

12 Preparing Cases for FFMP and Creating FFMP Data

12.1 Preparing a Case for FFMP

Background: FFMP data fundamentally changed in OB8.3 with the release of FFMP Advanced (FFMPA). WES has been modified significantly to limit some of the negative impacts of the changes. While you can still use DHR files and RFC flash flood guidance from your old archived cases as some of the common inputs, there are significant differences in AWIPS and WES compared to before. Below is some background information on FFMP in OB8.3 and WES8.3 that you should familiarize yourself with.

- FFMP data is now stored in the `<your_case>/ffmp` directory (`/data/fxa/ffmp` on real-time AWIPS) instead of in each radar's "ffmp" subdirectory.
- FFMP data are stored as hourly binary files under each source's subdirectory under the "ffmp" directory (see `ffmp/FFMPsourceConfig.dat` for sources).
- The D2D "**Freeze time at this position**" tool (selected after double clicking the clock on the bottom right of the D2D) used to not work with FFMP data, but now it does
- WES8.3 no longer uses FFMP tar files to manage FFMP data, and there is no longer any need to specify FFMP setting in the simulation entry window.
- FFMP basin files on your live AWIPS are now stored as FFMP* and ftmp* files in `/awips/fxa/data/localization/nationalData` as opposed to the previous convention of having file names represent their contents (like `ktlx*`). This creates problems in switching basin files for localization and keeping track of the contents of these files. To get around this, FFMP customization will be a little different on WES8.3 (see next bullet).
- **When you customize the AWIPS OB8.3 on WES8.3, all FFMP* and ftmp* customization files *must* be placed in a `/awips/fxa/data/localization/nationalData/WES-FFMP/$CWA` directory, where `$CWA` is the CWA (e.g. ABR).** The AWIPS `mainScript.csh` in WES8.3 has been modified to link to the appropriate CWA directory when the "-ffmp" switch is used, so you won't trip yourself up switching between CWAs or cases when localizing on WES.
- The AWIPS OB8.3 localization process will also *create* some new FFMP* files in `/awips/fxa/data/localization/nationalData` on your real-time AWIPS

or WES. These include the menu items for D2D. To insure these files are kept consistent with your other customization files, we modified mainScript.csh to copy the new files to your `.../nationalData/WES-FFMP/$CWA` directory after localization with the “-ffmp” switch is complete.

- The FFMP* and ffmt* in nationalData must also be kept consistent with the *data* being displayed. To insure this happens, mainscript.csh has also been modified to copy a version of the FFMP customization files to the data case in the `<your_case>/saved_FFMP_customization_files/$CWA` directory. The WES's `/awips/fxa/bin/awips5x*` D2D startup files have been modified to dynamically link the FFMP files in nationalData to the `<your_case>/saved_FFMP_customization_files/$CWA` directory. If you want to share FFMP data with others, you will need to package the `saved_FFMP_customization_files` directory with your case.
 - Localization in `mainScript.csh` with the “-ffmp” switch will delete all ffmt accumulation data on your real-time AWIPS or in your WES case when it is run. If this happens, you can use the FFMP data creation tool to recreate FFMP data accumulations. This tool will work on OB8.3 archived cases and pre-OB8.3 archived cases containing the inputs to FFMP (typically DHR files and RFC FFG files).
 - A tool button exists in WES to create FFMPA data for use with AWIPS OB8.3 and WES8.3. Use this tool when your accumulation data is deleted during localization or when you want to create FFMPA data from archived cases with DHR files and RFC FFG files. The FFMP_DRT AWIPS code used in this batch mode has shown sensitivities to large full day cases with lots of radars. If you have any problems with case generation don't hesitate in contacting WES support.
1. Customization of FFMP on WES requires many steps. These were covered in Sections 6 and 7. Ensure you have the following:
- FFMP* and ffmt* files from `/awips/fxa/data/localization/nationalData` stored in `/awips/fxa/data/localization/nationalData/WES-FFMP/$CWA` on WES where \$CWA is your CWA (e.g. ABR)
 - The `/data/fxa/tstorm` and `/data/fxa/ffmp` directories with all their contents from your local AWIPS copied to `<data_case>/tstorm` and `<data_case>/ffmp`

Note: If you are assembling a data case for a non-local CWA you will need to modify the `/data/fxa/tstorm/FFMPPradartoCWA.txt` file to be consistent with your radar data before localizing.

- 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)

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 missing FFG files you can email the wes@infolist.nws.noaa.gov to leverage other regional and national archives. If you are unable to locate any archived FFMP data, you can use FFG from a similar archived case (see Section 12.3).

- DHR files for each radar running FFMP stored in `<data_case>/radar/xxxx/DHR/layer0/res1/level256` (where **xxxx** is the radar name)
 - SCAN QPF files in `<data_case>/radar/xxxx/tstorm/QPF/rain_cat` (where **xxxx** is the radar name; note this is optional)
 - Any other locally specified input sources listed in `<data_case>/ffmp/FFMPSourceConfig.dat`
 - Note if you have configured FFMPA to use HPE and BHPE sources on your realtime AWIPS, these are located in `<data_case>/Grid/LOCAL/netCDF/HPE` and `<data_case>/Grid/LOCAL/netCDF/BHPE`
 - Have run a localization with the “-ffmp” switch
2. Start 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, your customization and relocalization needs to be redone (see Sections 6 and 7). Don't try to load the FFMP sources yet, since the data needs to be created first in Section 12.2.
 3. Under the “**Maps**” and “**FFMP Basins**” submenu on the D2D, select the “**xxxx Small Stream Basins**” map, where **xxxx** 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.
 4. Now the case should be ready to create FFMP data. If you can't see your basin maps or you don't have FFG data, then email wes support before going any farther.

12.2 Creating FFMP Data on WES

Follow this section to create FFMP data on WES8.3 after you have complete Section 12.1. You will need to create FFMP data for a case after every time an “-ffmp” switch is run on the case with mainScript.csh or if you want to generate new data for other reasons. The case can be in original format or DRT format when creating the data.

1. Start up WES8.3

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**)
- Click the “**OK**” button, and wait for the data to be created. WES is running the FFMP_DRT application to create a batch mode of data. For cases with no HPE/BHPE data the processing can take less than a minute (runs in fast mode). For case with HPE/BHPE data, this can take much longer, sometimes ten minutes (runs with a 1 second pause between each file to prevent errors in processing). While you are waiting for FFMP data to be created, a window will pop up with a clock counter and a message asking you to wait.

Note: It is very important not to kill the simulator while it is creating FFMP data.

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

- Click the “**Exit**” button on the WES interface

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.

Note: The D2D “Freeze time at this position” tool (selected after double clicking the clock on the bottom right of the D2D) now works with FFMP in OB8.3.

8. Exit the `enhanced_case_review` session by closing D2D
9. Start up WES8.3

e.g. `start_simulator`
10. Make sure your case is in DRT format before going on to the next step
11. Note that most of the AWIPS decoders are also started in this step.
12. 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.
13. 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 FFMP input files (e.g. DHR or HPE 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/fxa/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 12.2.

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.
