Career Tracks in the Biological Sciences

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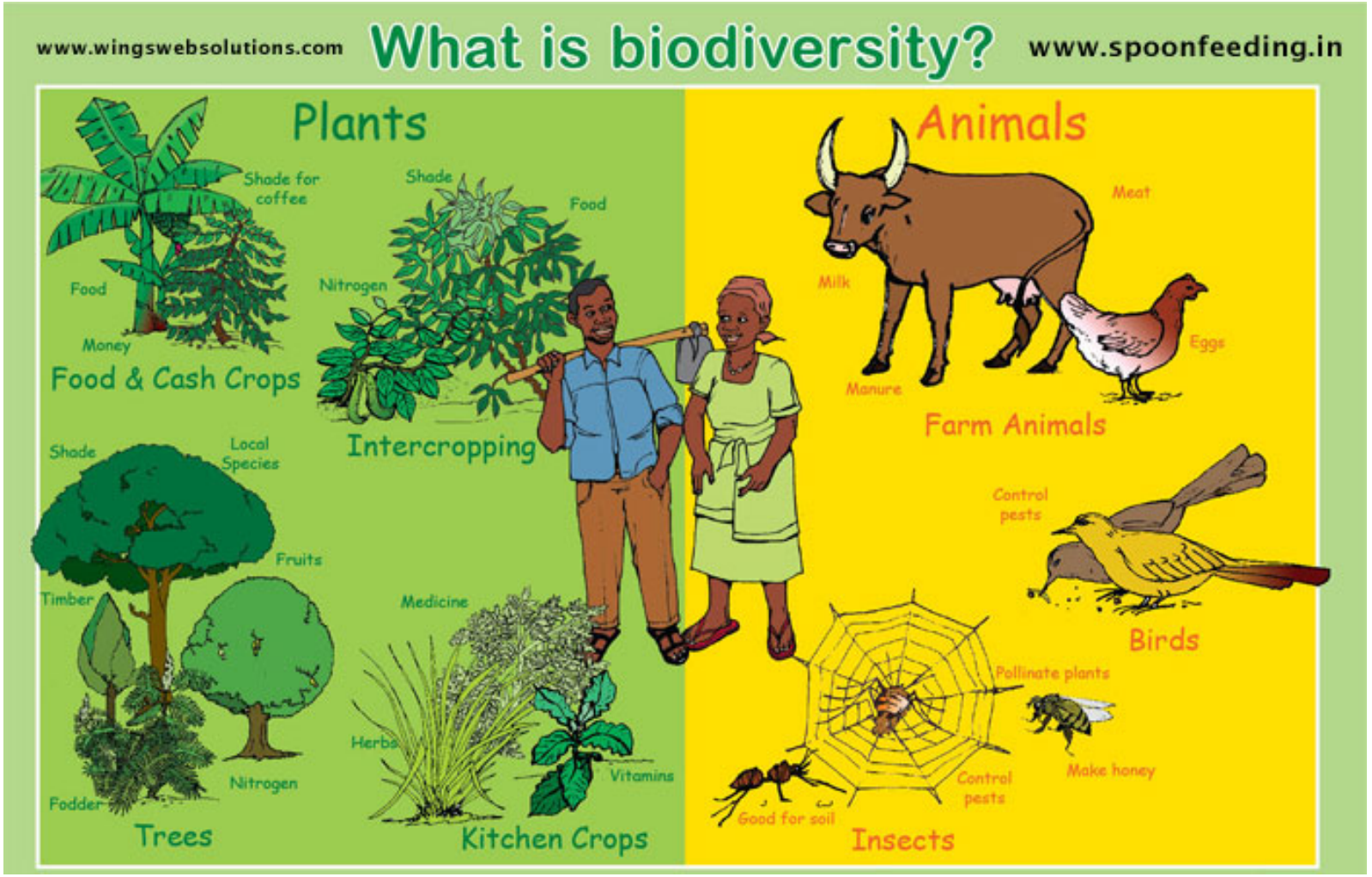
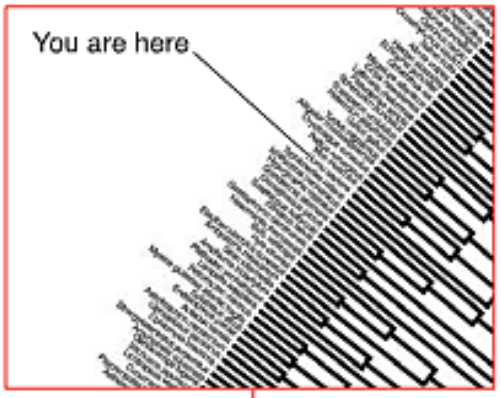
Anthropocentrism

Overconsumption of Natural Resources

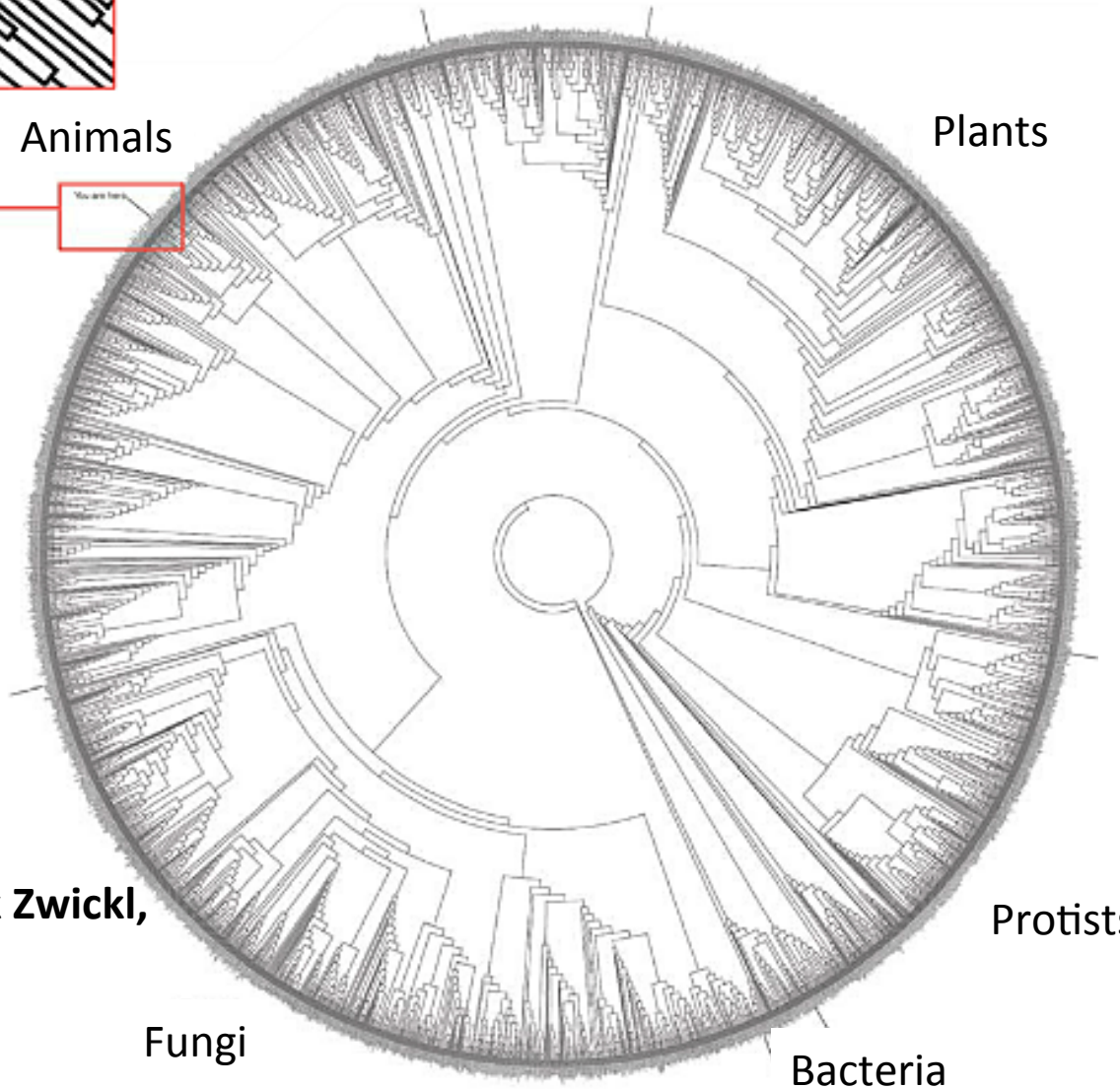
Human Induced Global Warming

Anthropocentric View of Importance of Biological Diversity





Homo sapiens is just one of the 2 million species of organisms on Planet Earth



David Hillis, Derreck Zwickl, and Robin Gutell
Tree of Life

Science of Biology

- Biology is a natural science concerned with the study of life (living organisms).
- Majority of undergraduate biology majors are interested in human health careers (medicine, pharmacy, dentistry, nursing).
- Biology encompasses so much more than this.
- Aim of this presentation is to give you an appreciation of the breadth of biology.

Biology (Sub-disciplinary areas)

- Anatomy
- Biochemistry
- Bioinformatics
- Biomechanics
- Biotechnology
- Cell biology
- Developmental Biology
- Ecology
- Evolution
- Genetics
- Histology
- Immunology
- Limnology
- Marine biology
- Microbiology
- Molecular biology
- Natural History
- Neurobiology
- Organismal biology
- Paleontology
- Parasitology
- Physiology
- Systematics
- Taxonomy
- Virology

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Organismal Biology

Major groups of living organisms

- **Viruses**: DNA viruses — RNA viruses — retroviruses
- **Single-cell organisms**:
  - prokaryotes : microbe — bacteria — archaea
  - eukaryotes: fungi — algae — protozoa — protista
- **Multicellular organisms**:
  - Plantae — plants — bryophytes — pteridophytes — seed plants
  - Animalia — animals — metazoa — insects — mollusks — vertebrates
  - Fungi — lichens — mycorrhizae

Biology (Taxonomic areas)

- Arachnology – spiders and mites
- Botany – plants
- Entomology - insects
- Herpetology – amphibians and reptiles
- Ichthyology – fishes
- Malacology - mollusks
- Mammalogy - mammals
- Mycology - fungi
- Myrmecology - ants
- Ornithology - birds
- Phycology – algae
- Zoology - animals

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Ecology

- Study of how organisms interact among themselves and with their environment.
- Encompasses ecosystem science, population biology, conservation biology.
- Careers –
  - Higher education
  - Governmental natural resource agencies (Agriculture, Forest Service, Park Service, Fish and Wildlife Service, NOAA fisheries)
  - Non-governmental conservation organizations (Nature Conservancy, Sierra Club, WWF, Conservation International, etc.).

Evolutionary Biology

- Study of changes in the characteristics of organisms over time.
- Encompasses species formation, taxonomy, interrelationships of species and higher groups (phylogenetics).
- Careers -
  - Higher education
  - Natural history museums

Biodiversity Informatics

- Application of information technology to facilitate the study of biodiversity.
- Interdisciplinary (biology and computer science).
- Encompasses digitization of biodiversity information and development of software tools for using biodiversity data in research.
- Careers in higher education and natural history museums (biodiversity research centers).

Advice for Career Planning

- Find and pursue your passion.
- Explore some of these subfields of biology at your institutions (faculty-mentored research experiences, independent study).
- Seek career advice from established professionals and trainees (your mentors and their students, us).
- Consider graduate school after graduation.

THANKS AGAIN FOR YOUR ATTENTON!

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