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Development and Validation of Rapid Assessment Indices of Condition for Coastal Wetlands in Southern New England, USA

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The goals of this study were to develop and validate a Rapid Assessment Method (RAM) for assessing the condition of coastal wetlands in New England, USA. Eighty-one coastal wetland sites were assessed; nested within these were ten reference sites which were previously assessed using an intensive method which included detailed measures of vegetation, soils, and infauna. RAMs use different indicators to evaluate the condition of coastal wetlands in different geographical regions. For example, the California RAM uses land buffers, stressor indicators, physical and biotic structure and hydrology, while the Delaware protocol uses stressor indicators which reflect changes in hydrology, biogeochemical cycling, and biota. We derived condition indices (CI) from various combinations of vegetation, soils, on-site disturbances, and watershed natural buffer data. To develop CIs from this multi-dimensional data, we used principal component analysis and ranking. Significant relationships were found between various rapid assessment CIs and the developed lands in a 1 km buffer. We also found significant relationships between the rapid assessment CIs and the more intensive assessment indices from the ten reference sites. Both these results validated the use of a Southern New England RAM which is composed of equally-weighted vegetative community, marsh landscape disturbance, and watershed natural land data. Further, the regression results between the RAM CIs and the ten reference coastal wetlands suggests that it is unnecessary to make finer scale measurements of plant species and soils when evaluating condition in a rapid fashion; more detailed measures of hydrology, soils, vegetation, and other organisms may be necessary for tracking restoration or mitigation projects. A standardized RAM will allow New England states to inventory the

condition of coastal wetlands, assess long term trends, and support management activities to restore and maintain healthy wetlands.