Data organized as spreadsheet:

Rows: Vectors of measurements

Col: A: Timepoint(T0,T1,T2)

Shelf (Wide, Narrow)

B: Treatment(Control, FE, DFB)

C: Sample Name

D: NO3

E:Phosphate PO4

S2O2

G: Bigger Cell Biomass

H: Small Cell Biomass

J/K: Fv/FM and Sigma IGNORE

L: Nitrogen uptake in bigger cells

M: Nitrogen uptake in smaller cells

O/P/Q Interest: Biomass-Normalized Nitrogen Uptake(Big,Small,Total)

R/S/T: Carbon Uptake (Big,Small,Total)

U/V/W Normalized Carbon Uptake (Big,Small,Total)

Analysis:  
 1. Diagnostic:

1. For each variable: Should we transform? Use log10 to normalize values that are orders of mag different, Use Log10(x) + c for the negative numbers. Or just set negative numbers to 0
2. Normalize: Already done

2. Biomass lower for the Wide shelf vs Narrow shelf?

1. Assess with P-Value
   1. Combine all data(Wide and Narrow) and do 2 sample T-Test
   2. 4-var ANOVA (Shelf by time by treatment by cell age/size)
   3. T0 Only (2 Sample T-Test)

3. Significant treatment effects

ANOVA as above but responses:

Above: Biomass,

Now: Uptake(8 different uptakes)

Nurtrient Concentrations (3 different nutrient concentrations)

Try: (Side Bar, not main analysis)

No Interactions

All Interactions

Diff between:

Crtl, DFB

Fe, DFB

Crtl,, Fe

4.In No3, is there difference between Narrow and Wide shelf?

Question answered in above section

5. PCA

Rows as vectors (Look on Perry’s notes for Rows)

Graph at as shown on Perry’s notes

Use colors to separate treatment and shelf:

“Grey” Crtl, “Red” Fe, “Blue” DFB

“Dark Gray/Red/Blue” WideShelf, “Light Gray/Red/Blue”, NarrowShelf

Use Symbols to separate time:

“0” T0, “+” T1, “Star” T2

Reshape data to add new variable: Cell Size(Large/Small) and just 1 col for Chl values.

Should double row count.

Add interactions as factors(not continuious)

T0 does not have treatments, take it out of Anova

Plot out Anova: Mean, CIs, etc

X: timepoint, y: shelf types(2 curves) and show 95% CI

Show for each interaction

Plot out residauals

Find CI and mean for each cell

Make sure data is fit for Anova(Too imblanaced?)

Check Distribution of Chl with overlapping density graph(overlap in size)

Do centering and scaling for PCA features

Center and scale by columns (each variable has same impact)

Diagnostic PCA plots (scree plot)

Shows how much variation in each principal component

Graph Treatment types as symbols

Put PCA in separate notebook

Add a lot more notes