Chlorophyll algorithms for coastal remote sensing: rationale and perspectives from mesocosm experiments and *in situ* observations in productive inland waters and Southeastern estuaries. John F. Schalles, Biology Department Creighton University, Omaha, NE 68178 (email jfsaqua@creighton.edu)

The remote detection of phytoplankton chlorophyll and other water constituents in optically complex, Case II coastal waters is a challenging task. Conventional ocean color algorithms, utilizing wavelengths in the lower and middle regions off the visible spectrum work are well proven and effective for oligotrophic to mesotrophic offshore, Case I waters. These algorithms are, however, poorly suited and, in many cases, inappropriate in situations with higher chlorophyll levels and/or interferences from CDOM and various tripton fractions including clays and detrital particles. Our research group in Nebraska and collaborators at other inland and coastal centers have pursued alternative approaches for chlorophyll estimation in productive, turbid inland and coastal environments using hyperspectral instruments. I will present a synthesis from 15 years of work in experimental mesocosms and observations in inland lakes and reservoirs and Southeastern estuarine mixing zones and nearshore waters. In the mesocosm experiments, phytoplankton taxonomic composition and the densities of phytoplankton and/or clay suspensions were manipulated. The natural systems we study vary by at least two orders of magnitude in concentrations of chlorophyll *a* (about 0.1 – 300 mg/m^3), total suspended solids (about 0.5 – 150 mg/L), and CDOM (about 0.5 to 50 mg/L). Our chlorophyll algorithms primarily utilize the red chlorophyll feature near 670 nm and the mixed scattering / fluorescence feature at about 690-710 nm, normalized for interferences by tripton and CDOM. Both the wavelength position and magnitude of this key feature near 700 nm are highly effected by phytoplankton density. In coastal waters we largely work in continuums of distributions of phytopigments and other optically active constituents. It may be time to reconsider the simple dichotomy in classifications of Case I and Case II waters and work towards pixel classification schemes which can select and apply an appropriate algorithm.