Using Macrofossils to Reconstruct Paleoenvironmental History of Cedar Swamp, High Point NJ

[1]K. Bühler, [2]D. Peteet

[1]Barnard College of Columbia University, [2]Lamont-Doherty Earth Observatory of Columbia University

Macrofossils from deep sediment cores taken from bog environments can reveal much about the paleoclimate of a certain site. A research study conducted by Niering in 1953 focused on the pollen records from Cedar Bog that, although are able to indicate which species were present regionally, are not able to establish the specific local vegetation of the site. By identifying and counting macrofossils from the core, we can determine the species growing in Cedar Bog in High Point State Park, NJ and utilize that data to reconstruct a paleoclimatic history at the highest elevation in New Jersey. We took a 6.5m core from Cedar Bog and, from that, used $4cm^3$ samples taken throughout the entire depth to wash through a 250*u*m sieve and sift through at 60x magnification, identifying the macrofossils using an extensive Lamont Doherty Earth Observatory reference collection. Additionally, we tested for the percentage of organic matter through the core using loss on ignition. We found 5 zones throughout the core depth that indicate altering habitats. Beginning with low organic matter, less than 5%, the deepest part of the core has little vegetation but high rock content. The next zone introduced *Chamaecyparis thyoides* in the region and a period of changing organic matter. Following this comes a domination of aquatic plants and byrozoan statoblast and, afterwards, a shift towards sedges. The top of the core shows present day vegetation types from Cedar Bog, such as sphagnum moss and *Tsuga canadensis*, and ~96% organic matter content. The lack of vegetation and high rock content, around 6.5m deep, signal erosion that took place after deglaciation. The vegetation types in zone 2 indicate deep lake/open landscape conditions. High aquatic vegetation and bryozoan statoblasts suggest a shallow lake. The site filled in to become a fen wetland as evidenced by the abundance of *Scirpus* and *Cladium*. The final zone signifies a bog habitat represented by the domination of sphagnum and *Chamaedaphne*. These shifts signal an altering landscape of Cedar Bog, evolving after deglaciation from a deep lake to a shallow lake, followed by a fen wetland and eventually into a modern bog habitat. Certain vegetation and organism data indicate climatic shifts at Cedar Bog that can uncover the paleoclimate for a site located at the highest elevation in New Jersey.