

tributions of organisms, but as information on those features has accumulated and as the importance of the management and preservation of estuaries has been recognized the emphasis has shifted. A comparison of these proceedings with those of the 1973 international conference indicates that the major advances in estuarine research have been an increased understanding of the physiological, biochemical, and behavioral adaptations of organisms to stress, of the population dynamics of important estuarine organisms, and of the processes that couple coastal wetlands with offshore areas. Efforts to model estuarine circulation numerically have also increased.

An understanding of the pathways and transfer mechanisms of important chemical, physical, and biological components of estuarine systems is essential if a holistic view of the ecosystem is to be taken and if models that can predict responses of estuarine systems to perturbation are to be constructed. Several contributors to the present volumes express the view that we are just beginning to quantify some of these processes and have a long way to go before we understand the complex dynamics of and relationships between biotic and abiotic factors in the estuarine environment. Also, there seems to be a deficiency of data for modeling, and most models have not been adequately tested with field data.

The present concern over perturbations in the estuarine environment induced by human activities is reflected in the volumes under review. Over half the papers presented in volume 1 are concerned directly or indirectly with estuarine perturbations. The studies include such diverse topics as the rehabilitation of estuaries, population dynamics, wetland uses, sublethal stresses and behavior, physiological adaptations, and pollutant cycling. Volume 2, which is devoted primarily to sediment transport and circulation, wetland and coastal interactions, and circulation models, contains a smaller percentage of papers explicitly concerned with environmental stress, but the information presented is indirectly important in understanding its effects.

Each of the 13 sections that make up the volumes has an introduction summarizing its major theme. The proceedings as a whole, however, suffers from the lack of a general summary or synthesis. Some of the papers on estuary rehabilitation, wetland uses, and coastal and wetland interactions that emphasize the importance and uniqueness of estuaries

may be of interest to the general reader. The major value of the proceedings, however, may lie in helping to make the marine scientist aware of issues that require further study.

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