

## **EVALUATING POTENTIAL SEA-LEVEL RISE IMPACTS TO THE U.S. MID-ATLANTIC OCEAN COAST: RESULTS FROM A PANEL ASSESSMENT**

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Sea-level rise over the 21<sup>st</sup> century is expected to cause significant changes to coastal regions. The ability to reliably predict changes to coastal landforms such as beaches and barrier islands is limited due to the current level of scientific understanding of the many factors and processes that contribute to these changes. This is due in part to limitations in existing conceptual, analytical, and numerical models to generate quantitative predictions of landform changes over 50-100 year time scales. In an effort to review and discuss potential sea-level rise impacts, as well as predictive methods, a panel of coastal scientists with extensive professional experience in the mid-Atlantic region was convened to develop a qualitative assessment of potential future coastal changes that may occur by the end of the 21<sup>st</sup> century. A qualitative assessment of future changes to the open ocean coast of the mid-Atlantic region was developed based on a synthesis of existing knowledge. Using criteria derived from published work, the mid-Atlantic coast was divided into four geomorphic types: spits, headlands, wave-dominated barriers, and mixed-energy barriers. A range of potential coastal responses was identified for each geomorphic type based on three principal sea-level rise scenarios. The scenarios assumed that: a) the long-term relative sea-level rise rate (~3-4 mm/yr) observed over the 20th century would persist through the 21<sup>st</sup> century, b) the 20th century rate would increase by 2 mm/yr, and c) the 20th century rate would increase by 7 mm/yr. The panel acknowledged that coastal engineering could be employed to mitigate erosion but it was uncertain if such practices would persist into the future. Potential responses to these sea-level rise scenarios depend principally on the landforms that occur within a region, and include increased likelihood for erosion and shoreline retreat for all coastal types; increased likelihood for erosion, overwash, and inlet breaching for barrier islands; as well as an unexpected suggestion that some barrier islands could cross a geomorphic threshold. Systems that cross a threshold may exhibit more dramatic responses such as rapid barrier island migration, or segmentation.

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