CONTROLS ON COMMUNITY COMPOSITION AND BIODIVERSITY IN NORTH-CENTRAL FLORIDA GEOGRAPHICALLY ISOLATED WETLANDS

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Wetlands span a continuum of hydrologic connectivity, from those with persistent surface water connections to downstream waters to those that only connect via groundwater. Geographically isolated wetlands (GIWs), those wetlands surrounded by uplands, are characterized as lacking persistent and measurable surface water connectivity, and thus occupy the lower end of the connectivity continuum. While they do not exhibit obvious impacts on downstream waters, and are therefore often viewed as functionally isolated, their weaker connectivity is what enables and enhances some GIW functions, with resulting implications for functioning at the landscape-scale. One such function is biodiversity support, in which spatially and temporally heterogeneous networks of GIWs may provide unique habitat for biota, and thus contribute to landscape-scale biodiversity and metapopulation stability. Understanding the factors that control the distribution of biota in GIWs will provide a better understanding of the biological significance of these systems. We selected 16 GIWs at the Ordway-Swisher Biological Station (north-central Florida sandhill ponds and cypress domes) to monitor for fish, plant, and larval amphibian composition (twice annually) and stage variation over two years. We recorded wetland macrophytes in 1 m by 5 m quadrats along two transects spanning north-south and east-west directions. We surveyed fishes and amphibians using dip-netting and minnow traps, both of which were distributed among the extant wetland habitat types. We recorded hourly water levels using monitoring wells instrumented with pressure transducers, and collected water quality data during biological sampling events. Using our community data, we measured alpha and beta diversity for each taxonomic group during each sampling period, and determined drivers of diversity metrics using generalized linear mixed models (alpha-diversity) and multivariate ordination analyses (beta-diversity). Preliminary results suggest hydrologic attributes (i.e., water level variability, surface hydrologic connectivity, and hydroperiod) to be the dominant factors influencing diversity and composition of the surveyed taxonomic groups.

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