

Gannon Carroll
Lab 14
Engr 115

Input parameters

Surface area lake (m ²)	8000
Evaporation (inch/nov)	1.04
Secondary Tributary Flow (m ³ /hr)	30.3439

Conversions
0.3048 ft to m
2.54 in to cm
0.0833 in to ft
0.0003 sec to hr
3600 hr to sec
720 month to hr

Velocity Meter

Inflow Method 1	Velocity (m/s)	Velocity (m/hr)	Depth (m)	Width (m)	Cross Area (m ²)	Flowrate(m ³ /hr)
Trial 1	0.12	438.84	0.12	0.81	0.099	43.4804
Trial 2	0.25	888.48	0.03	0.86	0.026	23.1812
Trial 3	0.15	548.64	0.07	0.65	0.044	24.3702
Ave Flowrate=						30.3439

Object Float

Inflow Method 2	Depth (m)	Width (m)	Length (m)	Volume (m ³)	Time (s)	Time (hr)	Flowrate(m ³ /hr)
Trial 1	0.06	0.45	0.91	0.02457	7.19	0.0020	12.3021
Trial 2	0.06	0.45	0.91	0.02457	7.4	0.0021	11.9530
Trial 3	0.06	0.45	0.91	0.02457	6.57	0.0018	13.4630
Ave Flowrate=							12.5727

Bucket

Outflow Method 1	Radius (m)	Area (m ²)	Depth of H ₂ O in Bucket (m)	Vol of H ₂ O Collected (m ³)	Time (s)	Time (hr)	Flowrate (m ³ /hr)
Trial 1	0.1429	0.0642	0.145034	0.0093	6.97	0.0019	4.8057
Trial 2	0.1429	0.0642	0.12065	0.0077	5.78	0.0016	4.8208
Trial 3	0.1429	0.0642	0.1651	0.0106	7.81	0.0022	4.8822
Ave Flowrate=							4.8362

Results

Total Inflow	Average (m ³ /hr)
method 1	30.3439
method 2	12.5727
Secondary Tributary	7.585984899
ave inflow	16.83420515

	Value (m/nov)	lake surface (m ²)	Lake evaporation (m ³ /hr)
Evaporation	0.026416	8000	0.2935

Total Outflow	Average (m ³ /hr)
Method 1	4.8362
Evaporation	0.2935
Average Outflow	2.5649

3) Fern Lake is not in steady state because the sum of the inputs is larger than the sum of the outputs.

Rate of volume change	Inflow (m ³ /hr)	Outflow (m ³ /hr)	Rate (m ³ /hr)
inflow-outflow	16.8342	2.5649	14.2694

increasing

Rate of depth change	rate of volume (m ³ /hr)	Surface area (m ²)	Depth Change (cm/hr)
Rate of volume change	14.2694	8000	0.1784

increasing

Assumptions:

- No water gained due to precipitation
- No water gained due to infiltration/seepage
- No water lost due to infiltration/seepage
- Multiplied pan test by 0.7 for evaporation rate
- The surface area of the lake is 8000 m^2
- Secondary stream has an inflow amounting to one-fourth of the primary water source flowrate as it had a cross sectional area of 0.0097 m^2 in an area with a similar flowrate to the one measure from the primary section of the stream.
- No runoff measurements for inflow
- No outflow from stream, even though there were visible amounts of water leaving.