

# Alligator Lake/Clayhole Creek Flood Abatement Study

## Columbia County, Florida

### Services Rendered

- Hydraulic and Hydrologic Modeling
- Development of Flood Abatement Solutions

### Project Summary

ATM was tasked by the Suwannee River Water Management District (SRWMD) and Columbia County to develop flood abatement alternatives for the Clayhole Creek-Cannon Creek-Price Creek and Alligator Lake watershed system. ATM constructed models to develop and evaluate improvements to the drainage system of the area to mitigate flooding during large storms and major hurricane events, such as the hurricanes of September 2004. ATM used the models to approximate the flood conditions observed during these events and to assess the effectiveness of proposed solutions for the hydrologic and hydraulic problems in the area.

The Hydrologic Modeling System (HEC-HMS) and the River Analysis System (HEC-RAS) developed by the U.S. Army Corps of Engineers was used in modeling the Clayhole Creek-Cannon Creek-Price Creek and Alligator Lake watershed system. The results of the modeling effort (routing of HEC-HMS flows through the HEC-RAS geometry) culminated in a model system that accurately reproduces the water surfaces observed in the flooding that occurred as a result of Hurricane Frances in September 2004. Road overtopping and peak water levels in Alligator Lake were reproduced with a reasonable tolerance of  $\pm 1$  foot.

ATM's attention focused on water quality improvements while solving the flooding problems. ATM proposed a control structure with a bleed down device for Alligator Lake and proposed rerouting the flooded portions of Clayhole Creek back into the lake for treatment. Extra water quality volumes were also proposed in addition to the flooding improvements. The solutions developed focused on needed maintenance as well as capital improvements.

In the development and evaluation of flood abatement solutions, ATM conducted discussions with county staff, interviewed citizens for input, considered acquisition of creek properties, and modeled multiple improvement scenarios including bridges, new storage areas, retrofit for 100-year storage volumes, a new control structure and outfall improvements for the lake, pump stations, and channel improvements.

Improvements were modeled for pre- versus post- 100-year criteria for SRWMD and for the September 2004 scenario. The project has gone through regulatory review and was approved, but has not yet been constructed.

