FFMP Functionality Walk-Through (Part 2)

Introduction

This presentation continues the FFMP Walk-Through from Part 1.

If continuing directly from Part 1, you should be in a WES simulation with FFMP products loaded into D2D. The FFMP data should be from 2214 UTC (the simulation time should be between 2217 and 2220 UTC) on 24 August 2006.

Note: In the following slides, any actions using FFMP or D2D are in a bulleted format, and any actions for this presentation are shown in red.

Click on many of the graphics contained in this presentation for a larger view.

2214 UTC: Aggregation Levels

FFMP performs its calculations using a concept of "Aggregation Levels". This basically refers to the spatial scale FFMP uses to perform basin averaging of rainfall accumulations. The **Layer** menu provides the ability to specify this setting. The default value is county-level averaging. Varying amounts of detail result from **HUC_0** (largest basins with most spatial averaging) to **HUC_4** (small basins with least spatial averaging).

To see displays at various levels of spatial averaging:

- Use the **Layer** menu to change the averaging to **HUC_2.**
- Use the **Layer** menu to change the averaging to **All and Only Small Basins**. **All and Only Small Basins** means no aggregation is performed.

Note that both the tabular values and D2D displays reflect the change in aggregation level.

Recommendation: Because of the potential of having tens of thousands of small basins at the smallest aggregation levels, it is recommended to keep the Layer setting at **County** to help you maintain geographic awareness. Widespread flooding of larger basins represents a situation when a different aggregation level is useful.

Click on the accompanying picture to see the displays at 2214 UTC.

2214 UTC: Click Behavior/Basin Connectivity

FFMP provides a method to examine the connectivity of basins.

Zoom into a basin in McPherson County that has 1.5-hr rainfall accumulation exceeding FFG by 0.47":

- Use the slider to set the **Duration** to 1.5 hours.
- Use the D2D menu to set the display to **diff** and click the **Refresh D2D** button.
- Click the **DIFF** column heading in the FFMP table to sort the table.
- Click the **SD,MCPHERSON** cell to zoom into McPherson County.
- Click on the **XXXX** label in the first row of the FFMP table to zoom to the basin.

Use D2D to see the basin connectivity:

•On the D2D display, make the **FFMP kabr Table Display** "editable". There are two ways to do this:

1. Right-click on the **FFMP kabr Table Display** legend label in the bottom right of the D2D display and select **Editable** from the pop-up menu.
2. Middle-click on the **FFMP kabr Table Display** legend label.

•Right-click on the un-named (XXXX) basin in the D2D display (it should be marked with the X).

The basins that are connected to this basin appear stippled. Suggestions to make the connectivity easier to see:

1. Change the color of the **FFMP kabr Table Display** in D2D to a more contrasting color (right-click on the legend entry). The example graphic below used red.
2. Make the **FFMP kabr Table Display** to blink (right-click on the legend entry).

The **Click** menu changes the behavior of the right-click action in D2D, either for upstream basins, downstream basins, or both. This menu also permits the right-click in D2D to request a basin trace (time series graph). The basin trace is always available by right-clicking on a cell in the **NAME** column in the FFMP table.

- Use the Click menu to set the various right-click options in D2D.
- In D2D, right-click on the XXXX basin to see the effect of the click options (viewing upstream, downstream, or both upstream and downstream connectivity, or the basin trace).

By comparing the up/down, upstream, and downstream connectivity, it appears that this stream flows to the west.

Click the graphic below to obtain an animation that illustrates these actions. The graphic should match your display for 2214 UTC.

2219 UTC: Interactive Basin Trace

The basin trend graphs in FFMP provide a level of user interactivity, allowing users to customize the appearance of the graph by specifying various line plots (rate, qpe, guidance, ratio, diff, and qpf). One of the line plots can be color-filled. See this example for more information on the features of the basin trend graphs.

- Using the 2219 UTC plot for same basin queried in the previous step (FFMP id: 6996, PFAFS id: 1988865000000, diff=0.47"), obtain the basin trace. This can be done in one of two ways:
  1. When the click behavior is set to Basin Trace, right-click on the basin in the D2D FFMP display.
  2. Right-click on the basin label ("XXXX") in the second row of the FFMP table (the FFMP table is "zoomed" into McPherson county).

- If they are not already displayed, toggle the FFG values on (click the **guid** box). When the FFG is plotted on the all hour plot, the time axis, in effect, is interpreted as an accumulation period. In this case, the 1-hour accumulation (3 inches) exceeds the 1 hr FFG (2.5 inches). The 3 hour accumulation (also 3 inches), exceeds the 3 hr FFG (about 2.7 inches). The 6 hour accumulation (3 inches) does not exceed the 6 hour FFG (3.1 inches). The 1, 3, and 6 hour accumulations are all the same because most of the rain fell in the last hour (shown by the blue rate curve).

- Click the **1 hr** button to see the 1 hour plot. The accumulation exceeded the 1-hr FFG just prior to 15 minutes ago.
- Click the **3 hr** button to see the 3 hour plot. The accumulation also exceeded the 3-hr FFG value within the last 15 minutes.
- Turn on the QPF plot (click the **qpf** box). The 3 hour plot shifts to become 2 hours of observed accumulation plus 1 hour of forecast accumulation. The forecast expects the 3 hour FFG value to be exceeded by about another inch within the next hour.
- Click the **1 hr** button to see the 1 hour plot. This plot displays only the 1 hour forecast accumulation.
- Click the **All hr** button to see the all hour plot, indicating that the observed 5-hour accumulation has exceeded the guidance. In addition, either the observed accumulation or the forecast accumulation exceeds

the FFG values for all time scales or accumulation periods (either the black line or the orange line is above the purple line for the entire graph).

Compare the reflectivity with the SCAN QPF forecast. Do this by:

- Swap D2D panes and choose WFO scale for the new main pane
- Get the best resolution 0.5 degree base reflectivity from the kabr radar. Choose **kabr**, then **kabr Best Res Refl,** followed by **0.5 Refl.**
- Add contours of 1 hour QPF as an overlay. Choose **SCAN,** then **QPF from kabr** under ***SCAN:kabr***, followed by **QPF 1 hr Categorical.**

Notice how the QPF contours basically are an advection of the reflectivity pattern. Experience seems to indicate that SCAN QPF values are capped at 0.7" per hour, which may be unrealistic. Other sources, such as the High Resolution Precipitation Nowcaster (HPN) may yield better QPF values.

Another way to see the QPF values is to load the image of the SCAN QPF produced by FFMP.

- Swap D2D panes and choose WFO scale for the new main pane.
- Under the **SCAN** menu, choose **kabr** under ***FFMP***. Then choose **QPF**, followed by **QPFSCAN**, followed **by FFMP kabr QPFSCAN 1 Hour display**.

Depending on your local office configuration, additional sources of QPF are likely available, including QPFHPE (HPE = High-resolution Precipitation Estimator), which is produced by HPN (High-resolution Precipitation Nowcaster).

Click the graphic below to obtain an illustration. This graphic should closely match your display at 2219 UTC.

2224 UTC: Zoom Menu (Maintain Layer/Basins in Parent)

The manner in which FFMP zooms into basins is controlled using the **Zoom** menu and setting **Maintain Layer** and **Only Basins in Parent** to either **off** or **on**.

- Set the time duration to 3.0 hours.
- Zoom into Sully County, SD (click on the **SD, SULLY** cell in the **NAME** column of the FFMP table).
- Zoom into the top Artichoke Creek basin listed (it has 1.77" of QPE at 2224 UTC).
- Make the county overlay easier to see:

1. Press the keypad **Enter** key until the map legend appears.
2. Right-click on County Boundaries and set its properties. The example sets the color to white, the line style to dashed, and the line width to the second thinnest line.

- Play with turning the **Zoom** menu options off and on. You will have to Refresh D2D each time.

The behaviors are as follows:

1. Maintain Layer is off and Only Basins in Parent is on: These default settings specify that the zoomed D2D display only shows the basins within the specified aggregation level and no other basins.
2. Maintain Layer is off and Only Basins in Parent is off: All basins within the D2D window are displayed.
3. Maintain Layer is on regardless of the setting of Only Basins in Parent: Only small basins within the chosen aggregation level are displayed. The small basins are given the color of the level that was zoomed from.

Note: Choosing **All & Only Small Basins** *in the* **Layer** *menu overrides any of these settings.*

Recommendation: When dealing with most flash flood situations, keep both **Maintain Layer** *and* **Only Basins in Parent** *turned off so long as you use appropriate maps to maintain your geographic bearings.*

Click the graphic below to obtain an animation that illustrates these actions. In the graphic, use the Zoom menu in the various zoomed displays to view the different combinations of these settings.

The graphic should match your display for 2224 UTC.

To obtain credit for this exercise, write the keyword for this exercise in your Topic 1 student guide. You will need this keyword for the Topic 1 post-test in the LMS. The keyword for this exercise is: basins.