

Water Resource Management



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Problem/Question

- ◆ Reduction in available water resources in California
- ◆ Need for long-term solutions that consider the dynamic and interdependent nature of the problem
- ◆ Question: What policies to adopt in order to maximize a state utility
- ◆ Utility = Economic Viability, Environmental Sustainability, Peace

Agent-Based Model

Full Model

Agents: consumer, farmer, dam, well

Globals: water, economy, environment, environmental change, peace, total consumed water, energy price

Externalities: Rainfall, Economy

Internalities: Population attitude of environmental protection

Policies: water price, food price

Simplified Model

Agents: consumer

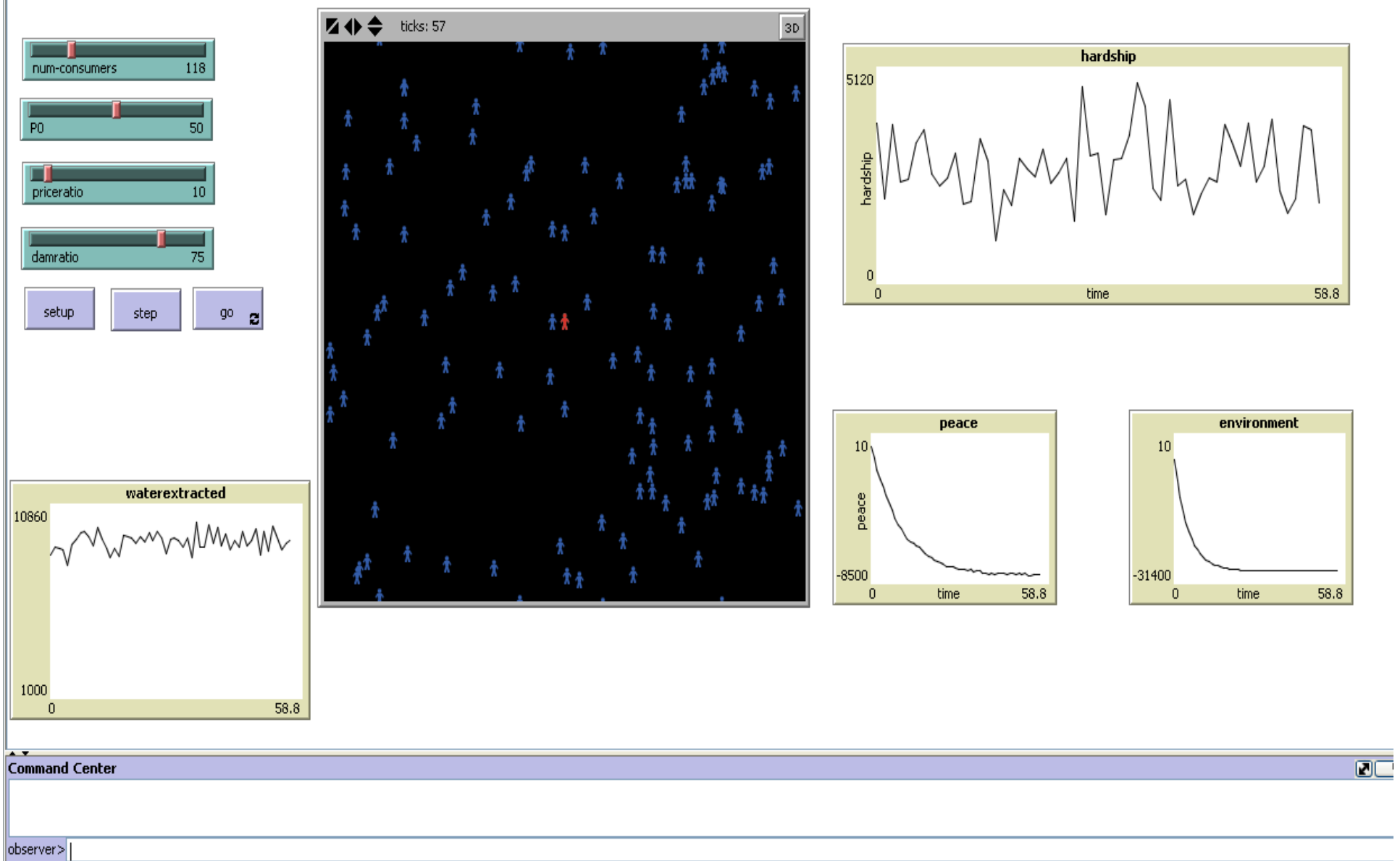
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Full Model



Simplified Model

The screenshot displays a NetLogo simulation window titled "Simplified Model". The interface is divided into several sections:

- Control Panel (Left):** Three sliders are visible: "num-consumers" set to 19, "damratio" set to 0.33, and "pricingpolicy" set to 2.50. Below the sliders are three buttons: "setup", "go", and "step".
- Central View (Middle):** A 3D view window showing a dark environment with a small, colorful object (possibly a consumer or dam) in the center. The window title is "ticks: 575" and "3D".
- Monitors (Right):** Three line graphs are displayed:
 - environment:** The y-axis ranges from 0 to 10700. The x-axis ranges from 0 to 715. The curve starts at (0,0), rises steeply, and then levels off at a value of approximately 10700.
 - hardship:** The y-axis ranges from 0 to 10. The x-axis ranges from 0 to 715. The curve starts at (0,10) and decreases steadily towards 0.
 - peace:** The y-axis ranges from -10800 to 1840. The x-axis ranges from 0 to 715. The curve starts at (0,1840), drops sharply to -10800, and then remains constant at that level.
- Command Center (Bottom):** A text input field with the prompt "observer >" and a "Command Center" label above it.



Lessons Learned/Challenges

- ◆ Net Logo (no experience)
- ◆ Simplified vs Realistic model
- ◆ A systems dynamics approach also appropriate and useful