Exercise 8: Model Selection
Due: 10/29/2013

Note 1: E-mail a single Word document with your results to both instructors. All analytical work needs to be done in R (unless otherwise noted). Scripts and output from R should be included in the Word document for full credit.

We collected plant demographic data of *Helianthemum squamatum* during 2008-2011. Plots were distributed in two different hills (hereafter SITE 1 and 2) located 400 m apart but similar in terms of total plant cover, slope and orientation (i.e. south-oriented and perennial cover below 20%). Trampling (TRAMP) was simulated at the end of each July by thoroughly destroying the biological soil crust with a hammer without damaging existing plants. This treatment was intended to mimic the effect of regular trampling by sheep on the soil (TRAMP=1). Control plots were not treated (TRAMP=0). We measured plant diameter (SIZE) and counted the number of flowering structures in each individual (INFLOR).

1. Using a model selection approach propose hypotheses explaining the potential effects of size, site and trampling treatment on the number of inflorescences produced by plant. You need to propose a **maximum of five** models to generate evidence for your hypotheses. All of them need to include the additive effect of size, but site and trampling can be included as additive or interactive effects. Explain why the diameter must always be included and justify your proposed model set (4 points).

2. Evaluate the relative information among your models and present a summary table with your findings that includes model name, K, AICc, Delta_AICc, AICcWt, Cum.Wt, and LL. What is this table telling us about your hypotheses (2 points)?

3. Calculate and discuss model average predictions for the number of flowering structures under four scenarios of your interest (2 points).

4. Calculate and discuss the model average slope for the effect of diameter (2 points).

Note 2: Please keep in mind that some variables may need to be transformed!