

**Teaching notes:** Farming the floodplain: overcoming tradeoffs to achieve good river governance in New England

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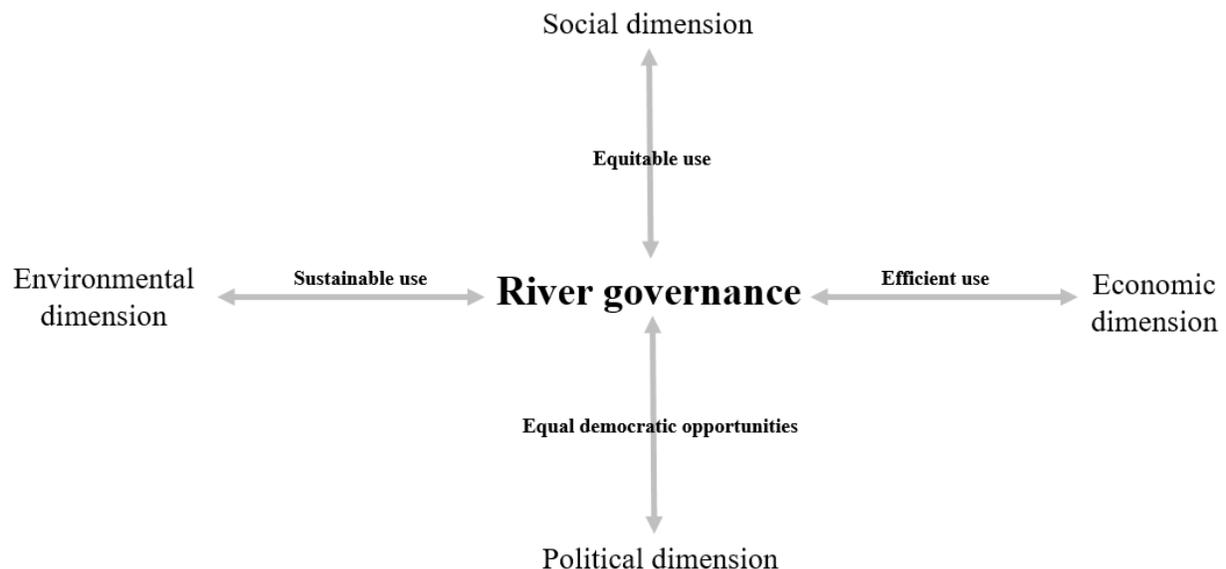
## Introduction

The goal of this case is for students to learn through the development of a sustainable river governance plan for Massachusetts focused on balancing needs and perspectives on local agriculture, flood resilience, and healthy ecosystems in the context of climate change. This will be challenging. Ideally, a river governance plan developed by the students would support local agriculture, increase flood resilience, and promote environmental stewardship. A role-playing exercise is included in this case that involves representatives of several stakeholders groups (personas assumed by a subset of students); these include a farmer, a fisher/recreationalist, a state river manager, an environmentalist, and a resident. The students will learn about the goals of a stakeholder to discuss with the others, negotiate with them, find ways to resolve conflicts and finally to create a governance plan. Specific learning objectives of this case are as follows:

1. Students should be able to articulate the different stakeholders and their perspectives in the examples they study, and be able to explain how each contributed to the governance process.
2. Students should be able to assess and explain the extent to which sustainable governance was achieved.
3. Students should be able to describe the complexity of environmental management problems and the diverse stakeholders and interests involved in creating sustainable river governance.

Good river governance requires that multiple stakeholder groups have their concerns and goals addressed through collective action and/or regulation. In an era of increasing flood frequency due to climate change, it is important that all stakeholders be able to reasonably protect themselves from the negative impacts of flooding. In Massachusetts, agricultural and non-agricultural stakeholders agree that river management policy should be revised, though doing so is challenging. A new governance system needs to be developed that clearly explains who has the right to manage river corridors, which will determine the amount of flood risk faced by both farmers and downstream communities. The representation of various interests in river-related decision-making and the role of power and politics are important factors to consider when developing this new governance system. These dynamics are complex, but they can be structured around four fundamental dimensions of natural resource governance (see Figure):

1. Social dimension, which focuses on equity of access to and use of resources. This includes issues such as the equitable distribution of resources and services among various social and economic groups and its effects on society.
2. Economic dimension, which highlights efficiency in resource use.
3. Political dimension, which focuses on providing stakeholders with equal rights and opportunities to take part in various decision-making processes.
4. Environmental dimension, which emphasizes sustainable use of resources and related ecosystem services.



**Figure** – The dimension of river governance (Jacobson, Meyer, Oia, Reddy, & Tropp, 2013)

Using the case study described above, students will assume different stakeholder roles and debate potential changes to the current Massachusetts Wetlands Protection Act (provided in supplemental material). Additional details for this role-playing game (RPG) will be provided in the accompanying lecture; additional details are also provided below. After the RPG, students will reconvene to work, using this governance framework, to develop a sustainable river governance plan that could meet the needs of each stakeholder represented in this case.

## Objectives

The objectives of this case are (1) to educate undergraduate students on the value and functions of rivers from different perspectives, (2) to demonstrate to students the complexity of environmental management problems and the diverse stakeholders and interests involved in creating sustainable river governance, and (3) to show, through dialogue supported by science, that stakeholders may civilly resolve difficult environmental management problems.

Additionally, this case study will allow students to develop and refine debate and public speaking skills, and teamwork. This two-step case is designed to enrich student curiosity in environmental governance through their own research, to show them how to take positions different to their own, to engage them in a dialogue, and finally to allow them to synthesize what they have learned to be able to describe the issues and challenges in environmental governance in the context of climate change.

## Process overview

Before starting the case, please review this document, the written case study, the Massachusetts Wetlands Protection Act, and the associated PowerPoint presentation. We have created a set of three steps that must be completed for the proper application of this module.

Step 1: (performed prior to class meeting) Students should be given the following essay assignment, to be completed as homework: Identify a journal article, magazine article, or news story that addresses a contemporary example of environmental governance in the context of climate change. Using this example, articulate the different stakeholders and their perspectives, and then explain how each contributed to (or was excluded from) the governance process. Assess the extent to which sustainable governance was achieved, and explain why you think so. (Hint: to do this, you will have to define *sustainable governance*.)

Step 2: The second step is a role playing game. It is based on the case study presented with these teaching notes and involves five stakeholders with different interests and demands. The aim is to understand together the issues involved in river governance and to create solutions through dialogue between various stakeholders.

## Process specifics

### *Step 1: Governance essay assignment*

Goal: To help students understand natural resource governance.

Learning objectives:

4. Students should be able to articulate the different stakeholders and their perspectives in the examples they study, and be able to explain how each contributed to the governance process.
5. Students should be able to assess and explain the extent to which sustainable governance was achieved.

Materials: Primary case study document

Location: Outside of class, before the role playing game

Estimated duration: 7 hours for a student to research and draft an 800-word essay.

Description of the activity: Assign this case study's primary case study document as a reading assignment, and then ask students to identify an unrelated journal article, magazine article, or news story that addresses a contemporary example of environmental governance in the context of climate change. Students can use descriptions and definitions of environmental governance found in the primary case study document to structure their analysis. Using their unrelated example, students should articulate the different stakeholders and their perspectives, and then explain how each contributed to the governance process. Students should assess the extent to which sustainable governance was achieved, and explain why.

Instructors should grade student essays using the following rubric:

TOPIC	Unsatisfactory (1)	(2)	Satisfactory (3)	(4)	Well done (5)
Use of environmental governance framework					
Selection of new governance article					
Articulated stakeholder perspectives					
Explanation of governance process					

### ***Step 2: Role playing game***

Goal: To demonstrate to students the complexity of environmental management problems and the diverse stakeholders and interests involved in creating sustainable river governance.

Learning objectives:

Materials: PowerPoint presentation (CaseStudySlides.ppt)

Location: In class

Estimated duration: 1.5 hour class period.

Description of the activity: Before starting this activity, present the case study PowerPoint presentation associated with this material; this presentation should take 15 minutes.

Next, divide the class into groups of five (there are 5 stakeholder roles). The aim of each group is to develop and present the best possible river management plan, using the sustainable governance framework presented in the reading. Groups must ensure that all five stakeholders have been heard and have agreed on a common strategy. This should take 45 minutes. Each of the five roles are as follows (student roles may also be provided to students; see

CaseStudyStudentRoles.doc):

1. **RIVER MANAGER:** You are a Massachusetts river manager, and your goal is to promote mixed-use management of rivers. You are to ensure that any new management scheme is both environmentally and socially conscious. Your responsibility in your group is to facilitate and to ensure that all members of the group are able to share their ideas and contribute to the development of a new plan. Ultimately, you must ensure that any proposed plan includes all elements of the sustainable governance framework provided in the case study.
2. **FARMER:** You farm 40 acres of vegetable fields in northwest Massachusetts. Your family has farmed this land for six generations. Very recently, you have experienced major losses of farmland and topsoil due to flooding of the river that runs through your property. In the past you have used your tractor to dredge the river and have placed large stones along its banks to reduce erosion. While this protects your field, it also increases the velocity of the water. This is a problem because you are directly upstream of a small town. You must work with residents, fishers, and other stakeholders to develop a management plan that may meet your needs and the needs of the other stakeholders.
3. **FISHER/RECREATIONALIST:** You have fly-fished trout in western Massachusetts and southern Vermont for most of your adult life. Recently, you have noticed that the number fish in local rivers are decreasing because trout habitat—wild, unaltered stretches of river—is being reduced. This reduction is being caused as people who live and work along the river try to protect themselves from floods by building levees, shoring up riverbanks with rocks, or dredging the rivers to make more space for water. You side with the Environmentalist in that all people and human activities should be moved away from rivers. However, you must work with those people in your group to develop a plan to meet all your river management needs.
4. **RESIDENT:** You are worried about flood impacts from the river that borders your property. While you have considered building a levee and placing stones along the bank to protect you land and house from erosion, you do not have the equipment or expertise to do so. Additionally, you have seen water velocity in the river increase because the farmer upstream has channeled the river. You blame the farmer for putting your land and house at greater flood risk. You think that upstream land should be allowed to flood to slow water velocity and absorb floodwaters; this would protect you and your neighbors from future floods.
5. **ENVIRONMENTALIST:** You have dedicated your life to protecting wild places across New England. You have recently joined with fishers in advocating for the protection of rivers in Western Massachusetts and Vermont. You advocate for a buy-out program in which the states allocate money to purchase all land along certain rivers to remove people and human activities. You see any manipulation of the river as uncalled for.

In the final portion of the class, each group takes 7 minutes to present their plan to all other groups. Presentations should be structured using the sustainable governance framework presented in the case study. To facilitate the discussion, the instructor should look for inclusion of all stakeholder perspectives into the governance plan and for areas of friction or conflict. The instructor should ask presenters to “unpack” any stakeholder disagreements that were not specifically addressed in the governance plan. In addition, common elements of governance plans may include enforcement mechanisms, communication mechanisms, methods of

sanctioning rule breakers, and methods to overcome stakeholder conflicts.

After each group has presented, the teacher is to facilitate a discussion with the entire class in which students articulate what they liked and did not like about other groups plans. The teacher may wish to ask students to vote to determine the best plan, or they may simply discuss pros and cons of each.