Announcements:
For Wednesday: Quiz on Ch. 17
For Thursday: Bio Journal Club – Coral Reefs, Carolyn, and free food
For Friday: Paper discussion – Jones et al.

Small Group Discussion Activity: How might principles of benefits and costs perspective of Johnson et al. (1997) be applied to other mutualist interactions?

1. Corals – Zooxanthellae
2. Ant – plant mutualisms
3. Plant – seed eating pollinator mutualism
4. Honey-guides – hominids
5. Gut bacteria – mammal

For each mutualism, describe:

1. The costs and benefits to each partner in the mutualism
   a. What are the “currencies” of the costs and the benefits?
   b. How might you measure them?
2. Conditions under which the mutualism would be reinforced
3. Conditions under which the mutualism might break down
   a. would it become amensal, comensal, neutral, or exploitive?
4. Conditions under which the mutualism could become obligate vs. facultative

Extension of interaction models to mutualism:

Holland and DeAngelis’ model of the Lophocereus – Upiga system
Depends on the ratio of Lophocereus flowers available to Upiga flying

Lophocereus can also abort flowers to reduce damage

From populations and interactions to communities:

Ecological Community: collection of interacting species populations that co-occur in space and time.

One way of defining a community is via the “web” of interactions … not the only way.

Food webs – most common of interaction webs.

Foodwebs may be organized by taxonomic species or “trophic species” (groups of species that eat and are eaten by similar taxa.)
What are the advantages or disadvantages of using one classification or another?
What are the different sorts of questions that might better utilize one or the other?

**Patterns of influence**

Some elements in the web are disproportionate in their influence


Experiments done on relatively simple webs

What happens in a more complex web – e.g., El Verde?

   Alternative hypotheses?

Example of large impact in a complex trophic web – Nile perch introduced to Lake Victoria (a “Natural Experiment”)

   *Lates nilotica* – up to 2 m in length 60 kg.
   Introduced 1954
   Exploded in the early 1980s

   Together with Nile tilapia *and nutrient loading*, has contributed to a massive extinction of native fish.

What are the limitations of such a Natural Experiment