

Climate change will force people to move. We need to find out where they'll go

September 16 2021, by Peter R. Orszag



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As the risk of severe climate change rises, and efforts to reduce carbon emissions ramp up, serious thought must also be given to the movement of people that climate change stands to provoke. This migration looks to

be disruptive, but it may also significantly affect the long-term economic consequences of climate change—and not necessarily for the worse.

Many studies have found reason to assume that people will relocate in response to climate change. A recent analysis by Jamie Mullins of the University of Massachusetts at Amherst and Prashant Bharadwaj of the University of California, San Diego, for example, found "substantial and significant effects of extreme temperatures on outmigration rates." The researchers estimate that every additional day per year with an average temperature above 90 degrees Fahrenheit could lead to almost a 1% increase in the migration rate. (That may sound alarmingly large, but note that the migration rate itself averages about 5% of the population, so a 1% increase means it rises from 5% to 5.05%. Also, the effect is diminishing, so a second day above 90 degrees has a smaller impact than the first day.)

Such movement of people will be costly, but it can also help reduce the ongoing economic damage from climate change. Indeed, a new analysis by a large team of scientists and economists suggests its impact could be surprisingly large. Sea level rise associated with climate change is expected to lower global real gross domestic product 4.5% in the year 2200. But that decrease shrinks to just 0.11% once migration is taken into account.

What explains this? Mostly it's that if we can relocate economic activity away from more affected areas and toward more protected ones, we can attenuate the effect on the economy. The size of the benefit from migration, though, depends on two assumptions: First, migration is assumed to occur because of a gradual rise in sea level, easing the adjustment. For example, even though the principal results of the new analysis exclude physical capital, most buildings and factories depreciate over time and therefore need to be replaced even if sea level doesn't rise. As the authors explain, " ... any substantial rise in sea level takes longer

to materialize than the standard time it takes for capital and infrastructure to depreciate. As a result, the cost of capital destruction due to the permanent rise in sea level is likely to be relatively small."

Second, the effects of migration depend crucially on where people move from and to. Cities, for example, have thrived when talented people have gathered in them, benefiting from the exchange of ideas and a fluid labor market. If people leave a city that is in danger of being flooded, the economic effects thus depend on whether they mostly gather again in another location. The analysis effectively assumes that it's possible to lift people out of Manhattan and move them collectively somewhere else. (Some people in New York during the coldest part of the winter or the warmest part of the summer often bemoan our inability to do so something similar.

Even making these two assumptions, the effects of migration can be expected to vary substantially across the world. Sea level rise will cause about 7% of the population in both Amsterdam and Miami to migrate elsewhere, compared with only 0.4% of people in New York City. This highlights how important it is to do this sort of analysis at a very granular level. (These researchers use a model with 64,800 cells across the world.)

To be sure, there are reasons to question the two assumptions. First, people may move not in response to gradual sea level increases, but rather to an increasing incidence of severe weather events—hurricanes and coastal flooding, for example. Scientists still do not understand all the potential non-linearities in the climate system, and weather events may become more frequent even if sea level rises only gradually. In other words, in this analysis, both the cause of migration and its timing may be misplaced. And that is crucial, because more sudden migration could impose more substantial costs than the researchers expect.

What's more, there may be other reasons that people gather in particular cities than the analysis assumes. Are people attracted to living in Boston only because of the other people already there, or also because of the city's rich history? If the Bostonians who scatter in response to climate change had been drawn by the city's unique heritage, they may not gather together again elsewhere. More broadly, it is extremely challenging to project future [migration](#) decisions with any degree of specificity—and yet that is what's required to predict the effects.

Then again, precise predictions are not what matters most here. More important is the message that our efforts to curb greenhouse gasses have not been fast enough to prevent [climate](#) change. At this point, it is essential to also pay attention to the inevitable economic adaptation.

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Citation: Climate change will force people to move. We need to find out where they'll go (2021, September 16) retrieved 13 March 2024 from <https://phys.org/news/2021-09-climate-people-theyll.html>

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