

Prepared in cooperation with Great Sand Dunes National Park and Preserve

Macroinvertebrate Community Sample Collection Methods and Data Collected from Sand Creek and Medano Creek, Great Sand Dunes National Park and Preserve, Colorado, 2005–07



Data Series 1012

U.S. Department of the Interior
U.S. Geological Survey

Cover. Sand Creek approximately 150 meters below Upper Sand Creek Lake, Great Sand Dunes National Park and Preserve, Saguache County, Colorado, June, 21, 2004. Photograph by Robert E. Zuellig, U.S. Geological Survey.

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Table

1. Description of sites, samples, and macroinvertebrate data collected from selected locations along Sand Creek and Medano Creek between 2005 and 2007, Great Sand Dunes National Park and Preserve, Colorado..... [link](#)

Conversion Factors

Multiply	By	To obtain
	Length	
micrometer (μm)	0.003937	inch (in)
millimeter (mm)	0.03937	inch (in.)
centimeter (cm)	0.3937	inch (in.)
meter (m)	3.281	foot (ft)
kilometer (km)	0.6214	mile (mi)
	Area	
square centimeter (cm^2)	0.001076	square foot (ft^2)
square meter (m^2)	10.76	square foot (ft^2)
	Volume	
milliliter (L)	33.81402	ounce, fluid (fl. oz)

Datum

Vertical coordinate information is referenced to the North American Vertical Datum of 1988 (NAVD 88).

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Abbreviations

NWQL	National Water Quality Laboratory
USGS	U.S. Geological Survey

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Abstract

This report provides a table of site descriptions, sample information, and semiquantitative aquatic macroinvertebrate data from 105 samples collected between 2005 and 2007 from 7 stream sites within the Sand Creek and Medano Creek watersheds in Great Sand Dunes National Park and Preserve, Saguache County, Colorado. Additionally, a short description of sample collection methods and laboratory sample processing procedures is presented. These data were collected in anticipation of assessing the potential effects of fish toxicants on macroinvertebrates.

Introduction

The U.S. Geological Survey (USGS), in cooperation with Great Sand Dunes National Park and Preserve, conducted an extensive inventory of mayfly (Ephemeroptera), stonefly (Plecoptera), and caddisfly (Trichoptera) species of the Sand Creek watershed (Zuellig and others, 2006). While conducting the initial Sand Creek watershed inventory (Zuellig and others, 2006), continuing through 2007, additional semiquantitative benthic samples were collected from selected sites in Sand Creek and from neighboring Medano Creek. The original survey data (Zuellig and others, 2006) and the supplementary data presented in this report were collected in anticipation of assessing the potential effects of fish toxicants on macroinvertebrates.

This report includes a table of site descriptions, sample information, and semiquantitative stream macroinvertebrate data collected between 2005 and 2007 from seven stream locations within the Sand Creek and Medano Creek watersheds, in Great Sand Dunes National Park and Preserve (fig. 1). Additionally, a short description of sample collection methods and laboratory sample processing procedures is presented.

Methods

Sample Collection

A total of 105 semiquantitative samples were collected on five occasions from seven sites between June 2005 and July 2007 (table 1, fig. 1). On each sampling occasion, three discrete samples were collected from riffle areas at each site using a Surber sampler equipped with 500-micrometer (μm) mesh and a 1-square-foot (ft^2) sampling grid following the general operating procedures described by Klemm and others (1990, Section 5.7.6, p. 52). The volume of each discrete sample was reduced in the field by elutriation and sieving (500- μm -mesh metal sieve) until the sample volume was less than 500 milliliters (mL). All samples were preserved in the field using 80-percent ethyl alcohol and stored at Colorado State University until they were transported to the USGS Aquatic Experimental Taxonomic Laboratory in Fort Collins, Colorado, for sample processing and taxonomic identification.

Laboratory Processing

All macroinvertebrates were removed from each sample following general procedures described by Klemm and others (1990, Section 6.4.1, p. 97). Each sample was rinsed and size-fractionated using nested, 4-millimeter (mm) and 500- μm standard test sieves. Each fraction was submerged in water and spread evenly along the bottom of one or more white plastic trays (each measuring 33.02 \times 40.64 \times 6.35 centimeters [cm]), leaving at least 50 percent of the tray bottom uncovered. Organisms were removed from each sample fraction using a 2.25X magnifying lamp. All individuals were enumerated and identified to the lowest practical taxonomic level using available keys (Andersen and others, 2013; Merritt and others, 2008; Stewart and Stark, 2002; Thorp and Covich, 2001; Wiggins, 1998), which was genus

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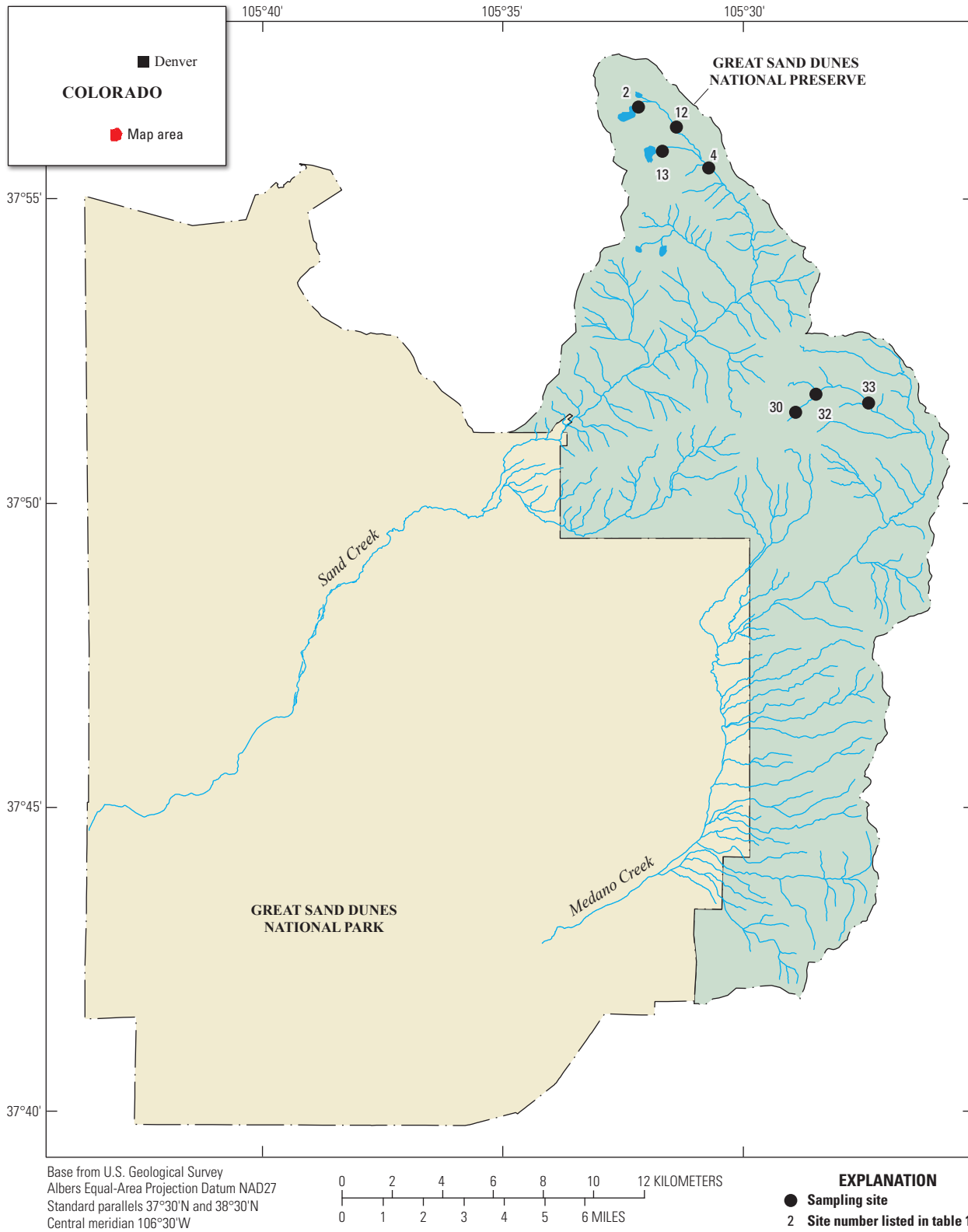


Figure 1. Sand Creek and Medano Creek site locations where invertebrate samples were collected between June 2005 and July 2007, Great Sand Dunes National Park and Preserve, Colorado.

for most groups (Coleoptera, Diptera, Ephemeroptera, Platyhelminthes, Plecoptera, Trichoptera), family for some (adult Ephemeroptera, adult Plecoptera, adult Trichoptera), and phylum (Oligochaeta), class (Hirudinea and Nematoda), or subclass (Acari) for others.

All Chironomidae were sorted by similar morphological features (morphotype) and slide-mounted using the semipermanent mounting media, CMC-10 (Master Company, Inc., Wood Dale, Illinois). For individuals larger than 5 mm in length, specimens' heads were removed and mounted separately to facilitate identification. All individuals were mounted vertically under a coverslip (usually no more than 10 specimens per group), ventral side up, with two coverslips per slide. When the abundance of a specific morphotype group was greater than 50 individuals, 10 percent were slide-mounted, identified, and the taxonomic name applied to all individuals in the associated group.

Additionally, a voucher collection of unique taxa encountered among all samples was prepared and verified by the Biological Group of the USGS National Water Quality Laboratory (NWQL) in Denver, Colorado. The NWQL also evaluated sorting efficiency by re-sorting remnants of 10 percent of the samples using the methods described earlier for 10 percent of original processing time. Re-sorting results indicated that samples exceeded 95-percent sorting efficiency and that identifications in the voucher collection were in agreement.

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