

Max Wrigley
Lab 14
Engr 115

Input Parameter

Surface are lake (m ²)	8000
Evaporation (in/nov)	1.04

Conversions:

3.28 ft to m
12 in to ft
100 cm to m
3600 s to hr
24 hr to day
30 day to nov

Float

Inflow method 1	Depth (m)	Width (m)	Length (m)	Volume (m ³)	Time (s)	Time (hr)	Flowrate (m ³ /hr)
Trial 1	0.036	0.60	1.2	0.026	7.2	0.6000	0
Trial 2	0.036	0.60	1.2	0.026	6.62	0.5517	0
Trial 3	0.036	0.60	1.2	0.026	5.38	0.4483	0
Avg Flowrate=							0

Flow Probe

Inflow method 2	Depth (m)	Width (m)	Cross area (m ²)	Meter Value (m/s)	Meter Value (m/hr)	Flowrate (m ³ /hr)
Trial 1	0.065	0.50	0.033	0.12	1.44	0.0468
Trial 2	0.065	0.50	0.033	0.24	2.88	0.0936
Trial 3	0.065	0.50	0.033	0.24	2.88	0.0936
Avg Flowrate=						0.078

Bucket

Outflow method 1	Area of Bucket (m ²)	Bucket Height (m)	Bucket Volume (m ³)	Time (s)	Time (hr)	Flowrate (m ³ /hr)
Trial 1	0.0642	0.214	0.01374	11.13	0.92750	0.01
Trial 2	0.0642	0.131	0.00841	6.16	0.51333	0.02
Trial 3	0.0642	0.143	0.00918	6.72	0.56000	0.02
Avg Flowrate=						0.02

Results

Total Inflow	Average (m ³ /hr)
Float	15
Flow Probe	23.4
Average Inflow	19.2

Outflow	Average (m ³ /hr)	Value (m/nov)	Value (m/hr)
Bucket	4.76		
Evaporation	0.002	0.0264	0.0000003
Total Outflow	4.762		

3. Fern Lake is not in a steady state, because the sum of the inputs are greater than the sum of the outputs.

Rate of Volume Change	Inflow (m ³ /hr)	Outflow (m ³ /hr)	Rate (m ³ /hr)	
Inflow - Outflow	19.2	5.054	14.1	Increasing

Rate of Depth Change	Rate of Volume (m ³ /hr)	Surface Area (m ²)	Depth Change (cm/hr)	
Rate of Volume Change	14.1	8000	0.177	Increasing

Assumptions:

- For evaporation, multiplied pan test by 0.7.
- For the flow probe method the average depth measurement was .0652 m and the width was .501 m.
- For the float method the average depth measurement was .0360 m and the width was .600m.
- Seepage was negligible
- No runoff measurements for inflow.
- No precipitation measurements.
- No water loss due to fish hatchery.