How Are Anthropogenic Influences and Climate Change Expressed by Fossil Flora and Fauna in the Last 3,000 Years at High Point Cedar Bog, NJ?

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Ombrotrophic, high-elevation *Chamaecyparis thyoides* (Atlantic White Cedar) bogs are severely understudied ecosystems. Their invaluable economic importance in the form of highly durable, fire-retardant, aromatic wood, in addition to their roles in supporting critical wildlife habitats and native vegetation, bring urgency to this study, especially amidst a rapidly changing climate. We investigated Cedar Bog in High Point State Park, NJ, the highest *C. thyoides* bog in the world at 457m above sea level, to further understand the implications and influences of natural climate change and anthropogenic impact through the upper 2.5 meters. This site was first studied by William A. Niering in 1953 who conducted a limited pollen analysis of the region and again in 2015 by Bühler and Peteet, who utilized macrofossil analysis and existing pollen records to reconstruct paleoenvironmental history of the lower 4m section of a 6.5m, 13,000yr record. A Dachnowski corer was used in 2017 to extract the upper 2.5m of the bog. After sieving 0-20cm at the 4-cm interval, every fifth sample was sieved and macrofossils were picked for analysis. Bryophyte identifications were also performed to estimate moisture and pH. Our preliminary results demonstrate significant shifts in flora and fauna communities through time. At 108cm depth the site was predominantly comprised of *C. thyoides* needles, *Picea mariana* needles, and *Larix laricina* needles, while charcoal, *Carex lenticular* seeds, *C. thyoides* bark, and charred *L. laricina,* and *P. mariana* needles were the main constituents at 88cm depth. *Pinus strobus* was also found in trace amounts. Furthermore, the highest levels of *Cenococcum geophilum* sclerotium were found at 68cm depth. Surface centimeters are 85% Sphagnum and both *S. russowii,* and *S. fimbriatum* in addition to the pronotum of an aquatic insect in *Corixidae* were identified at 0-4cm. These results inform our hypothesis that Cedar Bog transitioned from a drier climate to a wetter**,** contemporary environment dominated by *Sphagnum recurvum* and *Sphagnum centrale* with elevated precipitation levels that concurrently place ecological stress upon *C. thyoides* stands.