Ecoacoustics Workflow Overview (Everglades Soundscape Project)

1. Load & Merge Data

- Import hourly/daily acoustic index means and medians from all 7 sites.

- Validate structure and merge into a tidy long-format table.

2. Diel Analyses

- Plot 24■hour index cycles for each site.

- Fit cyclic GAMMs to test diel patterns with random effects for date/site.

3. Daily Seasonal Trajectories

- Plot daily index time series (phenology).

- Fit seasonal GAMMs using day■of■year; compare across sites.

4. Spatial Analyses

a. Site Summaries

- Compute daily, seasonal, or annual means/medians per site.

b. ANOVA / Kruskal–Wallis

- Test differences among sites; post■hoc Tukey or Dunn tests.

c. Mixed■Effects Models

- Estimate site-level acoustic signatures controlling for season/weather.

d. PCA & Ordination

- Build site × index matrix; run PCA; interpret loadings and site separation.

e. PERMANOVA & Clustering

- Test multivariate site differences; run hierarchical clustering.

5. Means vs Medians

- Compare robustness; use medians for heavy-tailed or noisy distributions.

6. Output Organization

- Save merged indices, spatial stats, GAMM models, PCA outputs, and plots under the appropriate directories within amp_soundscape_analyses/.