

**Topic category:** Geomorphology

**Keywords:** Geomorphology, flood, Mimbres River,  
Florida Gap, Luna, Deming

**County:** Luna County

**Title:** Flood Plain Information Mimbres River & Florida Gap Draw, Deming, Luna County, New Mexico

**Author:** Army Corps of Engineers

**Date:** 1978

**Publication/journal/publisher:** Army Corps of Engineers, Albuquerque District

25 p. + 22 plates

**Type of document:** Printed report

**Source of document / Search method (phone, internet, library, etc.):**

internet (from WRRRI library), <http://www.corpslibrary.com/cf/clientfNew.cgi?Id=49-16-6-8-24309&O=S&PId=PId1235077568428&C=0>

**Purchase Price:**

**Web site address:**

**Document Location:**

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:** Luna County

**Abstract or brief summary:**

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, environmental assessment, levee, Gila River  
**County:** Southwest New Mexico

**Title:** Environmental Assessment for Public Law 84-99, Emergency Levee Rehabilitation on the Gila River, New Mexico.

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**Author:** Army Corps of Engineers

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**Date:** 1979

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**Publication/journal/publisher:** Army Corps of Engineers

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**Type of document:**

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**Source of document / Search method (phone, internet, library, etc.):**

[http://www.ose.state.nm.us/isc\\_colorado\\_gila\\_sanfran\\_TS\\_RefGSF\\_Riparian.html](http://www.ose.state.nm.us/isc_colorado_gila_sanfran_TS_RefGSF_Riparian.html)

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**Purchase Price:**

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**eb site address:**

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**Document Location:**

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**Work initiated by:**

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**Work funded by:**

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**Type of review:**

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**Location of Work:** Gila River, Southwest New Mexico

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**Abstract or brief summary:**

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Grant, levee, Gila River  
**County:** Grant County

**Title:** Grant County Gila No. 5 Levee Rehabilitation Location/Site Map and Typical Levee Section.  
Albuquerque, NM

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**Author:** Army Corps of Engineers

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**Date:** 1979

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**Publication/journal/publisher:** Army Corps of Engineers

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**Type of document:**

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**Source of document / Search method (phone, internet, library, etc.):**

[http://www.ose.state.nm.us/isc\\_colorado\\_gila\\_sanfran\\_TS\\_RefGSF\\_Riparian.html](http://www.ose.state.nm.us/isc_colorado_gila_sanfran_TS_RefGSF_Riparian.html)

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**Purchase Price:**

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**Web site address:**

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**Document Location:**

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**Work initiated by:**

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**Work funded by:**

---

**Type of review:**

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**Location of Work:** Grant County

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**Abstract or brief summary:**

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Gila River, maps  
**County:** Arizona

**Title:** Geomorphic Map of the Upper Gila River, Arizona Study Area Location and Index of Maps

**Author:** Bureau of Reclamation

**Date:** 2003

**Publication/journal/publisher:** US Bureau of Reclamation

**Type of document:**

**Source of document / Search method (phone, internet, library, etc.):**

BOR Phoenix Area Office Library

**Purchase Price:**

**Web site address:**

**Document Location:**

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:** Arizona

**Abstract or brief summary:**

<b>Topic category:</b> Geomorphology
<b>Keywords:</b> Geomorphology, Gila River, vegetation, flood
<b>County:</b> Southeastern Arizona

**Title:** Hydraulic effects of changes in bottom land vegetation on three major floods, Gila River, in southeastern Arizona

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**Author:** Burkham, D.E.

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**Date:** 1976

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**Publication/journal/publisher:** U.S. Geological Survey, Professional Paper 655-J, 13 p.

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**Type of document:** Electronic file (DJVU)

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**Source of document / Search method (phone, internet, library, etc.):**  
USGS publication search <<http://pubs.er.usgs.gov/usgspubs/pp/pp655J>>

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**Purchase Price:** \$3.25

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**Web site address:** <http://pubs.er.usgs.gov/usgspubs/pp/pp655J>

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**Document Location:** USGS online

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**Work initiated by:** USGS

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**Work funded by:**

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**Type of review:**

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**Location of Work:** Southeastern AZ

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**Abstract or brief summary:**

Changes in bottom-land vegetation between December 1965 and October 1972 apparently caused significant differences in stage, mean cross-sectional velocity, mean cross-sectional depth, and boundary roughness at peak discharges of three major floods in an 11.5-mile study reach of the Gila River. The mean velocities of the three peak flows were relatively low where large parts of the flows moved across the steam channel. Effects of changes of bottom-land vegetation on scour and (or) fill could not be determined.

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, geology, Gila River  
**County:** Southwestern NM

**Title:** Scenic Trips to the Geologic Past No. 10: Southwestern New Mexico. Socorro, NM

**Author:** Clemons, R.E., P.W. Christiansen, and H.L. James

**Date:** 1980

**Publication/journal/publisher:** New Mexico Bureau of Mines & Mineral Resources

**Type of document:** Printed report

**Source of document / Search method (phone, internet, library, etc.):**

<http://geoinfo.nmt.edu/publications/scenictrips/10/>

**Purchase Price:** \$10.00

**Web site address:** <http://geoinfo.nmt.edu/publications/scenictrips/10/>

**Document Location:** NMT online

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:** Southwestern New Mexico

**Abstract or brief summary:**

Includes five road logs that discuss the geology, mining operations, history, and scenic attractions of the area. The first "tourist" to travel what now is the continental United States crossed Southwestern New Mexico. The wanderings of Alvar Nuñez Cabeza de Vaca were responsible for the first descriptions of this area which since has produced mineral wealth and rich farming area. Includes three side trips. Southwest New Mexico's geology, history, diverse cultural heritage, and economics have a common interest in the mining districts featured in several of the trips through this area. Large mines operating today were known to the Apache Indians hundreds of years ago and were worked by the Spanish in the early 19th century. The first road log from Las Cruces to the Arizona State line via I-10 parallels the Butterfield Trail, an overland mail route to California, along which stage coaches made twice-weekly runs. Rock collectors should stop at Rock Hound State Park, where rock collecting is encouraged. Trip two, from Deming to Lordsburg, meanders northward along the Mimbres River. This is an area of famous mining districts-Santa Rita, Hanover, Pinos Altos, Silver City, Tyrone, and Gold Hill. Trip three, from Silver City, takes the traveler into the Gila National Forest and Wilderness, the first wilderness area established in the U.S. It offers many hiking trails, campgrounds, hot springs, and Gila Cliff Dwellings National Monument. A final road log connects Deming with the Mexican border. Incorporates Scenic Trip 5, which is now out of print.

**Topic category:** Geomorphology

**Keywords:** Geomorphology, basin and range, watershed

**County:** Southwestern NM

**Title:** Late Cenozoic drainage development in the southeastern basin and range of New Mexico, southeastern most Arizona, and western Texas

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**Author:** Connell, S.D., J.W. Hawley, and D.W. Love

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**Date:** 2005

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**Publication/journal/publisher:** In, Lucas, S.G., Morgan, G.S. and Zeigler, K.E., eds., 2005, New Mexico's Ice Ages, New Mexico Museum of Natural History and Science Bulletin No. 28, p. 125-150

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**Type of document:** Electronic file (PDF)

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**Source of document / Search method (phone, internet, library, etc.):**

[http://geoinfo.nmt.edu/staff/connell/pubs/papers/documents/2005\\_nmmnhs\\_connelletal\\_000.pdf](http://geoinfo.nmt.edu/staff/connell/pubs/papers/documents/2005_nmmnhs_connelletal_000.pdf)

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**Purchase Price:** online

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**Web site address:**

[http://geoinfo.nmt.edu/staff/connell/pubs/papers/documents/2005\\_nmmnhs\\_connelletal\\_000.pdf](http://geoinfo.nmt.edu/staff/connell/pubs/papers/documents/2005_nmmnhs_connelletal_000.pdf)

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**Document Location:** NMT online

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**Work initiated by:** New Mexico Bureau of Geology and Mineral Resources

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**Work funded by:** New Mexico Bureau of Geology and Mineral Resources, New Mexico Water Resources Research Institute, and U.S. Geological Survey

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**Type of review:** Peer review

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**Location of Work:** New Mexico

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**Abstract or brief summary:** Comparisons of regional stratigraphic, sedimentologic, structural, and geomorphic data for Neogene basins of the southeastern Basin and Range, particularly those basins connected by the Rio Grande and upper Gila River, reveal downstream-directed drainage integration by basin filling and spillover across low-standing topographic sills between adjacent basins. Stream capture from adjacent internally drained basins probably played secondary, but locally important roles in the development of integrated drainages in the region. In the northern part of the Rio Grande drainage basin, late Miocene streams from mountainous headwaters in the Rio Chama and Sangre de Cristo Mountains formed the ancestral Rio Grande, which flowed into playa lakes at the southern part of the Albuquerque basin. By early Pliocene time, the ancestral Rio Grande drained into southern New Mexico, western Texas, and northern Mexico. During late Pliocene time, the ancestral Rio Grande flowed across a low topographic sill and continued downstream into western Texas and northern Mexico. Similarly, although less well documented, drainage associated with the Gila River integrated downstream across basin divides and intervening ranges from New Mexico into southeastern Arizona in Plio-Pleistocene time. The progression of regional drainage integration for both river systems does not appear to coincide with major climatic events, but might be associated with progressive filling of tectonically quiescent or slowly subsiding basins. Climatic controls on fluvial discharge and deposition are reflected by increased caliber of Plio-Pleistocene axial-river sediments. Regional stratigraphic correlations support a climatic link for river-valley incision. Incision of basin floors and the development of river valleys and inset fluvial terraces began between 1.2 Ma and 0.67Ma for the Rio Grande. The mechanisms of climatically induced incision are not clearly understood, but probably relate to episodes of increased stream power that might be linked to the increased amplitude and higher frequency of climatic changes that occurred during Pleistocene time.

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Fluvial, Gila River, water management  
**County:** New Mexico

**Title:** Upper Gila River Fluvial Geomorphology Study, Stream Corridor Assessment, New Mexico

**Author:** D.R. Levish and R.J. Wittler

**Date:** 2004

**Publication/journal/publisher:** Prepared by Fluvial Hydraulics and Geomorphology Team, Technical Service Center, Denver, CO - Bureau of Reclamation, Dept. of Interior, Jan. 26, 2004.

**Type of document:** Report

**Source of document / Search method (phone, internet, library, etc.):**  
Bureau of Reclamation, Phoenix Area Office Library

**Purchase Price:**

**Web site address:**

**Document Location:** BOR, Phx library

**Work initiated by:** BOR

**Work funded by:** BOR and NMED Surface Water Quality Bureau

**Type of review:** peer review

**Location of Work:** New Mexico

**Abstract or brief summary:**

The Stream Corridor Assessment Report synthesizes the findings of the Background Information, the Catalog of Historical Changes, Flood Frequency, Flow Duration, and Trends, the Qualitative Assessment of Upper Box Geomorphology, Geomorphic Map and Analysis, and the Stable Channel Analysis. Combined, these studies provide a coherent framework to understand the active physical processes that shape the Gila River in the study reach.



**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Fluvial, Gila River,  
Channel analysis  
**County:** Arizona

**Title:** Upper Gila River Geomorphology Study, Stable Channel Analysis, Arizona

**Author:** Delcau, M.R. and J.E. Klawon

**Date:** 2003

**Publication/journal/publisher:** US Bureau of Reclamation

**Type of document:** Report

**Source of document / Search method (phone, internet, library, etc.):**  
Bureau of Reclamation, Phoenix Area Office Library

**Purchase Price:**

**Web site address:**

**Document Location:**

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:** Arizona

**Abstract or brief summary:**

**Topic category:** Geomorphology

**Keywords:**

**County:** Arizona

**Title:** Upper Gila River Fluvial Geomorphology Study Flood Frequency and Flow Duration Analyses:  
Arizona

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**Author:** England, J.F.

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**Date:** 2005

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**Publication/journal/publisher:** US Bureau of Reclamation, Fluvial Hydraulics and Geomorphology  
Team

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**Type of document:** Report

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**Source of document / Search method (phone, internet, library, etc.):**

Bureau of Reclamation, Phoenix Area Office Library

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**Purchase Price:**

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**Web site address:**

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**Document Location:**

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**Work initiated by:**

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**Work funded by:**

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**Type of review:**

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**Location of Work:** Arizona

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**Abstract or brief summary:**

**Topic category:** Geomorphology

**Keywords:** Geomorphology, Fluvial, Gila River, water management, channel analysis, Flood frequency, flow duration, hydrology

**County:** Southwestern NM

**Title:** Upper Gila River Fluvial Geomorphology Study, flood frequency, flow duration and trends New Mexico

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**Author:** England, J.F.Jr.

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**Date:** 2002

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**Publication/journal/publisher:** Prepared by Fluvial Hydraulics and Geomorphology Team, Technical Service Center, Denver, CO - Bureau of Reclamation, Dept. of Interior, October 3, 2002.

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**Type of document:** Report

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**Source of document / Search method (phone, internet, library, etc.):**

Bureau of Reclamation, Phoenix Area Office Library

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**Purchase Price:**

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**Web site address:**

<http://69.63.217.22/B10113Staff/OPAC/TitleView/CompleteDisplay.aspx?FromOPAC=true&DbCode=0&PatronCode=0&Language=english&RwSearchCode=0&WordHits=&BibCodes=23252485>

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**Document Location:** BOR, Phx library

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**Work initiated by:** BOR

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**Work funded by:** BOR and NMED Surface Water Quality Bureau

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**Type of review:** peer review

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**Location of Work:** New Mexico

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**Abstract or brief summary:**

This report provides information on the magnitude, frequency and duration of upper Gila River basin streamflows. Results from these analyses may provide an understanding of the current hydrologic conditions in the upper Gila River basin, provide estimates of hydrologic changes over time, and be used to assess effective channel forming and maintenance discharges. There are three main objectives of this study: (1) estimate flood peak and volume frequencies; (2) estimate flow durations; and (3) examine streamflow and precipitation trends at selected locations within the Upper Gila River basin, for application in subsequent fluvial geomorphic and hydraulic analyses. The following items are documented in this report as part of Task 9: (1) flood peak and volume exceedance probability estimates at five gaging stations; (2) hydroclimatology of the largest flood-producing storms; (3) flow duration estimates at five gaging stations; and (4) streamflow trends at five gaging stations.

**Topic category:** Geomorphology  
**Keywords:** Southwest US, seasonal variations, monsoons, precipitation, hydrology, landscape evolution  
**County:** Southwest US

**Title:** Geomorphic response to seasonal variations in rainfall in the Southwest United States

**Author:** Etheredge D., D.S. Gutzler, and F.J. Pazzaglia

**Date:** 2004

**Publication/journal/publisher:** Geological Society of America Bulletin

Volume 116, Issue 5 (May 2004) pp. 606–618

**Type of document:** Journal Article

**Source of document / Search method (phone, internet, library, etc.):**

GSA Journal search <<http://www.gsjournals.org/perlserv/?request=get-document&doi=10.1130%2FB22103.1>>

**Purchase Price:** \$25.00 (1 day access to this article only)

**Web site address:**

**Document Location:** Contact GSA

**Work initiated by:**

**Work funded by:**

**Type of review:** peer review

**Location of Work:** Arizona

**Abstract or brief summary:**

The interaction of the North American Monsoon with watershed hydrology and landscape response is evaluated by observing geomorphic characteristics of hillslopes, hydrology, and stream channels in two mountain ranges with contrasting intensity of precipitation. The study compares watersheds in the Hualapai and Santa Catalina Mountains in Arizona, which are similar in lithology, elevation, tectonic setting, vegetation, and annual precipitation, but differ in the proportion of precipitation received in summer thunderstorms. In contrast to conventional interpretation, summer monsoonal precipitation is not primarily responsible for generating most of the discharges that modify channels in large-scale drainages. In the monsoonal climate regime of the Santa Catalinas, small basins flood most often in summer, whereas larger drainages exhibit peak discharges in response to low-intensity winter precipitation. We attribute the paradoxical discharge response of larger drainages to the small spatial scale of summer thunderstorms, which fail to deliver enough precipitation to generate floods in these larger basins, but do prime hillslopes by stripping colluvium and lowering hillslope-infiltration rates, making the large drainages more responsive to areally extensive winter storms.

**Topic category:** Geomorphology  
**Keywords:** Structure, geomorphology, west-central  
New Mexico  
**County:** West-central New Mexico

**Title:** Structure and geomorphology of west-central New Mexico

**Author:** Fitzsimmons, J.P.

**Date:** 1959

**Publication/journal/publisher:** In New Mexico Geological Society Fall Field Conference Guidebook - 10,  
West-Central New Mexico, 112-116. Reprinted 1996.

**Type of document:** Paper in Book

**Source of document / Search method (phone, internet, library, etc.):**

<http://nmgs.nmt.edu/publications/guidebooks/10/>

**Purchase Price:** \$20.00 for Entire Book

**Web site address:** <http://nmgs.nmt.edu/publications/guidebooks/10/>

**Document Location:** Contact NMGS

**Work initiated by:**

**Work funded by:**

**Type of review:** Journal Peer Review

**Location of Work:** West-Central NM

**Abstract or brief summary:**

This article provides a discussion of the structure and geomorphology of West-central New Mexico, including the Zuni Uplift, Gallup Embayment, Acoma Embayment, Rio Puerco Fault Zone, Lucero Uplift, Lemitar-Socorro-Magdalena Zone, Rio Grande Trough, Mongollon Slope, as well as the general geomorphology and structural and geomorphic development of the area.

**Topic category:** Geomorphology

**Keywords:** Geomorphology, Quaternary geology, Lake Animas, Hidalgo

**County:** Hidalgo County

**Title:** Quaternary Geology of Lake Animas, Hidalgo County, New Mexico,

**Author:** Fleischhauer, H.L.Jr. and W.J. Stone

**Date:** 1982

**Publication/journal/publisher:** New Mexico Bureau of Mines and Mineral Resources, Circular 174, 25 pages.

**Type of document:** Printed report

**Source of document / Search method (phone, internet, library, etc.):**  
NMBGMR search <<http://geoinfo.nmt.edu/publications/circulars/174/>>

**Purchase Price:** \$8.00

**Web site address:**

**Document Location:** Contact NMBGMR

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:** Lake Animas, Hidalgo County

**Abstract or brief summary:**

This study describes the geomorphology, soil stratigraphy, and ages for Lake Animas in Hidalgo County, New Mexico. The mapping of the shoreline features in the lower Animas Valley indicates three stages for Lake Animas. Estimated elevations of the high, intermediate, and low shorelines are 4,190–4,195 ft, 4,185 ft, and 4,175–4,180 ft, respectively.

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Gila River, flood  
**County:** Arizona

**Title:** Contrasting channel response to floods on the middle Gila River, Arizona

**Author:** Huckleberry, G.

**Date:** 1994

**Publication/journal/publisher:** Geology, v. 22, p. 1083-1086

**Type of document:**

**Source of document / Search method (phone, internet, library, etc.):**

[http://www.ose.state.nm.us/isc\\_colorado\\_gila\\_sanfran\\_TS\\_RefGSF\\_Geomorph.html](http://www.ose.state.nm.us/isc_colorado_gila_sanfran_TS_RefGSF_Geomorph.html)

**Purchase Price:** \$32.00

**Web site address:** <http://geology.geoscienceworld.org/cgi/content/abstract/22/12/1083>

**Document Location:**

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:** Gila River, Arizona

**Abstract or brief summary:**

Floods of January and February 1993 in Arizona resulted in the most dramatic channel widening on the middle Gila River since 1905. An earlier flood in October 1983 had a larger instantaneous discharge but resulted in little channel change. The 1993 flood was of greater volume and duration, factors important in destabilizing flood-plain vegetation and eroding bank material. The 1983 flood was produced by a dissipating eastern Pacific tropical storm, whereas the 1993 flood was produced by a series of cold fronts from the northern Pacific Ocean supplied with subtropical moisture from a split jet stream. Meridional global circulation patterns enhance the frequency of winter storms that produce sustained flooding in Arizona and are more likely to result in channel widening and flood-plain instability on main trunk streams like the Gila River.

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Gila River  
**County:** Southwest NM

**Title:** Historical Geomorphology of the Gila River

**Author:** Huckleberry, G.

**Date:** 1996

**Publication/journal/publisher:** Arizona Geological Survey, Open-File Report 96-14, Tucson, Arizona  
[note: probably covers only Arizona reach]

**Type of document:** Report

**Source of document / Search method (phone, internet, library, etc.):**  
internet <<http://www.azgs.az.gov/openfilereports.shtml>>

**Purchase Price:** \$7.00

**Web site address:**

**Document Location:** Contact AGS

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:** Gila River

**Abstract or brief summary:**



**Topic category:** Geomorphology  
**Keywords:** Geomorphology, sedimentation, erosion,  
Gila  
**County:**

**Title:** Erosion and sedimentation in the upper Gila drainage, a case study

**Author:** Kingston, R.L. and R.M. Solomon

**Date:** 1976

**Publication/journal/publisher:** Hydrology and Water Resources in Arizona and the Southwest, 6: 103-111. (currently does not have a website)

**Type of document:** Printed report

**Source of document / Search method (phone, internet, library, etc.):**

[http://www.ose.state.nm.us/isc\\_colorado\\_gila\\_sanfran\\_TS\\_RefGSF\\_Watershed.html](http://www.ose.state.nm.us/isc_colorado_gila_sanfran_TS_RefGSF_Watershed.html)

**Purchase Price:**

**Web site address:**

**Document Location:**

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:**

**Abstract or brief summary:**

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Fluvial, Gila River, water management  
**County:** New Mexico

**Title:** Upper Gila River Fluvial Geomorphology Study, Background Information New Mexico

**Author:** Klawon J.E. and R.J. Wittler

**Date:** 2001

**Publication/journal/publisher:** Prepared by Fluvial Hydraulics and Geomorphology Team, Technical Service Center, Denver, CO - Bureau of Reclamation, Dept. of Interior, Dec. 21, 2001.

**Type of document:** Report

**Source of document / Search method (phone, internet, library, etc.):**  
Bureau of Reclamation, Phoenix Area Office Library

**Purchase Price:**

**Web site address:**

**Document Location:** BOR, Phx library

**Work initiated by:** BOR

**Work funded by:** BOR and NMED Surface Water Quality Bureau

**Type of review:** peer review

**Location of Work:** New Mexico

**Abstract or brief summary:**

This document reviews existing studies that contain information about the upper Gila River watershed that may be useful in the present study of the upper Gila River. The references include, but are not limited to, hydrologic, geologic, and biologic data, accounts of floods and precipitation events, studies of channel change and erosion, links between flood records and climate, land use planning documents, water quality studies, and ground water studies. The document is split into two parts: (1) an annotated bibliography which summarizes references that may be pertinent to the present study with a list of useful data for each reference, and (2) a bibliography of related references that include water quality data, hydrogeologic data, fisheries studies, vegetation studies, soils data, and other miscellaneous information that provides background information relevant to the study. This document is subject to additions as other references are discovered during the course of the study and as new information becomes available.

**Topic category:** Geomorphology

**Keywords:** Geomorphology, Fluvial, Gila River, water management

**County:** Arizona

**Title:** Upper Gila River Fluvial Geomorphology Study, Catalog of Historical Changes, Arizona

**Author:** Klawon, J.E.

**Date:** 2001

**Publication/journal/publisher:** Prepared by Fluvial Hydraulics and Geomorphology Team, US Bureau of Reclamation, Technical Service Center, Denver, Colorado, June 8, 2001.

**Type of document:** Electronic file (PDF)

**Source of document / Search method (phone, internet, library, etc.):**

Internet <[http://www.usbr.gov/pmts/hydraulics\\_lab/reportsdb/wrrl\\_reports\\_action2.cfm?id=PAP-871](http://www.usbr.gov/pmts/hydraulics_lab/reportsdb/wrrl_reports_action2.cfm?id=PAP-871)>

**Purchase Price:** online

**Web site address:** [http://www.usbr.gov/pmts/hydraulics\\_lab/pubs/PAP/PAP-0871.pdf](http://www.usbr.gov/pmts/hydraulics_lab/pubs/PAP/PAP-0871.pdf)

**Document Location:** BOR online

**Work initiated by:** BOR

**Work funded by:** Arizona Water Protection Fund Commission, Graham County, Arizona, and the BOR

**Type of review:** Agency Peer Review

**Location of Work:** Arizona

**Abstract or brief summary:**

The Catalog of Historical Changes documents changes in the alluvial channel of the Upper Gila River, Arizona from 1935 to 2000, with additional information from the late 1800's to 1935. This task includes an analysis of trends in channel behavior and stability of river reaches based on lateral migration and changes in channel widths. The analysis of change using flood flow widths for Duncan Valley and Safford Valley show that Safford Valley has experienced many more perturbations in the period of study than Duncan Valley. Major channel changes generally occurred following large floods; this highlights the important point that the largest floods in the Gila River system have lasting effects that can be observed in channel morphology for decades following their occurrence.

**Topic category:** Geomorphology

**Keywords:** New Mexico, historical changes, fluvial geomorphology, Gila River, hydrology

**County:** Grant and Hidalgo Counties

**Title:** Upper Gila River Fluvial Geomorphology Study, Catalog of Historical Changes, New Mexico

**Author:** Klawon, J.E.

**Date:** 2002

**Publication/journal/publisher:** U.S. Department of the Interior Bureau of Reclamation, Technical Service Center, Denver, Colorado. December 20, 2002. Prepared by Fluvial Hydraulics and Geomorphology Team

**Type of document:** Report

**Source of document / Search method (phone, internet, library, etc.):**

Bureau of Reclamation, Phoenix Area Office Library

**Purchase Price:** NA

**Web site address:**

**Document Location:** BOR, Phx library, DBS&A SW library

**Work initiated by:** BOR

**Work funded by:** NMED, BOR

**Type of review:** Agency Peer Review

**Location of Work:** Gila River between Mogollon Creek near Cliff and Arizona State line

**Abstract or brief summary:**

The catalog of historical changes documents changes in the alluvial channel of the Upper Gila River, New Mexico from 1935 to 2001. This task includes an analysis of trends in channel behavior and stability of river reaches based on lateral migration and changes in channel widths. The analysis of change using flood flow widths for Virden, Redrock, and Cliff-Gila Valley show that Cliff-Gila Valley has experienced more perturbations in the period of study than either Virden or Redrock Valley. More unprecedented channel positions were formed between 1980 and 1996 than at any other time in the historic record. Major channel changes generally occurred following large floods.

**Topic category:** Geomorphology

**Keywords:** Geomorphology, Gila River, dams, floods

**County:** Arizona/New Mexico

**Title:** Geomorphic response of the upper Gila River, Arizona and New Mexico, to levees, diversion dams, and floods

**Author:** Klawon, J.E. and D.R. Levish

**Date:** 2003

**Publication/journal/publisher:** Congress of the International Union for Quaternary Research. 16: pages 111-112

**Type of document:** Report

**Source of document / Search method (phone, internet, library, etc.):**

[http://gsa.confex.com/gsa/inqu/finalprogram/abstract\\_55033.htm](http://gsa.confex.com/gsa/inqu/finalprogram/abstract_55033.htm)

**Purchase Price:** \$45.00

**Web site address:**

**Document Location:**

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:** Upper Gila River

**Abstract or brief summary:**

Over the past century, the majority of alluvial reaches along the upper Gila River in Arizona and New Mexico have been leveed in an attempt to protect adjacent property from flood damage. In addition, the demand for irrigation has prompted the construction of diversion dams in these alluvial reaches to divert water for agriculture. In fact, there is a clear relationship along the upper Gila River between the scale of channel modification and property loss. Detailed investigation of historical channel change along the upper Gila River reveals that many of these channel modifications are catalysts for major channel change and can result in catastrophic property loss rather than safeguarding valuable farmland. To quantify channel changes, channel widths were measured every kilometer for approximately 160 km from Safford Valley, Arizona through Cliff-Gila Valley, New Mexico for eight decades. An overall pattern of channel narrowing and widening coincides with periods of few large floods and periods of multiple large floods, respectively. In addition, reaches along the upper Gila River with greater channel modifications have experienced more variation in channel width than reaches with fewer modifications. Many channel changes in recent decades are unprecedented in previous historical aerial photography. These changes are consistently associated with artificial channel constrictions, such as levees, bank protection, and bridges, that have been built and rebuilt following large floods and that have accelerated natural channel narrowing during periods of few large floods. Examples of geomorphic responses due to channel modifications along the upper Gila River include lateral erosion upstream of levees and diversion dams, redirection of flow over diversion dams into opposite banks, breaching of levees during floods and resultant erosion behind levees, channel widening downstream of levees, aggradation in leveed reaches, and lateral migration associated with straightened tributary channels.

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Fluvial, Gila River, water management  
**County:** Arizona

**Title:** Upper Gila River Fluvial Geomorphology Study Background Information and Summary Addendum

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**Author:** Klawon, J.E. and R.J. Wittler

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**Date:** 2001

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**Publication/journal/publisher:** Fluvial Hydraulics and Geomorphology Team, US Bureau of Reclamation

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**Type of document:** Report

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**Source of document / Search method (phone, internet, library, etc.):**  
Bureau of Reclamation, Phoenix Area Office Library

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**Purchase Price:**

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**Web site address:**  
<http://69.63.217.22/B10113Staff/OPAC/TitleView/CompleteDisplay.aspx?FromOPAC=true&DbCode=0&PatronCode=0&Language=english&RwSearchCode=0&WordHits=&BibCodes=23252427>

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**Document Location:** BOR, Phx library

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**Work initiated by:**

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**Work funded by:**

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**Type of review:**

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**Location of Work:** Arizona

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**Abstract or brief summary:**

**Topic category:** Geomorphology  
**Keywords:** Fluvial geomorphology, Upper Gila,  
Geomorphic analysis, Arizona  
**County:** Arizona

**Title:** Upper Gila River Fluvial Geomorphology Study, Geomorphic Analysis, Arizona

**Author:** Klawon, J.E.

**Date:** 2003

**Publication/journal/publisher:** Prepared by Fluvial Hydraulics and Geomorphology Team, US Bureau of Reclamation, Technical Service Center, Denver, Colorado, December 31, 2003.

**Type of document:** Electronic file (PDF)

**Source of document / Search method (phone, internet, library, etc.):**

Bureau of Reclamation, Phoenix Area Office Library, Internet  
<[http://www.usbr.gov/pmts/hydraulics\\_lab/reportsdb/wrrl\\_reports\\_action2.cfm?id=PAP-914](http://www.usbr.gov/pmts/hydraulics_lab/reportsdb/wrrl_reports_action2.cfm?id=PAP-914)>

**Purchase Price:** NA

**Web site address:** [http://www.usbr.gov/pmts/hydraulics\\_lab/pubs/PAP/PAP-0914.pdf](http://www.usbr.gov/pmts/hydraulics_lab/pubs/PAP/PAP-0914.pdf)

**Document Location:** BOR online

**Work initiated by:** BOR

**Work funded by:** Arizona Water Protection Fund Commission, Graham County, Arizona, and the BOR

**Type of review:** Agency Peer Review

**Location of Work:** Arizona

**Abstract or brief summary:**

The Geomorphic Analysis synthesizes geomorphic information about the Gila River and compares results of the analysis to other tasks performed for the Upper Gila River Fluvial Geomorphology Study. Methods used for the Geomorphic Analysis include geomorphic mapping, soil descriptions and laboratory analysis. In Safford and Duncan Valleys, geomorphic change along the Gila River in recent decades appears to be controlled by changes in human factors such as levees and diversion dams rather than changes in external factors such as runoff and sediment influx.

**Topic category:** Geomorphology  
**Keywords:** Fluvial geomorphology, Upper Gila,  
Geomorphic map  
**County:** Arizona

**Title:** Upper Gila River Fluvial Geomorphology Study, Geomorphic Map, Arizona

**Author:** Klawon, J.E.

**Date:** 2004

**Publication/journal/publisher:** Prepared by Fluvial Hydraulics and Geomorphology Team, US Bureau of Reclamation, Technical Service Center, Denver, Colorado, Revised March 4, 2004.

**Type of document:** Electronic file (PDF)

**Source of document / Search method (phone, internet, library, etc.):**

Internet <[http://www.usbr.gov/pmts/hydraulics\\_lab/reportsdb/wrrl\\_reports\\_action2.cfm?id=PAP-922](http://www.usbr.gov/pmts/hydraulics_lab/reportsdb/wrrl_reports_action2.cfm?id=PAP-922)>

**Purchase Price:** NA

**Web site address:** [http://www.usbr.gov/pmts/hydraulics\\_lab/pubs/PAP/PAP-0922.pdf](http://www.usbr.gov/pmts/hydraulics_lab/pubs/PAP/PAP-0922.pdf)

**Document Location:** BOR online

**Work initiated by:** BOR

**Work funded by:** Arizona Water Protection Fund Commission, Graham County, Arizona, and the BOR

**Type of review:**

**Location of Work:** Arizona

**Abstract or brief summary:**

For the Upper Gila River Fluvial Geomorphology Study, the Geomorphic Map will illustrate geomorphic features that will aid in understanding recent channel changes of the Gila River. The objective of the geomorphic map is to provide a picture of long-term river behavior in the Safford Valley and the Duncan Valley. The accompanying maps present basic geomorphic data on black and white orthophotographs. The Geomorphic Map, along with the Catalog of Historical Changes (Task 7C), fieldwork, and laboratory analyses, will be combined in the Geomorphic Analysis (Task 10), a compilation of all geomorphic data developed in the Upper Gila River Fluvial Geomorphology Study.



**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Fluvial, Gila River, water management  
**County:** Arizona

**Title:** Upper Gila River Fluvial Geomorphology Study Background Information and Summary

**Author:** Klawon, J.E., R.J. Wittler, and D.R. Levis

**Date:** 2000

**Publication/journal/publisher:** US Bureau of Reclamation

**Type of document:** Report

**Source of document / Search method (phone, internet, library, etc.):**  
Bureau of Reclamation, Phoenix Area Office Library

**Purchase Price:**

**Web site address:**  
<http://69.63.217.22/B10113Staff/OPAC/TitleView/CompleteDisplay.aspx?FromOPAC=true&DbCode=0&PatronCode=0&Language=english&RwSearchCode=0&WordHits=&BibCodes=23252288>

**Document Location:** BOR, Phx library

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:** Arizona

**Abstract or brief summary:**

**Topic category:** Geomorphology

**Keywords:** Geomorphology, Fluvial, Gila River, water management

**County:** New Mexico

**Title:** Upper Gila River Fluvial Geomorphology Study, qualitative assessment of upper box geomorphology New Mexico.

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**Author:** Levish, D.R.

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**Date:** 2002

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**Publication/journal/publisher:** Prepared by Fluvial Hydraulics and Geomorphology Team, Technical Service Center, Denver, CO - Bureau of Reclamation, Dept. of Interior, May 31, 2002.

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**Type of document:** Report

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**Source of document / Search method (phone, internet, library, etc.):**

Bureau of Reclamation, Phoenix Area Office Library

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**Purchase Price:**

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**Web site address:**

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**Document Location:** BOR, Phx library

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**Work initiated by:** BOR

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**Work funded by:** BOR and NMED Surface Water Quality Bureau

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**Type of review:** peer review

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**Location of Work:** New Mexico

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**Abstract or brief summary:**

The purpose of the Qualitative Assessment of Upper Box Geomorphology is to gain an understanding of the geomorphology of the Gila River immediately upstream of the defined study reach for the Upper Gila River Fluvial Geomorphology Study. This is important because many speculated changes in Gila River geomorphology have been attributed to changes in the condition and sediment yield of the upstream watershed (e.g. Klawon and Wittler, 2001).

**Topic category:** Geomorphology

**Keywords:** Quaternary geology, Dusty, San Mateo Mountains, Catron, Socorro

**County:** Catron County

**Title:** Quaternary geology of the Dusty 7.5-minute quadrangle, Socorro and Catron counties

**Author:** McCraw, D.J.

**Date:** 2003

**Publication/journal/publisher:** New Mexico Bureau of Geology and Mineral Resources, Open File Geologic Map 66Q, May 2003, DRAFT.

**Type of document:** Electronic file (PDF)

**Source of document / Search method (phone, internet, library, etc.):**

NMBGMR search

<<http://geoinfo.nmt.edu/publications/maps/geologic/ofgm/details.cfm?Volume=66Q>>

**Purchase Price:** \$10.00 for CD

**Web site address:** [http://geoinfo.nmt.edu/publications/maps/geologic/ofgm/downloads/66/Dusty\\_v1p-00.pdf](http://geoinfo.nmt.edu/publications/maps/geologic/ofgm/downloads/66/Dusty_v1p-00.pdf)

**Document Location:** NMBGMR online

**Work initiated by:** NMBGMR

**Work funded by:** STATEMAP, USGS, NMBGMR

**Type of review:**

**Location of Work:** Dusty quadrangle, Socorro and Catron Counties

**Abstract or brief summary:**

One of 6 7.5-minute quadrangles covered in the report that extends south of the San Agustin Plains between the San Mateo Mountains to the east and the Luera Mountains to the west in Socorro and easternmost Catron Counties, west-central New Mexico. Kellog Well and the northern part of Oak Peak lie in the southern San Agustin basin, a large semiarid to arid closed basin, which contained one of the largest Pleistocene lakes in New Mexico. Present day surface drainage for this area flows into a playa which extends into the northwestern Kellog Well quadrangle. South of the basin divide extending roughly east-west in the center of Oak Peak at an elevation of around 2,200 m or 7,200 ft, lies the Alamosa Creek basin, which straddles the 4 remaining quadrangles. Surface drainage flows either from the northeast out of the San Mateo Mountains through a series of deeply cut canyons, or from the west out of the Luera Mountains into Alamosa Creek, which in turn flows through the water gap of Monticello Box, and the deeply incised Cañada del Alamosa before emptying into the Rio Grande immediately above Elephant Butte Reservoir.

**Topic category:** Geomorphology

**Keywords:** Quaternary geology, Kellogg Well, San Agustin, San Mateo Mountains, Catron, Socorro

**County:** Catron County

**Title:** Quaternary geology of the Kellogg Well 7.5-minute quadrangle, Socorro and Catron counties

**Author:** McCraw, D.J.

**Date:** 2003

**Publication/journal/publisher:** New Mexico Bureau of Geology and Mineral Resources, Open File Geologic Map 64Q, May 2003, DRAFT.

**Type of document:** Electronic file (PDF)

**Source of document / Search method (phone, internet, library, etc.):**

NMBGMR search

<<http://geoinfo.nmt.edu/publications/maps/geologic/ofgm/details.cfm?Volume=64Q>>

**Purchase Price:** \$10.00 for CD

**Web site address:**

[http://geoinfo.nmt.edu/publications/maps/geologic/ofgm/downloads/64/Kellog\\_Well\\_Quat\\_v1p-00.pdf](http://geoinfo.nmt.edu/publications/maps/geologic/ofgm/downloads/64/Kellog_Well_Quat_v1p-00.pdf)

**Document Location:** NMBGMR online

**Work initiated by:** NMBGMR

**Work funded by:** STATEMAP, USGS, NMBGMR

**Type of review:**

**Location of Work:** Kellogg Well quadrangle, Socorro and Catron Counties

**Abstract or brief summary:**

One of 6 7.5-minute quadrangles covered in the report that extends south of the San Agustin Plains between the San Mateo Mountains to the east and the Luera Mountains to the west in Socorro and easternmost Catron Counties, west-central New Mexico. Kellogg Well and the northern part of Oak Peak lie in the southern San Agustin basin, a large semiarid to arid closed basin, which contained one of the largest Pleistocene lakes in New Mexico. Present day surface drainage for this area flows into a playa which extends into the northwestern Kellogg Well quadrangle. South of the basin divide extending roughly east-west in the center of Oak Peak at an elevation of around 2,200 m or 7,200 ft, lies the Alamosa Creek basin, which straddles the 4 remaining quadrangles. Surface drainage flows either from the northeast out of the San Mateo Mountains through a series of deeply cut canyons, or from the west out of the Luera Mountains into Alamosa Creek, which in turn flows through the water gap of Monticello Box, and the deeply incised Cañada del Alamosa before emptying into the Rio Grande immediately above Elephant Butte Reservoir.

**Topic category:** Geomorphology

**Keywords:** Quaternary geology, Oak Peak, San Agustin, San Mateo Mountains, Catron, Socorro

**County:** Catron County

**Title:** Quaternary geology of the Oak Peak 7.5-minute quadrangle, Socorro and Catron counties,

**Author:** McCraw, D.J.

**Date:** 2003

**Publication/journal/publisher:** New Mexico Bureau of Geology and Mineral Resources, Open File Geologic Map 65Q, May 2003, DRAFT.

**Type of document:** Electronic file (PDF)

**Source of document / Search method (phone, internet, library, etc.):**

NMBGMR search

<<http://geoinfo.nmt.edu/publications/maps/geologic/ofgm/details.cfm?Volume=65Q>>

**Purchase Price:** \$10.00 for CD

**Web site address:**

[http://geoinfo.nmt.edu/publications/maps/geologic/ofgm/downloads/65/Oak\\_Peak\\_Quat\\_v1p-00.pdf](http://geoinfo.nmt.edu/publications/maps/geologic/ofgm/downloads/65/Oak_Peak_Quat_v1p-00.pdf)

**Document Location:** NMBGMR online

**Work initiated by:** NMBGMR

**Work funded by:** STATEMAP, USGS, NMBGMR

**Type of review:**

**Location of Work:** Oak Peak quadrangle, Socorro and Catron Counties

**Abstract or brief summary:**

One of 6 7.5-minute quadrangles covered in the report that extends south of the San Agustin Plains between the San Mateo Mountains to the east and the Luera Mountains to the west in Socorro and easternmost Catron Counties, west-central New Mexico. Kellog Well and the northern part of Oak Peak lie in the southern San Agustin basin, a large semiarid to arid closed basin, which contained one of the largest Pleistocene lakes in New Mexico. Present day surface drainage for this area flows into a playa which extends into the northwestern Kellog Well quadrangle. South of the basin divide extending roughly east-west in the center of Oak Peak at an elevation of around 2,200 m or 7,200 ft, lies the Alamosa Creek basin, which straddles the 4 remaining quadrangles. Surface drainage flows either from the northeast out of the San Mateo Mountains through a series of deeply cut canyons, or from the west out of the Luera Mountains into Alamosa Creek, which in turn flows through the water gap of Monticello Box, and the deeply incised Cañada del Alamosa before emptying into the Rio Grande immediately above Elephant Butte Reservoir.

**Topic category:** Geomorphology

**Keywords:** Quaternary geology, Wahoo Ranch, San Mateo Mountains, Catron, Socorro

**County:** Catron County

**Title:** Quaternary geology of the Wahoo Ranch 7.5-minute quadrangle, Socorro and Catron counties, New Mexico

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**Author:** McCraw, D.J.

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**Date:** 2003

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**Publication/journal/publisher:** New Mexico Bureau of Geology and Mineral Resources, Open File Geologic Map 68Q, May 2003, DRAFT.

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**Type of document:** Electronic file (PDF)

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**Source of document / Search method (phone, internet, library, etc.):**

NMBGMR search

<<http://geoinfo.nmt.edu/publications/maps/geologic/ofgm/details.cfm?Volume=68Q>>

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**Purchase Price:** \$10.00 for CD

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**Web site address:**

[http://geoinfo.nmt.edu/publications/maps/geologic/ofgm/downloads/68/Wahoo\\_Ranch\\_Quat\\_v1p-00.pdf](http://geoinfo.nmt.edu/publications/maps/geologic/ofgm/downloads/68/Wahoo_Ranch_Quat_v1p-00.pdf)

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**Document Location:** NMBGMR online

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**Work initiated by:** NMBGMR

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**Work funded by:** STATEMAP, USGS, NMBGMR

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**Type of review:**

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**Location of Work:** Wahoo Ranch quadrangle, Socorro and Catron Counties

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**Abstract or brief summary:**

One of 6 7.5-minute quadrangles covered in the report that extends south of the San Agustin Plains between the San Mateo Mountains to the east and the Luera Mountains to the west in Socorro and easternmost Catron Counties, west-central New Mexico. Kellog Well and the northern part of Oak Peak lie in the southern San Agustin basin, a large semiarid to arid closed basin, which contained one of the largest Pleistocene lakes in New Mexico. Present day surface drainage for this area flows into a playa which extends into the northwestern Kellog Well quadrangle. South of the basin divide extending roughly east-west in the center of Oak Peak at an elevation of around 2,200 m or 7,200 ft, lies the Alamosa Creek basin, which straddles the 4 remaining quadrangles. Surface drainage flows either from the northeast out of the San Mateo Mountains through a series of deeply cut canyons, or from the west out of the Luera Mountains into Alamosa Creek, which in turn flows through the water gap of Monticello Box, and the deeply incised Cañada del Alamosa before emptying into the Rio Grande immediately above Elephant Butte Reservoir.

**Topic category:** Geomorphology

**Keywords:** Geomorphology, wildfire, hydrologic response

**County:**

**Title:** Initial hydrologic and geomorphic response following a wildfire in the Colorado Front Range

**Author:** Moody, J.A. and D.A. Martin

**Date:** 2001

**Publication/journal/publisher:** Earth Surface Processes and Landforms 26:1049 1070.

**Type of document:**

**Source of document / Search method (phone, internet, library, etc.):**

<http://md1.csa.com/partners/viewrecord.php?requester=gs&collection=ENV&recid=5216803&q=&uid=1100685&setcookie=yes>

**Purchase Price:**

**Web site address:**

**Document Location:**

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:** Colorado Front Range

**Abstract or brief summary:**

A wildfire in May 1996 burned 4690 hectares in two watersheds forested by ponderosa pine and Douglas fir in a steep, mountainous landscape with a summer, convective thunderstorm precipitation regime. The wildfire lowered the erosion threshold in the watersheds, and consequently amplified the subsequent erosional response to shorter time interval episodic rainfall and created both erosional and depositional features in a complex pattern throughout the watersheds. The initial response during the first four years was an increase in runoff and erosion rates followed by decreases toward pre-fire rates. The maximum unit-area peak discharge was  $24 \text{ m}^3 \text{ s}^{-1} \text{ km}^{-2}$  for a rainstorm in 1996 with a rain intensity of  $90 \text{ mm h}^{-1}$ . Recovery to pre-fire conditions seems to have occurred by 2000 because for a maximum 30-min rainfall intensity of  $50 \text{ mm h}^{-1}$ , the unit-area peak discharge in 1997 was  $6.6 \text{ m}^3 \text{ s}^{-1} \text{ km}^{-2}$ , while in 2000 a similar intensity produced only  $0.11 \text{ m}^3 \text{ s}^{-1} \text{ km}^{-2}$ . Rill erosion accounted for 6 per cent, interrill erosion for 14 per cent, and drainage erosion for 80 per cent of the initial erosion in 1996. This represents about a 200-fold increase in erosion rates on hillslopes which had a recovery or relaxation time of about three years. About 67 per cent of the initially eroded sediment is still stored in the watersheds after four years with an estimated residence time greater than 300 years. This residence time is much greater than the fire recurrence interval so erosional and depositional features may become legacies from the wildfire and may affect landscape evolution by acting as a new set of initial conditions for subsequent wildfire and flood sequences. Published in 2001 by John Wiley & Sons, Ltd.

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Gila River,  
**County:**

**Title:** Geomorphology of the Upper Gila River Within the State of New Mexico

**Author:** Mussetter Engineering, Inc.

**Date:** 2006

**Publication/journal/publisher:** Mussetter Engineering, Inc., 1730 S. College Avenue, Suite 100, Fort Collins, Colorado 80525

**Type of document:** Electronic file (PDF)

**Source of document / Search method (phone, internet, library, etc.):**

ISC provided electronic copy of report

**Purchase Price:** NA

**Web site address:** <http://www.ose.state.nm.us/PDF/ISC/BasinsPrograms/GilaSanFrancisco/Mussetter-2006-Geomorphology-UpperGila.pdf>

**Document Location:** DBS&A network

**Work initiated by:** ISC

**Work funded by:** ISC

**Type of review:**

**Location of Work:** Upper Gila River

**Abstract or brief summary:**

This investigation of the Upper Gila River Basin in New Mexico was conducted to provide a basis for determining the geomorphic impacts on the Gila River, if any, due to annual diversion of up to 14,000 acre-feet (AF) of additional water as a result of implementation of the Consumptive Use and Forbearance Agreement (CUFA) in the 2004 Arizona Water Settlement Act. Geomorphic changes to the Gila River have the potential to adversely affect the physical habitat for a number of species listed under the Endangered Species Act, primarily, spikedace, loach minnow and the southwest willow flycatcher.



**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Gila River  
**County:**

**Title:** A Fluvial Geomorphology Assessment of the Gila River From the Gila Box to the Bird Area.

**Author:** Natural Resources Conservation Service

**Date:** 1998

**Publication/journal/publisher:** Natural Resource Conservation Service, Albuquerque, NM

**Type of document:**

**Source of document / Search method (phone, internet, library, etc.):**

[http://www.ose.state.nm.us/isc\\_colorado\\_gila\\_sanfran\\_TS\\_RefGSF\\_Geomorph.html](http://www.ose.state.nm.us/isc_colorado_gila_sanfran_TS_RefGSF_Geomorph.html)

**Purchase Price:**

**Web site address:**

**Document Location:**

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:** Gila River near the Gila Box

**Abstract or brief summary:**

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, stream trenching,  
vegetation removal  
**County:** Southwestern NM

**Title:** Recent stream trenching in the semi-arid portion of Southwestern New Mexico, a result of the removal of vegetation cover

**Author:** Rich, J.L

**Date:** 1911

**Publication/journal/publisher:** American Journal of Science (4th series). XXXII, v. 190, p. 237-245

**Type of document:** Journal Article

**Source of document / Search method (phone, internet, library, etc.):**

[http://www.ose.state.nm.us/isc\\_colorado\\_gila\\_sanfran\\_TS\\_RefGSF\\_Geomorph.html](http://www.ose.state.nm.us/isc_colorado_gila_sanfran_TS_RefGSF_Geomorph.html)

**Purchase Price:**

**Web site address:**

**Document Location:**

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:** Southwestern NM

**Abstract or brief summary:**

A conspicuous development of recent stream trenches in the valleys of many of the temporary streams of the western states is a feature of such widespread and common occurrence that it cannot be assigned to accidental causes, but calls for an explanation which shall have more than a local application. Here it is apparently an effect of removal of vegetation cover by excessive grazing. A brief description of the nature of the trenching and a statement of the evidence on which the above explanation of the phenomenon is based is the purpose of the following discussion.

**Topic category:** Geomorphology  
**Keywords:** Soil, geomorphology, prehistoric terrace, Mimbres  
**County:** Southwestern NM

**Title:** Soil-geomorphic setting and change in prehistoric agricultural terraces in the Mimbres area, New Mexico

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**Author:** Sandor, J.A., J.W. Hawley, R.H. Schiowitz, and P.L. Gersper

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**Date:** 2008

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**Publication/journal/publisher:** In New Mexico Geological Society Fall Field Conference Guidebook - 59, Geology of the Gila Wilderness-Silver City area, 167-176.

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**Type of document:** Paper in Book

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**Source of document / Search method (phone, internet, library, etc.):**  
<http://nmgs.nmt.edu/publications/guidebooks/59/>

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**Purchase Price:** \$45.00 for entire book

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**Web site address:** <http://nmgs.nmt.edu/publications/guidebooks/59/>

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**Document Location:** Contact NMGS

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**Work initiated by:**

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**Work funded by:**

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**Type of review:** Journal Peer Review

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**Location of Work:** Southwestern New Mexico

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**Abstract or brief summary:**

Soil-geomorphic relationships at some prehistoric agricultural terrace sites in the Sapillo and Mimbres Valleys in southwestern New Mexico were investigated to learn about agricultural management in this semi-arid mountainous region, evaluate soil productivity, and determine long-term effects of agriculture on the physical environment.

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Gila River, channel, flow  
**County:**

**Title:** A Study of Channel Form and Flow Regime on the Gila River

**Author:** Soles, E.S.

**Date:** 1999

**Publication/journal/publisher:** Upper Gila Watershed Association, Carapace, Vol. 6, 4-6. Gila, NM

**Type of document:** printed report

**Source of document / Search method (phone, internet, library, etc.):**

[http://www.ose.state.nm.us/isc\\_colorado\\_gila\\_sanfran\\_TS\\_RefGSF\\_Geomorph.html](http://www.ose.state.nm.us/isc_colorado_gila_sanfran_TS_RefGSF_Geomorph.html)

**Purchase Price:**

**Web site address:** [http://www.ugwa.org/pubs\\_carapace.shtml](http://www.ugwa.org/pubs_carapace.shtml)

**Document Location:**

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:** Gila River

**Abstract or brief summary:**

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, ditch, acequia  
**County:**

**Title:** The Fort West Ditch

**Author:** Stailey, L.

**Date:** 2000

**Publication/journal/publisher:** Unpublished chronology

**Type of document:**

**Source of document / Search method (phone, internet, library, etc.):**

[http://www.ose.state.nm.us/isc\\_colorado\\_gila\\_sanfran\\_TS\\_RefGSF\\_Hydrology.html](http://www.ose.state.nm.us/isc_colorado_gila_sanfran_TS_RefGSF_Hydrology.html)

**Purchase Price:**

**Web site address:**

**Document Location:**

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:**

**Abstract or brief summary:**

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, map, Animas Creek Valley, Hidalgo  
**County:** Hidalgo County

**Title:** Digital Geomorphic Surface Map and Geographic Database of the Southern Animas Creek Valley, Hidalgo County, NM

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**Author:** Vincent K.R. and P.R. Krider

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**Date:** 1999

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**Publication/journal/publisher:** DI-16. Tucson, AZ: Arizona Geological Survey

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**Type of document:** Electronic file (Arc/INFO)

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**Source of document / Search method (phone, internet, library, etc.):**  
internet <[http://www.azgs.az.gov/publist\\_1.shtml](http://www.azgs.az.gov/publist_1.shtml)>

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**Purchase Price:** \$30.00

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**Web site address:**

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**Document Location:** Contact AGS

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**Work initiated by:**

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**Work funded by:**

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**Type of review:**

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**Location of Work:** Southern Animas Creek Valley, Hidalgo County, NM

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**Abstract or brief summary:**

Digital Geomorphic Surface Map and Geographic Database of the Southern Animas Creek Valley, Hidalgo County, NM

**Topic category:** Geomorphology  
**Keywords:** Geomorphic map, Animas Creek, Hidalgo  
**County:** Hidalgo County

**Title:** Geomorphic surface maps of the southern Animas Creek valley, Hidalgo County, New Mexico

**Author:** Vincent, K.R. and P.R. Krider

**Date:** 1998

**Publication/journal/publisher:** New Mexico Bureau of Mines and Mineral Resources, Open File Report 429, 59 pages.

**Type of document:** Electronic file (PDF)

**Source of document / Search method (phone, internet, library, etc.):**

NMBGMR search <<http://geoinfo.nmt.edu/publications/openfile/details.cfm?Volume=429>>

**Purchase Price:** \$10.00 for CD

**Web site address:** [http://geoinfo.nmt.edu/publications/openfile/downloads/OFR400-499/426-450/429/ofr\\_429.pdf](http://geoinfo.nmt.edu/publications/openfile/downloads/OFR400-499/426-450/429/ofr_429.pdf)

**Document Location:** NMBGMR online

**Work initiated by:** University of Arizona

**Work funded by:** USFS, USGS, UA, Animas Foundation

**Type of review:** peer review

**Location of Work:** southern Animas Creek valley, Hidalgo County

**Abstract or brief summary:**

This report is the initial product of a study aimed at linking geomorphology, as a substrate, with the ecology of high desert grasslands in southwestern New Mexico. Fourteen geomorphic surface maps (7.5' quadrangles at 1:24,000 map-scale) accompany this document. The report elaborates on the philosophical basis and methods of the project including brief geologic history, then explains the meaning of the symbols used to identify the map units. Detailed soil descriptions are provided for reference.

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Fluvial, Gila River, water management  
**County:**

**Title:** Upper Gila River Fluvial Geomorphology Study Field Data Collection Plan

**Author:** Wittler, R.J. and D.R. Levis

**Date:** 2001

**Publication/journal/publisher:** US Bureau of Reclamation, Fluvial Hydraulics and Geomorphology Team

**Type of document:** Report

**Source of document / Search method (phone, internet, library, etc.):**  
Bureau of Reclamation, Phoenix Area Office Library

**Purchase Price:**

**Web site address:**  
<http://69.63.217.22/B10113Staff/OPAC/TitleView/CompleteDisplay.aspx?FromOPAC=true&DbCode=0&PatronCode=0&Language=english&RwSearchCode=0&WordHits=&BibCodes=23252180>

**Document Location:** BOR, Phx library

**Work initiated by:**

**Work funded by:**

**Type of review:**

**Location of Work:** Upper Gila River

**Abstract or brief summary:**



**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Fluvial, Gila River, water management, field methods  
**County:** New Mexico

**Title:** Upper Gila River Fluvial Geomorphology Study, Field data collection plan New Mexico

**Author:** Wittler, R.J. and D.R. Levis

**Date:** 2001

**Publication/journal/publisher:** Prepared by Fluvial Hydraulics and Geomorphology Team, Technical Service Center, Denver, CO - Bureau of Reclamation, Dept. of Interior, Feb. 28, 2001.

**Type of document:** Report

**Source of document / Search method (phone, internet, library, etc.):**  
Bureau of Reclamation, Phoenix Area Office Library

**Purchase Price:**

**Web site address:**

**Document Location:** BOR, Phx library

**Work initiated by:** BOR

**Work funded by:** BOR and NMED Surface Water Quality Bureau

**Type of review:** peer review

**Location of Work:** New Mexico

**Abstract or brief summary:**

The purpose of this plan is to summarize the “who, what, when, where, why, and how” of the field data collection portion of the Upper Gila Fluvial Geomorphology Study. Table 1 contains that summary, outlining the plans for nine types of field data to support the study. Each of the sections that follow go into significant depth explaining the rationale, criteria, and specifics of the types and quantities of field data. The primary piece of field data is the aerial photogrammetry of the study reach at a scale of 1:10,000. Most all other field data and much of the analysis will depend upon interpretation of the aerial photogrammetry and the resulting orthophotograph and topography. Data that normally would derive from field collection such as cross sections and inventories will now derive primarily from the aerial photogrammetry. Field verification, the process of verifying remotely sensed information such as aerial photogrammetry, will focus on occluded portions of the study reach such as the areas near bridges and diversion structures, and under the vegetative canopy. Some traditional surveying to supplement cross sections near hydraulic structures and bridges will probably be necessary, as will visual observations for the inventories of the vegetation, infrastructure, and tributaries. Ground disturbing activities will include the collection of bed material sediment samples and pits on overbank areas for dating of surfaces.

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Fluvial, Gila River, water management  
**County:** New Mexico

**Title:** Upper Gila River Fluvial Geomorphology Study, Final Report, New Mexico

**Author:** Wittler, R.J. and D.R. Levis

**Date:** 2004

**Publication/journal/publisher:** Prepared by Fluvial Hydraulics and Geomorphology Team, Technical Service Center, Denver, CO - Bureau of Reclamation, Dept. of Interior, March 24, 2004.

**Type of document:** Report

**Source of document / Search method (phone, internet, library, etc.):**  
Bureau of Reclamation, Phoenix Area Office Library

**Purchase Price:**

**Web site address:**

**Document Location:** BOR, Phx library

**Work initiated by:** BOR

**Work funded by:** BOR and NMED Surface Water Quality Bureau

**Type of review:** peer review

**Location of Work:** New Mexico

**Abstract or brief summary:**

The goal of this study is to analyze the fluvial geomorphological attributes of the upper Gila River. These attributes are a function of the physical processes at work in the stream corridor. The stream corridor includes the main stem of the Gila River at flood stage and the associated riparian area, as well as tributaries within the valley of the main stem. The purpose of the study is to increase the awareness of these processes enabling improved local, state, and federal management of the stream corridor. The study includes background information gathering, field data collection, photographic analyses, and a variety of topographic, geomorphic, hydraulic, and hydrologic analyses. The study includes a qualitative assessment of the Gila River in the Upper Box.

<b>Topic category:</b> Geomorphology
<b>Keywords:</b> Geomorphology, Fluvial, Gila River, channel stability
<b>County:</b> New Mexico

**Title:** Upper Gila River Fluvial Geomorphology Study, Stable Channel Analysis New Mexico

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**Author:** Wittler, R.J. and Delcau, M.R.

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**Date:** 2002

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**Publication/journal/publisher:** Prepared by Fluvial Hydraulics and Geomorphology Team, Technical Service Center, Denver, CO - Bureau of Reclamation, Dept. of Interior, Dec. 13, 2002.

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**Type of document:** Report

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**Source of document / Search method (phone, internet, library, etc.):**  
Bureau of Reclamation, Phoenix Area Office Library

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**Purchase Price:**

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**Web site address:**

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**Document Location:** BOR, Phx library

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**Work initiated by:** BOR

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**Work funded by:** BOR and NMED Surface Water Quality Bureau

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**Type of review:** peer review

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**Location of Work:** New Mexico

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**Abstract or brief summary:**

This report presents an analysis of the channel stability of the Gila River in the Cliff-Gila valley in New Mexico. The stability analysis uses the RISAD module of the SAM analytical model to determine the relative stability of Sub-Reaches of the upper Gila River and tributaries.

**Topic category:** Geomorphology  
**Keywords:** Geomorphology, Gila River, hydrology  
**County:** Arizona

**Title:** Upper Gila River Fluvial Geomorphology Study, Final Report, Arizona

**Author:** Wittler, R.J. and J.E. Klawon

**Date:** 2004

**Publication/journal/publisher:** Prepared by Fluvial Hydraulics and Geomorphology Team, Technical Service Center, Denver, CO - Bureau of Reclamation, Dept. of Interior, December 3, 2004.

**Type of document:** Electronic (PDF)

**Source of document / Search method (phone, internet, library, etc.):**

Bureau of Reclamation, Phoenix Area Office Library

**Purchase Price:** NA

**Web site address:** [http://www.usbr.gov/pmts/hydraulics\\_lab/pubs/PAP/PAP-0923.pdf](http://www.usbr.gov/pmts/hydraulics_lab/pubs/PAP/PAP-0923.pdf)

**Document Location:** BOR website

**Work initiated by:** BOR

**Work funded by:** Arizona Water Protection Fund Commission, Graham County, Arizona, and the BOR

**Type of review:** Agency Peer Review

**Location of Work:** Arizona

**Abstract or brief summary:**

This report finalizes the Upper Gila River Fluvial Geomorphology Study. In addition to summarizing the other study reports and findings, this report provides conceptual level recommendations for demonstration projects. The purpose of the projects is to demonstrate techniques for managing the river that take into account the causes of the geomorphic processes that dominate the fluvial system. This report also contains recommendations for a general-purpose monitoring program to accompany demonstration projects.

**Topic category:** Geomorphology

**Keywords:** Fluvial geomorphology, Upper Gila, stream corridor assessment

**County:** Arizona

**Title:** Upper Gila River Fluvial Geomorphology Study, Stream Corridor Assessment, Arizona

**Author:** Wittler, R.J. and J.E. Klawon

**Date:** 2004

**Publication/journal/publisher:** Prepared by Fluvial Hydraulics and Geomorphology Team, Technical Service Center, Denver, CO - Bureau of Reclamation, Dept. of Interior, March 5, 2004.

**Type of document:** Electronic (PDF)

**Source of document / Search method (phone, internet, library, etc.):**

internet <[http://www.usbr.gov/pmts/hydraulics\\_lab/reportsdb/wrrl\\_reports\\_action2.cfm?id=PAP-920](http://www.usbr.gov/pmts/hydraulics_lab/reportsdb/wrrl_reports_action2.cfm?id=PAP-920)>

**Purchase Price:** NA

**Web site address:** [http://www.usbr.gov/pmts/hydraulics\\_lab/pubs/PAP/PAP-0920.pdf](http://www.usbr.gov/pmts/hydraulics_lab/pubs/PAP/PAP-0920.pdf)

**Document Location:** BOR online

**Work initiated by:** BOR

**Work funded by:** Arizona Water Protection Fund Commission, Graham County, Arizona, and the BOR

**Type of review:** Agency Peer Review

**Location of Work:** Arizona

**Abstract or brief summary:**

This report is a synthesis of the Background Information report, the Catalog of Historical Changes, Flood Frequency and Flow Duration Analyses report, Geomorphic Analysis, Geomorphic Map, and the Stable Channel Analysis. This report presents an analysis of the stability of the Gila River between the San Carlos Reservation and the lower end of the Gila Box, and between the upper end of the Gila Box and the Arizona-New Mexico state line. The modeling indicates that the river is moderately unstable at the effective discharge in many sub-reaches, mostly in the area downstream of Safford and upstream of Sheldon. The modeling shows that the river is stable in a few sub-reaches, mostly between York and Sheldon, possibly due to bed-rock controls in the area. The instability is greatest with respect to the width and sinuosity of the stream. In general the channel has widened in response to an increase in the magnitude and frequency of floods since 1965. Without large floods in the future the channel will narrow and may locally aggrade, similar to the 1935-1965 period.

**Topic category:** Geomorphology  
**Keywords:** Fluvial geomorphology, stable channel analysis  
**County:** Arizona

**Title:** Upper Gila River Fluvial Geomorphology Study, Stable Channel Analysis, Arizona

**Author:** Wittler, R.J., M.R. Delcau, and J.E. Klawon

**Date:** 2001

**Publication/journal/publisher:** Prepared by Fluvial Hydraulics and Geomorphology Team, Technical Service Center, Denver, CO - Bureau of Reclamation, Dept. of Interior, November 30, 2001, Revised April 30, 2002.

**Type of document:** Electronic (PDF)

**Source of document / Search method (phone, internet, library, etc.):**  
internet <[http://www.usbr.gov/pmts/hydraulics\\_lab/reportsdb/wrrl\\_reports\\_action2.cfm?id=PAP-887](http://www.usbr.gov/pmts/hydraulics_lab/reportsdb/wrrl_reports_action2.cfm?id=PAP-887)>

**Purchase Price:** available online

**Web site address:** [http://www.usbr.gov/pmts/hydraulics\\_lab/pubs/PAP/PAP-0887.pdf](http://www.usbr.gov/pmts/hydraulics_lab/pubs/PAP/PAP-0887.pdf)

**Document Location:** BOR online

**Work initiated by:** BOR

**Work funded by:** Arizona Water Protection Fund Commission, Graham County, Arizona, and the BOR

**Type of review:** Agency Peer Review

**Location of Work:** Arizona

**Abstract or brief summary:**

This report presents an analysis of the stability of the Gila River between the San Carlos Apache Reservation and the lower end of the Gila Box, and between the upper end of the Gila Box and the Arizona-New Mexico state line. This analysis utilizes an analytical tool named SAM, developed by the US Army Corps of Engineers, to analyze the channel roughness, sediment transport, and discharge in four reaches of the Gila River in the study area. Input into SAM includes hydraulics produced by the HEC-RAS backwater model, bed material gradation data gathered during the Field Data Collection portion of the Upper Gila Fluvial Geomorphology study, and hydrology analyzed for this report based upon US Geological Survey stream gaging data collected at several gaging stations in the study area. The analysis uses hydrological data from water years 1965-2000.