



2019 Mass Envirothon Current Issue

Abundant, Affordable, Healthy Food

Background and Strategies for Community Research 1.0*

The Massachusetts Envirothon Current Issue challenges your team to investigate an important environmental issue as it occurs in your community, to develop recommendations, and to present your findings to a panel of judges at the Envirothon competition. Through your research you are likely to encounter people and organizations who are taking action to address the issue. Finding a way that you can join with them in making positive change can be the best part of your Envirothon experience.

In 2019, Mass Envirothon teams will focus on food: Global human population is expected to grow from 7 billion today to nearly 10 billion in 2050. Will we be able to feed the human family? What can Massachusetts farms and communities – urban, suburban, exurban, and rural – contribute to addressing this global issue?

Can we provide abundant, affordable, healthful food for all while protecting natural resources – including soil, water, and ecosystem diversity in terrestrial and marine environments – for the future? The ecosystems that our agriculture and fisheries rely upon are showing increased strain from climate change and human consumption.

A strong and healthy food system can provide many things we value in addition to food: human and environmental health, climate change mitigation, good jobs and robust local economies, open space protection, recreation, community development, a foundation for social justice. How do we work toward a food system that reflects our values?

Many pieces of a sustainable future are within reach. Many are already underway in Massachusetts. What is happening in your community? Who is involved? How are they contributing to solutions? What setbacks and successes are they experiencing?

These pages include background on the issue, with links to resources, and suggestions for strategies for community research. Use these pages as a springboard to launch your team into your explorations! Check for updates and new resources at: <https://massenvirothon.org/areas-of-learning/current-issue/2019-current-issue/>

For an excellent framing of the issue, see the *Massachusetts Local Food Action Plan* (2015):
<https://mafoodsystem.org/plan/>

For additional background, see the National Conservation Foundation Envirothon website (Note: The 2019 NCF Envirothon focuses more on agriculture than on the food system as a whole):
<https://www.envirothon.org/the-competition/current-competition>

* This is the 12/11/18 edition prepared for the UMass Envirothon fall workshop. Look for future updates at <https://massenvirothon.org/areas-of-learning/current-issue/2019-current-issue/>

What is a “food system”?

The idea of a **food system** is central to this year’s Mass Envirothon Current Issue. The term encompasses more than agriculture. It emphasizes the connections among nutrition, food, health, community economic development, and culture as well as agriculture and fisheries. A food system includes all the infrastructure and processes that go into feeding us: growing, harvesting, processing, packaging, transporting, marketing, consuming food, and disposal of waste. It also includes the inputs needed – like energy and water – and the outputs generated at each step. Most important, the food system is about PEOPLE and our social, political, economic, and ecological relationships!

Here are two curriculum resources designed to introduce the concept of food systems in ways that encourage community engagement. These activities will orient your team to the concept and prepare you for community research:

Discovering Our Food System (Cornell College of Agriculture and Life Sciences)

An interdisciplinary, community-based exploration of the people and processes that shape our food system.

<http://gardening.cals.cornell.edu/lessons/curricula/discovering-our-food-system/>

FoodSpan (Johns Hopkins University School of Public Health)

Provides high school students with a deep understanding of critical food system issues, empowers them to make healthy and responsible food choices, and encourages them to become advocates for food system change.

<http://www.foodspanlearning.org/>

1. The Global Food System

Most people in the world now participate in an industrial food system with global reach. The local food system you will explore this year is tied to this world-wide food system in complex and powerful ways – it is estimated that 90% of the food we eat comes from outside New England. This global system has been successful in the last 70 years, enabling world food production to keep pace with rapid population growth into the 21st century. However, this success has come at a cost. The system is straining both ecological and social capacities.

The industrial food system is characterized by huge environmental costs:

- Conversion of biodiverse forests and grasslands into landscape-scale monocultures,
- Crowded confined animal feeding operations (CAFOs) that produce cheap meat but require antibiotics and generate major nutrient pollution,
- Overdrawn ecosystem services, causing diminished soil health and depleted fisheries,
- Degraded water resources through nutrient, sediment, and pesticide pollution,
- Overproduction, resulting in wasted or underutilization of at least one third of food produced,
- Fossil-energy-intensive methods and technologies, including use of the chemical fertilizers and pest controls of the green revolution, that make significant fossil carbon additions to the atmosphere.

The system has social costs, too:

- Concentrated corporate ownership means less decision-making power in the hands of farmers, farmworkers, and local communities. “Putting profits over people” is a common criticism.
- Many processed foods – convenient and inexpensive, but calorie-dense and nutrient-poor – contribute to public health problems like obesity that are related to poor nutrition.
- Marketing and advertising drive demand for food of questionable nutritional value.
- Consumers are more and more distant from where and how and by whom their food is produced.
- Questions about food safety, some based in fact and some not, proliferate.

The global food system is now struggling to maintain the production gains of the 20th century. The miraculous increasing yields of the Green Revolution have declined, and there is no significant new agricultural land that can be brought into production without incurring severe ecological costs.

There is growing recognition that the global food system must be reformed. Prescriptions for a more sustainable food system have come from the mainstream of industrial agriculture establishment (“sustainable intensification”) as well as from oppressed communities (“food sovereignty”). The challenges recognized by all include:

- **A growing human ecological footprint.** World population grew rapidly in the 20th century, rising from 1.8 billion in 1918 to 7.7 billion in 2018. It is projected to reach nearly 10 billion by 2050. More significant than our numbers, however, is our ecological footprint (including sprawling land development in Massachusetts). It is estimated that human consumption now accounts for 25% of Earth’s current photosynthesis (Human Appropriation of Net Primary Production). What is Earth’s carrying capacity for human society?
- **Wasted abundance.** For the past half century, the global food system has consistently produced more than enough calories to supply all of us with our food energy needs. However, much of those food calories (e.g. corn and soy) are diverted to animal feed to produce meat, or to production of biofuels. In addition, at least one third of calories we produce go unused and become part of the waste stream. At the same time, 12% of American households, and a similar portion of the population worldwide, is food insecure – they often skip meals, eat less at meals, buy cheap non-nutritious food, and/or feed their children but not themselves.
- **Hunger and inequality.** Food insecurity in the U.S. and the world today is not a technical or agricultural problem of food production. It is a social and political problem of food access. Hunger is a symptom of a lack of democracy. It is a measure of people’s lack of power to gain access to food, or ways to produce their own food. This problem is increasing as a result of increasing wealth and income inequality, a defining feature of the 21st century economy. Concentration of corporate power and control in the food system worsens the problem. Government hunger programs provide some relief, but are often criticized for being insufficient, overly complex, band-aid efforts.
- **Changing climate.** The most significant consequence of the human ecological footprint is climate change. 20th century agricultural practices have been identified as a central cause of the climate crisis (*At the same time, a different set of agriculture practices can help to reduce greenhouse gas emissions and sequester carbon, and could play a part in slowing climate change*). Agriculture requires predictable climate conditions for production. Warming average temperatures, along with erratic weather extremes of heat, drought, and flood, are already occurring and are expected to increase. How resilient are the ecosystem services that agriculture relies upon? Will we be able to rely on them in the future?-----

There are echoes of these global issues in Massachusetts communities. An excellent overview is included in the *Existing Conditions* section of the *Massachusetts Local Food Action Plan* (<https://mafoodsystem.org/static/plan/pdfs/existingconditions.pdf>). Topics relevant to abundant, affordable, healthy food include:

- Land protection
- Soil, water, and related resources
- Waste
- Farm viability
- Commercial fishing
- Food distribution and marketing, including farmers markets and farm to school
- Food Access, Security, and Health

2. Infrastructure for Abundant, Affordable, Healthy Food in Massachusetts

Providing abundant, affordable, healthy food for 2050 is not a technical question alone, although science, technology, and engineering do play a part. It is a question of economic and social choices: What kind of food system do we want, and how do we get there?

Many pieces of a sustainable future are within reach. This section provides links to existing resources and efforts that are already underway in Massachusetts. What is happening in your community? Who is involved? How are they contributing to solutions? What setbacks and successes are they experiencing?

To address this complex problem, a variety of broad strategies is needed. Fortunately, much helpful infrastructure is already in place. Section 2 (this section) lists descriptions and links:

- Food system visions
- Key agencies
 - Massachusetts Department of Agricultural Resources
 - U.S. Department of Agriculture Farm Bill conservation and nutrition programs
- Organizations aiming to strengthen community as well as provide food
 - Food banks
 - “Buy Local” organizations
 - Farmers markets
 - Community Supported Agriculture
 - Community farms
 - Community gardens

Section 3 provides background and links in three fields that may be ripe for sustainability initiatives in Massachusetts:

- Sustainable “climate smart” agricultural practices
- Waste reduction and resource recovery
- Community food security

Food System Visions

[**Food Solutions New England**](#) is a regional collaborative organized to *support the emergence and continued viability of a New England food system that is a resilient driver of healthy food for all, racial equity, sustainable farming and fishing, and thriving communities*”. [**A New England Food Vision**](#) is FSNE’s report calling for the region to **build the capacity to produce at least 50% of our food by 2060**.

The [**Massachusetts Food System Collaborative**](#) was created to *promote, monitor, and facilitate implementation of the Massachusetts Local Food Action Plan*. The Collaborative’s work focuses on the four main goals of the Plan:

- *Increase production, sales and consumption of Massachusetts-grown foods.*
- *Create jobs and economic opportunity in food, farming and fishing, and improve the wages and skills of food system workers.*
- *Protect the land and water needed to produce food, maximize environmental benefits from agriculture and fishing, and ensure food safety.*
- *Reduce hunger and food insecurity, increase the availability of healthy food to all residents, and reduce food waste.*

Key Agencies

The [Massachusetts Department of Agricultural Resources \(MDAR\)](#) mission is to help keep the Massachusetts' food supply safe and secure, and to work to keep Massachusetts agriculture economically and environmentally sound.

- A [directory of programs and services](#) provides abundant links to programs relevant to the 2019 Envirothon Current Issue, including information on:
 - Agricultural Commissions
 - Aquaculture
 - Best Management Practices (BMPs)
 - Community Supported Agriculture (CSA) Farms
 - Energy Efficiency, Conservation, and Renewables Programs and Services
 - Farm to School (Connecting Massachusetts Farms with School Meals Programs)
 - Land Use (Preserving and Protecting Agricultural Land)
 - Pest Management
 - Plant Nutrient Management
 - Urban Agriculture Program
 - Women, Infants, & Children (WIC) Nutrition Program
- The [Massachusetts Grown . . . and Fresher](#) website spotlights seasonal crops, farms, and farmers markets.

Federal policy. While states and local communities have opportunities to shape their local food systems, it is important to recognize the power of the federal government in this realm. The effects of national policy, as dictated by the federal Farm Bill and other key legislation, are everywhere in the Massachusetts food system. For an introduction, look for presentations by a variety of interest groups. For example:

[How Does the Farm Bill Affect Everyday Americans?](#) (Union of Concerned Scientists)

[What is the Farm Bill?](#) (National Sustainable Agriculture Coalition)

[How the Farm Bill Is Helping Reduce Hunger](#) (Feeding America)

Here are just two ways that the Farm Bill has an impact on Massachusetts farms and communities:

- The U.S. Department of Agriculture's [Natural Resources Conservation Service \(NRCS\) in Massachusetts](#) offers volunteer conservation programs and funding that benefit farms and the environment. The NRCS [Soil Health](#) initiative is a major source of information and training for farmers and the public.
- The [Supplemental Nutrition Assistance Program](#) (SNAP) offers government (Farm Bill) food security assistance and healthy foods education to low income residents. The [Healthy Incentives Program](#) (HIP) is an inspiring, innovative initiative that helps SNAP program participants to afford fresh local produce by doubling the power of their dollars at farmers markets. HIP has been so popular that it has run out of money and has needed to be re-funded.

Organizations aiming to strengthen community as well as provide food

Food Banks. These regional anti-hunger organizations collect food donations and distribute to local food pantries, meal sites, shelters, childcare centers, and other food assistance programs. Their websites include finders (by zip code) for nearest food access sites. Their work also includes public education, networking, and public policy advocacy for community food security.

- [Greater Boston Food Bank](#)
- [Worcester County Food Bank](#)
- [Food Bank of Western Massachusetts](#)

“Buy Local” Groups. These regional agriculture networking organizations *connect farmers and their surrounding communities. Buy Local efforts have helped generate consumer awareness and demand for locally grown food products while at the same time improving logistical access to these food sources.* These groups frequently also provide farm connections for community food security efforts, and support and advice for farmland protection and farm business viability. The Mass Department of Agricultural Resources listing includes the following regional organizations:

- [Berkshire Grown](#)
- [Buy Fresh Buy Local - Cape Cod](#)
- [Central MassGrown](#)
- [Community Involved in Sustaining Agriculture \(CISA\)](#)
- [Island Grown - Martha's Vineyard](#)
- [Northeast Harvest](#)
- [Southeastern Massachusetts Agricultural Partnership \(SEMAP\)](#)
- [Sustainable Business Network of Greater Boston \(SBN\)](#)
- [Sustainable Nantucket](#)
- [Farm to Institution New England](#) aims to mobilize the power of New England institutions to transform the regional food system. FINE is a network of non-profit organizations, government agencies, institutions, foundations, farms, food distributors, food processors, food service operators and others working together to increase the amount of healthy, local food served in schools, hospitals, colleges and other institutions. The related [Massachusetts Farm to School](#) program aims to increase local food purchasing and education at schools. In 2016, 68% of MA school districts said that they participated in Farm to School activities.

Farmers Markets are a traditional business venue that has enjoyed a resurgence as part of the sustainable agriculture movement. *Farmers markets offer small and mid-sized farmers an entry point to develop their business free from the overhead necessary to sell in large retail outlets. Farmers markets create a space where the focus of food is on quality and farming practices rather than price alone.* MDAR's [MassGrown Map](#) provides location information for 241 farmers markets in Massachusetts. Did you know that the map also shows locations for 52 [winter farmers markets](#)?

Community Supported Agriculture (CSAs) are a way for the food buying public to invest in local agriculture through a relationship with a farm that includes receiving a weekly basket of produce. By making a financial commitment to a farm, people become "members" of the CSA. Some CSA farms also require that members work a small number of hours on the farm during the growing season. MDAR's [MassGrown Map](#) provides location information for CSAs.

Community farms are agricultural operations that serve a variety of community needs and interests. Each one is different. A community farm may engage in educational programs, host community gardens, provide food for hunger relief, demonstrate sustainable land use, preserve farmland and provide affordable land access, provide farm business incubation or farmer training, preserve historic structures and local traditions, or maintain open space. Community farms are typically run by non-profit organizations, with a board of directors who are community members.

Some notable examples:

- [New Entry Sustainable Farming Project](#) an initiative of Tufts University's Friedman School of Nutrition Science and Policy and additional partners, New Entry works locally, regionally, and across the country to strengthen local food systems by providing critical training, career development, and economic opportunity to new farmers, training the next generation to produce food that is sustainable, nutritious, and culturally-appropriate.
- [Nuestras Raíces](#) is a grassroots urban agriculture organization based in Holyoke, Massachusetts. The mission is *to create healthy environments, celebrate "agri-culture", harness our collective energy, and to advance our vision of a just and sustainable future. . . . The founding members were all farmers from Puerto Rico who took action into their own hands.*
- CISA has a list of [community and college farms in the Connecticut River Valley](#)
- To find community farms, search for <Community Farms [your town name, or "Massachusetts"] >

Community gardens are plots of garden land in urban or suburban areas, cultivated by individuals or groups for home consumption. Gardens are often started on vacant lots owned by businesses, local governments, not-for-profit groups, or faith-based organizations. Local governments, non-profits, and communities may support gardens through gardening education, distribution of seedlings and other materials, zoning regulation changes, or water supply. The organization Gardening Matters has prepared an extensive fact sheet on the [Multiple Benefits of Community Gardening](#).

3. Three fields that may be ripe for sustainability initiatives in Massachusetts communities

Sustainable (and “Climate Smart”) Agricultural Practices

Climate change has emerged as a major concern for everyone engaged in agriculture. Both the industrial farm establishment and its agro-ecological critics are looking for effective ways to address the challenges.

According to the University of Vermont’s [Center for Sustainable Agriculture](#), climate change in the Northeast means that agriculture has been, and will be, facing multiple changes and challenges - wetter springs, longer summer dry spells and droughts, warmer winters and a longer growing season.

Small Farm Resiliency

[On The Benefits of Small Farms](#). *For more than a century, pundits have confidently predicted the demise of the small farm, labeling it as backward, unproductive, and inefficient- an obstacle to be overcome in the pursuit of economic development. But this is wrong. Far from being stuck in the past, small-farm agriculture provides a productive, efficient, and ecological vision for the future.*

Small Farm resiliency will be critical to maintaining economic and environmental sustainability. Successful agricultural adaptations will involve creative solutions, including:

- managing soil and water differently,
- diversification of enterprises,
- infrastructure investment such as renewable energy generation,
- new crop types and varieties
- adoption of new and different enterprises.

[Farming & Climate Change: New England Farmers Adapt](#) (2017) Extreme weather is the new normal for farming in the Northeast. Hear how three successful organic farmers in Vermont, Massachusetts, and New Hampshire are adapting their farming practices to climate change.

[Farming and Climate Change Adaptation](#). The University of Vermont maintains this blog for farmers and agricultural service providers. Topics include: drought, climate change, climate change adaptation, cover crops, flooding, health, heat, irrigation, soil health, water management.

Soil Health

[The USDA Natural Resources Conservation Service maintains that](#) *managing for soil health (improved soil function) is mostly a matter of maintaining suitable habitat for the myriad of creatures that comprise the soil food web.* This can be accomplished by maintaining [Four Soil Health Principles](#):

1. Use plant diversity to increase diversity in the soil.
2. Manage soils more by disturbing them less.
3. Keep plants growing throughout the year to feed the soil.
4. Keep the soil covered as much as possible.

[Cover crops](#) are plantings used on agricultural land to slow erosion, improve soil health, enhance water availability, smother weeds, help control pests and diseases, increase biodiversity and bring a host of other benefits.

Cover crops have also been shown to [increase crop yields](#), break through a plow pan, add organic matter to the soil, improve crop diversity on farms and [attract pollinators](#). There is an increasing body of evidence that growing cover crops increases resilience in the face of erratic and increasingly intensive rainfall, as well as under drought conditions. Cover crops help when it doesn’t rain, they help when it rains, and they help when it pours!

No-Till systems disturb the soil less, but tend to rely on extensive use of herbicides to control weeds. Organic No Till is much more difficult. This Rodale Institute [fact sheet](#) reviews the use of cover crops and no-till in organic systems, including selection, establishment and mechanical termination of cover crops; crop rotations; and energy and production budgets.

[Building Soils for Better Crops](#) is a practical guide to ecological soil management, providing step-by-step information on soil-improving practices as well as in-depth background—from what soil is to the importance of organic matter. Case studies of farmers from across the country provide inspiring examples of how soil—and whole farms—have been renewed through these techniques.

Potential for carbon sequestration. There is debate on how big the impact could be, but there is no debate over whether agriculture can help mitigate climate change through reduced greenhouse gas emissions and increased carbon storage in soils. The organization [4 per 1000](#) maintains that the potential is substantial.

Silvopasture, also known as agroforestry, is the practice of combining woodland and livestock grazing in a mutually beneficial way. The end goal is to have both working together to provide food and shelter for livestock, with the potential for additional economical yields from the trees. While meat production has been identified as unsustainable on many scores, silvopasture offers the possibility that small amounts of meat production can be sustainable, including mitigating climate change.

[Planting a Small Silvopasture to Benefit Farm and Livestock](#)

[How we can make beef less terrible for the environment](#)

Food from riparian zones. Conservation best practices require maintaining belts of land to buffer between agriculture and wetlands and watercourses.

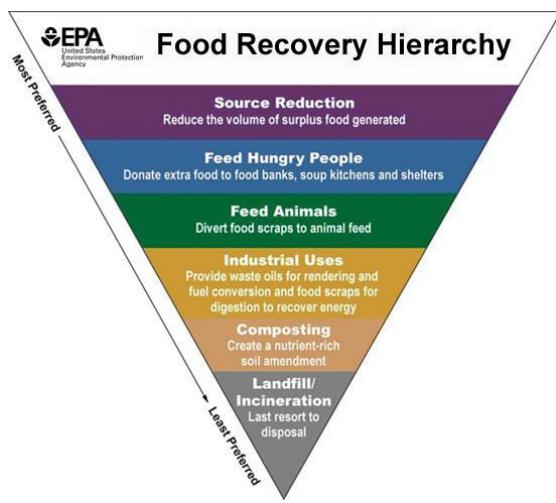
- This video shows how a farmer has developed a [riparian zone along the LaMoille River in Vermont](#) to go beyond just slowing erosion to also grow ecological health, food, medicine, fuel and other important trees and plants that provide for the river and the people living there.
- This presentation of [Productive Conservation in a Changing Climate](#) demonstrates the possibility of planting a diverse array of trees, shrubs, and herbaceous plants that will yield nuts, berries, vegetables, medicinal and culinary herbs, and ornamental crops. Suitable species will be of ecological and economic benefit.
- Both these projects were influenced by the principles of [Permaculture](#), which aims for agriculture that increases ecological health while meeting human needs.

Food waste reduction and food resource recovery

Enormous waste – estimated to be at least one third of all food resources – characterizes both the local and global food system. In theory, if we eliminated this waste, we would be able to provide for the additional 2-3 billion people on the planet in 2050. Further, this waste is a major source of greenhouse gas emissions, so reducing waste also means fighting climate change. See

- [We're Wasting Food and It's Hurting Our Climate.](#)
- [Wasting Away: HOW CUTTING DOWN FOOD WASTE CAN DO SO MUCH MORE THAN FEED THE WORLD'S HUNGRY](#)
- [Wasted: How America Is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill](#) (Natural Resources Defense Council)

The Massachusetts Department of Environmental Protection (MassDEP) in 2014 established [a solid waste disposal ban](#) that applies to businesses and institutions disposing one ton or more of food waste per week. We are on our way, but there is a long way to go.



The U.S. Environmental Protection Agency's [Food Recovery Hierarchy](#) provides an effective tool for understanding and prioritizing this work. The Hierarchy prioritizes actions organizations can take to prevent and divert wasted food. Each tier of the Food Recovery Hierarchy focuses on different management strategies for wasted food. The top levels of the hierarchy are the best ways to prevent and divert wasted food because they create the most benefits for the environment, society and the economy.

The Massachusetts Department of Environmental Protection has developed a [Guide to the Commercial Food Material Disposal Ban](#).

RecyclingWorks has assembled key [food waste links and case studies](#) and also provides assistance to help [compost operations](#) do a better job.

Gleaning is the gathering of surplus farm crops. The practice dates back to Biblical times. Farmers are often unable to sell all of their produce, either because of imperfections or because they simply cannot harvest it all. While such crops can be left in the field to compost, it is preferable to gather and put them to use at a higher place on the hierarchy. Two organizations coordinate gleaning:

[Boston Area Gleaners](#) (eastern Mass)

[The Gleaning Project: Helping Harvest](#) (western Mass)

[Daily Table](#) is a new kind of retail grocery store that offers fresh produce and grocery items as well as ready-to-cook and grab-n-go prepared meals at truly affordable prices. The company uses excess available food from growers, manufacturers and supermarkets to provide affordable, healthy food for the food insecure.

[Food Waste](#) is a current project of the Massachusetts Food System Collaborative.

Community Food Security

Community Food Security (CFS) is a necessary condition to ensure abundant, affordable, healthy food for 2050. It represents both a community development strategy and an anti-hunger strategy.

Massachusetts communities already have many pieces in place, but much more is possible. Food banks, food pantries, and community meals; farmers markets and CSAs; community farms and gardens; and youth empowerment programs are all part of the picture. Food Policy Councils, described below, can play an important coordinating role.

[Community food security](#) has been defined as . . . *a condition in which all community residents obtain a safe, culturally appropriate, nutritionally sound diet through an economically and environmentally sustainable food system that promotes community self-reliance and social justice.*

The [Congressional Hunger Center](#) has published an [introduction to CFS](#) prepared by Mark Winne, a champion of the movement and author of *Closing the Food Gap: Resetting the Table in the Land of Plenty* (2008).

The Community Food Security Coalition (which is no longer in operation) identified [Six Basic Principles of Community Food Security](#):

Community food security represents a comprehensive strategy to address many of the ills affecting our society and environment due to an unsustainable and unjust food system. Following are six basic principles of community food security:

- **Low Income Food Needs** - Like the anti-hunger movement, CFS is focused on meeting the food needs of low income communities, reducing hunger and improving individual health.
- **Broad Goals** - CFS addresses a broad range of problems affecting the food system, community development, and the environment such as increasing poverty and hunger, disappearing farmland and family farms, inner city supermarket redlining, rural community disintegration, rampant suburban sprawl, and air and water pollution from unsustainable food production and distribution patterns.
- **Community focus** - A CFS approach seeks to build up a community's food resources to meet its own needs. These resources may include supermarkets, farmers' markets, gardens, transportation, community-based food processing ventures, and urban farms to name a few.
- **Self-reliance/empowerment** - Community food security projects emphasize the need to build individuals' abilities to provide for their food needs. Community food security seeks to build upon community and individual assets, rather than focus on their deficiencies. CFS projects seek to engage community residents in all phases of project planning, implementation, and evaluation.
- **Local agriculture** - A stable local agricultural base is key to a community responsive food system. Farmers need increased access to markets that pay them a decent wage for their labor, and farmland needs planning protection from suburban development. By building stronger ties between farmers and consumers, consumers gain a greater knowledge and appreciation for their food source.
- **Systems-oriented** - CFS projects typically are "inter-disciplinary," crossing many boundaries and incorporating collaborations with multiple agencies.

Food Policy Councils (FPCs) can play a critically important role in organizing for community food security and building momentum for change in local food systems. They create an opportunity for discussion and strategy development among these various interests, and create an arena for studying the food system as a whole.

The central aim of most Food Policy Councils is to identify and propose innovative solutions to improve local or state food systems, spurring local economic development and making food systems more environmentally sustainable and socially just. FPCs often begin their work by conducting a community food assessment (see [Just Food](#) for an example). Usually initiated by local government, FPCs consist of a group of representatives and stakeholders from many sectors of the food system, including anti-hunger and food justice advocates, educators, nonprofit organizations, concerned citizens, government officials, farmers, grocers, chefs, workers, food processors and food distributors.

[Food First: The Institute for Food and Development Policy](#) has prepared a report on [Food Policy Councils: Lessons Learned](#).

[Creating a network of FPCs](#) is a current project of the Massachusetts Food System Collaborative.

The (Boston) Metropolitan Area Planning Council has developed a [Municipal Food Systems Planning Toolkit](#) (2013)

The Pioneer Valley Planning Council has developed [Municipal Strategies to Increase Food Access](#).

MDAR has assembled this list of [Food Policy Groups in Massachusetts](#). Some links appear to be defunct because the councils have moved to facebook accounts.

New technology in food production

Some advocates for abundant, affordable, healthy food claim that advances in technology will be an important source of solutions. This may be so in some cases. However, it is important to note that unquestioning acceptance of new technologies played a significant part in getting the global food system to the unjust, unsustainable place it is today.

This section includes links to articles on a wide variety of new, seemingly miraculous technologies: smart farming, precision agriculture, drones and robots, farm-wide use of sensors and artificial intelligence, genetically modified organisms, food science, farms run like factories.

Here are two perspectives on technology to temper the excitement:

- From an [NPR report on Amish views of technology](#): *"The difference between Amish people and most other Americans is the deliberation that takes place before deciding whether to embrace a new technology. Many Americans assume newer technology is always better, and perhaps even inherently good. . . . The Amish don't automatically embrace what's new, they evaluate it and decide if it's a good fit for the lives they want to lead."*
- [Appropriate technology](#) is a concept, and a movement, favoring technological choices and applications that are small-scale, decentralized, labor-intensive, energy-efficient, environmentally sound, and locally autonomous. Appropriate technology was originally articulated as "intermediate technology" by economist E.F Schumacher in his work [Small is Beautiful](#). Both Schumacher and many modern-day proponents of appropriate technology also emphasize the technology as people-centered.

[Factory Fresh. The Economist, Technology Quarterly.](#) *If agriculture is to continue to feed the world, it needs to become more like manufacturing, says Geoffrey Carr. Fortunately, that is already beginning to happen. . . . ONE way to view farming is as a branch of matrix algebra. A farmer must constantly juggle a set of variables, such as the weather, his soil's moisture levels and nutrient content, competition to his crops from weeds, threats to their health from pests and diseases, and the costs of taking action to deal with these things. If he does the algebra correctly, or if it is done on his behalf, he will optimise his yield and maximise his profit. The job of smart farming, then, is twofold. One is to measure the variables going into the matrix as accurately as is cost-effective. The other is to relieve the farmer of as much of the burden of processing the matrix as he is comfortable with ceding to a machine.* Topics include:
• Smart Farms: Silicon Valley meets Central Valley
• Bugs in the System: Bacteria and fungi can help crops and soil
• Crops of the Future: Tinker and tailor
• Fish Farming: Catch of the day
• Animal Husbandry: Stock answers

Smart Farming and Precision Agriculture. [Engineering.com](https://engineering.com). Smart farming and precision agriculture involve the integration of advanced technologies into existing farming practices in order to increase production efficiency and the quality of agricultural products. As an added benefit, they also improve the quality of life for farm workers by reducing heavy labor and tedious tasks. Just about every aspect of farming can benefit from technological advancements—from planting and watering to crop health and harvesting. Most of the current and impending agricultural technologies fall into three categories that are expected to become the pillars of the smart farm: autonomous robots, drones or UAVs, and sensors and the Internet of Things (IoT).

Can CRISPR help us stop wasting so much food? [Genetic Literacy Project](https://geneticliteracyproject.org). CRISPR. It's not what's for dinner. Not yet, at least. But the hot genetic editing technology could be instrumental in reducing the multi-billion global problem of food spoilage and waste.

Is Growing at Home the Future of Food? [Circulate News](https://circulate.news). The case for a localised, even home-based food growing system is being made by the [Open Agriculture Lab](https://openag.org) (OAL) at the Massachusetts Institute of Technology (MIT). They recently suggested that as much as 40% of an urban diet could eventually be produced in a domestic context, cutting down on transportation costs, while providing fresher and more nutritious food. The Lab is actively working to develop domestic grow-boxes, which create controlled environments, where deliberate combinations of temperature, humidity and soil are created to grow specific types of food. It's a new agricultural design that could then be utilised by families to create small home gardens, or even in the context of providing food for a local neighbourhood.

Opinion: Smart farming is key to developing sustainable agriculture. [National Center for Biotechnology Information](https://ncbi.nlm.nih.gov). Agriculture has seen many revolutions, whether the domestication of animals and plants a few thousand years ago, the systematic use of crop rotations and other improvements in farming practice a few hundred years ago, or the “green revolution” with systematic breeding and the widespread use of man-made fertilizers and pesticides a few decades ago. We suggest that agriculture is undergoing a fourth revolution triggered by the exponentially increasing use of information and communication technology (ICT) in agriculture.

FutureFood 2050 showcases how food science will provide solutions to feed the world's 9+ billion citizens sustainably by 2050. It will share the many ways food science is delivering solutions that make us better nourished, healthier and safer, and creating a more abundant supply of food. By presenting a more hopeful future that confronts anxiety with equal doses of fact and optimism, FutureFood 2050 shows that we can improve the world's food supply through the ingenuity of food science and technology.

Urban Prospects

More than half the people of the world now live in cities, and population growth is expected to center on urban areas. According to the United Nations, by 2030 nearly 5 billion people will be living in cities. Massachusetts is not an exception to this trend. What will the food systems we will rely on look like? Here are some views:

How Will We Feed the Megacities of the Future? [Takepart.com](https://takepart.com). More people are moving to urban areas, and making new connections with rural farmers will be necessary to feed them. Urban farms may provide a delicious source of delicate salad greens, honey, and even the occasional eggs, but they're a long way from feeding entire cities. As rural areas continue to house much of the world's poor, the question of who feeds these dense, agriculture-scarce areas becomes even more important. Linking small or subsistence farmers to urban markets could provide a way out of poverty for them, as well as opportunities for developing better infrastructure, creating new jobs along the way.

Exploring the concept of agroecological food systems in a city-region context. AGROECOLOGY AND SUSTAINABLE FOOD SYSTEMS 2018. Based on urgent needs for food security compounded by a changing climate which impacts and is

impacted by agricultural land-use and food distribution practices, we explore the processes of action in implementing agroecological food systems. We identified the following characteristics for an agroecological food system: 1. Minimizing use of external inputs, 2. Extent of internal resource recycling, 3. Resilience, 4. Multifunctionality, 5. Building on complexity and incorporating greater systems integration, 6. Contextuality, 7. Equity and, 8. Nourishment. We focus on the city-region food systems context, concluding with practical drivers for realizing more agroecological food systems in cityregion contexts.

With Vertical Farms, Food Banks are Growing their Own Produce to Fight Hunger. Civil Eats. Vertical farms allow food banks to grow their own produce with high-tech systems in an effort to fight food insecurity year-round.

Is Vertical Farming Really the Future of Agriculture? Eater.com. Indoor, LED-lit growing operations produce food without soil or sunlight — but scaling up could prove difficult. This is an excellent article on the pros and cons of a new technology.

Can Urban Soil Offer Edible Weeds Fit for Foraging? Civil Eats. Researcher Philip Stark says yes, and touts the benefits to the body—and the prospect of better biodiversity.

Paradise Lot: Two plant geeks, one-tenth of an acre and the making of an edible garden oasis in the city (a blog) Edible Forest Gardens spells out and explores the key concepts of forest ecology and applies them to the needs of natural gardeners in temperate climates. An edible forest garden is a perennial polyculture of multipurpose plants. Most plants regrow every year without replanting: perennials. Many species grow together: a polyculture. Each plant contributes to the success of the whole by fulfilling many functions: multipurpose. In other words, a forest garden is an edible ecosystem, a consciously designed community of mutually beneficial plants and animals intended for human food production. Edible forest gardens provide more than just a variety of foods. The seven F's apply here: food, fuel, fiber, fodder, fertilizer, and "farmaceuticals," as well as fun.

If you are interested in food deserts, you need to read these two:

The Hidden Resilience of 'Food Desert' Neighborhoods. Civil Eats. Researchers and scholars are exploring the plight—and the power—of urban communities struggling to meet their nutritional needs and asking hard questions about how the debate is framed.

Food apartheid: the root of the problem with America's groceries. The Guardian. Food justice activist Karen Washington wants us to move away from the term 'food desert', which doesn't take into account the systemic racism permeating America's food system. America's sustainable food movement has been steadily growing, challenging consumers to truly consider where our food comes from, and inspiring people to farm, eat local, and rethink our approaches to food policy. But at the same time, the movement is predominantly white, and often neglects the needs and root problems of diverse communities. . . . 'When we say 'food apartheid,' the real conversation can begin.'

Getting Started on Your Community Research

This page introduces several starting points for your Current Issue research. Start with any one of them. The resources and directions for research here barely scratch the surface of what is out there to be explored.

Starting Points:

▲ **Orient yourself with maps.** Identify familiar and unfamiliar places in your community. What land uses are represented? Where is food grown? Sold? Where does food waste go? Where can people get affordable, healthy food?

- **Bird's Eye View.** A fun way to start is by flying over your community: <http://www.bing.com/maps>.
- **Oliver.** Oliver, the MassGIS online mapping tool at http://maps.massgis.state.ma.us/map_ol/oliver.php can be used to map a variety of themes related to water resources.
- **Team maps.** The Massachusetts Executive Office of Energy & Environmental Affairs provides registered Envirothon teams with large-scale color printed maps of their communities showing information for use in research and presentations. How might you use this year's map?

▲ **Participate in your food system in ways that are unfamiliar! What can you learn through volunteering?**

- Participate/volunteer in a community meal
- Visit/volunteer at a community farm
- Plant/tend/harvest a food crop
- Visit/volunteer at an elementary school gardening project
- Visit/volunteer at a winter farmers market
- Attend a conference/workshop event that educates the public about abundant, affordable, and/or healthy food

▲ **What projects or initiatives are happening in your community? Explore some of the links provided** in the Current Issue *Background and Strategies for Community Research* document:

- Do the food system vision documents have relevance to your community?
- What organizations work in your community to strengthen the local food system (e.g. food banks, food pantries, CSAs, local food networks)?
- Where are the farms in your community? Map 'em!
- Do you have a Food Policy Council working for your community? If not, what pieces of that work are being done by other organizations?
- Is the federal farm bill at work in your community?

Then, follow up online research with real world research: Follow word-of-mouth leads. Seek face-to-face and telephone contact with real people.

▲ **Engage in at least one hands-on experience in the community related to each of the major approaches** Mass farms and communities can use to ensure abundant, affordable, healthy food – AND fight climate change?

1. **Sustainable agriculture, especially healthy soil practices**
2. **Food waste reduction. Where was your experience on the food recovery hierarchy?**
3. **Community food security**

▲ **Find and interview people in your community who can help you see your food system in different ways.** People are key to this year's Current Issue!

- Visit them in their natural habitats - the places where they work on these issues
- Focus on understanding their perspectives – and how they arrived at them
- Learn what opportunities and constraints they see – What gives them hope?

▲ **Spend time outdoors.** See the landscape through the eyes of your resource people. Get your hands in the soil! Be surprised. Prepare to tell the judges at the Envirothon about the people, places, and adventure you found.

The 2019 Current Issue Problem

In mid-March, your team will receive the 2019 Current Issue Problem, which will provide the specific questions that you will need to address in your Current Issue presentation at the May 17 Envirothon. You will also receive a copy of the scoring sheets that judges will use to score your presentation.

The 2019 problem will

- require you to be familiar with what is happening in your community regarding all three major approaches regarding abundant, affordable, healthy food.
- ask you to identify “leverage points” – initiatives that are (or could) really make a difference as we head toward the year 2050.
- Invite you to tell the story of your research, particularly the people and places you encountered.

How the Current Issue presentation works:

- Five (and only five) members of your team will make your presentation to a panel of five to eight judges. Your coach and other team members will be able to observe but not participate. The judges’ job is to listen, ask good questions, assess your work, and give you feedback on your research, your recommendations, and your presentation.
- You have 15 minutes for your presentation, followed by a 10 minute period when the judges can ask questions. You will be allowed to use posters, maps, and other visual aids, but no electricity is provided or allowed.
- The Current Issue Presentation score is 25% of your team's total Envirothon score.

Community Research & Community Action Awards

Your team works hard to prepare for your Envirothon Current Issue presentation. You deserve recognition for this work! And if your Current Issue research results in a service or action project that benefits your community, this also should be recognized. The Mass Envirothon Community Awards provide important recognition for your team, plus visibility for your school and your community.

Teams who work to qualify for the awards tell us that they have a better Envirothon experience overall. Everybody wins!

Some teams find that the Community Research Award checklist can be a helpful organizing tool for team research.

These awards are optional and noncompetitive. They can be earned by any team that meets the requirements for the awards. You and your coach are responsible for certifying the quality and completeness of your work. For more information, see <https://massenvirothon.org/areas-of-learning/activities-programs/community-awards/>

Mass Envirothon Current Issue Resources

Current Issue guidance and resources, including this document, are assembled and updated for Mass Envirothon by Will Snyder, Extension Educator for UMass Extension's 4-H Youth Development Program.

More Current Issue information, including links to workshop presentations, is at <https://massenvirothon.org/areas-of-learning/current-issue/>.

Please call or write with your questions! Contact Will Snyder at wsnyder@umext.umass.edu or 413/545-3876.