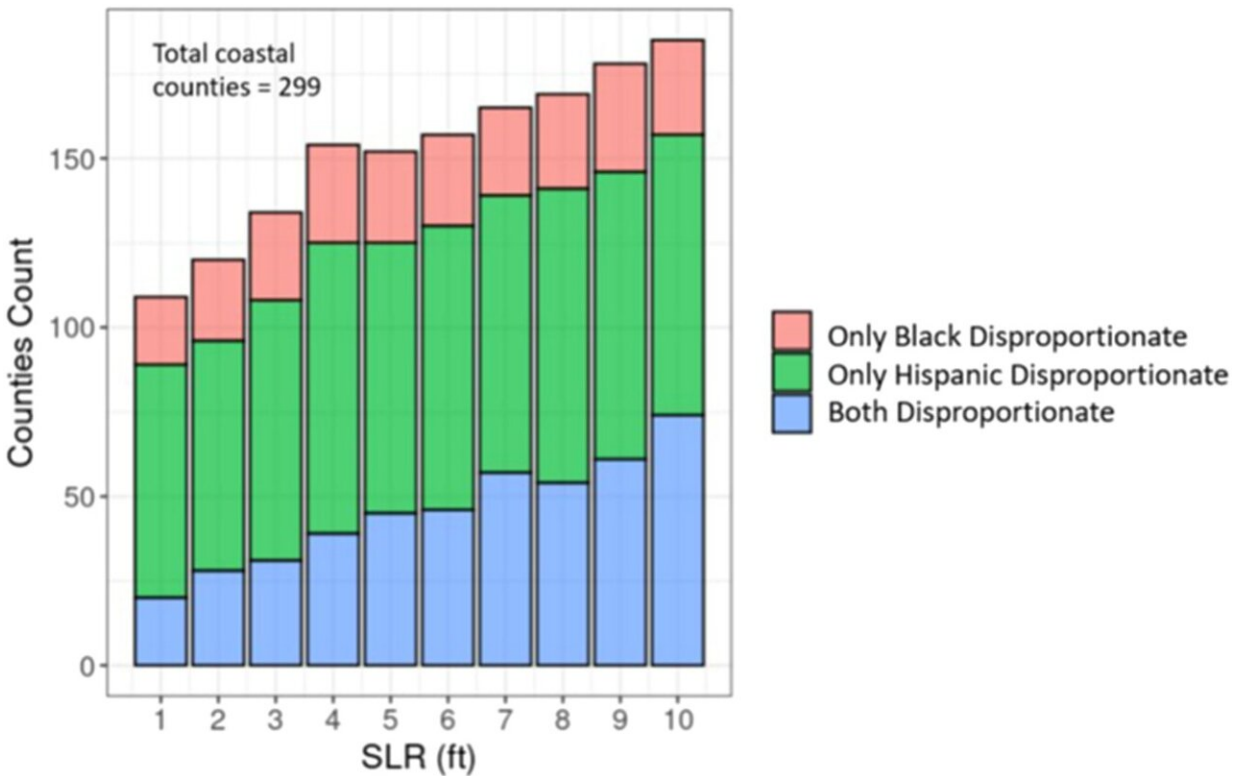


In coastal communities, sea level rise may leave some isolated

December 29 2023, by Tatyana Woodall



Numbers of coastal counties where it is predicted that only Black (red), only Hispanic (green), and both (blue) populations will be disproportionately at risk of isolation relative to the overall county population at varying levels of SLR.

Credit: *Nature Communications* (2023). DOI: 10.1038/s41467-023-43835-6

Amid the threat of dramatic sea level rise, coastal communities face

unprecedented dangers, but a new study reveals that as flooding intensifies, disadvantaged populations will be the ones to experience some of the most severe burdens of climate change.

While accelerating sea level rise will result in widespread intermittent flooding and long-term inundation in many coastal communities, the paper, recently published in *Nature Communications*, showed that when these levels increase above 4 feet, [minority populations](#) will be disproportionately at risk of isolation.

Rising sea levels could lead to isolation by disrupting transportation networks and roads, meaning that those affected lose access to essential locations such as critical emergency services and schools.

The study further exposed that renters and [older adults](#) face a greater risk of isolation, highlighting the growing connection between historical drivers of existing [social inequality](#) and the groups that incur the most risk of climate change.

According to Kelsea Best, lead author of the study and an assistant professor of civil, environmental and geodetic engineering at The Ohio State University, the first step in better characterizing these threats is changing how researchers assess community risk, as most studies measure this by exclusively determining impacts via direct flooding. But concentrating on this sole measurement neglects more complex aftereffects of sea level rise, such as isolation, and reinforces inequality in [coastal areas](#), Best said.

"We need to re-conceptualize how we measure who is burdened by sea level rise because there are so many ways that people might be burdened before their home is flooded," she said.

Current reports estimate that around 20 million coastal residents in the

U.S. will be affected by rising sea levels by 2030, but the paper notes that this number doesn't include the whole impact [global warming](#) will have on certain communities and demographics.

Notably, because people need access to essential places like [grocery stores](#), [public schools](#), hospitals and fire stations, Best and her colleagues argue that an inability to reach these places impacts individuals just as negatively as if they were living in inundated homes themselves, and should be documented as such.

Most importantly, their results expose one of the main reasons for these vast differences in risk: A group's risk of isolation is intimately entwined with specific road networks and where vital services are located in relation to where affected individuals reside.

They identified these disparities in risk by overlaying OpenStreetMap (OSM) road network data with National Oceanographic and Atmospheric Administration (NOAA) mean higher high water (MHHW) scenarios. These projections were then combined with recent census data to estimate the percentage of a population that would be left out or missed in estimates of who would be impacted by sea level rise if researchers only counted those who suffered direct inundation.

"If we take a one-size-fits-all approach, or a seemingly 'neutral' approach to understanding who gets access to safe, [affordable housing](#) and community in a world with climate change, then we're really just exacerbating these inequities and it's not good enough," said Best. "We have to deliberately seek to provide access to adaptation resources to groups of people who have historically been left out and therefore have fewer resources to respond in the first place."

The researchers showed that Hispanic populations are often overrepresented in the total citizenry for being at risk of isolation

beginning at 4 feet of sea level rise, and Black populations are overrepresented after 6 feet. Alternatively, white populations are underrepresented after 5 feet of sea level rise.

But to determine when these disparities will begin to develop, Best's team compared two long-term [sea level](#) rise scenarios: an intermediate scenario in which global [sea level rise](#) increased by a meter by 2100, and a high scenario in which that number increased to 2 meters by the same year.

Alarmingly, the study found strong evidence that these isolation effects would set in by 2120 in the intermediate scenario and as early as 2090 in the high scenario. "This timeline matters from a planning and adaptation perspective," said Best. "Part of why we included the temporal piece is to say this issue would not be as much of a problem if we had urgent, aggressive mitigation.

"The effects of climate change are going to be further reaching and more cascading than might be directly obvious, and those effects are not going to be felt equitably," said Best. "So we need to be thinking about those populations most at risk from the beginning and develop policies to support them."

More information: Kelsea Best et al, Demographics and risk of isolation due to sea level rise in the United States, *Nature Communications* (2023). [DOI: 10.1038/s41467-023-43835-6](https://doi.org/10.1038/s41467-023-43835-6)

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