**First Meeting of the Long-Term Resilience Group**  
**Participants:** Neil, Valentina, Eric, Zabdi, Willy, Ruben (via Zoom)  
**Discussion Topic:** Van Meerbeck Paper

**1. Introduction**

Each participant introduced themselves. Ruben provided an example of their work in collaboration with Lizzie.

**2. Summary of the Van Meerbeck Paper**

Presented by Ruben, highlighting the key points and framework proposed by the paper.

**3. Discussion on Strengths and Future Directions:**

* The group appreciates the effort and framework outlined in the paper.
* Agreement on the usefulness of the provided definitions in streamlining future research efforts.

**4. Key Discussion Topics**

**4.1 Shifting Equilibriums**

* Identified as a crucial topic, especially in the context of climate change.
* Existing efforts on this topic noted in the work of Peter Chesson and Stephen Jackson (referenced articles in the GitHub repository, worth probably to ready ahead).

**4.2 Approaching Scale Systematically**

* Two dimensions not specifically addressed in the paper:
  + **Temporal dimension:** How resilience and stability manifest in short-term vs. long-term responses.
  + **Spatial dimension:** How resilience/stability differs from ecophysiology to ecosystem levels.
* Example by Neil: **White oak** exhibits high short-term resistance to drought but faces significant long-term mortality driven by drought.
* Potential to address this from paleo reconstructions? Influence of environmental conditions on the variability of the ecosystems changes?

**4.3 Species Pools and Long-Term Stability**

* Discussion on how species pools influence long-term resilience.
* Eric suggested using island systems as a study model, though Willy pointed out limitations in paleo data for such systems.
* Noted that there is extensive literature on critical transitions in drylands and their indicators that may be useful to tap into.

**4.4 Stability Through Species Shifts**

* Willy raised the contrast between community ecology’s view of stability (via species asynchrony) and paleo/population ecology perspectives.
* Question: At what point does an ecosystem fundamentally change due to too many species shifts? This is not a common consideration in community ecology.

**4.5 Metrics of Stability and Resilience**

* Is **productivity** a reliable metric for stability? While historically significant, its interpretation can be challenging.
* Should **management for short- to medium-term stability** be a priority, or could this reduce long-term adaptability? (Referencing Scherrer’s work.)
* Investigating the relationship between **disturbance intensity and resilience**—can tree rings provide insights here from the datasets of neil and zabdi?

**4.6 Climate Change and System Predictability**

* Climate change reduces system predictability.
* Can we establish clear **reference states and baselines**?

**4.7 Repeated and Compound Disturbances**

* The paper does not thoroughly explore these disturbances.
* Questions raised:
  + How do repeated disturbances impact reference baselines?
  + Can succession theory be applied, or does succession fundamentally change under repeated disturbances?
  + Is this analogous to Neil’s **spaghetti monster plot**?

**4.8 Storage Theory and Demographic Dynamics**

* Neil highlighted the **potential of storage theory**, particularly regarding demographic dynamics.
* Noted experience of **lack of regeneration in many U.S. forests**, raising concerns for long-term resilience but better understood contextually by long-term dynamics.

**5. Next Steps**

* Further exploration of shifting equilibriums.
* Deeper investigation into the intersection of climate change, resilience metrics, and long-term adaptability.
* Addressing gaps in repeated and compound disturbance research.
* The group agrees there is a lot of potential and things to say but agree on slow building of something useful across scales.
* Ruben will send poll to decide next steps ahead and find a future meeting date.