**Spatial Data Analysis & Management Midterm Practicum – Spring 2019**

You have been asked to prepare a geodatabase and maps of larval fish and zooplankton data sets collected during the long-term California Cooperative Fisheries Investigation (CalCOFI) program for a technical report. This program conducts oceanographic survey several times a year since 1951 along the U.S. West Coast in order to track changes in key economic and ecological fishery stocks and the zooplankton prey that support them.

You will need to provide the program:

1. A link to a Git Hub repository (in a text file) that contains all your raw files, R scripts used to process the data sets with comments as commits, the finished geodatabase and map (PDF or .png).

2. A geodatabase that contains all the spatial data needed to create maps showing the location fish and invertebrate eggs as well as microzooplankton.

    a. Because each data set is a time series, the feature class should have a date-time field that is in the "YYYY-MM-DD hh:mm:ss" format for ArcGIS. Data sets need to be in a projected coordinate system that is appropriate for the California region.

    b. The "eggs" data was collected using a Continuous Underway Fish Egg Sampler (CUFES) that was turned on and off. Stations are considered the start of each CUFES transect.

    c. The 'eggs' and 'macrozoop' data need to be joined using a common field as the zooplankton and fish were collected during same cruises.

3. A map that show the annual mean of anchovy and sardine and anchovy eggs at each station within 200km of the U.S. coastline during the 1997/1998 El Nino event. Your map should contain all the elements needed to be published in a technical report, including: scale bar, north arrow, and grid of latitude and longitude coordinates around the border.

***Note: You are allowed to use the internet (e.g. Stack Overflow) and previous lab exercises to explore solutions. You cannot ask your colleagues for assistance.****

**All components are due Friday (10/13) at 9am CDT as a compressed file. Upload data to Moodle. If you have memory issues with Moodle, save to your cloud drive and send a link by email.**