Grephon: What we learned from the papers

Grephon group

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Contents

1 Quick results

Most folks submitted their tables trying to digest papers on growing season length relates to growth – thank you! We ended up with 42 rows of data across 24 papers. You can check out the merged file in the output folder here.

I did a quick review and then clean on some entries. You can look at the code (`tablemergeclean.R`) in the analyses folder. Here's some info from that....

Most studies are temperate or boreal forests as best I can tell. Lots of *Pinus, Abies, Betula, Fraxinus, Quercus, Fagus.*

Growth metrics were dominated by tree rings (annual cores):

```
                                                                    1
                                                              NDVI/LAI
                                                                    3
NEP and GPP (net ecosystem production and gross primary production)
                                                                    1
                                                           annual core
                                                                   10
                                                     biomass/height/R:S
                                                                    8
                                                   dendrometer diameter
                                                                    2
                                                      intra-annual core
                                                                    6
```

```
leaf chlorophyll (SPAD meter)
                            1
                        other
                            4
                photosynthesis
                            6
```

Study types were dominated by tree rings (intra and inter-annual) but then more diverse:

```
> table(d$study_type)
```

```
                                                  2
     continental scale obs phenology with model
                                                  1
                    ecosystem carbon budget model
                                                  1
                                         greenhouse
                                                  7
                              greenhouse or chamber
                                                  1
greenhouse or chamber (technically CHN terrace)
                                                  1
                 intra-annual cores (xylogenesis)
                                                  2
                     phenology observations (PEP)
                                                  1
                                       provenance
                                                  1
                                  provenance trial
                                                  3
                                        satellite
                                                  3
                                   satellite data
                                                  1
     shade and climate manipulation experiments
                                                  1
                  shade manipulation experiments
                                                  1
                                       synthesis
                                                  1
                                       tree ring
                                                 15
```

In 8 papers and 14 rows of data, authors thought they found a relationship, but this varied with growth metric (you'll also see we're rather unsure about those intra-annual core studies):

```
> table(d$simple.growth.metric, d$simple.authorsthink.gslxgrowth)
```

	no
	0
NDVI/LAI	0
NEP and GPP (net ecosystem production and gross primary production)	0
annual core	3
biomass/height/R:S	1
dendrometer diameter	2
intra-annual core	2
leaf chlorophyll (SPAD meter)	0
other	2
photosynthesis	0

	not mentioned
	0
NDVI/LAI	3
NEP and GPP (net ecosystem production and gross primary production)	0
annual core	1
biomass/height/R:S	0
dendrometer diameter	0
intra-annual core	0
leaf chlorophyll (SPAD meter)	1
other	0
photosynthesis	2

	unsure
	0
NDVI/LAI	0
NEP and GPP (net ecosystem production and gross primary production)	0
annual core	0
biomass/height/R:S	0
dendrometer diameter	0
intra-annual core	4
leaf chlorophyll (SPAD meter)	0
other	0
photosynthesis	0

	yes
	0
NDVI/LAI	0

```
NEP and GPP (net ecosystem production and gross primary production)   1
annual core                                                           4
biomass/height/R:S                                                    6
dendrometer diameter                                                  0
intra-annual core                                                     0
leaf chlorophyll (SPAD meter)                                         0
other                                                                 2
photosynthesis                                                        1
```

And we're not so sure more than one row of data includes a growth x growing season relationship:

```
> table(d$simple.authorsthink.gslxgrowth, d$simple.wethink.gslxgrowth)
```

```
                 no unsure yes
no            0  3      5   0
not mentioned 0  3      0   0
unsure        0  4      0   0
yes           1  0      9   4
```

2 Questions I think we need to answer before entering more data...

1. Was this data entry doable? It was easy enough for me to clean quickly, but I did not hear how it went for others doing entry?
2. I and Ailene want some of our papers reviewed by someone else, do we want to just have everything checked twice?
3. Adjustments to data entry ...
   (a) What do we mean by 'did authors think they found evidence?' ... I still struggled with this. Do we mean in whatever way they defined it? Do we want or have a column for GSL x growth (our version ... and what is our version? We could have a couple, see list below)?
   (b) Are we separating out leaf from wood phenology studies enough?
   (c) How to enter xylogenesis studies?
   (d) I like the study level question, but I think it needs refining. Ailene added "Strideck et al 2022 study created tree ring chronologies (by merging tree rings across individuals within sites- a common practices in tree ring research) so I selected 'Across sites' for study_level. Might be worth a discussion as there may be other tree ring studies that use a similar approach." See below also ...

```
> table(d$study_level)

                                                                  1
                                                 across individuals
                                                                 11
                                  across provenances within species
                                                                  3
                                                       across sites
                                                                  1
                                              across sites/populations
                                                                  9
       across sites/populations across years within individuals
                                                                  1
                                                     across species
                                                                  1
                                    across years within individuals
                                                                  8
                           across years within individuals\302\240
                                                                  2
across years within pixels (500 m pixels from 2001-2018 :MODIS)
                                                                  1
                                         across years within sites
                                                                  1
                                                 within individuals
                                                                  1
        within individuals for < 1 year (April to October 2018)
                                                                  1
                                    within years within individuals
                                                                  1
```

1. Can we write out the statements we want to make or line widths in a figure we want to define from this so we can make sure we're happy with the table?
2. What is our dream metric of GSL x growth?
   (a) GSL must be start to end for me – NOT days growth >0 or such ...
   (b) Does photosynthesis count as growth? What about the other random entries such as NDVI?

3 Next steps

1. Finalize the table again
2. Decide on how to assign additional reviews (re-reviewing) and assign!
3. Decide on aims to decide which papers we WOULD add

4. Do it ...