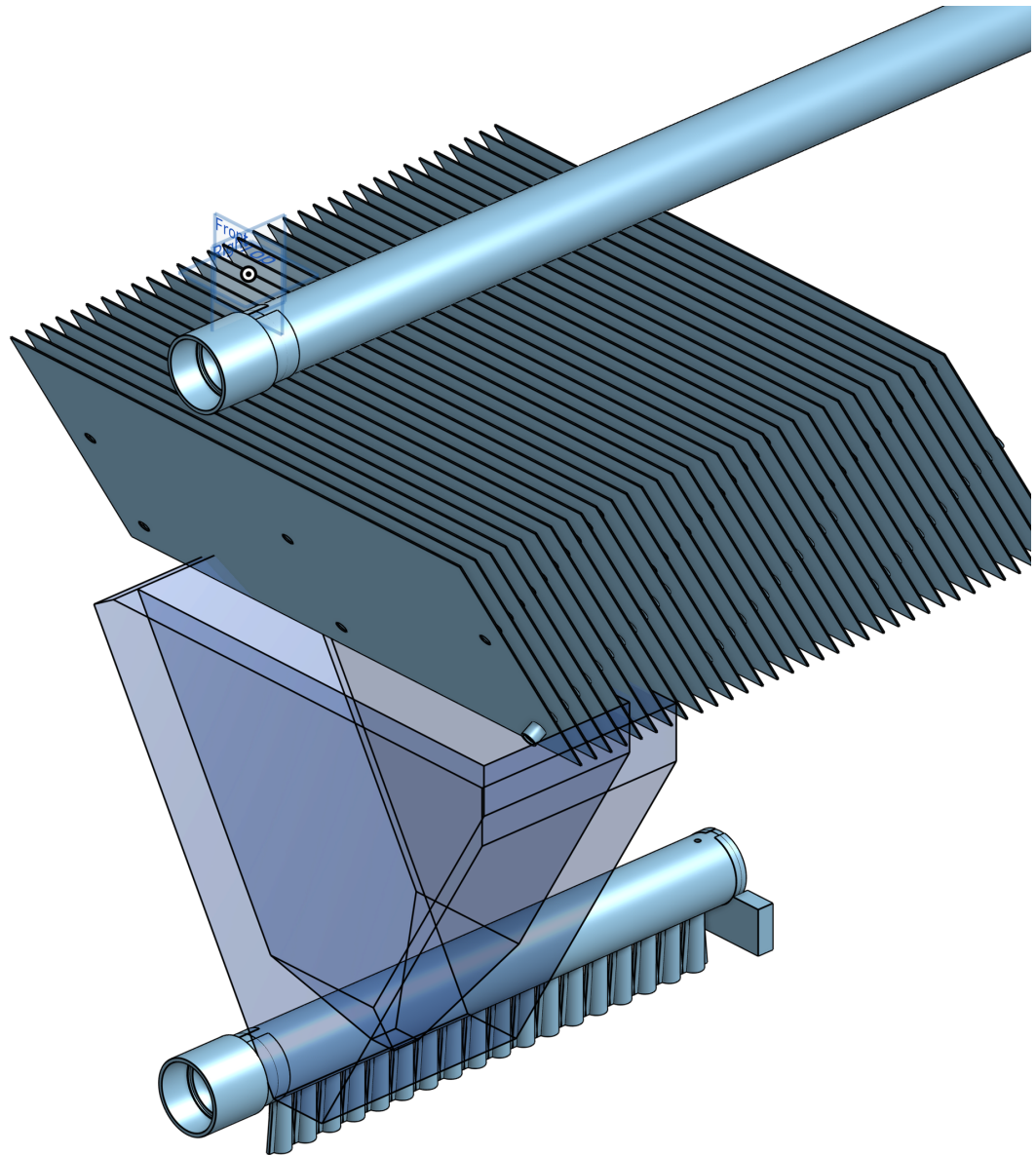


# WATER WE DOING?

An AguaClara Newsletter



*An AguaClara sedimentor designed and modeled using the AguaClara Infrastructure Design Engine (AIDE) in Onshape. This sedimentor design scales from 1-6 Liters per second (LPS).*



# LETTER FROM THE EDITOR

Hello AguaClara members, supporters, family, and friends,

We are excited to present you with the 2021 AguaClara Newsletter. In this edition, you will learn all about what we've been up to this past year, from how we've progressed our smart design using AIDE and started research at Ohio State University, to AguaClara Reach project pursuits and spotlights of student graduates and AguaClara Reach volunteers. Through all the challenges of the past year, the AguaClara community has found ways to continue learning and growing together.

Thank to you to all the contributors for helping to make this newsletter.

Thank you for being a drop in the AguaClara bucket.

With love,  
Zoe Maisel

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# STRATEGIC UPDATES

## SWOT ANALYSIS



In February 2021, members of ACR leadership met virtually for our annual Board Retreat. Coming out of the Retreat, we developed an updated mission statement, values, and strategic plan.

## Mission

AguaClara Reach promotes global access to safe drinking water through research and education, capacity building with local implementation partners, and design and innovation of community-scale, gravity-powered AguaClara water treatment technologies.

## Values

### LOVE

We celebrate people, communities, culture, and our journey working together in order to thrive.

### EQUITY

We advance social justice by addressing the needs of underserved communities around the world.

### LEARNING

We value continual learning and striving for excellence.

### INTEGRITY

We earn the trust and respect of our stakeholders through organizational and operational transparency.

### INNOVATION

We believe that continuous improvement grounded in reflection, feedback, humility, and purposeful iteration leads to new insight.

# 2021 STRATEGIC DIRECTIONS

AguaClara Reach is driven by **three Strategic Directions** which serve as guideposts for our decision making.

## TECHNOLOGY

Develop, design, and document open-source technologies that reliably deliver safe water on tap to communities.

## RESEARCH & EDUCATION

Empower learners to research, innovate, and design with love.

## IMPLEMENTATION PARTNERS

Provide world class service and water treatment technologies to our network of implementation partners.

For more information about our 2021 Strategic Plan, [check out our website](#). The Strategic Plan includes objectives for each goal to guide ACR's work and efforts over the next few years. The living document will be annually reviewed and updated to ensure progress towards our mission and vision.

# TECHNICAL DIRECTOR

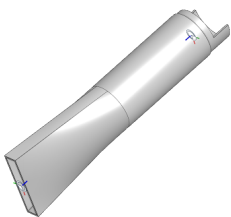
Monroe Weber-Shirk (he/him)



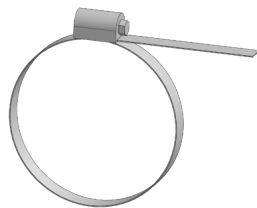
This past year has been my sabbatical year where I could step back and then refocus on what is most important and also prioritize my health. I am so grateful to have this opportunity to work full time as technical director with AguaClara Reach, both because of the amazing people I get to work with and because our mission is clear and it is guiding our work. It is energizing to work with a team that is all about creating solutions.

I've dedicated most of my time to development of the AguaClara Infrastructure Design Engine (AIDE). The AIDE team has continued our focus on creating a systematic approach to design, the tools to support that design approach, and finally to creating actual designs of AguaClara water treatment processes. There were many days when I realized that I didn't know how to solve a problem and I got to learn new skills and deepen my understanding of the design process.

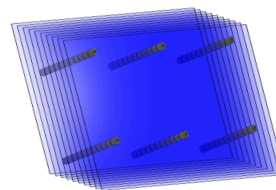
AguaClara Reach is all about distributed intelligence and that is the model for AIDE as well. Our previous LabVIEW - MathCAD - Autocad - Microsoft Word design tool had design code at the level of unit processes and at the level of the plant. AIDE makes it possible to have as many levels of smart components as desired. In each case the smart component has its own design code that uses physics and geometry to select a part from a parts database.



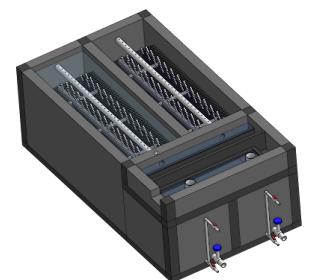
Diffuser tubes on the inlet manifold of the sedimentation tank, that makes sure that it doesn't break flocs too small



Hose clamps used to connect pipes, that design themselves based on the pipe diameter



Modules of plate settlers, that determine their length to achieve the specified capture velocity



A complete sedimentor with multiple sedimentation tanks

I'm happy to welcome our new AIDE Designer, Izumi Matsuda, to the AguaClara Reach team and to continue this journey of creating the next generation of AguaClara water treatment plant designs. Along the way we will be documenting the process, highlighting best design practices, enhancing the tools that we use, and connecting with implementation partners to provide them with designs.

## AIDE DESIGNER

Welcome to ACR's new employee, Izumi Matsuda! Izumi started working for ACR in September 2021 as the ACR AIDE Designer. She will be working with Monroe and ACR volunteers to advance our mission. Please join us in welcoming her to AguaClara Reach!



Izumi Matsuda (she/her) graduated from Cornell University in 2019 with a B.S. in Civil Engineering. She then spent the next couple of years working as a structural engineer in Baltimore. Currently, she is working with AguaClara in multiple capacities, mainly focused on further developing the AIDE design tool. Izumi is excited to continue facing interesting technical challenges while being able to pursue her passion for sustainability and innovative design.

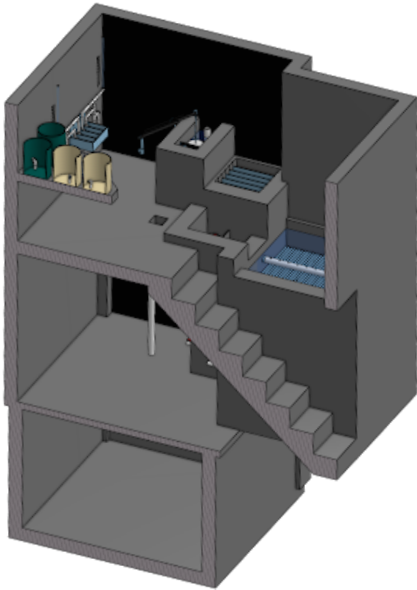
## PARTNERS UPDATE

ACR recently submitted a proposal to the St. Vincent and the Grenadines Central Water and Sewerage Authority (CWSA) for preliminary design services. We are hoping this will lead to a new implementation partner for ACR!

We are also continuing to build our relationship with Agua Para el Pueblo (APP). APP recently had the opportunity to connect with AZURE, a program to provide technical assistance and access to financing for small municipal systems in Honduras. ACR and APP are collaborating on ways ACR can provide support for these potential projects.

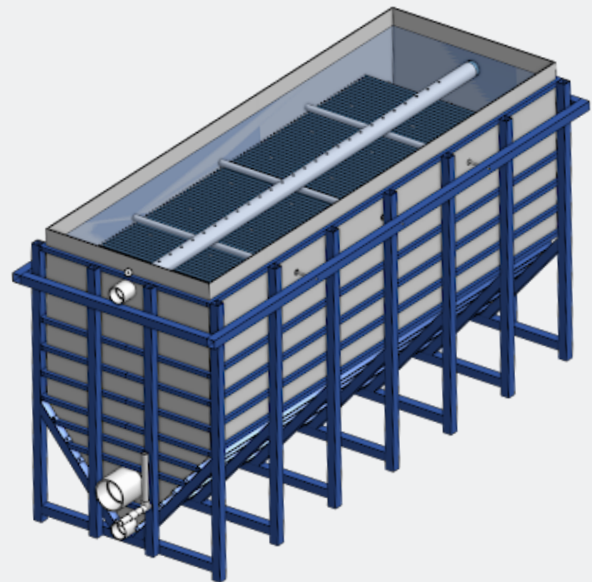
ACR is also working on developing engineering specifications for its technology.

# TECHNOLOGY UPDATES



AguaClara Reach is creating the 2nd generation design engine that we've named AIDE. The designs we are creating are far more detailed than anything we have created previously. We are improving our ability to provide guidance for how to fabricate the components. The detailed designs will make it easier to transfer the AguaClara technologies to new implementation partners.

We created a 1 L/s built in place design (above) for Gram Vikas (GV) and a 3 L/s prefabricated sedimentation tank with an exoskeleton (right) for APP. The sedimentation tank is the first time we incorporated structural engineering design equations into the Onshape design.



The next steps are to work with GV and APP for any needed design changes and to design the Stacked Rapid Sand (StaRS) filter. APP has also requested that we explore ways to increase the maximum flow rate that can be handled by a single StaRS filter above the 20 L/s that was used for Gracias. We are hoping to release a design that can treat 50 L/s in a single filter and thus provide a solution for plants as large as 500 L/s.

# RESEARCH & EDUCATION UPDATES

This fall marks a major milestone for ACR's new Research, Invent, Design, Empower (RIDE) Committee because we will be working with three active research partners: Cornell University, New Jersey Institute of Technology (NJIT), and Ohio State University (OSU). As we continue to support ongoing research, we will also begin marketing ourselves to new research institutions to grow the AguaClara research network. Students across the nation are looking for impactful and significant research to make their own, and RIDE plans to find them and give them the opportunity to do just that.



Cornell University



THE OHIO STATE UNIVERSITY

## AguaClara Cornell (ACC)



**Joseph Yoon**

He/Him/His  
Chemical Engineering, 2023



**Alice Zhao**

She/Her/Hers  
Computer Science, 2022



**Gaby Sibel**

She/Her/Hers  
Environmental Engineering, 2022

ACC has been busy with student recruitment. ACC plans to return to pre-COVID numbers which neared 100 members per semester, but has been closer to half that since the pandemic limited the team's ability to do in-person research. It seems that there may be more opportunity to provide students with access to in-person lab benches and be creative with the space we have been given.

## AguaClara NJIT

The new AguaClara NJIT program will be led by Cornell alum and current NJIT associate professor in Civil and Environmental Engineering, Will Pennock. Will has a lab space and equipment, and plans to begin research with three different subteams. Students from NJIT will be working together with Cornell's Activated Carbon team to create similar research at their university. RIDE hopes this will increase the feeling of community and shared knowledge across all of our research partners.



Will Pennock, PhD  
He/Him/His



## AguaClara OSU

In 2017, Dr. Michael Hagenberger and Patrick Sours of OSU connected with Monroe to talk about student research and education opportunities. RIDE has been working with OSU students since August of 2020 to get the student research program started. Since then, ACR has partnered with OSU to begin StaRS filtration research and offer a capstone design project for the Sustainable Resilient Communities Program.



Top left: ACR's Matt Cimini and Zoe Maisel presenting ACR student opportunities to OSU students. Top right and bottom left: OSU's Katie Vatke and Matt Parsons in the Global Engineering Lab working on the AguaClara StaRS filtration system. Bottom right: Matt Cimini, Patrick Sours, and Zoe Maisel at an OSU football tailgate.

The capstone project topic will focus on process sensing and automation. Automatic sensing and data collection will provide further opportunities for process optimization and automation. In Spring 2022, Monroe will be teaching a Safe Water on Tap (SWOT) course at OSU which will allow students to learn about AguaClara processes to support future research and design efforts.

# ACR JOINS SPARK COMPETITION



ACR was selected to be the Industry Partner in Ramboll's 2021 Spark Competition. As the Industry Partner, ACR will define a problem statement for students to work on. Over 50 students from 9 universities are expected to participate in the virtual competition this year. We're excited for the opportunity to work with students and industry professionals around the US to develop innovative solutions.

## 2021 STUDENT GRADUATES



**Paul Rossi, he/him, ACC**

*AIDE: Onshape and AIDE: FeatureScript*

I have begun working on my PhD at the University of Illinois Urbana-Champaign in the field of electrochemical cells with applications to CO2 capture, but I still plan to be involved with AguaClara as time permits.



**Emily Wood, she/hers, ACC**

*Dissolved Gas, String Digester, UASB*

I recently moved to Los Angeles to start my career as a water/wastewater engineering consultant, and I'm especially looking forward to working on projects related to water reuse and advanced water treatment processes.



**Oliver Leung, he/him, ACC**

*AIDE: Python & FeatureScript, AIDE Research Advisor*

I'm currently pursuing a Master of Education degree in Computer Science at Cornell. After graduating in December 2021, I plan to begin my career in software engineering at Amazon Web Services.



**Whitney Denison, she/hers, ACC**

*StaRS FInE, PF200, Fabrication RA*

I'm moving to Montana in December! Then maybe Greece or the Kyrgyz Republic depending on if I decide to do Fulbright or Peace Corps. Then probably grad school or try to work for the EPA or who knows?

# VOLUNTEERS

Dear AguaClara Family,

We hope that you and your loved ones are safe and well.

On behalf of ACR, we would like to thank all AguaClara Reach Volunteers (ACRV) for their generosity during these extraordinary times. Despite the challenges we experience globally, ACRV continues to do our part in achieving safe water on tap for all.

This year we welcomed Lois as a Volunteer Manager. With her support, we have grown our volunteer group by 35 volunteers. Every ACRV brings fresh ideas and perspectives to ACR to help ACR grow. If you are interested in joining the ACRV, please sign up here. Stay engaged by connecting with us on social media!

Stay well,

Lois (she/her) and Serena (she/her)  
ACR Volunteer Managers  
[volunteer@aguaclarareach.org](mailto:volunteer@aguaclarareach.org)

## Volunteer Spotlights

### Oliver Leung



He/Him/His

I spent this summer doing a software engineering internship with AWS Amplify in Seattle! Amplify is a cool open-source project under the Amazon Web Services umbrella.

### Alissa (and Justo) Diminich



Justo: He/Him/His

Alissa gave birth to her first child, Justo Diminich, this past January. He's newly mobile, getting teeth, and loves water!

### Melissa Louie



She/Her/Hers

This summer I met up with two AguaClara alums (Ian Cullings and Emily Wood!!) and we walked around Boston together - we learned how to treat water at the Boston Museum of Science :)

# BOARD OF DIRECTORS & COMMITTEE CHAIRS

The ACR Board of Directors currently includes Zoe Maisel, Blixty Taetzsch, Subhani Katugampala, Serena Takada, Monroe Weber-Shirk, Matt Cimini, Skyler Erickson, Cheer Tsang, and Lois Lee. Alison Xu and Ethan Keller are serving as Committee Chairs for the Communications & Engagement and Technology Committees, respectively. ACR Board Officers for 2021-2022 are Zoe as President, Blixty as Treasurer, and Matt as Secretary. The entire leadership team is grateful to work with great employees, volunteers, and partners!

## Thank you to our outgoing Board Directors!



Alissa (she/her) served as an ACR Board Director from 2019-2021, and as Board President from 2019-2020. Thank you, Alissa!

**Alissa Diminch**



John (he/him) served as an ACR Board Director from 2017-2021, and as Board President from 2018-2019. Thank you, John!

**John Finn**



Ben (he/him) served as an ACR Board Director from 2019-2020, and worked with the Fundraising and C&E Committees. Thank you, Ben!

**Ben Gassaway**



Kelly (she/her) served as an ACR Board Director from 2019-2021, and worked with the Volunteer Management Committee. Thank you, Kelly!

**Kelly Stefanski**

# THANK YOU TO OUR 2020 CORPORATE DONORS

We are so grateful for your support!

**Platinum**  
\$15,000+



**Gold**  
\$5,000+



# WATER WE DOING?

AN AGUACLARA NEWSLETTER



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AguaClara OSU and NJIT logos and social media coming soon!

Donations are accepted

through our website at  
[www.aguaclarareach.org/donate-now](http://www.aguaclarareach.org/donate-now)

by mail at  
407 College Ave. Suite 230  
Ithaca, NY 14850