

## BI 416/516 Final Exam study guide

Be ready to relate topics from the literature papers we read to the main concepts discussed below. The final exam is **comprehensive**; this study guide is in addition to the previous two study guides. Be ready to synthesize information from related topics across the entire quarter.

### Chapter 12 – Community effects on ecosystem properties

What is the sixth extinction? How can we estimate changes in extinction rates from pre-history to current to future? What's the difference between local and global extinctions? What are the various scales and types of community properties encompassed by the term "biodiversity"? What is the difference between effect and response functional groups? How might the relationship between them influence how ecosystem properties are likely to change in with global changes? What are the various components of ecosystem functioning? In what ways might dominance, keystones, and species diversity (richness and evenness) influence the way ecosystem processes change in response to community composition? What interactive controllers might these organismal traits influence (and vice versa)? What are some examples from the book and from the reading? What are the two main categories of effects that species/functional diversity are hypothesized to have on ecosystem processes? By what mechanisms might these effects occur? What's the difference between complementarity and the sampling effect? By what mechanisms might diversity influence stability of ecosystem processes? How might effects of functional traits be confounded with effects of changes in species diversity? What factors would you need to control for to adequately test for causal effects of diversity versus just correlation? Give examples of each kind of experimental design.

### Chapter 13 – Temporal dynamics, disturbance and succession

What is the ecological definition of disturbance? In addition to the type of disturbance (fire, hurricane, etc.), what are the 3 primary variables that describe a disturbance regime? What is the difference between resistance and resilience in terms of a community's stability in response to disturbance? What factors might influence a community's resistance or resilience in the face of a particular disturbance or changes in the disturbance regime? What is the difference between primary and secondary succession? What types of disturbances are associated with each? What are the typical characteristics of pioneer and climax species? Do these traits tend to vary independently or together? What are the mechanisms of succession? Do they always operate independently of each other? What are some examples of how they might operate? How do these mechanisms relate to changes in environmental variables (e.g., light availability, soil carbon and nitrogen pools)? What brings about these changes? How do plant and animal biomass, GPP, NPP, plant respiration, heterotrophic respiration, and NEP change through a typical successional sequence? How might this differ for primary and secondary succession? What mechanisms might account for these changes in productivity? What effects do disturbance and succession have on nutrient cycles? Do these differ for primary and secondary succession?

### Chapter 16 – Managing and sustaining ecosystems (THIS MATERIAL NOT ON TEST)

What is the technical definition of ecosystem management and what are 8 key tenets involved? (You don't need to memorize them, but you should be able to recognize them.) What is adaptive management? How does it differ from typical management strategies? What are ecosystem goods and services? How do they differ from ecosystem processes? How might they be used to inform adaptive ecosystem management, and what are some of the challenges to doing so? According to Kremen and Ostfeld (2005), what is a functional inventory? What is functional diversity? How do they relate to complementarity, redundancy, and the levels and stability of ecosystem services? How might they influence ecosystem management for pollination services? For Lyme disease?