

**NEW ENGLAND ESTUARINE RESEARCH SOCIETY**

**SPRING MEETING**

**April 21-23, 1977**

**Ramada Inn  
Dover, NH**

**hosted by**

**University of New Hampshire  
Marine Program  
and the  
Department of Earth sciences**

**ABSTRACTS**

Cation Adsorption Capacity of Phytoplankton: Implications for  
Trace Metal Deposition in Long Island Sound

[Carlton D. Hunt, Univ Connecticut Marine Sciences Institute]

The relationship between primary production and trace metal deposition in Long Island Sound (LIS) has been studied by two approaches. Budgetary estimates suggest a coupling between the trace metal and organic carbon composition of LIS sediments and metal concentrations in the important organic carbon sources (phytoplankton, macroalgae, marsh plants) and the productivity of these plants. Copper adsorption on the major plant species and particulate matter in LIS has been experimentally determined. The total adsorption capacity of the plants studied ranges from 0.2 to 2.0 meq/g (dry wt). Generally, phytoplankton have complexing capacities of 0.25 meq/g (dry wt). In sea water the total complexing capacity is not a true measure of potential trace metal removal due to competition for complexation sites by Mg, Ca, Na, and K. Therefore, copper distribution coefficients in  $5.5 \times 10^{-2} \text{M}$   $\text{Mg}(\text{ClO}_4)_2$  have been determined for the plant material. The distribution coefficients of phytoplankton at typical (Mg/(Cu) ratios in LIS are used to estimate the percentage of the total soluble copper which can be complexed by particulate organic matter. Implications of metal complexing by phytoplankton and particulate organic matter are discussed from the viewpoint of metal deposition.

DECOMPOSITION OF ALGAL DETRITUS  
IN ESTUARINE AND COASTAL ENVIRONMENTS

MICHAEL N. JOSSELYN  
DEPARTMENT OF BOTANY AND PLANT PATHOLOGY  
UNIVERSITY OF NEW HAMPSHIRE  
DURHAM, NEW HAMPSHIRE

The seaweeds, Ascophyllum nodosum and Fucus vesiculosus var. spiralis produce large numbers of receptacles or fertile branch tips each winter and early spring. The receptacles, which may equal the weight of the vegetative thallus, are shed during a 1 - 3 month period during spring and summer. The decomposition of the receptacles was studied using the litter bag method. Changes in total carbon, nitrogen, and phosphorous content were measured in the litter placed in coastal and estuarine locations. At all locations, weight losses from the litter occurred rapidly over a period of 1 - 3 months, however, significant differences were noted in C, N, and P content over time. Greater nutrient enrichment of litter occurred in the estuary as compared to the coastal station. Nutrient flux from the litter bags was two to three times faster during the summer than spring. The significance of algal receptacles to the estuarine detrital pool is discussed.

## DETRITAL STANDING CROP AND EXPORT FROM A NEW ENGLAND SALT MARSH

Bob Murray and Ernest Ruber, Northeastern University, Boston, Ma.

Detrital export from high and low marsh areas has been estimated from monthly measurements of tidal flow and detrital standing crop. Flow was measured by timing floats over creek sections of known cross-sectional area and the data fitted to multiple regression equations which relate flow to time in tidal cycle and tidal height. Detrital standing crop was measured by filtration of water samples on glass fiber filters with the subsequent determination of dry and ash weights on the retained material. Detrital levels range from 4 to 30mg/l dry weight and 1 to 6mg/l ash weight with a variation of up to 3 to 5 fold over the tidal cycle. The export studies, which are still in progress, will integrate the flow and standing crop data to produce a picture of the hourly flux of detrital material in the marsh over the tidal cycle. Seasonal variation in export rates along with the influence of tidal height and surface film phenomena will also be discussed.

THE ORGANIC CARBON BUDGET OF A SMALL, TIDALLY DOMINATED ESTUARY IN SOUTHEASTERN CONNECTICUT. Ernie Matson and John D. Buck. Marine Research Lab, University of Connecticut, Noank, Conn 06340

We are attempting to measure the organic carbon sources, sinks, and metabolism in a 20 ha estuary in Stonington, Conn., which has an almost pristine watershed and minimal recreational disturbance. Runoff of terrestrial total organic carbon (TOC) amounted to 33 Moles  $m^{-2}$  estuary during 1976 with a mean flow ratio of 0.07. Accumulation of particulate organic matter in sets of 15cm<sup>2</sup> epibenthic traps averaged  $2.6 \pm 1.8$  g ash-free dry weight  $m^{-2}$  day<sup>-1</sup> over 14 collections between May and November, 1976 (n=80). This net input to the benthos amounted to about 40 Moles TOC  $m^{-2}$  yr<sup>-1</sup>, and was largely derived from offshore-and tidal scour within the estuary. Preliminary data from three semi-diurnal tidal import/export studies reveal no trends but show large fluxes of both dissolved and particulate carbon across the estuarine/offshore boundary. The soft anoxic sediments range in depth from 2 to 6 m under a water column of 0.2 to 1.3m. We plan to measure benthic respiration (aerobic and anaerobic), sediment pore water  $SO_4^{=}$ , Cl, alkalinity,  $NH_3$ , Eh, and dissolved organic carbon (DOC) this year. Literature estimates and random--harvests of macrophytes will be used to estimate autochthonous carbon supply, which should total about 30-40 Moles  $m^{-2}$  yr<sup>-1</sup>. This approach to organic carbon supply and demand should aid in further understanding estuarine ecology.

DREDGE INDUCED REMOBILIZATION OF DISSOLVED ORTHO-PHOSPHATE  
AND PARTICULATE ORGANIC CARBON IN THE THAMES RIVER, CONNECTICUT

by

John M. Tramontano, Jr.  
Marine Sciences Institute  
The University of Connecticut  
Groton, Connecticut

The initiation of channel dredging in the lower Thames River near New London, Connecticut in the summer of 1974, provided an opportunity to investigate dredge induced remobilization from sediments of dissolved ortho-phosphate and particulate organic carbon. These substances were chosen because of their importance as nutrients, utility as tracers of other pollutants and ease of analysis. Thirteen sampling sites throughout the lower 8 miles of the river were sampled monthly. In addition, high resolution surveys in the vicinity of the dredging operation were conducted aperiodically. Temperature, salinity, total suspended solids, particulate organic carbon and ortho-phosphate were measured. Two gravity cores of the river bottom were analyzed for interstitial ortho-phosphate, particulate organic and inorganic phosphate, dissolved and particulate iron and particulate organic carbon. The interrelationships and possible depositional mechanisms of the measured parameters were explored. A P.O.C. to total P ratio of well under 106:1 suggested a large inorganic contribution of P to the sediments. Estimates of the potential impact of the

dredging operations indicated that from  $2-3 \times 10^7$   $\mu\text{g-at P/HR}$  could be released resulting in a 0.2-0.3  $\mu\text{g at P/L}$  increase within the immediate vicinity of the dredging operation. The high resolution surveys around the dredge showed large spatial variability in ortho-phosphate CMC. Mid- and near bottom samples generally showed increases in phosphate concentrations on the same order and greater than the amounts estimated from the core data. Surface phosphate concentrations were generally lower than mid- and near bottom samples. In some cases surface concentration fell below mean river values suggesting active removal mechanisms. Particulate organic carbon was found to increase near the dredge by a factor of 3 or more. Concentrations of total suspended material typically increased by a factor of ten. As a result, the relative percentage of organic material decreased in the vicinity of the dredge.

Dredge induced perturbations of the measured parameters were confined to within 300 m downstream of the operation. The rapid return to within average river levels beyond this distance implies rapid settling rates of the suspended solids and inorganic removal of phosphate.

Nutrient flux from estuarine sediments:  
Determination using pore water profiles and  
benthic bottom chambers

by

T.C. Loder, H.D. McGuinness and S. Murray

Department of Earth Sciences  
University of New Hampshire  
Durham, NH 03824

The flux of regenerated nutrients from estuarine sediments represents a significant source of nutrients to the water column during certain times of the year. The greatest impact occurs during high temperature summer months when concentrations in the water column are the lowest. In this study pore water was analyzed at 2 cm intervals from the top 18-24 cm of several cores from the Great Bay Estuary, New Hampshire. Nutrient flux rates were calculated using a diffusion equation and the linear concentration gradients in the top 5-15 cm of the cores. Plexiglass benthic bottom chambers with enclosed stirring motors were used to directly measure flux rates over 12 and 24 hour time periods at the core sites. Measured flux rates for silicate, ammonia and nitrite were found to be 20 to 300 times greater than estimated from diffusion equations and the core pore water data. Benthic respiration rates were also used to estimate nutrient fluxes. These methods of nutrient flux estimation will be compared and the significance of the sediments as a nutrient source will be discussed.

Populations of methane-producing and sulfate-reducing bacteria in near-shore marine sediments. M. E. Hines and J. D. Buck, U. of Conn. Marine Research Laboratory, Noank.

Vertical profiles of dissolved sulfate and liable methane-producing and sulfate-reducing bacteria were determined in three differing eastern Connecticut estuarine sediments. One site supported a methanogenic bacteria population of up to  $2 \times 10^5$ /g dry wt. and a sulfate-reducing bacteria population which closely followed dissolved sulfate indicating sulfate limitation of the latter. The depth where sulfate became depleted varied between cores (10-40 cm) despite the close proximity of samples (within 5 m). Sediments from an eel grass bed and nearby cove supported relatively low numbers of methanogenic bacteria ( $10^1$ - $10^2$ /g dry wt.) and the organisms were restricted to near-surface layers. Sulfate-reducing bacteria in these locations did not follow sulfate changes and were confined to surface layers indicating limitation by factors other than sulfate, i.e. organic compounds. Although previous chemical studies have suggested that highest numbers of methane-producers would be expected to occur in sulfate depleted zones, the present study, in most cases, obtained highest counts in sulfate enriched sediments. In some samples methane-producers were detected in sulfate enriched zones only. These data also support the premise that methanogenesis will be much less significant in sediments where sulfate reduction is not limited by sulfate.

Intended for Saturday session Projection needs: Slide projector

## Abstract

### An Estimate of Sediment Pelletization

by an Infaunal Deposit Feeder on an Estuarine Tidalflat

Luther Black and Franz E. Anderson, Jackson Estuarine Laboratory, University of New Hampshire, Durham, N.H.

Observations of fecal pellet accumulation on an estuarine tidalflat suggest that infaunal deposit feeders may be modifying sediments for resuspension and transport. Examination of tidalflat fauna shows that the tellinid bivalve, Macoma balthica, and the capitellid polychaete, Notomastus latericeous, are the major pellet producers. Samples of the substrate from the upper and lower intertidal zones were used in a tidal cycle simulation experiment to produce fecal pellets. There seemed to be no significant differences in pellet production between the two zones of the tidalflat, despite differences in numbers of resident infauna. The range of the tide does appear to be significant, with spring tide pellet production approximately twice that of the neap. Using a mean pellet production rate, the daily dry weight of pellets produced on the tidalflat was calculated to be between 110 and 230g/M<sup>2</sup>. This calculation indicates that infaunal deposit feeders are making a significant contribution to estuarine sediment transport.

Authors: Seth Barker and John Stewart

Title: Effects of acute exposure to elevated temperature on selected species of zooplankton.

Abstract: Experimental work is being carried out to determine the survival of selected species of zooplankton subjected to acute exposures to elevated temperature. A thermal gradient apparatus is being used which allows a range of temperatures and durations of exposure- to be tested at one time. The study is designed to include sets of conditions similar to those found at an existing power generating station and to aid in the interpretation of field data presently being collected at that site.

## Anomalous High Temperatures Observed in the Intertidal Zone

Franz E. Anderson  
Jackson Estuarine Laboratory and  
Department of Earth Sciences  
University of New Hampshire

In the course of examining the flux of flood water over a mud tidal flat, some extremely high water temperatures were observed. Temperature measurements were made at 3 cm above and below the mud/water interface at selected intervals up the tidal flat. Water temperatures were observed as high as 39°C, and the rate of change of water temperature across the tidal flat was as high as  $1/2^{\circ}\text{C}$  per meter of tidal flat traversed. The extreme water temperatures were related to sampling times, local climatic conditions, and the fortnightly constituents of the tide. The high water temperatures appear to be related to the suspended sediment load as may play a meaningful role in estuarine sedimentation.

Title: Patterns of Molluscan Diversity in Salt Marshes

Authors: D.J. Brousseau, W. Wiltse, and D.C. Edwards  
Department of Zoology, University of Massachusetts,  
Amherst, Ma.

Abstract: This study was designed in conjunction with a Massachusetts Coastal Zone Management survey to provide baseline data on the fauna of salt marshes. Seasonal and latitudinal patterns in the distribution of molluscs in eleven marshes were described. Molluscan diversities (both the number of species and overall diversity as measured by Simpson's index) were similar in these marshes and showed no clear latitudinal gradients. Two marshes near urban development, however, supported few molluscs and had low diversities. Our diversity findings are comparable to those reported for West Coast marshes and present an exception to the general global pattern of diversity. The nature of marsh communities and factors affecting faunal diversities are discussed.

Projection needs: 35mm slide projector

Larry J. Kelts  
RFD #1  
Whitefield, N. H. 03598  
March 12, 1977

Dr. Bernie McAlice  
Ira C. Darling Center  
University of Maine  
Walpole, Maine 04573

Dear Dr. McAlice;

I received your note and announcement of the spring meeting of NEERS, and as I am presently in the late revision stages of my Ph. D. dissertation, I can present more complete summary of my results than was the case at the Maine meeting in 1975. My paper is entitled "Ecology of two Tidal Marsh Insects, Trichocorixa verticalis (Hemiptera) and Erythrodiplax Berenice (Odonata), in New Hampshire".

My research deals with the ecology of the high tidal marshes with emphasis on aquatic insects. The paper constitutes a holistic yet autecological approach to understanding the natural history of a corixid, Trichocorixa verticalis var. sellaris and an odonate, Erythrodiplax berenice. I have sought to describe the high marsh panne ecosystem in relation to temperature and salinity factors, and to correlate laboratory tests with observations of seasonal occurrence and abundance of the two insects referred to above. In addition, behavioral and life history observations were made of other important organisms found in the pannes.

I am enclosing a check for \$3.00 to cover my 1977 membership. If my title is late for the regular program and you need a standby feel free to use my paper if you so wish.

If all goes well, I will see you in Durham on April 21. I am looking forward to taking in some of that southern sun.

Sincerely,

Larry Kelts

THE DISTRIBUTION OF INVERTEBRATES  
IN THE  
ROCKY SHORE HABITAT

[Luana Read, U. Connecticut Marine Sciences Institute]

One central problem in community ecology is the nature of the distribution of organisms along environmental gradients. Two schools of thought have developed on the subject. One idea is that groups of populations respond to an environmental gradient as discrete units with definite boundaries forming distinct communities. The other thought is that populations respond independently from each other and form a continuum of change along a gradient. Most of the arguments about these two hypotheses have been based on the distribution of terrestrial plants. An exception to this is the intertidal rocky shore habitat which is commonly seen as being supportive of the community-type hypothesis. A question remains as to whether or not the subtidal portion follows the same pattern. There is some evidence that the macroalgae form distinct communities, however, there is little data concerning the distribution of animals subtidally. I contend that the animals show a different distribution pattern from the algae; that their combined distribution pattern approaches that of a continuum in the subtidal portion of the rocky shore habitat. This study is an attempt to verify this hypothesis.

104 samples of seaweed and animals were taken from quadrats placed randomly along 12 transects on the subtidal rocks at Avery Point, Connecticut during the summer of 1976. When graphed by depth, seaweed samples indicated that two zones existed, each dominated by one species (Chondrus crispus or a species of

Gigartina) with a transition zone between. The transition zone was characterized by low biomass, high algal diversity, and a relatively large proportion of rock space not covered. The dominant mollusks tended to show the same pattern. This could be related to the amount of space between holdfasts and the external morphology of the snails involved. The crustaceans associated with the algal fronds, however, showed a different pattern. Each species seems to have been distributed independently from each other and from the dominant seaweeds, approaching that of a continuum. As these species are highly motile, they are probably not as dependent on the seaweed for support and therefore they would not be expected to be closely correlated.

STUDIES ON SUBTIDAL COMMUNITY

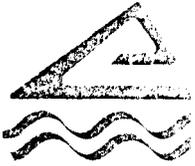
ZONATION IN THE GULF OF MAINE by

Larry G. Harris  
Zoology Department  
University of New Hampshire

ABSTRACT

Three distinct community zones occur between the low tide mark and 35 meters in depth along the exposed rocky coastline in the Gulf of Maine. Physical factors such as temperature and light attenuation appear to determine the limits of the zones, while a group of epibenthic predators influences community structure in each zone. Competitive and predatory interactions within this group of predators change with depth causing differences in relative abundances of species in the group and therefore influence the overall effect of predation on community structure in each zone.

Projection Needs Carousel Projector.



# NORMANDEAU ASSOCIATES, INC.

Nashua Road • Bedford, New Hampshire 03102 • (603) 472-5191

A Study of the Meiofauna Communities of coastal New Hampshire  
Wendy L. Coffin

The composition of the meiofauna community in the vicinity of Seabrook, NH was described from three habitats: oceanic sand, estuarine intertidal and subtidal sediments as well as holdfasts of the algae Corallina officianalis. Over 30 meiofaunal invertebrate taxa were found; nematodes and harpacticoid copepods were the predominant forms. Faunal composition varied with habitat, however no clear cut relationship between fauna and sediment type was evident. Distinct seasonal trends were also difficult to determine. Of noteworthy interest was the collection of several meiofauna species previously unknown to New Hampshire waters, including the kinorhynch Campyloderes macquariae and several species of boreal and circumpolar harpacticoid copepods.

projection needs: overhead projector  
projector for 2"x2" slides

DETERMINATION OF BIOMASS BY ATP AND ORGANIC CARBON  
EVALUATIONS IN THE THAMES RIVER, Connecticut

Robin K. Kutz and David A. McGill

U.S. Coast Guard Academy

New London, Connecticut

ATP evaluation by the method of Holm-Hansen and Booth (1966) was correlated with separate determinations of dissolved and particulate organic carbon by infra-red measurement on water samples from the Thames River. Surface samples were taken at all stages of the tide over a two month period in mid-winter. While data analysis is incomplete, it is hoped that the results for the Thames River will help clarify the relationships between ATP levels, cellular organic carbon and biomass, which have been much disputed in the literature.

## TITLE

Techniques and Applications of Aerial Imagery in Bathymetric Mapping and the Distinction of Floral Communities in Nearshore Sedimentological Surveys. Loop, Taylor and Geraci, Joseph.

## ABSTRACT

A detailed bathymetric map was required to evaluate the physical factors affecting a recent mass-stranding of Lagenorhynchus acutus in Lingley Cove, Cobscook Bay, Maine. Cobscook Bay is connected to and greatly influenced by the extreme tidal fluctuations of the Bay of Fundy. Tidal drops of 0.5 meters (above MLW) were measured over a six hour period and the time increments were corrected from the predicted values within the Bay complex. An aerial survey was conducted on the following day in which Lingley Cove was photographed at each successive time increment. Subsequently, the water level within the cove was utilized as a datum plain for the construction of an intertidal bathymetric map.

Infra-red film proved advantageous (over high speed Ektachrome) in that it is nearly opaque to thin sheets of water which characterize the draining of extensive mudflats. In addition to more accurately defining the sediment-water interface, gross distribution of algal communities and their associated substrate are readily discernible in aerial surveys. In areas of high tidal fluctuation, aerial surveys provide an exceptional means of low cost, rapid, accurate mapping of intertidal characteristics.

## PROJECTION NEEDS

One (1) Kodak carousel projector (I will provide slide tray)

## The Value of the Hampton-Seabrook Salt Marsh

[S. Rachel Ross, Dept. of Botany & Plant Pathology, UNH]

### Abstract:

This study constitutes a factual analysis of the economic status of the Hampton-Seabrook salt marsh. Monetary values are obtained for sport fishing, recreational activities and commercial fishing. A dollar value per acre of salt marsh was then estimated since these industries are marshland-dependent. A dollar per acre value was also obtained for the marshland in its natural condition, on the basis that the marsh is a necessary component of man's total environment. This figure surmounts any of the previous values since this value, on a theoretical basis, represents all uses and functions of the marsh, whether biological or by man. A summary of the evaluations are as follows: Commercial fisheries, \$167.00/acre; sport fisheries and recreation, \$1,029.00/acre; total "life-support" value, \$1,316.50/acre. Income capitalized values for these uses were derived, and revealed the potential value of the marshland as a renewable natural resource. An economic model was created for the proposal of a park, hotel, housing development, and a marina as a realistic approach toward the evaluation of the marshland as a site for development. In conclusion, from the data obtained from this study, there is a need to derive monetary values for natural lands and resources so economic evaluations of natural environments may act to balance the land-use decision making process. This would hopefully allow values, other than man-made, to be taken more seriously into consideration. (The Hampton-Seabrook salt marsh is the site for the proposed Seabrook Nuclear Power Plant.)

Author: W. R. Wright, NMFS Woods Hole

Title: A Simple Explanation of the Georges Bank Gyre

Abstract: A weak pressure gradient exists between the well-mixed water in the shallow central regions of Georges Bank and the stratified water at the edge of the Bank. The gradient intensifies in the summer but even then can be overshadowed by more rigorous forces such as storms.

[Note: This handwritten submission did not scan legibly and was therefore transcribed by the NEERS Historian, March, 2006]

The Application of a Segmented Tidal  
Mixing Model to the Great Bay Estuary, New Hampshire

by Wendell Brown

Department of Earth Sciences, University of New Hampshire

ABSTRACT

A simple tidal mixing model is used to predict the high and low water salinity distribution within the Great Bay Estuarine System for the condition of relatively low river flow ( $.2 \times 10^6 \text{ m}^3$  per tidal cycle). In this model the boundaries of the segments are determined from the river flow rate, the volume of the tidal prism and the geometry of the estuary. A mixing parameter, which is related to the tidal excursion of water within the estuary, is chosen to be .9 in the Lower Piscataqua and elsewhere. The results compare favorably with measured salinity distributions. The flushing times are calculated for each segment and for the entire estuary where it is found to be 59.72 tidal cycles for water entering through the Lamprey/Squamscott rivers and 35.28 tidal cycles through the Cocheco/Salmon Falls rivers.



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**U.S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
Northeast Fisheries Center Milford Laboratory  
212 Rogers Avenue  
Milford, Connecticut 06460

February 11, 1977

Dr. B. J. McAlice  
Ira C. Darling  
Center Walpole,  
Maine 04573

Dear Dr. McAlice:

In response to the "call for papers" for NEERS, Spring of 1977. I wish to submit the following.

The Effects of Oxygen and Nitrogen Supersaturated  
Seawater on Two Bivalve Mollusks

Two size classes of both Argopecten irradians and Spisula solidissima were exposed to different concentrations of gas supersaturated seawater in a flowing culture system.

Results indicate a correlation between mortality and level of super-saturation. Length of survival time was inversely proportional to gas concentration. Moderate concentrations of supersaturated seawater induced tissue emboli and membranous blisters in the experimental animals over ex-tended exposures.

Thank you.

Sincerely

*Ronald Goldberg*

Ronald Goldberg  
Fishery Biologist

Title: Environmental parameters of Ruppia maritima L.  
populations on New Hampshire tidal marshes.

Frank D. Richardson  
Department of Botany and Plant Pathology  
University of New Hampshire

#### ABSTRACT

Seasonal and diurnal fluctuations of selected parameters including depth, temperature, salinity and oxygen content were recorded for a variety of aquatic habitats populated by Ruppia maritima L. on coastal and estuarine tidal marshes of New Hampshire during 1974 and 1975. Large shallow pannes, deeper nearly vertically sided pools or pond-holes, ditches and occasionally creeks may provide suitable habitat for the various growth forms of Ruppia. Physiographic features, conditions of the substrate, ontogeny and other characteristics of specific habitats are described. Seasonal mean salinities ranged from 15 ‰ in pools on an upper estuarine marsh to 22 ‰ in those surrounding Great Bay to 31 ‰ on coastal marches. This gradient influences the growth and development of Ruppia as exemplified by differences in growth habit, pollination ecology and species strategy. Populations at various locations represent an ecocline of oligohaline in early spring to meso- and polyhaline situations with intermittent hyperhaline conditions occurring during periods of summer drought. Seasonal variations of dissolved oxygen at five sites ranged from 0.0 to 20.7 mg·L<sup>-1</sup> in 1975 with percent saturation varying from 0.0 to 307.4 % over the same period.

Species strategy, seasonal periodicity and growth form of the plants growing under natural conditions are considered in relation to the environmental parameters characterizing the different habitats. Comparative phenological data for representative populations are presented. The effect of turbidity, epiphytes and algal mats, and other biotic and physicochemical factors are examined in an attempt to determine the cause of the recent disappearance of large populations of Ruppia from New Hampshire marshes. The habitats of Ruppia accumulate considerable quantities of both autochthonous and allochthonous organic matter thereby functioning as detrital reservoirs and providing a source of nutrients to the tidal marsh estuarine system.

ANALYSIS OF THE ECOLOGY OF THE MUMMICHOG, FUNDULUS HETEROCLITUS,  
IN A NEW ENGLAND SALT MARSH.

Linda Deegan and Ernest Ruber, Northeastern University

The major focus of the study was the determination of the population distribution, standing crop, consumption and net production of Fundulus heteroclitus.

This study was conducted in the Rowley salt marsh, a section of the Parker River Wildlife refuge, adjacent to the Parker River, Essex County, Ma.

Growth rate was determined as the change in mean length of the population as determined by length-frequency histograms. This change was converted to biomass by length-weight regressions developed in this study. A food consumption rate was estimated using routine metabolism information in conjunction with the growth statistics and-known assimilation coefficients. Consumption peaked in mid-summer at 318 cal/m<sup>2</sup>/day in late August, declining to 170 cal/m<sup>2</sup>/day in September.

Net production was estimated as the amount of biomass accumulated over a period of time using the length-frequency histograms and the length-weight regressions. Production was estimated to be 10 cal/m<sup>2</sup>/day for early June, peaking at 151 cal/m<sup>2</sup>/day in August, and declining to 50.9 cal/m<sup>2</sup>day in early September.

This data will be discussed within the frame work of existing salt marsh energy studies, and compared to several others.

Life history strategies among the New England Coryphellidae

(Gastropoda: Nudibranchia).

[Alan Kuzirian, Department of Zoology, UNH]

#### ABSTRACT

The presence of six coryphellid nudibranchs within such narrow geographical limits as the Gulf of Maine is unique, and is equalled only by such comparable numbers of congeners from the expansive area of the northern coasts of Europe. The New England coryphellids all have distinctive prey preferences, seasonalities and reproductive strategies which allow their co-occurrence. A brief synopsis of the life history strategies of the six coryphellid species will be given and important differences discussed.

Projection Requirement: for 2 X 2" slides