**NASA DEVELOP National Program**

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**Short Title: Maryland Ecological Forecasting**

**Updated Abstract**

## Maryland experiences dozens of sea turtle strandings every year on both the Atlantic and Chesapeake Bay coasts. The majority of these strandings are juvenile loggerhead sea turtles (*Caretta caretta*) that wash onshore during the late spring to early fall. Although some strandings are attributable to anthropogenic recreational activities, such as fishing and boating, most of the strandings lack a clear cause of death. Changes in sea surface temperature, algal bloom activity, and weather events can all affect the survivorship of sea turtles. Here, we analyzed correlations in loggerhead strandings with sea surface temperature and chlorophyll-*a* measured remotely by the Aqua MODIS sensor, the SeaWIFS instrument onboard OrbView-2, and the Visible Infrared Imaging Radiometer Suite (VIIRS) on the Suomi National Polar-orbiting Partnership satellite to understand the environmental variables affecting survivorship since 1991. We also identified potential nesting site locations since this life cycle stage is the most sensitive. Nesting activity is limited in Maryland, but modeled climate change indicates warming along the Atlantic coastline – which will push the nesting range of loggerheads northward. Distance from human infrastructure, beach width, and beach slope were used to determine the greatest likelihood of future nesting under different climate and sea level rise scenarios using the Community Climate System Model. Our findings will be used by the Maryland Department of Natural Resources to react faster and efficiently to future strandings and to conserve potential nesting site locations.