Welcome to *Ecology 101*

Premise of course:

Ecosystems approach

a. Physical attributes
b. Energy flow
c. Productivity

Readings:

Required:

The Diversity of Life, Edward O. Wilson

Sand County Almanac, Aldo Leopold

Ecology: A Bridge Between Science and Society, Eugene P. Odum

Recommended:

Science Times

Science

Nature

Grading

1. Midterm: 50%

2. Final: 50%

Examination format:

Multiple choice, true/false, short answer, essay

Schedule:

September
- Introduction
- Basic Principles I - Evolution of Ecosystems
- Basic Principles II – Species and the Niche Concept
- *Basic Principles III – Energy Flow and Trophic Levels* `
- Biogeochemical Cycles I

October
- Biogeochemical Cycles II
- Rivers

MIDTERM EXAMINATION
- Lakes
- Estuaries and Wetlands

November
- The Oceans
- Coral Reefs
- Rain forests

December
- Hardwood and Boreal Forests

FINAL EXAMINATION

Websites:

Required:

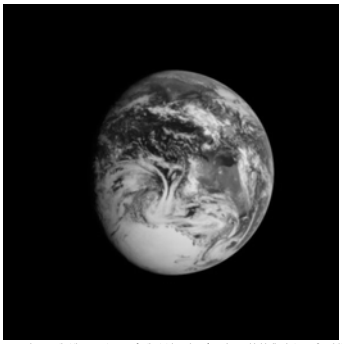
www.http://ci.columbia.edu/ci/eseminars/1111s_detail.html
www.http://streamecology.org
www.http://IES.org (Institute for Ecosystems Study)

Recommended:

www.medicalecology.org

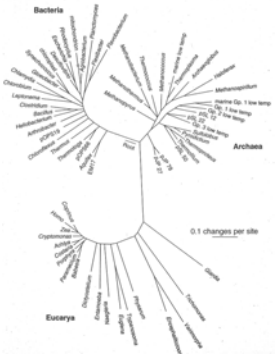
www.http://NASA.gov
, then go to Earthwatch
www.http://NOAA.gov

Is That All There Is?

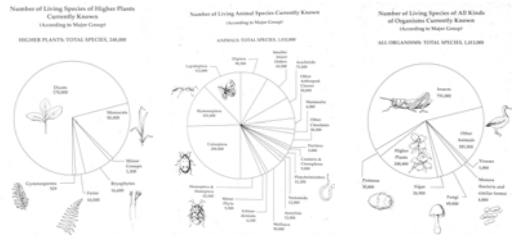


"Right now we can only guess that the correct answer for the total number of species worldwide lies between 2 and 100 million."

Life on Earth

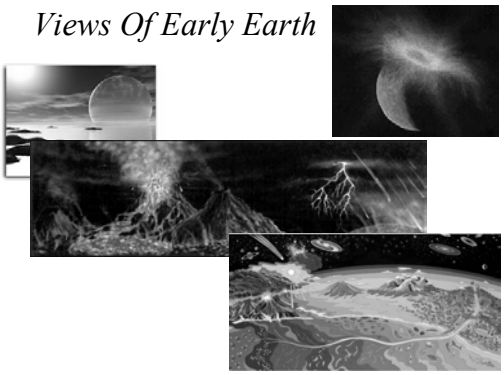


The Diversity Of Life



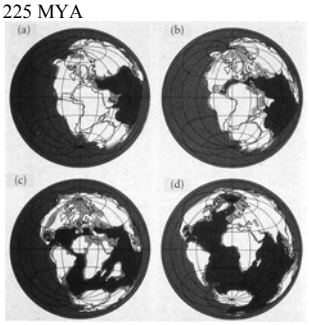
from: *The Diversity Of Life*, E.O. Wilson

Views Of Early Earth



"*Drifting Apart*"

225 MYA

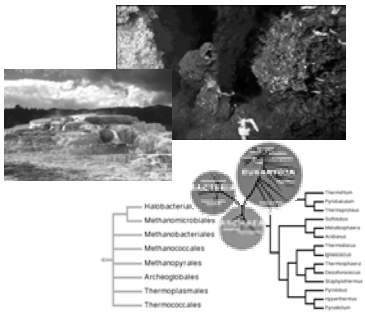


Now

Still Drifting After All These Years

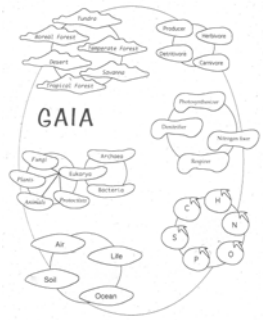
Life Without The Sun's Help

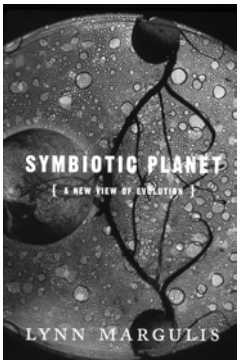
Extremophiles Rule!



www.extremophiles.org

GAIA Hypothesis





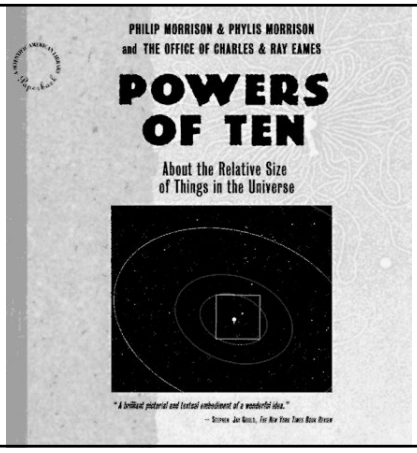
Some General Ecological Principles

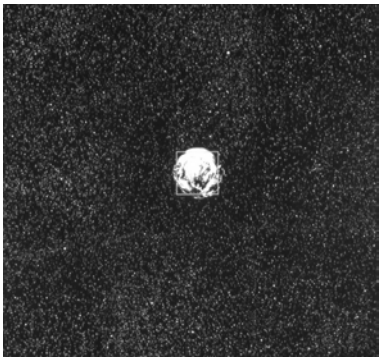
Ecosystem Ecology

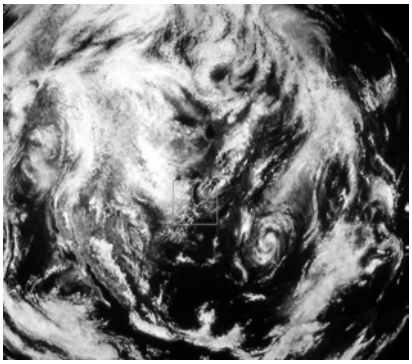
Describing Ecosystems

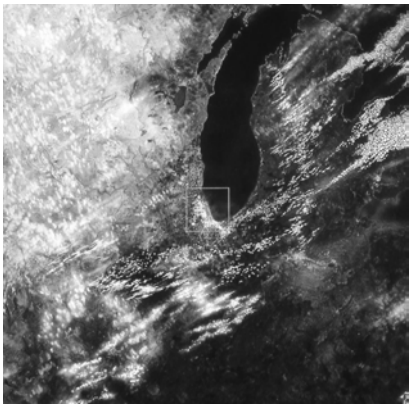
1. Identify a definable geographic region (e.g. grassland prairie)
2. Identify all plants and animals within that region (i.e., the biodiversity index)
3. Study how these disparate groups form associations of food chains and food webs (i.e. form ecosystems).
4. Study the flow of energy through these associations (i.e., measure productivity)

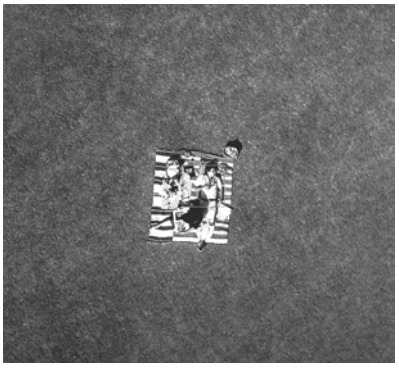
Levels of Complexity



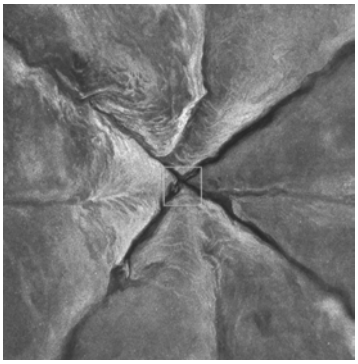


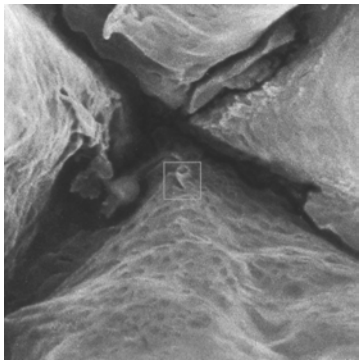




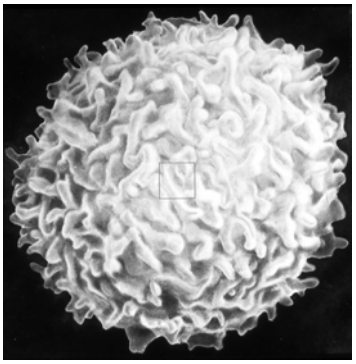


Why is this man sleeping?

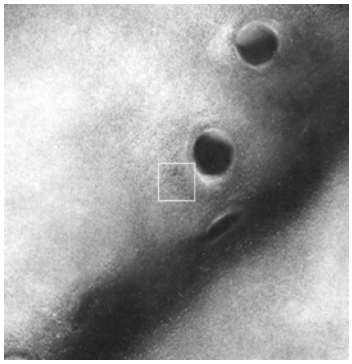




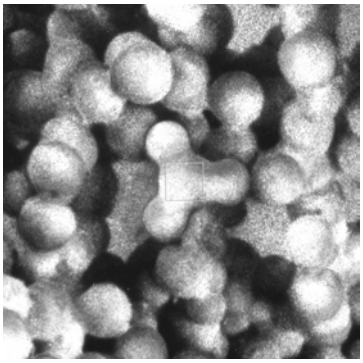
Lymphocyte



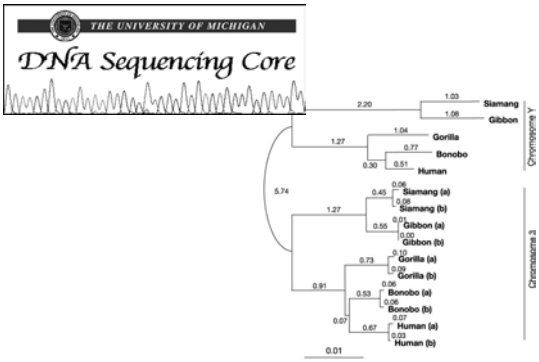
Nuclear Envelope



Chromosomal DNA



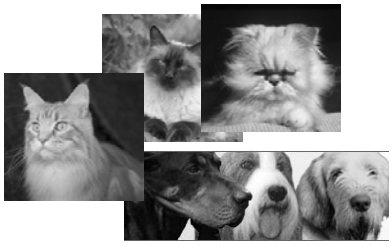
We have come a long way in just 20 years



*What Is A Species?**

* Variations on a theme. One snail species, many varieties

How Many Species of Dogs And Cats Are There?



One!

Two Species Or One?

Neandertal

Modern Human

Study: Human DNA Neanderthal-Free

By Jennifer Viegas, Discovery News

Cro-Magnon vs. Neanderthal

May 12, 2003 — Neanderthals did not contribute to the gene pool of modern humans, according to a recent study that compared the DNA of two ancient Cro-Magnons with that of four Neanderthals.

While Neanderthals and early humans coexisted in Europe for a few thousand years 40,000 years ago, the findings suggest they did not interbreed, an action that would have made Neanderthals a direct ancestor of modern humans.

The study also supports the "Out of Africa" theory. According to this view, modern humans evolved in East Africa and then spread into Europe and Asia through the Middle East.

Speciation Drives the System

http://www.sp2000.org/