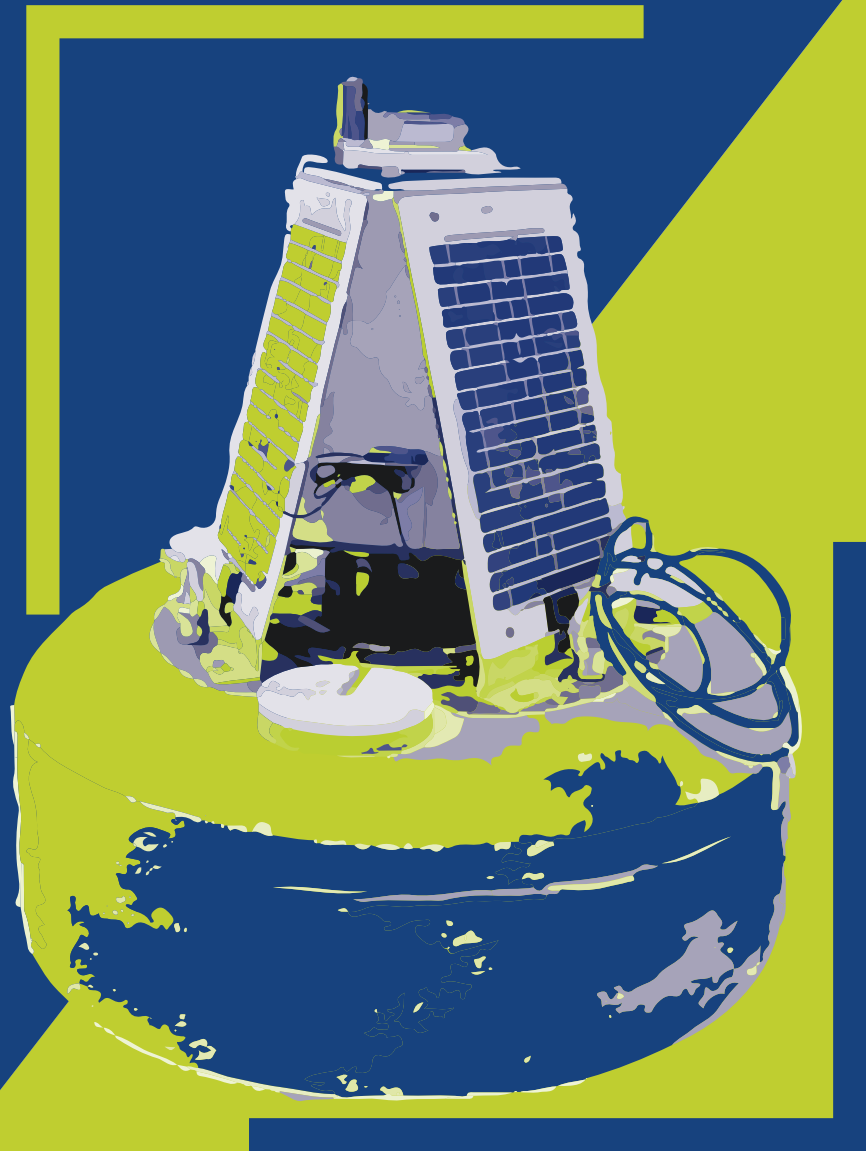


FIELD DATA SOLUTIONS

# REAL-TIME TURBIDITY MONITORING

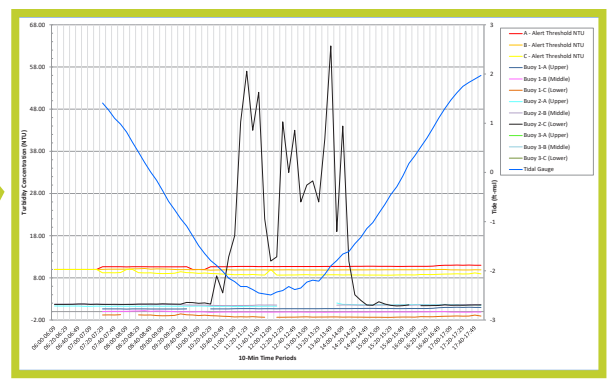
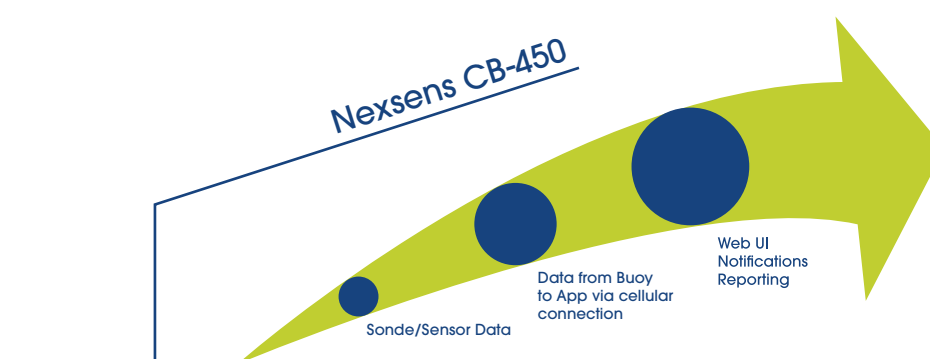
QUALIFICATIONS STATEMENT 2023



**FIELD ENVIRONMENTAL  
INSTRUMENTS, INC.**



**Field Data  
SOLUTIONS**

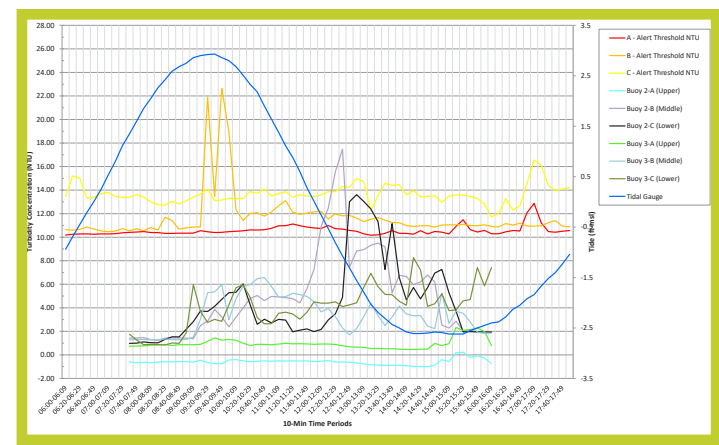


## REAL-TIME DATA WITH FDS CONNECT<sup>®</sup>



YSI EXO2

Cell	Power	GPS	Device	Label	Last Reading	Reading Value	Device Serial #	Device Type	Latitude	Longitude	Prev. 10 Min Block Avg	10 Min Block Avg
				Met Station	11/18/2020 10:57:23	11.6	X20072	AIO2	27.986360	-97.227540	13.255	11.94
				Station 1	11/18/2020 10:57:23	0.007	X15266	ES642	27.980200	-97.196620	0.007	0.007
				Station 2	11/18/2020 10:57:23	0.006	X15267	ES642	28.000130	-97.221930	0.006	0.005
				Station 3	11/18/2020 10:57:24	0.007	X15268	ES642	28.014750	-97.211920	0.005	0.006
				Station 4	11/18/2020 10:57:23	0.009	X15269	ES642	28.022450	-97.196810	0.008	0.007
				Station 5	11/18/2020 10:57:23	0.007	X15270	ES642	28.021790	-97.166090	0.006	0.007
				Station 6	11/18/2020 10:55:38	0.006	X15271	ES642	27.981010	-97.219720	0.006	0.007



### Access to Real-time Data

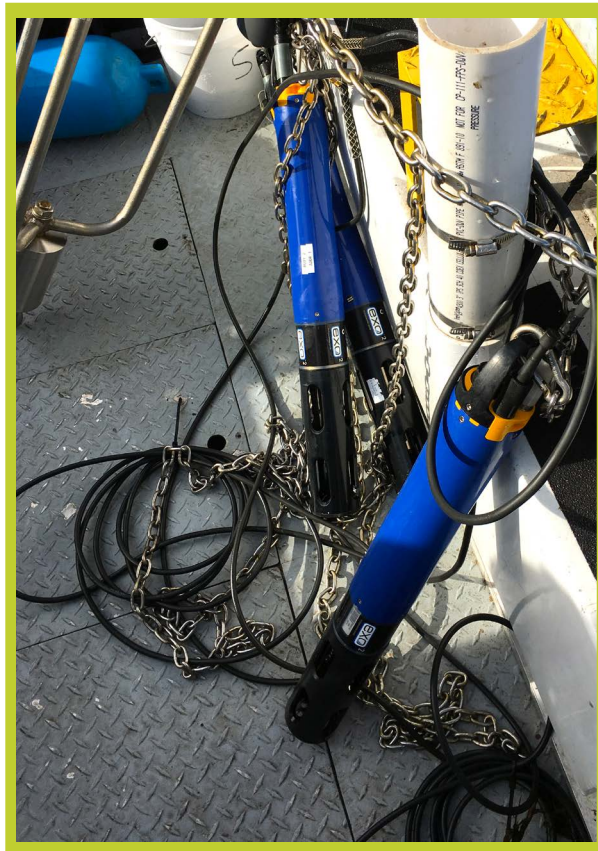
- Secure data storage and management
- Visualized data through charts and graphs
- Export data to Microsoft Excel
- Aerial overview with GPS-positioned instrument location

### Real-time Alerts & Alarms

- Provides the ability to instantly respond to changes in the field
- SMS notifications sent directly to your phone and e-mail

### Web Based Platform

- Cross-brand compatibility with multiple devices
- No software installation
- Accessible from any location with internet connection
- Ability to give multiple team members access to the data



## YSI EXO2

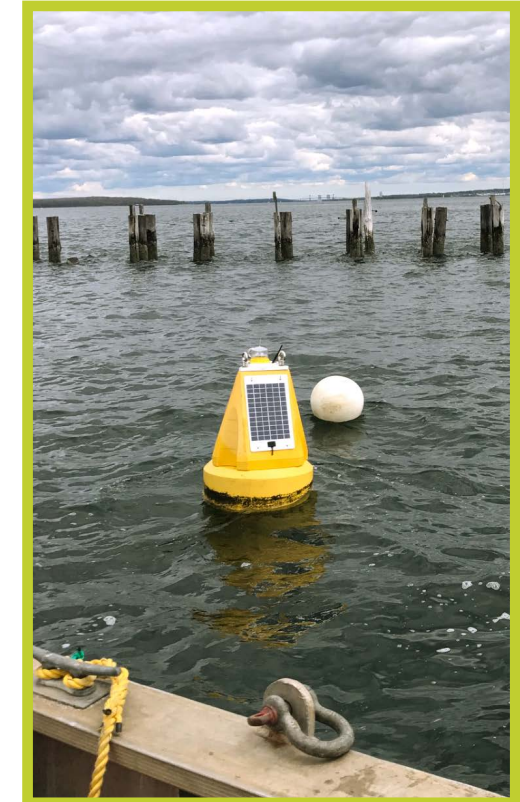
- Up to six sensor ports including conductivity and turbidity sensors
- Built in wiper that cleans sensor faces for improved operation
- Up to 90 days of battery life
- Operates at depths from 0 to 250 m
- Can work in temperature conditions of -5°C up to 50°C
- Smart sensors store calibration on-board

## Nexsens CB-450

- Designed for use in various freshwater and saltwater environments
- Support for various monitoring sensors
- Integrates with FDS Connect to send out real-time data
- Powered by three 10-watt 12 VDC solar panels
- Connect up to three sondes to a single buoy



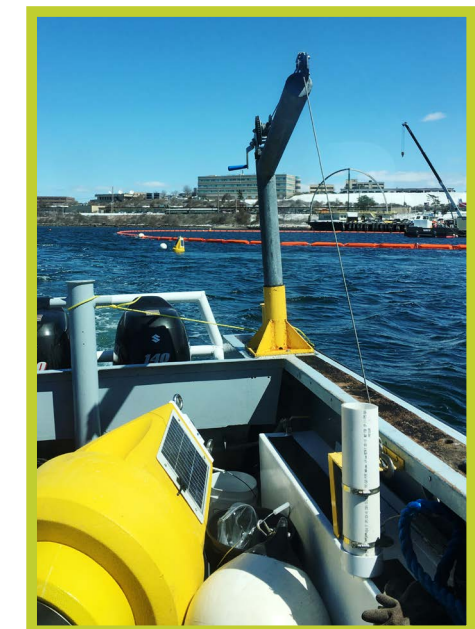
Active Naval Yard - Newport, RI 2017



Active Naval Yard - Newport, RI 2017



Legacy Environmental Site - Bay City, MI 2022



Active Naval Yard - Newport, RI 2017



Legacy Environmental Site - Bay City, MI 2022



Active Naval Yard - Little Creek, VA 2013



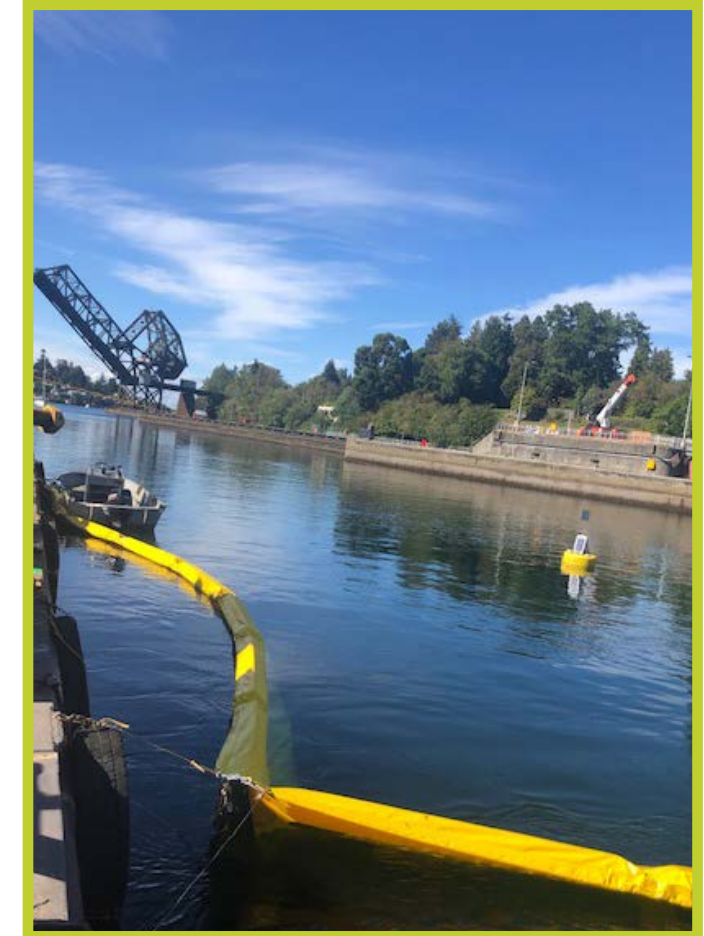
Active Naval Yard - Little Creek, VA 2013



Active Naval Yard - Newport, RI 2016



ACOE Site - Seattle, WA 2020



ACOE Site - Seattle, WA 2020

**Field Data SOLUTIONS** **Real-Time Monitoring to Support Sediment Remediation Processes** **FIELD ENVIRONMENTAL INSTRUMENTS, INC.**

**John Wright (Field Data Solutions, Pittsburgh, PA, USA)**

**Typical Project:**

- Potential for sediment suspension during dredging
- Turbidity curtains used for containment
- Turbidity monitoring to verify effectiveness of controls

**Example of Requirements:**

- 10-minute data interval (average of 60-sec readings)
- Real-time site-wide background
- Real-time tide measurement and incorporation
- Multiple active work areas
- Multiple monitoring depths per location for vertical profile
- Real-time calculations and alerts for action levels
- Assurance of transmission and data availability
- Harsh marine environment and long-term deployment
- Stringent sensor calibration requirements

**Results:**

- Provides highly effective and efficient monitoring
- Reinforces regulatory and community confidence
- Satisfies real-time requirements
- Adapts to background and site-specific conditions
- Reduces stop work periods
- Provides confidence in data quality
- Enables targeted maintenance and support
- Minimizes true releases from containment

**Approach:**

- Integrating:
  - Appropriate sensors
  - Buoys and/or fixed mounting locations
  - Power options (solar panels, batteries, etc.)
  - Communication hardware
  - Knowledge and experience of assembling components into a robust and reliable monitoring network
- Transmitting data from the sensor network to a central data processing application
- Providing sensor and site data to all stakeholders via an internet-based Web User Interface + real-time notifications

Accepted for Presentation at The 9th International Conference on the Remediation and Management of Contaminated Sediments on January 9th 2017

## Hydrologic Pile Rehabilitation Project Summary

Accepted for Presentation at the 10th International Conference on the Remediation and Management of Contaminated Sediments as Part of a Learning Labs Session

### Overview

A private company was hired to rehabilitate the pilings at a pier in Newport, Rhode Island. Rehabilitation work consisted of:

- Deploying turbidity controls (i.e., a turbidity curtain)
- Removal of loose and spalled concrete from select pilings
- Installation of re-enforced steel
- Wrapping each pile in a fiberglass form
- Pumping special mix concrete into each form to encase the pilings in concrete sleeves



This client was required to ensure that construction activities did not increase turbidity in the surrounding open waters. Field Data Solutions provided hardware, sensors, communication equipment, and a web-based user interface to create continuous real-time monitoring of the work site in order to prove effectiveness of engineering controls.

### Goal

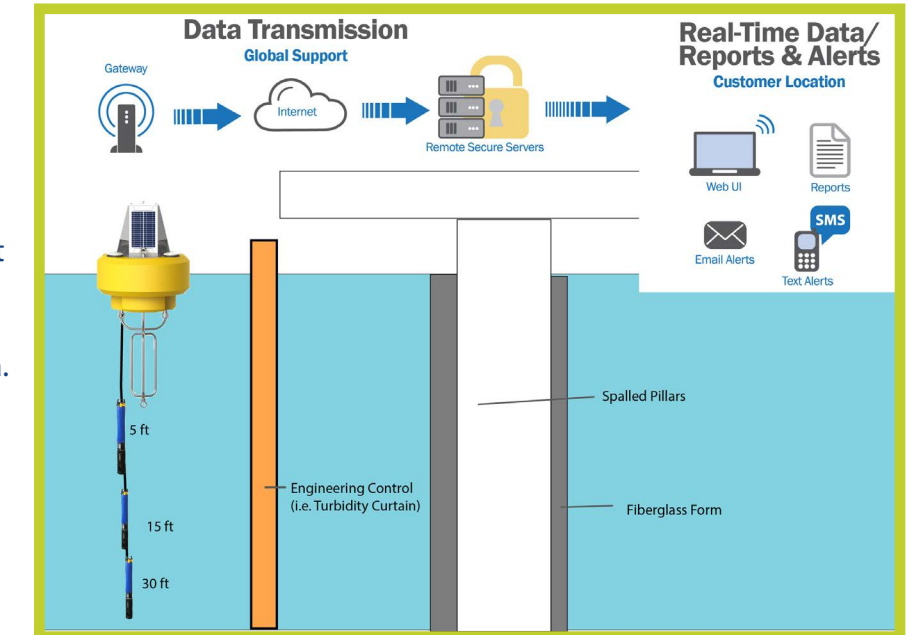
Monitor Turbidity of open water surrounding contained work zone to prove effectiveness of engineering controls.

### Design

Three daisy-chained YSI EXO 2 long-term monitoring water quality sondes were deployed from a solar-powered buoy to depths of 5, 15, and 30 ft. Each sonde was calibrated following stringent procedures to ensure accuracy at low NTU values found in the open waters at this project site. The buoy also contained a radio and or cellular transceiver that sent real-time data from each sonde to FDS Connect®'s software and was then viewable to a remote user.

### Monitoring

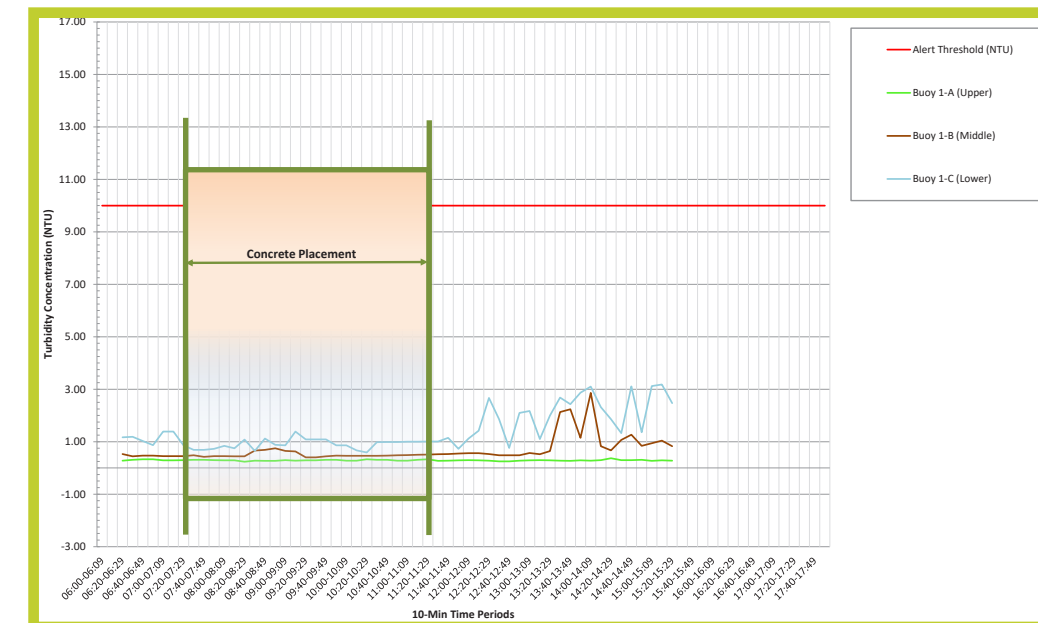
At FDS's headquarters in Pittsburgh, PA, The FDS Data Manager coordinated the start and stop of field activities each day with the quality control engineer on site. Although the monitoring system was active during all work activities, specific attention was given to periods of concrete placement and other tasks that could increase turbidity. Turbidity thresholds were established based on work plan criteria. Those thresholds (i.e., 10 NTU above background,) were programmed into the application. Text and email notifications were sent automatically if any criterion was exceeded. FDS also monitored failures in communication gear and the system.



### Conclusion

During the course of this project, the contractor maintained efficient controls and did not have exceedances of turbidity due to the operation. The turbidity curtain used was efficient and led to a successful completion of the project.

Web User Interface Example (lines show variable turbidity)





**FIELD ENVIRONMENTAL  
INSTRUMENTS, INC.**

# EQUIPMENT RENTAL

## Rental Rates

- Fairest rates in the industry
- Flexible rental terms, real-time rentals
- Rental period **STARTS** the day after you receive the equipment (except for morning deliveries)
- Rental period **ENDS** the business day before FEI receives the equipment; for **LOCAL PICK-UP**, the rental period ends the day you call

## Delivery

- **FREE** local delivery and pick-up of equipment
- Equipment arrives the day before rental starts
- Items shipped worldwide via FedEx or UPS

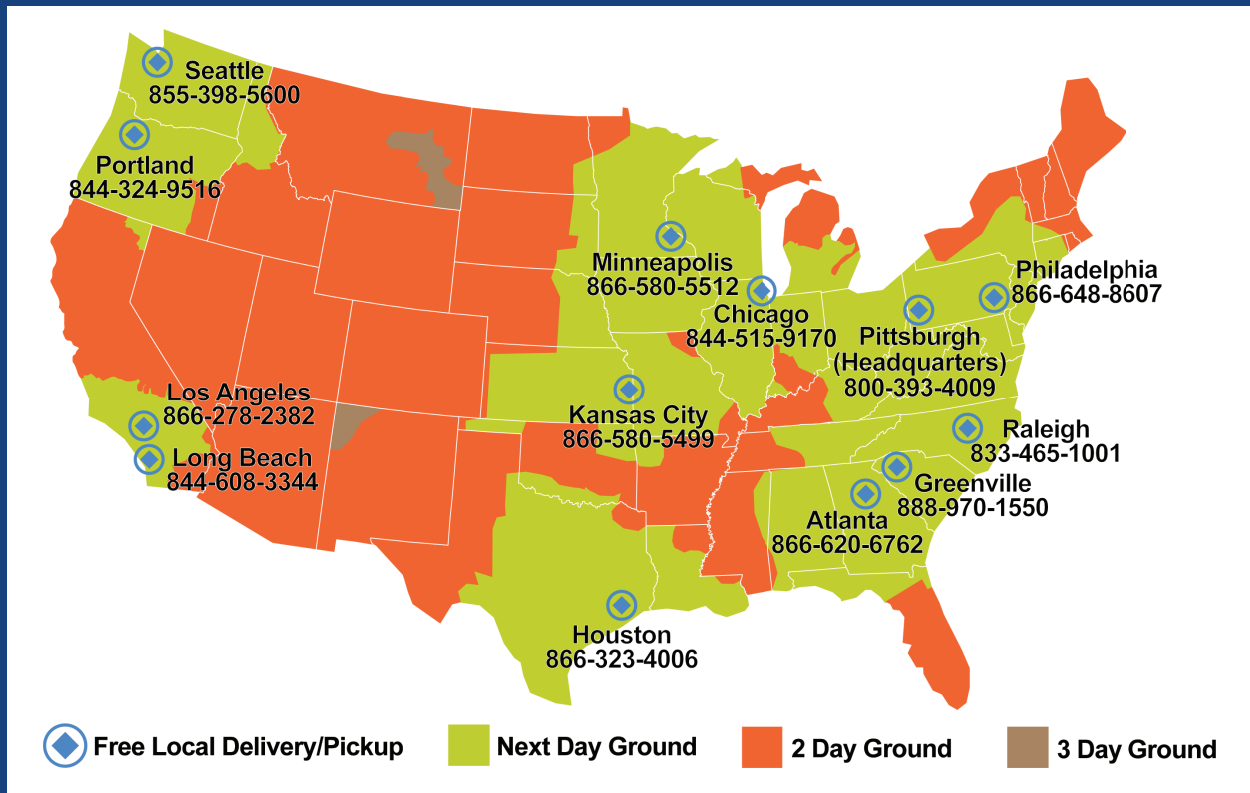
## Equipment

- No calibration or maintenance fees
- Instruments serviced and calibrated to manufacturers' specifications

## Support

- 24/7 technical support
- Cleaning, calibrating, and servicing the industry's most popular equipment

## Are you in the GREEN ZONE?



**Next day ground delivery if you are in the GREEN ZONE!**