



U.S. Fish & Wildlife Service

# National Conservation Training Center

*Conserving the Nature of America*

## CSP4210 - Statistical Modeling for Conservation

Course Code	<b>CSP4210</b>
Course Title	<b>Statistical Modeling for Conservation</b>
Description	<p>Statistical models are used to understand the mechanisms behind the patterns we see in nature. Statistical models are particularly good at this task because they embrace uncertainty in the environment, which provides a range of possibilities for conservation decision making.</p> <p>This course focuses on modeling trends and population-habitat relationships using “R” software. Emphasis is placed on model development, interpretation, understanding assumptions and evaluation of competing models.</p> <p>Statistical models explored in this class include simple and multiple linear regression, linear mixed models, generalized linear models such as Logistic, Poisson, and Negative Binomial regression and occupancy modeling. Other topics include variable selection and screening, model comparison techniques using AIC, BIC and cross-validation.</p> <p>Students are encouraged to bring a project or dataset to class for one-on-one consultation and for examples that may be integrated into the class. This coursework prepares students for CSP4220 Species Distribution Modeling for Conservation and CSP4230 Design and Analysis of Biological Monitoring.</p> <p><b>OBJECTIVES</b></p> <ul style="list-style-type: none"><li>• Develop simple linear and multiple linear regression models to examine relationships and predict abundance, density, etc.</li><li>• Use generalized linear models (e.g., logistic regression) to develop predictive species distributions.</li><li>• Use linear and generalized linear mixed models to evaluate trends in monitoring studies.</li><li>• Perform variable selection and screening, and compare models using AIC, BIC and cross-validation techniques.</li><li>• Use occupancy modeling for understanding changes in the proportion of sites occupied by a species when there is imperfect detectability.</li><li>• Evaluate multicollinearity and diagnose outliers.</li><li>• Exposure to integrating statistical models with GIS technology for the purposes of creating resource selection/species distribution maps.</li></ul> <p><b>PREREQUISITE</b></p> <p>Making Sense of Biological Data with R or equivalent experience with R and background in statistical concepts. Consult with course leader with requests for bypassing course prerequisite.</p> <p><b>TARGET AUDIENCE</b></p> <p>Biologists who are responsible for monitoring or conservation design projects and other population-habitat related studies.</p>
Delivery Method	Instructor Led
Non-FWS Fee	\$1,195.00
Instructional Hours	38
Credits/CEUs	3.0
Course Content Contact	Eric Kelchlin: <a href="mailto:eric_kelchlin@fws.gov">eric_kelchlin@fws.gov</a> ; (304) 876-7453; <a href="mailto:eric_kelchlin@fws.gov">eric_kelchlin@fws.gov</a>
Curriculum Category	<b>Statistics and Modeling</b>
Course Frequency	Once per year
Registration Link	<b>Register in DOI Talent</b>
DOI TALENT Course Type	ILT

College Credit Name	Semester Hours
College Credit Value	2

**Schedule: CSP4210 - Statistical Modeling for Conservation**

Start	End	Session Information	Location	Session Contact
1/14/2019	1/18/2019	For registration questions contact: jennifer_chin@fws.gov For course content questions contact: eric_kelchlin@fws.gov	National Conservation Training Center (NCTC)	Jennifer Chin; jennifer_chin@fws.gov
6/10/2019	6/14/2019	For registration questions contact: jennifer_chin@fws.gov For course content questions contact: eric_kelchlin@fws.gov	National Conservation Training Center (NCTC)	jennifer_chin@fws.gov