Wa-Tor World

Assignment 7 - CS324e

Overview

- Visualization - Animal Populations
- Description of Wa-Tor World
- Demos

Predator – Prey Equations

- a.k.a. Lotka–Volterra equations
- x = number of animals that are prey
- x = number of predatory animals

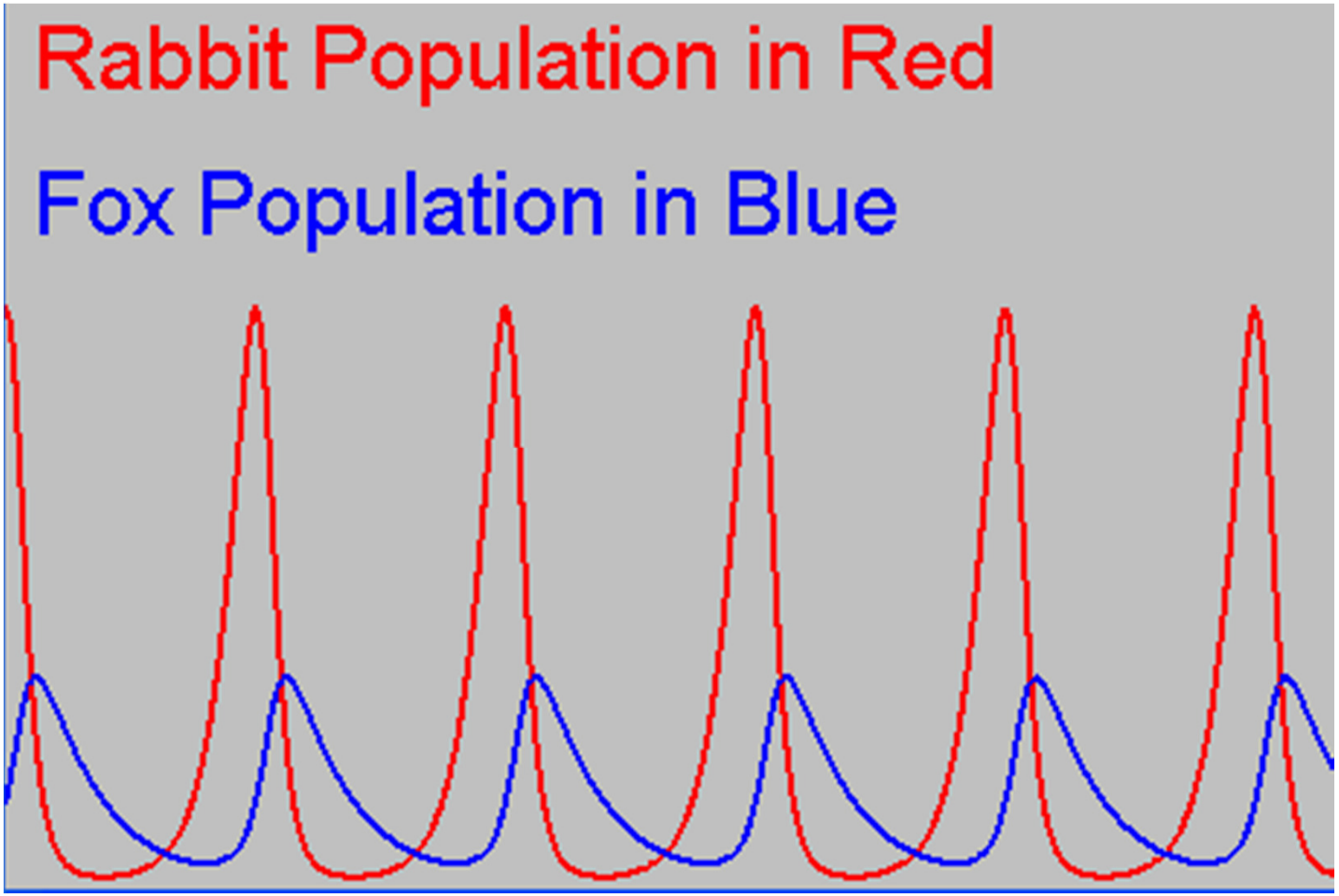
$$\frac{dx}{dt} = x(\alpha - \beta y)$$

$$\frac{dy}{dt} = -y(\gamma - \delta x)$$

- α = prey population increase (birth rate - death rate)
- β = rate the predators eat the prey
- γ = predator mortality rate
- δ = reproduction rate of predators per 1 prey eaten

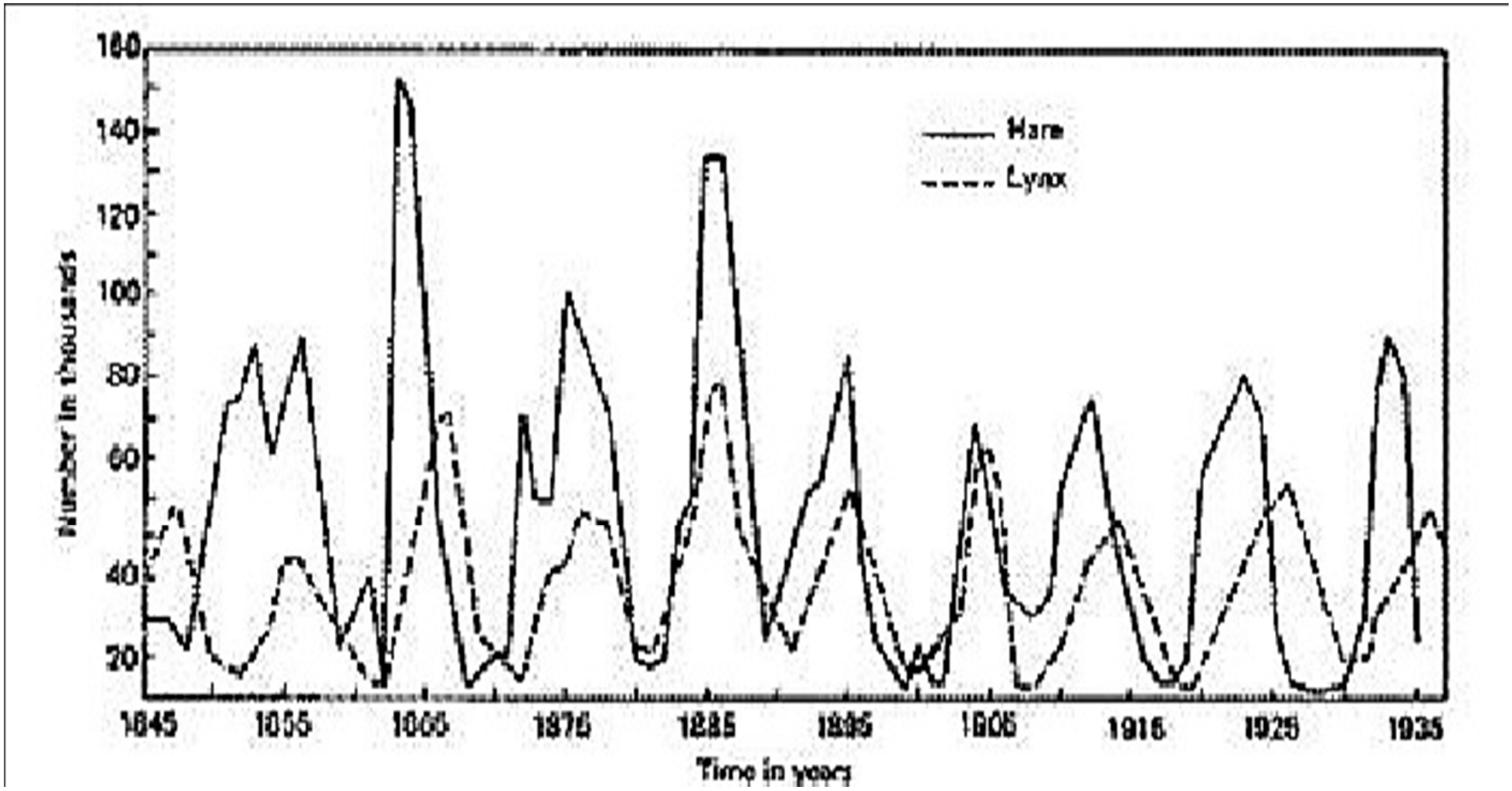
Lotka–Volterra equations

- Graphed over time

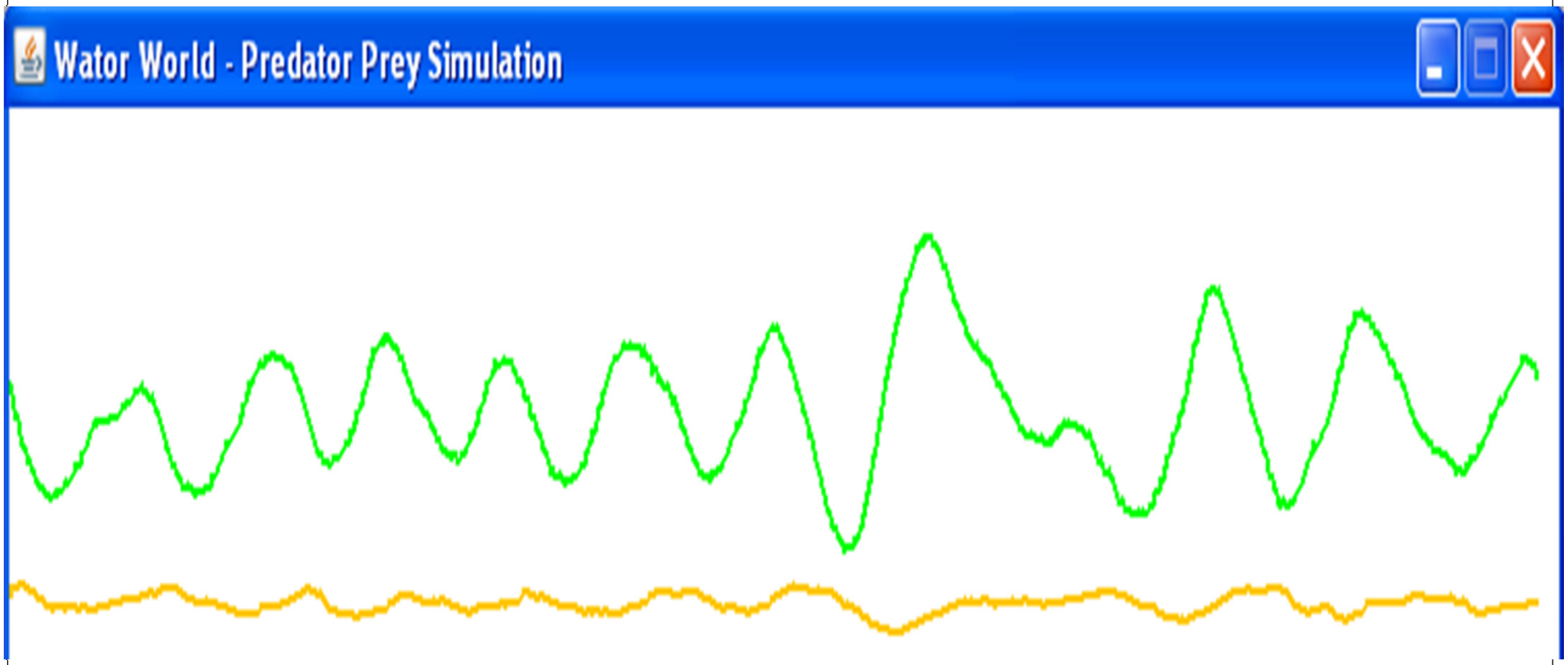


Hudson Bay Company - Pelts

- Solid line - Rabbits, dashed line - Lynxes

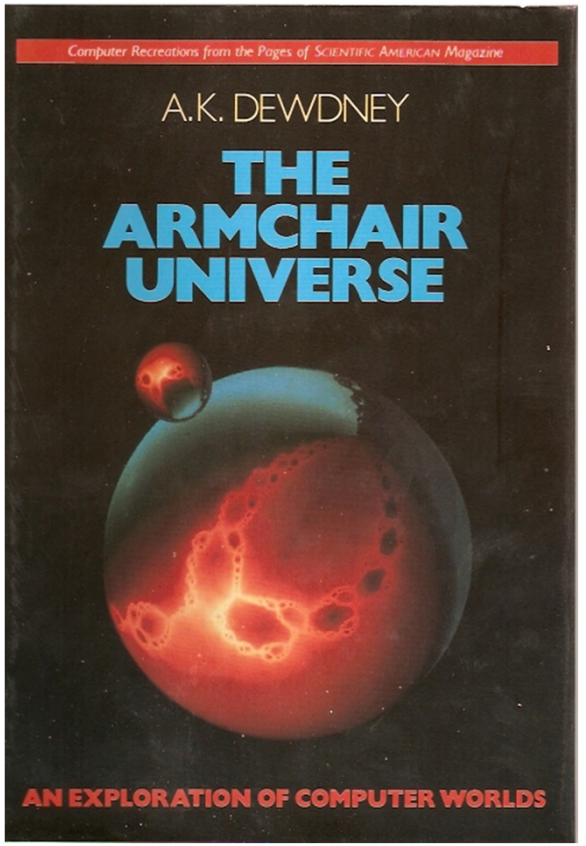


Wa-tor World Population

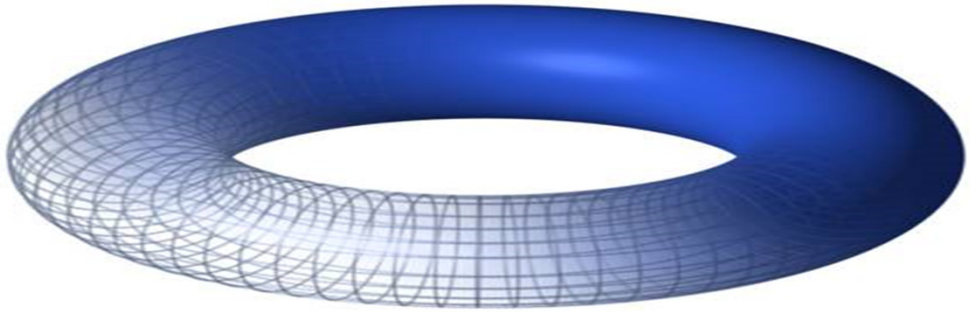


Description of Wa-Tor World

- A.K. Dewdney
- *Computer Recreations* column in *Scientific America*
- *Sharks and Fish Wage an Ecological War on the Toroidal Planet Wa-Tor*



The World and its Inhabitants



Wa-Tor

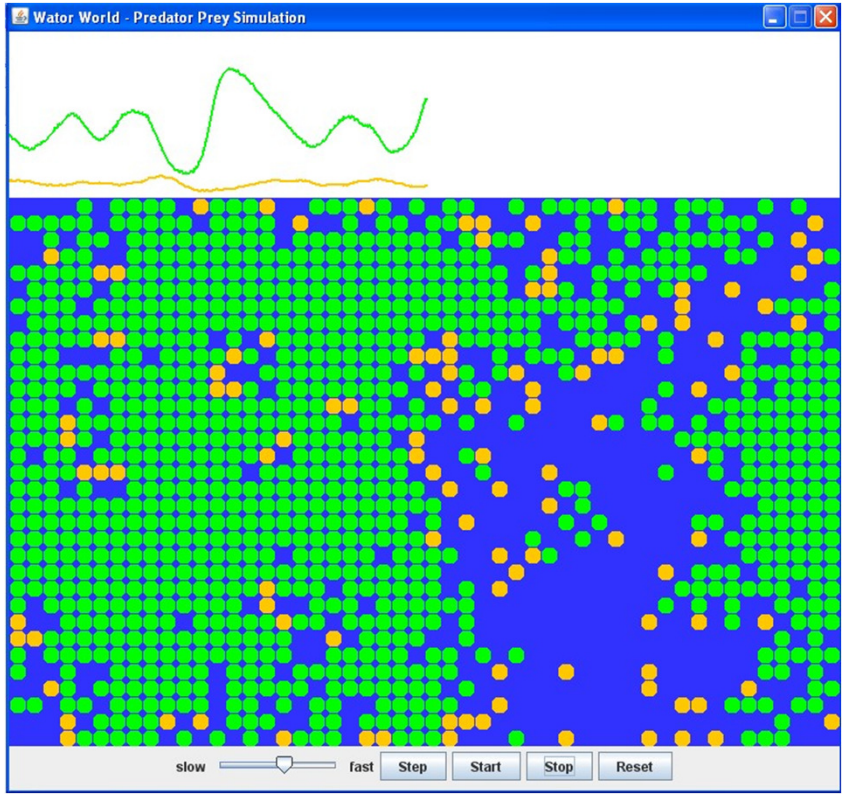
The Assignment

- Given Simulator
- Must implement GUI and controls

Population Graphs →

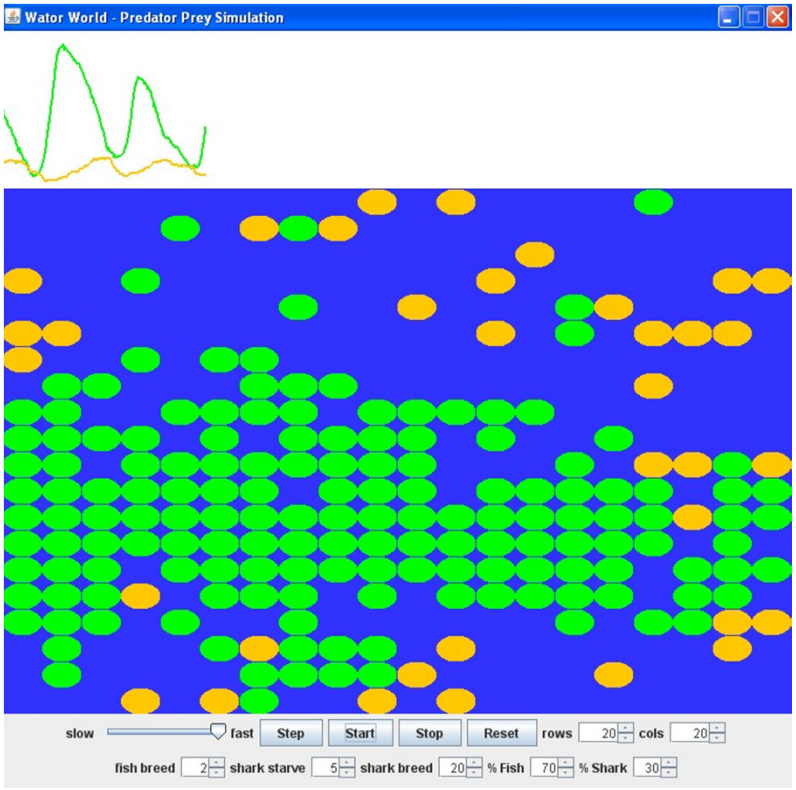
The World →

Controls →

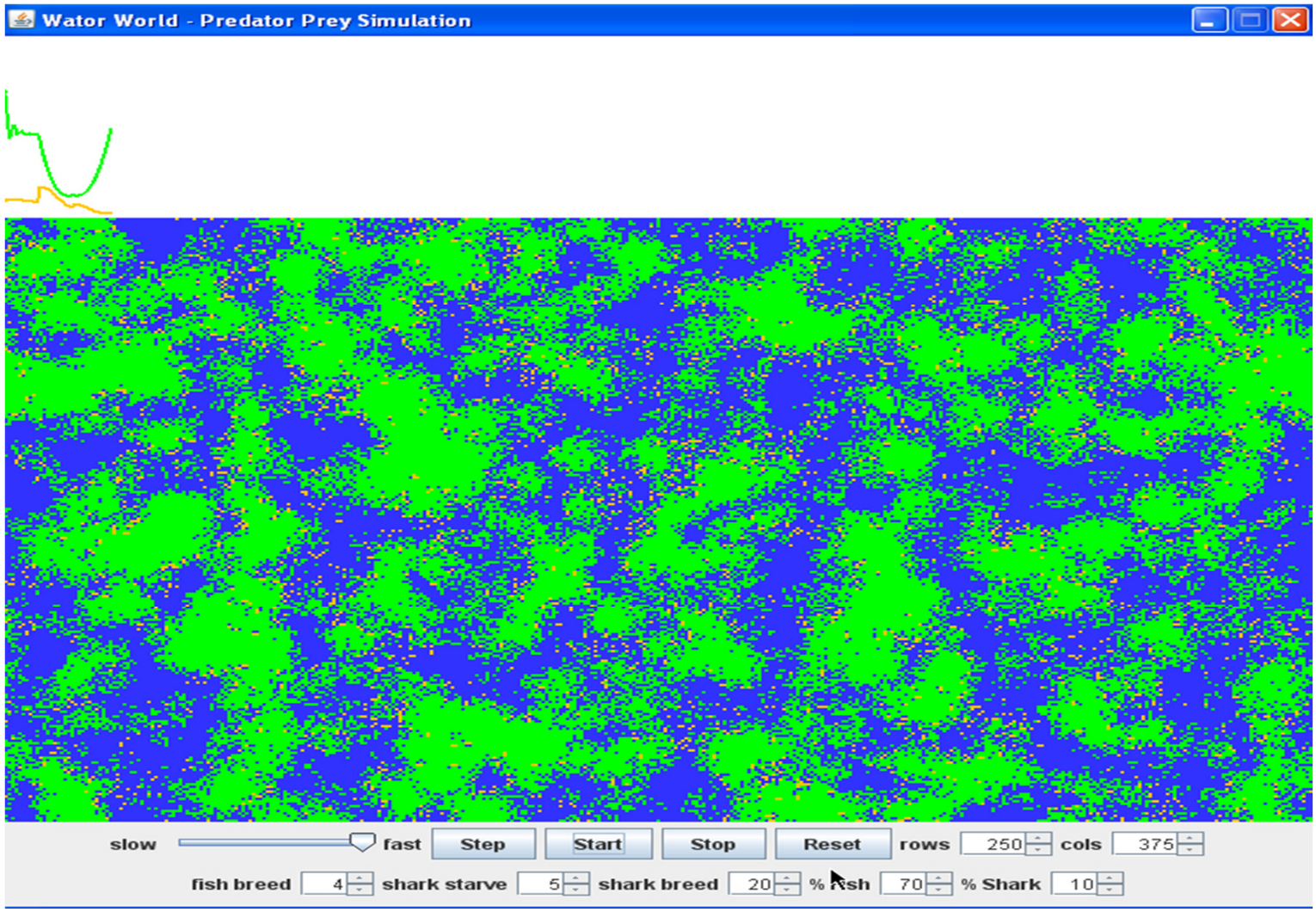


Demos

- Basic Version
- Advanced Controls
- Simple Demo in CS324E/A4 folder



Large Worlds



Wa-tor World