This document provides an explanation and overviews the replication data associated for the following publication:

Batbaatar, A., Carlyle, C.N, Bork, E.W., Scott, X.C, & Cahill Jr., J.F. 2021. Multi-year drought alters plant species composition more than productivity across northern temperate grasslands. *Journal of Ecology.*

Data are organized into the following csv files:

1. Batbaatar\_et\_al\_JEcol2021\_RepData1.csv: this contains community structure and productivity data for all plots.
2. Batbaatar\_et\_al\_JEcol2021\_RepData2.csv: this contains species cover data for all plots.
3. Batbaatar\_et\_al\_JEcol2021\_RepData3.csv: this contains soil water content data for all plots.
4. Batbaatar\_et\_al\_JEcol2021\_RepData4.csv: this contains soil carbon and nitrogen data for all plots.
5. Batbaatar\_et\_al\_JEcol2021\_RepData5.csv: this contains long-term precipitation for all grasslands.
6. Batbaatar\_et\_al\_JEcol2021\_RepData6.csv: this contains weather station data during the experiment for all grasslands.

Description of variables in Batbaatar\_et\_al\_JEcol2021\_RepData1-6.csv

* “plot”: treatment-specific ID for each replicate of precipitation treatment
* “site or id”: site name or site-specific unique ID for each grassland and used as a random factor in the analysis.
* “year”: Sampling year (length of records) and used as a fixed factor in the analysis.
* “drought”: precipitation treatment representing the ambient and drought conditions.
* “anpp”: total aboveground net primary productivity collected at peak biomass (unit = g m-2). anpp measured as both grass and forb standing biomass.
* “root”: standing root biomass down to 15 cm collected at peak biomass (unit = g m-2)
* “grass”: total biomass of grass species (unit = g m-2).
* “forb”: total biomass of forb species (unit = g m-2).
* “litter”: standing dead and detached material collected at peak biomass (unit = g m-2).
* “richness”: number of unique individuals in a plot.
* “evenness”: the variance in abundance values among all species present in a plot
* “species”: abbreviated names of species found in a plot
* “rel.cover”: relative abundance of a species recorded in a plot
* “func”: growth forms of each species found in a plot
* “C”: soil organic carbon sampled annually in a plot (%).
* “N”: soil total nitrogen sampled annually in a plot (%).
* “vwc”: daily soil volumetric water content measured in a plot
* “ppt”: monthly precipitation for long-term or received at the ambient treatment (mm)
* “rs.ppt”: monthly precipitation for long-term or received at the drought treatment (mm)
* “MAT”: mean annual temperature for long-term records for all grasslands
* Tave: average monthly temperate for long-term or recorded during the experiment (°C)
* Tmin: minimum monthly temperate for long-term or recorded during the experiment (°C)
* Tmax: maximum monthly temperate for long-term or recorded during the experiment (°C)

# Brief sampling description

All data except for climatic variables were sampled annually in each plot at each grassland. Detailed methods are provided in Batbaatar et al. (preliminary reference above).