

POSTER PRESENTATION

PAST FLOOD RECONSTRUCTION FROM LOWER WHITE RIVER, ARKANSAS USING DIATOMS AND SEDIMENT GEOCHEMISTRY AS PROXIES

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The White River in South Eastern Arkansas has been subjected to major river regulation which has likely influenced the flood regime of the river and thus affected the wetland ecosystem of the lower White River. In order to understand the effect of river regulation on flooding frequency we aim to reconstruct the past flood history of the lower White River, South Eastern Arkansas. Sediments deposited in oxbow lakes along the White River by the 100yr flood event in spring 2008 are used as a modern analogue for past flood events with diatoms and geochemistry as the major proxies.

Thirty oxbow lakes were selected along the gradient of flooding frequency and surface sediment and water samples were collected from each lake. A principle component analysis (PCA) for water chemistry and sediment geochemistry found the lakes located proximal to the river channel are characterized by lower sill elevations, are deeper, more turbid, and have higher Zn concentrations suggesting a riverine signature. Lakes located farther away from the main channel are characterized by higher sill elevations, have more transparent water columns, are shallower, and have higher conductivity suggesting a higher input of saline ground water compared to riverine input. Analysis of the Diatoms analysis from the surface sediments of the 30 lakes is currently in progress and will be used together with the environmental data to construct a training set for flooding frequency.

A 3m long sediment core was recovered from Maddox Bay Slough. Lead-210 dating of the top 28 cm of the core revealed an undisturbed high resolution record with an average sedimentation rate of 0.65 cm/year. AMS dating of a plant macrofossil showed a bottom age of AD 1280 ± 10 (Cal BP 670 ± 10). To identify the flood layers, the sediment cores were analyzed by a multi sensor core logger for magnetic susceptibility (MS), metals were analyzed by XRF scanning, and diatom assemblages were analyzed. Peaks in MS and Zn occurred when there was a decrease in diatom flux. Zinc and diatom concentrations are anti-correlated and are useful indicators of flood pulses along with MS. A comparison with the recorded peak gage height showed that over the past 50 years the flood peaks show an increase in *Fragilaria* spp. and a subsequent decrease in *Gomphonema* spp. Future work plan includes more detailed diatom analysis, grain size, and paleomagnetic analysis to help with further identification of the flood layers.