

Modeling and Mapping of Climate Migration

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ABSTRACT:

There is a growing awareness that climate change will drive large-scale human migration, both internationally and in the US. Modeling and communicating climate-driven migration flows is an underexplored area and identified field gap. Our presentation aims to delve into this gap with the goals of framing the problem, identifying potential areas of focus in our initial response, and developing an effective communications strategy encompassing diverse stakeholder groups as an integral approach component.

Through modeling and mapping of climate-driven migration flows, we may be able to understand and mitigate different scenarios and potential disruptions at both the origins and destinations of human migration pathways. Potential destination areas, once identified, could mitigate challenges related to the development of infrastructure and housing capacity by anticipating appropriately- sized growth. Areas that are likely to depopulate could devote resources towards mitigating the hazardous consequences of unplanned infrastructure decay.

Anticipating and helping both destinations and origins to prepare for migration flows could mitigate substantial human suffering. We posit an initial approach to the problem based on identifying three factors: probable migration size, likely origin communities, and likely destination communities. Probable origins and destinations could be identified by targeting higher-change and lower-change areas in the Fifth National Climate Assessment, a detailed federal climate report that models projected changes in many factors that are likely drivers of human migration, such as water availability and emerging hazards. Lower-change areas could be desirable destinations due to their relative stability. Higher-change areas are more likely to experience substantial disruptions; we would expect these areas to be origins of migration outflows.

Other than the climate factors, migration modeling will require consideration of economical, sociological and geographical factors that would drive or limit migration in distinct populations. This would help clarify which populations will be more likely to be able to move, allowing for better origin identification as well as targeted communication and assistance to vulnerable populations. Established climate modeling scenarios, such as the Shared Socioeconomic Pathway (SSP) and Representative Concentration Pathway (RCP) models, should also be examined for suitability for migration modeling purposes.

To enhance public awareness, secure public backing, and expand capacity across various fields, it is crucial to develop a communications strategy concurrent with addressing this issue. Given the previous work on spatial interaction modeling, and climate change communication, we believe that geographers, cartographers and GIScientists are well-positioned for this task of climate change modeling and mapping, however, they must connect with climate adaptation and resilience practitioners to build our shared understanding of the influential factors and robust climate migration models.

To be effective drivers of change, climate change migration models need to be shared and understood. Accordingly, an effective communications strategy must focus not only on academic audiences, but on connecting relevant findings to governance and policy administrators, community, and structural design practitioners, as well as the general public. Building trust and relationships around these issues with potential communication partners does not begin with the release of figures, but at the planning stage where we now find ourselves.

KEYWORDS: *climate change, migration, modeling, climate change communication*

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