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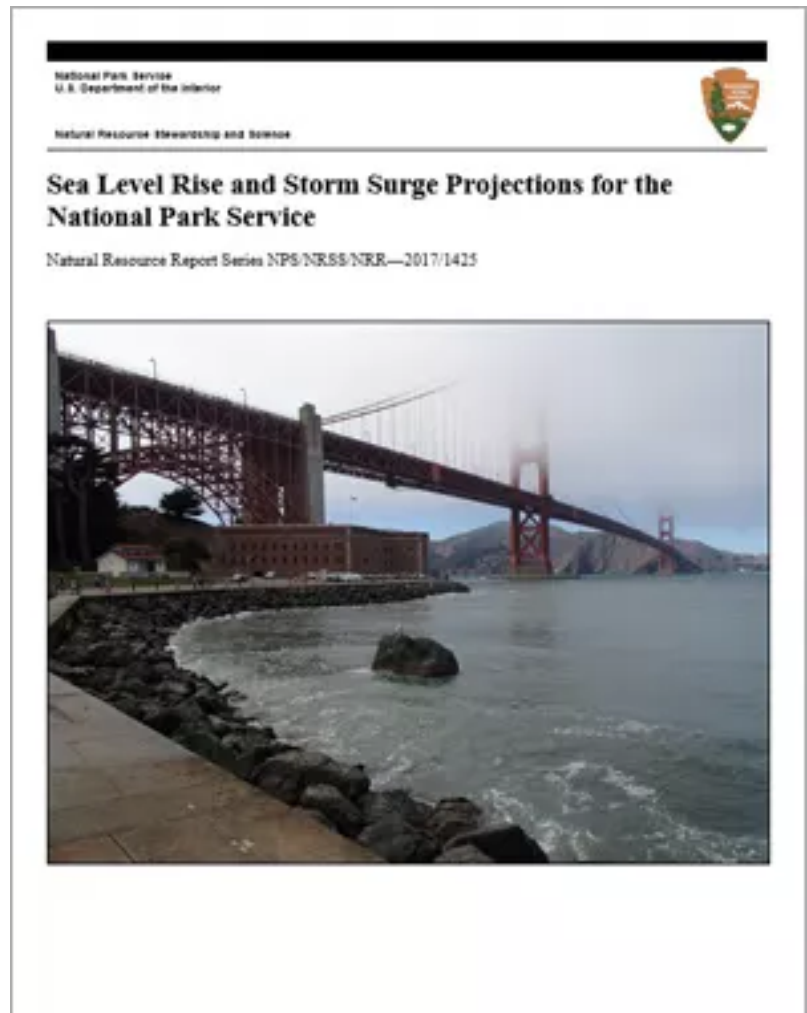
Climate Corner, December 2018

Sea Level and Storm Surge Projections for National Parks

Sea level rise is a big deal for the National Park Service given that one quarter of all park sites are located on or near the coast. But not all coastal parks will experience sea level rise in the same way. In some areas, geologic activity is causing the land itself to rise or fall, slowing or accelerating the effects of sea level rise. Ocean currents and coastal features can also make a difference.

Scientists with the University of Colorado and the National Park Service recently published a [report and webpage](#) (<https://www.nps.gov/subjects/climatechange/sealevelchange.htm>), to give us a better idea of the possible extent of sea level change for 118 coastal parks. They analyzed [IPCC](#) (<https://www.ipcc.ch/assessment-report/ar5/>), models at the park scale to provide projections for multiple dates and emissions scenarios. Their results suggest that under the “business as usual” emissions scenario, Golden Gate National Recreation Area and Point Reyes National Seashore could face 1.75 feet of sea level rise by 2100. That is less than the average projection of 2.2 feet of sea level rise for all 118 parks under the same scenario. Explore the accompanying [Sea Level Rise Viewer](#) (<https://maps.nps.gov/slr/index.html>), for a map-based presentation of some of the data.

Still, sea level rise data don't tell the whole story of how high waters might rise in the face of a changing climate. Storms are expected to become more frequent and intense over the next century. Flooding from associated storm surges could compound coastal inundation due to sea level rise. Thus, the scientists also analyzed data from NOAA and [others](#) (<https://iopscience.iop.org/article/10.1088/1748-9326/7/1/014032/meta>) to estimate storm surge heights and probabilities for 79 coastal parks. A series of [two-page briefs](#) (<https://irma.nps.gov/DataStore/SavedSearch/Profile/3588>) summarize key storm surge height and sea level



<https://www.nps.gov/subjects/climatechange/upload/2018-NPS-Sea-Level-Change-Storm-Surge-Report-508Compliant.pdf>

Click the report image above to download the PDF (4.9 MB PDF)

rise results, and other notable findings. For example, did you know that Golden Gate is likely to experience its first hurricane by the end of the century?

Species Relationships Disrupted?

Many plant and animal populations are already shifting their ranges in response to climate change. However, not all species will be able to migrate or adapt at the same rate. While some populations shift, others may become locally extinct. What could these differences mean for longstanding relationships between species? [A recent paper \(https://onlinelibrary.wiley.com/doi/full/10.1111/jbi.13442\)](https://onlinelibrary.wiley.com/doi/full/10.1111/jbi.13442) in the Journal of Biogeography offers a case study based on the relationship between lace lichens and valley oaks.

Valley oaks (and other California oak species) provide the lichens with ideal habitat, while the lichens deposit water and nutrients beneath the tree. The authors find genetic evidence that the relationship is longstanding. Their models also show that species' climate niches have overlapped and endured through past climate shifts. Yet models of the species' future distributions show that the overlap may not hold. The much faster rate of climate change, plus the valley oaks being longer lived and slower to disperse than the lichens, may cause their paths to split. The authors suggest that many other sets of species could be similarly disrupted. What the impacts might be of such disruptions would hard to predict.

Check out the [full article \(https://onlinelibrary.wiley.com/doi/full/10.1111/jbi.13442\)](https://onlinelibrary.wiley.com/doi/full/10.1111/jbi.13442) to learn more.

[See more from the Bay Area Nature & Science Blog \(https://www.nps.gov/rlc/pacificcoast/blog.htm\)](https://www.nps.gov/rlc/pacificcoast/blog.htm)



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