What if Hurricane Sandy made landfall on the SC Coastline???

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Background

- As Hurricane Sandy made her way up the Eastern Seaboard, South Carolina was one of the original states that Sandy was forecast to impact. While South Carolina was fortunate that Sandy took a turn to the northern states, the issues that those states have been and are currently dealing with could have very well happened here.
- This study looks at Hurricane Sandy and her potential impacts to SC using HURREVAC to provide the storm data and HAZUS to run the models.
- Hurricane Sandy was modeled in HAZUS along her original tract, making landfall near the Charleston Harbor, and making landfall near Edisto Beach
  - Like to talk about what it took to set up the model and show you a preliminary screen shot from the Edisto Beach model run.

- HURREVAC (Hurricane Evacuation) is a storm tracking and decision support tool for government emergency managers. The program tracks hurricanes, using the National Weather Service's National Hurricane Center Forecast/Advisory product, and combines this information with data from the various state Hurricane Evacuation Studies to assist local emergency managers in determining a proper evacuation decision time.
- HURREVAC is a product of the National Hurricane Program, a partnership between the Federal Emergency Management Agency (FEMA) and the U.S. Army Corps of Engineers (USACE), and the National Oceanic and Atmospheric Administration (NOAA).
- This project used the data in HURREVAC and exported that directly into HAZUS.

HURREVAC (v.1.3.2) Hurricane Decision Support for Emergency Management

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- Exercise
- 2013
- 2012
  - Atlantic (19)
    - Alberto
    - Beryl
    - Chris
    - Debby
    - Ernesto
    - Florence
    - Gordon
    - Helene
    - Isaac
    - Joyce
    - Kirk
    - Leslie
    - Michael
    - Nadine
    - Oscar
    - Patty
    - Rafael
    - Sandy
    - Tony
  - East Pacific (16)

- STORM FEATURES
- ANNOTATION
- BROWSERS
- UTILITIES
  - Storm Data Entry
  - Set Evac Options...
  - Decision Arc
  - Exercise Wizard
  - Export/Import
    - Export Plot (.stm)...
    - Import Plot (.stm)...
    - Export to GIS...

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Export Displayed Storm Plot to (.stm) file..

« Hazus-MH ▸ Data ▸ HU ▸ Hurrevac ▸ StormFiles ▸ Atlantic

Search Atlantic

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2_2005.stm	4/30/2009 3:24 PM	STM File	8 KB
3_2005.stm	4/30/2009 3:24 PM	STM File	7 KB
4_2005.stm	4/30/2009 3:24 PM	STM File	5 KB
5_2005.stm	4/30/2009 3:24 PM	STM File	10 KB
a_1992.stm	4/30/2009 3:24 PM	STM File	9 KB
a_1995.stm	4/30/2009 3:24 PM	STM File	2 KB
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a_1997.stm	4/30/2009 3:24 PM	STM File	2 KB
a_1998.stm	4/30/2009 3:24 PM	STM File	5 KB
a_1999.stm	4/30/2009 3:24 PM	STM File	6 KB
a_2000.stm	4/30/2009 3:24 PM	STM File	16 KB
a_2001.stm	4/30/2009 3:24 PM	STM File	2 KB
a_2002.stm	4/30/2009 3:24 PM	STM File	2 KB
a_2003.stm	4/30/2009 3:24 PM	STM File	3 KB
A_2004.stm	4/30/2009 3:24 PM	STM File	10 KB
A_2005.stm	4/30/2009 3:24 PM	STM File	9 KB
A_2006.stm	9/8/2006 11:40 AM	STM File	8 KB
a2_2005.stm	4/30/2009 3:24 PM	STM File	4 KB
b_1995.stm	4/30/2009 3:24 PM	STM File	2 KB

File name: sandy_ex

Save as type: Hurrevac StormPlot file (*.stm)

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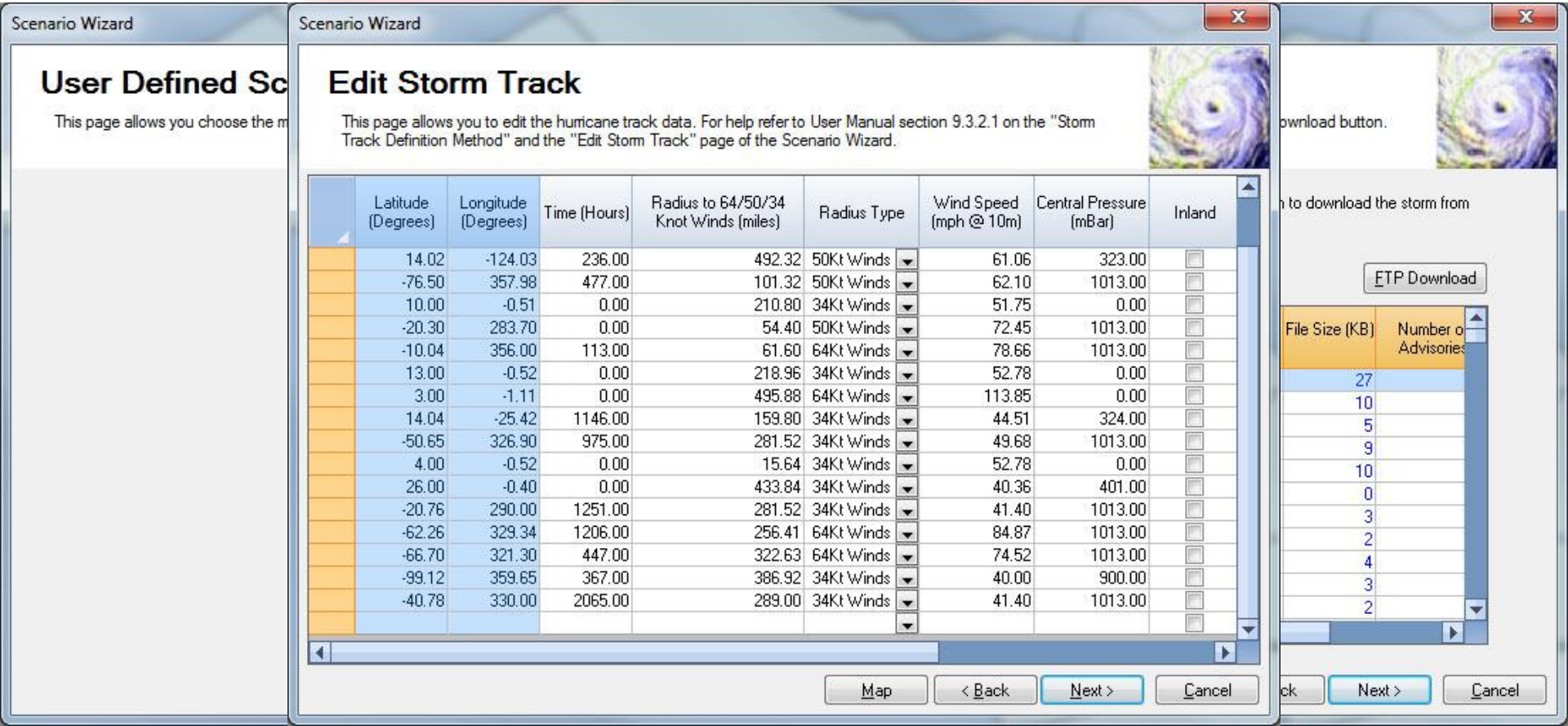
Getting Hurrevac Data into HAZUS

The reason you export the data from Hurrevac directly into the HAZUS structure is that HAZUS reads the storm as a pre-loaded scenario.

Once you select the storm and make it active, you can use the scenario wizard to edit location, speed, winds, etc….



Latitude (Degrees)	Longitude (Degrees)	Time (Hours)	Radius to 64/50/34 Knot Winds (miles)	Radius Type	Wind Speed (mph @ 10m)	Central Pressure (mBar)	Inland
14.02	-124.03	236.00	492.32	50Kt Winds	61.06	323.00	
-76.50	357.98	477.00	101.32	50Kt Winds	62.10	1013.00	
10.00	-0.51	0.00	210.80	34Kt Winds	51.75	0.00	
-20.30	283.70	0.00	54.40	50Kt Winds	72.45	1013.00	
-10.04	356.00	113.00	61.60	64Kt Winds	78.66	1013.00	
13.00	-0.52	0.00	218.96	34Kt Winds	52.78	0.00	
3.00	-1.11	0.00	495.88	64Kt Winds	113.85	0.00	
14.04	-25.42	1146.00	159.80	34Kt Winds	44.51	324.00	
-50.65	326.90	975.00	281.52	34Kt Winds	49.68	1013.00	
4.00	-0.52	0.00	15.64	34Kt Winds	52.78	0.00	
26.00	-0.40	0.00	433.84	34Kt Winds	40.36	401.00	
-20.76	290.00	1251.00	281.52	34Kt Winds	41.40	1013.00	
-62.26	329.34	1206.00	256.41	64Kt Winds	84.87	1013.00	
-66.70	321.30	447.00	322.63	64Kt Winds	74.52	1013.00	
-99.12	359.65	367.00	386.92	34Kt Winds	40.00	900.00	
-40.78	330.00	2065.00	289.00	34Kt Winds	41.40	1013.00	

tips and tricks

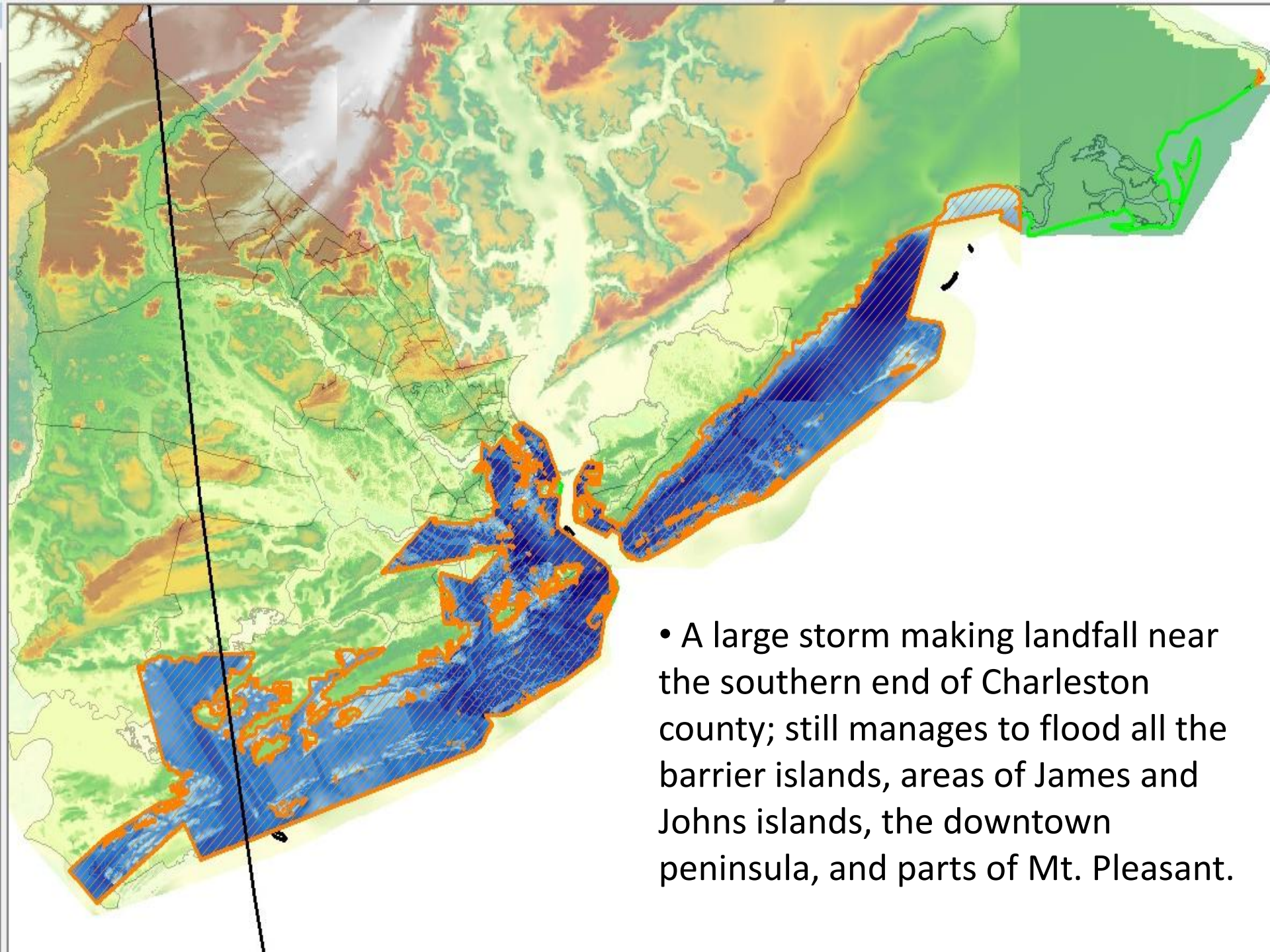
- The minimum requirements for HAZUS 2.1 are not kidding around. Recommend a larger system than listed, a hard core data processor or gaming computer would be best. This model was performed in the College of Charleston's GIS – Lowcountry Hazards Center.
- If you are using a system with dual hard drives (C:// and D://) – during your install set the regions and all output locations to the second drive. Usually the D:// drive is reserved for storage and backup and will have more space to handle large scale HAZUS runs.
- If your run is going to take a long time, remember to turn your screen saver off and disable the sleep (power saver) function on the computer. Both can disrupt and kill a run mid-stream.
  - Also, you are going to want to use a computer that can be solely devoted to HAZUS so there is no competition for memory use.

Study Region and Scenario Settings

- Our study region includes the tri-county areas of Berkeley, Charleston, and Dorchester counties at the tract level.
- The DEM used was not the prepackaged available from the HAZUS portal download. College of Charleston has been working on collecting high resolution DEMs from several sources and combining them into a master file. The DEM for the basins needed for the flood module were clipped from this file.
- The storm surge model was set for no-waves with a 5’ tidal range. The entire Charleston County Coastline / Barrier Island system was selected for the shoreline reach.

Outputs

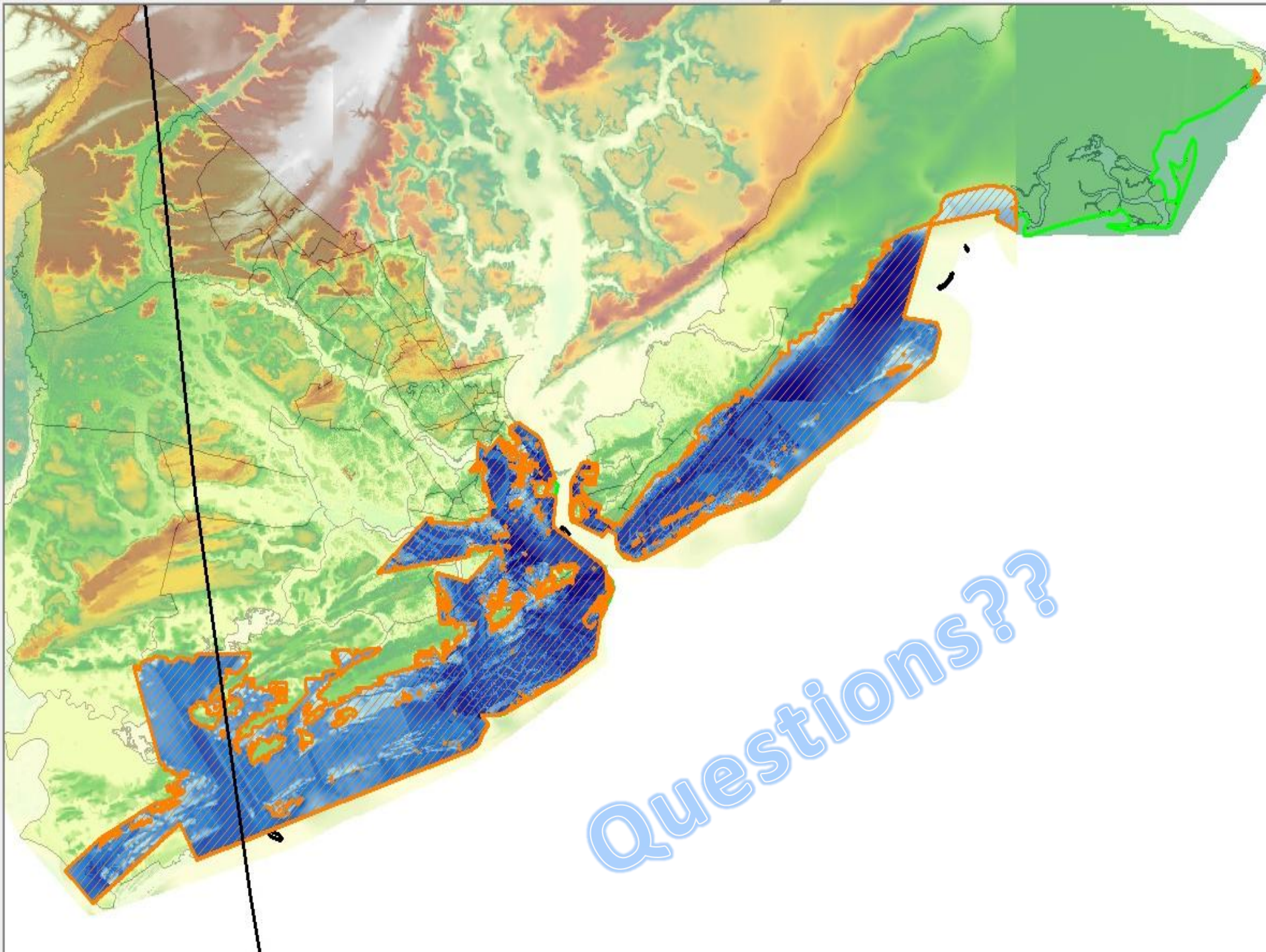
- We learned from the previously mentioned tips and tricks. The large scale and resolution of our DEM combined with the size of the coastline we were trying to flood caused multiple crashes on the College of Charleston computers.
  - At one point we actually filled up the C:// drive causing Windows to shut down.
- There was some error in our outputs, the storm surge seems to stop at a straight line in places going up some of the river channels, this may be due to the repeated crashes we had.
  - We simply re-started the run, and did not start over from scratch.
- This particular run was only for our “proof of concept” test to see if HAZUS could handle the entire coastline and it took 96 hours to complete.



• A large storm making landfall near the southern end of Charleston county; still manages to flood all the barrier islands, areas of James and Johns islands, the downtown peninsula, and parts of Mt. Pleasant.

Next Steps

- Dorchester County EMD and the College of Charleston are in the process or re-running this storm track.
- We are also in the process of moving Sandy's landfall closer to Folly Beach to see if the storm surge moves farther inland up the Ashley and Cooper River basins.
- Another step is to raise Sandy to Cat 3 strength to look at any changes in the flooding.
- The data on the storms, the outputs, and the reports will be shared with SCEMD, the local counties, and will hopefully be published in an upcoming journal.
- We hope to be invited back on another SCHUG call to share our final data in the fall/winter.


Questions??