

A Model of Wetlands and Wastewater

Figure 1 is a simplified model for determining a wetland's potential for treating wastewaters. Since wetland treatment potential varies among wetland types, the type and size of the wetland, as well as the quality and quantity of the wastewaters, are necessary input variables. Additional input variables include mean monthly rainfall and the quality and quantity of entering surface run-off.

Figure 2 presents the micro-computer simulation results of the Figure 1 model. Those results show the various species of nitrogen and total phosphorus, on a daily basis throughout one year, for a central Florida cypress wetland receiving two different application rates of secondary effluent.

The model can be used by local governments and utility departments to determine options available for wastewater disposal within the context of anticipated growth and additional treatment capacity needs. Generally, wetlands are under considerable pressure in those areas exhibiting the fastest growth. Some wetlands are simply in the "way of development" and their elimination from the landscape is imminent. However, the option of wetland wastewater disposal provides additional incentives for the preservation of otherwise unprotected wetlands, as well as renewed hydroperiods and the potential for reestablishment of conditions more conducive to wetlands.

"Artificial" Wetlands in the Landscape Mosaic

The creation of "artificial" wetlands may be an important method for reversing trends of wetland loss and adding new vitality to the landscape mosaic. Experience in Florida (Brown, 1975, 1980; Brown et. al. 1975) and ongoing research on the reclamation of phosphate-mined lands (Brown et. al. 1984a, 1985b) have shown that the creation of wetlands is possible and that hydroperiod is the most critical factor. The creation of wetlands using wastewater flows has great potential.

Figure 3 is a drawing of an artificial wetland planned for the City of Orlando, Florida. The wetland will be constructed on what is now improved pasture along the floodplain of the St. Johns River. The project has received considerable attention since much of the river's base flow has been diverted and the additional fresh water coming from the wetland is considered beneficial by most management personnel. Additionally, artificial wetlands are being planned for storm water renovation as part of major quality improvements planned by the city of Orlando. Numerous other municipalities throughout Florida are in various stages of planning for the use of artificial wetlands for both storm and waste water recycling.