Coastal research community suggests ways to deal with severe storms, coastal erosion and climate change

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(Phys.org) —Global sea level is rising at an accelerated rate in response to climate change, and to ensure a sustainable future, society must learn to anticipate and adapt to the dynamics of a rapidly evolving coastal system, according to a new article from the international coastal research community.

The article, "Coastal Processes and Environments Under Sea-Level Rise and Changing Climate: Science to Inform Management," appears in the August edition of *GSA Today*, the monthly magazine of the Geological Society of America. The article summarizes key takeaways from the Joint Penrose/Chapman Conference hosted last spring by Rice's Shell Center for Sustainability, the American Geophysical Union, the Geological Society of London, the Society for Sedimentary Research and the Geological Society of America.

Eighty-four coastal and social scientists from 12 countries gathered for presentations aimed at synthesizing knowledge of the causes and impacts of sea-level rise, severe storms and other influences on coastal regions and to engage in discussion on how science can and should inform the public and policymakers about the realities of sea-level rise and coastal change.

"Extreme events have contributed to loss of life, billions of dollars in damage to infrastructure, massive taxpayer funding for recovery and

degradation of our ecosystems," said John Anderson, the W. Maurice Ewing Professor of Oceanography at Rice, director of Rice's Shell Center and the article's author. "As scientists, we feel a responsibility to inform government, the public and the private sector about the impacts of rising sea levels and extreme events and the risks they pose, including considering the most appropriate responses."

Key points from the report include:

- Current rates of sea-level rise in many regions are unprecedented relative to rates of the last several thousand years, and scientific projections show it will continue to rise over this century and alter the coasts.
- Sea-level rise will exacerbate the impacts of extreme events, such as hurricanes and storms, over the long term.
- Increasing human activity, such as land-use change and water-management practices, adds stress to already fragile ecosystems and can affect coasts just as much as sea-level rise.
- To secure a sustainable future, society must learn to anticipate, live with and adapt to the dynamics of a rapidly evolving coastal system.
- Well-informed policy decisions are imperative and should be based upon the best available science; they should recognize the need for involvement of key stakeholders and relevant experts.

Anderson and his fellow researchers hope their recommendations will influence future policy decisions regarding planning for severe storms and the evolution of coastlines around the world.

"Coastal change is not a prediction—it is very real and in many parts of the world it is occurring at alarming rates," Anderson said. "We strongly believe that future policies should be based on the best available science, including analysis of our coastal areas, geohazard maps and other

accessible information systems that can be understood and used by planners to predict change, and management approaches to minimize costs and social and ecosystem impacts, given the inherent uncertainty of future coastal evolution."

More information: www.geosociety.org/gsatoday

Provided by Rice University