

12 Preparing Cases for FFMP and Creating FFMP Data

12.1 Preparing a Case for FFMP

1. Because FFMP data are stored differently than most AWIPS data (i.e. files contain latest 6 hour accumulations time stamped in the filenames), archived FFMP data won't work directly with WES. Instead, a tool exists within WES to create FFMP data from archived datasets. Before WES can be used to create FFMP data, the case needs to be prepared for FFMP. These instructions should work for local cases or cases from other CWA's.
2. Creation of FFMP data from an archived case requires the following:
 - Basin files for each radar running FFMP (stored in `/awips/fxa/data/localization/nationalData`)
 - HRAP grid digital RFC flash flood guidance (stored in `<data_case>/img/SBN/netCDF/HRAP/FFG/XXRFC/Yhr` (where `XXRFC` is the RFC for your area and `Yhr` is 1hr, 3hr, and 6hr)
 - DHR files for each radar running FFMP stored in `<data_case>/radar/xxxx/DHR/layer0/res1/level256` (where `xxxx` is the radar name)
 - Directories: `<data_case>/tstorm`, `<data_case>/radar/xxxx/tstorm`, `<data_case>/radar/xxxx/ffmp` (where `xxxx` is the radar name), and `<data_case>/radar/xxxx/ffmp/lookupFiles`
 - A localization run with the "`-scan`" switch

Note: Failure to include all of the above elements will result in incomplete or bad FFMP data.

3. The first step in preparing your case for FFMP is to copy the basin files for each radar onto your WES. For your local cases, you should already have basin files on your AWIPS. Basin files from other radars will have to be retrieved from other NWS offices or the AWIPS NOAA1 server.

4. On your LX workstation copy the basin files to the WES (e.g. copy files to a tmp directory and burn a cd):

e.g. `cd /awips/fxa/data/localization/nationalData`

e.g. `cp kabr_* /data/fxalocal/tmp` and burn a cd S

5. On the WES, copy these files to the `/awips/fxa/WEScustomization/storagefiles` directory to preserve the files on the machine after any future WES upgrades as outlined in Section 6:

e.g. `cp /media/cdrecorder/kabr_*
/awips/fxa/WEScustomization/storagefiles`

6. Copy the basin files to the `/awips/fxa/data/localization/nationalData` directory:

e.g. `cp /awips/fxa/WEScustomization/storagefiles/kabr_*
/awips/fxa/data/localization/nationalData`

7. After copying the basin files to the WES machine, you need to ensure the FFG data exists in the case.

e.g. `ls <data_case>/img/SBN/netCDF/HRAP/FFG/XXRFC/Yhr` where `XXRFC` is the RFC for your area and `Yhr` is 1hr, 3hr, and 6hr)

8. Ideally you should include FFG data in your regular local archive, since there is no easy-to-access archive source for the digital FFG data (netCDF format). If you are trying to recreate old FFG files, you can check with the COMET case study group to see if they have access to the data (note that digital FFG data in general is not available prior to 1999 because that is when it was first distributed via the SBN). If you can access some digital FFG data that is somewhat representative for your case, this data may be configured for FFMP (see Section 12.3), though not having the exact FFG data for a specific case can significantly change the way FFMP characterizes events.

9. After ensuring FFG data exists in your case, ensure DHR data exists for each radar that will run FFMP.

e.g. `ls <data_case>/radar/xxxx/DHR/layer0/res1/level1256` (where `xxxx` is the radar name)

10. After ensuring DHR files exist in the case, ensure the required directories exist.

e.g. `ls <data_case>/tstorm`

e.g. `ls <data_case>/radar/xxxx/tstorm` (where `xxxx` is the radar name)

e.g. `ls <data_case>/radar/xxxx/ffmp` (where `xxxx` is the radar name)

e.g. `ls <data_case>/radar/xxxx/ffmp/lookupFiles` (where `xxxx` is the radar name)

11. If the directories do not exist in your case, copy a version of these directories over from either a case that has them, or your local AWIPS (create them manually as a last resort). Recreating a localization (steps 12 and 13) should update all the files needed for the particular case.

12. After ensuring the case structure is ready for FFMP, create a new localization for your case running `mainScript.csh`.

e.g. `mainScript.csh ABR ABR`

13. Once the localization is done, relocalize with the “`-scan`” switch to create all the needed FFMP configuration files.

e.g. `mainScript.csh -scan ABR ABR`

14. Start up D2D and check the SCAN menu to verify the FFMP menus exist for the radars that should run FFMP. If the radar isn't listed, include the desired radar in `XXX-radarsInUse.txt` and `XXX-radarsOnMenu.txt` files in the `customFiles` directory in the case (where `XXX` is your localization id for the case).

Note: These steps are for evaluating the configuration, and not for testing data. You will need to create new FFMP data in section 12.2 to be ready to look at data.

15. On the main Guardian GUI, select the “**FF**” button and ensure a reasonable “FFG Expiration Time” exists (e.g. 96 hours), and click “**Save**”. If the “FFG Expiration Time” is blank, FFMP will not be able to access the FFG data needed to create FFMP data.

16. Under the “**Maps**” and “**FFMP Basins**” submenu on the D2D, select the “**kxxx Small Stream Basins**” map, where `kxxx` is the radar name. Note the scale must be “State” or “Local” to display this map. If all the needed basin files were included in `nationalData`, and the localization was rerun, the high resolution basin maps should display.

17. Now the case should be ready to create FFMP data.

12.2 Creating an FFMP Tar File for WES

The FFMP data format changed in OB5, therefore all FFMP data created in WES 4.0 or earlier versions will need to be recreated once. FFMP data that worked in OB5.0 or later should continue to work with no further modification.

Once the case is configured for FFMP data creation (Section 12.1), WES can create FFMP data. The case can be in original format or DRT format when creating the data. The FFMP data is stored as tar files that are subsequently selected in the simulation entry window (e.g. **19970507_2346.tar.gz**).

The time of the FFMP tar file represents the end of the FFMP accumulations. For example, a 19970507_2346.tar.gz file contains data up to 2346Z. During a simulation the FFMPprocessor will create new data each volume scan to add to the existing accumulations.

Note: To browse FFMP data in a static mode, you can create an FFMP tar file for the end of the time period of interest and review the last 32 frames of data. The D2D “**Freeze time at this position**” tool (selected after double clicking the clock on the bottom right of the D2D) will not work with FFMP data.

Note: To use FFMP data in a simulation you will want to create data up to the start time of the simulation. The FFMPprocessor will add to the accumulations each volume scan during the simulation.

1. Start up WES8.1

e.g. `start_simulator`

2. Click the “**Tools**” button
3. Click the “**Create FFMP Dataset**” button.
4. Enter the information for your planned simulation
 - Select the case name (**FXA_DATA**)
 - Select the localization (**FXA_LOCAL_SITE**)
 - Select the start time (**FFMP start time**)
 - Click the “**OK**” button.

While you are waiting for FFMP data to be created, you may watch the progress of the FFMP processor in the shell window used to launch the simulator.

FFMP data will be created for the most recent 96 DHR files at the start of the simulation (size of the FFMP storage). It does this by feeding a subset of the DHR files to the FFMPprocessor and other decoders started during the data generation. If you have multiple radars and many DHR files, the process can take 5-10 minutes. The WES will warn the user if some of the requirements in Section 12 are not met.

Note: It is very important not to kill the simulator while it is creating FFMP data. If you kill the simulator while the FFMP data is being created, theDHR/layer0/res1/level1256.saved directory will need to be renamed to "level1256" after removing "level1256" and "level1256ffmp". Be careful not to delete your original data directory.

5. Following successful FFMP data creation, exit the simulator.

- Click the "Exit" button on the WES interface

Note: A tar file is created for each radars **ffmp** directory with the time stamp entered as the FFMP start time. The tar files are subsequently selected from the WES main simulation entry window, and they reside in <data_case>/radar/xxxx/ffmptars (where xxxx is the radar).

6. Start enhanced_case_review.

e.g. **enhanced_case_review**

7. Verify the FFMP data was created correctly

- Load the FFMP table for one of the valid radars.
- If there is no FFMP data in your case, then review any error messages and contact WES support.

8. Exit the **enhanced_case_review** session by closing D2D

9. Start up WES8.1

e.g. **start_simulator**

10. Make sure your case is in DRT format before going on to the next step

11. After the data have been verified to exist, select the FFMP tar file in the main simulation entry window.

- In the main WES interface, click “**Run Simulation**”
 - Next to the “FFMP File and Radars” entry window, click on the “**Select**” button, and select a radar to be used.
 - A list of tar files should pop up. Select the desired tar file time, and click “**OK**”.
 - The tar file selected should appear in the main simulation entry window along with a list of radars that have tar files at that time. Selecting one tar file from one radar will grab all the available tar files from other radars. Click “**OK**” to proceed with the simulation startup.
12. After the links are created for the simulation start time, each radars `ffmp` directory is deleted, and a new directory is untarred into its place with the data valid up to the start time.
 13. Note that most of the AWIPS decoders are also started in this step.
 14. Before clicking on “**Run Simulation**” in the Verification Entry window, you may start D2D and view the new FFMP datasets with full FFMP table functionality.
 15. If you wish to run a simulation, you may click “**Run Simulation**”, and you will need to start a new D2D session. The FFMPprocessor is then started for simulation use, and each time the DHR files are processed by WES, a notification is sent to the FFMPprocessor and other AWIPS processes to create new FFMP data and update the table as in real time.

12.3 Creating FFG Data for an Old Case From Recent FFG Data

Background: Some of your old archived data sets may not have netCDF flash flood guidance needed for use with FFMP. If you have some digital FFG data from another event that is reasonably close to the FFG for the case, you may modify the files to serve as substitute FFG.

1. Copy the FFG files into your case as outlined in Section 12.1.
2. For each file you will need to create a new FFG netCDF file with the modified time.
3. Use “`ncdump`” to create a text version of the file to modify. The following examples will illustrate creating a `19910426_1200.multi` file from a `19970501_1200.multi` file.

e.g. `ncdump 19970501_1200.multi > tmp.txt`

4. Determine the time of the new FFG data you wish to create (e.g. `19910426_1200`).

5. Create a file, `newtime.txt`, with the time entered in the following format: `ss mm hh dd MM YYYY` where `ss` is the seconds, `mm` is minutes, `hh` is hour, `dd` is day, `MM` is month, and `YYYY` is year (e.g. `00 00 12 26 04 1991`).
6. Obtain the Julian seconds from 1970 for this time by running
`/awips/fixa/DRT/calJulSecFrom1970.linux < newtime.txt`
7. Edit the text version of the FFG data (e.g. "`vi tmp.txt`") and replace the integer following "`validTime =`" with the new Julian seconds from 1970 time calculated in step 6, and save the file.
8. Create a new netCDF file from your modified text file using `ncgen`.

e.g. `ncgen -o 19910426_1200.multi tmp.txt`
9. Remove all the old files just leaving the updated FFG file.
10. Start D2D, and verify the FFG data is visible, and that it loads the appropriate time.
11. Repeat the process for each FFG file in the 1hr, 3hr, and 6hr directories.
12. If the data displays correctly, try creating new FFMP data with Section 12.1.

Note: If the integer seconds time is incorrect, the data will still display correctly, but the FFMPprocessor will fail to time match the FFG data when new data is created with WES.
