Session 5: R check-in

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02/16/2018

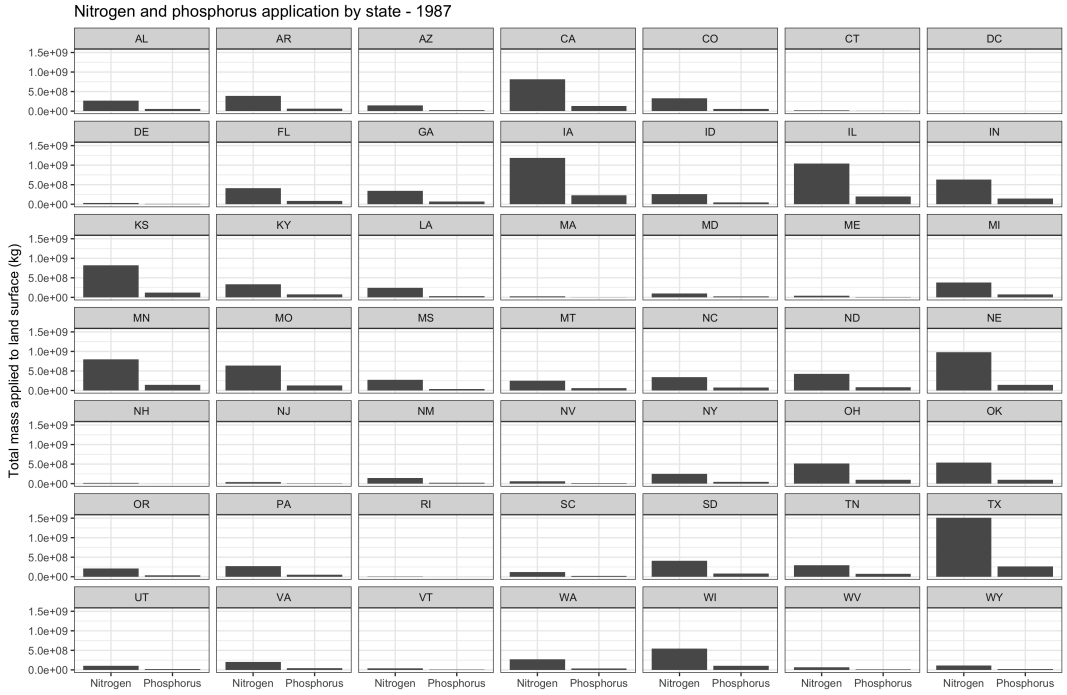
1 Data

Data analyzed in this session are from the US Geological Survey and include total nitrogen (N) and phosphorus (P) mass (kg) applied to the land surface in 1987 via fertilizer (applied to farm and non-farm settings), livestock (confined and unconfined) manure, and atmospheric deposition (N only). Measurements are reported at the county-scale across the US. The total land areas (sq. km) over which nutrients were applied are also reported per county. The data can be accessed from USGS Scientific Investigations Report 2006-5012, "County-Level Estimates of Nutrient Inputs to the Land Surface of the Conterminous United States, 1982-2001" by Barbara C. Ruddy, David L. Lorenz, and David K. Mueller.

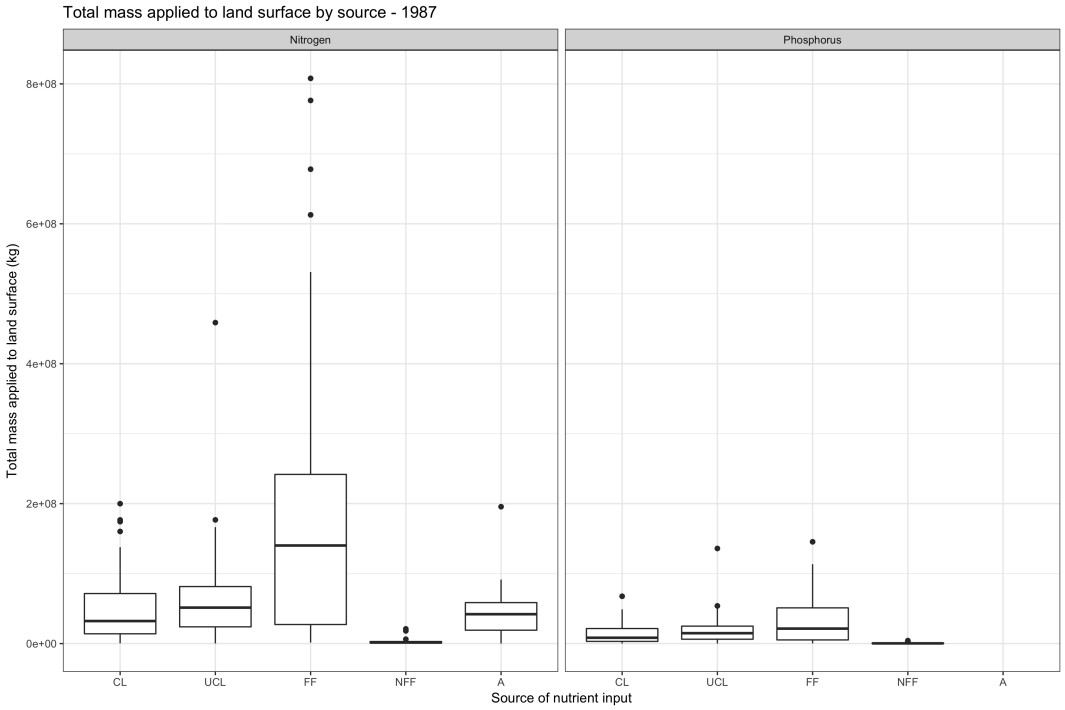
The data are saved in one .csv file named "Nutrient_Inputs_1987.csv"

2 Final outputs

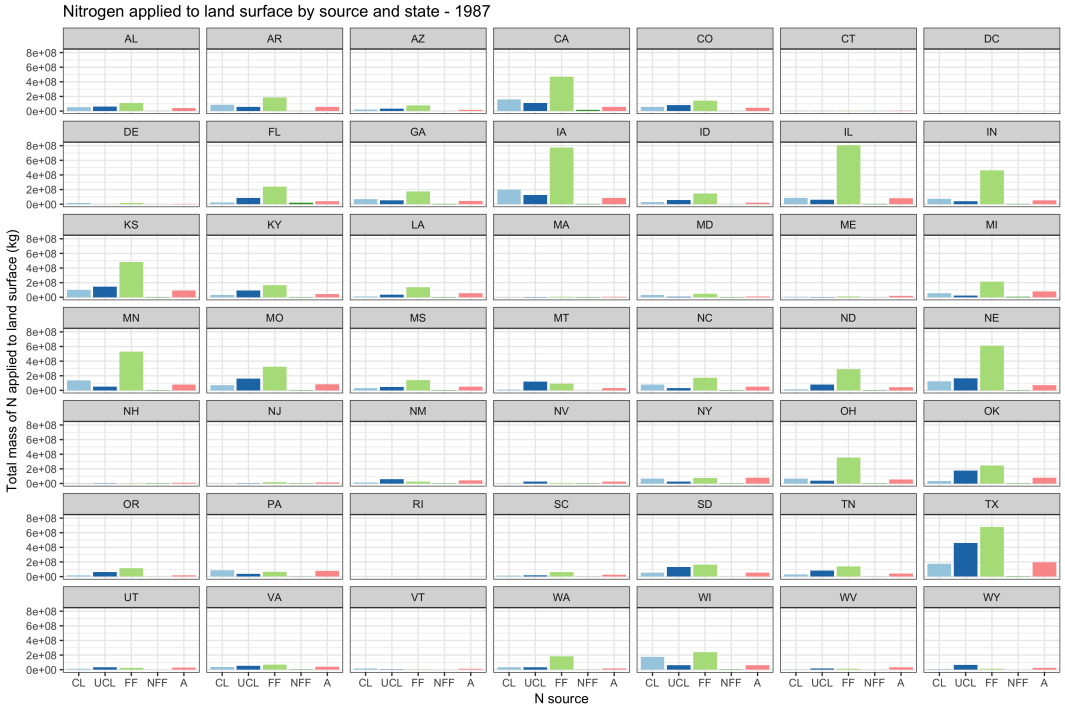
Plot 1



Plot 2


Total mass applied to land surface by source - 1987
Nitrogen
Phosphorus
Total mass applied to land surface (kg)
8e+08
6e+08
4e+08
2e+08
0e+00
CL
UCL
FF
NFF
A
Source of nutrient input

Plot 3


Nitrogen applied to land surface by source and state - 1987
AL
AR
AZ
CA
CO
CT
DC
DE
FL
GA
IA
ID
IL
IN
KS
KY
LA
MA
MD
ME
MI
MN
MO
MS
MT
NC
ND
NE
NH
NJ
NM
NV
NY
OH
OK
OR
PA
RI
SC
SD
TN
TX
UT
VA
VT
WA
WI
WV
WY
Total mass of N applied to land surface (kg)
8e+08
6e+08
4e+08
2e+08
0e+00
CL
UCL
FF
NFF
A
N source

Plot 4

3 Hints

- After you reorganize your table (and before you perform any calculations or create plots), you'll have to remove the NA values
- You can include multiple columns in `group_by()` to create groups based on several variables
- The function `sum(colname)`, where `colname` is the name of a column of interest, can be used to add all of the values in a group
- After you tidy and wrangle your data, the head of your dataset should look like:

	State	Nutrient	Application	Total	AppCode
1	AL	Nitrogen	Atmospheric	42263547	A
2	AL	Nitrogen	ConfinedLivestock	52581042	CL
3	AL	Nitrogen	FarmFertilizer	110342718	FF
4	AL	Nitrogen	NonfarmFertilizer	1532393	NFF
5	AL	Nitrogen	UnconfinedLivestock	62225937	UCL
6	AL	Phosphorus	ConfinedLivestock	15992508	CL
7	AL	Phosphorus	FarmFertilizer	21651999	FF
8	AL	Phosphorus	NonfarmFertilizer	262928	NFF
9	AL	Phosphorus	UnconfinedLivestock	19791197	UCL
10	AR	Nitrogen	Atmospheric	58559300	A

- To change the colors of the bars, add `scale_fill_brewer(palette = "Paired", guide = FALSE)` to your ggplot code