Water Quality and Quantity Modeling and Monitoring

In the "GA-EPD Response to Comments Draft Mining Land Use Plan Twin Pines Minerals, LLC" on page 10 under "7. Public Comments - Gages Used in Modeling:"

> *"**EPD Response:***
>
> *"EPD modelers used a more direct and conservative approach in assessing the impact on the Okefenokee Swamp and, consequently, EPD did not need to use either gage for the purpose of assessing the impact on the swamp. See November 16, 2023, Memorandum pgs. 7-8 and Appendix 3 and 4 of Zeng's November 16, 2023, Memorandum."*

Yet page 7 of Dr. Zeng's Memorandum begins, "Assuming that the Okefenokee Swamp is a wide (at 438,000 acres in surface area), shallow (with an average depth of 2 feet), and well-connected surface water reservoir".

- **How can this be called a more direct approach, when it is more abstract than using river gauge data and is thus a more indirect approach?**

In Dr. Zeng's Appendix 3, Dr. Rhett Jackson notes,

> *"The swamp presents a very difficult hydrologic modeling challenge. First of all, the internal hydrologic divides within the swamp are dynamic. At very high water levels, the swamp becomes a well-connected reservoir, but at lower water levels the swamp is divided into approximately five compartments identified by Cynthia Loftin and the USFWS, with minimal interaction between compartments. In other words, hydrologic routing within the swamp depends on water levels. At very low water levels, the swamp likely becomes a patchwork of mostly disconnected small basins. Even at high water levels, the swamp has two outlets: the Suwannee River and the St Marys River, but there are multiple drains connecting the swamp to each major outlet."*

Indeed, two of those drains leading to the Suwannee River are Cypress Creek, exiting the Swamp almost due west, and Little Swannee Creek, drawing from the southwest part of the Swamp.[1]

Dr. Jackson continues,

> *"The hydrologic divide between the two river systems in the swamp can move based on differences in precipitation and tributary inputs on different sides of the swamp. The swamp covers enough area that there can be significant precipitation differences between one side and another."*

Dr. Jackson recommended,

> *"Any analysis of the mine's potential effects on the swamp needs to focus on drought conditions, and it needs to focus only on the southeastern compartment*

[1] Okefenokee Swamp south drains west to Suwannee River, WWALS, April 4, 2021, https://wwals.net/?p=55258