Water Monitoring as a Service

Navigating California Water

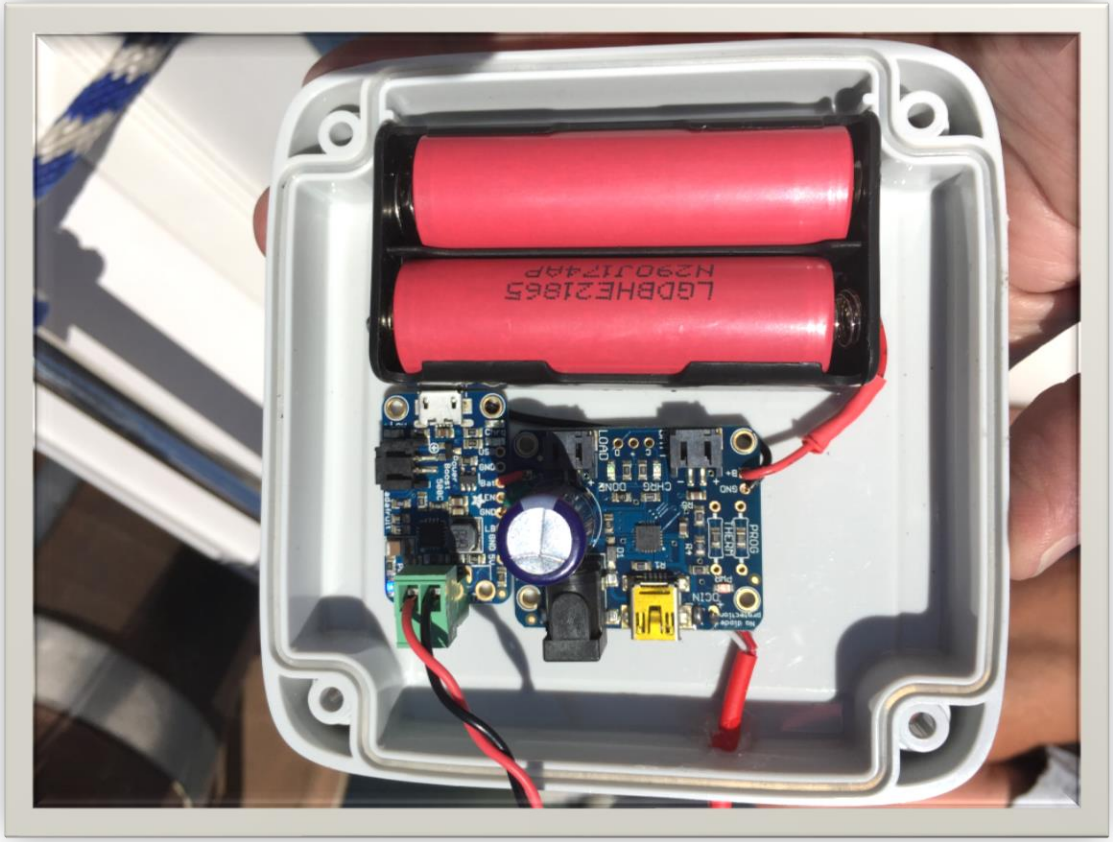
Multiple Types of Installation

Multiple Types of Installation

MARK I Lessons

Field Trials Yielded the Following Improvements:

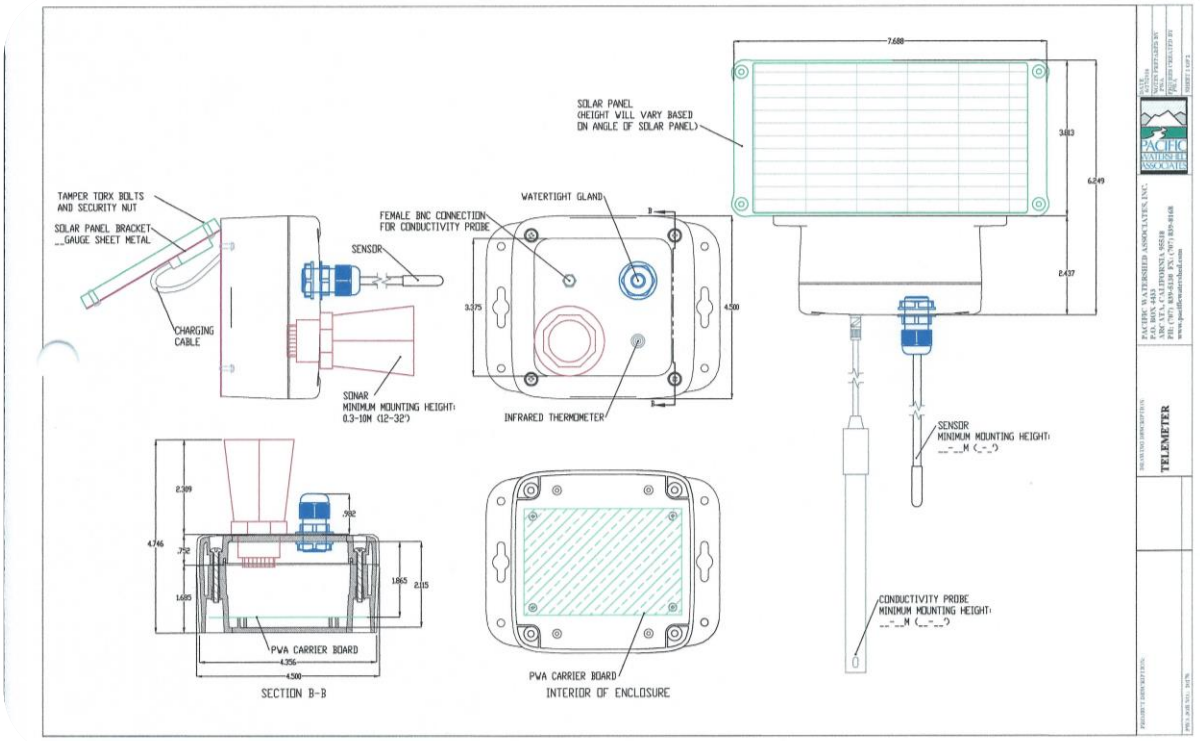
1. Battery for longer life
2. Increased Solar Panel Size
3. Changed carriers from AT&T to Verizon to increase probability of signal
4. Sourced a satellite board to have secondary signal if primary fails
5. Raised antenna for proper line of site



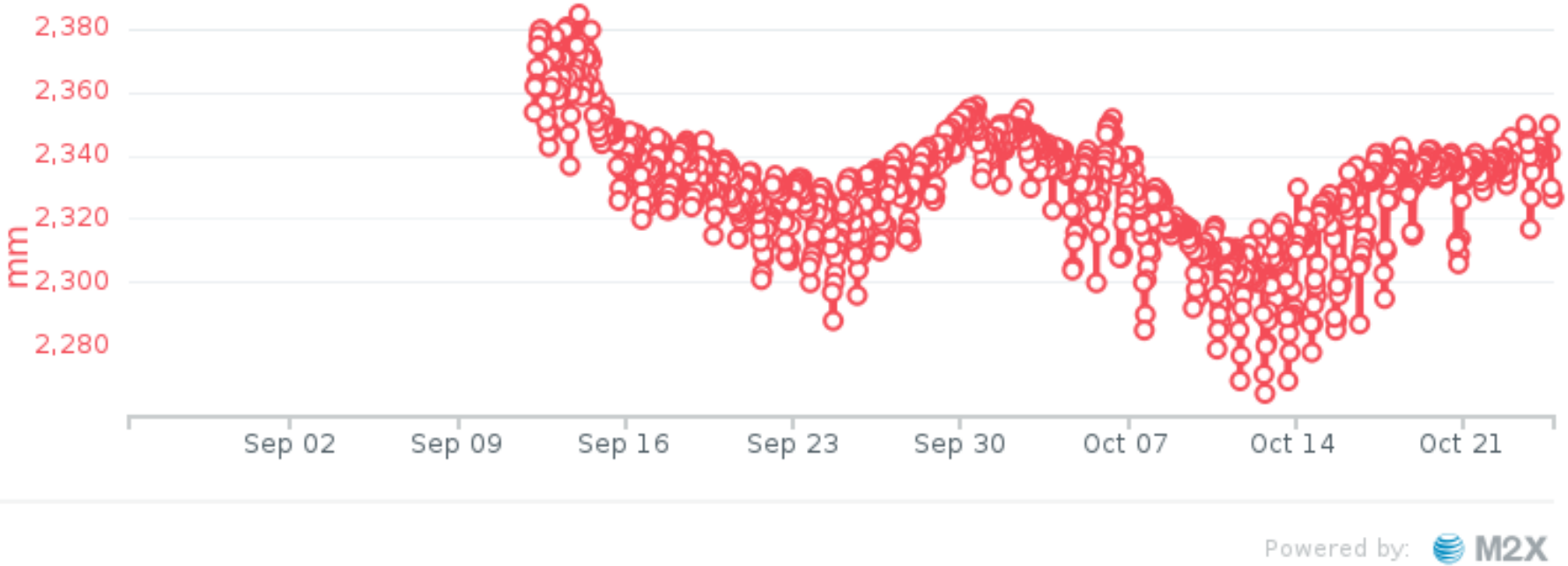
MARK II Board

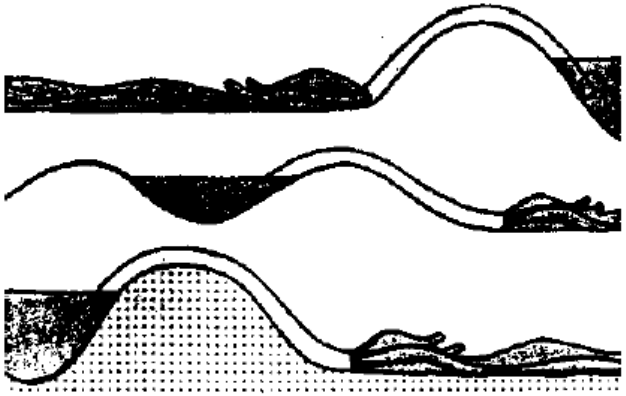
Improvements on Mark II:

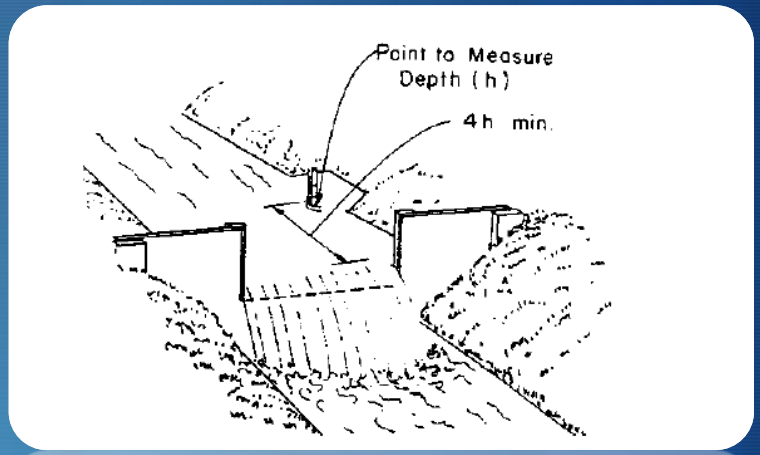
1. Battery for longer life
2. Backup on-board storage
3. ACK/NACK data transfer
4. Data Logging into queryable database
5. Backend system will morph into no sql
6. LoRan extendable field
7. Multiple port so one serves many sensors
8. Bluetooth for extended sensors

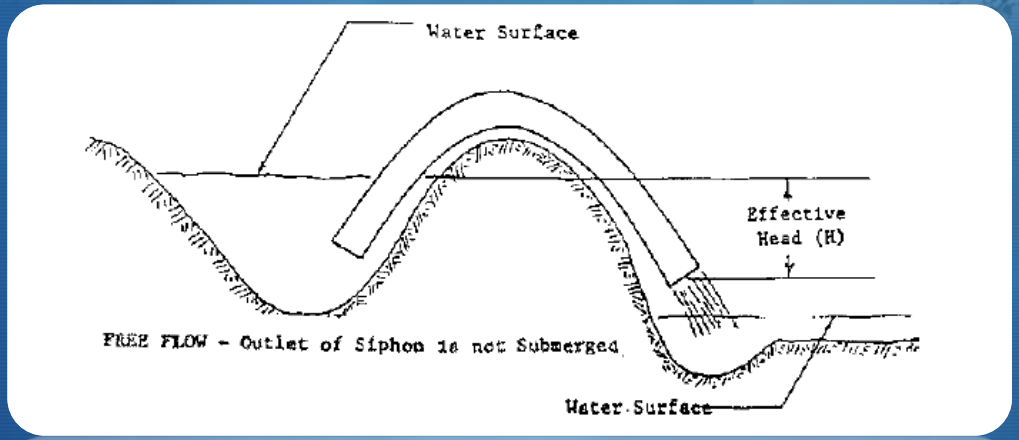


WE HAVE ACHIEVED LIVE DATA



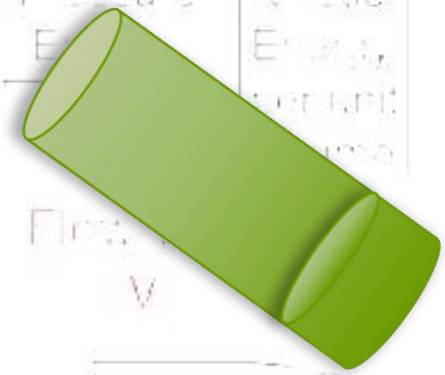






Field Measurement was Inconclusive

WE WERE NOT ABLE TO ACCURATELY MEASURE FLOW…YET



$$Q(m^3/s) = v(m/s) \cdot A_{tube}(m^2) = \left(\frac{\pi D^2}{4}\right)\sqrt{\frac{2g}{f\frac{L}{D}+1}}\sqrt{\Delta z}$$

$$g(v) = 0 = \left(\frac{\pi D^2}{4}\right)\sqrt{\frac{2g}{f\frac{L}{D}+1}}\sqrt{\Delta z} - v \cdot A_{tube}$$

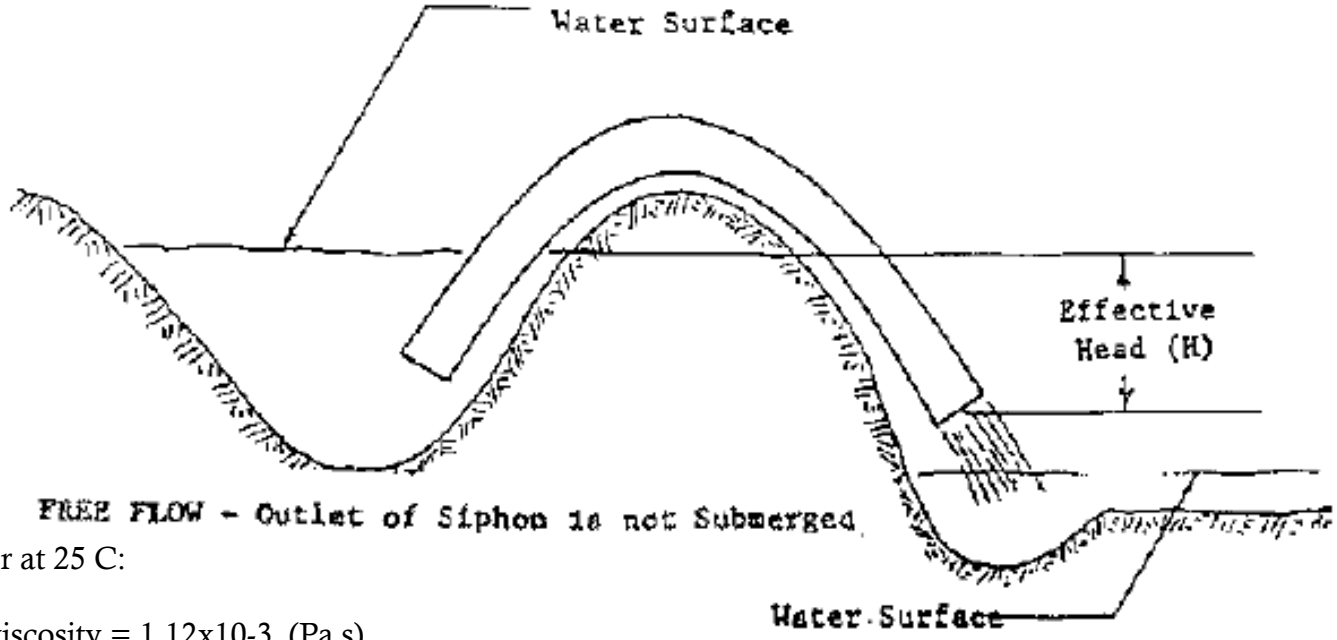
$A_2 < A_1$

$V_2 > V_1$

$$v(m/s) = \sqrt{\frac{2g(z_1 - z_2)}{f\frac{L}{D}+1}} = \sqrt{\frac{2g(\Delta z)}{f\frac{L}{D}+1}} = \sqrt{\frac{2g}{f\frac{L}{D}+1}}\sqrt{\Delta z}$$

$P_2 < P_1$!

WE KNOW HOW TO GET THERE



For siphoning water at 25 C:

μ = viscosity = 1.12x10-3 (Pa s)

r = density = 999 kg/m3

g = gravitational accel = 9.8 m2/s

D = tube diameter =

L = length of pipe or siphon =

e/D = pipe wall roughness =

Dz =

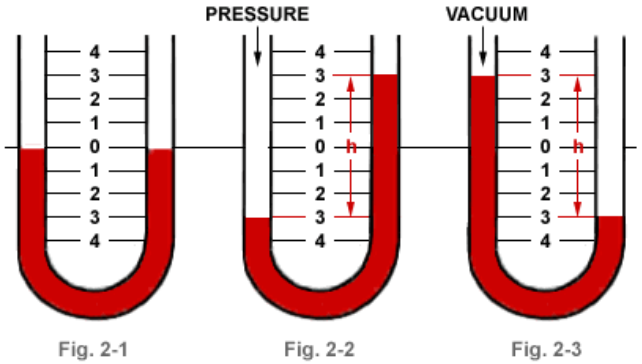
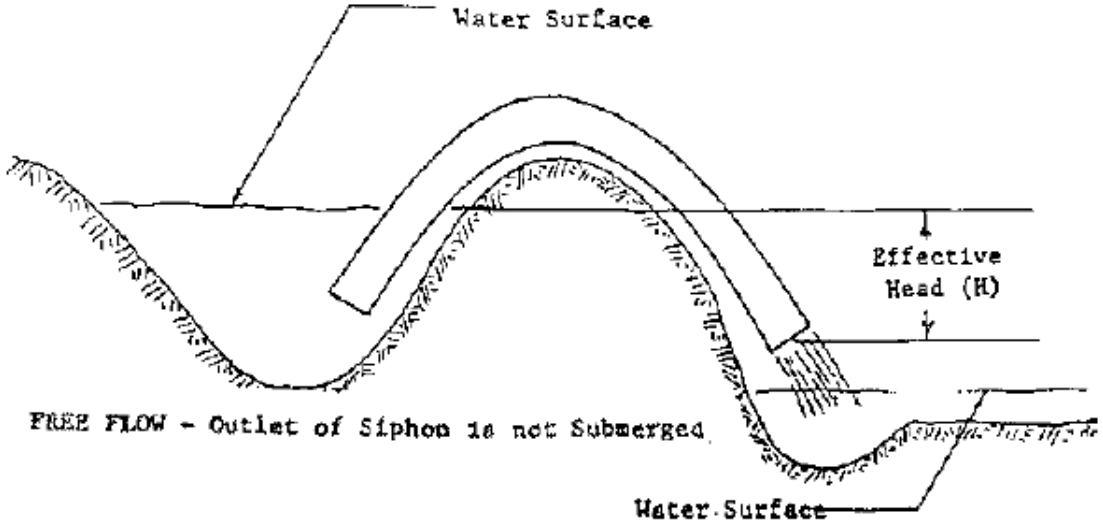


Fig. 2-1 Fig. 2-2 Fig. 2-3

WE WILL SOLICATE OUTSIDE HELP

CAL POLY
SAN LUIS OBISPO



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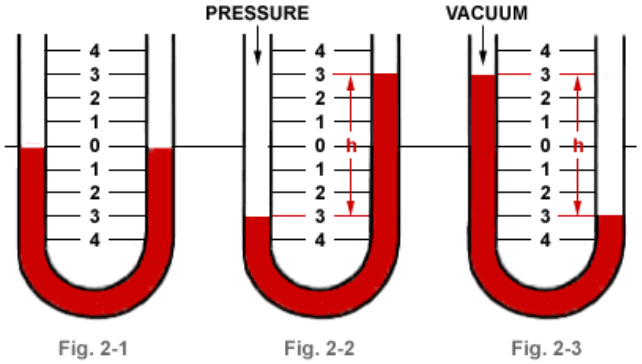

Fig. 2-1 Fig. 2-2 Fig. 2-3

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