



## Master's Degree Program in Natural Resources Conservation: Statistics Competency

January, 2020

Statistics are important in natural resources science, and are incorporated into several MSNRC program courses. Prospective graduate students are expected to have had exposure to statistics methods, concepts, and applications. Most often, this is satisfied by having completed an introductory statistics course in an undergraduate program. Please describe your statistics background in your application, or in an email to: [gradschool@paulsmiths.edu](mailto:gradschool@paulsmiths.edu).

Students without an undergraduate statistics course in their background have a variety of options including: 1) a *self-directed* review of the topics described below (this is a good idea even if you have had a course!), 2) taking a full, *non-credit* online statistics course, or 3) enrolling in a formal, *credit-bearing* undergraduate statistics course through an online provider or at a community college. The decision is yours, but if you are unsure and have questions, please contact Dr. Deborah Naybor at [dnaybor@paulsmiths.edu](mailto:dnaybor@paulsmiths.edu) to discuss your options.

**Guidance for a self-directed review of selected statistics concepts.** Students wishing to refresh their knowledge of basic statistics relevant to the PSC MSNRC program should pay attention to the following topic list and review the attached video links. Students are advised to repeat and extend their viewing of these materials and others until they feel comfortable.

Selected topics for PSC's MSNRC program:

- 1) Kinds of data (nominal, ordinal, interval, ratio, count) and what can and can't be done with different types.
- 2) Research questions (descriptive, comparison, process) and appropriate approaches
- 3) Basic parameters of a population (central tendency and dispersion)
- 4) Sampling, quantifying sample precision (sampling error, confidence intervals), and avoiding pitfalls (bias, pseudoreplication)
- 5) Basic methods of comparing populations (t-tests, f-tests, ANOVA, regression, and contingency tables.)

Suggested resources:

1. Dr. Nic's Maths and Stats (6 college-level topics – approx. 10 short videos each)  
<https://www.youtube.com/channel/UCG32MfGLit1pcqCRXyy9cAg>
2. Crash Course Statistics (45 sessions)  
[https://www.youtube.com/watch?v=zouPoc49xbk&list=PL8dPuuaLjXtNM\\_Y-bUAhblSAdWRnmBUcr](https://www.youtube.com/watch?v=zouPoc49xbk&list=PL8dPuuaLjXtNM_Y-bUAhblSAdWRnmBUcr)
3. Khan Academy – Playlist on Statistics (67 talks by topic)  
[https://www.youtube.com/watch?v=uhxfUt\\_-GyM&list=PL1328115D3D8A2566](https://www.youtube.com/watch?v=uhxfUt_-GyM&list=PL1328115D3D8A2566)
4. OpenStax (Rice University) Introductory Statistics - a free textbook  
<https://openstax.org/details/books/introductory-statistics>
5. Textbook: Gotelli and Ellison, 2012. A Primer of Ecological Statistics, 2nd edition. Sinauer Associates. 614p.