

## **Sea-level Rise and Storm Effects on the Florida Coast Under Changing Global Climate**

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Coastal science is focused on understanding how landforms have evolved and forecasting future change in response to sea-level rise (SLR). Research has formulated a conceptual framework regarding the primary factors and processes that drive coastal change. The geologic record shows that sea level is highly variable with levels ~ 5 m higher and ~120 m lower. Subsidence can further add to SLR. Current techniques used to predict coastal-change, however, do not accurately reflect the current scientific understanding of coastal change. Our ability to quantify impacts of SLR to inform policymakers remains limited.

A body of scientific information shows that global climate throughout Earth's history is highly variable with driving forces and complex feedbacks. Scientific consensus, however, is that the build-up of greenhouse gases from fossil fuel burning since the late 19<sup>th</sup> century has increased global mean temperatures and is primarily responsible for the environmental changes being observed. Climate-change assessments suggest global sea-level will rise ~1 m by year 2100, more than 3 times the 20th century rise. Impacts will include increased erosion, flooding, saltwater intrusion, wetland loss, and threats to human infrastructure.

Future rise will result from thermal expansion of warming oceans and addition of melt water from glaciers and ice sheets. In addition, consensus is strengthening that the rate of SLR will accelerate in the future due to climatic factors that have not been fully considered until recently. These could accelerate SLR by ~5 m over the next several centuries.

The USGS through the U.S. Climate Change Science Program has just completed an assessment (SAP 4.1) of potential future coastal changes associated with SLR. One finding is that current approaches to predicting coastal change result in an oversimplification of potential coastal hazards and a wide disparity in public awareness of risks and vulnerabilities to accelerating SLR.