Abundance, biomass and production of aquatic invertebrates in Rainbow Bay, a temporary wetland in South Carolina, USA

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With 6 figures and 5 tables in the text

Abstract: The abundance, biomass and production of aquatic invertebrates were determined for 1992 and 1993 at Rainbow Bay, a small (maximum inundated area ~1.5 ha), shallow (maximum depth ~1 m) depression wetland in South Carolina, USA, which dries annually. Estimates were based on invertebrates collected from benthic substrates and the water column, including those associated with macrophytes. Mean invertebrate density during the periods of inundation was $7.1 \times 10^5$ animals/m² in 1992 and $7.7 \times 10^5$ animals/m² in 1993. Small taxa, including nematodes, rotifers and micro-crustaceans dominated numerically. Biomass was 2.1 g dry mass/m² in 1992, and 0.9 g/m² in 1993. Oligochaetes, insects (mostly chironomids) and crustaceans dominated the biomass. The lower biomass in 1993 was the result of significant reductions in the biomass of oligochaetes and benthic chironomids. Laboratory-derived daily growth rates of oligochaetes and chironomids collected from Rainbow Bay, along with daily production rates for crustaceans and rotifers derived from other studies were used to estimate secondary production. Production in 1993 (14.7 g dry mass/m²) was less than in 1992 (36.7 g/m²), due primarily to lower biomass of oligochaetes and chironomids in 1993. Differences between years in abundance, biomass and production were associated with differences in hydrology of the wetland, including duration of inundation, and abundances of salamanders.

Introduction

Carolina bays and other isolated wetlands of the Atlantic Coastal Plain physiographic province support a great diversity of insects, crustaceans and other