Module 02: biodiversity

FR Module 2 ----------

Environmental indicators: what we know and can observe that indicate the condition of a system

Ecosystem services: can be economic, direct or cascading (off shore oil for example, impacting fishing in the gulf of Mexico)



Biodiversity is a key indicator (why?)



These are the 5 challenges that you will deal with in this century. Knowing about them will enable you to impact change.

It's all about you...

More terms:

Genetic diversity: variation in a population (could be age distribution in our **class**)

Species: different in obvious ways (definitions vary on this)

Species diversity: variation of species in a habitat (age distribution in the **school** or elab)

Speciation: an adaptation based on **stress**

Evolution needs three things:

1. some form of genetic variation
2. some **stress** that favors this variation
3. survivors have to reproduce and carry on the variation

Think of giraffes as an example:

1. longer necks in some animals
2. drought that kills all short neck creatures (just like in "land before time")
3. long neck animals survive to reproduce and carry on the variation

There is an interesting theory that the background rate of mutation/speciation was much higher long ago because our atmosphere was thinner, and enabled more cosmic rays to penetrate, causing much higher rates of mutation/speciation.
Cool stuff:
In England, butterflies have adapted since 1850 to look more like soot from coal fires.
In NYC, a species of "subway mosquitoes" have been found that feed on humans in a dark, cool place
Huh.

Extinction is the opposite of speciation, where species die off.
There is such a thing as a "background rate of extinction", which we have surpassed by many times
Diversity is good: think of monoculture food crops: one pest kills everything.

Food production: see Malthus and Norman Borlaug, e.g. Mexico famine (APHG?)

Anthopogenic (anthro=man, genic=cause) Climate change:
Greenhouse gases (see car windshield as an example)
Not too many people know we need some CO2 on our planet to keep water above freezing-think of this as we search for exoplanets...
Resource depletion is hard to grasp, but resource constraints are easier:
If we had a major tsunami here that closed airports (all near the shore) and ports, how long would we have:

- electricity?
- water? (pumped by electricity)

- food?

Our key concept:
energy->water->food->culture

1. With energy you can move/purify water
2. With water you can grow food
3. With food you can maintain a culture

Global Footprint countries

Sustainability: Thinking of forever



Notice that these are not your usual "energy, food and water" items people think about.
Sustainability is living within your means.
Starbucks example...

Ecological footprint: created by Jurgen Randers and Mathis Wackernagel (both here for the opening of this famed structure)

1. energy
2. settlements
3. timber
4. food
5. seafood
6. carbon
7. built up land
8. forests
9. cropland
10. fisheries

What impacts your global footprint?

Weekend Homework, Due Wednesday (yay!) 8.25.21:
Read modules 1-3, complete the practice questions at the end of each module, email your answers.

Cause and effect, email your answers:

Why does the girl think her dad is an alien?

https://www.youtube.com/watch?v=sVRAtQ7XjkM

What don’t we see between the kiss and him driving home?

https://www.youtube.com/watch?v=g7_slK24lXU

Monty Python Witch scene:

https://www.youtube.com/watch?v=Ii68tPliZOo

1. Can you follow cause and effect?
2. What is their logical path?
3. Why do folks associate fracking with earthquakes? (chapter one in the text)
4. Why do folks associate fossil fuels with global heating?
5. Who might be against this line of reasoning and why?

Migrated from Apple Server Wiki. Original page ID: b7v7i7r

Revision #2
Created 2026-09-29 15:58:01 UTC by Admin
Updated 2026-09-29 16:19:06 UTC by Admin