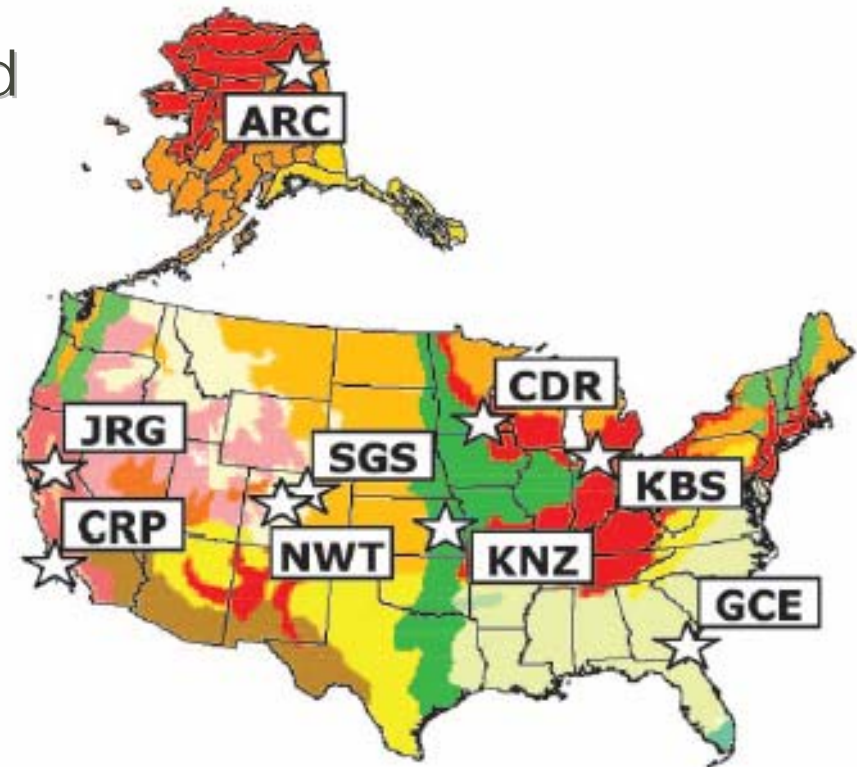




# Fertilization Synthesis Group

- Collaborators: Katharine Suding, Chris Clark, Elsa Cleland, Scott Collins, Joe Fargione, Laura Gough, Jim Grace, Kay Gross, Daniel Milchunas, Steven Pennings
- NCEAS postdoc: Elsa Cleland





# Examples





# BEAM Working Group

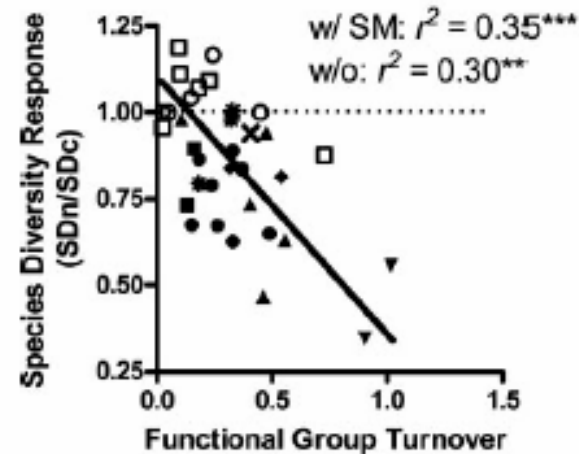
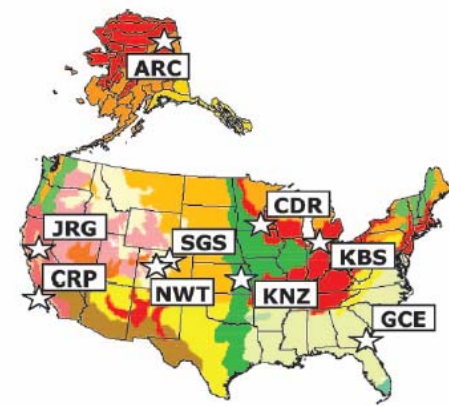
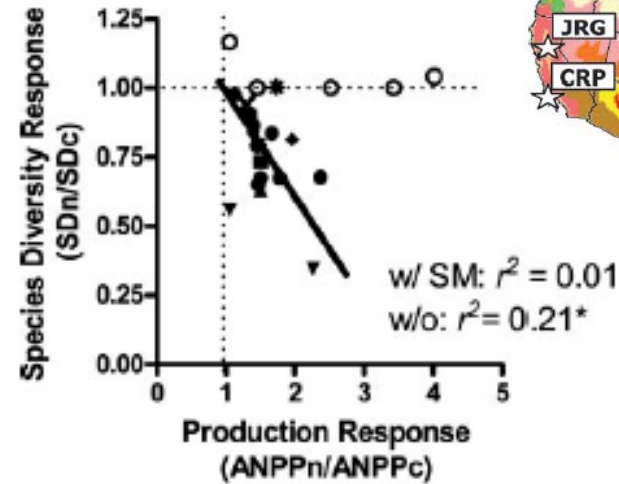
- Steve Cox (NCEAS)
- David Chalcraft (NCEAS)
- Elsa Cleland (NCEAS)
- Katie Suding
- Chris Clark
- Evan Weiher





-Fertilization caused species richness decline in concert with production increase.

- As species were lost, functional group turnover increased.



Suding et al. 2005 – *P.N.A.S.*





# BEAM question...

- Does fertilization homogenize a community?
  - hypothesis: because species richness declines, plots would tend to be more homogenous





# Data requirements

- Data from 8 grassland sites

- Format:

Site Community PlotID1 PlotID2 Fert Species Relabund





SITE	COMMUNITY	METHOD	PLOT SIZE m-squared	REPS each treat	TOTAL AREA m-squared
ARC - Arctic LTER	5 - Tundra types	cover	1	16 - 32 (2-4 blocks with 8 sub-plots in each)	16-32
CDR - Cedar Creek LTER	2 - Old fields	biomass harvest	0.3	6	1.8
KNZ - Konza LTER	2 - Watered and Unwatered Prairie	cover	1	6	6
KBS - Kellogg Biological Station LTER	2 - Tilled and Untilled oldfields	biomass harvest	1	6	6
CARP - Carpenteria LTER	6 - saltmarsh zones	cover	0.25	10	2.5
GCE - Georgia Coastal LTER	5 - saltmarsh zones	biomass	0.25	10	2.5
JRGCE - Jasper Ridge Global Change Experiment	2 - Watered and Unwatered annual grassland	pin hits	0.5	8	4
SGS - Short Grass Steppe	2 - Watered and Unwatered dry grassland	cover classes	0.1	100 (2 large plots with 50 subplots)	



# SEEK Data details

A  
R  
C

```

1999lgcover.dat - Notepad
File Edit Format View Help
year,Site,Treatment,Block,Plot,Species,Relative Cover
1999,MAT,CT,1,1,Andromeda polifolia,0.02
1999,MAT,CT,1,4,Andromeda polifolia,0.01
1999,MAT,CT,1,8,Andromeda polifolia,0.01
1999,MAT,CT,1,5,bare,0.01
1999,MAT,CT,1,1,Betula nana,0.15
1999,MAT,CT,1,2,Betula nana,0.14
1999,MAT,CT,1,3,Betula nana,0.08
1999,MAT,CT,1,4,Betula nana,0.17
1999,MAT,CT,1,5,Betula nana,0.13
1999,MAT,CT,1,6,Betula nana,0.08
1999,MAT,CT,1,7,Betula nana,0.05
    
```

**Abstract.** Relative percent cover was measured for plant species on Arctic LTER experimental plots in moist acidic and moist non-acidic tundra

**Methods.** The experimental design is four blocks of 5 x 20 meter plots with randomly assigned treatments within each block. Treatments include control (CT) and nitrogen plus phosphorus (NP). Calculations: All percent cover values were summed within each plot, and then each value was divided by the total to generate a percent cover value standardized to 100%.

## Variables.

Year	The year of percent cover measurement
Site	The site of percent cover measurement
Treatment	The manipulated treatment
Block	The treatment block number
Plot	Sample plot where percent cover was measured
Species	Species and cover categories determined on plots as described above.
Relative Cover	The percent cover of a given species relative to the total cover of the plot





# SEEK Data details

Plant community response to fertilization at Sapelo Island, Georgia

## Variables

Site	Nominal GCE-LTER study site
Community	Plant community code
Treatment	Fertilization treatment
Replicate	Treatment replicate
Species_Code	Plant species code
ITIS_TSN	Taxonomic Serial Number
Plant_Mass	Plant mass measured per 0.25 square meter quadrat
Plant_Mass_m2	Plant mass calculated per square meter

G  
C  
E

PLT-GCED-0409_1_1.TXT - Notepad							
File Edit Format View Help							
Site	Community		Treatment	Replicate	Species_Code	ITIS_TSN	Plant_Mass
Plant_Mass_m2							
GCE6	BorJun	N	1	JROM	39238	75.13	300.5
GCE6	BorJun	N	2	JROM	39238	179.81	719.2
GCE6	BorJun	N	3	JROM	39238	443.20	1772.8
GCE6	BorJun	N	4	JROM	39238	227.53	910.1
GCE6	BorJun	N	5	JROM	39238	176.42	705.7
GCE6	BorJun	N	6	JROM	39238	121.69	486.8
GCE6	BorJun	N	7	JROM	39238	75.91	303.6
GCE6	BorJun	N	8	JROM	39238	38.69	154.8
GCE6	BorJun	C	1	JROM	39238	256.95	1027.8
GCE6	BorJun	C	2	JROM	39238	193.50	774.0
GCE6	BorJun	C	3	JROM	39238	192.28	769.1
GCE6	BorJun	C	4	JROM	39238	248.93	995.7
GCE6	BorJun	C	5	JROM	39238	330.00	1320.0
GCE6	BorJun	C	6	JROM	39238	250.84	1003.4
GCE6	BorJun	C	7	JROM	39238	167.68	670.7
GCE6	BorJun	C	8	JROM	39238	113.87	455.5



# Exercise

With your Pod:

– Using the datasets:

- Determine what they contain
- Determine the fields you would need in the target dataset to answer the question
- Describe how the datasets would map into the target ... which fields would be used, how would they be converted, etc.





# Results

1999lgcover.dat - Notepad

```
File Edit Format View Help
Year,Site,Treatment,Block,Plot,Species,Relative Cover
1999,MAT,CT,1,1,Andromeda polifolia,0.02
1999,MAT,CT,1,4,Andromeda polifolia,0.01
1999,MAT,CT,1,8,Andromeda polifolia,0.01
1999,MAT,CT,1,5,bare,0.01
1999,MAT,CT,1,1,Betula nana,0.15
1999,MAT,CT,1,2,Betula nana,0.14
1999,MAT,CT,1,3,Betula nana,0.08
1999,MAT,CT,1,4,Betula nana,0.17
1999,MAT,CT,1,5,Betula nana,0.13
1999,MAT,CT,1,6,Betula nana,0.08
1999,MAT,CT,1,7,Betula nana,0.05
```

PLT-GCED-0409\_1\_1.TXT - Notepad

Site	Community	Treatment	Replicate	Species_Code	ITIS_TSN	Plant_Mass
Plant_Mass_m2						
GCE6	BorJun N	1	JROM	39238	75.13	300.5
GCE6	BorJun N	2	JROM	39238	179.81	719.2
GCE6	BorJun N	3	JROM	39238	443.20	1772.8
GCE6	BorJun N	4	JROM	39238	227.53	910.1
GCE6	BorJun N	5	JROM	39238	176.42	705.7
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GCE6	BorJun N	7	JROM	39238	75.91	303.6
GCE6	BorJun N	8	JROM	39238	38.69	154.8
GCE6	BorJun C	1	JROM	39238	256.95	1027.8
GCE6	BorJun C	2	JROM	39238	193.50	774.0
GCE6	BorJun C	3	JROM	39238	192.28	769.1
GCE6	BorJun C	4	JROM	39238	248.93	995.7
GCE6	BorJun C	5	JROM	39238	330.00	1320.0
GCE6	BorJun C	6	JROM	39238	250.84	1003.4
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