# Appendix Figure Legends

Figure A1: The line indicates the critical harvesting rate as a function of climate velocity on the x-axis. These results are from an approximated Gaussian dispersal kernel parameterized for black rockfish.

Figure A2: (A) The equilibrium biomass of a black rockfish population as a function of the climate velocity on the x-axis and the harvesting rate on the y-axis. (B) Interaction between the two stressors as a function of climate velocity and harvesting rate. The heat map indicates the interaction measure *S*, as defined in Eq. 10, i.e., the loss in biomass in the doubly stressed population in excess of the sum of the losses caused by each stressor individually. *S* of zero indicates additive interaction of the stressors. The excess loss is small in comparison to the total biomass. These results are from an approximated Gaussian dispersal kernel parameterized for black rockfish.

Figure A3: Fluctuations in biomass caused by MPAs. We show biomass as a function of the number of generations for both many small and few large reserves and both removed harvesting pressure and constant harvesting pressure (i.e. reallocation). The fluctuations in biomass with many small reserves are small enough that the biomass appears nearly constant. While the biomass has a larger maximum with few large reserves, the fluctuations are much greater in magnitude. These results are from simulations with a Laplacian dispersal kernel with *c* = 0.1 and *h* = 0.02.

Figure A4: The equilibrium biomass of the population as a function of the climate velocity on the *x*-axis and the harvesting rate on the *y*-axis under alternative management strategies. (A) The equilibrium biomass for simulations with constant harvest rates. (B) Equilibrium biomass for simulations with threshold management. For threshold management, we set a threshold density below which no fishing is allowed. The threshold ranges between zero (no fishing allowed) and one (all fish taken), with intermediate density thresholds determined as fractions of the maximum population density observed at a given time step before harvesting. We show this on the y-axis. (C) Equilibrium biomass for simulations with protected areas where harvesting pressure outside reserves is unchanged (i.e., harvest effort inside reserves is eliminated). (D) Equilibrium biomass for simulations with protected areas in which harvesting pressure is reallocated outside reserves. These results are from simulations with a Laplacian dispersal kernel parameterized for black rockfish.