ISSUE NO. 1 | SUMMER 2019

WATER WE DOING?

AN AGUACLARA NEWSLETTER

NOTES FROM THE EDITOR

Hello AguaClara members, supporters, family, and friends. I am thrilled to present you with the AguaClara Newsletter! I studied environmental engineering at Cornell (B.S. '18, M.Eng '18) and currently work as an Assistant Engineer at Hazen and Sawyer in NYC. I recently joined the AguaClara Reach Board of Directors and serve as Secretary. I am endlessly grateful for the learning and growth opportunities that AguaClara has shared with me, and I look forward to continuing to work with you all.

The goal of this newsletter is to provide a way to stay connected to all of the different components of AguaClara, from our work in the lab at Cornell to our projects in India. Thank you to everyone who contributed to this issue and all those who continue to make AguaClara a thriving community. Please email me with feedback/thoughts/questions/suggestions for future issues. We hope you enjoy!

With love,

Zoe Maisel

Zoe Maisel
zmaisel@aguaclarareach.org

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MEDIA PRESENCE

Follow AguaClara Cornell and AguaClara Reach on social media!

AGUACLARA CORNELL (ACC)

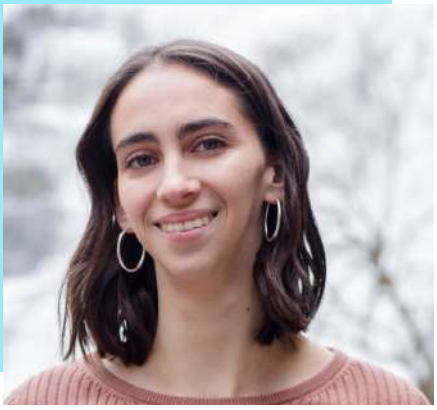
UPDATE FROM MONROE

2018 was a very difficult year for many reasons and I was in survival mode working to find a way to keep the AguaClara Cornell program strong. Happily, 2019 is going very well and the AguaClara program continues to invent new technologies. The sense of community and purpose provided by the AguaClara program dramatically changes student lives. I routinely have students tell me how they were about to switch majors away from engineering until they discovered AguaClara.

One highlight of this spring was that I taught the AguaClara theory and design course. The outpouring of support from alumni in support of that course was remarkable. I'll be teaching that course pro bono in the coming years because it empowers students to invent new technologies.

Summer team

MEET THE FALL 2019 CORNELL TEAM LEADS



Rosie Krasnoff

Environmental Engineering '20 Fun Fact: This summer, I'm in an REU program studying climate change in the arctic at the University of Alaska Fairbanks. Fairbanks has the worst air quality of any city in the US due to forest fires in the summer and burning wood for heat in the winter.

Justin Conneely

Environmental Engineering '20 Fun fact: I perform spoken word poetry with an organization on campus.

Ian Cullings

Environmental Engineering '20 Fun Fact: I spent the last semester in Santander, Spain as part of the Cornell Cantabria Exchange Program. The North is incredibly beautiful and mostly untouched vacation spot.

SUMMER RESEARCH AT CORNELL

The AguaClara Summer Internship programs has 21 students working in 8 different subteams, including AguaClara Infrastructure Design Engine (AIDE) Design, AIDE Template, Fluoride, Ram Pump, String Digester, UASB, and PF300. The Upflow Anaerobic Sludge Blanket (UASB) team worked on constructing and installing their pilot plants at the Ithaca Wastewater Treatment Plant this summer. The Ram Pump team worked on techniques to improve the efficiency of the new inline design in order to pump water from the filter exit up to the chemical stock tank. The Fluoride team investigated issues related to their Automated and Gravity fluoride removal systems. The String Digester team designed a water distribution system to prevent preferential flow, and created a matrix of strings using "loopy yarn" as the filter media.

Summer team in a strawberry patch

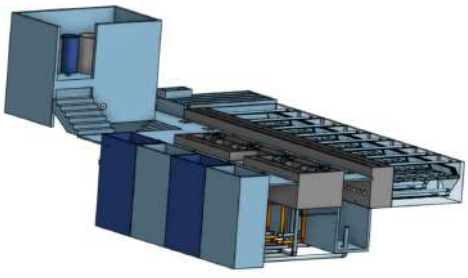
MODIFYING THE PF300

Ian & Marcin with the PF300at Cornell WFP

The PF300 (formerly 1 L/s), first designed and built in Fall 2016, functions as a small scale AguaClara plant with each system treating enough water for a community of 300. Six of these plants treat water in Honduras. Currently, a PF300 plant is operating in the Cornell Water Filtration Plant (CWFP), allowing a direct comparison between the efficiency of the PF300 and the CWFP itself, which can later be extrapolated to conventional water treatment plants. This summer, the team has two main focuses: data collection to better understand floc blanket function, and design work to optimize the system for use in the field. Hopefully, the continued collection of this data will provide more justification for adoption of this technology abroad and within the U.S.

AGUACLARA INFRASTRUCTURE DESIGN ENGINE (AIDE)

The AIDE Template and AIDE Design subteams have been hard at work drawing Onshape 3D models and writing Python code to create an open-source, prototype successor to the Mathcad Design Engine! AIDE Template's 3D models of the singular components and overall plant design in Onshape (a free, web-based CAD platform), are highly configurable so that engineers can finely tune the dimensions of each plant component and fulfill a wide variety of design specifications. AIDE Design has created a new framework for calculating component dimensions in the context of the entire plant, and has applied this framework to most of the plant's design code.



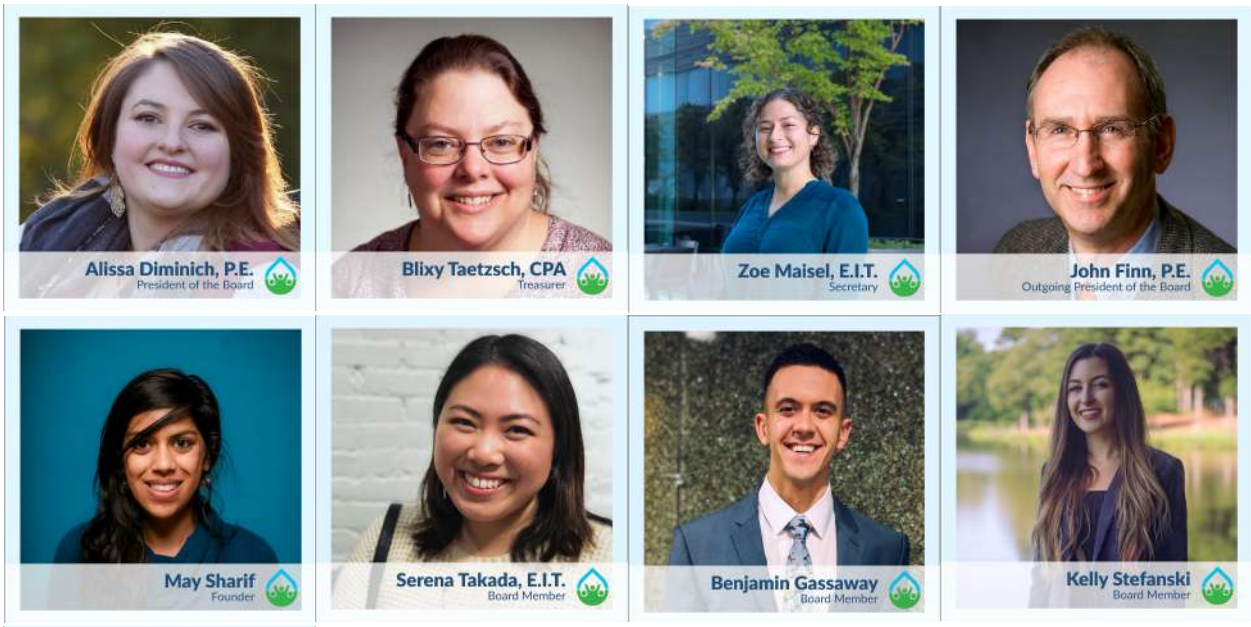
Plant model in Onshape

FALL 2019 RESEARCH TEAM LIST

Public Relations - Investments - AIDE: Template - AIDE: Design - POST - Research IT - UASB - String Digester HRS: Bot Geo - Humic Acid - Dissolved Gas - Fluoride - PF300 - Ram Pump - Sensor Development - 3D-Print Textbook

AGUACLARA REACH (ACR)

BOARD MEMBERS



INTERN

Emily is working as a liaison between ACR and GV during the installation of two new hydrodosers in India. Her primary responsibilities include creating a project update report for the installation process, compiling a material list, and improving ACR training materials. She's excited to be joining the team and learning more about the fieldwork that goes into creating an ACR water treatment system!

AGUACLARA VOLUNTEERS (ACV)

My name is Serena and I graduated from Cornell in 2017. I now work in NYC as an environmental engineering consultant. AguaClara and Monroe showed me what engineering can be and taught me what it means to dedicate your life to serve others.

In the fall of 2018, we started AguaClara Volunteers (ACV). Our goal is to support AguaClara Cornell, AguaClara Reach, and AguaClara engineers as they grow. We work on a range of tasks, from establishing partnerships and mentoring AguaClara Cornell students to publishing this newsletter and organizing Alumni Happy Hours!

Volunteers in Central Park, March 2019

When I was a student at Cornell, Monroe showed my class a picture of a bucket. When that bucket is full, everyone on Earth will have access to safe water on tap. We have a long way to go to fill that bucket, but together we will make waves in the mission to ensure safe drinking water is guaranteed for all. If you are interested in joining the AguaClara Volunteers on this journey, please sign up and we will work with you to figure out a way for you to volunteer in the capacity that you feel comfortable and fulfilling.

Cheers,

Serena Takada - Volunteer Coordinator

aguaclaravolunteers@gmail.com

PROJECT UPDATES

HONDURAS

Construction of the AguaClara plant in Gracias, Honduras has been completed by our partner Agua Para el Pueblo (APP), and the majority of the plant is online. This is the highest capacity treatment plant that has been designed to date by the AguaClara Cornell team, producing 120 L/s of clean water (nearly 3 million gallons per day). The plant design includes the full array of AguaClara treatment technology – chemical dosing, flocculation, sedimentation, filtration via the Stacked Sand Rapid (StaRS) Filter. The total plant construction cost was approximately $1 million.

INDIA

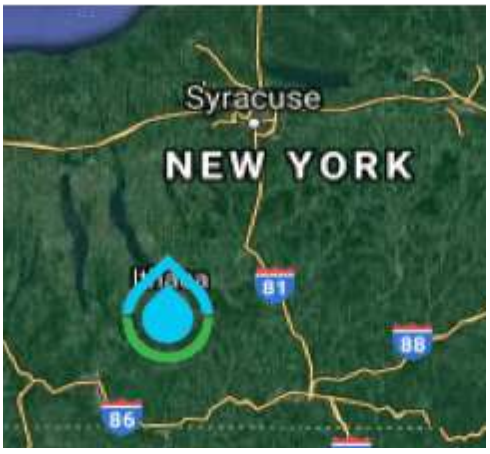
The AguaClara Hydrodoser system treats low-turbidity water for bacterial contamination, providing 2-3 liters of safe drinking water per second. AguaClara Reach works in India with our partner Gram Vikas (GV), a nonprofit whose mission is to enable rural communities to lead a dignified life, to build and install hydrodosers. So far, the hydrodoser system has been installed in Lahanda and will be installed in multiple villages throughout Odisha, India in the near future.

The hydrodoser is elevated above the village, either at the top of a several-story tall building or on a hill. Contaminated water enters the hydrodoser room (possibly with the use of a solar pump), and the hydrodoser delivers a designated concentration of chlorine to the contaminated water. The treated water is then sent to ground level and delivered to the community using gravity.

TOTAL NUMBER OF PLANTS: 19 | TOTAL NUMBER OF PEOPLE SERVED: 70,000

Central America

India



United States

AGUACLARA AROUND THE WORLD

Yitzy with WASRAG founder Dr. Ron Denham, Dr. Isis Mejias Carpio, and Monica De La Torre in Germany

ACC was invited to attend the ACODAL (Colombian Association of Environmental and Sanitary Engineers) Conference in Cartagena, Colombia by Luis Alberto Jaramillo Gómez, the current Director of the ACODAL Editorial Board. ACC got the opportunity to mingle and present the work done by AguaClara to some of the 1500 people from the water and sanitation sector representing both private and public organizations that attended the three day long ACODAL Conference.

Subhani and Yitzy at NYWEA

This past May, ACR was fortunate enough to host a table at the World Water Summit and then attend the International Rotary Convention in Hamburg, Germany. ACR was inspired by some tremendous people, learned helpful industry best practices, and further developed their public image. As a result, ACR has been following up on some incredible connections that they hope will continue to partner with on ACR's mission.

Prof. Luis Alberto Jaramillo from the Universidad Pontificia Javeriana in Bogota with Marcin and Kevin

ACR had a wonderful time presenting at the NYWEA Spring Conference in Saratoga Springs, New York. ACR's presentation titled "Empowering Communities Through Safe Water" helped inform our local water sector on the work AguaClara Reach has done and hopes to do in the future. ACR is excited to develop their relationship with the local water community so that they can learn from each other. ACR also published an article in NYWEA's Summer 2019 *Clear Waters* magazine.

AWARDS

EPA P3 Phase I Ram Pump and EPA P3 Phase II UASB

AEESP Award for Global Outreach

PUBLICATIONS

The 2019 Rural Water Supply Network Directory

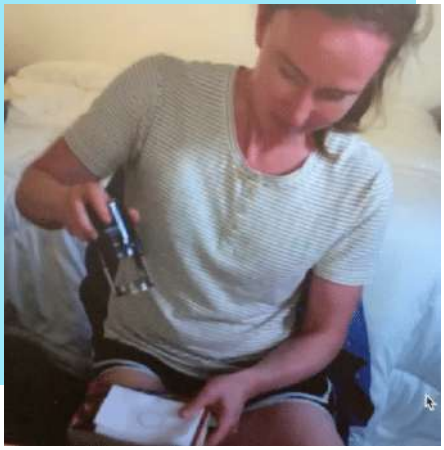
NYWEA *Clear Waters* magazine

ALUMNI, WATER YOU DOING?


Psst, can you spot the chameleon?!

"I moved into a new apartment in Seattle and became a chameleon parent, which is going great! Also, my photo website went online (fcfotography.me)."
- Fletcher Chapin '18 (Seattle, WA)

"This year, my husband and I bought a house and got a new dog and cat (for a total of 3 dogs and 2 cats)!"
- Alissa Diminich '08 (Nashville, TN)



Tori just got her PE license and here she is, practicing her stamping during one of our Volunteer meetings! Congrats, Tori!
- Tori Klug '14 (Los Angeles, CA)

"This year, members of my town and I founded the Harrison Sustainability Committee (HSC) to address local environmental concerns."
- Serena Takada '17 (Harrison #It'sGreatToLiveInHarrison NY)

"Signed my first lease out of college and just came back from a trip to Australia!"
- Jenny Yin '17 (New York, NY)

"Just started a new job with Michael Baker international with their ecosystems restoration and stormwater group! Also really fun news I'm excited to share, I was selected as one of Adobe's rising stars in photography for 2019!"
- Kelly Stefanski '18 (Raleigh, NC)

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