

# CONSERVING TIDAL MARSH BIRDS IN AN ERA OF CLIMATE CHANGE

*Prioritizing actions at the intersection of our changing land and seascapes.*

***Tidal marshes*** form the dominant transition zone between terrestrial and marine communities in eastern North America, and over one-third of the world distribution of this unique ecosystem is found along the U.S. Atlantic and Gulf coasts. This shoreline also possesses the highest level of vertebrate biodiversity and endemism of any tidal marsh region worldwide and is home to over half of the world's specialist salt marsh taxa (Greenberg et al. 2006). Tidal marsh biodiversity is primarily a North American resource, and therefore, a primary North American responsibility.





*Because of their restricted, linear distribution along the shoreline, tidal marshes are particularly susceptible to the effects of human land use and climate change. Tidal marshes compete for space with (and are downstream of) some of the continent's most highly developed areas. Over 60% of US residents live in coastal areas (Burlington 1999), and this overlap with human use has contributed to a suite of impacts that have degraded ecosystem quality. Further, climate change has impacted tidal marshes through sea-level rise and changing weather patterns. Sea-level rise has altered vegetation communities and caused interior marsh loss across the seaboard (0.2-0.7% per year: Erwin et al. 2004).*

Tidal marsh loss from sea-level rise is projected to accelerate over the next century, with predicted tidal marsh losses of 0.5-1.5% per year (Greenberg et al. 2006). Climate change will also continue to increase the frequency and intensity of storm-related tidal surges. Flooding is a strong determinant of successful reproduction in the tidal marsh (Greenberg et al. 2006), and both sea-level rise and changing storm patterns are likely to increase this threat to many marsh birds, most of which are near-ground nesters. Together, this information suggests that small sea-level increases could push populations to a threshold beyond which rapid declines are likely.

We are attempting to prevent species from entering such an extinction vortex by quantifying species vulnerability across the eastern North American coastline, by identifying the thresholds at which serious declines become probable, and by investigating potential solutions that would preempt the need for drastic, and costly, remedies. In an ongoing collaboration with researchers from five state universities, nine state wildlife agencies and a suite of federal biologists and non-governmental organizations, we are combining detailed tidal marsh surveys, reproductive observations, and region-wide computer modeling efforts to identify critical areas for tidal marsh bird conservation and to identify which marshes and species from Maine to Virginia are most sensitive to land and seascape change.



## Selected References

Burlington, L. B. 1999. Ten year historical perspective of the noaa damage assessment and restoration program. *Spill Science & Technology Bulletin* 5:109-116.

Erwin, R. M., G. M. Sanders, and D. J. Prosser. 2004. Changes in lagoonal marsh morphology at selected northeastern Atlantic coast sites of significance to migratory waterbirds. *Wetlands* 24:891-903.

Greenberg, R., J. E. Maldonado, S. Droege, and M. V. McDonald. 2006. *Terrestrial Vertebrates of Tidal Marshes: Ecology, Evolution, and Conservation*. Studies in Avian Biology (No. 32). Cooper Ornithological Society.

For more information, please see <http://www.tidalmarshbirds.org/>