

**Exercise 10 – Model Selection 2:  
Binary Mixed Models  
Due March 27, 2024**

A UCF researcher (Pierre, et al. 2017) studied, among other topics, the survival of apple snails in wetlands with different pH and previously occupied and unoccupied by this species.



1. Use the `Exercise10_data.txt` script provided in the class website to generate a sample [snails] following the description above (you only need to run it once and then keep the data as a fixed input for your analyses).
2. State *your* scientific hypothesis.
3. Inspect and plot your data (publication quality).
4. Select and justify a statistical model to test your hypothesis using the data.
5. Verify the assumptions of the model you selected using plots.
6. Plot your *predictive* model with 95% CI (publication quality).
7. Interpret your results.

**Hint:** start evaluating random effects and then the model fixed effects. As you add more complex parameterizations justify why you think the changes are appropriate in this case, think back to what we did in this week's demonstration.

**NOTE 1:** Please submit your results as a single document – pdf preferred – via email to Michelle ([Michelle.Bardales@ucf.edu](mailto:Michelle.Bardales@ucf.edu)). Remember to include your code in an R file.

Pierre S.M, P.F. Quintana-Ascencio, E.H. Boughton, and D. G. Jenkins. 2017. Dispersal and local environment affect the spread of an invasive apple snail (*Pomacea maculata*) in Florida, USA. *Biological Invasions* 19: 2647-2661