

COASTAL DEVELOPMENT AND WATER QUALITY: ASSESSING THE HEALTH OF MISSISSIPPI'S ESTUARINE WATERS

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During 1968/69 a large-scale study was conducted to provide baseline data on the hydrological and biological characteristics of coastal waters of the Mississippi Sound (Gulf of Mexico Estuarine Inventory and Study, Mississippi). In 2000/01 forty-two of the original 1968/69 stations were revisited and water and fauna were sampled using protocols developed during the earlier study. Data from the two studies were used to assess changes in water quality and to evaluate the environmental health of coastal waters. Monthly samples were taken (May through April) in the Pascagoula, Biloxi, Bay St Louis, and Pearl River estuaries at five salinity zones. Hydrological parameters measured at each site were temperature, salinity, and dissolved oxygen. Ammonia, nitrite, nitrate, orthophosphate, and total phosphate concentrations in surface and bottom water samples were analyzed at the Gulf Coast Research Laboratory. Water quality parameters were evaluated by study, estuary, and salinity zone. Salinities were significantly higher at most stations in 1968/69 than in 2000/01 and in both studies salinities were generally lowest in the western Sound. Nitrate and nitrite concentrations were significantly higher while total phosphate and orthophosphate levels were lower in 2000/01 when compared to the earlier study. In 2000/01, salinity, pH, and dissolved oxygen levels increased and nitrate and nitrite levels decreased from inshore to offshore stations. Increased nitrogen loading is apparent and related to industrialization and rapid population growth in south Mississippi. Observed decreases in levels of phosphate may be attributed to the ban of these compounds in detergents. Data from these and other studies will be used to develop numeric water quality criteria that can be incorporated into State water quality standards.