

# NOS CO-OPS

Demos of Equipment and Technical Procedures Lighting Talks



Water Levels in the Southeast  
June 13-15, 2023

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# Overview of Sensor(s)

Acoustic Water Level- Aquatrak Model 3000 series and Model 4110 Controller, Aquatrak Model 5000 series sensor.

Microwave Water Level Radar (MWL): YSI H-3611, YSI Nile 502, YSI NOAA Nile P/N# 203360

## Pressure Sensors

Paroscientific Digiquartz® Intelligent Transmitter - Model # 6000-30G with RS232/485 interface (Dual or Single Orifice)

SUTRON Compact Constant Flow Bubbler, Model # 56-0133-25-1S

GE Druck UNIK PDCR 5031 Pressure Transducer, p/n PDCR5031-TB-A3- CC-H1-PE-30PSIG-7

KPSI 500T 500T1CA0A-0021

NOS Measurement and Specifications Sheet: [https://tidesandcurrents.noaa.gov/publications/CO-OPS\\_Measurement\\_Spec.pdf](https://tidesandcurrents.noaa.gov/publications/CO-OPS_Measurement_Spec.pdf)



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# Sensor Choice

- Optimally NOS CO-OPS prefers to use 2 differing sensor technologies at each station (when possible), one sensor oriented downward and one oriented upward.
- Infrastructure is one of the biggest deciding factors of what sensor type is typically used. As long as there is stable structure that can accommodate a sensor being mounted directly over the water with minimal obstructions, a downward looking sensor (Aquatrak and MWWL) is preferred. If there is no stable infrastructure to mount a sensor directly over the water or there are obstructions that can't be bypassed then an upward looking sensor (pressure based) is used.
- Other deciding factors include accuracy/drift/price. CO-OPS has approved certain sensors for Primary and/or Backup use depending on accuracy drift over time.



# Accuracy

NOS CO-OPS Estimated Accuracy: Relative to Datum  $\pm 0.02$  m  
(Individual measurement)  $\pm 0.005$  m (monthly means)

Sensor Manufacturer/Model	Vendor Provided Accuracy	Measurement Specifications
Aquatrak 3000 Series Transducer and Model 4110 Controller, Aquatrak Model 5000 Series Sensor	Resolution 0.0033 feet (1 mm) Vendor Calibration: Standard $\pm 0.025\%$ Optional $\pm 0.01\%$	181 one-second water level samples centered on each tenth of an hour are averaged, a three standard deviation outlier rejection test applied, the mean and standard deviation are recalculated and reported along with the number of outliers. (3 minute water level average) Note - Tsunami Ready stations also send 6 - 1 minute average water level measurements per 6-minute Tx.
Paroscientific DigiQuartz® Intelligent Transmitters - Model # 6000-30G with RS232/485 interface	0-30 psia (0.21 MPa) 0.01% Typical Accuracy	36 five-second water level samples centered on each tenth of an hour are averaged, a three standard deviation outlier rejection test applied, the mean and standard deviation are recalculated and reported along with the number of outliers. Note - Tsunami Ready stations also send 6 - 1 minute average water level measurements per 6-minute Tx
YSI WaterLog H3611, YSI Nile 502, YSI NOAA Nile (item # 203360)	0-40m 0.01% Typical Accuracy	359 one-second water level samples centered on each tenth of an hour are averaged, a three standard deviation outlier rejection test applied, the mean and standard deviation are recalculated and reported along with the number of outliers. Note - Tsunami Ready stations also send 6 - 1 minute average water level measurements per 6-minute Tx. (Primary only)
SUTRON Compact Constant Flow Bubbler, Model # 56-0133-25-1S	0-20ft, +0.01ft 20-57.5 ft, +0.05%	180 two-second water level samples centered on each tenth of an hour are averaged, a three standard deviation outlier rejection test applied, the mean and standard deviation are recalculated and reported along with the number of outliers.
GE Druck UNIK PDCR 5031 Pressure Transducer, p/n PDCR5031-TB-A3- CC-H1-PE-30PSIG-7	Ranges from 70 mbar (1 psi) to 700 bar (10000 psi) $\pm 0.05\%$ FS typical ( $\pm 0.1\%$ FS maximum) per year	181 one-second water level samples centered on each tenth of an hour are averaged, a three standard deviation outlier rejection test applied, the mean and standard deviation are recalculated and reported along with the number of outliers. (3 minute water level average )
KPSI 500T 500T1CA0A-0021	Range: 10 thru 230 ft (3 thru 70 m) H2O $\pm 0.05\%$ FS TEB for level ranges > 10 ft (3m) H2O $\pm 0.10\%$ FS TEB for level ranges $\leq$ 10 ft (3m) H2O	181 one-second water level samples centered on each tenth of an hour are averaged, a three standard deviation outlier rejection test applied, the mean and standard deviation are recalculated and reported along with the number of outliers. (3 minute water level average )

