

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

# Elevation Maps of the San Francisco Bay Region, California: A Digital Database

By SCOTT E. GRAHAM<sup>1</sup> and RICHARD J. PIKE<sup>1</sup>

---

*A portrayal of the most accurate data on the region's topography,  
35,000,000 digital elevations spaced 30 meters apart*

OPEN-FILE REPORT 98-625

**1998**

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards or with the North American Stratigraphic Code. Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

This database, identified as "Elevation Map of the San Francisco Bay Region, California: A Digital Database," has been approved for release and publication by the Director of the USGS. Although this database has been subjected to rigorous review and is substantially complete, the USGS reserves the right to revise the data pursuant to further analysis and review. Furthermore, it is released on condition that neither the USGS nor the United States Government may be held liable for any damages resulting from its authorized or unauthorized use.

---

<sup>1</sup>MENLO PARK, CA 94025



## **PREFACE**

Topography, the configuration of the land surface, plays a major role in various natural processes that have helped shape the ten-county San Francisco Bay region and continue to affect its development. Such processes include a dangerous type of landslide, the debris flow (Ellen and others, 1997) as well as other modes of slope failure that damage property but rarely threaten life directly—slumping, translational sliding, and earthflow (Wentworth and others, 1997). Different types of topographic information at both local and regional scales are helpful in assessing the likelihood of slope failure and the mapping the extent of its past activity, as well as addressing other issues in hazard mitigation and land-use policy. The most useful information is quantitative.

## **INTRODUCTION TO THE DIGITAL DATABASE**

This Open-File report is a digital map database. This pamphlet serves to introduce and describe the digital data. There are no paper maps included in the Open-File report. The report does include, however, PostScript, and Portable Document Format (PDF) plot files containing images of the map sheets depicting elevation of the San Francisco Bay region and each of its ten constituent counties.

For those interested in the elevation maps, but who do not use an ARC/INFO compatible Geographic Information System (GIS), and would like to obtain the paper maps, 11 PostScript plot files and 11 PDF files containing map images of the data in the digital database have been included in the database package (please see the section "PostScript and PDF Plot Files Packages" page 9). A PostScript plot file and PDF file showing problematic areas in the DEM from which the elevation database was derived are also included. Note that the PostScript plot files require gzip and tar utilities to access the files.

For those without computer capability, we can provide users with the PostScript plot files or PDF files on tape that can be used by other vendors. Additionally, plots can be ordered from the USGS via the plot-on-demand program once it has been initiated (please see the section "Obtaining Plots from USGS Open-File Services" page 9)

The content and character of the database, methods of obtaining it, and processes of extracting the map database from the tar file are described herein. The map database itself, consisting of eleven ARC/INFO GRIDs and two ARC/INFO coverages, can be obtained over the Internet or by magnetic tape copy as described below.

The database was compiled using ARC/INFO, a commercial Geographic Information System (Environmental Systems Research Institute, Redlands, California), with version 3.0 of the menu interface ALACARTE (Fitzgibbon and Wentworth, 1991, Fitzgibbon, 1991, Wentworth and Fitzgibbon, 1991). The ARC/INFO GRIDs are stored in compressed tar files, and the coverages are stored in uncompressed ARC export format (ARC/INFO version 7.x) in a compressed UNIX tar (tape archive) file. All data files have been compressed, and may be uncompressed with gzip, which is available free of charge over the Internet via links from the USGS Public Domain Software page (<http://edcwww.cr.usgs.gov/doc/edchome/ndcddb/public.html>). A tar utility is

required to extract the databases from tar files. This utility is included in most UNIX systems, and can be obtained free of charge via the Internet from Internet Literacy's Common Internet File Formats Webpage (<http://www.matisse.net/files/formats.html>) for Macintosh and Windows. If you are using a Windows machine, WinZip is also capable of dealing with both gzip compression and tar files. ARC/INFO export files (files with the .e00 extension) can be converted into ARC/INFO coverages in ARC/INFO (see below) and can be read by some other Geographic Information Systems, such as MapInfo via ArcLink and ESRI's ArcView.

## **THE DIGITAL ELEVATION-MAP DATABASE**

The data from which the new maps were computed consist of a digital elevation model (DEM), an (X,Y) array of terrain heights spaced 30 m apart. We assembled the data set from 204 separate DEM's derived from topographic maps in the USGS 7.5' series (see the quadrangle index map, Figure 1 in Pike, 1997). Because all constituent DEM's were created by the recent and higher-accuracy "Level II" procedures that interpret elevations from digital line graphs of the map contours (U.S. Geological Survey, 1993), these maps are free from the striped artifacts that mar shaded-relief portrayals computed from older 7.5' DEM's. A few problems in the DEM remain, principally minor edgematch errors, and are identified in a separate map.

At 1:275,000 scale, the full Bay Region map comprises some 35,000,000 rectangular picture elements (pixels), each about 0.11 mm across. The array measures 7743 cells in the east-west direction and 7423 cells in the north-south direction. Pixels of the ten 1:125,000-scale county maps, at about 0.24 mm across, are below the size at which the human eye begins to resolve individual elements.

Drainage lines and nearshore bathymetry, and major roads from an existing digital base (Aitken, 1997) were added to elevation on all 11 maps. A two-km buffer zone around all counties was added to each 1:125,000-scale map to provide context for any terrain details at or near the county boundary (mapped by a white-bounded black line).

The database for the elevation map consists of ARC/INFO GRIDs for the region as a whole and for each of the ten counties, an ARC/INFO vector coverage identifying areas of the DEM compilation that have edgematch or other problems, PostScript map-image files for each of those 11 areas, a PostScript version of a map showing the problematic areas, and a PostScript version of this text. Additionally, a PDF file for each of the PostScript plot files has been included.

The 204 7.5 minute DEM's were compiled into a single dataset using the LATTICEMERGE command in ARC/INFO. Most of the inconsistencies and edgematch problems between adjacent quadrangles were cleaned up using the FOCALMEAN function in ARC/INFO GRID. A number of these problems still exist (see of98-625\_51.ps or of98-625\_51.pdf).

We selected 12 elevation ranges, designated in the plotfiles by different colors, to enhance presentation of the new data. Slope intervals and their associated colors are:

0-25 meters  
 25-50 meters  
 50-100 meters  
 100-200 meters  
 200-300 meters  
 300-400 meters  
 400-500 meters  
 500-600 meters  
 600-800 meters  
 800-1000 meters  
 1000-1200 meters  
 >1200 meters

The map database itself is rather simple, consisting of attributed GRID cells stored in Universal Transverse Mercator (UTM) projection (Table 1).

**Table 1 - Map Projection**

PROJECTION	UTM
ZONE	10
DATUM	NAD27
ZUNITS	decimeters
UNITS	meters
PARAMETERS	none

Content of the map database can be described in terms of the grid cells comprising the map. Descriptions of the database fields use the terms explained in Table 2.

**Table 2 - Field Definition Terms**

ITEM NAME	name of the database field (item)
WIDTH	maximum number of digits or characters stored
OUTPUT	output width
TYPE	B-binary integer, F-binary floating-point number, I-ASCII integer, C-ASCII character string
N.DEC	number of decimal places maintained for floating-point numbers

The database format of the grid is described in tables 3 and 4, which show the format of the GRID attribute and statistics tables.

**Table 3** - Contents of GRID Value Attribute Table (<GRIDNAME>.VAT)

ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC
AREA	4	10	B	--
COUNT	4	10	B	--

**Table 4** - Contents of GRID Statistics Table (<GRIDNAME>.STA)

ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC
MIN	8	15	F	3
MAX	8	15	F	3
MEAN	8	15	F	3
STDV	8	15	F	3

## **LINES**

The lines (arcs) are recorded as strings of vectors and are described in the arc attribute table (tables 5 and 7). They define the boundaries of the map units, the boundaries of open bodies of water, and the map boundaries. These distinctions, including the geologic identities of the unit boundaries, are recorded in the LTYPE field according to the line types listed in tables 6 and 8.

**Table 5** - Contents of the Arc Attribute Table (DEMPROBS.AAT)

ITEM NAME	WIDTH	OUTPUT	TYPE	N. DEC	
FNODE#	4	5	B		starting node of arc (from node)
TNODE#	4	5	B		ending node of arc (to node)
LPOLY#	4	5	B		polygon to the left of the arc
RPOLY#	4	5	B		polygon to the right of the arc
LENGTH	4	12	F	3	length of arc in meters
<coverage>#	4	5	B		unique internal control number
<coverage>-ID	4	5	B		unique identification number
LTYPE	35	35	C		line type (see Tables 4 and 5)
SEL	1	1	I		user defined field used to save a selected set
SYMB	3	3	I		user defined field used to save symbol assignments (such as color)

**Table 6** - Line Types Recorded in the LTYPE Field (DEMPROBS.AAT)

problem

**Table 7** - Contents of the Arc Attribute Table (SFBR-QI.AAT)

ITEM NAME	WIDTH	OUTPUT	TYPE	N. DEC	
FNODE#	4	5	B		starting node of arc (from node)
TNODE#	4	5	B		ending node of arc (to node)
LPOLY#	4	5	B		polygon to the left of the arc
RPOLY#	4	5	B		polygon to the right of the arc
LENGTH	4	12	F	3	length of arc in meters
<coverage>#	4	5	B		unique internal control number
<coverage>-ID	4	5	B		unique identification number
LTYPE	35	35	C		line type (see Tables 4 and 5)
SEL	1	1	I		user defined field used to save a selected set
SYMB	3	3	I		user defined field used to save symbol assignments (such as color)
TICS	4	4	C		

**Table 8** - Line Types Recorded in the LTYPE Field (SFBR-QI.AAT)

15  
7.5  
santa cruz

## AREAS

Map units (polygons) are described in the polygon attribute table (tables 8 and 10). The identities of the map units are shown in tables 9 and 11.

**Table 8** - Content of the Polygon Attribute Tables (DEMPROBS.PAT)

ITEM NAME	WIDTH	OUTPUT	TYPE	N. DEC	
AREA	4	12	F	3	area of polygon in square meters
PERIMETER	4	12	F	3	length of perimeter in meters
<coverage>#	4	5	B		unique internal control number
<coverage>-ID	4	5	B		unique identification number
PTYPE	35	35	C		unit label (see Tables 7 and 8)
SEL	1	1	I		user defined field used to save a selected set
SYMB	3	3	I		user defined field used to save symbol assignments (such as color)

**Table 9** – Polygon types recorded in the PTYPE field (DEMPROBS.PAT)

problem

**Table 10** - Content of the Polygon Attribute Tables (SFBR-QI.PAT)

ITEM NAME	WIDTH	OUTPUT	TYPE	N. DEC	
AREA	4	12	F	3	area of polygon in square meters
PERIMETER	4	12	F	3	length of perimeter in meters
<coverage>#	4	5	B		unique internal control number
<coverage>-ID	4	5	B		unique identification number
NAME	35	35	C		7.5 minute quadrangle name

**Table 11** - Polygon types recorded in the NAME field (SFBR-QI.PAT)

AETNA SPRINGS	BOULDIN ISLAND	CLIFTON COURT
ALLENDALE	BRENTWOOD	FOREBAY
ALTAMONT	BRIONES VALLEY	CLOVERDALE
ANNAPOLIS	BROOKS	COPPER MOUNTAIN
ANO NUEVO	BYRON HOT SPRINGS	CORDELIA
ANTIOCH NORTH	CALAVERAS RESERVOIR	COTATI
ANTIOCH SOUTH	CALISTOGA	COURTLAND
ARCHED ROCK	CAMP MEEKER	CREVISON PEAK
ASTI	CAPELL VALLEY	CUPERTINO
BENICIA	CASTLE ROCK RIDGE	CUTTINGS WHARF
BIG BASIN	CAZADERO	DAVENPORT
BIG FOOT MTN	CEDAR MTN	DAVIS
BIRD VALLEY	CHILES VALLEY	DENVERTON
BIRDS LANDING	CHITTENDEN	DETERT RESERVOIR
BODEGA HEAD	CLARKSBURG	DIABLO
BOLINAS	CLAYTON	DIXON

DOUBLE POINT  
DOZIER  
DRAKES BAY  
DUBLIN  
DUNCAN MILLS  
ELDORADO BEND  
ELMIRA  
ESPARTO  
EYLAR MTN  
FAIRFIELD NORTH  
FAIRFIELD SOUTH  
FELTON  
FORT ROSS  
FRANKLIN POINT  
GEYSERVILLE  
GILROY  
GILROY HOT SPRINGS  
GLEN ELLEN  
GRAYS BEND  
GUALALA  
GUDE MOUNTAIN  
GUERNEVILLE  
GUINDA  
HALF MOON BAY  
HAYWARD  
HEALDSBURG  
HONKER BAY  
HUNTERS POINT  
INVERNESS  
ISABEL VALLEY  
ISLETON  
JERICHO VALLEY  
JERSEY ISLAND  
JIMTOWN  
KENWOOD  
KNIGHTS LANDING  
KNOXVILLE  
LA COSTA VALLEY  
LA HONDA  
LAKE BERRYESSA  
LAS TRAMPAS RIDGE  
LATHROP  
LAUREL  
LIBERTY ISLAND  
LICK OBSERVATORY  
LIVERMORE  
LOMA PRIETA

LONE TREE CREEK  
LOS GATOS  
MADISON  
MANTECA  
MARE ISLAND  
MARIPOSA PEAK  
MARK WEST SPRINGS  
MCGUIRE RIDGE  
MENDENHALL SPRINGS  
MERRITT  
MIDDLETOWN  
MIDWAY  
MILPITAS  
MINDEGO HILL  
MISSISSIPPI CREEK  
MONTARA MTN  
MONTICELLO DAM  
MORGAN HILL  
MOUNT ST HELENA  
MOUNTAIN VIEW  
MT BOARDMAN  
MT DAY  
MT GEORGE  
MT MADONNA  
MT SIZER  
MT STAKES  
MT VACA  
MUSTANG PEAK  
NAPA  
NEWARK  
NILES  
NOVATO  
OAKLAND EAST  
OAKLAND WEST  
ORESTIMBA PK  
PACHECO PASS  
PACHECO PEAK  
PALO ALTO  
PATTERSON  
PETALUMA  
PETALUMA POINT  
PETALUMA RIVER  
PIGEON POINT  
PLANTATION  
POINT BONITA  
POINT REYES NE  
REDWOOD POINT

RICHMOND  
RIO VISTA  
RIPON  
RUTHERFORD  
SACRAMENTO WEST  
SAN FELIPE  
SAN FRANCISCO  
NORTH  
SAN FRANCISCO  
SOUTH  
SAN GERONIMO  
SAN GREGORIO  
SAN JOSE EAST  
SAN JOSE WEST  
SAN LEANDRO  
SAN MATEO  
SAN QUENTIN  
SAN RAFAEL  
SANTA CRUZ  
SANTA ROSA  
SANTA TERESA HILLS  
SAUNDERS REEF  
SAXON  
SEARS POINT  
SEBASTOPOL  
SOLYO  
SONOMA  
SOQUEL  
ST HELENA  
STEWARTS POINT  
TASSAJARA  
TAYLOR MONUMENT  
THE GEYSERS  
THREE SISTERS  
TOMALES  
TOMBS CREEK  
TRACY  
TWO ROCK  
UNION ISLAND  
VALLEY FORD  
VERNALIS  
VERONA  
VINE HILL  
WALNUT CREEK  
WALTER SPRINGS  
WARM SPRINGS DAM  
WATSONVILLE EAST



WATSONVILLE WEST  
WESTLEY  
WHISPERING PINES  
WILCOX RIDGE

WINTERS  
WOODLAND  
WOODSIDE  
WOODWARD ISLAND

YOUNTVILLE  
ZAMORA

## DATABASE CONTENTS

The digital map database consists of digital files representing the five parts of the database, some of which are presented in more than one format. The names of the files are unique designators based on the report identifier, of98-625, followed by part numbers and an extension indicating file type. The larger files, which have been compressed with gzip, have .gz extensions as well.

### 1. Revision List

A list of the parts of the report and at what version number of the report each was last revised (if at all) followed by a chronologic list that describes any revisions.

a. of98-625revs\_1a.txt                      ASCII file

### 2. Open File Text

The text of the open-file report (this document), which describes the database and how to obtain it.

a. of98-625\_2a.txt                      unformatted ASCII text  
b. of98-625\_2b.ps                      PostScript file  
c. of98-625\_2c.pdf                      PDF file

### 3. Elevation Database

A separate GRID (ARC/INFO raster digital map database) is included for each of the ten counties in the San Francisco Bay region, as well as one for the Bay region as a whole. The GRIDs, which have been packaged in tar (tape archive) files, are described below.

----- ARC/INFO export file or tar file -----	----- Size of gzip compressed tar file (uncompressed) -----	----- Resultant Grid, Coverage or file(s) -----	----- Description of Grid or Coverage -----
of98-625_3a.tar	30 MB (49 MB)	sfbr-el	SF Bay region elevation GRID
of98-625_3b.tar	2.5 MB (4.3 MB)	al- el	Alameda County elevation GRID
of98-625_3c.tar	2.2 MB (4.1 MB)	cc- el	Contra Costa County elevation GRID
of98-625_3d.tar	2 MB (3.6 MB)	ma-el	Marin County elevation GRID
of98-625_3e.tar	3.3 MB (5.5 MB)	na- el	Napa County elevation GRID
of98-625_3f.tar	224 KB (496 KB)	sf- el	San Francisco County elevation GRID
of98-625_3g.tar	2 MB (3.2 MB)	sm- el	San Mateo County elevation GRID
of98-625_3h.tar	6 MB (8.9 MB)	scl- el	Santa Clara County elevation GRID
of98-625_3i.tar	2.3 MB (3.6 MB)	scr- el	Santa Cruz County elevation GRID
of98-625_3j.tar	1.9 MB (3.5 MB)	sol- el	Solano County elevation GRID
of98-625_3k.tar	5.5 MB (9.9 MB)	son- el	Sonoma County elevation GRID

#### 4. Quadrangle Index and DEM Problems databases

The data files representing the lines and polygons of the quadrangle index and problems associated with the SF Bay region DEM from which the slope map was derived (ARC export and ARCVIEW shape formats).

----- ARC/INFO export file or tar file -----	----- Size of gzip compressed tar file (uncompressed) -----	----- Resultant Grid, Coverage or file(s) -----	----- Description of Grid or Coverage -----
of98-625_4a.e00	256 KB (1.1 MB)	sfbr-qi	SF Bay region Quadrangle Index (ARC/INFO export file)
of98-625_4b.tar	272 KB (912 KB)	sfbrqiln sfbrqipy	SF Bay region Quadrangle Index (ARCVIEW shape files)
of98-625_4c.e00	7 KB (27 KB)	demprobs	DEM problem areas (ARC/INFO export file)
of98-625_4d.tar	4 KB (22 KB)	probsln probspy	DEM problem areas (ARCVIEW shape files)

For the map identifying problematic areas in the source DEM, and the accompanying quadrangle index map, only a coverage for the entire SF Bay region is included. There are no separate county databases. The coverages, along with their associated INFO directory have been converted to uncompressed ARC/INFO export files. ARC export files promote ease of data handling, and are usable by some Geographic Information Systems in addition to ARC/INFO (see below for a discussion of working with export files). The ARCVIEW shapefile packages each consist of three files - <name>.dbf, <name>.shp, and <name>.shx.

## 5. PostScript and PDF plot files

Slope maps of the SF Bay Region and each of its ten constituent counties in PostScript and PDF formats. Note, the PDF files have not been compressed. The file sizes listed for them below are the actual sizes of the PDF files.

Plot file	Size of gzip compressed plot file (uncompressed)	Description of plot file
of98-625_5a.ps	16.8 MB (371.4 MB)	SF Bay region elevation map (PostScript)
of98-625_5b. ps	3.9 MB (46.1 MB)	Alameda County elevation map (PostScript)
of98-625_5c. ps	3.6 MB (42.1 MB)	Contra Costa County elevation map (PostScript)
of98-625_5d.ps	3 MB (36.7 MB)	Marin County elevation map (PostScript)
of98-625_5e.ps	3.8 MB (43 MB)	Napa County elevation map (PostScript)
of98-625_5f.ps	976 KB (9.1 MB)	San Francisco County elevation map (PostScript)
of98-625_5g.ps	2.5 MB (31 MB)	San Mateo County elevation map (PostScript)
of98-625_5h.ps	5.3 MB (66 MB)	Santa Clara County elevation map (PostScript)
of98-625_5i.ps	3 MB (37.2 MB)	Santa Cruz County elevation map (PostScript)
of98-625_5j.ps	3.5 MB (45.5 MB)	Solano County elevation map (PostScript)
of98-625_5k.ps	5.8 MB (82 MB)	Sonoma County elevation map (PostScript)
of98-625_5l.ps	5.8 MB (21 MB)	Map of problems associated with SF Bay region DEM (PostScript)
of98-625_5a.pdf	7.6 MB	SF Bay region elevation map (PDF)
of98-625_5b. pdf	2.7 MB	Alameda County elevation map (PDF)
of98-625_5c. pdf	2.7 MB	Contra Costa County elevation map (PDF)
of98-625_5d. pdf	2 MB	Marin County slope elevation (PDF)
of98-625_5e. pdf	2.4 MB	Napa County slope elevation (PDF)
of98-625_5f. pdf	792 KB	San Francisco County elevation map (PDF)
of98-625_5g. pdf	1.7 MB	San Mateo County elevation map (PDF)
of98-625_5h. pdf	3.3 MB	Santa Clara County elevation map (PDF)
of98-625_5i. pdf	1.8 MB	Santa Cruz County elevation map (PDF)
of98-625_5j. pdf	2.6 MB	Solano County elevation map (PDF)
of98-625_5k. pdf	3.3 MB	Sonoma County elevation map (PDF)
of98-625_5l. pdf	5.7 MB	Map of problems associated with SF Bay region DEM (PDF)

## **OBTAINING PLOTS FROM USGS OPEN-FILE SERVICES**

NOTE: As of this writing, plot-on-demand is not available from USGS. This service may not begin until 1999.

U.S. Geological Survey is planning to provide a plot-on-demand service for map files, such as those described in this report, through Open-File Services. In order to obtain plots, contact Open-File Services at:

USGS Information Services  
Box 25286  
Denver Federal Center  
Denver, CO 80225-0046

(303) 202-4200  
1-800-USA-MAPS

FAX: (303) 202-4695

e-mail: [infoservices@usgs.gov](mailto:infoservices@usgs.gov)

Be sure to include with your request the Open-File Report number and the exact names, as listed in the Database Contents section above, of the plot file(s) you require. An Open-File Report number and its letter alone are not sufficient, unless you are requesting plots of all the plot files for this report (as many as 12 plot files!).

## **POSTSCRIPT PLOT FILE PACKAGE**

For those interested in the any of the elevation maps of the SF Bay region who don't use an ARC/INFO compatible GIS system, but would like to obtain any of the paper maps, we have included separate PostScript and PDF plot files for each of the ten counties and the Bay Region, as well as for the map delineating problem areas in the composite DEM for the SF Bay region.

The plot files are available in any of the three ways described below, including the World Wide Web pages. The plot files have been compressed with gzip and they must be uncompressed to access them. The compression utility gzip is available free of charge for Windows, Macintosh and Unix platforms via the Internet from the gzip home page (<http://w3.teaser.fr/~jlgailly/gzip>).

The PostScript images are as large as 36 inches wide by 40 inches high, so they require a large plotter to produce paper copies at the intended scale. Because this release is primarily a digital database, the plot files (and plots derived therefrom) have not been edited to conform to U.S. Geological Survey standards.

## OBTAINING THE POSTSCRIPT OR PDF PLOT FILES

The PostScript and PDF plot files can be obtained in any of three ways:

### 1. Sending a tape with request

A compressed plot file(s) can be obtained by sending a tape with request to:

SFBR Elevation Map Plot File  
c/o Database Coordinator  
U.S. Geological Survey  
345 Middlefield Road, MS 975  
Menlo Park, CA 94025

The compressed tar file will be returned on the tape. The acceptable tape types are:

2.3 or 5.0 GB, 8 mm Exabyte tape.

Be sure to include with your request the Open-File Report number and the exact names, as listed in the Database Contents section above, of the plot file(s) you require. An Open-File Report number and its letter alone are not sufficient, unless you are requesting plots of all the plot files for that report (as many as 12 plot files!).

### 2. Anonymous ftp over the Internet

To obtain plotfiles by ftp:

The files in these reports are stored on the U.S. Geological Survey Western Region FTP server. The Internet ftp address of this server is:

`ftp://wrgis.wr.usgs.gov`

The user should log in with the user name 'anonymous' and then input their e-mail address as the password. This will give the user access to all the publications available via ftp from this server.

The files in this report are stored in the subdirectory:

`pub/open-file/of98-625`

### 3. From the Western Region Geologic Information Web Page.

The U.S. Geological Survey now supports a set of graphical pages on the World Wide Web. Digital publications (including this one) can be accessed via these pages. The web server for digital publications from the Western Region is "`http://wrgis.wr.usgs.gov`". Once at the main page, click on '**Geologic Map Databases**' under the heading '**Data Online**'; next click on '**California**.' Scroll down to the section for this database and click on the Open-File button to get to this publication's web page. Click on '**Open-File Report 98-625**'; this will take you to the web

page for this database. Set your web browser to save to a local disk and click on the link for the desired file to download the compressed PostScript plot file or PDF file.

For those interested in the elevation map of the bay region, any of its ten constituent counties, or the map showing problems with the SF Bay region DEM who do not use computers, we will also provide any of the PostScript or PDF plot files on digital tape for use by other vendors. The PostScript or PDF plot files can be obtained by sending a tape with request and return address to:

SFBR Elevation Map Plot File  
c/o Database Coordinator  
U.S. Geological Survey  
345 Middlefield Road, MS 975  
Menlo Park, CA 94025

The compressed plot file(s) will be returned on the tape. The acceptable tape types are:

2.3 or 5.0 GB, 8 mm Exabyte tape.

Be sure to include with your request the Open-File Report number and the exact names, as listed in the Database Contents section above, of the plot file(s) you require. An Open-File Report number and its letter alone are not sufficient, unless you are requesting plots of all the plot files for this report (as many as 12 plot files!).

Make sure your vendor is capable of reading these tape types and this PostScript plot file. Important information regarding tape file format is included in the section "PostScript Plot Files" below, so be certain to provide a copy of this document to your vendor.

## **OBTAINING DIGITAL DATABASES**

The digital database package can be obtained in any of three ways:

### **1. Sending a tape with request**

A compressed tar file(s) of the elevation map database for the bay region, any of its ten counties, or the DEM problems coverage can be obtained by sending a tape with request and return address to:

SFBR Elevation Map Database  
c/o Database Coordinator  
U.S. Geological Survey  
345 Middlefield Road, M/S 975  
Menlo Park, CA 94025

The compressed tar file(s) will be returned on the tape. The acceptable tape types are:

2.3 or 5.0 GB, 8mm Exabyte tape.

Be sure to include with your request the Open-File Report number and the exact names, as listed in the Database Contents section above, of the database file(s) you require. An Open-File Report number and its letter alone are not sufficient, unless you are requesting all of the database files for this report (as many as 15).

## 2. Anonymous ftp over the Internet

To obtain digital database package by ftp:

The files in these reports are stored on the U.S. Geological Survey Western Region FTP server. The Internet ftp address of this server is:

`ftp://wrgis.wr.usgs.gov`

The user should log in with the user name 'anonymous' and then input their e-mail address as the password. This will give the user access to all the publications available via ftp from this server.

The files in this report are stored in the subdirectory:

`pub/open-file/of98-625`

## 3. From the Western Region Geologic Information Web Page.

To obtain the tar file via the World Wide Web:

The U.S. Geological Survey now supports a set of graphical pages on the World Wide Web. Digital geologic publications (including this one) can be accessed via these pages. The web page for digital geologic publications from the Western Region (including this one) is "<http://wrgis.wr.usgs.gov>". Once at the main page, click on '**Geologic Map Databases**' under the heading '**Data Online**'; next click on '**California**.' Scroll down to get to the listing for this database. Click on '**Open-File Report 98-625**'; this will take you to the web page for this database. Set your web browser to save to a local disk and click on the link for the desired database to download the compressed tar file or ARC/INFO export file.

## CONVERTING ARC EXPORT FILES

ARC export files are converted to ARC coverages using the ARC command IMPORT with the option COVER. Change directories to the database directory. From the ARC command line type:

```
Arc: import cover <filename>.e00 <output coverage>
```

ARC export files can also be read by some other Geographic Information Systems. Please consult your GIS documentation to see if you can use ARC export files and the procedure to import them.

## **ACKNOWLEDGEMENTS**

Thanks to Brian Bennett, Robert Lugo, and Douglas Aitken of National Mapping Division for providing assistance with obtaining the highest quality digital elevation models for use in this compilation.



## REFERENCES CITED

- Aitken, D.S., 1997, Digital version of the 1970 Topographic Map of the San Francisco Bay Region: U.S. Geological Survey Open-file Report 97-500, three sheets, map scale 1:125,000.
- Ellen, S.D., Mark, R.K., Wieczorek, G.F., Wentworth, C.M., Ramsey, D.W., and May, T.E., 1997, Map Showing Principal debris-flow source areas in the San Francisco Bay Region, California: U.S. Geological Survey, Open-file Report 97-745 E, map scales 1:275,000 and 1:125,000.
- Fitzgibbon, T.T., 1991, ALACARTE installation and system manual (version 1.0): U.S. Geological Survey, Open-File Report 91-587B.
- Fitzgibbon, T.T., and Wentworth, C.M., 1991, ALACARTE user interface - AML code and demonstration maps (version 1.0): U.S. Geological Survey, Open-File Report 91- 587A.
- Pike, R.J., 1997, Index to detailed maps of landslides in the San Francisco Bay Region, California: U.S. Geological Survey, Open-file Report 97-745 D.
- U.S. Geological Survey, 1970, Topographic map of the San Francisco Bay region: 3 sheets, scale 1:125,000.
- U.S. Geological Survey, 1993, Digital elevation models, data users guide 5 (3<sup>rd</sup> printing, revised), Reston, VA, National Mapping Program, Technical Instructions, 48 p. [replaces 1987 ed. (38 p.) & 1990 ed. (51 p.)]
- Wentworth, C. M., and Fitzgibbon, T. T., 1991, ALACARTE user manual (version 1.0): U. S. Geological Survey Open-File Report 91-587C.
- Wentworth, C. M., Graham, S.E., Pike, R.J., Beukelman, G.S., Ramsey, D.W., and Barron, A.D., 1997, Summary distribution of slides and earth flows in the San Francisco Bay Region, California: U.S. Geological Survey, Open-file Report 97-745 C, map scales 1:275,000 and 1:125,000.