

## Notes and Images for the Stella Version of the Eutrophication Model

Stella users can perform the same exercises by downloading the Stella version of the lake model. They will see the main control panel in Figs. 1A, B and C. Stella's graph pad is used to store graphs of the carbon, nitrogen and phosphorous results on one pad. The main stocks and flows for nutrient cycling are shown in Fig. 2. Initial conditions and molar ratios are shown in Fig. 3. The seasonal effects and the Michaelis-Menten kinetics are shown in Fig 4. The scatter graphs in Fig. 5 confirm that the M-M curves have been implemented properly. Fig. 6 shows the first half of the a gaming simulation with the N inflow at 2  $\mu\text{mol/L}$  per month. The N inflow is set to zero for the remainder of the simulation, and Fig. 7 confirms the results seen previously. That is, cutting the N inflow to zero will have no effect because the lake has already made the transition from N limited to P limited conditions.

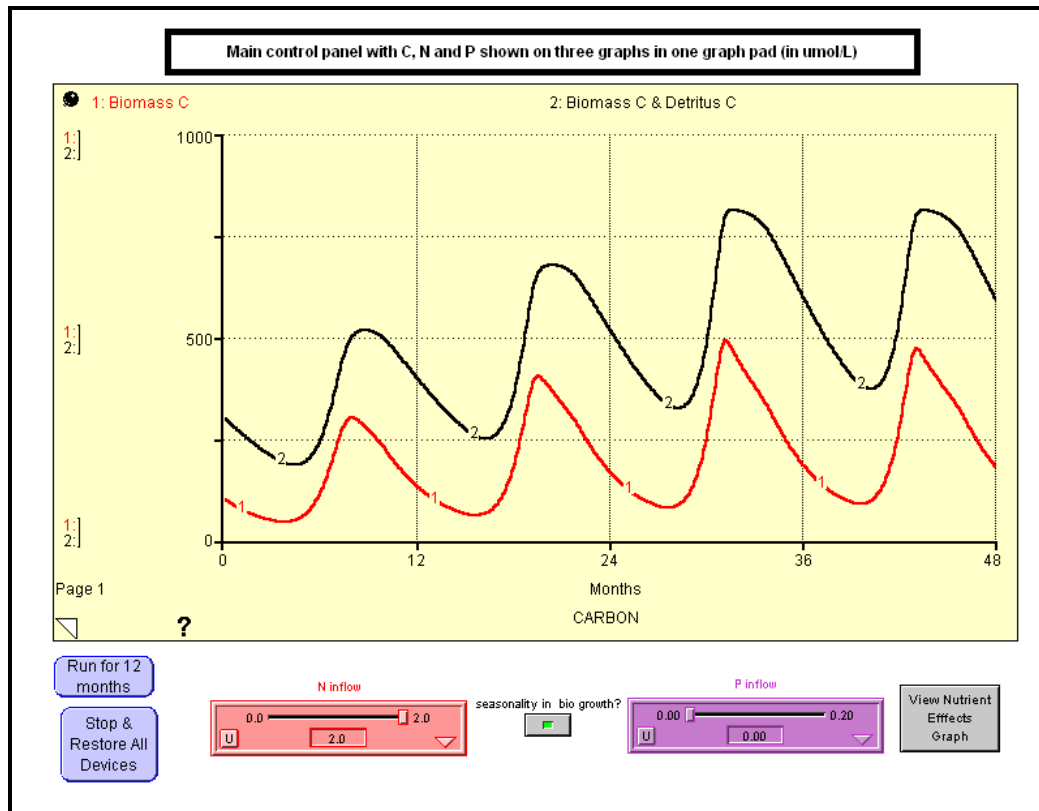


Fig. 1A. Main control panel of the Stella model.  
The graph corresponds to the carbon results in Fig 1 of the previous document.

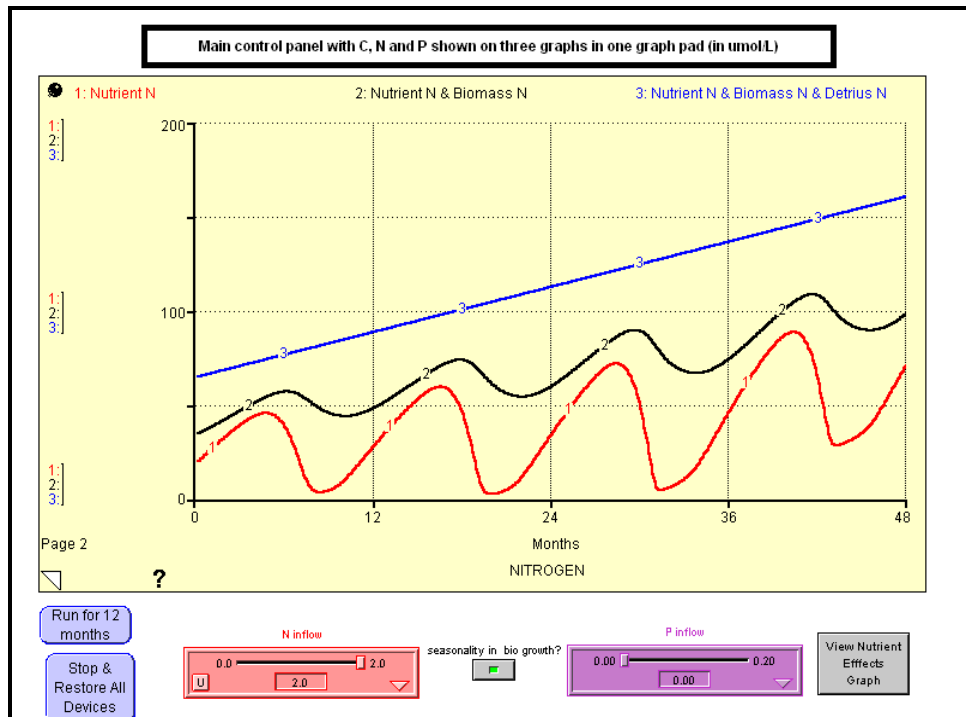


Fig. 1B. Main control panel of the Stella model.

The graph corresponds to the nitrogen results in Fig 1 of the previous document.

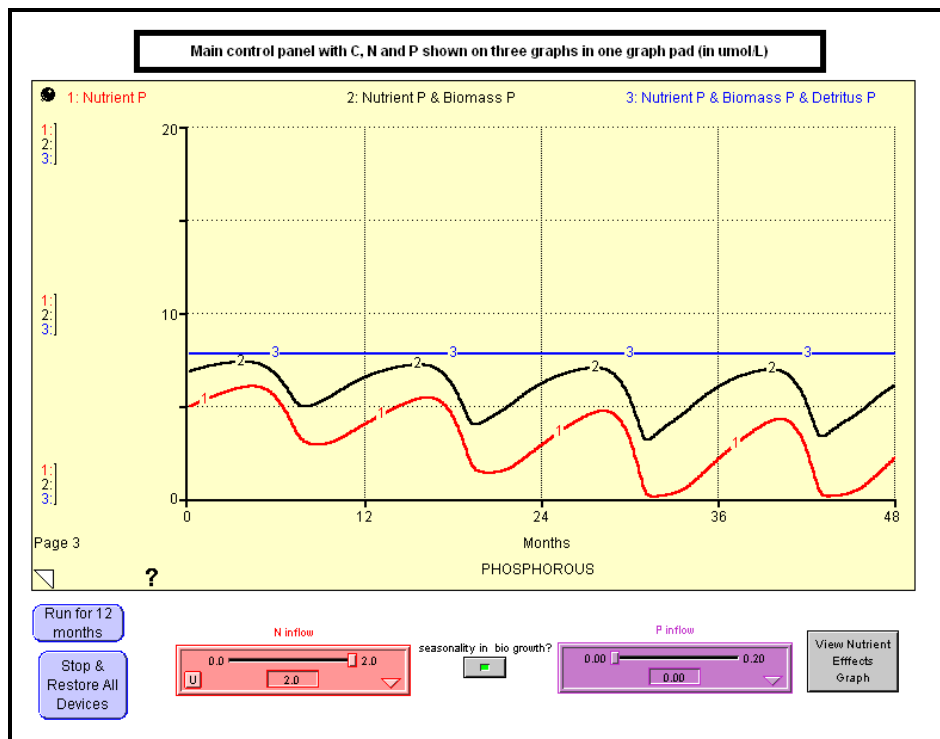


Fig. 1C. Main control panel of the Stella model.

The graph corresponds to the phosphorous results in Fig 1 of the previous document.

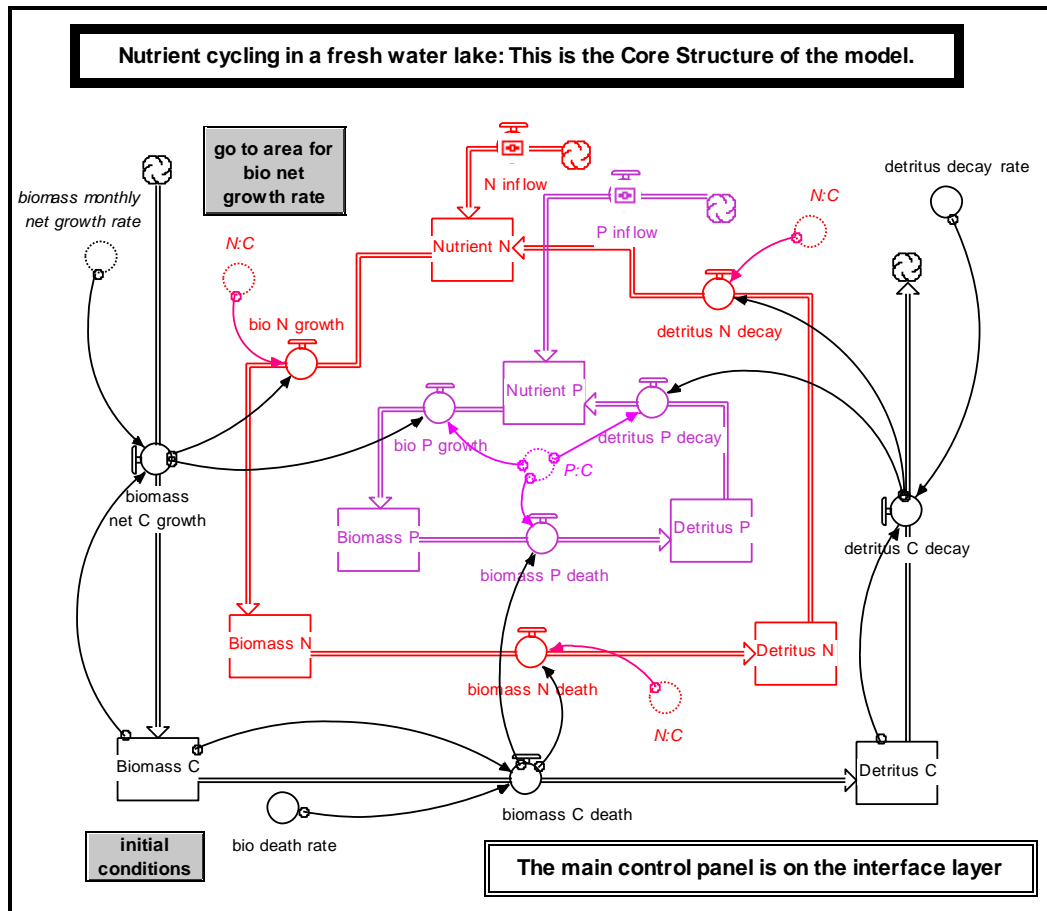


Fig. 2. Core structure in the Stella model, corresponding to Fig. 2.

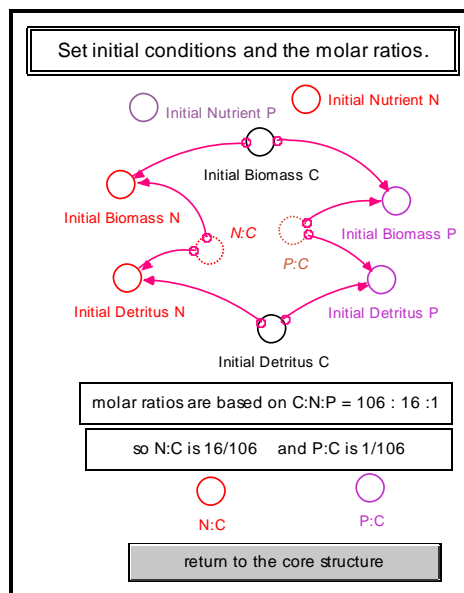


Fig. 3. Initial conditions and molar ratios, the Stella version of the Vensim variables in Fig. 3.

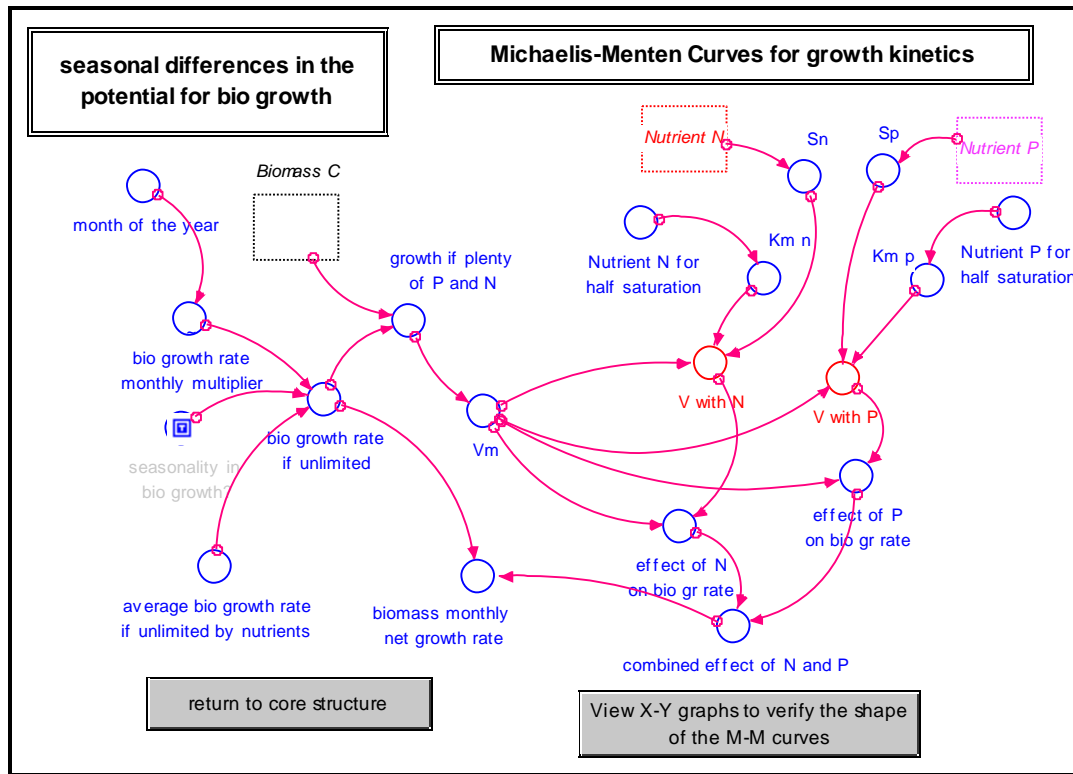


Fig. 4. Seasonal effects and Michaelis-Menten curves, corresponding to the Vensim diagram in Fig. 4.

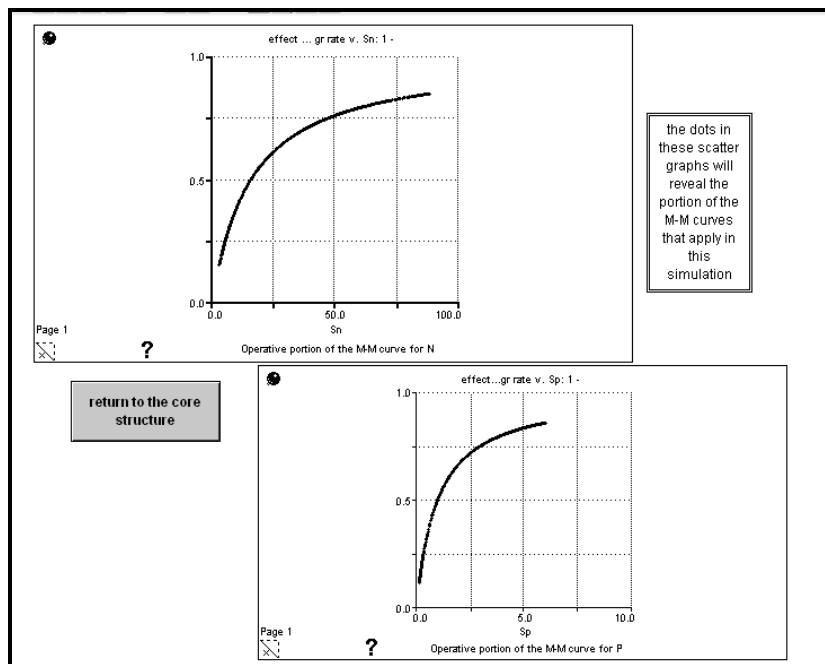


Fig. 5. Graphs to trace the operative portions of the M-M curves. These are Stella's scatter graphs; they correspond to the Venim results in Fig. 6.

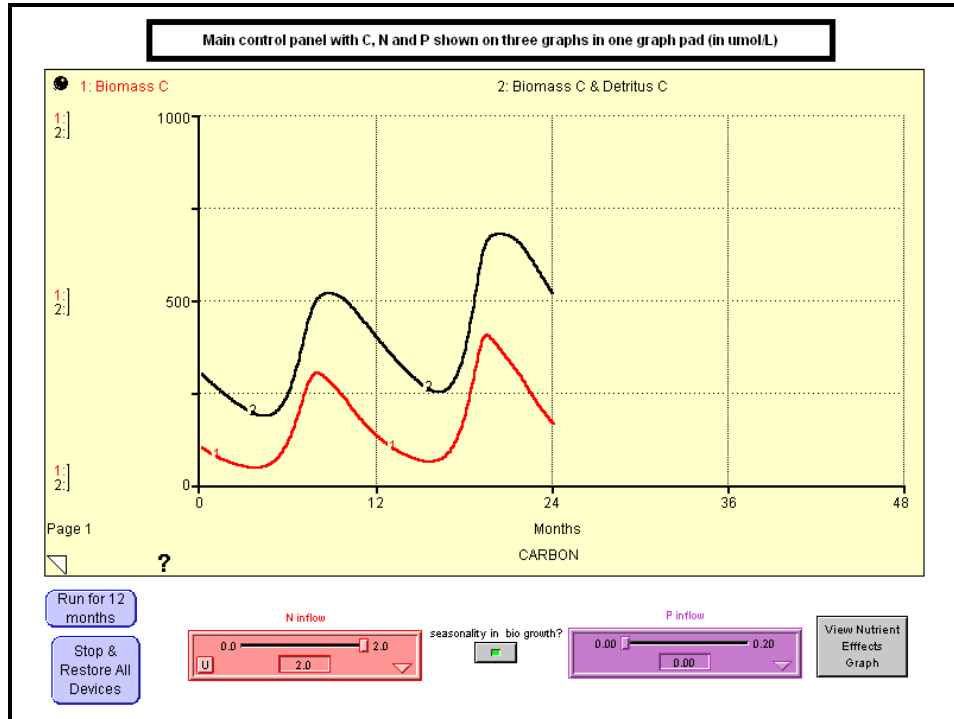


Fig. 6. First half of a policy simulation with N inflow at 2 umol/L per month. This image corresponds to the carbon results in Fig. 8.

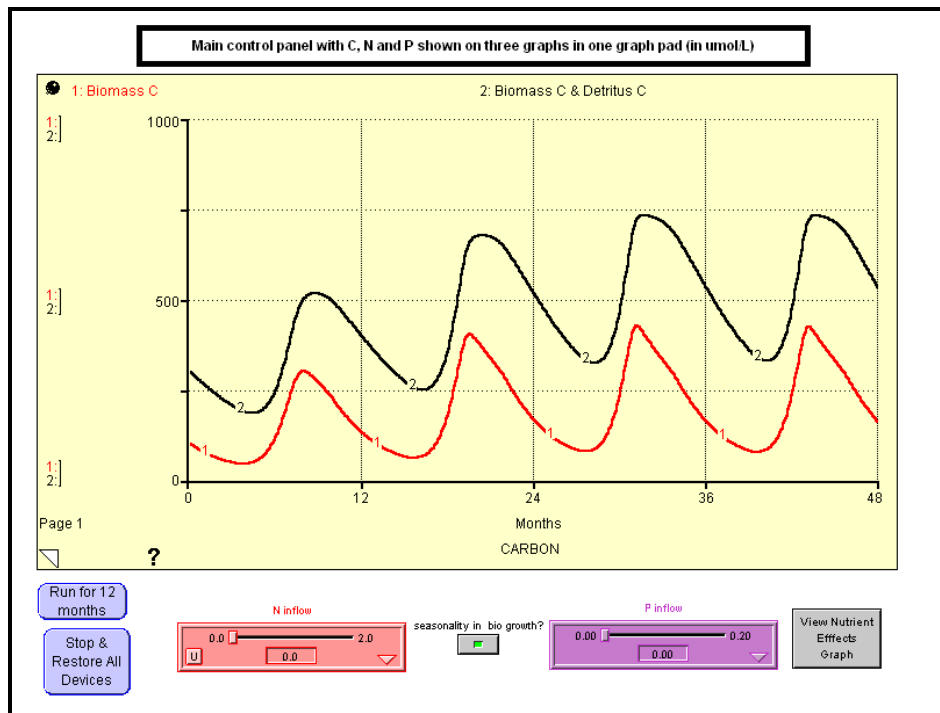


Fig. 7. Remainder of the policy simulation with N inflow reduced to zero. This image corresponds to the carbon results in Fig. 9.