



## **Hazard Vulnerability Assessment (HVA) Tool**

### ***Basic Overview:***

The South Carolina Department of Health and Environment Control (SCDHEC) - Ocean and Coastal Resource Management (OCRM) Office is presenting a new coastal hazard assessment tool called the Hazard Vulnerability Assessment (HVA).

The goal of the HVA is to provide a geospatial tool that can be used by federal, state, and local coastal managers and scientists to improve comprehensive and hazard mitigation planning, post-disaster redevelopment, as well as determine areas best suited for restoration and mitigation.

This tool was created through a collaborative effort of the Governor's South Atlantic Alliance (GSAA). GSAA is a regional partnership among four states (NC, SC, GA, and FL) focused on shared ocean and coastal challenges and opportunities, promoting environmental sustainability, disaster preparedness, and strong economies. Federal partners of the GSAA include NOAA, EPA, and the DOI.

The HVA is an analysis tool that evaluates coastal hazard vulnerability from four hazards: storm surge, shoreline change rate (erosion or accretion), flooding, and social/economic vulnerability (SoVI®). The final product is a vulnerability index on a scale of 1 to 5 (1 being the least risk, 5 being the most risk). In addition to this composite product, HVA also produces products for Inundation (surge + flooding), Inundation + SoVI®, and Shoreline Change (rate, plus temporal and spatial variations). Users can examine each hazard component to see what has the most impact in any given area.

The tool is open source and available free to any users. In addition to building this tool, the GSAA has tested it in pilot areas in each of the four states. In SC, the SCDNR Geological Survey ran the tool for a portion of Edisto and Wadmalaw Islands, located in southern Charleston County. The results from this pilot area are available on the GSAA portal (see below). To expand the use of this tool to other areas in SC or other states, some GIS skills and datasets are required. For GIS users, SCDHEC – OCRM, SCDNR – Geological Survey, and GSAA HVA tool builders will provide technical assistance. For non-GIS users, SCDHEC – OCRM, in collaboration with other agency partners will be running this tool, and rolling out final results for all SC coastal counties between the Fall 2014 and the Fall 2015.

### ***How to use it (generalized step by step for GIS users)***

1. Download HVA tool
2. Download AMBUR tool
3. Digitize or obtain shorelines using current and historic imagery
4. Run AMBUR on digitized shorelines
5. Download or gather 4 dataset components (see links below)
  - a. Storm surge
  - b. Shoreline Change Rate – erosion or accretion (from AMBUR)
  - c. Flood maps
  - d. Social vulnerability
6. Run HVA tool using 4 components
7. Get final GIS products with HVA rankings of 1 – 5.

### ***How to use it (Info for non-GIS users)***

- View the results from the pilot area on the GSAA portal – coming March 2014 (see link below).
- If available, work with in-house GIS staff to use the tool.
- If there is no in-house GIS staff, determine if your area(s) of interest are north or south of Capers Inlet, SC. If area(s) of interest are south of Capers Inlet, look for final HVA products (coastal areas

ranked 1 to 5) in the Fall 2014. If they are north of Capers Inlet, look for final HVA products (coastal areas ranked 1 to 5) in the Fall 2015.

### ***Link to the download for the HVA and AMBUR tools***

- HVA: [http://r-forge.r-project.org/R/?group\\_id=476](http://r-forge.r-project.org/R/?group_id=476)
- AMBUR: [http://r-forge.r-project.org/R/?group\\_id=476](http://r-forge.r-project.org/R/?group_id=476)
- Tool documentation: <http://ambur.r-forge.r-project.org/>

### ***Links to the four dataset components***

- Storm surge (SLOSH): <http://slosh.nws.noaa.gov>
- Shoreline change: Your output from the AMBUR software is used.
- FEMA Flood maps:  
<https://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1>
  - On the left hand side with the address tab, there is a pulldown for Select a Product. Select NFHL Data. Enter Address, and it will take you to a Map Search. Draw a box around the area of interest and then click the link to “Retrieve Available NFHL Data”. That link will pull up a list and you can click download. The shapefile you want to use is called S\_FLD\_HAX\_AR and you want to use the attribute field FLD\_ZONE.
- Social vulnerability index: <http://www.csc.noaa.gov/digitalcoast/>

### ***Links to GSAA***

- Home page: <http://www.southatlanticalliance.org/>
- Data portal: <http://www.gsaaportal.org/>

### ***Contacts***

- GSAA
  - General questions about GSAA: Kristine Cherry, Regional Alliance Coordinator, [kristine.cherry@gsaalliance.org](mailto:kristine.cherry@gsaalliance.org)
  - AMBUR or HVA technical questions: Dr. Chester Jackson, Georgia Southern University, [cjackson@georgiasouthern.edu](mailto:cjackson@georgiasouthern.edu)
- SCDNR – Geological Survey
  - AMBUR or HVA Technical support: Scott Howard, HVA pilot area project lead for SC, [howards@dnr.sc.gov](mailto:howards@dnr.sc.gov)
  - Katie Luciano, Geologist II, [lucianok@dnr.sc.gov](mailto:lucianok@dnr.sc.gov)
- SCDHEC – Ocean and Coastal Resource Management Office
  - General or technical questions: Jessica Boynton (presenter), Coastal Services Division, Shoreline Specialist, [boyntojb@dhec.sc.gov](mailto:boyntojb@dhec.sc.gov)