**Subject:** Re: Estimates of seed production per unit plant biomass?
**From:** Eric Seabloom <seabloom@umn.edu>
**Date:** 4/1/16, 4:07 PM
**To:** Elizabeth Wolkovich <lizzie@oeb.harvard.edu>

Ahhh.... send me more of those pictures!

This sounds like an exciting project!
I could definitely provide seed mass and seeds per plant biomass for these 3 annual and 3 perennial species. These estimates could include the effects of N, H2O, and fire, and the effects of perennial competition on the annuals.

It is funny your wrote me about this coexistence question. I was just thinking about a project with Kat Shea to ask about coexistence using these seed data quite a while ago, and wondering if it was worthwhile trying to resuscitate. She started playing around with a Chesson-eque lottery kind of model, but it never went far and it is not on either of our agendas now.

FYI, here are a couple modeling papers we did using some of these data -- none of which overlap with your ideas at all. The 2007 PNAS paper is an integro-difference equation, so it might interesting for your as it has within and among season dynamics. The Everard paper looks at linkages between water and nitrogen limitation in these plots.

I could also provide you with R* data based on monocultures of these species where we measured above and belowground biomass, light, soil N, soil moisture, etc. This is a project I did with Stan and Sophie Parker, one of J. Schimel's students. Mostly it is in a dissertation now. Sophie is mostly doing management for the TNC and this paper suffered some pretty brutal reviews. I should probably revitalize it at some point.

Anyway, I'd be more than happy to help with any data I can provide that would help. I should check with Stan and Sophie about the monoculture data, but I doubt it would be a problem.

Cheers,

Eric

On 4/1/16 2:23 PM, Elizabeth Wolkovich wrote:

> Hi Eric,
>
> This is great! And amazing and rare (at least from my literature search, which I have been working on for a while). Please publish these!
>
> What I am trying to do is parameterise a multi-year model of a coexisting plant community where within-year dynamics are described by Rstar (I have some estimates of these for moisture and N for some California species from Janneke's work and others) and between year dynamics include the storage effect model. In case it helps I have attached the model info from my notes.
>
> What I ideally need is:
> - biomass per seed at the start of the growing season (b_0 in the attached pdf, I have the info from Table 1 in your 2003 PNAS paper)
> - seeds per plant biomass at the end of the growing season (to calculate phi in the attached pdf)
>
> It seems like you might have this for annuals but not perennials? Both would be great as once we get the model running and understand its dynamics a little I did plan to use it to look at invasions in drought conditions but data for just annuals would help much.
>
> Knowing how much the estimates vary across treatments -- especially water addition since we plan to vary the water pulse dynamics in the model -- would be good so we can use those values to help bracket the parameter space we search.
>
> I also need estimates of any loss due to overwintering and % germination success, though neither of these is as critical and for % germination we have estimates from Oscar Godoy's work.
>
> It would be super cool to compare the curves we get from the model with your seasonal growth rates! But that might be another project in and of itself. Maybe something we could collaborate on once I have the model up and running if you're interested?
>
> Middle school and third grade, that seems impossible. Marjorie is still this age in my head (attached), I don't even think she should be

walking, let along attending the third grade.

Many thanks!
Lizzie

On 4/1/16 2:01 PM, Eric Seabloom wrote:
> Seed data? I am up to my eyeballs in unpublished seed data from that experiment!
>
> We put so much into counting and weighing seeds and I have just never done much with it. I am also on a bit of a campaign to publish some older data sets, so this could be a good excuse to get this one pulled together. I just finished putting together all the plant cover and biomass data from these experiments.
>
> Can you tell me a little more detail on what you need?
>
> I should be able to provide seeds per m2 for 3 perennial (Elymus glaucus, Bromus carinatus, and Nassella) and 3 annual (Hordeum marinum, Bromus madtritensis, and Bromus hordeaceus) grasses.
>
> Specifically, I should mostly have the following:
> - Individual Seed Mass
> - Individual Plant Mass (Annuals)
> - Seeds per plant (Annuals)
> - Seeds per inflorescence (Perennials)
> - Plant mass per m2
> - Inflorescences per m2 (Perennials)
>
> All of these data would include effects of N addition, Water addition, and burning across multiple years.
>
> If you are interested in phenology, I might be able to dig up light interception through the growing season for about 20 CA species in monoculture, which could give seasonal growth rates. I would have to dig for this a bit and no guarantees.
>
> All is well here. Liam is in Middle School which seems crazy. Marjorie is in 3rd grade. We live about 20 minutes from my sister and her kids and my parents, and I am happy that the kiddos get to have grandparents, cousins, and an Aunt and Uncle close by.
>
> Best to you as well!
>
> Eric
>
> On 4/1/16 10:50 AM, Elizabeth Wolkovich wrote:
> > Hi Eric,
> >
> > Greetings from windy Boston! Where biking is most treacherous from the wind+crazy driver combo. I hope this note finds all well with you. I wonder if you guys are expecting the same series of clippers that is supposed to sweep through here for the weekend.
> >
> > Anyway, I am writing with a query. I am working on a model that incorporates phenology and am the stage of tracking down reasonable parameter estimates. I have a few from your 2003 PNAS paper but am stuck on finding an estimate of biomass to seed conversion (i.e., per unit of plant biomass how many seeds are produced?). I don't think this is in your 2003 paper but I was wondering if you perhaps published the data in another paper or have some estimates of plot biomass per species and seed production per species together that I could use to estimate it?
> >
> > I realize it is a pain to sift out old data so if it something you simply don't have time for I completely understand but if you have any ideas please send them along! I can offer something in return like phenology data or my baseline stan-modeling skills....
> >
> > All the best,
> > Lizzie

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Attachments:

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|---|---|
| borer-etal-2007-pnas-supp.pdf | 206 KB |
| borer-etal-2007-pnas.pdf | 133 KB |
| everard-etal-2009-amnat.pdf | 1.6 MB |