



Burlington Street Bridge in Iowa City on June 30, 2014  
(Photo Credit: Adam Wesley/The Gazette-KCRG-TV9)

# Warning Operations Course: Flash Flood

## Background Case Information

June 29 – July 1, 2014 Des Moines event

Designed by the National Weather Service  
WARNING DECISION TRAINING DIVISION (WDTD)  
Office of the Chief Learning Officer (OCLO)  
Release Date: February 2016



# Table of Contents

(Labels are clickable links to navigate to that section)

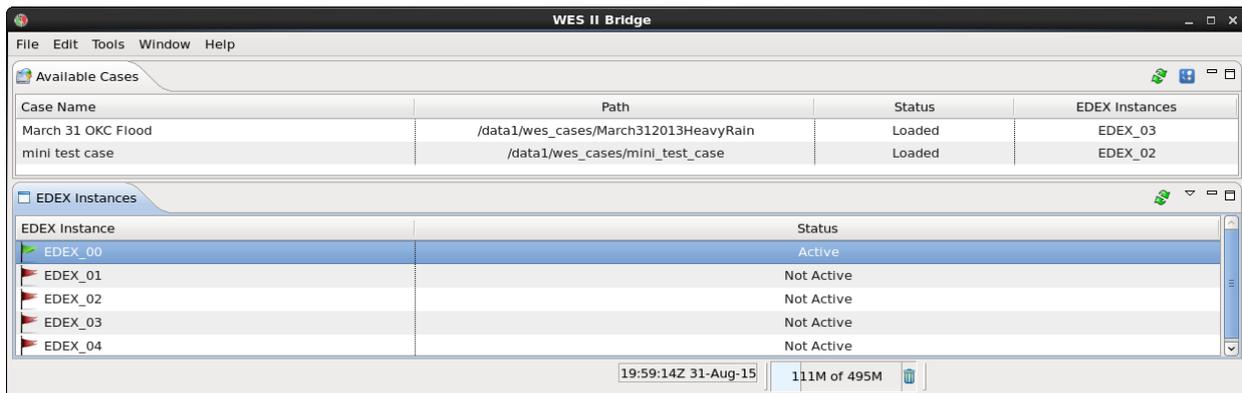
- I. [Weather Event Simulator](#) .....3
- II. [Data Characteristics](#) .....4
  - 1. [Radar Data](#) .....4
  - 2. [FFMP Data](#) .....4
  - 3. [Upper Air](#) .....5
  - 4. [Satellite Data](#) .....6
  - 5. [Model Data](#) .....6
  - 6. [Standardized Anomalies](#) .....6
- III. [Procedures](#) .....7
- IV. [Pre-Loaded Warnings](#) .....7
- V. [WESSL Script](#) .....8
- VI. [Launching the Simulations](#) .....8



# I. Weather Event Simulator: WES-2 Bridge

The “Bridge” in WES-2 Bridge is just that – this application is a “bridge” between the Legacy WES (Weather Event Simulator), or “WES-1” in AWIPS 1 and the eventual WES-2 capability in the AWIPS 2 baseline. WES-2 Bridge is an application that allows playback of data in either “Review” or “Simulation” mode, the difference being now the clock time is managed.

This simulation requires that you have at least the 14.3.1 release of the WES-2 Bridge (example below). Do not continue with these simulations until you have successfully installed and tested WES-2 Bridge. Full and updated information about this process can be found on the WES-2 Bridge training web page at: <http://www.wdtd.noaa.gov/tools/wes2/training.php>. The page contains an installation guide and a set of job sheets that is used with the WES-2 Bridge Test Case.



Instructions on how to load the case, and begin the simulation is provided in the Quick Start Guide. A new feature of the WES-2 Bridge is the ability to control the simulation progress, via the “Simulation Controls” window (image below). You may pause, stop, and skip around in a case. The “SYNC” feature forces CAVE and WES-2 Bridge to be at the same time in case they get separated.





You will be using the PAUSE feature during Simulation Application #2. We do **not** recommend that you attempt to skip while completing our performance objectives, as there are known issues with FFMP that may interfere with your case interpretation.

## II. Data Characteristics

The original AWIPS data was provided by the National Weather Service (NWS) Des Moines, IA (DMX) Weather Forecast Office (WFO). Most data is accessible during the simulations. While there may be some incomplete or missing data due to the archiving process and to reduce the overall size of the case on your WES hard drive, there is enough data present for the trainee to be able to satisfy the performance objectives. This section will outline the details of the various AWIPS data that are available.

### 1. Radar Data

KDMX is the primary radar, (the only radar data provided in this case). There is no radar data for Simulation Application #1. Table 1 lists the radar characteristics for KDMX in Simulation Application #2. This table includes the location, primary VCP, and availability of FSI, SCAN, and DMD.

Simulation Application #2: 30 June 2014 -- 1800 UTC to 1930 UTC

Radar ID	Location	VCP	Dual-Pol	FSI	SCAN/DMD
KDMX	Des Moines, IA	212	Yes	No	Yes

**Table 1:** Details of the radar(s) provided in this case.

### 2. FFMP Data

The Flash Flood Monitoring and Prediction (FFMP) program is available for KDMX during the time period of available radar data in Simulation Application #2 (see above). FFMP data were computed from both the legacy Digital Hybrid Reflectivity (DHR) and Dual-Polarization Digital Precipitation Rate (DPR) files. HPE and BiasHPE data are also available in FFMP. For reasons discussed in the Simulation Application #2 pre-brief (as well as the Guide), we



do not recommend you use FFMP with any source other than DHR for this case.

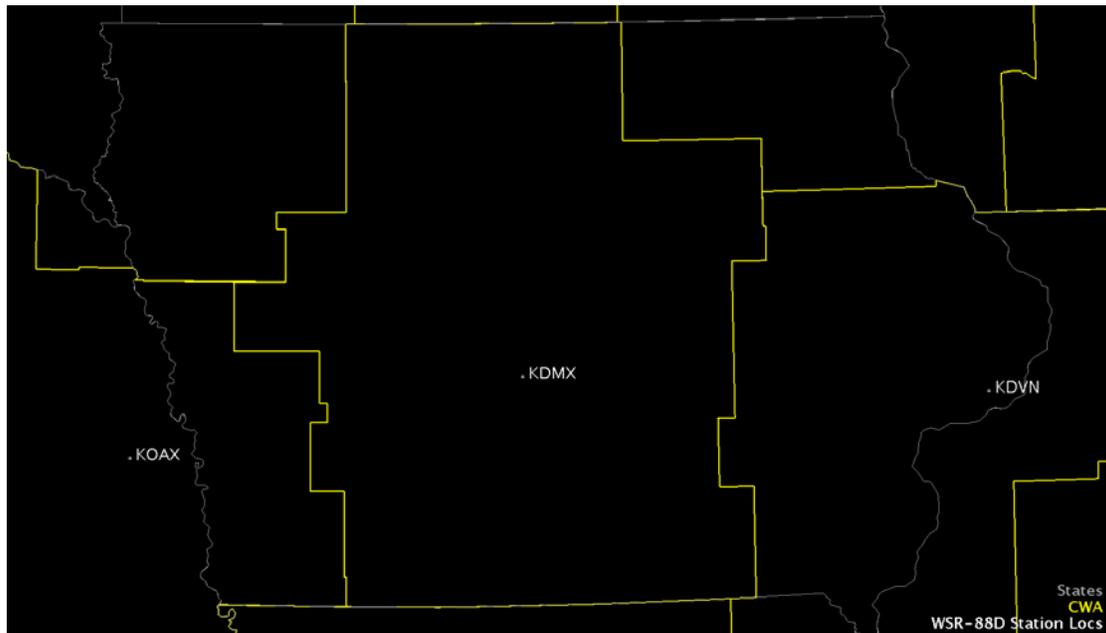
The Flash Flood Guidance (FFG) provided is from the two RFCs that serve the DMX CWA (i.e., MBRFC and NCRFC) at the 1-HR, 3-HR, and 6-HR time scales. Gridded FFG can be viewed from the NCEP/Hydro menu, under “RFC Flash Flood Guidance”. Basin-averaged FFG (used in FFMP) can be found under the SCAN menu by navigating to any of the FFMP source sub-menus, and then going to Guidance → RFCFFG.

### 3. Upper Air

Upper-air soundings are available for all RAOB sites in both simulations. Since a sounding is not launched from the Des Moines office, Table 2 provides a list of recommended sounding locations that can assist the trainee in his/her regional analysis. Figure 1 shows the locations of these sites.

RAOB ID	Location	Location with respect to DMX
KOAX	Omaha, NE	West
KDVN	Quad Cities, IL	East

**Table 2:** Upper-air sounding locations for this case.



**Figure 1.** RAOB sites for this case.



## 4. Satellite Data

The majority of base satellite and satellite sounder imagery products are available under the Satellite menu. However, none of the Derived Product Plots are available in this case. The satellite products are viewable at all scales.

## 5. Model Data

Table 3 lists all available model data provided for both simulations. Please note which models are available and their model run times. Some runs have been removed in order to reduce the overall size of the case.

Model	Model Runs (UTC) for Application #1 (29 June 2014 - 14Z)	Model Runs (UTC) for Application #2 (30 June 2014 - 18Z)
GFS-40	1200	1200, 1800
Canadian-NH	--	1200
Canadian-Reg	--	1200
LAPS	--	Hourly
MSAS	--	Hourly
NAM-12	1200	1200, 1800
NAM-20	1200	1200, 1800
NAM-40	1200	1200, 1800
NAM-80	1200	1200, 1800
RAP-13	Hourly	Hourly

**Table 3:** Available model runs for each simulation.

## 6. Standardized Anomalies

Standardized anomaly data is supplied for Simulation Application #1 within a separate browser window that will appear automatically at the start of the simulation. This GUI is a replica of the Ensemble Situational Awareness Table available at: <http://ssd.wrh.noaa.gov/satable/> . A list of available fields, heights, and forecast hours is provided in Table 4.



Field	Height (hPa)	Forecast (hrs)
Geopotential Height (m)	200, 500, 700, 850, 1000	06-36 hr
Temperature (°C)	200, 500, 700, 850, 1000	06-36 hr
Zonal Wind (kts)	200, 500, 700, 850, 1000	06-36 hr
Meridional Wind (kt)	200, 500, 700, 850, 1000	06-36 hr
Mean Wind Speed (kt)	200, 500, 700, 850, 1000	06-36 hr
Mean Sea Level Pressure (hPa)	Surface	06-36 hr
Specific Humidity (g/kg)	500, 700, 850, 925	06-36 hr
Precipitable Water (in)		06-36 hr
Integrated Water Vapor Transport (kg/ms)		06-36 hr

**Table 4:** Details of the NAEFS Standardized Anomalies Table provided within Simulation Application #1.

### III. Procedures

Procedures are packaged with the two simulation applications to assist in answering questions related to the performance objectives of the applications. These procedures are also good examples of ways to organize your flash flood-related products at your local WFO. To access the descriptions of each procedure, navigate to the WDTD Training Resources page and find the link named “Procedures List”.

### IV. Pre-Loaded Warnings

Simulation Application #2 features active Flash Flood Warnings (FFWs) at the beginning of the simulation. These warnings do not expire during the running of Simulation Application #2. The warnings are written to the archived text database and should properly display during the playback of Simulation Application #2. The warning polygons can be accessed via the Obs menu → “Local CWA Flood Warnings”.



## V. WESSL Script

The WESSL scripts utilized for Simulation Applications #1 and #2 provide critical information for the trainee. In particular, the Articulate presentations embedded in the WESSL scripts help the trainee to learn more about the simulation performance objectives, to take quizzes, and to get feedback. In addition to these presentations, local storm reports and Twitter reports pop-up throughout Simulation Application #2 to simulate the operational warning environment.

## VI. Launching the Simulations

In the upper-left corner of the WES-2 Bridge desktop, navigate to the Applications menu, and then the WDTD submenu. Click the link “WDTD Training Resources” (Figure 2).



**Figure 2.** Location of the WDTD Training Resources link

By clicking this link, a Firefox web browser will open a local web page with links to PDF resources related to the WOC Flash Flood simulations. Here you will find a PDF titled “Instructions for Launching Simulations”. Please refer to this document for details on how to load, launch, and start the simulation.