SUDDEN SALT MARSH DIEBACK: UPDATE FROM 20 EXPERIMENTAL SITES IN TERREBONNE AND BARATARIA BASINS

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Our approach to the recent dieback phenomenon has been to establish multiple sites throughout the most affected region (Terrebonne and Barataria Basins) to: 1) document the degree and pattern of damage and current status of affected areas, 2) assess potential for natural recovery, 3) identify causal mechanisms, and 4) establish reference points and baseline data against which future changes may be accurately assessed. Aerial and ground surveys were conducted in August and October 2000 from Point Au Fer to the Mississippi River, and permanent stations were established in 18 dieback and 2 control sites. At each dieback site, permanent markers were placed in three zones: a healthy zone with <10% mortality, a transition zone with ~50% mortality, and a die-off zone with >90% mortality. Within each zone, three plots were randomly located where the following variables were measured: aboveground vegetative condition (species composition; percent live/dead by cover; stage of decomposition of standing dead plants); rooting depth; rhizome viability; pathogens (shoot and rhizome/root); leaf tissue elemental composition; and soil physicochemical conditions (bulk density, % organic matter, salinity, redox potential, pH, sulfide, and extractable cation and trace metal concentrations). The die-off zone consisted primarily of stubble or leafless stems (16 of 18 sites), indicating an advanced state of shoot decomposition and no regeneration (during this growing season) for most of the affected areas. In contrast, healthy and transition zones had live shoots and some evidence of resprouting. Examination of rhizome viability revealed that <5% of perennating organs in the die-off zone were alive, compared to >70% in adjacent transition and healthy zones. Thus, dieback areas may be slow to recover naturally, but the healthy and transition zones will be important in stabilizing marsh edges in the short-term. Two fungal species were isolated, but pathogenicity has not been established; in any case, these organisms typically infect previously stressed plants and at most played a secondary role in the dieback. Examination of soil physicochemical conditions in the dieback areas revealed nonlethal levels of salinity, sulfide, and pH, but these values may not reflect conditions that prevailed earlier in

the growing season. Further experimental work will be required to establish the precise causative mechanism.