# Spring 2018 - Landscape Genetics WLF 561
## Wednesday 8:30-10:30
Instructor: Lisette Waits

2 Credits with optional 1 credit lab section (WLF 562) – online only option also available

**Course Organizers: Helene Wagner, Melanie Murphy, and Lisette Waits**

Co-Instructors: Niko Balkenhol, Jeff Bowman, Sam Cushman, Marie-Josee Fortin, Caren Goldberg, Nusha Keyghobadi, Erin Landguth, Stephanie Manel, Sean Schoville, Kim Selkoe, Steve Spear, and others

**Course description**

This course on *Landscape Genetics* provides a unique opportunity for interdisciplinary training and provides an overview of the field of landscape genetics. The course caters to students in basic and applied ecology, conservation and population genetics, landscape ecology, evolutionary biology and conservation biology. A key objective of landscape genetics is to study how landscape modification and habitat fragmentation affect organism dispersal and gene flow across the landscape. Landscape genetics requires highly interdisciplinary specialized skills making intensive use of technical population genetic skills and spatial analysis tools (spatial statistics, GIS tools and remote sensing). Even when students receive disciplinary training in these areas, educational programs often lack the necessary linkage and synthesis among disciplines. This linkage can only be accomplished after experts from each discipline work together to develop guiding principles for this new research area.
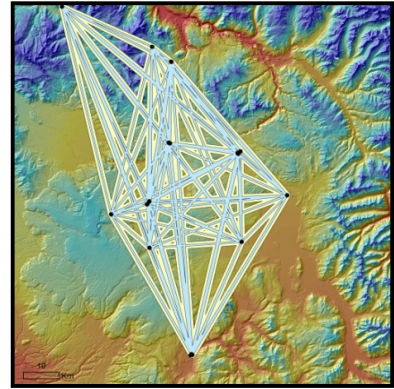
*Landscape Genetics* will be concurrently offered at multiple universities across the globe, giving students the opportunity to learn from international experts and work with peers from outside institutions. For students who are not members of the participating institutions, we are offering a web-based online course to reach a broader audience. Each course meeting will start with a live web-cast lecture (no special software required) by an expert on the topic that introduces foundations and methods and highlights points for discussion in local seminar groups. After breaking out into local course group discussion (including a discussion group for online course students), a web-based discussion across campuses will wrap up the weekly topic. Students who are unable to make it to live-cast of lectures can view taped lectures. In addition, students can choose to participate in an optional lab section using R and/or interdisciplinary group term projects with web-based collaboration across institutions. The final two options are provided to help students develop analytical skills in Landscape Genetics. Students who participate in group projects will have the option of applying to attend a project synthesis meeting in Coeur d'Alene, Idaho in May 2018. See more information at https://sites.google.com/site/dgs2018landscapegenetics/

**Course topics**
- Landscape genetics framework, Measuring gene flow, Alternative views of landscapes
- Spatial analysis framework, Identifying discrete populations
- Incorporating landscape data, Matrix resistance approaches in landscape genetics
- Distance-based methods, Model selection and validation
- Role of simulation modeling, Network-based methods
- Landscape genetics of adaptive variation

**Course Textbook:** *Landscape genetics: Concepts, methods, applications.* 2015. Balkenhol, Cushman, Storfer, Waits, eds, Blackwell.