Project #1: Weatherization and Tenant Protection

Community Partners: Dan Fingas, Vermont Movement Politics Director and Tom Proctor, Statewide Campaigns Organizer for Housing Justice, Rights and Democracy-Vermont

Background / Context
The mission of Rights and Democracy Vermont is to "bring people together to take action to build healthy communities and make the values of our communities guide the policies of our government." Working in partnership community groups, progressive unions, faith communities, organizations fighting for human and civil rights, and environmental and climate action groups, RAD-VT is "building a popular movement to advance rights and build a real democracy." Their work is aimed at achieving their vision of "society where people earn a livable wage and have access to affordable health care, and where a progressive and equitable tax system supports an economy that protects the environment and human rights."[1]

One of just many areas of RAD-VT's work includes a focus on promoting energy equity – i.e., the belief that all people should have access to reliable, safe, and affordable sources of energy; protection from a disproportionate share of negative impacts or externalities associated with building and operating society's energy supply and distribution systems; and equitable distribution of and access to benefits from these systems.

A salient example of energy inequity can be seen among Vermonters renting their homes. Despite Vermont's investments in weatherization programs at a scale never seen before – $80 million for low- and moderate-income Vermonters – these funds primarily are available to Vermonters that own their homes.[2] These weatherization programs are incredibly valuable and an important first step, yet, currently the resulting health, comfort, and financial savings cannot be realized by renters.

Further, rental housing units 1) comprise almost a third of Vermont's housing stock and will be a critical part of achieving the state's Climate Action Plan goals to reduce GHG emissions in the thermal sector, 2) almost 75% of people who rent their homes have incomes under Vermont's median household income of approximately $63,500, and 3) tenants cannot choose to weatherize their homes, as major structural changes to a building are a decision only a landlord can make. There are some modest incentives for landlords in existing weatherization programs (e.g. the 3EThermal Program offered through Capstone Community Action and Multi-family Renovation and Construction programs through Efficiency Vermont), yet they are not comprehensive enough to address the scale of the issues.

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[1] https://www.radvt.org/about/
[2] https://vnrc.org/80-million-in-weatherization-investments-bring-greater-access-and-affordability-for-low-and-moderate-income-vermonters/

<u>Research Description</u>
RAD-VT firmly believes that the weatherization of rental units will lead to not only environmental benefits, but also massive financial benefits for Vermonters most in need. Further, safer and more comfortable homes will also lead to better health outcomes for renters and their children.

To achieve this weatherization of rental units, RAD-VT has outlined a proposal to:
- Create policy language that sets a cap for the maximum out of pocket heating cost for every rental unit in Vermont. Heating costs that exceed this maximum will be required to be paid by the property owner. The cap will fluctuate based on the square footage of the unit.
- This cost cap will be waived if landlords take advantage of the state-subsidized weatherization programs.
- Landlords will be required to freeze rent or be limited to reasonable rent increases for a set period of time after any weatherization projects to discourage landlords from seeking higher profits after taking advantage of state-funded property upgrades.

This team of students will assist your community partner in their efforts by:
- Researching and developing case studies for both a) models of successful rental unit weatherization programs in other cities/states/countries and b) enacted weatherization and tenant protection policies. The City of Burlington has a *proposed* policy reform goal to improve the energy efficiency of the city's rental properties, so this is one starting point.
- Gathering and mapping data for where any rental weatherization projects have already been completed and/or are underway in Vermont.
- Conducting tenant interviews to make sure their stories and narratives are at the forefront of this work.

Products can include a range of formats to best convey the information that you gathered and could also include your recommended model policy language informed by your research.

Project #2: Heat-related health impacts for Vermonters experiencing homelessness
Community Partners: Jared Ulmer, Climate & Health Program Manager, Vermont Department of Health; Amy Redman, Health Equity Team Lead, Environmental Health, Vermont Department of Health

Background / Context
Based on Vermont's most current (2018) Hazard Mitigation Plan's Extreme Heat Section, "the primary impact of extreme heat or prolonged periods of hot weather is to human life. Hot conditions, especially when combined with sun and high humidity, can limit the body's ability to thermoregulate properly. Prolonged exposure to hot conditions can lead to heat cramps, heat exhaustion, heat stroke, or exacerbate other pre-existing medical conditions. Some of these impacts require medical attention and can be fatal if left untreated."

Addressing these and many other climate-related health impacts is the primary focus of the Vermont Department of Health's Climate and Health Program – work that is unfortunately increasingly necessary given Vermont's trend toward warmer and wetter weather. The northeast region of the country is the fastest-warming area in the United States and is warming at a rate 50% greater than the global average. Climate change models for Vermont predict that by the end of the century, the number of days where temperatures reach 87°F or warmer are expected to increase from about six per year currently to more than 20 per year.[3]

While the health effects of climate change affect all Vermonters, the Health Department has identified populations that are disproportionately affected. Populations at highest risk of experiencing a heat-related illness include:[4]
- People with more exposure to hot conditions, including people without access to air conditioning, outdoor workers and hobbyists, people experiencing homelessness, and urban residents
- People that are particularly sensitive to heat exposure, including anyone not acclimated to hot weather, older adults and young children, pregnant women, people that are overweight or have a chronic medical condition, people using drugs, alcohol or some prescription medications, and people who experienced a prior heat illness
- People with limited adaptation resources, including people who live alone, have limited transportation options, are unable to purchase or use an air conditioner, or are unable to access community cooling resources

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[3] https://www.healthvermont.gov/sites/default/files/documents/pdf/ENV_CH_HeatReport.pdf
[4] https://www.healthvermont.gov/health-environment/climate-health/vulnerable-populations

Research Description

Your partner has identified a key goal for this team's work: *to learn more about how hot weather affects Vermonters experiencing homelessness and what strategies or resources are needed to support this population during hot weather.*

Here are some statistics that underscore the importance of this work. Based on the annual Point in Time Count of Homelessness in Vermont (a must read for this team):

- "January 2022 found a 7.3% increase in persons experiencing homelessness in Vermont compared to the prior year, from 2,591 individuals to 2,780. This comes on the heels of a 133% increase from 2020 (pre-pandemic) to 2021.
- The number of persons experiencing homelessness in a household with children increased by 36% in compared to 2021; there was a 5% increase of people in households with adults only over the same time period.
- BIPOC (Black, Indigenous, and People of Color) Vermonters disproportionately experienced homelessness in 2022 compared to the general population in both Chittenden County and Statewide."

This team's research will aim to answer these questions:

- Do Vermonters experiencing homelessness suffer from health or quality-of-life impacts related to increasingly hot weather in Vermont?
- What resources do Vermonters experiencing homelessness currently use to help stay safe during hot weather? What additional resources are needed?
- Are shelters and human service providers equipped with the resources needed to support homeless Vermonters during hot weather?

Your partner has identified the following data collection strategies to address these questions:

- Review risk factors for heat-related health impacts, best practices for heat safety and strategies for protecting people experiencing homelessness.
- Interview Vermonters experiencing homelessness to learn about what heat-related impacts they have experienced, and what resources they need to stay safe during hot weather. Although individual interviews are preferable, an anonymous survey could also be considered.
- Interview homeless shelter directors, human service providers, police/EMS, or others to learn more about the heat-related impacts they have observed, their plans, actions, and resources for supporting clients during hot weather.
- Survey emergency shelters to learn if they have air conditioning and if they would be willing to open and advertise their facility as a daytime cooling center or overnight cooling shelter during an emergency.

This team's final products should be presented in a format best suited to effectively summarize and convey your findings & recommendations. In addition to a brief technical report summarizing project activities, findings, and recommendations, please also consider storytelling methods that help humanize the situation, such as a photo essay, podcast, short documentary video, or interview audio clips.

Suggested background reading and references

- [Hot weather and health impacts](#) (Vermont Department of Health)
- [Homeless in the heat: How heat waves impact Vermont's most vulnerable residents](#) (Burlington Free Press)
- ['All I have left': The struggle of seeking shelter with pets](#) (VT Digger)
- [Extreme heat can be deadly for people who are homeless](#) (PBS News Hour)

Suggested community interview partners

- [Charter House Coalition](#) (Middlebury)
- [John Graham Housing & Services](#) (Vergennes)
- [Helping Overcome Poverty's Effects](#) (Middlebury)
- [ANEW Place](#) (Burlington)
- [Committee on Temporary Shelter](#) (Burlington)
- [Spectrum Youth & Family](#) (Burlington)
- [Champlain Valley Office of Economic Opportunity](#) (Addison & Chittenden Counties)
- [United Way of Addison County](#)
- [Economic Services Division](#) (Vermont Department for Children and Families)

Project #3: Health risks of contaminants in seafood: Establishing and communicating acceptable risk levels

Community Partner: Jonathan Petali, Environmental Toxicologist, New Hampshire Department of Environmental Services

Background / Context

Risk assessment is a tool used by public health and environmental professionals to establish safety thresholds to protect public health and wildlife populations from potentially harmful environmental conditions. Human health risk assessments require careful scoping and robust data about environmental conditions (e.g., concentrations of chemicals in water and/or seafood, the amount of seafood people typically consume) and toxicity of these conditions to humans (e.g., concentrations at which toxicity is likely to occur). They also require technical judgement calls by risk assessors and policy decisions by government agencies. For example, a decision must be made about what an acceptable level of risk is. Is a risk of 1 excess case of cancer out of 10,000 people acceptable? Or would it be better if the acceptable risk threshold was set at 1 excess case per 1,000,000 to be more protective of human health?

The US Environmental Protection Agency (EPA) provides guidance for how to use the risk assessment process to Develop Fish Advisories to protect seafood consumers from potential contaminants found in aquatic organisms. However, risk assessments are typically conducted at the state level, and acceptable risk thresholds may vary across jurisdictional boundaries. Ultimately, risk assessment results may differ for a contiguous body of water, leading to incongruent information about which fish and how much fish are safe to eat. For instance, a fish caught in a river or lake along a state boundary, such as Lake Champlain, may be safe to consume according to one state but not the other. This presents challenges to risk assessors, health and environmental professionals, communication specialists, and the general public, alike. Since seafood is an important source of protein and essential nutrients (omega-3 fatty acids), scaring and/or confusing the public might hamper public seafood consumption and be disadvantageous to public health. Further, seafood is one of the most accessible sources of self-harvested food and is culturally significant to numerous racial/ethnic groups, so vulnerable populations may be at greater risk of challenges with risk assessments and communication efforts.

Research Description

Your partner has identified two key goals for this team's work: *(1) to compare risk thresholds used across New England when conducting risk assessments for contaminants in seafood, and (2) to develop communication strategies to convey these risks thresholds and discrepancies between jurisdictions to the general public.*

This team's research will be guided by answering the following three questions:

- How do risk thresholds used by risk assessors compare across New England states and across the US? And why do cancer risks thresholds vary between fish and other environmental media (e.g., soil, water, air) within the same state?
- What strategies exist to communicate these risk thresholds and their impact on the risk assessment process to the general public? What strategies exist specifically for communicating to vulnerable populations and/or people who are harvesting their own fish to eat?
- Which communication strategies are most (or more) effective? How might they be replicated and/or exported so that risk assessors and risk managers can easily use these tools when communicating with the public?

Here are some statistics that underscore the importance of this work:

- Dietary Guidelines for Americans recommend consuming two servings of seafood each week, yet based on the National Health and Nutrition Examination Survey (NHANES), only ~20% of adults consume this much seafood (National Center for Health Statistics, US Centers for Disease Control and Prevention).
- US adults who consume seafood eat ~18 grams of seafood per day (median), though rates of consumption are highest among individuals earning ≥$75,000 per year and among individuals identifying as a race other than White, Black, or Hispanic (Estimated Fish Consumption Rates for the US Population and Selected Subpopulations, US EPA).
- Differences in risk thresholds are one of the largest drivers of discrepancies in fish consumption advisories across jurisdictional boundaries (Cleary et al., 2021).

Your partner has identified the below data collection strategies to address these questions:

- Review existing US states' risk thresholds used for conducting risk assessments of contaminants in seafood and other environmental media, and define / describe differences, including where different states align on health protectiveness.
- Interview professionals involved with establishing fish consumption advisories and risk thresholds for other media to learn how different agencies make risk assessment and risk management decisions.
- Review related risk communication strategies and their efficacy.

If time permits, your partner is also interested in pursuing the following:

- Develop communication materials to convey risk thresholds and in the context of fish advisories.
- Pilot communication materials among local anglers to refine messaging.
- Develop (and potentially pilot) a survey for anglers in NH and/or VT about their awareness of the risks and benefits of seafood consumption.

This team's final products should be oriented around formats that are best suited to effectively summarizing and conveying your findings & recommendations. Your partner is particularly interested in publishing your findings, such as the Debates, Dilemmas, and Discoveries format in the *Integrated Environmental Assessment and Management* journal. This team's work could also be shared at the US Environmental Protection Agency roundtable discussion about fish consumption advisories.

Project #4: Municipal Energy Use Baseline & Tracking to Support the Development of a Washington County+ GHG Inventory

Community Partner: Sam Lash, Climate & Energy Planner, Central Vermont Regional Planning Commission
Additional Resource Contacts: Maddie Shropshire, Climate & Energy Planner, Addison County Regional Planning Commission, Town of Middlebury Energy Committee and Climate Economy Action Center of Addison County.

Background/Context
Many municipalities lack the capacity to track their baseline energy usage which undermines the efforts of local volunteer entities to develop energy projects, apply for state and federal programs, track the impacts of implementation efforts, etc. Through the Global Warming Solutions Act, Vermont is currently developing energy data infrastructure but to date has no common template for municipalities nor consistent tracking protocols for local or regional levels.

This project directly addresses a gap in data infrastructure and prepares municipalities to participate in future grant programs which require basic energy use baseline and tracking as critical components for eligibility and project implementation & assessment.

Relevant complementary CVRPC actions this work will support include:
- Enhanced Energy Planning (Act 174) with several municipalities this fall
- Regional Energy Plan update
- Regional Working group of municipal entities interested in establishing and refining their municipal baseline energy use
- Upcoming programs (state and federal) which will likely require annual energy usage data e.g., developing RFPs for renewable energy generation projects (need to size appropriately based on municipal use and projected future use taking into account increased demand and electrification)

Research Description
This team of students will assist CVRPC, town planning commissions, and energy committees with aggregating and analyzing municipal energy use data across the transportation, thermal, and electric sectors for 4-6 municipalities within Washington and Orange Counties who are developing Enhanced Energy Plans. Ideally, this project group would also create a template for municipal energy use baseline and tracking in coordination with the CVRPC regional baseline and tracking working group that can be provided to other municipalities across the state in the future. This group may choose to take on a more comprehensive approach after establishing initial annual usage baselines and conduct a **county-wide GHG emissions inventory** (e.g. CEAC Addison County).

This team will:
- Review examples of existing enhanced energy plans which include data from transportation, electric, and thermal sectors
- Collaborating with municipalities and regional planning commissions to aggregate data (2018-2021) including:
  - Utility bills (electric, fuel)
  - Relevant data from additional datasets provided by your partner
  - Equity and energy burden indices
- Develop a template for municipal baseline energy data tracking that can be shared / replicated
  - Ideally FREE and easy to use
- As time allows, lay the groundwork for a Central VT GHG Emissions Inventory (Washington County +3 towns in Orange County)

This team's final products should be oriented around formats that are best suited to effectively summarize and convey the results of your work and should be developed in consultation with your partner.

Project #5: [Re]imagining Community Resilience Hubs in Rural Vermont: Shifting power to communities via energy and community resilience
Community Partners: Sam Lash, Climate & Energy Planner, Central Vermont Regional Planning Commission; Allie Webster, Energy Planner, Northeastern Vermont Development Association; Laura Cavin Bailey, Climate Economy Program Manager, Vermont Council on Rural Development

Background/Context:
Many of our communities across our rural state lack a central hub to formalize community and external assets including services, investments, volunteer and professional support. Local champions step up and meet needs as they arise during catastrophe and on a daily basis, drawing on local knowledge and expertise to anticipate the needs of vulnerable community members, ecosystems, and infrastructure. As we see increasing local impacts of climate change, we note the ad hoc cycle of these efforts result in delayed deployment, burnout, redundancy, and general lack of access to basic needs.

Renewed efforts across the state are focusing on reducing energy burdens, access to heating and cooling, broadband, healthy and affordable food, transportation options, and reliable well-compensated work; all of these efforts will increasingly depend on clean, reliable, affordable energy. Access to services and the financial, social, and environmental benefits of clean and resilient energy at the community level is essential.

With an unprecedented amount of investment at the federal and state levels earmarked for (an equitable) energy transition, it is critical we assess successful models for implementation to ensure these investments produce sustainable community-level results. This project will directly support a working group focused on adapting the USDN resilience hub model for Vermont communities.

This working group has submitted a proposal ("pitch") to the Energy Action Network to financially support this work; the background research that this student team completes this semester will be instrumental in moving this work forward regardless of the proposal outcome. Please refer to the full Pitch Script and Pitch Slides for additional information.

Research Description
The concept of the resilience hub sits at the nexus of community and energy resilience, emergency management, climate change mitigation, and social equity while providing expanded opportunities for communities to be successful before, during, and after disruptions. We believe adapting this model for our rural communities has the potential to augment existing centers in order to:

- reduce energy burdens and increase access to energy transition programs and their benefits (energy equity)
- reduce fossil fuel use and GHG pollution at aging community facilities, and set-up model to aggregate funding for replication across Vermont's rural communities
- expand green workforce development and provide local jobs (depending on community organization partners)
- complement existing emergency management by
  - targeting gaps in outreach/communication with, and services for, frontline communities
  - providing reliable clean power (mobile options too[5]) for expanding activities/services (e.g., cooling and warming needs), and more!

This team of students will assist CVRPC, NVDA, VCRD, and partnering community organizations both in adapting the USDN Resilience Hub model to Vermont communities (bridging the rural resilience divide characterized by low population density, dispersed infrastructure including community services and networks, low capacity, and populations often inadequately included, valued, and/or compensated) and identifying potential partners for pilots in Washington and Orleans Counties.

Based on the interests and skillsets of the students, this can include:
- Reviewing and cataloging needs and projects identified in previous community discussions, efforts, and listening sessions (i.e., community asset and shortcoming mapping)
- Researching existing rural resilience models across 5 main categories where upgrades to existing community-facilities are often needed:
  - Resilient Power, Building & Landscape, Communications, Operations, Programs & Services
- Collecting organizational and community data to support the working group in identifying which elements existing community organizations need to transition into a rural community resilience hub and better meet community needs in all resilience modes. This is in service of the goal of developing 2 pilot hubs.
  - Create a prioritization process to address barriers and opportunities;
  - Determine principles for partnership and co-development processes (also including site selection, assessment, and prioritization)
  - Key site audits and performance specifications

This team's final products should be oriented around formats that are best suited to effectively summarize and convey the results of your work and should be developed in consultation with your partner.

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[5] Needed for electrically dependent populations: https://empowerprogram.hhs.gov/empowermap