Salt Marsh Dieback in Coastal Georgia

Georgia Coastal Research Council Fact Sheet

The Problem

Reports of salt marsh dieback in Georgia began in the spring of 2002. Affected areas are left with little or no live aboveground vegetation, and they have caused great concern along the Georgia coast. Salt marsh dieback has now been reported in all of Georgia's coastal counties and in coastal South Carolina. Current estimates exceed 1000 affected acres, and in some areas the marsh is down to bare mud and beginning to slough into the water (Fig. 1).

Loss of the salt marsh can increase local flooding and result in habitat loss for juvenile shrimp, crabs, and fish. The sediment that washes off the marsh can adversely affect tidal creeks and estuaries and can hinder navigation.

Fig. 1: Examples of salt marsh die-off in coastal Georgia: (A) aerial photograph of a die-off area near the Jerico River; (B) a close-up of rhizome "stubble"; (C) example of eroding area in Liberty County; (D) area with standing water at Sapelo Island National Estuarine Research Reserve.

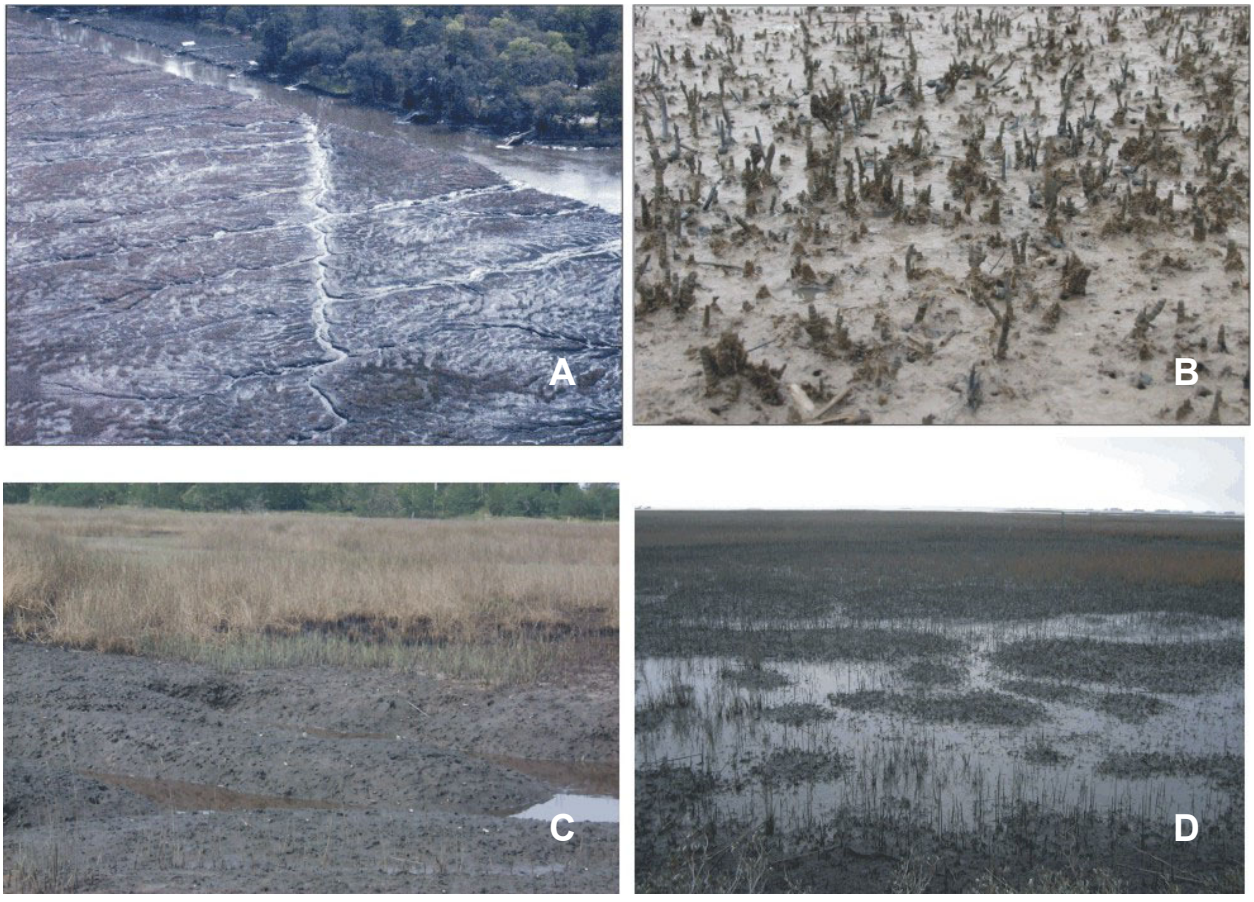

Photo credits; A – Jan MacKinnon, B – Mac Rawson, C – Mac Rawson, D -.Matt Ogburn

The Georgia Coastal Research Council (GCRC), located in the School of Marine Programs at UGA, works to bring information regarding emerging coastal management issues to scientists and to enable managers to stay up-to-date regarding current research activity. The issue of marsh dieback is a current focus area of the GCRC. We are having regular, coordinated meetings to discuss the issue. For more information, see the GCRC web site (www.marsci.uga.edu/coastalcouncil) or contact
Merryl Alber or Janice Flory via e-mail (gcrc@uga.edu) or telephone (706-542-1283).

Georgia Coastal Research Council

Efforts to address marsh dieback in Georgia

- In October 2002 a team from the Georgia Coastal Ecosystems Long Term Ecological Research program sampled sites near the Jerico River in conjunction with staff of the Coastal Resources Division of the Georgia Department of Natural Resources (CRD-DNR). There was no evidence of increased salinity in the dieback areas, nor was it obvious that the densities of snails and crabs were related to die-off (their report is available at *www.marsci.uga.edu/coastalcouncil/marshsummarylter2.pdf*).

- Drs. Mary Ann Moran (UGA Dept of Marine Sciences), Steve Newell (UGA Marine Institute) and David Porter (UGA Dept of Plant Biology) have analyzed samples of affected plants for bacterial and fungal community composition.

- Dr. Merryl Alber (UGA Dept of Marine Sciences) has conducted greenhouse trials with material collected from a dieback site and found that rhizomes from dieback areas could not re-sprout when watered, but that healthy salt marsh plants (*Spartina alterniflora*) could grow in soil from both healthy and "dead" marsh areas. In addition, Mr. Matthew Ogburn, a graduate student in M. Alber's laboratory, conducted a transplant study in the field with both *S. alterniflora* and *Juncus romerianus* from May-Oct 2003. This research demonstrated that healthy plants can survive in dieback areas as well as in reference sites. The study was done at the Sapelo Island National Estuarine Research Reserve as well as at Melon Bluff Plantation in Liberty County.

- Dr. Chandra Franklin (Sav. State Univ., Dept of Natural Science and Mathematics) and Jan MacKinnon (CRD-DNR) have received funding from GA Sea Grant and the M.K. Pentecost Ecology Fund to perform morphological, anatomical and cytological analyses of plants from marsh dieback sites. Their results suggest that rhizomes from dieback sites are not viable, and even healthy-looking rhizomes may be affected.

- The GCRC has established a standardized marsh monitoring protocol to monitor both healthy and affected sites. The marsh monitoring subcommittee is working with CRD to coordinate sampling at dieback sites along the coast. Eight sites are being monitored quarterly for specific biological, physical and chemical parameters. Data from this effort are available on the web: *http://www.marsci.uga.edu/coastalcouncil/marsh_data2.htm*.

- A SSU-UGA team also surveyed 18 dieback areas in the summer of 2003. Aside from the vegetative dieback, they found no difference between dieback and reference sites and no obvious relationship between severity of the dieback and potential causal factors (*e.g.* herbivory, elevation, soil chemistry, salinity).

- CRD-DNR is now conducting regular aerial surveys of the coast to identify and map marsh dieback sites. For more information, contact Jan MacKinnon or Jill Huntington at CRD (912-264-7218).

- Representatives of the Marine Extension Service, NMFS Marine Sanctuary Program at Gray's Reef, CRD-DNR and Sapelo Island National Estuarine Research Reserve have formed a remote sensing collaboration. The group has leveraged funding for the acquisition and analysis of aerial imagery to identify areas in different stages of dieback and track vegetation patterns over time.

- The GCRC organized a workshop on marsh dieback with colleagues from Louisiana, where marsh dieback has also generated tremendous concern. The workshop was supported with funds from Georgia Sea Grant, Louisiana Sea Grant, Georgia DNR (CRD) and Sapelo Island NERR - Coastal Training Program, and occurred February 3-4 in Savannah. Workshop information is available at http://www.marsci.uga.edu/coastalcouncil/dieback_workshop.htm