Lecture 1

Introductions

Jerry Wellington - coral reef ecologist
Zac Forsman - Phylogeny of corals
Franc Trampus - E&E of ant behavior
Adrienne Sloan - Symbiosis

Invitation to lab – S&R II 329

- Review of syllabus: lecture and lab (note room change labs: S&R II 334)
- Important dates
- Lab manuals available at Copy Center
- Grading: lecture 2/3’s, lab 1/3

Text: Krebs 4th Edition: basis of 50% of lecture. Exams based on lectures

What is ecology?

Word derived from Greek word oikos= house and logos= study

To lay public ecology=environmental issues, platform of political parties "Green Party" certainly synonymous with conservation programs such as "save the whales", etc.

Derived from a sense that we as human beings are inextricably linked to that of the rest of biological world. Problem is that solution to environmental issues requires thorough scientific study.

The science of ecology is the study of the factors affecting the distribution and abundance of organisms – everything from bacteria, viruses to humans.

Overall goal of ecology – as in any science is to develop general theories that are predictive.

e.g. Highest diversity of species in a community is maintained when the community experiences disturbances that are intermediate in intensity and frequency.

or, competition amongst species in a community is stronger at higher trophic levels since intensity of predation is low and resources are likely to be limiting.
Unlike physics and chemistry, predictions in ecology are often conditional and probabilistic. Why?

Variation – 2 sources

1. Organisms themselves, due to genetic uniqueness.
   
   *individuals* (genetic differences) -> *populations* (between pops differences due to natural selection/genetic drift) ->
   
   *Communities* (differences due to historical events) – convergences or divergences.

2. Environmental – stochastic and unpredictable events.

Because of natural variation a major tool in ecology is statistics – learn in lab.

In order to make any general statement about processes governing the distribution and abundance of organisms one needs to make numerous observations and conduct experiments that are both *controlled* and *replicated*.

In the course we will review the history of ideas/concepts to give you an appreciation of how the field has advanced and matured over the past 150 years.

Ecology has benefited from those who approach questions from a purely theoretical or modeling point of view – often provides key questions that can be addressed (tested) through experimental approaches, either lab and/or field work.

This course will be presented from an evolutionary/ecology point of view since this is my interest.

**Why should you be interested in ecology?**

The human population now stands at 6 billion. Sometime in the next century ~2050 that population will asymptote at around 10 billion. Biodiversity is diminishing at an unprecedented rate that is directly or indirectly due to human activities. So who cares? Problem is that many organisms have a direct influence on our lives – e.g., pollinators.

Approaches to ecological questions are quite varied and overlap, or "hybridize" with adjacent disciplines, e.g.:

1. Physiological ecology
2. Biogeography
3. Evolutionary ecology
4. Molecular ecology
5. Behavioral ecology
6. Ecosystems ecology (biotic/abiotic interactions)
7. Landscape ecology (spatial patterns)
8. Systems ecology (math models)
9. Environmental science (applied ecology
10. Incorporates sociology and economics, e.g. wildlife management, conservation)