DEPARTMENT OF STATISTICS SEMINAR SERIES

SIDNEY SMITH HALL, ROOM SS1083

THURSDAY, 15 NOVEMBER 2012 AT 3:30PM

Mark-recapture of Whale Sharks with Multiple, Natural Marks: A Bayesian Approach

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Mark-recapture experiments often rely on natural markings in place of man-made tags or rings to uniquely identify individuals. Doing so means that individuals need to be handled less (if at all) and might be identified by untrained observers (citizen scientists) or by remote means (like motion triggered cameras). However, complications arise if identifications can be made from multiple markings whose correspondence for a single individual is not always known. Our work is motivated by data from the ECOCEAN worldwide study of whale sharks (Rhincodon typus), which bases identification on skin pigmentation patterns extracted from photographs submitted to an on-line database by recreational divers and members of the related research community. These photographs may show either the left or right side of an individual, and the skin pigmentation patterns from the two sides of a shark cannot be matched without external information. Naively constructing capture histories from both sides risks duplicating individuals (breaking the assumption of independence), while restricting to one side only may greatly reduce the amount of information in the data.

In this talk, I will discuss the new model we have developed for mark-recapture data based on multiple, natural marks and describe the Bayesian methods of inference we have applied. I will present results of modeling data from the ECOCEAN whale shark data study and will further compare inference from the new model with inference based on restricting the data to a single mark or including all marks without any adjustment for dependence and duplication.

Simon J Bonner and Jason Holmberg

Light refreshments will be served at 3:10 p.m.