

DRAFT Climate Change and Resiliency Issue Paper

Section 1 – Goal for Enhancing Rural Conditions

As climate change continues to disrupt the definitional cultural and economic ties between rural towns and their natural landscapes, the Commonwealth should arm these communities with the knowledge and resources necessary to implement climate change mitigation and accommodation measures.

Section 2 – The Key Issues

1. Natural-resource based industries concentrated in rural towns such as agriculture, forestry, fisheries, and tourism face extreme challenges from a warmed, volatile climate. In 2018, Pioneer Valley farmers reported crop losses between 10% and 80% for some vegetables due to excess rainfall, heat and humidity¹, prompting Community Involved in Sustaining Agriculture (CISA) to open its Emergency Farm Fund loan program.² Predictions anticipate increased rainfall (winter and spring); drought potential (summer and fall); higher ocean temperatures; and acidic water conditions. Secondary impacts will include intensified erosion, pest and disease pressure, and the migration of plant, terrestrial and marine species.
2. The absence of “system redundancies” is a particular challenge in rural communities whenever rainfall and flooding events interrupt roadway and utility networks. For example, a lack of alternate routes between destinations can seriously impede emergency evacuation and access to critical facilities. Both restoration of natural systems and consideration of appropriate locations for siting buildings are needed so that an increasing volume of rainwater can find unimpeded riverine pathways to floodplains; cause limited runoff and erosion; and create minimal conflict with homes and infrastructure.
3. Rural towns currently operating with minimal staff are occupied by everyday problems and immediate issues, with little time left to focus on preventative, future-oriented actions for mitigating and accommodating climate change. Local governments need expert technical assistance to cut through the multiple sources of information and tools to implement

¹ Greta Jochem, Valley Farmers Suffer Losses in Soggy Summer, Daily Hampshire Gazette, 9/7/2018,

² Greta Jochem, Wetter Weather Weighing on Pioneer Valley Farmers, Daily Hampshire Gazette, 12/12/2018

best practices for visualizing potential climate change impacts in town, as well as in facing unfamiliar challenges about which little is known, such as salt water intrusion into private wells (occurring in rural communities on the north shore).

4. Rural towns include environmental justice communities and vulnerable, aging, isolated, low-income, and transient populations, some of whom labor outdoors in rural industries. Vulnerabilities to the public health effects of climate change (extreme heat, mobilized contaminants in downstream flooding, vector borne disease, among others) increase for populations with the least recourse to avoid climate impacts. The geographically disbursed population in rural areas adds a challenge to emergency response. Novel, nimble, and mobile responses are likely to become necessary.

Section 3 – Existing Policies and Programs

- The **Municipal Vulnerability Program** is working well to bring climate change impacts down to the local level and communicate anticipated future conditions. To date, 61 of the 170 rural towns in Massachusetts (36%) are participating in the MVP program. Transitioning from planning to implementing priority actions, however, presents another hurdle for rural communities that lack the staff to manage implementation programs. While the state may hire regional MVP staff to assist local rural towns, this capacity also exists within many of the state's RPAs. (Dedicating resources for RPAs to support MVP action grants and project management may be an efficient way to help local communities bridge this gap.)
- The **MDAR Agricultural Climate Resiliency & Efficiencies (ACRE) program** offers reimbursement grants to farmers for implementing practices that address the agricultural sector's vulnerability to climate change, including measures that improve soil health and soil carbon, and water use efficiency and availability, as well as projects that promote energy efficiency in farm operations.
- The Office of Coastal Zone Management's **StormSmart Coasts Program** and Shoreline Change Project offers the Massachusetts Sea Level Rise and Coastal Flooding Viewer, allowing towns to see localized inundation predictions. A similar tool in the public health realm is provided by **DPH's Climate and Health Program and Climate Change Vulnerability Mapping Tool**.

- The **ResilientMA Climate Change Clearinghouse** is a very helpful resource for rural communities, especially the features that allow for the exploration of specific sectors that are key to the rural economy, including agriculture, coastal zones, forestry, natural resources, and recreation. The sector portals frame the issues clearly and offer additional resources. Building upon the success of this tool to make town-specific queries would assist rural municipalities in honing in on local conditions quickly and efficiently.
- Though its content concerns another topic, the **Cape Housing Institute** provided a framework for efficiently communicating information on a very nuanced topic to a large audience of interested local officials. The free six-week institute (one session per week) provided elected and appointed officials throughout the Cape with the education, support, tools and resources to boost the development of affordable housing in their communities. Regional Climate Institutes could be held that take a similar approach, and that familiarize local officials with the slate of relevant climate tools and programs.

Section 4 – Best Practice Examples

- The **Fluvial Geomorphology Assessment Protocol piloted in the Deerfield River Watershed (FRCOG)** recommends actions to return riverine systems to natural equilibrium (reconnecting floodplain, removing obstructions, etc.). This work was modeled on techniques developed by the **Vermont Department of Environmental Conservation Rivers Program**, which achieves river resource protection through permitting, regulatory/non-regulatory technical assistance, assessment, planning, education, and outreach.
- The **4 per 1000 Initiative** (France) is an innovative mitigation technique with the goal of increasing soil organic carbon in agricultural lands by 0.4% annually, sequestering carbon, improving soil health, strengthening ecosystems, and contributing to food security. In Australia, scientists are pursuing the **Australian Soil Carbon Accreditation Scheme**, which would pay farmers for measurable increases in soil carbon.
- **The California Cap and Trade program.** California's multi-sector emissions trading system is expected to reduce GHG emissions from regulated entities by 16% between 2013 and 2020, and by an additional 40% by

2030.³ GHG reduction and carbon sequestration goals exist for the agricultural sector. In 2019, a **2030 Natural and Working Lands Climate Implementation Plan** was developed. **Oregon's recent Cap and Invest** bill would have legislated a 20% set aside to be invested in natural and working lands.

Section 5 – Policy, Program or Investment Recommendations

Legislation and Regulation

- **Consider the creation of a state carbon tax or carbon trading policy.** Such an approach, particularly if it includes a soil carbon offset accreditation scheme that pays landowners for measurable increases in soil carbon, would assist rural working lands in continuing their operations and the climate change mitigation services they provide. However, in depth discussion is required about the implementation of such a program on how to distribute the costs and benefits, and requires voices at the table to represent a diversity of rural constituencies from the earliest planning stages.
- **Revise enabling legislation to give local communities greater agency in code regulations.** Rural towns are currently prevented from regulating some climate adaptation measures, such as the ability to increase freeboard requirements in floodplain zones to build above required base flood elevations.
- **Streamline the permitting process for structural and non-structural (nature-based) sea level rise mitigation projects.** It is extremely difficult for municipalities with limited staff to manage permit applications that require the coordination of multiple state and federal agencies. Present clear guidance, for example, with an update of the 2003 *Environmental Permitting in Massachusetts* document produced by CZM.
- **Upgrade design storm standards for infrastructure, such as culvert sizing, to the NOAA Atlas 14 figures as a better reflection of current conditions.** The current design storm standards are decades out of date, and as such, add to the problem of cyclically replacing undersized infrastructure with more of the same.

³ Center for Climate and Energy Solutions, <https://www.c2es.org/content/california-cap-and-trade/>

Policies and Programs

- **Achieve the long-standing “One Percent for Nature” goal** whereby the annual state operating budget would devote at least 1% to environmental programs (0.64% in 2014). Additional expenditures should be targeted toward climate change mitigation efforts. Set aside funding from some of the currently proposed bills and budgets (S.10 and the Greenworks Bill) to fund technical assistance specifically for rural communities on climate-related needs. Staff and fund the Division of Ecological Restoration to expand its work related to restoring natural river and floodplain processes to enhance flood resilience.
- **Revive a framework similar to the Massachusetts Watershed Initiative and Watershed Teams approach, coordinated at the RPA/COG level, to conduct resiliency planning that connects upstream and downstream effects and achieves economies of scale for smaller rural towns.** The original Watershed Teams approach did not emphasize a forward-looking climate change perspective, which should be added to this framework.
- **Partner with state academic institutions to study climate-related issues that are still not well understood.** In particular, the issue of saltwater intrusion requires additional research, with a dearth of information about where and why rural communities are vulnerable. This is a major threat, especially if drought conditions intensify, and is not just a coastal issue, but one that affects inland areas up through tidal rivers and estuaries. Similarly, more information is required regarding specific points of dam failure vulnerability, as dams hold back many historical pollutants in their sediment that would travel downstream.
- **Climate change is discussed in terms of adaptation and mitigation, but in rural communities we should be talking accommodation,** considering programs that incentivize actions such as managed retreat, property buy-outs in repetitive loss locations, and planning for the abandonment or relocation of utility and roadway infrastructure that continually flood.
- **Elevate CZM’s role in communicating resiliency practices and provide the resources necessary for additional technical assistance to local governments.**
- **Prioritize resources for setting up heating and cooling shelters accessible by vulnerable populations.** In rural towns, we need to consider cooling shelters for livestock, as the need to care for these animals prevents rural

residents on working lands from leaving their homes and seeking assistance.

- **Target the anticipated increase in vector-borne diseases from ticks and mosquitos with a public health campaign for repellants (ex: pre-treated clothing) similar to sun screen/UV protection.** Increased risks from these diseases will impact local rural populations as well as deter ecotourism.

Stakeholders in Issue Paper Development: Many people, agencies and organizations were consulted in the drafting of this Plan. Recommendations contained in this document are not necessarily supported or endorsed by all parties listed below.

- MassAudubon
- The Nature Conservancy
- MA Food System Collaborative
- Cape Cod Cranberry Growers Association
- Blackstone River Watershed Association
- Manomet, Inc
- Mass Climate Action Network
- Southeastern Massachusetts Agricultural Partnership
- DCR
- CZM
- USGS
- Town officials representing
 - Carver
 - Dighton
 - Westport
 - Freetown
- Regional Planning Agencies
 - Southeastern Regional Planning and Economic Development District
 - Central Massachusetts Regional Planning Commission
 - Cape Cod Commission
 - Franklin Regional Council of Governments