

Department of Applied and Computational Mathematics and Statistics Colloquium

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will give a lecture entitled:

*Estimating the Maximum Probability of Categorical Classes and Applications to
Biological Diversity Measurement*

Abstract

The study of biological diversity has seen a tremendous growth over the past few decades. Among the commonly used indices capturing both the richness and evenness of a community, the Berger-Parker index, which is equivalent to the maximum proportion of all species, is particularly effective. However, when the number of individuals and species grows without bound, the index changes. It is important to develop statistical tools to measure this change. In this talk, we introduce two estimators for the maximum proportion: the multinomial maximum and the length of the longest increasing subsequence. In both cases, the limiting distribution of the estimators as the number of individuals and species simultaneously grows without bound is obtained. Then, constructing the 95% confidence intervals for the maximum proportion helps improve the comparison of Berger-Parker index among communities. Finally, we compare the two approaches by examining their associated bias corrected estimators.



**Thursday, March 1, 2012
4:00 p.m. to 5:00 p.m.
118 DeBartolo Hall**