Climate Migration in Vermont:

Receiving Areas, Key Demographics, and Potential Impacts on Natural and Social Resources

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Abstract

Climate change has had significant impacts on how humans migrate. While some impacts are better known, like managed retreat associated with sea level rise and flooding, other impacts are just being discovered and studied, like the long-term effects of climate migration on receiving communities. This paper serves to identify potential receiving areas in the state of Vermont, demographics that might migrate to Vermont, and the potential impact on natural and social resources in the state as a result of major in-migration. Research was conducted based on guided questions formed through the literature review and synthesized following major themes.

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Executive Summary

As part of the Collaborative Service Initiative through Antioch University New England, Raleigh Tacy, Shameika Hanson, and Jessica Poulin conducted research into climate migration and its potential impacts for the state of Vermont. There are four main goals for this report: to identify migrant demographics and reasons for migration, to identify potential receiving areas within the state, to identify impacted resources, and share existing research and research-based recommendations to help in preparing for climate migrants. This was done through a review of general literature on climate migration that then shaped guiding questions and recommended further research into the impacts of climate migration on Vermont. The foundation of the report is the initial literature review conducted by Emma Okell.

Climate migration is dynamic. It can occur on two major scales: short-term and long-term. Short-term climate migration is reactive; it is generally in response to natural disasters, but it can occur because of necessity and scarce resources as well. Long-term climate migration becomes more difficult to track. This type of migration is in response to climate change impacts that occur over time, like increased temperatures, changes in weather patterns, land degradation, and pollution. Some types of migration are considered both, as seen with wildfires, where immediate impacts drive migration as well as the long-term effects. Population changes become difficult to track over long periods of time, as reasons for migration are not always known. Most climate migration data is derived from census records, demographic data, and economic data.

Migration can occur for numerous reasons. These reasons generally fall into three categories: environmental, economic, and social. People will migrate when they have the means to do so or when they have absolutely no other choice. Those with choice tend to migrate sooner

to avoid natural disasters and tend to move to areas with ideal characteristics: employment opportunities, culture and diversity, strong social systems like school systems, and the natural environment, which can include green space, recreational access, and the general climate of the area. Those who migrate due to having no other choice also prefer these attributes but have much less choice and access to them because of the forced nature of their migration. Overall, migration tends to follow pre-existing patterns and generally remains localized.

Vermont is not considered to be an area of immediate relocation for migrants. Research shows that even in the case of industry collapses, like coastal fishing or agriculture, Vermont is not considered a primary spot to relocate. This does not mean migrants will not come to Vermont, but it does highlight that Vermont will not see major in-migration the way other places might. Vermont is a small, rural state with a homogenous population, a cold climate, and a perceived lack of diversity, which can be a deterrent for migrants. However, there are migrants that find those characteristics ideal for relocation. These characteristics are shared with Buffalo, New York, a city named as a climate haven for its natural environment and existing infrastructure that can accommodate a population increase.

The most likely demographic of migrants to Vermont are amenity migrants. Amenity migrants are generally wealthy, older, and white. This group of migrants typically already has ties to Vermont, either through repeated vacationing, second home ownership or familial ties. They typically seek rural areas for "rural aesthetic" and the benefits they believe that rural life offers tranquility and peace, a better quality of life, recreational access and the aesthetics of the natural landscape. The amenities they move for are tied to the environment: they want the perks of rural living seen in the ability to hike, fish, boat and ski, as well as the benefits of an area with a lower seasonal temperatures in the summer, generally mild water, and isolation from other

natural disasters like coastal flooding and wildfires. An important distinction between this group and the first who migrates due to natural disaster, is that migration is a choice ahead of any specific climate event, but in anticipation of worsening climatic/weather conditions in the place they are migrating from.

A lot of the characteristics and driving forces behind this type of migration were pulled from amenity migration and rural gentrification literature, and then extrapolated to potential climate migration in Vermont. As a result of this population's move into the state, it has the potential to bring other demographics. Wealthier amenity migrants seek services and tend to create a boom in service industries where they migrate. As a result, migrant workers and low-income workers seeking job opportunities, will follow amenity migrants to fill those positions.

Receiving areas in Vermont follow pre-existing migration patterns within the state. Chittenden and Washington counties are seen as an ideal location to move, with focus being on the city of Burlington. Chittenden is often the area where refugees from outside the country are resettled, as it has the most infrastructure and services that will provide a smooth transition for the new inhabitants. These areas are more urbanized, with public transit access, housing, employment opportunities, and other social services being concentrated here. Other necessities for migrants are often clustered here as well: access to cultural and social touchstones, religious institutions, and access to necessities that might not be available elsewhere. These areas are perceived as some of the most diverse in Vermont, which makes it an ideal place to live.

Rural towns may see an increase in population due to amenity migrants making second homes their permanent residence partially as a result of increased climate vulnerability in their current locations. Rural population increase could also occur due to an increase in service

industries in these areas, and people of lower economic status moving to fulfill those jobs, in response to an increase in wealthier in-migration. These population changes can have dramatic impacts to rural areas. Social inequality and class polarization will rise between the wealthier amenity migrants and migrant workers. Gentrification is often the result of amenity migration due to the changes the in-migrants make to the area. The housing market changes, with more permanent residences being established that take away from rental housing stock. In-migrants will often seek to preserve the rural aesthetic they moved for, which can lead to clashes between long-time rural residents and in-migrants. Vermont's rural industries have historically been extractive, seen in lumber and agriculture, which damage the landscape most in-migrants move for.

Due to climate migration, impacted resources in Vermont will largely be social and economic. Existing social services and infrastructure, especially those that serve vulnerable populations, will see increased use due to need. These services include but are not limited to: affordable housing, public transit and transportation services, day-care services, public education, mental health services, health care services, food distribution and grocery stores, and cultural, religious and community spaces. Services that focus on marginalized populations will only see an increase of need with in-migration. The research notes that any service that caters to a vulnerable population will also be needed for in-migrants, as they've been needed by refugees who have relocated to the area. Case studies on refugees in Vermont provide a fair understanding for how major in-migration could be handled. Refugees have dealt with tension and discrimination on racial and religious grounds, as well as pushback from locals through votes and protests against relocation policies. Long-time residents of Vermont have noted that even in a diverse area like Burlington, they still experience discrimination and racism.

Infrastructure and development will see increased use as well. In rural areas with in-migration, sewage and water systems could see strain to handle the increased population and development. Transportation in rural areas will see the same, as public transit has limited access in rural areas and more people need it. Development in rural areas will need to be done carefully, as research shows that it can lead to habitat and land fragmentation, erosion, diminished water quality and displacement of lower-income residents. There is also a chance for development sprawl as the housing market shifts. Land use can become contested between in-migrants and long-term residents as they have differing opinions on how the land is best valued. Historically, rural development in Vermont has impacted forest and farmlands to a large degree, despite a slow rate of population growth.

A key takeaway to use in policy and planning is that climate migration is highly regional and dependent on the cause for migration. Policies need to be made for specific areas on a long-term basis, planning ahead as best as possible for unknown scenarios. Short-term planning should be avoided as much as possible, as ad hoc policies can cause significant harm. Planning and development need to account for social inequalities and existing vulnerabilities in the local population and from in-migrants. Using the experiences of in-migrants and the community can help avoid pitfalls that lead to harm as well. Vermont can plan for in-migration and development in a way that can focus on compact development, infilling, and help to prevent natural resource losses. By bringing the community into the process, it can lessen the barriers to taking action and ease potential conflicts before they start.

Climate migration is an ongoing field of research. This report is not conclusive; it serves to provide a comprehensive overview of what climate migration may look like for the state of Vermont. While there are areas where further research is necessary to understand the full impacts

of climate migration in Vermont, those provide future opportunities for further research and exploration.

Introduction

The purpose of this report is to research the potential types of climate migrants as well as the reasons particular demographics may migrate to Vermont, identify potential receiving areas within the state, identify potentially impacted resources, both man-made and natural, and share existing research and research-based recommendations to help in preparing for climate migrants. This was done through a review of general literature on climate migration that then shaped guiding questions and recommended further research into the impacts of climate migration on Vermont.

This report is being compiled for Elena Mihaly of the Conservation Law Foundation and Kate McCarthy of the Vermont Natural Resources Council through a partnership with Antioch University New England. As part of the Collaborative Service Initiative, student candidates for the Master of Science degrees completed this project. The primary authors are Raleigh Tacy, Shameika Hanson, and Jessica Poulin. Their work is based on an initial literature review created by Emma Okell, who worked under Mihaly last year as an intern. Special thanks is credited to Sarah Bockus, MS, Internship Program Director and Collaborative Service Initiative Coordinator for the Environmental Studies department, as well as Christa Daniels, Ph.D., AICP, who worked with the student group as faculty advisor for this project.

Literature Review

The literature review as presented below is a compiled effort between the research completed in 2019 by Emma Okell, and the further research from Raleigh Tacy, Shameika Hanson, and Jessica Poulin. This review is broken down into categories for type of information which are then organized in reverse-chronological order, as per client's request. This background information is meant to give a broad, basic understanding of the driving factors behind climate migration. Using the general understanding of climate migration gained from the literature review, research was then targeted to identify specifics of climate migration that could impact Vermont.

Journal Articles

Kelman, I. (2019). "Imaginary Numbers of Climate Change Migrants?" *Social Sciences*, *8*(5) www.mdpi.com/2076-0760/8/5/131

This article focuses on the difficulty in ascertaining whether or not people are migrating due to climate change by highlighting the importance of increasing the understanding behind motivations people have for migrating. Anywhere can become a potential sending area for climate migrants. Potential sending areas may lack the resources necessary for climate change adaptation and mitigation; these areas could also have the resources, but not the ability to prepare for these impacts. Other possible sending areas may have undertaken maladaptive strategies, which then necessitate the need for out-migration. The article lays out a framework for determining how many people are migrating for climate related reasons: count the number of people who are moving, clearly define the timescale of movement, and determine the spatial scale of migration. The framework asserts it is not necessary to determine whether a move is

permanent or not in this process. The primary difficulty addressed in the article is how distance defines whether a person is a “climate migrant”.

Jokisch, B. D., Radel, C., Carte, L., & Schmook, B. (2019). “Migration Matters: How Migration Is Critical to Contemporary Human–Environment Geography.” *Geography Compass*, *13*(8). https://doi.org/10.1111/gec3.12460

Migration is a multifaceted, complicated process. Numerous factors tie into the reasons that drive migration, including environmental issues and climate change impacts as well as political, social, demographic, and economic factors. Research has noted that adverse environmental conditions do not necessarily lead communities or individuals to migrate. The paper also explored the idea of “amenity migration”, where affluent, mainly white, individuals move from the city to more rural areas for specific lifestyle amenities, such as natural scenery, proximity to outdoor recreation, cultural richness, or a sense of rurality. This can lead to land use and land cover changes, land subdivision and residential development, changes in private land use, and effects on local governance. One common struggle arises from conflict over the use of rural landscapes as working lands, to preservation areas whose value is mainly aesthetically or recreationally derived. The paper also explores environmental justice in terms of who has access and control over green space and how it is used. There are ethnic and racial differences in how land is valued and how parks are used; “Anglo-normativity” assumes a particular White pattern of park use as the goal, and fails to account for localized constructions of race that create access and use barriers. Most research does not directly engage with out-migration or trace where people move, how and what the impacts are, but this will be important for reconciling cultural, political, and land-use decisions between sending and receiving populations.

Desmet, K., Kopp, R. E., Kulp, S. A., Oppenheimer, M., Rossi-Hansberg, E., Strauss, B. H., & Krisztián Nagy, D. (2018). Evaluating the Economic Cost of Coastal Flooding. *National Bureau of Economic Research Working Paper Series*. https://doi.org/10.3386/w24918

The authors mapped the effect of sea level rise's impacts to economic change and human migration on a global scale projected over the next two hundred years. There are natural, economic, and institutional barriers to relocation due to sea level rise. Connecticut and Massachusetts experienced small (less than 5%) population decreases and, in the New York - Newark area, there was little to no population loss. Most population decreases are calculated to be in the southeast region of the United States.

Keenan, J. M., Hill, T., & Gumber, A. (2018). Climate gentrification: from theory to empiricism in Miami-Dade County, Florida. *Environmental Research Letters*, *13*(5). https://doi.org/10.1088/1748-9326/aabb32

Individual cities across the United States are experiencing climate gentrification. Miami, Florida was used as a case study. The rental costs of single-family homes was tracked over time. Results showed that consumers prefer higher-elevation homes which increases long-term home prices. The value of low-elevation homes also decreased over the same time period, likely due to nuisance floods. The authors include that higher-elevation homes are becoming the property of the wealthy.

Matthews, T., & Potts, R. (2018). Planning for climigration: a framework for effective action. *Climatic Change*, *148*(1). https://doi.org/10.1007/s10584-018-2205-3

The study addresses community-scale relocation, climigration, specifically in response to sea level rise. Climigration is the most extreme type of climate adaptation. Climigration is most successful if the affected community agrees to move, and sometimes climigration is assisted by strong local leadership, government support, and economic resources, but damaged communities have relocated without economic resources. Climigration is less successful if no land is available or if community members perceive that the risk of staying in the vulnerable location is small. However, climigration does still occur even if no land is available. In these instances, relocated communities merge with established communities rather than move as a separate, whole community. Policy frameworks and choice did not have an effect in this study's data. The study also addressed difficulties in climigration: emotional costs, financial costs of finding affordable land, and the burden on receiving communities if the migrating community cannot find land. Anticipatory, collaborative policy frameworks are needed for both the sending and receiving communities.

Piguet, E., Kaenzig, R., & Guélat, J. (2018). The uneven geography of research on "environmental migration." *Population and Environment*, *39*(4), 357–383. https://doi.org/10.1007/s11111-018-0296-4

This article synthesizes existing environmental migration reviews, observing that most climate migration studies are funded by the global north but use the global south as case studies. 35% of these studies focused on droughts, 22% on floods, 18% on hurricanes, 27% on sea level rise, and 8% on rainfall, mainly in other disaster contexts. Studies about the United States were mostly about hurricanes, especially Hurricane Katrina, or drought, especially the Dust Bowl. Little research existed about sea level rise in 2018. The authors conclude that environmental

migration is likely still entrenched in racism, which views poor, non-white populations as victims. This can lead to an inaccurate display of population dynamics and migration.

Clement, M. T., & York, R. (2017). The asymmetric environmental consequences of population change: an exploratory county-level study of land development in the USA, 2001-2011. *Population and Environment*, *39*(1), 47–68. https://doi.org/10.1007/s11111-017-0274

The authors focus on the impacts of population change on land development at the county level in the U.S. They conducted a study that combined birth, death, and migration statistics with land development statistics. Their study found that population increases through births had a greater impact on land development than population decreases. In-migration and out-migration have similar effects initially, but in-migration increases land development more over time than out-migration suppresses it. The lesser impacts of out-migration is noted to potentially be due to the economic downturn part-way through the study period. Additionally, white populations decrease the effects of the variables, which suggests that white populations have more say in local development than non-white populations.

Hauer, M. E. (2017). Migration induced by sea-level rise could reshape the US population landscape. *Nature Climate Change*, *7*(5), 321–325. https://doi.org/10.1038/nclimate3271

The author studies population increases in coastal counties and projected the estimates into migration data, if migrants will follow pre-existing patterns. Based on the out-migration trends, it was estimated that Vermont counties could see a population increase ranging from none to up to fifty thousand individuals moving into the state. Those projections still showed a lesser rate of population growth than most states in the study. However, the study did not encompass smaller, more rural destinations, and the author predicts that rural areas may see more in-

migration than predicted. Also, nearby areas, like New York City, will see different migration patterns depending on whether the area adapts. New York City and Newark, New Jersey will see population decreases without adaptation, but population increases with adaptation.

Graif, C. (2016). (Un)natural disaster: vulnerability, long-distance displacement, and the extended geography of neighborhood distress and attainment after Katrina. *Population and Environment, 37*, 288-318. https://doi.org/10.1007/s11111-015-0243-6

This report discusses the study and findings on approximately 700, low-income, mostly minority mothers, who were in community college in New Orleans before hurricane Katrina. As part of the study, the participants were tracked for a year and a half as part of the "Resilience in the Survivors of Katrina" project. Results of the study show that communities can prepare for migrants ahead of migration. Preparation occurs at different geographic scales (municipality to state-wide). The main impacts preparation had were in expanded housing access and affordability, stronger communication between migrants and groups with different cultural norms in receiving areas, the mitigation of disaster-based psychological and financial tolls, and aiding evacuees to overcome employment obstacles, education and discrimination issues. Receiving communities can also help to mitigate disrupted networks, reduce, or eliminate prohibitive childcare costs, and reduce or eliminate poverty in their community for both the current and migrant populations.

Hamilton, L. C., Saito, K., Loring, P. A., Lammers, R. B., & Huntington, H. P. (2016). "Climigration? Population and Climate Change in Arctic Alaska." *Population and Environment*, *38*(2), 115-133. https://link.springer.com/article/10.1007/s11111-016-0259-6

This article explores the relocation of whole indigenous communities in Alaska that are experiencing environmental issues due to climate change. Relocation is a difficult process, and some communities do not wish to relocate regardless of environmental issues. These reasons include social resistance, difficulties in identifying an appropriate relocation site, and the high costs of relocation. Alaska developed a framework to identify communities at risk of relocation based on factors including the safety of life during a reasonably foreseeable storm or flood event, the potential loss of critical infrastructure, potential health threats to the community as defined by the Center for Disease Control (CDC), and potential loss of 10% or more of residential dwellings. Distinguishing "climate factors" as a discreet reason for relocation is difficult, so the authors suggest tracking net migration over time in both threatened and non-threatened communities and comparing overall migration rates as a measure of whether migration is influenced by environmental and climate change factors.

Koslov, L. (2016). The case for retreat. *Public Culture, 28*(2), 359–387. https://doi.org/10.1215/08992363-3427487

Relocation and buyout efforts in parts of the United States are explored in an effort to understand public culture and perception around retreat and relocation due to climate change. Communities from Staten Island, New York, Valmeyer, Illinois, and two small towns in Missouri that relocated due to climate pressures were studied. Community members relocated from Staten Island to protect inland communities and to lessen tax burdens on other U.S residents. In all cases, grassroots activism played a crucial role in the success of the community coming together to decide what actions to take. In most cases, there are more people in need of a buyout than funds available, so some people experienced repetitive loss, exacerbating compounding issues. Community ownership and social networks have major impacts on how

communities discuss and approach relocation. The author makes a point to state that their preferred term for talking about managed retreat like this is “community-organized relocation”. and the preferred term used by the author is "community-organized relocation."

Burkett, M. (2015). Lessons from Contemporary Resettlement in the South Pacific. *Journal of International Affairs, 68*(2), 75–91.

This article discusses the challenges for those moving from Carteret Atoll islands to mainland Bougainville. Relocated populations experienced challenges including the loss of land, property and homes; unemployment and loss of businesses; social disintegration and loss of community; lost access to common property, spaces, and cultural areas; marginalization; and food insecurity. There is mass devastation in the community and their ancestral lands, erosion of culture of the "Taro people", government resistance to act, and lack of assistance from the international community. Funding is underutilized due to numerous factors. The UN Sustainable Development Initiative may be a means to help through the Adaptation Fund and Global Environment Facility- Small Grants Programme. The philanthropic sector can be helpful, through a partner approach with the relocated community.

Curtis, K. J., Fussell, E., & DeWaard, J. (2015). Recovery Migration After Hurricanes Katrina and Rita: Spatial Concentration and Intensification in the Migration System. *Demography*, *52*(4), 1269–1293. https://doi.org/10.1007/s13524-015-0400-7

The authors study migration vectors in New Orleans after Hurricanes Katrina and Rita. The findings showed that disasters rarely cause permanent population loss. People move for a variety of reasons, including economic, political, or social factors that are indirectly tied to environmental factors. Finally, they follow a set of principles: first, most people prefer not to

move even if given the chance. Second, if they must move, people will move short distances. Third, migrants prefer places where they have other ties. Finally, migration is rarely permanent. Then, the authors studied how New Orleans recovered its population. They used a systems-based approach to study a migration system in and out of an area rather than individual migrants. They found that immigration into New Orleans increased from nearby and distant counties in similar amounts, especially from urban counties. However, out-migration from New Orleans was low after the initial evacuation. Most people migrated to nearby counties, including counties affected by disasters. A minority of people migrated to other metropolitan areas.

Sastry, N., & Gregory, J. (2014). The location of displaced New Orleans residents in the year after Hurricane Katrina. *Demography*, *51*(3), 753–775. https://doi.org/10.1007/s13524-014-0284-y

The authors study the short-term migration patterns of New Orleans residents. The study used the US Census Bureau's ACS, a mail survey that tracked residential locations before Hurricane Katrina and a year after. Key demographics were then analyzed to show impact in comparison to location data; these include age, race, sex, education, place of birth, and other similar demographic statistics. More than half of the residents returned or remained in New Orleans. The remainder moved to Texas, other parts of Louisiana, or another part of the South. Less than 8% of black people and 4% of non-black people left the South. Black people were less likely to return to the city area, and they were more likely to move to Texas, other parts of Louisiana, other parts of the South, or outside the South than non-black people. Non-black people with higher education were more likely to stay in New Orleans while non-black people with a high school degree or less were more likely to be in Texas or in other parts of Louisiana. Young adults between 25 and 39 were especially more likely to relocate than any other age

group. Finally, people born outside Louisiana were more likely to move outside Louisiana and Texas. The study attributes the latter to people moving closer to their former home after a life-changing event.

McLeman, R. A., Dupre, J., Berrang Ford, L., Ford, J., Gajewski, K., & Marchildon, G. (2013). What we learned from the Dust Bowl: lessons in science, policy, and adaptation. *Population and Environment*, *35*(4), 417–440. https://doi.org/10.1007/s11111-013-0190-z

The authors review recent studies conducted about the Dust Bowl and group them by topic. Some of these groups included studies about climate change and migration patterns. The studies documented a mass migration to the West because of the Dust Bowl, particularly to California. However, most of the migrants to California came from the eastern periphery of the areas most affected by the Dust Bowl. Other studies reviewed rural-urban, urban-rural, and rural-rural migration depending on socio-economic, environmental, and institutional factors. The authors focused on a study that described the economic influence (the New Deal) on migration, especially how programs decreased out-migration and encouraged in-migration.

Sinha, P., & Cropper, M. L. (2013). The Value of Climate Amenities: Evidence from US Migration Decisions. *National Bureau of Economic Research Working Paper Series*, *6*(32). https://doi.org/10.3386/w18756

The study reviews the value of summer and winter temperatures as they relate to amenity migration. The authors used data about household migrations from 1995 to 2000 and calculated multiple values, including housing costs, moving costs, potential amenities in different areas, and location-specific amenities. Temperature changes were then taken into consideration. By comparing the economic change from one place to another, they were able to factor in whether

the household placed value on temperatures. They found that at least 85% of migration decisions were based on location-specific amenities. Otherwise, they found that households placed more value on lower summer temperatures than higher winter temperatures. Summer and winter temperature changes were then modeled in twenty-six cities and calculated their welfare under two climate scenarios based on the values people attached to temperature. Under a "climate-friendly" scenario, summer and winter temperatures increased 3.3 degrees Fahrenheit overall. Northeastern and midwestern states benefited while southern and southwestern states lost welfare. Under the second scenario, consisting of more climate extremes, summer temperatures increased greatly. All cities suffered detriment to their welfare except Fargo, North Dakota in the second scenario.

Feng, S., Oppenheimer, M., & Schlenker, W. (2012). Climate Change, Crop Yields, and Internal Migration in the United States. *National Bureau of Economic Research*. https://doi.org/10.3386/w17734

The article studies county-level migration in rural counties, especially the Corn Belt (defined by the article as Midwestern states, including Kentucky), between 1970-2009. The rate of change was then projected into future global warming scenarios. The study starts by comparing overall migration trends to crop yields based on temperature, using Eastern non-Corn Belt rural counties as a comparison. The authors then separated the data down into different factors, including age, gender, temperature, and precipitation. The age group most likely to migrate are young adults ranging in age of 15-29 years old. As people age, they are less likely to migrate. Factors influencing the likely migration of young people in the Corn Belt include temperature increases affecting corn and soybean harvest rates. Changes in precipitation had little effect on migration patterns. The same trends did not appear in Eastern states. The authors

hypothesize that in the Corn Belt, agricultural yields create the need for jobs in other services to support the industry; with the loss of agricultural yields, the need for jobs in supportive industries disappears, showing how agriculture is systematically entwined with other industries and how one collapsed industry can cause others to collapse.

Heffernan, O. (2012). Adapting to a warmer world: No going back. *Nature*, *491*(7426), 659–661. https://doi.org/10.1038/491659a

Worldwide climate adaptation is discussed, with a particular emphasis on outcomes that local communities can have on the adaptation process. If local communities collectively decide how to adapt to climate change, adaptation is more successful. Successful adaptations include warning systems, different building structures, village relocation (seen in the village of Newtok, Alaska, which serves as a model for other community relocations in Alaska), and flexible water reservoir plans.

Curtis, K. J., & Schneider, A. (2011). Understanding the demographic implications of climate change: estimates of localized population predictions under future scenarios of sea-level rise. *Population and Environment*, *33*(1), 28–54. https://doi.org/10.1007/s11111-011-0136-2

The article focuses on the interactions between local population forecasts, migration, and sea level rise. For the case studies, four areas were selected that had higher rates of impact: California, New Jersey, South Carolina, and Florida. The case studies reviewed impacts based on race, ethnicity, and geography. It was noted that areas impacted severely by Hurricane Katrina were not counted in the study as the out-migration following the disaster would skew data results. They then projected the population changes in the regions to 2030 using Census Bureau and Health and Human Services records. Finally, they reviewed the ripple effects on other areas

when the population migrates. Their study found that people in vulnerable counties currently relocate to other vulnerable counties, but they did not examine how migratory routes would change with sea level rise. They noted that some areas would need to increase their health care and education to accommodate young and elderly migrants from flooded counties while others would have an oversupplied labor force because of working-age migrants.

To address the economic and environmental factors that drive migration, the authors ran three additional migration scenarios. The scenarios included: economic growth with increased migration, based on Fulton County, Georgia's statistics; economic decline with decreased migration, based on Wayne County, Michigan's statistics; and environmental disaster with decreased migration, based on Orleans Parish, Louisiana. The environmental disaster scenario had the most dramatic change in migration rate (-669.4 people/1000 people). Under the last scenario, each area would have a lower population in 2030 than 2000. However, the authors note that the migration change would be short-term, not long-term, and that the long-term effect would depend on resource distribution.

Warnecke, A., Tanzler, D., & Vollmer, R. (2010). Climate Change, Migration and Conflict: Receiving Communities under Pressure. *Climate Change and Mitigation, 12.* https://www.bicc.de/uploads/tx_bicctools/gmf_climate-change-migration-conflict_07_2010.pdf

This article looks at the implications of migration as a source of potential conflict in receiving areas. It focuses on the existing research to draw information about what these changes could mean, including accounting for conditions that can exacerbate conflict and the challenges that the receiving communities may face overall and the likelihood of repopulating the area.

Gutmann, M. P., & Field, V. (2009). Katrina in historical context: environment and migration in the U.S. *Population and Environment*, *31*, 3–19. https://doi.org/10.1007/s11111-009-0088-y

The authors review how environmental calamities, environmental hardships with periods of benefits, environmental amenities, and environmental barrier management can affect migration and create a historical context for disasters using Hurricane Katrina as their primary example. Their paper orders these four factors from least to most influential on human migration. Environmental calamities include hurricanes, floods, tornados, and other disasters. They have a short duration and small-scale effect usually, but recovery depends on reconstruction and social factors. Environmental calamities impact individual cities, and they especially affect poor and non-white communities. Environmental hardships with short-term benefits include periodic droughts, like the Dust Bowl. Studies often review out-migration during droughts but not in-migration between droughts. They affect states, and they affect agriculture-dependent societies. While environmental calamities have negative impacts on a community, environmental amenities are features of a natural space that draw people to an area, including temperature, weather, mountains, seacoast, and other aesthetic values, especially recreation values. Young people and retirees move for recreation opportunities, especially to the rural West, if their livelihoods do not depend on climate. Amenities-driven migration affects regions. Environmental barrier management includes environmental limiting factors, and the ways humans manage them, from levees to air conditioning. Environmental engineering created mass population movements across the continent as it allowed people to live in areas previously inhospitable by removing or mitigating the environmental limitations.

Ultimately, Hurricane Katrina is a subject of study because the disaster resulted from a calamity and failed environmental management. Environmental management that addresses how

impacts like flood control, heat, drainage, and irrigation are managed. New Orleans shows that environmental management can falter, as management attempts can still fail and cause great harm to people, infrastructure, and natural systems. Ultimately, as the climate warms, amenity-driven and engineering-driven migration will decrease, and disaster-driven migration will increase. Overall, studies may have a poor estimate of environmentally driven migration. Currently, amenity-driven and engineering-supported migration have larger effects on population movements, but both may decrease with climate change, as the study noted that areas appealing for these types of migration could change drastically as a result of climate change impacts. Studies might not account for our increasing inability to engineer our environments or our resulting dependence on an amenable climate over recreational opportunities.

Hornbeck, R. (2009). The Enduring Impact of the American Dust Bowl: Short and Long-run Adjustments to Environmental Catastrophe. *National Bureau of Economic Research*, *102*(4), 1477–1507. https://doi.org/10.3386/w15605

The article focuses on economic readjustment during the Dust Bowl. The Dust Bowl particularly impacted the agricultural industry through the erosion and lost viability of farmlands. It focuses on how areas impacted by the Dust Bowl achieved "economic equilibrium", a phrase used to cover a variety of factors, including population, industry, and land that had not been impacted by serious erosion. Out-migration came up as a recurring factor that helped to maintain equilibrium in impacted areas over other factors like development and capital flows.

Reports

Summers, J. K., Harwell, L. C., Buck, K. D., Smith, L. M., Vivian, D. N., Bousquin, J. J., Harvey, J. E., Hafner, S. F., & McLaughlin, M. D. (2017). *Development of a Climate Resilience*

Screening Index (CRSI): An Assessment of Resilience to Acute Meteorological Events and Selected Natural Hazards. EPA. https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100SSN6.txt

This study focuses on analyzed data to determine state and county levels of resilience to climate change in the United States. Vermont is the fourth most resilient state regarding climate change-based weather extremes after Alaska, Maine, and Hawaii. On a county level, some New Hampshire and Massachusetts counties compete with Vermont's counties. New York, New Jersey, Connecticut, and Rhode Island have lower resilience. However, the upper northeast is the third most resilient region after the western United States and the Great Lakes region.

Rosenfield, T., Warner, K., & Tamer, A. (2013). *Climate change, migration, and displacement.* The Encyclopedia of Global Human Migration. https://doi.org/10.1002/9781444351071.wbeghm143

The report looks at climate induced migration in international communities of India, China, and Morocco. The authors focus on the lack of grounded science linking climate change and human migration and how it limits the ability to coordinate and create policies to prepare for it. Planned migration as a form of adaptation can reduce vulnerability, mitigate impact of human migration, and support displaced peoples. Political and economic factors are important to consider for both migrant and receiving communities, especially concerning governance. The authors suggest adaptation plans be inclusive by informing migrants of new risks in receiving locations and help to build their capacity to migrate.

News Publications

Deaton, Jeremy. (2019, December 5). "Will Buffalo Become a Climate Change Haven?" *CityLab*. www.citylab.com/environment/2019/12/climate-change-displacement-refuge-city-buffalo-new-york/602758/

This article discusses factors that may make Buffalo, New York an attractive place for climate migrants. The city is a former population hub, so there is both room (land wise) and infrastructure (housing, water, sewer, roads) already in place to accommodate an influx of people. It has a relatively cool climate with few extreme heat days (above 90F), and ample fresh water supplies. The article explores the two types of climate migrants the city has already seen: those who come fleeing natural disaster, and those who actively choose to come to avoid future climate conditions. There is concern over gentrification. Potential planning tools include having smart housing policies, smart growth plans, and economic policy to attract workers and revitalize the local economy.

Wasser, M. (2019, September 25). Here's What the New U.N. Report on Oceans and Ice Means for New England | Earthwhile. *WBUR*. https://www.wbur.org/earthwhile/2019/09/25/ipcc-oceans-ice-massachusetts-northeast-takeaways

New England is experiencing sea level rise faster than other areas. New England will also see stronger nor'easters and snowstorms in the winter, as well as stronger tropical storms and hurricanes traveling further north than before through summer into fall. New England will also have "heat waves" in the winter. Although this article does not directly address climate migration, the article suggests that New England may have climate-related out-migration factors as well as in-migration factors.

Gribkoff, E. (2019, September 17). Climate change: Could "climigration" help reverse Vermont population trends? *VTDigger*. https://vtdigger.org/2019/09/17/climate-change-will-vermonts-population-increase-from-climigration/

In 2017, Montana saw a summer of smoke, with the effects of wildfires in the state having a profound, lingering impact on the local population. A family who had been there for a decade made the decision to move by fall into Vermont. They wanted to be somewhere safe and healthy for their child, but Vermont was. Relocating to Vermont meant better air quality, outdoor access, less wildfires, and work opportunities for the family. It also brought them closer to their own family, a key reason for relocating to Vermont.

Wildfires plague the West Coast, but the Northeast faces its own series of climate change impacts. Sea level rise goes beyond the global average, which has caused a severe spike of high tide floods and a rapid decrease in coastal property prices. Despite that, Vermont was ranked 4th in resilience to climate change in 2017 by the EPA and has been noted in other reports to be a potential receiving area for the Northeast. The director for the Windham Regional Planning Commission has stated for the county that towns should begin planning for in-migration, though Vermont only mentioned migration briefly as a possibility in the 2018 Hazard Mitigation Plan. The article closes by focusing on the reasons people may or may not migrate. Community ties and lack of opportunities are deterrents to migration, whereas reasons for migration include the resources to do so, availability of employment, and the sense of having nothing left to lose.

Parsons, A. (2019, September 16). From Texas to Maine, in search of a kinder climate. *The Boston Globe*. https://www.bostonglobe.com/opinion/2019/09/17/from-texas-maine-search-kinder-climate/e7RV7D6pWIIs9zyXtuh2FP/story.html

Parsons describes relocating from Texas to Maine. He left to escape the increasing, more dramatic hurricanes. However, his decision was also influenced by better education for his children and the improved costs of living. His biggest disincentive was New England winter, but he decided winter was less frightening than a hurricane.

Benson, T. (2019, September 15). Climate Redlining Could Soon Make Millions of U.S. Homes Totally Uninsurable. *The Daily Beast*. https://www.thedailybeast.com/climate-redlining-could-soon-make-millions-of-us-homes-totally-uninsurable?ref=scroll

Risk-prone areas may become uninsurable in the West, mid-West, and Southeast. The most vulnerable people generally live in the areas most at risk of climate change. They will not be able to sell their houses and may be forced to foreclose. Insurance policies may lead to greater displacement.

Petenko, E. (2019, September 13). People are leaving VT in droves. Where are they going? *VTDigger*. https://vtdigger.org/2019/09/13/people-are-leaving-vt-in-droves-where-are-they-going/

Currently, most migrants from Vermont are middle and working class, and they are moving to Florida, New Hampshire, the Southeast, and the West. They stay for reasons ranging from economic (jobs and taxes) to cultural (urban areas and diversity) to environmental (weather). Most people migrating to Vermont are 26-44 years old and earn around $200,000 per year. They stay for the landscape, for culture and community, and for family.

Hotakainen, R. (2019, May 28). Warming waters spark marine migration, fish wars. *Eenews*. https://www.eenews.net/stories/1060416271

The migration routes of two-thirds of fish species along the eastern United States coast are changing, ranging from a few miles to thousands of miles. However, U.S regulations have not adapted to these changing migration routes. Sea bass have migrated to Connecticut waters from Virginia's coast, and warm-water fish like wahoo have migrated to New England. Fish catch allotments for North Carolinian and Connecticut fishermen have not changed to reflect the new higher numbers of these species. One consequence is that North Carolina fishermen go to Connecticut waters to catch their allocation, while New England fishermen are losing their lobster and cod catches as these species migrate further north to colder waters. Current fishing practices exacerbate these problems, driving the fish populations further north. As a result, New England fishermen are quickly leaving the business, which may lead to coastal outmigration as fishing job markets collapse. Sea level rise could also be a contributing factor.

Malo, S. (2019, April 6). Cool U.S. cities prepare as future "havens" for climate migrants. *Reuters*. https://www.reuters.com/article/us-usa-climatechange-migration/cool-u-s-cities-prepare-as-future-havens-for-climate-migrants-idUSKCN1RI061

Cities in the northern Rust Belt, including Duluth, Minnesota; Buffalo, New York; and Portland, Oregon, may become climate havens. Some cities were structured to hold higher populations, but many would have to build more amenities to accommodate more people. Portland does not expect climate migration to become more significant than its current migration because it already has high economic-related migration. Other cities are still building economic opportunities, and they may not have the revenue in advance to build their cities' infrastructure.

Tamman, M. (2018, October 30). Ocean Shock: The great lobster rush. *Reuters*. https://www.reuters.com/investigates/special-report/ocean-shock-lobster/

Warming in the Gulf of Maine is among the fastest in the world, especially within the last decade. The warming waters push fishing stocks, especially lobster, further north. Northern Maine depends on lobster fishing and tourism, and climate change has created a lobster boom in northern Maine while the rest of New England has lost its lobster stock. Maine is also one of the few places where most fishers are young. So, when lobster fishing collapses, there could be an economic collapse along its coastal regions, with a subsequent migration of working-age people from the shore.

Paris, F. (2018, October 20). What Migrants Displaced by The Dust Bowl and Climate Events Can Teach Us. *NPR.* https://www.npr.org/2018/10/20/659074873/what-migrants-displaced-by-the-dust-bowl-and-climate-events-can-teach-us

North America has seen many mass migrations linked to climate factors throughout its history. However, due to the increased pressures of current climate change, by 2050 the World Bank predicts that there could be as many as 143 climate migrants, which is double the number of current world refugees. Mass migration and dislocation disproportionately affects black populations who are more likely to be uprooted and relocated into vulnerable areas than white populations. Poverty and inadequate infrastructure exacerbate the damages created by natural disasters. The southeast of the United States has seen an increase in population due to its relative affordability, even though these coastal areas are especially vulnerable to sea level rise from climate change. Because populations are new, a "cultural memory" about why settlement has not occurred in these vulnerable locations is lacking. Continued in-migration and climate displacement has the potential to greatly increase vulnerabilities and inequalities.

Milman, O. (2018, September 24). “We’re moving to higher ground”: America’s era of climate mass migration is here. *The Guardian*. https://www.theguardian.com/environment/2018/sep/24/americas-era-of-climate-mass-migration-is-here

Milman reviews climate change impacts on different regions and current climate migration research. Climate migration is a phenomenon that is not well-studied due to its large scale in both geography and time. By time scale, the author means the fact that climate migration is occurring now and will occur into the future, but not on a set timescale that can be accounted for at the current moment. It is also an unprecedented phenomenon. One climate expert expects the population shift to be twice as large as the Dust Bowl and more akin to the Great Migration of the early 20th century. Most migration caused by sea level rise and storms will be to the closest inland city, although the early migration routes are only now becoming apparent. Experts predict that coastal cities will migrate mostly to other parts of the south and other inland metropolitan areas. The Pacific north-west will likely experience more than 10% population increase, although the Great Lakes and New England will see in-migration over time, up to 9%. Vermont may see minimal population increases. Most nearby out-migration will come from New York City, Boston, and the Maine coast. However, the migration predictions do not include migration because of agricultural harvest decrease or lost habitability. Migration may also be affected by the expense of moving, job availability, family connections, and the binding effect of property rights.

Hananel, S. (2018, September 10). RELEASE: Fishermen on Front Lines of Climate Change Reveal Impact of Warming Oceans in New CAP Report. *American Progress*.

https://www.americanprogress.org/press/release/2018/09/10/457646/release-fishermen-front-lines-climate-change-reveal-impact-warming-oceans-new-cap-report/

In 2015, the U.S fishing industry, comprising both commercial and recreational fishing, supported 1.6 million across the country's coastlines. Warming oceans are affecting fish catches as species move to waters, they typically have not been found in. In 2016, 93% of the excess heat seen in record temperatures was absorbed into the ocean. The predominant cause of the excess heat is attributed to human activity. Due to the warmer water temperatures, fish species along the coasts of Virginia, New Jersey, and New York have migrated an average of 50 miles north, threatening the survival of fishing industries in those areas. Lobster fishing off the coast of New England has seen a decline in a once-plentiful population over the last decade, which is attributed as well to warming water temperatures. Based on the qualitative data collected in interviews, many fishing communities on the Pacific coasts have sought emergency disaster relief. Eastern coasts have changed business practices and gone after different species of fish than before. Increases in carbon emissions, and subsequent further ocean warming will decrease the global fish catch potential 25% by 2100.

Goodell, J. (2018, February 25). Welcome to the Age of Climate Migration. *Rolling Stone*. https://www.rollingstone.com/politics/politics-news/welcome-to-the-age-of-climate-migration-202221/

Goodell describes individual migration stories and cities' adaptive challenges. Wealth transfers and concentrates, not only toward the north and west but also in affected areas. Simultaneously, cities are learning that engineering is not enough to avoid climate impacts. New Orleans is struggling to pump out even ordinary rainfall, and the population is smaller, whiter,

and wealthier. After Hurricane Katrina, some areas of New Orleans faced major population decreases, with hard-hit neighborhoods only at 25% of the pre-hurricane population. In those areas, the out-migration is largely attributed to the storm-recovery programs. The federal money was simply not enough to rebuild, so many took settlements and relocated elsewhere. In this scenario, predominantly low-income, black communities were the ones to migrate due to the lack of funds for rebuilding.

Rebuilding and adaptation pose significant issues for city officials nationwide. Through what the article calls “climate-drive exodus”, a blanket term for migration due to climate change whether disaster or anticipation of disaster, funding disappears as property values decrease, tax revenues decrease, and already difficult budgets that cover essential functions are stretched thinner while still trying to manage existing infrastructure and prepare for the future. This out-migration has been predominantly seen in coastal areas.

Drought-prone areas, like Phoenix, are still seeing in-migration, but that may change. The hot season starts three weeks earlier, there is little moisture which causes significant fire risks as well as dust storms called haboobs, water scarcity is increasing, and the higher temperatures present major health-risks that lead to increases to heat-related deaths. Certain regions in the United States are becoming areas of refuge for climate migrants, like Flagstaff, Arizona and Asheville, North Carolina, which offer respite from dangers like drought and flooding for nearby regions. However, these havens are seeing an increase in gentrification as population increases, presenting future issues if more migrants come to the area.

Mansfield, H. (2018, February 22). Rising Seas | New England Climate Change Report. *Yankee*. https://newengland.com/yankee-magazine/living/new-england-environment/rising-seas-our-land-our-sea-our-future/

New England is losing its seacoast due to rising sea levels. Boston and New York City are projected to flood if the Antarctic Ice Shelf collapses. Connecticut has been working on a Coastal Resilience Program since 2007. However, communities are not yet addressing sea level rise and relocation, so relocation may happen in a crisis rather than gradually in a purposefully planner manner.

Voosen, P. (2017, June 29). Here's how much climate change is going to cost your county. *Science | AAAS*. https://www.sciencemag.org/news/2017/06/here-s-how-much-climate-change-going-cost-your-county

According to a study, wealth will shift to the northern and western regions of the United States. Vermont will gain GDP and see some population growth, especially in the city of Burlington. New Hampshire, Maine, and most of New York will see gains as well. Maine is forecasted to see larger growth. However, the South will lose GDP.

N/A. (2017, January 18). New England's 1816 "Mackerel Year," Volcanoes and Climate Change Today. *USGS*. https://www.usgs.gov/news/new-england-s-1816-mackerel-year-volcanoes-and-climate-change-today

In 1816, when Mt. Tambora erupted, the world had a year without summer, and 90% of crops failed. New England saw a long-term change to its fishing industry. Before 1819, New England mostly caught and used alewives, but alewives struggled during 1819 because their

migration grounds were frozen. Their population plummeted and catch decreased. New England supplemented with mackerel, which migrated after. By the time the alewife recovered twenty-five years later, New England had replaced their alewife consumption with mackerel. The alewife remains vulnerable to climate change.

Ryan, B. (2014, December 29). Climate change migration. *VTDigger*. https://vtdigger.org/2014/12/29/benjamin-ryan-climate-change-migration/

Hurricane Irene caused displacement within Vermont. Population growth has pushed people into flood plains and other vulnerable areas, both country-wide and state-wide. As climate change worsens, there will be increased numbers of peoples displaced due to natural disasters, with resulting losses of jobs, social networks, security, and assets. There are negative consequences for both displaced communities, as well as the communities they move to.

Blogs, Commentaries and Reviews

MacDonald, J. (2017, June 9). *5 Places to Move If You Are Worried About Climate Change (And 5 to Avoid!)*. The SpareFoot Blog. https://www.sparefoot.com/self-storage/blog/18384-where-to-live-to-avoid-climate-change-effects/

The article recommends Burlington as a climate refuge because it has a climate action plan and is more insulated from the urban heat island effect because it is located on a hillside by Lake Champlain. In contrast, Boston is already experiencing dramatic flooding, is vulnerable to climate change, and will start to see higher category hurricanes. The article does not address climate change, but it suggests that a stronger hurricane may hit near Boston, which could cause a Katrina-like mass migration.

Burkett, M. (2016, August 8th). *Justice and Contemporary Climate Relocation: An Addendum to Words of Caution on "Climate Refugees".* NewSecurityBeat. https://www.newsecuritybeat.org/2016/08/justice-contemporary-climate-relocation-addendum-words-caution-climate-refugees/

The author asserts that climate change should be considered a trigger for migration and displacement. There is a need for a framework that acknowledges the special climate-related circumstances faced by small-islanders displaced by government resilience programs, which is predominantly the fact that wealthy countries are not just simply accommodating these communities. It also has suggestions for planners to consider: how to conduct the process equitably, how to fully fund the process and, how to relocate people in a way that affords them opportunities to thrive?

Shankman, S. (2013, June 28). *Climate change expected to slowly kill birdwatching tourism in Maine*. Skift. https://skift.com/2013/06/28/climate-change-expected-to-slowly-kill-birdwatching-tourism-in-maine/

Maine's bird populations are changing. Some bird populations have moved north, and their migration time, population size, and survivorship have changed. Generalist species have moved north into Maine, and they compete with the migratory species that draw tourists. Maine's tourism and recreation industry will decrease as a result. Again, Maine might see lost jobs, although the industry might not have the same Dust Bowl-scale effect as a collapsed fish market.

Toolkits and Frameworks

Downs-Karkos, B. S., Adkins, M. A., Alexander, P., Ancheta, J., Archuleta, F., Brown, P., Mchugh, M. (2011). The Receiving Communities Toolkit: A Guide for Engaging Mainstream America in Immigrant Integration. *Welcoming America.* https://www.welcomingamerica.org/sites/default/files/Receiving-Communities-Toolkit_FINAL1.pdf

The toolkit is designed to help communities jumpstart conversations about engaging receiving community members in immigrant integration efforts. It is a resource to help communities understand community tensions and mitigate potential struggles. Key findings include establishing contact between longer-term residents and incoming residents with a strong facilitator for the dialogues, cultivating the type of messages portrayed in media using storytelling/culture/arts, and being sure to involve community leaders of receiving communities and work with partners on joint projects.

Thematic Summary

The foundation of this report is the initial literature conducted by Emma Okell. Additional resources were contributed by the Antioch authors (Raleigh Tacy, Shameika Hanson, and Jessica Poulin) to help provide a comprehensive background on climate migration. The literature review raised key topics and questions that became the basis for further research. To do this, a thematic summary was created to synthesize and highlight key themes and information. From there guided research questions were created to shape further research into climate migration into Vermont. Key topics in this research include potential receiving areas, potential impacts of climate migration, and the demographics of potential migrants.

Reasons for Migration

There are multiple factors that determine why people migrate. Financial reasons include the cost of living, transportation, housing, availability of well-paying jobs, and quality of education (Milman, 2018; Parsons, 2019). Social reasons include proximity to family, friends, and cultural/social centers. Environmental reasons include the frequency and intensity of region-specific natural disasters, as well as existing climate, weather, and landscape preferences, which include aesthetics (Petenko, 2019; Sinha & Cropper, 2013; Gutmann & Field, 2009). Overall, people are more likely to migrate if they have the financial resources to do so, a job in the place they are migrating to, or have nothing else to lose (Gribkoff, 2019).

Demographics of Migrants

Financial resources are a limiting factor to migration. Acknowledging this, the research shows that wealthier people are the most likely to migrate, especially if migrating to avoid potential climate impacts (Deaton, 2019). Their wealth presents choice and ability for how, when, and where they migrate. This migration tends to be gradual. Those without financial means for migration tend to be in a lower socioeconomic bracket and tend to include vulnerable populations. It is these populations without the financial means to migrate that often remain in, or relocate close to disaster-prone areas (Benson, 2019; Curtis & Schneider, 2011). Migration for these communities is not gradual, but often done in crisis (Mansfield, 2018).

When looking at racial and ethnic demographics, black populations are seen as less likely to migrate due to limited resources. Black populations are also more likely to be uprooted by a natural disaster than white populations, due to living in vulnerable, more disaster-prone areas (Paris, 2018). Some of these vulnerable areas experience a higher rate of in-migration due to lack

of cultural memory about why settlement has not historically occurred in those areas, leading to further vulnerability and risk (Paris, 2018).

Disaster-Induced Migration

In the case of sudden or long-term disaster induced migration, populations do not tend to stray far from their original settlement. The tendency is to move within the region to similar areas nearby, which can cause further vulnerability as these regional areas are not necessarily more resilient to climate change or from the natural disasters that caused the initial migration (Curtis, Fussell, DeWaard, 2015). Younger people and those who are not originally from the affected area are the most likely to migrate further away from the disaster area, as they have less familial or cultural ties. (Sastry & Gregory, 2014).

Looking at the United States as a whole, there are numerous areas where natural disasters occur that can force migration. Areas in the West, Midwest, and South are expected to become increasingly more risk-prone, which can increase vulnerability as well as decrease the likelihood of insurance for disasters being possible for the local population (Benson, 2019). Disasters in these regions include hurricanes and associated flooding, tornadoes and other severe windstorms, sea level rise and erosion, and drought and increased risks for wildfire. Vulnerable populations tend to live in these areas, and as insurance policies change to make it harder to insure homes in these areas, large-scale displacement may occur (Benson, 2019).

These areas are also notable for the long-term permanent damage and changes that could occur to industries reliant on natural systems due to climate change, like fisheries and agricultural operations. The eastern United States coast could see industry collapse as species migrate north due to warming water temperatures (Hotakainen, 2019; Tamman, 2018; Hananel,

2018). These areas will see out-migration of working age populations as a result of the market collapse (Hotakainen, 2019; Tamman, 2018). The same can be seen in the Midwest, where it is estimated that the loss of crops and crop-based revenue will see migration of young workers (Feng, Oppenheimer & Schlenker, 2012).

Coastal areas are also notable due to sea-level rise and erosion of viable land. If the Antarctic ice shelf collapses, Boston, and New York City will flood (Mansfield, 2018). Boston is highly vulnerable to climate change. If a strong hurricane hits, dramatic flooding will occur, possibly leading to a large-scale, Hurricane Katrina-like mass migration (MacDonald, 2017). New York City presents an interesting dichotomy for climate migration. One article focuses on how projected sea level rise and impacts would cause little (less than 5%) to no population loss through migration (Desmet et al, 2018). Another suggests that if New York City adapts, there will be a population increase; failure to adapt will see population loss through migration (Hauer, 2017). As it stands, New York state overall is seen to have a low resilience, along with other Northeast states including Connecticut, New Jersey, and Rhode Island (Summers et al, 2017).

The southeast will see large-scale population decreases over the next 200 years due to sea-level rise. Whole communities may need to relocate, and they may purchase land (based on availability) for themselves within existing communities. These large movements can either be done in isolation or through merging with existing communities in the area. Effects may be intensified as communities are generally not addressing the possibility of relocation related to sea-level rise or other natural disasters; this may lead to mass migration occurring in a crisis and largely unplanned, as opposed to systemic, gradual migration (Mansfield, 2018).

Possible Receiving Areas in Vermont

New England is referenced as a region that will see a great deal of in-migration only after other states have seen a population increase, with Vermont being one of the latter to see a population increase, if any (Milman, 2018). Despite this, Vermont is also noted as a desirable place to live. The state is seen as an attractive place due to the access to water and other land resources, like parks and green space, as well as the local communities and cultures there (Petenko, 2019; Gribkoff, 2019). The state is ranked as the fourth most resilient to climate change induced weather extremes (Summers et al, 2017). Burlington, VT is likely to see in-migration because it has a "Climate Action Plan" and is insulated from the urban heat island effect (Macdonald, 2017). Rural areas are predicted to see more in-migration than calculated (Hauer, 2017). It also shares similar characteristics to Buffalo, New York, which has been deemed a climate haven (Deaton, 2019). This could contribute to Vermont receiving more climate migrants in the future.

Migration tends to follow pre-existing patterns. In-migration has the potential to shift wealth and grow Vermont's GDP, as migrants are likely to be young (22-44 years old) and have an estimated income of approximately $200,000 per year (Petenko, 2019). These migrants will prefer higher elevation housing, as it is out of disaster-prone areas. This could potentially increase home prices and cause gentrification (Keenan, Hill & Gumber, 2018). When people choose to migrate to Vermont (as opposed to being forced to due to displacement) they come because of the landscape, the community, to be close to family, and because of the climate (lower summer temperatures are more desirable than higher winter temperatures) (Gribkoff, 2019; Petenko, 2019; Jokisch et al, 2019; Sinha & Cropper, 2013).

Planning

Climate migration will have myriad impacts on receiving areas. In-migration will have long-lasting impacts on land development and infrastructure (Clement & York, 2017). Some cities or rural areas may not have enough money to increase infrastructure to deal with population growth, as seen by areas experiencing out-migration due to climate change (Goodell, 2018). Buffalo, New York has been highlighted in research as an attractive place for climate migrants. It shares similarities to much of Vermont, with a relatively cool climate and few extreme heat days, as well as access to water and green space (Deaton, 2019). It is a former population hub, which has land access and infrastructure (housing, water, sewer, roads) in place that can accommodate population growth (Deaton, 2019). Knowing this, planning in Vermont can begin to prepare for migration by accounting for this in city planning. It is also noted that a common struggle that can occur with population growth is how the purpose of rural landscapes are conceptualized and used. With population growth, rural working lands, such as farms, may be prized more for their aesthetic value and proximity to recreational areas than for their productive value. (Jokisch et al, 2019).

Climate migrants face numerous challenges during the process of relocation. Studies show that environmental migration is still entrenched in racism, which skews perceptions of non-white migrant populations as victims (Piguet, Kaenzig & Guélat, 2018). Depending on the reason for migration, accommodations may need to be made for certain populations. One article noted that some areas might need to increase healthcare and educational opportunities for incoming migrants, while other areas might need to accommodate for a larger workforce and fewer job opportunities (Curtis & Schneider, 2011). Gentrification is also a concern for areas with major population growth (Deaton, 2019).

Policy and planning will be critical for climate migration. Research recommends that there be policy frameworks for both sending and receiving communities that are anticipatory and collaborative (Matthews & Potts, 2018). Planning tools mentioned in the research include smart housing policies, smart growth plans, and economic policies that will attract workers and revitalize local economies (Deaton, 2019). It is also recommended that those working to create these plans consider some hard questions that address how to conduct the process equitably, how to fund the process, and how people who have been relocated can be given opportunities to thrive (Burkett, 2018). Other research shows that planned migration helps those being relocated as it helps build resiliency, includes them in the process, informs them of risk, and mitigates the impacts of migration (Rosenfield, Warner & Tamer, 2013).

Initial Analysis and Guiding Questions

The initial research analysis shows that there are specific demographics that will migrate into Vermont due to climate change. The primary demographic of migrants Vermont might see are generally white, wealthy, and making the conscious choice to move to Vermont. This group of migrants are commonly referred to as "amenity migrants" in the literature review, and examining this literature leads to issues surrounding rural gentrification. The second group of potential migrants to Vermont is best broken into two subcategories. The first is the working class, younger individuals that will move following the collapse of industries they are employed in (such as the fishing industry on the East Coast), whereas the second are people who come in response to a specific natural disaster. The key distinction that separates disaster-based migration from the other types Vermont might see are the speed at which those populations will migrate into the state. Disaster migration could be a large-scale event for Vermont, whereas the first two groups are slower and steadier in population increase. These demographics are important to

guide further research for the rest of this report because of the potential impacts their migration will have on Vermont.

The information provided in the literature review has shaped guiding questions and areas of focus. Further research will focus on potential receiving areas within Vermont, following some key criteria. What areas of Vermont are going to draw specific demographics of individuals who migrate due to climate change related issues and why those specific areas? What specific characteristics of an area are migrants considering, and how does that make these areas more attractive for migration? Burlington, Vermont is mentioned as a likely receiving area for migrants, but there is no specific research on migration and its impacts to Vermont's rural areas. All rural data that has been used was extrapolated from research done on amenity migration and rural gentrification in other areas, as the profile of amenity migrants is similar to that of the group of affluent migrants that Vermont is likely to see. When people are forced to move to Vermont because of a loss of their job, or because of a specific natural disaster, where do they go and why? As the resiliency of Vermont due to climate change planning is mentioned in the literature, keying into the research that backs up that claim is also crucial, as it designates Vermont as a desirable place to migrate to. It is also important to address the factors that might limit people from migrating to Vermont, as it will indicate why these specific demographics are mentioned over others.

In addition to these areas of focus, further research is required to understand the impacts of migration on natural resources and the local environment. This information may need to be highly specific to local areas in Vermont based on the potential migration patterns presented in the research. It might also need to include social resources that are impacted through climate migration to best understand how Vermont will handle influx to its population in a socially and

racially equitable manner. It is also necessary to further research how climate migration will affect policies and land use planning, as well as how it can be incorporated within both to prepare for the future.

Framework for Research and Analysis

Further research focused on specific terms and key experts in fields related to climate change and migration as well as research generated for and within Vermont. Vermont-specific research included population changes, migration history, planning and policies associated with climate change, and the potential impacts climate migration could have to social, environmental, and economic systems in Vermont.

Climate migration is just one of multiple terms used to describe how people move in response to climate change. Keying into research for one specific state required a myriad of search terms to find the most relevant and recent research available. Search terms included are: climate displacement, climigration, climate refugees, disaster-induced displacement, Vermont climate migration, Vermont managed retreat, Vermont climate retreat, Vermont climate haven, climate relocation, community relocation, community resettlement and planning, climate change relocation, disaster relocation and planning, climate migration receiving states, receiving communities, Vermont migrant, environmental migration, amenity migration, rural gentrification, exurban development, and rural land use planning among others. Knowing the search terminology used will help in future research into this or similar topics, as this field of research is varied, ever-growing and ever-changing. It will also help delineate the different types of climate migrations that exist, as well as how each type has different potential impacts on communities, land, and natural resources.

To narrow the scope of research, the authors focused on criteria to apply to the dearth of research available on climate migration. The criteria included finding research written within the last 10 years, focusing on areas similar to Vermont (i.e., New England, northern states, smaller states, etc.), and bringing in research done on Vermont that focuses on migration patterns in and out of the state, adaptation, historical context and socio-cultural context of migration, and impacts of climate change on the state so far.

Expertise from the Field

As part of the research into climate migration's impacts on Vermont, notable experts were recommended through colleagues, advisors, and other research in the field. Notable experts in fields that relate to climate migration include AR Siders, Maxine Burkett, Pablo Bose, Victoria Hermann, Mathew E. Hauer, Peter B. Nelson and others. There is a multitude of foci within the researchers and their research used in this report; the majority is on climate migration, forced retreat, amenity migration, rural gentrification, and the legal and planning aspects of how to manage and mitigate negative outcomes that arise from large population influx, like the accessibility of basic needs like housing and social services. There is also a focus on the social systems in place within states that will be used by climate migrants. Understanding where Vermont's current population is in terms of affordability, housing, employment, and social services informs how the state will respond to further influxes of migrants due to climate change.

Journal Articles

Lübken, U. (2019). Histories of the Unprecedented: Climate Change, Environmental Transformations, and Displacement in the United States. *Open Library of Humanities*, *5*(1), 7. http://doi.org/10.16995/olh.347

The study focuses on applying historical context to major natural disasters to understand how people have adapted previously. History is a lens to help understand climate migration because of the unprecedented events that have forced migration. Climate change has not changed these events drastically (yet), but has increased their frequency and intensity, making these historical lessons translatable. Settlement in hazardous areas is based on the ideal that the benefits outweigh the risks, which accounts for large settlements around bodies of water despite having no knowledge of how the water will behave. These areas are also called marginal environments, as this is often where vulnerable populations resettle. These environments include swamps, bayous, river floodplains, and ravines. Traditionally seen as a refuge for the outcast, these become safe havens for marginalized groups. But these populations also become trapped there, which causes further harm, and leads to more displacement. Groups in these environments are often migratory, mobile, and seen as rootless and transitory, even if they have lived in the area for generations due to the heavy cultural connotation of the land and their placement.

Disasters underlie and bring to the forefront other issues like racism and institutional oppression; these further the negative impacts from the disaster and exacerbate responses like displacement and distress. They also provide opportunities for migration from dangerous areas to stable, better environments for these groups. Especially in these marginalized and rural communities, people are distrusting of outsiders, have a strong attachment to place and a refusal to move, and see these disasters as part of their heritage. This distrust can extend to authorities as well, leading to ignored warning signs and evacuation calls during disasters. Rebuilding from disaster is a long, arduous process because of the depth of destruction. Only small communities get moved as a whole.

Migration always benefits from established routes and destinations, family connections, information, and networks among migrants. It is important to include this into environmental justice. Environmental justice has recognized marginalized groups placement in hazards, degraded spaces and urban out areas, but not disaster risk reduction and climate migration. Bringing migration and risk into environmental justice will allow for safer transitions for migrating groups and safer environments for those who stay. It can also help with the paradox of harm mobility has. It can be forced on people and withheld at the same time, causing harm to these already marginalized groups. Refugee as a label has racialization tied into it, especially for climate migrants. Migrant workers are in themselves a form of environmental displacement that should also not be discounted. Bringing migration into environmental justice will allow for shifting of what is called cultural baggage. This term is used for the lack of understanding and recognition that comes with migration and how others perceive migrants coming from these marginal environments.

Hardy, R. D., & Hauer, M. E. (2018). Social vulnerability projections improve sea-level rise risk assessments. *Applied Geography*, *91*. https://doi.org/10.1016/J.APGEOG.2017.12.019

The study is based in coastal Georgia. Population changes are measured by birth, death, and migration rates based on the current year and census data. It is then broken down into counties and by demographics like age, sex, race, ethnicity, socioeconomic status, poverty levels, and education levels. The Social Vulnerability Index is used as a measure for environmental hazards and climate change impacts, where risk is based on vulnerability, hazard, and exposure. Projections showed that by 2050, the coastal population of Georgia will predominantly be non-White, with higher rates of poverty and lower rates of education than what is currently seen. There is a projected loss of land to sea level rise that is ranged based on the scenario projected.

The lowest amount of land loss is at 82 kilometers, while highest is shown around 285 kilometers, meaning that the range of exposed population can be anywhere from 13,600 to 45,300 people. The most vulnerable and exposed comprise a range of 2,300 to 10,200 in the most at-risk category. This study shows that there is a need to include factors that drive social inequality into projections for population shift and climate change impacts. Doing so will allow for better understanding of who will be impacted and how much the impacts will exacerbate existing vulnerabilities in these communities.

Bauer, D. M., Swallow, S. K., Liu, P., & Johnston, R. J. (2017). Do exurban communities want more development? *Journal of Land Use Science, 12*(5), 351-374. https://doi.org/10.1080/1747423X.2017.1338769

In this study, four "exurban" towns in western Rhode Island were surveyed concerning their views on development. "Exurban" is defined as largely heterogeneous communities, with suburban style subdivisions, large lot residences, and village centers that are close to employment centers. Questions about the rate and type of development that communities want is important for planners to consider, and the study suggests that planners are often swayed by hearing the voices of a "vocal minority" whose development views are not representative of the community as a whole. The authors suggest that planners utilize stated choice preference surveys (that are mailed) with hypothetical scenarios that respondents are asked to rate on their preference in order to better capture what citizens want in terms of future land-use and development choices.

A large majority of survey respondents prefer no added development beyond the current rate of development. If development were to occur, they strongly preferred recreational services

as opposed to commercial development. If commercial development were to happen, respondents preferred small scale shops, convenience stores, and restaurants that were part of multi-purpose developments and not single development "box-store" constructions. All of this is to preserve the "rural aesthetic" that residents in these places value.

Access to hiking trails was one of the strongest indicators for support for recreational development. The results showed that respondents were more likely to support preservation measures or the creation of wildlife refuges, if there was public access; otherwise, they were indifferent.

Siders, A. (2017). A role for strategies in urban climate change adaptation planning: Lessons from London. *Regional Environmental Change*, *17*(6). https://doi-org.antioch.idm.oclc.org/10.1007/s10113-017-1153-1

The article focuses on best practices and strategies in climate change planning for urban areas. Adaptation planning has been shown to be ineffective, as it is often too broad with no specific focused actions to follow as a plan. Strategies are seen as big, overarching visions rather than action-oriented plans. Metrics can be useful, but also provide limitations based on the types and amount used and the difficulty in defining and evaluating them. Strategies can be defined across silos and show limitations and acceptable levels of risk. An interviewee notes "it's almost like our ability to project the climate has exceeded our ability to use that information" (pg. 1804). Points of interdependency were shown to also be points of greater vulnerability. Best practices from this article focus on changing perspectives. The city can be viewed as a network of networks. Simplified, streamlined information is the best means to raise awareness, which lets actions get closer to fruition. Continuity of action is necessary, because stopping means falling

behind and having to start the process from the beginning. Since most urban planning is limited spatially or temporally, having a desired end-state and a finite number of actions or actions should be a requirement. Adaptation strategies also need to have flexibility in them to account for new breakthroughs and major changes.

Bose, P. (2016). Vulnerabilities and displacements. *Area*, *48*(2). https://doi-org.antioch.idm.oclc.org/10.1111/area.12178

This article focuses on displacement and the vulnerabilities associated with it. Displacement occurs through conservation, extraction industries, sudden natural disasters, long-term degradation, development projects, and violent conflict. Extraction industries include timber, coal, oil, and minerals. Development includes dams, urbanized coastal areas, and removing natural barriers against flooding in the process. These are important when discussing displacement because of the weighted cost seen in these transactions. Against the economic benefits of development, extraction and conservation of natural environments, local communities are always at a disadvantage, and these disadvantages only compound when addressing the marginalization and vulnerability of communities experiencing this. Marginalized and vulnerable communities are then further impacted in their ability to adapt to climate change and environmental impacts. They have limited power in the decision process, limited resources, limited capacity to adapt, issues with land ownership through institutionalized racism and other legal red tape. These struggles lead to short-term strategies that prioritize survival over long-term adaptation. This is also seen in slums and homeless encampments, where these impacts are commonplace, but these types of communities are building as development ousts more people and it becomes the sole option for survival. The author recommends two things in order to help address these issues. The first is to understand the vulnerable by listening to their experiences

and including them in the planning process. The second is addressing institutional perspective about these populations: are they seen as a roadblock to change? Do they impact projects that seek to undo damage and decrease vulnerability? Are they blamed for their circumstances and seen as ignorant and unwilling because of their current lifestyle? By being critical and addressing potential bias early on, projects that seek to aid these populations can better serve them.

Lunstrum, E., Bose, P., & Zalik, A. (2016). Environmental displacement. *Area*, *48*(2). https://doi-org.antioch.idm.oclc.org/10.1111/area.12193

The article begins with a quote that focuses their definition of environmental displacement as well as the purpose of the article: "Environmental displacement...justified by environmental or ecological rationales, motivated by desires to access natural resources, and provoked by human-induced environmental change and attempts to address it" (pg. 130). To this end, the authors go into great detail looking into the causes of environmental displacement. Extraction and conservation are the two main focuses of the research. Conservation can entail green grabs, large-scale land acquisitions, or land-use restrictions. These cause displacement of local communities as well as lost resources and livelihoods. Conservation is shown as a form of enclosure and displacement, which can limit its public use and further conflicts. Fossil fuel extraction causes degradation of the surrounding areas through pollution, contamination, and displacement through land loss and social-economic factors. It is often state approved. Areas with potential resources are necessary economically, and this leads to the loss of the space for inhabitants who are often evicted, bought out and displaced legally in order for fossil fuel extraction to begin.

Golding, S. A. (2015). Gentrification and Segregated Wealth in Rural America: Home Value Sorting in Destination Counties. *Population Research and Policy Review, 35*(1), 127–146. https://doi.org/10.1007/s11113-015-9374-9

By examining data from the 1980, 1990 and 2000 censuses in 25 states, this paper seeks to understand the impacts of rural gentrification on home values and consequent societal changes in rural counties of the US. The paper defines gentrification as "the process by which higher-income households displace lower-income residents of a community, changing the essential character and flavor of that community", and posits that rural gentrification is a national housing issue, as today's expensive urban housing markets are spreading into rural areas.

The links between rural development and migration are complex and not always straight-forward. They can also be highly localized, with the drivers of in-migration and the effects varying from community to community. Some of the key findings are that in-migrants are not always local workers, but are often retirees or telecommuters, which has consequences for local economies and job sectors. When in-migration does lead to new businesses, they are often in the service sector, and the businesses are less likely to be locally owned, which has negative consequences for local tax bases. These jobs are also often low wage. Due to the rising cost of housing in these places, they are bad at attracting and keeping young people to fulfill these jobs.

As amenity migration occurs, housing costs rise along with it. Home prices increase more rapidly in rural areas than they do in cities. Housing stock may be purchased, renovated, and converted from rentals to permanent residences, creating housing shortages. This can put pressure on low-income households who cannot afford the rising property taxes, costs of living, rent, higher transportation costs, or service in these areas. These pressures can compel out-

migration, especially among people, resulting in localized displacement. The paper notes the negative impact on children whose families move around often, and the negative impacts this has on academic success due to moving through many school districts. The loss of long-time social safety nets is also noted as a response to displacement. When gentrification first begins, income and social inequality is high, but as gentrification reaches completely, inequality becomes less severe as lower income residents leave, and areas become homogenized.

The author suggests that when rural areas are undergoing development pressures, they need to have policies in place that secure benefits and safeguard social and financial safety nets and affordable housing for local residents.

Bose, P., & Lunstrom, E. (2013). Introduction Environmentally Induced Displacement and Forced Migration. *Refuge, 29*(2).

This article introduces environmental displacement and forced migration through a comprehensive overview of the term and its history through statistics, research and current events. The authors start by detailing their definition of environmental displacement, which emphasizes that displacement can be caused by conservation efforts, development, climate change impacts, natural disasters, or industries. It is estimated that the population of those forced to move due to environmental conditions ranges from 50 million to 1 billion, depending on the definition of displacement used. The authors use the term refugees to refer to the displaced in this article, as there is a focus on the international system in place for refugees that ensures certain protections when discussing the displaced. Marginalized populations, like indigenous communities, low-income and poverty level individuals, women, and people of color, are often the most impacted by displacement. The authors also discuss the impacts displacement causes:

loss of income and livelihoods, loss of land and housing, loss of connection to cultural and religious spaces, and physical and mental harm.

To prepare for the environmental displacement, there needs to be a shift in understanding about what drives displacement. Immediate disasters can see an increase in migration, but there are long-term impacts that will also drive migration but do so more slowly, or in combination with other factors. These factors include increasing temperatures in all seasons, dramatic changes to the weather, inhospitality of the land to development, extraction or pollution, and peoples' need for sanctuary in times of conflict and uncertainty. Understanding current migration and adaptation patterns, like flexible migration that comes with people migrating for seasonal flooding, needs to be addressed as well, especially when assessing risk and best practices to support the displaced. It is also noted that in seeking to aid displaced populations, people must be aware of privilege and other social factors. These factors include institutional racism, migrants lack of power and participation in decision-making, and psychological justifications for the plight of the displaced. The latter can also be part of how governments, or authorities, frame the choices made as being "for the greater good" despite the harm that comes to people as a result. The authors also recommend long-term planning and strategies for the future, as ad-hoc policies can cause harm to the populations they seek to help.

Nelson, P. B., Oberg, A., & Nelson, L. (2010). Rural gentrification and linked migration in the United States. *Journal of Rural Studies, 26*(4), 343–352. https://doi.org/10.1016/j.jrurstud.2010.06.003

This paper explores drivers of amenity migration to rural areas, impacts, and then develops a methodology to help identify rural communities that are in the process of

gentrification. People are originally drawn to rural areas by the promises of rural living, which is rooted in ideals, and often not reality; they have a preconception of what these places will provide in terms of a better quality of life due to perceived metrics of tranquility, safety, family ties, access to nature, landscape ideals, and outdoor recreational opportunities. The age demographic of this type of migrant to be in their 50s and 60s, close to or in retirement age, and empty nesters. This group of people relies more on their accumulated wealth and retirement savings, and so are not necessarily looking for job opportunities.

As wealthier individuals (who tend to have a 22% higher per capita income) move into rural areas, these communities are altered in a number of ways, with changes in housing markets, community politics, and class stratification being the most prevalent. Rural housing stocks tend to be older, and as they gentrify, they are often rehabbed and upgraded for new residents, increasing prices, driving out lower income individuals who can no longer afford to rent or own. At the other end of the spectrum, development of lower priced homes may increase due to the increase in service sector jobs that amenity migrants tend to create. These factors can all lead to increases in social and class discrepancies, but it is not as simple as a distinction between newcomer and old-timers.

Numerous factors could signal that a rural area is undergoing gentrification. Rural populations that are largely composed of older generations with few ties to the labor market, especially if these populations are largely in-migrants to the area, is a contributing factor to gentrification. These population changes may involve an increase in second-home ownership, shifts in the housing markets from rental to ownership in general, and the shifting of seasonal homes to permanent housing. A factor to look for in this is also if development, specifically of housing units, outpaces that of population growth. Other factors focus more on the community

itself. Gentrification can be signaled by heightened class polarization and income inequality. This is seen in economic restructuring in rural areas, where there is an increase in service workers and a decline in employment in resources and extractive sectors. Communities with major changes in cultural attitudes toward the environment and preservation can be an indication of gentrification. Communities that deal with political disputes over community resources, especially those tied to land use planning, environmental aesthetics, and resource management, are an example of this.

Gosnell, H., & Abrams, J. (2009). Amenity migration: diverse conceptualizations of drivers, socioeconomic dimensions, and emerging challenges. *GeoJournal, 76*(4), 303–322. https://doi.org/10.1007/s10708-009-9295-4

This paper examines the role of amenity migration in changing rural destination areas. Motivations for moving to rural spaces are often driven by expectations about the quality of life that rural places will provide, recreation, proximity to nature, environmental concerns, and escaping from urban "ills." Environmental quality is especially important to older migrants who are close to, or in retirement age. There is an important scale of time in amenity migration, that begins with frequent tourism to a rural destination, second or seasonal home ownership, and then permanent residence.

There can be great differences in opinion between communities and in-migrants regarding land use. In-migrants can view the purpose of the land differently from the rest of the community, with varying traditions and perspectives on land management across private property boundaries. The study found that new ranchers in Montana often had stricter, less communal interpretations of property rights than longtime owners, and that they often posted

land with “No Trespassing” signs, as well as rebuked neighbors who sought to engage in cross-boundary management and public access. This can create challenges in regard to both community and conservation needs.

In-migrants often viewed land in terms of its aesthetic appeal, and actions taken on their own property, as well as politically in terms of community activism and (non)support of development projects. There can be a significant “last settler syndrome” where recent in-migrants voice opposition to any new in-migration in attempts to protect the rural ideal that they sought in their move, which can conflict with long-standing community development and growth initiatives.

Despite the challenges associated with in-migration, positives were also highlighted. Some studies that the authors reviewed showed that in places with lots of amenity migration, community satisfaction is typically higher. New skills that in-migrants bring with them are valued, population decline can be reversed, and the capacity of local government has the potential to increase due to the increase in people, their political engagement, and the diversity of values represented. The study highlights that amenity migration to rural spaces is often complex, with both positive and negative consequences that are highly time and place dependent.

Reports

Piggott-McKellar, A. E., Pearson, J., McNamara, K. E., & Nunn, P. D. (2019). *A livelihood analysis of resettlement outcomes: Lessons for climate-induced relocations*. Ambio. https://doi.org/10.1007/s13280-019-01289-5

This report is an analysis of relocation case studies with the goal of understanding how relocation impacts the livelihoods of people in resettled communities. The six frames identified ran across natural, social, financial, human, physical, and cultural asset categories. Overall, it showed that the only areas where resettled people did better post move were provision of services, improved community infrastructure, and housing. It concludes by recommending areas where the research can be used to improve the livelihood outcomes of people affected by climate-induced relocations.

Blogs, Commentaries and Reviews

Martin, C. (2019, October 22nd). *"Who Are America's 'Climate Migrants,' and Where Will They Go?"* Urban Wire: Neighborhoods, Cities, and Metros. www.urban.org/urban-wire/who-are-americas-climate-migrants-and-where-will-they-go.

The article discusses research that was undertaken by the Urban Institute and several partners as the result of a grant. It is part of an ongoing series of blogs to update interested parties on their findings. The purpose of their work was to explore whether receiving communities had the capacity to plan for and support incoming climate migrants. The authors looked at topics such as potential resettlement areas in the U.S., and perceptions of how migrants are integrated in their new communities. Results found showed that climate migration impacts are highly regional and are influenced by the cause of migration. The author notes that receiving communities can tend to view newcomers as competition for jobs and housing, and that the communities may have few means to prepare for and integrate newcomers, let alone adapt to climate change impacts. Receiving community data shows that climate migration in the U.S. is likely to increase.

Continued research is necessary to increase the ability for communities to manage regional migration.

Books

McLeman, R. A. (2013). *Climate and Human Migration: Past Experiences, Future Challenges*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9781139136938

This book covers many topics related to climate migration. Focusing on the eighth chapter, called Emergent Issues in Climate and Migration Research, the author brings up the intersections of climate migration research with other topics. He notes that these areas need further research, as these interactions are understudied. Areas of further research include the interaction of migration with conditions of political instability and conflict, how the global food systems and household food security are impacted, and the types of migration patterns and behavior from unexpected impacts of climate change, aka "climate surprises".

Climate change acts as a threat multiplier in conflict-ridden or unstable areas and has been seen to have severe impacts on pre-existing factors like food, water, and energy shortages, usable farmland, greater shifts in migration and displacement, increased competition for resources, increases in disease beyond capacity to handle, areas of land opened for resource wars, and areas of land being made uninhabitable. Scarcity in this scenario creates a feedback loop, where it leads to competition, conflict, institutional breakdown, and violent conflict that furthers scarcity. It can be seen in rising prices of commodities too, which is a method of control for larger groups. Conflict is not always the result. There has been community cooperation too.

Food security is a complex topic; it is not only based on the ability to produce and purchase food, but also dependent on access to fresh water, sanitation, and transportation, gender relations, the general health of an individual, and cost. The issue is not with the food systems, which produce enough if they were utilized to reduce waste and food was distributed fairly, on a global scale. Issues arise in the smaller scale food systems, with discrepancies in type, price and quantity and quality seen on regional and local levels, which is a distribution issue. Food and migration are deeply linked. Temporary workers seek new places due to seasonal conditions, creating networks to work with food price fluctuations for the benefit of their communities and families, which shows how adaptive out-migration can lessen the ability to maintain local food production. A form of migration called "hunger-related migration" is seen in the shift of people moving from rural areas to urban areas and vice versa but is also specifically seen when people migrate out of urban areas during periods of urban food insecurity. The latter is also related to high urban unemployment. It becomes a form of distress migration, which is based on shifting to find resources in scarcity. Land grabs from people outside of the region seeking to stabilize their own resources (normally on agricultural land) can lead to displacement as well as disruption of local food systems. Land grabs usually mean commercial industry, more machinery, monoculture, and chemicals with little options for employment. This creates further competition and scarcity for existing resources.

Vermont-Specific Research

Topics related to climate migration are highly intersectional. Specific research into Vermont demonstrated this. Climate migration may be a developing field of research, but population changes, the impacts of climate change, and the qualities that draw migrants to the

state are researched. The following research highlights the potential impacts climate migration may have on Vermont.

Journal Articles

Park, M., Derrien, M., Geczi, E., & Stokowaski, P. A. (2019). Grappling with Growth: Perceptions of Development and Preservation in Faster- and Slower-Growing Amenity Communities. *Society & Natural Resources, 32*(1), 73-92. https://doi.org/10.1080/08941920.2018.1501527

This paper examines four rural towns in Vermont that are considered rich in amenities; however, the four towns (Eden, Cabot, Craftsbury, and Waitsfield) are experiencing different growth rates. The authors examine attitudes and perceptions of development between seasonal and permanent residents. The paper notes that rural economies in Vermont historically have been tied to extractive industries, such as forestry, mining, agriculture and grazing, but that as these types of livelihood have decreased, a shift in the definition of "natural resources" has occurred, whereas aesthetics of the natural environment are valued more highly. This reconceptualization of nature into scenic landscapes, forested hillsides, lakes, walkable hills and mountains, and "quaint" rural villages, have been reworked as foundations for Vermont's recreation and tourism sectors. Vermont's amenity economy is heavily based on seasonal tourism, especially focused on skiing, lake camps, recreation focused on things such as hiking and mountain biking, and second home ownership.

There are several consequences of growth in rural amenity locations, many of them unintended. The very things that attract tourists, such as forest landscapes, can be adversely affected by increases in people. Development of seasonal and second homes can lead to land

fragmentation, affecting wildlife habitat and species diversity, lead to erosion, diminish water quality, “ruin” scenic views, and overload local services, such as transportation, sewage, and water infrastructure. Positive effects of new residents include possible increases in local businesses (especially in the service sectors), increased social interactions, community activities, and local pride.

People who migrate to local amenity locations are often interested in quality of life issues that are related to the natural environment. If they chose to permanently move, they generally tend to do so because of the ties they have made with local residents and the natural environment. The study examined the idea of conflict arising between “new-comers” and “old-timers” and found that results were mixed, often based on the rate and speed of development, as well as with how well “newcomers” integrated into the community. It was noted that sometimes new residents give voice to values that were previously present but unvoiced in a community.

Slower growing towns attributed a higher importance to development and natural resource preservation than did residents of faster growing towns. Individuals' attitudes are highly influenced by their level of community engagement. Both short and long-term residents cared about community preservation initiatives and were supportive of maintaining clean air and water.

The paper emphasized the importance in looking at the rate of growth and social change in rural communities as a starting point to understanding how well community development and preservation proposals may be received as part of planning initiatives.

Bose, P. (2018). Welcome and Hope, Fear, and Loathing: The Politics of Refugee Resettlement in Vermont. *Peace and Conflict: Journal of Peace Psychology*, *24*(3). https://doi.org/10.1037/PAC0000302

This article focuses on receiving communities in Vermont responded to refugees resettled in their towns. Refugees provide diversity to a primarily homogenous population in Vermont. This sudden change with new people coming into the community can arouse unwarranted suspicion, negative attention, and can create conflict and tension with newcomers. Refugees often come in with trauma and desperation due to the circumstances that forced them to leave, and this can leave them vulnerable. Communities might not have experience integrating newcomers in larger amounts, which furthers tension and conflict. Local citizens have responded in unwelcoming ways, leading votes and protests against policies meant to support resettlement. Other tensions have included race and religious discriminations against refugees from police and the school systems in Vermont.

Most resettlement has occurred in the north of Vermont, with a primary focus being on Chittenden County and the city of Burlington. This is because of the major cultural, social, historical, and religious touchstones people desire often being located in major urban areas. While this means further travel for rural areas, it also makes these areas popular for resettlement. Any sort of crisis or issue that existed in the receiving communities prior to refugees has shown to only become further exacerbated by their presence due to these populations also needing the same resources, seen in housing shortages and waitlists for social services. Other marginalized populations in the receiving areas were just as vulnerable as refugees to these issues. Services that work with refugees have been shown to sometimes hinder their acclimation and resettlement, sometimes being paternalistic and misunderstanding of the refugees' circumstances. Stakeholder assessments that have worked to solve these issues for refugees have not historically included refugees in the process, but have included healthcare, housing, employers, and education centers.

Hoffman, M. (2017). The Role of Public Land Use Planning in Facilitating Conservation on Private Land. *Natural Areas Journal, 37*(4), 556–563. https://doi.org/10.3375/043.037.0412

This article argues for community based collective land use planning and conservation efforts in Vermont. The author finds that there is a disconnect between Vermonters stated conservation preferences and sprawling development patterns that he suggests can be bridged by focusing on bringing neighbors together for collective conservation practices and development planning.

95% of Vermonters value the rural working landscape and are knowledgeable and care about environmental issues. However, the pace and patterns of land development do not match population increases (10% increase between 1982-1992) and the amount of land being developed (25% increase in developed land, with 40% of that being former cropland or pasture). The author suggests that this pattern of land development is due to development largely being an individualized, private decision on private property, instead of being part of larger community development plans. Focusing on improving civic processes to engage landowners in collective conservation would also benefit and increase the functionality of rural wildlife habitats, as wildlife needs connectivity of habitats, and ranges go across property boundaries. Small parcels are affected by the effects of surrounding land use decisions.

Property owners are more likely to engage in collective action if their neighbors have also committed to doing so; people do not like to make conservation commitments first or by themselves. This social behavioral component is a stronger driver and predictor of conservation action than are financial incentives.

66% of Vermonters have stated that low-density automobile focused development outside existing town centers is an increasing problem, and that development needs to be concentrated in existing towns, instead of spreading into the countryside.

There is great potential for planners to bridge these gaps between stated preferences around development and conservation, and actual practice. Planners need to work with groups of landowners and with town governments to engage in meaningful dialogue about shared future visions of towns and development patterns. Due to the small size of many rural towns (70% of Vermont towns have less than 2000 people) there is great potential for land use planning to be highly participatory.

Morse, C. (2017). The emotional geographies of global return migration to Vermont. *Emotion, Space and Society, 25*. https://doi.org/10.1016/J.EMOSPA.2017.09.007

The author focused on researching the migration patterns of Vermonters who had left the state and returned after living elsewhere for a period of time. It was done to further research the recent trend of out-migration from the state and understand what drew people back to their home state. Participants were invited to share stories and experiences on record, which offered numerous anecdotes. Many reported a sense of othering for having left the community and returning. Sharing experiences and stories with others depended entirely on the context. Some welcomed it, while others saw it as bragging and something that went against Vermont's culture. There was noted rural resistance to outside stories, which people talked about coming from peoples' strong connection to the land, culture and community and not wanting to hear about others. Some also noted resistance in places to other religions and cultures in general. Chittenden county was mentioned specifically for being seen as a diverse, ideal place to be where this sort of

resistance was not common. It was then added that while it is one of the most diverse places in Vermont, it is still not always great, as people of color and different religions deal with a lot of racism and bigotry.

Ryan, K. (2016). Incorporating emotional geography into climate change research: A case study in Londonderry, Vermont, USA. *Emotion, Space and Society, 19.* https://doi.org/10.1016/j.emospa.2016.02.006.

This study focuses on community responses to suggested development and land use changes regarding the dam in Londonderry, Vermont. The dam has deep cultural significance to the local community through their associated history with it and the pond feature it creates. However, the dam also worsens flooding in the area, and recommendations have been made for the dam to be removed. The resources to do have also been offered for its removal, but the local community has resisted this. The flooding caused by the faulty dam has led to FEMA buyouts of some properties, which is a source of workshops seeking to address the loss of property and develop interdisciplinary approaches for it in the future. The study found that connecting to these issues through emotive-physical exercises and storytelling eased the tensions between those who wanted the dam removed and those who wanted it to stay. It helped create connections for people and let them express how they felt through guided exercises that led to better communication after on the hard topics like climate change and dam removal. Issues like these can become deeply entrenched, but people found connection through a shared love of their home and community and the shared concern for its well-being. While the dam was not removed, dealing with the issues caused by flooding has become prevalent, and there is work in process to become more adaptive and resilient and plan for these circumstances.

Bolduc, V., & Kessel, H. (2015). VERMONT'S DOMESTIC MIGRATION PATTERNS: A Cause of Social and Economic Differences. *Northeastern Geographer, 7*.

This article focuses on the historical migration patterns Vermont has experienced. Vermont has a long-standing trend of slow population growth and consistent out-migration. New England has a slow population growth rate, with the largest increases being seen in a high birth rate and intentional migration to the area. Migration between states that is not caused by a natural disaster is based on economic and job opportunities, but it can be even more specific depending on different demographic variables. Migration to Vermont comes from job opportunities, the landscape, recreation opportunities, the pace and quality of life. It is noted that moving to Vermont would make people less well-off financially, but they would still move to the state.

Bose, P. (2015). "NEW VERMONTERS" AND PERSPECTIVES on Vermont Migration. *Northeastern Geographer, 7*.

This article focused on the perspectives of life-time residents to the narratives of migration in the state. The predominant narrative of Vermont's population shift is that young people are moving from the state in search of better jobs, opportunities, and education. This is correlated by documented out-migration of Vermont's population. However, Vermont has also been a destination state, where people have moved for the culture, land, and the small, rural population. Migrants have always been a historical part of Vermont's history, where large groups of primarily refugees have moved in over a short span of time, not the slow trickle and increase seen from other migrant groups. What distinguishes refugees from other migrants further is the lack of choice in where they resettle and the state aid that is given as part of their resettlement.

The movement within and out of the state is not an even exchange, as much of the population is concentrated in urban areas in the north.

Geller, W. I., Marineau, S., & Watts, R. (2015). DISCOURSES OF DEPARTURE?: EXAMINING THE "Rural as Deficit" and "No Jobs Narratives" in Vermont. *Northeastern Geographer*, *7*.

This article breaks down the predominant narratives of out-migration in Vermont. The two main narratives are "rural is deficit" and "there are no jobs", meaning that there is no intellectual capital in these areas, no job opportunities, and no opportunities for younger people to thrive. These narratives enforce negative stereotypes and inform ill-suited policy decisions that seek to resolve these problems. It sets Vermont up in a self-fulfilling prophecy: by focusing on these two narratives as a reason for out-migration, it causes out-migration from these areas. Rural perceptions and connotations are deeply connected to migration in Vermont, which further exacerbates these narratives and their impact. The necessity of education is part of multiple narratives, but in Vermont it furthers out-migration. People seek higher education because it is seen as necessary, and despite the numerous colleges in Vermont most in-state students leave the state for college. It also means that these populations migrate elsewhere in search of job opportunities and makes them less likely to return to rural living after. This plays into the narrative of "rural is deficit", as it is seen as a brain drain and a major loss to Vermont when this occurs. What these narratives do not consider is the reality of living in Vermont. Migrants from the state have reported their reasons for moving as: the high cost of living, the ability to earn more out of state, work being located out of state, the desire for more diversity/culture, and wanting to leave the colder climate behind.

Bose, P. (2014). Refugees in Vermont: mobility and acculturation in a new immigrant destination. *Journal of Transport Geography, 36*. http://rave.ohiolink.edu/ejournals/article/329950579

Resettlement in Vermont comes from convenience, the ease of travelling to jobs, healthcare, education (both access and accessibility), the presence of shared culture within the community, and independence. Despite that, resettlement is limited in Vermont. The state is not a traditional place of resettlement, as it is small, largely white, and rural, which can be seen as major drawbacks to large-scale shifts in migration. The author focuses his research into the experiences of refugees once they are already living in Vermont to better understand the draws to and against living in Vermont. One crucial point made in the article is that many of the issues refugees face in resettlement are issues that are felt by other marginalized groups, like the low-income, the elderly, the physically challenged.

Transportation is seen as a limiting factor for refugees in Vermont, despite its necessity for easier transitions into the community. It is largely based on specific access points, which can limit who uses it due to proximity; there are also few transit options, both public and private. In the Burlington area specifically, public transit is seen as not enough by refugees compared to locals. This is attributed to the specific area in the city they are resettled, as there are no bus stops or routes that travel that area. Public transit is also noted to have issues with frequency, route and access, especially on weekends and evenings, when most shift work occurs. This means that refugee neighborhoods rely heavily on alternative plans like carpooling, local services that become overextended to accommodate, and neighbors and friends. It is such an issue for them because opportunities become limited: work (in major industries and agriculture), education,

childcare, healthcare, shopping areas all become harder to access with limited transportation, especially if these services are clustered further away from residential neighborhoods.

Bose, P. (2013). Building sustainable communities: Immigrants and mobility in Vermont. *Research in Transportation Business & Management*, *7*. https://doi.org/10.1016/J.RTBM.2013.03.006

This article addresses best practices and recommendations for building sustainable communities in Vermont that incorporate the needs of immigrants to the state. It begins by addressing that to plan for the future appropriately, urban growth and planning needs to incorporate diversity of perspective to best accommodate all potential users. For this article, transportation is the primary focus. In general, the bus system is the most used public transit in Vermont, but it is not the most desired form of transit due to its restrictions, like limited service hours in evenings and on weekends and the infrequency of the bus going through its route. Bikes are not always seen as an option due to the weather conditions in the state, as well as the safety of bike paths overall. Transit assistance groups are often restricted, only having the ability to be used for specific circumstances, like medical appointments. Other transit services have restrictions through required insurance and credit histories. Having a license is seen as necessary and desirable, but there are often blocks to acquiring it due to the education required or the bureaucracy of the process. This could be mitigated by having these services include education about the available transit options and how to use them. Vermont has specific areas that are underserviced by public transit, like Winooski, Colchester, Shelburne, and Williston Tilley Drive. The article has recommendations for improving these systems to best serve all residents. These include expanding the bus services by making them free, improving the communication of

bus schedules and routes, providing, and educating on alternative transportation options, and holding public meetings and other opportunities for input into the transit system.

Groen, J. A., & Polivka, A. E. (2010). Going home after Hurricane Katrina: Determinants of return migration and changes in affected areas. *Demography*, *47*(4), 821–844. https://doi.org/10.1007/BF03214587

In this report, authors sought to understand what factored into the decision for people displaced by Hurricane Katrina to return home. It shows that some of the indicators were income, age, race, and perceived risk/severity of damage to their homes. The report also addresses the changes in the characteristics of these communities because of people's decision or ability to return. This analysis differs from others as it looks at a multitude of indicators that go into the decision for an individual to return post disaster opposed to single indicators. Some of these changes have resulted in a shift in the demographic makeup of certain areas. Various places saw an increase in Hispanic populations, others a higher percentage of residents of older age, as well as those with increases of residents with higher incomes. These demographic alterations are determined by who chooses to return to an area which has an overwhelming impact on what public services will be needed.

Paxson, C., & Rouse, C. E. (2008). Returning to New Orleans after Hurricane Katrina. *The American Economic Review*, *98*(2), 38–42. https://doi.org/10.1257/aer.98.2.38

The decision for an individual to return to an area post displacement after a disaster relies on many factors. The authors of the report examined what some of those determinants were for some Katrina victims. A small population of low income African American women were used as the sample to the exclusion of other demographics, providing an important but limited view of

those impacted. The data is not traditional, in the sense that it was not collected prior to the event and following through after, but it still provides understanding that can further future research. Findings from the information gathered revealed that people who were more likely to return were homeowners and had social ties to the community. People who were less likely to return had children or experienced increases to their income within new locations.

Reports

Morse, C., & Geller, W. (2015). *The Vermont roots migration project: Summary of initial findings.* Burlington: Center for Research on Vermont, University of Vermont. http://benningtonvt.org/wp-content/uploads/2012/11/vt_migration_final.pdf

This report is a summarization of research done on Vermont's migration patterns. It focuses on the reasons behind migration from the state, back to the state, and within the state from different counties. People were shown to be more likely to stay in Vermont or return to the state if they have family living there. People who leave tend to have college degrees or higher, while those who stay have college or less. Major reasons to stay include the landscape and environment, family, culture and community, the small size, work opportunities, wanting to raise children there, never wanting to live outside the state, and finding Vermont as the best place for them to live. Major reasons for migration out of the state include better paying jobs and opportunities, wanting to live somewhere with better cultural diversity, Vermont's high cost of living and its cold climate. Returners cited their moves back to Vermont stemming from missing their family, the environment, culture, and community, waiting to raise their families here, sense of missing place and homesickness, and their time away being temporary. Major in-state migration is from other counties to Chittenden county or to Washington county.

Galford, G. L., Hoogenboom, A., Carlson, S., Ford, S., Nash, J., Palchak, E., Pears, S., Underwood, K., & Baker, D. V. (2014). *Considering Vermont's Future in a Changing Climate: The First Vermont Climate Assessment.* Gund Institute for Ecological Economics. http://dev.vtclimate.org/wp-content/uploads/2014/04/VCA2014_FullReport.pdf

This climate assessment for Vermont is a comprehensive compilation of information from across the state. It identifies the changes occurring in the state's climate and how those changes impact quality of life for residents. It is the first state-scale climate assessment in the nation and covers not only individuals and communities, but other sectors such as tourism and recreation.

Pealer, S. (2012). *Lessons from Irene: Building resiliency as we rebuild.* Vermont Agency of Natural Resources. https://anr.vermont.gov/sites/anr/files/specialtopics/climate/documents/factsheets/Irene_Facts.pdf

The report provides an overview of multi-sector impacts Vermont has dealt with following Tropical Storm Irene. Data is quantified from sectors including transportation, emergency response, buildings and infrastructure, public health and safety, water supply, hazardous waste and fuel spills, wastewater treatment, solid waste disposal, forests, agriculture, water resources, and aquatic life & habitat. It finalizes the summary with a list of questions that the agency asks to analyze the lessons learned and help build resilience in Vermont.

Blogs, Commentaries and Reviews

IPX1031 Insight Blog. (n.d). Data Reveals Vacation Home Hot Spots Across the Country. *IPX1031*. https://www.ipx1031.com/vacation-hot-spots/

Home data was analyzed from census designated locations across the country to determine the amount of vacation homes per state per capita. 17% of Vermont's housing stock is second homes.

News Publications

Allen, A.W. (2019, August 5). Study: Vermont is No. 2 nationwide for second home ownership. *VTDigger*. https://vtdigger.org/2019/08/05/study-vermont-is-no-2-nationwide-for-second-home-ownership/

This article explores the rates and related consequences of second home ownership in Vermont. The state has the second highest number of vacation homes per capita. In 2017, 58,500, or 17% of the state's housing units were vacation homes. The top three towns in the state for second home ownership are Greensboro (81%), Quechee (69%) and Proctorsville (45%). According to the Census Bureau, vacation homes are housing units that are "vacant for seasonal, recreational, or occasional use." Vermont's proximity to major cities throughout the northeast make it attractive to second homeowners.

The article also examines the effects of second home ownership on housing stock and costs. It is one of the major contributing factors to Vermont's high housing costs, which creates a shortage of available housing units, making them unaffordable for low-income Vermonters. This

housing shortage is especially prevalent in resort areas, and owners of ski resorts have difficulty attracting seasonal workers because of both the shortage of housing and the high costs.

Hoffman, M. (2019, February 15). Keep Vermont special to attract new residents. *VTDigger*. https://vtdigger.org/2019/02/15/matthew-hoffman-keep-vermont-specia-to-attract-new-resident

This commentary is written by Matthew Hoffman, who is a rural sociologist at the University of Southern Maine. In it, he examines the potential effects of the Remote Worker Grant Program that was passed in 2018 on population growth in Vermont and community development. The program incentivized out of state workers to move to Vermont, and work remotely, by paying them $10,000. He discusses the relationship between population growth and development, noting that development of land in VT often outpaces population growth, with developed land increased by 60% between 1982 and 2003, while population grew by 19%. This resulted in two million acres of farmland being lost to development. Increased development can put pressures on local provisioning services, and actually raise property taxes, especially in areas where growth was poorly planned. Towns in rural communities losing populations is also examined. Loss of population in these towns can have cascading effects on local businesses when there are no longer enough people to support those businesses, which can result in greater loss of local jobs, residents, and inability to attract new business.

It is important to note that Hoffman is not arguing against the program to attract out-of-staters to relocate to Vermont. Rather he is advocating for growth that is well planned, coordinated, and focuses on compact development, so as to prevent loss of natural resources, farm and forest land, and is able to provide essential services at low costs, jobs, and amenities.

He advocates for planning that protects Vermont's natural landscape, traditions of small-scale farming and forestry, as these are things that attract out-of-state people to Vermont.

Padro Ocasio, B. (2019, February 2nd). Puerto Ricans struggled more in Central Florida. *The Ledger*. https://www.theledger.com/news/20190202/puerto-ricans-struggled-more-in-central-florida

The article discusses the findings from a study of Hurricane Maria evacuees from Puerto Rico. Research indicated that the people settling in South Florida experienced fewer issues than their counterparts in Central Florida. Those living in Central Florida reported higher rates of inability to find jobs, housing, or a means of transportation. Language barriers affected both sets of people but did so disproportionately. In Central Florida, incoming migrants post Maria experienced hostility from the more established Puerto Ricans who felt there would be more competition due to their arrival. This was much less the case for those who moved to South Florida where tensions were mild but did not play a major factor in their ability to establish themselves.

Discussion and Analysis

Demographics & Reasons for Migration

Climate migrants are a mix of demographics. Vermont could see any potential demographic as a climate migrant in the future as climate change and its impacts escalate. Marginalized and vulnerable populations are often the most impacted by climate change; these populations include indigenous communities, low-income and poverty level individuals, women, and people of color (Bose & Lunstrum, 2013). Their migration comes with great personal losses

and trauma that will necessitate resources that might be necessary to aid in their resettlement (Bose, 2018). Disasters bring forward other issues facing these populations, like racism and institutional oppression, which only further the negative impacts of displacement and migration (Lübken, 2019). Migration because of displacement is shown to be increasing, as displacement occurs through numerous means: development, industry, conservation, conflict and both acute climate disasters and long-term climate change impacts (Bose, 2016). For Vermont specifically, research shows that climate migration and its impacts are highly regional and influenced by the cause of migration (Martin, 2019).

Migration that is not caused by disaster can often be motivated by economic and job opportunities (Bolduc & Kessel, 2015). Migration to Vermont for job opportunities is mentioned multiple times in the research (Bolduc & Kessel, 2015; Bose, 2014). However, research also shows that Vermont has a strong narrative in place that there are not many job opportunities, especially for younger generations (Bose, 2015). Major migration out of the state has been tied to people seeking better paying jobs and opportunities in connection to Vermont's high cost of living (Morse & Geller, 2015). One article mentions that environmental displacement can be seen through migrant workers (Lübken, 2019). This can include temporary workers who move due to seasonal conditions, leaving behind family to work (McLeman, 2013). Vermont could focus on data like this to better understand migration patterns regarding employment and to help prevent issues like gentrification. Research shows that in-migration can lead to more business entering the area, which provides employment opportunities; however, depending on the type of business that follows migrants, employment opportunities can be low-paying (Golding, 2015). Another author notes that population growth and migration within Vermont has already seen

impacts like this, where rural areas experiencing population loss have seen a decrease in local jobs and an inability to attract new business (Hoffman, 2019).

There are many other reasons that Vermont is highlighted as an ideal place to migrate. Migration to Vermont, for both first timers and those who have moved away in the past, is often connected to family, the environment, the culture and community (Morse & Geller, 2015). Vermont's natural landscape and traditional industries like farming and forestry are named as factors that attract migrants to Vermont (Hoffman, 2019), as well as the recreation opportunities offered by the natural landscape (Bolduc & Kessel, 2015). While it has been noted before in the report that Vermont's size and homogenous population can be deterrents to migration for some communities, research has shown that the small size and culture of Vermont has made it an ideal place for others to live (Morse & Geller, 2015), and that it offers migrants a better quality of life (Bolduc & Kessel, 2015). This is an area that would require further research to understand how Vermont's communities and culture can both be a draw and a deterrent for migrants, especially those of marginalized populations.

Migration, in general, benefits from established routes, destinations, family connections, and networks and information, which bring others to the same places where there are opportunities (Lübken, 2019). This is not a new phenomenon for Vermont, where migrants have been a large part of the state's history, as noted by Pablo Bose, whose research is primarily focused on refugee resettlement in the state (2015). Migration into Vermont can be categorized as fast-onset and slow-onset, with fast-onset being immediate migration following a natural disaster, and slow-onset being characterized by those who move to escape major impacts like dramatic changes to weather, temperature increases, and pollution (Bose & Lunstrum, 2013).

Receiving Areas

Vermont has a few potential receiving areas. Chittenden and Washington counties are cited as primary areas for migrants, with focus on the city of Burlington (Bose, 2018; MacDonald, 2017; Morse, 2017; Morse & Geller, 2015). These areas are perceived as diverse, ideal places to live due to major cultural, social, historical and religious touchstones that people desire often being located within major urban areas (Bose, 2018; Morse, 2017). While Chittenden county is seen as one of the most diverse places in Vermont, one author notes that even in a more urban environment, people of color and different religions still deal with racism and bigotry (Morse, 2017). Clustering of necessary amenities also means difficulty of access for those in rural areas of the state (Bose, 2018). Urban areas also see more indicators of gentrification, seen in income and social inequality, population homogenization, and housing shortages (Golding, 2015). These areas also can see a great deal of out-migration due to the high cost of living, which is prevalent throughout Vermont (Geller, Marineau & Watts, 2015). However, Chittenden and Washington counties are still ideal receiving areas, as they can provide the services, community infrastructure, and housing that will allow for migrants to resettle and flourish (Piggot-McKellar et al, 2019).

Migration into rural areas of Vermont will most likely be quite different to what the urban areas see. Rural areas in Vermont have an ongoing trend of out-migration. This is due to strong social narratives and stereotypes that rural areas have no opportunities for younger generations (Bose, 2015). Perceptions and connotations about migration in rural Vermont fuel further out-migration from rural areas, creating a self-fulfilling prophecy (Geller, Marineau & Watts, 2015). Rural areas of Vermont have also been noted to have strong community resistance to outsiders, often due to their own strong connection to the land, community, and culture

(Morse, 2017). Rural areas are no exception to gentrification, which can come through the community and cultural changes, changes in housing from seasonal and rental to permanent residences, and conflict that arises from political disputes about resource and land management (Nelson, Oberg & Nelson, 2010). These areas are also limited in access to public transportation, which can make connections to urban areas with resources harder to maintain (Bose, 2018). Rural areas could see major in-migration despite potential issues simply because the areas are rural. People are drawn to Vermont because they value the "rural aesthetic" (Bauer et al, 2017). Rural life is perceived to provide a better quality of life through the access to nature, landscape, outdoor recreational opportunities, as well as the peace and quiet of a less populated area (Nelson, Oberg & Nelson, 2010). Migrants seeking rural life are generally older, wealthier, and less likely to seek employment opportunities due to independent wealth (Nelson, Oberg & Nelson, 2010), though individuals who telecommute for work have been seen to migrate to rural areas (Golding, 2015). This type of migration is known as amenity-migration.

Amenity Migration

Research on amenity migration is well established, while rural gentrification is relatively newer. Both are mentioned as the two are interconnected, with shared drivers and impacts in rural spaces. Amenity migrants can be difficult to classify as climate migrants due to the wealth of choice and ability to migrate prior to major disasters. However, climate change impacts do tend to influence amenity migrants, as they may choose to migrate to Vermont for better weather conditions, and/or to avoid increasingly common natural disasters in the places they are migrating from.

Amenity migrants tend to be largely white, older, wealthy individuals moving from an urban area to a rural area for specific amenities (Jokicsh et al, 2019). Amenity migrants are attracted to certain rural locations due to the natural amenities that those locations provide, such as hiking access, boating and fishing, and skiing (Park et al, 2019), as well as the natural scenery, cultural richness, and the value of "rural aesthetic" of Vermont (Jokicsh et al, 2019). The tourism and recreation sectors of Vermont use this as an advantage to attract tourists (Park et al, 2019). Vermont has long attracted vacationers and second homeowners to its rural areas for precisely all of these reasons. This starts the trend of in-migration for amenity migrants. It generally occurs on a different timescale to other types of migration. Amenity migration often begins with tourism to a rural destination, followed by second or seasonal home ownership, and then ends with permanent residence (Gosnell & Abrams, 2009). In 2019, 58,500 homes in Vermont were vacation homes, which is 17% of the state's total housing stock (IPX1031 Insight Blog; Allen, A.W. 2019). Analyzing data available on secondary and seasonal home ownership and the rates at which these are converted into permanent residences could be an indicator to pay attention to in regards to potential climate migrants, as climate migrants will relocate to places with which they have pre-existing ties.

Amenity migration can be a driver of rural gentrification. One indication noted in the research is the conversion of seasonal and vacation homes to permanent residences (Nelson, Oberg & Nelson, 2010). The same authors note that a factor and a consequence of gentrification can be the change in mindset about the functions of natural spaces in rural areas (2010). Vermont's rural economies have historically been involved in extractive industries, seen in forestry, mining, and agriculture, but with the decrease of these livelihoods and the population changes, the definition of natural resources has shifted to value aesthetics and natural

environments over working lands (Park et al, 2019). As productive industries decline, service sector industries tend to increase as wealthier in-migrants seek amenities and services (Park et al, 2019; Golding, 2015; Nelson, Oberg & Nelson, 2010). These jobs tend to be lower paying with little to no benefits, which increases class and income disparity (Golding, 2015; Nelson, Oberg & Nelson, 2010). Pressures on housing stock in rural areas, which is generally low to begin with, increases rent and ownership costs, creating a working class that is highly mobile (Nelson, Oberg & Nelson, 2010). When an area first begins to become gentrified, this class and income disparity is large, but as time passes, and lower income residents are increasingly priced out, areas become progressively more homogenous (Golding, 2015).

Climate Migration Impacts

Vermont has history with the impacts of resettlement from migrant groups, seen in the work done with refugees in the state. Research has shown that the issues and needs of refugees reflect those felt by other marginalized communities in receiving areas (Bose, 2018), like the low-income, elderly, and physically challenged (Bose, 2014). Receiving communities are likely to see a drastic increase in need for housing and social services, which can compound with pre-existing shortages and waitlists (Bose, 2018). Bose's work with refugees has already shown that there are gaps in public transportation access, which means limited opportunities for employment, education, childcare, healthcare, and other necessities of living (Bose, 2014). Climate migration will have further impacts on other pre-existing issues outside of social services. It can act as a multiplier to existing problems with infrastructure and access to clean water, food, and energy (McLeman, 2013).

With a potential increase in population in rural areas, there are environmental impacts to consider. Rural development, especially because of amenity migration, can see many unintended impacts. Development in rural areas, especially those without zoning to prevent sprawl and promote compact development can lead to land fragmentation, erosion, diminished water quality, and infrastructure overload, which can overburden pre-existing water, transportation, and sewage systems (Park et al, 2019). Another environmental impact is the change to land use in rural areas, where land gets converted from working lands to recreational, or conservation land.

Vermont's natural environment is highly valued by both Vermont residents and in-migrants. It has been noted that Vermonters are known for their deep connection to the land, culture, and community (Morse, 2017). However, this does not mean that everyone agrees on how to maintain or use land. Differences in opinion run deep, as seen in case studies where communities can become deeply divided on issues regarding environmental work. Despite continued flooding and loss of homes, the town of Londonderry remained divided on whether to remove the dam causing the flooding. Mediation resulted in the community sharing an understanding of how they all cared about each other and the environment, even if they could not agree on a course of action (Ryan, 2016). This disconnect is discussed further by Hoffman, who found that Vermonters dealt with a cognitive dissonance between their stated conservation preferences and sprawling development patterns that are occurring (2017). From 1982-1992, Hoffman found that land development rates did not match population increases, with land being developed at twice the rate the population increased (2017). Of the 25% increase to developed land, 40% of the land was former cropland or pasture (Hoffman, 2017). Other research supports these findings, showing that often what attracts migrants to an area, such as forests, is adversely affected by continual in-migration and development pressures (Park et al, 2019). There is also

potential for new residents to give voice to long held but rarely voiced similar conservation ethics in communities, and to drive momentum behind these efforts (Park et al, 2019).

In-migration is highly regional and deeply dependent on the cause for migration (Martin, 2019). Vermonters could have varied reactions to in-migration. Research shows that some communities within Vermont do not have experience integrating newcomers in larger amounts, and this can lead to tension and conflict (Bose, 2018). Newcomers can be perceived as competition for resources, such as jobs and housing (Martin, 2019). Citizens have responded in unwelcoming ways, as Bose notes regarding his research on refugees in Vermont. Bose states that citizens have led votes and protests against policies that support resettlement, alongside tensions from police and school systems focused on racial and religious discrimination (2018). Generally, though, most communities simply have few ways to prepare for and integrate newcomers, which compounds existing stressors within the community (Martin, 2019). This can be seen in rural areas that have seen an increase of amenity migrants. Low-income residents can be priced out of rental and home ownership markets because of increased home values due to amenity migration, leading to localized displacement in some areas (Golding, 2015). Impacts of this kind of localized displacement can lead to the erosion of social safety nets and negatively impact children especially, who suffer academically due to constant moving (Golding, 2015).

Policy and Planning Recommendations

The purpose of writing this report is not to make recommendations on any specific actions Vermont should take, as this report is introductory, and such recommendations would require deeper research and study. However, many authors cited in this report have stated best practices and recommendations as part of their research. The following recommendations reflect

what is found in the studies provided above, and not based on speculation from the group writing the report.

Multiple authors iterate that there is a need for further research into the interactions and reasons behind climate migration, including causes, outcomes, and how non-environmental problems exacerbate these issues. It is also noted that a deeper understanding of local and regional food systems is necessary (McLeman, 2013). Vermont has a long agricultural history, and so supporting local farmers as they adapt and diversify in response to climate change is an especially important aspect for local and state leaders to consider mitigating food insecurity. Preparing for the unexpected, or climate surprises, is also recommended, as projections for climate change impacts and population changes only show an approximation of what may occur (McLeman, 2013). Any preparations need to consider factors that drive social inequality and acknowledge the existing vulnerable populations in the receiving communities, as those factors will become exacerbated with climate change impacts, including migration (Hardy & Hauer, 2018). Bringing migration and risk into the process of planning and environmental justice allows for safer transitions for migrating groups (Lübken, 2019).

A case study based in Vermont showed that one effective method to bring communities with deeply entrenched, opposing ideas together is through facilitated exercises focused on open communication. The found connection that was built through these exercises created a shared understanding of how much people care for their community, and it allowed them to discuss heavy, complicated topics without malice (Ryan, 2016). An important finding from another study asserted that in regards to conservation efforts on private property, community collective action is especially important, as private property owners do not wish to act on conservation measures if their neighbors are not also committed to doing so (Hoffman, 2017). Another article

asserted that for public buy-in and awareness, simplified and streamlined information is critical, because it lessens the barriers to taking action, which include the stop-and-start efforts that tend to reset any progress made toward change (Siders, 2017). What all these case studies and reports highlight is how important it is for community planners to include community members in bottom-up planning and decision-making in order to increase buy-in and community cohesion. This can help negate one article's concern that planners can be swayed by a vocal minority that does not represent the community as a whole (Bauer et al, 2017). Another article notes that there can be what is called "last settler syndrome" from in-migrants seeking to preserve an area, which can run counter to community development and growth initiatives (Gosnell & Abrams, 2009). Planners can help facilitate and lead discussions that negate potential conflicts like this.

When working with displaced and/or vulnerable populations, research shows that there needs to be a deep awareness of privilege and other social inequality factors (Bose & Lunstrum, 2013). In general, these groups have not had any power or ability to participate in decision making that has impacted them. Decisions have come down from the government and have caused harm, and the harm has then been justified for any number of reasons (Bose & Lunstrum, 2013). There is a deep distrust of authority that can exist in marginalized groups, which can be to everyone's detriment in a crisis. Research shows that one of the first steps in working with vulnerable populations is to listen to their experiences and include them in the planning process (Bose, 2016). Most of their planning has been short-term and prioritized survival, even to their own detriment later, but including these communities in long-term planning and strategies for the future allows for lessons to be learned from negative experiences (Bose, 2016).

Hoffman has numerous suggestions for how to better prepare Vermont for in-migration. He advocates for growth that is planned and focuses on compact development that prevents

losses to natural resources like forests and farmlands (2019). Other researchers support this kind of development and planning. Bose addresses that the future needs to be planned for appropriately, and that urban growth needs to incorporate diverse perspectives to best accommodate everyone (2013). Another article notes that when polled, residents tend to prefer the development of recreational services over commercial services; if commercial services are to be developed, most residents prefer small-scale, local shops and restaurants that enhance the natural charm of the area (Bauer et al, 2017). Long-term planning needs to be the foundation for policy and planning, as short-term planning can cause more harm than good (Bose & Lunstrum, 2013). This sort of planning needs research into growth rates and social change in the local communities, particularly in rural areas, to best understand how community development can occur (Park et al, 2019). Hoffman supports this engaged planning, as divides in communities can be healed by making land use planning participatory and bringing people together for conservation and development planning (2017).

Conclusion

Projecting population changes due to climate change impacts has no one right method. It is, in fact, largely based on approximations and extrapolations. Numerous factors can be used to project population changes, and those factors only increase in number when climate change and its potential impacts are accounted for as well. However, research demonstrates population shifts will occur on a larger scale due to myriad climate-related reasons. It also shows that preparing for these large changes is crucial to mitigating negative impacts on both receiving communities and the migratory communities. Despite evidence that shows planning will only account for a small part of what could potentially occur, incorporating climate migration into everyday

planning and policy decisions creates frameworks and connections that will be necessary to adaptation.

Vermont is not necessarily the first state most climate migrants will move to. This can be attributed to the population, diversity, landscape, proximity to migratory populations, and employment opportunities available in the state. However, Vermont is well primed to receive community migrants due to its abundant land, water resources, and lower summer temperatures. The most likely populations that will migrate to Vermont are going to be those who move for work, or those who move for the culture and already have a connection to the state, through either family, vacationing, or second home ownership. Those who move for culture bring risks of gentrification, and their migration to Vermont will increase the migration of people moving for work, especially in service industries, which will see an increase in order to meet the needs of those who are moving for the culture, landscape, and lifestyle.

This report is not conclusive; it is a comprehensive overview of climate migration, climate change, and what impacts Vermont may face. Guiding questions were used to direct the group's research, but the group was not able to provide resources to answer all of them. It instead provides an opportunity in the future for further research and exploration.

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