

was computed using pressure-volume curves to determine ability to maintain turgor at low ψ^{scip} . Plants in dry to mesic ψ^{scip} showed no significant difference in π_1 , but plants in dry ψ^{scip} had significantly different π_1 from plants in mesic ψ^{scip} . Under saturated conditions M. villosa has ψ^{scip} higher than most mesophytes, indicating the plant is well adapted to aquatic conditions. M. villosa also exhibits drought tolerance, under dry ψ^{scip} . M. villosa can maintain turgor pressure, and therefore growth, in dry ψ^{scip} , which would cause wilting for most aquatics. Marsilea villosa appears well adapted to growth in both aquatic and drought conditions.

BRUGGER, KRISTIN E. and CARLOS MARTINEZ DEL RIO, USDA/APHIS/ADC and University of Florida, Gainesville, FL, 32611, USA. Morphological response of the gut to shifting diet in Red-winged blackbirds.

Extensive collections of Red-winged blackbirds in March and April in southwestern Louisiana showed an inverse relationship between length of small intestine and %insects in gut contents as spring progressed. Birds naturally switched diet from seeds to insects during this time. To see if gut morphology is responsive to changes in diet, captive birds were tested with one of three ad-libitum diets that varied in fiber and protein, but not caloric content. Mean mass of birds on control and high protein diets increased significantly during the 4-week feeding trial. Mean length of small intestine and mass of gizzard of birds on the high protein diet were smaller than in birds on other diets. The simplest explanation for differences in gut morphology among diet groups was lower intake by birds on the high protein diet. Dynamic morphological response of the gut occurs within one month in Red-winged blackbirds and may contribute to differential ability to utilize shifting food resources.

BRUNT, JAMES W., WALT CONLEY and MARSHA R. CONLEY. New Mexico State University, Las Cruces, NM, 88003, USA. Behavior of a multivariate algorithm for ecological edge detection.

Ecologically important edges are best characterized by multivariate data, and represent organizational changes of varying intensity. Squared Euclidian Distances (SED) have the paradoxical properties of best representing experiences and realities on well studied transects, while at the same time presenting several mathematically undesirable properties. We examined the behavior of the SED metric using data from 2 2700 m field transects that represented changing organizational structure among ants, reptiles, birds and mammals, and their vegetational and abiotic backgrounds. Concurrently an extensive simulation study was conducted to examine the behavior of the SED metric on data with known properties. Different trophic levels (and other organizational schemes) show different edge characteristics with respect to location and variance. The monte-carlo simulations provide a way to relate described behavioral properties of the SED algorithm to interpretations of results available from field data.

BRUSH, GRACE S. and WILLIAM B. HILGARTNER. The Johns Hopkins University, Baltimore, MD, 21218, USA. Recent paleogeography of submerged macrophytes in the upper Chesapeake Bay.

Analyses of fossil seeds of submerged macrophytes in 54 dated sediment cores from the upper Chesapeake Bay show spatial and temporal distributions reflecting the response of species to changes in water quality governed both by climate and human activity. Seeds of Vallisneria americana are dominant where salinities are $\leq 1\text{‰}$, and Zannichellia palustris where salinities are $\geq 3\text{‰}$. Species diversity decreases as sedge and cordgrass marshes become more extensive, with no macrophytes present in tributaries surrounded by Cyperaceae and Spartina alterniflora, or Taxodium distichum. Within the major geographic gradients, which have not changed for at least 1,000 years, there have been significant increases and decreases in populations over the past several centuries with the majority of increases occurring immediately after European settlement and the