**CSUMB 550 Homework 6c**

**Discriminant Analysis**

**Sea Lions from Space**

As the images from remote sensing have become more and more detailed, we have begun to use those images to count a variety of species that are very difficult to access. No joke, this is really happening now. Examples include penguin colonies in Antarctica and whales far from shore. There is promise for identifying endangered Stellar sea lions on rookeries in a similar manner. However, processing all the images can take quite a lot of time if done with the human eye. We would like to develop a method that can predict whether or not a pixel in an image is a cloud or waves, sand, water, a pup, or an adult female based on the color of the different objects. The colors are represented as different scores in the red-green-blue spectrum.

Carry out both a linear and quadratic discriminant analysis predicting image type based on color scores. Which works better? Provide the means by image type and color scores and the coefficients. Attempt to interpret them. Plot the discriminant scores. Comment on the ability of the scores to separate the data. In particular, how good a job does the third discriminant function do at separating the data? Describe why any points were misclassified using the model.

Use the notes in the updated R code to guide you in terms of interpretation.