# Preliminary Details for ESA Disease Ecology Workshop

## Workshop information

**Instructors**: Cherie Briggs and Mark Wilber

**Date and Time**: Sunday, August 6, 2017: 8:00 AM-11:30 AM

**Location**: B111, Oregon Convention Center

## Preliminary Schedule

1. 8:00 - 8:15: Introduction and Motivation [Cherie and Mark]
2. 8:15 - 9:15: From discrete dynamical systems to ODEs in disease ecology [Mark]
   * Writing down discrete dynamical systems
   * Simulating with Euler's Method
   * For loops and functions
3. 9:15 - 9:30: Coffee Break
4. 9:30 - 10:30: Introduction to ODEs for disease ecologists [Cherie]
   * Simulation with R (deSolve)
   * Quantifying
   * Numerically calculating equilibrium
   * Stability analysis
   * Plotting results
5. 10:30 - 11:30: Fitting Dynamic Models To Data [Cherie and Mark]
   * Trajectory matching/Plug-and-play methods
   * Least-squares
   * Future directions: some more complex alternatives?

## Logistics

1. Using Rmarkdown notebooks in R studio.
   * Will have "learner" notebooks that do not have the answers filled in and "full" notebooks that participants can refer to catch up.
2. Data sets to use
   * Flu, Measles, Whooping Cough Data?
   * Could also simulate some data for participants to work with
3. Power cords in room?
4. Internet access in room?
5. Bring green and red sticky notes

## Resources

1. [SWC dynamical model lessons with SIR (2015)](http://mqwilber.github.io/2015-04-17-ucsb/lessons/dynamic_models/dynamic_models.html)
2. [For loops and functions with logistic growth](http://mqwilber.github.io/2015-04-17-ucsb/lessons/intro_R_lessons/R_basics_I.html)
3. [2012 EEID material](https://ms.mcmaster.ca/~bolker/eeid/)