The primary goal of this project is to determine experimentally the amount of lead time required to prevent a state change. To achieve this goal, we will (1) experimentally induce state changes in a natural aquatic ecosystem - the Sarracenia microecosystem; (2) use proteomic analysis to identify potential indicators of states and state changes; and (3) test whether we can forestall state changes by experimentally intervening in the system. This work uses state-of-the art molecular tools to identify early warning indicators in the field of aerobic to anaerobic state changes driven by nutrient enrichment in an aquatic ecosystem. The study tests two general hypotheses: (1) proteomic biomarkers can function as reliable indicators of impending state changes and may give early warning before increasing variances and statistical flickering of monitored variables; and (2) well-timed intervention based on proteomic biomarkers can avert future state changes in ecological systems.