DATA MANAGEMENT PLAN

Data Collection, Processing, and Analysis

This project will generate data of three types:

1) Ecological datasets consisting of information on abundance, size structure, sex, reproductive output, growth, and behavior of fishes on the experimental reefs at Santa Catalina Island. These data will be collected by SCUBA divers on underwater paper and transcribed daily into Microsoft Excel spreadsheets. These files will be uploaded to a server at CSUN as .csv and .xlsx files. Copies will be emailed to all PIs and saved on their computers, as well as on servers at all three institutions, ensuring they are broadly geographically distributed.
2) Reproductive output will be measured from underwater photographs of nests containing eggs. Digital photograph files (.tif or .jpg) will be downloaded from cameras daily to a dedicated project laptop and then uploaded to a server at CSUN.
3) Computer model code and simulation output will be generated by researchers at UNCW using Matlab and R. The modeling efforts will generate code and output for IPM simulations. Code will be stored in .m, .r., or .txt format; simulation results will be saved as .mat or .dat files; both will be stored on servers in the White lab at UNCW.

The servers at each institution are backed up daily and regularly backed up to offsite tape storage. General analysis of all data will be conducted using the software packages Matlab, R, SYSTAT, PRIMER, and JMP.

Documentation

Metadata will be documented at the time of collection and analysis for each data component described above. For empirical data, metadata will consist of information on the origin, timing, location, and observer at the time of original data collection; metadata will be updated to include modifications, QA/QC, transformations, and the researcher responsible for these changes. For model data, metadata will be embedded in the model code and consist of documentation of changes and additions to code by each researcher.

Products

The data products made available to the public will vary depending on the data type:

1) Fish population data will be made available as raw data. Digital photographs of fish eggs in nests will not be archived publicly due to their large size, but will be available upon request (and egg counts corresponding to each photo will be included in the aforementioned files).
2) Final versions of computer model code and simulation output that are used in journal publications will be made publicly available. Additionally, code written for more general application of theory and techniques developed during this project will be made publicly available.

Data Curation and Publication.

Metadata and raw data will be made available using the Biological and Chemical Oceanography Data Management Office (BCO-DMO). We will register with BCO-DMO when our award begins and submit data/metadata to them on a regular basis, at the time of publication, and no more than two years after collection. We will consult with BCO-DMO staff to identify appropriate data for submission, and appropriate standards. If appropriate, our data will be published as a data paper in the Ecological Society of America's *Ecological Archives*.

Data Access Policy

Data and metadata described above will be made available to the public at the time of journal publication or within two years of the completion of the project. This will enable the PIs, postdoc, and graduate students sufficient time to analyze, interpret, and publish results before data are made public. Prior to being made public, data will be the intellectual property of the PIs and their home institutions. Data may be shared with collaborators from other institutions and portions of the data may be shared with interested researchers upon request. When sharing data, the PIs will request and encourage the interested users to collaborate with the original data collectors (students or PIs) on any new projects or publications that use those data.

We anticipate the primary users of our empirical data will be academic researchers interested in fisheries biology, fish ecology, sex-change biology, and population dynamics. For the modeling products, we expect that academic researchers, nonprofit conservation groups, and management agencies may be interested in the use of computer code.

Outside of formal data archiving, students and PIs will periodically report on preliminary findings in blogs, lab Facebook pages, and other informal outreach forums. Data summaries, photos, and videos released in this manner will remain the intellectual property of the PIs and video/photo content will fall under the copyright of CSUN, MLML or UNCW, as appropriate.