Morphological Evolution within Holocystitid Diploporitans
Presenter Stephen Phillips, Geology major
Mentored by Dr. Brad Deline

Biogeography is an important driver of evolutionary trends, such that the morphological consequences of migrations and faunal invasions are vital in understanding large-scale evolutionary patterns. The holocystitids are diploporitan echinoderms typified by having food grooves that lack floor plates, which end with a single, large brachiole facet. The holocystitids are a locally abundant and largely North American clade of diploporitans that became established, likely following a migration from Europe. Following the Late Ordovician Mass Extinction, few lower tiered echinoderms with broad feeding structures survived such that the Holocystites fauna, particularly Holocystites, experienced a competitive release following the invasion.

To explore the evolutionary patterns that occurred during this migration, we constructed a novel morphological character suite. We characterized 24 individuals, from holocystitids and closely related diploporitan taxa, from seven genera and combined the morphological patterns with a recently published phylogeny to construct a phylomorphospace. This methodology allows for the visualization of morphology within an evolutionary framework.