

Assumptions:

- Assumes that the beaker was capturing 1/100 of the total inflow volume when measuring.
- For evaporation, multiplied pan test by 0.7.
- We took an average depth 8.2m and an average width 6.6m.
- seepage was negligible.
- No outflow from stream , even though we could see tiny amounts

leaving.

- No runoff measurements for inflow.
- No precipitation measurements.

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 Lab 11- Fern Lake  
 3-Nov-16

Input Parameter	
Surface Area (m <sup>2</sup> )	8000
Evaporation (in/dec)	0.72

Velocity Meter			
Inflow Method 1	Depth (m)	Width (m)	Cross Area (m <sup>2</sup> )
Trial 1	#####	0.09	0.01
Trial 2	#####	0.09	0.01
Trial 3	#####	0.09	0.01

Float			
Inflow Method 2	Depth (m)	Width (m)	Length (m)
Trial 1	0.06	0.30	0.3
Trial 2	0.06	0.30	0.3
Trial 3	0.06	0.30	0.3

Bucket Method			
Outflow method 1	Bucket Volume (gal)	Bucket Volume (m <sup>3</sup> )	Time (s)
Trial 1	5	0.019	12
Trial 2	5	0.019	11
Trial 3	5	0.019	11.3

#### Knowns

3.28 ft/m  
 0.0254 m/in  
 0.3048 m/ft  
 0.00378541 meter<sup>3</sup>/ gallon  
 0.000277778 hour/second  
 60 sec/min  
 60 min/hour  
 12 in/feet

Meter Value (m/s)	Flowrate (m <sup>3</sup> /s)
0.12	2.45
0.12	2.45
0.18	4.59
Average Flowrate=	3.16

Volume (m <sup>3</sup> )	Time(s)	Time(hr)	Flowrate (m <sup>3</sup> /hr)
0.0059	10.8	0.003	1.97
0.0059	10.5	0.003	2.02
0.0059	11.2	0.003	1.90
average flowrate=			1.96

Time (hr)	Flowrate(m <sup>3</sup> /hr)
0.0033	5.68
0.0031	6.19
0.0031	6.03
Average Flowrate=	5.97

## Results

Total Inflow	Average (m <sup>3</sup> /h)
Method 1	3.16
Method2	1.96
Method 3	5.97
avg inflow	3.70

Total Outflow	Value (m/nov)	Lake Surface (m <sup>2</sup> )	Lake Evaporation (m <sup>3</sup> /hr)
Evaporation	0.02	8000	0.20

1.) Fern like is not in a steady state because the inflow rate is greater the outflow rate.

Rate of Change of Volume	Inflow(m <sup>3</sup> /hr)	Outflow (m <sup>3</sup> /hr)	Rate(m <sup>3</sup> /hr)
Inflow-Outflow	3.7	0.2	3.5

Rate of Depth Change	Rate of Volume (m <sup>3</sup> )	Surace Area (m <sup>2</sup> )	Depth Change (cm/hr)
Rate of Volume Change	3.5	8000	0.04

## Knowns

3.28 ft/m  
 0.0254 m/in  
 0.3048 m/ft  
 0.00378541 meter<sup>3</sup>/ gallon  
 0.000277778 hour/second  
 60 sec/min  
 60 min/hour  
 12 in/feet  
 39.0731 in/m

