

Annual Report Summary Format

Period Covered by the Report: April 2002-December 2002

Date of Report: January 24, 2003

Title: Effects of anthropogenic eutrophication on the magnitude and trophic fate of microphytobenthic production in estuaries

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Institution: Dauphin Island Sea Lab

Research Category: SGER

Project Period: on paper (07/2000-06/2001); real period: 01/2001-present (non-cost extension granted till 09/2003).

Objective(s) of the Research Project: The goals of the project are two-fold. First, describe the importance of grazing by macro-herbivores (i.e. excluded by mesh > 1mm²) and resuspension and subsequent transportation on the water column as routes followed by microphytobenthic production. This is important to understand the role of microphytobenthic populations as food resources for resident and exogenous, through transportation by waves and currents, consumers. Second, the project will also evaluate how sediment fertilization, one of the most important consequences of anthropogenic eutrophication of coastal systems, affects those routes of microphytobenthic production. This second goal will contribute to our knowledge of how increasing human-induced nutrient delivery into coastal systems alters the ecological role of microphytobenthic communities.

Progress Summary/Accomplishments: As it was explained in our previous report, we started the project several months later than the initially planned start date. The reasons for that are well elaborated in the previous report. Our work is now proceeding satisfactorily and it is about 60% completed. We are now confident, based on preliminary results and a number of modifications made, that our approach is sound and our experimental design and techniques appropriate. We have also chosen to implement a number of new activities that were not included in the initial proposal. First, concomitantly with the grazing/resuspension experiments described in the proposal, we are also doing a series of experiments to test the effects of the interaction between sediment fertilization and water-column shading, two of the most important consequences of anthropogenic eutrophication, on microphytobenthos dynamics. Second, we are also working on the validation of a spectrophotometric method to measure metabolic rates of microphytobenthic communities.

We are pleased with the results, which already unveil interesting patterns on the effects on anthropogenic eutrophication on microphytobenthos dynamics. At this point, we have sampled several seasons and during this winter we will conclude our first study year. We have requested (and been granted) a non-cost extension and, using matching from other on-going projects in the PI's lab, we plan to continue our experiments seasonally till Fall 2003. The work done will generate one Master Thesis and two publications. It will also represent important complementary information for other current studies on microphytobenthos in the PI's lab (see <http://ecosystemslab.disl.org>).

Publications/Presentations: Three oral presentations in professional meetings have been given so far (detailed in the previous plan). We plan to present a new contribution in the upcoming 2003 bi-annual ERF meeting in Portland (Oregon). As mentioned above, we anticipate to produce a couple of publications out of this work.

Future Activities: We will continue our sampling till Fall 2003. During next year, one Master thesis based on this work will be defended and the resulting scientific papers (we anticipate they will be two) submitted. Also, in the mean time we plan to give several presentations about the work done in scientific meetings (upcoming 2003 ERF, 2004 ASLO, Benthic Ecology meetings).

Supplemental Keywords: microphytobenthos, herbivory, export/import, eutrophication

Relevant Web Sites: <http://ecosystemslab.disl.org>

Acknowledgments and disclaimers

This research has been supported by a grant from the U.S. Environmental Protection Agency's Science to Achieve Results (STAR) program. Although the research described in the article has been funded wholly or in part by the U.S. Environmental Protection Agency's STAR program, it has not been subjected to any EPA review and therefore does not necessarily reflect the views of the Agency, and no official endorsement should be inferred.