

RH: Interactive cues and spring phenology

**Concept paper on understanding interactive cues
and climate change (with growth chamber studies);
or How interactive cues will drive climate change
responses**

THE LAB ^{1,2}

¹ *Arnold Arboretum, 1300 Centre Street, Boston, Massachusetts, 02131, USA*

² *Organismic & Evolutionary Biology, 28 Oxford Street, Cambridge, Massachusetts, 02138,
USA*

Corresponding author: XX, see ^{1,2} above ; E-mail:.

¹ *Abstract.*— Goes here.

² (Keywords:)

³

1. Introduction

- (a) Climate change: it means all that work on phenology comes due ... now!
- (b) Something on all the focus on forcing but really it's more complicated
- (c) Think about one tree¹
- (d) Look at its distribution!²
- (e) Cues are adapted to high climate variation!

2. Random other bits to fit in

- (a) Fig: Number of studies by year (OSPREE)³
- (b) Fig: Map of students, color coded or such by which of the three cues they manipulated
- (c) Say something about material (seeds/saplings/cuttings)?
- (d) Fig: Variation in treatments across space (photo/chill/force)
- (e) Fig: Variation in treatments across time (graph with year on x -axis or divide time in half or such?)

3. What cues will be most limiting with climate change?

- (a) Take each PEP725 datapoint within our selected species' range ...
- (b) Calculate:

We need to think about this a lot more! Do we want to do? And if so, exactly what metrics do we want?

- i. Min daily temp for 1-2 months before leafout
- ii. Max daily temp for 1-2 months before leafout
- iii. Chilling units (which?) for Oct-February

4. Wrap-up....

¹Here we pick one PEP725 species that is well-represented spatially for leafout or budburst data (Cat?)

²Here, we show a distribution map (Nacho?), maybe with some spring climate and/or phenology mapped on it.

³Other ideas: number of species studied by year. Show crops or remove or show separately?