

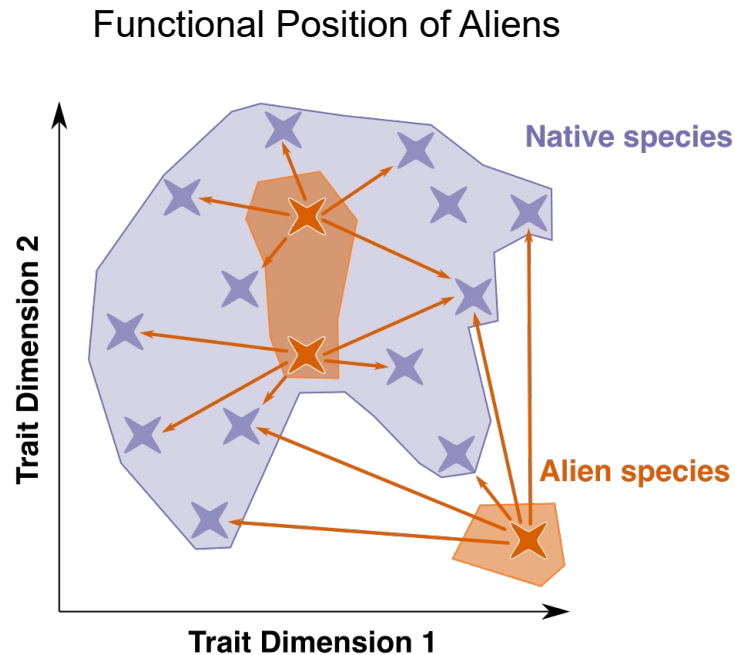
# **Global Alien Trait Gaps Prelim. Results & Meeting February 3rd 2022**

# Idea

We want to study  
**functional biogeography of aliens**

Always facing lack of trait data

Systematically study gaps  
in trait data



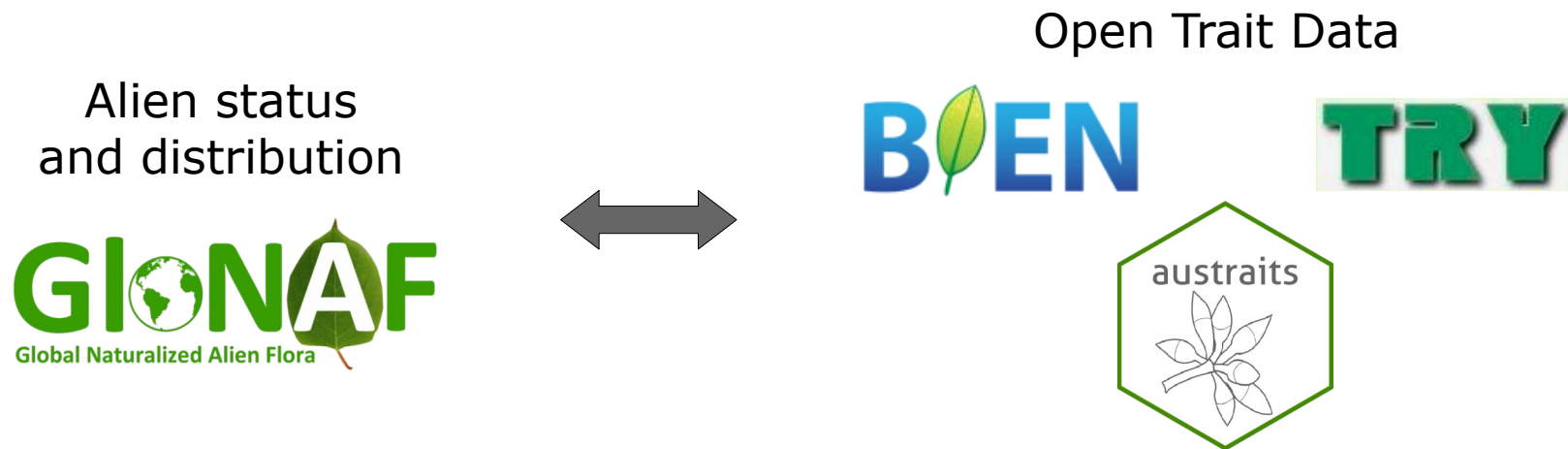
## Questions

1. How much trait data is out there?
2. For how many species do we have “classical” trait combinations? (LHS, Díaz et al. 2016, Bergmann et al. 2020)
3. Are there taxonomic bias in missing trait data?
4. Are there geographic bias in missing trait data?

## Potential Outputs

1. Maps/Phylogenetic trees of missing data
2. Priority list for species/traits missing
3. (Potential ideas for trait imputation?)

## Process



**16 538** species in GloNAF  
→ **13 669** species with **trait (consolidated data)**

NB: here we're neglecting whether **trait** comes **alien** or **native range**  
(we know it **may be important** but too restrictive)

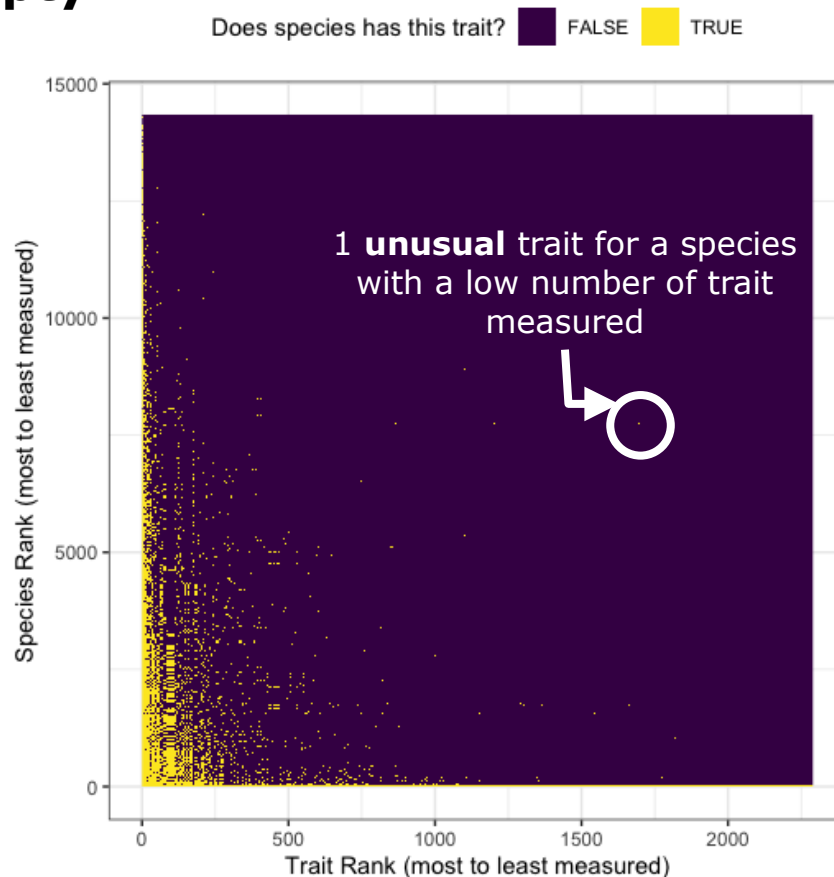
# The trait matrix is mostly empty

1 pixel = 1 trait for 1 species

Traits ordered from  
most to least measured

Species ordered from  
most to least measured

Many species measured  
but rarely same traits

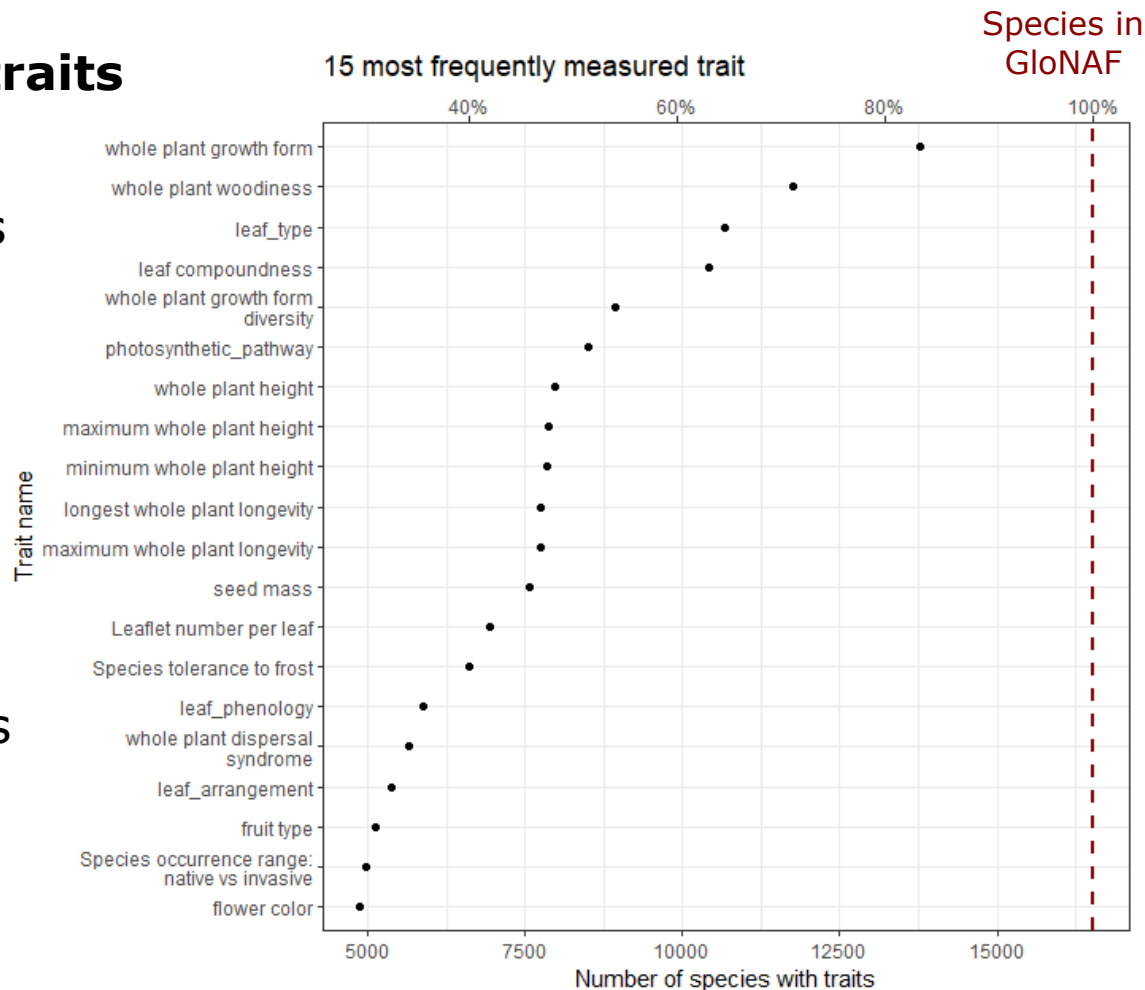


# Most measured traits

Very “crude” traits

Very related traits

“Interesting” traits  
for <1/2 species

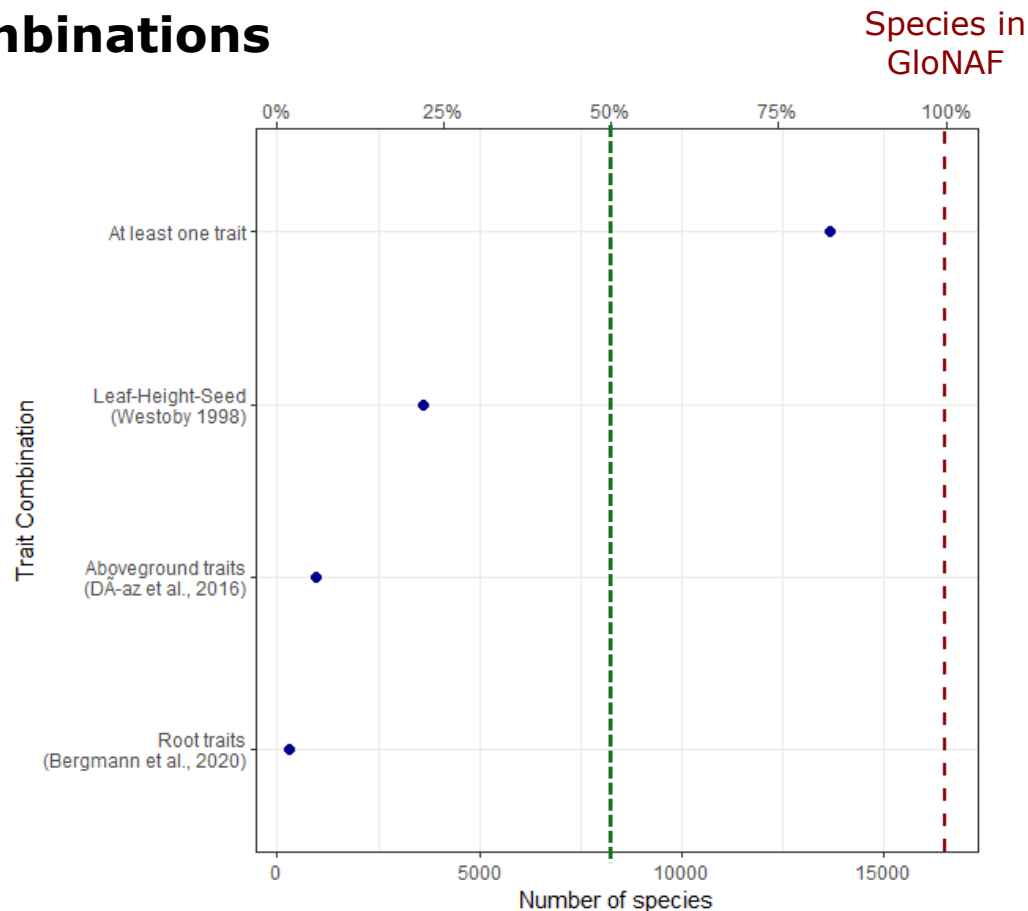


## “Classical” trait combinations

Proportion of  
species with given  
trait combinations

Could add  
“invasion-specific  
combination”

Mathakutha et al.  
2019 JVS?



# Trait gaps in taxonomy

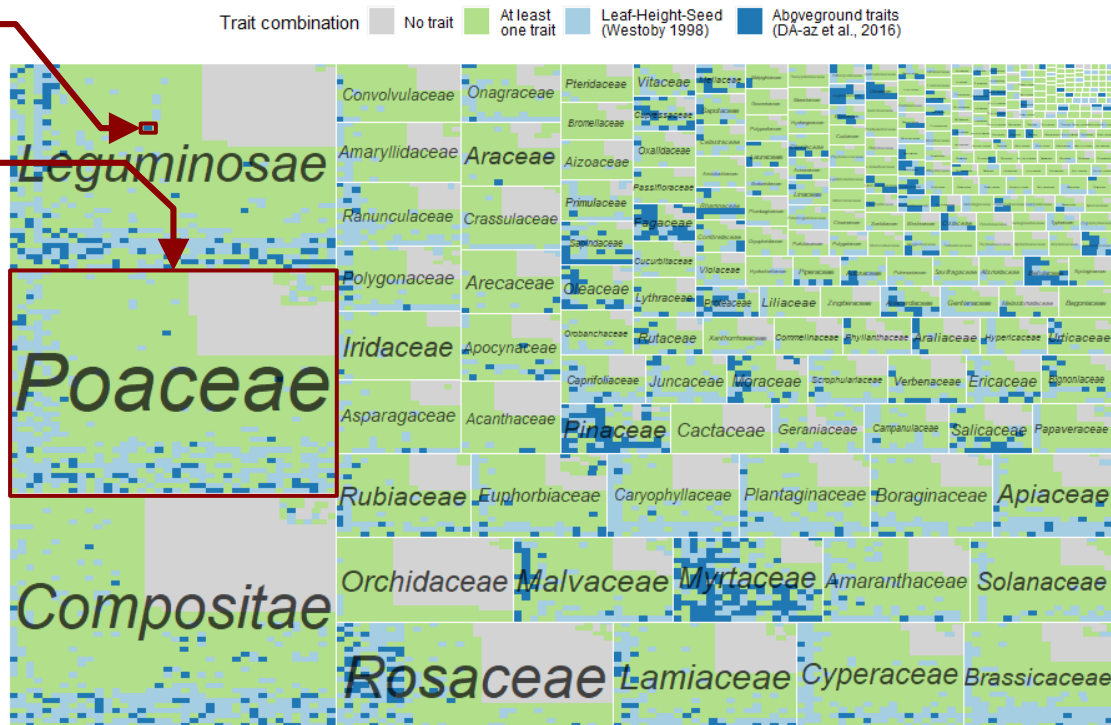
1 pixel = 1 alien sp.

1 white rectangle =  
1 family

Family ordered by  
number of species

Many species  
with  $\geq 1$  trait

Low proportion  
of LHS or Díaz comb.  
per family





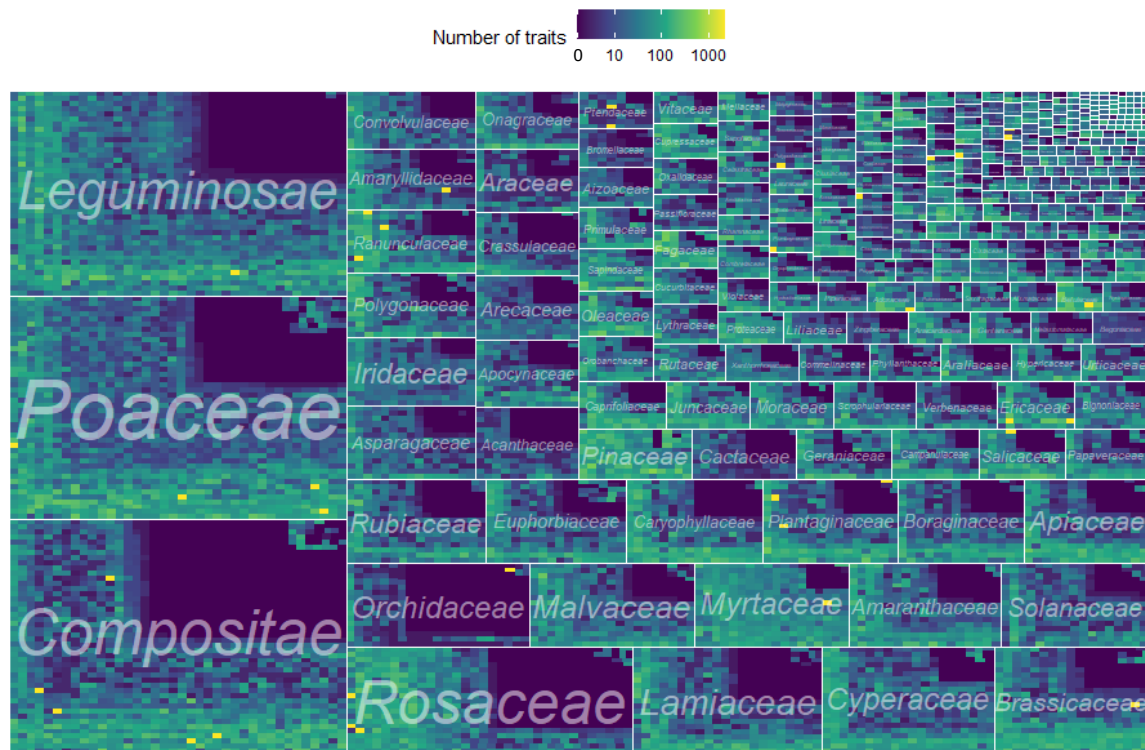
# Trait gaps in taxonomy

1 pixel = 1 alien sp.

Brighter color =  
More traits

Many species  
with multiple traits

**No guarantee  
these are similar  
between species**



## Map of trait gaps for alien species



Standard process to get maps from GloNAF data anyone?

## **Trait/Species priority list**

**Context:** we will have a student helper to extract data from the literature  
Prioritize species/traits/locations?

### **Species**

By potential (alien) range size? By ecosystem impact (invasive vs. not)?  
By cost (through Invacost, underestimated for plants)?

### **Traits**

LHS traits? Díaz et al. Traits? Any trait?  
Additional traits on species we know already?  
Or basic traits on unknown species?

### **Locations**

Easy to have trait locations (Europe)? Lesser known?  
Bigger donors/recipients?

# Future projects to define our “priority list”

## Potential Idea

## Potential Trait Acquisition Priority

Functional Resistance  
in the Tropics

Area = Tropics  
Traits = Díaz + Invasion

Impact of aliens  
on regionally threatened species  
(functional overlap)

Area = Temperate  
Traits = Díaz + Invasion

CWM-environment relationship  
for aliens vs. natives

Area = Temperate  
Traits = Invasion