

When developing critical nitrogen loading thresholds, the nitrogen inputs from both the surrounding watershed and that transported in tidal flows from other segments of the same estuary need to be addressed.

*Stable versus Transitional Habitat Quality:*

In all classification and threshold analysis there needs to be an awareness that the conditions during the data gathering may not be in steady state. For example, there may be water quality conditions non-supportive of eelgrass beds, yet beds are present with high coverage. This has occurred in situations where nitrogen loads have increased at a rate faster than the rate of response of eelgrass distribution. In the case of eelgrass, several years may be required to fully manifest a shift in distribution in response to a rapid increase in nitrogen loading. As a result, the Estuaries Project is constantly seeking additional historical data from which to determine whether systems are relatively stable (on a 10 year interval) or in transition.

Further reconciliation of the existing Massachusetts Surface Water Quality Standards with the more ecologically oriented proposed habitat quality classifications will be needed. This is particularly evident with regard to specific indicators as well as the more qualitative nature of the state standards when addressing ecological state.

## **Summary**

This interim report documents the progress made on steps one and two of a three- step process for developing site-specific nutrient criteria. The first step was the definition and selection of components for site-specific threshold determination. The components include State Water Quality Standards and embayment habitat indicators (biological, chemical, and physical). The second step was the development of draft qualitative and quantitative threshold levels. Threshold levels are proposed for six general water quality categories: excellent, excellent/good, good/fair, moderate impairment, significant impairment, and severe degradation. These initial levels (thresholds) will be used to interpret, or translate, habitat quality to narrative nutrient criteria in the State Water Quality Standards. The last step of the process will include calibration and refinement of thresholds, based on the detailed analysis of embayments, and the development of individual site-specific criteria.

Before the final criteria are established, several habitat quality classification issues need to be resolved, including, but not limited to: variation in multiple indicators, embayments versus salt marsh habitat, upper versus lower embayment thresholds, and stable versus transitional habitat quality.

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