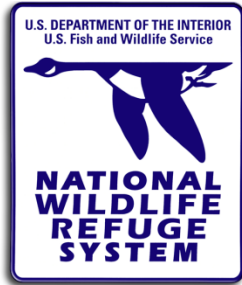


Water-Data Report 2013

432139084024201 SHIAWASSEE RIVER AT JAMES TOWNSHIP MI



Division of Biological Resources
Water Resources Branch

Water-Data Report 2013

432139084024201 SHIAWASSEE RIVER AT JAMES TOWNSHIP MI

LOCATION: Lat. 43°21'38"N, Long. 84°02'18"W, approximately 4 miles southwest of Saginaw, MI, Saginaw County. Gage is located on Shiawassee National Wildlife Refuge

DRAINAGE AREA: 2,599 square miles

SURFACE WATER RECORDS

PERIOD OF RECORD: Regional Office data analysis May 19, 2012 to present.

GAGE SITE: Design Analysis H522+ datalogger in communication with KPSI submersible pressure transducer and GOES antenna, powered through Solar Controller voltage regulator with 12V battery and solar panel. Gage installed in metal enclosure 15' above ground on tree. Stage data collected at 15 minute intervals. Weekly gage height data available online, NWS Id is JTSM4. Datum of gage is North American Vertical Datum of 1988.

NATIONAL WILDLIFE REFUGE: Shiawassee NWR

REMARKS: Stage records coded FAIR for 2013 calendar year.

EXTREMES FOR PERIOD OF RECORD: Maximum gage height, 590.52 ft, April 21, 2013; minimum gage height 576.36 ft November 25, 2012.

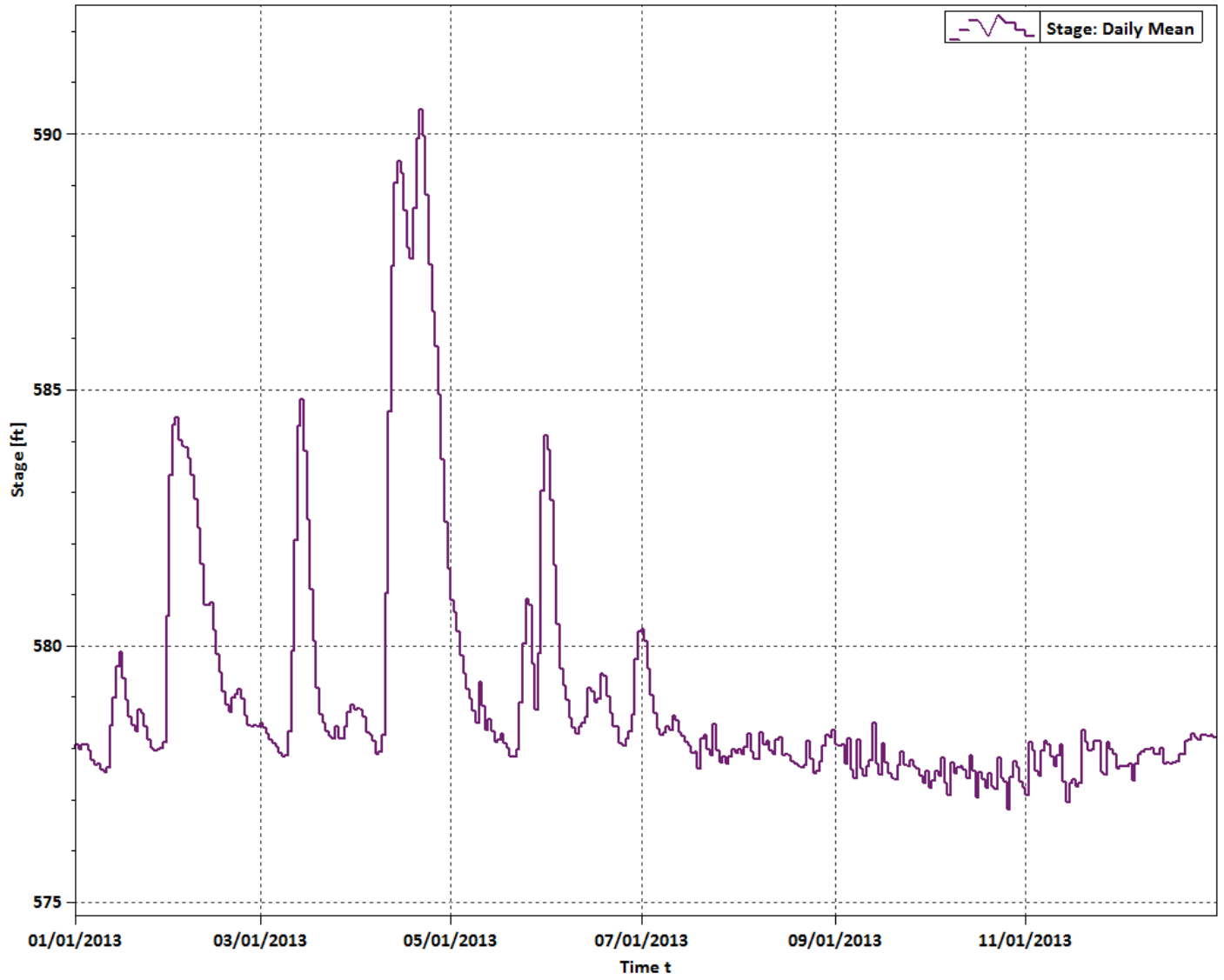
EXTREMES FOR CURRENT YEAR: Maximum gage height, 590.52 ft, April 21; minimum gage height 576.55 ft, October 26.

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GAGE HEIGHT, FEET
CALENDAR YEAR 2013
DAILY MEAN VALUES

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	578.07	584.31	578.48	578.77	580.90	583.82	580.32	577.98	578.07	577.22	577.09	577.66
2	577.97	584.45	578.39	578.76	580.67	582.85	580.10	577.89	578.04	577.37	578.13	577.64
3	578.07	584.02	578.27	578.61	580.27	581.56	579.56	578.03	578.07	577.56	577.95	577.65
4	578.07	583.89	578.17	578.30	579.81	580.42	579.04	578.28	577.69	577.46	577.55	577.69
5	577.95	583.86	578.08	578.25	579.46	579.54	578.69	577.93	578.19	577.81	577.47	577.36
6	577.77	583.65	578.02	578.13	579.15	579.23	578.39	577.78	577.57	577.31	577.96	577.69
7	577.68	583.32	577.91	577.87	578.97	578.93	578.25	577.78	577.42	577.09	578.14	577.89
8	577.69	582.86	577.83	577.94	578.72	578.58	578.32	578.30	578.18	577.72	578.06	577.93
9	577.57	582.29	577.87	578.25	578.50	578.40	578.43	578.07	577.61	577.51	577.83	577.99
10	577.54	581.60	578.34	581.02	579.30	578.29	578.35	578.15	577.45	577.63	577.65	577.98
11	577.62	580.79	579.91	584.57	578.83	578.43	578.63	577.94	577.65	577.65	577.86	577.99
12	578.46	580.79	582.07	587.41	578.36	578.51	578.53	577.88	577.78	577.59	578.07	577.89
13	578.98	580.85	584.30	589.04	578.58	578.62	578.30	578.17	578.48	577.41	577.35	577.89
14	579.60	580.31	584.81	589.45	578.34	579.18	578.25	578.20	577.69	577.85	576.94	578.00
15	579.88	579.83	583.80	589.23	578.12	579.11	578.13	577.85	577.48	577.55	577.32	577.70
16	579.36	579.48	582.47	588.50	578.16	578.89	578.06	577.88	578.09	577.04	577.39	577.73
17	578.95	579.10	581.11	587.77	578.29	578.97	577.91	577.85	577.72	577.54	577.26	577.69
18	578.62	578.85	580.09	587.56	578.10	579.45	577.93	577.75	577.51	577.38	577.32	577.72
19	578.45	578.71	579.18	588.54	577.99	579.42	577.59	577.71	577.42	577.23	578.36	577.74
20	578.33	578.98	578.65	589.90	577.84	579.02	578.19	577.65	577.38	577.51	578.12	577.88
21	578.76	579.06	578.49	590.47	577.84	578.69	578.26	577.62	577.67	577.24	577.94	577.88
22	578.69	579.14	578.34	589.96	577.97	578.43	577.97	577.67	577.93	577.19	577.98	578.14
23	578.43	578.96	578.23	588.80	578.89	578.43	577.86	578.13	577.68	577.80	578.14	578.17
24	578.17	578.63	578.18	587.44	580.04	578.10	578.46	577.79	577.66	577.42	578.13	578.28
25	578.00	578.46	578.42	586.53	580.91	578.04	577.95	577.50	577.77	577.35	577.52	578.21
26	577.95	578.41	578.19	585.85	580.80	578.20	577.72	577.56	577.65	576.79	577.48	578.17
27	577.99	578.45	578.18	584.90	579.63	578.32	577.84	577.75	577.59	577.45	578.13	578.26
28	577.99	578.42	578.42	583.63	578.75	578.66	577.70	578.05	577.45	577.74	577.98	578.27
29	578.13		578.70	582.41	579.85	579.73	577.84	578.25	577.33	577.62	577.88	578.24
30	580.58		578.84	581.50	583.02	580.29	577.98	578.20	577.56	577.33	577.60	578.26
31	583.32		578.75		584.10		577.91	578.36		577.23		578.21
Mean	578.54	580.77	579.37	584.31	579.36	579.27	578.34	577.93	577.73	577.44	577.75	577.93
Max	583.32	584.45	584.81	590.47	584.10	583.82	580.32	578.36	578.48	577.85	578.36	578.28
Min	577.54	578.41	577.83	577.87	577.84	578.04	577.59	577.50	577.33	576.79	576.94	577.36

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WATER QUALITY RECORDS

PERIOD OF RECORD: Regional Office data analysis May 19, 2012 to present.

INSTRUMENTATION: Design Analysis H522+ datalogger in communication with KPSI submersible pressure transducer and GOES antenna, powered through Solar Controller voltage regulator with 12V battery and solar panel. Gage installed in metal enclosure 15' above ground on tree. Water temperature data are collected at hourly intervals.

REMARKS: Records considered FAIR for 2012 calendar year.

Water-Data Report 2013
432139084024201 SHIAWASSEE RIVER AT JAMES TOWNSHIP MI

WATER TEMPERATURE [°C]

Day	January			February			March			April			May			June		
	min	max	mean	min	max	mean	min	max	mean	min	max	mean	min	max	mean	min	max	mean
1	-0.31	0.00	-0.20	-0.33	0.44	-0.13	-0.11	0.31	0.05	4.39	6.70	5.47	16.17	18.81	17.05	20.33	21.55	20.82
2	-0.31	-0.15	-0.24	-0.33	-0.27	-0.31	-0.33	0.57	0.05	3.59	5.93	4.80	17.03	19.17	18.05	17.62	20.39	18.88
3	-0.30	-0.16	-0.25	-0.33	-0.28	-0.31	-0.35	1.10	0.17	4.51	7.10	5.46	17.21	19.21	18.16	17.53	19.95	18.62
4	-0.28	0.13	-0.16	-0.33	-0.25	-0.31	-0.20	1.22	0.41	6.54	8.54	7.24	16.96	19.46	18.11	17.92	19.89	18.96
5	-0.27	0.09	-0.14	-0.34	-0.28	-0.31	-0.03	1.35	0.54	7.09	8.20	7.50	16.81	19.65	18.19	17.84	19.43	18.48
6	-0.20	-0.05	-0.16	-0.33	-0.24	-0.30	0.38	1.87	1.05	6.85	7.23	7.00	17.12	19.76	18.49	17.01	18.37	17.67
7	-0.26	0.21	-0.12	-0.31	-0.25	-0.29	0.93	3.24	1.71	5.83	6.85	6.22	18.05	20.83	19.27	17.09	18.91	17.85
8	-0.18	0.27	-0.04	-0.33	-0.26	-0.30	1.52	2.82	2.05	6.08	6.35	6.18	19.26	21.24	20.30	17.71	19.63	18.44
9	-0.17	0.36	0.01	-0.34	-0.24	-0.30	1.00	2.75	1.77	5.23	6.23	5.71	17.20	21.48	19.73	18.74	19.52	19.01
10	-0.25	0.23	-0.08	-0.31	-0.21	-0.27	0.30	1.15	0.54	4.19	5.14	4.55	15.04	16.96	15.87	18.83	22.02	19.81
11	-0.12	0.09	-0.04	-0.29	-0.21	-0.26	0.31	1.56	1.03	3.67	4.15	3.84	12.38	15.49	13.39	20.23	21.84	21.03
12	-0.05	1.87	0.67	-0.33	-0.24	-0.28	-0.30	0.20	-0.11	3.59	3.87	3.74	10.56	12.59	11.52	20.66	22.75	21.55
13	1.78	3.15	2.39	-0.31	-0.15	-0.26	-0.34	0.37	-0.09	3.49	4.14	3.73	11.87	13.25	12.39	20.52	22.52	21.53
14	1.76	2.80	2.22	-0.27	-0.15	-0.22	-0.22	0.24	-0.03	3.97	5.18	4.28	12.95	17.41	14.29	20.25	21.91	21.09
15	0.48	1.77	0.99	-0.21	-0.01	-0.14	0.11	1.03	0.38	5.23	7.46	5.87	16.10	19.97	17.30	20.22	22.77	21.24
16	-0.33	0.55	0.04	-0.24	-0.02	-0.15	0.50	2.13	1.05	7.40	8.80	7.87	16.99	19.65	17.86	20.93	23.60	22.11
17	0.04	0.77	0.36	-0.33	0.05	-0.20	0.87	2.04	1.36	8.51	9.63	8.85	16.05	19.51	17.10	20.71	23.40	22.06
18	-0.29	0.54	-0.03	-0.27	0.19	-0.10	0.61	1.30	1.02	8.94	9.83	9.51	17.27	21.92	18.90	19.53	22.54	21.04
19	-0.31	0.35	-0.08	-0.22	0.06	-0.11	-0.28	1.37	0.51	7.99	9.13	8.37	20.37	23.59	21.64	20.09	23.36	21.50
20	-0.37	0.68	0.01	-0.35	-0.19	-0.31	-0.30	1.34	0.32	7.36	8.49	7.75	21.43	23.57	22.35	21.27	23.34	22.48
21	-0.35	-0.27	-0.31	-0.33	0.06	-0.23	-0.30	1.81	0.48	7.28	8.79	8.03	21.59	23.57	22.26	22.14	25.31	23.25
22	-0.32	-0.17	-0.27	-0.35	-0.13	-0.28	1.04	2.25	1.53	8.23	9.10	8.62	17.11	22.50	20.13	23.87	26.85	25.04
23	-0.29	-0.06	-0.22	-0.33	-0.16	-0.27	1.60	2.36	2.02	8.43	9.12	8.69	13.82	16.93	15.24	25.12	27.88	26.23
24	-0.28	-0.17	-0.24	-0.32	0.12	-0.20	1.49	2.46	1.93	7.56	8.60	8.03	13.69	15.72	14.77	25.10	27.83	26.35
25	-0.28	-0.22	-0.26	-0.27	0.31	-0.08	2.07	3.80	2.62	7.50	9.12	8.07	14.18	16.68	15.31	24.70	27.79	25.92
26	-0.28	-0.21	-0.25	-0.21	0.42	0.05	2.78	5.28	3.70	8.93	11.62	9.61	15.08	17.43	16.25	25.61	27.57	26.47
27	-0.30	-0.23	-0.27	-0.17	0.32	0.04	3.83	6.51	4.85	11.50	12.76	11.93	15.66	17.14	16.35	23.89	26.08	24.70
28	-0.29	-0.25	-0.28	-0.01	0.58	0.25	5.12	7.57	6.10	12.20	14.63	12.92	16.21	17.53	16.93	22.07	24.11	22.56
29	-0.30	-0.18	-0.26	0.02	0.45	0.28	5.79	7.79	6.83	13.88	14.76	14.21	17.58	20.17	18.38	21.14	22.87	21.78
30	-0.34	0.05	-0.22				6.73	8.46	7.49	13.85	16.84	14.86	19.83	20.99	20.18	21.05	22.67	21.64
31	0.24	1.11	0.78				6.21	8.47	7.19				20.19	21.77	20.81			
Monthly Average	-0.09	0.42	0.11	-0.28	-0.02	-0.18	1.30	2.73	1.89	7.13	8.48	7.63	16.51	19.16	17.63	20.66	22.89	21.60

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WATER TEMPERATURE [°C]

Day	July			August			September			October			November			December		
	min	max	mean	min	max	mean	min	max	mean	min	max	mean	min	max	mean	min	max	mean
1	20.35	21.50	20.91	21.02	23.73	22.26	21.66	23.80	22.86	17.44	18.76	18.16	9.29	10.19	9.63	---	---	---
2	20.46	22.77	21.22	21.20	24.15	22.60	20.41	23.61	21.61	17.21	19.08	18.16	7.75	9.19	8.42	---	---	---
3	21.46	23.99	22.39	21.21	24.13	22.24	20.42	25.05	22.14	18.55	20.51	19.11	6.54	8.51	7.36	---	---	---
4	22.30	24.93	23.41	21.13	23.48	21.95	19.19	22.84	21.46	18.74	21.46	19.47	6.88	7.96	7.24	---	---	---
5	23.52	26.38	24.72	20.84	22.84	21.57	19.91	22.53	21.14	18.84	19.45	19.16	7.75	9.06	8.38	---	---	---
6	24.82	26.23	25.49	21.38	24.52	22.49	20.22	23.20	21.12	16.22	18.92	17.29	8.09	9.00	8.40	---	---	---
7	24.44	25.64	24.85	22.24	24.65	23.43	19.85	22.53	20.99	14.71	17.21	15.62	---	---	---	---	---	---
8	23.62	26.12	24.50	22.30	25.20	23.60	19.61	22.38	20.59	14.71	17.11	15.86	---	---	---	---	---	---
9	24.66	27.18	25.53	22.37	24.83	23.55	20.00	25.00	22.01	14.87	17.03	15.90	---	---	---	---	---	---
10	24.04	26.88	25.27	22.71	25.25	23.74	22.95	25.28	24.15	14.52	17.25	15.79	---	---	---	---	---	---
11	23.22	26.40	24.69	22.49	24.90	23.46	21.99	24.53	23.11	14.60	17.00	15.62	---	---	---	---	---	---
12	23.86	26.94	25.11	22.23	25.01	23.50	19.42	22.70	20.91	15.30	17.24	16.36	---	---	---	---	---	---
13	24.77	28.11	26.05	19.29	22.83	20.93	17.17	19.96	18.42	14.58	16.16	15.19	---	---	---	---	---	---
14	26.27	29.59	27.33	19.16	22.25	20.67	17.05	19.65	18.25	13.09	15.58	14.22	---	---	---	---	---	---
15	27.89	30.80	28.88	19.22	21.91	20.69	15.23	17.01	16.26	13.68	14.57	14.11	---	---	---	---	---	---
16	28.48	31.22	29.52	20.37	23.34	21.56	14.00	16.81	15.18	12.89	13.94	13.36	---	---	---	---	---	---
17	29.05	31.51	30.07	21.13	24.00	22.52	15.04	18.76	16.41	11.08	13.01	12.04	---	---	---	---	---	---
18	28.83	31.59	29.93	21.53	24.94	23.06	17.12	19.09	17.89	11.42	13.38	12.21	---	---	---	---	---	---
19	27.41	30.33	28.97	22.07	25.58	23.75	18.35	19.50	18.84	10.16	11.70	10.91	---	---	---	---	---	---
20	26.18	29.80	27.68	23.24	26.45	24.58	18.36	19.66	19.10	10.79	11.66	11.16	---	---	---	---	---	---
21	25.63	28.66	26.90	24.20	26.26	25.22	16.45	18.77	17.47	8.53	11.08	9.46	---	---	---	---	---	---
22	25.23	27.51	26.14	23.31	26.33	24.59	15.51	17.84	16.35	8.35	9.59	8.88	---	---	---	---	---	---
23	22.49	26.21	24.14	22.38	25.97	23.87	14.85	17.85	16.28	7.01	9.30	7.94	---	---	---	---	---	---
24	21.90	25.35	23.28	22.47	26.50	24.21	15.25	16.84	15.98	7.01	7.75	7.42	---	---	---	---	---	---
25	22.53	25.45	23.56	23.57	25.83	24.67	15.68	16.94	16.13	6.35	7.74	7.10	---	---	---	---	---	---
26	22.35	23.99	23.11	23.92	25.05	24.52	15.79	18.86	16.74	5.99	7.09	6.41	---	---	---	---	---	---
27	20.70	23.78	21.67	24.11	25.19	24.40	16.12	19.77	17.82	5.66	7.28	6.88	---	---	---	---	---	---
28	19.78	21.88	20.65	23.15	26.12	24.44	17.00	19.89	17.81	5.74	6.66	6.13	---	---	---	---	---	---
29	19.79	22.69	20.90	23.28	26.01	24.62	16.49	17.84	17.21	5.68	7.02	6.18	---	---	---	---	---	---
30	21.19	23.84	22.12	23.90	25.95	24.69	16.03	18.40	17.20	6.92	9.39	8.09	---	---	---	---	---	---
31	20.53	23.68	21.48	22.76	25.02	23.72				9.19	10.18	9.70				---	---	---
Monthly Average	23.80	26.48	24.85	22.07	24.78	23.26	17.90	20.56	19.05	11.93	13.68	12.71	---	---	---	---	---	---

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SUMMARY STATISTICS

	Calendar Year 2013	Period of Record (2012-2013)
Minimum Daily Value [°C]	-0.37 (Jan 20)	-0.37 (Jan 20, 2013)
Maximum Daily Value [°C]	31.59 (Jul 18)	32.69 (Jul 7, 2012)
Median of Daily Mean [°C]	18.85	17.24

