

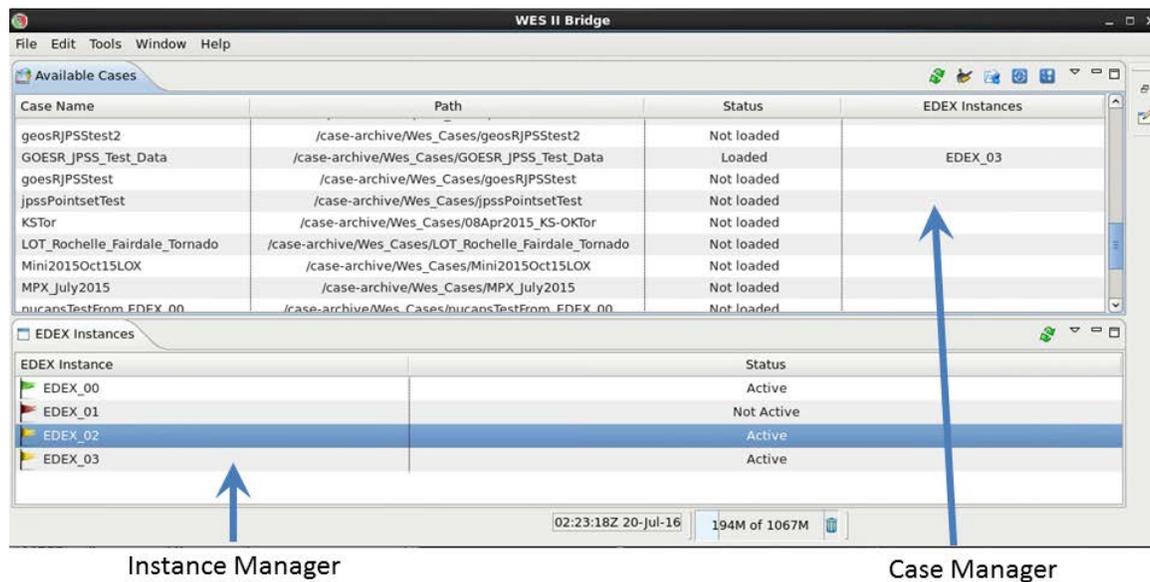
WES-2 Bridge Job Sheets

Basic Introduction.

There are two main parts of the WES-2 Bridge interface: a case manager and an instance manager. The case manager displays the cases that are available for the particular user. From the case manager, users start case reviews or simulations as well as load and unload cases. The interactions primarily occur through right-clicking on a particular case.

The instance manager allows you to start, stop, and reset any of the EDEX instances (independent versions of the main AWIPS server that each can hold a case and localization) as well as start additional CAVEs for each instance. WES-2 Bridge comes with 5 EDEX instances, labeled EDEX_00 through EDEX_04, so you have 5 AWIPSSs on your WES-2 Bridge machine that can run at the same time and each have its own case and own localization.

WES-2 Bridge Basic Interface



Instance Manager

Case Manager

WES-2 Bridge also provides an updated scripting capability (WESSL-2; a misnomer, but a carry-over from the old WES-1 WES Scripting Language). WESSL-2 adds some command and control capabilities to the simulation plus provides a method of viewing non-AWIPS data in a simulation. While more features are planned, it is already very flexible because it contains the ability to issue any Linux command.

Contents:

This packet contains four jobsheets (with accompanying explanations). These are examples of some the tasks you may complete with WES-2 Bridge.

Task 1: Import or Create a small archived case for event review

Task 2: Load a case and run a basic simulation.

Task 3: Build a short WESSL Script and Play it in a Simulation

Task 4: Examine a Hydro case and run a simulation with Hydro Apps capabilities

Task 1: Import (“Create”) a small archived data case for event review (no simulation).

Concepts:

- Examine a case as it came out of the archiver
- Start WES-2 Bridge, if needed.
- Start the EDEX_00 instance, if needed
- Use the AWIPS Archive Case wizard to create a WES-2 Bridge case from the archiver-produced case.
- Start another EDEX instance if needed
- Load the case
- Review the case.

Note: In operational practice, the archived case as it is produced by the AWIPS-2 Case Creation GUI is stored at /data/archiver. These instructions use a case delivered via Blu-Ray disc and unpacked on your machine. This necessitates a few changes in these instructions than would normally would be done for a ordinary case. These changes are notated below.

Step-by-Step Instructions:

1. Right-click on the desktop and select **Open in Terminal** to launch a shell window. Issue the following commands to list out the contents of an archived data case before the metadata is added:

- `cd /data1/wes_cases/W2B_16_2_2_ExerciseCase`

Note: you can hit the tab key after starting to type out the paths and the terminal will sometimes finish the command for you

Note: In practice, you would use this command: `cd /data/archiver`

- `ls`
- `ls Processed`
- `ls Processed/*`

Note: Only some bufrua (soundings), grid (ETA, FFG, LAPS, MSAS), obs, redbook, satellite, sfcobs and warning data should exist in this case as shown here.

```
[dmorris@awips2-dm W2B_16_2_2_ExerciseCase]$ ls
Processed
[dmorris@awips2-dm W2B_16_2_2_ExerciseCase]$ ls Processed
bufrua  grid  obs  redbook  satellite  sfcobs  warning
[dmorris@awips2-dm W2B_16_2_2_ExerciseCase]$ ls Processed/*
Processed/bufrua:
bufrua-2016-02-23-12  bufrua-2016-02-23-18  bufrua-2016-02-24-00
bufrua-2016-02-23-12.h5  bufrua-2016-02-23-18.h5  bufrua-2016-02-24-00.h5

Processed/grid:
ETA  FFG-FWR  FFG-MSR  FFG-PTR  FFG-RSA  FFG-TAR  FFG-TUA  MSAS
FFG-ALR  FFG-KRF  FFG-ORN  FFG-RHA  FFG-STR  FFG-TIR  LAPS

Processed/obs:
metar-2016-02-23-16  metar-2016-02-23-18.h5  metar-2016-02-23-21  metar-2016-02-23-23.h5
metar-2016-02-23-16.h5  metar-2016-02-23-19  metar-2016-02-23-21.h5  metar-2016-02-24-00
metar-2016-02-23-17  metar-2016-02-23-19.h5  metar-2016-02-23-22  metar-2016-02-24-00.h5
metar-2016-02-23-17.h5  metar-2016-02-23-20  metar-2016-02-23-22.h5
metar-2016-02-23-18  metar-2016-02-23-20.h5  metar-2016-02-23-23

Processed/redbook:
PEBF98  PEIC43  PEIY96  PGIC42  PGNW53  PHZ050  PMND02  PPBE89  PPTR98  PSBC04  PTI052  PTTU98  PYAA89  PYMA85
PEBG98  PEID44  PEIY97  PGIE43  PGWA31  PHZ050  PMND03  PPBI89  PPZM50  PSBC08  PTI053  PTWA32  PYAA98  PYNA98
PEBH98  PEIE40  PENA01  PGNA00  PGWA32  PJAA88  PMNE00  PPHK01  PPZ050  PSBC12  PTIY51  PTWA93  PYBA89  PYWA31
PEBI88  PEIE41  PENE00  PGNE00  PGWE46  PJAI88  PMNE01  PPHM01  PPZ050  PSBC25  PTIY96  PTWA94  PYIY96  PYWA32
PEBI98  PEIF40  PENJ88  PGNI00  PGWI47  PJBI88  PMNE02  PPH001  PRWA51  PSBD04  PTIY97  PWIA97  PYIY97  PYWK43
PEBJ88  PEII42  PETT00  PGN098  PHBV50  PMNA00  PMWE98  PPIC01  PSA072  PSBD08  PTNK98  PWIA98  PYNA20  PYWM44
PEBJ98  PEIK98  PEWA31  PGNW49  PHNT50  PMNC01  PMWI98  PPIE01  PSBB04  PSBD12  PTNM98  PWIE97  PYNA25  PYW045
PEBK98  PEIO46  PEWA32  PGNW50  PHTT50  PMNC02  PPAA89  PPIG01  PSBB08  PSBD25  PTNO98  PWIE98  PYNA30  PYW046
PEI745  PEIS46  PEWA33  PGNW51  PHTT51  PMNC03  PPAA89  PPII01  PSBB12  PTIC94  PTNO98  PWNE00  PYNA50  PYW598
PEIB40  PEIY47  PEWA34  PGNW52  PHZM50  PMND01  PPAI89  PPTG98  PSBB25  PTIE94  PTNS98  PXWA50  PYNA70

Processed/satellite:
East CONUS  West CONUS

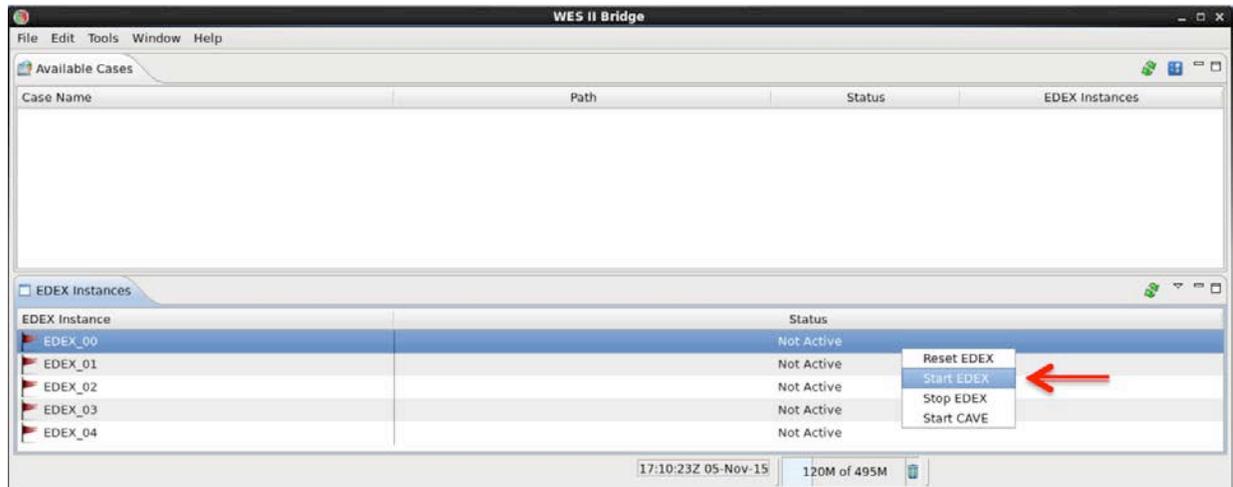
Processed/sfcobs:
1001  1003  1004  1005  1006  1007

Processed/warning:
warning-2016-02-23-12  warning-2016-02-23-16  warning-2016-02-23-20  warning-2016-02-24-00  warning-2016-02-24-11
warning-2016-02-23-13  warning-2016-02-23-17  warning-2016-02-23-21  warning-2016-02-24-01
warning-2016-02-23-14  warning-2016-02-23-18  warning-2016-02-23-22  warning-2016-02-24-02
warning-2016-02-23-15  warning-2016-02-23-19  warning-2016-02-23-23  warning-2016-02-24-10
[dmorris@awips2-dm W2B_16_2_2_ExerciseCase]$
```

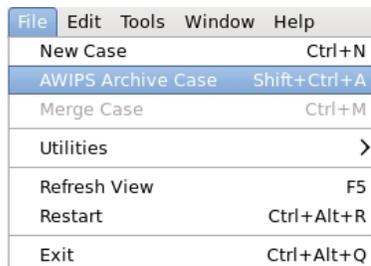
2. If WES-2 Bridge is not already started, you can start it by navigating to **Applications → WDTD → WES-2 Bridge** in the top-left Desktop menu.



- Once the WES-2 Bridge GUI appears, **check to see if EDEX_00 is Active** under the “EDEX Instances” list. If it is listed as **Not Active**, **right click on EDEX_00 and select Start EDEX**.



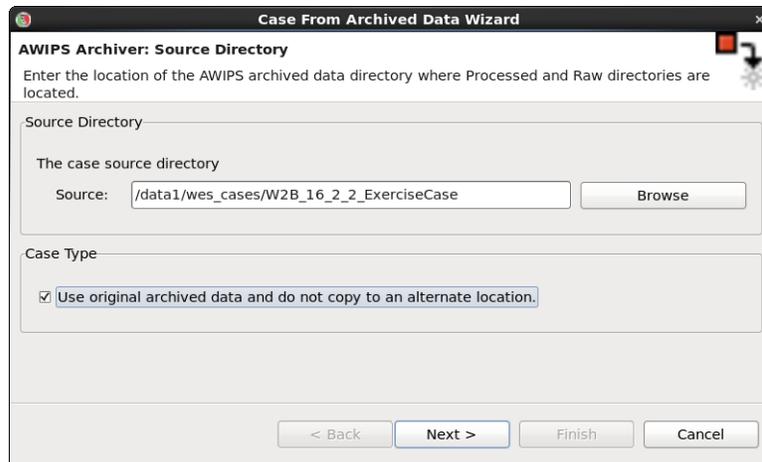
- Under the **File** menu select **AWIPS Archive Case**.



- In the first page of the wizard:

- Click on the **Browse** button and navigate to **/data1/wes_cases** where you will select **W2B_16_2_2_ExerciseCase**.

Note: In operational practice, this location will be **/data/archiver**.



- **Ensure the “Use original archived data and do not copy to an alternate location” checkbox is checked.**

Note: In operational practice, you will leave this box unchecked. This will ensure the WES-2 Bridge software copies data from /data/archiver to a case directory on the WES-2 Bridge box.

6. Click the **Next** button.
7. In the wizard’s second page enter the following information:

Destination	/data1/wes_cases/W2B_16_2_2_Exercise case (This choice is grayed out because of the check box on the previous screen. Had we left it unchecked, then this dropdown box lists the available places on your WES-2 Bridge machine where you can store case data.)
Case Name	Feb 23 LIX W2B Exercise Case (the spaces in this case name and the resulting directory name will be changed to underscores by the WES-2 Bridge software)
AWIPS II Version	16.2.2 (this is used for tracking build dependencies)
Case Description	archiver case with limited bufrua (sounding), satellite, obs, warnings, LAPS, FFG, MSAS data (this is useful documentation for later use; any comment listed here can be seen by any user who loads the case.)

Case From Archived Data Wizard

AWIPS Archiver: Select Destination

Select the destination where the case will be saved.
Additional directories can be specified by going to Window -> Preferences -> NEW.

Destination Directory

Select a destination case directory.

Destination: /data1/wes_cases/W2B_16_2_2_ExerciseCase

Case Name

Set a name for the new case.

Case Name: Feb 23 LIX W2B Exercise Case

Awips II Version

Enter Awips II Version for the case.

Awips II Version: 16.2.2

Case Description

Set a brief description for the case.

Case Description: archiver case limited bufrua (sounding), satellite, obs, warnings, LAPS, FFG and MSAS data.

< Back Next > Finish Cancel

8. Click the **Next** button.

9. Under the **WFOs** box, you should select your own WFO. This case was collected from the LIX WFO, and we packaged the localization for LIX with the main test case. Cases that you make from your own archived data will need to use your own localization.

Note: If your WFO does not appear in the list, then you have not customized WES-2 Bridge with your own localization. These job sheets pre-suppose that you have performed the local customization steps as described in the guide on “Customizing WES-2 Bridge with AWIPS Localizations” on WDTD’s WES-2 Bridge web site at <http://www.wdtd.noaa.gov/tools/wes2/documentation/LocalizationSteps.pdf>.

Multiple WFOs may appear in this list, and the available WFOs may change depending on which cases are loaded into WES-2 Bridge at a given time. The list is constructed from the localizations that are located in the /awips2/edex/data/utility/site and /awips2/edex/data/utility/configured directories.

Note: If you had a lot of data you may choose to filter the data that would be loaded in WES by using the **Data Types** box.

Note: In this job sheet we are purposefully not using FSI. In your office, if you choose to use FSI, then selecting this checkbox will require you to specify the location of Raw radar data for this case because

that Raw radar data is required for FSI.

On Localizations and Transferring WES-2 Bridge Cases. At the current time, every case that is made on WES-2 Bridge also includes a copy of the localization. This does result in multiple copies of the localization residing on the machine, which is inefficient. However, this does make it easier to transfer cases to different WES machines (for example, to other WFOs). All that is needed to transfer cases to other machines is to tar up an entire case (including the caseMetaData.xml file, the localization and Processed directories and any Raw and/or wessl2 directories that are part of the case. Then simply untar the case on the target machine in one of the case directories (/data1/wes_cases, /data2, etc.) and refresh the case manager window. After transferring the case, you will need to ensure the permissions on the case are set to group write (chmod -R g+w <caseDirectory>). The size of the case will affect how the case is transferred (the physical media and any splitting up of the case into multiple tar files). Plans for future versions of the WES-2 Bridge software include not always copying the localization into every case and a “Package Case” option to make this process easier by grabbing the localization and by splitting up large tar files into manageable pieces. In the meantime, if you have questions about doing transferring cases to other WFOs, contact WDTD for assistance.

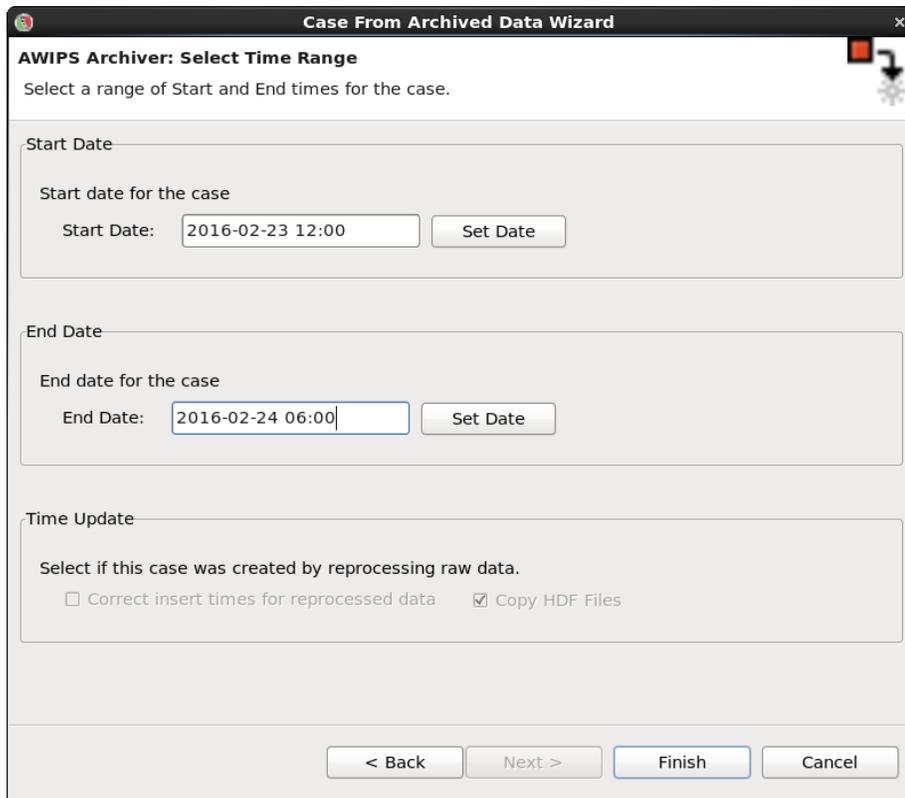
10. Click the **Next** button.

11. On the wizard’s third page enter the following:

- **Start Date: 2016-02-23 12:00**
- **End Date: 2016-02-24 06:00**

Note: You may want to use the Set Date button to select the time from the calendar to ensure you don’t make a typo. Also, you can hold down the arrows on the spin-boxes to rapidly index to a number.

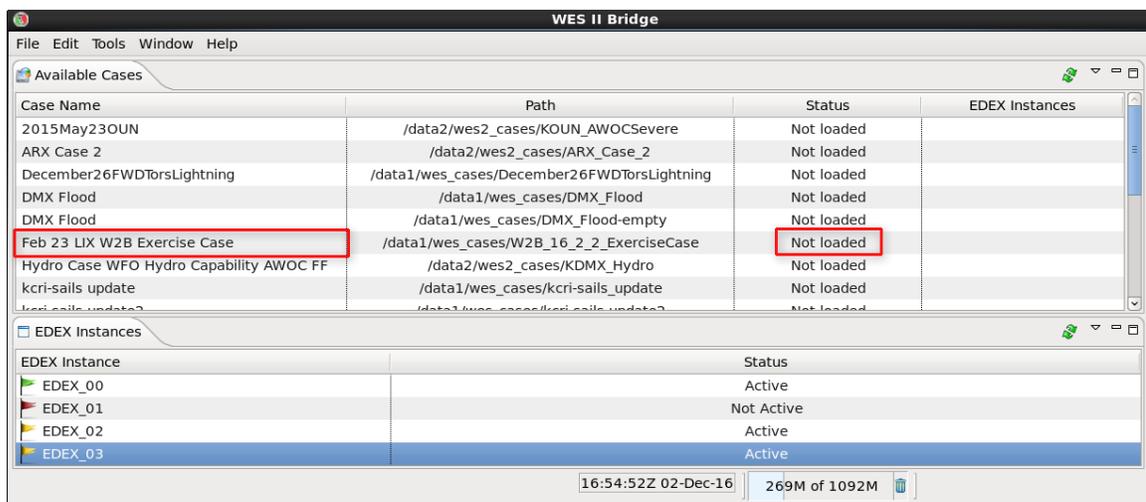
Note: You may have noticed that the “Correct insert times for reprocessed data” is grayed out. This is grayed out because of choosing the “Use original archived data and do not copy to an alternate location” check box above in Step 5. Most of the time, the “Correct insert times” option is available to you. If you are using data that came directly from your archiver, you can leave this setting alone. If you have used rawPlay to reprocess **raw radar** data you must select this box for simulations to work correctly. Eventually this will apply to datatypes other than radar.



- Click the **Finish** button to create the case metadata. It should take a couple of minutes to create the metadata and copy the localization.

When WES is done creating metadata for the case, you will see **Feb 23 LIX W2B Exercise Case** listed in the **Case Name** list of **Available Cases**, and it will have a status of **“Not loaded”**.

Note: If you do not see your case listed, check under **Window** → **Preferences** and make sure **/data1/wes_cases** has been added to your **“Case directory paths”**.



13. In the terminal window from Step 1, issue the following commands to list the contents of the case after the metadata and localization are added:

- `cd /data1/wes_cases`
- `ls W2B_16_2_2_ExerciseCase`

Note: WES-2 Bridge changed the spaces in your case name to underscores for the case directory. The case name in the interface still contains spaces.

Note: The caseMetaData.xml and the localizations folder should now exist

- `ls W2B_16_2_2_ExerciseCase/localizations`

Note: The localization tree and maps have been copied into the case from the AWIPS-2 installed on WES-2 Bridge. The maps directory will only exist if you have customized your WES-2 Bridge machine with the maps from your operational AWIPS system. For more information, see the “Customizing WES-2 Bridge with Local Maps” guide on the WES-2 Bridge web site at <http://www.wdtd.noaa.gov/tools/wes2/documentation/LocalMaps.pdf>.

Note: Beginning in WES-2 Bridge 16.2.2, part of the customization involves copying Average Recurrence Interval (ARI) data into the localization in order to support FFMP’s usage of ARI. Because it is static data (not changing in time), the ARI data is not normally available as part of an archived case. For that reason, WES-2 Bridge implemented ARI as part of an addition to the localization.

```
[dmorris@awips2-dm utility]$ cd /data1/wes_cases/W2B_16_2_2_ExerciseCase/
[dmorris@awips2-dm W2B_16_2_2_ExerciseCase]$ ls
caseMetaData.xml  localizations  Processed
[dmorris@awips2-dm W2B_16_2_2_ExerciseCase]$ cd localizations/
[dmorris@awips2-dm localizations]$ ls
cave_static  common_static  edex_static  ffmpari  maps
[dmorris@awips2-dm localizations]$ ls ffmpari maps
ffmpari:
lix

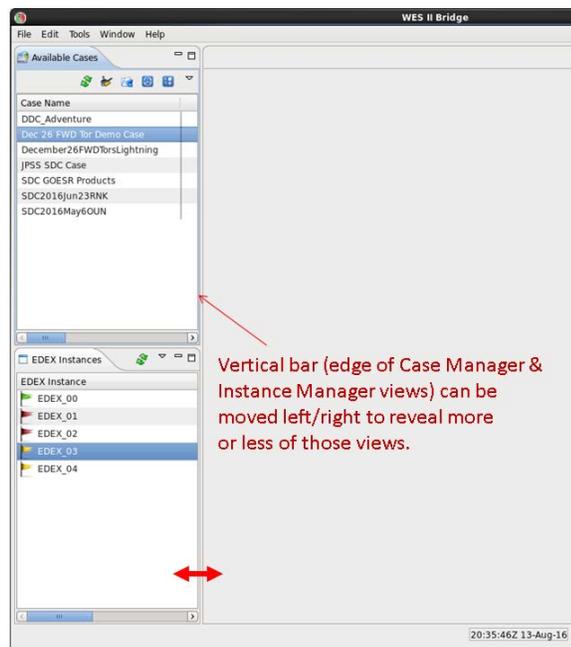
maps:
LIX_alllocalroads_map.csv  LIX_hurricane_map.dump  LIX_ms_map.csv  LIX_river_map.dump
LIX_alllocalroads_map.dump  LIX_ihnctdetour_map.csv  LIX_ms_map.dump  LIX_stormsurge_map.csv
LIX_ffmp_map.csv  LIX_ihnctdetour_map.dump  LIX_nha_map.csv  LIX_stormsurge_map.dump
LIX_ffmp_map.dump  LIX_la_map.csv  LIX_nha_map.dump  LIX_warngenloc_map.csv
LIX_hurricane_map.csv  LIX_la_map.dump  LIX_river_map.csv  LIX_warngenloc_map.dump
[dmorris@awips2-dm localizations]$
```

14. Right-click on the “Feb 23 LIX W2B Exercise Case” and select **Load Case**.

In the **Load Case** tab, review the metadata, and then click **Load** to load the records into the database.

- This will take a minute or two, and the Progress Information bar will disappear when the data is loaded into an available EDEX instance.
- If there are no available (empty) EDEX instances, you will be prompted to unload an EDEX instance before being able to proceed.
- If no EDEX instances are running, WES-2 Bridge should prompt you to start one. You can also manually start one by right-clicking on an instance in the instance manager and choosing “Start EDEX”.

15. Drag the vertical bar (the right edge of the Available Cases window) to the right, so you can see that the Status of “Feb 23 LIX W2B Exercise Case” is **Loaded** and which EDEX instance (in the EDEX Instances window) the case is loaded on.



- When a case is **loaded**, it can be quickly accessed for event review or simulation.

Note: “Loading” means that the Postgres database for a particular EDEX instance has been populated with data from a case and that the localization for the case has been linked into the EDEX.

16. Right-click on “Feb 23 LIX W2B Exercise Case”, and select **Review**.

17. In the Review Wizard, click **Finish**.

- CAVE will load with all the data visible, and after 1 minute WES-2 Bridge sets the D2D clock to the end of the case for reference.

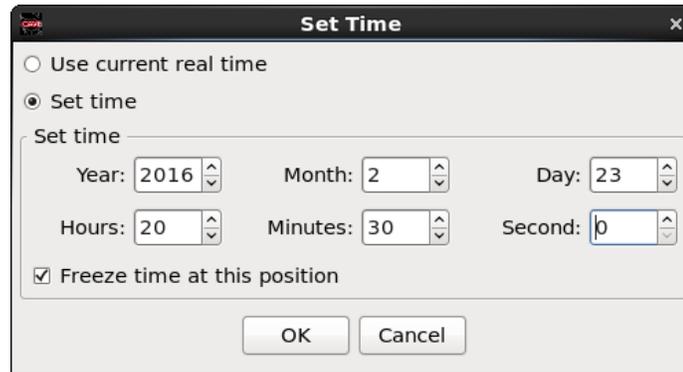
Note: The D2D clock is frozen at the time of the end of the loaded case.

18. Under the **Satellite** menu select **Visible** and navigate through the data.

Note: This is static case review (no simulation), so the data doesn't update automatically, and D2D displays the last data in the case. In case review, you can manually set the clock to an earlier time (and freeze it if you want to). Loading data after setting the clock then causes data from the earlier time to appear (which occurs later in this exercise).

19. Double-click on the **D2D clock** change the time to **2016/02/23** (Year/Month/Day) and **20/30/0** (Hours/Minutes/Second). Ensure the time is frozen with the **Freeze time at this position** checkbox selected.

20. Swap panes with an empty pane and then swap the pane again. The satellite data should now be at a time that ends just previous to 2030 UTC February 23.



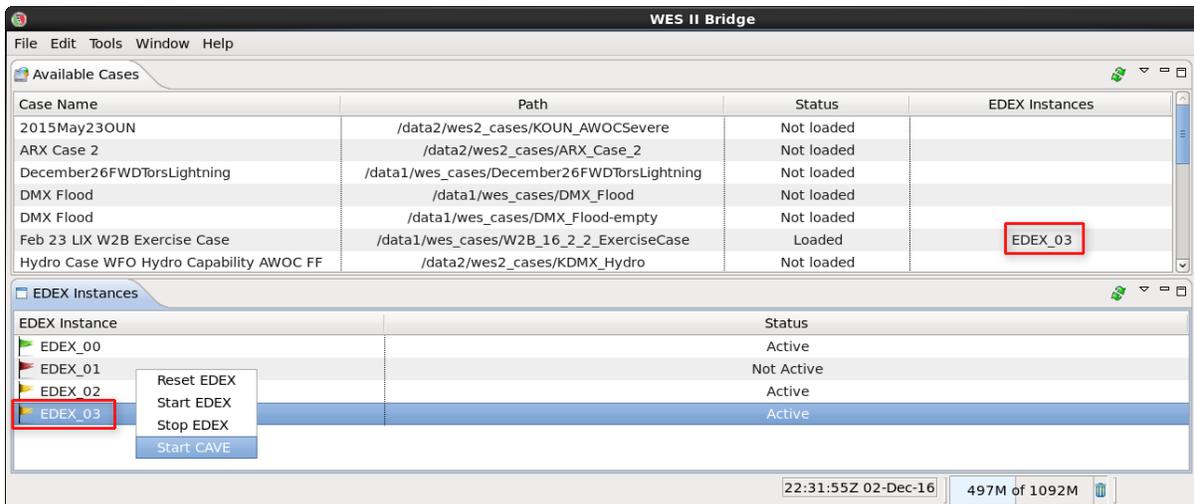
- Your CAVE clock should have yellow text with a red background when the time is frozen and is set backwards from the system time. (This color configuration is part of AWIPS versions later than 16.1. Previous AWIPS builds had yellow text on a black background when the time was frozen. The red background indicates the time is not the current system time.)



- When the clock time is not set to the system time but is moving forward, the clock will have white text with a red background.

21. **Swap panes with an empty pane**, and under the **Obs** menu select **Other Warning Displays** then **All Regional Warnings** and navigate through the data. Since we created this case with your own localization, you may not see a display of warning polygons because this is a mostly southern US convective event. The warnings that are displayed are the actual warnings that were issued during the event.
22. **Swap panes with an empty pane**, and under the **Volume** menu select **NAM80** and navigate through the data. Clear this pane and then under the **Volume** menu select **LAPS** and navigate through the data. LAPS for this case uses the LIX domain.

Note: Some localizations may have removed LAPS from their main Volume menu and only have it as an option for the Surface Families menu under the Volume menu.
23. **Swap panes with an empty pane**, and under the **Obs** menu select **Station Plot** (in the METAR section) and navigate through the data.
24. Under the **Upper Air** menu, select US Eastern and New Orleans, LA and verify the sounding appears in an NSHARP display.
25. Under the **MRMS** menu and under the **Hail Products** menu, select **MESH Tracks (1440 min. accum.)** and notice no data will load because this data type (MRMS) was not included in this case.
26. To launch another CAVE on this case, **identify the EDEX Instance** in the **Case Name** list of available cases (EDEX_04 in the figure below), and then in the **EDEX Instances** on the bottom left of the WES - 2 Bridge interface, **right click on the appropriate EDEX Instance and select Start CAVE**.



- Click **OK** on the available memory popup window if it pops up.

Note: You have to manually set the CAVE clock when using Start CAVE.

27. Load and view data on the new CAVE and verify it is the same data.

28. Shut down CAVE.

Note: Any active EDEX started above will remain running even after shutting down CAVE.

Task 2: Load a Case and Run a Basic Simulation: WES-2 Bridge 16.2.2 Test Case (LIX 2016-02-23)

Introduction. EDEX_01 is an EDEX instance that is reserved for simulations on cases that are not already pre-loaded, so you can load a case and run a simulation in one step. After running the simulation or case review, the case remains loaded in EDEX_01. The other instances (EDEX_02, EDEX_03, and EDEX_04) are designed to be used in a two-step fashion (loading the case and subsequently running a simulation or case review). After running a case review or simulation on EDEX_01, EDEX_01 behaves like EDEX_02 through EDEX_04 as long as the case remains loaded in EDEX_01.

You will also use one of the two parts of WESSL-2, the WESSL-2 Event Browser, to view ancillary information included with the simulation.

Concepts:

- Start an EDEX instance
- Load a simulation
- Start the Simulation with a sample WESSL script.
- Observe the events from the sample WESSL script.
- Issue a warning
- Stop the simulation
- Find the text file that contains the warning (for subsequent evaluation purposes).

Step-by-Step Instructions:

1. In the WES-2 Bridge Case Manager, determine if any of the EDEX_02, EDEX_03, or EDEX_04 instances are both Active and have no case loaded. If needed, start and/or reset an instance by right-clicking on the instance in the instance manager, and selecting “**Start EDEX**” or “**Reset EDEX**”.
2. Load the WES-2 Bridge Test Case by selecting **WES-2 Bridge 16.2.2 Test Case (LIX 2016-02-23)**, then **right click** and select **Load Case**. It may take about 10 minutes to load the case.
3. Start the simulation by selecting **WES-2 Bridge 16.2.2 Test Case (LIX 2016-02-23)** in the Available Cases tab, and **right click** and select **Simulation**.
4. In the **Simulation tab** (may need to move the right-edge vertical bar to see) enter the following:

Load Data Time Range	
Start Date	2016-02-23 12:00
End Date	2016-02-24 12:00
Simulation Data Time Range	
Start Date	2016-02-23 22:20
End Date	2016-02-23 22:55
WESSL Script	TestScript
Remove Warnings from WFO is checked.	

Verify your settings with the graphic below. When you select “Remove Warnings from WFO” acknowledge the path where warnings will be saved by clicking OK. These warnings are one form of the user-generated warnings from a simulation, but currently not easily usable.

WES-2 Bridge 16.2.2 Test Case (LIX 2016-02-23) ✕

Simulation

WES-2 Bridge 16.2.2 Test Case (LIX 2016-02-23)
 Test Case for WES-2 Bridge 16.2.2 LIX February 23 2016

Case Information

Name, location, and description of the case

Case Location:

Case Name:

Case Description:

Is Remote

Host - JMS port:

Load Data Time Range

The start and end dates of the loaded data must be within the case start and end dates.

Case Start Date:

Start Date:

Case End Date:

End Date:

Simulation Data Time Range

The start and end dates of the simulation must be within the start and end dates of the loaded data.

Start Date:

End Date:

WESSL Script:

Remove warnings for the WFO

Case Creation Information

5. In the **upper-right part of the simulation tab** (may need to use scroll bars), click on the **Simulate** button.

- Several windows will begin to pop-up, including the WESSL-2 browser.

6. Click **OK** on the available memory popup window if it pops up, and note when the WESSL-2 window and Simulation Controls window pops up.
7. After CAVE finishes loading, click the **PLAY** button on the **Simulation Controls** window.
8. This WESSL-2 script will pop up several events at the beginning of the simulation, one at 22:27 and another towards the end (at 22:51 UTC), and you can click on each one of the WESSL Events manually if you want to review them.

This WESSL-2 script does not demonstrate all the functions possible. WESSL-2 can pause a simulation at prescribed times, and it can play audio and video clips, display web (HTML) pages and run any system command. Therefore, there are numerous possibilities of displaying ancillary information alongside your simulation, limited mostly by one's creativity. Task 3 below demonstrates adding observations (spotter reports) by importing files downloaded from SPC.

9. From the **klix** menu, select **0.5 Z+SRM8** and review the recent radar data.
10. Under the **CAVE** menu and **New** submenu select **Text Workstation**, and then **issue a tornado warning** with WarnGen (don't spend much time doing it -- this is just for demonstration purposes), making sure to **select a basis for the warning** (radar detected, spotter, etc.) **and/or hail or wind threat**. Also, **deselect the pathcast** as a WarnGen option, because AWIPS-2 does not calculate pathcasts when the CAVE time is not set to the current system time. This issue has been verified to be fixed in AWIPS 16.4.1.
 - If you receive a message about product expiration, **click the "Go Ahead" button**. The AWIPS-2 issue that is responsible for this notice also has been verified to be fixed in AWIPS 16.4.1.
 - **If warning product does not display** in the Text Workstation after you select "Create Text" in Warngen, **navigate to CAVE → Preferences → Text Workstation** and make sure the **host matches the workstation name you are running WES II Bridge from**.
11. In a **new pane**, load the **Local CWA Warnings** plot from the **Obs** menu, and see your new Warning polygon.
12. The simulation will stop automatically at 22:55:00. If you have finished issuing your warning, you can manually stop the simulation at any time by pressing the **STOP** button in the **Simulation Controls** panel.
 - **Note:** In WES-2 Bridge 14.3.1, it was critically important to actually **STOP** the simulation by using the STOP button or allow it to finish naturally. This ensured that radar and other data were ready for the next simulation or review used on a particular case. In Builds 16.2.2 and later, WES-2 Bridge improved the methodology of loading radar and other data to remove this dependency and this problem should no longer occur.
 - After the simulation has stopped, shut down CAVE and the WESSL-2 Event Browser.
13. In order to locate and examine the text file that contains your warning (for later evaluation purposes), open a terminal window (right-click on desktop and select "Open in Terminal") and issue this command:
 - **cd /data_store_xx/manual/warning/YYYYMMDD/HH**
 - ▶ xx is 02, 03, or 04, depending on which EDEX instance you are using to run the simulation.

- ▶ YYYYMMDD/HH is based on a complicated combination of the actual clock-time of when the warning was issued [today] and the time the warning was valid for.

For example, in this exercise, you are issuing a warning for February 23 (DD here is 23). If the current date is ≥ 23 , then the YYYYMM is the current year and two-digit month. If the current date is < 23 , then the YYYYMM is the current year and the two-digit month of the previous month (for performing this exercise on December 5, 2016, the YYYYMMDD will be 20161123; if today's date were December 24, 2016, the YYYYMMDD would be 20161224). The HH is the hour of the valid time of the warning. (This is AWIPS-2 logic, by the way; AWIPS-2, not WES-2 Bridge, places the warnings in the /data_store_xx/manual/warning/YYYYMMDD/HH directory.)

In this directory, you will see files named with the AWIPS PIL of the warning with a ten-digit number that represents the Epoch seconds (elapsed since January 1, 1970) of when the warning was issued. If there are multiple warnings in this directory, issuing an "ls -l" command shows you the creation/modification date of the file which helps to narrow down which file you want to save or examine.

Note: The warning text is also available in the fxatext database and in the warning table of the metadata database. Both of these can be accessed via pgadmin or psql.

Task 3: Build a short WESSL Script and Play it in a Simulation

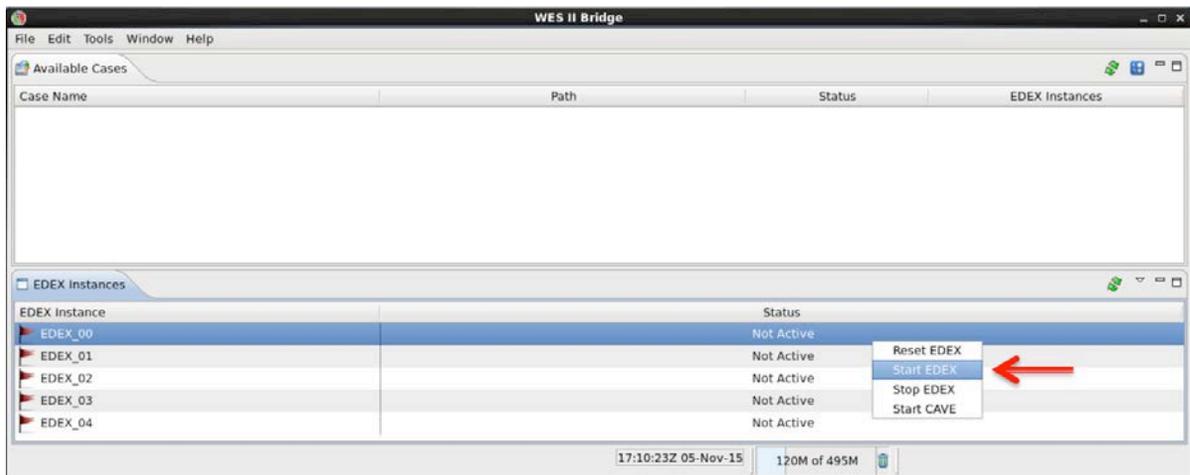
Introduction. A case can contain more than one WESSL-2 script. We will add a new script to the WES-2 Bridge 16.2.2 Test Case (LIX 2016-02-23) case. This script will contain some of the same content as the previous script plus some additional media to demonstrate how to use the Script Builder to add various commands.

Concepts:

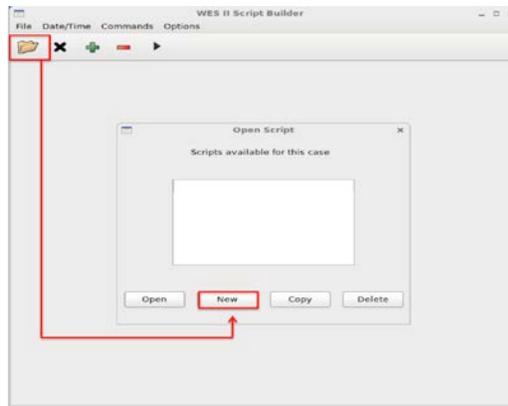
- Create a new script
- Add a pre-brief web page (SPC Day 1 Convective Outlook) and image (tornado watch county graphic)
- Give students a period to do environmental assessment by pausing the simulation
- Add text to instruct the students to skip forward in the simulation
- Add a few reports using the Script Builder Local Storm Report Importer. WESSL-2 has the ability to import .CSV files containing SPC storm reports to save you from having to enter reports one-by-one. At a WFO, because WES-2 Bridge machines do not have Internet access, you will have to obtain the .CSV files on a PC that does have Internet access, then subsequently scp the files to the wes2 workstation (e.g., **scp file.csv user@wes2:)**
- Add a video
- Add a recap animated gif using a Linux command to display in a Firefox window. (WESSL-2 does not natively display animated gif files)
- Stop the simulation

Step-by-Step Instructions:

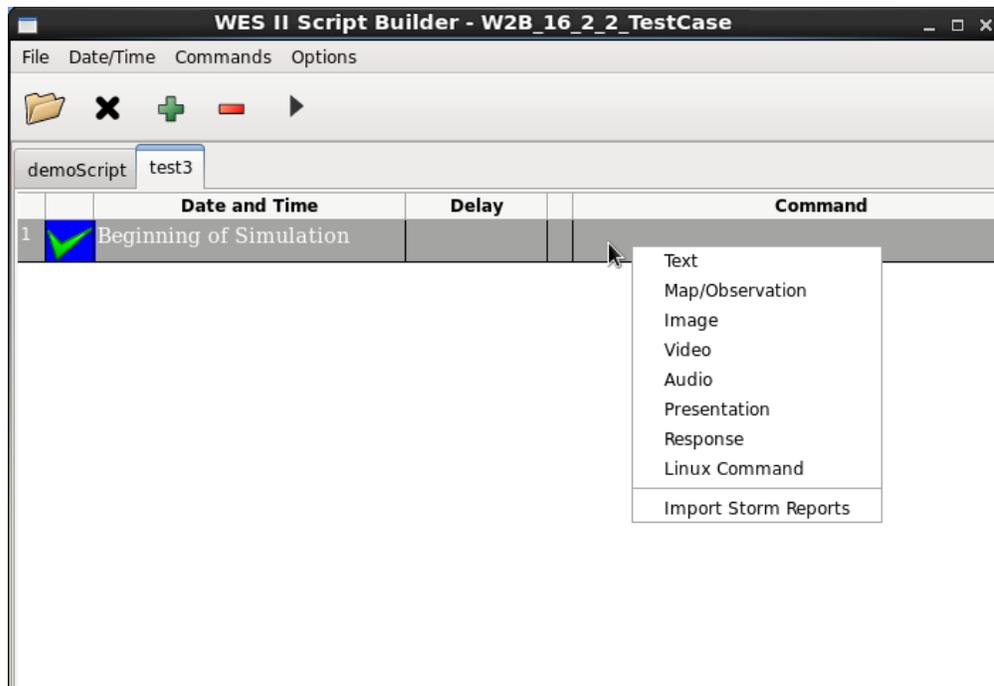
1. **Check to see if EDEX_00 is Active** under the “**EDEX Instances**” tab. If it is listed as **Not Active**, right-click and **select Start EDEX**. EDEX_00 **MUST** be active for Script Builder to run.



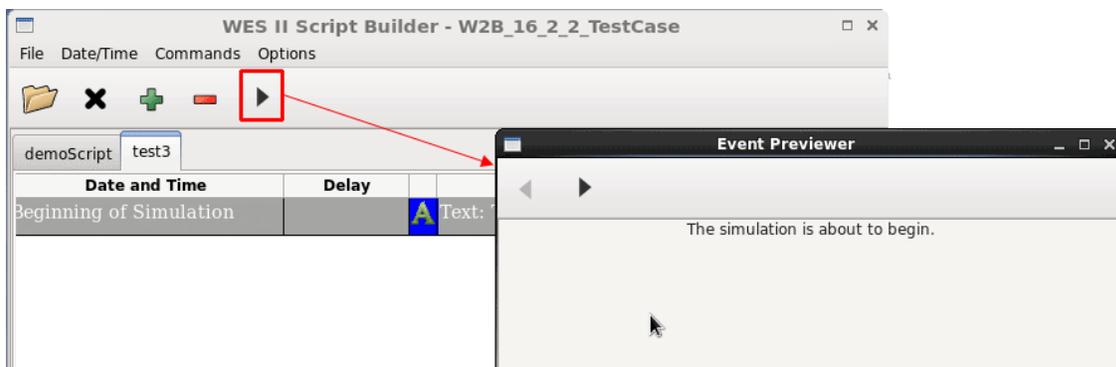
2. In the Case Manager, **Right-click** on **WES-2 Bridge 16.2.2 Test Case (LIX 2016-02-23)** and select **Launch Script Builder**.
3. **Click on the folder icon**, click the **New** button, and **enter a name for your script**.



4. **Right-click** on the empty **Date and Time** cell and select “Beginning of Simulation”.
5. **Right-click** on the empty Command cell and select Text. In the **Text Event** box, type “The simulation is about to begin.” Click **OK**.

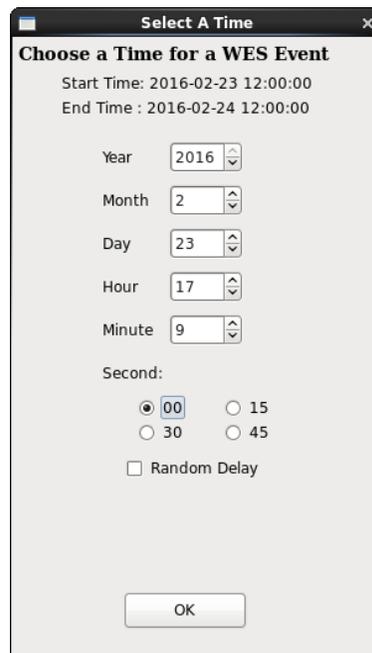


6. **Click the right arrow** in the tool bar to preview the command.



7. Click the green + sign in the tool bar to create a new row for a new event.

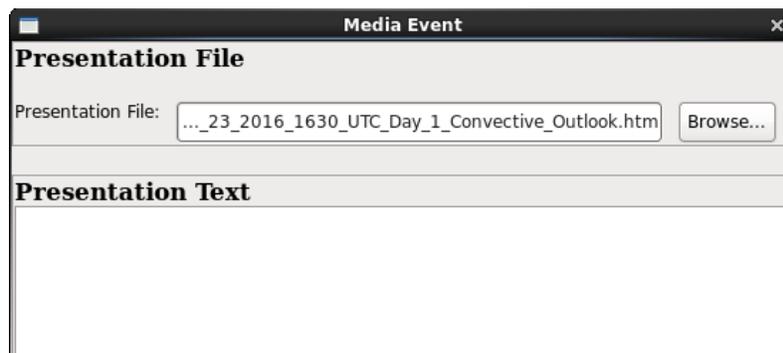
8. Double click on the **Date and Time empty cell** where you will enter **2016 02 23 17 09** and click **OK**.



- **Right-click** in the **Command** box, and **select Presentation**.
- **Browse through the filesystem to find this HTML page** (for the SPC Day 1 Convective Outlook):

**/data1/wes_cases/W2B_16_2_2_TestCase/wessl2/Resources/
Storm Prediction Center Feb 23, 2016 1630 UTC Day 1 Convective Outlook.html**

After **Opening the file**, Click **OK**.

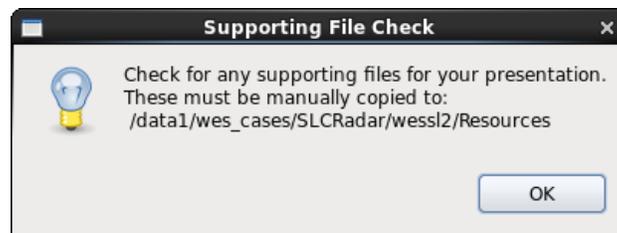


- Click on the **Play** button to preview the convective outlook web page in the Firefox browser.

Note: It is a best practice to collect external media (web pages, audio/video/image files) in a common directory inside the wessl2 directory. Here we created a Resources folder inside the wessl2 directory to contain this content. This makes the wessl2 script much easier to share with others.

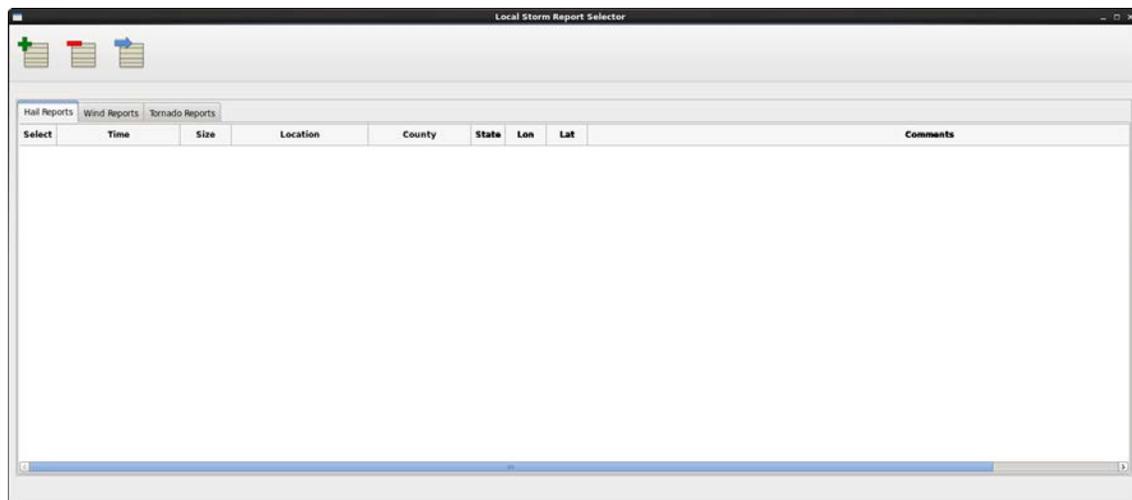
Note: This build of WESSL-2 is the first to handle relative pathnames (i.e., using media files that are located in the wessl2/Resources folder that is relative to the case directory, rather than absolute paths like /data1/wes_cases...). This change was made to make sharing scripts among machines much easier. There now are likely incompatibilities with scripts created with the earlier version of WESSL-2 that utilized absolute paths and the referenced media files could be located at any location on the machine. Now the media files (audio, video, images, notification sounds, and presentations/web pages) must be in the Resources folder, and the path names in older scripts may need to be adjusted in Script Builder.

Note: “Presentations” in WESSL-2 normally consist of some type of web-based content, like a web page or more interactive content, like Articulate or Camtasia presentations. All of these require multiple (supporting) files in addition to the main .html file that launches the presentation. WESSL-2 now automatically copies the main .html file into the Resources folder but doesn’t support automatically grabbing the supporting content. Therefore, when using a Presentation, the Script Builder displays a reminder message:



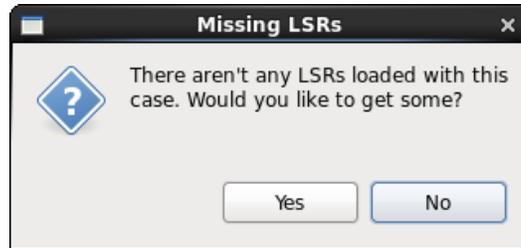
For the purposes of this job sheet, we have already packaged the supporting content in the Resources folder for you, so you can ignore this message. But this is an issue for when you make your own scripts using your own content.

9. **Open** the drop-down **Commands** menu at the top of the script builder window and **click Storm Reports**. This will pull up the **Local Storm Report Selector** window, where storm reports can be imported from .CSV files containing SPC storm reports to save you from having to enter reports one-by-one.

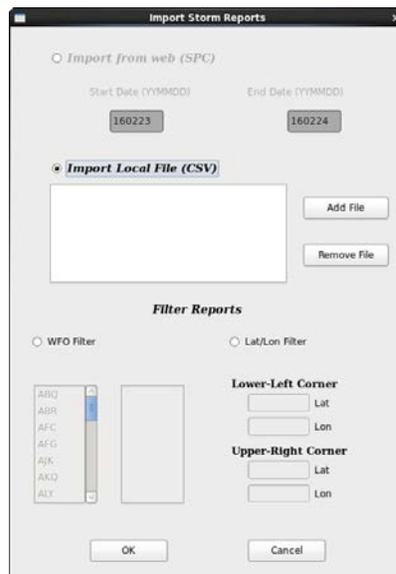


Note: At a WFO, because WES-2 Bridge machines do not have Internet access, you will have to obtain the .CSV files on a PC that does have Internet access, then subsequently scp the files to the wes2 workstation (e.g., `scp file.csv user@wes2:`). For ease we have included the reports file with this case.

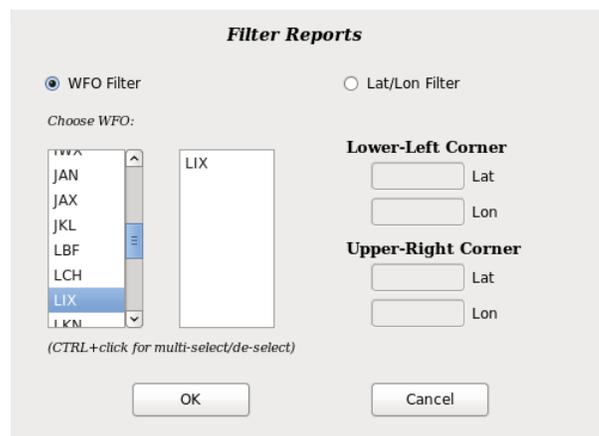
- When no reports have previously been imported a pop-up message appears asking if you would like to get some. You can also import reports by **clicking the “Get New Reports” button** (green plus sign) at the top of the window. **Click “Yes”** on the pop-up that appears.



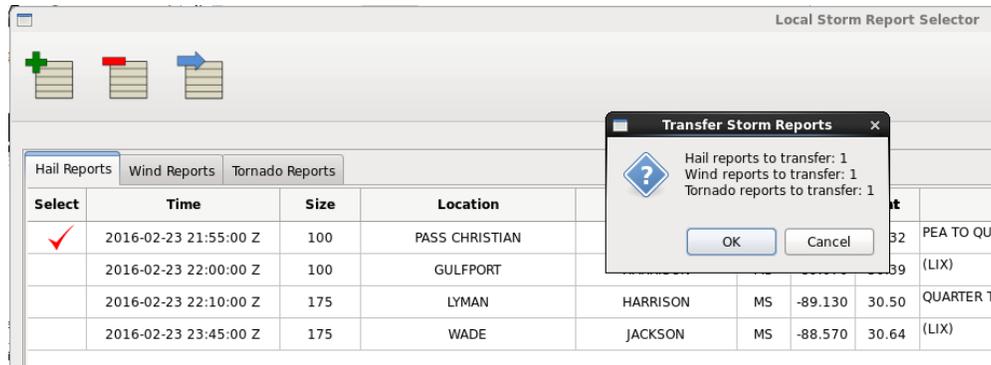
- The **Import Storm Reports** window will appear. Click **“Add File”** and navigate to .CSV file at: `/data1/wes_cases/W2B_16_2_2_TestCase/wess12/Resources/160223_rpts.csv`



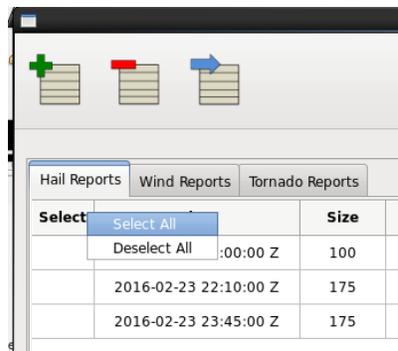
- After selecting the 160223_rpts.csv file, it should appear in the list. To only import the reports for the LIX CWA, **select the “WFO Filter” radio button**, then **scroll through the list and select LIX**. Reports can also be filtered by Lat/Lon by selecting the **“Lat/Lon Filter” radio button** and entering coordinates for two corners of a filtering bounding-box.



- Click **“OK”** to import the storm reports. It may take a few moments but once complete the reports will appear in the LSR Selector window. You can then **close the Import Storm Reports** window.
- **Select** a couple of the hail, wind, and tornado reports. To add them as events in your script, **click the “Transfer to Script”** button (blue arrow) at the top of the window. A summary will pop-up of the reports to transfer. **Click “OK”**. The reports will now appear in your Script Builder window.



- To reset the window for future users, **click “Select”** in the top-left corner of the table, then **“Select All”** to select all the reports. Then **click the “Delete Reports”** button (red minus sign) at the top of the window. Repeat this step for all reports tabs (Hail, Wind, Tornado) to fully clear the database of reports.

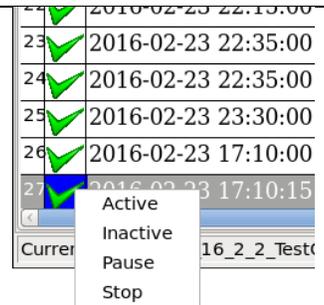


10. Use this table to fill out the remaining events in this script. You have already entered then the first event (at 02/23/2016 17:09:00). To generate each new event, click the green + sign in the toolbar.

Note: The media files in this exercise are for instructional purposes. Some of the files may not correspond to this specific case.

Time	Command	Details
02/23/2016 17:09:00	Presentation	Add a web page for the SPC Day 1 Convective outlook. Browse in the filesystem to /data1/wes_cases/W2B_16_2_2_TestCase/wess12/Resources/Storm Prediction Center Feb 23, 2016 1630 UTC Day 1 Convective Outlook.html
02/23/2016 17:10:00	Image	Add an image of the counties included in Tornado Watch #0019. Browse to /data1/wes_cases/W2B_16_2_2_TestCase/wess12/Resources/www0019_counties.gif

		For the optional text caption, enter this text: Tornado Watch #0019 Issued at 1110 AM CST
02/23/2016 17:10:15	Text	Enter this text: The simulation will pause in 15 seconds to allow you to analyze the environment. When you are finished, use the simulation controls to SKIP forward to 02/23/2016 19:14:00.
02/23/2016 17:10:30	Text	Enter this text: The simulation is paused. To enter a Pause in the script, right click on the green checkmark in the first column of the row, and select Pause.
02/23/2016 19:14:00	Observation	Type: Tornado Latitude: 30.68 Longitude: -90.60 Text: Reports of moderate damage to a trailer, 3 miles east of Montpelier Note: This is how reports can be added to a script manually, without using the Storm Report Importer used previously.
02/23/2016 19:14:15	Video	Browse in the filesystem to: /data1/wes_cases/W2B_16_2_2_TestCase/wess12/Resources/GarlandNTTA.mp4 For the optional text caption, enter this text: Video from North Texas Tollway Authority traffic cameras.
02/23/2016 19:15:00	Linux Command	Enter this text in the box (this command text is all one line): firefox -new-tab file:///data1/wes_cases/W2B_16_2_2_TestCase/wess12/Resources/myanimation.gif Note: The WESSL-2 Event Browser cannot natively display animated GIFs, but a web browser can, so that's why this Linux command starts Firefox. Linux commands can also run shell scripts to do most any other task.



11. After completing steps 3–10, your Script Builder window should be populated with events similar to this:

WES II Script Builder - TestCase					
File Date/Time Commands Options					
SampleScript					
	Date and Time	Delay	Command	Notification	Category
1	Beginning of Simulation		Text: The simulation is about to begin.	None	
2	2016-02-23 17:09:00 Z		Presentation: ...630 UTC_Day_1_Convective_O	asterisk.wav	
3	2016-02-23 21:55:00 Z		Local Storm Report: HAIL	asterisk.wav	HAIL, SIZE:1.0 (IN), PASS CHRISTIAN, HARRI
4	2016-02-23 17:42:00 Z		Local Storm Report: WIND	asterisk.wav	WIND, SPEED: UNK, WHITE CASTLE, IBERVII
5	2016-02-23 16:56:00 Z		Local Storm Report: TORN	asterisk.wav	TORN
6	2016-02-23 17:10:00 Z		Image: ww0019_counties.gif	asterisk.wav	
7	2016-02-23 17:10:15 Z		Text: The simulation will pause in 15 seconds t	asterisk.wav	
8	2016-02-23 17:10:30 Z		Text: The simulation is paused.	asterisk.wav	
9	2016-02-23 19:14:00 Z		Observation: TORN	asterisk.wav	
10	2016-02-23 19:14:15 Z		Video: GarlandNTTA.mp4	asterisk.wav	
11	2016-02-23 19:15:00 Z		Linux Command: ...-new-tab file:///data1/wes	asterisk.wav	

12. In practice, here you would **close** the **WES II Script Builder** and **Event Previewer** windows and click **Yes**.
13. In the WES-2 Bridge Case Manager, select **WES-2 Bridge 16.2.2 Test Case (LIX 2016-02-23)** in the Case Name tab, **right click**, and select **Simulation** since the case would already be loaded through completing Task 2.
14. In the **Simulation** tab **Simulation Data Time Range** enter **2016-02-23 17:09** for the **Start Date** and **2016-02-23 19:30** for the **End Date**.
15. Under the **WESSL Script**, select the script name you created in Step 3. Click the **Simulate** button.
16. If it appears, click **OK** on the available memory popup window, and note when the WESSL2 window and Simulation Controls window pops up.
17. Click the **PLAY** button on the **Simulation Controls** window.
18. WESSL-2 will display your events as you created them.

Task 4: Examine a Hydro Case and Run a Basic Simulation with Hydro Apps Capabilities: WES-2 Bridge 16.2.2 Hydro Test Case (LIX 2016-02-23)

Introduction. Since Build 14.3.1, WES-2 Bridge has had the capability of running simulations using some of the basic Hydro Apps (in the Hydro and MPE perspective). These simulations display hydro data at the proper times; RiverPro does not yet work, so product issuance is not yet possible. Running these simulations is not difficult, but constructing hydro cases can be challenging. This task illustrates the structure of a WES-2 Bridge case with hydro capabilities and how to access these data.

Note: Case Review does not work with hydro simulations and attempts to use Case Review with hydro-enabled simulations can generate errors. This will be addressed in future WES-2 Bridge versions.

You will also use one of the two parts of WESSL-2, the WESSL-2 Event Browser, to view ancillary information included with the simulation.

Concepts:

- Examine the structure of a hydro case:
 - caseMetaData.xml
 - hydro database
 - coord_host.dat
 - XMRG files used in Hydro Perspective (gridded FFG and Best Estimate QPE)
 - XMRG files used in MPE Perspective
- Load a hydro simulation
- Start a Hydro Simulation.
- Access various hydro data
- Use the Skip function to move ahead in the simulation
- Stop the simulation

Step-by-Step Instructions:

1. In a terminal window, issue the following commands to list out the contents of the WES-2 Bridge 16.2.2 Hydro Test Case:

- **cd /data1/wes_cases/W2B_16_2_2_HydroCase**
- **more caseMetaData.xml**

Note: notice there is a Hydro data type. This must be manually added to the caseMetaData.xml file for a case that has hydro capabilities.

- **ls hydro**
- **ls hydro/***

There are five folders here. This entire structure has to be manually created because the AWIPS-2 archiver cannot archive hydro data, partly because the hydro data has different purging mechanisms than the rest of the AWIPS-2 datasets.

The following discussion describes the contents of these folders and where the data may be obtained. Currently these datasets must be obtained manually and some of the datasets are purged very aggressively so there is limited time to grab these perishable files.

```

[dmorris@awips2-dm W2B_16_2_2_HydroCase]$
[dmorris@awips2-dm W2B_16_2_2_HydroCase]$ ls hydro
database geo_data griddedffg hpe mpe
[dmorris@awips2-dm W2B_16_2_2_HydroCase]$ ls hydro/*
hydro/database:
hd_ob92lix

hydro/geo_data:
coord_host.dat

hydro/griddedffg:
misc

hydro/hpe:
avgrmosaic ebmosaic hpe_gif hpe_netcdf lsatpre
bdhrmosaic ermosaic hpe_grib hpe_xmrg maxrmosaic
dhrmosaic height hpe_jpeg index nowcast

hydro/mpe:
avgrdmosaic ldmosaic lqmosaic mlqmosaic rmosaic srmosaic
bdmosaic lmosaic lsatpre mmosaic satpre state_var
bmosaic locbias maxrdmosaic q2_state_var sat_state_var state_var_dp
gageonly locbiasdp mdmosaic qpe sgmosaic
height locspan mldmosaic qpe_grib srdgmosaic
index locspandp mlmosaic rdmosaic srdmosaic
[dmorris@awips2-dm W2B_16_2_2_HydroCase]$ █

```

Directory	Description	How To Obtain
database	copy of hydro database for a given case (e.g., hd_ob92lix)	<p>The hydro database is backed up daily in /data/fxa/DAILY_BACKUP/postgres/{day of week}/hd_ob92xxx. These files require root access.</p> <p>The database can also be retrieved manually by using a pg_dump command on dx1:</p> <pre>pg_dump -Fc -U awips -f /data/local/hd_ob92xxx hd_ob92xxx</pre> <p>(xxx is your WFO ID)</p> <p>Your hydro database contains both static and dynamic information. Among other things, static information includes data about rating curves, flood stage impacts, and stream gage locations, ownership, contact information and so on. Dynamic information is time-dependent, and the database has its own purging mechanism. This data is mostly, but not exclusively, from SHEF format data files. If you manually dump your database, you should probably do it the day after your event. It is also possible to reprocess much of the SHEF data if the hydro database needs to be reconstructed for an event.</p>
geo_data	Boundary coordinates of the HRAP (Hydrological Rainfall Analysis Project) grid for a WFO.	<p>This file is different for each WFO. The gridded data files in the remaining directories are in XMARG format (a binary grid) using a subset of a national HRAP grid. Your WFO's file is located at this location on dx3 or dx4:</p> <pre>/awips2/edex/data/share/hydroapps/geo_data/host/ascii/coord_host.dat</pre> <p>This file is necessary to display the griddedffg, best estimate qpe and mpe files. It is also necessary if you wanted to reprocess XMARG-format HPE files for FFMP.</p>

griddedffg/misc	XMRG format version of FFG for your WFO. This grid is displayable in the Hydro Perspective	<p>These files contain gridded FFG for 1-, 3- and 6-hour periods. These files normally remain on your system for 2 days.</p> <p>The files are located in this directory on dx3 or dx4:</p> <p>/awips2/edex/data/share/hydroapps/whfs/local/data/grid/misc/</p> <p>Here are some example filenames for the LIX case:</p> <p>LIX201602220001.ffg LIX201602220003.ffg LIX201602220006.ffg</p> <p>The format is XXXYYYYMMDDHHFF.ffg, where XXX is the WFO ID, FF is the forecast period (01, 03, and 06). Thus, these particular files are for February 22, 2016 at 00 UTC.</p>
hpe	These are XMRG format files for the High Resolution Precipitation Estimates produced at your own WFO.	<p>The hydro simulation currently does not utilize these files, but they may be useful for reprocessing HPE for FFMP. These are the “raw” format files for HPE, Bias HPE, and HPN (HPN files are in a “nowcast” directory.).</p> <p>These files are found at the following directory on dx3 or dx4:</p> <p>/awips2/edex/data/share/hydroapps/precip_proc/local/data/hpe/</p> <p>The previous day’s files up to 09Z are purged each day at 1200 UTC, so there is a three-hour daily window between 9Z and 12Z where files can be obtained for the previous day.</p>
mpe/qpe	These are XMRG format files for the Best Estimate QPE produced at your own WFO. This gridded data is viewed in the Hydro Perspective.	<p>These files normally remain on your system for 2 days.</p> <p>The files are located in this directory on dx3 or dx4:</p> <p>/awips2/edex/data/share/hydroapps/precip_proc/local/data/mpe/</p> <p>Here is an example file from the LIX case: xmrg0224201607z, which is for February 24, 2016 at 07 UTC.</p> <p>By default, the MMOSAIC (multi-sensor mosaic from MPE) is used for the Best Estimate QPE.</p>
mpe	<p>These are XMRG format files for various precipitation estimate mosaics produced by the MPE (Multi-sensor Precipitation Estimate) system on a local AWIPS system.</p> <p>These are viewable by the MPE perspective.</p>	<p>These files normally remain on your system for 2 days, but some files have a longer purge time.</p> <p>The files are located in this directory on dx3 or dx4:</p> <p>/awips2/edex/data/share/hydroapps/precip_proc/local/data/mpe.</p> <p>The filename is usually {PRODUCT}YYYYMMDDHHz, where PRODUCT is the name of the particular MPE mosaic (e.g. MMOSAIC, RMOSAIC, GAGEONLY, etc.)</p> <p>Here are a few sample filenames:</p> <p>gageonly/GAGEONLY2016022123z mmosaic/MMOSAIC2016022123z rmosaic/RMOSAIC2016022123z</p>

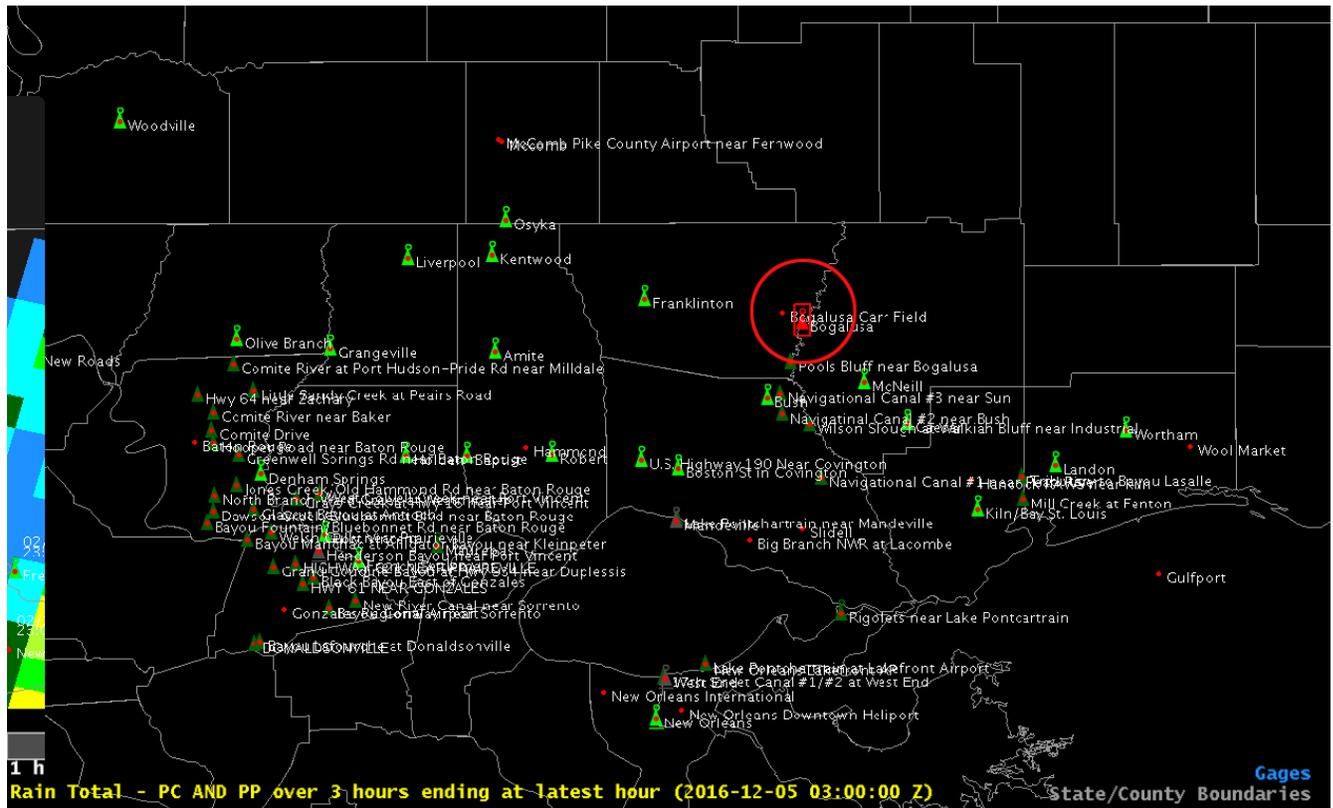
- In the WES-2 Bridge case manager, **right-click on the “WES-2 Bridge 16.2.2 Hydro Test Case (LIX 2016-02-23)”** and select **Load Case**.

Note: Loading and running a simulation for a hydro case is the same as for any other case.

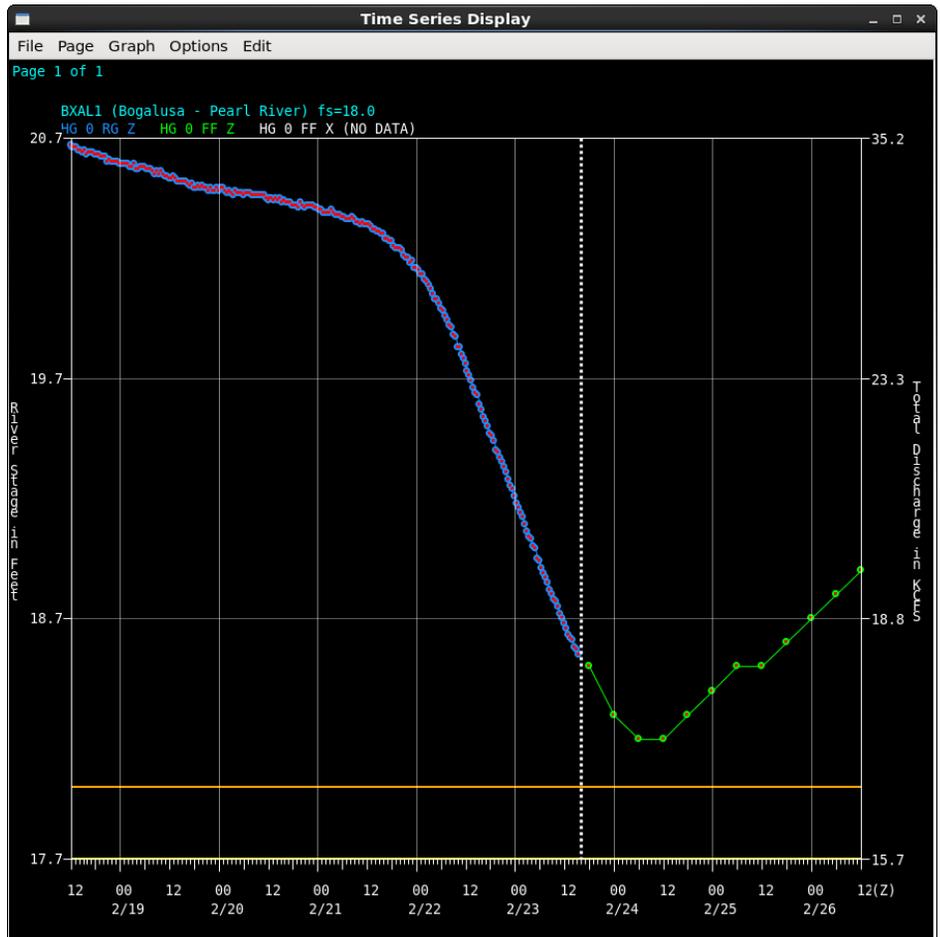
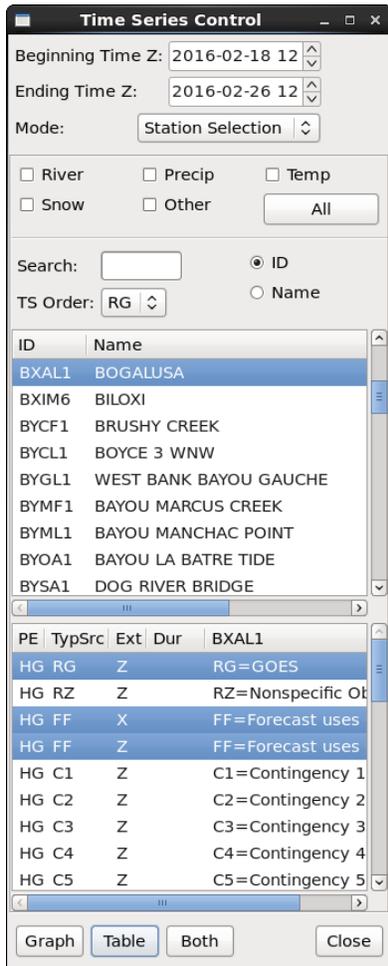
- Start the simulation by selecting **WES-2 Bridge 16.2.2 Hydro Test Case (LIX 2016-02-23)** in the Available Cases tab. Then **right click** and select **Simulation**.
- Set the Start Date for the Simulation Data Time Range to **2016-02-23 16:00**
- Click the **Simulate** button.

Note: It may take several minutes for the simulation to initialize. When the simulation is ready to run, a CAVE window should launch and the simulation controls window should appear.

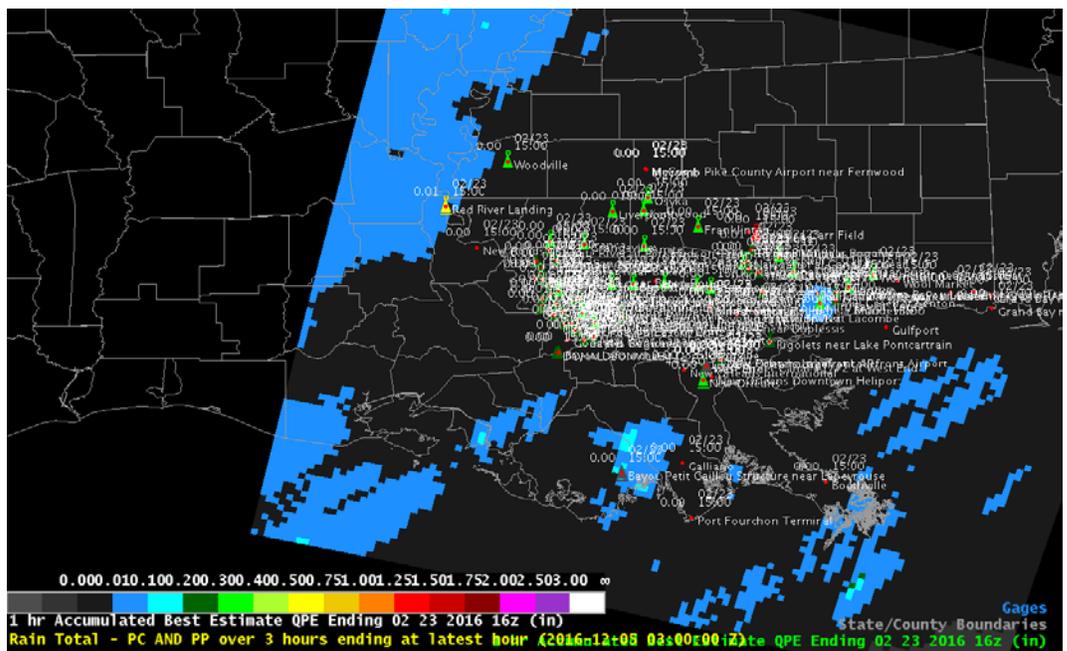
- Press the **Play** button in the Simulation Controls.
- Use the **Open Perspective** button to change to the **Hydro Perspective** or use the CAVE menu and choose **Perspective** then **Hydro**.
- Find the Bogalusa stream gauge station, in the northeast portion of the CWA (highlighted with a red circle in the figure below). **Double-click** the station to select it (it becomes highlighted in a red box). **Right-click** on the station, and click **Timeseries**.



9. In the Time Series Control dialog, highlight the HG RG and HG FF lines in the lower list box and then click the **Graph** button. You should see a hydrograph similar to the one below.



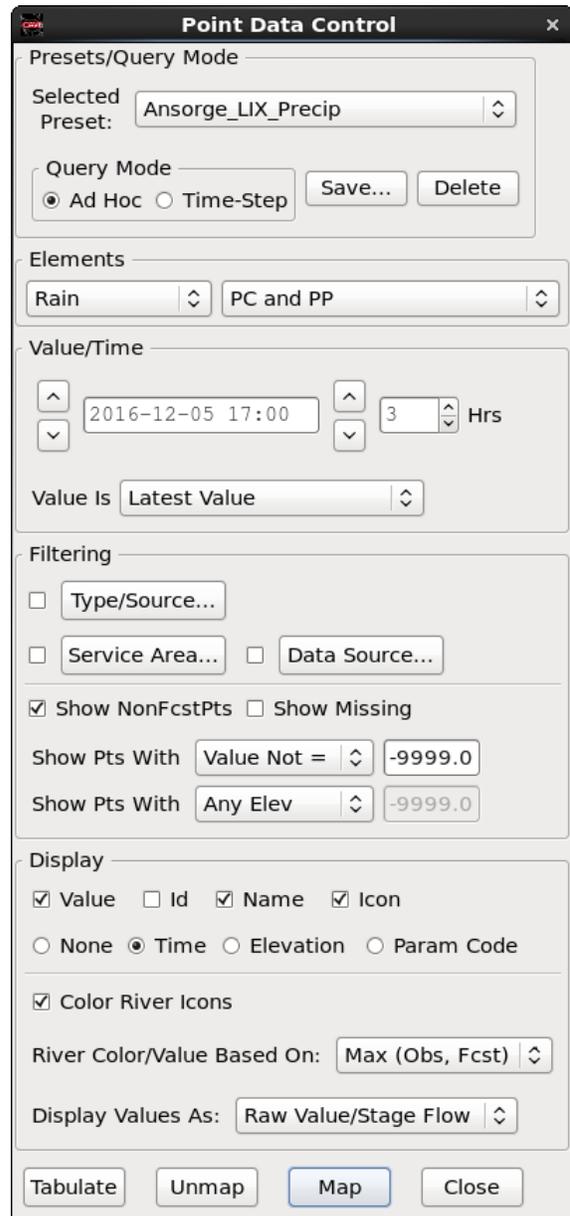
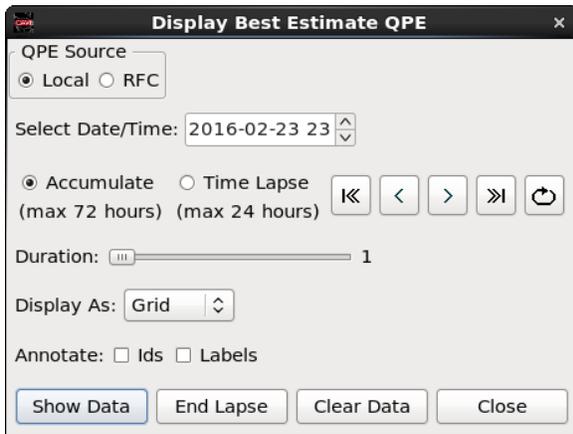
10. In the CAVE window, click Map Data then Best Estimate QPE. In the resulting Dialog Box, ensure the Date/time is **2016-02-23 16** and then click the **Show Data** button. The Hydro perspective window should look similar to the image at the right.

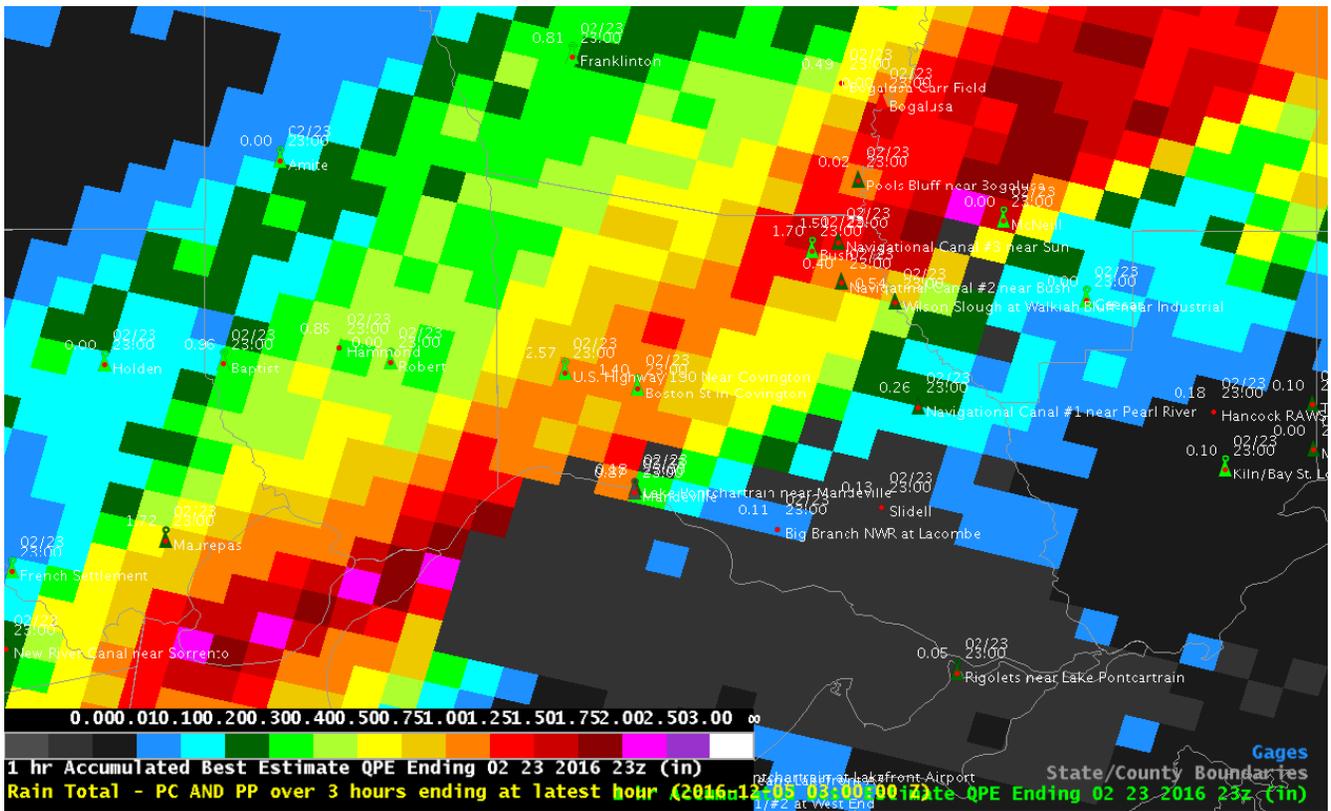


11. Find the Simulation Controls window and click the Skip button. Skip to **2016-02-23 2300 UTC**.

Note: The Hydro Apps displays do not typically auto-update like their D2D counterparts.

12. Force the main Hydro Perspective Window to update by finding the **Best Estimate QPE** dialog, ensuring the date is now **2016-02-23 23** and clicking the **Show Data** button. Also find the **Point Data Control** dialog (you can choose the **MapData** menu and **Point Data Control** option). Click its **Map** button to force a screen refresh. This display should update and look similar to the image on the next page.





13. Find the **Time Series Control** dialog and click the **Graph** button, and the hydrograph plot should update. Notice how the most recent precipitation has caused the stream stage to deviate from the forecasted values.

14. Use the Simulation Controls to **STOP** the simulation. Finally, unload the case.

