Open Hydrological Sensor Technologies: DIY Stream Sensor Networks Virtual Workshop

CUAHSI and OPEnS Lab on Zoom
September 20 – 22, 2021

Welcome to the Open Hydrological Sensor Technologies Virtual Workshop. We are looking forward to this virtual workshop, and working with you. Read the information below, and feel free to reach out with any additional questions.

Prior to the workshop, there are five tasks that you will need to complete.

1) Gather or purchase necessary additional materials
2) Ensure you are able to download workshop related software, this may include admin privileges on your computer!
3) Create a user profile on HydroShare
4) Fill out your slide for introductions
5) Join the CUAHSI Community Slack Workspace and workshop channel

See below for more information on these tasks and other important workshop information.

Task 1: Workshop Materials

All participants will be shipped a Smart Rock Assembly Kit. Kits were due to arrive prior to the first day of the workshop on September 20th, but due to shipping delays, we will spend the first day working through relevant activities to get acquainted with sensors, OPEnS Lab and Hydroshare.

This kit will contain many of the tools and components needed to assemble the sensor. However, there are some materials listed below that you will need to gather or purchase prior to the workshop.

Required Materials from Home

- A workspace for working with wet things
- Computer with USB port
- USB port or USB wall charger for battery charging
- 5 gallon bucket or bathtub that can be filled with water overnight
- Table salt
- Ice
- Paper towels or rag to wipe probes

Task 2: Download the Arduino IDE

Download the Arduino IDE for your Operating System (e.g. Windows version if you use Windows, Mac version if you use Mac). Download the Arduino IDE application; not the web editor on the top of the page.

Advanced users may want to download the Arduino Loom Library for updating SmartRock Firmware: Follow the directions for the Arduino and Loom Manual Setup. Take special note of the versions to use for the board file definitions specified in the directions. For the Loom SAMD Package, this should be version 2.5.1.

Task 3: Workshop Documents on HydroShare

All workshop documents and materials will be shared and accessed via HydroShare. To access workshop content, please follow these complete instructions to do the following:

1. Create a free user account in HydroShare
2. Complete your user profile
3. Request access to the workshop group

Workshop materials will be uploaded to this group in the weeks preceding the workshop.

Task 4: Introductions

It is our hope that even in a virtual setting, participants will be able to meet and network with fellow members of the water science community. Please fill out your slide here so that we can learn more about you! We will have everyone introduce themselves on Day 1, so have your slide ready!

Task 5: CUAHSI Community Slack Workspace

For easy communication with workshop participants prior to and during the workshop, please consider joining the CUAHSI Community Slack Channel if you have not already. Invitations were sent to your emails, reach out if there are any issues. You will be added to a private channel #smart_rock_workshop_2021 with workshop participants and instructors.

Connection Information

This workshop will be hosted on Zoom. We expect that all participants are able to participate for the 3 hours allotted for this workshop each day synchronously from 9:00 am PT (12 pm ET) to 12:00 pm PT (3 pm ET) on Monday Sept 20 - Wednesday Sept 22.
Click here to add to your Google Calendar.

Additionally, at 4PM PT (7PM ET) for all of the days of the workshop, one of the OPEnS staff will be available on the Zoom channel for tech support or conversation. Priority will be given to those needing troubleshooting of workshop related issues.
Click here to add office hours to your Google Calendar.

Join Zoom Meeting
https://us06web.zoom.us/j/85411016320?pwd=MXhaZ3IxVnFNUkhzaSthNndoVG4yZz09

Meeting ID: 854 1101 6320
Passcode: 230078

One tap mobile
+16465588656,,85411016320# US (New York)
+13017158592,,85411016320# US (Washington DC)
Find your local number: https://us06web.zoom.us/u/kbXwenKBox

Schedule

See below for daily schedule

Be a Part of the SmartRock Story!

As an early adopter of the SmartRock, we would greatly appreciate your continued use and reporting of this device's performance to help us better refine and understand this system. You will learn to upload data via HydroShare. We would like to observe and analyze continued uploads of your data for as long as convenient and relevant for you. In doing this, you are helping make this device more robust for our community.

We are looking forward to seeing everyone soon!

Best regards,

OPEnS Lab and CUAHSI

Workshop Agenda

DIY Hand-Made Stream Sensor Networks

Day 1 – Monday, September 20, 2021

Schedule:

9:00 – 9:05 am PT	Welcome
9:05 – 9:20 am PT	OPEnS Lab (Chet)
9:20 -- 9:30 am PT	Introduction to CUAHSI (Julia)
9:30 – 9:35 am PT	Workshop Overview -- walk through of Orientation Document and instructions on how to access workshop materials
9:35 – 9:45 am PT	Break
9:45 -- 10:15 am PT	Instructor and Participants Introductions
10:15 – 10:30 am PT	Introduction to SmartRock. Overview of fully functional, assembled device
10:30 – 10:45 am PT	Intro to Sensors and Mechanical Components: Specifications and limitations
10:45 – 10:50 am PT	Break
10:50 – 11:10 am PT	Deployment considerations
11:10 am –11:25 am PT	Tutorial for uploading data to HydroShare
11:25 – 11:45 am PT	Opportunities for collaboration w/ OPEnS
11:45 am-12:00 pm PT	Session wrap, homework assignment

Homework:

1. Review kit contents relative to packing list and introduction
2. Charge batteries (lipo battery, charger, microUSB cord, USB adapter/port),

4:00 – 5:00 pm PT	OPEnS staff available for technical support or conversation

Day 2 – Tuesday, September 21, 2021

Materials Needed (Please Have These Ready By 9AM PT):

From OPEnS:

- All Smart Rock components (see packing list)
- 3 salinity solution pouches
- DI solution pouch
- 4 30 mL cups
- Pipette
- Thermometer
- Ruler

From Home:

- Workstation for wet
- 5 gallon bucket
- Powdered creamer
- Ice
- Paper towels/rag to wipe sensor probes

Schedule:

9:00 – 9:10 am PT	Overview of schedule and activities, material collection,
9:10 – 10:05 am PT	SmartRock Assembly and basic operation, use SD file to set logging period and switching modes for calibration, how to ensure SmartRock is sealed for underwater deployment versus field use
10:05 - 10:15 am PT	Break. Set up salinity wet-lab.
10:15 – 11:00 am PT	3-point salinity calibration
11:00 – 11:15 amPT	Break. Prepare ice-turbidity bucket
11:15 – 11:45 am PT	Pressure and temperature validation and turbidity calibration
11:45 am –12:00 pm PT	Session wrap up, homework assignment.

Homework:

1. Take operational data in solutions of your choosing and upload to HydroShare

4:00 – 5:00 pm PT	OPEnS staff available for technical support or conversation

Day 3 – Wednesday, September 22, 2021

Materials Needed (Please Have These Ready By 9AM PT):

From OPEnS:

- Completed SmartRock

Schedule:

9:00 – 10:00 am PT	Troubleshooting any issues, some participants share overnight experiment results
10:00 – 10:15 am PT	Break
10:15 am –12:00 pm PT	Learn to program your SmartRock; update firmware; pro tips (adding sensors)
4:00 – 5:00 pm PT	OPEnS staff available for technical support or conversation