjustmentFactorFromFirstDataValue" value="-6"/> </properties> </exportRunFileActivity> … **</**generalAdapterRun**>**

4.3 *CFSv2 Location Specific Time Series Files Failed to Export*

Errors in executing CFSv2 location specific time series files are most often detected when executing CFSv2LaggedEnsembleModelAdapter which uses those files as input; see the *MEFP Configuration Guide: Forecast Components.* Specifically, when executing a module that runs that adapter, a log message similar to the following may be seen:

> Error executing model: Error building ensemble component list for ASEN6HUD: No acceptable first time series file was found in the archive directory with a time within 24 hours of 2013-03-26 12:00:00 GMT for location ASEN6HUD and parameter FMAP.

Note that the system time (T0) of the module execution is in the error message, highlighted above. The catchment locationId is also noted in the error message and is highlighted. To determine the cause of the problem, check the following directory:

> <*mefp_root_dir*>/cfsv2Interpolated/archived/<*catchment*>

where <*catchment*> is the catchment locationId noted in the error message. List the files in that directory in reverse chronological order and include the last modified dates (i.e., ls –lrt). You may see something similar to the following:

```
-rw-r--r-- 1 fews fxalpha 17769 Mar 25 05:02 ASEN6HUD.TFMX.2013032400.fi
-rw-r--r-- 1 fews fxalpha 17658 Mar 25 05:02 ASEN6HUD.TFMN.2013032400.fi
-rw-r--r-- 1 fews fxalpha 17743 Mar 25 05:02 ASEN6HUD.FMAP.2013032400.fi
-rw-r--r-- 1 fews fxalpha 17713 Mar 25 11:02 ASEN6HUD.TFMX.2013032406.fi
-rw-r--r-- 1 fews fxalpha 17596 Mar 25 11:02 ASEN6HUD.TFMN.2013032406.fi
-rw-r--r-- 1 fews fxalpha 17521 Mar 25 11:02 ASEN6HUD.FMAP.2013032406.fi
-rw-r--r-- 1 fews fxalpha 17854 Mar 25 17:02 ASEN6HUD.TFMX.2013032412.fi
-rw-r--r-- 1 fews fxalpha 17734 Mar 25 17:02 ASEN6HUD.TFMN.2013032412.fi
-rw-r--r-- 1 fews fxalpha 17310 Mar 25 17:02 ASEN6HUD.FMAP.2013032412.fi
-rw-r--r-- 1 fews fxalpha 17741 Mar 25 23:02 ASEN6HUD.TFMX.2013032418.fi
-rw-r--r-- 1 fews fxalpha 17610 Mar 25 23:02 ASEN6HUD.TFMN.2013032418.fi
-rw-r--r-- 1 fews fxalpha 17638 Mar 25 23:02 ASEN6HUD.FMAP.2013032418.fi
-rw-r--r-- 1 fews fxalpha 17830 Mar 26 05:02 ASEN6HUD.TFMX.2013032500.fi
-rw-r--r-- 1 fews fxalpha 17783 Mar 26 05:02 ASEN6HUD.TFMN.2013032500.fi
-rw-r--r-- 1 fews fxalpha 17527 Mar 26 05:02 ASEN6HUD.FMAP.2013032500.fi
-rw-r--r-- 1 fews fxalpha 17702 Mar 26 17:00 ASEN6HUD.TFMX.2013032506.fi
-rw-r--r-- 1 fews fxalpha 17573 Mar 26 17:00 ASEN6HUD.TFMN.2013032506.fi
-rw-r--r-- 1 fews fxalpha 17882 Mar 26 17:00 ASEN6HUD.FMAP.2013032506.fi
```

You should see the following pattern:

- Files for hour 00Z (i.e., *00.fi) should be generated with a last modified time of 05:00 GMT (or shortly thereafter) on the next day.
- Files for hour 06Z should have time 11:00Z (or shortly thereafter) on the next day.
- Files for hour 12Z should have time 17:00Z (or shortly thereafter) on the next day.
- Files for hour 18Z should have time 23:00Z (or shortly thereafter) on the next day.

Note the lines highlighted above: the files are for 06Z but have the time 17:00Z. When this occurs, it likely indicates that the scheduled workflow execution for the preceding time (11:00Z) failed, so that no grids were imported. Then, at 17:00Z, both the 06Z and 12Z CFSv2 grids require processing, but CHPS only indicates that the earlier grid was processed, those at 06Z. Hence, the grids for 12Z were not properly processed. Other possible errors include the import succeeding, by export failing. In that case, the last modified times for all files will be correct, but some files for a specific time will be missing.

In any case, the fix is to manually execute the CFSv2 import workflow using any OC or SA that has the proper MEFP_ROOT_DIR global property setup. The files to import can be found in the directory <*ftp_dir*>/CFSv2 (see Section 2.7.1 for the value of <*ftp_dir*>), which contains an archive of 30-days of data. The files to import for a given date, denoted <*yyyymmdd*>, are stored in a tar file:

cfs.<*yyyymmdd*>.tgz

The contents of a tar package will be as follows:

```
cfs.<yyyymmdd>/…
    <hh>/…
        time_grib_01/
        time_grib_01/prate.01.<yyyymmdd><hh>.daily.grb2
        time_grib_01/tmin.01.<yyyymmdd><hh>.daily.grb2
        time_grib_01/tmax.01.<yyyymmdd><hh>.daily.grb2
        time_grib_01/prate.01.<yyyymmdd><hh>.daily.grb2.idx
        time_grib_01/tmin.01.<yyyymmdd><hh>.daily.grb2.idx
        time_grib_01/tmax.01.<yyyymmdd><hh>.daily.grb2.idx
```

where <*hh*> indicates the hour of the files and is 00, 06, 12, or 18.

Action: Untar the *.grb2 files for the appropriate hour to the appropriate import directory:

```
cd <CHPS_import_dir>/CFSv2
tar –zxvf <ftp_dir>/CFSv2/ cfs.<yyyymmdd>.tgz cfs.<yyyymmdd>/<hh>/time_grib_01/*.grb2
mv cfs.<yyyymmdd>/<hh>/time_grib_01/*.grb2 .
rm –rf cfs.<yyyymmdd>
```

(See Section 2.7.1 for the value of <*CHPS_import_dir*>.)

Action: Start a CHPS session configured to run the HEFS data ingest components and use the default import directory, <*CHPS_import_dir*>, for importing. Set the system time to match the date and hour of the data to import: <*yyyymmdd*> and <*hh*>. Using the **Manual Forecast** Dialog, execute the workflow ImportMEFP-CFSv2Grids.