Coral-Algae Model

<u>Part I</u>: 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
```