Coral-Algae Model

Part I: While the **coral\_algaeV2.**nlogo file is loaded into the NetLogo Web browser, the following code should be pasted into the ‘NetLogo Code’ Tab. I’ve made the comments a different font for readability, but you can also paste them into the code tab as well (the semi-colon means that NetLogo won’t read them as code). Copy and paste all of the GREEN code in the NetLogo Code window.

**breed [ parrots parrot ]**

**turtles-own [ energy ]**

**to setup**

**clear-all**

**setup-algae**

**setup-coral**

**setup-parrots**

**reset-ticks**

**end**

**to go**

**if ticks >= time-steps [ stop ] ;; stop after 1000 ticks**

**grow-coral**

**grow-algae**

**grow-algae-coral**

**;recruit-coral**

**;ask parrots [**

**; move**

**; set energy energy - 1**

**; eat-algae**

**; reproduce-parrots**

**; death**

**; ]**

**tick ;; increment the tick counter and update the plot**

**end**

**;; choose initial-algae no. of random patches and make them green (set by slider)**

**to setup-algae**

**ask n-of initial-algae patches [set pcolor green]**

**end**

**;; choose initial-coral no. of random patches and make them pink (set by slider)**

**to setup-coral**

**ask n-of initial-coral patches [set pcolor pink]**

**end**

**;; grow algae by asking black patches next to green patches to turn green at a probability 40/100**

**to grow-algae**

**if random 100 < 40 [**

**ask patches with [pcolor = green] [**

**ask neighbors [if pcolor = black [set pcolor green]]]**

**]**

**end**

**;; grow coral by asking pink patches if they are next to black patches, and if so, tell the black patches to turn pink a probability 30/100**

**to grow-coral**

**if random 100 < 30 [**

**ask patches with [pcolor = pink] [**

**ask neighbors [if pcolor = black [set pcolor pink]]]**

**]**

**end**

**;; grow algae over coral by asking green patches if they are next to pink patches, and if so, tell the pink patches to turn green a probability 5/100**

**to grow-algae-coral**

**if random 100 < 5 [**

**ask patches with [pcolor = green] [**

**ask neighbors [if pcolor = pink [set pcolor green]]]**

**]**

**end**

**;;PARROTFISH PROCEDURES**

**;; create parrotfish at random locations throughout grid**

**to setup-parrots**

**create-parrots initial-parrots**

**[**

**set shape "fish"**

**set color violet**

**set size 1.5 ; easier to see**

**set energy random (2 \* parrot-gain-from-food)**

**setxy random-xcor random-ycor**

**]**

**end**