Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States

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Open-File Report 2006-1141

Version 1.0

2006

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

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Abstract

The U.S. Geological Survey (USGS) initiated a study of the Lower Colorado River to derive temporal-change characteristics from the predam period to the present. In this report, we present summary information on accomplishments under a USGS task for the Department of the Interior's *Landscapes in the West* project. We discuss our preliminary results in compiling a digital database of geospatial information on the Lower Colorado River and acquisition of data products, and present a geospatial digital dataset of 1938 aerial photography of the river valley. The U.S. Bureau of Reclamation (BOR)'s, Resources Management Office in Boulder City, Nev., provided historical aerial photographs of the river valley from the Hoover Dam to the United States-Mexican border, with some exclusions. USGS authors scanned and mosaicked the photographs, registered the photo mosaics, and created metadata describing each mosaic series, all of which are presented here.

CONTENTS

ABSTRACT **2**

BACKGROUND **5**

INTRODUCTION **5**

STUDY AREA **6**

STATEMENT OF THE PROBLEM **7**

OBJECTIVE **10**

APPROACH **10**

- DATA ACQUISITION 10
- DATA PROCESSING 12
- DATA ANALYSIS 17

RESULTS **18**

FUTURE RESEARCH **23**

ACKNOWLEDGMENTS **23**

REFERENCES CITED **24**

APPENDIX A: METADATA **25**

- LCR1938_01.TXT 25
- LCR1938_02.TXT 30
- LCR1938_03.TXT 35
- LCR1938_04.TXT 40
- LCR1938_05.TXT 45
- LCR1938_06.TXT 50
- LCR1938_07.TXT 55
- LCR1938_08.TXT 60
- LCR1938_09.TXT 65
- LCR1938_10.TXT 70
- LCR1938_11.TXT 76
- LCR1938_12.TXT 81
- LCR1938_13.TXT 86
- LCR1938_14.TXT 91
- LCR1938_15.TXT 96

APPENDIX B: AERIAL-PHOTOGRAPHIC MOSAICS **101**

FIGURES

Figure 1: Lower Colorado River riparian study area. 7
Figure 2: Scanned image of Cibola, Ariz.-Calif. 7.5-minute topographic quadrangle, showing stream channel as field checked from aerial photographs from 1961 (left). USGS scientist Sandy Owen-Joyce penciled in position of the current stream channel in 2002 according to current knowledge (right)..... 9
Figure 3: Scanned poster mosaic of Colorado River Index Sheet 10 of 13 (#423-1938-1). 13
Figure 4: Screen capture of 1938 image-registration process, with identifiable ground control points along roadways selected in red. 14
Figure 5: Newly registered 1938 photomosaic overlain with a transparent GIS layer describing 1997 size and position (blue areas). 15
Figure 6: Extents of 1938 photomosaics of the Lower Colorado River. 17
Figure 7: Screen capture of digitizing session of 1938 stream channel from registered historical aerial photographs. 18
Figure 8: Mosaic of 1938 aerial photographs of Lake Mojave, with prereservoir river channels from 1938 overlain on insert map by 1997 reservoir shoreline. 19
Figure 9: Image sequence showing visual spatial-change analysis of aerial photographs from 1938 (left) to 1997 (right) of Lake Mojave. 20
Figure 10: Image sequence showing river-channel spatial analysis of Cibola National Wildlife Refuge (see fig. 2). 23

Background

In January 2003, the U.S. Geological Survey (USGS) formed a research team to study the Lower Colorado River from the Hoover Dam southward to the river's delta. On June 17-18, 2003, a Lower Colorado River Science Workshop was held at the Blue Water Casino Conference Center on Colorado River Indian Reservation, Parker, Ariz. The workshop was cosponsored by the USGS and the U.S. Fish and Wildlife Service. Topics included endangered species, vegetation, sedimentation, hydrology, flood-plain mapping, climate, and the delta region. The workshop's aim was to integrate science priorities with the needs of land and water managers along the Lower Colorado River from the Hoover Dam downstream to the river's delta. Scientists and managers from Federal, State, and local agencies convened to synthesize current scientific information, needs, issues, and priorities in order to guide interdisciplinary research that would support land and water management on the Lower Colorado River. Amongst others, the USGS mapping expertise was identified as a positive asset for this effort, and a geographic information system (GIS) supported, atlas-based approach was chosen as a priority.

Introduction

The history of 20th-century changes in the landscape, riverflow, climate, and development of the Lower Colorado River offers clues to better understand the environmental processes and conditions needed to maintain populations of native species and ecosystems. Agriculture and development, together with dams and channelization of the river, have brought large, mostly undocumented changes to the ecosystems extending from Lake Mead to the Colorado River delta. Wildlife habitats in the study area (fig. 1) change in response to invasive species, urban growth, and public works, including water regulation, flood control, flow regulation, and water diversion. These change vectors intermingle with wildlife refuges, parks, agriculture, tribal lands, water-recreation centers, mining districts, and wilderness areas. This patchwork of different ownership and management priorities, in combination with severe constraints on the magnitude and timing of flow releases, leaves limited possibilities for management actions that could create positive ecosystem changes. A thorough understanding of how the water, sediment, and ecosystems have responded to past changes would allow better forecasting of how the ecosystems and wildlife habitats may respond to alternative future changes.

Historical aerial photography beginning in the 1930s and 1940s identifies historical and sometimes predam conditions in both landscape and vegetation. These images offer a base source of information and an analysis tool for research on such topics as changes in riparian vegetation and wildlife habitat, surface hydrology, predam conditions, land-use change, and sediment sources and sinks. Image processing and GIS analysis of these photographs are needed to make the datasets usable. The compilation of a GIS database of maps and photographs is helping provide a ready research tool for the broader Lower Colorado River project. This report presents aerial photography from 1938, pieced together into mosaics and georeferenced by comparison with orthophotos derived from 1990s aerial photography. Superimposed as digital polygons on these images are historical river-channel positions. This initial set of map information can be built upon to include the full range of historical hardcopy and digital maps, aerial photography, and satellite imagery available for the study area (fig.1; Norman and others, 2004).

Study Area

We defined a buffer around the Lower Colorado River from Lake Mead to the Colorado River delta of 25 km (~15.5 mi) on either side to capture all potential riparian-zone areas. This buffer was used for researching available datasets and to delimit the study area (fig. 1).

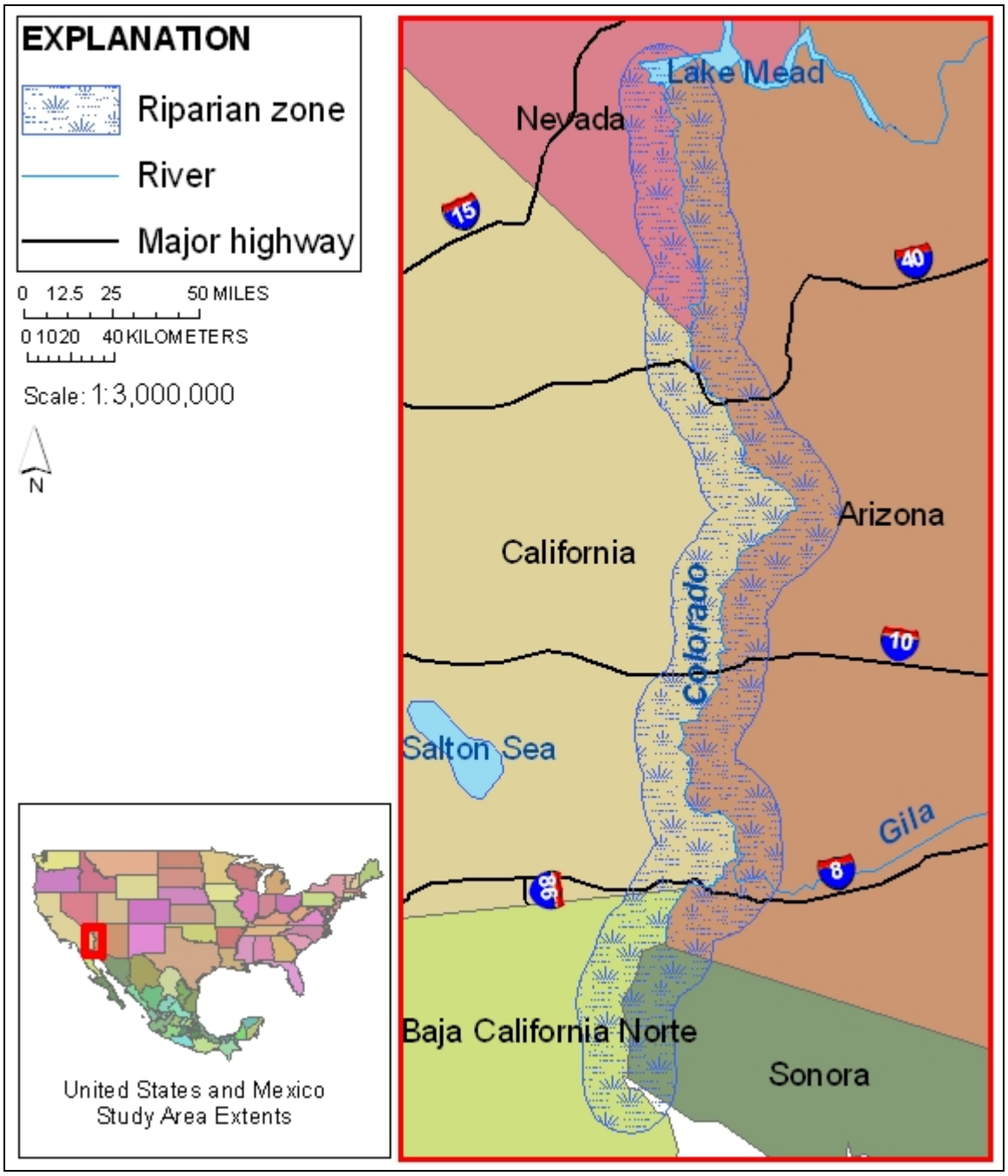


Figure 1: Lower Colorado River riparian study area.

Statement of the Problem

Little is known about the natural variation in the river valley's riparian and aquatic ecosystems. The flows of the Colorado River below the Hoover Dam are regulated on the basis of flood-control requirements, downstream diversion, and the

demand for hydroelectric power (Nathanson, 1980). The river's delta and flood plain have been altered by impoundments, flow regulation, and the conversion of native wetlands to irrigated agriculture (Luecke and others, 1999). Channel straightening and dredging (Mueller and Marsh, 2002) have significantly altered the channel. Changes in the channel position are especially important to hydrologists and other researchers in the study area. USGS scientists typically use topographic maps from the 1960s and 1970s to locate wells, but the position of the river channel has shifted so much since the creation of these maps that the known channel must be "penciled in" to maintain accurate records (fig. 2).

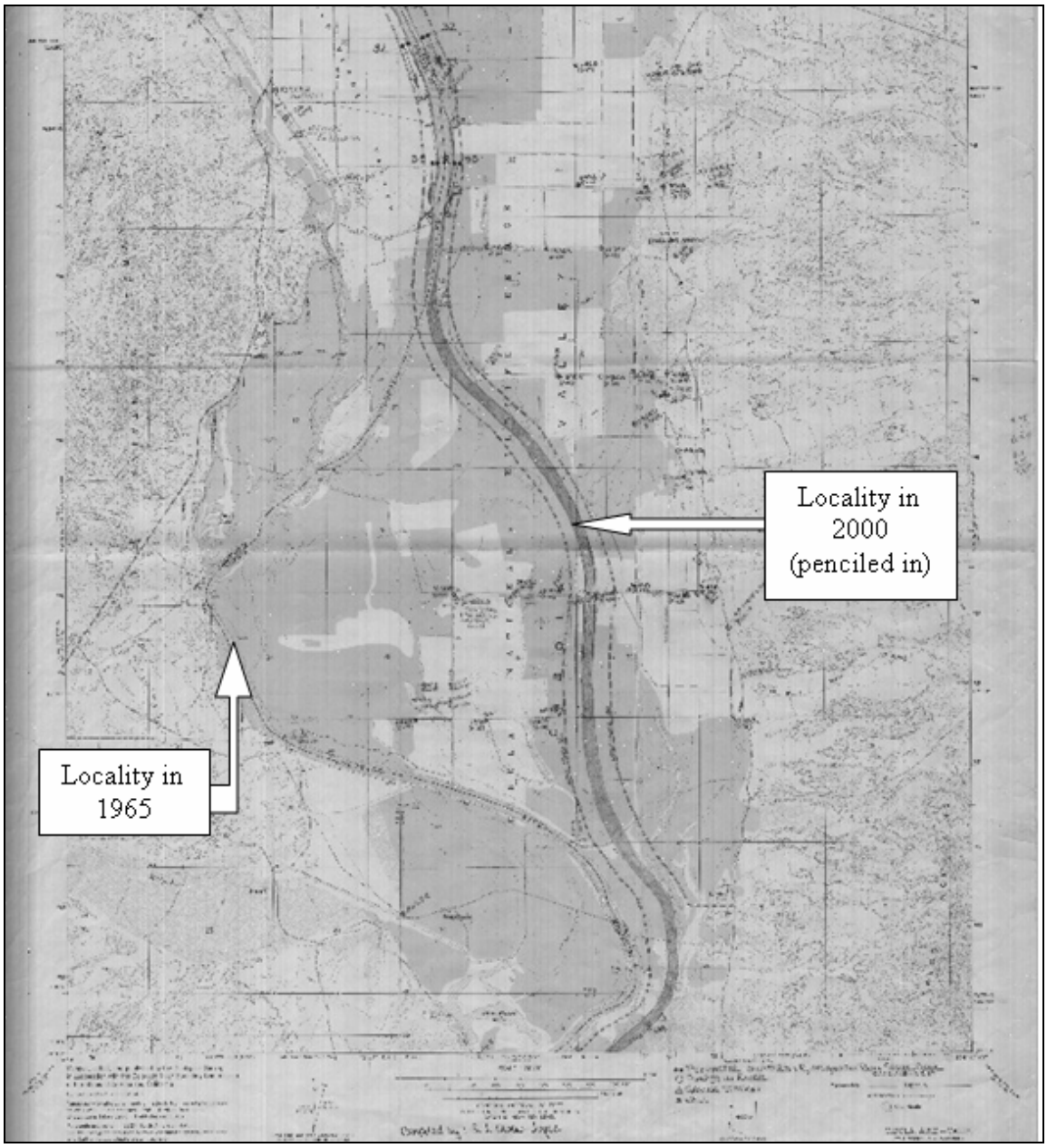


Figure 2: Scanned image of Cibola, Ariz.-Calif. 7.5-minute topographic quadrangle, showing stream channel as field checked from aerial photographs from 1961 (left). USGS scientist Sandy Owen-Joyce penciled in position of the current stream channel in 2002 according to current knowledge (right).

A history of changes in the landscape, riverflow, climate, and development can aid in understanding the environmental processes and conditions needed to maintain populations of native species and ecosystems.

Successive maps of the predam flood plain and river-meander system can provide a basis for understanding variation in the river's position and riparian habitat, and allow for reliable predictions of hydrologic and sedimentologic conditions under different management or natural-change scenarios (Ohmart and others, 1975; Kunkel, 1970). Aerial photography of the river valley and dam sites can provide direct documentation of changes in landscape, river-channel position, and flora. GIS techniques are well suited for documenting and analyzing landscape changes along large sections of the river valley (Tiegs and Pohl, 2005). A thorough knowledge of the modern and prehistoric river is a prerequisite to interdisciplinary research, as well as sound management plans.

Objective

This report presents initial results of a project to compare the landscape at different times in order to improve knowledge of the history and rates of landscape and ecologic change along the Lower Colorado River, and of links between those changes and geologic and hydrologic processes. Our goal is to provide reliable information contributing to knowledge of the geohydrologic framework of the landscape and ecosystem in order to assist in management approaches to restoring and conserving wildlife habitats. An improved understanding of that framework can help form a basis for evaluating landscape and ecosystem sensitivity, and predicting the effect of future changes and alternate scenarios.

We are developing a time series of geospatial data that incorporate repeat aerial photography, Landsat imagery, and other mapped information that can be analyzed to document changes in both landscape and vegetation on regional and local scales. The data collected set the stage for an analysis of historical changes in the river's landscape and ecosystems and geomorphic modeling of the river valley and related linkages between wildlife habitat, ground water, surface water, and sediment.

Approach

Data Acquisition

Aerial photography of the Lower Colorado River from 1938 was located in the BOR Office in Boulder City, Nev. This dataset was acquired through a Memorandum of Understanding (MOU) established between the BOR and the USGS to facilitate data

sharing in fiscal years 2004-6 (FY04-06). Tasks identified in the MOU to be carried out within a 3-year period included the following:

- The USGS will develop a Microsoft Access database containing bibliographic information and aerial-photographic identification; the BOR will provide its aerial-photographic database files for inclusion in the Access database.
- The USGS will determine yearly increments for the study, e.g. 10-year increments beginning in the predam period to the present.
- The BOR will provide use of its aerial-photographic library to the USGS and assist in the acquisition and compilation of its hardcopy photographs as determined by the USGS to be pertinent to the study.
- The USGS will use their scanning equipment at the BOR site, and the BOR can supplement the scanning process with an onsite scanner for oversize photographs to digitize them.
- The BOR will assist in providing methodologies and spatial databases to the USGS to georectify the digitized photographs to Universal Transverse Mercator (UTM) coordinates and projection.
- The USGS and BOR will share the geospatial data derived from the study.
- The USGS and BOR will continue to share geospatial data and coordination for a period of at least 3 years, at which time the MOU is renewable.

In FY04, USGS staff downloaded more than 100 digital orthophoto quarter quadrangles (DOQQs) from the Arizona Regional Image Archive (URL http://aria.arizona.edu) including 29 images from 1992 (from Needles northward to the Hoover Dam), 27 images from 1994 (from Parker northward to near Needles), and 55 images from 1996 (from the United States-Mexican border northward to Parker).

The BOR provided a 1997 Vegetation Mapping and GIS Development report (CH2MHILL, 1999) that contains a GIS layer describing vegetation and the river channel at that time, derived from a 1997 aerial-photographic set from the Hoover Dam to the Davis Dam that was also provided by BOR. The river-channel position was determined from this dataset and used for comparison with the historical data in this report.

Data Processing

In FY04, USGS staff scanned 468 prints of black-and-white aerial photographs taken by BOR in 1938. The historical photographs, which are archived in the BOR office in Boulder City, Nev., include 364 images from 1938 (from the Hoover Dam to just inside the United States-Mexican border, excluding Topock Gorge to the Parker Dam) and 104 images from 1939 (from just inside the border to the Gulf of California). The prints were scanned at a resolution of 500 dots per inch. BOR staff had also produced posters of river segments that pieced the aerial photographs together into mosaics, according to their relative positions. These poster mosaics, which were also scanned were used to help guide the data processing (fig. 3).

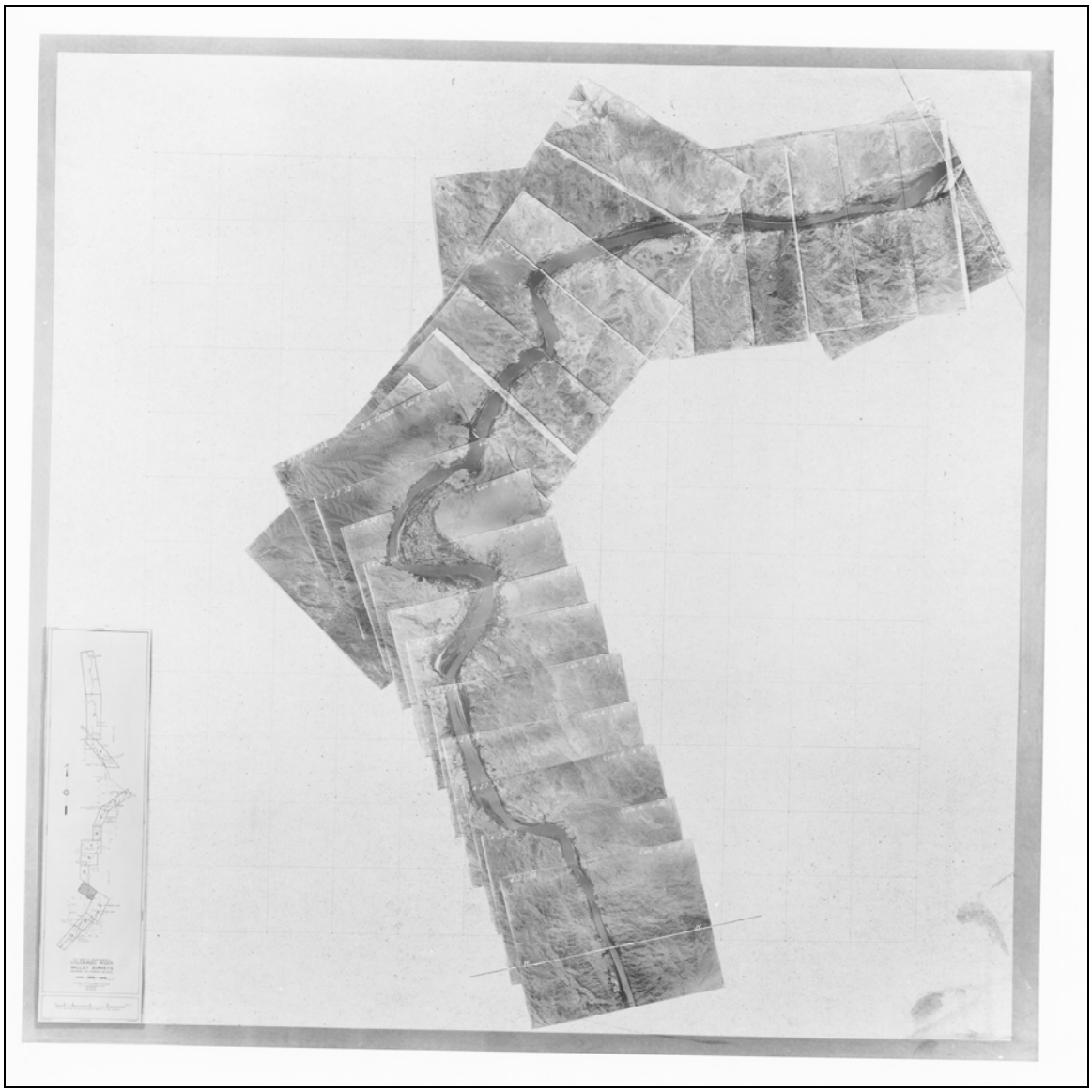


Figure 3: Scanned poster mosaic of Colorado River Index Sheet 10 of 13 (#423-1938-1).

In FY05, USGS staff scanned an additional 295 images of the Lower Colorado River from 1938 to add to the collection, based on identified gaps in previous data collection.

Individual scanned aerial photographs were then digitally pieced together into mosaics with Adobe Photoshop software, resulting in 16 mosaic images that followed the index maps previously prepared by the BOR (fig. 3). The mosaics were rectified to mid-1990s DOQQs (image to image) using the program ERDAS Imagine, with 14 to 57 ground-control points per mosaic (fig. 4). The number of ground-control points

depended on the number of features identifiable in both the 1938 aerial photographs and the 1990s DOQQs.

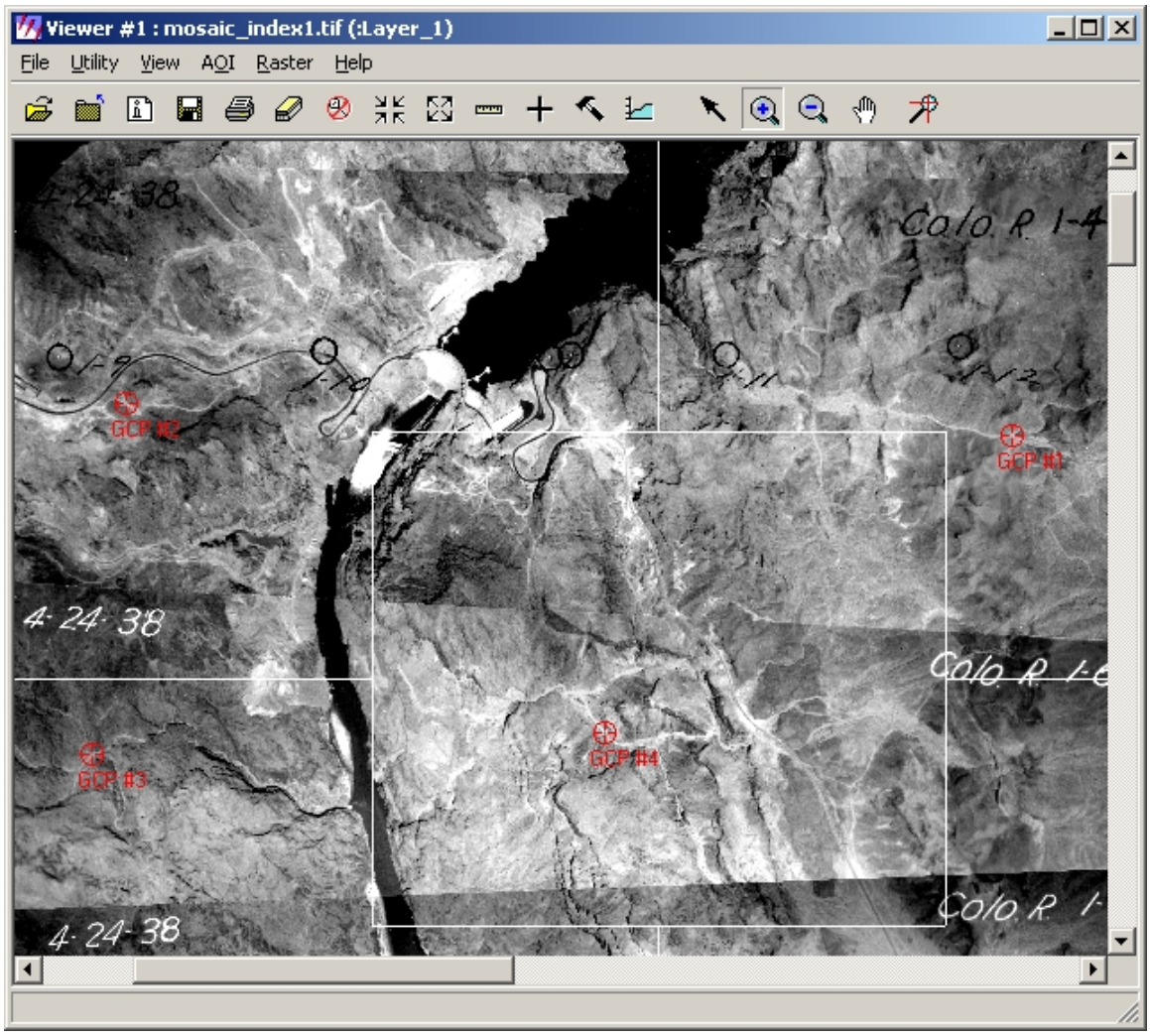


Figure 4: Screen capture of 1938 image-registration process, with identifiable ground control points along roadways selected in red.

Newly registered imagery were immediately useful to view the changes in river morphology since 1938, when overlain with a transparent GIS layer describing more recent river size and position (fig. 5).

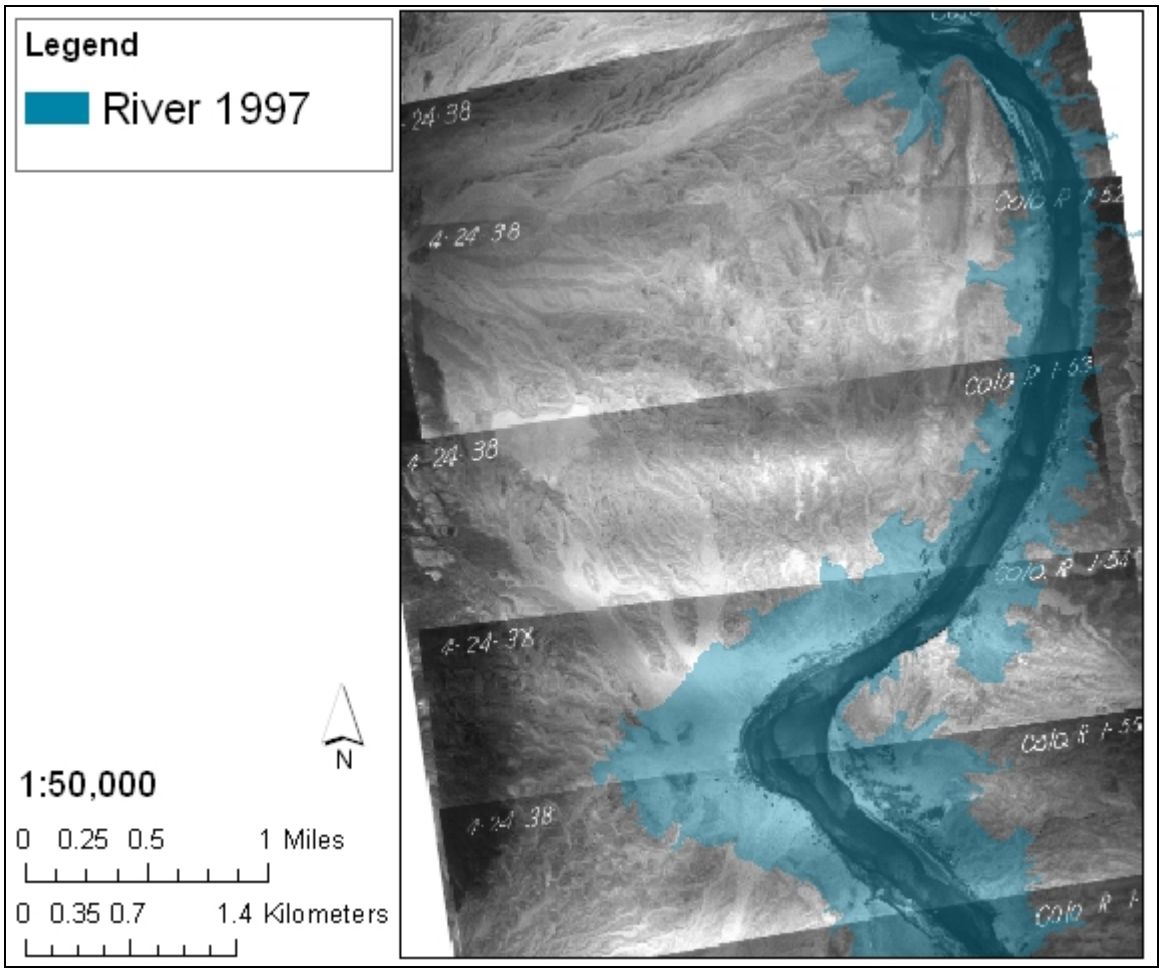


Figure 5: Newly registered 1938 photomosaic overlain with a transparent GIS layer describing 1997 size and position (blue areas).

The registered mosaics were converted to GeoTIFFs (fig. 6), and metadata has been compiled to support them.

Although the final product contains many potential errors, it is meant to be used for comparison of river-channel position and surface area in a broad sense. The registered aerial photographs were taken from an airplane for which the analysts of this dataset had no documentation. Therefore, the tilt of the airplane and camera were unknown in processing the images. Each photograph may have contained its own distortion based on these angles, and when the images were pieced together into a photomosaic, this distortion may have accumulated owing to individual variance.

Additional error may have been introduced in georeferencing the mosaics. Each mosaic was carefully compared to the area's DOQQ during data processing, and as many ground-control points as possible were selected for use in the referencing algorithm. However, because of the 60-year timelapse between photographs, the landscape was not useful for selecting areas along the river or vegetation unless obvious trees were present. Generally, roads and especially road crossings, where available, were used to warp the mosaic into referenced data. Once the ground-control points were selected, an algorithm based on the input was used to stretch the entire image through those points. This process may have stretched wilderness areas that were or are currently lacking roads into entirely wrong locations (unknown to the analyst) and may have altered the locations of the few ground-control points that were entered on the basis of the polynomial convolution.

Other errors, including an unknown error in the processed DOQQs or in the image-processing software, as well as analyst mistakes, could also have occurred. The flatter terrain of the flood plain will minimize the terrain error. Occasional shrinkage of paper in one direction more than another could also contribute to error. An error matrix could not be generated for these data because field conditions in 1938 could not be checked.

Despite these potential problems, the process used to create these photomosaics is supported in image processing for the generalized datasets. Higher-resolution, more accurate data could be obtained by orthorectifying each of the 763 aerial photographs into orthophotos by securing X, Y, and Z data points, which would require more resources than those available for this study.

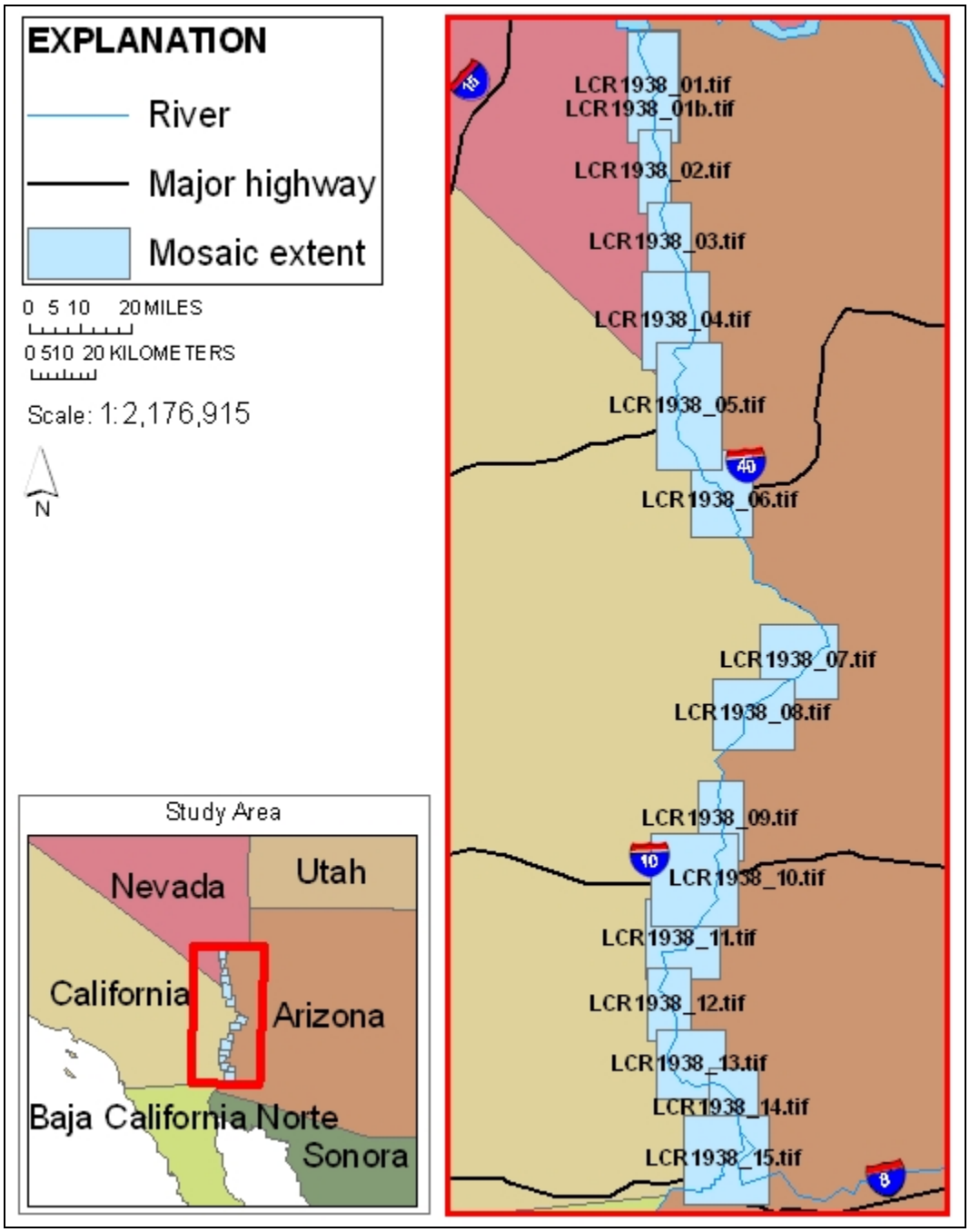


Figure 6: Extents of 1938 photomosaics of the Lower Colorado River.

Data Analysis

In FY05, a geospatial analysis was completed of the variation in river-channel position and riparian vegetation of selected parts of the Lower Colorado River for the period of record. From the registered historical aerial photographs, the entire stream channel for 1938 was digitized at a regular scale of 1:15,000, based on the analyst's

perception (fig. 7). However, the geospatial characteristics of the original data do not support the scale at which analyes were conducted.

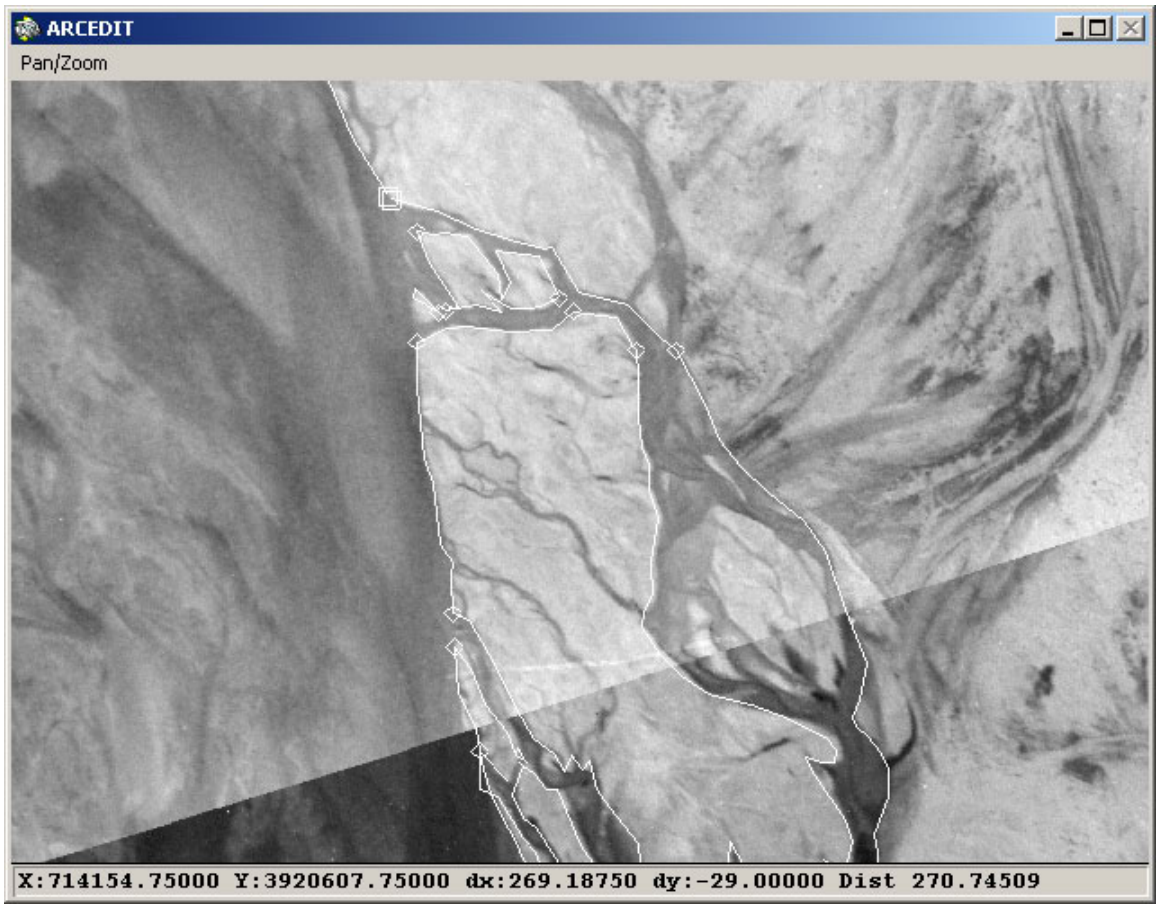


Figure 7: Screen capture of digitizing session of 1938 stream channel from registered historical aerial photographs.

Results

The resulting geospatial database includes the registered photomosaics from the 1938 aerial photographs and 1992-96 DOQQs, digital raster graphics, and the stream channel from this time series. These data can be analyzed to document changes in both landscape and vegetation on regional and local scales. Using different combinations of these data, visual analyses of change can be achieved, for example, at Lake Mojave (figs. 5, 8, 9) or Cibola National Wildlife Refuge (fig. 10).

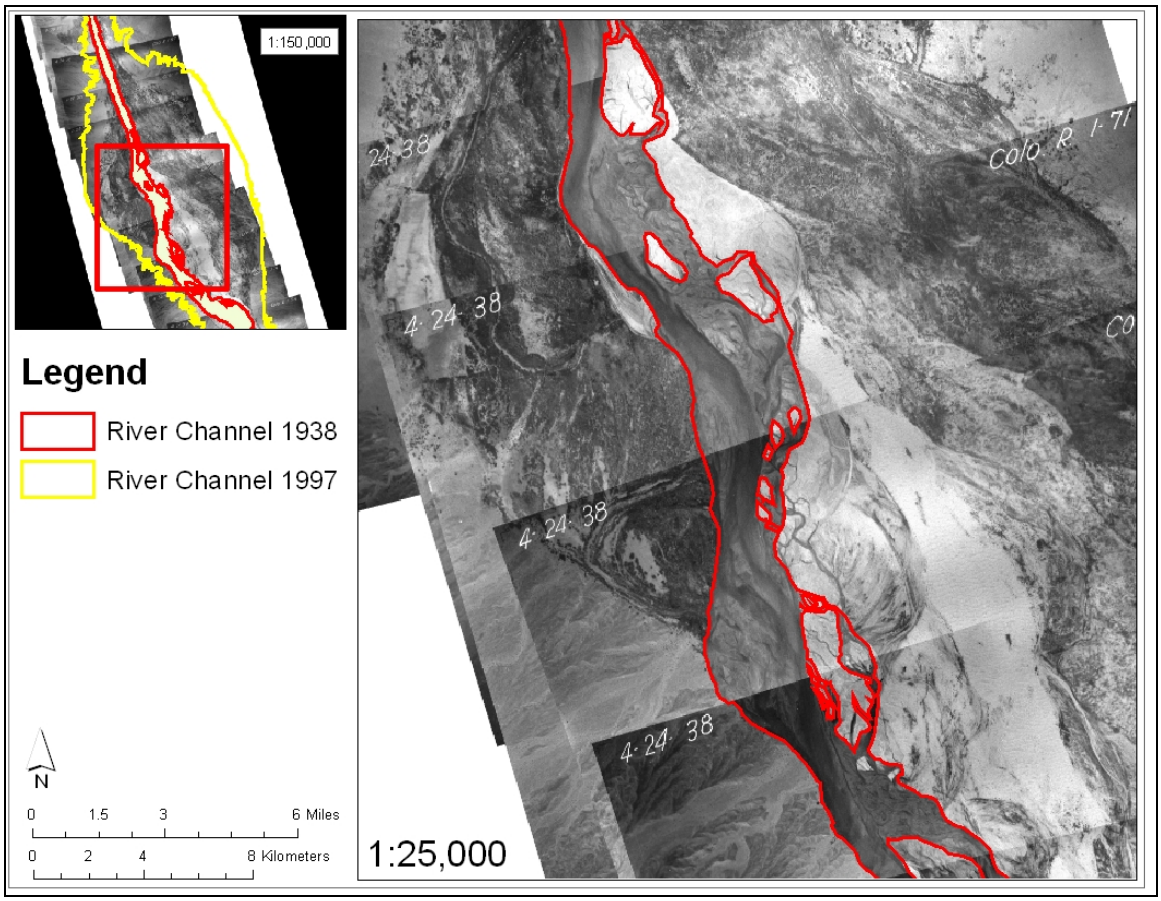


Figure 8: Mosaic of 1938 aerial photographs of Lake Mojave, with prereservoir river channels from 1938 overlain on insert map by 1997 reservoir shoreline.

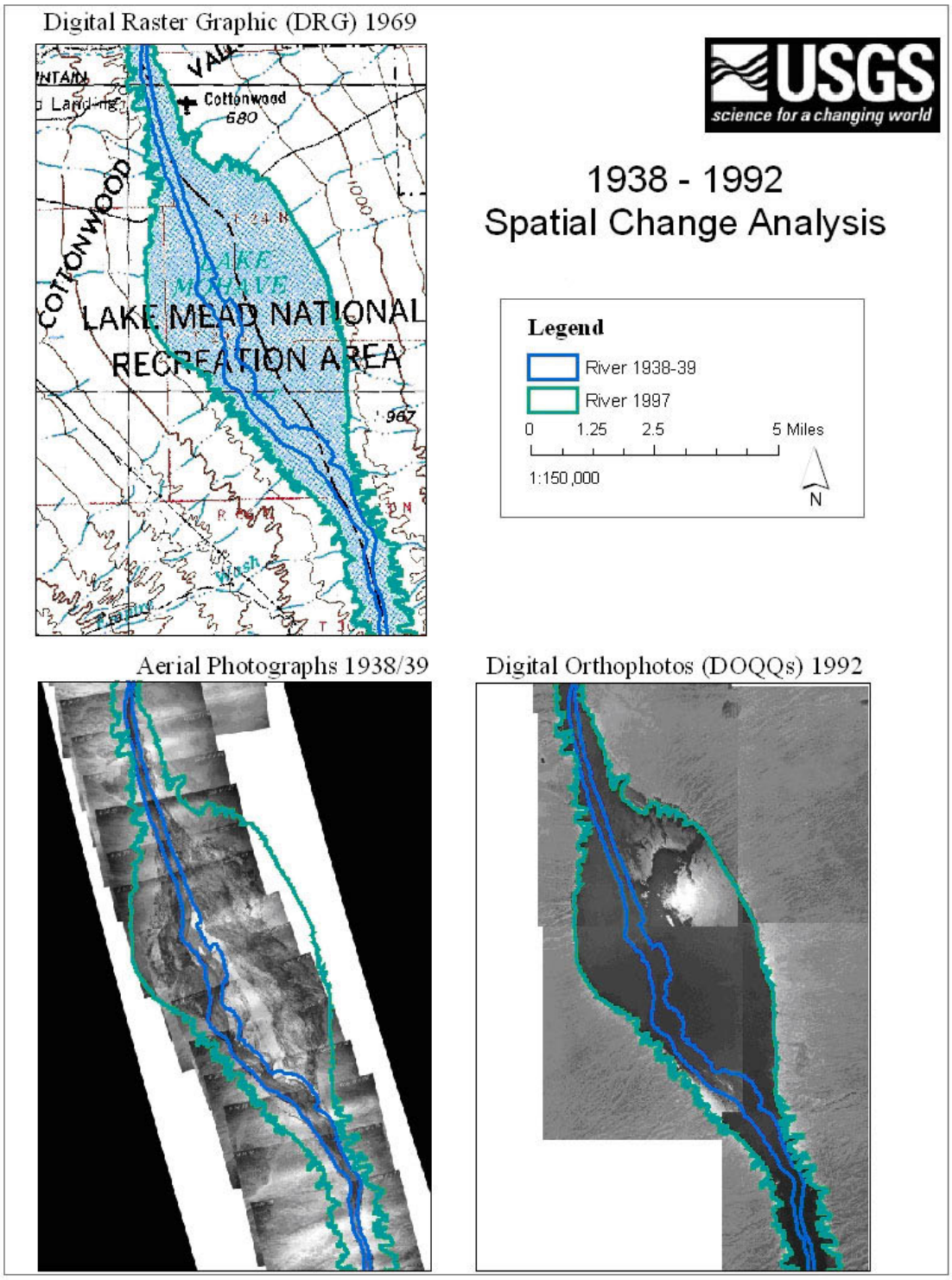
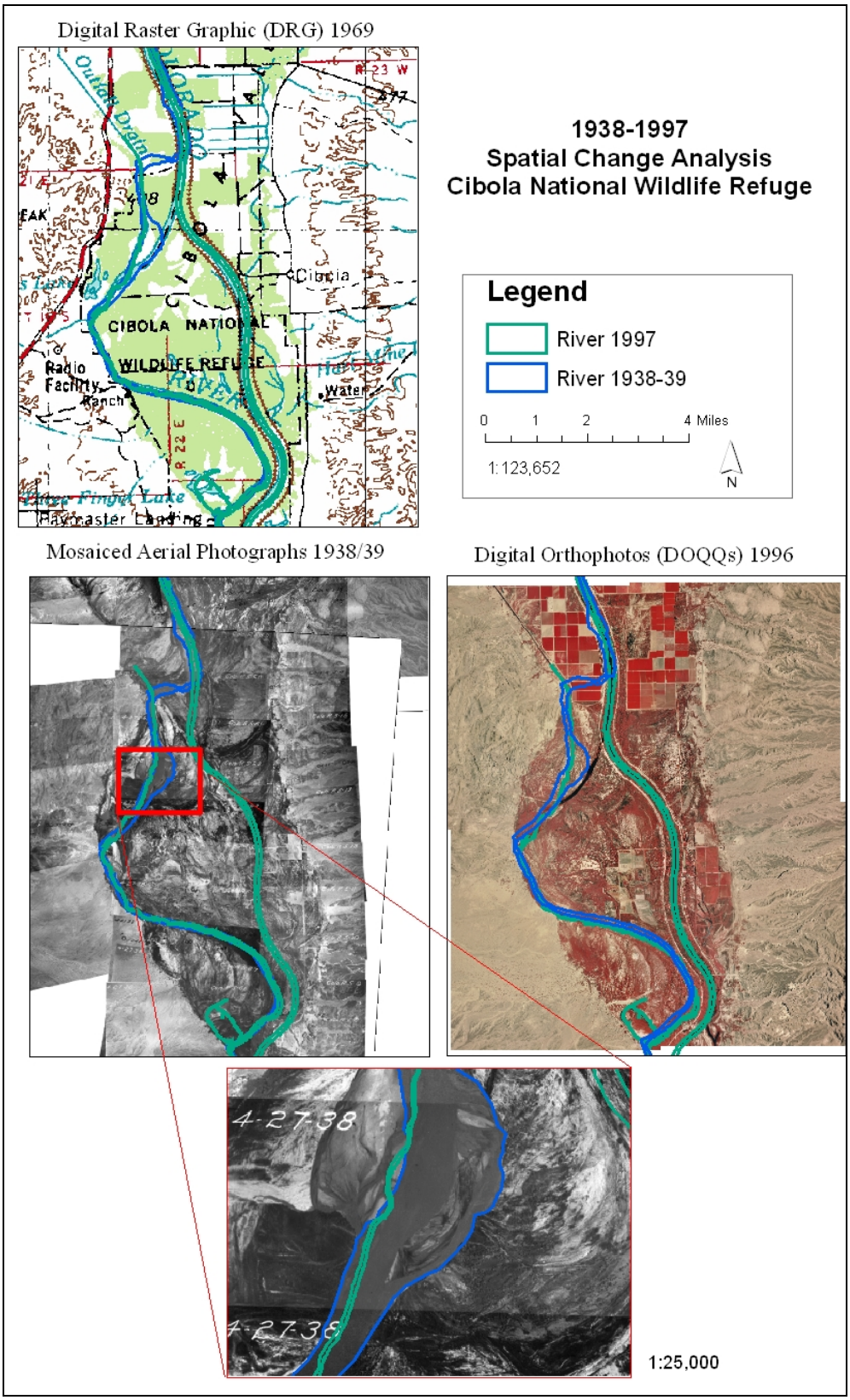


Figure 9: Image sequence showing visual spatial-change analysis of aerial photographs from 1938 (left) to 1997 (right) of Lake Mojave.

The maps of Cibola National Wildlife Refuge (fig. 10) are particularly useful to scientists studying in that area (as shown by fig. 2) who may not specialize in GIS yet rely on accurate maps for their research.


Digital Raster Graphic (DRG) 1969
1938-1997
Spatial Change Analysis
Cibola National Wildlife Refuge
Legend
River 1997
River 1938-39
0 1 2 4 Miles
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N
Mosaiced Aerial Photographs 1938/39
Digital Orthophotos (DOQQs) 1996
4-27-38
1:25,000

Figure 10: Image sequence showing river-channel spatial analysis of Cibola National Wildlife Refuge (see fig. 2).

Future Research

This study has demonstrated the need for a unified GIS database that would aid other research on the Lower Colorado River. The USGS and BOR are arranging an interagency agreement in FY06. At present, our time series extends from just after construction of the Hoover Dam in 1938 to digital raster graphics from 1969 and DOQQs from the 1990s. We plan to continue building a sound, robust dataset and to upload the result to an online Web mapping service. This dataset will then be available to the general public for visual analysis using ArcIMS software, in which the user needs only Internet access to be able to navigate the GIS data, turning layers on/off and zooming into areas of interest.

The BOR has about 400 aerial photographs of parts of the river channel from 1930. These photographs will be added to our collection and eventually mosaicked, registered, and made available to the public through our Web server. They include the Hoover damsite, Needles, Palo Verde-Cibola, and Yuma, and because they predate the effects of any of the dams, they will be an important dataset to acquire. In addition, some maps from 1902 have been identified in the USGS, Menlo Park, Calif. Office, that we plan to include in our collection as well. We hope to provide scientists interested in geospatial temporal imagery and maps of the Lower Colorado River with a GIS database, that they can use in their own research.

Acknowledgments

We thank William Waddilove of the BOR for his help in scanning aerial photographs, and Sue Beard, Keith Howard, and Karen Sue Bolm of the USGS for their helpful suggestions and careful reviews of the manuscript.

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Appendix A: Metadata

lcr1938_01.txt

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      Larger_Work_Citation:
        Citation_Information:
          Originator: By Laura M. Norman, Michael Gishey, Leila Gass, Brian Yanites, Edwin Pfeifer, Ron Simms, and Ray Ahlbrandt
          Publication_Date: 2006
          Title: Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States
          Geospatial_Data_Presentation_Form: document
          Series_Information:
            Series_Name: Open-File Report
          Publication_Information:
            Publisher: U.S. Geological Survey
  Description:
    Abstract: The objective of this project is to improve understanding of the history and rates of landscape and ecologic change along the Lower Colorado River and of their effects on geologic and hydrologic processes. The datasets allow an analysis of historical changes in the river's landscape and ecosystems, as well as modeling of the geomorphology of the river valley and related linkages between habitat, ground water, surface water, and sediment.
    Purpose: This image is one of 15 created for a geospatial analysis of change in river-channel position for the Lower Colorado River.
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Place:
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Place_Keyword: Nevada
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Laura Norman
Contact_Organization: Southwest Geographic Science Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Country: USA
Contact_Electronic_Mail_Address: lnorman@usgs.gov
Data_Set_Credit: Aerial photos from the U.S. Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, Nev. Scanning, mosaicking, and image rectification by Brian Yanites and Mike Gishey, U.S. Geological Survey.
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.0.0.535
Data_Quality_Information:
Attribute_Accuracy:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: Mosaic images vary in positional accuracy. Offsets from digital orthophotos used in the rectification process are due to lack of elevation data and other ground-control data.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Bureau of Reclamation
Title: Colorado River Frontwork & Levee System
Edition: flown by Fairchild Aerials, Los Angeles

Other_Citation_Details:
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Colo. R. 1-3,4/24/1938; Colo. R. 1-4,4/24/1938; Colo. R. 1-6,4/24/1938; Colo. R. 1-7,4/24/1938; Colo. R. 1-8,4/24/1938; Colo. R. 1-9,4/24/1938; Colo. R. 1-15,4/24/1938; Colo. R. 1-16,4/24/1938; Colo. R. 1-11,4/24/1938; Colo. R. 1-21,4/24/1938; Colo. R. 1-20,4/24/1938; Colo. R. 1-19,4/24/1938; Colo. R. 1-18,4/24/1938; Colo. R. 1-23,4/24/1938; Colo. R. 1-24,4/24/1938; Colo. R. 1-25,4/24/1938; Colo. R. 1-26,4/24/1938; Colo. R. 1-27,4/24/1938; Colo. R. 1-30,4/24/1938; Colo. R. 1-31,4/24/1938; Colo. R. 1-32,4/24/1938; Colo. R. 1-33,4/24/1938; Colo. R. 1-34,4/24/1938; Colo. R. 1-35,4/24/1938; Colo. R. 1-36,4/24/1938; Colo. R. 1-37,4/24/1938; Colo. R. 1-38,4/24/1938; Colo. R. 1-39,4/24/1938
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Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 1938
Source_Currentness_Reference: ground condition
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: 1992-96
Title: Digital Orthophoto Quarter Quadrangle
Publication_Information:
Source_Time_Period_of_Content:
Time_Period_Information:
Multiple_Dates/Times:
Single_Date/Time:
Calendar_Date: 1992-1996
Process_Step:
Process_Description: Individual aerial photoprints were scanned at 500 dpi. Images were then mosaiced using Adobe Photoshop, resulting in 16 mosaic images that followed index maps previously prepared by the U.S. Bureau of Reclamation. The mosaics were then rectified to mid-1990s digital orthophotos (image to image) using ERDAS Imagine, with 14 to 57 ground-control points used per mosaic (number of ground-control points depended on the number of identifiable features appearing in both the 1938/1939 images and the 1990s digital orthophotos). This mosaic had 46 ground-control points.
Process_Date: 12/2004
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: 39312
Column_Count: 18239
Vertical_Count: 1
Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 11
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -117.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 0.912828
Ordinate_Resolution: 0.912828
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: Band_1
Attribute:
Attribute_Label: ObjectID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Value
Attribute:
Attribute_Label: Count
Distribution_Information:
Resource_Description: Downloadable Data
Distribution_Liability:
Although these data have been compiled by the U.S. Geological Survey (USGS), U.S. Department of the Interior (USDOI), these data and information are provided with the understanding that they are not guaranteed to be 100% accurate or complete.
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conduct of business that involves substantial monetary or operational consequences. Conclusions drawn from, or actions undertaken on the basis of, such data and information are the sole responsibility of the user.

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Trade, firm, or product names and other references to non-USGS products and services are provided for information only and do not constitute endorsement or warranty, express or implied, by the USGS, USDOI, or U.S. Government, as to their suitability, content, usefulness, functioning, completeness, or accuracy.

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        Transfer_Size: 0.000
Metadata_Reference_Information:
  Metadata_Date: 20060322
  Metadata_Contact:
    Contact_Information:
      Contact_Organization_Primary:
        Contact_Organization: U.S. Geological Survey
        Contact_Person: Southwest Geographic Science Team
      Contact_Address:
        Address_Type: mailing and physical address
        Address: 520 N. Park Ave., Suite 106
        City: Tucson
        State_or_Province: AZ
        Postal_Code: 85719
      Contact_Voice_Telephone: 520-670-5510
  Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
  Metadata_Standard_Version: FGDC-STD-001-1998
  Metadata_Time_Convention: local time
  Metadata_Extensions:
    Online_Linkage: http://www.esri.com/metadata/esriprof80.html
    Profile_Name: ESRI Metadata Profile
  Metadata_Extensions:
    Online_Linkage: http://www.esri.com/metadata/esriprof80.html
    Profile_Name: ESRI Metadata Profile
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lcr1938_02.txt

Identification_Information:
  Citation:
    Citation_Information:
      Originator: U.S. Geological Survey
      Publication_Date: Unpublished Material
      Title: lcr1938_02.txt
      Geospatial_Data_Presentation_Form: remote-sensing image
      Larger_Work_Citation:
        Citation_Information:
          Originator: By Laura M. Norman, Michael Gishey, Leila Gass, Brian Yanites, Edwin Pfeifer, Ron Simms, and Ray Ahlbrandt
          Publication_Date: 2006
          Title: Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States
          Geospatial_Data_Presentation_Form: document
          Series_Information:
            Series_Name: Open-File Report
          Publication_Information:
            Publisher: U.S. Geological Survey
  Description:
    Abstract: The objective of this project is to improve understanding of the history and rates of landscape and ecologic change along the Lower Colorado River and of their effects on geologic and hydrologic processes. The datasets allow an analysis of historical changes in the river's landscape and ecosystems, as well as modeling of the geomorphology of the river valley and related linkages between habitat, ground water, surface water, and sediment.
    Purpose: This image is one of 15 created for a geospatial analysis of change in river-channel position for the Lower Colorado River.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 19380424
    Currentness_Reference: ground condition
  Status:
    Progress: Complete
    Maintenance_and_Update_Frequency: None planned
  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -114.746120
      East_Bounding_Coordinate: -114.625219
      North_Bounding_Coordinate: 35.754820
      South_Bounding_Coordinate: 35.515214
  Keywords:
    Theme:

Theme_Keyword_Thesaurus:
http://www.fgdc.gov/clearinghouse/reference/nasa_long.html
Theme_Keyword: Rivers
Theme_Keyword: Geomorphology
Theme_Keyword: Riparian Communities
Place:
Place_Keyword: Arizona
Place_Keyword: Nevada
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Laura Norman
Contact_Organization: Southwest Geographic Science Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Country: USA
Contact_Electronic_Mail_Address: lnorman@usgs.gov
Data_Set_Credit: Aerial photos from the U.S. Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, Nev. Scanning, mosaicking, and image rectification by Brian Yanites and Mike Gishey, U.S. Geological Survey.
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.0.0.535
Data_Quality_Information:
Attribute_Accuracy:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: Mosaic images vary in positional accuracy. Offsets from digital orthophotos used in the rectification process are due to lack of elevation data and other ground-control data.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Bureau of Reclamation
Title: Colorado River Frontwork & Levee System
Edition: flown by Fairchild Aerials, Los Angeles
Other_Citation_Details:

Scale of photos is 1:20,000.
Colo. R. 1-40,4/24/1938; Colo. R. 1-41,4/24/1938; Colo. R. 1-42,4/24/1938; Colo. R. 1-43,4/24/1938; Colo. R. 1-44,4/24/1938; Colo. R. 1-45,4/24/1938; Colo. R. 1-46,4/24/1938; Colo. R. 1-47,4/24/1938; Colo. R. 1-48,4/24/1938; Colo. R. 1-49,4/24/1938; Colo. R. 1-50,4/24/1938; Colo. R. 1-51,4/24/1938; Colo. R. 1-52,4/24/1938; Colo. R. 1-53,4/24/1938; Colo. R. 1-54,4/24/1938; Colo. R. 1-55,4/24/1938; Colo. R. 1-56,4/24/1938; Colo. R. 1-57,4/24/1938;
Type_of_Source_Media: Aerial photographs
Source_Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 1938
Ending_Date: 1939
Source_Currentness_Reference: ground condition
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: 1992-96
Title: Digital Orthophoto Quarter Quadrangle
Source_Time_Period_of_Content:
Time_Period_Information:
Multiple_Dates/Times:
Single_Date/Time:
Calendar_Date: 1992-96
Process_Step:
Process_Description: Individual aerial photoprints were scanned at 500 dpi. Images were then mosaicked using Adobe Photoshop, resulting in 16 mosaic images that followed index maps previously prepared by the U.S. Bureau of Reclamation. The mosaics were then rectified to mid-1990s digital orthophotos (image to image), using ERDAS Imagine, with 14 to 57 ground-control points used per mosaic (number of ground-control points depended on the number of identifiable features appearing in both the 1938/1939 images and the 1990s digital orthophotos). This mosaic had 17 ground-control points.
Process_Date: 12/2004
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: 29410
Column_Count: 11534
Vertical_Count: 1
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:

Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 11
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -117.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 0.896044
Ordinate_Resolution: 0.896044
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: Band_1
Attribute:
Attribute_Label: ObjectID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Value
Attribute:
Attribute_Label: Count
Distribution_Information:
Resource_Description: Downloadable Data
Distribution_Liability:
Although these data have been compiled by the U.S. Geological Survey (USGS), U.S. Department of the Interior (USDOI), these data and information are provided with the understanding that they are not guaranteed to be 100% accurate or complete.

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Trade, firm, or product names and other references to non-USGS products and services are provided for information only and do not constitute endorsement or warranty, express or implied, by the USGS, USDOI, or U.S. Government, as to their suitability, content, usefulness, functioning, completeness, or accuracy.

Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 0.000
Metadata_Reference_Information:
Metadata_Date: 20060322
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Person: Southwest Geographic Science Team
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Contact_Voice_Telephone: 520-670-5510
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

lcr1938_03.txt

Identification_Information:
  Citation:
    Citation_Information:
      Originator: U.S. Geological Survey
      Publication_Date: Unpublished Material
      Title: lcr1938_03.txt
      Geospatial_Data_Presentation_Form: remote-sensing image
      Larger_Work_Citation:
        Citation_Information:
          Originator: By Laura M. Norman, Michael Gishey, Leila Gass, Brian Yanites, Edwin Pfeifer, Ron Simms, and Ray Ahlbrandt
          Publication_Date: 2006
          Title: Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States
          Geospatial_Data_Presentation_Form: document
          Series_Information:
            Series_Name: Open-File Report
          Publication_Information:
            Publisher: U.S. Geological Survey
  Description:
    Abstract: The objective of this project is to improve understanding of the history and rates of landscape and ecologic change along the Lower Colorado River and of their effects on geologic and hydrologic processes. The datasets allow an analysis of historical changes in the river's landscape and ecosystems, as well as modeling of the geomorphology of the river valley and related linkages between habitat, ground water, surface water, and sediment.
    Purpose: This image is one of 15 created for a geospatial analysis of change in river-channel position for the Lower Colorado River.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 19380424
    Currentness_Reference: ground condition
  Status:
    Progress: Complete
    Maintenance_and_Update_Frequency: None planned
  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -114.723039
      East_Bounding_Coordinate: -114.560242
      North_Bounding_Coordinate: 35.551730
      South_Bounding_Coordinate: 35.310616
  Keywords:
    Theme:

Theme_Keyword_Thesaurus:
http://www.fgdc.gov/clearinghouse/reference/nasa_long.html
Theme_Keyword: Rivers
Theme_Keyword: Geomorphology
Theme_Keyword: Riparian Communities
Place:
Place_Keyword: Arizona
Place_Keyword: Nevada
Place_Keyword: Mohave Crossing
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Laura Norman
Contact_Organization: Southwest Geographic Science Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Country: USA
Contact_Electronic_Mail_Address: lnorman@usgs.gov
Data_Set_Credit: Aerial photos from the U.S. Bureau of Reclamation, Lower Colorado Regional Office, Boulder City. Scanning, mosaicking, and image rectification by Brian Yanites and Mike Gishey, U.S. Geological Survey.
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.0.0.535
Data_Quality_Information:
Attribute_Accuracy:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: Mosaic images vary in positional accuracy. Offsets from digital orthophotos used in the rectification process are due to lack of elevation data and other ground-control data.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Bureau of Reclamation
Title: Colorado River Frontwork & Levee System
Edition: flown by Fairchild Aerials, Los Angeles

Other_Citation_Details:
Scale of photos is 1:20,000.
Colo. R. 1-61,4/24/1938; Colo. R. 1-58,4/24/1938; Colo. R. 1-62,4/24/1938; Colo. R. 1-59,4/24/1938; Colo. R. 1-64,4/24/1938; Colo. R. 1-60,4/24/1938; Colo. R. 1-65,4/24/1938; Colo. R. 1-66,4/24/1938; Colo. R. 1-67,4/24/1938; Colo. R. 1-68,4/24/1938; Colo. R. 1-69,4/24/1938; Colo. R. 1-70,4/24/1938; Colo. R. 1-71,4/24/1938; Colo. R. 1-72,4/24/1938; Colo. R. 1-73,4/24/1938; Colo. R. 1-74,4/24/1938; Colo. R. 1-75,4/24/1938; Colo. R. 1-76,4/24/1938; Colo. R. 1-77,4/24/1938;
Type_of_Source_Media: Aerial photographs
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19380424
Source_Currentness_Reference: ground condition
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: 1992-96
Title: Digital Orthophoto Quarter Quadrangle
Source_Time_Period_of_Content:
Time_Period_Information:
Multiple_Dates/Times:
Single_Date/Time:
Calendar_Date: 1992-96
Process_Step:
Process_Description: Individual aerial photo prints were scanned at 500 dpi. Images were then mosaiced using Adobe Photoshop, resulting in 16 mosaic images that followed index maps previously prepared by the U.S. Bureau of Reclamation. The mosaics were then rectified to mid-1990s digital orthophotos (image to image) using ERDAS Imagine, with 14 to 57 ground-control points used per mosaic (number of ground-control points depended on the number of identifiable features appearing in both the 1938/1939 images and the 1990s digital orthophotos). This mosaic had 21 ground-control points.
Process_Date: 12/2004
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: 28893
Column_Count: 15481
Vertical_Count: 1
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:

Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 11
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -117.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 0.914593
Ordinate_Resolution: 0.914593
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: Band_1
Attribute:
Attribute_Label: ObjectID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Value
Attribute:
Attribute_Label: Count
Distribution_Information:
Resource_Description: Downloadable Data
Distribution_Liability:
Although these data have been compiled by the U.S. Geological Survey (USGS), U.S. Department of the Interior (USDOI), these data and information are provided with the understanding that they are not guaranteed to be 100% accurate or complete.

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Trade, firm, or product names and other references to non-USGS products and services are provided for information only and do not constitute endorsement or warranty, express or implied, by the USGS, USDOI, or U.S. Government, as to their suitability, content, usefulness, functioning, completeness, or accuracy.

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Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 0.000
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Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Person: Southwest Geographic Science Team
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Contact_Voice_Telephone: 520-670-5510
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

lcr1938_04.txt

Identification_Information:
  Citation:
    Citation_Information:
      Originator: U.S. Geological Survey
      Publication_Date: Unpublished Material
      Title: lcr1938_04.txt
      Geospatial_Data_Presentation_Form: remote-sensing image
      Larger_Work_Citation:
        Citation_Information:
          Originator: By Laura M. Norman, Michael Gishey, Leila Gass, Brian Yanites, Edwin Pfeifer, Ron Simms, and Ray Ahlbrandt
          Publication_Date: 2006
          Title: Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States
          Geospatial_Data_Presentation_Form: document
          Series_Information:
            Series_Name: Open-File Report
          Publication_Information:
            Publisher: U.S. Geological Survey
  Description:
    Abstract: The objective of this project is to improve understanding of the history and rates of landscape and ecologic change along the Lower Colorado River and of their effects on geologic and hydrologic processes. The datasets allow an analysis of historical changes in the river's landscape and ecosystems, as well as modeling of the geomorphology of the river valley and related linkages between habitat, ground water, surface water, and sediment.
    Purpose: This image is one of 15 created for a geospatial analysis of change in river-channel position for the Lower Colorado River.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 19380424
    Currentness_Reference: ground condition
  Status:
    Progress: Complete
    Maintenance_and_Update_Frequency: None planned
  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -114.746099
      East_Bounding_Coordinate: -114.508078
      North_Bounding_Coordinate: 35.352412
      South_Bounding_Coordinate: 35.067794
  Keywords:
    Theme:

Theme_Keyword_Thesaurus:
http://www.fgdc.gov/clearinghouse/reference/nasa_long.html
Theme_Keyword: Rivers
Theme_Keyword: Geomorphology
Theme_Keyword: Riparian Communities
Place:
Place_Keyword: Arizona
Place_Keyword: Nevada
Place_Keyword: Bullhead City
Place_Keyword: Riviera
Place_Keyword: Davis Dam
Place_Keyword: Katherine
Place_Keyword: Laughlin
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Laura Norman
Contact_Organization: Southwest Geographic Science Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Country: USA
Contact_Electronic_Mail_Address: lnorman@usgs.gov
Data_Set_Credit: Aerial photos from the U.S. Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, Nev. Scanning, mosaicking, and image rectification by Brian Yanites and Mike Gishey, U.S. Geological Survey.
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.0.0.535
Data_Quality_Information:
Attribute_Accuracy:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: Mosaic images vary in positional accuracy. Offsets from digital orthophotos used in the rectification process are due to lack of elevation data and other ground control data.
Lineage:
Source_Information:
Source_Citation:

Citation_Information:
Originator: U.S. Bureau of Reclamation
Title: Colorado River Frontwork & Levee System
Edition: flown by Fairchild Aerials, Los Angeles
Other_Citation_Details:
Scale of photos is 1:20,000.
Colo. R. 1-78,4/24/1938; Colo. R. 1-79,4/24/1938; Colo. R. 1-80,4/24/1938; Colo. R. 1-81,4/24/1938; Colo. R. 1-82,4/24/1938; Colo. R. 1-83,4/24/1938; Colo. R. 1-84,4/24/1938; Colo. R. 1-85,4/24/1938; Colo. R. 1-86,4/24/1938; Colo. R. 1-87,4/21/1938; Colo. R. 1-88,4/24/1938; Colo. R. 1-89,4/24/1938; Colo. R. 1-90,4/24/1938; Colo. R. 1-91,4/24/1938; Colo. R. 1-92,4/24/1938; Colo. R. 1-93,4/24/1938; Colo. R. 1-94,4/24/1938; Colo. R. 1-95,4/24/1938; Colo. R. 1-96,4/24/1938; Colo. R. 1-97,4/24/1938; Colo. R. 1-98,4/24/1938; Colo. R. 1-99,4/24/1938; Colo. R. 1-100,4/24/1938; Colo. R. 1-101,4/24/1938; Colo. R. 1-102,4/24/1938
Type_of_Source_Media: Aerial photographs
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19380424
Source_Currentness_Reference: ground condition
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: 1992-96
Title: Digital Orthophoto Quarter Quadrangle
Source_Time_Period_of_Content:
Time_Period_Information:
Multiple_Dates/Times:
Single_Date/Time:
Calendar_Date: 1992-96
Process_Step:
Process_Description: Individual aerial photoprints were scanned at 500 dpi. Images were then mosaicked using Adobe Photoshop, resulting in 16 mosaic images that followed index maps previously prepared by the U.S. Bureau of Reclamation. The mosaics were then rectified to mid-1990s digital orthophotos (image to image) using ERDAS Imagine, with 14 to 57 ground-control points used per mosaic (number of ground-control points depended on the number of identifiable features appearing in both the 1938/1939 images and the 1990s digital orthophotos). This mosaic had 34 ground-control points.
Process_Date: 12/2004
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel

Row_Count: 32325
Column_Count: 21771
Vertical_Count: 1
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 11
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -117.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 0.961827
Ordinate_Resolution: 0.961827
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: Band_1
Attribute:
Attribute_Label: ObjectID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Value
Attribute:
Attribute_Label: Count
Distribution_Information:
Resource_Description: Downloadable Data
Distribution_Liability:

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Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 0.000
Metadata_Reference_Information:
Metadata_Date: 20060322
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Person: Southwest Geographic Science Team
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Contact_Voice_Telephone: 520-670-5510
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

lcr1938_05.txt

Identification_Information:
  Citation:
    Citation_Information:
      Originator: U.S. Geological Survey
      Publication_Date: Unpublished Material
      Title: lcr1938_05.txt
      Geospatial_Data_Presentation_Form: remote-sensing image
      Larger_Work_Citation:
        Citation_Information:
          Originator: By Laura M. Norman, Michael Gishey, Leila Gass, Brian Yanites, Edwin Pfeifer, Ron Simms, and Ray Ahlbrandt
          Publication_Date: 2006
          Title: Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States
          Geospatial_Data_Presentation_Form: document
          Series_Information:
            Series_Name: Open-File Report
          Publication_Information:
            Publisher: U.S. Geological Survey
  Description:
    Abstract: The objective of this project is to improve understanding of the history and rates of landscape and ecologic change along the Lower Colorado River and of their effects on geologic and hydrologic processes. The datasets allow an analysis of historical changes in the river's landscape and ecosystems, as well as modeling of the geomorphology of the river valley and related linkages between habitat, ground water, surface water, and sediment.
    Purpose: This image is one of 15 created for a geospatial analysis of change in river-channel position for the Lower Colorado River.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 19380424
    Currentness_Reference: ground condition
  Status:
    Progress: Complete
    Maintenance_and_Update_Frequency: None planned
  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -114.707522
      East_Bounding_Coordinate: -114.464850
      North_Bounding_Coordinate: 35.149618
      South_Bounding_Coordinate: 34.784093
  Keywords:
    Theme:

Theme_Keyword_Thesaurus:
http://www.fgdc.gov/clearinghouse/reference/nasa_long.html
Theme_Keyword: Rivers
Theme_Keyword: Geomorphology
Theme_Keyword: Riparian Communities
Place:
Place_Keyword: California
Place_Keyword: Arizona
Place_Keyword: Nevada
Place_Keyword: Mojave City
Place_Keyword: Needles
Place_Keyword: Mohave Valley
Place_Keyword: Willow Valley
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Laura Norman
Contact_Organization: Southwest Geographic Science Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Country: USA
Contact_Electronic_Mail_Address: lnorman@usgs.gov
Data_Set_Credit: Aerial photos from the U.S. Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, Nev. Scanning, mosaicking, and image rectification by Brian Yanites and Mike Gishey, U.S. Geological Survey.
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.0.0.535
Data_Quality_Information:
Attribute_Accuracy:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: Mosaic images vary in positional accuracy. Offsets from digital orthophotos used in the rectification process are due to lack of elevation data and other ground-control data.
Lineage:
Source_Information:
Source_Citation:

Citation_Information:
Originator: U.S. Bureau of Reclamation
Title: Colorado River Frontwork & Levee System
Edition: flown by Fairchild Aerials, Los Angeles
Other_Citation_Details:
Scale of photos is 1:20,000.
Colo. R. 2-57,4/24/1938; Colo. R. 2-1,4/24/1938; Colo. R. 2-11,4/24/1938; Colo. R. 2-56,4/24/1938; Colo. R. 2-58,4/24/1938; Colo. R. 2-2,4/24/1938; Colo. R. 2-12,4/24/1938; Colo. R. 2-55,4/24/1938; Colo. R. 2-59,4/24/1938; Colo. R. 2-3,4/24/1938; Colo. R. 2-13,4/24/1938; Colo. R. 2-54,4/24/1938; Colo. R. 2-60,4/24/1938; Colo. R. 2-4,4/24/1938; Colo. R. 2-14,4/24/1938; Colo. R. 2-53,4/24/1938; Colo. R. 2-61,4/24/1938; Colo. R. 2-5,4/24/1938; Colo. R. 2-15,4/24/1938; Colo. R. 2-52,4/24/1938; Colo. R. 2-62,4/24/1938; Colo. R. 2-6,4/24/1938; Colo. R. 2-16,4/24/1938; Colo. R. 2-50,4/24/1938; Colo. R. 2-63,4/24/1938; Colo. R. 2-7,4/24/1938; Colo. R. 2-17,4/24/1938; Colo. R. 2-48,4/24/1938; Colo. R. 2-64,4/24/1938; Colo. R. 2-8,4/24/1938; Colo. R. 2-47,4/24/1938; Colo. R. 2-65,4/24/1938; Colo. R. 2-9,4/24/1938; ,,Colo. R. 2-45,4/24/1938; Colo. R. 2-66,4/24/1938; Colo. R. 2-10,4/24/1938; Colo. R. 2-44,4/24/1938; Colo. R. 2-67,4/24/1938; Colo. R. 2-43,4/24/1938; Colo. R. 2-68,4/24/1938; Colo. R. 2-69,4/24/1938; Colo. R. 2-70,4/24/1938
Type_of_Source_Media: Aerial photographs
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19380424
Source_Currentness_Reference: ground condition
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: 1992-96
Title: Digital Orthophoto Quarter Quadrangle
Source_Time_Period_of_Content:
Time_Period_Information:
Multiple_Dates/Times:
Single_Date/Time:
Calendar_Date: 1992-96
Process_Step:
Process_Description: Individual aerial photoprints were scanned at 500 dpi. Images were then mosaicked using Adobe Photoshop, resulting in 16 mosaic images that followed index maps previously prepared by the U.S. Bureau of Reclamation. The mosaics were then rectified to mid-1990s digital orthophotos (image to image) using ERDAS Imagine, with 14 to 57 ground-control points used per mosaic (number of ground-control points depended on the number of identifiable features appearing in both the 1938/1939 images and the 1990s digital orthophotos).
Process_Date: 12/2004
Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: 40059
Column_Count: 21205
Vertical_Count: 1
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 11
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -117.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 1.000000
Ordinate_Resolution: 1.000000
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: Band_1
Attribute:
Attribute_Label: ObjectID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Value
Attribute:
Attribute_Label: Count
Distribution_Information:

Resource_Description: Downloadable Data
Distribution_Liability:
Although these data have been compiled by the U.S. Geological Survey (USGS), U.S. Department of the Interior (USDOI), these data and information are provided with the understanding that they are not guaranteed to be 100% accurate or complete.

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Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 0.000
Metadata_Reference_Information:
Metadata_Date: 20060322
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Person: Southwest Geographic Science Team
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Contact_Voice_Telephone: 520-670-5510
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

lcr1938_06.txt

Identification_Information:
  Citation:
    Citation_Information:
      Originator: U.S. Geological Survey
      Publication_Date: Unpublished Material
      Title: lcr1938_06.txt
      Geospatial_Data_Presentation_Form: remote-sensing image
      Larger_Work_Citation:
        Citation_Information:
          Originator: By Laura M. Norman, Michael Gishey, Leila Gass, Brian Yanites, Edwin Pfeifer, Ron Simms, and Ray Ahlbrandt
          Publication_Date: 2006
          Title: Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States
          Geospatial_Data_Presentation_Form: document
          Series_Information:
            Series_Name: Open-File Report
          Publication_Information:
            Publisher: U.S. Geological Survey
  Description:
    Abstract: The objective of this project is to improve understanding of the history and rates of landscape and ecologic change along the Lower Colorado River and of their effects on geologic and hydrologic processes. The datasets allow an analysis of historical changes in the river's landscape and ecosystems, as well as modeling of the geomorphology of the river valley and related linkages between habitat, ground water, surface water, and sediment.
    Purpose: This image is one of 15 created for a geospatial analysis of change in river-channel position for the Lower Colorado River.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 19380424
    Currentness_Reference: ground condition
  Status:
    Progress: Complete
    Maintenance_and_Update_Frequency: None planned
  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -114.592388
      East_Bounding_Coordinate: -114.367147
      North_Bounding_Coordinate: 34.841443
      South_Bounding_Coordinate: 34.588398
  Keywords:
    Theme:

Theme_Keyword_Thesaurus:
http://www.fgdc.gov/clearinghouse/reference/nasa_long.html
Theme_Keyword: Rivers
Theme_Keyword: Geomorphology
Theme_Keyword: Riparian Communities
Place:
Place_Keyword: California
Place_Keyword: Arizona
Place_Keyword: Topock
Place_Keyword: Catfish Paradise
Place_Keyword: Fivemile Landing
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Laura Norman
Contact_Organization: Southwest Geographic Science Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Country: USA
Contact_Electronic_Mail_Address: lnorman@usgs.gov
Data_Set_Credit: Aerial photos from the U.S. Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, Nev. Scanning, mosaicking, and image rectification by Brian Yanites and Mike Gishey, U.S. Geological Survey.
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.0.0.535
Data_Quality_Information:
Attribute_Accuracy:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: Mosaic images vary in positional accuracy. Offsets from digital orthophotos used in the rectification process are due to lack of elevation data and other ground control data.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Bureau of Reclamation

Title: Colorado River Frontwork & Levee System
Edition: flown by Fairchild Aerials, Los Angeles
Other_Citation_Details:
Scale of photos is 1:20,000.
Colo. R. 2-71,4/24/1938; Colo. R. 2-72,4/24/1938; Colo. R. 2-73,4/24/1938; Colo. R. 2-74,4/24/1938; Colo. R. 2-75,4/24/1938; Colo. R. 2-76,4/24/1938; Colo. R. 2-77,4/24/1938; Colo. R. 2-79,4/24/1938; Colo. R. 2-80,4/24/1938; Colo. R. 2-81,4/24/1938; Colo. R. 2-82,4/24/1938; Colo. R. 2-83,4/24/1938; Colo. R. 2-84,4/24/1938; Colo. R. 2-85,4/24/1938; Colo. R. 2-86,4/24/1938; Colo. R. 2-87,4/24/1938; Colo. R. 2-88,4/24/1938; Colo. R. 2-89,4/24/1938; Colo. R. 2-90,4/24/1938
Type_of_Source_Media: Aerial photographs
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19380424
Source_Currentness_Reference: ground condition
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: 1992-96
Title: Digital Orthophoto Quarter Quadrangle
Source_Time_Period_of_Content:
Time_Period_Information:
Multiple_Dates/Times:
Single_Date/Time:
Calendar_Date: 1992-96
Process_Step:
Process_Description: Individual aerial photoprints were scanned at 500 dpi. Images were then mosaicked using Adobe Photoshop, resulting in 16 mosaic images that followed index maps previously prepared by the U.S. Bureau of Reclamation. The mosaics were then rectified to mid-1990s digital orthophotos (image to image), using ERDAS Imagine, with 14 to 57 ground-control points used per mosaic (number of ground-control points depended on the number of identifiable features appearing in both the 1938/1939 images and the 1990s digital orthophotos). This mosaic had 27 ground-control points.
Process_Date: 12/2004
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: 31279
Column_Count: 22623
Vertical_Count: 1
Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 11
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -117.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 0.881985
Ordinate_Resolution: 0.881985
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: Band_1
Attribute:
Attribute_Label: ObjectID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Value
Attribute:
Attribute_Label: Count
Distribution_Information:
Resource_Description: Downloadable Data
Distribution_Liability:
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conduct of business that involves substantial monetary or operational consequences. Conclusions drawn from, or actions undertaken on the basis of, such data and information are the sole responsibility of the user.

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  Standard_Order_Process:
    Digital_Form:
      Digital_Transfer_Information:
        Transfer_Size: 0.000
Metadata_Reference_Information:
  Metadata_Date: 20060322
  Metadata_Contact:
    Contact_Information:
      Contact_Organization_Primary:
        Contact_Organization: U.S. Geological Survey
        Contact_Person: Southwest Geographic Science Team
      Contact_Address:
        Address_Type: mailing and physical address
        Address: 520 N. Park Ave., Suite 106
        City: Tucson
        State_or_Province: AZ
        Postal_Code: 85719
      Contact_Voice_Telephone: 520-670-5510
  Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
  Metadata_Standard_Version: FGDC-STD-001-1998
  Metadata_Time_Convention: local time
  Metadata_Extensions:
    Online_Linkage: http://www.esri.com/metadata/esriprof80.html
    Profile_Name: ESRI Metadata Profile
  Metadata_Extensions:
    Online_Linkage: http://www.esri.com/metadata/esriprof80.html
    Profile_Name: ESRI Metadata Profile
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lcr1938_07.txt

Identification_Information:
  Citation:
    Citation_Information:
      Originator: U.S. Geological Survey
      Publication_Date: Unpublished Material
      Title: lcr1938_07.txt
      Geospatial_Data_Presentation_Form: remote-sensing image
      Larger_Work_Citation:
        Citation_Information:
          Originator: By Laura M. Norman, Michael Gishey, Leila Gass, Brian Yanites, Edwin Pfeifer, Ron Simms, and Ray Ahlbrandt
          Publication_Date: 2006
          Title: Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States
          Geospatial_Data_Presentation_Form: document
          Series_Information:
            Series_Name: Open-File Report
          Publication_Information:
            Publisher: U.S. Geological Survey
  Description:
    Abstract: The objective of this project is to improve understanding of the history and rates of landscape and ecologic change along the Lower Colorado River and of their effects on geologic and hydrologic processes. The datasets allow an analysis of historical changes in the river's landscape and ecosystems, as well as modeling of the geomorphology of the river valley and related linkages between habitat, ground water, surface water, and sediment.
    Purpose: This image is one of 15 created for a geospatial analysis of change in river-channel position for the Lower Colorado River.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 19380424
    Currentness_Reference: ground condition
  Status:
    Progress: Complete
    Maintenance_and_Update_Frequency: None planned
  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -114.364513
      East_Bounding_Coordinate: -114.090167
      North_Bounding_Coordinate: 34.340659
      South_Bounding_Coordinate: 34.120807
  Keywords:
    Theme:

Theme_Keyword_Thesaurus:
http://www.fgdc.gov/clearinghouse/reference/nasa_long.html
Theme_Keyword: Rivers
Theme_Keyword: Geomorphology
Theme_Keyword: Riparian Communities
Place:
Place_Keyword: California
Place_Keyword: Arizona
Place_Keyword: Cienega Springs
Place_Keyword: Parker
Place_Keyword: Cross Roads
Place_Keyword: Earp
Place_Keyword: Parker Dam
Place_Keyword: Big River
Place_Keyword: Bluewater
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Laura Norman
Contact_Organization: Southwest Geographic Science Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Country: USA
Contact_Electronic_Mail_Address: lnorman@usgs.gov
Data_Set_Credit: Aerial photos from the U.S. Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, Nev. Scanning, mosaicking, and image rectification by Brian Yanites and Mike Gishey, U.S. Geological Survey.
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.0.0.535
Data_Quality_Information:
Attribute_Accuracy:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: Mosaic images vary in positional accuracy. Offsets from digital orthophotos used in the rectification process are due to lack of elevation data and other ground-control data.
Lineage:

Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Bureau of Reclamation
Title: Colorado River Frontwork & Levee System
Edition: flown by Fairchild Aerials, Los Angeles
Other_Citation_Details:
Scale of photos is 1:20,000.
Colo. R. 3-1,4/26/1938; Colo. R. 3-3,4/26/1938; Colo. R. 3-4,4/26/1938; Colo. R. 3-5,4/26/1938; Colo. R. 3-6,4/26/1938; Colo. R. 3-9,4/26/1938; Colo. R. 3-10,4/26/1938; Colo. R. 3-11,4/26/1938; Colo. R. 3-12,4/26/1938; Colo. R. 3-14,4/26/1938; Colo. R. 3-19,4/26/1938; Colo. R. 3-20,4/26/1938; Colo. R. 3-21,4/26/1938; Colo. R. 3-22,4/26/1938; Colo. R. 3-24,4/26/1938; Colo. R. 3-25,4/26/1938
Type_of_Source_Media: Aerial photographs
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19380424
Source_Currentness_Reference: ground condition
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: 1992-96
Title: Digital Orthophoto Quarter Quadrangle
Source_Time_Period_of_Content:
Time_Period_Information:
Multiple_Dates/Times:
Single_Date/Time:
Calendar_Date: 1992-96
Process_Step:
Process_Description: Individual aerial photo prints were scanned at 500 dpi. Images were then mosaicked using Adobe Photoshop, resulting in 16 mosaic images that followed index maps previously prepared by the U.S. Bureau of Reclamation. The mosaics were then rectified to mid-1990s digital orthophotos (image to image), using ERDAS Imagine, with 14 to 57 ground-control points used per mosaic (number of ground-control points depended on the number of identifiable features appearing in both the 1938/1939 images and the 1990s digital orthophotos). This mosaic had 33 ground-control points.
Process_Date: 12/2004
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: 26000
Column_Count: 27002

Vertical_Count: 1
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 11
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -117.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 0.912881
Ordinate_Resolution: 0.912881
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: Band_1
Attribute:
Attribute_Label: ObjectID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Value
Attribute:
Attribute_Label: Count
Distribution_Information:
Resource_Description: Downloadable Data
Distribution_Liability:
Although these data have been compiled by the U.S. Geological Survey (USGS), U.S. Department of the Interior (USDOI), these data and information are provided with the understanding that they are not guaranteed to be 100% accurate or complete.

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Trade, firm, or product names and other references to non-USGS products and services are provided for information only and do not constitute endorsement or warranty, express or implied, by the USGS, USDOI, or U.S. Government, as to their suitability, content, usefulness, functioning, completeness, or accuracy.

Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 0.000
Metadata_Reference_Information:
Metadata_Date: 20060322
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Person: Southwest Geographic Science Team
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Contact_Voice_Telephone: 520-670-5510
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

lcr1938_08.txt

Identification_Information:
  Citation:
    Citation_Information:
      Originator: U.S. Geological Survey
      Publication_Date: Unpublished Material
      Title: lcr1938_08.txt
      Geospatial_Data_Presentation_Form: remote-sensing image
      Larger_Work_Citation:
        Citation_Information:
          Originator: By Laura M. Norman, Michael Gishey, Leila Gass, Brian Yanites, Edwin Pfeifer, Ron Simms, and Ray Ahlbrandt
          Publication_Date: 2006
          Title: Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States
          Geospatial_Data_Presentation_Form: document
          Series_Information:
            Series_Name: Open-File Report
          Publication_Information:
            Publisher: U.S. Geological Survey
  Description:
    Abstract: The objective of this project is to improve understanding of the history and rates of landscape and ecologic change along the Lower Colorado River and of their effects on geologic and hydrologic processes. The datasets allow an analysis of historical changes in the river's landscape and ecosystems, as well as modeling of the geomorphology of the river valley and related linkages between habitat, ground water, surface water, and sediment.
    Purpose: This image is one of 15 created for a geospatial analysis of change in river-channel position for the Lower Colorado River.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 19380424
    Currentness_Reference: ground condition
  Status:
    Progress: Complete
    Maintenance_and_Update_Frequency: None planned
  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -114.531191
      East_Bounding_Coordinate: -114.246816
      North_Bounding_Coordinate: 34.187907
      South_Bounding_Coordinate: 33.978193
  Keywords:
    Theme:

Theme_Keyword_Thesaurus:
http://www.fgdc.gov/clearinghouse/reference/nasa_long.html
Theme_Keyword: Rivers
Theme_Keyword: Geomorphology
Theme_Keyword: Riparian Communities
Place:
Place_Keyword: California
Place_Keyword: Arizona
Place_Keyword: Calzona
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Laura Norman
Contact_Organization: Southwest Geographic Science Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Country: USA
Contact_Electronic_Mail_Address: lnorman@usgs.gov
Data_Set_Credit: Aerial photos from the U.S. Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, Nev. Scanning, mosaicking, and image rectification by Brian Yanites and Mike Gishey, U.S. Geological Survey.
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.0.0.535
Data_Quality_Information:
Attribute_Accuracy:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: Mosaic images vary in positional accuracy. Offsets from digital orthophotos used in the rectification process are due to lack of elevation data and other ground-control data.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Bureau of Reclamation
Title: Colorado River Frontwork & Levee System
Edition: flown by Fairchild Aerials, Los Angeles

Other_Citation_Details:
Scale of photos is 1:20,000.
Colo. R. 3-37,4/26/1938; Colo. R. 3-26,4/26/1938; Colo. R. 3-80,4/26/1938; Colo. R. 3-38,4/26/1938; Colo. R. 3-27,4/26/1938; Colo. R. 3-78,4/26/1938; Colo. R. 3-39,4/26/1938; Colo. R. 3-28,4/26/1938; Colo. R. 3-77,4/26/1938; Colo. R. 3-40,4/26/1938; Colo. R. 3-29,4/26/1938; Colo. R. 3-76,4/26/1938; Colo. R. 3-41,4/26/1938; Colo. R. 3-75,4/26/1938; Colo. R. 3-42,4/26/1938; Colo. R. 3-74,4/26/1938; Colo. R. 3-43,4/26/1938; Colo. R. 3-73,4/26/1938; Colo. R. 3-44,4/26/1938; Colo. R. 3-72,4/26/1938; Colo. R. 3-45,4/26/1938; Colo. R. 3-71,4/26/1938; Colo. R. 3-70,4/26/1938
Type_of_Source_Media: Aerial photographs
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19380424
Source_Currentness_Reference: ground condition
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: 1992-96
Title: Digital Orthophoto Quarter Quadrangle
Source_Time_Period_of_Content:
Time_Period_Information:
Multiple_Dates/Times:
Single_Date/Time:
Calendar_Date: 1992-96
Process_Step:
Process_Description: Individual aerial photoprints were scanned at 500 dpi. Images were then mosaicked using Adobe Photoshop, resulting in 16 mosaic images that followed index maps previously prepared by the U.S. Bureau of Reclamation. The mosaics were then rectified to mid-1990s digital orthophotos (image to image) using ERDAS Imagine, with 14 to 57 ground-control points used per mosaic (number of ground-control points depended on the number of identifiable features appearing in both the 1938/1939 images and the 1990s digital orthophotos). This mosaic had 17 ground-control points.
Process_Date: 12/2004
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: 24872
Column_Count: 28241
Vertical_Count: 1
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:

Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 11
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -117.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 0.909496
Ordinate_Resolution: 0.909496
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: Band_1
Attribute:
Attribute_Label: ObjectID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Value
Attribute:
Attribute_Label: Count
Distribution_Information:
Resource_Description: Downloadable Data
Distribution_Liability:
Although these data have been compiled by the U.S. Geological Survey (USGS), U.S. Department of the Interior (USDOI), these data and information are provided with the understanding that they are not guaranteed to be 100% accurate or complete.

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Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 0.000
Metadata_Reference_Information:
Metadata_Date: 20060322
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Person: Southwest Geographic Science Team
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Contact_Voice_Telephone: 520-670-5510
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

lcr1938_09.txt

Identification_Information:
  Citation:
    Citation_Information:
      Originator: U.S. Geological Survey
      Publication_Date: Unpublished Material
      Title: lcr1938_09.txt
      Geospatial_Data_Presentation_Form: remote-sensing image
      Larger_Work_Citation:
        Citation_Information:
          Originator: By Laura M. Norman, Michael Gishey, Leila Gass, Brian Yanites, Edwin Pfeifer, Ron Simms, and Ray Ahlbrandt
          Publication_Date: 2006
          Title: Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States
          Geospatial_Data_Presentation_Form: document
          Series_Information:
            Series_Name: Open-File Report
          Publication_Information:
            Publisher: U.S. Geological Survey
  Description:
    Abstract: The objective of this project is to improve understanding of the history and rates of landscape and ecologic change along the Lower Colorado River and of their effects on geologic and hydrologic processes. The datasets allow an analysis of historical changes in the river's landscape and ecosystems, as well as modeling of the geomorphology of the river valley and related linkages between habitat, ground water, surface water, and sediment.
    Purpose: This image is one of 15 created for a geospatial analysis of change in river-channel position for the Lower Colorado River.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 19380424
    Currentness_Reference: ground condition
  Status:
    Progress: Complete
    Maintenance_and_Update_Frequency: None planned
  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -114.590651
      East_Bounding_Coordinate: -114.430752
      North_Bounding_Coordinate: 33.900350
      South_Bounding_Coordinate: 33.669334
  Keywords:
    Theme:

Theme_Keyword_Thesaurus:
http://www.fgdc.gov/clearinghouse/reference/nasa_long.html
Theme_Keyword: Rivers
Theme_Keyword: Geomorphology
Theme_Keyword: Riparian Communities
Place:
Place_Keyword: California
Place_Keyword: Arizona
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Laura Norman
Contact_Organization: Southwest Geographic Science Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Country: USA
Contact_Electronic_Mail_Address: lnorman@usgs.gov
Data_Set_Credit: Aerial photos from the U.S. Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, Nev. Scanning, mosaicking, and image rectification by Brian Yanites and Mike Gishey, U.S. Geological Survey.
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.0.0.535
Data_Quality_Information:
Attribute_Accuracy:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: Mosaic images vary in positional accuracy. Offsets from digital orthophotos used in the rectification process are due to lack of elevation data and other ground-control data.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Bureau of Reclamation
Title: Colorado River Frontwork & Levee System
Edition: flown by Fairchild Aerials, Los Angeles
Other_Citation_Details:

Scale of photos is 1:20,000.
Colo. R. 4-33,4/26/1938; Colo. R. 10-10,5/3/1938; Colo. R. 3-89,4/26/1938; Colo. R. 4-32,4/26/1938; Colo. R. 10-9,5/3/1938;Colo. R. 3-90,4/26/1938; Colo. R. 4-31,4/26/1938; Colo. R. 10-8,5/3/1938; Colo. R. 3-91,4/26/1938; Colo. R. 4-30,4/26/1938; Colo. R. 10-7,5/3/1938;Colo. R. 3-92,4/26/1938; Colo. R. 4-29,4/26/1938; Colo. R. 10-6,5/3/1938; Colo. R. 3-93,4/26/1938; Colo. R. 4-28,4/26/1938; Colo. R. 10-5,5/3/1938;Colo. R. 3-94,4/26/1938; Colo. R. 4-27,4/26/1938; Colo. R. 10-4,5/3/1938; Colo. R. 3-95,4/26/1938; Colo. R. 4-26,4/26/1938; Colo. R. 10-3,5/3/1938;Colo. R. 3-96,4/26/1938; Colo. R. 4-25,4/26/1938; Colo. R. 10-2,5/3/1938; Colo. R. 4-24,4/26/1938; Colo. R. 10-1,5/3/1938; Colo. R. 4-23,4/26/1938;Colo. R. 3-99,4/26/1938; Colo. R. 4-22,4/26/1938; Colo. R. 3-100,4/26/1938; Colo. R. 4-21,4/26/1938; Colo. R. 3-101,4/26/1938; Colo. R. 4-20,4/26/1938;Colo. R. 3-102,4/26/1938; Colo. R. 4-19,4/26/1938; Colo. R. 4-18,4/26/1938; Colo. R. 10-18,5/3/1938;
Type_of_Source_Media: Aerial photographs
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19380424
Source_Currentness_Reference: ground condition
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: 1992-96
Title: Digital Orthophoto Quarter Quadrangle
Source_Time_Period_of_Content:
Time_Period_Information:
Multiple_Dates/Times:
Single_Date/Time:
Calendar_Date: 1992-96
Process_Step:
Process_Description: Individual aerial photoprints were scanned at 500 dpi. Images were then mosaicked using Adobe Photoshop, resulting in 16 mosaic images that followed index maps previously prepared by the U.S. Bureau of Reclamation. The mosaics were then rectified to mid-1990s digital orthophotos (image to image), using ERDAS Imagine, with 14 to 57 ground-control points used per mosaic (number of ground-control points depended on the number of identifiable features appearing in both the 1938/1939 images and the 1990s digital orthophotos). This mosaic had 14 ground-control points.
Process_Date: 12/2004
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: 28229
Column_Count: 15854

Vertical_Count: 1
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 11
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -117.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 0.896051
Ordinate_Resolution: 0.896051
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: Band_1
Attribute:
Attribute_Label: ObjectID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Value
Attribute:
Attribute_Label: Count
Distribution_Information:
Resource_Description: Downloadable Data
Distribution_Liability:
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Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 0.000
Metadata_Reference_Information:
Metadata_Date: 20060322
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Person: Southwest Geographic Science Team
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Contact_Voice_Telephone: 520-670-5510
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

lcr1938_10.txt

Identification_Information:
  Citation:
    Citation_Information:
      Originator: U.S. Geological Survey
      Publication_Date: Unpublished Material
      Title: lcr1938_10.txt
      Geospatial_Data_Presentation_Form: remote-sensing image
      Larger_Work_Citation:
        Citation_Information:
          Originator: By Laura M. Norman, Michael Gishey, Leila Gass, Brian Yanites, Edwin Pfeifer, Ron Simms, and Ray Ahlbrandt
          Publication_Date: 2006
          Title: Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States
          Geospatial_Data_Presentation_Form: document
          Series_Information:
            Series_Name: Open-File Report
          Publication_Information:
            Publisher: U.S. Geological Survey
  Description:
    Abstract: The objective of this project is to improve understanding of the history and rates of landscape and ecologic change along the Lower Colorado River and of their effects on geologic and hydrologic processes. The datasets allow an analysis of historical changes in the river's landscape and ecosystems, as well as modeling of the geomorphology of the river valley and related linkages between habitat, ground water, surface water, and sediment.
    Purpose: This image is one of 15 created for a geospatial analysis of change in river-channel position for the Lower Colorado River.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 19380424
    Currentness_Reference: ground condition
  Status:
    Progress: Complete
    Maintenance_and_Update_Frequency: None planned
  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -114.758281
      East_Bounding_Coordinate: -114.453403
      North_Bounding_Coordinate: 33.751011
      South_Bounding_Coordinate: 33.481039
  Keywords:
    Theme:

Theme_Keyword_Thesaurus:
http://www.fgdc.gov/clearinghouse/reference/nasa_long.html
Theme_Keyword: Rivers
Theme_Keyword: Geomorphology
Theme_Keyword: Riparian Communities
Place:
Place_Keyword: California
Place_Keyword: Arizona
Place_Keyword: Ehrenberg
Place_Keyword: Blythe
Place_Keyword: Miller Farms
Place_Keyword: Nicholls Warm Springs
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Laura Norman
Contact_Organization: Southwest Geographic Science Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Country: USA
Contact_Electronic_Mail_Address: lnorman@usgs.gov
Data_Set_Credit: Aerial photos from the U.S. Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, Nev. Scanning, mosaicking, and image rectification by Brian Yanites and Mike Gishey, U.S. Geological Survey.
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.0.0.535
Data_Quality_Information:
Attribute_Accuracy:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: Mosaic images vary in positional accuracy. Offsets from digital orthophotos used in the rectification process are due to lack of elevation data and other ground-control data.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:

Originator: U.S. Bureau of Reclamation
Title: Colorado River Frontwork & Levee System
Edition: flown by Fairchild Aerials, Los Angeles
Other_Citation_Details:
Scale of photos is 1:20,000.
Colo. R. 5-39,4/27/1938; Colo. R. 5-36,4/27/1938; Colo. R. 4-83,4/26/1938; Colo. R. 4-82,4/26/1938; Colo. R. 4-41,4/26/1938; Colo. R. 10-19,5/3/1938; Colo. R. 4-17,4/26/1938; Colo. R. 3-103,4/26/1938; Colo. R. 5-40,4/27/1938; Colo. R. 5-35,4/27/1938; Colo. R. 4-84,4/26/1938; Colo. R. 4-81,4/26/1938; Colo. R. 4-42,4/26/1938; Colo. R. 10-20,5/3/1938; Colo. R. 4-16,4/26/1938; Colo. R. 3-104,4/26/1938; Colo. R. 5-41,4/27/1938; Colo. R. 5-34,4/27/1938; Colo. R. 4-85,4/26/1938; Colo. R. 4-80,4/26/1938; Colo. R. 4-43,4/26/1938; Colo. R. 10-21,5/3/1938; Colo. R. 4-15,4/26/1938; Colo. R. 3-105,4/26/1938; Colo. R. 5-42,4/27/1938; Colo. R. 5-33,4/27/1938; Colo. R. 4-86,4/26/1938; Colo. R. 4-79,4/26/1938; Colo. R. 4-44,4/26/1938; Colo. R. 10-22,5/3/1938; Colo. R. 4-14,4/26/1938; Colo. R. 3-106,4/26/1938; Colo. R. 5-43,4/27/1938; ,,Colo. R. 4-87,4/26/1938; Colo. R. 4-78,4/26/1938; Colo. R. 4-45,4/26/1938; Colo. R. 10-23,5/3/1938; Colo. R. 4-13,4/26/1938; Colo. R. 3-107,4/26/1938; Colo. R. 4-88,4/26/1938; Colo. R. 4-77,4/26/1938; Colo. R. 4-46,4/26/1938; Colo. R. 10-24,5/3/1938; Colo. R. 4-12,4/26/1938; Colo. R. 3-108,4/26/1938; Colo. R. 4-89,4/26/1938; Colo. R. 4-76,4/26/1938; Colo. R. 4-47,4/26/1938; Colo. R. 10-25,5/3/1938; Colo. R. 4-11,4/26/1938; Colo. R. 3-109,4/26/1938; Colo. R. 4-90,4/26/1938; Colo. R. 4-75,4/26/1938; Colo. R. 4-48,4/26/1938; Colo. R. 10-26,5/3/1938; Colo. R. 4-10,4/26/1938; Colo. R. 3-111,4/26/1938; Colo. R. 4-91,4/26/1938; Colo. R. 4-74,4/26/1938; Colo. R. 4-49,4/26/1938; Colo. R. 10-27,5/3/1938; Colo. R. 4-9,4/26/1938; Colo. R. 3-112,4/26/1938; Colo. R. 4-92,4/26/1938; Colo. R. 4-73,4/26/1938; Colo. R. 4-50,4/26/1938; Colo. R. 10-28,5/3/1938; Colo. R. 4-8,4/26/1938; Colo. R. 3-113,4/26/1938; Colo. R. 4-72,4/26/1938; Colo. R. 4-51,4/26/1938; Colo. R. 10-29,5/3/1938; Colo. R. 4-7,4/26/1938; Colo. R. 3-114,4/26/1938; Colo. R. 4-71,4/26/1938; Colo. R. 4-52,4/26/1938; Colo. R. 10-30,5/3/1938; Colo. R. 4-6,4/26/1938; Colo. R. 3-115,4/26/1938; Colo. R. 4-70,4/26/1938; Colo. R. 4-53,4/26/1938; Colo. R. 10-31,5/3/1938; Colo. R. 4-5,4/26/1938; Colo. R. 3-116,4/26/1938; Colo. R. 4-69,4/26/1938; Colo. R. 4-54,4/26/1938; Colo. R. 10-32,5/3/1938; Colo. R. 4-4,4/26/1938; Colo. R. 4-55,4/26/1938; Colo. R. 10-33,5/3/1938; Colo. R. 4-3,4/26/1938; Colo. R. 4-2,4/26/1938; Colo. R. 4-1,4/26/1938;
Type_of_Source_Media: Aerial photographs
Source_Time_Period_of_Content:
Time_Period_Information:
Multiple_Dates/Times:
Single_Date/Time:
Calendar_Date: 19380424
Source_Currentness_Reference: ground condition
Process_Step:
Process_Description: Individual aerial photo prints were scanned at 500 dpi. Images were then mosaicked using Adobe Photoshop, resulting in 16 mosaic images that followed index maps previously prepared by the U.S. Bureau of Reclamation. The

mosaics were then rectified to mid-1990s digital orthophotos (image to image), using ERDAS Imagine, with 14 to 57 ground-control points used per mosaic (number of ground-control points depended on the number of identifiable features appearing in both the 1938/1939 images and the 1990s digital orthophotos). This mosaic had 57 ground-control points.

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      Process_Date: 12/2004
Spatial_Data_Organization_Information:
  Direct_Spatial_Reference_Method: Raster
  Raster_Object_Information:
    Raster_Object_Type: Pixel
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    Column_Count: 27627
    Vertical_Count: 1
Spatial_Reference_Information:
  Horizontal_Coordinate_System_Definition:
    Planar:
      Grid_Coordinate_System:
        Grid_Coordinate_System_Name: Universal Transverse Mercator
        Universal_Transverse_Mercator:
          UTM_Zone_Number: 11
          Transverse_Mercator:
            Scale_Factor_at_Central_Meridian: 0.999600
            Longitude_of_Central_Meridian: -117.000000
            Latitude_of_Projection_Origin: 0.000000
            False_Easting: 500000.000000
            False_Northing: 0.000000
      Planar_Coordinate_Information:
        Planar_Coordinate_Encoding_Method: row and column
        Coordinate_Representation:
          Abscissa_Resolution: 1.000000
          Ordinate_Resolution: 1.000000
        Planar_Distance_Units: meters
    Geodetic_Model:
      Horizontal_Datum_Name: North American Datum of 1983
      Ellipsoid_Name: Geodetic Reference System 80
      Semi-major_Axis: 6378137.000000
      Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
  Detailed_Description:
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    Attribute:
      Attribute_Label: ObjectID
      Attribute_Definition: Internal feature number.
      Attribute_Definition_Source: ESRI
      Attribute_Domain_Values:
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Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Value
Attribute:
Attribute_Label: Count
Distribution_Information:
Resource_Description: Downloadable Data
Distribution_Liability:
Although these data have been compiled by the U.S. Geological Survey (USGS), U.S. Department of the Interior (USDOI), these data and information are provided with the understanding that they are not guaranteed to be 100% accurate or complete.
Users are cautioned to consider carefully the provisional nature of these data and information before using them for decisions that concern personal or public safety or the conduct of business that involves substantial monetary or operational consequences. Conclusions drawn from, or actions undertaken on the basis of, such data and information are the sole responsibility of the user.
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Trade, firm, or product names and other references to non-USGS products and services are provided for information only and do not constitute endorsement or warranty, express or implied, by the USGS, USDOI, or U.S. Government, as to their suitability, content, usefulness, functioning, completeness, or accuracy.
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 0.000
Metadata_Reference_Information:
Metadata_Date: 20060322
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Person: Southwest Geographic Science Team
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Contact_Voice_Telephone: 520-670-5510
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time
Metadata_Extensions:
  Online_Linkage: http://www.esri.com/metadata/esriprof80.html
  Profile_Name: ESRI Metadata Profile

lcr1938_11.txt

Identification_Information:
  Citation:
    Citation_Information:
      Originator: U.S. Geological Survey
      Publication_Date: Unpublished Material
      Title: lcr1938_11.txt
      Geospatial_Data_Presentation_Form: remote-sensing image
      Larger_Work_Citation:
        Citation_Information:
          Originator: By Laura M. Norman, Michael Gishey, Leila Gass, Brian Yanites, Edwin Pfeifer, Ron Simms, and Ray Ahlbrandt
          Publication_Date: 2006
          Title: Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States
          Geospatial_Data_Presentation_Form: document
          Series_Information:
            Series_Name: Open-File Report
          Publication_Information:
            Publisher: U.S. Geological Survey
  Description:
    Abstract: The objective of this project is to improve understanding of the history and rates of landscape and ecologic change along the Lower Colorado River and of their effects on geologic and hydrologic processes. The datasets allow an analysis of historical changes in the river's landscape and ecosystems, as well as modeling of the geomorphology of the river valley and related linkages between habitat, ground water, surface water, and sediment.
    Purpose: This image is one of 15 created for a geospatial analysis of change in river-channel position for the Lower Colorado River.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 19380424
    Currentness_Reference: ground condition
  Status:
    Progress: Complete
    Maintenance_and_Update_Frequency: None planned
  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -114.778983
      East_Bounding_Coordinate: -114.522336
      North_Bounding_Coordinate: 33.563139
      South_Bounding_Coordinate: 33.334410
  Keywords:
    Theme:

Theme_Keyword_Thesaurus:
http://www.fgdc.gov/clearinghouse/reference/nasa_long.html
Theme_Keyword: Rivers
Theme_Keyword: Geomorphology
Theme_Keyword: Riparian Communities
Place:
Place_Keyword: California
Place_Keyword: Arizona
Place_Keyword: Ripley
Place_Keyword: Palo Verde
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Laura Norman
Contact_Organization: Southwest Geographic Science Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Country: USA
Contact_Electronic_Mail_Address: lnorman@usgs.gov
Data_Set_Credit: Aerial photos from the U.S. Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, Nev. Scanning, mosaicking, and image rectification by Brian Yanites and Mike Gishey, U.S. Geological Survey.
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.0.0.535
Data_Quality_Information:
Attribute_Accuracy:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: Mosaic images vary in positional accuracy. Offsets from digital orthophotos used in the rectification process are due to lack of elevation data and other ground-control data.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Bureau of Reclamation
Title: Colorado River Frontwork & Levee System

Edition: flown by Fairchild Aerials, Los Angeles
Other_Citation_Details:
Scale of photos is 1:20,000.
Colo. R. 5-88,4/27/1938; Colo. R. 5-44,4/27/1938; Colo. R. 5-32,4/26/1938; Colo. R. 4-94,4/26/1938; Colo. R. 4-56,4/26/1938; Colo. R. 10-33,4/26/1938; Colo. R. 5-87,4/27/1938; Colo. R. 5-45,4/26/1938; Colo. R. 5-31,4/26/1938; Colo. R. 4-95,4/26/1938; Colo. R. 4-57,4/26/1938; Colo. R. 10-34,4/26/1938; Colo. R. 5-85,4/27/1938; Colo. R .5-46,4/26/1938; Colo. R. 5-30,4/26/1938; Colo. R. 4-96,4/26/1938; Colo. R. 4-58,4/26/1938; Colo. R. 5-83,4/27/1938; Colo. R. 5-47,4/26/1938; Colo. R. 5-29,4/26/1938; Colo. R. 4-97,4/26/1938; Colo. R. 4-59,4/26/1938; Colo. R. 5-81,4/27/1938; Colo. R. 5-48,4/26/1938; Colo. R. 5-28,4/26/1938; Colo. R. 4-98,4/26/1938; Colo. R. 4-60,4/26/1938; Colo. R. 5-79,4/27/1938; Colo. R. 5-49,4/26/1938; Colo. R. 5-27,4/26/1938; Colo. R. 4-99,4/26/1938; Colo. R. 5-77,4/27/1938; Colo. R. 5-50,4/26/1938; Colo. R. 5-26,4/26/1938; Colo. R. 4-100,4/26/1938; Colo. R. 5-75,4/27/1938; Colo. R. 5-51,4/26/1938; Colo. R. 5-25,4/26/1938; Colo. R. 4-101,4/26/1938; Colo. R. 5-52,4/26/1938; Colo. R. 5-24,4/26/1938; Colo. R. 4-102,4/26/1938; Colo. R. 5-53,4/26/1938; Colo. R. 5-23,4/26/1938; Colo. R. 4-103,4/26/1938; Colo. R. 5-54,4/26/1938; Colo. R. 5-22,4/26/1938; Colo. R. 4-104,4/26/1938; Colo. R. 5-55,4/26/1938; Colo. R. 5-21,4/26/1938; Colo. R. 4-105,4/26/1938; Colo. R. 5-57,4/26/1938; Colo. R. 5-20,4/26/1938; Colo. R. 4-106,4/26/1938; Colo. R. 5-58,4/26/1938; Colo. R. 5-19,4/26/1938; Colo. R. 4-107,4/26/1938; Colo. R. 5-18,4/26/1938;
Type_of_Source_Media: Aerial photographs
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19380424
Source_Currentness_Reference: ground condition
Process_Step:
Process_Description: Individual aerial photo prints were scanned at 500 dpi. Images were then mosaicked using Adobe Photoshop, resulting in 16 mosaic images that followed index maps previously prepared by the U.S. Bureau of Reclamation. The mosaics were then rectified to mid-1990s digital orthophotos (image to image), using ERDAS Imagine, with 14 to 57 ground-control points used per mosaic (number of ground-control points depended on the number of identifiable features appearing in both the 1938/1939 images and the 1990s digital orthophotos). This mosaic had 27 ground-control points.
Process_Date: 12/2004
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: 27750
Column_Count: 26028
Vertical_Count: 1

Spatial_Reference_Information:
  Horizontal_Coordinate_System_Definition:
    Planar:
      Grid_Coordinate_System:
        Grid_Coordinate_System_Name: Universal Transverse Mercator
        Universal_Transverse_Mercator:
          UTM_Zone_Number: 11
          Transverse_Mercator:
            Scale_Factor_at_Central_Meridian: 0.999600
            Longitude_of_Central_Meridian: -117.000000
            Latitude_of_Projection_Origin: 0.000000
            False_Easting: 500000.000000
            False_Northing: 0.000000
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        Planar_Coordinate_Encoding_Method: row and column
        Coordinate_Representation:
          Abscissa_Resolution: 0.895607
          Ordinate_Resolution: 0.895607
        Planar_Distance_Units: meters
    Geodetic_Model:
      Horizontal_Datum_Name: North American Datum of 1983
      Ellipsoid_Name: Geodetic Reference System 80
      Semi-major_Axis: 6378137.000000
      Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
  Detailed_Description:
    Entity_Type:
      Entity_Type_Label: Band_1
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      Attribute_Definition: Internal feature number.
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      Attribute_Domain_Values:
        Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
    Attribute:
      Attribute_Label: Value
    Attribute:
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Distribution_Information:
  Resource_Description: Downloadable Data
  Distribution_Liability:
    Although these data have been compiled by the U.S. Geological Survey (USGS), U.S. Department of the Interior (USDOI), these data and information are provided with the understanding that they are not guaranteed to be 100% accurate or complete.

Users are cautioned to consider carefully the provisional nature of these data and information before using them for decisions that concern personal or public safety or the conduct of business that involves substantial monetary or operational consequences. Conclusions drawn from, or actions undertaken on the basis of, such data and information are the sole responsibility of the user.

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Trade, firm, or product names and other references to non-USGS products and services are provided for information only and do not constitute endorsement or warranty, express or implied, by the USGS, USDOI, or U.S. Government, as to their suitability, content, usefulness, functioning, completeness, or accuracy.

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Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 0.000
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Metadata_Date: 20060322
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Person: Southwest Geographic Science Team
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Contact_Voice_Telephone: 520-670-5510
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

lcr1938_12.txt

Identification_Information:
  Citation:
    Citation_Information:
      Originator: U.S. Geological Survey
      Publication_Date: Unpublished Material
      Title: lcr1938_12.txt
      Geospatial_Data_Presentation_Form: remote-sensing image
      Larger_Work_Citation:
        Citation_Information:
          Originator: By Laura M. Norman, Michael Gishey, Leila Gass, Brian Yanites, Edwin Pfeifer, Ron Simms, and Ray Ahlbrandt
          Publication_Date: 2006
          Title: Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States
          Geospatial_Data_Presentation_Form: document
          Series_Information:
            Series_Name: Open-File Report
          Publication_Information:
            Publisher: U.S. Geological Survey
  Description:
    Abstract: The objective of this project is to improve understanding of the history and rates of landscape and ecologic change along the Lower Colorado River and of their effects on geologic and hydrologic processes. The datasets allow an analysis of historical changes in the river's landscape and ecosystems, as well as modeling of the geomorphology of the river valley and related linkages between habitat, ground water, surface water, and sediment.
    Purpose: This image is one of 15 created for a geospatial analysis of change in river-channel position for the Lower Colorado River.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 19380424
    Currentness_Reference: ground condition
  Status:
    Progress: Complete
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      West_Bounding_Coordinate: -114.778586
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      South_Bounding_Coordinate: 33.155426
  Keywords:
    Theme:

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http://www.fgdc.gov/clearinghouse/reference/nasa_long.html
Theme_Keyword: Rivers
Theme_Keyword: Geomorphology
Theme_Keyword: Riparian Communities
Place:
Place_Keyword: California
Place_Keyword: Arizona
Place_Keyword: Cibola
Place_Keyword: Paymaster Landing
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Laura Norman
Contact_Organization: Southwest Geographic Science Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Country: USA
Contact_Electronic_Mail_Address: lnorman@usgs.gov
Data_Set_Credit: Aerial photos from the U.S. Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, Nev. Scanning, mosaicking, and image rectification by Brian Yanites and Mike Gishey, U.S. Geological Survey.
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.0.0.535
Data_Quality_Information:
Attribute_Accuracy:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: Mosaic images vary in positional accuracy. Offsets from digital orthophotos used in the rectification process are due to lack of elevation data and other ground-control data.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Bureau of Reclamation
Title: Colorado River Frontwork & Levee System

Edition: flown by Fairchild Aerials, Los Angeles
Other_Citation_Details:
Scale of photos is 1:20,000.
Colo. R. 5-69,4/27/1938; Colo. R. 5-59,4/27/1938; Colo. R. 5-17,4/27/1938; Colo. R. 5-70,4/27/1938; Colo. R. 5-60,4/27/1938; Colo. R. 5-16,4/27/1938; Colo. R. 5-71,4/27/1938; Colo. R. 5-61,4/27/1938; Colo. R. 5-15,4/27/1938; Colo. R. 5-72,4/27/1938; Colo. R. 5-62,4/27/1938; Colo. R. 5-14,4/27/1938; Colo. R. 5-73,4/27/1938; Colo. R. 5-63,4/27/1938; Colo. R. 5-13,4/27/1938; Colo. R. 5-64,4/27/1938; Colo. R. 5-12,4/27/1938; Colo. R. 5-65,4/27/1938; Colo. R. 5-11,4/27/1938; Colo. R. 5-66,4/27/1938; Colo. R. 5-10,4/27/1938; Colo. R. 5-67,4/27/1938; Colo. R. 5-9,4/27/1938; Colo. R. 5-68,4/27/1938; Colo. R. 5-8,4/27/1938; Colo. R. 5-7,4/27/1938; Colo. R. 5-6,4/27/1938; Colo. R. 5-5,4/27/1938; Colo. R. 5-4,4/27/1938; Colo. R. 5-3,4/27/1938
Type_of_Source_Media: Aerial photographs
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19380424
Source_Currentness_Reference: ground condition
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: 1992-96
Title: Digital Orthophoto Quarter Quadrangle
Source_Time_Period_of_Content:
Time_Period_Information:
Multiple_Dates/Times:
Single_Date/Time:
Calendar_Date: 1992-96
Process_Step:
Process_Description: Individual aerial photoprints were scanned at 500 dpi. Images were then mosaicked using Adobe Photoshop, resulting in 16 mosaic images that followed index maps previously prepared by the U.S. Bureau of Reclamation. The mosaics were then rectified to mid-1990s digital orthophotos (image to image), using ERDAS Imagine, with 14 to 57 ground-control points used per mosaic (number of ground-control points depended on the number of identifiable features appearing in both the 1938/1939 images and the 1990s digital orthophotos). This mosaic had 26 ground-control points.
Process_Date: 12/2004
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: 26495
Column_Count: 15294

Vertical_Count: 1
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 11
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -117.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 0.885786
Ordinate_Resolution: 0.885786
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: Band_1
Attribute:
Attribute_Label: ObjectID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Value
Attribute:
Attribute_Label: Count
Distribution_Information:
Resource_Description: Downloadable Data
Distribution_Liability:
Although these data have been compiled by the U.S. Geological Survey (USGS), U.S. Department of the Interior (USDOI), these data and information are provided with the understanding that they are not guaranteed to be 100% accurate or complete.

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Trade, firm, or product names and other references to non-USGS products and services are provided for information only and do not constitute endorsement or warranty, express or implied, by the USGS, USDOI, or U.S. Government, as to their suitability, content, usefulness, functioning, completeness, or accuracy.

Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 0.000
Metadata_Reference_Information:
Metadata_Date: 20060322
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Person: Southwest Geographic Science Team
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Contact_Voice_Telephone: 520-670-5510
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

lcr1938_13.txt

Identification_Information:
  Citation:
    Citation_Information:
      Originator: U.S. Geological Survey
      Publication_Date: Unpublished Material
      Title: lcr1938_13.txt
      Geospatial_Data_Presentation_Form: remote-sensing image
      Larger_Work_Citation:
        Citation_Information:
          Originator: By Laura M. Norman, Michael Gishey, Leila Gass, Brian Yanites, Edwin Pfeifer, Ron Simms, and Ray Ahlbrandt
          Publication_Date: 2006
          Title: Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States
          Geospatial_Data_Presentation_Form: document
          Series_Information:
            Series_Name: Open-File Report
          Publication_Information:
            Publisher: U.S. Geological Survey
  Description:
    Abstract: The objective of this project is to improve understanding of the history and rates of landscape and ecologic change along the Lower Colorado River and of their effects on geologic and hydrologic processes. The datasets allow an analysis of historical changes in the river's landscape and ecosystems, as well as modeling of the geomorphology of the river valley and related linkages between habitat, ground water, surface water, and sediment.
    Purpose: This image is one of 15 created for a geospatial analysis of change in river-channel position for the Lower Colorado River.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 19380424
    Currentness_Reference: ground condition
  Status:
    Progress: Complete
    Maintenance_and_Update_Frequency: None planned
  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -114.752230
      East_Bounding_Coordinate: -114.515312
      North_Bounding_Coordinate: 33.191054
      South_Bounding_Coordinate: 32.987382
  Keywords:
    Theme:

Theme_Keyword_Thesaurus:
http://www.fgdc.gov/clearinghouse/reference/nasa_long.html
Theme_Keyword: Rivers
Theme_Keyword: Geomorphology
Theme_Keyword: Riparian Communities
Place:
Place_Keyword: California
Place_Keyword: Arizona
Place_Keyword: Nommel Place
Place_Keyword: Nortons Landing
Place_Keyword: Picacho
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Laura Norman
Contact_Organization: Southwest Geographic Science Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Country: USA
Contact_Electronic_Mail_Address: lnorman@usgs.gov
Data_Set_Credit: Aerial photos from the U.S. Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, Nev. Scanning, mosaicking, and image rectification by Brian Yanites and Mike Gishey, U.S. Geological Survey.
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.0.0.535
Data_Quality_Information:
Attribute_Accuracy:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: Mosaic images vary in positional accuracy. Offsets from digital orthophotos used in the rectification process are due to lack of elevation data and other ground-control data.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Bureau of Reclamation

Title: Colorado River Frontwork & Levee System
Edition: flown by Fairchild Aerials, Los Angeles
Other_Citation_Details:
Scale of photos is 1:20,000.
Colo. R. 5-2,4/27/1938; Colo. R. 5-92,4/27/1938; Colo. R. 5-94,4/27/1938; Colo. R. 5-95,4/27/1938; Colo. R. 5-97,4/27/1938; Colo. R. 5-101,4/27/1938; Colo. R. 5-103,4/27/1938; Colo. R. 5-105,4/27/1938; Colo. R. 5-107,4/27/1938; Colo. R. 6-4,4/27/1938; Colo. R. 6-6,4/27/1938; Colo. R. 6-8,4/27/1938; Colo. R. 6-10,4/27/1938
Type_of_Source_Media: Aerial photographs
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19380424
Source_Currentness_Reference: ground condition
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: 1992-96
Title: Digital Orthophoto Quarter Quadrangle
Source_Time_Period_of_Content:
Time_Period_Information:
Multiple_Dates/Times:
Single_Date/Time:
Calendar_Date: 1992-96
Process_Step:
Process_Description: Individual aerial photoprints were scanned at 500 dpi. Images were then mosaicked using Adobe Photoshop, resulting in 16 mosaic images that followed index maps previously prepared by the U.S. Bureau of Reclamation. The mosaics were then rectified to mid-1990s digital orthophotos (image to image), using ERDAS Imagine, with 14 to 57 ground-control points used per mosaic (number of ground-control points depended on the number of identifiable features appearing in both the 1938/1939 images and the 1990s digital orthophotos). This mosaic had 36 ground-control points.
Process_Date: 12/2004
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: 23252
Column_Count: 22746
Vertical_Count: 1
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:

Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 11
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -117.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 0.950926
Ordinate_Resolution: 0.950926
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: Band_1
Attribute:
Attribute_Label: ObjectID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Value
Attribute:
Attribute_Label: Count
Distribution_Information:
Resource_Description: Downloadable Data
Distribution_Liability:
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Standard_Order_Process:
  Digital_Form:
    Digital_Transfer_Information:
      Transfer_Size: 0.000
Metadata_Reference_Information:
  Metadata_Date: 20060322
  Metadata_Contact:
    Contact_Information:
      Contact_Organization_Primary:
        Contact_Organization: U.S. Geological Survey
        Contact_Person: Southwest Geographic Science Team
      Contact_Address:
        Address_Type: mailing and physical address
        Address: 520 N. Park Ave., Suite 106
        City: Tucson
        State_or_Province: AZ
        Postal_Code: 85719
      Contact_Voice_Telephone: 520-670-5510
  Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
  Metadata_Standard_Version: FGDC-STD-001-1998
  Metadata_Time_Convention: local time
  Metadata_Extensions:
    Online_Linkage: http://www.esri.com/metadata/esriprof80.html
    Profile_Name: ESRI Metadata Profile

lcr1938_14.txt

Identification_Information:
  Citation:
    Citation_Information:
      Originator: U.S. Geological Survey
      Publication_Date: Unpublished Material
      Title: lcr1938_14.txt
      Geospatial_Data_Presentation_Form: remote-sensing image
      Larger_Work_Citation:
        Citation_Information:
          Originator: By Laura M. Norman, Michael Gishey, Leila Gass, Brian Yanites, Edwin Pfeifer, Ron Simms, and Ray Ahlbrandt
          Publication_Date: 2006
          Title: Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States
          Geospatial_Data_Presentation_Form: document
          Series_Information:
            Series_Name: Open-File Report
          Publication_Information:
            Publisher: U.S. Geological Survey
  Description:
    Abstract: The objective of this project is to improve understanding of the history and rates of landscape and ecologic change along the Lower Colorado River and of their effects on geologic and hydrologic processes. The datasets allow an analysis of historical changes in the river's landscape and ecosystems, as well as modeling of the geomorphology of the river valley and related linkages between habitat, ground water, surface water, and sediment.
    Purpose: This image is one of 15 created for a geospatial analysis of change in river-channel position for the Lower Colorado River.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 19380424
    Currentness_Reference: ground condition
  Status:
    Progress: Complete
    Maintenance_and_Update_Frequency: None planned
  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -114.579941
      East_Bounding_Coordinate: -114.403668
      North_Bounding_Coordinate: 33.077917
      South_Bounding_Coordinate: 32.847467
  Keywords:
    Theme:

Theme_Keyword_Thesaurus:
http://www.fgdc.gov/clearinghouse/reference/nasa_long.html
Theme_Keyword: Rivers
Theme_Keyword: Geomorphology
Theme_Keyword: Riparian Communities
Place:
Place_Keyword: California
Place_Keyword: Arizona
Place_Keyword: Castle Dome Landing
Place_Keyword: Fishers Landing
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Laura Norman
Contact_Organization: Southwest Geographic Science Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Country: USA
Contact_Electronic_Mail_Address: lnorman@usgs.gov
Data_Set_Credit: Aerial photos from the U.S. Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, Nev. Scanning, mosaicking, and image rectification by Brian Yanites and Mike Gishey, U.S. Geological Survey.
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.0.0.535
Data_Quality_Information:
Attribute_Accuracy:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: Mosaic images vary in positional accuracy. Offsets from digital orthophotos used in the rectification process are due to lack of elevation data and other ground-control data.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Bureau of Reclamation
Title: Colorado River Frontwork & Levee System

Edition: flown by Fairchild Aerials, Los Angeles
Other_Citation_Details:
Scale of photos is 1:20,000.
Colo. R. 6-12,4/27/1938; Colo. R. 6-32,4/27/1938; Colo. R. 6-14,4/27/1938; Colo. R. 6-33,4/27/1938; Colo. R. 6-18,4/27/1938; Colo. R. 6-34,4/27/1938; Colo. R. 6-19,4/27/1938; Colo. R. 6-35,4/27/1938; Colo. R. 6-20,4/27/1938; Colo. R. 6-36,4/27/1938; Colo. R. 6-21,4/27/1938; Colo. R. 6-37,4/27/1938; Colo. R. 6-22,4/27/1938; Colo. R. 6-39,4/27/1938; Colo. R. 6-23,4/27/1938; Colo. R. 6-24,4/27/1938; Colo. R. 6-26,4/27/1938; Colo. R. 6-28,4/27/1938; Colo. R. 6-30,4/27/1938
Type_of_Source_Media: Aerial photographs
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19380424
Source_Currentness_Reference: ground condition
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: 1992-96
Title: Digital Orthophoto Quarter Quadrangle
Source_Time_Period_of_Content:
Time_Period_Information:
Multiple_Dates/Times:
Single_Date/Time:
Calendar_Date: 1992-96
Process_Step:
Process_Description: Individual aerial photoprints were scanned at 500 dpi. Images were then mosaicked using Adobe Photoshop, resulting in 16 mosaic images that followed index maps previously prepared by the U.S. Bureau of Reclamation. The mosaics were then rectified to mid-1990s digital orthophotos (image to image), using ERDAS Imagine, with 14 to 57 ground-control points used per mosaic (number of ground-control points depended on the number of identifiable features appearing in both the 1938/1939 images and the 1990s digital orthophotos). This mosaic had 24 ground-control points.
Process_Date: 12/2004
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:
Raster_Object_Type: Pixel
Row_Count: 27307
Column_Count: 17222
Vertical_Count: 1
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:

Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 11
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -117.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 0.922600
Ordinate_Resolution: 0.922600
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: Band_1
Attribute:
Attribute_Label: ObjectID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Value
Attribute:
Attribute_Label: Count
Distribution_Information:
Resource_Description: Downloadable Data
Distribution_Liability:
Although these data have been compiled by the U.S. Geological Survey (USGS), U.S. Department of the Interior (USDOI), these data and information are provided with the understanding that they are not guaranteed to be 100% accurate or complete.

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Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 0.000
Metadata_Reference_Information:
Metadata_Date: 20060322
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Person: Southwest Geographic Science Team
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Contact_Voice_Telephone: 520-670-5510
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

lcr1938_15.txt

Identification_Information:
  Citation:
    Citation_Information:
      Originator: U.S. Geological Survey
      Publication_Date: Unpublished Material
      Title: lcr1938_15.txt
      Geospatial_Data_Presentation_Form: remote-sensing image
      Larger_Work_Citation:
        Citation_Information:
          Originator: By Laura M. Norman, Michael Gishey, Leila Gass, Brian Yanites, Edwin Pfeifer, Ron Simms, and Ray Ahlbrandt
          Publication_Date: 2006
          Title: Processed 1938 Aerial Photography for Selected Areas of the Lower Colorado River, Southwestern United States
          Geospatial_Data_Presentation_Form: document
          Series_Information:
            Series_Name: Open-File Report
          Publication_Information:
            Publication_Place: U.S. Geological Survey
  Description:
    Abstract: The objective of this project is to improve understanding of the history and rates of landscape and ecologic change along the Lower Colorado River and of their effects on geologic and hydrologic processes. The datasets allow an analysis of historical changes in the river's landscape and ecosystems, as well as modeling of the geomorphology of the river valley and related linkages between habitat, ground water, surface water, and sediment.
    Purpose: This image is one of 15 created for a geospatial analysis of change in river-channel position for the Lower Colorado River.
  Time_Period_of_Content:
    Time_Period_Information:
      Single_Date/Time:
        Calendar_Date: 19380424
    Currentness_Reference: ground condition
  Status:
    Progress: Complete
    Maintenance_and_Update_Frequency: None planned
  Spatial_Domain:
    Bounding_Coordinates:
      West_Bounding_Coordinate: -114.668245
      East_Bounding_Coordinate: -114.373908
      North_Bounding_Coordinate: 32.948028
      South_Bounding_Coordinate: 32.685231
  Keywords:
    Theme:

Theme_Keyword_Thesaurus:
http://www.fgdc.gov/clearinghouse/reference/nasa_long.html
Theme_Keyword: Rivers
Theme_Keyword: Geomorphology
Theme_Keyword: Riparian Communities
Place:
Place_Keyword: California
Place_Keyword: Arizona
Place_Keyword: Kool Corner
Place_Keyword: Laguna
Place_Keyword: Bard
Place_Keyword: Ross Corner
Access_Constraints: None.
Use_Constraints: None.
Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Laura Norman
Contact_Organization: Southwest Geographic Science Center, U.S. Geological Survey
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Country: USA
Contact_Electronic_Mail_Address: lnorman@usgs.gov
Data_Set_Credit: Aerial photos from the U.S. Bureau of Reclamation, Lower Colorado Regional Office, Boulder City, Nev. Scanning, mosaicking, and image-recitification by Brian Yanites and Mike Gishey, U.S. Geological Survey.
Security_Information:
Security_Classification: Unclassified
Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2; ESRI ArcCatalog 9.0.0.535
Data_Quality_Information:
Attribute_Accuracy:
Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: Mosaic images vary in positional accuracy. Offsets from digital orthophotos used in the rectification process are due to lack of elevation data and other ground-control data.
Lineage:
Source_Information:
Source_Citation:
Citation_Information:

Originator: U.S. Bureau of Reclamation
Title: Colorado River Frontwork & Levee System
Edition: flown by Fairchild Aerials, Los Angeles
Other_Citation_Details:
Scale of photos is 1:20,000.
Colo. R. 8-11,5/2/1938; Colo. R. 8-10,5/2/1938; Colo. R. 6-45,4/27/1938; Colo. R. 6-79,4/27/1938; Colo. R. 6-80,4/27/1938; Colo. R. 8-13,5/2/1938; Colo. R. 8-8,5/2/1938; Colo. R. 6-47,4/27/1938; Colo. R. 6-78,4/27/1938; Colo. R. 6-81,4/27/1938; Colo. R. 8-6,5/2/1938; Colo. R. 6-49,4/27/1938; Colo. R. 6-77,4/27/1938; Colo. R. 6-83,4/27/1938; Colo. R. 8-4,5/2/1938; Colo. R. 6-51,4/27/1938; Colo. R. 6-76,4/27/1938; Colo. R. 6-52,4/27/1938; Colo. R. 6-75,4/27/1938; Colo. R. 6-53,4/27/1938; Colo. R. 6-74,4/27/1938; Colo. R. 6-54,4/27/1938; Colo. R. 6-73,4/27/1938; Colo. R. 6-55,4/27/1938; Colo. R. 6-72,4/27/1938; Colo. R. 6-56,4/27/1938; Colo. R. 6-71,4/27/1938; Colo. R. 6-57,4/27/1938; Colo. R. 6-70,4/27/1938; Colo. R. 6-58,4/27/1938; Colo. R. 6-69,4/27/1938; Colo. R. 6-60,4/27/1938; Colo. R. 6-68,4/27/1938
Type_of_Source_Media: Aerial photographs
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar_Date: 19380424
Source_Currentness_Reference: ground condition
Source_Information:
Source_Citation:
Citation_Information:
Originator: U.S. Geological Survey
Publication_Date: 1992-96
Title: Digital Orthophoto Quarter Quadrangle
Source_Time_Period_of_Content:
Time_Period_Information:
Multiple_Dates/Times:
Single_Date/Time:
Calendar_Date: 1992-96
Process_Step:
Process_Description: Individual aerial photo prints were scanned at 500 dpi. Images were then mosaicked using Adobe Photoshop, resulting in 16 mosaic images that followed index maps previously prepared by the U.S. Bureau of Reclamation. The mosaics were then rectified to mid-1990s digital orthophotos (image to image) using ERDAS Imagine, with 14 to 57 ground-control points used per mosaic (number of ground-control points depended on the number of identifiable features appearing in both the 1938/1939 images and the 1990s digital orthophotos). This mosaic had 27 ground-control points.
Process_Date: 12/2004
Spatial_Data_Organization_Information:
Direct_Spatial_Reference_Method: Raster
Raster_Object_Information:

Raster_Object_Type: Pixel
Row_Count: 28529
Column_Count: 26909
Vertical_Count: 1
Spatial_Reference_Information:
Horizontal_Coordinate_System_Definition:
Planar:
Grid_Coordinate_System:
Grid_Coordinate_System_Name: Universal Transverse Mercator
Universal_Transverse_Mercator:
UTM_Zone_Number: 11
Transverse_Mercator:
Scale_Factor_at_Central_Meridian: 0.999600
Longitude_of_Central_Meridian: -117.000000
Latitude_of_Projection_Origin: 0.000000
False_Easting: 500000.000000
False_Northing: 0.000000
Planar_Coordinate_Information:
Planar_Coordinate_Encoding_Method: row and column
Coordinate_Representation:
Abscissa_Resolution: 1.000000
Ordinate_Resolution: 1.000000
Planar_Distance_Units: meters
Geodetic_Model:
Horizontal_Datum_Name: North American Datum of 1983
Ellipsoid_Name: Geodetic Reference System 80
Semi-major_Axis: 6378137.000000
Denominator_of_Flattening_Ratio: 298.257222
Entity_and_Attribute_Information:
Detailed_Description:
Entity_Type:
Entity_Type_Label: Band_1
Attribute:
Attribute_Label: ObjectID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: ESRI
Attribute_Domain_Values:
Unrepresentable_Domain: Sequential unique whole numbers that are automatically generated.
Attribute:
Attribute_Label: Value
Attribute:
Attribute_Label: Count
Distribution_Information:
Resource_Description: Downloadable Data
Distribution_Liability:

Although these data have been compiled by the U.S. Geological Survey (USGS), U.S. Department of the Interior (USDOI), these data and information are provided with the understanding that they are not guaranteed to be 100% accurate or complete.

Users are cautioned to consider carefully the provisional nature of these data and information before using them for decisions that concern personal or public safety or the conduct of business that involves substantial monetary or operational consequences. Conclusions drawn from, or actions undertaken on the basis of, such data and information are the sole responsibility of the user.

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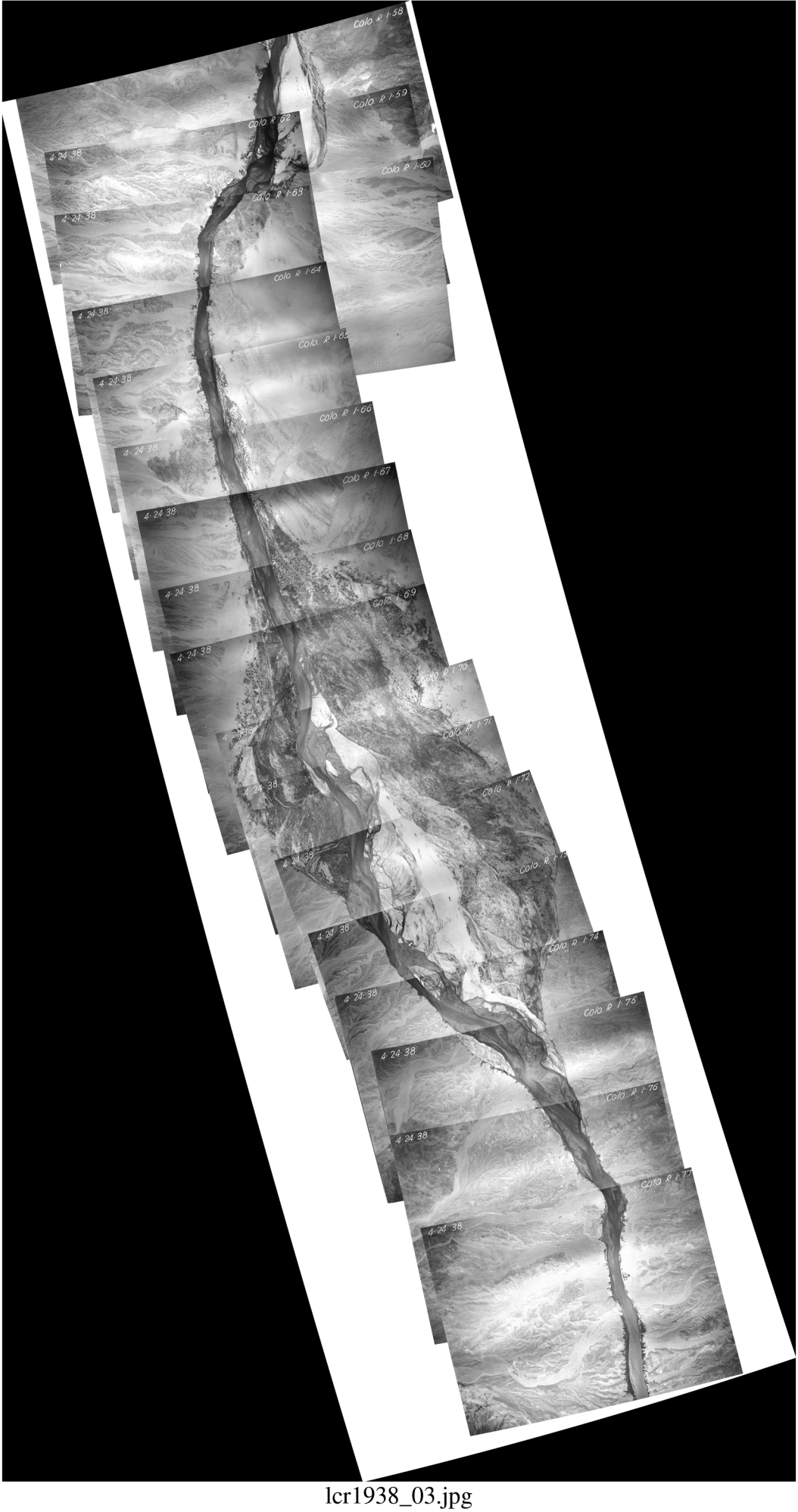
Standard_Order_Process:
Digital_Form:
Digital_Transfer_Information:
Transfer_Size: 0.000
Metadata_Reference_Information:
Metadata_Date: 20060322
Metadata_Contact:
Contact_Information:
Contact_Organization_Primary:
Contact_Organization: U.S. Geological Survey
Contact_Person: Southwest Geographic Science Team
Contact_Address:
Address_Type: mailing and physical address
Address: 520 N. Park Ave., Suite 106
City: Tucson
State_or_Province: AZ
Postal_Code: 85719
Contact_Voice_Telephone: 520-670-5510
Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
Metadata_Standard_Version: FGDC-STD-001-1998
Metadata_Time_Convention: local time
Metadata_Extensions:
Online_Linkage: http://www.esri.com/metadata/esriprof80.html
Profile_Name: ESRI Metadata Profile

Appendix B: Aerial-Photographic Mosaics

lcr1938_01

lcr1938_02.jpg



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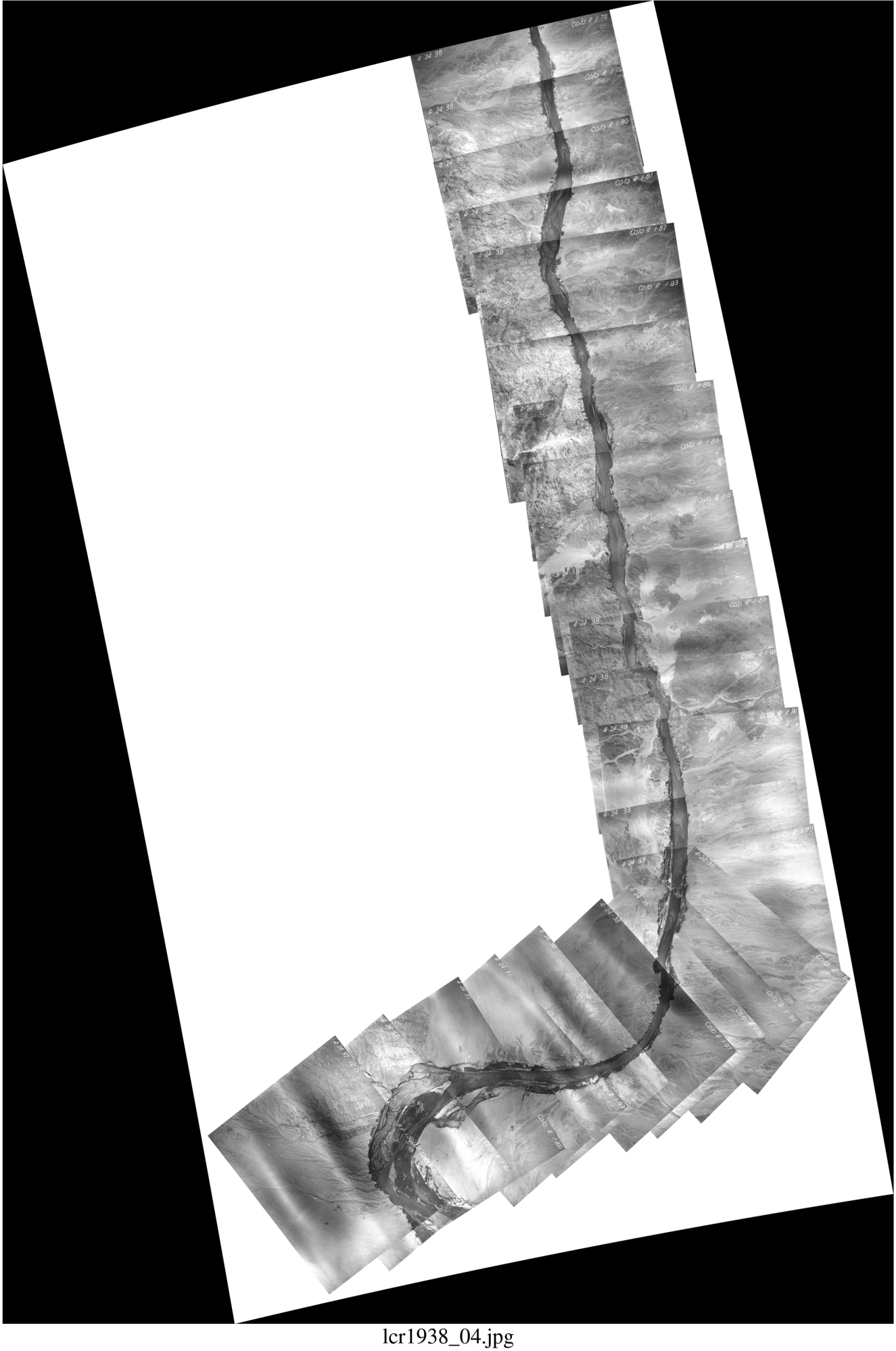

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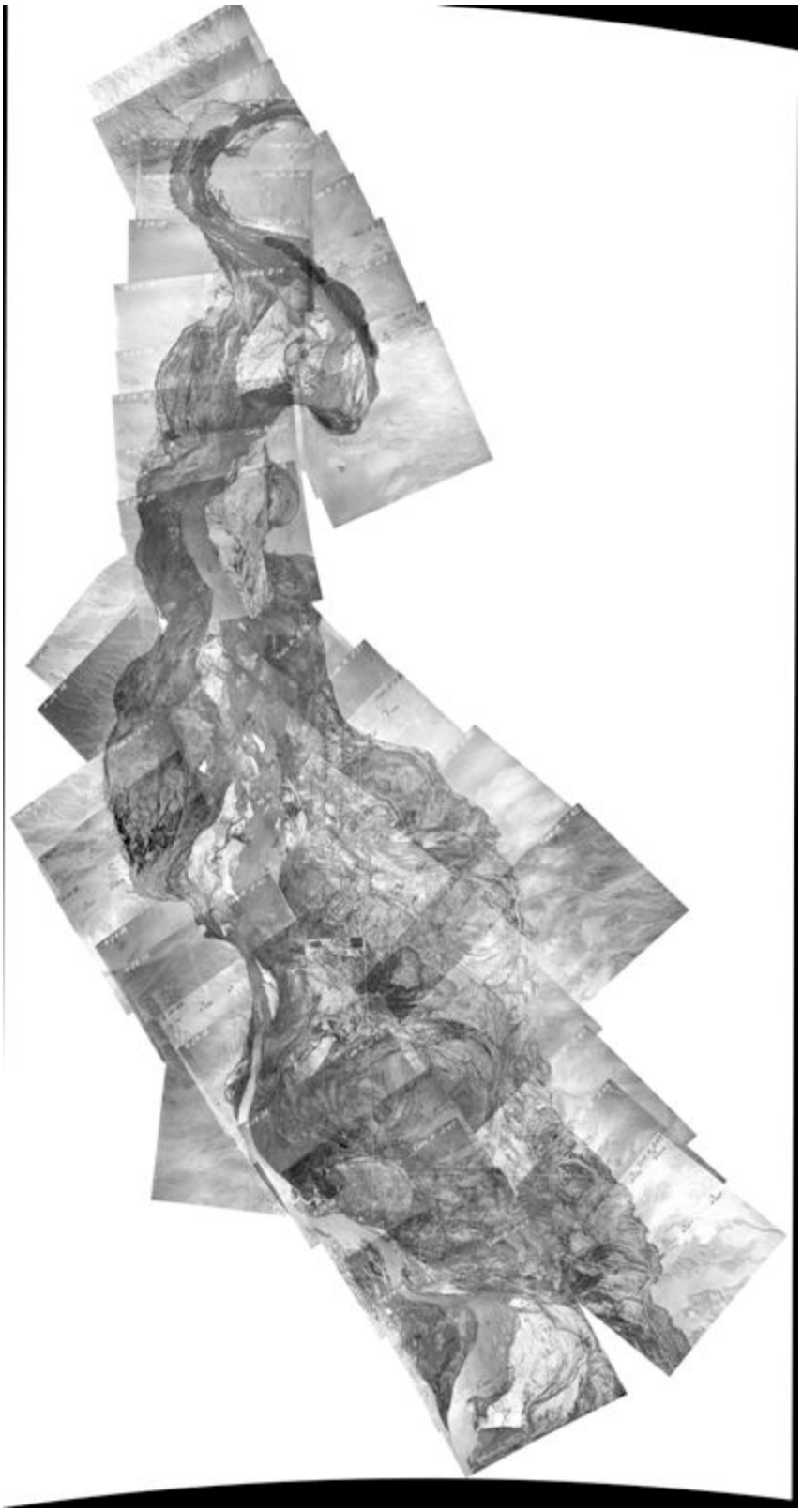

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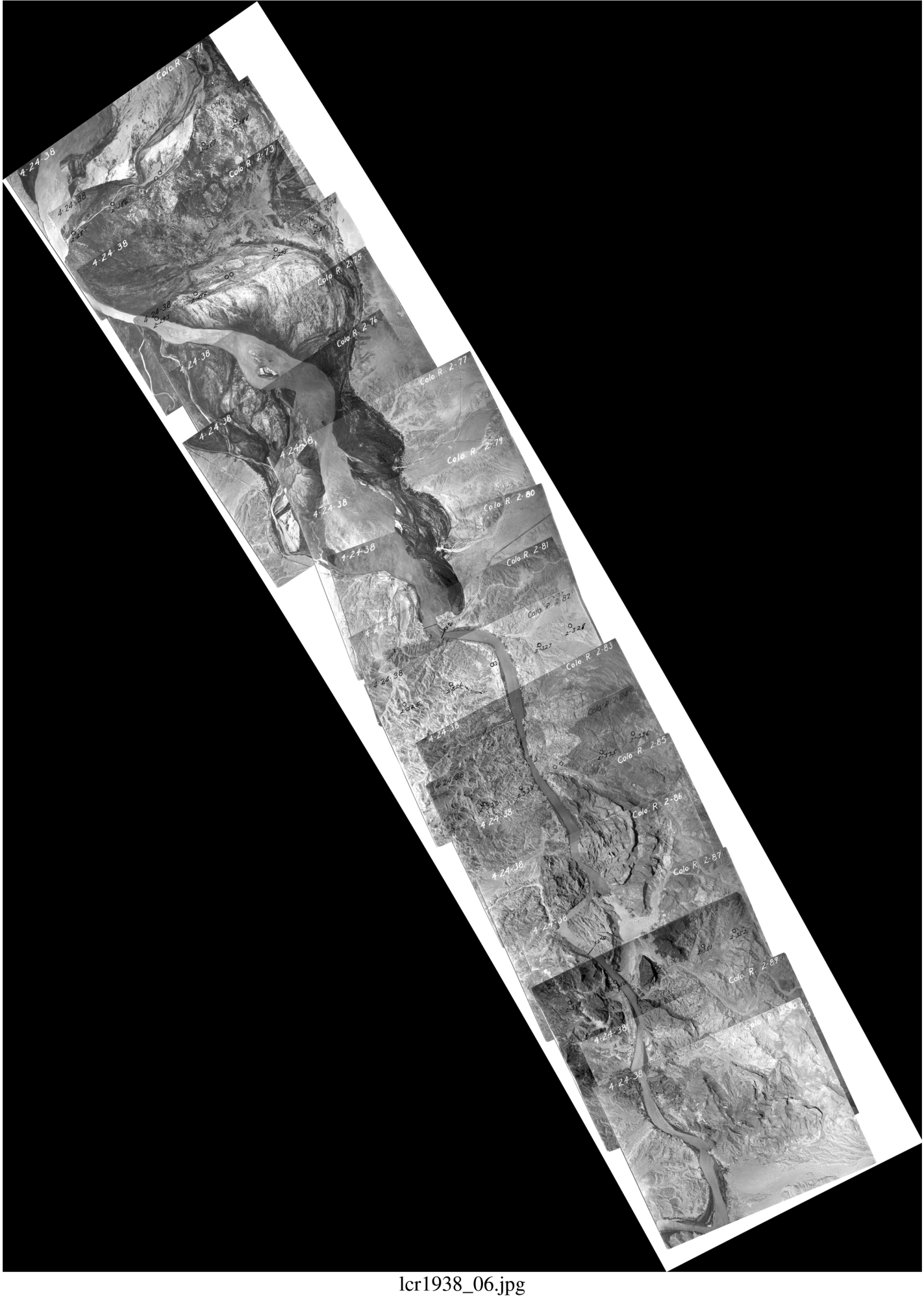

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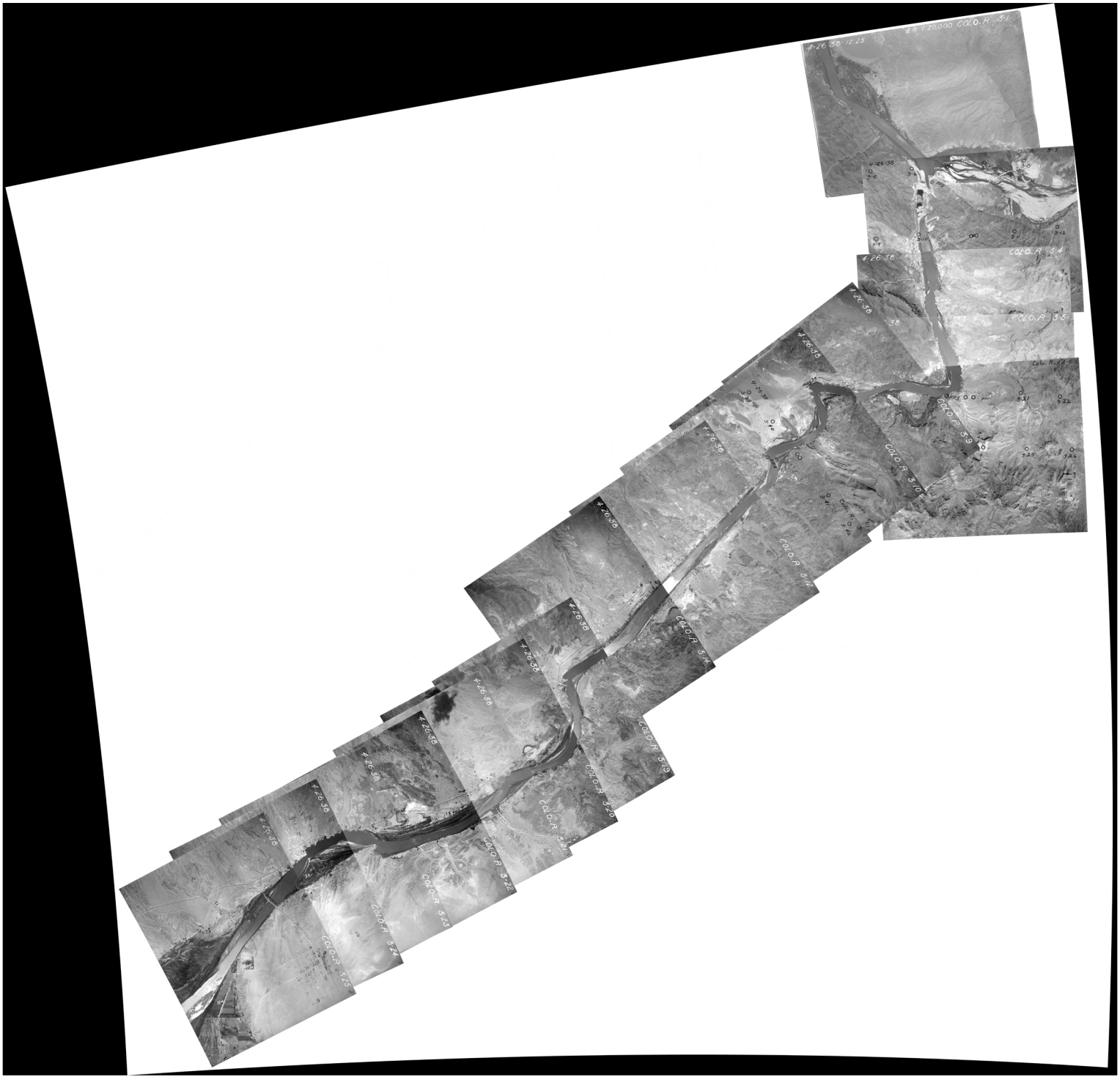

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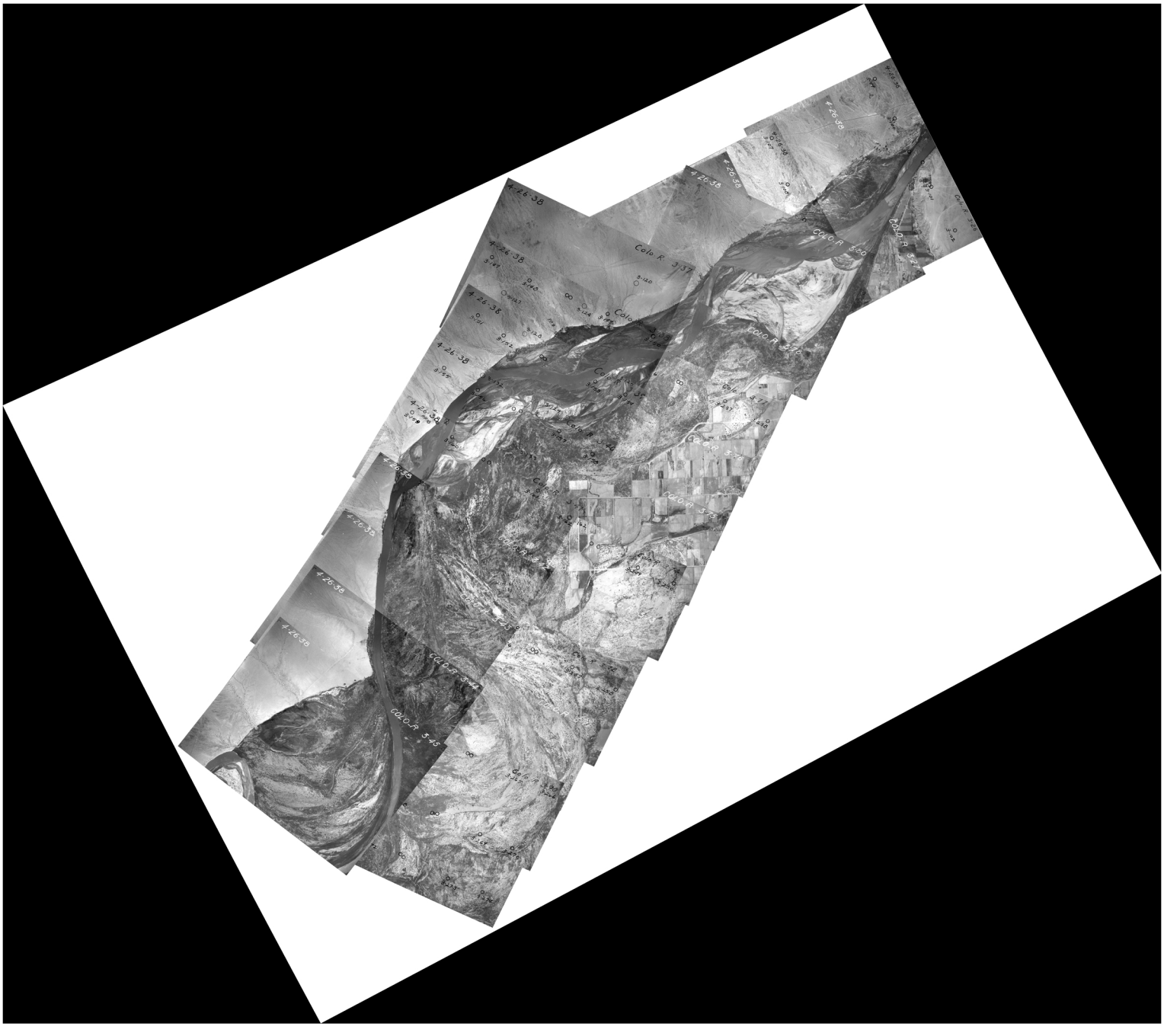

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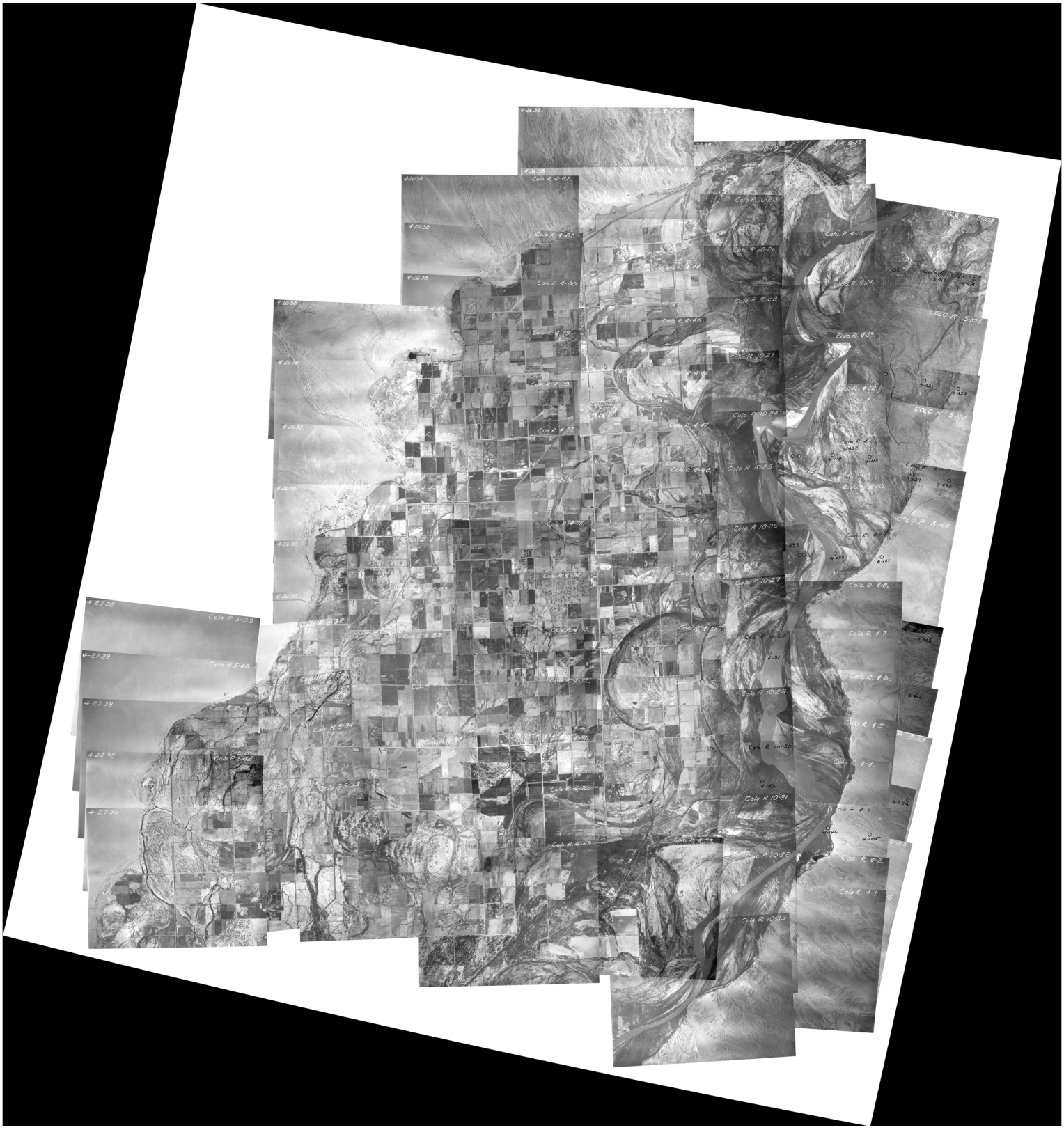
lcr1938_09.jpg



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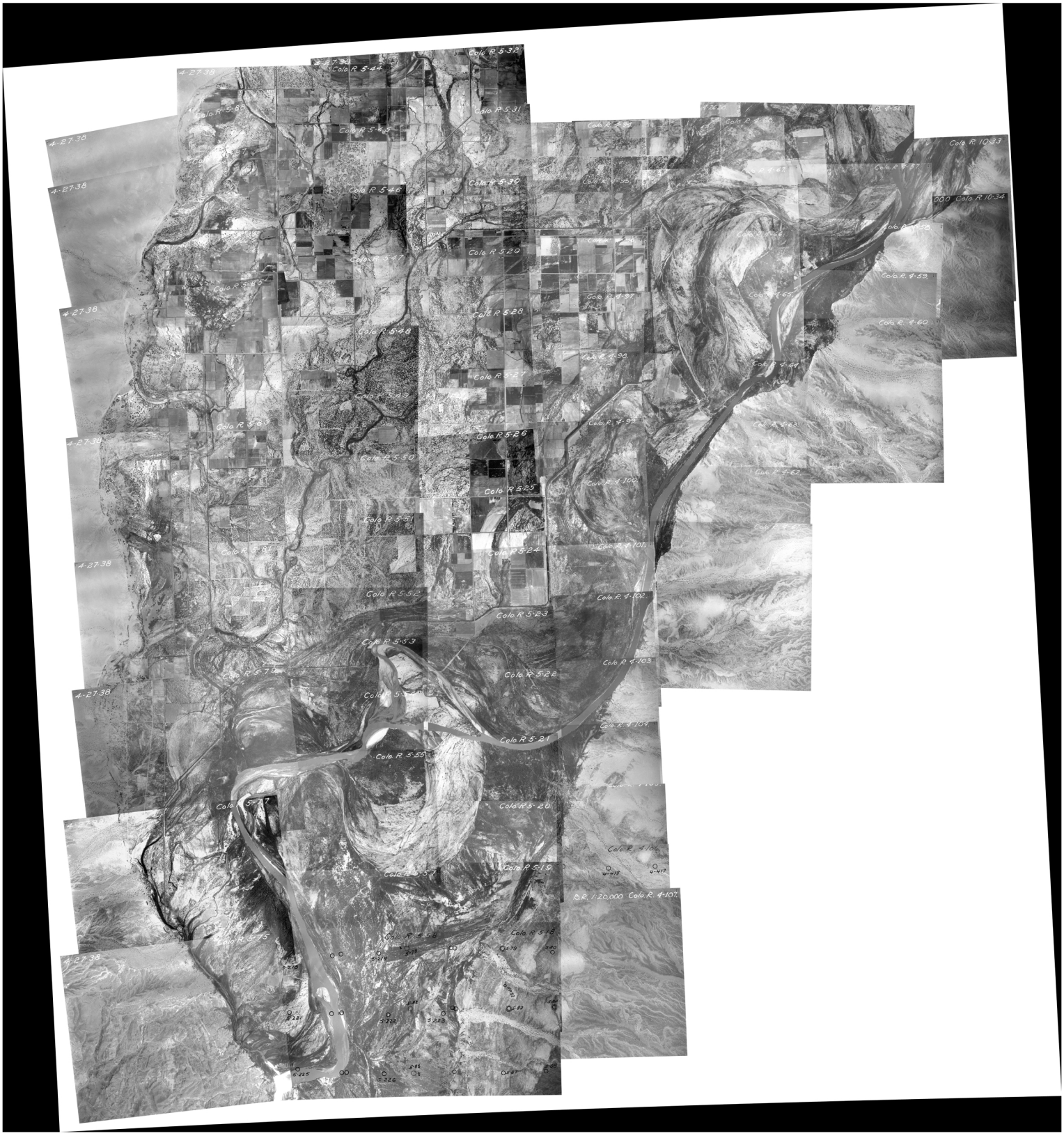

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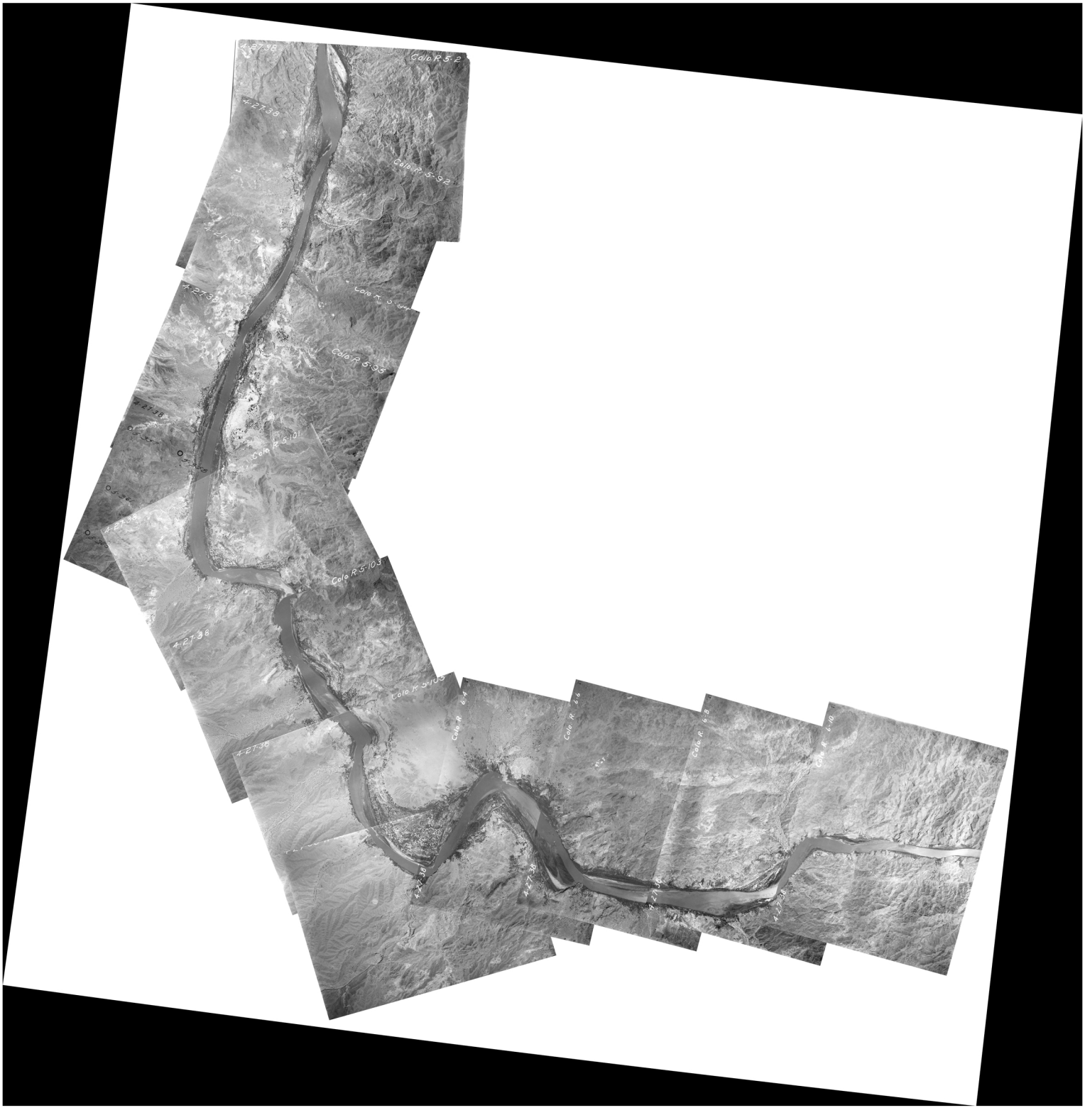
lcr1938_12.jpg



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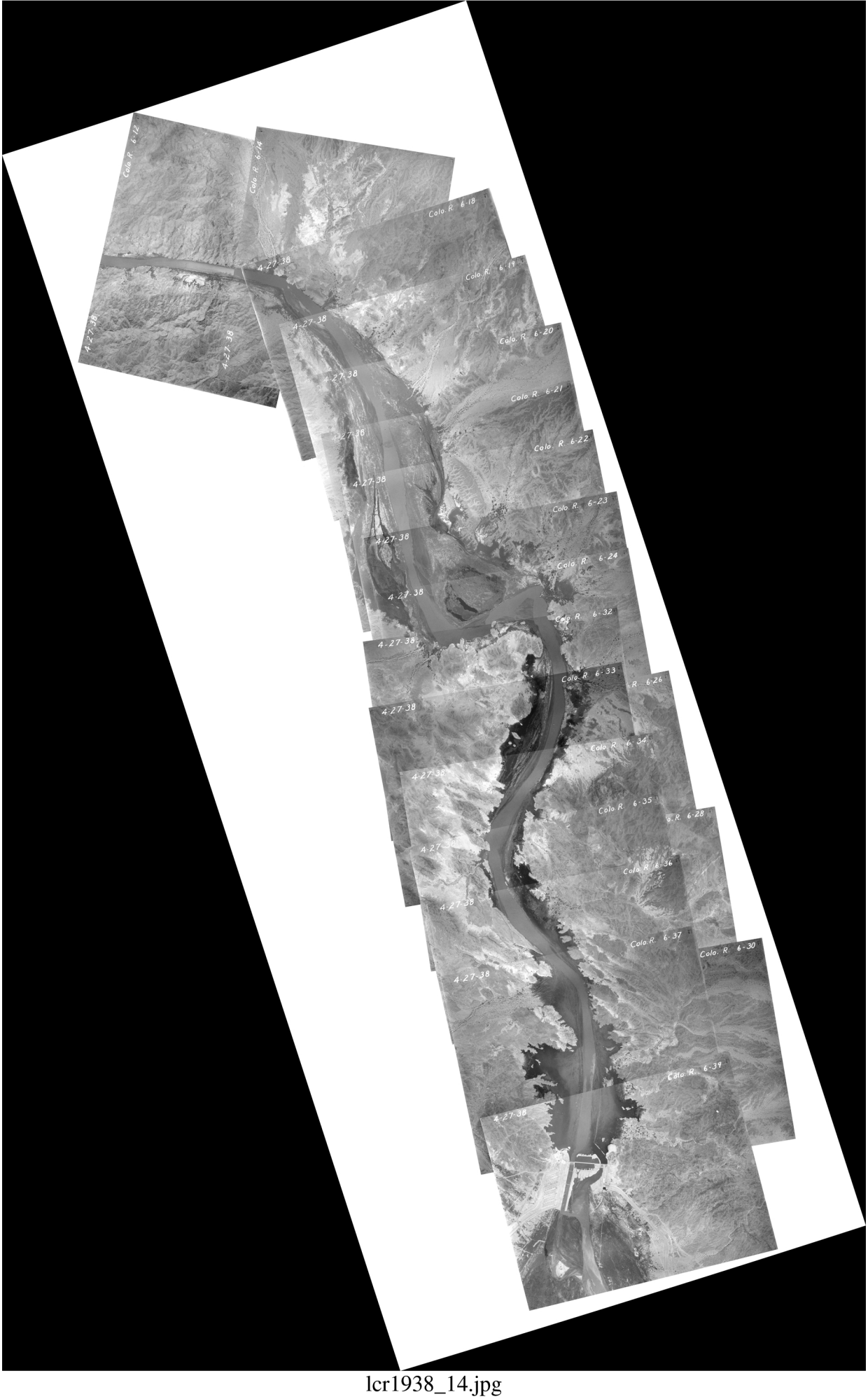

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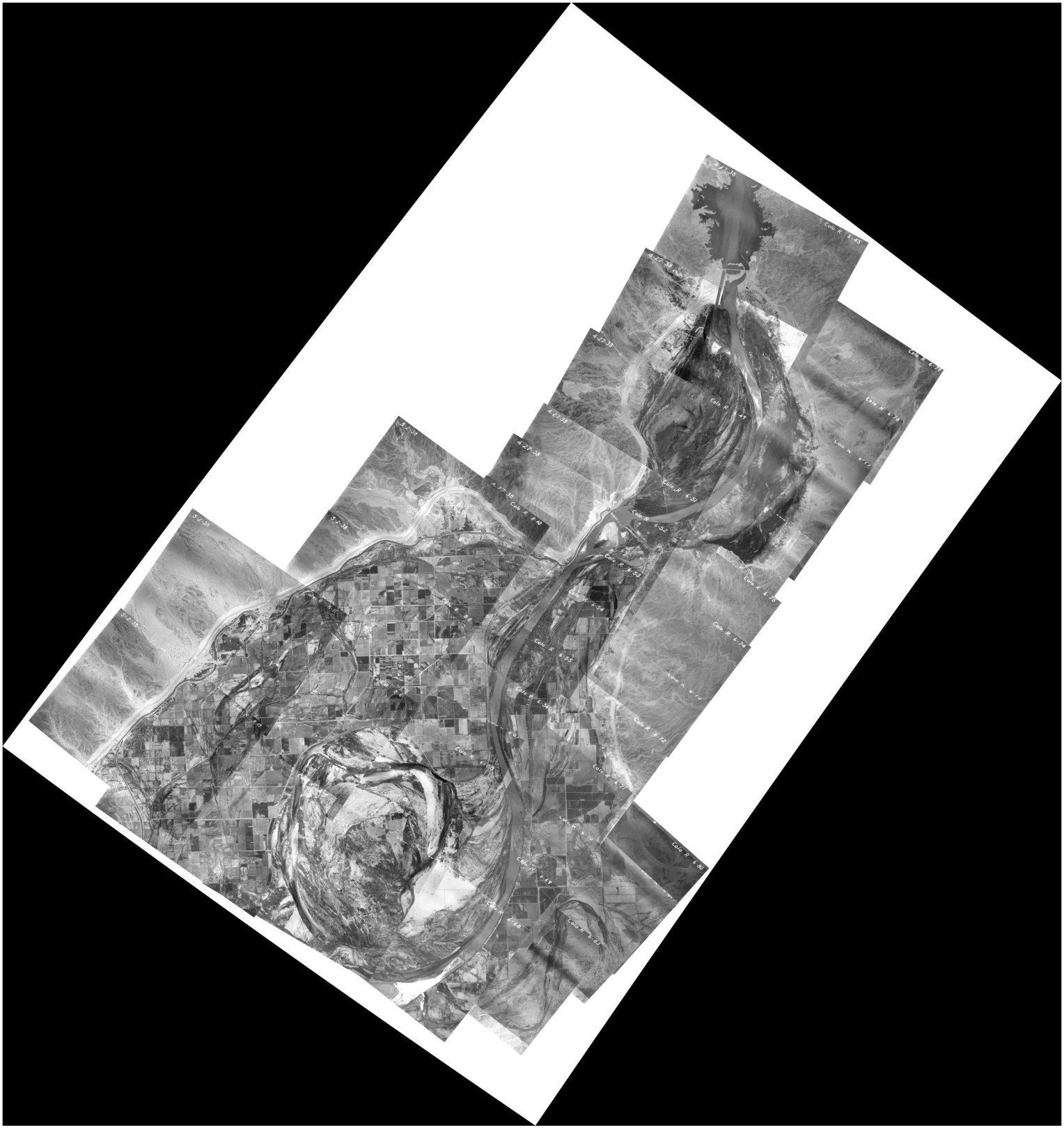

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