Advanced Ecology Discussion Questions, 10 Sep

Rietkerk *et al* (2003)

1. What do the authors mean by "self-organized" in the title? How does this concept relate to the positive feedback controls discussed in previous readings?
2. The authors posit that in these examples, "patterns are the result of fine-scale positive feedback and coarse-scale negative feedback." How do the qualities shared by the examples (either of the ecosystems, resources, or consumers) drive this trend? And how might the nature of scale-dependent responses differ for systems not demonstrating these qualities?
3. We've previously discussed how the value of evidence for alternative stable states (or "bistability") depends on scale. Do you feel Rietkerk *et al*'s hypothesis successfully addresses this issue? Is temporal scale addressed in this model (see Fig 3)? Why or why not?
4. Are you convinced that management actions could be prescribed on the basis of patterns visible from "a snapshot in time"?

Schroder et al 2005

Stochastic: Randomly determined; that follows some random probability distribution or pattern, so that its behaviour may be analysed statistically but not predicted precisely; **stochastic process** = **random process** *n.*

1. The authors define "environment" as being a "*set of external parameters which influence the system, but are not affected by it.*" They posit that if a factor is coupled, i.e. influencing the system, but moving "*very slow compared with the state variable,*" it can be considered a constant, and thus external. Are there any real life situations we can think of that align with this? Any that this would not apply to?
2. The authors say that "*the preclusion of potentially confounding factors as stochasticity and environmental variance which may prevent the establishment of ASS in natural systems may make it easier to detect ASS in the laboratory.*" Without such factors (stochasticity and environmental variance), can we really believe that ASS has occurred by simply measuring generational turnover?
3. Studies of treatment-independent random divergence often had "*too high process variance due to stochasticity*" that could lead to "*frequent transitions or high degree(s) of divergence.*" Therefore, it was hard to distinguish basins of attraction and the system could be in a permanently transient state. Does stochasticity itself negate ASS?