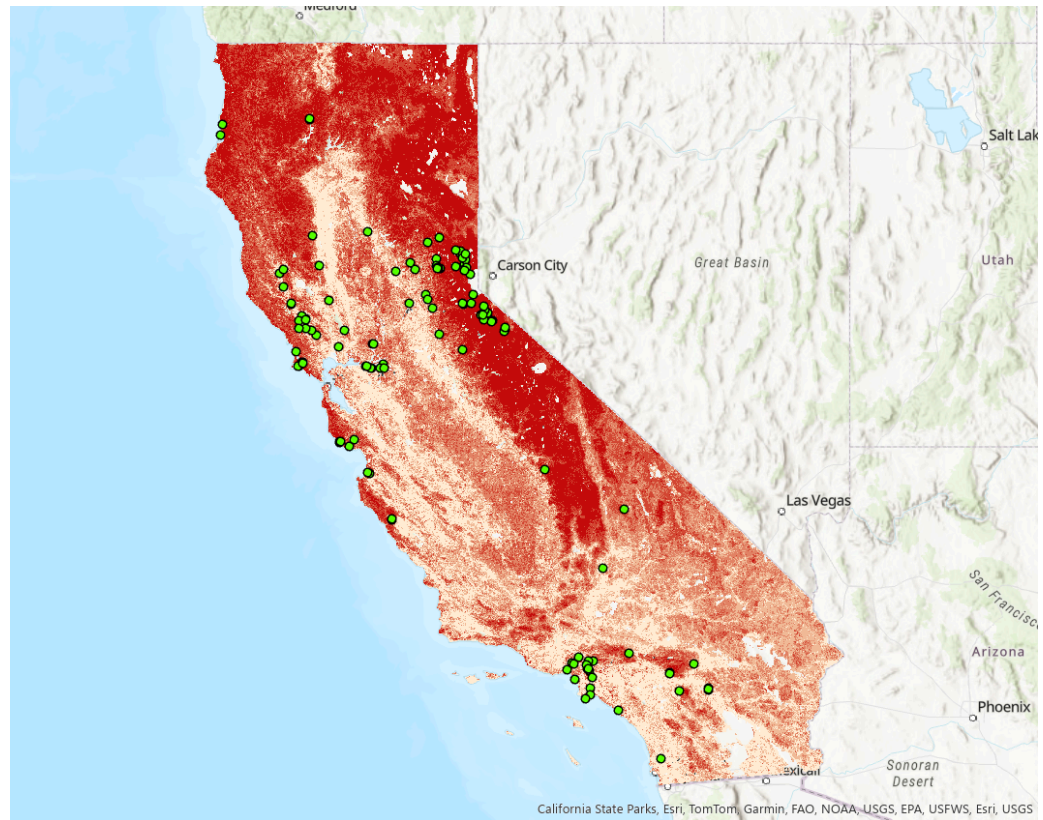


Settings

1. Beta diversity script: https://github.com/levisimons/CIB/blob/main/CIB_BetaDiversity.R
2. Primer: ITS1_Fungi
3. Taxonomic agglomeration: None
4. Beta diversity metric: chao
5. Filtering
 - a. Decontamination
 - i. Remove taxa with fewer than two reads
 - ii. Remove samples with fewer than two reads
 - b. Remove empty samples after decontamination.
 - c. Remove samples without location/date information.
 - d. Retain taxa within the order Boletales
6. Final filtered data set statistics
 - a. 529 samples
 - b. 67 taxa
 - c. 14 projects
7. Percent variation attributed to principal components:
 - a. PC1: 16.7%
 - b. PC2: 13.3%
 - c. PC3: 12.8%
8. Environmental layers used
 - a.  CIB_EnvironmentalLayers
9. Random forest modeling to predict the values of the first three principal components using environmental variation.
 - a. 80/20 training/testing split
 - b. 100 models with results averaged
10. Beta diversity PC maps.
 - a.



Boletales_PC1.tif

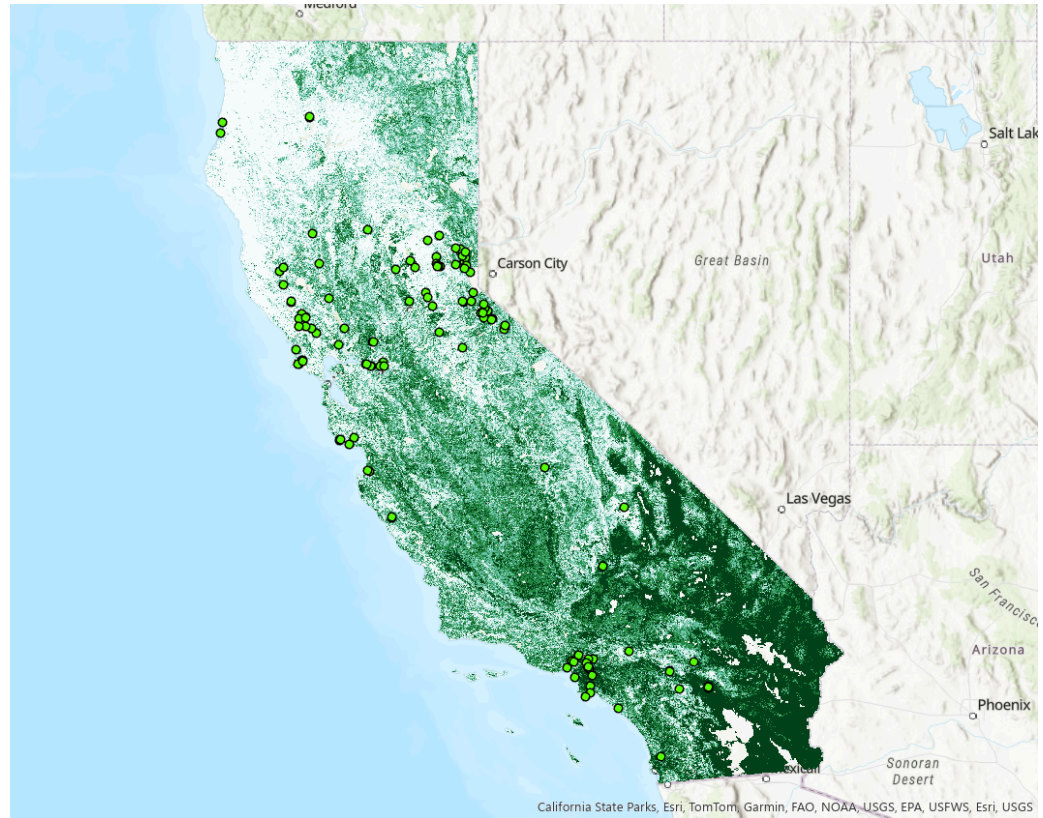
Principal component 1

Top five important variables

1. SoilBulkDensity_B0 (Density of soil at 0 cm depth)
2. BIO01 (Annual Mean Temperature)
3. SoilOrganicCarbon_B0 (Concentration of organic carbon in soil at 0 cm depth)
4. SoilClay_B0 (Concentration of clay in soil at 0 cm)
5. Sentinel2Variance_B1 (Variance in 443.9nm (S2A) / 442.3nm (S2B) band)

Pearson correlations between predicted and actual principal component values
0.16 +/- 0.07

b.



Boletales_PC2.png

Principal component 2

Top five important variables

1. BIO01 (Annual Mean Temperature)
2. BIO12 (Annual Precipitation)
3. SoilTextureClass_B60 (Category of soil texture at 60 cm depth)
4. Sentinel2Variance_B1 (Variance in 443.9nm (S2A) / 442.3nm (S2B) band)
5. SoilSand_B0 (Concentration of sand in soil at 0 cm depth)

Pearson correlations between predicted and actual principal component values
0.53 +/- 0.07

c.

Principal component 3

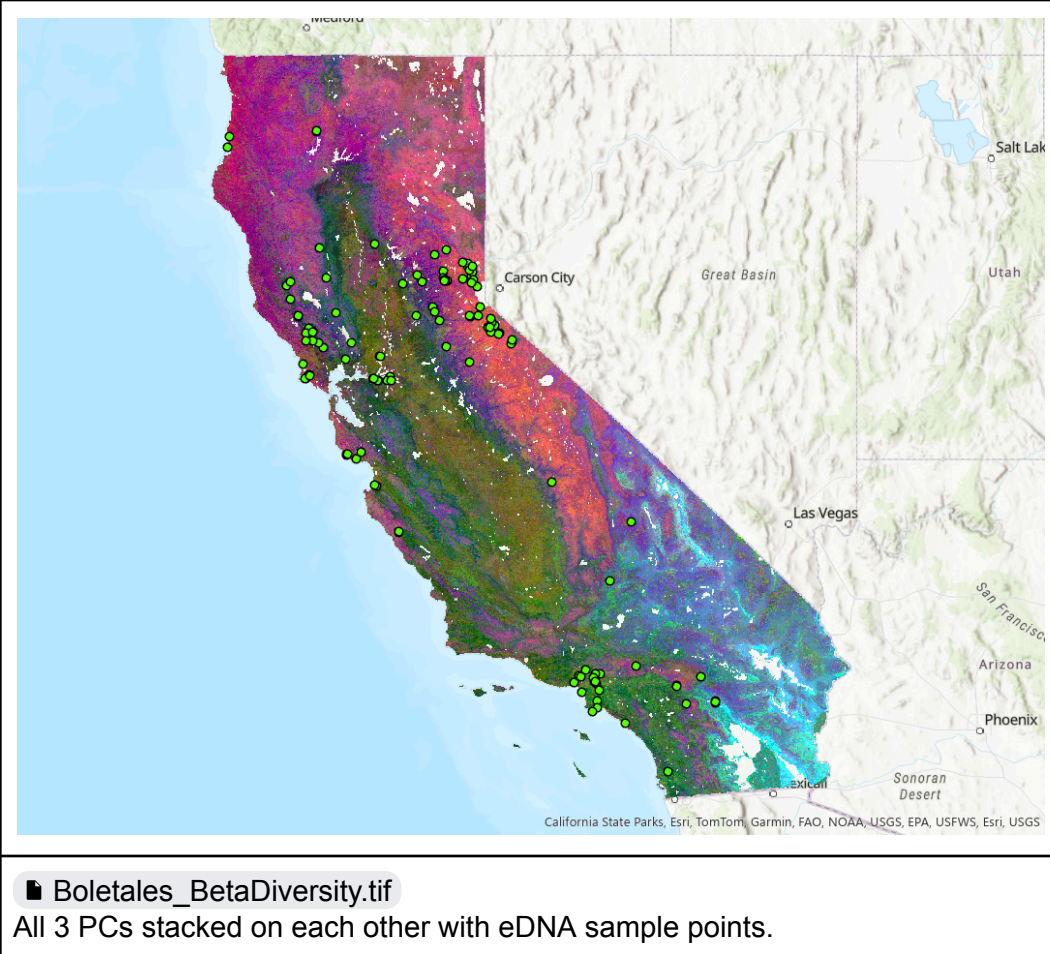
Top five important variables

1. BIO01 (Annual Mean Temperature)
2. BIO12 (Annual Precipitation)
3. SoilWaterContent_B0 (Concentration of water in soil at 0 cm depth)

4. Sentinel2Variance_B10 (Variance in 1373.5nm (S2A) / 1376.9nm (S2B) band)
5. BIO02 (Mean Diurnal Range (Mean of monthly (max temp - min temp)))

Pearson correlations between predicted and actual principal component values
0.32 +/- 0.08

d.



e.