

# Papers for Stat 548

Marie Auger-Méthé

I'm interested in papers that present new statistical methods to analyze the movement and space use of animals, as well as statistical models describing population dynamics. I have listed papers representing methodologies that I'm interested in exploring, but I'm also open to discuss papers you find interesting.

You can contact me at [auger-methe@stat.ubc.ca](mailto:auger-methe@stat.ubc.ca)

## ~ Please read ~ general expectations

As you will see in the assessment form from the class (see <https://www.stat.ubc.ca/phd-qualifying-course>), students are graded based on 3 criteria: 1) "General understanding", 2) "Going beyond/ creative approach", and 3) "Work habits/reporting and communication skills". As you will see in the assessment form, each criterion has a list of points that needs to be addressed. I use this sheet to grade you and so make sure you address all of these points.

**General understanding:** The way I assess whether a student understands the article revolves around whether the student was capable of rewriting the explanation of the method in his/her own words and in a way that clearly describes the method. This means not following the structure of the original manuscript (my philosophy is that there are rarely only one way to explain something, so find the one that suits you best). If your description of the method follows that of the manuscript, I will return you the report and ask you to rewrite it. It also means linking the methods to other papers in the field. There is no need to have an exhaustive understanding of the field, but I expect students to read beyond the manuscript assigned to judge whether there are potential improvements or alternatives (a few tricks: check briefly the papers that cite the article, browse through the papers that the article list as important, and do a quick search on google scholar to see whether there are other important papers on the topic). Being critical of the article may be hard, but is important. Finding errors, limitations, or flaws in the article, definitely shows that you understand the methods. There are always some limitations or ways to expand the method to make it more general or to improve it. So if you cannot find a flaw or error per se, suggest improvements.

**Going beyond:** Going beyond is one of only 3 criteria, as such I think it's extremely important to go beyond describing the method. I am fairly flexible in terms of what the student does to go beyond. For examples, it can be applying it to real data, create a simulation to show a problem or limitation, writing an in-depth critique of the manuscript, etc. You need to at least create a small computer simulation to show that you are capable of using the method.

**Work habit & communication skills:** The final criterion is pretty self-explanatory. But you have to send your report at the very least *two weeks* before the deadline for the grade. Note that I sometime leave for weeks for the field, where I have no email contact. So make sure to check with me well in advance to see if I'll be available to read your report

when you expect to complete it.

### **General goals (we can discuss these)**

1. Describe the method in your own words to demonstrate that you understand how it works and the theory behind it.
2. Test the method via simulations, to demonstrate that you are capable of using the method
3. Go beyond in a way of your choice (e.g. demonstrate a problem with method, improve the method, apply to data [if data is available])
4. Discuss potential extensions of the method, preferably in an ecological context.

### **Suggested papers**

1. Leos-Barajas, V, Gangloff, EJ, Adam, T, Langrock, R, van Beest, FM, Nabe-Nielsen, J, Morales, JM (2017) Multi-scale Modeling of Animal Movement and General Behavior Data Using Hidden Markov Models with Hierarchical Structures. *Journal of Agricultural, Biological and Environmental Statistics* 22: 232-248
2. Langrock, R, Adam, T, Leos-Barajas, V, Mews, S, Miller, DL, Papastamatiou, YP (2018) Spline-based nonparametric inference in general state-switching models. *Statistica Neerlandica* 72: 179-200
3. Avgar, T, Potts, JR, Lewis, MA, and Boyce MS (2016) Integrated step selection analysis: bridging the gap between resource selection and animal movement. *Methods in Ecology and Evolution* 7: 619-630
4. Brost, BM, Hooten, MB, Hanks, EM, and Small, RJ (2015) Animal movement constraints improve resource selection inference in the presence of telemetry error. *Ecology* 96:2590-2597