**Example\_2\_Analysis Files**

This folder includes the processed dataset, stan model, and R code necessary to perform the analysis for Example 2.

*ex2.Rda*

This file contains the processed dataset. Each row relates to a unique transect. There are 9717 transects. The columns are described below:

* *gap*: the percent total gap cover for each transect.
* *yr*: the year gap data was collected for each transect. These are recorded as years 1 to 8 referring to 2011 to 2018 respectively.
* *eco*: the Level III EPA ecoregion the transect is located in. These are presented as numbers so they can be accounted for in the Stan model. Eco 1 refers to the Central ecoregion, eco 2 refers to the Mojave ecoregion, and eco 3 refers to the Northern ecoregion.
* *plot*: the unique plot each transect is within. Each plot is presented as numbers so they can be accounted for in the Stan model. There are 3256 different plots.
* *obs*: the observer who collected cover data at each transect. Each observer is presented as numbers to they can accounted for in the Stan model. There are 253 different observers.

*ex2\_heterogeneous\_variance\_mixed\_effects.stan*

This file contains the stan model for the heterogeneous-variance mixed-effects model. See the comments within the code for more details on the model.

*ex2\_heterogeneous\_variance\_mixed\_effects\_analysis.R*

This file contains the R code to run the heterogeneous-variance mixed-effects analysis. It includes the necessary packages, further data set up and formatting, uploading and fitting the stan model which draws samples of the posterior distribution, and basic summary and graphics for the sample posterior distributions of the heterogeneous-variance mixed-effects model parameters. See comments within the Rscript for more details.