

Coastal Hazards System (CHS)

Need



Coastal Hazards System website home page.

Flood and wind damage from annual coastal storms continues to cause dramatic negative impacts to the U.S. economy with direct cost of over \$400 billion for the top 7 hurricanes. Six of the top seven most damaging storms occurred from 2004 to 2014. Over 52% of the U.S. population lives in coastal watershed counties and the coastal population is expected to increase 10% between now and 2020. Sea level change and increasing storminess are exacerbating the vulnerability of coastal communities. Hurricane Sandy alone accounted for roughly \$66 billion in damage and over 200 lives lost.

- Federal agencies and partners need accurate and comprehensive coastal storm hazard information
- Hazards must include a complete description of uncertainty for risk assessment
- Extreme storms are rare and spatially sparse, so even long-term measurements are insufficient
- Coastal storm simulations are complex and produce gigantic data sets requiring innovative analysis, data formats and big data technology.

Approach

Following Hurricane Katrina in 2005, both the Federal Emergency Management Agency (FEMA) and the US Army Corps of Engineers (USACE) embarked on a new strategy to employ high-fidelity numerical climate and hydrodynamic modeling, and rigorous joint probability methods, to quantify the coastal storm hazard. These efforts culminated in the CHS, which includes numerous products and features, such as, storm climate, winds, waves, water levels, joint probability of storm responses, and annual exceedance probabilities.

Outcomes

USACE and other Federal coastal projects, R&D studies, flood-risk mapping, and emergency response activities require storm data and extensive high-resolution modeling in a statistical context in order to plan, design, and ascertain risk. The CHS provides comprehensive coastal data and the associated uncertainties in easily ingestible standardized formats producing great potential for monetary savings as well as improved understanding of the complex processes by Federal, State, and local governments and the public at large. CHS metamodeling provides a very rapid high-fidelity prediction capability that does not currently exist elsewhere (<https://chs.erdrc.dren.mil>).

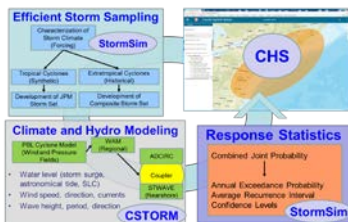
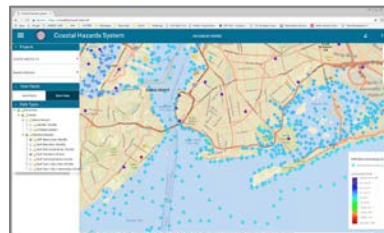


Diagram of processes that make up the Coastal Hazards System (CHS).



CHS screenshot displaying non-linear residual results for storm surge.



CHS display of NACCS data point locations and AEP plot.

More Information

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