

**Stat 547H - Statistics in Ecology**  
M/W 1:30-3:00 pm, January 3<sup>rd</sup> – February 7<sup>th</sup> 2018  
Room ESB 4192  
Instructor: Marie Auger-Méthé

**Prerequisites:** Open to all interested graduate students from the Department of Statistics. Graduates students from other departments are welcome as long as they have a strong enough statistical background. Students from other departments should contact the instructor to discuss whether they have sufficient knowledge to take the course. Basic R proficiency is expected.

**Description:** Data in ecology is frequently associated with large challenges. Controlled experiments are often difficult and observational studies are often associated with missing data and measurement error. This class will introduce some of the challenges of using statistics to answer ecological questions and the statistical tools developed to handle them. A large emphasis of the course will be on applying statistical models to real *messy* ecological data.

**Topics will include:**

- Data constraints on ecological data analysis
- Handling missing, censored, and truncated data
- Working with overdispersion
- Handling measurement error with state-space models

**Readings:** No textbook required. Scientific papers and excerpt from books will be assigned. Some of the reference books will be:

*Ecological models and data in R* by Benjamin Bolker (available online through the university library)

*Ecological detective: confronting models with data* by Marc Mangel & Ray Hilborn

*Ecological Statistics: contemporary theory and application* edited by G.A. Fox, S. Negrete-yankelevich, V.J. Sosa

**Assessment:**

In-class tutorial and activities (e.g. exercise in R, paper critique)	30%
Weekly assignments (e.g. data analysis)	40%
Final project	30%