

News Release: March 13, 2019

Zach Warnow, Director of Communications, (415) 786-5285, zwarnow@pointblue.org
Maya Hayden, Ph.D., Senior Ecologist and Coastal Adaptation Program Leader, (707) 781-2555, ext. 373, mhayden@pointblue.org

New Research: Powerful Combination of Sea Level Rise and Coastal Storms Poses High Economic and Social Threat to California's Coasts and Coastal Communities

New research from a team led by USGS and including Point Blue Conservation Science and other partners highlights how important it is to plan for the combined threats of sea level rise and coastal storms. In a paper published today in *Scientific Reports* (a publication of *Nature Research*) new modeling that combines these two threats shows a three to seven-fold increase in the projected social and economic impacts to coastal communities in California than with just sea level rise alone.

According to the study, even modest sea level rise projections of ten inches (25 centimeters) by 2040 could flood more than 150,000 residents and affect more than \$30 billion in property value when combined with an extreme 100-year storm along California's coast. Societal exposure that included storms was up to seven times greater than with sea level rise alone.

"The impact of temporary flooding from episodic storms can be really significant, especially if they are occurring with the increasing frequency that we expect," says Dr. Maya Hayden, Senior Ecologist and Coastal Adaptation Program Leader at Point Blue. "A lot of the hazard mitigation and adaptation planning currently underway is focused on a 20-30 year time horizon and most planning is only taking sea level rise into account. This research highlights the importance of including coastal storms and high tides on top of sea level rise so that communities don't underestimate their near-term risk."

The research team has also taken things a step further by providing user-friendly access to the hazard maps and socioeconomic exposure results so that communities can use the information immediately for local planning. It is already being used by over 40 cities, counties, and special districts in southern California and the San Francisco Bay Area.

Looking at an example of the same 100-year coastal storm scenario with 6.6 feet (2 meters) of sea level rise possible by the year 2100, the impacts increase dramatically, with as many as 600,000 people and \$150 billion in property value at risk from coastal flooding – comparable to the impact of Hurricane Katrina. The study found that by the end of the century, even a typical winter storm, when combined with elevated sea levels, could threaten \$100 billion of coastal real estate across the Golden State annually.



“If I had one message for coastal planners, it would be, ‘Don’t underestimate the risk,’” Dr. Hayden added. “Coastal storms matter, and while the extreme scenarios are attention grabbing, even a typical winter storm can add a significant amount of exposure risk on our coast. But our team has done more than just add another worry to people’s list. We’ve also provided tools and technical support so that planners can actually use the modeling results to make their communities more resilient.”

USGS scientists and collaborators used state-of-the-art computer models to determine the coastal flooding and erosion that could result from a range of plausible 21st-century sea level rise and storm scenarios. The authors then translated the physical hazards into economic and social exposure to show the lives and dollars that could be at risk from climate change in California during the 21st century. Their analysis focused on highly developed coastal counties in Southern California and the San Francisco Bay area, home to 95 percent of the state’s coastal population. The results are provided to the public via two web tools, one focused on physical exposure (Our Coast, Our Future [OCOF]: www.ourcoastourfuture.org) and the other on socioeconomic impacts (Hazard Exposure Reporting and Analytics [HERA]: <https://www.usgs.gov/apps/hera/>).

Most climate change projections forecast 10 inches (25 cm) of sea level rise in California within 30 years. At every high tide, the research showed, this could mean flooded areas where 37,000 people live and 13,000 people work, affecting \$8 billion in property value. Add a 100-year coastal storm, which has a 1 percent chance of happening every year, and the study showed that the numbers jump to 155,000 residents, 86,000 employees and \$32 billion of coastal at-risk real estate. Emergency managers and others often use 100-year storms for planning purposes.

The new paper was published on March 13th in the peer-reviewed journal *Scientific Reports* (<http://dx.doi.org/10.1038/s41598-019-40742-z>). “Dynamic flood modeling essential to assess the coastal impacts of climate change” included research by scientists from the [USGS](#), [Coastal Carolina University](#), [Deltares](#), the [University of Illinois at Chicago](#), and [Point Blue Conservation Science](#).

###

About Point Blue Conservation Science:

Point Blue advances conservation of birds, other wildlife and ecosystems through science, partnerships, and outreach. Our highest priority is to reduce the impacts of habitat loss, climate change, and other environmental threats while promoting nature-based solutions for wildlife and people, on land and at sea. Visit Point Blue at www.pointblue.org.