Informing social decision making: Physical vulnerability to sea level rise

Alexander D. Renaud
Virginia Institute of Marine Science

Karinna Nunez
Virginia Institute of Marine Science

Molly Mitchell
Virginia Institute of Marine Science

Carl Hershner
Virginia Institute of Marine Science

Follow this and additional works at: https://scholarworks.wm.edu/presentations

Part of the Climate Commons, Environmental Indicators and Impact Assessment Commons, and the Oceanography Commons

Recommended Citation
The study of vulnerability to floods, sea-level rise and other hazards has become an increasingly hot topic over recent years as Americans try to better manage our coastlines. By better understanding vulnerability, we can better predict how different communities will be impacted by such threats.

However, while several vulnerability indices tackle such issues, few of them do so on a scale that is directly connectable to human socio-economic conditions and thereby fail to provide the full picture. Those that do often are so specific that they fail to be applicable elsewhere.

Therefore, a team of individuals at CCRM has developed a new basic physical vulnerability approach and applied it to the Chesapeake Bay region. Consisting of 5 factors, the process creates an index that supports the examination of the relationship between human communities and coastal flooding, thereby helping us better manage these hazards.

**Physical Vulnerability Index Construction**

- **Percent Area Under 10 ft**
- **Wave Energy**
- **Percent Developed of sub-10 ft area**

**Highlights**

- The index easily ties to human geographies and thus can find the highest risk socio-economic populations that are also threatened by flooding
- It is relative, so can be recalculated at different scales to manage different community/policy units
- It can be used to target areas with high vulnerability for further study and mitigation efforts
- The index utilizes replicable data sources allowing relatively simple exportability

**Application**

Southeast Newport News has:
- Combination of low income, people under 18 and above 65, and disabled population
- Few households with cars
- High physical risk

**Possible Recommendations:**
- Increase shelter capacity
- Clear bus evacuation plans
- Education on "shelter in place"