

# OVERVIEW OF THE GLOBAL PALEOFLOOD DATABANK

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## THE PALEOFLOOD DATABANK

MAIN PAGE

This Paleoflood Databank is a repository for paleoflood data that has been created for use by the paleoflood research community. It was compiled by researchers at The Arizona Laboratory for Paleohydrological Analysis (ALPHA) and The Laboratory of Tree-Ring Research, University of Arizona, under the direction of K.K Hirschboeck with funding from NOAA Office of Global Programs and the US Bureau of Reclamation.



Paleoflood data are entered by adding records in a BASIN-RIVER-SITE sequence:

Add Records

Data records are extracted via queries and reports:

Query DATA

Report DATA

Query PALEOFLOOD

Report Paleofloods

Query flood 1983

Report flood 1983

Exit Database

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**This Paleoflood Databank is a repository for paleoflood data that has been created for use by the paleoflood research community.**

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**Paleoflood** = discrete flood / paleoflood stage or discharge estimate

**Threshold** = a stage or discharge level below which floods are not preserved; only floods which overtop the threshold level leave evidence; smaller events not preserved (over specific time interval)

**Non-exceedence bound** = a stage or discharge level which has either never been exceeded, or has not been exceeded during a specific time interval

*A brief tour of the databank . . .*

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[This is Version 3.1. 2003]

Paleoflood data are entered by adding records in a BASIN-RIVER-SITE sequence:

**Add Records**

Data records are extracted via queries and reports:

Query DATA      Report DATA  
Query PALEOFLOOD      Report Paleofloods  
Query flood 1900      Report flood 1900

**Exit Database**

Paleoflood data are entered by adding records in a BASIN-RIVER-SITE sequence:

**Add Records**

Data records are extracted via queries and reports:

Query DATA      Report DATA  
Query PALEOFLOOD      Report Paleofloods  
Query flood 1983      Report flood 1983

**Exit Database**

**THE PALEOFLOOD DATABANK**

**ADD RECORDS**

BASIN - RIVER  
SITE  
EVENT  
PUBLICATION  
CONTRIBUTOR  
**RETURN TO MAIN PAGE**

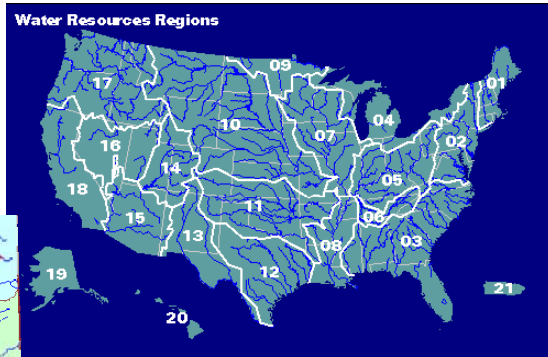
**OVERVIEW OF DATA ENTRY PROCEDURE:**

1. Enter or select the drainage basin and river where the paleoflood site is located
2. Enter or select the site name, along with supplementary information
3. Enter each flood event, along with supplementary information
4. Enter or select publication and/or contributor information to record the source of the data



# BASIN – RIVER

(based on USGS regions, basins, & river names)



## Arizona Watershed Map

with USGS stream gage locations

**Form\_Basin\_River : Form**

### BASIN - RIVER

Refresh Close Form

**DIRECTIONS:**  
Select a "Basin\_Name" and "SubBasin\_Name" from the drop-down list, then select the "River\_Name" for the site.  
If the basin, subbasin or river is not in the list, add the name by clicking on the ADD button.

Basin\_Name: Lower Colorado Basin Add

SubBasin\_Name: Salt River Basin Add

River\_Name: Santa Rosa Wash, Silver Creek, **Tonto Creek**, Upper Gila - San Carlos Reservoir, Upper Gila-Mangos River, Upper Salt River, Upper San Pedro River, Upper Santa Cruz River

**SITE NAME** Refresh Add Record Save Record Undo Record Close Form

**DIRECTIONS:**  
1. Select "Add Record" button. From "River\_Name" drop-down list select river name on which the new site is located.  
2. Type the new site name in "Site\_Name" field.  
3. Proceed to enter or select from drop-down lists (Boundary\_Type, Continent, State, Latitude, Longitude) information in the other field. Channel slope has to be entered in decimal format: ".30".  
4. After entering new "USGS\_Quad\_Name" and "Country Name" press "Refresh" button. Newly entered data will appear in drop-down lists and now should be selected.  
5. Save record and return to previous page using "Close Form" button.  
6. If data which have been entered are incorrect, select "Undo Record" button and start from step 1.

River\_Name: Lower Salt River

Site\_Name: Chinle Creek near Mexican Water

USGS\_ID\_Name: 9379200

SITE NAME:  
1. for all PALEOFLOODS: PF-River Name@Site Name  
2. for all hydrological gauge data use USGS site names

link to USGS >>> <http://waterdata.usgs.gov/nwis/sw>

Drainage\_Area\_mi2: 3660

Drainage\_Area\_km2: 9480

Boundary\_Type: [dropdown]

Channel\_Slope: 0

**MAP LOCATION**

Section: 19 Range: 41 N Township: 25 E 1/4 Section: 0 USGS\_Quad\_Name: 0 Add

Comment: NONE

**GEOGRAPHIC LOCATION**

Continent: North America Country: USA State: Arizona County: Apache Add

Latitude: North Longitude: West Elevation: 0

**EVENT DESCRIPTION** Add Record Save Record Undo Record Close Form

**DIRECTIONS:**  
1. Select "Add Record" button. From "Site\_Name" drop-down list select site name at which the new event happened.  
2. Type the new event name in "Event\_Name" field using the format of the given example below.  
3. Select the SOURCE or CAUSE of the flood (if known), the TYPE OF DATA (gaged, dated paleoflood event, threshold, or non-exceedance bound) and enter the event's DATE.  
4. Select from drop-down lists METHODS OF DATING (Dating\_Code, Discharge\_Calc\_Code, Paleostage\_Indicators\_Tech\_Code, Other\_Tech\_Code) how the event was dated.  
5. Enter the estimated DISCHARGE and STAGE information.  
6. Save record and return to previous page using "Close Form" button.  
7. If data which have been entered are incorrect, select "Undo Record" button and start from step 1.

Site\_Name: Chinle Creek near Mexican Water

EVENT NAME example:  
River Name@Site Name:Flood Year

Event\_Name: San Juan River\_Cinle Creek\_1964

Event\_Description: NONE

Flood\_Source\_or\_Cause: glacial break dam

Date\_Format: AD

Date\_Type: [dropdown]

Data\_Type Explanation: <== CLICK HERE to see a figure that explains the various types of paleoflood data

Dating\_Code: [dropdown]

Other\_Tech\_Code: [dropdown]

Comments: DAM

**DATED FLOOD/PALEOFLOOD EVENT**

Date of Event: 1964 Date "+": 0 Date "-": 0

Month Flood Occurred: August

Discharge [m3s]: 3280 Discharge "+": 0 Discharge "-": 0

Contributing Drainage Area: [dropdown]

Stage [m]: [dropdown]

Discharge\_Calc\_Code: [dropdown]

Paleostage\_Indicators\_Tech\_Code: [dropdown]

1 THRESHOLD or NON-EXCEEDANCE EVENT

Fields in "brown" should only be used when entering censored data describing thresholds on non-exceedance bound.

End\_Date: [dropdown] End\_Date "+": [dropdown] End\_Date "-": [dropdown] Number of Times Exceeded: [dropdown]

Site Name: PF-Lower Salt River near Phoenix

**EVENT NAME example:**  
River Name@Site Name: Flood Year

Event Name:

Event Description:

Flood Source or Cause: rain and snow

Date Format: AD

Data Type: Paleoflood

**Data Type Explanation** <== CLICK HERE to see a figure that explain the various types of paleoflood data

Dating Code: Historical Records

Other Tech Code: Newspaper Accounts

Method of Dating the Flood / Paleoflood

- Radiocarbon Analysis
- Discharge Gage Records
- Historical Records
- Precipitation Records
- Radiocarbon Analysis
- Soil Carbonate Accumulation
- Soil Development
- Tephrochronology
- Other

Comments:

DAM

**DATED FLOOD/PALEOFLOOD EVENT**

Date of Event: 1964

Date "+": 0

Date "-": 0

Month Flood Occurred: August

Discharge [m3s]: 3280

Discharge "+": 0

Discharge "-": 0

Contributing Drainage Area:

Stage [m]:

Discharge Calc Code:

Paleostage Indicators Tech Code:

**THRESHOLD or NON-EXCEEDANCE EVENT**

Fields in "brown" should only be used when entering censored data describing thresholds on non-exceedance bound.

End Date:

End Date "-":

End Date "+":

Number of Times Exceeded:

**Methods of discharge or stage calculation:**

- slope-area method
- regression analysis
- max clast size "tractive force"
- bedform geometry
- floodplain botanical data
- Manning equation
- Chezy equation
- 2 dimensional modeling

**Techniques used to indicate paleostage level:**

- slackwater deposits
- flood-scarred trees
- silt lines
- scour lines
- debris lines
- highwater marks
- non-exceedance level
- other

**PUBLICATIONS**

Refresh

Add Record Save Record Undo Record Close Form

Event Name: San Juan River, Circle Creek, 1964

DIRECTIONS: To link the publication to a flood event, select the event name in "Event Name" line and fill in the publication information.

Title: Statistical Summaries of Arizona Stream Flow data

1st\_Author\_Last\_Name: Anderson Add

1st\_Author\_First\_Name: T Add

2nd\_Author\_Last\_Name: White Add

2nd\_Author\_First\_Name: Natalie Add

3rd\_Author\_Last\_Name: NONE Add

3rd\_Author\_First\_Name: NONE Add

Other\_Authors: NONE

Publication Date: 1979

Journal Name: NONE Add

Journal Volume: 0

Journal Issue: 0

Book Name: NONE

Publisher Name: U.S. Geological Survey Add

Publication Place: Tucson Add

Translator: None

Edition Number: 1

Pages: 1-116

**CONTRIBUTOR** Refresh

Add Record Save Record Undo Record Close Form

Event\_Name:  DIRECTIONS: To link a contributor to a flood event, select the event name in "Event\_Name" line and fill in the contributor's information.

Last\_Name:  Add

First\_Name:  Add

Title:  Add

Institution\_Name:  Add

Address:

Town:  Add

State:  Add

Postal\_Code:

Country:  Add

Telephone\_Number:

Fax\_Number:

E-mail\_Address:

URL\_Address:

Telex:

# THE PALEOFLOOD DATABANK

**MAIN PAGE**

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**Add Records**

Data records are extracted via queries and reports:

Query DATA Report DATA

Query PALEOFLOOD Report Paleofloods

Query flood 1983 Report flood 1983

Exit Database

Paleoflood data are entered by adding records in a BASIN-RIVER-SITE sequence:

**Add Records**

Data records are extracted via queries and reports:

Query DATA Report DATA

Query PALEOFLOOD Report Paleofloods

Query flood 1983 Report flood 1983

Exit Database

**QUERIES & REPORTS**

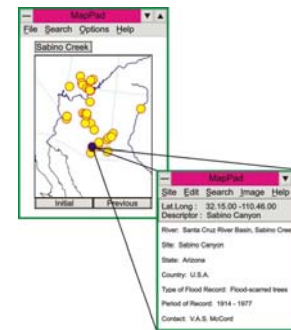
**Example of a QUERY: for a given date, e.g. 1983:**

Event Name	Event Description	Date_Type	Date	Date+	Date-
Sanita Maria River near Bagdad_1983 AD	flood 09/24/1983	Hydrological gauge data	1983	0	0
Agua Fria River near Mayer_1983 AD	flood 09/23/1983	Hydrological gauge data	1983		
Agua Fria River near Mayer_1983 AD	flood 09/23/1983	Hydrological gauge data	1983		
Black River below Pumping Plant, Nr Point of Pines_1983 a	flood 04/01/1983	Hydrological gauge data	1983	0	0
Black River below Pumping Plant, Nr Point of Pines_1983 a	flood 04/01/1983	Hydrological gauge data	1983	0	0
Black River below Pumping Plant, Nr Point of Pines_1983 b	flood 10/02/1983	Hydrological gauge data	1983	0	0
Black River below Pumping Plant, Nr Point of Pines_1983 b	flood 10/02/1983	Hydrological gauge data	1983	0	0
Black River near Fort Apache_1983 A AD	flood 01/30/1983	Hydrological gauge data	1983	0	0
Black River near Fort Apache_1983 A AD	flood 01/30/1983	Hydrological gauge data	1983	0	0
Black River near Fort Apache_1983 B AD	flood 10/02/1983	Hydrological gauge data	1983	0	0
Black River near Fort Apache_1983 B AD	flood 10/02/1983	Hydrological gauge data	1983	0	0
Black River near Maverick_1983 AD	flood 10/02/1983	Hydrological gauge data	1983	0	0
Black River near Maverick_1983 AD	flood 10/02/1983	Hydrological gauge data	1983	0	0
Brawley Wash near Three Points_1983 AD	flood 10/01/1983	Hydrological gauge data	1983		
Brawley Wash near Three Points_1983 AD	flood 10/01/1983	Hydrological gauge data	1983		
Los Robles Wash near Marana_1983 AD	flood 10/02/1983	Hydrological gauge data	1983		
Los Robles Wash near Marana_1983 AD	flood 10/02/1983	Hydrological gauge data	1983		
Hassayampa River near Arlington_1983 AD	flood 09/30/1983	Hydrological gauge data	1983	0	0
Hassayampa River near Arlington_1983 AD	flood 09/30/1983	Hydrological gauge data	1983	0	0
Gila River below Gillespie Dam_1983 AD	flood 10/05/1983	Hydrological gauge data	1983	0	0
Gila River below Gillespie Dam_1983 AD	flood 10/05/1983	Hydrological gauge data	1983	0	0
Araupa Creek near Mammoth_1983 AD	flood 10/01/1983	Hydrological gauge data	1983		
Araupa Creek near Mammoth_1983 AD	flood 10/01/1983	Hydrological gauge data	1983		
PF-Lower San Pedro River_Buehman Canyon_1983 AD	flood 1983 AD	Paleoflood	1983	U	U
PF-Lower San Pedro River_Buehman Canyon_1983 AD	flood 1983 AD	Paleoflood	1983	0	0
PF-Lower San Pedro River_Edgar Canyon_1983 AD	flood 1983 AD	Paleoflood	1983	0	0
PF-Lower San Pedro River_Edgar Canyon_1983 AD	flood 1983	Paleoflood	1983	0	0
PF-Lower San Pedro River_Edgar Canyon_1983 AD	flood 1983	Paleoflood	1983	0	0
PF-Lower San Pedro River_Edgar Canyon_1983 AD	flood 1983	Paleoflood	1983	0	0
PF-Lower San Pedro River_Araupaia Creek/Canyon_1983 AD	flood 1983 AD	Paleoflood	1983	0	0
PF-Lower San Pedro River_Araupaia Creek/Canyon_1983 AD	flood 1983 AD	Paleoflood	1983	0	0
San Pedro River below Araupaia Creek near Mammoth_1983	flood 10/01/1983	Hydrological gauge data	1983		

## Example of a DATA REPORT

Event Name		PF-Upper Salt River 10 km Upstream of Roosevelt Lake_600 BP	
Continent	North America	<b>Site Characteristics</b>	
Country	USA	Latitude_ddmmss	33.37.10 North
State	Arizona	Longitude_ddmmss	110.55.15 West
County		Elevation	
Range		Boundary_Type_Code	Fixed boundary
Section		Channel_Slope	
Township		Drainage_Area_mi2	
1/4 Section		Drainage_Area_km2	11153
USGS_Quad_ID	0		
<b>Event Characteristics</b>			
Date_Format:	BP	Data_Type	Paleoflood
Date	000	Source_or_Cause_of_Flood	unknown
Date+	0	Month_Flood_Occurred	
Date-	0	Contributing_Drainage_Area	
End_Date	0	Stage	
End_Date+	0	Number_of_Times_Exceeded	none
End_Date-	0	Dating_Code	Radiocarbon Analysis
Discharge	3200	Paleostage_Indicators_Tech_Code	Slackwater Deposits
Discharge+	000	Discharge_Calc_Code	Step_Backwater
Discharge-	200	Other_Tech_Code	NONE

## Future Plans: Geo-referencing Web-based user interface



To be housed at:  
**National Geophysical  
Data Center NGDC**

## Possible "universal" data entry form: (could be a web-based form)

### Global Paleoflood Databank Contribution Form

This first page contains the most vital information. \* Indicates required fields.  
PLEASE REPORT RESULTS IN SI UNITS

*Name: (Last)	* (First)	* (Middle)
*Title:	*Institution	
*Address:		
Phone number:	Fax number:	
*E-mail address:	Telex:	
URL Address:		

### Site/Basin Information

*Name of River where the flood occurred:		Basin name:	
*Name of Study Site:		*State/Country of study site:	
*Latitude of study site: (ddm:ss)	*Longitude of study site: (ddd:m:ss)	Basin relief:	
Nearest gage name or number:	Hydrologic Unit Code:	Max recorded discharge at gage:	PMF estimate for basin:
*Contributing drainage area:	km <sup>2</sup>	Total basin area:	km <sup>2</sup>
*Does the study reach of the river have a:		deformable boundary or fixed boundary?	

### Flood Information (please fill out this portion of the form separately for each flood)

Discrete floods										
*Date of Flood Event	+	-	*Peak Discharge (m <sup>3</sup> /s)	+	-	*Nature of flood				
BP (1950)										
Censored flood data (Exceedance/non-exceedance/thresholds)										
No.	Oldest Bound age BP (1950)	+	-	Youngest Bound age BP (1950)	+	-	Peak Discharge (m <sup>3</sup> /s)	+	-	times exceeded
1										
2										
3										

Use the following selections to describe the techniques and methods used for this particular flood

\*Method of dating

- Tree-ring analysis/dendrochronology
- radiocarbon analysis
- Cesium-137 dating
- thermoluminescence (TL) dating
- stratigraphic analysis/relative age
- dates based on presence or age of artifacts
- historical records

or Stage Calculation

techniques

chiques

Is this data published in a peer review journal/book? Yes  No  If you checked Yes, fill in the citation info below. If you checked No, please describe where the data came from in the comment section below.

Authors		
Title	Publication date	
Journal name	Vol. Number	Page numbers
Book name	Editors	
Publisher	Publisher location	Date of publication
Keywords		
Comments		



### POTENTIAL USES OF DATABANK:

- **Seasonal / long-term / extreme event perspective**
- **Site-specific and regional synthesis of extremes**
- **Regional linkages / differences identified**
- **Entire flood history context → benchmarks of extreme events**
- **Archive /reference database for near-real time assessment of developing events**

### LESSONS LEARNED:

- **Multiple sources of data → an extremely complex database**
- **Understand all linkages & attributes of data**
- **Involve a database expert from the start , ideally someone familiar with the nature of the data (false start with first database structure, e.g. linked, but not relational; additional modifications needed based on nature of data)**
- **Think broadly re: all potential uses of data (even “negative” information, e.g., non-exceedance)**
- **Discipline-wide standardization in reporting of data ideal (but not always practical)**

### **CURRENT STATUS**

- **Additional beta-testing needed**
- **Central repository issue**
- **Standardization of PF data-reporting format**
- **Quality control issue**
- **When issues are resolved, goal is for databank to be available publicly (featuring Arizona data) in late 2009**