

swamp (roughly 94% of the swamp's area) is disconnected and therefore not impacted.”

As Dr. Jackson points out, “All hydrologic models are hopefully useful simplifications of reality.” But this model that assumes disconnection of the southeastern region is too simplified.

- **When the southeast region of the Swamp is not completely compartmented from the southwest region, would there not be some effect on water level in the southwest region, which drains to the Suwannee River, and thus some effect on the Suwannee River?**

While the effect would probably be less than the maximum 0.58 inches (14.7 mm) Dr. Zeng estimates for the southeast region if completely compartmented, nonetheless it would be an effect.

And if there is interchange of water between the different regions of the Swamp, which apparently there is, since both Dr. Zeng and Dr. Jackson discuss modeling low water levels then there is at least some compartmentalization, then water levels are not the only concern. Any contaminants introduced into the Swamp from the mining could affect its southwest region and the Suwannee River.

Dr. Jackson further makes a good case that the data do not exist to do proper modeling,

“The swamp’s hydrodynamics do not fit any of the simplifications used to model either rivers, groundwater, or reservoirs. To capture the stage-storage-discharge relationships used in hydrologic routing, a minimum necessity would be high-resolution high-quality LiDAR data shot at an extreme low water level, but this does not presently exist. Even if this did exist, much of the topography of the swamp is not created by soil but rather by buoyant mats of organic matter. The moisture holding and release characteristics of such peat mats are not understood. To accurately model evapotranspiration from the swamp, it would be helpful to have eddy covariance tower data spanning wet and dry periods, but this also does not exist.”

- **While I applaud Dr. Zeng and Dr. Jackson for attempting to model with insufficient information, their models are also too simplified, so how can we depend on them to prove no harm by the mine?**
- **Why are the EPD and a UGA professor attempting to do the job the permit applicant should have already done: attempt to prove no harm?**
- **Will GA-EPD require the MLUP to be updated to include better models and modeling, as also requested by the U.S. Fish and Wildlife Service?²**
- **Will GA-EPD at the very least require the miners to include in their Mining Land Use Plan active monitoring of not only the Moniac and Macclenny gauges on the St. Marys River, but also the Fargo gauge on the Suwannee River and another location downstream of Little Swanee**

² Independent Technical Review of the Twin Pines Permit Application Hydrologic Modeling Kiren Bahm and Rajendra Paudel South Florida Natural Resources Center, National Park Service, Report Submitted to Fish and Wildlife Service February 2023, https://www.fws.gov/sites/default/files/documents/078450%2020230221_ONWR%20Final%20Report%20-%20SENRRC%20to%20FWS.pdf