

Fall 2020

CPRC Newsletter



Hello! by Mary Gerasimova

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MISSION STATEMENT

Serving the Chesapeake-Potomac Region (Maryland, DC, Virginia, and West Virginia), our chapter of SETAC North America (SNA) provides a professional forum for individuals from private industry, academia, and government agencies who are engaged in the study and analysis and solutions for environmental problems, management and regulation of natural resources, and/or research and development. We facilitate networking and educational opportunities for scientific professionals, mentoring and career guidance for students, and environmental education and outreach for the public.

Get in Touch!



Chapter Leadership

Officers		
President	Jennifer Flippin, Tetra Tech	president.cprc.setac@gmail.com
Vice President	Nathalie Lombard, University of Maryland Baltimore County	vice.president.cprc.setac@gmail.com
Past President	Ben Burruss, Toxicology Regulatory Services	BBurruss@toxregserv.com
Treasurer	Meredith Bohannon, U.S. Army Public Health Center's Health Effects Division (HEF)	treasurer.cprc.setac@gmail.com
Secretary	James Sanders, US Environmental Protection Agency	cprc.setac@gmail.com
Board Members		
2018 – 2020	Scott Lynn, US Environmental Protection Agency	scottglynn@scottglynn.com
2018 – 2020	Jamie Suski, EA Engineering, Science, and Technology, Inc.	jsuski@eaest.com
2019 – 2021	Sarah Lanasa, Student Representative, Towson University	slanas1@students.towson.edu
2019 – 2021	Michael Quinn, U.S. Army Public Health Center's Health Effects Division (HEF).	michael.j.quinn104.civ@mail.mil
2020 – 2022	Tyler Frankel, University of Mary Washington	tfrankel@umw.edu
2020 – 2022	Upal Ghosh, University of Maryland Baltimore County	ughosh@umbc.edu
Web Presence	cprcsetac.wordpress.com	
Website Manager	Scott Lynn, U.S. Environmental Protection Agency	website.cprc.setac@gmail.com
Social Media	Sarah Lanasa, Towson University	cprc.social.media@gmail.com
Newsletter Editor	C. Daniel Furst, Towson University	newsletter.cprc.setac@gmail.com
Assistant Editors	Scott Lynn, U.S. Environmental Protection Agency/ Nathalie Lombard, University of Maryland Baltimore County	

GET YOURS NOW!- CPRC SETAC FACE MASK



Click Here to Order!

**CPRC
SETAC**



Nathalie Lombard Models our New CPRC SETAC Face mask!

Ghosh lab trip to Roanoke City (VA) for passive sampler deployment

This project in collaboration with the Department of Public Work (DPW) of Roanoke City allowed us to test a new way to deploy samplers on deep water while still keeping social distancing. Below are some pictures of our adventure on Kayaks!



Preparing for a deployment for Kayak



Anchoring to perform the passive sampler deployment (from left to right: Louis Cheung, Leigh Anne Weitzenfeld our partner from DPW of Roanoke City, and Nathalie Lombard)



Accessing the deployment sites by Kayak (from left to right: Louis Cheung and Upal Ghosh) 3

Distant Summer



CPRC Board of Directors member, Scott Lynn, enjoys some socially distanced time at the beach

Distant Summer



President's Podium



Happy Autumn CPRC SETAC Members!

Hello CPRC SETAC members. September was an exciting month as our chapter successfully hosted its first fully virtual meeting! Many thanks to everyone who responded to our planning survey, helped shape our program and virtual platform, organized the event, and participated in one or more sessions. We hope that the weekly one-hour lunch series format was easy to fit into schedules and served as an educational lunch break. You recently received a survey link, and we would love to hear your feedback so we can continue to improve virtual events. If you are unable to complete the survey or have additional feedback, you are welcome to email me.

We were pleased to award cash prizes and two registrations to SETAC NA to our top student presenters in poster and platform categories. Our students are the heart of the chapter and thanks to your membership dues and sponsorships, we can invest some of that generosity in the next generation of leaders and researchers in the science community.

Watch out for upcoming activities and opportunities with CPRC in 2021. Do you like the idea of fame, fortune, and a life of glamour? Then maybe a leadership role in CPRC is right for you!* Chapter elections are held each winter and we want you! We will accept nominations for two seats on Board of Directors as Scott Lynn and Jamie Suski complete their terms in 2020. What's it like being on the Board, you ask? We typically have about 10 calls per year to keep the chapter active and on track. Our biggest goals include hosting the Spring Meeting; engaging with members and potential members through events, short courses, and socials; networking; sharing research and career opportunities; supporting students with awards for outstanding research; and connecting our group through social media, newsletters, and emails.

If you are not ready to commit to an elected position, we always welcome new members to our committees—Events Planning, Communications, and Membership. I started out by volunteering with the Communications committee, spent three years on the board, and the past two as President. Volunteering has given me the chance to meet so many amazing colleagues who I may not have encountered otherwise in my professional circle. The Events Planning Committee spearheads the spring meeting, social events, dinners, and other activities. The Communications Committee is responsible for our social media presence and highly anticipated, twice yearly newsletter. The Membership Committee manages sponsorship opportunities and works to maintain active chapter members along with performing outreach to connect to new members or members who have lost touch over the years.

I hope you have stayed well and found some silver linings in 2020 whether it meant spending more time with family, finding a new hobby, slowing your pace, cooking new recipes, going outside more often, or simply getting by in a very challenging year. We were hoping to see you in person for Spring Meeting 2021 but given the uncertainties, we will likely host a virtual meeting and look forward to meeting in person as soon as we can safely get together.

Sincerely,

Jennifer Flippin

President, CPRC SETAC



***Fame fortune and life of glamour results are not guaranteed, but it is a very rewarding opportunity to work with some fantastic local scientists.**

WE ARE SEEKING!

New Website Manager

New Social Media Coordinator

New Newsletter Editor

The communications committee is seeking volunteers to fill the Website Manager, Social Media Coordinator, and Newsletter Editor positions. A description of the Communications Committee and the positions are available on the CPRC website ([HERE](#)). Volunteer and help CPRC SETAC reach out to and expand its membership, develop your personal skills, and expand your professional network! Time commitment is minimal (on average one hour per week or less) and training will be provided. If you are interested, or if you know someone else who you think would be a good fit for any of these opportunities, please contact James Sanders the CPRC Secretary: cprc.setac@gmail.com

SETAC NA 2020 as SciCon2



SETAC NORTH AMERICA 41th ANNUAL MEETING

15 – 19 November 2020 | SciCon2



The SETAC 41st Annual SETAC North America Meeting is now [SciCon2](#) and will be held completely online. Here are some of the ways you can get engaged:

- [Registration](#) is still open for SciCon2!
- The preliminary daily schedule and meeting program, featuring a list of on-demand presentations, is now [live](#). Look for presentations by your fellow CPRC members.
- Registered attendees will be able to view on-demand presentations and recordings of the live sessions for three months after the meeting.
- There are still side and networking [events](#) taking place, including the Buddy Program, Women in SETAC Symposium, Early Career Social, and an Inclusive Diversity Committee Event.
- Look for a Regional Chapters Committee break out room for CPRC on [Tuesday, November 17th](#), at 15:00 CST (or 4 pm EST).
- SETAC North America offers the [Dependent Care Attendance Grant](#) to assist those who incur additional expenses associated with childcare or other significant dependent care during the meeting.





Transitioning from physical to virtual meetings

By

Nathalie Lombard

The COVID-19 pandemic has forced us, like other scientific conferences worldwide, to postpone the joint CPRC-HDR Spring meeting planned for last April. However, this opened the doors to new ways to communicate and share research.

CPRC includes 4 states, which encompass a total of 79,676 square miles (Figure 1). To allow a wide variety of CPRC members to attend the Annual Spring Meeting, the location of the venue changed each year: in 2019 it took place in Canaan Valley (WV), 2018 in Fredericksburg (VA), 2017 in Annapolis (MD) and 2016 in Charlottesville (WV). The change of venue is always exciting as we are able to further discover the Chesapeake Potomac region. For example, last year we carpoled with several lab members from Baltimore to Canaan Valley. It was a beautiful drive of three to four hours across several states. Despite the remoteness of the location, attendance was high with more than 100 participants. The cancelation of this year's in-person meeting was the occasion to test alternate ways of communication within the chapter that were consistent with the stay-at-home orders and social distancing rules, but also an opportunity to expand the reach of our meeting to participants who might not have been able to travel due to distance.

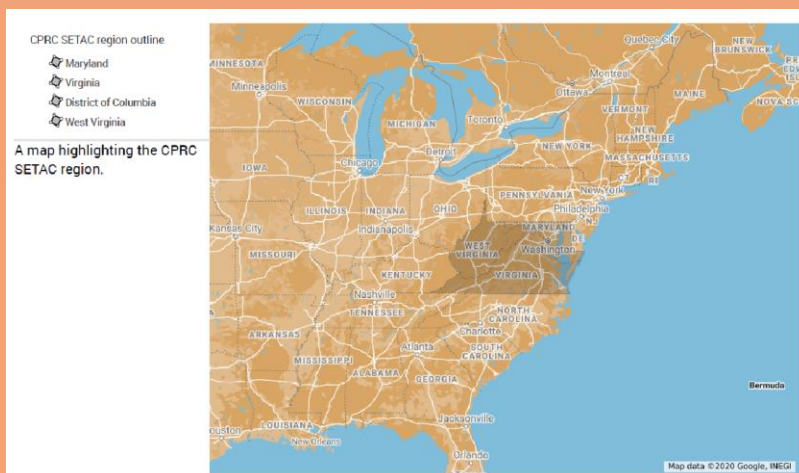


Figure 1: CPRC SETAC Region.

<https://cprcsetac.wordpress.com/archived/cprc-map/>

CPRC SETAC – Virtual Meeting

Most likely, several of you have attended webinars over the past few years, which are a convenient way to learn, share and discuss while sitting at our desk. Could we adapt the webinar format to a full meeting? Which platform would we use? Shall we do a live or a pre-recorded meeting? If live, how do we integrate live interaction between poster presenter and attendees? To help in the organization of our first virtual meeting, we included CPRC members in the discussion on the format by sending out a survey back in May 2020 (Figure 2) and opted for the weekly lunch series which was held in September 2020. The ideal candidate for the virtual platform was WebEx, though several test drives and adjustments were required for use in our final virtual meeting format.

Virtual lunch sessions occurred every Wednesday from September 9th to September 23rd 2020 at noon to watch one platform presentation and three to four posters presentations on subjects related to legacy and emerging contaminants, pharmaceuticals, microplastics in the environment, passive sampling tool development, ecotoxicology of heavy metals, pesticides and PFAS. The meeting was well attended with about 30 participants present at each session. Among the attendees, roughly 50% were from academia, 26% from government, and 20% from the private sector. Live interaction between poster presenters and attendees was especially appreciated.

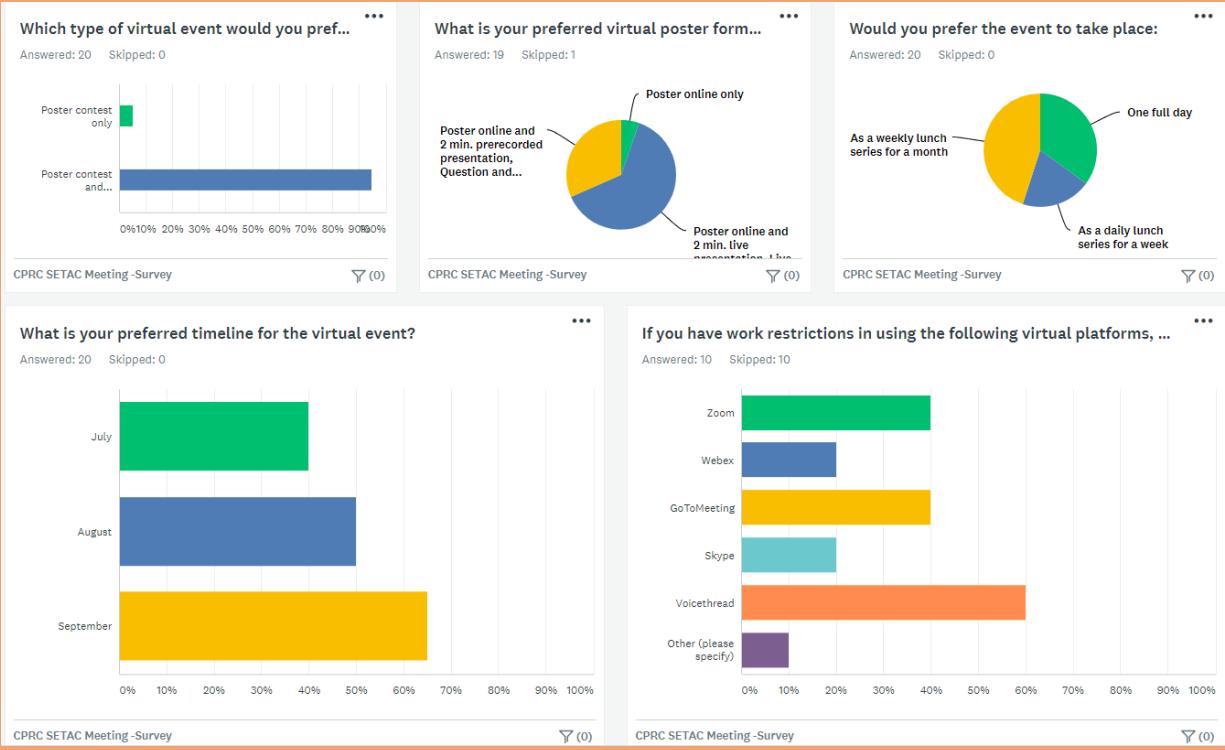


Figure 2: Results of the Meeting Preparation Survey

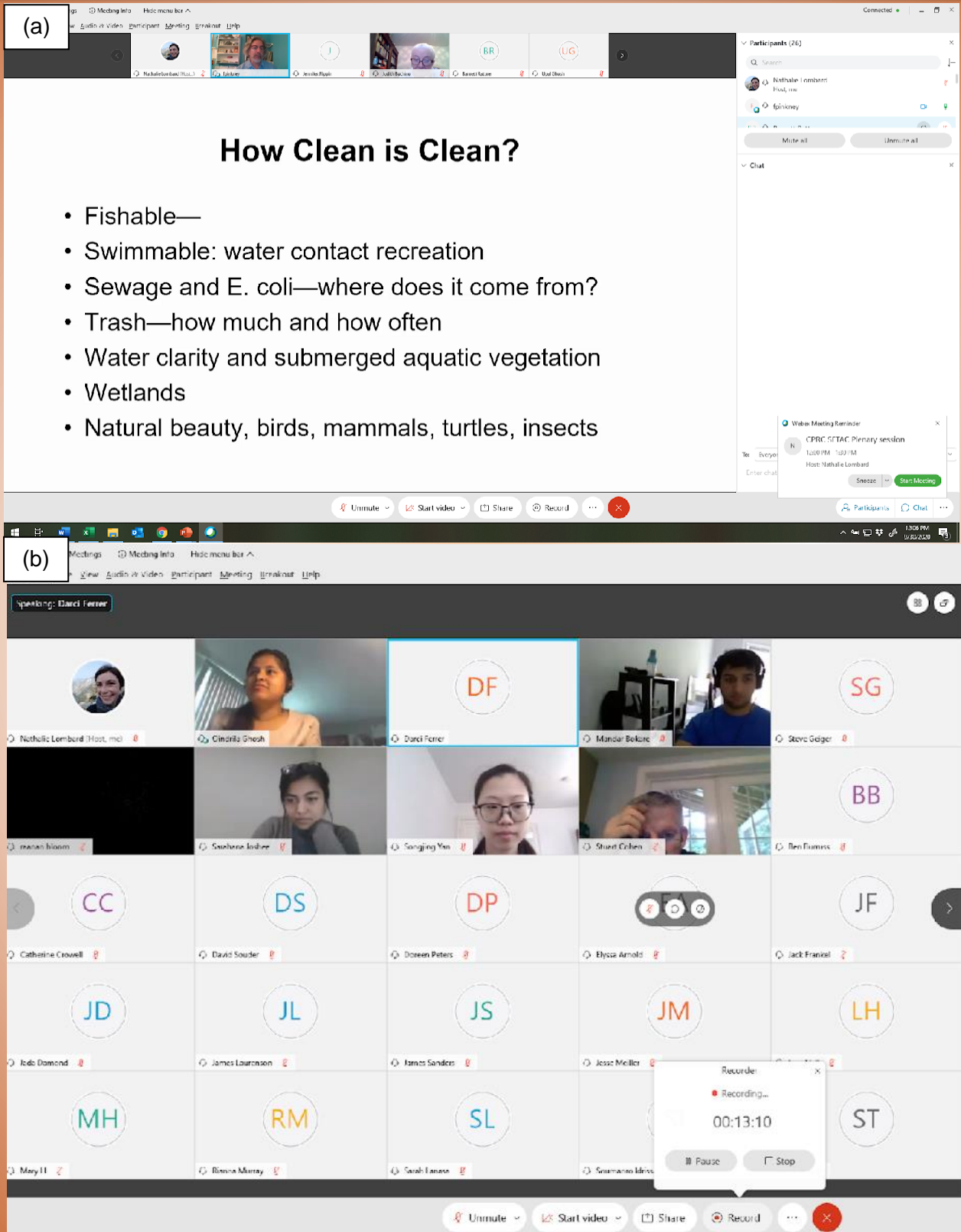


Figure 3: Screenshots of the Virtual meeting (a) Keynote address by Dr A. Pinkney, (b) Q&A session

The virtual meeting also featured a student contest with SETAC NA and cash awards for best platform and poster presentations (Figure 3c), as well as a virtual happy hour with a mask contest. The meeting was concluded by a talk from our keynote speaker, Dr. A. Pinkney, a long-time CPRC member and Senior Biologist with the Environmental Contaminants Program, U.S. Fish and Wildlife Service. He shared lessons learned from the Anacostia River cleanup and research efforts over the past 25 years (Figure 3a & b).

Our first attempt to meet virtually was a great success and showed us that alternate ways to connect with members within our regional chapter but also overseas are feasible.

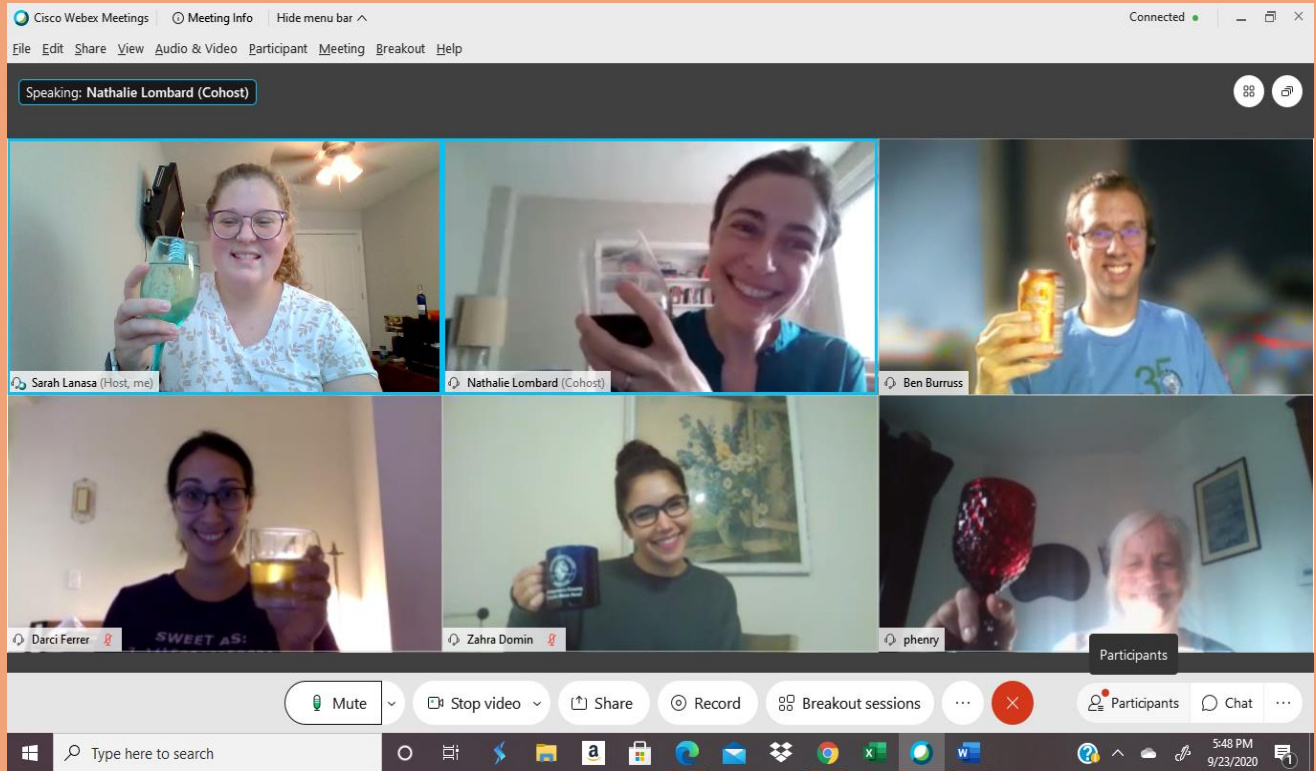
The screenshot shows a virtual meeting interface with a grid of participants at the top. The main content is a poster presentation titled "Overview of High Priority FDA Research on Human Pharmaceuticals in the Environment" by Zahra Domin, James Laursen, and Raanan Bloom. The poster is divided into several sections:

- Introduction:** Discusses the National Environmental Policy Act (NEPA) and the Environmental Assessment (EA) process. It includes a flowchart showing the process from "Review Agency Action" to "Final EA/Record of Decision".
- Question #1:** "Are there classes of drugs active at effluents < 1 ppb?" Includes a table of drug classes and their associated risks.
- Question #2:** "How do we address cumulative and synergistic effects?" Discusses the challenges of assessing multiple low-dose exposures.
- Question #3:** "What are the terrestrial risks from bioactive?" Includes a bar chart showing the relative risk of various pharmaceuticals.
- Question #4:** "What are the effects of pharmaceuticals in reclaimed water?" Discusses the potential impacts on aquatic life.
- Key Topics and Issues:** Lists four key areas for research: 1) Drugs active at concentrations < 1 ppb, 2) Cumulative and synergistic effects, 3) Terrestrial risks via bioactive, and 4) Pharmaceuticals in WWTP effluents.
- Concluding Remarks:** Summarizes the need for continued research on low-dose and cumulative effects.

The meeting interface includes navigation controls like "Unmute", "Start Video", "Share", "Record", and "Close".

Figure 3 cont. (c) Poster presentation

By Sarah Lanasa



In mists of a global pandemic unfortunately we did not have an in person happy hour. Instead we decided to meet virtual with beverages in hand. Following the 3rd day of the Virtual Meeting we held a Virtual Happy Hour. It was interesting to hear how everyone is adapting to these unprecedented times. Everyone is having a different experience. With representatives from government, industry and academic the conversation was truly diverse. We also held a mask contest for the reward for a one-of-a-kind CPRC mask! The Winner is none other than Nathalie Lombard our Vice President. Thank you to everyone that attended and if you did not, we hope to see you next time! Keep in mind we host happy hours year-round!

From Fragrance to Sanitizer: Adaptability for Public Health Needs

Ms. Darci Ferrer is a regulatory scientist for the Fragrance Creators Association. As such, she is responsible for analyzing new regulations and liaising with U.S. and Canadian authorities (U.S. EPA, U.S. FDA, Health Canada, Environment and Climate Change Canada, state regulators, etc.) to provide data and comments on new policies and risk assessments on behalf of the fragrance industry. She has worked for the consumer products industry at various capacities since 2011. Ms. Ferrer holds a Master of Science degree from Johns Hopkins University in Environmental Science and Policy.



Transitioning into a new position always has its challenges, but starting a new position during a pandemic is unique in itself. There were no first-day jitters about what to wear or getting lost on the way to the office, since my first day at Fragrance Creators Association—the trade association representing the North American fragrance industry—was from the safety and comfort of my home. After several years working in the consumer products industry, focused primarily on cleaning products, I was prepared to learn all about the nuances of state and federal fragrance regulations. Instead, I began receiving familiar questions about hand sanitizers and disinfectants regulations. Initially, I was surprised, but it made sense given the global health crisis: Fragrances are an important component of disinfectants and many companies that manufacture fragrances have the resources to produce hand sanitizers. Fragrance is a critical input into many products used for essential cleaning, disinfecting, and hygiene products. People often think fragrance is all about good smells, but fragrance technology plays a big role taking on malodors. In addition, to remove them would require a complete reformulation, which takes time and substantial costs. These are some of the reasons fragrance manufacturing was deemed an “essential business” and granted permission to stay open during the early stages of the pandemic when most other businesses were required to close. In order to have employees continue to safely work on site, companies employed a number of additional safety measures, including having certain hygiene products available, such as hand sanitizers. Some companies elected to produce their own for employees, others began producing the products for donations to their local frontline workers, and some to community organizations for sale and distribution.



Hand sanitizers and disinfectants are regulated very differently and by two agencies (FDA and EPA, respectively). For many businesses, the regulations can be a maze to sort through and understand. As Fragrance Creators' Director, Regulatory Science, one of my roles is to shine a light to help companies through the maze. In this case, companies needed to navigate the dynamic temporary guidance and applicable regulations surrounding these products in response to the pandemic. For example, FDA developed a Temporary Policy for the Preparation of Certain Alcohol-Based Hand Sanitizer Products During the Public Health Emergency (COVID-19) and a similar policy for the manufacture of alcohol. The temporary policies were developed to help increase the production of hand sanitizers by offering a simpler, alternative, regulatory pathway than the traditional approach. These temporary policies have undergone multiple iterations over the past several months. At Fragrance Creators, I leveraged informational documents and facilitated webinars with Agency experts to provide our membership with support. Ultimately, many members were able to keep production of critical products running smoothly across the country and promote public health.

Although this year has been anything but predictable, it is rewarding to help member companies keep their employees and their families and the public as healthy as possible during this challenging time.

Taylor Anderson

Towson University: Environmental Science & Animal Behavior Undergraduate Degree 2021

The current COVID pandemic has affected millions of people around the world, changing the way we live and interact with others. As a student and undergraduate research assistant at Towson University, my daily classes as well as my research studies have also been vastly affected due to COVID.

Under the guidance of Dr. Christopher Salice, my studies specifically involve exploring the ecotoxicity of PFAS chemicals on invertebrates, and how it is relevant to the current environmental levels. Once Towson closed its door in lieu of the pandemic earlier this spring, I was unsure if I would be able to continue my research as I had been over previous semesters. Of course this puts more pressure on me as a student, as well as many others like myself, that rely on research and internship experience in order to be hired after graduation or get into graduate school. It was (and continues to be) difficult to navigate without knowing how long and how hard our country would be dealing with this pandemic.



Taylor poses with her cricket tanks preparing for another study.

Fortunately Towson did allow some very minimal continuation of research programs, but the dynamic of our lab changed drastically. I would say these changes have had the biggest impact on my overall research experience. Before the pandemic I was able to work with Dr. Salice, as well as three other students in our ecotoxicology lab: Dan Furst and Patrick Sykes, our graduate students, and Shaina Furman, a fellow undergraduate. All of whom I worked with on an almost daily basis; where we were able to discuss, inquire and help each other carry out each of our studies. Physically learning techniques and proper lab protocols with my lab mates is one of the most enriching parts of working in a lab. Once Towson shut down, the dynamic of the lab changed considerably to account for proper COVID protocols. Whereas before we were able to work together on all our projects at once, we now have to come in separately and follow strict COVID guidelines in order to ensure the safety and health of each of us. I feel fortunate enough that luckily my studies are relatively easy to execute and maintain, meaning I am able to complete the entire study by myself if needed. I have been carrying out my studies this way since March, as well as other lab duties, but the shared cooperation amongst my lab mates is greatly missed given this current situation. I'm looking forward to the days where I can get hands on experience with my lab mates again!

Name: **Sarahana Joshee**

University: University of Maryland Baltimore County

Department: Chemical Biochemical and Environmental Engineering

Type of Degree: M.S.

Award: 1st Place Platform (\$100)

Title: PCB levels in the surface water, sediment porewater, and benthic organisms in Back River watershed.



Sarahana is currently a Masters student at the University of Maryland, Baltimore County (UMBC), pursuing a degree in Chemical Engineering. She recently obtained her Bachelor's Degree in Chemical Engineering this past spring also at UMBC and is continuing research under Dr. Upal Ghosh. Her work focuses on the monitoring of Polychlorinated Biphenyls (PCBs) in contaminated watersheds. Her past two projects were focused on PCB monitoring in the Back River watershed, located in Baltimore MD, to ultimately provide a conceptual site model.

Abstract: Polychlorinated biphenyls (PCBs) are contaminants of concern in Back River Watershed, resulting in fish consumption advisories in Maryland. In collaboration with the Baltimore County, and the Maryland Department of Environment (MDE), we performed a pilot assessment of ongoing contribution of PCBs from tributaries in the Back River watershed with a focus on the freely dissolved concentration of PCBs. Freely dissolved concentrations are indicative of biological uptake, toxicity, and provide information on fluxes of pollutants between sediment and water column that will help in the identification of potential sources or hot spots of PCB release in the watershed. Measurement of freely dissolved concentration is challenging due to the ultra-low aqueous concentrations and interference with colloidal particles. Passive sampling has emerged as an alternative technique to measure freely dissolved concentrations of hydrophobic chemicals without interference from colloidal particles. In this study, freely dissolved PCB concentrations were measured in the water column and sediment porewater of four tributaries and main stem of Back River using LDPE passive samplers. PCB concentrations ranged from 0.027 – 2.6 ng/L during the deployment period from June 2018 to August 2018, with Bread and Cheese Creek tributary showing the highest dissolved PCB concentrations among the sites. PCB levels at two locations in Back River itself were 0.99 and 0.56 ng/L. Concentrations at five out of nine sampling locations exceeded the USEPA Water Quality Criteria of 0.64 ng/L, associated with a cancer risk of 10 in a million. Sediment porewaters and benthic organisms in the main stem of the river were analyzed to gain insight on bioaccumulation in the aquatic food web through dietary uptake. Ex-situ porewater concentrations ranged from 0.72 – 0.97 ng/L while the concentration in benthic organisms ranged from 36.69 – 172.69 ng/g. These results are being used to investigate potential legacy sources of contaminants in upland areas that may be impacting water quality. Furthermore, results will be compared to previous studies conducted in the Back River watershed and wastewater treatment plant. Ongoing work is evaluating potential inputs of PCBs from additional Tributaries within the Baltimore City.

Name: **Jada Damond**

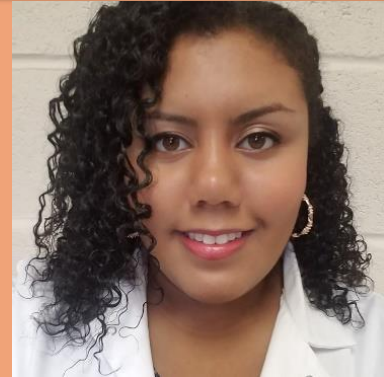
University: University of Maryland Baltimore County

Department: Chemical Biochemical and Environmental Engineering

Type of Degree: PhD.

Award: 2nd Place Platform (\$75)

Title: Novel Equilibrium Passive Sampling Device for the Measurement of Methylmercury in Water and Porewater of a Sediment Microcosm



Jada is a first year Ph.D. student in Environmental Engineering at the University of Maryland, Baltimore County (UMBC). Her research focuses on passive sampling methods to detect metals in the environment. Currently, she is working on a project in collaboration with the Smithsonian Environmental Research Center, studying an equilibrium-based passive sampler for the measurement of methylmercury (MeHg) in aqueous matrices. She started research as an undergraduate, which involved quantifying black carbon in sediments. She obtained her bachelor's degree in Chemical Engineering at UMBC in May 2020.

Abstract: Mercury is a global pollutant that can undergo methylation in natural systems to form the more toxic and bioaccumulative form, methylmercury (MeHg). MeHg can biomagnify within aquatic biota to levels unsafe for human consumption, making accurate determination of its concentration across aquatic environments crucial for adequate risk assessment. However, MeHg concentrations in waters and porewaters can be low (concentrations in unimpacted waters at the pM level) and highly variable through time, rendering accurate measurement with traditional field sampling methods challenging. Passive sampling approaches can provide a time-averaged estimate of aqueous MeHg concentration. The present work continues the development of a novel equilibrium-based passive sampling device comprised of activated carbon suspended in agarose gel (ag+AC). This work demonstrates the ability of this novel sampler to measure water and porewater MeHg concentrations in a sediment microcosm and to measure aqueous MeHg concentrations across a sediment-water interface. Sediment microcosms were constructed using mixture of Phragmites marsh soil contaminated with MeHg, topped with saline (3 ppt Instant Ocean) overlying water. Passive samplers were inserted partially in the water column and partially in the sediment column. The portion within the sediment measured concentrations two orders of magnitude higher than the portion exposed to the water column; the samplers successfully measured the gradient of aqueous MeHg concentration, demonstrating the ability to measure concentration gradients critical for flux calculations. Furthermore, by applying an experimentally determined sampler-water partitioning coefficient, the samplers could predict surface water and porewater concentrations within a factor of two. The presented work demonstrates the ability of a single ag+AC sampler to predict surface and porewater MeHg concentrations in a sediment microcosm, while capturing the MeHg concentration gradient across a sediment-water interface.

Name: **Oindrila Ghosh**

University: University of Maryland Baltimore County

Department: Chemical, Biochemical and Environmental Engineering

Type of Degree: Ph.D.

Award: 3rd Place Platform (\$50)

Title: How Efficient is Time-Integration for Equilibrium Passive Sampling?



Oindrila Ghosh is a third-year Ph.D. student of Environmental Engineering at the University of Maryland Baltimore County. Her research focuses on using mass transfer modeling techniques to optimize passive sampling of hydrophobic organic chemicals that exist in the dissolved phase of various environmental media like surface water or sediment porewater. Prior to this, she spent a year working on a project aimed at establishing hydrochemical connectivity in transboundary groundwater aquifers on the Texas-Mexico border under the Texas Water Resources Institute at Texas A&M University. She secured her master's degree in environmental sciences in 2017 from the School of Ecology and Environment Studies at Nalanda University, India. Her work focused on the transport of biochar in a saturated porous medium under various physical and chemical conditions.

Abstract: The effect of temporal variation of water concentrations of hydrophobic organic contaminants (HOCs) with events like stormflow or industrial runoff on the time weighted average water concentration is important for ecological exposure assessment. How well polymeric passive sampler concentrations represent the time-averaged concentration over an entire deployment period, is the key topic of investigation in this study. A first order and a one-dimensional Fickian diffusion model (solved using a finite difference numerical approach) were used to simulate the uptake and loss kinetics of PCB molecules in a polyethylene (PE) sheet from water. Several conditions of ambient concentration of polychlorinated biphenyl (PCB) molecules, sampler characteristics and molecular properties were simulated. For each of these simulations, the PRC corrected mass of uptake into the PE is converted to ambient water concentration and compared with the actual time averaged water concentration calculated over a period of 90 days with 1000 ng/L in no storm and 100 ng/L in storm condition respectively. Some preliminary results from the diffusion model show us that when the sampler is retrieved at the end of the deployment period, after a 1day storm on the 80th and 87th day, the passive sampler induced freely dissolved concentration of PCB 37 in the overlying water is 2% and 5% less than the actual time-averaged concentration (990ng/L), respectively. A storm-induced concentration drop on the 45th day that lasts for 10 days instead of 1day results in a drop to 900ng/L of the actual time-averaged concentration. The time scale of 'time-averaging' in passive sampling is a strong function of compound hydrophobicity. This was confirmed by how the effect of the storm is embedded in the prediction of the freely dissolved concentration of higher homolog groups like PCB 128, which matches the time averaged concentration. Lower congeners like PCB 15 and 37 recover from the history of the storm with the predicted water concentrations 11% and 8% higher than the actual time averaged concentration, respectively. The first order model agreed well with the diffusion model in terms of the trend of concentration gained or lost from passive samplers as an effect of fluctuation in ambient concentration.

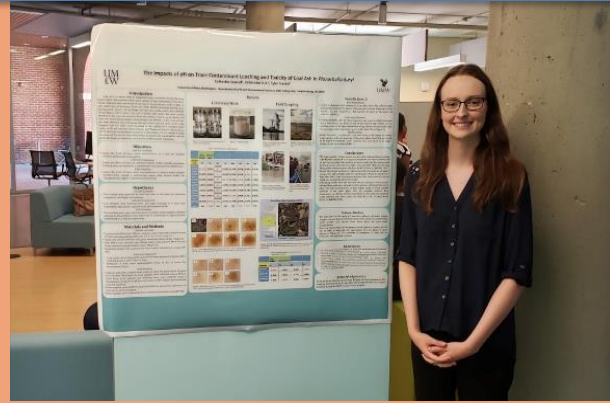
Name: **Catherine Crowell**

University: University of Mary Washington

Department: Department of Earth and Environmental Sciences

Type of Degree: B.S.

Award: 1st Place Poster (\$100)



Title: The presence, distribution, and concentration of trace metals in the James River near a coal-burning repository

Catherine is a third year B.S. student at the University of Mary Washington. Her research focuses on understanding the effects of trace metals from coal ash on a freshwater snail species. In particular, Catherine is interested in water quality and the effects of pollutants on aquatic organisms and human health. She plans to pursue her Master's of Science (M.S.) in Environmental Studies.

Abstract: In the United States, the Chesapeake Bay is the largest estuary system along the east coast, containing multiple coal-burning power stations throughout the region. Coal fly ash is one of the largest forms of industrial waste that is primarily produced by coal-burning power stations. Fly ash contains various heavy metals that have the potential to leach from the ash into waterways, resulting in the mobility of trace metals in the environment. Few laboratory studies have examined the distribution of trace metal contamination within the James river, which runs beside a coal-burning power station. Thus, the goal of this study was to evaluate the spatial and temporal distribution of trace metals within the James River beside the Chesterfield power station near Richmond, Virginia. Water and sediment samples were collected in the James river upstream, midstream, and downstream from the Chesterfield power station via core, grab, and dip sampling. Sediment samples were oven dried, sieved, and digested using aqua regia, then filtered to remove any particulates. Water samples were filtered to remove any suspended particulates and acidified using nitric acid. Sediment and water samples were analyzed for trace metal contamination using ICP-OES. While this project is currently ongoing, preliminary results have identified high concentrations of arsenic (0.055 ppm), copper (6.065 ppm) and selenium (0.590 ppm) in sediments collected upstream, downstream, and behind the power station. Additionally, high concentrations of cadmium (0.017 ppm) and selenium (0.061 ppm) were detected in water samples collected downstream and behind the power station. This study will provide important information regarding the potential impacts of coal-burning repositories on the mobilization of trace contaminants within aquatic ecosystems and their potential effects on aquatic and terrestrial organisms.

Name: **Sarah Lanasa**

University: Towson University

Department: Environmental science

Type of Degree: Masters of Science

Award: 2nd Place Poster (\$75)



Title: Are unregulated “safeners” safe for non-target organisms? Effects of herbicide safener additives on the population growth and size of green algae, *Raphidocelis subcapitata*

Sarah is a second year M.S. student at Towson University in Maryland. Her research focuses on the effects of safeners, herbicide adjuvants, on non-target aquatic algae and daphnia. In particular, the direct population growth and cell size effects of safeners, and the indirect bioenergetic and biotransformation effects of safeners. In the future she plans to go for her Ph.D. and continue ecotoxicology research.

Abstract: Chloroacetanilide herbicides are used worldwide to control grass weeds that affect important crops such as corn. When applied they are frequently paired with a “safener” or adjuvant which prevents herbicidal damage on the crop without lessening herbicidal effects that control weeds. Safeners are considered inert or “other” ingredients, therefore, are not regulated or tested for toxicity. Similarly, their occurrence in the environment is not entirely understood because of apparent little research focus. Common chloroacetanilide herbicides S-metolachlor and acetochlor have been well studied for presence and toxicity, while their co-formulated safeners have not. The safeners we focused on were benoxacor (commonly paired with S-metolachlor), AD-67 (sold individually to be paired with many different herbicides), dichlormid and furilazole (commonly paired with acetochlor). We conducted a series of 72-hour algae toxicity tests separately with the four safeners and two herbicides to determine the EC50 (the effective concentration causing 50% growth inhibition) on a non-target algae, *Raphidocelis subcapitata*. Both herbicides were much more toxic than the safeners, with acetochlor more toxic than S-metolachlor by an order of magnitude. AD-67 was the most toxic safener followed by benoxacor, then dichlormid and furilazole less toxic by two orders of magnitude. ED50 values for all safeners tested were far above environmentally relevant levels, the herbicides, however, were toxic at or below environmental concentrations. Interestingly, a difference in size of algae cells was observed during the toxicity tests. Images of algae were captured at the 72-hour timepoint and analyzed using ImageJ software to measure the total area of each cell. We found a size increase from the controls for only the herbicides at their EC50 concentration. Standard algae toxicity test did not show the safeners have a high toxicity but more research is required before environmental risk can be assessed. We are exploring other more sensitive endpoints for the safeners and herbicides. Results of these studies may lead to an improved understanding of the potential ecological effects of safeners.

Name: **Zahra Domin**

University: Dominican University

Department: Physical Sciences (Chemistry) and
Biological Sciences (Biology)

Type of Degree: Bachelor of Science

Award: 3rd Place Poster (\$50)



Title: An Overview of High Priority Research on Human Pharmaceuticals in the Environment at FDA

Zahra is an Oak Ridge Institute for Science and Education Research Fellow for the Environmental Assessment Team at the US Food and Drug Administration (FDA), Center for Drug Evaluation and Research. Her current research is looking at the impacts and potential risks of human pharmaceuticals in wastewater treatment plant effluent on terrestrial environments. Prior to her fellowship at the FDA, Zahra was a Natural History Research Experiences intern in Botany (seedless plants) for the Smithsonian National Museum of Natural History's Research Experiences for Undergraduates program. In the future, Zahra hopes to be able to pursue an advanced degree that enables her to intersect her passions for quantum chemistry and botany with her appreciation for the environment. Currently, her graduate plan is TBD.

Abstract: This poster will provide a review of the research on pharmaceuticals in the environment being conducted at the US Food and Drug Administration (FDA), Center for Drug Evaluation and Research. One project involves analyzing a 3-year compilation of environmental assessment (EA) reports on hormonally active drugs, to help determine whether a lower than 1 ppb in wastewater treatment plant (WWTP) effluent is needed for purposes of the "categorical exclusion" from an EA for these drugs, per National Environmental Policy Act (NEPA) rules. This poster also will address other research, including assessment of environmental impacts in the context of water reuse and wastewater treatment sludge, as well as an examination of current research into alternative animal eco-testing models and methods as they relate to pharmaceuticals.



SETAC: The Society of Environmental Toxicology and Chemistry is an independent, nonprofit professional society that provides a forum for individuals and institutions engaged in the study of environmental issues, management and conservation of natural resources, environmental education, and environmental research and development.



CPRC: The Chesapeake and Potomac Regional Chapter of SETAC is a non-profit organization started in the year 1983. CPRC's mission is to promote the exchange of information among environmental scientists in the Mid-Atlantic States.

Note: you do not have to be a SETAC member to be a member of CPRC.

There are three ways to join/renew:

- 1) Preferred Method: SETAC North America (SNA) ([LINK](#)). SNA will send us your contact information so we can add you to our chapter mailing list. You do not have to be an SNA member to use this option.
- 2) PayPal CPRC ([LINK](#)): Credit cards accepted, no PayPal account needed. Enter appropriate fee amount (\$5 student, \$15 professional). Please note that it is easier for us to track your membership when you join via the SNA site (option1 above).
- 3) Snail Mail: Check and money orders accepted. Please include your name, affiliation and address with your payment.

SETAC-CPRC P.O. Box 2728
Brooklyn, MD 21225
Attn: Meredith Bohannon, Treasurer

Membership renewals occur every December. If you have any difficulty with your membership application or payment, please contact Meredith Bohannon (treasurer.cprc.setac@gmail.com).

CPRC Sponsorship Form



CPRC SETAC Sponsorship Form

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Annual Spring Meeting Student Awards (1st, 2nd, & 3rd place) for best poster or platform presentation	\$250	2		
Student Travel Award to SETAC NA	\$500	Unlimited		
Virtual Poster Contest Student Awards	\$250	1		
Annual Spring Meeting Travel Support for one student (includes short course, meeting registration, overnight)	\$250	Unlimited		
Autumn / Winter Dinner Travel Support for four students	\$250	1		
CPRC EVENTS				
Poster Social / Coffee Break at the Annual Spring Meeting	\$250	2		
Student-Mentor Luncheon during the Annual Spring Meeting	\$500	1		
CPRC Pub Night / Evening Social at SETAC NA meeting	\$1,000	1		
Annual Autumn / Winter Dinner Event with Guest Speaker	\$500	1		
			TOTAL DUE \$	



STEP THREE: PAYMENT INFORMATION

Please submit a completed copy of this form and a check (payable to "CPRC SETAC") to the following address:

CPRC SETAC Treasurer
 PO Box 2728
 Brooklyn, MD 21225
 Attn: Meredith Bohannon

If you have any difficulty with your sponsorship payment, or have any questions, please contact CPRC Treasurer Meredith Bohannon (treasurer.cprc.setac@gmail.com) or (cprc.setac@gmail.com).

CPRC SETAC Sponsorship Form

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Benefit	Primary Producer (\$250/year) ^A	Secondary Producer (\$500/year) ^A	Keystone Sponsor (\$1000+/year) ^A
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Table and poster display space at a CPRC annual meeting (if requested)			✓
Logo appears in CPRC newsletter and meeting documents. Logo and link posted on CPRC website ^C	2 years ^C	3 years ^C	5 years ^C
Advertising in newsletter	Half Page	Full Page	Full Page
Advertising in Spring Meeting Program		Half Page	Full Page

^A Sponsorship Tier is determined by the total amount given on an annual basis from **STEP TWO**.

^B Complimentary Spring Meeting Registrations are granted on an annual basis according to the sponsorship tier with the recommendation that they are to be used within a year.

^C Length of time during which the logo appears in the newsletter, meeting documents, and website is a benefit only and does NOT represent a commitment to provide sponsorship money on an annual basis.



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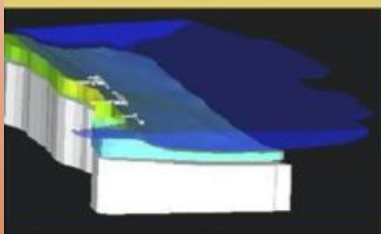
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