

EFFECTS OF CULVERTS ON MISSISSIPPI'S RENOURISHED BEACHES

Keil Schmid, Mississippi Office of Geology, Jackson MS 39289

Culverts, which drain local roads and coastal developments, are striking features along the renourished beaches in Mississippi, especially in Harrison County. Their important function is offset by their stark contrast and inadvertent hardening of the shoreline. Hardened shorelines generally override natural sedimentation and create very localized erosion and accretion trends, which can cause management problems. Development growth, which reduces the amount of permeable area, adjacent to the coast will likely increase the number of culverts along the beach. A closer inspection of the culverts and the shoreline patterns shows how different construction variables affect shoreline evolution. In some cases the culverts effectively act like groins, whereas others seemingly have little impact on sediment transport. Global Position System (GPS) surveys coupled with Geographic Information System (GIS) analysis of the culverts and shoreline patterns in two test areas have been used to investigate the roles of several construction variables on beach evolution. Shoreline deviation and temporal change near culverts were compared with construction variables including pipe diameter, culvert spacing, double vs. single culverts and culvert length. Results suggest that culvert diameter is the most important factor in determining shoreline response. This indicates that sediment movement is driven by high energy, low frequency events that are able to transport sediment over the tops of small culverts but not large ones. Future studies of the entire beach system may establish the longer-term effect of culverts on erosion patterns.