



UNIVERSITY of  
MASSACHUSETTS

UMass Extension

K-12 Outreach Initiative  
*Natural Resources and Environmental Conservation,  
Agroecology, Nutrition Education, and  
4-H Youth & Family Development Programs*

Draper Hall  
40 Campus Center Way  
Amherst, MA 01003-9244  
413.545.3876  
413.545.6555 fax

## Questions and Resources for Team Preparation 2003 Mass Envirothon Current Issue

# Strengthening Local Food Systems

The 2003 Current Issue problem asks teams to determine a significant and achievable step that their community can take to strengthen their local "food system". Our food system relies on fossil carbon. Oil supply disruptions could have serious effects on food prices in Massachusetts. Ratification of the Kyoto treaty on climate change could also require us to take a long hard look at how we produce, process, and distribute food.

This document is intended to offer an outline of background information, resources, and questions teams can use to investigate the issue and prepare for their presentation.

The following resource people offered ideas, advice, and resources:

Anne Carter, UMass Amherst Department of Plant & Soil Sciences  
Marjorie Cooper, Cooper Hill Farm  
Debi Hogan, Mass Agriculture in the Classroom  
Debbie Humphries, Nutrition Policy Consultant  
Kirsten Johnson, UMass Extension Family Nutrition Program  
Mary Jordan, Mass Department of Food & Agriculture  
Andrea Langhauser, Mass Watershed Initiative  
Julie Meyer, Gardens of Delight Landscaping  
Laura Muller, Wheaton College  
Kathy Ruhf, New England Small Farms Institute

This guide benefitted greatly from the framing of food and agriculture issues in the new publication *Northeast Farms to Food: Understanding Our Region's Food System* by the Northeast Sustainable Agriculture Working Group (NESAWG), 2002 (available from the New England Small Farm institute, <http://www.smallfarm.org>).

This guide is not a comprehensive, finished document. It will be supplemented in coming months with email additions on specific topics not included here, and in response to questions from coaches and teams. For more information, to suggest questions, or to ask about competition scoring, contact Will Snyder, UMass Extension, 413/545-3876 or [wsnyder@umext.umass.edu](mailto:wsnyder@umext.umass.edu).

For more information on the Mass Envirothon Silver Award for Community Investigation, contact Nina Danforth ([nina.danforth@state.ma.us](mailto:nina.danforth@state.ma.us)) or Laura Muller ([lmuller@wheatonma.edu](mailto:lmuller@wheatonma.edu)).

## **Background on Massachusetts Food Systems**

### **What is a "food system"?**

The term "food system" refers to the production, processing, distribution, and consumption of food. The system has social, economic, and ecological dimensions. The concept offers a powerful tool for analysis and generating solutions because it primes us to think ecologically ("everything is connected to everything else").

The term "foodshed," borrowed from the concept of a watershed, describes the flow of food from the area where it is grown to where it is consumed. It offers another helpful way for Envirothon teams to think about their food system. See <http://www.foodshed.wisc.edu/foodshed.htm>

What do we mean by "local"? There is no single answer to this question - teams will need to define this for themselves, in terms of what they discover in their investigations. And what does it mean to "strengthen" a food system? Grappling with this question is part of the challenge of this year's current issue.

### **Sustainable Agriculture and Community Food Security**

Two strong movements that support local food systems have developed in recent decades.

The movement for "sustainable agriculture" - generally defined as agriculture that is ecologically sound, economically viable, and socially just - has reached beyond simply instituting farm practices that do not deplete natural resources. Sustainable agriculture advocates may be found promoting urban farmers' markets or farmworkers' rights. For a view of the field from a farming perspective, see the website of the Sustainable Agriculture Network at <http://www.sare.org/>

Similarly, the movement for "community food security" has moved beyond traditional issues of hunger and poverty to address public health, community economic development, nutrition and food safety, and cultural factors in food systems. For an overview, see the website of the Community Food Security Coalition at <http://www.foodsecurity.org>

These movements find common ground in their support for food-related economic development that maximizes production close to home.

### **Energy in the Food System**

As any trip to the supermarket will attest, our foodshed is increasingly global. While conventional economists can argue that this is a natural result of market forces, there can be no doubt that this globalization is only possible because of cheap energy.

Our food system is becoming more and more energy intensive. Fossil fuels are used to make fertilizers and plastic packaging, fuel for transportation and irrigation pumps, and electricity for processing and refrigeration. By one estimate, approximately 15 Calories of energy are expended to produce and process each Calorie that Americans consume as food. This is an average; the study also estimates that the fossil fuel inputs to food energy for eating in restaurants (presumably because of travel to the restaurant) is 100 to 1. According to a 1995 study of climate change and world food supply, the "green revolution" of the late 20th century, which brought a 60% increase in yields of food crops in India through fertilizers, pesticides, tractors, and new hybrid seeds, resulted in increased electricity use by 5.1 times, number of tractors by 4.7 times, and manufactured fertilizers by 4.8 times.

Fossil fuel inputs also mean outputs of carbon dioxide, a major contributor to global climate change. We know that plants generally flourish in laboratories with more atmospheric CO<sub>2</sub>, but we do not know

how other predicted effects of climate change - changes in rainfall patterns, weather extremes, pests and weeds and diseases - will affect such plants in natural settings.

Looking at food in terms of energy inputs is good practice for thinking in terms of systems. It also underscores that fact that the human economy is only one piece of nature's economy. If your Envirothon team is interested in pursuing the energy question, two studies available on the web, one new and one old, are worth looking at:

*Food, Fuel, and Freeways: An Iowa Perspective on how far food travels, fuel usage, and greenhouse gas emissions* (2001, The Leopold Center for Sustainable Agriculture)

<http://www.leopold.iastate.edu/pubinfo/papersspeeches/ppp/introlhtml>

*Energy Allocation in the Food System: A Microscale View* (1976, Marschall Invitational Italian Cheese Seminar)

[http://www.rhodiadairy.com/marschall/proceed/pdf/76\\_12.pdf](http://www.rhodiadairy.com/marschall/proceed/pdf/76_12.pdf)

Calculation of energy inputs can become a pretty complex endeavor. For most teams it will be sufficient to note that a local food system is much more energy efficient than a global one, particularly in terms of fossil fuel inputs.

## **Background on Massachusetts Food & Agriculture**

**Geography.** The *Massachusetts Envirothon Team Resource Manual* has a chapter on Agriculture, including a history and profile of Massachusetts agriculture and aquaculture.

**Policy.** From the perspective of strengthening local food systems, teams should pay special attention to the following sections:

"Farms are Region's Stone Wall Against Sprawl" by Jonathan L. Healy and Stephen H. Burrington. This is a brief but pithy defense of farming as the best bulwark against sprawl because of its many economic and cultural benefits.

"Massachusetts DFA Programs to Aid Farmers and the Environment". This section describes DFA programs aimed at supporting local farms in an ecologically sound ways. These DFA programs are also described on the following web pages:

The Massachusetts Farm Viability Enhancement Program

<http://www.state.ma.us/dfa/funding/farmviability/index.htm>

Agricultural Environmental Enhancement Program

<http://www.state.ma.us/dfa/funding/aEEP/index.htm>

Agricultural Preservation Restriction Program

<http://www.state.ma.us/dfa/funding/APR/index.htm>

**The Food and Farmland Protection Act.** This bill recently introduced to the Massachusetts legislature would, among other things, establish a preference for locally-grown food in state procurement and, at local option, in local government procurement; amend state laws governing farmstands and labeling of food as "native" or "local" in ways calculated to promote retail sales of locally-grown food. See a description at

[http://www.cif.org/advocacy/food\\_and\\_farmland\\_protection\\_act.htm](http://www.cif.org/advocacy/food_and_farmland_protection_act.htm)

**The Northeast Dairy Compact.** Farms in the northeastern U.S. are a small part of the national

agriculture picture and usually benefit little from federal programs. One home grown New England program, the Northeast Dairy Compact, did become part of the Federal Farm bill in the late 1990s over the objections of bigger dairy states and large dairy processing organizations. The compact aimed to protect New England dairy farmers by guaranteeing a higher milk price. The difference between the average cost of producing milk and the minimum price which a processor must pay for milk from the farm was paid to the dairy farmer by the dairy processor. The minimum price is set each month by the Federal Milk Marketing Order. An appointed board assessed processors and paid farmers. The federal law allowing this compact expired on September 30, 2002. For some background from proponents and opponents of the Compact, see statements and news releases from the Conservation Law Foundation over the past year supporting the Compact - [http://www.cif.org/hot/prindex\\_project\\_area.htm#Agriculture](http://www.cif.org/hot/prindex_project_area.htm#Agriculture) - and the legislation web page from the International Dairy Foods Association, including news releases and fact sheets opposing the Dairy Compact - <http://www.idfa.org/leg/dairycom.cfm> .

### **What about organic agriculture?**

In October 2002 the U.S. Department of Agriculture, responding to a huge groundswell of consumer interest, finalized new national standards for what is to be considered "organic" (see <http://www.ams.usda.gov/nop/FactSheets/ProdHandE.html> ), officially bringing key organic agricultural practices into the mainstream.

What place does organic farming have in strengthening local food systems? If organic agriculture were simply a matter of the kinds of substances used and management practices employed on a farm, it might be argued that the only relevance of organic farming to strengthening a local food systems is that it may increase the price that farmers can get for their produce.

The reality is that the organic farming movement, at heart, remains committed to radical change in how our society produces and distributes food to protect both people and the earth. Organic growers, and to some extent organic consumers, are among the strongest advocates for local food systems. The first page of the Northeast Organic Farming Association web site, ( <http://www.nofa.org> ) includes the following quote from farmer/writer Wendell Berry from his book *The Gift of Good Land*:

*"An organic farm, properly speaking, is not one that uses certain methods and substances and avoids others; it is a farm whose structure is formed in imitation of the structure of a natural system that has the integrity, the independence and the benign dependence of an organism."*

### **Conditions for development of strong local food systems in Massachusetts**

#### **Conditions and opportunities favoring local food systems**

- \* Massachusetts' abundant rainfall, and diverse topography and soil types, favor a variety of farm products.
- \* Massachusetts' population density and diversity and proximity to farmland presents a marketing opportunity.
- \* Public appreciation of the multi-functional role of agriculture and other working landscapes is increasing, including understanding of the variety of natural resource, environmental, and quality of life benefits such as open space, recreation and tourism, biodiversity and wildlife habitat, clean air, and clean water, community vitality.
- \* The public is concerned about sprawl and interested in community preservation and smart growth.
- \* Massachusetts has several well-developed models for farmland protection public policy.
- \* The northeast has more land trusts than any other region of the country, and new interest among land trusts and conservation organizations in farmland protection.
- \* Farmers are increasingly business-savvy and adaptable.
- \* A shift in purchasing behaviors by just a small fraction of the population could have an enormous

impact on local agriculture. We don't need to convert everyone's eating habits in order to see real change.

### **Impediments to strong local Massachusetts food systems**

- \* Massachusetts productive land base is threatened by competing uses that drive up land prices, promoting conversion of farmland.
- \* Funding for innovative land protection policies is not able to keep up with demand
- \* An increasingly globalized food system supported by international agreements such as NAFTA and federal government policies favors bigger and more specialized farming and processing.
- \* There is a shortage of farm labor, and a lack of meaningful food system jobs/careers.
- \* A large proportion of the citizenry do not know how food is produced, where it comes from, who controls the markets, and why this is important.
- \* The multifunctional benefits of agriculture are not valued or even recognized in the marketplace. The U.S. lags behind Europe in integrating these elements into public policy.
- \* Higher profits for non-food agricultural products (e.g. nursery/landscaping products) keeps agriculture in business but discourages food production
- \* The American diet is still trending toward fast food and processed food.
- \* There is a lack of support for education and training for future farmers.

### **Strategies for Strengthening the Massachusetts Food System**

This list is not comprehensive. It is intended to provide a broad view of the diverse possibilities that Envirothon teams may consider as next steps for strengthening their local food system. This section draws heavily in structure and content from "How Do We Get There?" (pp. 64-72 of NESAWG's *Northeast Farms to Food: Understanding our Region's Food System*)

**Farm Viability and Economic Development.** These strategies aim to help farmers survive economically.

- \* Technological advances in agriculture
  - greenhouses - season-extending technology
  - Integrated Pest Management
  - irrigation systems
- \* Farm policy
  - Farm Viability Enhancement program
  - New England Dairy Compact
- \* Agri tourism
- \* Research and education
  - land grant university and extension ( ongoing education and technical assistance)
  - community-based research
  - agricultural high schools and community colleges
- \* Marketing (connecting grower with consumer)
  - community supported agriculture
  - cooperatives (consumer or producer)
  - buy local campaigns
  - farmers markets
  - farm stands
  - institutional procurement policies (e.g. farm to school)
  - branding with farm identity

**Natural Resource Conservation and Enhancement.** These strategies aim to maintain the productive capacity of the natural resource base through education, regulation, and incentives for good stewardship.

- \* organic farming
- \* on-farm composting
- \* best management practices for control of nonpoint source pollution from runoff and management of livestock waste
- \* farm planning to promote habitat and species diversity (e.g. haying practices, woodlot management)
- \* land conservation tools
  - Agricultural Preservation Restrictions (APR)
  - prime farmland overlay zoning
  - reduced property tax rates (Chapter 61a)
  - models for encouraging long term land tenure

**Community Food Security.** These strategies aim not for local self-sufficiency, but increased local self-reliance. The goal is for the community to produce more of what it needs, and to market more locally.

- \* Thinking of urban communities as food systems linked to surrounding rural areas can lead to strategies such as
  - \* improving transportation for urban residents to purchase food
  - \* promoting policies that keep grocery stores in urban communities
  - \* linking low income families to local producers through the Farmers Market Nutrition Program
  - \* offering nutrition and food safety education programs
  - \* celebrating diverse cultures and their foods.
  - \* policies enabling community gardens to compete for vacant lots with other development interests

\* Food Policy Councils. Some urban communities have formed councils including representation from farms, retail food industry, educational institutions, community development groups, health agencies, city departments, and emergency food providers to strengthen local food systems in a variety of ways.

\* Urban food production is also a realistic strategy. According to a 1995 study, Singapore and Hong Kong, among the most densely populated places on earth, are 30-50% self reliant in produce needs. Production can include community gardens in vacant lots, small livestock (e.g. chickens, rabbits), fish grown in tanks (possibly in combination with a crop like basil), and produce grown in containers on patios and rooftops.

\* Benefits of urban agriculture, in addition to food, include community beautification and environmental improvement, waste management, youth crime prevention, child nutrition, economic development, and school science curriculum enhancement.

\* Urban food production has needs and issues different from rural farming. Community gardeners, backyard gardeners, and greenhouse operators have a need for infrastructure (e.g. sources of seeds and tools) and extension services (e.g. soil testing, pest management, community garden management) that address their particular needs.

**Food Citizenship.** These strategies involve reframing the relationship of people and their food into a broader context. A sustainable food system will depend not simply on changing consumer habits, but changing how we think and act as citizens and community members.

- \* Food labeling - including information on origin, farm practices, genetic modifications, processing practices, labor practices - can raise consumer consciousness of choices.
- \* Promoting agricultural literacy in schools - for instance, through farm visits, school gardens, food service changes, and vocational information.
- \* Promoting positive images connecting personal health, fresh local foods, home cooking, and farmland to counter industry advertising and its messages about food self interest.
- \* Opening questions of diet and food choice, such as vegetarianism.

## Resource Organizations

The following list of resource organizations and agencies is far from complete. Many of these sites are large and have lots of information. Seek and ye shall find.

Mass Department of Food and Agriculture <http://www.state.ma.us/dfa/>  
 UMass Extension <http://www.umass.edu/umext/>  
 American Farmland Trust <http://www.farmland.org/>  
 Communities Involved in Sustaining Agriculture <http://www.buylocalfood.com>  
 Northeast Organic Farming Association <http://www.nofa.org>  
 New England Small Farms Institute <http://www.smallfarm.org>  
 Natural Resource Conservation Service <http://soils.usda.gov/>  
 Berkshire Grown <http://www.berkshiregrown.com/>  
 Nuestras Raices <http://www.nuestras-raices.org>  
 Southeast Massachusetts Agricultural Partnership  
 Conservation Law Foundation <http://www.clf.org/advocacy/agriculture.htm>  
 Massachusetts Audubon Society <http://www.massaudubon.org>  
 Massachusetts Association of Conservation Districts  
 Town tax assessor and Conservation Commission

## Strategies for Community Investigations

The following suggested activities and questions are designed to help teams in their investigations. They are meant only as a guide; every investigation will be different.

Teams that document thorough and wide-ranging community investigations in their preparation for the current issue presentation will be eligible for the **Massachusetts Envirothon Silver Award for Community Investigation**. Last year, teams that completed the Silver Award criteria found that organizing their records made it easier to pull together important information for their presentation. For suggestions on how to organize your documentation, see the section on How the Current Issue will be Judged, below. For minimum requirements for the Silver Award, see the 2003 Silver Award Checklist.

- A. Calculate your ecological footprint  
<http://www.lead.org/leadnet/footprint/intro.htm>
- B. Analyze your diet  
 what would a year-round all-Massachusetts diet look like?  
<http://www.nutrition.cornell.edu/FoodGuide/>
- C. Contact agricultural advocacy organizations - local, statewide, and regional  
 what issues are they working on?

what strategies are they using?

D. Investigate your local "foodshed" (see the Wisconsin Foodshed Research Project for a definition at <http://www.foodshed.wisc.edu/foodshed.htm> ) What are the actual or potential food sources within your watershed, metropolitan area, or other region?

1. Use the map supplied by MassGIS or another base map to show such things as:
  - land currently in agricultural production
  - land currently in food production
  - working forests
  - prime agricultural land
  - other open space
  - farm stands/farmers markets
  - community gardens
2. Interview commercial businesses:
  - who grows? for how many generations?
  - what crops? why this choice? food potential?
  - promising innovations/technology (e.g. season extension, energy conservation)?
  - marketing strategies?
  - what agencies and organizations support their work? how?
  - what are the economic, environmental, social pressures on the enterprise?
  - concerns for sustainability? how do they define this?
  - how did they learn the business & keep up to date?
3. Interview home and community gardens:
  - who grows what?
  - motivations - food, recreation, cultural heritage
  - what organizations provide assistance?
  - interview residents to learn the history of gardens in your community (Go back two generations)
  - how do people learn how to garden?

E. Investigate nearby food processing enterprises

- what are their sources of raw material?
- why have they located their business here?

F. Investigate food distribution infrastructure

- where can consumers find local products?
- what are the information sources for consumers?

G. Based on your investigations, decide:

- What is the next step you would recommend that your community take to support and enhance the local food system?
  - focus on the options for collective action as a community rather than individual choices as consumers.
  - look for key leverage points - what step could move things significantly toward a stronger local food system? The step might be small or large, but it should in your judgment be achievable.

H. In your presentation, you should

- define your local foodshed/area of inquiry
- provide a brief overview of your foodshed and its issues
- state the issue you chose and why it is key
- state the next step you are recommending and the outcomes you hope will result

- include general information about what you expect costs will be, and who will be involved in implementing your proposal
- note how your proposal will affect the local ecosystem and natural resources it provides (forests, wildlife, soils, water)
- note how your proposal will affect local people and economy.

## How will the Envirothon Current Issue be Judged?

### The Silver Award for Community Investigation

The Mass Envirothon Silver Award recognizes teams who have done thorough and wide-ranging community research in preparation for their Current Issue presentation at the Envirothon. ***The award is optional and non-competitive, and is completely separate from the competitive scoring*** described below. It can be earned by any team that completes and documents the research steps noted in the 2003 Silver Award checklist.

**Teams seeking to qualify for the Silver Award should signal their intent by Friday, April 4, 2003.**

Teams planning to present work for the Silver Award should organize their work in three-ring binders divided into sections that reflect their community investigations. We have provided dividers for one possible presentation method:

- Log sheets - Overall activities should be documented on log sheets. Entries should include the date, names of people who participated in the task, the time on task, and a brief description of the task.
- Maps - Any maps or other information you use to create the map you will use in your presentation. For example, if your community has CSA farms or other farms stands, you can include this information on a map in your Maps section.
- Organizations and Boards - Save informational brochures and leaflets from your explorations. Depending on context, you might organize information from these investigations in more than one section.
- Interviews and Field Notes - Keeping careful notes from all of your interviews in your binder will help you to include quotations and cite your sources in your presentation.
- Reflections/Workshop Feedback - This section can include work that does not fit in any of the other sections such as your calculation of your ecological footprint or your diet analysis, and is a good place to keep notes from workshops.

Each binder section should include a list of the most relevant references (web sites, newspaper/magazine articles, and books) that you find. Information about correct formats for bibliographic citations can be found on the web at <http://www.dartmouth.edu/~sources/coirothontents.html>

To facilitate verification of Silver Award status on the day of the Massachusetts Envirothon, we ask that each team provide a Table of Contents for each binder section.

## Competition Scoring

The Current Issue represents 100 points, or one quarter of the team's total Envirothon score.

As in past years, teams will have 15 minutes to present their recommendations to a panel of judges on the day of the Envirothon. This will be followed by a 10 minute period for formal questions from the panel. Judging criteria will include:

- Evidence of first hand knowledge of your local food system, from field exploration and contacts and interviews with people working on the issue in your community
- Evidence of background knowledge gained from document and web research
- Quality of proposal for the next step your community should take to support the local food system, including compelling reasoning for why the proposed step is the best one
- Quality of presentation including organization, speaking skills, teamwork, effective use of maps and other visual aids, time management, and response to questions
- Overall quality, including evidence of curiosity, critical thinking, effort, depth, honesty, and creativity

A copy of the scoring sheet to be used by the judges will be mailed to participating teams at least four weeks before the Envirothon.

