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Data S1

R code for EBT simulation and numerical computation

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File list (files found within DataS1.zip)

```
ebt-disturbance.r
ebt-master.r
figure-data.r
license.txt
ode-equilbrium.r
```

Description

`ebt-disturbance.r` – This script uses the escalator boxcar train (EBT) method (de Roos 1988, 1997) to generate simulations that yield average coral cover under disturbance regimes. This is the primary code used to generate the data in Fig. 4B and 4C.

`ebt-master.r` – This script provides the basic implementation of the escalator boxcar train (EBT) method to simulate model dynamics.

`figure-data.r` – This script contains function calls used to generate the simuation data shown in Figs. 2 - 5 and Appendix S1: Fig. S1. (Fig. 1 and Appendix S1: Fig. S2 do not show simulation data.) This script only generates the data shown in the figures, but does not generate the figures themselves.

`license.txt` – The license under which this code is provided.

`ode-equilbrium.r` – This code uses the method of Kirkilionis et al. (2001) to find the equilibrium coral cover and size strutucture in undisturbed conditions. This code is used to calculate the equilibrium quantities shown in Fig. 2, Fig. 4a, and Appendix S1: Fig S1. The code is also helpful for validating the output of the EBT simulations.

Literature Cited

de Roos, A. 1988. Numerical methods for structured population models: the escalator boxcar train. Numerical Methods for Partial Differential Equations 4:173–195.

de Roos, A. M. 1997. A gentle introduction to physiologically structured population models. Pages 119–204 *in* S. Tuljapurkar and H. Caswell, editors. Structured-population models in marine, terrestrial, and freshwater systems. Springer.

Kirkilionis, M. A., O. Diekmann, B. Lisser, M. Nool, B. Sommeijer, and A. M. de Roos. 2001. Numerical continuation of equilibria of physiologically structured population models I: Theory. Mathematical Models and Methods in Applied Sciences 11:1101–1127.