

## Appendix 6. Overview of the interactive web-based tool generated to explore perceived risks to razor clams.

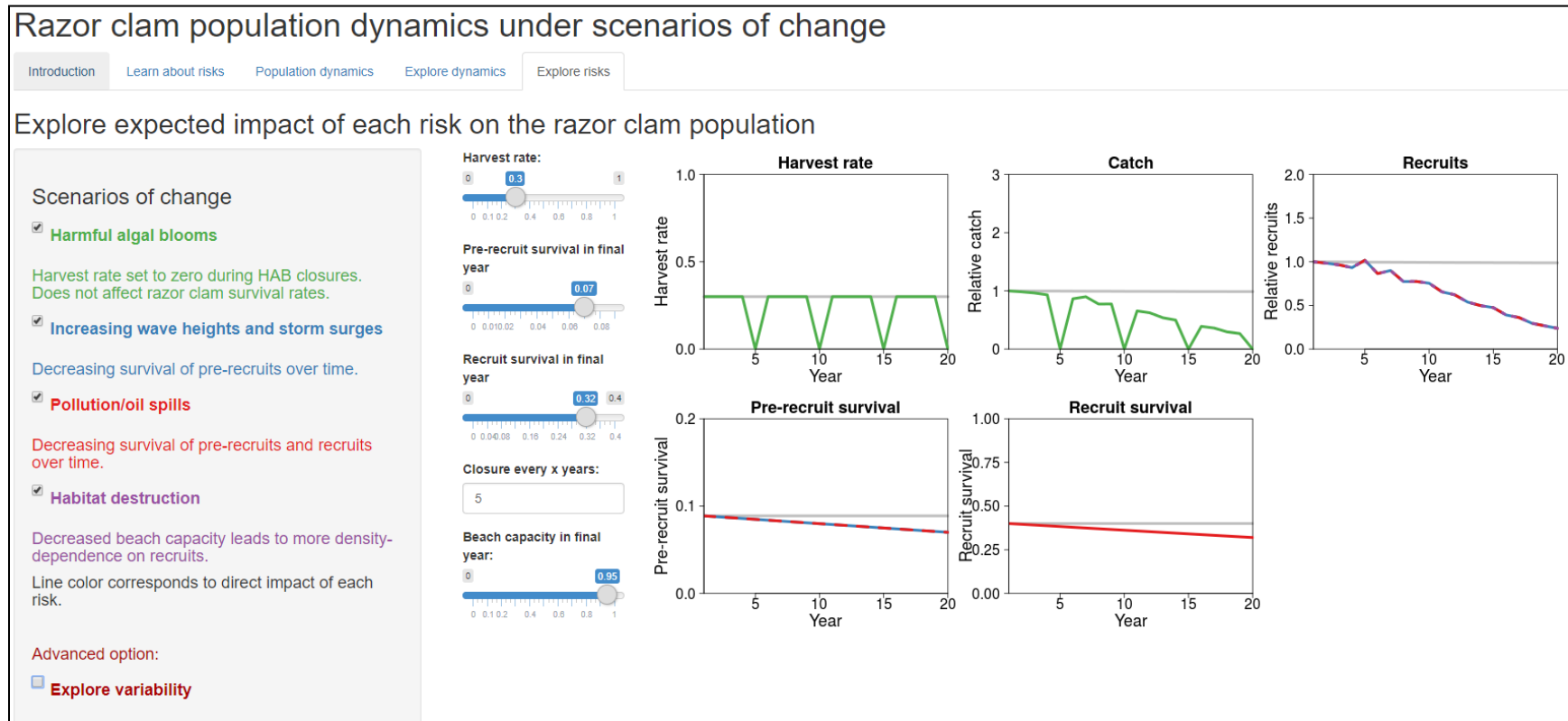


Figure A6.1. Screenshot of the shiny app ([https://merrillrudd.shinyapps.io/razor\\_clam\\_pop/](https://merrillrudd.shinyapps.io/razor_clam_pop/)) “Explore risks” tab where the user can examine the expected impact of any combination of harmful algal blooms, increasing wave heights and storm surge, pollution and oil spills, and habitat destruction on harvest rate, catch, and recruits as implemented via harvest closures, changing survival rates, and beach capacity.

# Razor clam population dynamics under scenarios of change

Introduction Learn about risks Population dynamics Explore dynamics Explore risks

Explore expected impact of each risk on the razor clam population

## Scenarios of change

### Harmful algal blooms

Harvest rate set to zero during HAB closures. Does not affect razor clam survival rates.

### Increasing wave heights and storm surges

Decreasing survival of pre-recruits over time.

### Pollution/oil spills

Decreasing survival of pre-recruits and recruits over time.

### Habitat destruction

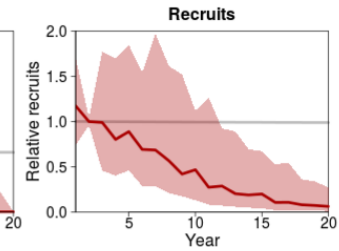
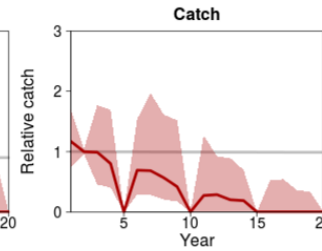
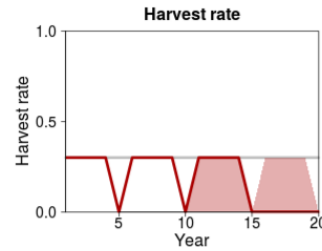
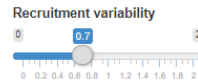
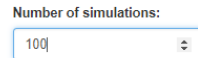
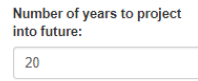
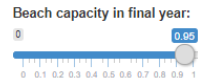
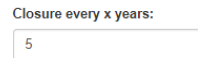
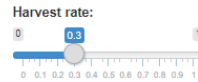
Decreased beach capacity leads to more density-dependence on recruits.

Line color corresponds to direct impact of each risk.

Advanced option:

### Explore variability

Uncheck the 'Explore variability' box to go back to exploring predicted impacts without variability.



**Average number of years with no harvest**  
7 out of 20 years  
Due to HAB closures: 4/20  
Due to lack of clams on beach: 3/20

**Average % change in catch from status quo**  
Total over 20 years: -51.94%  
Variability only: -22.94%  
Impacts from risks: -45%

Figure A6.2. Screenshot of the shiny app ([https://merrillrudd.shinyapps.io/razor\\_clam\\_pop/](https://merrillrudd.shinyapps.io/razor_clam_pop/)) “Explore risks” tab where the user can explore variability on top of the expected impact of any combination of harmful algal blooms, increasing wave heights and storm surge, pollution and oil spills, and habitat destruction by including stochastic iterations of simulated populations with lognormally distributed variability on annual recruitment. The user can explore the average number of years with no harvest and average percent change in catch from equilibrium without variability across 100 simulations of projected populations.