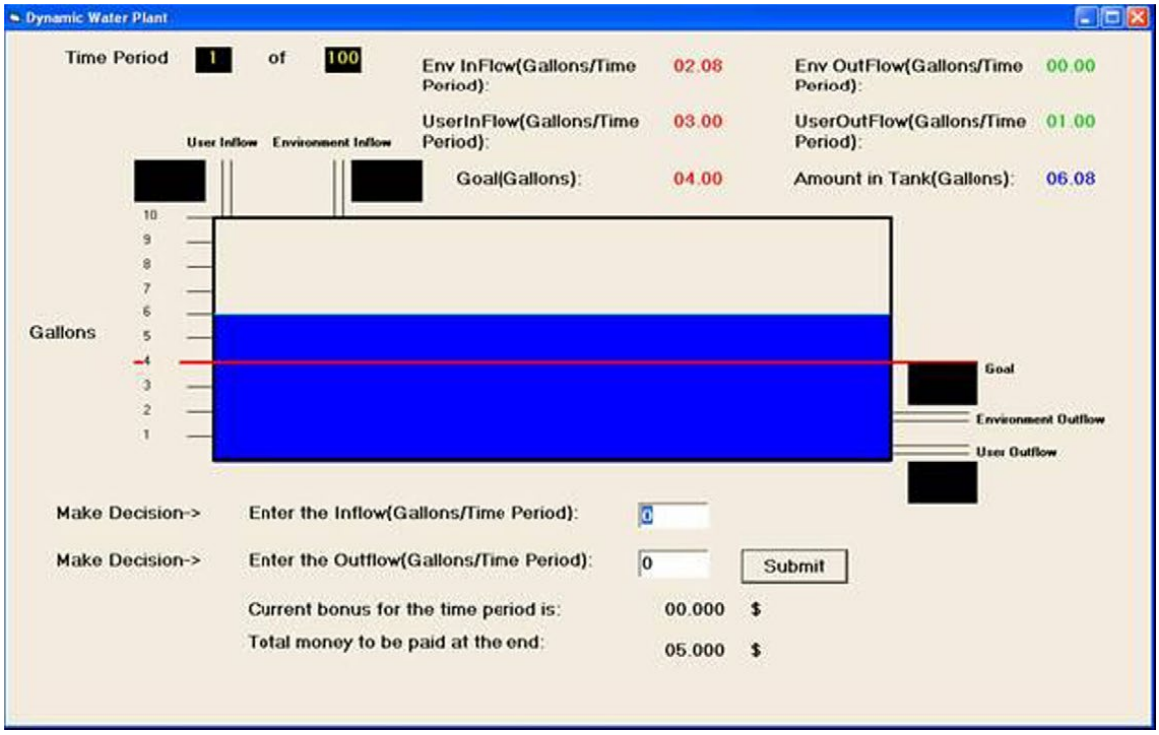
DSF Task description

See: Gonzalez & Dutt, 2011- Extra readings

Dynamic Stocks and Flows (a.k.a. "DSF") is a generic control task that portrays the basic building blocks of dynamic systems: an accumulation, influenced by inflow and outflow decisions made by the User, and by the inflow and outflow decisions made by the environment. The Figure below presents a screenshot of this task.



The accumulation is represented graphically as water in a tank in continuous units (gallons). The markings on the left side of the tank helps represent the water level in the tank in any given time period.

As shown in the figure, there are four pipes connected to the tank. The two pipes labeled User Inflow and Environment Inflow are located on the input side and increase the accumulation of water in the tank. The two pipes labeled User Outflow and Environment Outflow are located on the output side and decrease the accumulation of water. The User controls the accumulation of water level with the goal of maintaining the accumulation at a particular goal level, or at least within an acceptable range around the goal level. The goal in the example above is 4 gallons, and the current amount of water in the tank is 6.08 gallons.

The User makes User inflow and User outflow decisions. At every time period, the User enters the number of units for inflow and outflow in the decision boxes at the bottom of

the screen and then clicks the submit button. Then the environment inflow and outflow take effect on the accumulation.

The simulation gives information about the decisions made by the User and by the environment, the resulting amount of water in the tank and the goal.

Best performance in this task is measured by the discrepancy between the amount of water in the tank and the goal, across all the time periods. Optimal performance is ZERO, meaning that in each time period the amount of water in the tank is the same as the Goal. A User is rewarded (i.e., current bonus for the time period), for every time period in which the user achieves the goal.

The simulation can be run in two modes: EventDriven and TimeDriven as shown in the "Version" of the set up screen below, which are set up at the beginning of the simulation.

An EventDriven mode allows the User to decide when a decision is made; ie., the system does not advance unless the User clicks on the "Submit" button. A TimeDriven mode advances independently of the User's decisions; the User must make decisions in real-time.