Climatic drivers and intrisic biological processes shape masting dynamics...

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1. Intro (all forests → stand sync → ind. trees)

    - Widespread meltdown fears
      → maybe mention invasion, homogeneization, pest outbreaks...
      → regeneration shifts... masting!
    - Meltdown and masting
        - simple definition of masting
        - ...
        - end paragraph on masting being hypothesized as critical to regeneratino via seed predator overwhelmed... or pollen etc. and this could have big effects!
    - How does masting work? Synchrony
        - individual trees need to be synchronized within certain distance (but maybe not further...)
        - population-level characteristics! So how do individual treews do it together?
    - How do individual trees cue to mast?
        - what is a good year environmentally... warm summer, no frost
        - but that doesn't cause synchrony! No cues can cause 2-year cycles or other cycles...
        - however, most trees take 2 years to make buds, and have alternate bearing
        - (Conceptual figure)
    - Combo of cues + constraints
      → could explain what we see?
        - year before need warm summer...
    - So ACC could really screw this up → but to know this, we need to model the individuals!

2. Results and discussion

    - We built a model that matches conceptual figure
        - alternate states (latent)
        - states encode constraints
        - tree level estimates lead to stand estimates!

  - and we added climate
- Model identifies 2 states (here, figure with the two distributions)
  - masting is real! Mirror the intro
  - some level of synchrony within stands
  - say how often they transition in average conditions...
- Climate impacts on masting (figure of climate effects)
  - warm summer increase transition
  - frost decrease number of seeds
  - no efect of spring (supp mat)
- Our projections vs current studies
  - current studies: ACC leads to more seeds via more masting
  - but even if you drive warming way upp you still get a plateau
  - this even happens with summer temp effect on M to M (figure proj)
  - To actually ahve a breakdown, we would nee the parameter valeu on M to M to be at least as important as NM to M
- How constraints prevent breakdown!
  - ...
- But synchrony does appear to go down
  - Review previous results and overall figure
  - these years look less synchrone...
  - but here, it could be driven both by within and between asynchrony
  - (what level of between-stand synchrony predict..?)
  - evolutionary benefits of mating depends on scale of synchrony
    rightarrow which scale depends on which evolutionnary model you consider, but for seed predators... should be quite small (foraging distance = X km)
- Asynchrony indeed driven by multiple factors
  - within between
  - discuss results... maybe figure with %?
- What drives synchrony?
  - bad years could act as precise cue, and with biol. constraints it would explain the following synchrony
  - how ACC could change those dynamics, and on which scale?
  - (Unclear how breakdown at tree and then at stand level?)
  - basically, we need to figure out the biology useful for predictions with ACC