



* **HUMAN DIMENSIONS OF
MARINE ECOSYSTEMS**

Lecture 11 - Nov 16th, 2015

Intro to Marine Science

Instructor: Lauren Bell

* Learning objectives

After this lesson, you will be able to:

- Define "environmental ethics" and give an example of a modern resource which has come under a debate over environmental ethics
- List several ways in which fisheries are important to humans (besides economically and nutritionally)
- Describe why wealthy people and countries often benefit from marine resources more than the poorer people and communities that live directly on the water
- Differentiate between "Tragedy of the Commons" and "Tragedy of Open Access"

*Ethics

A branch of philosophy dealing with morality
(right vs. wrong)

ENVIRONMENTAL ETHICS

How should humans treat the environment?

Our discourse (the way we talk about this topic) has changed over time



* Anthropocentrism

In Western history, man is the most important being

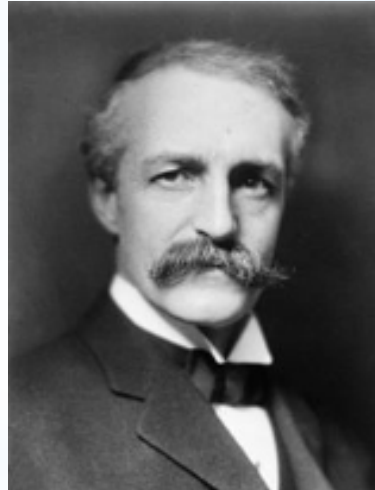
- Man is 'separate' from nature
- Humans 'superior' to nature, have dominion over it
- Nature only valuable in its usefulness to man

John Locke
(1632-1704)



Locke's Second Treatise on Government (1690):

- Human labor gives nature value (becomes property)
- Spurred development of United States



Gifford Pinchot
(1865-1946)

1st Chief of
U.S. Forest Service

Believed in:

Utilitarianism - value of nature based on its usefulness to people

Conservation - efficient and sustainable resource use for "greatest good for greatest number"

*Ecocentrism

Natural world / ecological relationships most important

- Interdependence of system components
- Nature has own intrinsic value - we have nothing to do with it
- 'Moral extensionism' to 'sentient' beings (who?)

John Muir
(1838-1914)

Founder of
Sierra Club



Aldo Leopold
(1887-1948)

Author -
A Sand County Almanac

Believed in:

Preservation - the management of resources or the environment for protection *for its own sake*

“A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise”

-Leopold 1949

*Ethics and marine resources

Subject	Objective
Ecosystem	Ecosystem well-being
Fish stocks	Conservation
Fisheries	Responsible fisheries, sustainable development
Fishers	Safety on board, freedom and well-being, just access
Fishing communities	Eradication of poverty, cultural diversity
Other stakeholders	Cross-sectoral equity, societal efficiency
Consumers	Right to food, food safety
Politicians	Transparent policies, public deliberation

FAO: <ftp://ftp.fao.org/docrep/fao/008/y6634e/y6634e00.pdf>

Marine resource use from a variety of viewpoints:

- Is industrial fishing a defensible practice?
- Is aquaculture a defensible practice?
- Are marine protected areas defensible?
- Who has the legal right to fish?
- Who has the moral right to fish?

*What is “Wilderness”?



What does the concept mean to you?

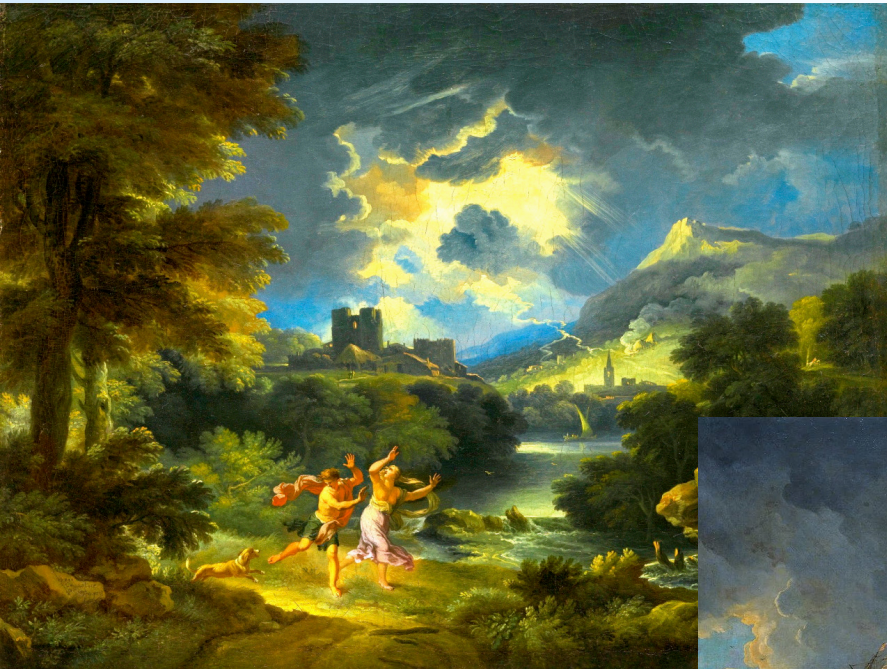


* “Wilderness” through time

17th and 18th centuries in Europe & America

“deserted, savage, desolate, barren, wasteland”

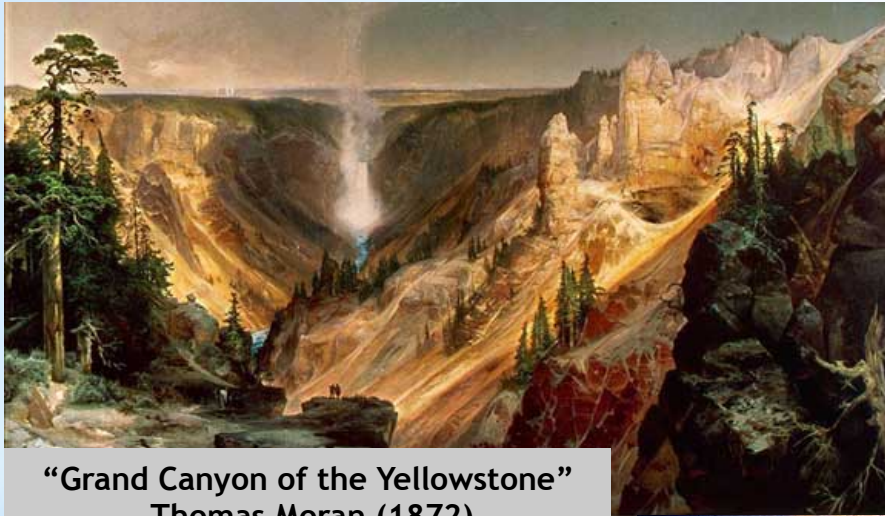
Inspired bewilderment and terror



* “Wilderness” through time

By mid-19th century ideas about wilderness transform

Two key ideas: “sublime” & “frontier”



“Grand Canyon of the Yellowstone”
Thomas Moran (1872)



* “Wilderness” through time

Today - what kind of rhetoric do you hear?

ANWR



It is the last vestige of quintessential American wilderness, a microcosm of our original frontier - the Arctic National Wildlife Refuge....the "Serengeti of the North"

-The Inquirer

*Wow, look how pretty that is. It's flat, it's watery. Mosquito infested for your enjoyment during the summer months. And when all the cute caribou leave for the winter, ANWR looks even more like Prudhoe Bay; a snowy, barren wasteland.... There's nothing there. There is an Eskimo tribe that lives near this ANWR area; a group of 240 people who actually want us to drill because they know we can drill in a responsible way, but **there's nothing there.***

- Glen Beck and John Boehner

*The trouble with “wilderness”

It keeps separate: non-human from human
nature from culture
a ‘paradise’ for leisure
from a home realm



If we deem something to be mediocre, is it then not worth looking after?

“my principle objection to wilderness is that it may teach us to be dismissive or even contemptuous of humble places & experiences”

- William Cronon (1995)

* Wilderness & ethics - Pebble Mine



6.44 billion
tonnes of ore
deposits
= \$300 billion
total

\$1.5 billion / year,
12,000 local jobs

DISCOURSE:

- which is the “right” resource to use
- anthro vs. eco centric
- “perpetual remediation”
- Cultural value

*Transboundary mines

[https://
www.salmonbeyo
ndborders.org/
xboundary-
film.html](https://www.salmonbeyondborders.org/xboundary-film.html)

Listen to:

- Discourse used
- Issues discussed
- Comparisons
- Portrayal of mining executive



* Environmental justice

THEORY:

Low income & minority communities are disproportionately exposed to environmental risks & harms, and receive less benefit

This can take the form of either:

1. Intentional discrimination

- Low income & minority communities targeted intentionally for waste or toxic facilities due to their lack of economic & political power
- “Economic blackmail”

2. Institutional discrimination

- Historical patterns of discrimination & inequity in legal structures, lending practices, salaries, access to education, political opportunities...
- Built into structure of society



* EJ and fisheries

“small-scale fishers tend to be marginalized in social, economic, and political terms, and often include indigenous groups, disadvantaged castes and other groups who face particular obstacles to participation in broader development decision-making”

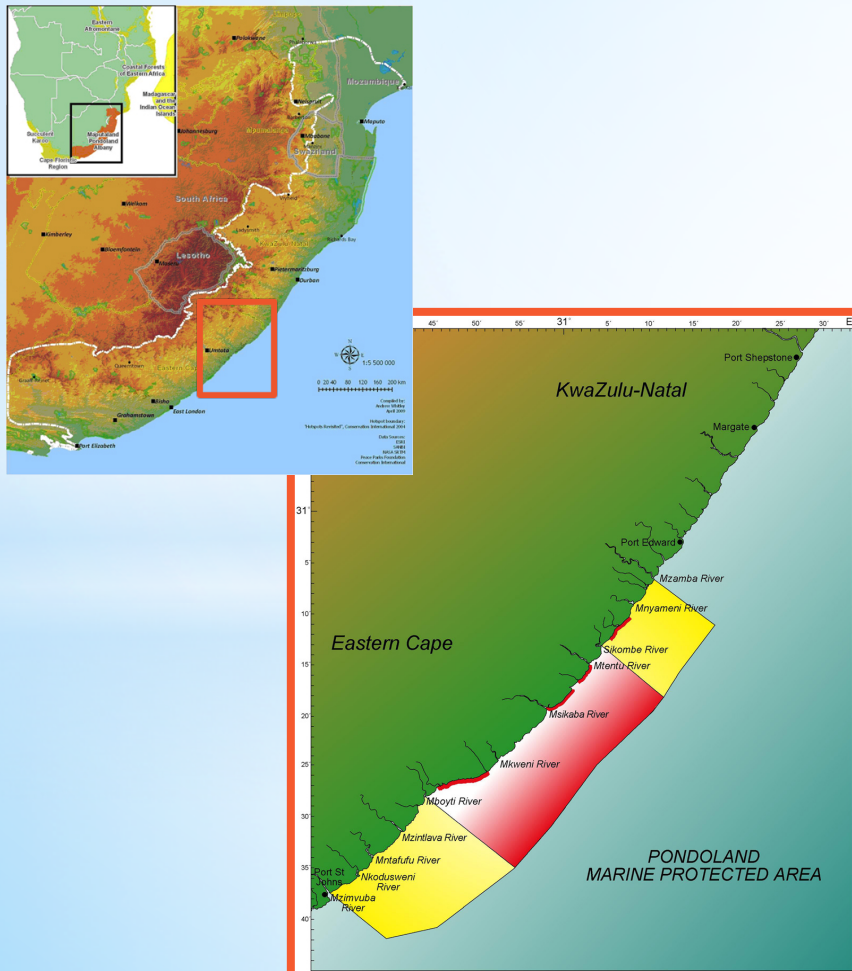
-Ratner et al. 2014



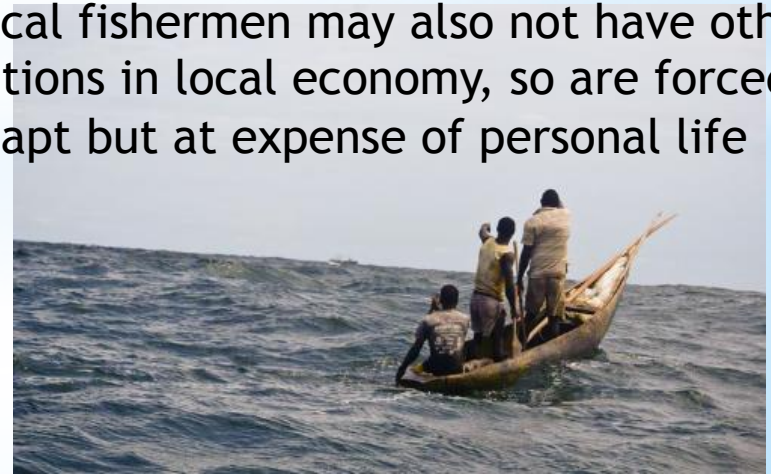
* EJ and fisheries

Marine Protected Areas (MPAs)

Areas designated to protect nursery grounds for commercially important species



- Often placed nearshore, where local, small-scale fishermen fish
- Large, industrial trawlers are not as affected by MPAs
- Small-scale, poor fishermen may not be able to afford to fish outside of local waters (extra gas, time, bigger boats required)
- Local fishermen may also not have other options in local economy, so are forced to adapt but at expense of personal life



* EJ and fisheries - case study

Hawaii-based longline fishery

- Lands vast majority of Hawaii's pelagic commercial catch
- Capped at 164 permits; 1/3 owned by Vietnamese-Americans
- Since 1980's nearly all V-A fishermen targeted swordfish
- By 2000, swordfish was largest component of fishery
- In 2001, NMFS prohibited targeting swordfish due to interactions with endangered sea turtles
- V-A fishermen disproportionally affected
- Language barriers; intentionally left out of decision process(?)
- Loss of income, cultural impacts, quality of life



* Humans' relationship with marine systems

Marine resources importance beyond economy & food

- “Fishing as a way of life”
- Heritage and cultural tradition
- Community narrative and identity
- Pride at ability as community/family “provider”
- Community cohesion and structuring relationships



*Types of resources

	Excludable	Non-excludable
Subtractable	Private goods (cars, clothing)	Common pool resources (fish, timber)
Non-subtractable	Club goods (cinemas, private parks, satellite TV)	Public goods (public radio, air, national defense)

* Common-pool resource

Characteristics:

- Exclusion is difficult, costly, impossible
Fish, migratory species, ground water, range & forest land, oceans
- Subtractability - my use detracts from your use
Examples, more boats fishing = less fish overall, less catch per unit effort



*Fishing Property Rights

At least 4 basic types:

1) Open access:

- No ownership claims, resource available to all

2) Commons (a.k.a. common-property system):

- Community or collective ownership & access

3) Private property:

- Individual, kin group, or corporate ownership

4) State property:

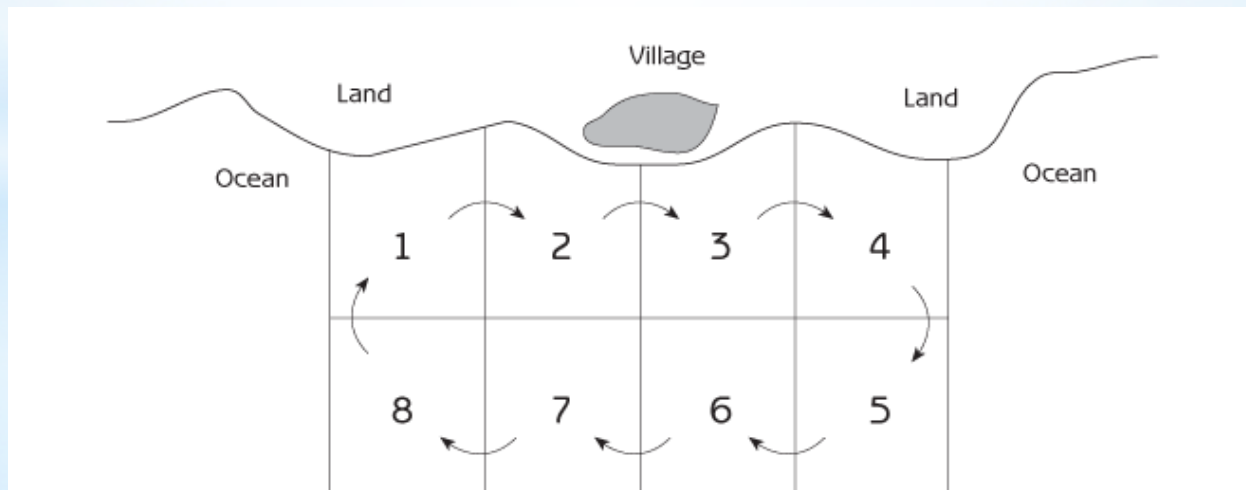
- Autocratic or democratic control over access & use

*Common-property system

Community or collective ownership

Successful common-property systems tend to share characteristics:

- Restrict resource access/use to members
- Have management rules governing resource use
- Have a system for monitoring adherence to these rules
- Impose sanctions (punishment) on violators

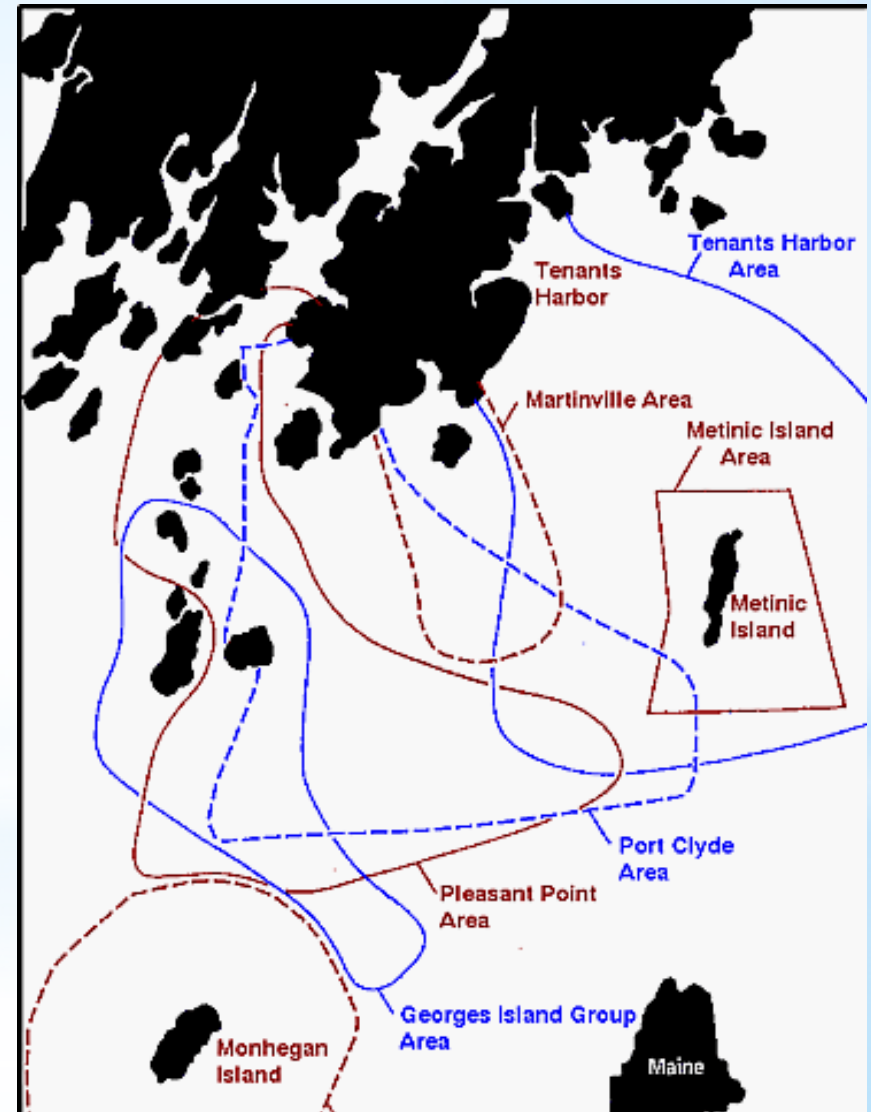


* Common-property examples

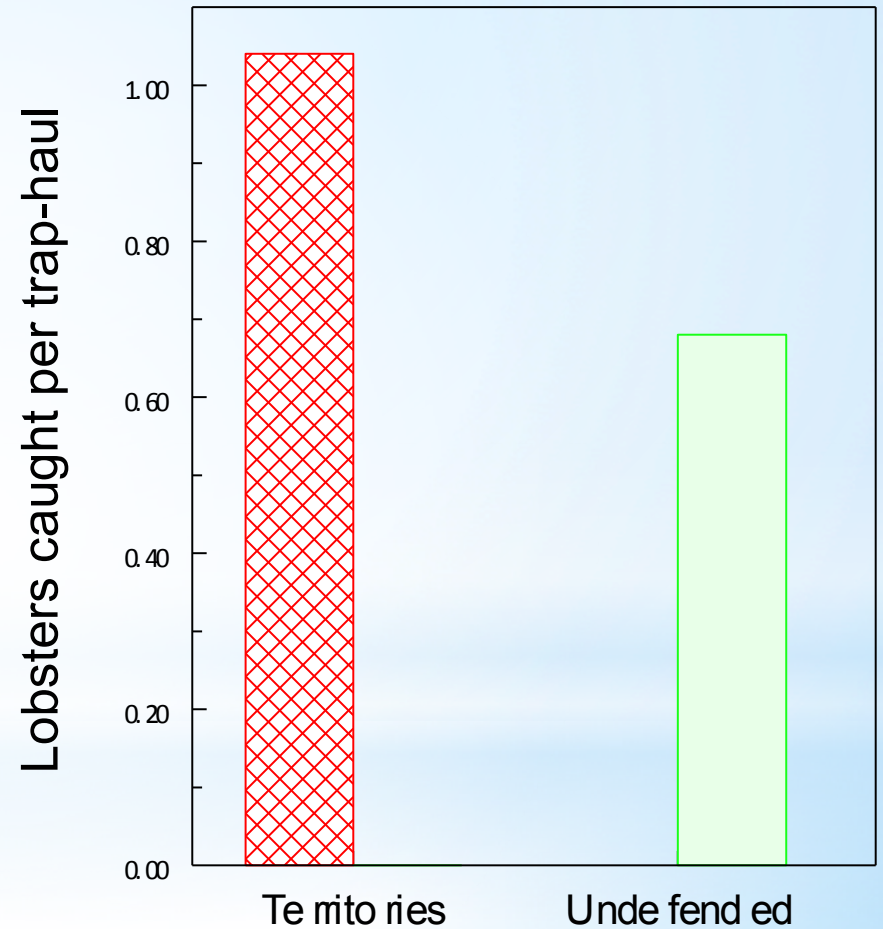
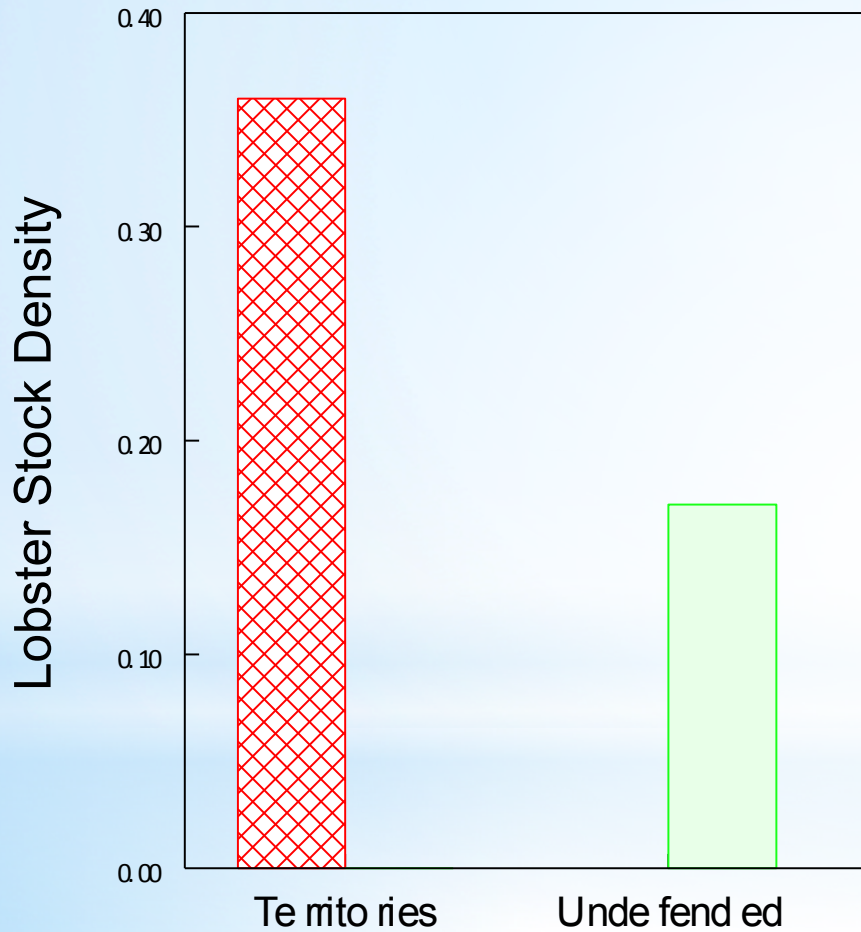
Location	Resource	Management Rules	Regulated Access	Monitoring	Sanctions
Törbel, Switzerland	Alpine pastures	Limit on grazing stock	Village residents	Informal	Fines
Japan; India; Thailand	Forests	Limit on type & amt. of use	Village residents	Informal	Social pressure
Rural Spain (several)	Irrigation water	Limit on timing & amt. of use	Watershed residents	Informal	Fines, formal hearings
Coastal Maine	Lobster	Fishing territories	Village residents	Informal	Destruction of traps
Palau, Micronesia	Nearshore fisheries	Limits on gear, effort, timing	Lagoon residents	Formal & informal	Confiscation, fines
Kei Islands, Indonesia	Commercial shellfish	Limits on effort, season, gear	Village residents	Formal	Fines, beatings
Bacarra-Vintar, Philippines	Irrigation water	Limit on timing & amt. of use	Watershed residents	Formal	Fines

* Case study: Maine Lobster fishery

- Lobster-fishing grounds legally open-access (if have lobstering license)
- But *de facto* system of territories in many fishing communities (lobster “gangs”)
- Anyone who violates access restrictions ends subject to (illegal) gear sabotage
- New fishermen can only enter the system if someone retires or dies

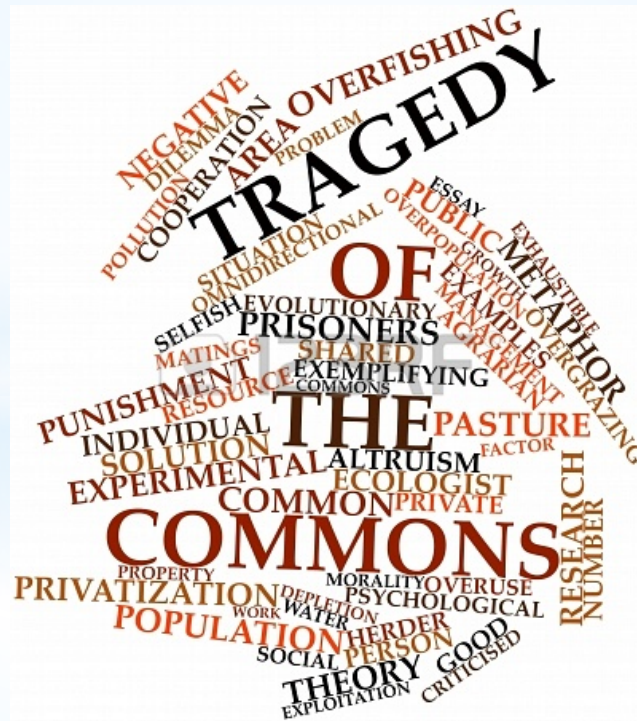
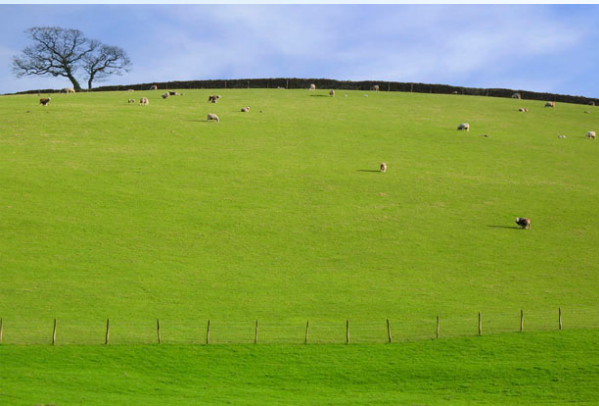


* Case study: Maine Lobster fishery



*Tragedy of the commons?

- A kind of collective action problem
- Individuals pursuing their own best interests tend to create collective outcomes that are not optimal
- If they cooperated, better collective outcomes



*Prisoner's dilemma

- Why might “rational” individuals not cooperate, even when in best interest to do so?

Situation:

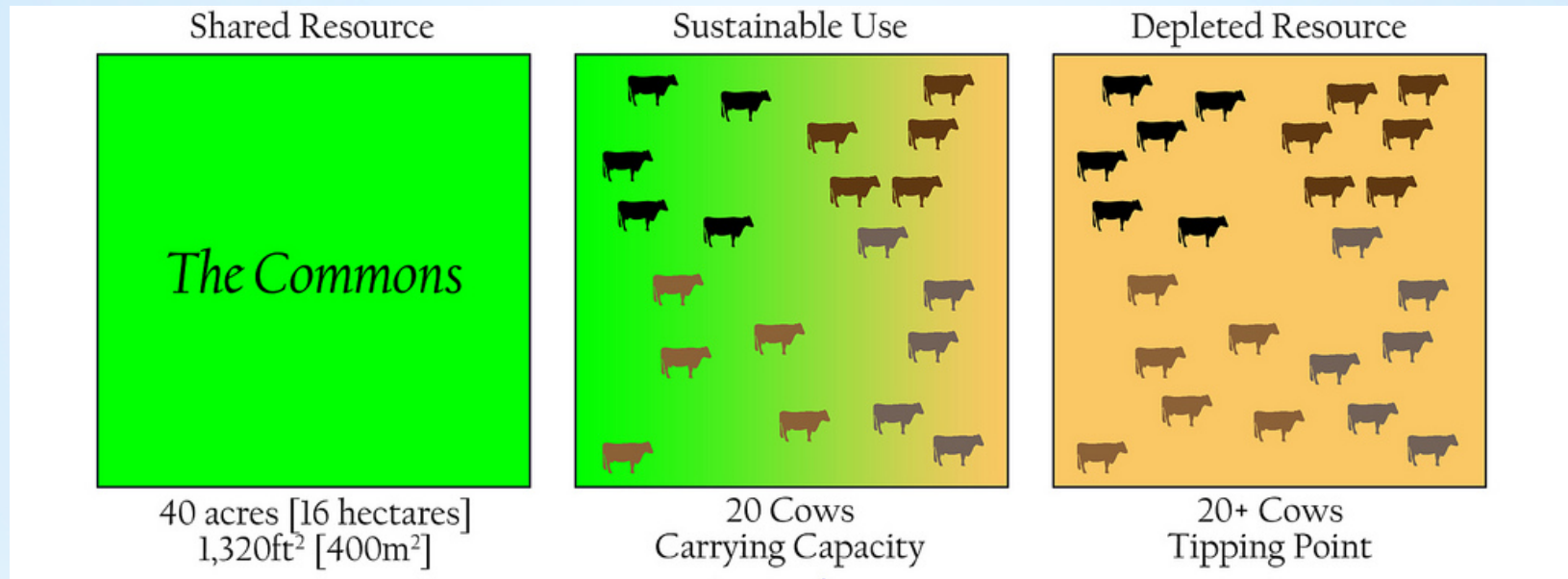
Two members of a criminal gang (Autumn & Bryan) are arrested and imprisoned. Each prisoner is in solitary confinement with no means of communicating with the other. The prosecutors lack sufficient evidence to convict the pair on the principal charge. They hope to get both sentenced to a year in prison on a lesser charge. Simultaneously, the prosecutors offer each prisoner a bargain. Each prisoner is given the opportunity either to: betray the other by testifying that the other committed the crime, or to cooperate with the other by remaining silent.

	Autumn stays silent (cooperates)	Autumn confesses (defects)
Bryan stays silent (cooperates)		
Bryan confesses (defects)		

*Prisoner's dilemma

	Autumn stays silent (cooperates)	Autumn confesses (defects)
Bryan stays silent (cooperates)	Both: jail for 1 year	Bryan: jail for 10 years, Autumn: goes free
Bryan confesses (defects)	Autumn: jail for 10 years Bryan: goes free	Both: jail for 5 years

*We are all just “rational actors”



“As a rational being, each herdsman seeks to maximize his gain.”

- Garret Hardin 1968

What is the utility (some benefit gained) of adding one more animal to my herd?

- Herdsman receives all the benefits of adding one more animal
- He shares in the collective cost of that animal’s contribution to overgrazing/habitat destruction

*Tragedy of the commons?

A collective action problem:

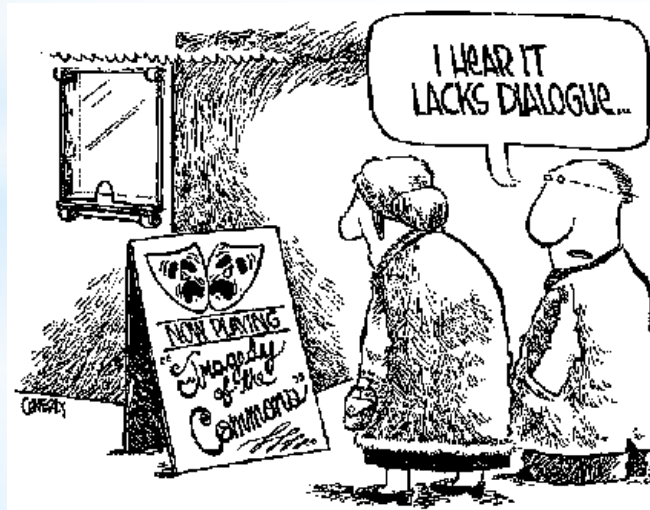
When cooperation entails individual cost for collective benefit

Key features of Tragedy of Commons:

1) **Open-access problem:** no restrictions on resource access; thus users have little incentive to conserve or manage the habitat or resource

*****so, tragedy is of common pool resource,
NOT common property system*****

2) **Free-rider problem:** users can singly reap benefits (use resources) while sharing costs (e.g., resource depletion)



Really talking about
Tragedy of Open Access,
rather than
Tragedy of Commons

* 'Solving' TOC

Commonly proposed solutions:

1. Private property rights
2. Strong centralized control of use & access

Problems with this.....

- Oversimplifies variety of property rights
- Overlooks ways people have avoided tragedy of the commons without resorting to private ownership or centralized gov't

Eliminating communal systems (which have had widespread success) often leads to overharvesting or habitat degradation

- * *Conversion to open-access system*
- * *Undercutting of local monitoring & enforcement*
- * *No local incentives to conserve for future*
- * *Short-term exploitation by outsiders*

*TOC: overly-reductionist

Ignore social and cultural realities of human behavior.

- * Anthropologists and other social scientists attempt to study & explain deviation from narrow economic models.

One recent example is the Ultimatum Game:

Sawyer gets \$100. She has to choose how she would like to divide this money between herself and Daniel.

Daniel chooses to accept or reject Sawyer's division

If he accepts: they both keep the \$\$ as divided

If he rejects: neither of them get any of the \$\$

ONLY PLAY ONCE

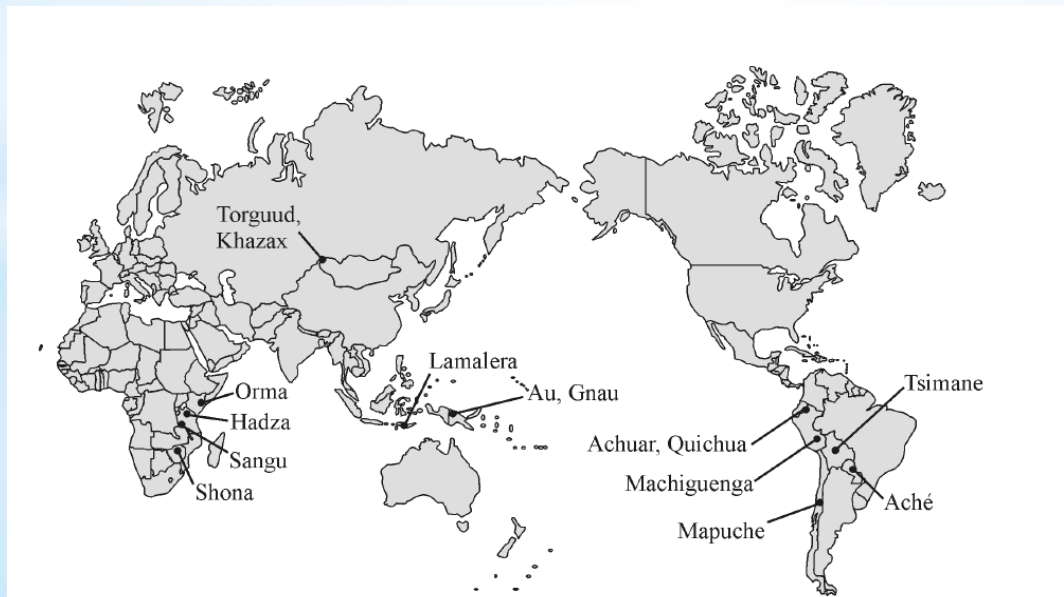


* Ultimatum game

How would narrowly self-interested actors behave “rationally”?

- * Player A should give the minimum number of units that will be accepted
- * Player B should accept anything over 0 units

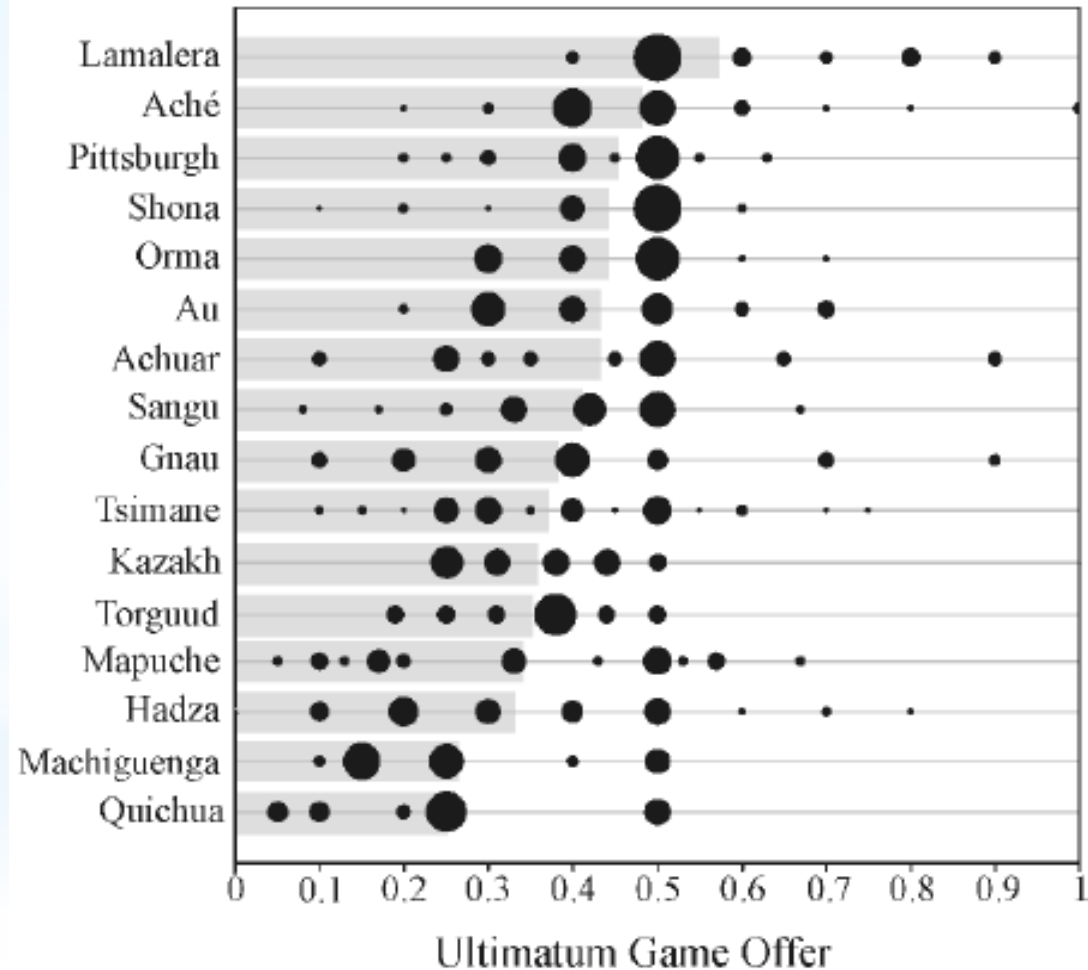
Do people behave “rationally”?



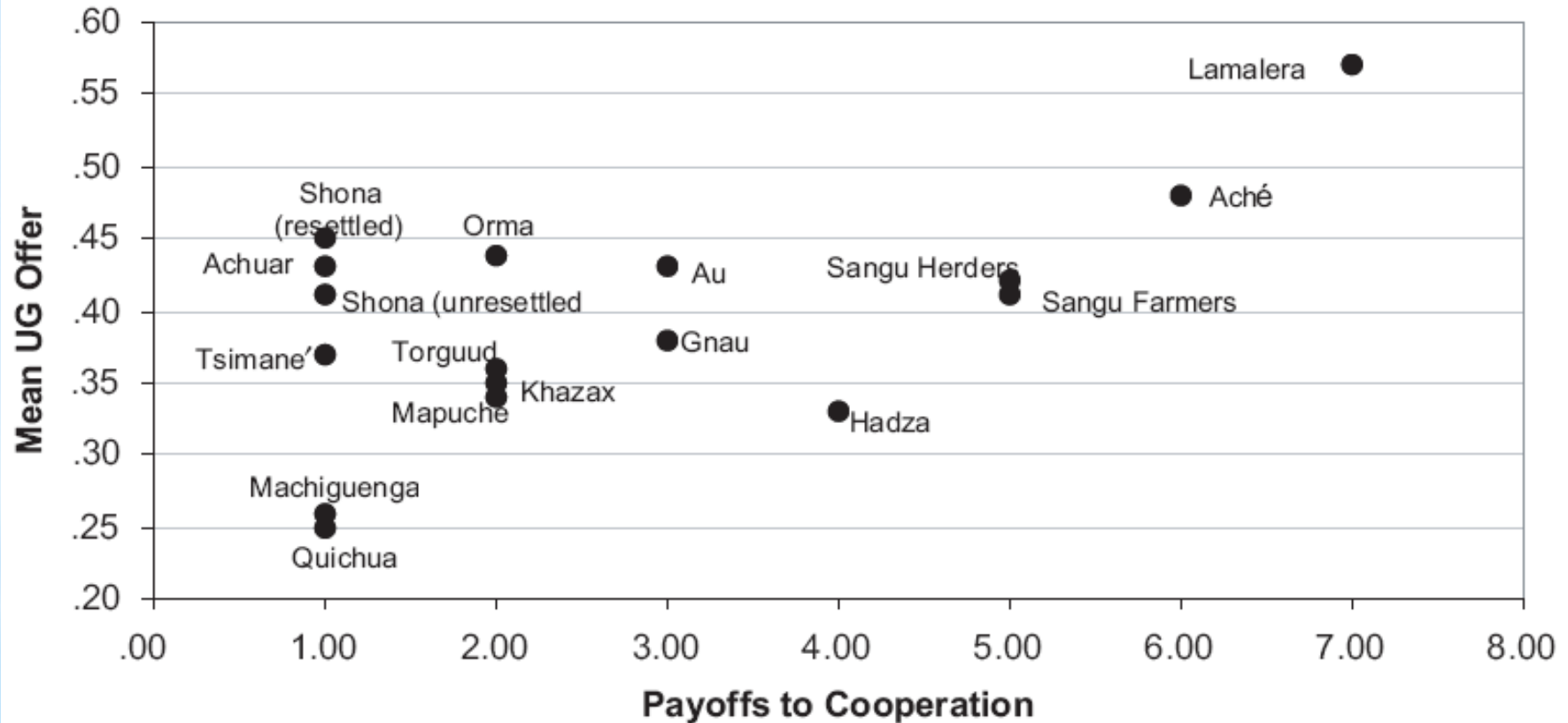
Cross-Cultural Game Project (2004)
- Played Ultimatum Game in 15 different countries

* Ultimatum game - cross-cultures

- Standard self-interest model fails in all the societies tested
- Substantial behavioral variability across groups
- Group-level differences in social and economic structures largely determine differences
- Individual level economic and demographic characteristics do not explain very much



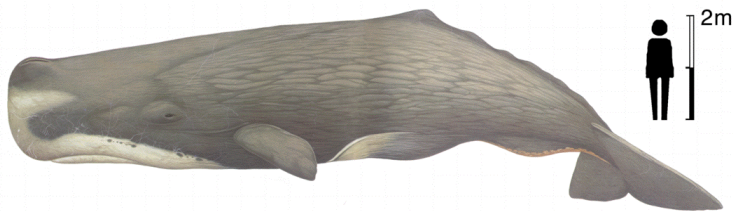
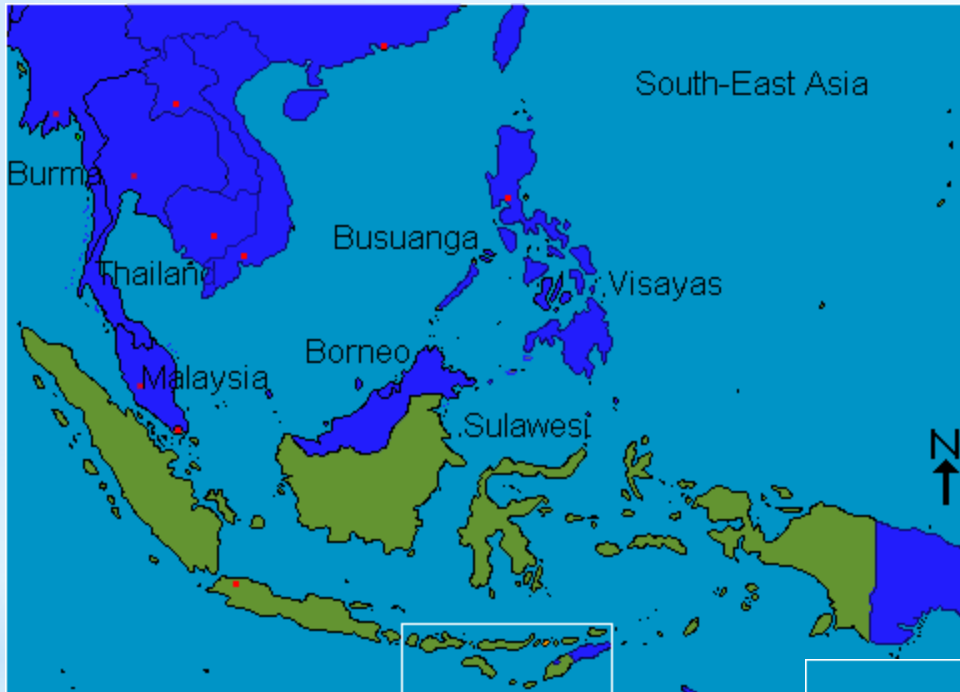
* Ultimatum game - cross-cultures



Payoffs to Cooperation: the degree to which economic life depends on interactions with non-immediate kin

* Who are the Lamalera??

- Cooperative whale hunters in Indonesia
- Hunt with bamboo spears, using small (10-12 m long) wooden outriggers
- Have to get close enough that harpooner leaps onto whale's back



Sperm Whale



*Lecture Summary

- Our societal “ethics” influence our fisheries management
- Need to be aware of discourse surrounding resource mngmt
- TOC is better termed: Tragedy of Open Access
- Common property resource-management systems widespread & often very successful
- Success requires
 - Controls on access
 - Clear & agree-upon management rules
 - Monitoring to ensure compliance w/ these
 - Effective punishment (formal or informal) of violators
- Communal systems threatened by privatization & governmental take-over



* **HUMAN DIMENSIONS OF
MARINE ECOSYSTEMS**

NEXT WEEK WE HAVE YOUR PRESENTATIONS!

If using ppt slides - you must get them to me by
3pm next Monday, or you will have no visuals!