SMC Earth Sciences
ES7-Geog7 Lecture 3
G. Leddy

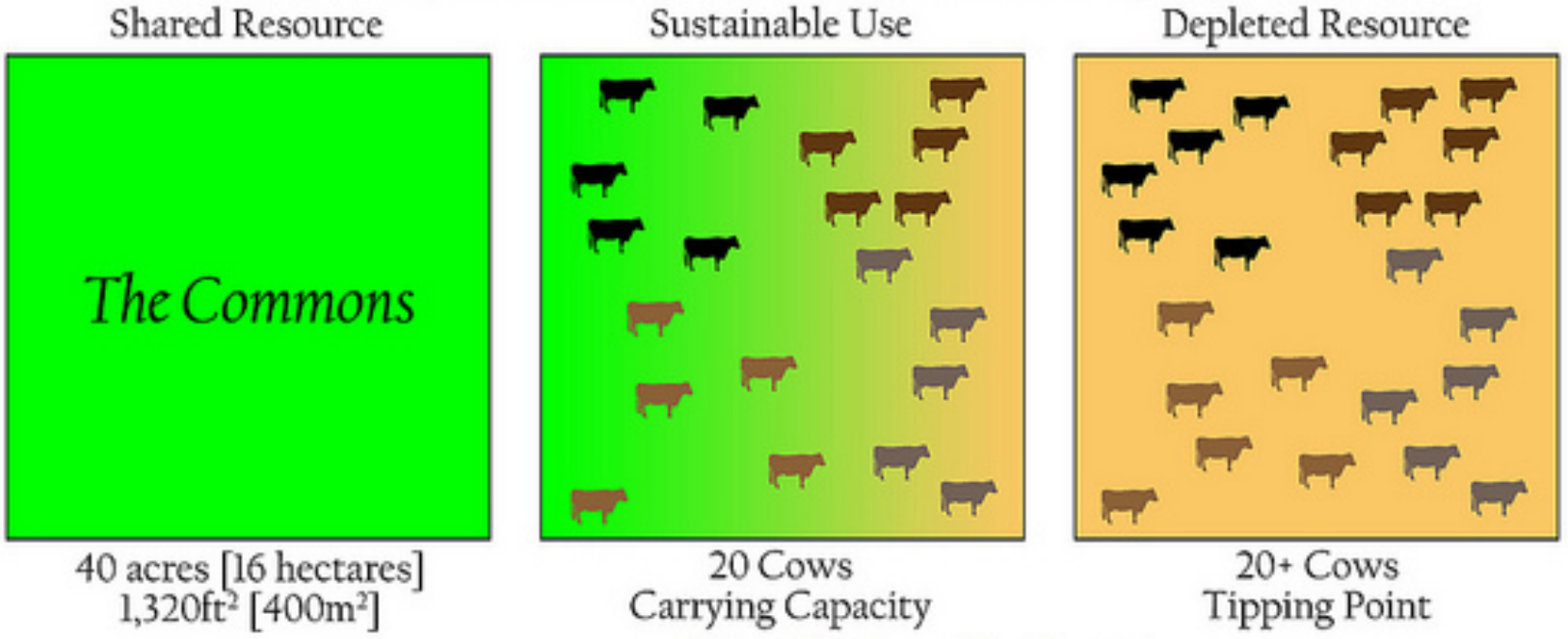
Tragedy of the commons

"A **dilemma** arising from the situation in which multiple individuals, **acting independently** and rationally consulting their **own self-interest**, will ultimately **deplete** a shared limited **resource**, even when it is clear that it is not in anyone's long-term interest for this to happen."

http://en.wikipedia.org/wiki/Tragedy_of_the_commons

The Tragedy of the Commons

Imagine an open pasture shared by multiple cattle owners. Each owner increases their herd to maximize their benefit. With an unregulated resource this is "logical" since the benefit is enjoyed by the individual and the impacts are shared by all. This leads to the ultimate overgrazing of the pasture.



The Tragedy of the Commons applies to numerous environmental, economic and social phenomena and has particular relevance to greenhouse gas regulation related to global warming.

Hardin, G. (1968-12-13) "The Tragedy of the Commons" Science 162 (3859) : 1243-1248
The "commons" dimensions and formulae are for illustrative purposes only.

Stephens Planning & Design LLC
May 10, 2011

Garrett Hardin – Economist

Authored essay in 1968 titled "The Tragedy of the Commons".

Focuses on:

1. environmental degradation
2. population growth
3. limited natural resources
4. privatization of land

SCIENTIFIC AMERICAN

The Tragedy of the *Tragedy of the Commons*

The man who wrote one of environmentalism's most-cited essays was a racist, eugenicist, nativist and Islamaphobe—plus his argument was wrong

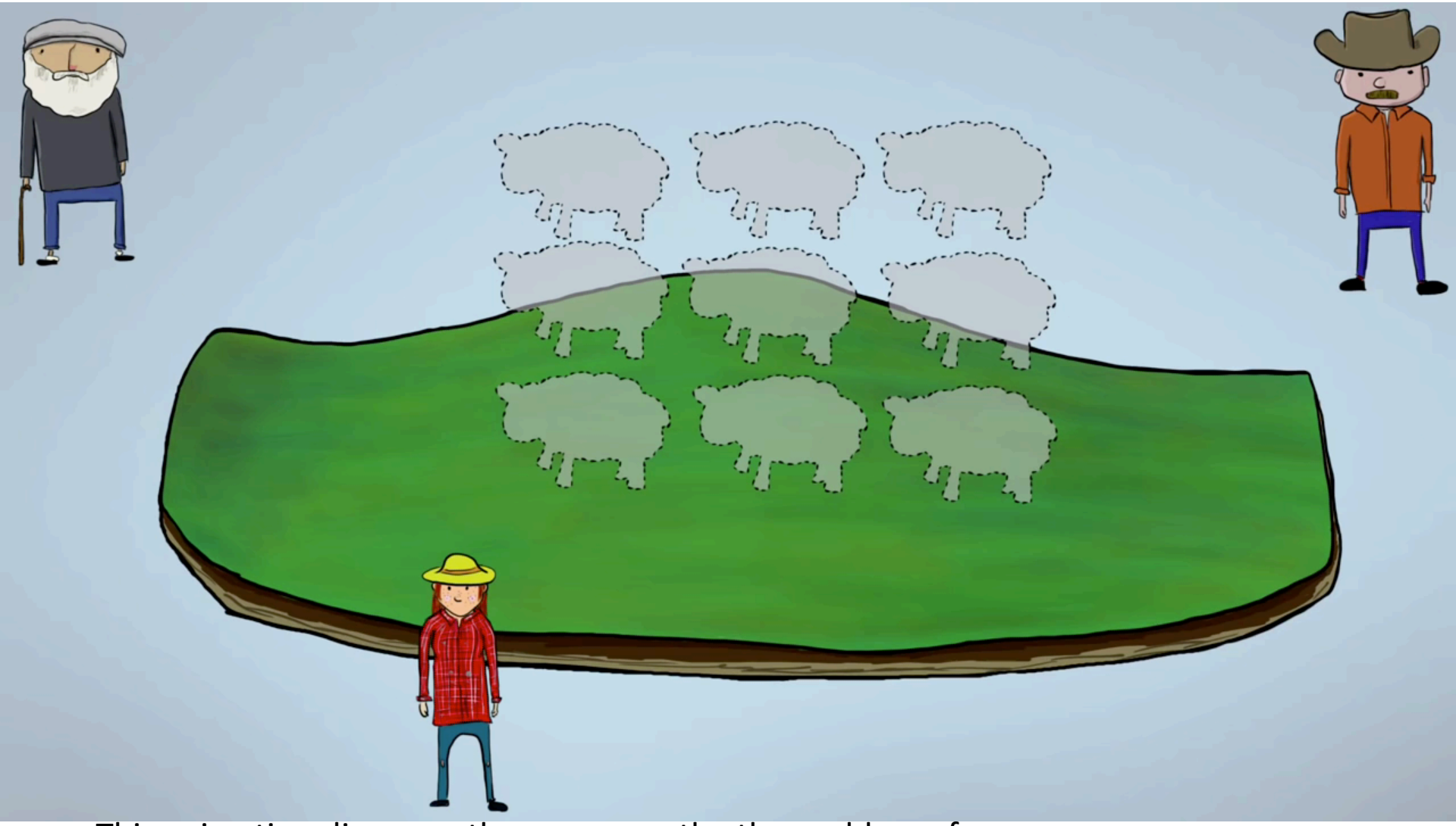
By Matto Mildenberger on April 23, 2019

cycle of environmental degradation that Hardin described as the "tragedy of the commons."

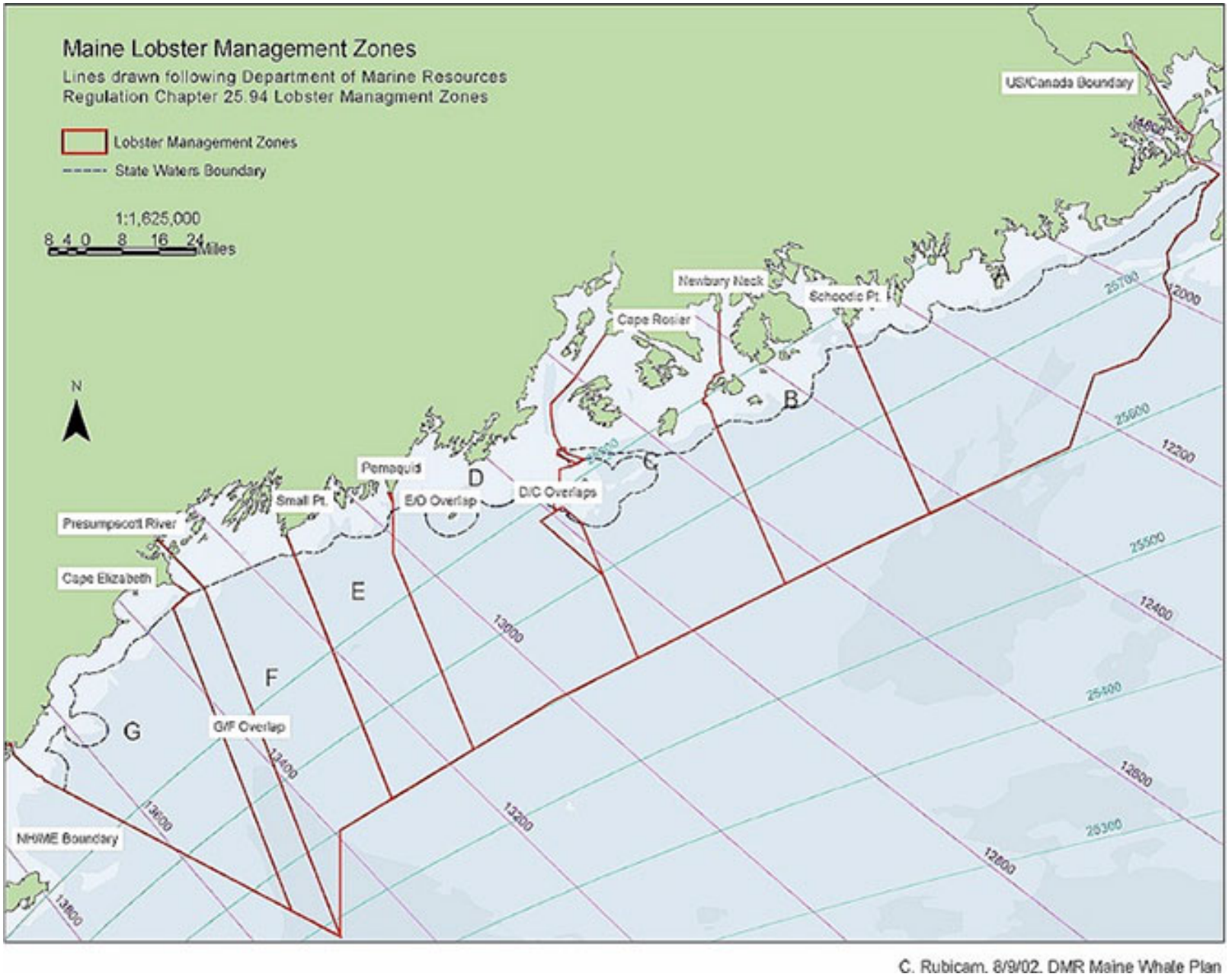
It's hard to overstate Hardin's impact on modern environmentalism. His views are taught across ecology, economics, political science and environmental studies. His essay remains an academic blockbuster, with almost 40,000 citations. It still gets republished in prominent environmental anthologies.

But here are some inconvenient truths: Hardin was a racist, eugenicist, nativist and Islamophobe. He is listed by the Southern Poverty Law Center as a known white nationalist. His writings and political activism helped inspire the anti-immigrant hatred spilling across America today.

And he promoted an idea he called "lifeboat ethics":



This animation discusses the commons the the problem of open access.



The Lobster “fiefs” of Maine managed as common property with limited access.

James Acheson, The Lobster Fiefs: Economic and Ecological Effects of Territoriality in the Maine Lobster Industry

- Informal property right exist in the Maine Lobster Industry, these territorial arrangements have substantial economic and ecological impact.

- Background: Federal Government has made no effort to regulate the lobster industry. State has few conservation laws.
- Only 37 state fishery wardens for over 2500 miles of coast, yet the laws on size of lobster caught are universally obeyed.
- Maine laws do not begin to solve problems inherent in managing the common property resource. They do not limit entry in to the fishing industry and they do little to restrict fishing effort.

Argument: Informal norms concerning territoriality certainly do operate to limit both.

- From a legal standpoint, anyone with a license can go fishing anywhere, in reality, far more is required (acceptance into a harbor gang).

- Delineation of boundaries varies with distance from shore. Close to shore, boundaries are often known to the yard, offshore they are less definite.

- Failure to obey the informal property rights often ends up in threats of violence, cutting traps, even full blown lobster wars.

- Two types of lobster fishing areas (1) Nucleated and (2) Perimeter Defended. Shifting from (2) to (1) explains some of the overexploitation of lobster in Maine.

- Conservation efforts are practiced in type (2).

e.g. Voluntarily agreed to limit the number of traps they fish. Ecological and economic implications include

a) Decreased production cost.

b) Lower lobster mortality rates

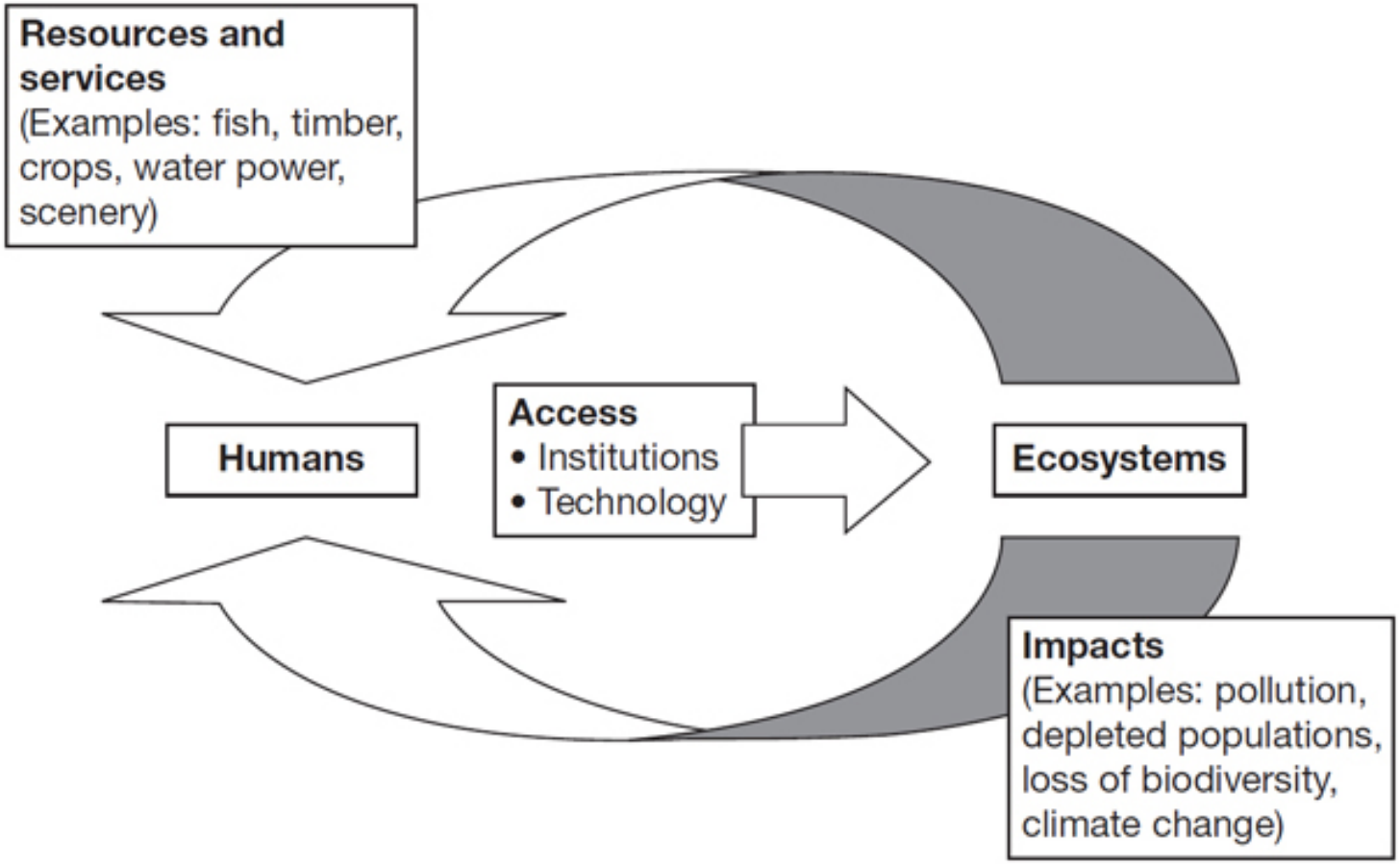
c) Trap limits do NOT cut down total catch. When trap limits are imposed, men dispense with the marginal traps and put remainder to better use. Yield per trap increases.

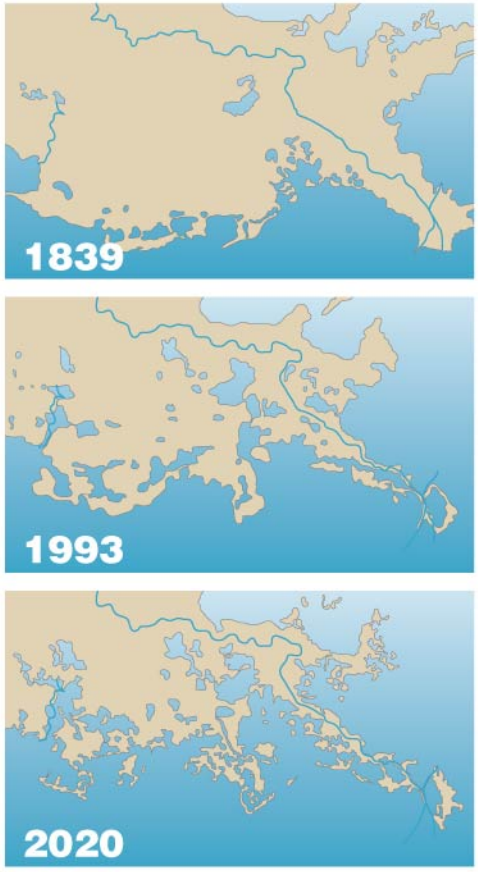
d) Men in type (2) have substantially larger incomes, catching more and bigger lobsters.

e) This occurs at a reduced fishing effort.

Management Implications

- State of Maine does not take advantage of the principle of having more well defined property rights.
- State has not instituted any of the conservation measures men in (2) have instituted for themselves.
- Administrative cost with establishing and maintaining small exclusive fishing areas would be prohibitive.


Resources and services
(Examples: fish, timber, crops, water power, scenery)
Humans
Access
• Institutions
• Technology
Ecosystems
Impacts
(Examples: pollution, depleted populations, loss of biodiversity, climate change)



(a) Coastal wetland area in 1839, 1993, and 2020

(b) Mississippi River watershed

(c) Sediment plumes from Mississippi River entering Gulf

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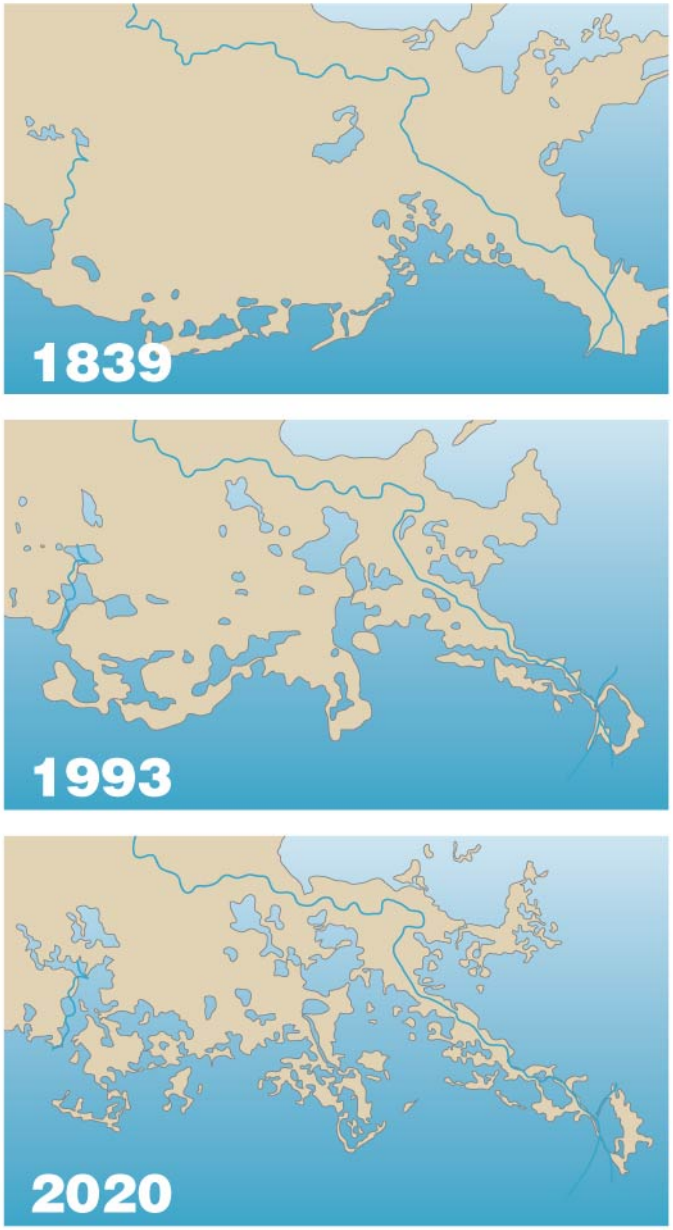

(a) Coastal wetland area in 1839, 1993, and 2020

(c) Sediment plumes from Mississippi River entering Gulf

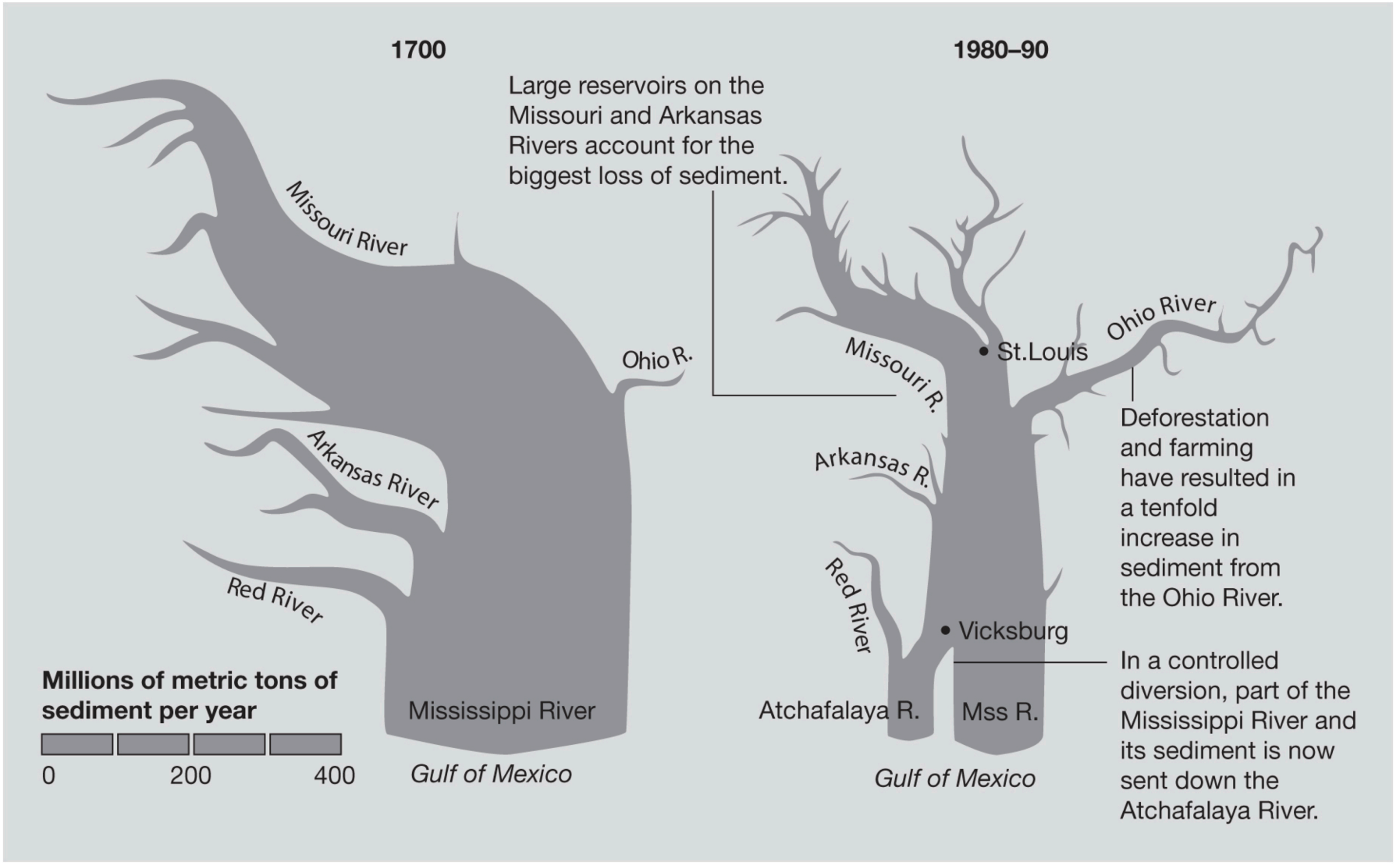
1700
1980–90
Large reservoirs on the Missouri and Arkansas Rivers account for the biggest loss of sediment.
Missouri River
Ohio R.
Arkansas River
Red River
Mississippi River
Gulf of Mexico
Millions of metric tons of sediment per year
0
200
400
Missouri R.
St.Louis
Ohio River
Arkansas R.
Red River
Vicksburg
Atchafalaya R.
Mss R.
Gulf of Mexico
Deforestation and farming have resulted in a tenfold increase in sediment from the Ohio River.
In a controlled diversion, part of the Mississippi River and its sediment is now sent down the Atchafalaya River.

TABLE 3.1 COMMUNITY-GOVERNANCE PRINCIPLES FOR WELL-MANAGED COMMONS

1. The boundaries and membership are clearly defined.
2. The rules fit local conditions.
3. The rules are open to modification by participants.
4. Monitoring is effective and affordable.
5. Enforcement relies on *graduated* sanctions.
6. Conflict resolution is fast and fair.
7. Control is local.
8. Local control is exercised within nested institutions.

TABLE 3.2 MISMATCHES BETWEEN HUMAN USE AND NATURAL SYSTEMS

Mismatch	*Examples of environmental problem*	*Possible solutions*
Spatial (benefits are localized, costs are widespread)	Pollution; climate change	Regulation; technology; transparency
Temporal (benefits are immediate, costs are delayed)	Over-harvesting of fish or trees; buildings that can't withstand earthquakes	Binding agreements (insurance, liability laws) based on measurement and projection
Functional (benefits follow functional use, costs are defined as "external")	Water rights; sprawl	Enable larger range of stakeholders to participate; transparency; wider scope and accountability for planning