



RACING
EXTINCTION

Extinction and
What We Eat
Food & The Environment

Essential Questions

- What is the relationship between food production and extinction?
- What is the impact of food production on the environment?
- What is the correlation of human population with fish stocks and meat production?
- How does human population impact agriculture?
- How do different types of food production differ in impacts on extinction and climate?

Objectives

- Describe the relationship between food production and extinction.
- Use data to show environmental impacts of modern agriculture.
- Demonstrate the correlation of human population with fish stocks and meat production.
- Illustrate how human population impacts agriculture.
- Show how types of food production differ in their impacts on extinction and climate.

Favorite Foods!

What is your favorite food?

Write a list of your three favorite foods.

Destroying Our Oceans Video



[Click image above to view video](#)

What could **you** do?

What are **three things** you could do to prevent destruction of our oceans?

 **Tip** *Think of daily activities that may have a wider impact on our oceans.*

Could you eat **differently**?

Would you change your diet to save the oceans?

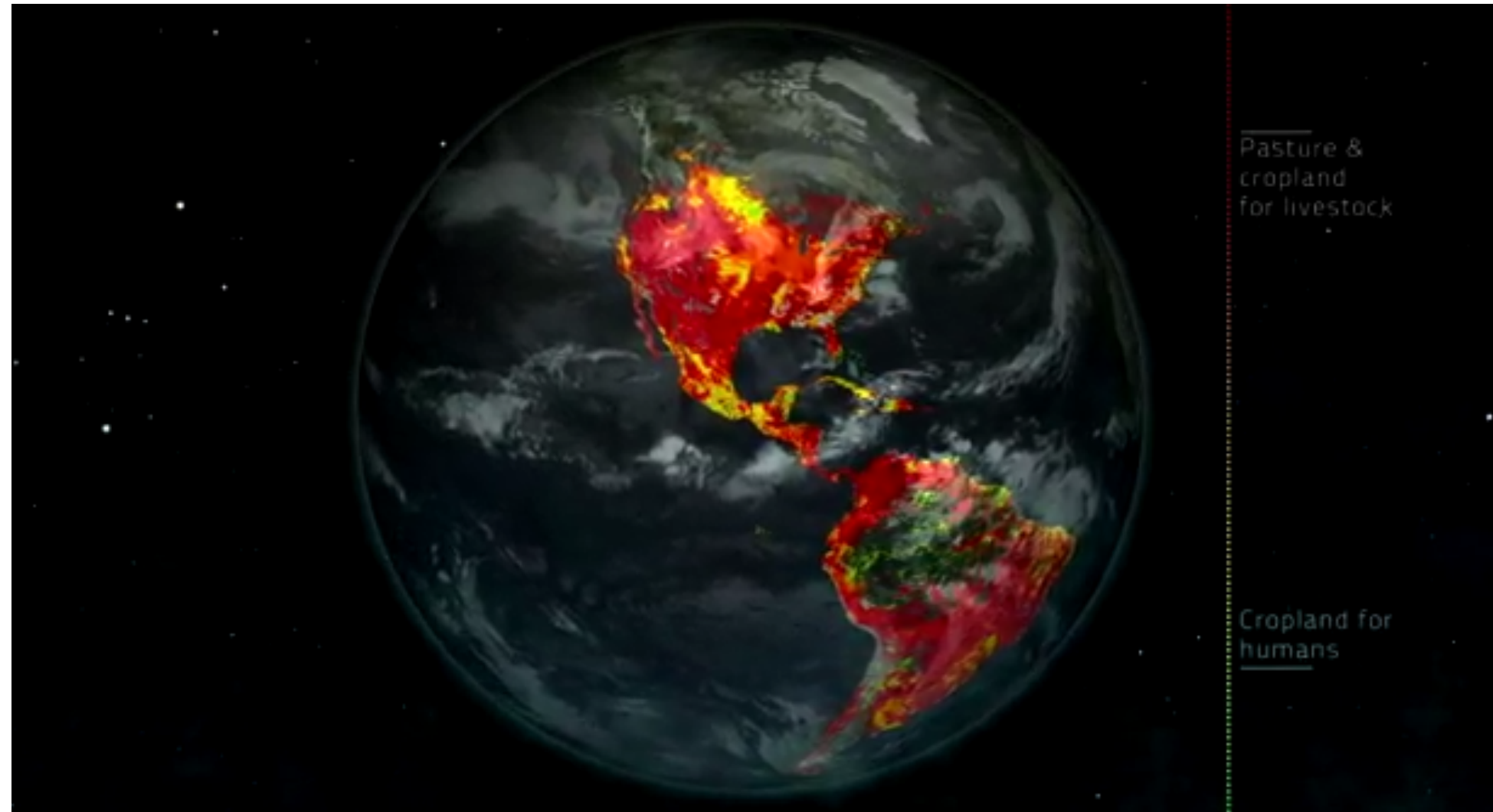
Use your food logs to create a sample menu of what you eat in one day.



Understanding Food

You will learn about how food production affects the environment and Earth's wildlife.

Change Your Diet, Save The World Video



Click image above to view video

How Much Do You Eat?

Use your food logs to estimate your annual animal protein consumption.



Consider...

- Units to quantify consumption:
 - Biomass
 - Calories
 - Soil and water
- Including dairy as well as meat and fish

Impacts of Modern Agriculture

With your group:

Research evidence for the environmental impacts of modern agriculture.

- Create a graphic organizer showing environmental impacts



Use maps to explore impacts:

- Habitat loss
- Carbon dioxide emissions
- Pollution
- Decline of crop diversity
- Soil erosion

Impacts of Modern Agriculture: Resources

ScienceDaily
Your source for the latest research news

UNIVERSITY OF MARYLAND

Health • Physical/Text • Environment • Society/Education • Quality

Science News From research organizations

Agriculture, food production among worst environmental offenders, report finds

Date: June 9, 2010
Source: The Norwegian University of Science and Technology (NTNU)
Summary: Earth is expected to be home to nearly 9 billion people by 2050 — and everyone needs to eat. But a new report from the United Nations Environment Programme warns that growing and producing food make agriculture and food consumption among the most important causes of environmental pressures, including climate change and habitat loss.

CORNELL CHRONICLE
October 14, 2010

Science, Tech & Medicine | Arts & Humanities | Business, Law & Society | Campus Life

Aug. 7, 2007

U.S. could feed 800 million people with grain that livestock eat, Cornell ecologist advises animal scientists

MONTREAL — From one ecologist's perspective, the American system of farming grain-fed livestock consumes resources far out of proportion to the yield, accelerates soil erosion, affects world food supply and will be changing in the future.

"If all the grain currently fed to livestock in the United States were consumed directly by people, the number of people who could be fed would be nearly 800 million," David Pimentel, professor of ecology in Cornell University's College of Agriculture and Life Sciences, reported at the July 24-26 meeting of the Canadian Society of Animal Science in Montreal. Or, if those grains were exported, it would boost the U.S. trade balance by \$50 billion a year, Pimentel estimated.

With only grain-fed livestock, individual Americans would still get more than the recommended daily allowance (RDA) of meat and dairy protein, according to Pimentel's report, "Livestock Production: Energy Inputs and the Environment."

History

Academy History | British History | World Wars | Historic Figures | Family History | Hobbies & Lifestyle | More

Agricultural Revolution in England 1500 - 1850
By Professor Mark Overton
Last updated 2012-02-17

From the 16th century onwards, an essentially organic agriculture was gradually replaced by a farming system that depended on energy-intensive inputs. Mark Overton assesses the impact of this agrarian revolution.

An enduring myth

Explaining Food Production

With your group:

Present your graphic organizer to the class.

- Explain your conclusions
- Describe other ways you could collect data
- Discuss the scientific method



Your discussion should include:

- How the scientific method can be used to address complex questions about:
 - The environment
 - Prioritizing conservation
 - Balancing societal and human needs

An Encounter with a Manta Ray Video



Click image above to view video

What is the impact of human activities?

Working individually:

Write a short passage explaining how resource depletion is connected to human activities.



Consider focusing on:

- Needs and role of local communities
- Dilemmas such as food or jobs versus exploiting resources
- Large-scale activities such as industrial fisheries

Correlation of Population and Food Production

With your group:

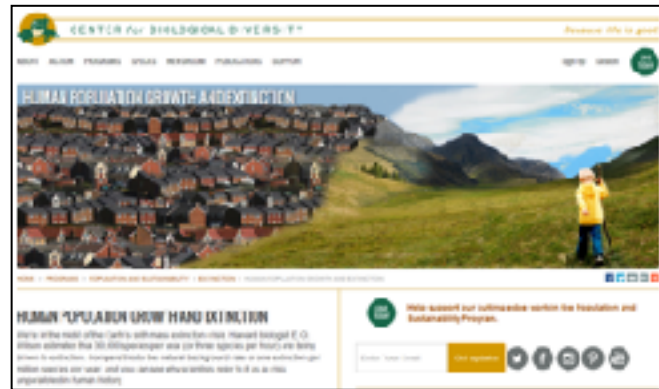
Explore online resources to describe the relationship between human population and fish stocks and meat production.



Be sure to:

- Obtain data on:
 - Human population increase
 - Decline of fish stocks
 - Increase in global meat production
- Describe potential sources of error or inaccuracy in estimating correlations

Correlation of Population and Food Production: Resources



Impacts on Communities

With your group:

Choose a case study of food resource decline and research the impact on local communities.



Examples of possible case studies:

- Collapse of North Atlantic cod fishery
- Destruction of tropical rainforests
- Overgrazing in North Africa's Sahel region

***The
greatest
danger to
our future
is apathy.***

**- Jane
Goodall**



Brainstorm!

Your mission (should you choose to accept it)!

Create a list of activities that publicize and educate about dietary choices.



Ensure that your activities:

- Are feasible and realistic
- Do not require funding
- Ideally could be conducted in a class setting

Know
the
carbon
cost of
what
you eat.



Eating For Wildlife

- Eat less meat
- Eat seasonally and locally
- Go vegetarian or vegan
- Eat organic
- Eat sustainable seafood
- Drink filtered tap water
- Choose shark-free tuna
- Avoid shark fins and oils
- Vote with your wallet and your fork



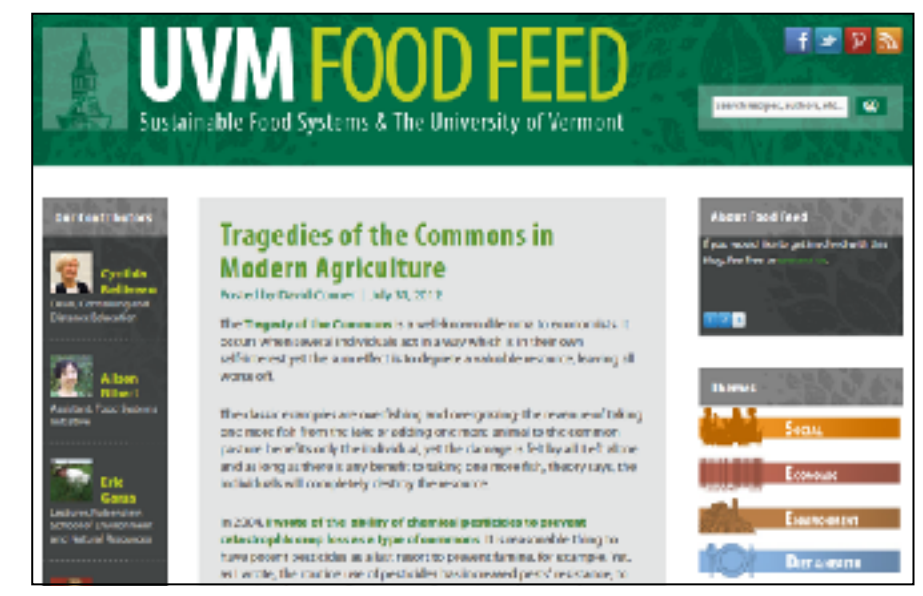
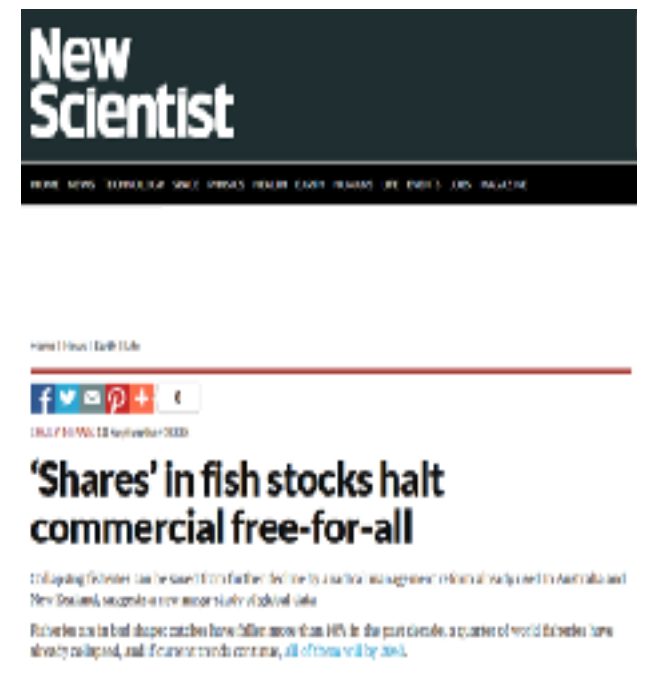
Tragedy of the Commons

If time allows:

Investigate the concept of The Tragedy of the Commons.

- Write a passage describing how this concept explains environmental problems such as overfishing.

Tragedy of the Commons: Resources



Evaluation

1. Write a short passage describing the relationship between food production and extinction.
2. Which of the following have the greatest impact on food production: habitat loss, carbon dioxide emissions, pollution, decline of crop diversity, or soil erosion? Justify your answer.
3. Explain how human population increase and consumption has led to the decline of fish stocks and increased meat production.
4. Compare and contrast different types of food production in their impacts on extinction and climate.

Resources

Impact of modern food production

- <http://www.sciencedaily.com/releases/2010/06/100609094353.htm>
- <http://www.news.cornell.edu/stories/1997/08/us-could-feed-800-million-people-grain-livestock-eat>
- http://www.bbc.co.uk/history/british/empire_seapower/agricultural_revolution_01.shtml

Correlation between population and food production

- http://www.biologicaldiversity.org/programs/population_and_sustainability/extinction/
- <http://www.pnas.org/content/108/20/8317.full>
- <http://www.grida.no/publications/rr/food-crisis/page/3569.aspx>
- <http://www.scientificamerican.com/article/aquaculture-replace-fish-stocks>

Resources

Collapse of food resources

- <http://www.nature.com/news/2010/100602/full/465540a.html>
- <http://rainforests.mongabay.com/0902.htm>
- <http://oceanworld.tamu.edu/resources/environment-book/desertificationinsahel.html>

Tragedy of the Commons

- <http://www.bbc.com/future/story/20120920-are-we-running-out-of-fish>
- <https://www.newscientist.com/article/dn14762-shares-in-fish-stocks-halt-commercial-free-for-all>
- <http://learn.uvm.edu/foodsystemsblog/2012/07/31/tragedies-of-the-commons-in-modern-agriculture/>

Further Research

- <http://www.nmfs.noaa.gov>
- http://www.idrc.ca/EN/Programs/Agriculture_and_the_Environment/Pages/default.aspx
- <http://www.sciencedirect.com/science/journal/01678809>
- <http://www.sciencedirect.com/science/journal/01657836>