



# Geologic map and digital database of the Porcupine Wash 7.5 minute quadrangle, Riverside County, California

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Readme, version 1.0

## **Open-File Report 01-30**

Online version 1.0

<http://geopubs.wr.usgs.gov/open-file/01-30>

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**For database limitations, see following page**

## **DATABASE LIMITATIONS**

### **Content**

This database 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 “ Geologic map and digital database of the Porcupine Wash 7.5 minute quadrangle, Riverside County, California,” has been approved for release and publication by the Director of the U.S. Geological Survey. 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 the condition that neither the USGS nor the United States Government may be held responsible for any damages resulting from its authorized or unauthorized use.

### **Spatial Resolution**

Use of this digital geologic map should not violate the spatial resolution of the data. The Porcupine Wash database was developed using digital orthophotograph quarter quadrangles (DOQQs) as a base. DOQQs have a pixel resolution of 1 m and are accurate to a scale of 1:12,000 (1 in = 1,000 ft). Any enlargement beyond 1:12,000 exceeds the spatial resolution of the geologic data and should not be used in lieu of a more detailed site-specific geologic evaluation. Similarly, the digital topographic base map is derived from the U.S. Geological Survey, 1:24,000-scale Porcupine Wash 7.5 minute quadrangle (provisional edition, 1986); any enlargement beyond 1:24,000 exceeds the spatial resolution of the topographic data. Where the geologic data is used in combination with the topographic data, the resolution of the combined output is limited by the lower resolution of the topographic data. Where this database is used in combination with other data of higher resolution, the resolution of the combined output will be limited by the lower resolution of these data.

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## INTRODUCTION

Open-File Report 01-30 is a digital geologic data set that maps and describes the geology of the Porcupine Wash 7.5 minute quadrangle, Riverside County, southern California. The Porcupine Wash database is one of several quadrangle databases that are in preparation for Joshua Tree National Park and vicinity. These quadrangles are a subset of digital quadrangle maps being generated for the Southern California Areal Mapping Project (SCAMP). The SCAMP maps are, in turn, part of the nation-wide digital geologic map coverage being developed by the National Cooperative Geologic Map Project (NCGMP) of the U.S. Geological Survey (USGS).

The Porcupine Wash data set consists of a digital geologic map database accompanied by graphics, plot, and explanatory files. The digital database was created using ARCVIEW, version 3.2, and ARC/INFO, version 7.2.1, commercial Geographical Information System (GIS) software designed by Environmental Systems Research Institute (ESRI), Redlands, California (<http://www.esri.com>). The database includes five ARC/INFO map coverages: geology, dikes, structural data, ornamentation indicating relative movement of fault blocks, and leaders for annotated map unit symbols. It also contains a scanned 1:24,000-scale topographic base and supporting SCAMP symbolsets. PostScript and Portable Document Format files contain a geologic map generated from the database combined with map margin explanatory information created in Adobe Illustrator. Other PDF and ASCII text files contain metadata, a readme document, an explanatory pamphlet, and stand-alone versions of the map-margin Correlation of Map and Database Units (CMU) and Description of Map and Database Units (DMU). As yet, not all of the detailed information about geologic units contained in the map-margin explanation has been entered into the digital database.

The Porcupine Wash quadrangle lies between 115° 45' and 115° 52' 30" west longitude and 33° 52' 30" and 33° 45' north latitude. The 7.5 minute quadrangle is subdivided in latitude and longitude by a 2.5-minute tic grid that is marked on the topographic map. For the digital coverages, only the four corner tics that represent the geographic extent of the quadrangle have been generated mathematically in ARC/INFO. Geologic map information entered into ARC/INFO has been spatially registered using the four tics that represent the geographic extent of the quadrangle. Both the geologic database and the topographic base map are represented in polyconic projection referenced to the NAD27 datum. (See metadata for more information about projection.)

In mapping real-world geologic features into the database, geologic contacts, faults, and dikes are represented as lines (arcs), geologic units as polygons and regions, and site-specific structural data as points. ARC/INFO records the spatial coordinates and topology of each feature and links it to a polygon, arc, or point attribute table (.pat, .aat, and .pat, respectively) that uniquely identifies the feature. Feature-attribute tables can be related to other tables that further describe and classify the geologic features. (See metadata and explanatory pamphlet for more information about geologic content of database.)

## WHERE TO OBTAIN THE DATABASE

The Porcupine Wash 7.5 minute quadrangle data set is available on the USGS Western Region Geologic Publications Server. The data set may be downloaded from the website

<http://geopubs.wr.usgs.gov/open-file/01-30>

or by anonymous ftp from the Publications Server:

Server: `geopubs.wr.usgs.gov`  
Directory: `/pub/open-file/of01-30`.

The Porcupine Wash geologic map and database can also be accessed through links to the Western Region Geologic Publication Server by any of the following paths:

- <http://geology.wr.usgs.gov/wgmt/scamp/scamp.html>  
This website provides links to SCAMP-related digital geologic mapping in southern California. The site lists new releases by year and title
- <http://geopubs.wr.usgs.gov/>  
This website provides links to USGS Western Region digital geologic maps, including Open-File. The site lists new releases series and number
- <http://geology.usgs.gov/open-file/maps.html>  
This website provides links to all digital USGS Open-File Reports that contain digital map databases. The site lists the Open-File Reports by number along with the title and author(s) of the report
- <http://geo-nsdi.er.usgs.gov/cgi-bin/publication?open-file>  
This website provides links to all digital USGS Open-File Report maps via their metadata files. The site lists the Open-File Reports by number along with the title of the report (see 'How to obtain metadata' below)

## DATABASE AS AVAILABLE ON USGS GEOPUBS SERVER

On the USGS Western Region Geologic Publications Server (geopubs) website for the Porcupine Wash geologic map and digital database, information is arranged as follows:

### Title

Geologic map and digital database of the Porcupine Wash 7.5 minute quadrangle, Riverside County, southern California

### Authors

Robert E. Powell

Pamela M. Cossette (digital cartography)

### Introduction

#### Browse-graphic image

Page-sized, non-navigable image of geologic map with marginal explanation  
(pwash\_browse.jpg: ~35 KB JPEG image of geologic map with marginal explanation)

#### Explanatory files

- **Readme** tabulates contents of database and describes how to access them. Provided on website in ASCII text and Portable Document formats
- **Metadata** file contains detailed technical descriptions of structure and content of digital data. Provided on website as parseable text in ASCII format, and as outline in Hypertext Markup Language format. Also available on the USGS Geologic Division Node of the National Geospatial Data Clearinghouse in these two and other formats (see 'How to obtain metadata' below).
- **Explanatory pamphlet** describes approach used in building database, and discusses purpose, content, and geologic framework of database. Provided on website in ASCII text and Portable Document formats

<i>File name</i>	<i>File type and description</i>	<i>File size</i>
pwash_readme.txt	ASCII readme file	25 KB
pwash_readme.pdf	PDF readme file	116 KB
pwash_pamph.txt	ASCII version of explanatory pamphlet	50 KB
pwash_pamph.pdf	PDF version of explanatory pamphlet	163 KB
pwash_met.txt	ASCII metadata file	68 KB
pwash_met.html	HTML metadata file	88 KB

## Database files

Database files are packaged as a tarred and gzipped file that bundles and compresses the following information:

- Database files: ASCII-formatted ARC/INFO interchange/export (.e00) file for each ARC/INFO coverage, symbolset, and dictionary. (See ‘Database contents and structure’ below.)
- ASCII text files for readme, metadata, and explanatory pamphlet

<i>File name</i>	<i>File type and description</i>	<i>File size</i>
pwash.tar.gz	GZIP compressed 25.5-MB TAR bundle of all database files	5.5 MB

## Files for viewing and plotting

- Gzip-compressed PostScript plot-file for generating paper copy of geologic map with marginal explanation
- Portable Document Format file containing full-sized, navigable graphic image of geologic map with marginal explanation
- Portable Document Format files containing stand-alone versions of Description of Map and Database Units (DMU) and Correlation of Map and Database Units (CMU) from map-margin explanation

<i>File name</i>	<i>File type and description</i>	<i>File size</i>
pwash_map.ps.gz	Gzipped 244-MB PostScript plot file of map with marginal explanation	9.5 MB
pwash_map.pdf	PDF file containing geologic map with marginal explanation	5.4 MB
pwash_cmu.pdf	PDF Correlation of Map & Database Units file	54 KB
pwash_dmu.pdf	PDF Description of Map & Database Units file	54 KB

## HOW TO ACCESS THE DATABASE

### Extracting the database files

The Porcupine Wash database files have been bundled and compressed using tar and gzip utilities. Before attempting to unzip the file after downloading, be sure that the .gz extension is present in the file name.

Extraction creates the directory pwash/ that contains the database in ARC/INFO interchange (.e00) files, the topographic map in a GEOTIFF file, and the readme, metadata, and explanatory pamphlet in ASCII text files. The database interchange files include five ARC/INFO coverages and supporting symbolsets and dictionaries.

Tar and uncompress utilities are included in most UNIX systems, and are available free of charge for all systems at various websites:

Gnu Software: <http://www.gnu.org/order/ftp.html> (UNIX tar and gzip)

(This web page links to mirror archive sites for Gnu tar and gzip utilities)

Gnu zip: <http://www.gzip.org> (UNIX gzip)

CNET Shareware: <http://shareware.cnet.com/> (Macintosh and Windows)

(Search for 'tar' or 'gzip' for any Macintosh or Windows operating system.)

WinZip: <http://www.winzip.com> (Windows gzip)

USGS Public Domain Software web page:

<http://edcwww.cr.usgs.gov/doc/edchome/ndcdb/public.html> (UNIX and Macintosh)

(Provides links to Washington University at St. Louis Gnu archive for UNIX tar and gzip; and to AOL mirror site for Macintosh tar and gzip)

Internet Literacy's Common Internet File Formats:

<http://www.matisse.net/files/formats.html> (Macintosh and Windows tar and gzip)

(Note: this website has not been maintained since December 1995)



## Converting the ARC/INFO interchange/export files

The ARC interchange/export (.e00) files are converted to ARC coverages using the ARC command IMPORT.

1. Change directories to the pwash/ directory
2. At the UNIX command prompt, launch ARC/INFO by typing “arc”
3. From the ARC command line type:  
import <option> <interchange\_file> <output>  
(e.g., import auto pwash\_geo pwash\_geo; repeat for each interchange file)

Consult the ARC/INFO command references manual in ESRI’s software documentation for other <option> choices appropriate for importing the interchange files.

After importing the Porcupine Wash ARC/INFO interchange files, the pwash/ directory contains five map coverages, two dictionaries, four symbolsets, and three documentation files:

pwash/		
info/	lines.rel	pwash_readme.txt
pwash_geo/	points.rel	pwash_met.txt
pwash_dk/	geoscamp2.lin	pwash_pamph.txt
pwash_str/	geoscamp2.mrk	
pwash_orn/	scamp2.shd	
pwash_ldr/	geology2.shd	
pwash_topo.tif		

The info/ directory contains INFO files integral to the database coverages.

ARC/INFO interchange files can be read by some other Geographic Information Systems, including ARCVIEW (ESRI) and MapInfo (via ArcLink). Please consult your GIS documentation to see if your system recognizes ARC interchange files and follow the procedure to import them. (NOTE: the graphical symbols contained in the two symbolsets (geoscamp2.lin; geoscamp2.mrk) cannot be read in ARCVIEW.)

## DATABASE CONTENTS AND STRUCTURE

This readme section contains tabular listings that summarize the structure and content of the database. Refer to the metadata for a complete technical description of the database structure and content; refer to the explanatory pamphlet for a discussion of the approach used in building the database within the context of its purpose and geologic database.

The database files comprise:

- ARC/INFO coverages
- INFO tables that contain line and point dictionaries
- Symbolsets
- Topographic base map: 500-dpi raster scan of USGS Porcupine Wash 7.5 minute quadrangle (provisional edition, 1986), registered and rectified to the coverage quadrangle in ARC/INFO and saved as a Georeferenced Tagged Image Format (GEOTIFF) file

<i>Directory or file name</i>	<i>Directory or file type</i>	<i>Directory or file contents</i>	<i>File size</i>
pwash_geo/	ARC/INFO coverage	Geologic units and contacts	
pwash_dk/	ARC/INFO coverage	Dikes	
pwash_str/	ARC/INFO coverage	Geologic structure	
pwash_orn/	ARC/INFO coverage	Ornamentation	
pwash_ldr/	ARC/INFO coverage	Leaders	
pwash_topo.tif	GEOTIFF	Raster-scanned topographic map	13.1 MB
lines.rel	INFO table	Line dictionary	
points.rel	INFO table	Point dictionary	
geoscamp2.lin	Lineset	Lines	
geoscamp2.mrk	Markerset	Points	
scamp2.shd	Shadeset	Colors	
geology2.shd	Shadeset	Patterns	

Content of ARC/INFO coverages:

Coverage:

<i>Feature class: Subclass</i>	<i>Feature attribute table</i>	<i>Contents</i>
pwash_geo/		Geology
Arcs	pwash_geo.aat	Contacts and faults
Polygons	pwash_geo.pat	Geologic map units
Regions		
Metunit	pwash_geo.patmetunit	Metamorphic rock units
Pedunit	pwash_geo.patpedunit	Pedogenic rock units
Plutunit	pwash_geo.patplutunit	Plutonic rock units
Sedunit	pwash_geo.patsedunit	Sedimentary rock units
Veinunit	pwash_geo.patveinunit	Vein rock units
Volcunit	pwash_geo.patvolcunit	Volcanic and hypabyssal rock units
Hydaltunit	pwash_geo.pathydaltunit	Hydrothermally altered rock units
Annotations		
Geo (anno.geo)		Geologic map unit labels
Fault (anno.fault)		Fault names
pwash_dk/		Dikes
Arcs	pwash_dk.aat	Dikes
pwash_str/		Structure
Points	pwash_str.pat	Spatial orientation of point data: Azimuth and dip of planar features Azimuth and plunge of linear
features		
Annotations		
Value (anno.value)		Dip and plunge values
pwash_orn/		Ornamentation at points on lines
Points	pwash_orn.pat	Ornamentation Fold axis symbols Fault symbols: slip arrows
Annotations		
Line (anno.line)		Fault symbols: U / D

Coverage:

<i>Feature class: Subclass</i>	<i>Feature attribute table</i>	<i>Contents</i>
pwash_ldr/		Leaders for annotated unit labels
Arcs	pwash_ldr.aat	Leaders

## HOW TO OBTAIN A PAPER PLOT OF THE GEOLOGIC MAP

1. Download and, using a gzip utility (see ‘Extracting the database files’ above), uncompress the file **pwash\_map.ps.gz**. The 244-MB file **pwash\_map.ps** is a PostScript plot-file of the geologic map and its explanation. The PostScript file will plot a 1:24,000-scale, full-color geologic map of the Porcupine Wash quadrangle on its topographic base and accompanied by a map-margin explanation. The plot has a format similar to the U.S. Geological Survey’s Miscellaneous Investigations (MF) map series, and is approximately 33 x 44 inches in size. It has been plotted successfully on Hewlett-Packard large-format plotters, models HP650C, HP755CM, and HP2500C using 36 x 48-in paper.

To add a topographic base to the geologic map, the monochromatic raster-scan file (**pwash\_topo.tif**) and the geologic map coverages were converted to ARC/INFO grids. The grids were then merged to display the topographic and cultural information from the raster scan in gray, with geologic map unit colors filling the intervening areas of the topographic map. The combined map is a digital image in which geologic and topographic lines and points are displayed in their proper geospatial locations, but in which no information other than location is attached to the lines and points.

The marginal explanation includes a Correlation of Map and Database Units diagram, a Description of Map and Database Units, and a key to line and point symbols. The map margin explanation was created in Adobe Illustrator and imported into ARC/INFO to combine it with the geologic map.

The plot files have been prepared using line- and point-symbols and unit colors and patterns located in the following symbolsets:

geoscamp2.lin	Lines
geoscamp2.mrk	Points
scamp2.shd	Colors
geology2.shd	Patterns

These sets are included in the **pwash.tar.gz** data package and are available at the Southern California Areal Mapping Project (SCAMP) website

<http://geology.wr.usgs.gov/wgmt/scamp/attrib/attribute.html>

In addition, the plot files contain specialized geologic-age fonts of the GeoAge font group, which is accessed through geofont.txt and is available from the USGS by anonymous ftp:

Server: onyx.wr.usgs.gov  
Directory: /pub/wpg/supplies/geoage/.

2. Download and plot the 5.4-MB file **pwash\_map.pdf**, which generates a paper map equal in quality to that of the much larger post-script plot file. Care must be taken to select a page size format that results in 1:24,000-scale map-plot.

## HOW TO ACCESS PORTABLE DOCUMENT FORMAT (.PDF) FILES

The .pdf files are accessed using Adobe Acrobat Reader software, available free of charge from the Adobe web site (<http://www.adobe.com>).

## HOW TO OBTAIN METADATA

Metadata for the Porcupine Wash geologic map database are available as part of the National Spatial Data Infrastructure through the USGS Geologic Division Node of the National Geospatial Data Clearinghouse (<http://nsdi.usgs.gov/>). Within this site, Open-File Reports are located at

<http://geo-nsdi.er.usgs.gov/cgi-bin/publication?open-file>

where they are listed by OFR number along with the title. Metadata at this node are viewable in five formats (ASCII as parseable text; HTML outline, HTML as answers to questions, XML, and DIF). Metadata for the Porcupine Wash database site at this node is located at

<http://geo-nsdi.er.usgs.gov/metadata/open-file/00-31/metadata.faq.html>

ASCII text and HTML outline versions of the metadata are also available at the Porcupine Wash website (<http://geopubs.wr.usgs.gov/open-file/of01-30>) and bundled with database files in the tarred and gzipped file.

## LIST OF URLs CITED

### U.S. Geological Survey websites

#### *Porcupine Wash 7.5 minute quadrangle*

Open-File Report: <http://geopubs.wr.usgs.gov/open-file/01-30>

Metadata: <http://geo-nsdi.er.usgs.gov/metadata/open-file/01-30/metadata.faq.html>

#### *Southern California Areal Mapping Project (SCAMP) website*

GIS attributes: <http://geology.wr.usgs.gov/wgmt/scamp/attrib/attribute.html>

Databases: <http://geology.wr.usgs.gov/wgmt/scamp/>

#### *Western Region Geologic Publication Server*

Open-File Reports:

<http://geopubs.wr.usgs.gov/open-file/of00-> (followed by the OFR number)

All digital publications

<http://geopubs.wr.usgs.gov/>

#### *U.S. Geological Survey website (<http://geology.usgs.gov>)*

Open-File Reports

Digital maps: <http://geology.usgs.gov/open-file/maps.html>

Metadata: <http://geo-nsdi.er.usgs.gov/cgi-bin/publication?open-file>

#### *Metadata (USGS Node of the National Geospatial Data Clearinghouse)*

<http://nsdi.usgs.gov/>

#### *National Geologic Map Database*

<http://ncgmp.usgs.gov/ngmdbproject/standards/>

<http://geology.usgs.gov/dm/>

## Software websites

### *GIS systems*

Environmental Systems Research Institute (ESRI): <http://www.esri.com>

MapInfo: <http://www.mapinfo.com>

### *Compression and tar software*

Gnu Software: <http://www.gnu.org/order/ftp.html> (UNIX tar and gzip)

(This web page links to mirror archive sites for Gnu tar and gzip utilities)

Gnu zip: <http://www.gzip.org> (UNIX gzip)

CNET Shareware: <http://shareware.cnet.com/> (Macintosh and Windows)

(Search for 'tar' or 'gzip' for any Macintosh or Windows operating system.)

WinZip: <http://www.winzip.com> (Windows gzip)

USGS Public Domain Software web page:

<http://edcwww.cr.usgs.gov/doc/edchome/ndcdb/public.html> (UNIX, Macintosh)

(Provides links to Washington University at St. Louis Gnu archive for UNIX tar and gzip; and to AOL mirror site for Macintosh tar and gzip)

Internet Literacy's Common Internet File Formats:

<http://www.matisse.net/files/formats.html> (Macintosh and Windows tar and gzip)

(Note: this website has not been maintained since December 1995)

### *Portable document reader*

Adobe web site: <http://www.adobe.com>