

2012 Massachusetts Envirothon Current Issue Problem

Sustainable Stormwater Management

Background (For more extensive background see <http://www.maenvirothon.org/currentissue.htm>)

Stormwater is polluted runoff from rain events or snowmelt. It results when nonpoint source pollution is washed off the land into streams, rivers, ponds, and other surface waters. Both water quality and water quantity are dimensions of the problem.

In a naturally vegetated watershed, natural processes absorb runoff, moderating the quantity of water that flows over the land surface. Natural processes also filter the water to maintain a healthy quality for human use as well as for the ecosystem. Where human activity (particularly nonpoint source pollution and development that increases impervious surfaces) becomes a significant element in a watershed, these ecosystem services can become strained. In these systems, maintaining water quality and quantity requires more human management and incurs higher costs.

Through most of history, our approach to stormwater management has been to engineer ways to move polluted runoff “away” as quickly and efficiently as possible. The 20th century was marked by large scale, resource- and energy-intensive projects such as urban storm sewer systems and river levees that moved problems downstream.

In the 21st century, new approaches to managing stormwater are emerging in response to the desire for systems that are lower cost and more environmentally friendly. A variety of practices and technologies fall under the heading of sustainable stormwater management, including low impact development (LID), green infrastructure, and conservation design.

More sustainable stormwater management strategies for the 21st century:

- Maintain and make use of ecosystem services to reduce costs and effort.
- Address water quality issues by preventing pollution in the first place
- Address water quantity issues as close to the source (where the precipitation falls) as possible
- Protect the quality and quantity of water for downstream people and ecosystems
- Plan for changing precipitation patterns that are occurring as part of climate change

Under the federal Clean Water Act, the US Environmental Protection Agency works with the Mass Department of Environmental Protection, issuing permits for stormwater discharges by urbanized or urbanizing municipalities (Is your town one? See <http://www.epa.gov/ne/npdes/stormwater/ma.html>). Whether or not your community is required to have a permit, there is much opportunity for nonpoint source pollution prevention and stormwater management by individuals and municipalities (see an overview and resources from a watershed perspectives at <http://www.commonwaters.org/> and an extensive resource for best practices at <http://projects.geosyntec.com/NPSManual/npsmanual.pdf>).

The Problem

Your team has been asked by your select board/mayor to make a presentation to the public about “stormwater management for the future.” What, they ask, are the problems and solutions? What, in your judgment, is the highest priority stormwater issue to be addressed?

These officials have heard the terms sustainable stormwater management, green infrastructure, and low impact development. They want your assessment of whether such strategies will be appropriate in specific instances in your community. They also want recommendations for how citizens, including young people, should be involved.

Your challenge is twofold: This general public audience will need a big picture overview of stormwater issues in the watershed. But you must also choose a specific high priority issue and convince them that certain steps should be taken to remedy the problem for the long run.

In your presentation, you should:

Acquaint your audience with stormwater issues in your community:

- Provide a geographic orientation to your watershed and runoff quantity and quality, including:
 - Physical features (including surface waters) and how water flows in the watershed
 - Land uses and nonpoint pollution sources
 - Extent of developed land and impervious surfaces
 - Drinking water supplies and wastewater treatment
- Provide an overview of current stormwater management in your community, including
 - Existing infrastructure. Compare examples of 20th century and 21st century stormwater management.
 - Nonstructural best management practices (e.g. public education) currently in use
 - Existing plans (e.g. EPA permit for stormwater discharge) for improving stormwater management
 - Opinions and judgments of local people who are involved with stormwater issues

Introduce the stormwater issue you have identified as highest priority.

- Sketch the outlines of future stormwater issues you see for your community.
- Describe the particular problem you have chosen, and why you have selected it as the highest priority. Include:
 - The geographic scope of the problem
 - The specific nature of the problem in terms of water quantity and quality
 - The history of the problem and any attempts to address it
 - The judgments and opinions of local officials, watershed advocates, and others about the significance of the problem

Provide your recommendations:

- Detail action steps you recommend, including
 - Structural (e.g. site engineering) best management practices
 - Nonstructural (e.g. education) best management practices
- Explain how these steps will make your community's stormwater management more sustainable for the 21st century.
- Detail how the public can be involved in decisions and actions.

Your team has the freedom to plan your own presentation as best fits what you want to say. YOU can choose whether, how, and in what order you will address the items above. Your presentation will stand out if you:

- **Use visual aids, especially maps**, to introduce the audience to your community and its resources and issues.
- **Answer these questions clearly:** What is the highest priority stormwater management issue your community faces, and why? How can it be addressed in the most sustainable way?
- **Describe firsthand experiences** of meeting with people who have knowledge and opinions about stormwater management. What do they see as the most important issues? What actions are they taking?
- **Tell true stories** about your experiences/surprises/adventures while following stormwater in your community.

Some Tips for Your Presentation

How it works:

- The Current Issue Presentation score is 25% of your team's total Envirothon score.
- You will make your presentation to a panel of five to eight judges. Their job is to listen, ask good questions, assess your work, and give you feedback on your research, your proposal, and your presentation.
- You will have 15 minutes for your presentation, followed by a 10 minute period when the judges can ask you questions.
- Five of the judges will give you a number score. The average of these will be your score for the competition.
- All the judges are asked to give you helpful comments. Copies of the score and review sheets are sent to your coach.
- Your coach will be able to observe the presentation.

Be Prepared! You will be presenting in a tent, outdoors. The day of the Envirothon is often surprisingly windy and cold, and sometimes wet. Mount your visual aids on sturdy boards in case of wind.

Practice your presentation. Practice makes it easier for you to be poised and at ease in your presentation, including being able to make good eye contact and speak naturally with the judges.

Show the judges how you know what you know, and how you came to your conclusions. Tell them about where you visited, who you talked to, what documents you researched.