

# Peer Review Plan

**Date:** 03/21/2023

**Source Center:** U.S. Geological Survey (USGS)  
Pacific Coastal and Marine Science Center  
2885 Mission Street  
Santa Cruz, CA 95060

**Title:** Coral reef restoration would provide disproportionately greater protection to the most vulnerable peoples.

**Subject and Purpose:** The purpose of this product is to provide information to supplement the USGS Recovery Activities described in [USGS Fact Sheet 2018-3063](#) in response to the 2018 Additional Supplemental Appropriations for Disaster Relief Requirements Act. Hurricanes Irma and Maria in 2017 caused widespread damage to coral reefs in the State of Florida and the Commonwealth of Puerto Rico. This product describes the engineering, ecologic, geospatial, social, and economic data and tools that were combined to provide a rigorous valuation of where potential coral reef restoration could decrease the hazard faced by reef-fronted coastal communities in Florida and Puerto Rico. A standardized approach to 'place' potential restoration projects throughout the whole (linear) extent of reefs bordering Florida and Puerto Rico was used to identify where coral reef restoration could be useful for meeting flood reduction benefits. Risk-based valuation approaches were followed to map flood zones at 10-m<sup>2</sup> resolution along all 980 km of Florida and Puerto Rico reef-lined shorelines and were then compared to the flood zones without coral reef restoration. The potential coastal flood risk reduction provided by coral reef restoration was quantified using the latest information for return-interval storm events from the U.S. Census Bureau, U.S. Federal Emergency Management Agency, and U.S. Bureau of Economic Analysis. Based on the damages associated with each storm probability, the change in 'Annual Expected Damages' a measure of the annual protection gained due to coral reef restoration, was calculated. The study supports a conclusion that coral reef restoration could protect an estimated at more than 4,000 citizens, \$128 million damage to buildings, and \$150 million in indirect economic effects along 1,005 km of shoreline from flooding annually. This product will be submitted to the scientific journal *Nature* for publication.

**Impact of Dissemination:** This product is considered by the USGS to be Influential Scientific Information.

**Timing of Review (Including Deferrals):** March-April 2023. Deferrals are not anticipated at this time.

**Manner of Review, Selection of Reviewers, and Nomination Process:** Peer review will be by individual letters. USGS will select the peer reviewers in accordance with the requirements found in [Survey Manual chapter 502.3—Fundamental Science Practices: Peer Review](#).

**Expected Number of Reviewers:** Anticipates a minimum of four reviewers.

**Requisite Expertise:** Geology and oceanography.

**Opportunity for Public Comment:** No opportunity for public comment is formally incorporated by the USGS for this product.

**Agency Contact:** [peer\\_review\\_agenda@usgs.gov](mailto:peer_review_agenda@usgs.gov).