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