Analysis plan:

# Questions

The main objective of this work is to infer stability of plant community compositional structure in the absence of large-scale or direct disturbance in a tidal freshwater marsh. I used three observational datasets spanning four decades to answer the following questions:

1. Are TFM assemblages composed of the same dominant species in each year of observation? In the absence of significant environmental disturbance, I expect the same species to dominate each assemblage as identified by Bradfield & Porter (1982).
2. Is species diversity stable within and between assemblage types over time? I expect community-wide diversity to be more stable than diversity within each assemblage type.
3. What is the total turnover within each assemblage, and which species gained or lost are driving changes within each assemblage? I expect greater invasive species abundance (or greater number of species lost) will be evident in assemblages that experience greater total turnover.

# Analyses to answer questions

1. Cluster analysis
   1. indicator species analysis to show species driving 3 main cluster groups.
   2. Optional: shifts in composition over time may be shown by NMDS (environmental drivers are unknown).
2. Focus on showing diversity within and between assemblages
   1. Alpha, beta within assemblage
      1. Gamma across all assemblages (marsh-wide), OR, is marsh-wide diversity the same as beta diversity among assemblages?
   2. Beta-div, community\_stability, OR multivariate dispersion. All three return a relative magnitude that can only be compared within this study.
      1. Justify pseudo-independence of assemblages.
   3. Beta div across all assemblages
3. turnover

# Double-checks and Supplements

1. Does ‘0’ affect any analyses? (should data be entered as presence only, not using 0?)
2. How to code diversity metrics (which beta-div, why?; what is gamma in this instance?)
3. Run cluster analysis w/ bray-curtis and Euclidean distance.
   1. See if indicator analysis finds same groupings
   2. Save as supplement
4. Make a frequency table showing n plots per year, which species are gained/lost, or moved to different assemblages

Do it.