

SWIMS
11/26/24

Wisconsin DNR – Lake Level Monitoring Staff Gauge Survey Data Sheet

6/27/2024

8:01-8:02

Lake Information

Lake Name Sand Lake

County Polk

Data Collectors

Primary Data Collector _____

Email _____

Phone No. _____

Additional Data Collector(s) _____

Reference Mark and Staff Gauge Information

Reference Mark #1 (RM1)

Reference Mark Type: 9" Spike Set

Latitude: _____ Longitude: _____ Mean Sea Level Yes ☐ No ☐ Elevation: 1123.52 Photograph ☐

Location Description: Polk County Coordinates #103,N=260720.483,E=482536.258,Elev=1123.52

Reference Mark #2 (RM2)

Reference Mark Type: 9" Spike Set

Latitude: _____ Longitude: _____ Mean Sea Level Yes ☐ No ☐ Elevation: 1115.89 Photograph ☐

Location Description: Polk County Coordinates #102,N=260651.269,E=482512.379,Elev=1115.919

Reference Mark #3 (RM3)

Reference Mark Type: PK Nail set in Stump

Latitude: _____ Longitude: _____ Mean Sea Level Yes ☐ No ☐ Elevation: 1115.45 Photograph ☐

Location Description: Polk County Coordinates #101,N=260674.875,E=482620.624,Elev=1115.45

Staff Gauge

Latitude: _____ Longitude: _____ Mean Sea Level Yes ☐ No ☐ Elevation: 1113.96 Photograph ☐

Location Description: _____

Date: _____ Time: _____ AM/PM

Check one: Install ☐ Midseason ☐ Removal ☐

Survey Stage 1 - Instrument at first height*

	Reference Mark 1		Fore sight (FS1)	Calculated Elevation (CE1)	Water FS1 10.82 Elev. = 1113.25 - 6.28 = SWIMS 1106.97
Given Elevation (GE _{RM1})	<u>1123.52</u>				
Back sight 1 (BS1)	+ <u>0.55</u>				
Height of Instrument (HI1)	<u>1124.07</u>	- Staff Gauge	<u>10.11</u>	= <u>1113.96</u>	
	HI1	- Ref Mark 2	<u>8.18</u>	= <u>1115.89</u>	
	HI1	- Ref Mark 3	<u>8.62</u>	= <u>1115.45</u>	

Survey Equations:

HI1 = GE_{RM1} + BS1

CE1 = HI1 - FS1

Survey Stage 2 – Reset instrument at different height

	Staff Gauge		Fore sight (FS2)	Calculated Elevation (CE2)	
Calculated Elevation1	<u>1113.96</u>				
Back sight 2 (BS2)	+ <u>10.19</u>				
Height of Instrument (HI2)	<u>1124.15</u>	- Ref Mark 1	<u>0.63</u>	= <u>1123.52</u>	
	HI2	- Ref Mark 2	<u>8.26</u>	= <u>1115.89</u>	
	HI2	- Ref Mark 3	<u>8.70</u>	= <u>1115.45</u>	

Survey Equations:

HI2 = CE_{SG1} + BS2

CE2 = HI2 - FS2

Quality Assurance Checks:

Reference Mark 1: BS1 0.55 FS1 10.11
GE = CE2 BS2 + 10.19 FS2 + 0.63
10.74 = 10.74

QA Equations:

BS1 + BS2 = FS1_{SG} + FS2_{RM1}

GE_{RM1} = CE2_{RM1}

*Accept Survey Stage 1 if QA checks within 0.01 ft. Use calculated elevations 1 for the rest of the season unless the gauge moves.



Wisconsin DNR – Lake Level Monitoring Staff Gauge Survey Data Sheet

Lake Level Reading: 6.28 ft

Revised 2016

Site Diagram (including Staff Gauge and Reference Marks)



Notes

[illegible]

Data Management

Survey Data uploaded to SWIMS? Yes ☐ No ☐ **Date:** _____ **Name:** _____

Data Sheet scan uploaded to SWIMS? Yes ☐ No ☐ Date: _____ Name: _____

Equipment Maintenance

Replace bolts/screws on staff gauge? Yes ☐ No ☐ Date: _____ Name: _____

Replace gauge plate on staff gauge? Yes ☐ No ☐ Date: _____ Name: _____

Replace post or wooden board? Yes ☐ No ☐ Date: _____ Name: _____



SWIMS
11/26/24

Wisconsin DNR – Lake Level Monitoring Staff Gauge Survey Data Sheet

9/26/2024 8:04-8:05

Lake Information

Lake Name Sand Lake County Polk

Data Collectors

Primary Data Collector _____ Email _____ Phone No. _____
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Additional Data Collector(s) _____

Reference Mark and Staff Gauge Information

Reference Mark #1 (RM1) Reference Mark Type: 9" Spike
Latitude: _____ Longitude: _____ Mean Sea Level Yes ☐ No ☐ Elevation: 1123.52 Photograph ☐
Location Description: _____

Reference Mark #2 (RM2) Reference Mark Type: 9" Spike
Latitude: _____ Longitude: _____ Mean Sea Level Yes ☐ No ☐ Elevation: 1115.89 Photograph ☐
Location Description: _____

Reference Mark #3 (RM3) Reference Mark Type: PK Nail in Stump
Latitude: _____ Longitude: _____ Mean Sea Level Yes ☐ No ☐ Elevation: 1115.45 Photograph ☐
Location Description: _____

Staff Gauge

Latitude: _____ Longitude: _____ Mean Sea Level Yes ☐ No ☐ Elevation: 1113.96 Photograph ☐
Location Description: _____

Date: _____ Time: _____ AM/PM Check one: Install ☐ Midseason ☐ Removal ☐

Survey Stage 1 - Instrument at first height*

	Reference Mark 1		Fore sight (FS1)	Calculated Elevation (CE1)	Water FS1 11.33 Elev. = 1113.33 - 6.36 = SWIMS 1106.97
Given Elevation (GE _{RM1})	<u>1123.52</u>				
Back sight 1 (BS1)	+ <u>1.14</u>				
Height of Instrument (HI1)	<u>1124.66</u>	- Staff Gauge	<u>10.70</u>	= <u>1113.96</u>	Survey Equations:
	HI1	- Ref Mark 2	<u>8.77</u>	= <u>1115.89</u>	HI1 = GE _{RM1} + BS1
	HI1	- Ref Mark 3	<u>9.21</u>	= <u>1115.45</u>	CE1 = HI1 - FS1

Survey Stage 2 – Reset instrument at different height

	Staff Gauge		Fore sight (FS2)	Calculated Elevation (CE2)	
Calculated Elevation1	<u>1113.96</u> ←				
Back sight 2 (BS2)	+ <u>10.67</u>				
Height of Instrument (HI2)	<u>1124.63</u>	- Ref Mark 1	<u>1.11</u>	= <u>1123.52</u>	Survey Equations:
	HI2	- Ref Mark 2	<u>8.73</u>	= <u>1115.90</u>	HI2 = CE _{SG1} + BS2
	HI2	- Ref Mark 3	<u>9.17</u>	= <u>1115.46</u>	CE2 = HI2 - FS2

Quality Assurance Checks:

Reference Mark 1: BS1 1.14 FS1 10.70 QA Equations:
GE = CE2 BS2 + 10.67 FS2 + 1.11 BS1 + BS2 = FS1_{SG} + FS2_{RM1}
11.81 = 11.81 GE_{RM1} = CE2_{RM1}

*Accept Survey Stage 1 if QA checks within 0.01 ft. Use calculated elevations 1 for the rest of the season unless the gauge moves.



Staff Gauge Survey Data Sheet

Revised 2016

Lake Level Reading: 6.36 ft

Site Diagram (including Staff Gauge and Reference Marks)



Notes

[illegible]

Data Management

Survey Data uploaded to SWIMS? Yes ☐ No ☐ Date: _____ Name: _____

Data Sheet scan uploaded to SWIMS? Yes ☐ No ☐ **Date:** _____ **Name:** _____

Equipment Maintenance

Replace bolts/screws on staff gauge? Yes ☐ No ☐ Date: _____ Name: _____

Replace gauge plate on staff gauge? Yes ☐ No ☐ Date: _____ Name: _____

Replace post or wooden board? Yes ☐ No ☐ Date: _____ Name: _____

