

Lecture 01, 24 Aug 2004
Introduction and photos

Conservation Biology
ECOL 406R/506R
University of Arizona
Fall 2004

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Kathy Gerst

Conservation Biology 406R/506R

1. Introductions
2. 3x5 cards
3. Syllabus
4. Topics

3x5' card

Registered? 406R or 506R? In Lab?

Name (and what you prefer to be called)
-Distinguishing characteristic

Email address

Year in school

Major

Relevant courses taken, or research projects, etc.

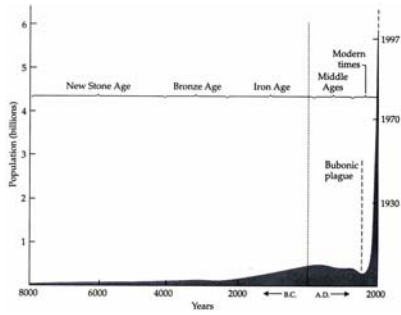
Why are you taking this course?

hold until photo





Humans on planet Earth

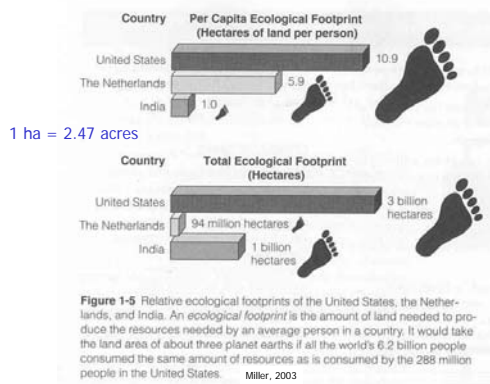


Meffe and Carroll 1997





Ecological Footprint



Ecological Footprint

Def: Number of productive acres (fishing grounds, forests, agricultural fields) needed to maintain a given lifestyle

- Driving (roads, vehicles, fuel, etc.)
- Housing (land and resources for construction)
- Food (land, transport, inputs, trophic level)
- Other goods and services

US citizens use 24 acres/person on average (Canadians 17, Italians 9, Pakistanis 2)

As of ~2002, planet has about 4.5 acres/person

Sustainability?

(1 acre = 0.405 hectare)

Ecological Footprint



How many planets needed, at 4.5 acres/person, to live like the mean ECOL406R/506R student?

= mean/4.5 = ??

AVERAGE ECOLOGICAL FOOTPRINT IN USA IS 24 ACRES PER PERSON. WORLDWIDE, THERE EXIST 4.5 BIOLOGICALLY PRODUCTIVE ACRES PER PERSON.

Ecological Footprint

The big choices seem to matter the most:

- transportation
- food (unprocessed, local, trophic level)
- housing
- reproduction

Recycling etc. important, but not as big an impact

Paper or Plastic? - Bring your own.

Contribution to Greenhouse Gas Emissions and Global Warming

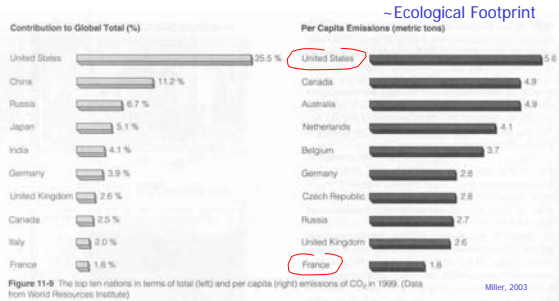


Figure 11-9 The top ten nations in terms of total (left) and per capita (right) emissions of CO₂ in 1999. (Data from World Resources Institute) Miler, 2003

Nation *9/18/03 KED/Star*
Survey finds big bonus in some EPA rules

Benefits said to substantially outweigh costs

By John H. Cushman Jr.
The New York Times

WASHINGTON — The White House office in charge of reviewing federal regulations has reported that the benefits of some major environmental rules appear to exceed the costs by several times and that the net benefits may be even larger than previously acknowledged.

In its annual review of the costs and benefits of regulations, the Office of Management and Budget examined a sampling of major rules and found that the total benefits — to the extent they can be measured — were at least triple the costs.

The conclusion is not surprising. Most agencies calculate the anticipated costs and benefits of rules before they are issued. While the estimates are often challenged, the agencies seldom issue major rules that are

thought to cost more than their benefits would justify.

The budget office itself often challenges agency estimates of costs and benefits in the preliminary rule-making process. But its annual report simply adds up the final estimates produced by the agencies, and therefore is little more than an aggregate balance sheet. The report was required by Congress several years ago, when lawmakers were trying to rein in what some believed to be unduly burdensome federal rules.

In this report, which was described on Saturday in *The Washington Post*, the Environmental Protection Agency was found to have produced significantly greater net benefits than last year's report acknowledged. But the change was mainly due to accounting technicalities, not to any fundamental reassessment of the value of environmental controls.

In one change, the budget office expanded its review by looking back 10 years. This change during the fiscal year that ended on Sept. 30, 2002, the principal focus this year was on

pollution that causes acid rain, a program that ended up costing much less than originally estimated. The Transportation Department and the EPA. They imposed estimated annual costs of \$1.6 billion to \$1.8 billion, but produced estimated annual benefits of \$4.4 billion to \$4.5 billion.

Looking back at 107 major regulations issued from 1992 to 2002, the budget office calculated that estimated annual costs were \$26.6 billion to \$28.9 billion, and annual benefits were \$146.8 billion to \$230.9 billion. For every dollar spent complying with these regulations, in other words, the public got roughly at least three to eight dollars of benefits.

Just four clean air rules, the report said, are producing benefits of \$100 billion a year or more at a cost less than one-fourth of that amount.

The 203-page report counted the costs and benefits of only a handful of the 4,312 final rules published in the Federal Register during the fiscal year that ended on Sept. 30, 2002. The principal focus this year was on

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 Arizona Daily Star
 www.azstarnet.com

9/15/03 KED/Star
Report: CO₂ piling up in seas, adding to environmental worry

By Mike Taylor
The New York Times

Rising carbon dioxide levels are increasing the acidity of the world's oceans more rapidly than any time since the end of the last ice age, a study published last week by the British journal *Nature* in the first to show that over the course of a mere 50-year period, the pH of the world's oceans has fallen by 0.1 units. That is a 30 percent increase in the amount of acidity in the oceans, and it is a concern because the ocean is the source of many of the world's proteins.

"If we continue down the path we are going, we will produce changes greater than any experienced in the past 100 million years — with the possible exception of the dramatic events that led to the extinction of dinosaurs," said the study's lead author, scientist Richard Zeebe of the University of Vienna. "The ocean is a very sensitive system, and we are now seeing changes that are not only significant but also potentially dangerous."

Until now, climate experts have focused on the impact of rising carbon dioxide on the earth's atmosphere, but this study shows that the ocean is also a major player in the global climate system. The study found that the ocean's ability to absorb CO₂ from the atmosphere is being overwhelmed, leading to a steady increase in the amount of CO₂ in the air. This, in turn, is causing the ocean to become more acidic, which can have a devastating impact on marine life.

"The ocean is a very sensitive system, and we are now seeing changes that are not only significant but also potentially dangerous," said the study's lead author, scientist Richard Zeebe of the University of Vienna. "The ocean is a very sensitive system, and we are now seeing changes that are not only significant but also potentially dangerous."

Data: Deaths from warming trend to rise

By Mike Taylor
The New York Times

MOSCOW — About 100,000 people die every year from side effects of global warming, ranging from malaria to malnutrition, and the numbers could almost double by 2020, a group of scientists said Tuesday.

The study, by scientists at the World Health Organization and the London School of Hygiene and Tropical Medicine, said children in developing nations seemed most vulnerable.

"We estimate that climate change may already be causing in the region of 100,000 deaths a year, professor Andrew Haines of the London School of Hygiene and Tropical Medicine told a climate change conference in Moscow.

"The disease burden caused by climate change could almost double by 2020," he added, even taking into account such factors as improvements in health care. He said the estimates had not been previously published.

Most deaths would be in developing nations in Africa, Asia, America and Southeast Asia, which would be hardest hit by

rising sea levels and water shortages. The study also found that the number of deaths from malaria and malnutrition would increase significantly. In some areas, the number of deaths could rise as much as 100 percent.

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9/15/03 NYTimes
Thinning Ice

There has been no end of scholarly studies confirming the gradual rise in global temperatures over the past century. Yet nothing focuses the mind on global warming and its potential consequences quite so sharply as the occasional news flash from some remote corner of the globe documenting startling changes in landscapes once thought to be immutable. Two years ago, for instance, scientists told us that the snows of Kilimanjaro, which inspired Ernest Hemingway's famous short story, could vanish in 15 years, and that the seemingly indestructible glaciers in the Bolivian Andes might not last another 10. Last year brought evidence of disturbing and apparently irreversible changes in Alaska's environment — melting permafrost, sagging roads, dying forests — arising from an astonishing rise of 5.4 degrees in Alaska's average temperature over the past 30 years.

Now comes more unsettling news: a report from three scientists that the Arctic's largest ice shelf — a 120-square-mile, 100-foot-thick mass of ice that has been sitting more or less intact off the northern Canadian coast for 3,000 years — is dis-

integrating. The scientists say the breakup results from a century-long warming trend that has accelerated in the last two years. It is not yet possible, they say, to tie the melting directly to rising atmospheric concentrations of so-called greenhouse gases, or to the human activities — chiefly the burning of fossil fuels like coal and oil — that create these gases. But they warn that a "critical threshold" has been breached, and that on the other side of this threshold lie abrupt changes in natural conditions we have long taken for granted.

There could be a bright side to all this, if it persuaded the Bush administration and Congress to take the issue of climate change more seriously. That is not happening. Mr. Bush remains fixated on a voluntary approach that offers little hope of meaningful reductions in industrial emissions of carbon dioxide, the main global warming gas. Congress, meanwhile, is fashioning an energy bill that will do little to reduce these emissions, and indeed could increase them by heaping new subsidies on the oil, gas and coal industries. Washington's carapace of denial seems sturdier than any glacier.

9/15/03 KED/Star
Beached whales and dolphins may be suffering from 'bends'

By Mike Taylor
The New York Times

LONDON — Beached marine mammals are suffering from a type of decompression sickness similar to the "bends" in humans, scientists said Wednesday.

Although it seems an unlikely place for the aquatic creatures, researchers from the Zoology Department of the University of Liverpool and the University of Exeter in the United Kingdom have found bubbles in the tissues of stranded whales and dolphins similar to the effects of decompression sickness, or DCS, in humans.

"The only way we can explain these findings is that it is a condition very similar to decompression sickness in humans," said the study's lead author, scientist Dr. Andrew Haines.

Dr. Haines said the bubbles in the tissues of beached whales and dolphins are similar to the bubbles that form in the joints of divers who ascend too quickly to the surface. The bubbles can cause pain and, in severe cases, death.

"The fact that we have found bubbles in the tissues of beached whales and dolphins is a very strong indication that they are suffering from decompression sickness," Dr. Haines said. "This is a very serious condition, and we need to take steps to prevent it from occurring again."

9/15/03 KED/Star
Keystone Species?

By G.A. Koenig
The New York Times

It is a half-million whales that are missing from the North Pacific, and the loss is a cause for concern. The whales are the keystone species of the ecosystem, and their disappearance would have a devastating impact on the marine food chain.

The study, by scientists at the University of California, Santa Cruz, found that the whales are being killed off at an alarming rate. The researchers found that the whales are being killed off by a combination of factors, including climate change and overfishing.

"The loss of the whales would have a devastating impact on the marine ecosystem," said the study's lead author, scientist Dr. Andrew Haines. "We need to take steps to prevent this from happening again."

9/15/03 KED/Star
Radio campaign

By G.A. Koenig
The New York Times

The Southern Arizona House of Representatives is waging an air campaign against what it considers a costly and unnecessary radio campaign.

The radio campaign has been waged since the state's election in 2002. The campaign is a radio campaign, and it is a radio campaign.

"The radio campaign is a waste of money," said the study's lead author, scientist Dr. Andrew Haines. "We need to take steps to prevent this from happening again."

9/15/03 KED/Star
SAHBA counters owl 'void' on air

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GUEST OPINIONS

Sonoran Desert Conservation Plan

The plan would guard today's fragile lands for tomorrow's generations

Where will our children live when the plan is enacted?

By Chuck Hackathorn
Editor, The Sonoran Desert Institute

By Curtis Pawlik
Director, The Sonoran Desert Institute

The Sonoran Desert Conservation Plan is simply one of the many responsible elements of our fragile Sonoran Desert environment for future generations. We must better understand and protect our natural landscapes as well as our environmental and cultural resources. That is the basic premise on which we are guided in the conservation plan. We have an ethical obligation to leave this place much as we found it for future generations to enjoy. For the first time, we recognize a sense of public responsibility will guide future land use decisions, and public or special interests.

The conservation plan will clearly guide future growth and development. The plan identifies critical and sensitive resources and then assigns high to low values for the conservation of those resources. This concept is simple — where there are high value resources, it would be wise to build carefully, and where those resources are low or do not exist, building should be encouraged.

Critics of the plan say we will not have enough land left in Pima County open which to build. Their view of the country has developed since

Since 40 percent of all land in Pima County falls under some type of land use restriction. For months, some of our environmental experts have been debating into the finer details of Pima County's proposed Sonoran Desert Conservation Plan. I asked them for a final word on whether or how it will affect the land people who live here.

"What we found was a complex, well-organized concept that is focused on taking away private property rights. The conservation plan is dangerous.

"We found land use policies that are arbitrary. Based on 'qualitative' approved in June 2001 for land in 'environmentally sensitive areas,' you can be required to set aside 40 percent of your 'developable' land as permanent open space.

These policies are arbitrary laws, yet the owners have no input in them or no input in the legislation. That means you are required to comply or they will deny your permits and zoning applications.

Under these restrictions, only 200,000 acres is available

Study finds many are mistaken about war

WASHINGTON — A majority of Americans have held at least one of three mistaken impressions about the war in Iraq, according to a new study released Thursday.

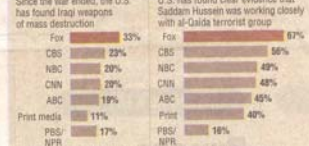
The three common mistaken impressions are that:

- 1 U.S. forces found weapons of mass destruction in Iraq.
- 2 There's clear evidence that Iraqi President Saddam Hussein worked closely with the Sept. 11 terrorists.
- 3 People in foreign countries generally either backed the U.S.-led war or were evenly split between support and opposition.

Getting it wrong on the Iraq war

Polls show many Americans have misperceptions about key facts of the Iraq war.

Primary news source for those who believe:



Source: PBS/Knowledge Networks poll of 2,354 adults, June-Sept. 2002. 1.7% error margin. © 2003 PBS.

Overall, 60 percent of Americans held at least one of those views in polls reported between January and September by the Program on International Policy Attitudes, based at the University of Maryland in College Park, and the polling firm Knowledge Networks based in Menlo Park, Calif.

"While we cannot assert that these misperceptions created the support for going to war with Iraq, it does appear likely that support for the war would

be substantially lower if fewer members of the public had these misperceptions," said Steven Kull, director of Maryland's program.

In fact, no weapons of mass destruction have been found in Iraq, U.S. intelligence has found no clear evidence that Saddam was working closely with al-Qaida or was involved in the Sept. 11 attacks. Gallup polls found large majorities opposed to the war in most countries.

Kull and other analysis noted that the Bush administration had misstated or exaggerated some intelligence findings, with Bush himself saying in May: "We found the weapons of mass destruction and we'll find more as time goes by."

Competent before radical...
Data and science, then fingerprinting



Photos courtesy of Ben Joslin





END