*Disease & Parasitism*

* What do we mean by the term *complex life-cycle*?
* What types of parasites (microparasites, macroparasites, endo-, ecto-) tend to have complex life-cycles and why?
* How would you test the effects of a particular parasite on the behaviour or growth of a particular host species (paying special attention to the important elements we have discussed with regards to study design)?

*Disturbance & Succession*

* Describe the differences in life history strategies of the types of plants that are associated with early and late successional stages following a large disturbance like a volcanic eruption. Be able to explain the contradiction of what was predicted versus observed from the Mt. St. Helens example discussed in lecture.
* Describe two examples of *facilitation* in succession. Describe the organism and the process it accomplishes that provides facilitation. What does this say about nutrient limitation in ecosystems?

*Patterns of Diversity*

* Describe the pattern of latitudinal gradients in species diversity. What hypotheses exist to explain these patterns in species diversity with latitude? Give examples of a few taxonomic groups that fit this pattern and a few taxonomic groups that do not.
* How does the number of species observed change with increasing area? What does the z term mean in the species-area equation?
* From memory, be able to draw the graph used to explain why there are different equilibrium numbers of species on islands of different size and distances from the mainland (be sure to understand the mechanisms!). Explain why island biogeography is an example of an ecosystem in dynamic equilibrium.
* How is the theory of island biogeography both similar to and different from metapopulation theory?

*Ecosystems I*

* Explain the difference between production to biomass ratios, ecological efficiencies, assimilation efficiencies, and production efficiencies. How are these different measures of efficiency related to how energy is allocated among trophic levels in ecosystems?
* Discuss the importance of detritus in ecosystems. What is the source of detritus? What is its ultimate fate? How do these processes differ between tropical and temperate ecosystems?
* Describe how REDOX reactions explain most biological components of nutrient cycles. Be able to list some biologically important reduction reactions and oxidation reactions.

*Deb Obrist’s Guest Lecture*

* How would you incorporate the following factors into Island Biogeography Theory, which predicts the dynamic equilibrium number of species on an island: 1. Habitat heterogeneity, 2. Primary Productivity, 3. Exposure (wind/waves), 4. Nutrient Subsidies?

*Ecosystems II*

* What do we mean when we say that N or P are limiting nutrients for plant growth and productivity? What about co-limitation?
* Be able to describe (generally) differences in the nitrogen and phosphorus cycles.
* How are these cycles (N, P) different in marine and freshwater systems? What are the most important components of each for the ecology of ecosystems?
* What causes some lakes to thermally stratify? When do they stratify? What are the patterns with latitude? What are the ecological consequences of stratification?
* Which ecosystem-types are most productive in terrestrial and marine systems? What makes them so productive? How much does nutrient recycling (also called nutrient regeneration) account for their high productivity?

*From Nico Muñoz’s Guest Lecture*

* What is meant by the term nutrient subsidy? Be able to describe two examples including what changes in the recipient ecosystem.
* What are the symptoms of *ecosystem nutrient limitation*?
* What are some of the possible effects (both positive and negative) of introduced salmon subsidy on stream biofilm in Patagonia?

*Global Ecology & Climate Change*

* What are the biggest human-caused changes in the global ecosystem (we covered 8)? For each of these drivers, describe how changes impact ecological systems (species, communities, ecosystems), and also describe something that society could do to reduce or reverse the effect on the Earth’s ecosystems.
* Name at least four reasons for modern species extinctions. Explain, using island biogeography, why habitat loss due, for instance, to land use for agriculture, tends to reduce biodiversity.