

Discussion Questions for 09/03/2024

Paper: Nystrom et al., 2000

1. Consider the occurrences of natural coral reef disturbances and artificial, anthropogenic coral reef disturbances. What would be some effective management strategies that could mitigate human-induced coral reef disturbances? Also, how do we disentangle natural disturbances from anthropogenic disturbances?
2. What is functional diversity, and why do the authors emphasize its importance?
3. (*Related to the previous question*), describe the phase shifts that occur from a coral-dominated to an algae-dominated state.
4. Is the phase shift from a coral-dominated to an algae-dominated stable state a one-way transition (*meaning it is unlikely that an algae-dominated stable state will return to a coral-dominated stable state*)? Do these multiple stable states affect the traditional view that once ecosystem stressors are removed, the ecosystem will naturally return to an “ideal” stable state (*in this case, a coral-dominated stable state*)?
5. Along with “genetic variability within populations, diversity within and among functional groups, and variability and connectedness of habitats,” what other characteristics of ecosystems may help them cope with disturbance?

Paper: Scheffer et al., 2001

1. How does the addition of the word “catastrophic” to the title affect how we feel/talk about the concept of stable state shifts?
2. Thinking about hysteresis, would actions taken by environmental managers to revert an undesirable ecosystem shift to its original state be as simple as reversing the conditions that previously caused the change? What is a good example of this from the paper, and what does this mean for professionals managing undesirable shifts in ecosystems?
3. Do you think hysteresis occurs in all cases of ecosystem restoration to a former state?
4. Why is the term “dynamic regime” not used as frequently as alternative stable states? How applicable is this concept of permanent, cyclical fluctuations between alternative states resulting from internal and external processes to your study system?