



Back yard in Urbandale, IA on June 30, 2018
(Photo Credit: Stephanie Boutard, Twitter)

Warning Operations Course: Flash Flood

Background Case Information

June 30 – July 1, 2018 Des Moines event

Designed by the National Weather Service
WARNING DECISION TRAINING DIVISION (WDTD)
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I. Weather Event Simulator: WES-2 Bridge

This simulation requires that you have at least the 17.3.1 release of the WES-2 Bridge (example below). Do not continue with these simulations until you have successfully installed and tested this version of your WES-2 Bridge. Full and updated information about this process can be found on the WES-2 Bridge training web page at: <https://training.weather.gov/wdtd/tools/wes2/index.php>.

II. Simulation Structure

1. The Applications

The simulation consists of two Applications:

- Application #1 takes place several hours before the onset of flash flooding and focuses on forecasting for the event. There is a narrated Articulate presentation that guides the forecaster through various objectives, culminating in using GFE to issue a Flash Flood Watch and Area Forecast Discussion.
- Application #2 takes place in the middle of the flash flood event and focuses on warning operations best practices. There is a pre-brief Articulate presentation that guides the forecaster through objectives related to identifying the flash flood threat. This leads into a 1.5-hour real-time simulation where the focus is issuing sound Flash Flood Warnings and Statements. A post-brief presentation wraps up the event.

2. Receiving Credit

In order to pass the simulation, the forecaster must complete all of the objectives in Applications #1 and #2 by passing quizzes along the way. The quizzes have codes that are later entered into the LMS. To locate these LMS entries, please refer to the WOC Flash Flood curriculum on the LMS or search for “WOC Flash Flood Simulation Application”.



3. Procedures

Procedures are packaged with the two 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 Details”.

4. WESSL Scripts

The WESSL scripts utilized for 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 Application #2 to simulate the operational warning environment.

5. Simulation Output

The WES has the option to save warning polygons, GFE grids, and text products via an output data directory. This is useful for reviewing forecast and warning decisions with a Training Officer at a later time. By default, this directory is in /data1/wesSimData/. However, you can alter the path within the Simulation page of the WES (Figure 1).

Simulation Options	
Leave Input data directory blank to use the defaulted case processed data directory.	
Input Data Directory:	<input type="text"/> <input type="button" value="Browse..."/>
Output Data Directory:	<input type="text" value="/data1/wesSimData/WOCFF_DMX_30June2018_201907100045"/> <input type="button" value="Browse..."/>

Figure 1. Output Data Directory in the Simulation page of the WES.



III. 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 to satisfy the performance objectives and to be satisfactorily operationally relevant. This section will outline the details of the various AWIPS data that are available.

1. Radar Data

KDMX is the primary radar, with a subset of radar data available for KEAX and KOAX. You will not need radar data for Application #1. Table 1 lists the radar characteristics for Application #2. This table includes the location, primary VCP, and availability of some features.

Application #2: 1 July 2018 -- 0100 UTC to 0230 UTC

Radar ID	Location	VCP	SAILS	SCAN/DMD
KDMX	Des Moines, IA	212	Yes	Yes
KEAX	Pleasant Hill, MO	215	No	No
KOAX	Valley, NE	212	No	No

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 Application #2 (see above). FFMP data is available for all five sources: Legacy DHR, Dual-Pol DPR, HPE, Bias HPE, and MRMS.

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 D2D 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, Figure 2 shows the recommended sounding locations that can assist the trainee in his/her regional analysis.

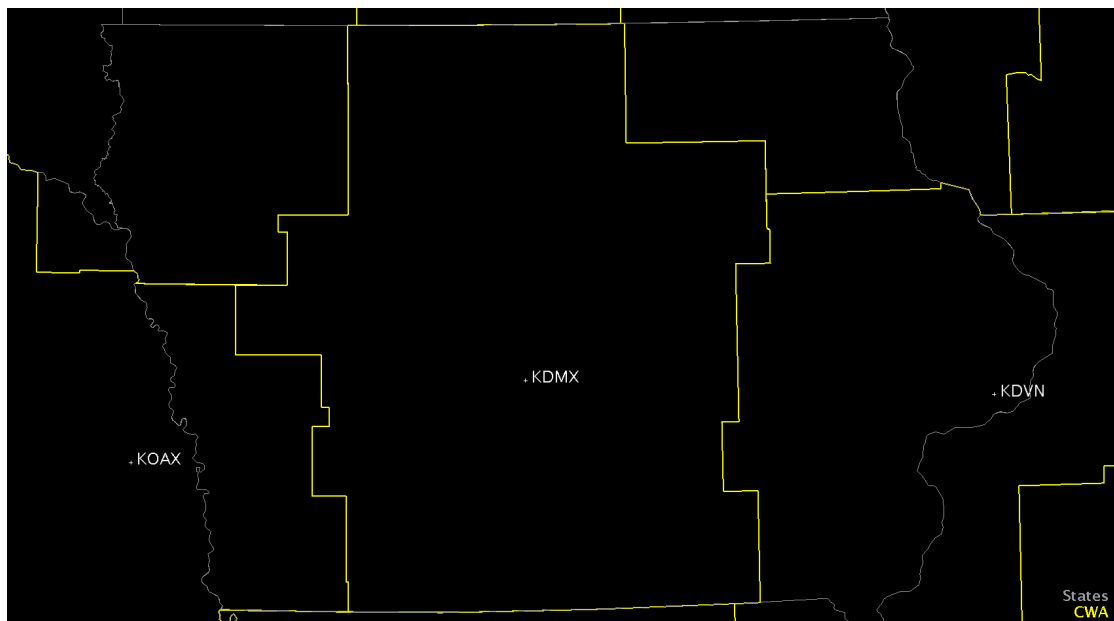


Figure 2. RAOB sites for this case.

4. Satellite Data

GOES-16 satellite products for the east CONUS sector are available under the Satellite menu. The satellite products are viewable at all scales.

5. Model Data

Table 2 lists all available models 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. Some data may be missing.



Model	Model Runs (UTC) for Application #1 (30 June 2018 - 15Z)	Model Runs (UTC) for Application #2 (1 July 2018 - 01Z)	Extra Model Runs
ECMWF-HiRes	30/12Z	01/00Z	
GFS20	30/12Z	30/18Z, 01/00Z	01/06Z
GFS (GFS90)	--	--	01/06Z
HRRR	Hourly starting at 30/12Z through 01/09Z		
LAPS	Hourly starting at 30/12Z through 01/09Z		
NAM12	30/12Z	30/18Z, 01/00Z	01/06Z
NAM80	--	--	01/06Z
RAP13	Hourly starting at 30/13Z through 01/09Z		
RAP40	--	--	01/03Z-09Z

Table 2: Available model runs for each simulation.

6. Standardized Anomalies

Standardized anomaly data is supplied for Application #1 via the WDTD Training Resources page of the WES. This GUI is a replica of the Ensemble Situational Awareness Table available at: <https://satable.ncep.noaa.gov/>. A list of available fields, heights, and forecast hours is provided in Table 3.

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

Table 3: Data in the NAEFS Standardized Anomalies Table provided w/in Application #1.



7. MRMS and FLASH

All MRMS precip products and FLASH products are available for this simulation, with the exception of the MRMS Gauge Only QPE product. MRMS severe products have more limited availability due to the nature of this simulation. Please look through the MRMS menu in AWIPS to see what is available.