

Connecticut State University Outer Island Education Program Report

Submitted by:

Vincent T. Breslin

Environment, Geography and Marine Sciences

Southern Connecticut State University

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Connecticut State University Outer Island Summer Programs

Outer Island Interns

This year (Summer 2022) two student interns were hired to staff Outer Island and to assist groups with educational programming during their visit to the island. The interns also conducted research activities, including monitoring water quality and fouling, and participated in maintenance activities on the island facilities. This past summer the island interns were Eleni Haskos and Alexis Yashin. Brief bios were provided by the interns and are included below:



Eleni Haskos

Hello! My name is Eleni Haskos and I had the pleasure of interning on Outer Island, a part of the Stewart B. McKinney Wildlife Refuge. I am senior at Southern Connecticut State University studying Biology with a minor in Chemistry and Environmental Studies. Being a part of the Outer Island crew was a wonderful experience as it was multifaceted; from educating visitors, controlling invasive plant species, to water quality testing. This was a great opportunity to widen my scope of knowledge in island ecology. One of my favorite aspects of the job was being welcomed nearly each morning by a nesting pair of herons, one of whom we nick-named “Marge”. I look forward to working with the refuge biologist this upcoming summer as an invasive plant intern!



Alexis Torres

Hi, my name is Alexis Torres. I'm currently an undergraduate at UConn and I'm in the process of designing my own major called "Marine Resource Management and Indigenous Communities". I grew up in Branford and have fond memories of visiting Outer Island for a field trip in 8th grade. I remember the excitement and urge to learn about marine and coastal life that the island keepers taught me that day. I finally got to live out my childhood dream of being an educator for protected lands and environmental habitats. For the past three years I have traveled the globe seeking to explore different cultures, languages and terrains. In 2020, I worked on a trail crew for the Rocky Mountain Youth Corps, then I took a solo road trip down the east coast to Florida where I settled in Miami for a few months. In Spring 2021, I volunteered for All Hands and Hearts in the Bahamas for a few months where I helped build a preschool from the ground up for Hurricane Dorian victims. After the Bahamas I lived in Cartagena, Colombia while teleworking as a student intern for CIRCA UConn. Lastly, I lived in a village next to a dairy farm in the mountains of Bavaria, Germany where I learned some German and took advantage of being surrounded by the pristine landscape. After Germany, I was so excited to return home where I live and work at the Stewart B. McKinney National Wildlife Refuge for the summer. It was a great opportunity to learn more about wildlife and share my passion for it to young children of whom I hoped to inspire enough to go work at Outer as well, just as the interns once did for me.

As in past years, Thimble Island Ferry tickets were purchased on two occasions during the summer for use by the interns and visitors to Outer Island (\$2,800). Both interns did an outstanding job in providing visitor services during another challenging summer following the pandemic. Student interns each received a salary processed via CCSU. Both Eleni Haskos (\$1,344) and Alexis Torres (\$1,929) received 3 credits tuition payments as part of their compensation for summer 2022.

Schedule of Visitors

The island interns supervised group visitors on Outer Island from May 25th until the island seasonal closing on September 25th, 2022. Those visitors included twelve different groups that scheduled 19 separate visits during the summer 2022 with an estimated 350 visitors participating in education programs (see attached schedule). Both the number of scheduled groups and the total number of scheduled group visitors to Outer Island in summer 2017 were comparable to previous years. Many of the scheduled groups have visited the island in previous years. Some of the notable first-time visitors to the island included the Cub Scouts and Girl Scout Troops, members of the Southeastern CT Adventurers Kayakers and staff members the Yale Sustainable Food Program.

| Outer Island Visitor Schedule 2022 | | | | | | |
|------------------------------------|--------|--------------------|------------|--------------------------------------|--------------------------|--|
| CSU Escort | Date | Time | Attendance | Organization | Contact | email |
| Interns | 31-May | 1:00 pm - 3:00 pm | 20 | Hopkins School, New Haven | Emilie Harris | eharris@hopkins.edu |
| Shaun Roche | 2-Jun | 10:00 am - 2:00 pm | 25 | US Fish & Wildlife School Group | Shaun Roche | Shaun_Roche@fws.gov |
| Shaun Roche | 3-Jun | 10:00 am - 2:00 pm | 25 | US Fish & Wildlife School Group | Shaun Roche | Shaun_Roche@fws.gov |
| Shaun Roche | 6-Jun | 10:00 am - 2:00 pm | 25 | US Fish & Wildlife School Group | Shaun Roche | Shaun_Roche@fws.gov |
| Shaun Roche | 7-Jun | 10:00 am - 2:00 pm | 25 | US Fish & Wildlife School Group | Shaun Roche | Shaun_Roche@fws.gov |
| Interns | 13-Jun | 9:00 am - 1:00 pm | 25 | Brass City Charter School | Becca Caravello | bcaravello@brasscitycharter.org |
| Interns | 15-Jun | 9:00 am - 12:00 pm | 15 | Arts and Ideas, Yoga Event | FOI | bergemann1@southernct.edu |
| Interns | 22-Jun | 12:00 pm - 2:00 pm | 20 | Arts and Ideas, New Haven | FOI | bergemann1@southernct.edu |
| Interns | 27-Jun | 10:00 am - 2:00 pm | 15 | SCSU Faculty Development | Suzie Humanski | humanskis1@southernct.edu |
| Interns | 21-Jul | 10:00 am - 2:00 pm | 6 | Yale Sustainable Food Program | Jaqueline Munno | jaqueline.lewin@yale.edu |
| Interns | 24-Jul | 1:00 pm - 4:00 pm | 12 | Cub Scout Pack 26 | Matt Peregrin | matthew.peregrin@gmail.com |
| Interns | 3-Aug | 9:00 am - 12:00 pm | 15 | Friends of Outer Island Yoga | Chris Gaynor | bergemann1@southernct.edu |
| Interns | 18-Aug | 11:00 am - 1:00 pm | 15 | Girl Scouts of America | Melissa Iles | milles@gsaact.org |
| Interns | 24-Aug | 9:00 am - 12:00 pm | 15 | Friends of Outer Island Yoga | Chris Gaynor | bergemann1@southernct.edu |
| Interns | 27-Aug | 2:00 pm - 4:15 pm | 12 | Girl Scout Troup 60875 | Vaneza Clarke | troup60875@gmail.com |
| FOI | 31-Aug | 9:00 am - 12:00 pm | 15 | Friends of Outer Island Yoga | Chris Gaynor | bergemann1@southernct.edu |
| FOI | 8-Sep | 9:00 am - 1:00 pm | 27 | Foote School, New Haven | Allison Moncriet Bromage | amoncrietbromage@footeschool.org |
| FOI | 17-Sep | 2:00 pm - 6:00 pm | 15 | Friends of Outer Island, End of Year | Ian Bergemann | bergemann1@southernct.edu |
| FOI | 18-Sep | 11:00 am - 1:00 pm | 12 | Southeastern CT Adventurers | Carolyn van Gemert | civanp0101@gmail.com |

Research Activities

Water Quality Monitoring



Water quality parameters were monitored by the CSU interns during the summer 2022 from May 31st to August 5th. Water quality monitoring occurred each day at 2:00 pm from the end of the floating dock. Water quality parameters monitored included: water temperature, salinity, conductivity, specific conductance, dissolved oxygen, Secchi disk depth, turbidity, and pH. All measurements were made on water samples collected from at a depth of one meter.

Salinity measurements showed little variability, with a range of only 26.5 ppt (5/31) to 29.0 ppt (7/17), while conductivity showed a slightly larger range from 34.70 mS (5/31) to 44.07 mS (7/23) (Figure 1a). Both parameters showed similar variability compared to previous years. Water temperature gradually increased from the spring to the end of the summer. Water temperature ranged from 16.7°C (5/31) to a high of 25.3°C

(8/4). Variations in water temperature over the summer correlated well with changes in measured air temperature (Figure 2). Dissolved oxygen concentrations were highest initially (8.82 mg/L) on 5/31 and showed a decrease over the summer months correlating with increasing temperatures reaching a low of 6.38 mg/L on 7/26 (Figure 1b).

Water clarity, as measured by a Secchi disk, varied from 0.8 m (7/7) to 1.6 m (8/2) during the monitoring period (Figure 3a). pH ranged from a low of 7.92 (7/31) to a high of 8.15 (8/4) (Figure 3b). Like other parameters this season, water clarity/turbidity and pH showed less variation than previous years.

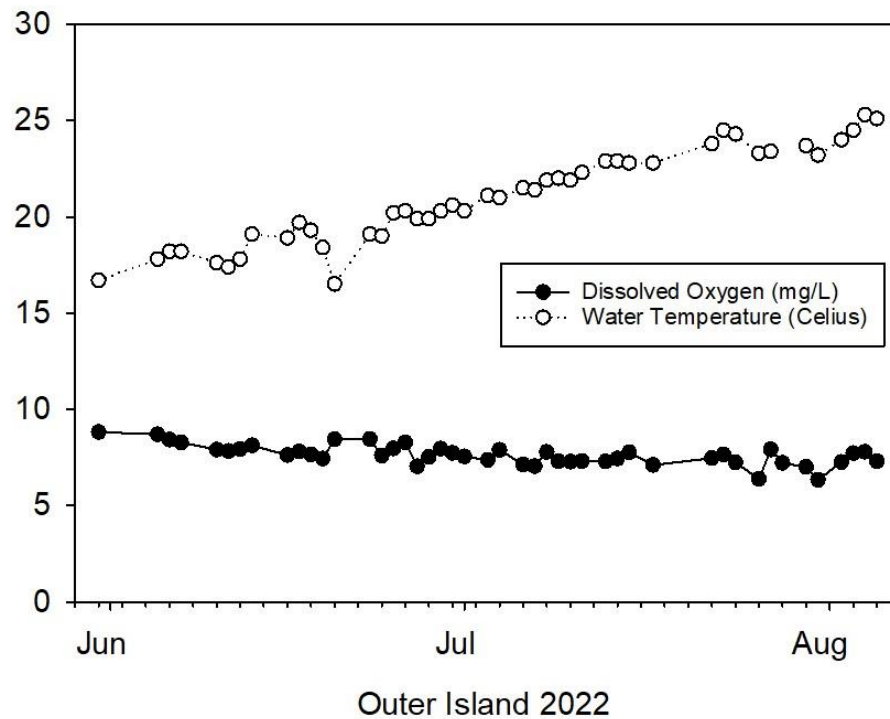
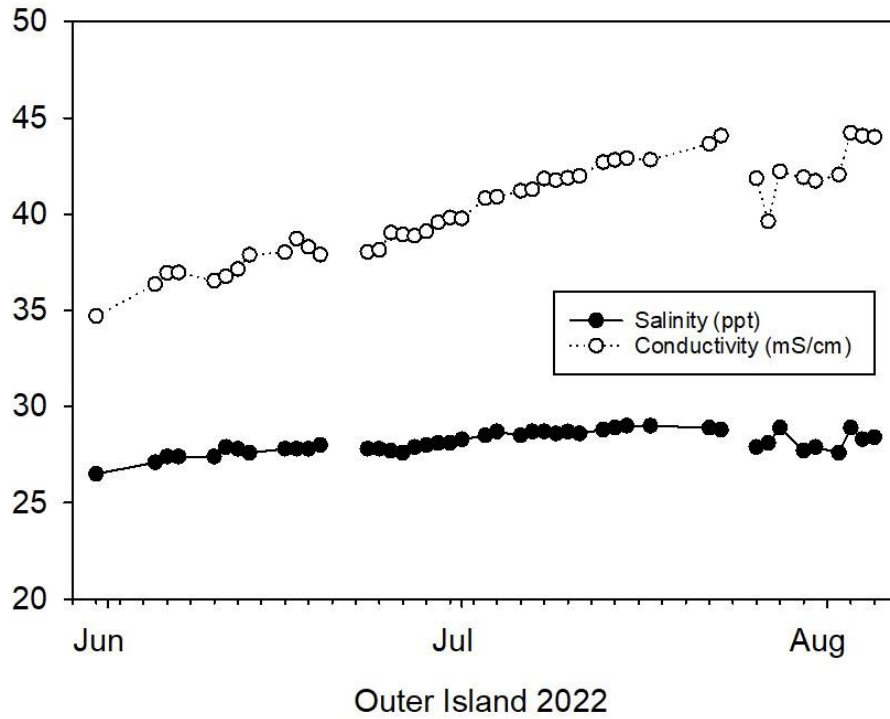


Figure 1. Outer Island 2022 water quality monitoring results: (a) salinity and conductivity and (b) temperature and dissolved oxygen.

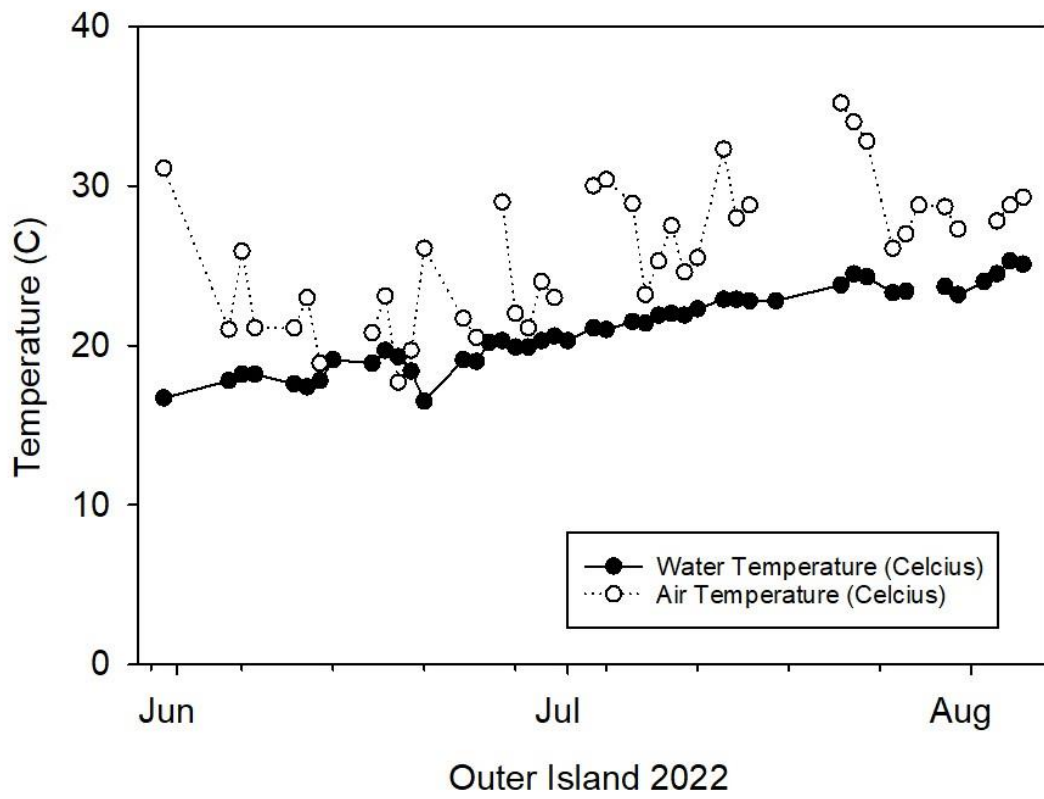
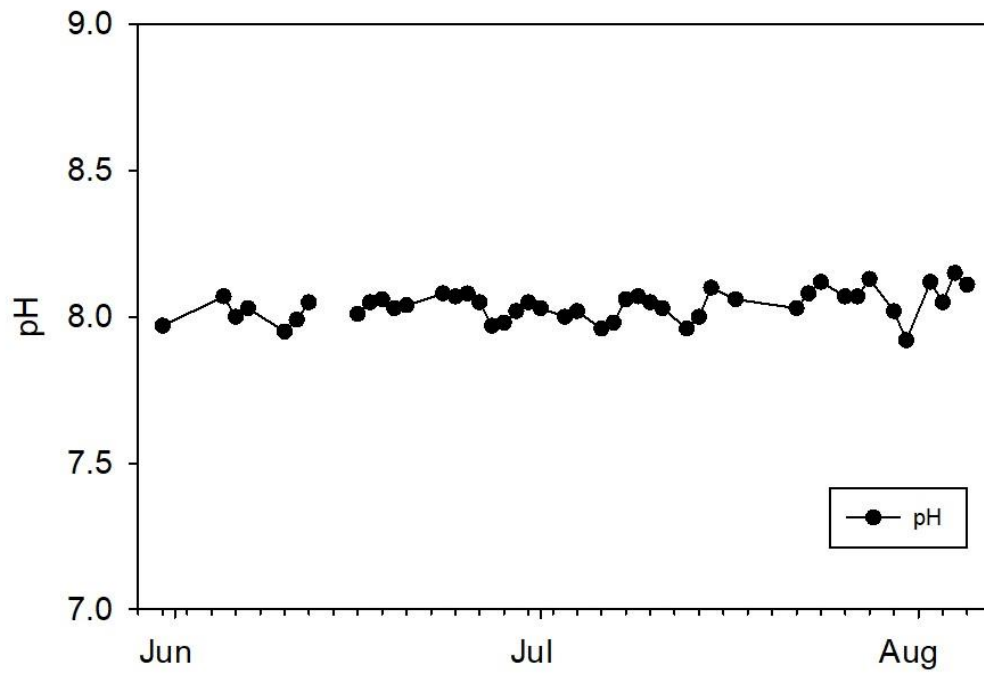
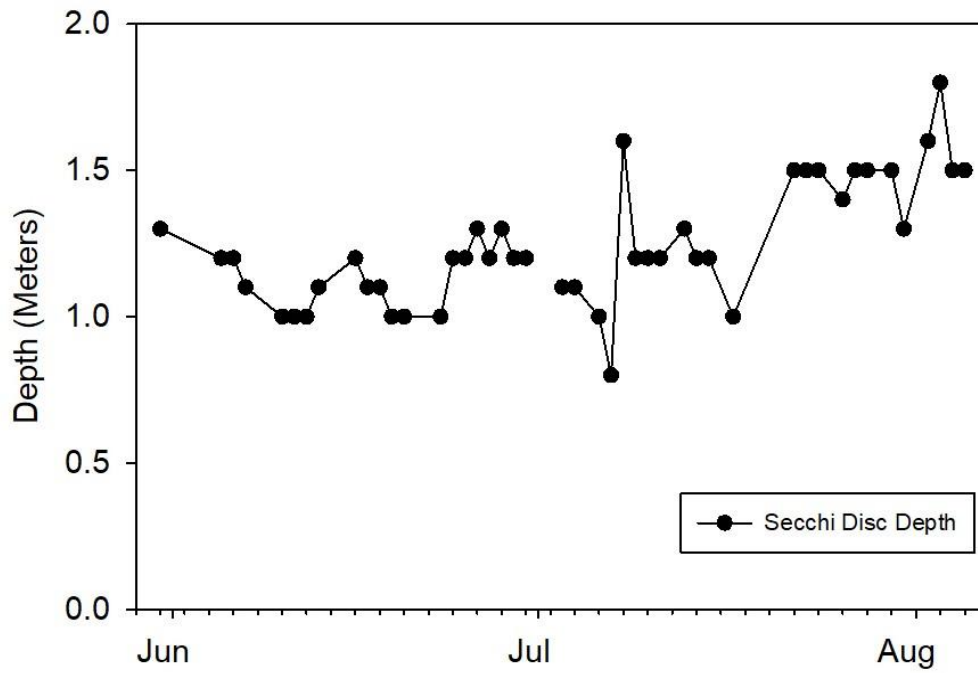


Figure 2. Outer Island water quality monitoring results: water and air temperature.



Outer Island 2022



Outer Island 2022

Figure 3. Outer Island water quality monitoring results: (a) pH and (b) secchi disk depth.

HOBO Water Quality Probes

This past summer, we deployed three Onset water quality data loggers on the pier at Outer Island including a HOBO Saltwater Conductivity/Salinity Data Logger, pH and temperature logger and a Dissolved Oxygen data logger. These data loggers allow for continuous water quality data monitoring and allow for extending the water quality monitoring program beyond the time the interns are on the island.



This past summer we deployed ONSET water quality probes for continuous water quality monitoring. These probes were returned to ONSET for battery upgrades and servicing prior to deployment. These probes measured temperature, conductivity, dissolved oxygen and pH from July 21 to September 14, 2022. The probes were mounted using PVC pipe as a framework to hold the probes and allow attachment to the pier at a fixed height of 1 meter above the bottom (subtidal). The framework worked well and the probes recorded data for seven weeks. The conductivity probe did not properly function due to biofouling. A comparison of the probe data to the intern data (7/22-8/5) shows similar results for all parameters measured.

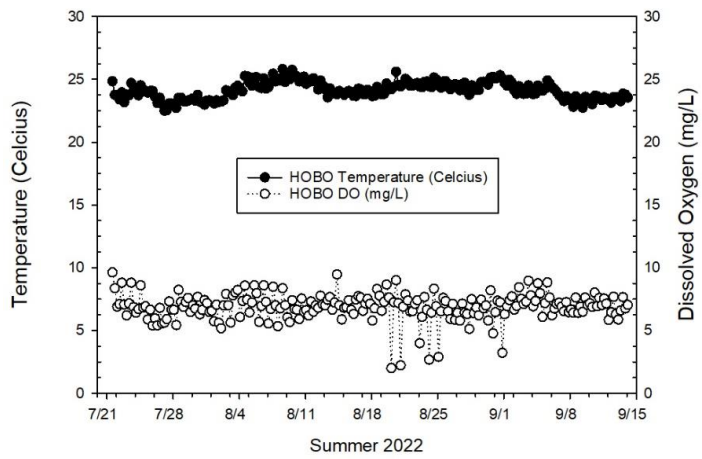
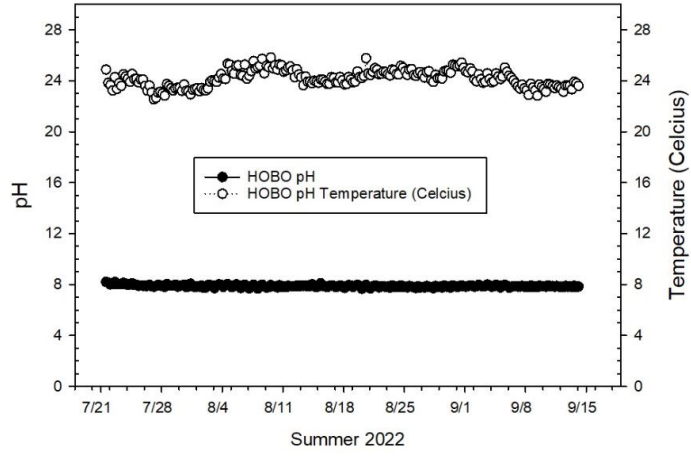
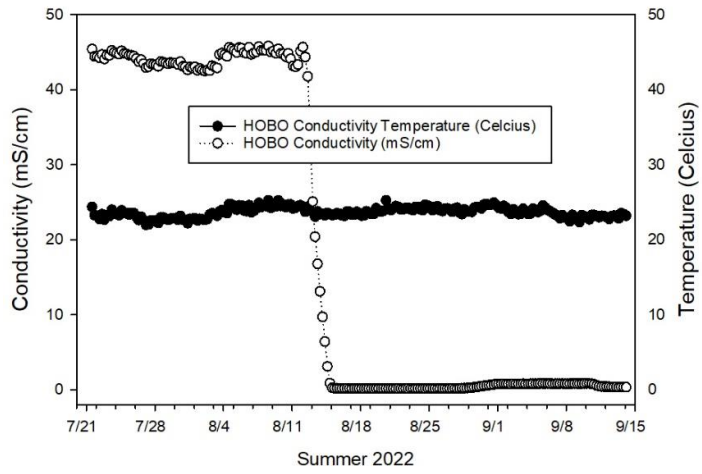


Figure 4. ONSET probe results for the measurement of conductivity (top), pH (middle) and dissolved oxygen (bottom).

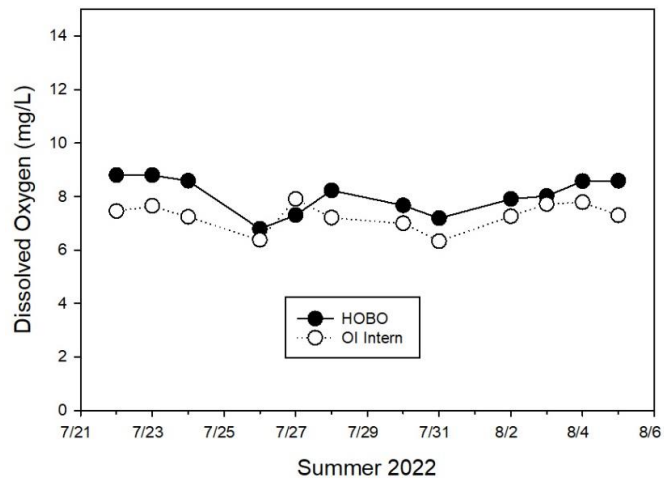
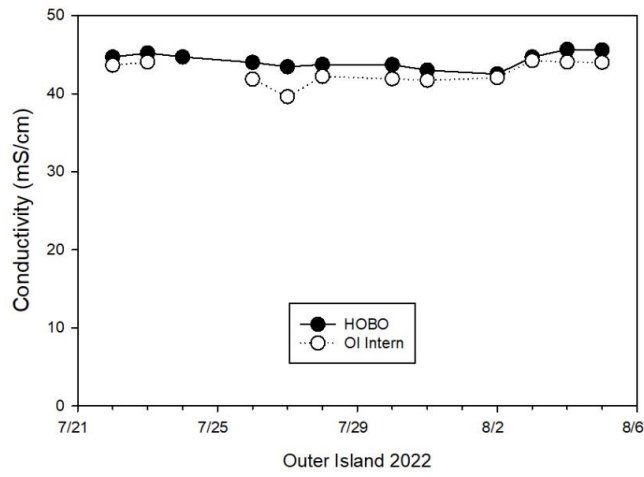
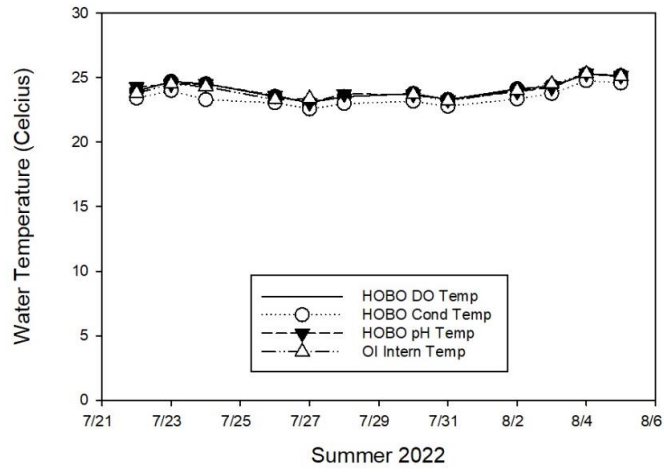


Figure 5. Comparison of water quality measurements made by the interns and probes for temperature (top), conductivity (middle) and dissolved oxygen (bottom).

Water Quality and Supplies for Education Programs

Additional supplies were purchased in support of the water quality monitoring and education programs. Environmental quality meters (weather meters and pH probes) were purchased to replace older, poorly functioning equipment. The new meters will assure continued water quality measurements for the summer 2023. These supplies supplement previously purchased supplies to be used in support of visiting groups and educational programming.

Nine new environmental/marine themed books were purchased for the Outer Island library (see photo and attached bibliography for titles) in support of educational programs. Several of the children books feature diversity and inclusion themes (characters/language). The island now has a diverse collection of marine reference books and children's books for the public use.



Outer Island Children's Library

- Befort, O. (2019). *Backpack explorer: Beach Walk*, Storey Publishing. ISBN: 9781612129020, Pages 1-48.
- Burgess, T. W., Southwick, W. H., & Sutton, G. M. (2005). *The Burgess seashore book for children*. Dover Publications. ISBN: 978-0486442532, Pages 1-288.
- Diesen, D., & Hanna, D. (2019). *The pout-pout fish cleans up the ocean* (First edition). Farrar Straus Giroux. ISBN: 978-0374309343, Pages 1-32.
- Garrow, L. illus, & Tibbitts, C. K. (1999). *Seashells, Crabs & Sea Stars*. NorthWord. ISBN: 978-1559716758, Pages 1-48.
- Murray, L., (2019) *Beneath the Waves*, Big Picture Press, ISBN 978-1-5362-1040-8, pages 1-60.
- Muñoz Ryan, P., (2003), *Hello Ocean / Hola Mar*, Charlesbridge Publishing, ISBN 978-1-57091-372-3, pages 1-32.
- Pfister, M., (1992) *The Rainbow Fish / Il Pesce Arcobaleno*, NordSud Verlag AG, ISBN 978-0-7358-4370-7, pages 1-29.
- Rosa-Mendoza, G., (2021) *Who Lives in the Sea? / ¿Quién vive en el mar?*, Chosen Spot Publishing, ISBN 978-1-945296-09-3, pages 1-17.
- Scales, H., (2022) *What a Shell Can Tell*, Phaidon Press, ISBN 978-1-83866-431-2, pages 1-47.
- Sibley, D. (2020). *What it's like to be a bird: What birds are doing, and why -- from flying to nesting, eating to singing*. Alfred A. Knopf. ISBN: 978-0307957894, Pages 1-240.
- Stahl, B. (2019). *Save the ocean*. Bethany Stahl. ISBN: 978-1732395138 Pages unknown.
- Trinick, L., White, T., (2021) *Oceanarium*, Big Picture Press, ISBN 978-1-78741-631-4, Pages 1-96.
- Weiss S., (2018) *Ocean: Secrets of the Deep*, White Star s.r.l, ISBN 978-1-9999680-7-6, Pages 1-71
- Wright, A., & Peck, M. H. (1992). *At home in the tide pool*. Charlesbridge. ISBN: 978-0881064834, Pages 1-32.

Outer Island Website Update

We continue to revise the Outer Island website (www.outerisland.org) to create a more informative, user friendly interface for Outer Island information and educational programming. The Outer Island website is hosted on iPage (www.iPage.com). The website hosts the two web cameras on the landing page of the website. We did experience a loss of the image of the west (marsh) camera. This past summer we invited the Earth Works Network to the island to examine the camera performance and evaluate the components of the weatherbug weather station. During this visit, the west camera image on the home page was restored. However, the signal from the camera was lost once again in the fall 2022. We will have the Earth Works Network out to the island in the spring to re-establish access to the camera.

We were fortunate to identify and hire Paul Johnson, a website coordinator, in fall 2022 to continue to post new content. Paul is a graduate of SCSU Computer Science department. The loss of the past student web manager has resulted in some content not being updated as frequently as desired; some elements have not been updated in the past 2-3 years. Although some elements of the website are out of date, the visitor calendar continues to be updated frequently and continues to be a resource for scheduling educational and civic group programs.

Recent updates to the website have been completed, or are scheduled to be completed including:

- Changes to the homepage (removal of Covid restrictions)
- Intern bios (2021, 2022 and 2023)
- Water quality data (2021, 2022) and

- Annual reports (2021, 2022)
- Attendance reports (2021, 2022 and 2023)

AT&T Wireless Account

The AT&T wireless account used in support of the Outer Island WeatherBug station and video cameras now supports two wireless lines transmitting data and images. The two lines support the cameras and WeatherBug weather data. AT&T broadband access fees for the wireless for the 12 months service period from April 2022 to March 2023 totaled \$1,230.

Outer Island Watercolor Workshop/Art Experience

Unfortunately, the Watercolor workshop was cancelled for this past year.

| SCSU Outer Island Funds Accounting 2022-2023 | | | | | | | |
|---|--|--|--|---------------------------|--|--|--------------------------------|
| Category | | | | | | | Funds |
| Personnel | Paul Johnson | | | | | | |
| | Outer Island website maintenance | | | | | | |
| | Personal Service Agreement (80 hours @ \$50/hour) | | | | | | \$4,000 |
| | Total Personnel | | | | | | \$4,000 |
| Tuition | (3 credits) | | | | | | |
| | Alexis Torres | | | | | | \$1,929 |
| | Eleni Haskos | | | | | | \$1,344 |
| | Total Personnel and Tuition | | | | | | \$7,273 |
| Supplies | | | | | | | |
| | Eureka | | | | | | \$286 |
| | | | | | | | \$549 |
| | Water Quality, Weather Meters | | | Forestry Suppliers | | | \$783 |
| | Laboratory and field supplies | | | Home Depot | | | \$163 |
| | | | | | | | \$135 |
| | Probes and Probe Repair | | | Onset | | | \$574 |
| | | | | | | | \$142 |
| | Educational Supplies and Books | | | Amazon | | | \$36 |
| | | | | | | | \$240 |
| | | | | | | | \$81 |
| | Staples | | | | | | \$197 |
| | Total Supplies | | | | | | \$3,184 |
| Travel (in State) | | | | | | | |
| | Thimble Islands Ferry Tickets to Outer Island | | | | | | |
| | | | | | | | 6/6/2022 \$1,400 |
| | | | | | | | 7/28/2022 \$1,400 |
| Other | | | | | | | |
| | Annual AT&T Broadband Access fees | | | | | | |
| | | | | | | | (12 x \$102.49) \$1,230 |
| | Total Funds Disbursed 2022-2023 | | | | | | \$14,487 |