Metadata S1. Description of data and code.

Moore, Jacob L, Pucket, Brandon, and Schreiber, Sebastian J. Restoration of Eastern oyster populations with positive density dependence.

Data.—

- **fecundityData_WB.csv**: Contains data on the relationship between female length (LVL) and mean number of eggs. Data from Mroch et al. 2012.
- **growthSurvData_WB.csv**: Contains data on the growth and survival of individually marked oysters. Data from Puckett and Eggleston 2012.
- **recruitSizes_WB.csv**: Contains data on new recruit sizes from June 2006 and June 2007 cohorts. Data from Puckett and Eggleston 2012.
- **popSizeData_WB.csv**: Contains frequency data on the number and frequency of oysters of a given size in the WB population. Data from Puckett and Eggleston 2012.
- **WB_oysterOutput_final.csv**: Contains simulation output of minimum number of oysters required to cross threshold surface, generated from "oysterFeedbacks_oysterAdditions.R." Data used by "oysterFeedbacks_plotAdditions.R."
- **WB_substrateOutput_final.csv**: Contains simulation output of minimum substrate levels required to cross threshold surface, generated from "oysterFeedbacks_substrateAdditions.R." Data used by "oysterFeedbacks_plotAdditions.R."
- **WB_separatrixOutput_final.csv**: Contains simulation output of separatrix location given a specified size distribution. Generated from "oysterFeedbacks_findSep.R." Data used by "oysterFeedbacks_plotSep.R."
- **WB_eqVals_Linear.Rdata**: Contains equilibrium properties of IPM run with no positive feedbacks (from "oysterFeedbacks.R"). Data used in various scripts.
- **WB_sizeDists.Rdata**: Contains data on the size distribution of age a oysters, generated from "oysterFeedbacks_getSizeDists.R."
- **WB_sensitivities_rhoValestimate_alphaValestimate_deltaValmid.Rdata**: Results from sensitivity analysis. Generated by "oysterFeedbacks_sensitivities.R." Data used by "oysterFeedbacks_plotSensitivities.R."
- **WB_sensitivities_rhoVallow_alphaValestimate_deltaValmid.Rdata**: Results from sensitivity analysis. Generated by "oysterFeedbacks_sensitivities.R." Data used by "oysterFeedbacks_plotSensitivities.R."

Code.—

- **oysterFeedbacks.R**: Runs a single iteration of the IPM model with either no feedbacks, or positive feedbacks. If running linear model with no feedbacks, creates "WB_eqVals_Linear.Rdata."
- **oysterFeedbacks_demography.R**: Contains functions for creating growth, survival, and fecundity kernels. Called by various scripts.

- **oysterFeedbacks_estimateParams.R**: Estimates parameters used in the model. Called by various scripts.
- **oysterFeedbacks_findEq.R**: Solves for equilibrium of positive feedback model. Called by oysterFeedbacks_estimateParams.R.
- **oysterFeedbacks_runIPM.R**: Builds and runs the integral-projection model. Called by various scripts.
- **oysterFeedbacks_makePlots.R**: Creates plots of initial size/age distributions, trajectories of oyster number and substrate levels, and phase planes for a single run of the IPM. Called by oysterFeedbacks.R.
- **oysterFeedbacks_getSizeDists.R**: Projects forward the survival+growth kernel to determine the size distribution of oysters of a particular age. Creates "WB_sizeDists.Rdata."
- **oysterFeedbacks_plotFits.R**: Plots fits to growth and fecundity data, and age-specific size distributions. Creates Figures 1, 2, and 5.
- **oysterFeedbacks_oysterAdditions.R**: Implements bisectional search to determine total number of oysters of a particular age that are required to cross the threshold surface, beginning from a scorched earth. Creates "WB_oysterOutput_final_<timestamp>.csv." Note, "_<timestamp>" must be removed for this file to work with oysterFeedbacks_plotAdditions.R.
- **oysterFeedbacks_substrateAdditions.R**: Implements bisectional search to determine total amount of substrate required to cross the threshold surface. Creates "WB_substrateOutput_final_<timestamp>.csv." Note, "_<timestamp>" must be removed for this file to work with oysterFeedbacks_plotAdditions.R.
- **oysterFeedbacks_plotAdditions.R**: Plots data from substrate and oyster addition simulations, with analytic approximations. Creates Figures 6 and 7.
- **oysterFeedbacks_sensitivities.R**: Calculations sensitivity of the threshold surface to δ, ρ, and α. Creates "WB_sensitivities_rhoVallow_alphaValestimate_deltaValmid.Rdata" and "WB_sensitivities_rhoValestimate_alphaValestimate_deltaValmid.Rdata."
- **oysterFeedbacks_plotSensitivities.R**: Plots sensitivity of the threshold surface to δ, ρ, and α for ρ_{low} and ρ_{est}. Creates Figure 4.
- **oysterFeedbacks_findSep.R**: Runs the bisectional search to find the separatrix between persistence and extinction for different initial size distributions. Creates "WB_separatrixOutput_final_<timestamp>.csv." Note, "_<timestamp>" must be removed for this file to work with oysterFeedbacks_plotSep.R.
- **oysterFeedbacks_plotSep.R**: Plots phase plane and trajectories for three initial conditions (starting from either equilibrium size distribution or harvested size distribution). Includes separatrix for each starting size distribution, as well as figure of each starting size distribution. Creates Figure 3.