

Top-down maps of sea-level rise can undermine public concern

Governments and stakeholders have invested in communicating sea-level rise risks through birds-eye maps of coastal flooding – but this communication approach may inadvertently undermine public risk perceptions.

Based on **Matto Mildenberger, Mark Lubell, and Michelle Hummel. 2019.**
“Personalized risk messaging can reduce climate concerns.” *Global Environmental Change*

The Policy Problem

Public risk perceptions are important for issues like sea-level rise, where adaptation may require individual behavior change and strong public buy-in for community planning. As a result, governments and advocates have worked to make these risks personally relevant for individuals, including investing in tools to visualize sea-level rise and flooding scenarios at the local level. Examples include the privately-funded “Surging Seas” initiative tool and the “Sea-Level Rise and Coastal Flooding Impacts Viewer” that was developed by the National Oceanic and Atmospheric Administration's Office for Coastal Management.

Key findings and proposed solutions

- Top-down maps of coastal flooding may inadvertently *reduce* public concern about sea-level rise, particularly among people who accept climate science.
- These maps may overemphasize the risk of private property inundation instead of systemic risks to community infrastructure and local economies.
- Risk communicators should explore different forms of risk visualization, including highlighting impacts on local infrastructure and public spaces.

What We Found

We found that sea-level rise was not viewed as an immediate threat for many Bay Area residents; the majority believed it will not harm them personally and that the most significant harms will be experienced by future generations and developing countries. Providing residents with personalized flood risk maps *decreased* rather than increased respondents' concerns about sea-level rise.

This effect was concentrated among individuals who already accept climate science, suggesting that top-down flooding maps may have refocused public attention onto the narrow risks the private property inundation, rather than the systemic risks to community infrastructure and local economies. Negative effects were somewhat moderated among respondents whose zip code is projected to experience extreme flooding threats; yet, many individuals living in zip codes where some flooding is projected still reduced their personal sea-level rise concerns after exposure to a zip-code level flooding map. More encouragingly, backlash to flooding risk maps did not translate into a reduced willingness-to-pay for climate adaptation spending.

What We Did

We conducted a survey experiment with respondents (n=2201) from San Francisco Bay Area zip codes. Some respondents were randomly provided with a customized map of projected sea-level rise flooding in their zip code. We then assessed how individual concern about sea-level rise and support for adaptation policies was influenced by whether a respondent received (or didn't) receiving this information.

Figure 1. An example map as shown to a survey respondent in our experiment. This map was provided to a respondent who lived in the San Francisco Bay Area zip code 94403, and mapped projected flooding in that respondent's immediate community under a 1m sea-level rise scenario.

