Products

Project: 2020RI206B Hybrid Nano-bioreactors For The Treatment Of Recalcitrant Contaminants In Drinking Water.

- Thompson, E., Cretella, K., Shepard, Z., Oyanedel-Craver, V., "Isolation of Manganese Oxide Nanoparticle Producing Bacteria from Drinking Water", American Chemical Society: Division of Environmental Chemistry, April 2021. (Poster, delivered virtually)
- Cretella, K., Thompson, E., Shepard, Z., Oyanedel-Craver, V., "Analysis of Metals in Southern Rhode Island Drinking Water Distribution System", American Chemical Society: Division of Environmental Chemistry, April 2021. (Poster, delivered virtually)
- Shepard, Z., Barbosa DeCastilho, C., Hurt, R., Oyanedel-Craver, V., "High Throughput Screening for Nanosheet Interactions With Bacteria", Sustainable Nanotechnology Organization, November 2020. (Poster, delivered virtually)
- Shepard, Z., Zhang, Y., Anaya, N., Cardace, D., Oyanedel-Craver, V., "Development of Ceramic Water Filter Clay Selection Criteria", American Chemical Society, August 2020, San Francisco. (Poster, delivered virtually)
- Shepard, Z., Barbosa DeCastilho, C., Hurt, R., Cullen, R., Thompson, E., Leone, A., Oyanedel-Craver, V. "Friend or Foe? The Relationship Between Bacterial Growth and Nanosheets," 2nd Pan-American Nanotechnology Conference, March 2020, Águas de Lindoia, Sao Paolo, Brazil. (Poster)
- Shepard, Z., Barbosa DeCastilho, C., Hurt, R., Oyanedel-Craver, V., "Nanosheet Toxicity Dependence on Bacterial Growth Stage", Sustainable Nanotechnology Organization, November 2021. (Poster, delivered virtually)
- Canales, C., Shepard, Z., Andreu-Blanco, I., Oyanedel-Craver, V., "Biosynthesis of Manganese Oxide Nanoparticles", Sustainable Nanotechnology Organization, November 2021. (Poster, delivered virtually)

Project: 2020RI207B Understanding Urban Water Resources And Energy Nexus In Rhode Island

- Akanda, A. S., Wagner, F., Siemon, L., Nusrat, F., & Thiem, L. (2019, December). Leveraging Earth Observations to Monitor and Understand Linkages between Urbanization, Climate Extremes, Heat Islands and Air Quality Indices in Emerging Megacities. In *AGU Fall Meeting Abstracts* (Vol. 2019, pp. GH21B-1209).
- Wagner, F., Nusrat, F., Thiem, L. and Akanda, A.S., An Earth Observations based nexus approach to evaluate the water-energy interactions and human vulnerability in urban regions. ASCE Journal of Water Resources Planning Management, In Progress.

Project: 2020RI208B The Applicability Of South Korean Aquatic Litter Management Strategies To Rhode Island Freshwater Bodies

Nothing to report

Missing Project: Clean Water Rhode Island

- Because of the COVID-19 restriction no summer camp was performed during 2020 and 2021.
- A Water Quality Sensor Kit was prepared containing several sensors and sampling systems was put together to support hands-on activities on middle and high school. With

the funds from this project, the sensors, data loggers, water sampler along with teacher and student were put together and tested. A small focus group with local teacher provided feedback about the materials in the Water Quality kit.

Publications from previously funded projects

- S. Daer, J.E. Goodwill, K. Ikuma. "Effect of ferrate and monochloramine disinfection on the physiological and transcriptomic response of Escherichia coli at late stationary phase" Water Research, Volume 189, 2021
- Franco, P., Spellman, C., Addison, E., and Goodwill, J., "Measuring and Managing Trihalomethanes with Novel Gas Chromatography and Aeration Approaches" 2021 UCOWR/NIWR Annual Water Resources Conference.
- E. L. Addison, K. T. Gerlach, C. D. Spellman, G. Santilli, A. R. Fairbrother, Z. Shepard, J. D. Dudle, J. E. Goodwill, Physicochemical implications of cyanobacteria oxidation with Fe(VI), Chemosphere, Volume 266, 2021.
- Young, K.S.R.; Pradhanang, S.M. "Small Unmanned Aircraft (sUAS)-Deployed Thermal Infrared (TIR) Imaging for Environmental Surveys with Implications in Submarine Groundwater Discharge (SGD): Methods, Challenges, and Novel Opportunities". Remote Sens. 2021, 13, 1331.

Information Transfer Program

- RI Water Resources Virtual Forum, September 13th, 2021. Moderator: Vinka Oyanedel-Craver Director Rhode Island Water Resources Center.
    - Speakers: **Paul Barlow**,*USGS New England Water Science Center*; **Meredith Brady**, *Rhode Island Department of Administration*; **Kathleen Crawley**, *Rhode Island Water Resource Board*; **Timothy Stagnitta**, *Rhode Island Water Resources Board*; **Sue Kiernan**, *Office of Water Resources Rhode Island Department of Environmental Management*; **Zhengkai Li**, *Center for Drinking Water Quality Rhode Island Department of Health*
    - Topics focused on specific agencies research needs
    - Meeting Recording: https://uri-edu.zoom.us/rec/share/gMV9Be5_E1aEXu6A3pKRdJZ6B7_NnS00gISXV6g8ZaPObM57SvSWR4UNmIpb-ao9.aOsJZVlK7J2soUsQ [uri-edu.zoom.us]
    - Meeting notes: https://web.uri.edu/riwrc/files/Rhode-Island-Water-Resource-Virtual-Forum-notes.DSP_.WRB_.pdf
- Water Quality Kit session in November 2021 with Science Teachers from the Burrillville School District from Rhode Island. Kit demonstration and feedback from teachers about modifications needed for the activities.

USGS Collaboration

- Bi-annual meetings with Paul Barlow, Paul Barlow, Associate Director of the Hydrologic Interpretive Program for the USGS New England Water Science Center. The purpose of the meeting is to communicate the activities of the center and received feedback from the NE USGS office.

Student Support

- Farah Nusrat, Ph.D. Student Civil and Environmental Engineering, URI
- Zachary Shepard, Ph.D. Student Civil and Environmental Engineering, URI
- Andrew Sheerin, M.Sc. Student Civil and Environmental Engineering, URI
- Katherine Cretella, Undergraduate Student, Civil and Environmental Engineering, URI
- Sadie LaFleur, Undergraduate Student, Civil and Environmental Engineering, URI
- Brenna Collins, Undergraduate Student, Civil and Environmental Engineering, URI
- Evan Thompson, Undergraduate Student, Biological Sciences, URI

Total: 7 students supported (2 Ph.D, 1 M.Sc, 4 UG)

Notable Achievements and Awards

- Farrah Nusrat, scholarship award from Rhode Island Society of Environmental Professionals for her presentation in the annual conference
- Katherine Cretella, won second place at the UCOWR/NIWR undergrad poster competition
- Professor Joseph Goodwill received and NSF CAREER Award from the CBET Environmental Engineering Program with the project titled “Closing the Rural Water and Education Gap with a Simple Advanced Oxidation Process”