COURSE ANNOUNCEMENT: Summer 2018

We can offer this course only if a minimum of 3 students register.
Please let Anna or Rebecca know by **March 31, 2018** if you intend to enroll and attend.

Course: Spatial Bioinformatics

Instructors: **Mary Blair (AMNH) and Rob Harbert (AMNH); Peter Galante**
Credits: **1**
Dates: **May 14-23, 2018** Daily except Saturday and Sunday (8 class days)

Spatial data and models are ubiquitous in modern comparative biology and ecology due to the vast amount of available data and ever developing modeling methods. This course will focus lectures on a series of "best-practices" in handling and modeling spatial biological data including data-mobilization, bias detection and reduction, geographic projection management, and comparative modeling frameworks. Labs will concentrate on demonstration of best-practices on a range of datasets including student's personal data. The course will culminate in student's working in "hackathon" style working groups to develop a spatial data analysis pipeline to address a question of mutual interest to be posted on appropriate code-sharing repositories.

Daily schedule:

Lecture/Workshop: 10:00-12:00 Working Lab: 1:30-4:30

Day 1 - Lecture: Introduction to programming
Lab: Unix command line, basic data handling in R

Day 2 - Lecture: Geographic data and handling in R
Lab: What's in a GPS coordinate? GPS vs. cell-phone locality information. Handling GIS data in R.

Day 3 - Lecture: Occurrence data and distribution modeling
Lab: Comparative niche modeling. Covering - sampling, data layers, model evaluation and parameterization, niche differentiation and overlap.

Day 4 - Lecture: Survey of advanced modeling topics (see lab topics)
Lab: Advanced modeling exercises. TBD

Day 5 - Lecture: Literature Discussion of spatial data in Comparative Biology
Lab: Advanced topics in R programming and an introduction to Git for code sharing and management. Will cover scripting, functions, and documentation. A primer in preparation for workshops and hackathon days.

Day 6-7 - BYOD (Bring Your Own Data) Workshops 1-4 pm

Students will bring or find data relevant to their own research (from i.e., Landsat, GBIF, iNaturalist) and will work through practical issues with their data analysis plans. These sessions will also serve as a brainstorming and guidance period for Hackathon project development.

Day 8 - Project/Hackathon day 9AM - 5PM

Students work in small groups a project that will develop a data analysis pipeline to address a question of interest to them. The goal of a hackathon is to create usable code with a specific focus by collaboration. Students will develop an R script or library, an example dataset, and a demonstration. Students will provide a write-up of the supporting literature and target audience for the code. Final code will be shared on the course GitHub repository to facilitate reuse and further development.