U.S. Department of the Interior
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Open-File Report 95-619
Sheet 1 of 4

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TOPOGRAPHIC MAPS OF

NOVARUPTA DOME

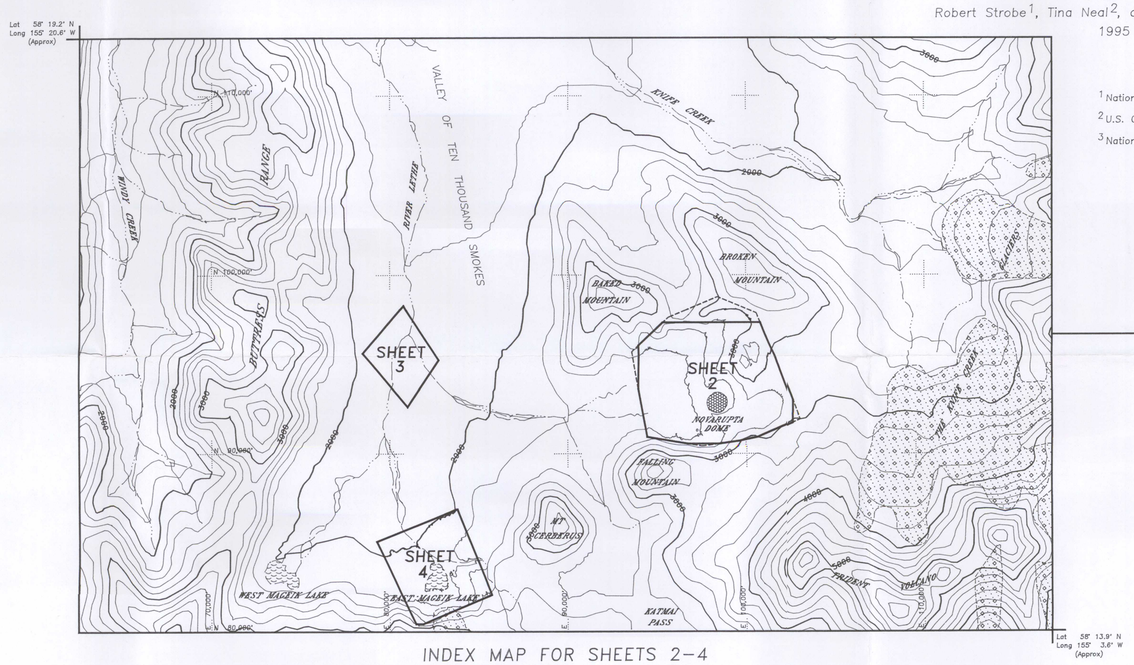
AND SELECTED PORTIONS OF

THE VALLEY OF TEN THOUSAND SMOKES

KATMAI NATIONAL PARK AND PRESERVE, ALASKA

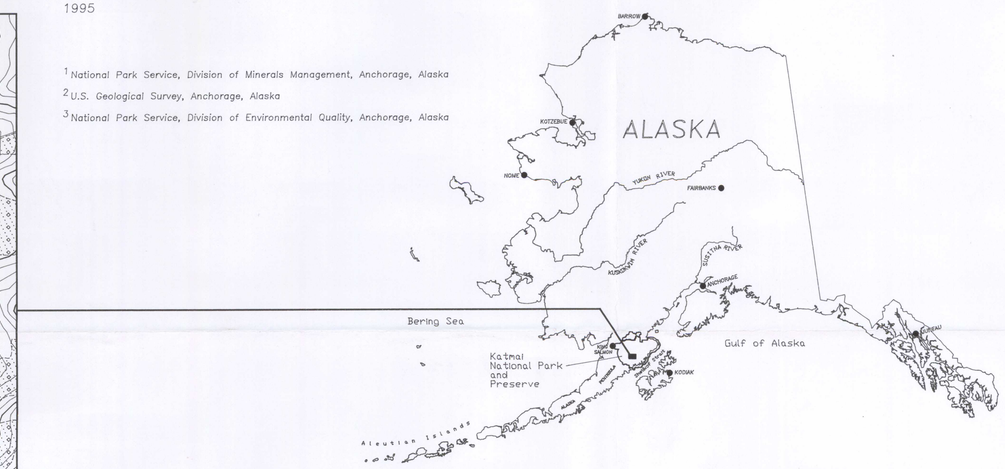
By
Robert Strobe[1], Tina Neal[2], and William "Bud" Rice[3]
1995

[1] National Park Service, Division of Minerals Management, Anchorage, Alaska
[2] U.S. Geological Survey, Anchorage, Alaska
[3] National Park Service, Division of Environmental Quality, Anchorage, Alaska



INDEX MAP FOR SHEETS 2–4

Topography for this index map is from USGS 1 deg DEM data except area inside mapped boundaries which is from sheets 2–4 ACAD data set.
Other features digitized from 1:63,360 USGS topo.
Grid coordinates above are assumed (in feet) from 1991 NPS survey. Also see title block.
Contour Interval = 200 feet



EXPLANATION FOR ALL MAP SHEETS
(Line weight and symbol size may change)

- Lake or other standing water
- Stream- Intermittent or year round
- Glacier
- Snow
- Contour line- Value in feet.
  - 4100 Index contour
  - Intermediate contour
  - Depression contour- Hatchures point toward depression
- Area mapped with 5 ft contours- Shown on index sheet (Dashed area located in digital files)
- Novarupta, 100 ft contour line- Shown on index sheet
- Survey control point- Visible in digital files only
- Photo panel/temp control pt- Visible in digital files only
- 1857.4 Spot elevation- Visible in digital files only
- Aerial photo center- Visible in digital files only
- 2 Photo panel and Station number
- Map base grid ticks (from local 1991 NPS survey)

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

TOPOGRAPHIC MAPS OF NOVARUPTA DOME AND PARTS OF THE VALLEY OF TEN THOUSAND SMOKES, KATMAI NATIONAL PARK AND PRESERVE, ALASKA

By

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This text and accompanying map sheets are preliminary and have not been reviewed for conformity with the U.S. Geological Survey (USGS) editorial standards (or with the North American Stratigraphic Code). Any use of trade, product or firm is for descriptive purposes only and does not imply endorsement by the U.S. Government. Although this program has been used by the U.S. Geological Survey, no warranty, expressed or implied, is made by the USGS as to the accuracy and functioning of the program and related program material, nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the USGS in connection therewith.

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Four map sheets, three maps at 1"=200 (1:2400) scale and one index sheet at 1"=4,000' (1:48,000) scale.

INTRODUCTION

Within Katmai National Park and Preserve in southwest Alaska is the site of one of the most violently explosive volcanic eruptions in recorded history, and the largest eruption of the 20th century. During a 60-hour period in June, 1912, about 13 km^3 of magma erupted from a vent at the head of a broad glacial valley dissecting the Aleutian Range (Fierstein and Hildreth, 1992). About half of this volume is represented by fallout from the resulting plinian eruption column. As much as 30 cm of primary tephra accumulated at the town of Kodiak, 170 km downwind. The remaining volume is found in a sequence of ash-flow deposits up to 200 m in total thickness, which partially filled major valleys leading away from the vent (Curtis, 1964; Kienle, 1991). During the final phase of the eruption, extrusion of rhyolitic lava formed an 80-m high blocky lava dome, called Novarupta, which now plugs the vent. The synchronous withdrawal of magma from beneath Mount Katmai, 10 km east of Novarupta Dome, caused Mount Katmai's summit to collapse producing the spectacular Katmai caldera, now largely water-filled.

The Valley of Ten Thousand Smokes, so-named for the multitude of fumaroles that emanated from the ash-flow deposits when first viewed by explorers, and other features of the remarkable volcanic cluster at Katmai have been a focus of numerous scientific investigations since 1912. Many modern concepts of explosive volcanism have evolved from studies of this eruption. Scientists from around the world continue to visit this area to conduct fundamental research in a variety of disciplines.

In 1988, a team of scientists represented by the Interagency Coordinating Group (ICG) for Continental Scientific Drilling requested permission from the National Park Service (NPS) to conduct research drilling at Novarupta and on the ash-flow sheet near the River Lethe about 5 km distant (Sattler, 1990). The ICG was composed of geoscience program managers from the U.S. Geological Survey, the U.S. Department of Energy, and the National Science Foundation. The proposal to drill was withdrawn in March, 1994 (Eichelberger and Sattler, 1994).

While completing an environmental impact analysis, large-scale topographic maps of Novarupta Dome, East Mageik Lake, and the ash-flow drill site were prepared. The purpose of this open-file report is to release these large-scale topographic maps. Map sheet 1 contains an index map. Map sheet 2 (scale 1:2400) shows the Novarupta Dome and parts of adjacent features such as Baked, Broken and Falling Mountains and most of the inferred extent of the 1912 vent (Eichelberger and Sattler, 1991). Map sheet 3 (scale 1:2400) shows a small area of the ash-flow sheet adjacent to the incised River Lethe that contains a dense cluster of fossil fumaroles (Keith, 1991). Map sheet 4 (scale 1:2400) depicts East Mageik Lake, a proglacial, ash-sheet-dammed lake that was to be the water source for the proposed drilling operation.

DIGITAL TOPOGRAPHIC DATA AND MAP CONTROL

Data for the 1:4800 scale index sheet were generated from DEM (Digital Elevation Model) files obtained from the USGS National Mapping Division in Anchorage, Alaska. The 1:2400 scale maps were compiled as DWG files in AutoCAD, release 12 (the use of AutoCAD by Autodesk does not imply official endorsement of this software by the U.S. Department of the Interior). Topographic data and boundaries of interpreted hydrologic features were generated on an analytical stereo plotter by Walker-Alaska Aerial Surveys, Inc. using large format color aerial photography. Horizontal and vertical control for the maps was obtained by the technique of postmarking, described below. In 1991, 14 photo panels were placed near photo-identifiable features in the vicinity of the area to be mapped (see photo-panel symbols on index). Near-vertical, low-altitude photography of these targets were then taken from a helicopter. A team of NPS surveying technicians, in consultation with other NPS, USGS and Sandia National Laboratory personnel, used standard electronic distance measuring equipment to survey panel locations with respect to stations Broken and Windy City, bench marks previously surveyed by the USGS (Kleinman and others, 1991). Due to the remoteness of the area, the surveys are not tied into the Alaska state plane coordinate system or other reference grid.

TO OBTAIN THE DIGITAL DATA (available in DWG and DXF [Drawing Interchange File] formats) CONTACT:

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Sattler, A.R. and Blankenship, D., 1992, Revised operations plan for the Katmai Scientific Drilling Project: SAND92-0850, Sandia National Laboratories, Albuquerque, NM.

CREDITS

Project funded by the USGS under Interagency Agreement 9700-0-9025 as part of the Katmai Scientific Drilling Project environmental impact statement. Original digital cartography by Walker-Alaska Aerial Surveys, Inc., September, 1992, under contract with the NPS. Aerial photography in 1987 by Aeromap U.S. under contract with the USGS. Field surveying by Robert Strobe and John Pinamont of the NPS, Alaska Regional Office-Division of Minerals Management and John Paskievitch, USGS, Anchorage, Alaska. Photography of postmarks by John Eichelberger, Geophysical Institute, University of Alaska Fairbanks, Joan Beattie Darnell, NPS, Alaska Regional Office-Division of Environmental Quality and Doug Blankenship, Sandia National Laboratories, Albuquerque, New Mexico. Supplementary cartography by Robert Strobe and Bud Rice (index map).

SURVEYED BY: NPS DATE: 8-8-91	REVISIONS AND CHECKS :	BY	DATE	HORIZONTAL AND VERTICAL DATUM :	1" = 4000'	PREPARED IN COOPERATION WITH:	This text and accompanying map sheets are preliminary and have not been reviewed for conformity with the U.S. Geological Survey editorial standards (or with the North American Stratigraphic Code). Any use of trade, product or firm is for descriptive purposes only and does not imply endorsement by the U.S. Government. Although this program has been used by the U.S. Geological Survey, no warranty, expressed or implied, is made by the USGS as to the accuracy and functioning of the program and related program material, nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the USGS in connection therewith.	NPS DRAWING NO. 127 / 80,528
FLOWN BY: AEROMAP U.S. DATE: 8-30-87				Basis of Bearing: ASSUMED BY STAFF COMPASS FROM USGS STATION BROKEN TO USGS STATION WINDY CITY. DECL. = 21° 15' EAST Elevation: ASSUMED FROM 9-24-86 USGS SURVEY USING 3524.7' FOR STATION WINDY CITY	4000 0 4000 8000 12000 INDEX MAP GRAPHIC SCALE IN FEET MAPPED BY: WALKER-ALASKA AERIAL SURVEYS, INC. 9/92	UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE ALASKA REGIONAL OFFICE MINING AND MINERALS BRANCH & DIVISION OF ENVIRONMENTAL QUALITY		AUTOCAD FILE NAME VTTS1