

## **Marsh Elevation Response to Prescribed Burning at Blackwater National Wildlife Refuge**

Donald R. Cahoon  
U.S. Geological Survey, Patuxent Wildlife Research Center  
C/o BARC-East, Bldg 308  
10300 Baltimore Avenue  
Beltsville, MD 20705  
(301) 497-5523  
[dcahoon@usgs.gov](mailto:dcahoon@usgs.gov)

Glenn Guntenspergen  
U.S. Geological Survey, Patuxent Wildlife Research Center  
(218) 720-4307  
[Glenn\\_guntenspergen@usgs.gov](mailto:Glenn_guntenspergen@usgs.gov)

Land managers at Blackwater National Wildlife Refuge (BNWR) and Fishing Bay Wildlife Management Area (FBWMA) manage ~ 11,000 acres of tidal marsh with annual prescribed fires to reduce hazardous fuel conditions, promote rare/endangered species, and enhance habitat for wildlife. The managers would like to know: *Does the annual prescribed fire regime adversely or positively affect marsh elevation, and does it contribute to marsh loss at BNWR?* More than 8,000 acres of tidal marshes at BNWR and FBWMA have been lost because rates of soil organic matter accumulation are inadequate to offset sea-level rise. Fire affects the accumulation of plant organic matter in the soil, but the magnitude and direction (i.e., positive or negative) of its effects are poorly understood. Understanding the relationship between fire, organic matter accumulation, and marsh sustainability is important in recognizing the limits and consequences of fire as a management tool in these coastal marshes. We are experimentally determining annual prescribed burn effects on soil organic matter accumulation and surface elevation trends in the marshes. Annual burning has a strong positive effect on plant growth, including belowground production. This increased belowground production reduces root zone collapse compared to the other burn treatments. But the net effect of increased root production on elevation change is negligible. We will assess the risks and benefits that annual burns pose to long-term marsh sustainability and the findings will be applied to the adaptive management plan being developed by the refuge for their prescribed fire program.