



Data rescue & recovery

A prototype project to unlock more than 100 years of USGS data



SUFFERING

In the flood districts must be relieved. Houston has organized for the relief of those sorely afflicted and funds and provisions will be systematically handled.

THE

Ben Campbell, Chairman
 "R. B. Gilmer, President
 "W. B. Chew, House
 "M. E. Foster, House
 "Harry T. Warner,
 "J. F. Wolters,
 "C. R. Wharton.

SCC

FLOODS ST DEVASTAT MANY HO

Many Names Added to Roll With Crest at Headstead Yesterday.

SIMONTON IS REPORTED AS NOW INUNDATED

Five Miles to Dry Land From That Point—Over 100 Homes in Vicinity of Wallis Were Washed Away by Rising Water Yesterday.

Hempstead, where the crest of the flood passed Monday, is reported to have a loss of life of over a score.

The crest of the flood passed Wharton Sunday night. Only one death is reported that of a woman, but the Schudall family is reported missing. Thirty are reported lost up and down F Creek.

At Bryan, H. R. Cavitt, Clifton E. A. J. Robbins, Albert Worley and Henry Berger, all engaged in rescue work, died, the former three of exposure and the latter two being drowned.

Simonton, according to a report from Fulshear, is submerged, a number of people being reported marooned in the second story of a store there.

Flood water is subsiding at Victoria, Smithville and Columbus, the village of Fiekiwille, near Victoria, being inundated.

Estimated at Somerville that hundreds of people are still marooned in the bottoms of that section; many refugees now making their way to that point.

Fifty deaths between Hearne and Navasota, but not including deaths at Simonton, is the estimate announced by Lieutenant L. A. Brown, U. S. A., in charge of relief work.

Work of rescuing marooned people on Ross Mound, near Sealy, was undertaken yesterday by boats from Galveston.

Over 100 homes in the vicinity of Wallis were washed away by water yesterday.

Water is reported to be surrounding the county jail at Richmond and still rising.

A wide expanse of water surrounds Hungerford, additional deaths including six negroes being reported.

RICHMOND SE BY THE RI

No Loss of Life Reported
 rounded

Early this morning feared for the safety of the flood waters were rising in the town. Early indications that the section had been flooded even with the sea houses and the j o'clock this morning Richmond by tel port that from f was in the ma loss of life wa that the effo further inur Two hun with live near Fuls rising w Bay undat ing o ver live M v



LIBERAL FUND FLOOD VICTIM

RIVER STAGE DATA

RIVER DISTRICT OFFICE
 Houston, Texas

Richmond
 Station Texas

River Brazos

Dec 10 1913 48.2 ft

July 1899 45.6 ft

June 6 1929 40.0 ft



48.0 Elevation RR

42.0 Elevation LF

Nov
 Dec 28 1940 36.7
 May 5 1937 37.5

1991 flooding

9-975-17
(May 1975)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
DISCHARGE MEASUREMENT NOTES

UNITED STATES

870

Meas. No. 870
Camp by JSK
Checked by VAM

Sta. No. 08114000

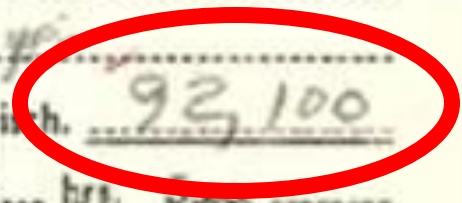
Brazos River at Richmond, Tx

Date Dec 30, 1991 Party Hutchison Sawyer

Width 573 Area 16800 Vel. 5.48 C. H. 49.15 Disch. 92,100

Method 2.8 No. sec. 33 C. H. change +0.2 in 1 hrs.

Method coef. 2.8 Hor. angle coef. noted Susp. coef. 1 Meter No. 226723



toward a 17-10 win over the new York Jets, the sell-out crowd went ballistic.

The win means the Oilers will advance to Saturday's semifinal against the Broncos in Denver.

"I'm so happy!" said Paulette Nezart, 43. "These Oilers are going to give us a heart attack yet. But we're going to the Super Bowl."

The hoopla seemed a far cry from the anger expressed by many



BY KAREN ROEBUCK
OF THE HOUSTON POST STAFF

Fort Bend County was as this morning in what is believe be the brunt of torrential rains have swelled the Brazos and southeast Texas rivers, while

Control Red banks, willows, debris, etc.

Remarks _____

G. H. of zero flow _____ ft. 1 of 4



Wealth of information



9-275a
(October, 1927)

Original notes in Rosenberg file

Copy

FILE IN 1931 MAPS 210

REGULAR STATION

NO. OF MEAS. 2

DISCHARGE MEASUREMENT NOTES

WATER RESOURCES SURVEY

DEPARTMENT OF THE INTERIOR

UNITED STATES

Geological Survey

1929

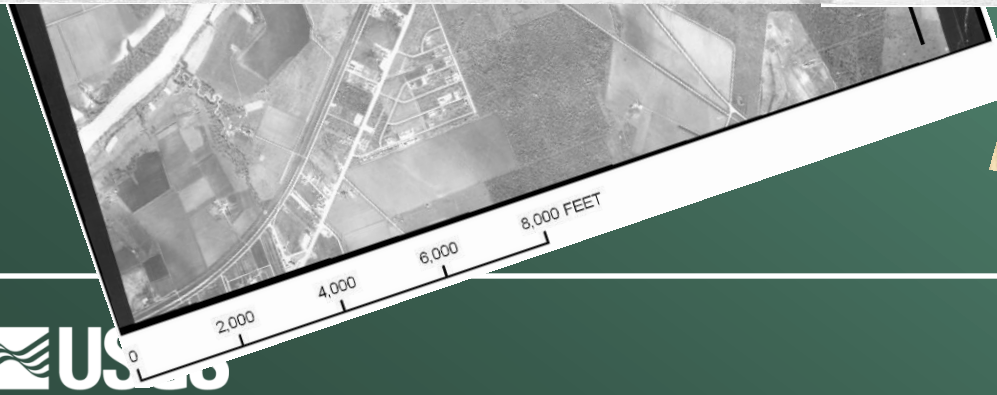
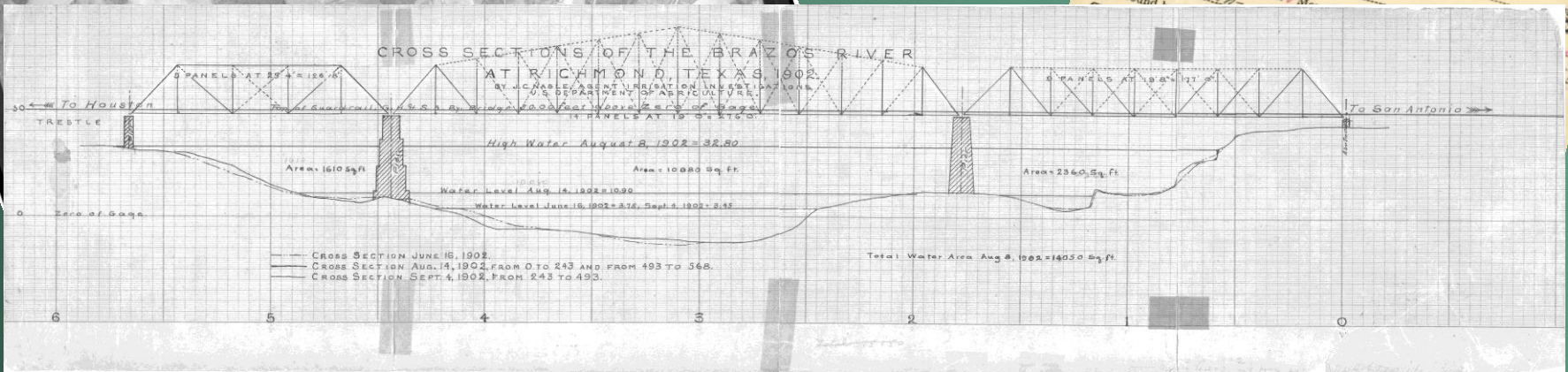
Date June 5

at Brazos

Width 556 (cross channel) Area 18,900 M.

Party Blumh

Gage found



between measuring points, dist. to W. S. Meter 5 ft. above bottom of 30 lb. weight

marked. Verified with measuring points obtained by

Weather favorable, unfavorable (rain, snow, extremely hot or cold)

Wind medium upstr., downstr., across. Observer seen G. Ht. record inspected

Examine station locality and report on Form 9-275d any special conditions which

might affect rating; condition of station equipment, etc.

Sheet No. 1 of 1 sheets.

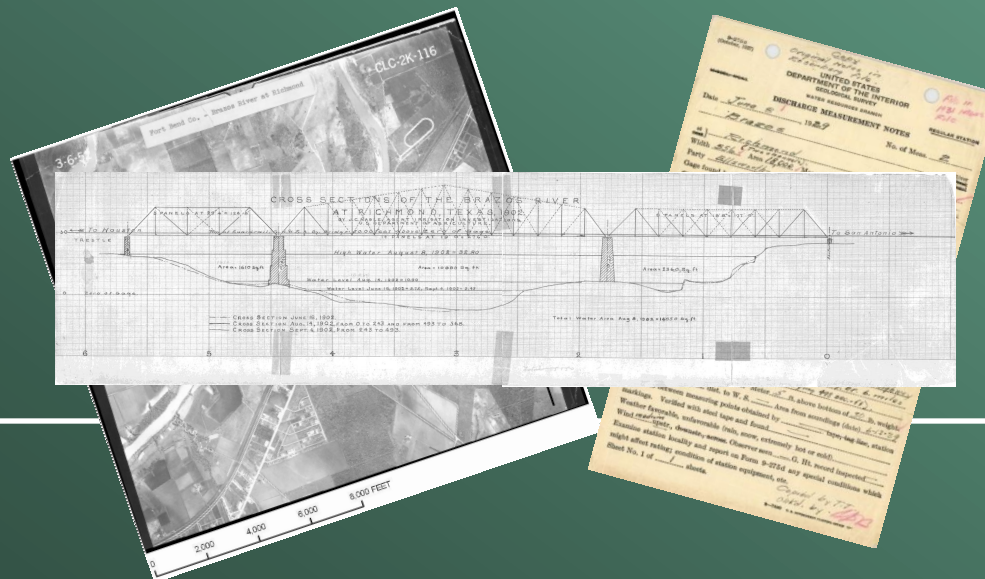
Checked by T. J. [Signature]

6-7240 U. S. GOVERNMENT PRINTING OFFICE



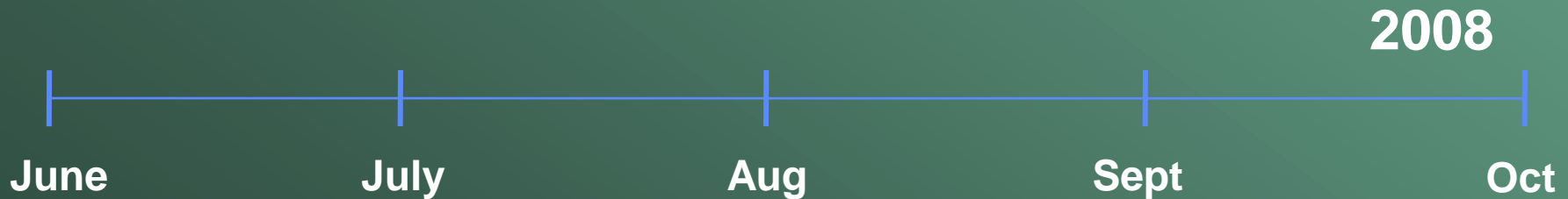
Valuable data are at risk

- USGS records contain 100+ years of data
- Records storage is de-centralized
- Records retrieval is time consuming and cost prohibitive
- Valuable historical data are at risk!



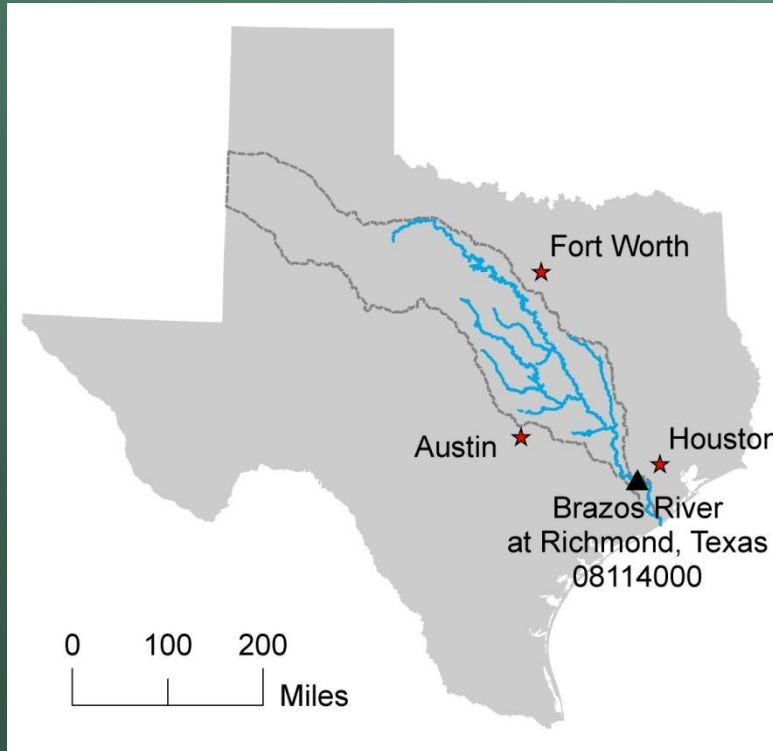
Approach

1. Select a focus site
2. Retrieve & inventory records
3. Set standards for digitizing data
4. Select a vendor to scan the data
5. Index scanned data
6. Design and test Web user interface

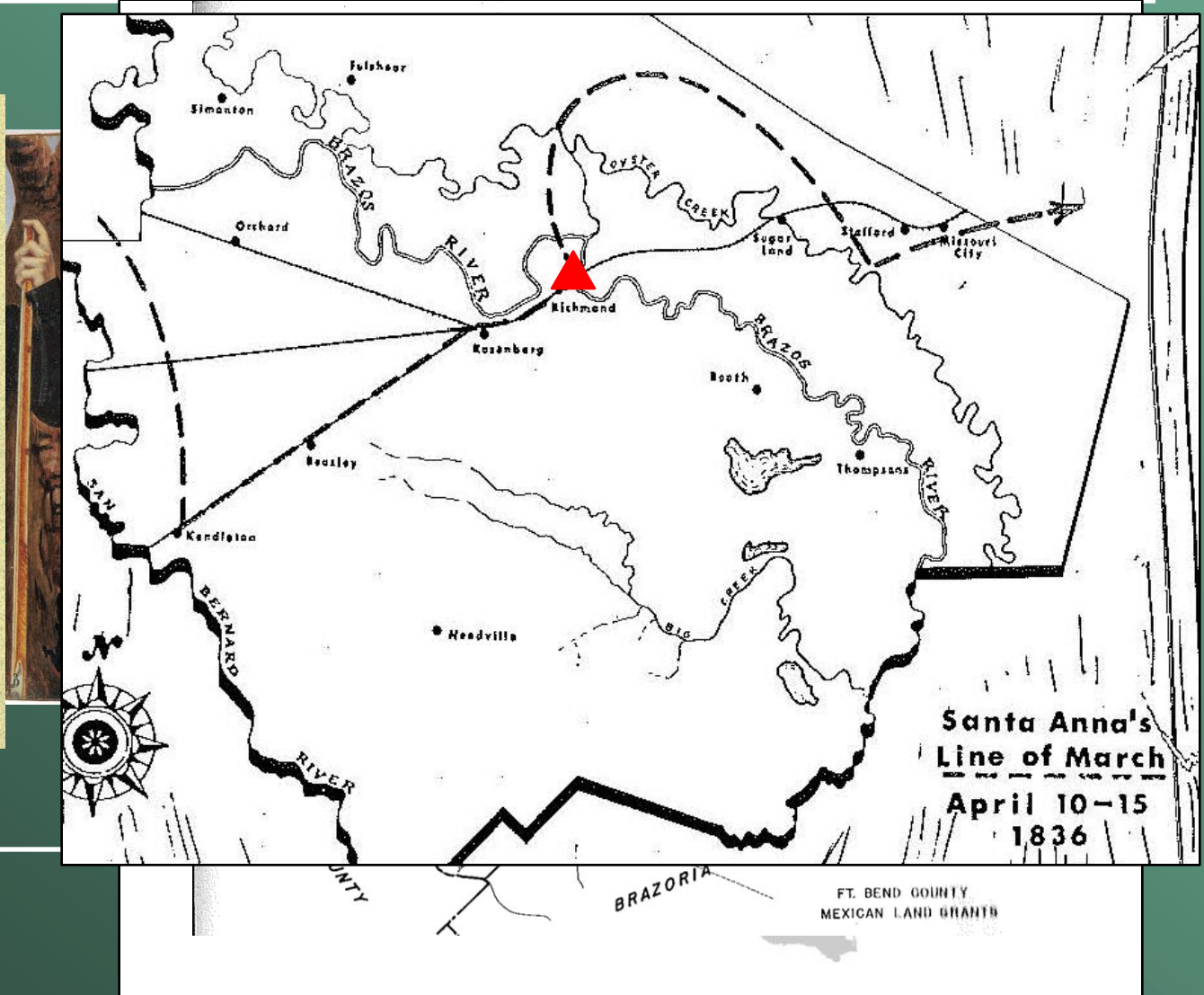


Focus site: USGS gage 08114000

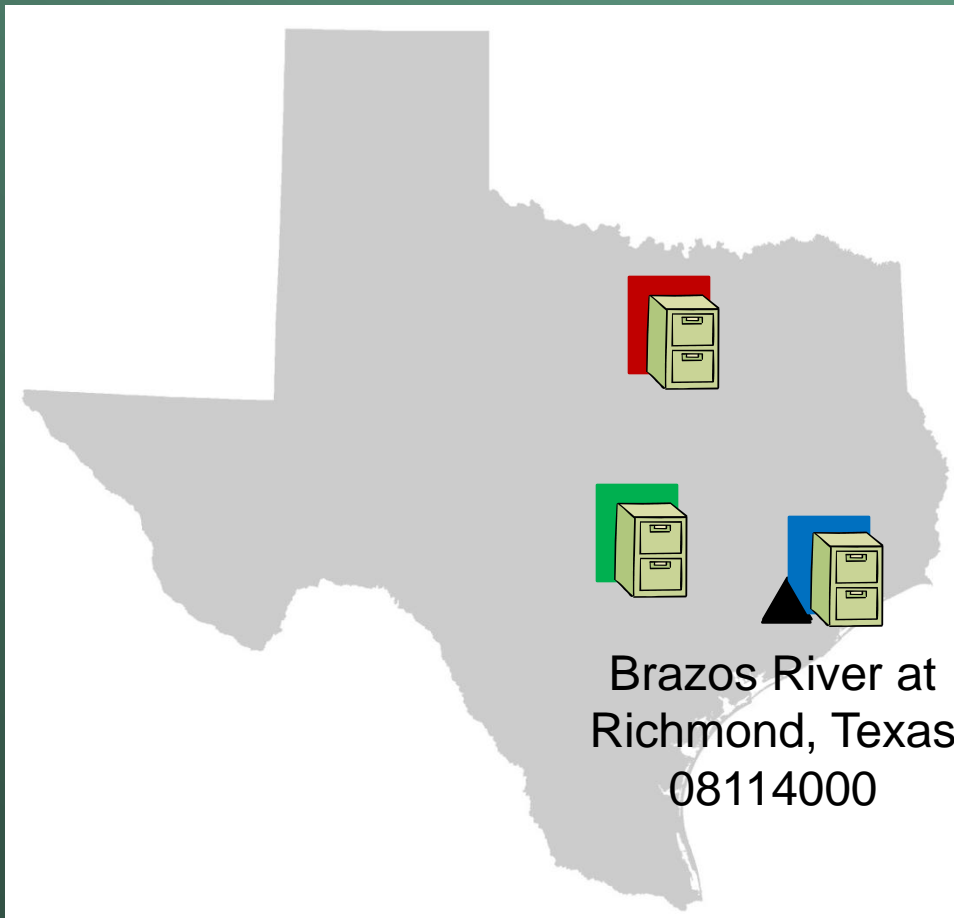
- Brazos River at Richmond, Texas
- Consistent gage location
- Observations recorded beginning in 1901



Brazos River history



Records retrieval

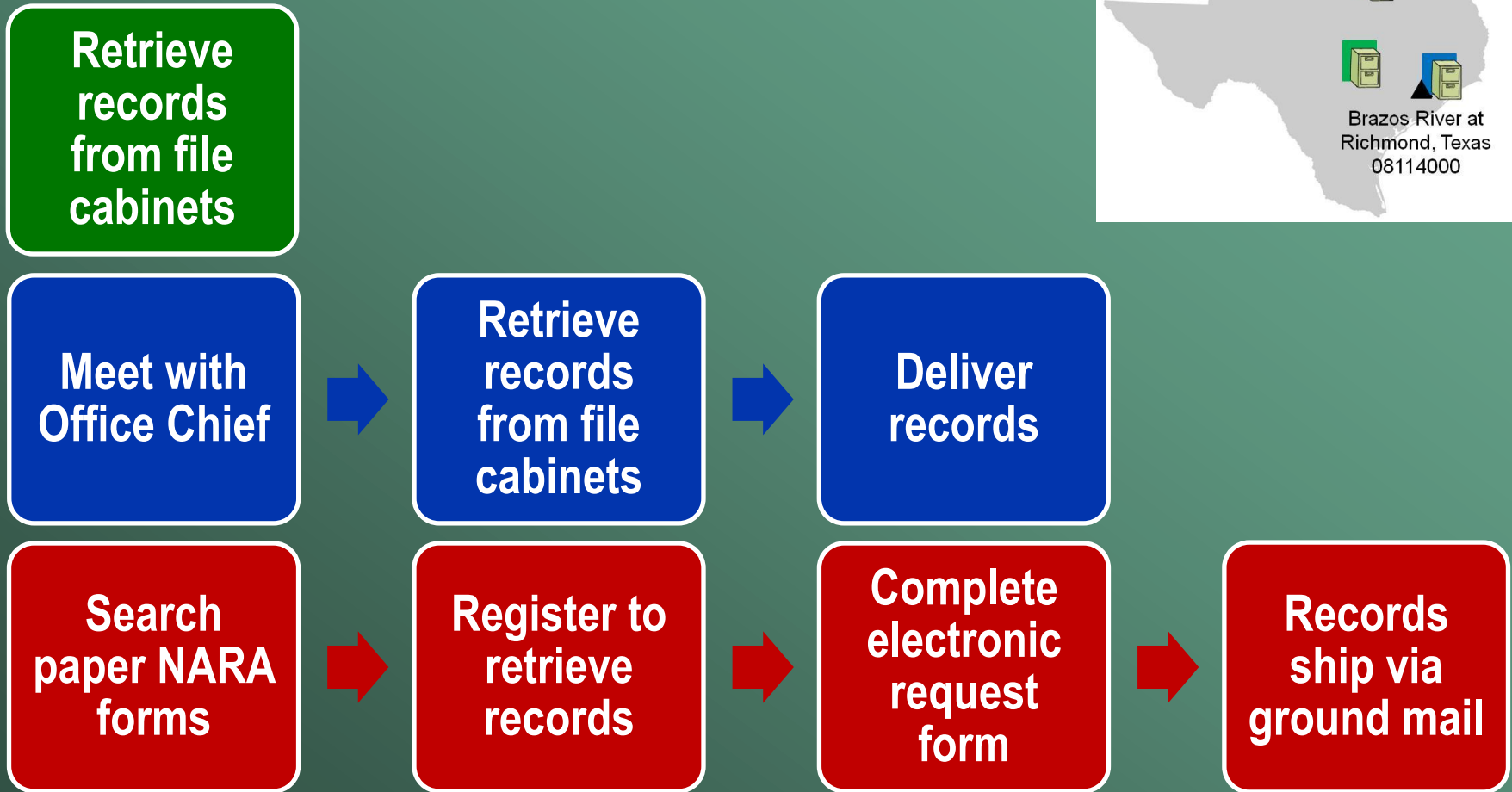
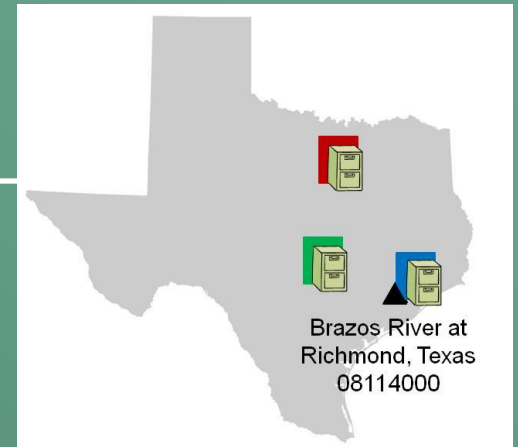


- **USGS Austin**
- **USGS Houston**
- **National Archives and Records (NARA)**

750
MILES!



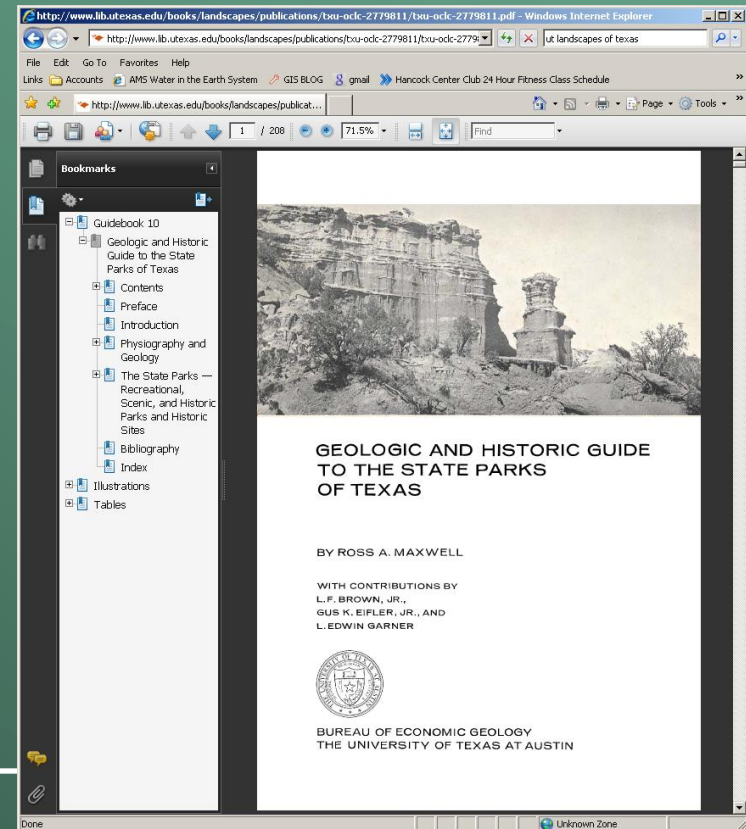
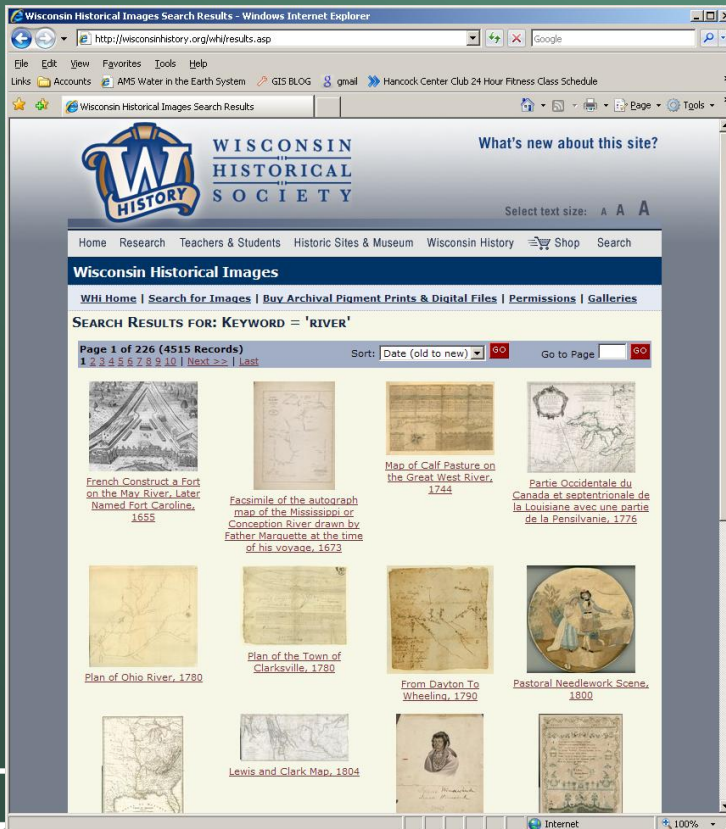
Records retrieval steps



Data recovery is nothing new

Wisconsin Historical Society

UT Austin Landscapes of Texas



Books to bits: Digitizing data



9-275c
(October, 1927)

Original Notes in
Rosenberg File
File in
1931 MEAS.
File

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES BRANCH
REGULAR STATION

DISCHARGE MEASUREMENT NOTES

Date June 8, 1929 No. of Meas. 2

Brazos

at Richmond State of Tex
(Two channels)

Width 556 Area 18,000 Mean Vel. 5.88 Cor. M. G. H. 38.85

Party Ellsworth Cook (Meter) Disch. 105,000

Gage found by levels to read _____

Chain length corrected on basis of levels to _____ ft. at _____ o'clock.

Chain length measured under 12-lb pull, with steel tape, found _____ ft.

Correct length _____ ft. Chain length changed to _____ ft. at _____ o'clock.

Gage reading		Time	Station	Meter No.
Outside	Inside			<u>859</u>
<u>See graph with notes</u>				Date rated <u>7-26-27</u>
<u>Not made June 7 1929</u>				Meas. began <u>10:55</u> ; ended <u>12:19</u>
<u>Level notes dated 6/8/29</u>				Time of meas. (hrs.) <u>1:4</u> No. sec's. <u>26</u>
<u>and original meas. notes</u>				Method <u>S</u> Coef. acct. method <u>95</u>
<u>in the Rosenberg file</u>				Coef. acct. angle of current <u>Noted</u>

Weighted mean G. Ht. _____ ft.

G. Ht. correction _____ ft.

Correct mean G. Ht. _____ ft. _____ per cent diff. by _____ rating table

Meas. from cable, bridge, boat, ice, wading. Meas. _____ ft. above below gage.

If not at regular section note location and conditions. Meas. from highway
bridge at Richmond and from h. br. 6 miles
East of Richmond (200 channel carrying 498 sec-ft)

Meter suspended on rod, 18 cable. Meter 5 ft. above bottom of 30 lb. weight.

Stay wire. _____ Approx. dist. to W. S. _____ Area from soundings (date) 6-12-29

Distances between measuring points obtained by _____ tape, tag-line, station markings. Verified with steel tape and found _____

Weather favorable, unfavorable (rain, snow, extremely hot or cold) _____

Wind mod upstr., downstr., across. Observer seen _____ G. Ht. record inspected _____

Examine station locality and report on Form 9-275d any special conditions which might affect rating; condition of station equipment, etc.

Sheet No. 1 of 1 sheets.

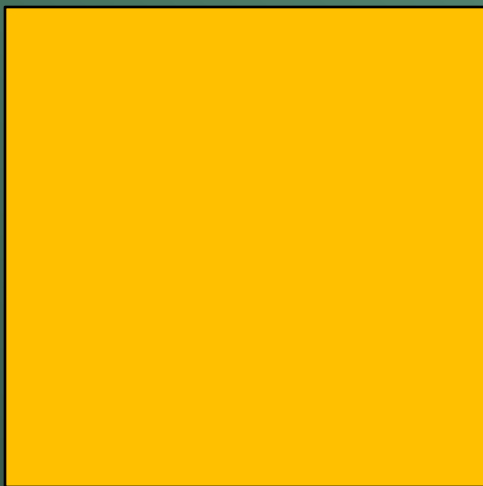
*Copied by T.T.
ok'd. by [Signature]*

6-7440 U. S. GOVERNMENT PRINTING OFFICE 12"

Decisions, decisions

JPG

- 622 kb @ 300 DPI scan



PDF

- 57 kb @ 300 DPI scan



Decisions, decisions

JPG

- 622 kb @ 300 DPI scan
- Document stored as separate images
- Rely on indexing to link pages of a single document
- Good for photos
- Easy to view right away on a website

PDF

- 57 kb @ 300 DPI scan
- Pages stored as a single document
- Good for multi-page measurements
- Takes longer to view on a website



Color vs. black and white

9-275c
(October, 1927)

Copy
Original Notes in Rosen

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES BRANCH

DISCHARGE MEASUREMENT NOTES

Date June 7, 1927 No. of Meas. 1

Brazos

at Richmond State of _____
near _____

Width 570 Area 19200 Mean Vel. 6.15 Cor. M. G. H. 99.95

Party Ellsworth - Cook Disch. 118,000

Gage found by levels to read _____

Chain length corrected on basis of levels to _____ ft. at _____ o'clock.

Chain length measured under 12-lb pull, with steel tape, found _____ ft.

Correct length _____ ft. Chain length changed to _____ ft. at _____ o'clock.

Gage reading		Time	Station	Meter No. <u>859</u>
Outside	Inside			
				Date rated <u>7/26/27</u>
				Meas. began <u>5:15</u> ; ended <u>6:40</u>
				Time of meas. (hrs.) <u>1.2</u> No. sec's <u>28</u>
				Method <u>S</u> Coef. acct. method <u>25</u>
				Coef. acct. angle of current <u>As M/G</u>
				Av. width sec. <u>20.4</u> Av. depth <u>33.7</u>
				G. Ht. change during meas. <u>-.09</u>
				Weighted mean G. Ht. _____ ft.
				G. Ht. correction _____ ft.
				Correct mean G. Ht. _____ ft.
				per cent diff. by _____ rating table

Meas. from cable, bridge, boat, ice, wading. Meas. _____ ft. above below gage.

If not at regular section note location and conditions Meas. from by bridge
at Richmond and by bridge 6-8 miles east of Richmond

Peak of flood 4.0 ft. See levels dated 6/8/27

Meter suspended on red, 1/8 cable. Meter .5 ft. above bottom of 30 lb. weight.

Stay wire _____ Approx. dist. to W. S. _____ Area from soundings (date) 6-12-27

Distances between measuring points obtained by _____ tape, tag-line, station markings. Verified with steel tape and found _____

Weather favorable, unfavorable (rain, snow, extremely hot or cold) _____

Wind light upstr., downstr., across. Observer seen _____ G. Ht. record inspected _____

Examine station locality and report on Form 9-275d any special conditions which might affect rating; condition of station equipment, etc.

Sheet No. 1 of 2 sheets.

Copied by T.T. Ched. by JST

6-7460 U. S. GOVERNMENT PRINTING OFFICE

9-275c
(October, 1927)

Copy
Original Notes in Rosen

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES BRANCH

DISCHARGE MEASUREMENT NOTES

Date June 7, 1927 No. of Meas. 1

Brazos

at Richmond State of _____
near _____

Width 570 Area 19200 Mean Vel. 6.15 Cor. M. G. H. 99.95

Party Ellsworth - Cook Disch. 118,000

Gage found by levels to read _____

Chain length corrected on basis of levels to _____ ft. at _____ o'clock.

Chain length measured under 12-lb pull, with steel tape, found _____ ft.

Correct length _____ ft. Chain length changed to _____ ft. at _____ o'clock.

Gage reading		Time	Station	Meter No. <u>859</u>
Outside	Inside			
				Date rated <u>7/26/27</u>
				Meas. began <u>5:15</u> ; ended <u>6:40</u>
				Time of meas. (hrs.) <u>1.2</u> No. sec's <u>28</u>
				Method <u>S</u> Coef. acct. method <u>25</u>
				Coef. acct. angle of current <u>As M/G</u>
				Av. width sec. <u>20.4</u> Av. depth <u>33.7</u>
				G. Ht. change during meas. <u>-.09</u>
				Weighted mean G. Ht. _____ ft.
				G. Ht. correction _____ ft.
				Correct mean G. Ht. _____ ft.
				per cent diff. by _____ rating table

Meas. from cable, bridge, boat, ice, wading. Meas. _____ ft. above below gage.

If not at regular section note location and conditions Meas. from by bridge
at Richmond and by bridge 6-8 miles east of Richmond

Peak of flood 4.0 ft. See levels dated 6/8/27

Meter suspended on red, 1/8 cable. Meter .5 ft. above bottom of 30 lb. weight.

Stay wire _____ Approx. dist. to W. S. _____ Area from soundings (date) 6-12-27

Distances between measuring points obtained by _____ tape, tag-line, station markings. Verified with steel tape and found _____

Weather favorable, unfavorable (rain, snow, extremely hot or cold) _____

Wind light upstr., downstr., across. Observer seen _____ G. Ht. record inspected _____

Examine station locality and report on Form 9-275d any special conditions which might affect rating; condition of station equipment, etc.

Sheet No. 1 of 2 sheets.

Copied by T.T. Ched. by JST

6-7460 U. S. GOVERNMENT PRINTING OFFICE

In-house or outsource?

Student



Pro



Vendor selection

- Factors to consider:

- Cost
- References
- Knowledge and expertise
- Document handling methods
- Turn around time

- Selection process:

- Site visits
- Test scans
- Relationship building



Indexing

Please print all information in the spaces provided

Last Name _____

Home Address _____

Home Phone _____

Employer Name and Address _____

Social Security Number _____

Primary Insurance
Company Name and Phone Number _____

Billing Address _____

Name of Insured and Relation to Patient _____

Insured's ID Number _____

9-275
May, 1916

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES BRANCH

File No. _____
Washington _____
Field _____
No. of Meas. _____

Date 5-8, 1931 **DISCHARGE MEASUREMENT NOTES**
Brazos River, at Richmond, Texas

Dist. from initial point	Depth	Depth of observation	Revolutions	Time in seconds	VELOCITY			Area	Mean depth	Width	Discharge
					At point	Mean in vertical	Mean in section				
11	6.7		est. Vel. =		.00						
						.36	188	9.9	19		68
30	13.1	12	20	42	1.13	.72					
		.8	5	42	.31		365	19.6	25		428
55	16.1	12	40	13 ¹ / ₂	2.16	1.60					
		.8	20	16 ¹ / ₂	1.03		260	17.35	15		499
70	18.6	12	50	48 ¹ / ₂	2.42	2.24					
*		.8	40	46	2.05		280 278	16.7	15		636 700
87	18.8	12	50	47	2.49	2.30					
		.8	50	56	2.14		419	18.2	23		989
110	17.6	12	50	45	2.60	2.42					
		.8	40	42	2.24		411	16.45	25		1036
135	15.3	12	60	48	2.93	2.61					
		.8	40	41	2.29		226	15.05	15		574
150	14.8	12	50	43	2.72	2.46					
		.8	40	43	2.19		287		20		697
170	13.9	12	50	44 ¹ / ₂	2.63	2.40					
		.8	40	43 ¹ / ₂	2.16		203	13.55	15		508
185	13.2	12	60	47 ¹ / ₂	3.96	3.60					
		.8	40	42	2.24		372	12.9	25		642 900
210	12.6	12	50	40	2.93	2.68					
		.8	60	57 ¹ / ₂	2.47		254	12.5	15		478
225	12.4	12	50	45	2.60	2.41					
		.8	40	42 ¹ / ₂	2.32						
Totals,											

No. 2 of 6 Sheets. Comp. by MLC Chk. by mcw

U. S. GOVERNMENT PRINTING OFFICE: 1929 6-7682



Genealogy & history

4. Observer. (List as far as possible and in chronological order, all observers who have maintained readings at this station.)

a.	<u>Name of observer</u>	<u>Dates of service</u>	<u>Compensation</u>
	C. S. Mc Elroy	1/1/03 - 6/5/06 (Booth)	
	W. J. Meininger	7/1/14 - 10/15/19 (Rosenberg)	
	James D. Jones	10/10/19 - 1/10/20 (")	
	Geo. W. Nelson	1/17/20 - 11/21/27 (")	
	Oliver Cochran	11/22/27 - 3/26/30 (")	
	Robert S. O'Brien	3/27/30 - 8/22/31 (")	
	Lewis A. Goss	8/23/31 - 12/31/34 (")	
	Leon J. Helwig	2/1/35 - 4/30/44	\$7/mo + 25¢ ea.
	Sanford J. Butler	5/1/44 - 3/31/52	10/1/45 to date:
	Earl Wright	4/1/52 - 5/31/55	\$8.50/mo (S & E);
	Sanford J. Butler	6/1/55 - 3/31/57	3.50/mo (RH-1); 60¢
	Mrs. Willie H. Butler	4/1/57 to date	ea. extra (RH-1).



W. J. Meininger
1912-1913

W. J. Meininger, USGS Observer, 1914-19,
and Mayor of Rosenberg, Texas, 1912-13.

Genealogy & history

4. Observer. (List as far as possible and in chronological order, all observation stations.)

a. Name of observer Dates of service

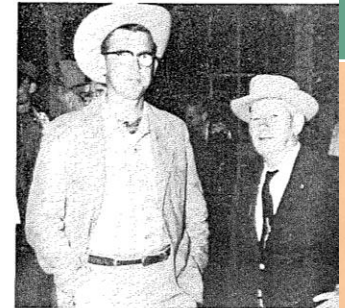
T. R. Booth

6/6/06 - 6/30/14

W. J. Meininger	7/1/14	-	10/15/19	(R)
James B. Jones	10/16/19	-	1/16/20	(
Geo. W. Nelson	1/17/20	-	11/21/27	(
Oliver Cochran	11/22/27	-	3/26/30	(
Robert S. O'Brien	3/27/30	-	8/22/31	(
Lewis A. Goss	8/23/31	-	12/31/34	(
Leon J. Helwig	2/1/35	-	4/30/44	
Sanford J. Butler	5/1/44	-	3/31/52	
Earl Wright	4/1/52	-	5/31/55	
Sanford J. Butler	6/1/55	-	3/31/57	
Mrs. Willie H. Butler	4/1/57		to date	



Tom Russell Booth (1890-1962) was the son of Mildred (Ryon) and Freeman I. Booth. Circa 1938, from Richmond High School Yearbook.



Thomas Walter Booth and father Tom Booth



Booth Store, Booth, Texas

Tom Booth, USGS Observer, 1906-1914, and descendent of the "Old Three Hundred".

Agency history

U. S. GEOLOGICAL SURVEY
TEXAS DISTRICT CONFERENCE
BAR K RANCH
JONESTOWN, TEXAS
JUNE 24-27, 1963



Holland Reeves Johnson Reynolds McGrand Alexander Hampton In attendance but not in picture — Corney, Dodd.
 Anderson Pleasant Mills Rothbun Sauer ~~Rehner~~ Montgomery Rosenquest Joerns Bell Schroeder
 Smith Twichell Albert Robbins Hulme Hutchison Jennings Bothner Goines Williams Kennon Pritchett Lear
 Massey Martin Carnes Steger Buckner Espey Gilbert Krauss Ferguson Gordon Hastings Largent Grozier Sansom
 Kaminski

Agency history

U. S. GEOLOGICAL SURVEY
TEXAS DISTRICT CONFERENCE
BAR K RANCH
JONESTOWN, TEXAS

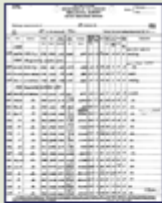
Search Results

Click on a document group to expand your search results

Jump to: [Data Supplementary](#)

Data

» return to top



Document	Date	Description
Data: Discharge, Gage Height, Velocity	1/10/1932	Discharge Measurement Notes
Data: Discharge, Gage Height, Velocity	7/19/1934	Discharge Measurement Notes
Data: Discharge, Gage Height, Velocity	12/4/1936	Discharge Measurement Notes
Data: Discharge, Gage Height, Velocity	12/6/1936	Discharge Measurement Notes

75 •

9-275
January 1935

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES BRANCH

Meas 184

Date 12-8-49, 19 10 DISCHARGE MEASUREMENT NOTES
Brazos River, at Richmond, Tex.

Dist. from initial point	Angle coefficient	Depth	Depth of observation	Revolutions	Time in seconds	VELOCITY		Area	Mean depth	Width	Discharge
						Mean in vertical	Mean in section				
71			.2			0	2.4	38			10
80						29	1.74	266			460
100						299	2.88	422			1220
120						276	3.84	474			1350
140						291	3.37	466			1570
160						383	4.12	512			2110
180						440	4.34	563			2440
200						427	4.21	546			2300
220						415	4.10	508			2080
240						404	3.92	495			1940
260						380	3.62	483			1750
280						346	3.56	470			1670
300						367	3.48	469			1630
320						330	3.32	456			1510
340						333	3.02	461			1400
360						270	2.80	473			1320
380						291	2.82	444			1250
400						272	1.96	299			780
420						120	.84	349			290
440						49	.24	246			60
460						0	0	55			0
470						0		2598			27140
$V_2 = 2.94$											
$V_2 = \frac{27100}{8600} = 3.15$											
$V_2 = \frac{2.94}{3.15} = .933$											

No. 1 of 1 Sheets, Comp. by WHS Chk. by WHS
U.S. GOVERNMENT PRINTING OFFICE 6-7052

Ferguson Gordon Largent Grozier Sansom
Kaminski



Holland Reeves Johnson Reynolds McGrand Alexander Hampton
 Pleasant Mills Rothbun Sauer Montgomery Rosen
 Smith Anderson Twichell Albert Robbins Hulme Hutchison Jennings Goines Williams Ruggles
 Massey Martin Carnes Steger Buckner Espy Gilbert Krauss

Interface development

Search

- What might Joe Q. Public want to search by?
 - Ancestor name
 - Photograph
 - Place name
- What might Frank want to search by?
 - Gage number
 - Date
 - Type of document

Basic Options

Site name: Brazos Rv at Richmond, TX

Decade:

Document type:

People:

Advanced Options

Site number: 08114000

County: Fort Bend County

Year start: end:

Form number: ?

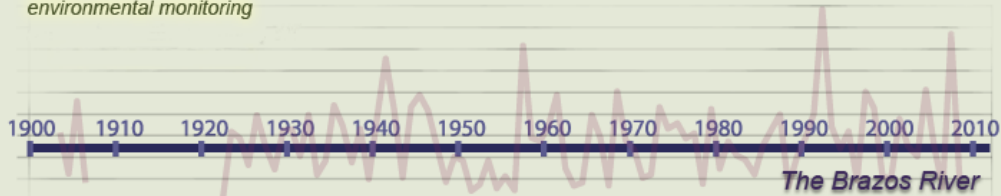
NARA accession no.:



USGS Home
Contact USGS
Search USGS

Long Term Monitoring: Unlocking the Past

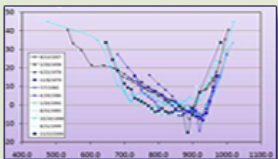
USGS: Over 100 years of environmental monitoring



► Mouseover timeline to unlock the past



Major Brazos River Flood Events



Applications of long term monitoring data

Faces of History



Search Documents and Images

Basic Options

Site name:

Decade:

Document type:

People:

◆ Advanced Options

Site number:

County:

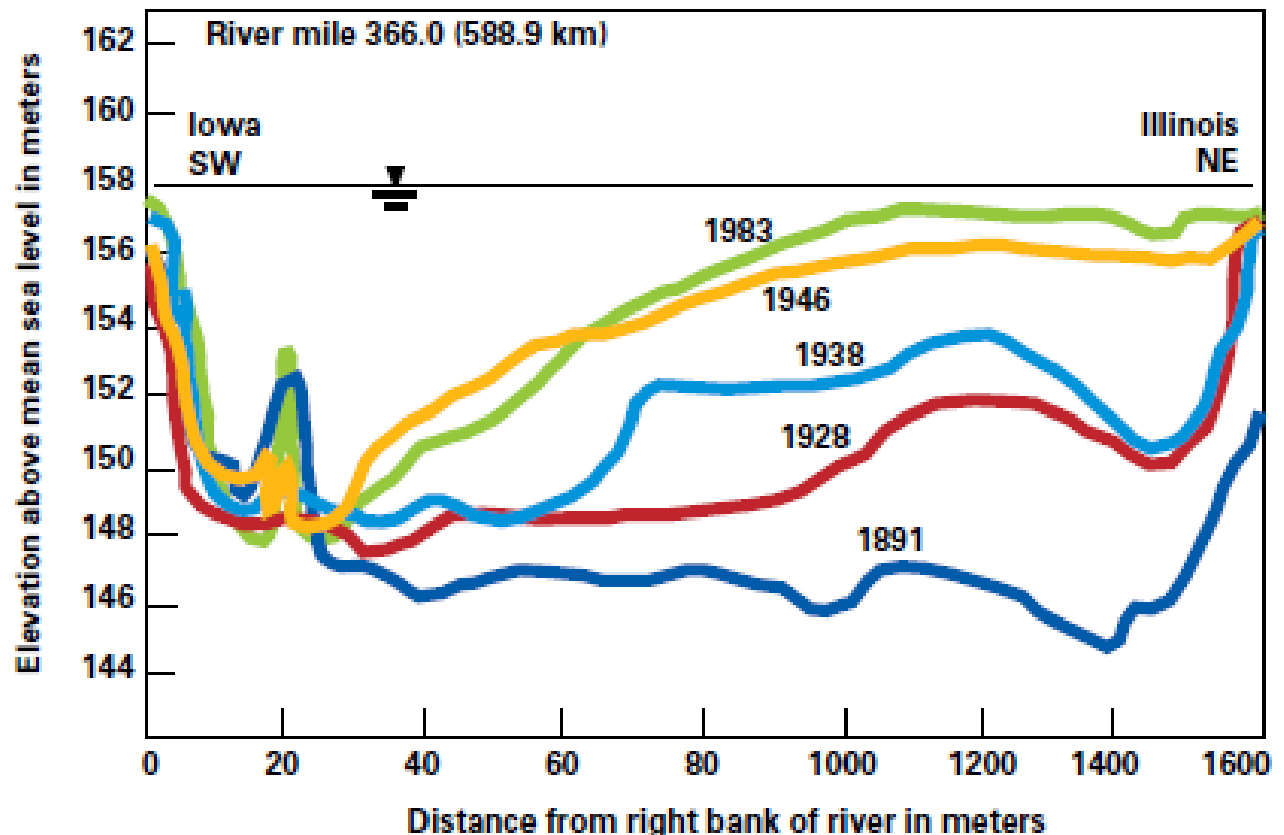
Year start: end:

Form number: ?

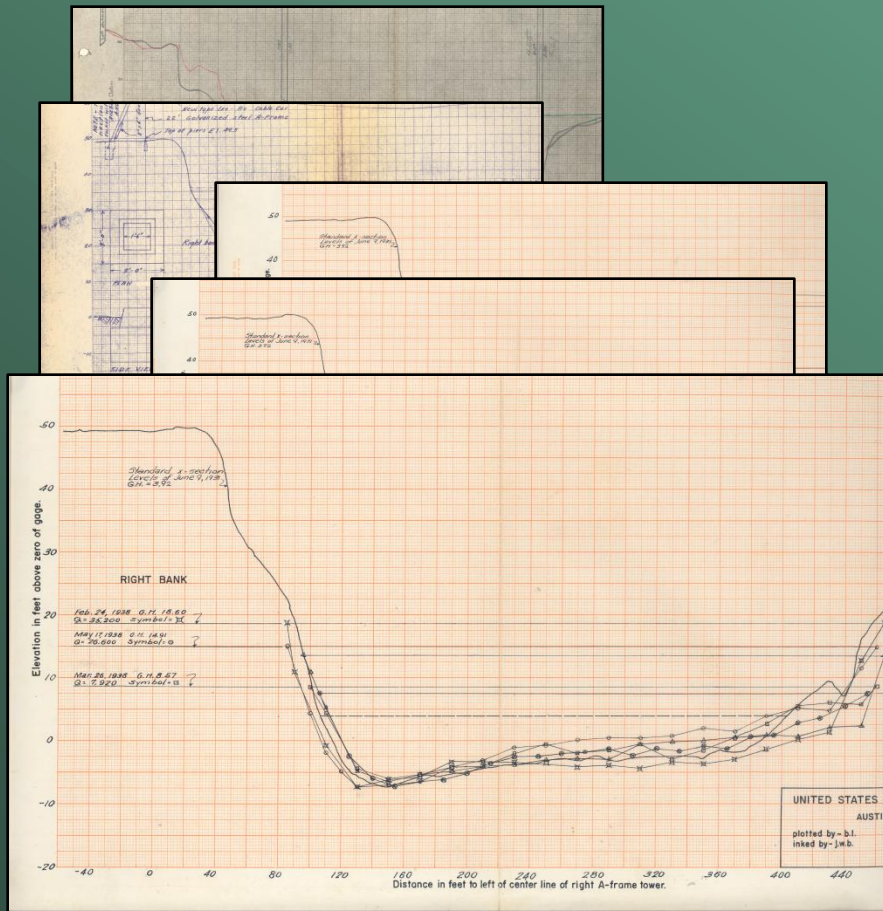
NARA accession no.:

Environment and wildlife health

“The prediction that ecologically productive backwaters will fill and disappear in the next 50 to 100 years is alarming and clearly identifies sedimentation as a major concern of natural resource managers. »



Texas Instream Flow Program



Search Documents and Images

Basic Options

Site name:

Decade:

Document type:

Data: Chemical, Biological

Data: Discharge, Gage Height, Velocity

Supplementary: Analysis, Ratings, Reports

Supplementary: Construction, Engineering, Map

Supplementary: Cross-Section

Supplementary: Description

Supplementary: Flood, Peak Flow / Low Flow

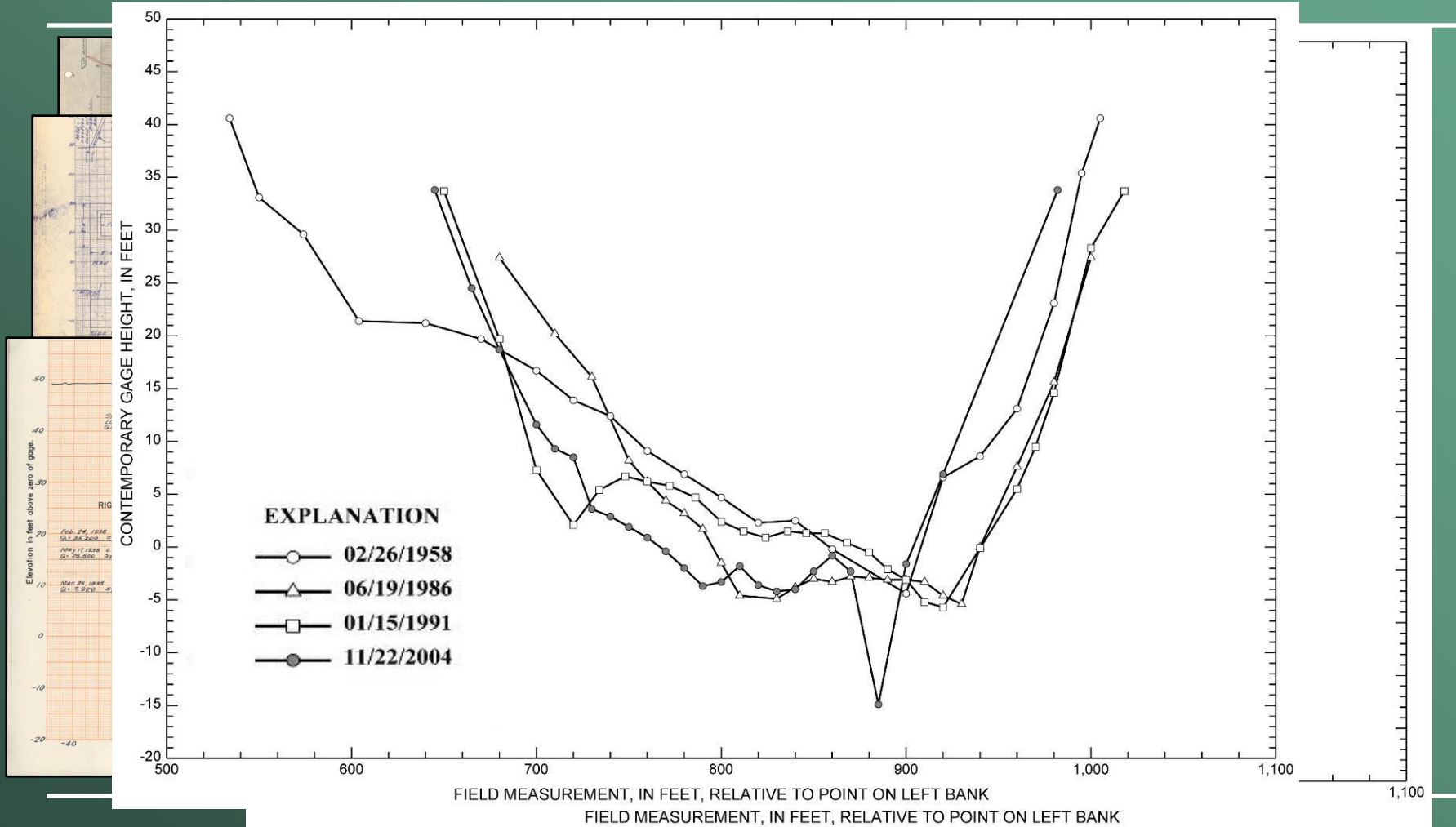
Supplementary: News articles, Correspondence

Photo: Aerial

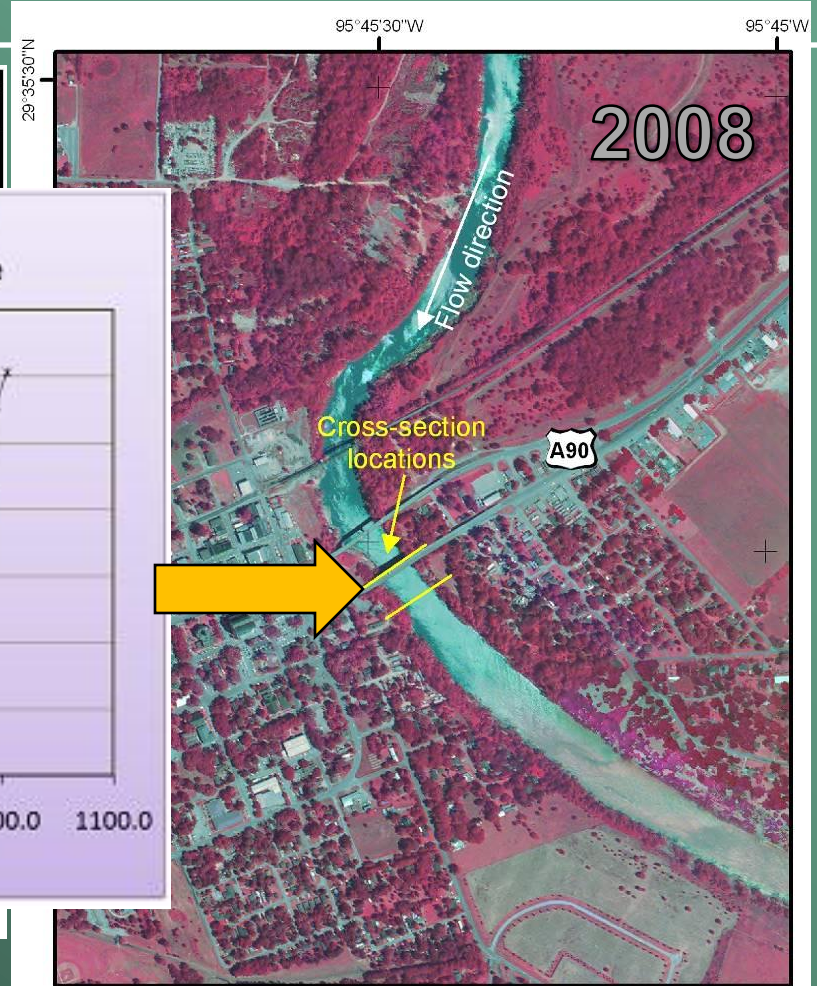
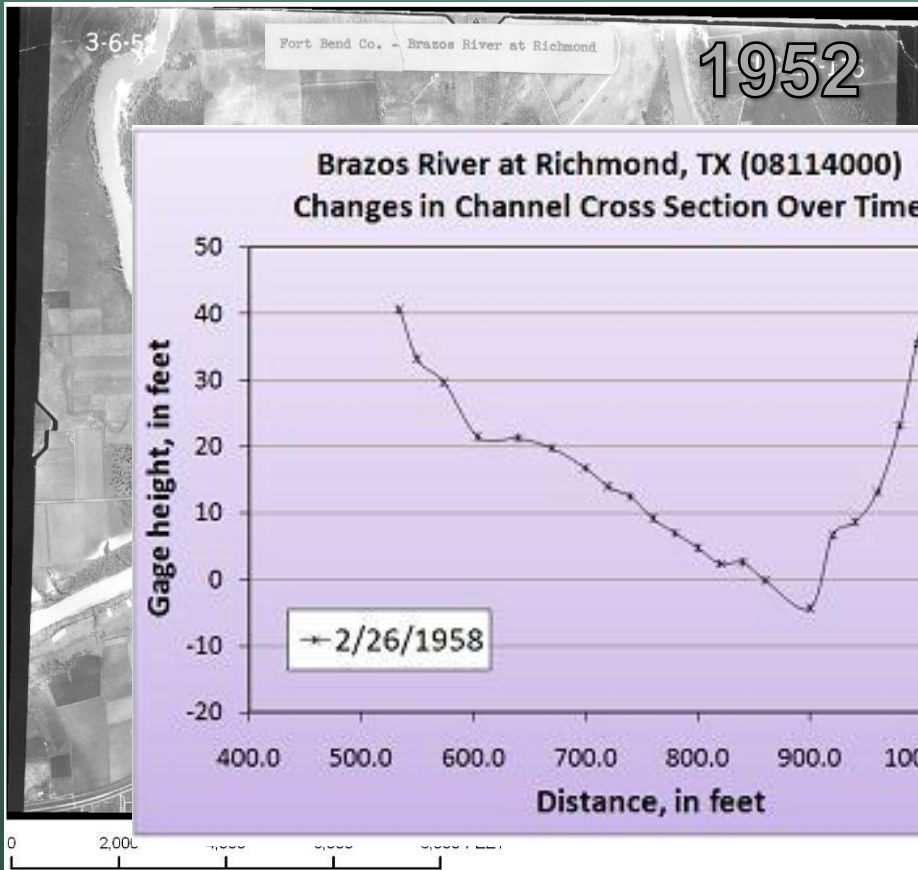
Photo: Field

Photo: Metadata

Historical channel adjustment



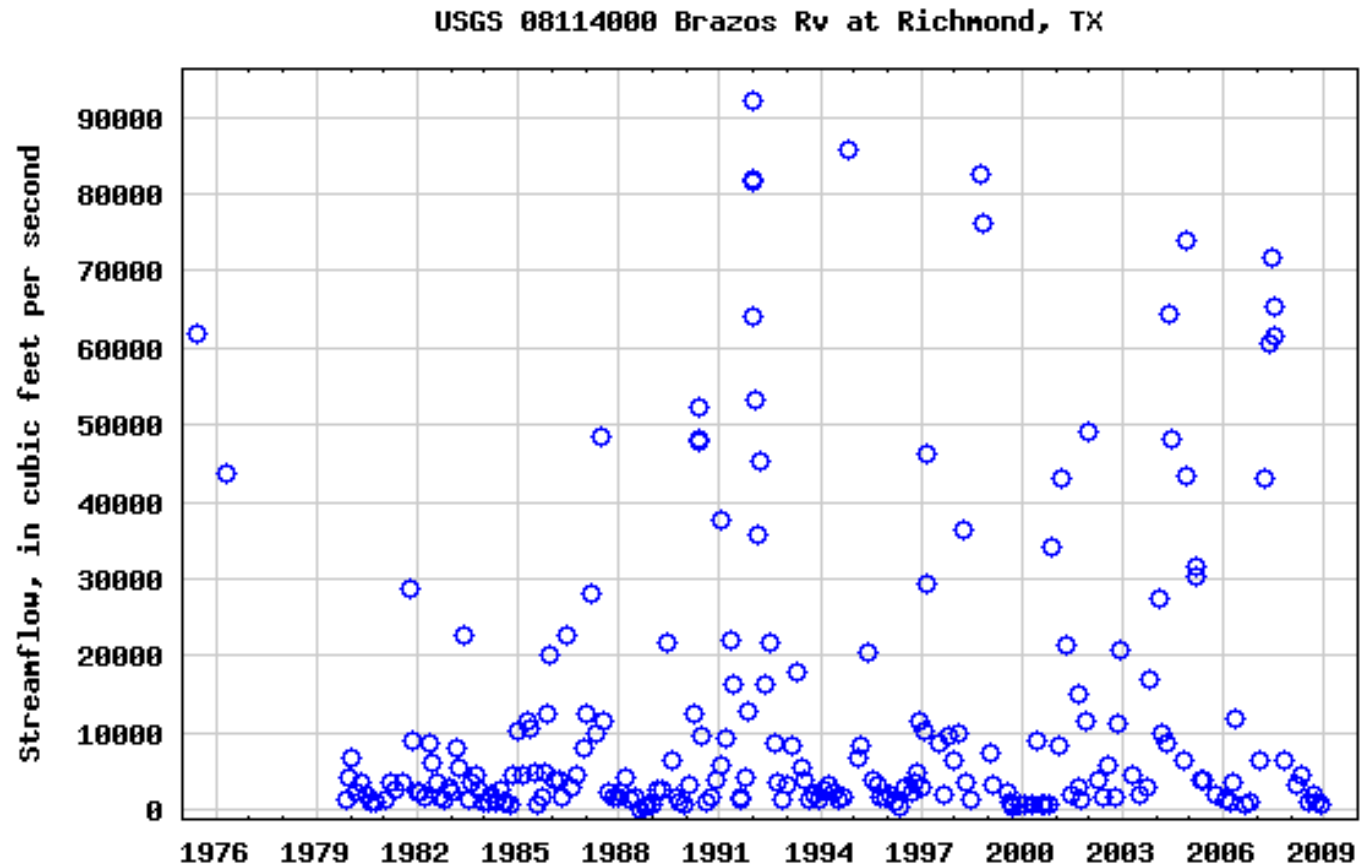
Historical channel adjustment



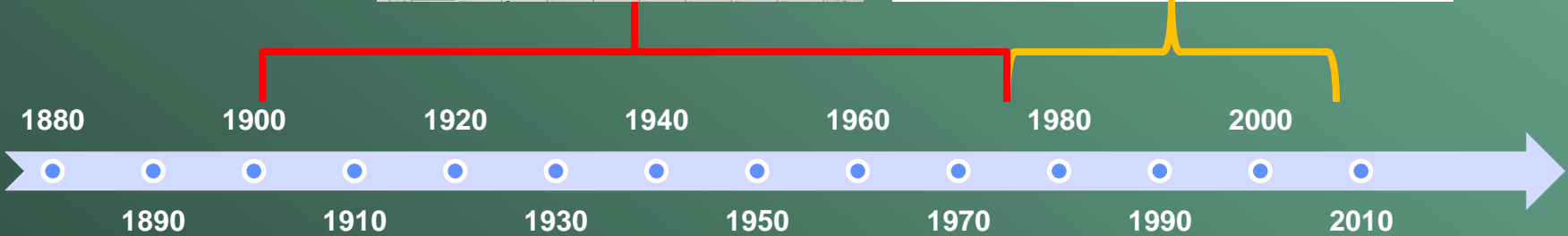
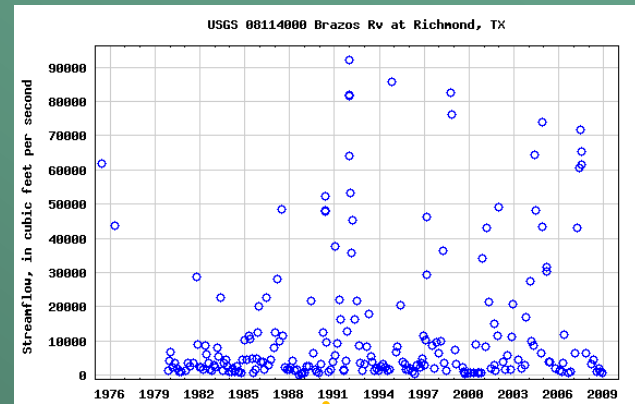
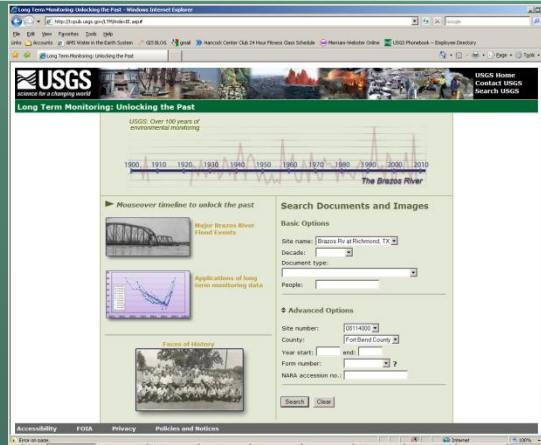
2004 NAIP color infrared imagery
Projection: UTM Zone 15 North
Datum: NAD83



NWISWeb

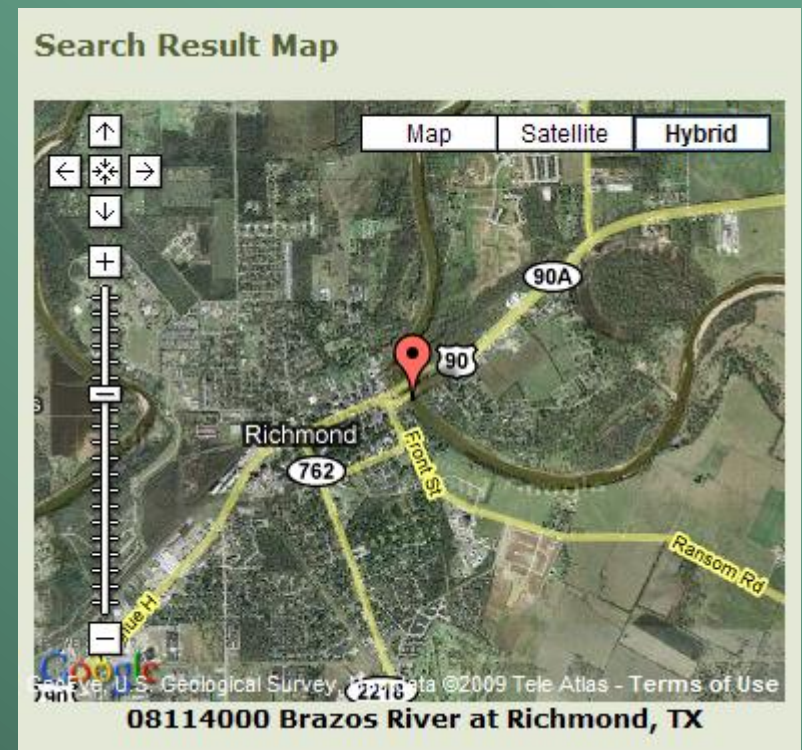


NWISWeb



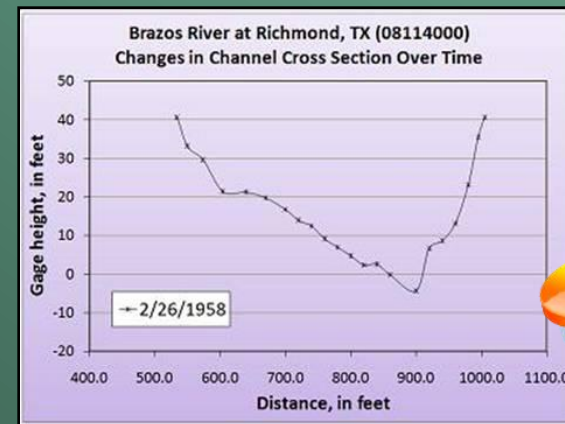
Products

- 5709 scanned pages
- 2243 documents
- Spatially enabled database
- Searchable Web site



Application

- Estimate of time saved on Instream Flow project if historical data were available online
 - Student hours - 10
 - Records retrieval & shipping hours - 20
 - Researcher hours - 2
- 32 hours total



Future work

- Text recognition
- Improve indexing
- More sites and data types
- Optimize viewing in different browsers (Firefox, Safari) and platforms (Mac, PC)



Acknowledgments



- Brian Reece
- Deanna Eames
- Jayne May
- Franklin Heitmuller
- Lauren Greene
- Sophia Hurtado
- Stephanie Ford
- Venezia Chavez

<http://txpub.usgs.gov/LTM>



Contact



- Sally Holl
 - slholl@usgs.gov
- Brian Reece
 - bdreece@usgs.gov



<http://txpub.usgs.gov/LTM>

