

NGGDPP Final Technical Report

Award Number: G14AP00146

Project Title: Creation of Metadata for Historical Oklahoma Aerial Photographs at the Oklahoma Geological Survey – Phase II

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Amount Funded \$10,912

Project Term: 9-15-14 to 9-15-15

Submittal Date of Final Technical Report: 11-27-15

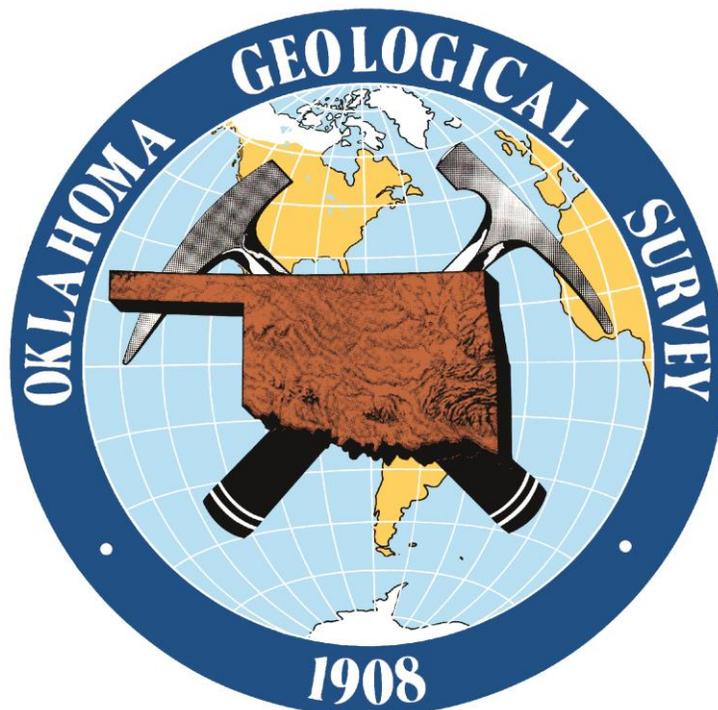


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I. Abstract

In FY 2012, per our cooperative agreement with the USGS-NGGDPP program, the Oklahoma Geological Survey (OGS) was able to successfully rescue approximately 15,600 Oklahoma aerial photographs from its Oklahoma Petroleum Information Center (OPIC) library and storage facility. These data were rescued from environmentally adverse storage conditions. Once rescued and housed in a suitable archival space, the photos were sorted and assimilated into the extant public access collection of aerial photographs housed at the OGS-OPIC facility. The previous FY 2013 NGGDPP (phase I) and FY 2014 NGGDPP (phase II) proposals intended to utilize this rescued source material in combination with the extant public access collection in order to facilitate a comprehensive inventory of all aerial photo holdings located at the OGS-OPIC facility.

II. Project Goals and Objectives

The FY 14 proposal would allow OGS staff to continue to facilitate the management of the most comprehensive collection of aerial photographs in the state of Oklahoma by creating NGGDPP compliant metadata at the individual sample level for a proposed 10,000 Oklahoma aerial photographs.

These 10,000 photographs constitute a portion of the holistic collection of approximately 200,000 aerial photographs maintained by the OGS for which there is currently only a partial inventory. Metadata was to be generated by extracting header data from sorted photographs and entering it into an Excel spreadsheet. Each record would contain the necessary elements pertaining to the required metadata criteria as outlined by the NGGDPP. Once metadata was created for the proposed 10,000 records they would then be uploaded to the National Digital Catalog. Contents of the spreadsheet would be used to develop an online catalog viewable to patrons of the library and for upload to the National Digital Catalog via a CSV ‘flat file’.

This initial dataset would continue the cataloging efforts generated by the previous NGGDPP award in order to develop a comprehensive inventory aerial photos located at the OGS. The ultimate goal is the development of a complete inventory of Oklahoma aerial holdings at OGS available for public dissemination.

In summation, the project goals and objectives proposed by the FY14 proposal to create metadata from OGS Oklahoma aerial photographs collection include:

- (1) The creation of metadata for 10,000 aerial photographs representing approximately 10 of the 77 counties in Oklahoma.
- (2) To continue the development of an inventory of aerial photos that includes metadata at the individual sample level.
- (3) To establish a comprehensive inventory of rescued and extant data that will allow patrons of OGS to remotely access aerial photo inventory.

The proposed project was envisioned as the continuation of incipient cataloging efforts of the existing public access collection – which also includes recently incorporated rescued aerial photographs. OGS has emerged as the principle custodian of statewide aerial photographs within Oklahoma. It is therefore the goal of OGS to improve curation of current aerial holdings, and rescue proposed materials in order to enhance this data set.



Photo 1. Rescued photos being sorted and prepped for recording metadata.



Photo 2. Rescued photos being sorted and prepped for recording metadata.

III. Work Accomplished

As a result of the cooperative agreement between OGS and DOI-USGS, we were able to build upon the foundation of a holistic inventory for all OGS aerial holdings. We envision subsequent project phases for this collection given the scope and breadth of the labor required to fully inventory and develop critical digital infrastructure at the individual sample level.

In all, metadata was created for 10,017 photographs during this second phase of metadata creation provided by the FY 14 NNGDPP award (G14AP00146). Based off our experience gained from the previous phase of aerial metadata generation, we were able to reach our proposed goal of 10,000 metadata records. In the previous phase (FY 13) it became clear within the early stages of the project that the proposed goal of 10,000 photographs was considerably optimistic given the time and research required to create metadata for each individual sample. In particular, determining the location coordinates of non-annotated aerial photographs proved extremely time consuming. This was corrected for by utilizing various mapping utilities, namely the BLM's online geocommunicator app, USGS topo maps, and aerial mosaics, to assist in the detection of coordinate data.

Many of the OGS aerial photographs have not been geo-referenced down to a level of section-township-range (STR). In many cases, township and range alone constituted the most detailed level of analysis. Ideally, essential header data required in order to rapidly generate NNGDPP compliant metadata consist of four basic elements:

- County
- Flight Date
- Frame ID/Alpha Fip Code
- S-T-R

In many instances one, many, or all basic data elements were absent from the photographs and had to be researched in order to generate metadata. In the case where header data was not available, photographs would be checked against NAIP alpha-fip codes generated by the USDA Aerial Photography Field Office, and cross referenced against a collection of photo mosaic indices and topography maps to determine precise coordinate data. Additional BLM STR mapping resources were also used to determine missing data elements.

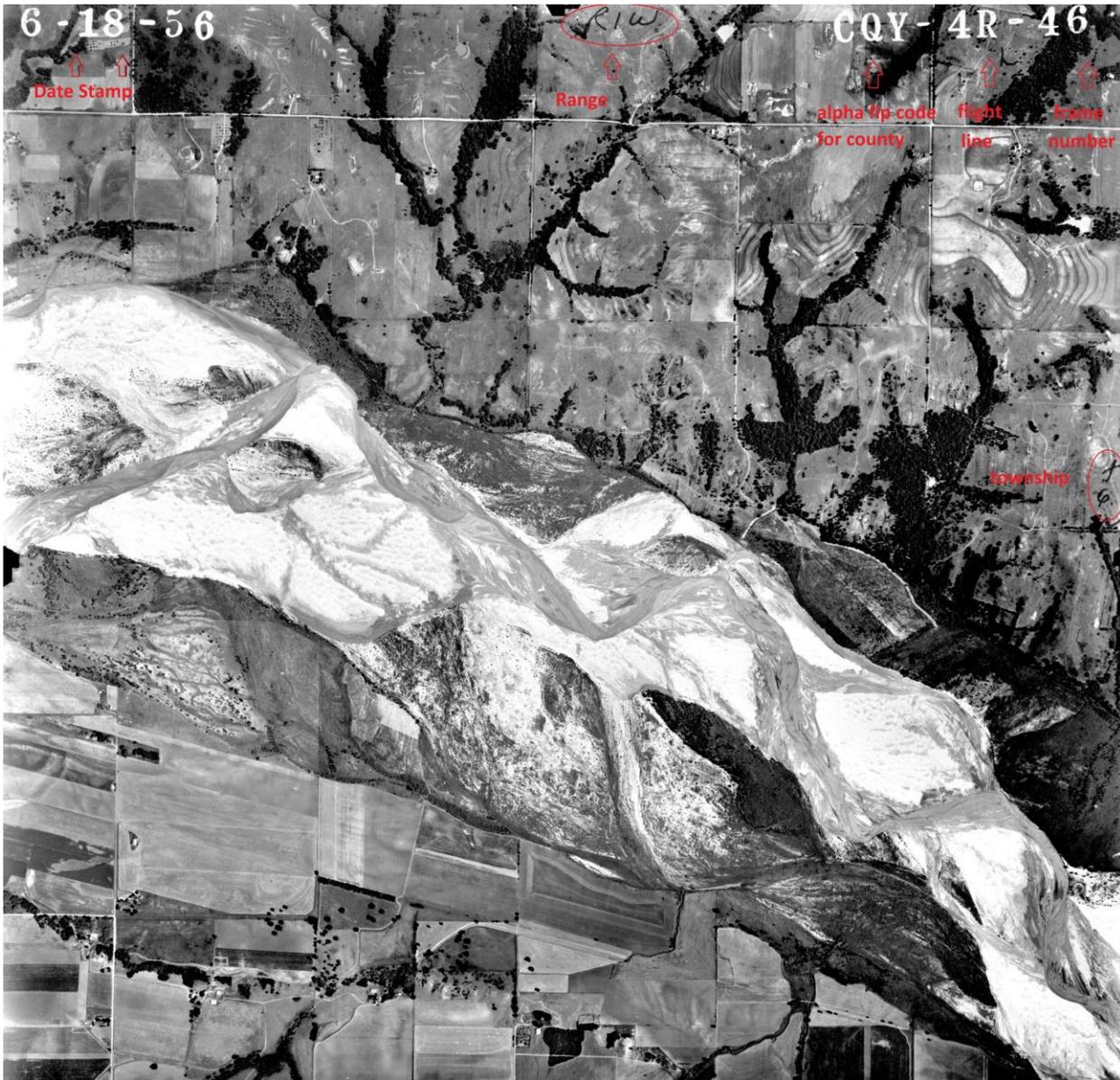


Fig 1. Example of aerial photo and basic data elements used to create metadata.

Because the FY14 NGGDPP award was the second year we were strictly focusing on the generation of metadata, the feasibility of the arbitrary project goal of 10,000 was deemed plausible, but due to the difficulties inherent in this medium listed above, any amount over the proposed number is deemed implausible.

Metadata created for the 10,017 aerial photographs was uploaded to the National Digital archive as a flat CSV file.

With the additional funding of \$10,912 OGS was able to hire additional student workers to assist in the completion of the project as assisted and supervised by Richard Tarver. Without funding opportunities provided by the DOI-USGS NGGDPP project, we would be unable to accomplish even the most basic data preservation endeavors, such as creating an inventory of aerial photographs or rescuing historical aerial photographs from adverse storage conditions. We sincerely thank the auspices of the DOI-USGS in facilitating the funding for this project.

IV. Conclusion

Historical aerial photographs are utilized by an ever-increasing number of individuals from various professional backgrounds including petroleum engineers, drilling operators, geologists, environmental due diligence professionals, and archaeologists. The inherent value of this data is demonstrated in its ability to:

- (1) Exhibit geophysical and environmental change through time within a temporal range that encapsulates much of the 20th century, most of which preceded the advent of landsat/satellite imagery.
- (2) Facilitate the planning of petroleum drilling and sampling projects.
- (3) Demonstrate the environmental impact of both naturally and artificially occurring phenomena which are not otherwise readily observable. In doing so, salvage and conservation measures may be strategized in order to alleviate environmental blight.
- (4) Facilitates historic archaeological research which contributes to state heritage as well as further developing an archaeological record of America's indigenous peoples.

Most pre-1950s historical aerial photographs are limited in circulation and lack negative backup. As many photos have likely remained in storage for decades, there has been little opportunity to digitally preserve this data. OGS is leading efforts to curate Oklahoma aerial photographs within the state.

As with most of our collections, only a portion of partially organized aerial photographs are accessible to the public through OGS. Yet, this public collection constitutes the most comprehensive collection of Oklahoma aerial photographs in the state, representing all 77 counties and ranging in dates from 1936-1986. These photographs represent an extremely valuable data collection due to their limited circulation as well as their ability to demonstrate geophysical and environmental change through time.



Photo 4. Public Access Collection of OGS Aerial Photos

The photographs are used by a wide range of professionals including geologists, civil engineers, archaeologists, and environmental conservationists. OGS annual user statistics for calendar years 2011-2014 indicate an increasing demand for this data set among our patrons both local and nationally (See attached Fig 2.).

The aerial photo project will continue into FY 2015 (G15AP00142) which will allow OGS to further efforts in the development of a comprehensive inventory of all aerial photographs for public dissemination (See attached Table 1). The anticipated results of this work will be a digital catalog of all aerial holdings at OGS which serve to facilitate public awareness of this unique and degrading medium.

V. Appendix

2012 OGS-OPIC Visitor Usage by Collection

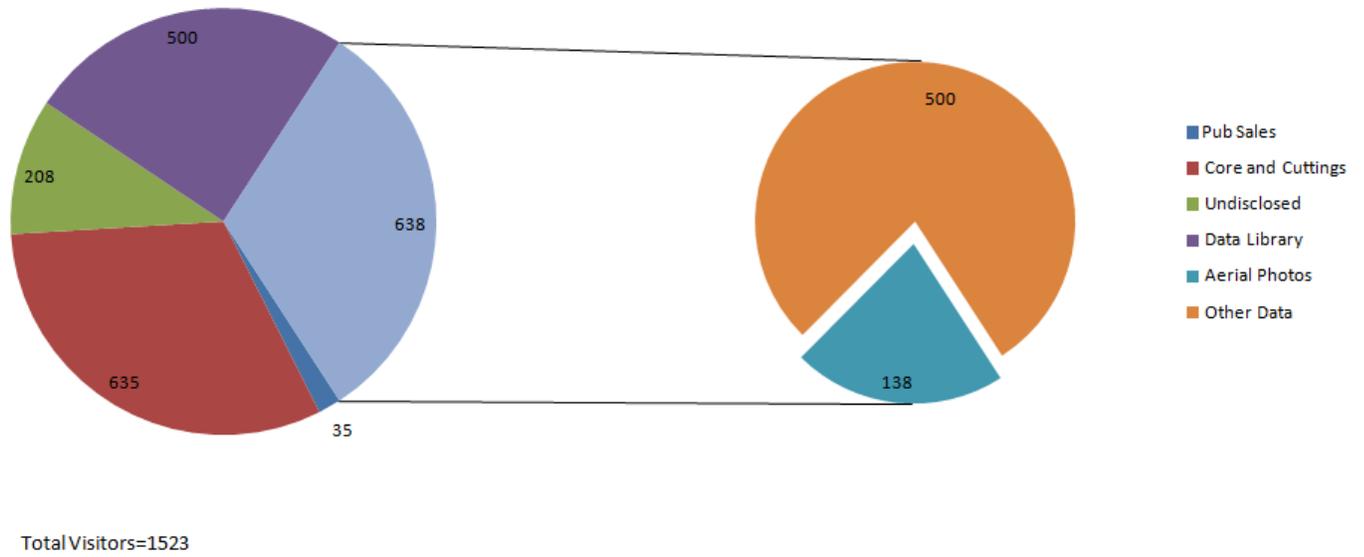


Fig 2. 2012 OGS-OPIC User Statistics

Previous NGGDPP Projects Completed by OGS			
<i>NGGDPP Collection ID</i>	<i>Collection</i>	<i>Number of collection inventories or metadata records uploaded to the National Digital Catalog</i>	<i>Year uploaded</i>
	Data Inventory	26 Collection Inventories	FY 2007
P1355	Oklahoma Rock Cores	8910 metadata records	FY 2009
P1165	Oklahoma mud logs	700-800 metadata records	FY 2010
P1165	Oklahoma mud logs	2000 metadata records	FY 2011
P1163	Oklahoma aerial photos	15,600 rescue photos assimilated into extant public access collection, 2,237 Metadata Records Created	FY 2012
P1163	Oklahoma aerial photos	6,184 Metadata Records Created	FY 2013
P1163	Oklahoma aerial photos	10,017 Metadata Records Created	FY 2014
P1163	Oklahoma aerial photos	In Progress	FY 2015

Table 1. Completed NGGDPP Projects by OGS