

Population Modeling Workshop/WIS6466
26 February – 5 March
University of Florida, Gainesville

1. Software

You will need to bring your laptop with the following programs or packages pre-installed (available for free download):

- R (<https://cran.r-project.org/bin/windows/base/>)
- R Studio (<https://www.rstudio.com/products/rstudio/download/>)
- MARK (<http://www.phidot.org/software/mark/>). MARK runs on Windows operating system. Mac users: MARK runs on Windows operating systems. Detailed installation instructions can be found at: <http://www.phidot.org/software/mark/downloads/>.
- JAGS (<http://mcmc-jags.sourceforge.net/>)
- Following R packages (these packages can be installed from RStudio interface):
 - RMark (<https://cran.r-project.org/web/packages/RMark/index.html>). You will need MARK for RMark to work. Some helpful tips for Mac users: <http://www.phidot.org/forum/viewtopic.php?f=21&t=3233>.
 - popbio (<https://cran.r-project.org/web/packages/popbio/index.html>)
 - jagsUI (<https://cran.r-project.org/web/packages/jagsUI/index.html>)

Some (but not all) exercises will also be available on ULM, a freely available matrix population modeling software (<http://www.biologie.ens.fr/~legendre/ulm/ulm.html>).

2. Course-related material

All course-related material (lecture notes, exercises, computer codes) will be provided in the class (hard copy or download). Your learning experience would be substantially enhanced if you came to the class/workshop with some understanding of the topics covered (see the attached schedule for details), and familiarity with the R/RStudio, and RMark (a nice overview can be found at: http://www.phidot.org/software/mark/docs/book/pdf/app_3.pdf) and popbio packages (all packages come with up to date documentation, or just google!).

- The MARK book (<http://www.phidot.org/software/mark/docs/book/>) is an excellent source of readable information on various capture-mark-recapture models implemented in MARK/RMark. It is quite long, so we recommend focusing only on the relevant chapters.
- Some papers that provide nice overview of topics covered in this course are attached with this email (.
- Serious population modelers might find the following textbooks useful:
 - Caswell, H. 2001. *Matrix population models: Construction, analysis, and interpretation*. Sunderland, MA: Sinauer Associates.
 - Morris, W. F., and D. F. Doak. 2002. *Quantitative conservation biology*. Sunderland: Sinauer.
 - Williams, B. K., J. D. Nichols, and M. J. Conroy. 2002. *Analysis and management of animal populations*. Academic Press.

3. Class projects and data

All participants are expected (graduate students are required) to work on a project related to some aspect of population modeling (matrix modeling, IPMs, or direct estimation and modeling of λ). We suggest working in groups of ≤ 3 . You are encouraged to bring on your data (and questions) so you get help and advice from your instructors. Here are some options for in-class projects:

- Bring your own data or pair-up with someone who has appropriate data (type of data you need would depend on modeling framework to be used and questions/objectives to be addressed. However, data must be adequate to address interesting and relevant questions.
- Many published studies make data publicly available (journals such as *Journal of Animal Ecology* and *Ecological Monographs* require data to be publicly available). These data can be used for the in-class project, with proper acknowledgement of the original data source. For example, see Coulson 2012 (*Oikos* 121: 1337–1350; <http://www.oikosjournal.org/appendix/oik-00035>).
- Many important questions in population ecology can be addressed using simulation studies. You can ask questions that can be addressed using simulated data. Example: Coggins et al. (2007; *Fish and Fisheries* 8: 196–210).
- Ideas that make use of published data frequently make excellent projects. Examples, Koon et al. (2006; *Ecological Modelling* 197: 418–430); Stahl & Oli (2006; *Ecological Modeling* 198:183-194; van de Kerk et al; <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0070354>)
- Population projection matrices for 100's of animal (and plant) species are now publicly available for download as *Rdata* objects at <http://www.compadre-db.org/>. See Salguero-Gomez et al. (2016) for details. These data can be used for class projects (or more broadly, demographic analyses). **Grading scale for students enrolled in WIS6466: see the course announcement (also attached).**

If you are a R user, you can probably ignore the Introduction to R document (attached).

Question? Contact Ms. Claire Williams (cwillia@ufl.edu).