

Final Technical Report

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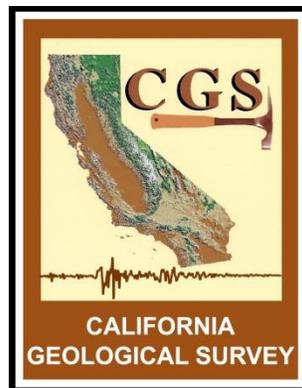
**METADATA CREATION FOR THE AERIAL PHOTOGRAPHY COLLECTION
CALIFORNIA GEOLOGICAL SURVEY, MENLO PARK**

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By

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ABSTRACT

Funds provided through the U.S. Geological Survey – National Geological and Geophysical Data Preservation Program (NGGDPP) Award No. G12AP20139, enabled the California Geological Survey (CGS) to support a **metadata creation project** focusing on the aerial photography collection located in its Menlo Park office.

The California Geological Survey (CGS) office in Menlo Park maintains a collection of approximately 68,000 aerial photographs. The collection is comprised primarily of black and white and color 9"x 9" aerial photographs, acquired over the years by CGS staff geologists, to support various projects throughout the state. Projects include statewide fault and seismic hazards evaluations, mineral resource assessment, and regional geologic mapping. Photos in the collection are frequently cited in documents supporting CGS regulatory maps. For this reason, they are often used by CGS and Department of Conservation staff and private consultants in the course of site reviews and the preparation of geotechnical reports. In addition, geologists from other state and federal agencies, including the U.S. Geological Survey, use this collection. As part of the NGGDPP FY-2010 **Collection Inventory** grant, CGS determined that this collection of aerial photography is a priority for conservation and preservation efforts.

Each photographic frame or series of frames within a flight line was reviewed and compared to existing analog inventories. Pertinent information such as agency, date, type, scale, location, and availability was recorded in an NGGDPP-compatible format.

Creating metadata provided an opportunity to evaluate the current status of the collection by generating an up-to-date account of photos on hand as well as on loan. This information will provide the means to identify missing items and support an effort to re-link them to the collection. The metadata will also be useful to CGS as an expedient method for locating relevant photographs for staff and other stakeholders. In addition, the metadata will be entered into the **USGS-ScienceBase Catalog** in an effort increase awareness of this collection.

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DATA PRESERVATION FOR THE CALIFORNIA GEOLOGICAL SURVEY

Introduction:

This report covers the **metadata creation project** that was funded in part through the U.S. Geological Survey – National Geological and Geophysical Data Preservation Program (NGGDPP) Award No. G12AP20139. It was proposed following the NGGDPP FY-2010 **Collection Inventory** conclusions in which CGS determined that this collection of aerial photography was a priority for conservation and preservation efforts.

The Aerial Photography Collection has been neglected for many years. Originally housed in the Ferry Building in San Francisco, with a dedicated staff member to oversee the collection, it has undergone numerous office moves before arriving at its present location in the CGS-Menlo Park office. The collection was cataloged on index cards (Figure 1.) and no longer had a staff member responsible for its upkeep. When requests were received, CGS staff members had to physically look through index cards, paper map indexes, and boxes of photographs (Figure 2.) to see if requested frames were available. Over time numerous photographs have been checked out, misfiled, or lost. A searchable in-house database and proper storage would make the collection easier to access and provide a more efficient way to locate and keep track of individual photographs.

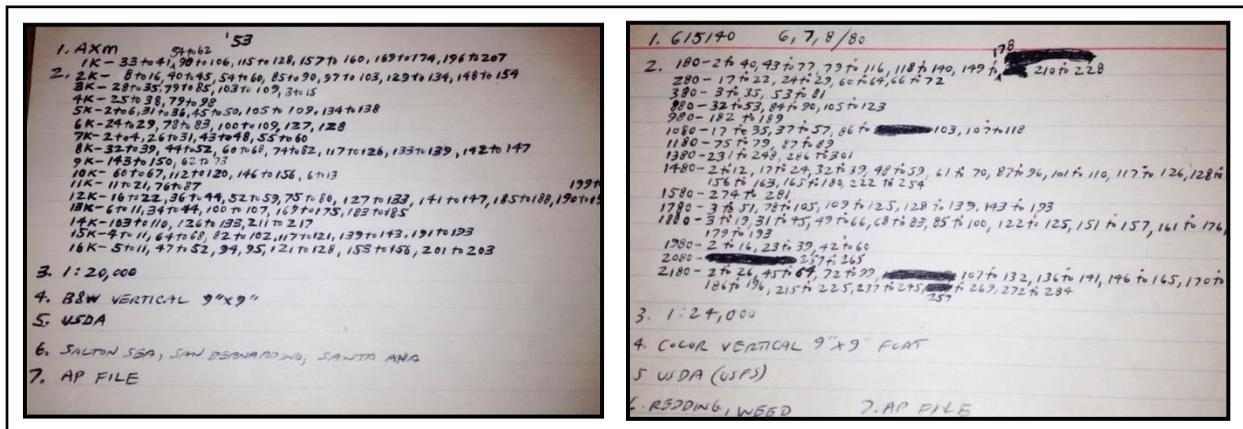


Figure 1. Example of index cards used to identify photographs in the Aerial Photography Collection - California Geological Survey, Menlo Park.

The goals of this project were: 1) to create an accurate catalog of this collection of aerial photographs; 2) increase collection visibility and availability to users; and 3) have a means to evaluate and prioritize future preservation needs such as scanning and replacement of missing or damaged photographs.

Project Description:

The project began September 15, 2012 and was completed on September 15, 2013. However a three month, no-cost extension was requested and granted due to delays in hiring a student assistant and to address photograph identification and location issues that came up during the project time frame.

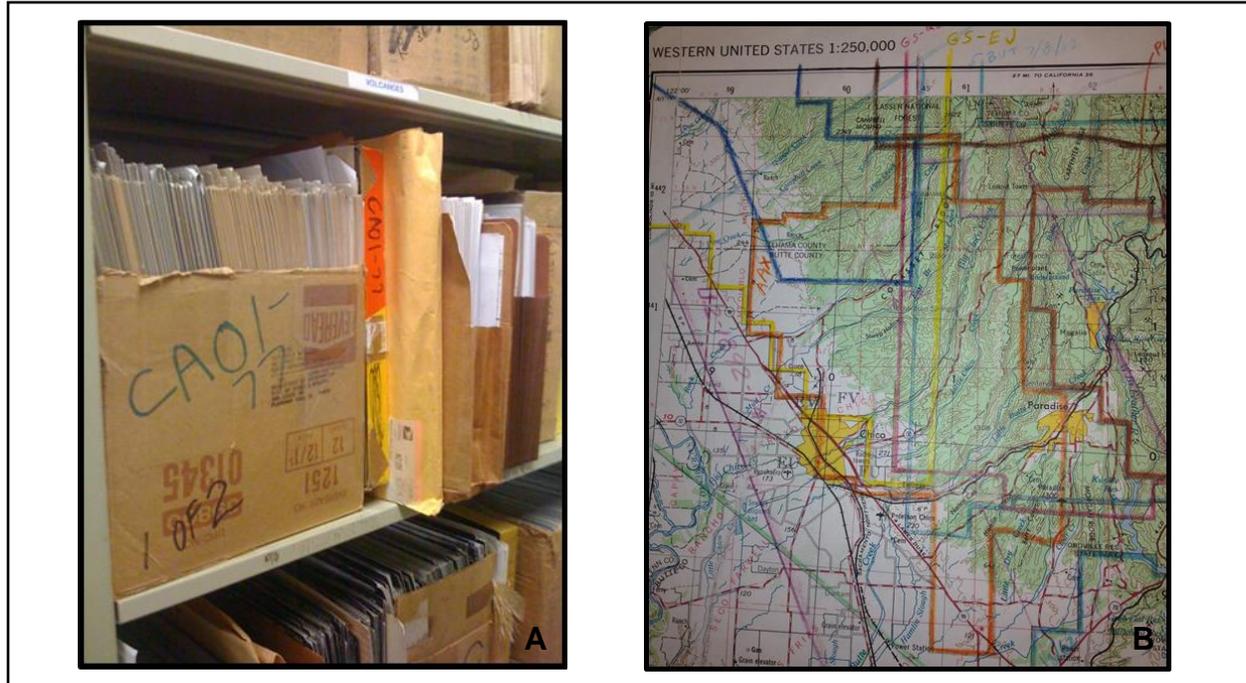


Figure 2. A) Photo showing boxes containing aerial photographs; B) Example of index map showing extent of air photo coverage for a portion of the Chico 1:250,000-scale quadrangle.

The first step in this project was to prepare a Microsoft Excel template that would hold all pertinent information to be recorded. A template for CSV spreadsheet format was created following the guidelines provided by the “Metadata Profile for the National Digital Catalog” (March 17, 2008; version 1.0) found at the following website. <http://datapreservation.usgs.gov/docs/NGGDPPMetadataProfile.pdf>

Template **elements** and **definitions** used for this project are as follows:

Element Name	Name Definition
CollectionID	The unique ID assigned by the U.S. Geological Survey to this collection.
Title	The title represents 1) the photograph series, 2) date if necessary to distinguish between two similar named series, 3) flight line number, and 4) frame number of the first and last aerial photographs of a flight line (i.e. WAC-84C-2-30-39, AAX-6K-53-65).

AlternateTitle	The alternate title corresponds to the agency or private contractor responsible for the acquisition of the aerial photography (i.e. BLM, USGS, USFS, Cartwright, WAC).
Abstract	Description of the individual record – for this collection all entries are the same. <i>“This item represents a set of aerial photographs currently housed in the California Geological Survey Menlo Park office.”</i>
DataType	This collection inventory falls under the category of “Photographs” as derived from the NCGDPP Implementation Plan.
SupplementalInformation	This field was not used
Coordinates	In this field, the coordinates for longitude and latitude (respectively) are in decimal degrees and represent the approximate center point of an individual flight line or flight line segment.
OnlineResource	This field was not used.
Date	Corresponds to the date of the aerial photograph in year, month, day format (19600827) – no entry indicates the date is uncertain.
DatasetReferenceDate	This is the date the metadata record was assembled for the National Catalog.
VerticalExtent	This field was not used.

In addition to the above elements several others were included for CGS in-house use. They are as follows:

Element Name	Name Definition
Quad1 through Quad6	The name(s) of the 1:250,000-scale quadrangle(s) where the photographs are located.
Scale	The scale of the photography.
Comments	Description of coverage extent where available.
Missing	Photograph frame numbers that are missing from the collection.
Staff Member	The name of the CGS staff member that has checked out photographs.

Once the template elements and definitions were established each photo storage box was then reviewed. The aerial photographs are stored in boxes alphabetically or numerically by the source agency’s flight line identifying code (i.e. AXL, CA01-77, 51160, etc.) (see Figure 2A.). Along with photographs each box typically contains a paper index map showing the location of starting and end points of flight lines contained in the box and a check-out sheet (Figure 3A and B respectively).

The review process for each storage box was essentially the same. Individual photos were reviewed and the series, date (if necessary), flight line number, and frame numbers of the first and last photos of the flight line were recorded in the “Title” field.

Frame numbers were checked against the listings shown on the original analog index cards (Figure 1.). If any photographs were missing their frame numbers were recorded in the “Missing” field and the check-out sheet (Figure 3B.) was reviewed to see who might have them. If there was a record of the photos being checked out, the name of the person holding the photos was recorded in the “Staff Member” field for later confirmation. Additional information obtained from the index cards, such as scale, agency source, 1:250,000-scale quadrangle location, location descriptions, and general comments were added to the appropriate fields (see Element Name and Name Definitions previously described).

Once these data were entered into the Excel Template the next step was to determine locational information for the “Coordinates” field. The paper index maps (Figure 3A.) contained in the photo storage boxes and the 1:250,000-scale quadrangle indexes (Figure 2B.) were used for this step. Scanned images of the quadrangle indexes containing the appropriate flight lines were brought into the ArcMap application within ArcGIS 10.0 (Environmental Systems Research Institute) and georeferenced. The

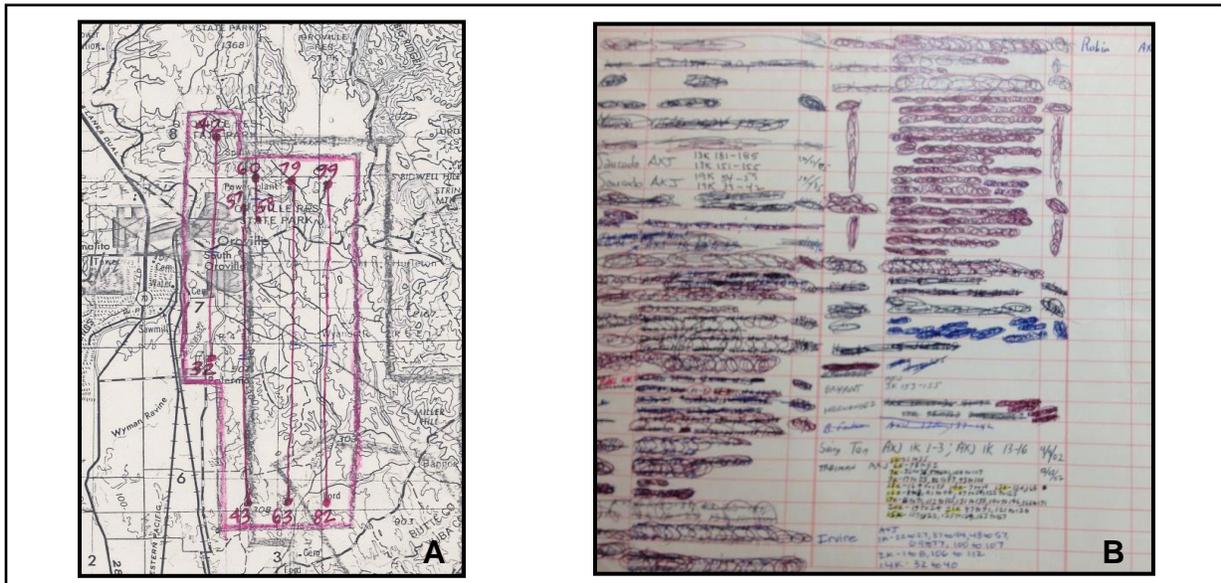


Figure 3. Examples of paper index map showing the location of starting and end points of flight lines (A) and check-out sheet (B) contained in the photo storage boxes.

paper index was then used to determine the location of the flight line within the georeferenced 1:250,000-scale quadrangle. Once the flight lines were located center points could then be estimated for each flight line entry using end point photo numbers (Figure 4.). Coordinates for longitude and latitude could then be read directly from the ArcMap application which had been set to read locational information in decimal degrees. In some cases storage boxes did not contain paper index maps or identifying information and therefore were not entered into the spreadsheet.

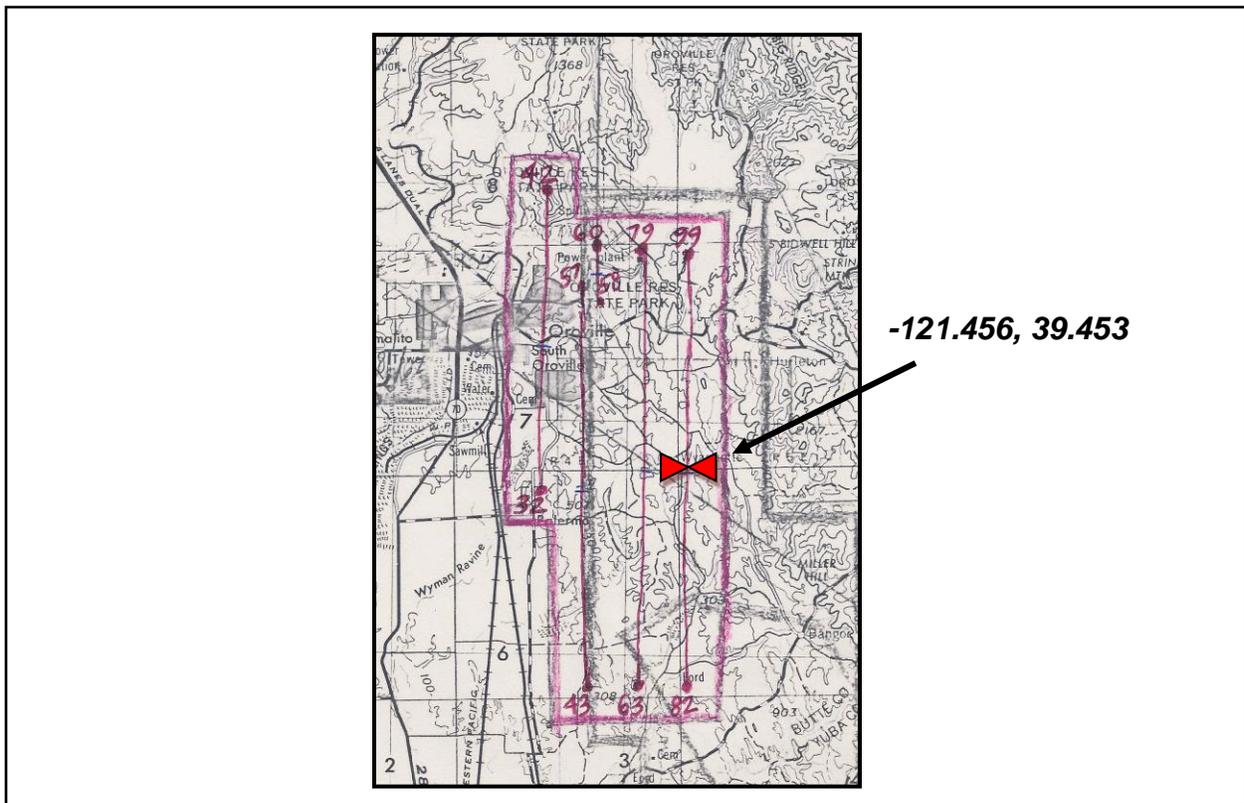


Figure 4. Example of coordinates determined for the approximate center point (red arrows) for flight line WR-AEX-82-99 (longitude and latitude in decimal degrees).

Outcome:

Funding through the NGGDPP provided the opportunity to create metadata for the aerial photography collection located in the California Geological Survey’s Menlo Park office. The metadata created as a direct result of this project was used to evaluate the current status of the collection by generating an up-to-date inventory of photos on hand as well as on loan. This information will provide the means to identify missing items and support an effort to re-link them to the collection. The metadata will also be useful to CGS as an expedient way to locate relevant photographs for staff and other stakeholders. In addition, the metadata was entered into the **USGS-ScienceBase Catalog** in an effort increase awareness of this collection.

The following is a summary of results of this project:

- Metadata was created for approximately 90 – 95% of the collection – over 4,200 records were entered. Some were omitted because:
 - a) Photographs were missing locational information (i.e. index maps)
 - b) They were small-scale regional coverages such as Satellite imagery (SKYLAB), high altitude photography (U2), and photo transparencies in rolled format
- A cross-check between original analog listing and actual inventory was made
- A record of photographs missing from the collection was created

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	R	S	T	U
1	COLLECTIONID	TITLE	ALTERNAT	ABSTRACT	DATATYPE	SUPPLEM	COORDINATES	ONLINE	DATE	DATA	VERT	QUAD1	QUAD2	QUAD3	SCALE	COMME	MISSING	STAFF MEMBER
80	4fb5480ce4b04	AXI-9K-80-101	USDA	This item repre	Photographs		-119.181, 34.284		19531007			Los Angeles			20000		83-90	Swanson
81	4fb5480ce4b04	AXI-9K-117-124	USDA	This item repre	Photographs		-119.141, 34.381		19531007			Los Angeles			20000		117-122/123-124	Swanson/Irvine
82	4fb5480ce4b04	AXI-10K-35-37	USDA	This item repre	Photographs		-118.892, 34.452		19531007			Los Angeles			20000		35-37	Perez
83	4fb5480ce4b04	AXI-10K-87-91	USDA	This item repre	Photographs		-118.856, 34.446		19531007			Los Angeles			20000		87-91	Perez
84	4fb5480ce4b04	AXI-10K-93-97	USDA	This item repre	Photographs		-118.823, 34.437		19531007			Los Angeles			20000		93-97	Perez
85	4fb5480ce4b04	AXI-10K-116-123	USDA	This item repre	Photographs		-118.864, 34.127		19531007			Los Angeles			20000		116-121/122-123	Irvine
86	4fb5480ce4b04	AXI-10K-125-132	USDA	This item repre	Photographs		-118.782, 34.186		19531007			Los Angeles			20000		125-126	Irvine
87	4fb5480ce4b04	AXI-11K-9-18	USDA	This item repre	Photographs		-118.86, 34.358		19531019			Los Angeles			20000		9-12/13	Perez/Olson
88	4fb5480ce4b04	AXI-11K-26-32	USDA	This item repre	Photographs		-118.681, 34.191		19531019			Los Angeles			20000		28-32	Swanson
89	4fb5480ce4b04	AXI-11K-33-39	USDA	This item repre	Photographs		-119.242, 34.536		19531019			Los Angeles			20000		33-35	Jones
90	4fb5480ce4b04	AXI-11K-72-76	USDA	This item repre	Photographs		-118.758, 34.449		19531019			Los Angeles			20000		72-76	Perez
91	4fb5480ce4b04	AXI-11K-82-84	USDA	This item repre	Photographs		-118.793, 34.456		19531019			Los Angeles			20000		82-84	Perez
92	4fb5480ce4b04	AXI-11K-130-138	USDA	This item repre	Photographs		-118.929, 34.364		19531116			Los Angeles			20000		135-138	Perez
93	4fb5480ce4b04	AXI-11K-146-150	USDA	This item repre	Photographs		-118.931, 34.452		19531116			Los Angeles			20000		146-149	Perez
94	4fb5480ce4b04	AXI-11K-166-173	USDA	This item repre	Photographs		-118.93, 34.098		19540114			Los Angeles			20000		171-173	Irvine
95	4fb5480ce4b04	AXI-11K-174-182	USDA	This item repre	Photographs		-118.861, 34.242		19540114			Los Angeles			20000		174-180	Irvine
96	4fb5480ce4b04	AXI-23-21-22	National A	This item repre	Photographs		-118.399, 34.264		1938			Los Angeles	San Bernardino		20000		21-22	Treiman
97	4fb5480ce4b04	AXI-23-24-26	National A	This item repre	Photographs		-118.362, 34.27		1938			Los Angeles	San Bernardino		20000		24-26	Treiman
98	4fb5480ce4b04	AXI-23-47-49	National A	This item repre	Photographs		-118.359, 34.226		1938			Los Angeles	San Bernardino		20000		47-49	Treiman
99	4fb5480ce4b04	AXI-23-87-91	National A	This item repre	Photographs		-118.435, 34.289		1938			Los Angeles	San Bernardino		20000		87-91	Treiman
00	4fb5480ce4b04	AXI-42-7-16	National A	This item repre	Photographs		-117.764, 34.123		1938			Los Angeles	San Bernardino		20000		7-16	Treiman
01	4fb5480ce4b04	AXI-42-96-110	National A	This item repre	Photographs		-117.8, 34.149		1938			Los Angeles	San Bernardino		20000		96-110	Treiman
02	4fb5480ce4b04	AXI-44-6-9	National A	This item repre	Photographs		-118.226, 34.146		1938			Los Angeles	San Bernardino		20000		6-9	Treiman
03	4fb5480ce4b04	AXI-44-13-19	National A	This item repre	Photographs		-118.083, 34.146		1938			Los Angeles	San Bernardino		20000		13-19	Treiman

Figure 5. Screen shot of a portion of the Microsoft Excel spreadsheet containing the metadata created for the aerial photography collection held by the California Geological Survey, Menlo Park.

Future:

As a result of this project future efforts pertaining to the air photo collection include:

- Retrieving or at least verifying the location of missing photos from CGS staff members
- Determining which photos are actually missing and should be replaced
- Purchasing new containers suitable for storing the photos
- Studying the feasibility of starting a project to scan and georeference individual photographs
- Revising the metadata as necessary

In conclusion, the California Geological Survey appreciates the opportunity to take part in this program and looks forward to future cooperation and participation in this program.