2016 Long Island Sound Research Conference

Friday May 13, 2016
Holiday Inn Bridgeport (CT)

Acknowledgments

Support for the 2016 Long Island Sound Research Conference was provided by the EPA Long Island Sound Study through award LI-96172701 to the Connecticut Sea Grant Program, University of Connecticut. Thank you for the support that enabled the continuation of this conference.

The conference is co-sponsored by the Long Island Sound Study, Connecticut Sea Grant and New York Sea Grant. Many thanks to Sue McNamara and the Long Island Sound Foundation for its longtime support and management of this conference. We miss you Sue, and wish you well!

Logistics

Anyone who parked in the hotel garage (directly behind hotel) received a pink ticket when you parked your car. Please bring the ticket to the HOTEL FRONT DESK to have it validated.

Every registrant received one ticket for a chance at a door prize. At the end of the day, several items will be given away before the closing remarks are made.

Many thanks to all those who helped put this conference together, including Syma Ebbin, Peg Van Patten, Nancy Balcom, Andrea Kelly, Bill Wise, and Sylvain De Guise. Thanks to our reviewers and our moderators.

AGENDA

(* denotes student presenter)

8:00 am	**Registration** and light continental breakfast (outside Harbor Ballroom 2&3) **Poster presentation set-up** (Harbor Ballroom 1)	
9:00 am	**Welcome** (Harbor Ballroom 2&3) *Sylvain De Guise,* Connecticut Sea Grant	
9:10 am	**Plenary: LIS Seafloor Mapping Initiative** *Ivar Babb,* Director, Northeast Underwater Research Technology & Education Center *Kevin O'Brien,* CT Department of Energy and Environmental Protection	
9:40 am	**Break for concurrent sessions**	
9:50 am	**Concurrent Session 1**	
	Sound Science and Inclusive Management (Lido Room) Moderator: *William Wise,* New York Sea Grant	**Sustainable and Resilient Communities** (Bishop Bronson Room) Moderator: *Sylvain De Guise,* Connecticut Sea Grant
9:50 am	**Atlantic Sturgeon in Connecticut waters** *Tom Savoy* CT Department of Energy & Environmental Protection	**Changes in the statistics of sub-tidal sea level fluctuations in Long Island Sound** *James O'Donnell[1], Jennifer O'Donnell[2]* [1]University of Connecticut [2]Coastal Ocean Analytics
10:10 am	***Isolating the influence of coastal islands on river water pathways and mixing in western Long Island Sound: July 2015** *Steven R. Schmidt, Michael M. Whitney, Yan Jia* University of Connecticut	**Predicting a response to warming in the copepod genus *Acartia* in the North East USA** *Hans G. Dam[1], Michael Finiguerra[1], Benjamin Cournoyer[1], David Avery[2]* [1]University of Connecticut [2]Maine Maritime Academy

10:30 am	***Fate of the Connecticut River water: main routes and corresponding time scales** *Yan Jia, Michael Whitney* University of Connecticut	***Will coastal landowners allow tidal marsh migration?** *Chris Field[1], Ashley Dayer[2], Chris Elphick[1]* [1]University of Connecticut [2]Virginia Tech
10:50 am	**Break**	
11:00 am	**Concurrent Session 2**	
	Clean Waters and Healthy Watersheds (Lido Room) Moderator: *Chet Arnold,* CLEAR and UConn Extension	**Thriving Habitats and Abundant Wildlife** (Bishop Bronson Room) Moderator: *Syma Ebbin,* Connecticut Sea Grant
11:00 am	**New insights into eutrophication in Long Island Sound** *Gary H. Wikfors, Julie M. Rose, Shannon L. Meseck, Judy Li May* NOAA Fisheries Service	**Upslope migration of a Long Island Sound tidal marsh as a function of upland land use** *Shimon C. Anisfeld[1], Katharine Cooper[1], Andrew C. Kemp[2]* [1]Yale University [2]Tufts University
11:20 am	**Ecosystem services valuation of shellfish resources provided to a Long Island Sound municipality** *Julie M. Rose[1], Mark Dixon[1], Anthony Dvarskas[2], Roger Bowgen[3], Gary H. Wikfors[1]* [1]NOAA Fisheries Service [2]Stony Brook University [3]Greenwich Shellfish Commission	**Tidal marsh birds are not thriving in Long Island Sound** *Chris S. Elphick[1], Alyssa Borowske[1], Jonathan B. Cohen[2], Maureen D. Correll[3], Christopher R. Field[1], Thomas P. Hodgman[4], Adrienne I. Kovach[6], Brian J. Olsen[3], Katharine J. Ruskin[1], Emma Shelly[1], W. Gregory Shriver[5], Whitney A. Wiest[5]* [1]University of Connecticut [2]State University of New York College of Environmental Science and Forestry [3]University of Maine [4]Maine Dept. of Inland Fisheries and Wildlife [5]University of Delaware [6]University of New Hampshire
11:40 am	***Quantifying the stormwater management benefits of bioretention in New Haven, CT: from grey to green infrastructure** *Kelsey Semrod, Gaboury Benoit* Yale University	***Living Shorelines: Are Reef Balls® a viable strategy for shellfish habitat, remediation & erosion control in Connecticut's coastal waters?** *Lisa Piastuch, Jennifer Mattei, Mark Beekey, LaTina Steele* Sacred Heart University

12:00 pm 12:40 pm	**Lunch and Networking** **Invited Plenary:** Fishing and Farming in LIS *DJ King*, King Lobsters and Montowese Bay Oysters (Harbor Ballroom 2&3)	
1:00 pm	**Poster Presentations** (Harbor Ballroom 1)	
2:00 pm	**Concurrent Session 3**	
	Clean Waters and Healthy Watersheds (Lido Room) Moderator: *Carmela Cuomo,* University of New Haven	**Thriving Habitats and Abundant Wildlife** (Bishop Bronson Room) Moderator: *Paul Anderson,* Mystic Aquarium
2:00 pm	**Application of a linked hydrodynamic-harmful algal bloom model for assessment of management scenarios to impaired Long Island embayments** *Elizabeth M. Lamoureux[1], Raghav Narayanan[1], John P. Connolly[1], Shuhei Miyasaka[1], Christopher Gobler[2]* [1]Anchor QEA, LLC [2]SUNY Southhampton	**Habitat restrictions for fish and lobster: Results of a high resolution climate change model for Long Island Sound** *Penny Howell[1], Nickitas Georgas[2], Vincent Saba[3], Kurt Gottschall[1], Deb Pacileo[1]* [1]CT Department of Energy & Environmental Protection [2]Stevens Institute of Technology [3]NOAA Fisheries Service
2:20 pm	**Alkylphenols in Long Island Sound are toxic to lobster larvae and affect their development, molting and metamorphosis** *Hans Laufer, Ming Chen* University of Connecticut	**Spatial distribution and temporal variability of the blue crab, *Callinectes sapidus,* in eastern Long Island Sound** *Howard M. Weiss, James Downs* Project Oceanology
2:40 pm	**Evidence of plastic microbead contamination in New Haven Harbor** *Vincent Breslin, Peter Litwin, James Tait* Southern Connecticut State University	**Paying respect to the elders in marine recreational fisheries management: Tautog as a case study** *Amanda Caskenette[1], Jason Vokoun[2], Eric Schultz[2]* [1]Fisheries & Oceans Canada [2]University of Connecticut
3:00 pm	***Distribution of the invasive colonial tunicate, *Botrylloides violaceus,* in Long Island Sound** *Marisa Bottari, Carmela Cuomo* University of New Haven	***Sound fisheries management: developing a regional stock assessment for Tautog** *Jacob M. Kasper[1], Amanda Caskenette[2], Jason Vokoun[1], Eric T. Schultz[1]* [1]University of Connecticut [2]Fisheries & Oceans Canada

3:20 pm	**Break**	
3:40 pm	**Concurrent Session 4**	
	Clean Waters and Healthy Watersheds (Lido Room) Moderator: *Syma Ebbin,* Connecticut Sea Grant	**Thriving Habitats and Abundant Wildlife** (Bishop Bronson Room) Moderator: *Nancy Balcom,* Connecticut Sea Grant
3:40 pm	**Flow-adjusted trends in nutrients, organic carbon and chloride in Long Island Sound tributaries, 1973-2013** *John R. Mullaney* U.S. Geological Survey	**Trends in the physical and biological structure of the Thames River estuary** *Karina Lorenz Mrakovcich, Deanna L Bergondo, Lucy S. Vlietstra, Sam C. Wainwright* U.S. Coast Guard Academy
4:00 pm	**Nitrogen reduction pathways in estuarine sediments: Influences of organic carbon and sulfide** *Craig Tobias[1], Patrick Plummer[2]* [1]University of Connecticut [2]U.S Coast Guard Academy	**Summer on the marsh: A case study for integrating citizen science to monitor a priority habitat in Long Island Sound** *Paul Anderson[1], Danny Badger[2], Meagan Gonneea[3], Mary Ellen Mateleska[1], Aimee Bonanno[4]* [1]Mystic Aquarium [2]New England Aquarium [3]U.S. Geological Survey [4]New England Ocean Science Education Collaborative
4:20 pm	***High temporal resolution data illuminates controls on dissolved organic carbon in a large watershed** *Matthew Shultz[1], Peter Raymond[1], Brian Pellerin[2], George Aiken[2]* [1]Yale University [2]U.S. Geological Survey	**Validation of a commercial cytokine assay to help measure the health of stranded pinnipeds** *Milton Levin[1], Tracy Romano[2], Keith Matassa[3], Sylvain De Guise[1]* [1]University of Connecticut [2]Mystic Aquarium [3]Pacific Marine Mammal Center
4:45 pm	**Drawing for Door Prizes and Closing Remarks** (Harbor Ballroom 2&3) *Jim Ammerman*, LISS Science Coordinator	
5:00 pm	**Adjourn**	

POSTER PRESENTATIONS

(Harbor Ballroom 1)

Sound Science and Inclusive Management

1. *The benthic geologic habitats of Long Island Sound in the vicinity of the Thimble Islands and Branford River, Connecticut, USA
Joshua Bartosiewicz, Bryan A. Oakley
Eastern Connecticut State University

2. *Lifted from the dust: Digitizing and analyzing the ~40 year data set collected by Project Oceanology
Jacob Snyder[1], Hannes Baumann[1], Lauren Rader[2]
[1]University of Connecticut, [2]Project Oceanology

3. *Establishing timescales to detect trends in sea surface temperature and dissolved oxygen in Long Island Sound
Allison Staniec, Penny Vlahos[1]
University of Connecticut

Sustainable and Resilient Communities

4. *Structural resiliency assessment of coastal residential homes along Connecticut's shoreline
Jeffrey Weston, Wei Zhang, Jin Zhu
University of Connecticut

5. *Framework of coupled dynamic analysis of vehicle-bridge-wind-wave system for slender coastal bridges
Jin Zhu, Wei Zhang
University of Connecticut

Clean Waters and Healthy Watersheds

6. The Yale Experimental Watershed (YEW)
Gaboury Benoit, Leana Weissberg
Yale University

7. *Detection of estrogens in the Quinnipiac River using bioluminescent yeast assays
Kimberly Johnson, Jean-Paul Simjouw, Melanie Eldridge
University of New Haven

8. *Assessing the efficiency and ecological impacts of various anti-fouling methods
Elias Kane
Fishers Island School

9. Remote sensing of a ciliate red tide in Long Island Sound
George McManus, Heidi Dierssen, Senjie Lin
University of Connecticut

19. *Plant Growth and Seasonal Denitrification in Wetlands
Priscilla Moley[1], Mary Alldred[2], John Haviland[1], Stephen Baines[1]
[1]Stonybrook University, [2]Baruch College - CUNY

10. *Densities of phytoplankton in an acidic ocean
Mackenzie Switz
Fishers Island School

11. *Comparison of sediment cadmium concentrations in Black Rock and Stonington Harbors, CT
Sadia Younas, Vincent Breslin
Southern Connecticut State University

12. Investigating the effects of storm and wastewater on the bio-uptake and transfer of heavy metals in urban stream food webs
Bin Zhu, Dylan Rossi, Man Lok Yu[1]
University of Hartford

Thriving Habitats and Abundant Wildlife

13. Viability and utility of µUAS for wetland monitoring
Scott M. Graves, Peter Broadbridge
Southern Connecticut State University

14. *The nearshore fish fauna of Orchard Beach, Bronx NY
Jesse Keltz, Maryann McEnroe
Purchase College, SUNY

15. *Field and lab investigation of desiccation tolerance of the invasive *Hemigrapsus sanguineus* (Asian shore crab)
Lara Pratt, George Kraemer
SUNY Purchase

16. LIS Gulls and Plankton Project: What do seabirds eat in LIS?
Thomas Robben, Jack Barclay, Charles Barnard, Patrick Comins, Larry Flynn, M. Lyman, Frank Mantlik, Keith Mueller, S. Robben, Dennis Varza
Research Committee, Connecticut Ornithological Association

17. Seasonal patterns of hydroacoustically derived finfish biomass in the Thames River estuary, Connecticut
Lucy Vlietstra
U.S. Coast Guard Academy

18. Keys to the larvae of common brachyuran crabs in Long Island Sound
Howard M. Weiss[1], Margaret (Peg) Van Patten[2]
[1]Project Oceanology, [2]Connecticut Sea Grant

Contributed Oral Presentation Abstracts

*(Alphabetical by first author; * denotes student presenter)*

Summer on the marsh: A case study for integrating citizen science to monitor a priority habitat in Long Island Sound. **Paul Anderson**[1], Danny Badger[2], Meagan Gonneea[3], Mary Ellen Mateleska[1], Aimee Bonanno[4], [1]Mystic Aquarium,[2]New England Aquarium, [3]U.S. Geological Survey, [4]New England Ocean Science Education Collaborative. panderson@mysticaquarium.org.

Summer on the Marsh" is a citizen science project developed by the New England Ocean Science Education Collaborative to monitor salt marsh health, a priority habitat of the Long Island Sound Study's Comprehensive Conservation and Management Plan (CCMP), and increase people's awareness of and visitation to priority habitats and stewardship sites. Eight New England environmental education institutions, including two in Long Island Sound, have participated. The Collaborative planned and executed the project according to citizen science best practices, engaged 290 youth, 31 educators and scientists, and disseminated results to 1,491 people. The project fulfilled action items within two themes of the CCMP: Thriving habitats and abundant wildlife, and sustainable and resilient communities.

Upslope migration of a Long Island Sound tidal marsh as a function of upland land use. **Shimon C. Anisfeld**[1], Katharine Cooper[1], Andrew C. Kemp[2],[1]Yale University,[2]Tufts University. shimon.anisfeld@yale.edu.

To thrive in a time of rapid sea-level rise, marshes will need to migrate upslope into adjacent uplands. Yet little is known about the mechanics of migration, especially in urbanized estuaries like LIS, where the adjacent upland is likely to be a mowed lawn rather than a wooded natural area. We studied marsh migration in a Westport, CT salt marsh using hydrologic, edaphic, and biotic sampling along marsh-to-upland transects in wooded and lawn environments. We found that the overall pace of marsh development was largely unaffected by whether the upland was lawn or wooded, but the marsh-edge plant communities that developed in these environments were quite different, and some indicators (soil salinity, foraminifera) appeared to migrate more easily into lawns.

Distribution of the invasive colonial tunicate, Botrylloides violaceus, in Long Island Sound. **Marisa Bottari**[1], Carmela Cuomo[1.],[1]University of New Haven. ccuomo@newhaven.edu.

The introduction of nonindigenous species (NIS) into coastal waters occurs worldwide, including in Long Island Sounds (LIS). Over time, many NIS in LIS have become invasive and impacted the LIS ecosystem. One of the most recent invaders to LIS is the colonial violet tunicate Botrylloides violaceus. B. violaceus is known to cause damage to ship hulls, docks, and aquaculture operations; it has also altered the structure of fouling communities and had negative impacts on biodiversity in areas where it has become fully established. While this species has been reported as occurring in LIS, the extent of its presence within LIS is not known. This study documented and mapped the present distribution of B. violaceus throughout LIS. Results indicate that B. violaceus is present in the ELIS, CLIS, and WLIS Basins along the northern coastline but is only present in the WLIS basin along the southern coastline of the Sound. The implications of its distribution with regards to point of entry, mode of dispersal, and potential for further spread as well as its distribution relative to other invasive tunicates in LIS will be discussed, in particular as these relate to management of invasive species within the LIS ecosystem.

Evidence of plastic microbead contamination in New Haven Harbor. **Vincent Breslin**[1], Peter Litwin[1], James Tait[1], [1]Southern Connecticut State University. breslinv1@southernct.edu.

Plastic microbeads (< 5mm) in cosmetic and skin care products bypassing municipal wastewater treatment systems may cause harm to marine ecosystems yet no systematic study has been conducted to confirm their presence in Long Island Sound. New Haven harbor was sampled by towing an 80 µm mesh plankton net at the water surface along four predetermined transects in June 2015 and the water samples examined for the presence of plastic microbeads. A total of 28 plastic microbeads were found in four plankton tows conducted on two separate

occasions. Plastic microbeads matched the size and color of microbeads isolated from cosmetic products and microbead concentrations ranged from 0.031 to 0.18 microbeads per cubic meter of water.

Predicting a response to warming in the copepod genus Acartia in the North East USA. **Hans G. Dam**[1], Michael Finiguerra[1], Benjamin Cournoyer[1], David Avery[2] , [1]University of Connecticut, [2]Maine Maritime Academy. hans.dam@uconn.edu.
We tested for local adaptation to temperature in copepod species, Acartia tonsa (warm season) and Acartia hudsonica (cold season), from the east coast of the USA. We compared thermal performance curves (TPC) for fecundity, egg hatching and adult survival among three populations of each species that span a latitudinal (5 degrees Celsius) and thermal (13 degrees Celsius) gradient. TPC were not significantly different among populations of either species, indicating no local adaptation to temperature. We predict shifts in phenology and fitness in response to warming based on TPC and local temperature climatologies. The Northernmost population of A. hudsonica and southern populations of A. tonsa face local extinction risk. Warming only benefits the northernmost population of A. tonsa.

Tidal marsh birds are not thriving in Long Island Sound. **Chris S. Elphick**[1], Alyssa Borowske[1], Jonathan B. Cohen[2], Maureen D. Correll[3], Christopher R. Field[1], Thomas P. Hodgman[4], Adrienne I. Kovach[6], Brian J. Olsen[3], Katharine J. Ruskin[1], Emma Shelly[1], W. Gregory Shriver[5], Whitney A. Wiest[5], [1]University of Connecticut, [2]State University of New York College of Environmental Science and Forestry, [3]University of Maine, [4]Maine Dept. of Inland Fisheries and Wildlife, [5]University of Delaware, [6]University of New Hampshire. chris.elphick@uconn.edu.
The Saltmarsh Habitat and Avian Research Program has studied tidal marsh birds in Long Island Sound, and beyond, using a combination of extensive surveys and intensive demographic studies. Point count data suggests that the state supports ~150 clapper rails, ~800 willets, ~1600 saltmarsh sparrows, and ~1000 seaside sparrows. Since 1998, clapper rails have declined by ~13%/year and saltmarsh sparrows by ~9.5%/year. Demographic data further suggest that saltmarsh sparrows have consistently negative growth rates both locally and throughout the region. Tidal restrictions appear to have contributed to saltmarsh sparrow declines, and sea-level rise is expected to exacerbate future declines. Current data suggest that several tidal marsh birds will be extirpated over the next few decades.

** Will coastal landowners allow tidal marsh migration?* **Chris Field**[1], Ashley Dayer[2], Chris Elphick[1] , [1]University of Connecticut, [2]Virginia Tech. christopher.field@uconn.edu.
The future of Long Island Sound's tidal marshes will be determined in large part by the potential for landward migration, which depends on physical, ecological, and social factors. More data is needed on social factors, especially the proportion of landowners who are likely to use hardening strategies or participate in conservation agreements that would prevent hardening. We present the results of a coast-wide survey on the behavioral intentions of people who own land within Connecticut's marsh migration zone. We quantified intentions with respect to hardening and a set of alternative conservation agreements, and identified beliefs and attitudes that influence their stated intentions. Our results highlight significant challenges to using common conservation strategies to encourage marsh migration in Long Island Sound.

Habitat restrictions for fish and lobster: Results of a high resolution climate change model for Long Island Sound. **Penny Howell**[1], Nickitas Georgas[2], Vincent Saba[3], Kurt Gottschall[1], Deb Pacileo[1]
[1]CT Department of Energy & Environmental Protection, [2]Stevens Institute of Technology, [3]NOAA Fisheries Service. penny.howell@ct.gov.
CT DEEP Long Island Sound Trawl Survey abundance indices show significant compositional changes which correlate with water temperature changes. Habitat Suitability Indices were generated for cold and warm 'fish guilds' and merged with results of a high resolution climate model which estimated daily water temperatures from 1979-2013. Results showed a significant upward trend in preferred temperatures for the warm fish guild but not

the cold guild. For lobster, results showed preferred temperature frequencies decreased over time, while increasing for stressful temperatures. Projected water temperatures based on a doubling of atmospheric CO2 showed that unsuitable temperatures for the warm fish guild decreased to half historic values, increasing the probability of guild competition. For lobster, projected frequency of stressful temperatures nearly doubled.

* *Fate of the Connecticut River water: main routes and corresponding time scales*. **Yan Jia[1]**, Michael Whitney[1], [1]University of Connecticut. yan.jia@uconn.edu.
Using the Regional Ocean Modeling System (ROMS), with passive dyes and age tracers, the main routes of the Connecticut River (CR) water, are determined with their corresponding time scales. The results suggest an annual cycle of CR water pathways. During summer, CR water enters central Long Island Sound (LIS) by flowing underneath the previous spring water, and half of these waters stay until next spring flood. Most winter CR water stays in eastern LIS because of influence by the westerly winds. Spring floods run into central LIS along the coast, and freshen the sound again. The CR mean water age is twice the CR residence time because only half of the water circulates in the sound.

* *Sound fisheries management: developing a regional stock assessment for Tautog.* **Jacob M. Kasper[1]**, Amanda Caskenette[2], Jason Vokoun[1], Eric T. Schultz[1], [1]University of Connecticut, [2]Fisheries and Oceans Canada. jacob.kasper@uconn.edu.
The Atlantic States Marine Fisheries Commission (ASMFC) is considering two alternative regional management schemes for Tautog, a chronically overfished coastal species: either Long Island Sound (LIS) will be split between Connecticut and New York, which could complicate management, or will be combined with the New York Bight, which may not make biological sense. To aid the ASMFC in its deliberations, we are preparing an LIS-specific Tautog stock assessment. Three decades of data on regional demography and fishing activity have been assimilated from state and federal databases into a depiction of the fishery. We will use the LIS-specific stock assessment as a model system, incorporating emerging findings on life-history patterns in evaluation of alternative management strategies.

Application of a linked hydrodynamic-harmful algal bloom model for assessment of management scenarios to impaired Long Island embayments. **Elizabeth M. Lamoureux[1]**, Raghav Narayanan[1], John P. Connolly[1], Shuhei Miyasaka[1], Christopher Gobler[2], [1]Anchor QEA, LLC, [2]SUNY Southhampton. blamoureux@anchorqea.com.
Harmful Algal Blooms (HABs) of organisms such as brown tide (Aureococcus anophagefferens) and red tide (Alexandrium) in Long Island embayments have increased in frequency and duration, presenting human health and ecological risks due to contamination of surface and drinking water. Studies have associated these blooms with increasing nitrogen loadings from cesspool and septic tank effluents. Anchor QEA is developing a linked hydrodynamic-HAB eutrophication model for a few east end embayments. This talk will focus on the development of this model, which is comprised of a hydrodynamic submodel to simulate water flows and residence time in the bays and a water quality submodel to simulate the nitrogen cycle and growth rate of brown and red tide.

Alkylphenols in Long Island Sound are toxic to lobster larvae and affect their development, molting and metamorphosis. **Hans Laufer[1],** Ming Chen[1], [1]University of Connecticut. laufer@uconn.edu.
Alkylphenols, including bisphenol A (BPA), are manufactured in billions of tons, contained in plastics, antioxidants, detergents, paints, can linings, etc. They are endocrine disrupting pollutants. Sixty percent end up in marine environments. The producing chemical companies claim they are safe, EPA and FDA agree. These claims are refuted by independent investigators. We examined 736 lobsters from LIS and found up to 50% were alkylphenol contaminated. Larval treatments with low concentrations (5 or 10 ng/day for 20 days) with BPA or 2,4-bis-(dimethylbenzyl)phenol, (BDBP) are toxic to 80%, survivors delayed molting and 63% had abnormal metamorphosis. We found nuclear receptors of molting hormone and juvenile hormone bind BPA and BDBP, suggesting molecular action mechanisms. Alkylphenols must be diminished in LIS.

Validation of a commercial cytokine assay to help measure the health of stranded pinnipeds. **Milton Levin[1],** Tracy Romano[2], Keith Matassa[3], Sylvain De Guise[1], [1]University of Connecticut, [2]Mystic Aquarium, [3]Pacific Marine Mammal Center. milton.levin@uconn.edu
Cytokines are proteins that help direct a proper immune response to pathogens. This work was conducted to validate the cross-reactivity of the Bio-Plex Human Cytokine and Millipore Canine Cytokine kits to measure cytokines in three pinniped species: harbor, grey, and harp seals. Cross-reactivity was assessed by measuring cytokines in the supernatant of mitogen-stimulated human, canine and seal peripheral blood mononuclear cells (PBMC). The human cytokine panel allowed the detection of cytokines in human PBMCs, but not in the three seals. The canine kit cross-reacted with the majority of cytokines in the seals. Cytokines quantified in seals included three pro-inflammatory cytokines (IL-6, IL-8 and TNFα). Overall, the canine cytokine panel allowed for the successful measurement of clinically important pinniped cytokines.

Trends in the physical and biological structure of the Thames River estuary. **Karina Lorenz Mrakovcich[1]**, Deanna L Bergondo[1], Lucy S. Vlietstra1, Sam C. Wainwright[1], [1]U.S. Coast Guard Academy. Karina.L.Mrakovcich@uscga.edu.
Researchers at the US Coast Guard Academy have been measuring long-term trends in biological and physical parameters of the Thames River Estuary, Connecticut, the third largest river discharge into Long Island Sound by volume. The results from multiple field studies conducted in the estuary indicated substantial variation in the strength of vertical stratification in the estuary and mean flushing times over both seasonal and interannual time scales. Seasonal trends in primary production, plankton density, and finfish biomass were also observed. Long-term trends in relative finfish abundance in the estuary include a shift in dominant species from winter flounder (Pseudopleuronectes americanus) to scup (Stenotomus chrysops). Future work will focus on elucidating some of the biophysical mechanisms driving these patterns.

Flow-adjusted trends in nutrients, organic carbon and chloride in Long Island Sound tributaries, 1973-2013. **John R. Mullaney**. U.S. Geological Survey. jmullane@usgs.gov.
Long-term water-quality data collected at 14 Long Island Sound tributaries were analyzed for the period of 1973-2013, using a recently-developed methodology of weighted regressions with time, discharge, and season (WRTDS). The WRTDS method produces an estimate of the history, and flow-adjusted history of concentration and flux for each site. Trends were analyzed for nitrogen, total phosphorus, total organic carbon, dissolved silica, and chloride. Downward flow-adjusted trends were identified for most stations for nitrogen, total phosphorus, and total organic carbon. Small upward trends were identified for dissolved silica, and large upward trends were identified for chloride. Streamflow data from each site also were analyzed, using a locally-weighted scatterplot smoothing method. Increases in mean streamflow averaged 8 percent during the study period.

Changes in the statistics of sub-tidal sea level fluctuations in Long Island Sound. **James O'Donnell[1]**, Jennifer O'Donnell[2], [1]University of Connecticut, [2]Coastal Ocean Analytics. james.odonnell@uconn.edu.
We have analyzed sea level observations obtained at the eastern and western end of LIS. The tidal effects were extracted using NOAA tidal predictions and the statistics of the anomalies summarized. We show that the frequency distribution of the DJF anomalies is significantly impacted by sea level rise, particularly at New London and in the summer at Willets-Kings Point. At the west end of LIS, the DJF percentile bands narrow from 1960 to 2015. This is consistent with a reduction in the magnitude of the along-Sound wind stress driving the local setup in the Sound, a characteristic that has been detected in wind stress time series.

** Living Shorelines: Are Reef Balls® a viable strategy for shellfish habitat, remediation & erosion control in Connecticut's coastal waters?* **Lisa Piastuch[1],** Jennifer Mattei[1], Mark Beekey[1], LaTina Steele[1]
[1]Sacred Heart University. piastuchl@mail.sacredheart.edu.
Stratford Point was historically part of a functional estuary of the Housatonic River. Sixty years of human disturbance, i.e. gun club operation and lead remediation has resulted in poor quality fish and wildlife habitat. In 2014, a 49m artificial reef was installed at mean tide using 64 Reef Balls® and over 3,500 Spartina alterniflora plugs

were planted as a pilot study to test shoreline stabilization and habitat enhancement. Biodiversity, Spartina growth and sedimentation were monitored. Both biodiversity and population densities increased around the reef; sediment accumulation ranged from 15-30 cm. and Spartina has increased in density. Initial results indicate the artificial reef has the potential to perform as intertidal habitat, a cap for the lead, and stabilize the shoreline.

Ecosystem services valuation of shellfish resources provided to a Long Island Sound municipality.
Julie M. Rose[1], Mark Dixon[1], Anthony Dvarskas[2], Roger Bowgen3, Gary H. Wikfors[1], [1]NOAA Fisheries Service, [2]Stony Brook University, [3]Greenwich Shellfish Commission. julie.rose@noaa.gov.
Shellfish provide a myriad of ecosystem services, including improving water clarity, reducing excess nutrients, providing habitat, stabilizing sediments, and serving as a food for wildlife and humans. We sought to quantify some of the ecosystem services provided by shellfish to Greenwich, CT. We used the biodeposition method to quantify nitrogen and total particulates removal by hard clams, the FARM model to quantify nitrogen and total particulates removal by Eastern oysters, and flow cytometry to quantify bacterial removal by ribbed mussels. Results indicate the value of these ecosystem services to a coastal municipality is considerable. We are working to elucidate the social and economic benefits to Greenwich residents and surrounding communities.

Atlantic Sturgeon in Connecticut waters. **Savoy Tom.** CT Department of Energy & Environmental Protection. tom.savoy@CT.gov
Atlantic sturgeon are the largest anadromous fish on the East Coast of North America, yet despite being very large, potentially long lived and traveling extensively along the coast, little is known beyond a generalized life history. Lack of information led to Atlantic sturgeon being declared US Endangered in 2012. Over 2,200 Atlantic sturgeon were collected from 1984 through 2015 in Connecticut waters and Long Island Sound. Recapture of tagged fish, acoustic detections and analysis of genetic origin indicate that Atlantic Sturgeon from all 5 DPS's can be found in CT waters. Evidence was also collected of a recent natural spawning in the Connecticut River.

** Isolating the influence of coastal islands on river water pathways and mixing in western Long Island Sound: July 2015*.
Steven R. Schmidt[1], Michael Whitney[1], Yan Jia[1], [1]University of Connecticut steven.r.schmidt@uconn.edu.
There is an island chain offshore of where the Saugatuck, Norwalk, and Five Mile Rivers enter western Long Island Sound (LIS). Prior research found these and other small coastal rivers increase stratification along the southwestern Connecticut shoreline. Recent observations, however, suggest that that these unresolved islands can enhance mixing in some areas and reduce near-shore stratification. The Regional Ocean Modeling System is used to isolate the effect of these islands on the flow pathways and mixing of coastal river waters. The islands changed the tidal average and range of surface salinities. Mixing power and flow perpendicular to the mainland's shoreline are enhanced in some island passes. Riverplumes appear to be split by the presence of the islands.

Paying respect to the elders in marine recreational fisheries management: Tautog as a case study.
Amanda Caskenette[1], Jason Vokoun[2], **Eric Schultz[2],** [1]Fisheries & Oceans Canada, [2]University of Connecticut. eric.schultz@uconn.edu.
Larger and older individuals often produce disproportionally large numbers of future recruits. Unfortunately, such so-called maternal effects are not typically accounted for in evaluating the potential effect on stock sustainability of recreational fishery management regulations such as minimum length limits. We modeled maternal effects and alternate length limits and calibrated the model to represent Tautog, a marine fish species with a substantial recreational fishery. We found that the impact of alternate length limits was sensitive to maternal effects. We call for more empirical work on maternal effects and their incorporation into stock assessments and management strategies.

** Quantifying the stormwater management benefits of bioretention in New Haven, CT: from grey to green infrastructure.* **Kelsey Semrod**[1], Gaboury Benoit[1] , [1]Yale University. kelsey.semrod@yale.edu.
Stormwater runoff due to increased urbanization is a major cause of impairment to US waterways, and there is growing interest in using natural infrastructure to combat pollution and flooding in cities. Eight bioretention swales (bioswales) and three in-ground infiltration cisterns were installed in a neighborhood in New Haven, CT in a combined sewer system to quantify how effective bioswales are at decreasing stormwater runoff and reducing its contaminant loads. A Before-After-Control-Impact (BACI) study was conducted to compare two sewersheds: one with bioswale implementation and one without. Hydrologic and water quality testing was performed within sewer pipes and cistern inlets, and in three of the bioswales. Bioswales removed over 50 % of street runoff that would otherwise travel to the combined sewer system and, with cisterns, reduce combined sewer overflows and improve water quality in the West River. This research is one of the first to quantify the time course of the effectiveness of bioretention, building a case for additional investments in green infrastructure in cities around the country.

** High temporal resolution data illuminates controls on dissolved organic carbon in a large watershed.* **Matthew Shultz**[1], Pater Raymond[1], Brian Pellerin[2], George Aiken[2], [1]Yale University, [2]U.S. Geological Survey. matthew.shultz@yale.edu.
We analyzed a five year, high resolution in situ fluorescent dissolved organic matter (FDOM) time series from the Connecticut River main-stem, exploring seasonal dissolved organic matter (DOM) export response to discharge. Seasonal classification by soil temperature at 10cm resulted in the best predictions for discharge to concentration relationships, suggesting that soil temperature may control seasonality in riverine DOM. HPOA concentration, a potential indicator of soil water flow paths derived from FDOM, showed an asymmetric, cyclical response to discharge while concentrations at low flows appear to be relatively static. This work results in empirical models which are evaluated using exceedence and seasonal quantile discharges to expose potential and realized annual patterns of concentration and flux.

Nitrogen reduction pathways in estuarine sediments: Influences of organic carbon and sulfide. **Craig Tobias**[1], Patrick Plummer[2], [1]University of Connecticut, [2]U.S Coast Guard Academy. craig.tobias@uconn.edu.
Rates of sediment denitrification, anaerobic ammonium oxidation (anammox), and dissimilatory nitrate reduction to ammonium (DNRA) were mapped across the entire Niantic River Estuary, CT, USA, at 100–200m scale resolution. Overall, denitrification accounted for ~ 90% of the nitrogen reduction, followed by DNRA and anammox. However, the relative importance of these reactions to each other was not evenly distributed. A Nitrogen Retention Index (NIRI) was calculated from the rate data as a metric to assess the relative amounts of nitrogen being recycled versus retained following reduction. Controls on NIRI were linked to organic carbon abundance and source, and pore water sulfide. Sulfide proved the single best predictor of NIRI, accounting for 44% of its observed variance in NIRI. We suggest that as a single metric, sulfide may have utility as a proxy for gauging the distribution of denitrification, anammox, and DNRA.

Spatial distribution and temporal variability of the blue crab, Callinectes sapidus, in eastern Long Island Sound. **Howard M. Weiss**[1], James Downs[1], [1]Project Oceanology. weissmail@aol.com.
Blue crabs were sampled for 4 years with an otter trawl in Long Island Sound (LIS) and with traps in 3 rivers in eastern Connecticut. In the rivers, 72% of the crabs were males, 17% immature females, and 11% mature females. In LIS, 93% were mature females and 6% males. One third of the females in LIS were egg bearing, while none were gravid in the upper estuaries. These results are consistent with the blue crab life cycle described for other regions. Crab catches per unit effort (CPUE) were high in 2012-13 and significantly lower in 2014-15. Summer CPUEs and winter water temperatures were strongly correlated, suggesting that annual fluctuations in LIS crab abundance may vary with over-winter survival rates.

New insights into eutrophication in Long Island Sound. **Gary H. Wikfors[1]**, Julie M. Rose[1], Shannon L. Meseck[1], Judy Li May[1], [1]NOAA Fisheries Service. Gary.Wikfors@noaa.gov.
The recent LIS "Report Card" graded most of LIS as having good-excellent (81-93%) environmental conditions, with the exception of the Western Narrows (WN). Nutrient and turbidity grades were poor, but the chlorophyll grade in the WN was high (indicating that chlorophyll was low). We used a combination of field experiments and monitoring data to confirm high-nutrient, low chlorophyll conditions of the WN in summer. We demonstrated that phytoplankton in this highly-turbid region are light limited, in contrast to the nitrogen limitation that is observed in summer in the Central and Eastern LIS. This talk will explore the implications of these observations for summertime hypoxia in western LIS.

Contributed Poster Abstracts

*(Alphabetical by first author; * denotes student presenter)*

*1. * The benthic geologic habitats of Long Island Sound in the vicinity of the Thimble Islands and Branford River*, Connecticut, USA. Joshua Bartosiewicz, Bryan A. Oakley, Eastern Connecticut State University. bartosiewiczjo@my.easternct.edu.
Using side-scan sonar, grab samples and underwater video imagery, 4 km2 of benthic geologic habitats were mapped in north-central Long Island Sound offshore of Branford, Connecticut, U.S.A. Units were named based on the geologic processes, morphologic form, particle size, biota and anthropogenic impacts. The distribution of geologic habitats are complex but generally, coarser units (sand, limited amounts of gravel and gravel sized shell fragments) are near bedrock outcrops. Areally the largest units are low-energy depositional habitats, which range in water-depth from subtidal flats <1.5 to >10 m in incised channels and are significant sinks for fine-grained sediment (sandy silt, silt and clayey silt). The fine-grained sediment is likely from several key sources; eroded glacial lakefloor, river input and organic production.

*6. * The Yale Experimental Watershed (YEW).* Gaboury Benoit, Leana Weissberg, Yale University. gabouryb@gmail.com.
The Yale Experimental Watershed has an area of 7.8 ha and is located in the city of New Haven on the Yale campus not far from Long Island Sound. The watershed is drained by a small seasonal stream, and the central portion of the property is a woodland surrounded by homes, streets, and university buildings. Faculty and students have been using the site for research and teaching for the past 5 years, and extensive baseline data have been collected. Detailed hydrologic monitoring of surface and groundwater is ongoing. Live and archived data are available at http://hixon.yale.edu/research/yew and researchers are invited to use the site for studies of urban ecology and its connection to coastal environments.

13. Viability and utility of µUAS for wetland monitoring. Scott M. Graves, Peter Broadbridge, Southern Connecticut State University. gravess1@southernct.edu.
Osprey µUAS is a Pilot Research program focused on determining the viability/utility of employing µUAS (micro drones) for coastal wetland monitoring, mapping, and 3D Modeling. µUAS was flown over a section of the Cove River Estuary, West Haven, CT; a salt marsh recently treated with herbicide and mulched with a bulldozer in 2012 to eradicate the invasive Phragmites. Original hypothesis: native marsh grasses (Spartina) would recolonize the marsh top and channel margins. Unfortunately, that has not happened to the extent and/or rate anticipated. Further, it appears that the current marsh-top is deflating and the channel margins collapsing. Some of these aspects may well be documented and visualized using µUAS overflights and employing Image Mosaics and 3D Modeling software (Pix4D Mapper).

*8. * Assessing the efficiency and ecological impacts of various anti-fouling methods.* Elias Kane, Fishers Island School. e.kane@fischool.com.
I conducted two experiments testing different anti-fouling methods. I compared a control with a copper based paint, a zinc based paint, and a freshwater rinse. For the first experiment which tested efficiency, I applied each anti-fouling method to a four foot square fiberglass panel. After over one month suspended in LIS, growth was measured and massed. For the second experiment, I conducted an LC50, determining the lethal concentration of the different anti-fouling methods. The results from these two experiments were then compared and analyzed.

*14. * The nearshore fish fauna of Orchard Beach, Bronx NY.* Jesse Keltz, Maryann McEnroe, Purchase College, SUNY. maryann.mcenroe@purchase.edu.
The nearshore fish fauna of a marsh in the far western Long Island Sound was sampled in summer 2015. Water temperature, salinity, dissolved oxygen (DO) and pH were measured using an YSI 556 MPS meter. A total of 5 species were collected in minnow traps deployed in shallow water, and the dominant fish was the mummichog, Fundulus heteroclitus. Most fish collected were juveniles suggesting that the marsh serves as a nursery area for forage fish. To further describe the fish fauna collections were also made in deeper water by hook & line and an additional 9 species were collected. The variation in environmental parameters will be discussed with relation to time of high tide and fish abundance.

*7. * Detection of estrogens in the Quinnipiac River using bioluminescent yeast assays.* Kimberly Johnson, Jean-Paul Simjouw, Melanie Eldridge, University of New Haven. kjohn13@unh.newhaven.edu.
Running 38 miles, the Quinnipiac River headwaters in Plainville and flows into New Haven harbor. The legacy of industrial inputs, as well as continuous discharges of various types, are sources of contamination and a threat to the river's health. The public has become increasingly concerned about contamination with chemicals that can mimic human hormones and subsequently cause endocrine dysfunction. Using a genetically modified bioluminescent yeast bioassay, estrogens and toxicity have been measured in surface water along the length of the Quinnipiac River. A modified EPA Method (1694) was used to extract/concentrate chemicals from water samples collected at six sites along the river. We have attempted to relate the presence and bioavailability of estrogens/toxicity to surrounding industry or other traceable sources.

9. Remote sensing of a ciliate red tide in Long Island Sound. George McManus, Heidi Dierssen, Senjie Lin University of Connecticut. george.mcmanus@uconn.edu.
Mesodinium rubrum is a ciliate that is known to produce intense red-colored blooms. These blooms are difficult to quantify because the organism can aggregate into clouds of rusty-red water in a very short time due to its high growth rates and rapid swimming and disaggregate just as quickly by vertical or horizontal dispersion. A September 2012 hyperspectral image from the prototype HICO sensor aboard the International Space Station captured a dense bloom of M. rubrum (106 cells L-1) in western Long Island Sound (LIS). Cell abundance was estimated at 100 m resolution using an algorithm based on the distinctive yellow fluorescence of the ciliate's accessory photosynthetic pigment phycoerythrin. Future deployment of hyperspectral sensors will allow for better enumeration of bloom-forming coastal plankton, and should be incorporated into LIS monitoring.

19. * *Plant Growth and Seasonal Denitrification in Wetlands.* Priscilla Moley[1], Mary Alldred [2], John Haviland [1], Stephen Baines[1] ,[1]Stony Brook University, [2] Baruch College – CUNY. priscilla.moley@stonybrook.edu.
We tracked vegetative growth, nitrogen transformations, sediment nitrogen pools and denitrification over the course of a growing season in three wetlands. Each received similar nitrogen inputs but differed in the amount of root biomass, which previous research has shown is related to sediment oxygenation and denitrification rate. The marshes with the lowest root content and highest aboveground biomass experienced the greatest DNT potential peaks. DNT peaks occurred nearly synchronously in all three sites, in early summer before plant biomass reached a maximum. These patterns suggest that direct competition with plants for nitrogen and the sediment organic

matter quality are less important determinants of denitrification than sediment oxidation, as it is influenced by root mass and above ground photosynthetic biomass.

*15. * Field and lab investigation of desiccation tolerance of the invasive Hemigrapsus sanguineus (Asian shore crab).*
Lara Pratt, George Kraemer, SUNY Purchase. lara.pratt10@gmail.com.
The invasive intertidal Asian shore crab, Hemigrapsus sanguineus, has become abundant in Long Island Sound. Tolerance of desiccation during emersion is crucial to this crab's success. Field measurements determined that crabs has lost 2-14% (mean=8.2%) of body water during mid-summer low tides. Laboratory experiments, measuring the rate of water loss determined the point of death to be at water losses >22%. Additionally, after H. sanguineus were dried to one of five levels of desiccation, their escape response to a hot surface was observed. Movement away from stressful stimulus (heat) was positively related to water loss up to ca. 19% body water. Overall, H. sanguineus appears tolerant of local desiccation stresses.

16. LIS Gulls and Plankton Project: What do seabirds eat in LIS? Thomas Robben, J.Barclay, C.Barnard, P.Comins, L.Flynn, M.Lyman, F.Mantlik, K.Mueller, S.Robben, D.Varza. Connecticut Ornithological Association, robben99@gmail.com.
What are the prey animals that are occurring in large dense patches in LIS, which elicit large feeding flocks of gulls and other seabirds? Are these occurrences random in space or do they happen in the same places yearly, due to oceanographic conditions? And have these events changed over recent decades? The COA Connecticut Ornithological Association (working with UConn and others) has a number of citizen-science bird watchers observing, photographing, netting and documenting those patchy waters to try to determine the principal food items those seabirds are preying on. More generally we believe this project is becoming a good example of collaboration between bird watching, citizen science, and professional academic science.

*2. * Lifted from the dust: Digitizing and analyzing the ~40 year data set collected by Project Oceanology.*
Jacob Snyder[1], Hannes Baumann[1], Lauren Rader[2], [1]University of Connecticut, [2]Project Oceanology. jacob.snyder@uconn.edu.
We are currently assembling a dataset of near-shore environmental observations from LIS collected over the past 40 years by Project Oceanology, an educational facility for students and the public; data include pH, oxygen, benthic invertebrates, near-shore fish catches and other important abiotic and biotic factors. In our first step, a web-based data entry form has been developed, with data being entered into the Long Island Sound Integrated Coastal Observing System (LISICOS). In our second step, we will explore the dataset for evidence of long-term warming, acidification, and shifts in near-shore species assemblages. Our third and final step will be to formulate this database into a web-based tool to visualize long-term trends, and made available to educators, researchers, and students.

*3. * Establishing timescales to detect trends in sea surface temperature and dissolved oxygen in Long Island Sound.*
Allison Staniec, Penny Vlahos[1], University of Connecticut. allison.staniec@uconn.edu.
In long term time series it is essential to isolate trends from natural variability. Here we apply the statistical n* method to water quality parameters in Long Island Sound (LIS) to ascertain the length of time required to detect a trend. Analysis shows that the CT DEEP LIS time series is approaching the needed amount of time to detect long term trends in temperature (SST) and dissolved oxygen (DO), which, on average, is less than 20 years. Significant trends in SST and DO are identified in both surface and deep waters from west to east. N* values calculated here are consistent with open ocean values indicating that the n* method is consistent in open ocean and coastal time series.

*10. * Densities of phytoplankton in an acidic ocean.* Mackenzie Switz, Fishers Island School. m.switz@fischool.com.
The purpose of this experiment was to determine what cell concentration of Tetraselmis PLY429 is most effective in increasing the pH of an acidic ocean. The procedure tested Tetraselmis PLY429 at its naturally occurring density,

103cells/L, and two higher densities, 104cells/L and 105cells/L. A control without phytoplankton augmentation was also conducted. There were two environments, the first replicated the ocean currently state with a pH 7.7, and the second environment replicated the ocean in 100 years with a pH 7.2. The results show that pH increases are directly proportional to increases in phytoplankton densities. The analysis of the variances with an alpha of 0.05 proved that the relation between higher phytoplankton density and increased pH was significant.

17. Seasonal patterns of hydroacoustically derived finfish biomass in the Thames River estuary, Connecticut. Lucy Vlietstra, U.S. Coast Guard Academy. lucy.s.vlietstra@uscga.edu.
This study examined seasonal trends in finfish biomass (backscatter > -70 dB) relative to surface temperature in a vertically stratified estuary on Long Island Sound. Hydroacoustic surveys were conducted with a 200 kHz BioSonics Inc. 6.5° split-beam transducer every 2-3 weeks from 13 May to 3 December, 2015. Water temperature was measured with a 6500 YSI sonde. Finfish biomass in the estuary was highly variable over space and time but most abundant in May and early August. Little correlation was observed between fish abundance and surface temperature. Future research will focus primarily on the potential role of seasonal thermal stratification and other environmental factors in the timing of the occurrence of finfish in the Thames River Estuary.

18. Keys to the larvae of common brachyuran crabs in Long Island Sound
Howard M. Weiss[1], Margaret (Peg) Van Patten[2], [1]Project Oceanology, [2]Connecticut Sea Grant. weissmail@aol.com.
Crab larvae are a common constituent of Long Island Sound (LIS) plankton. Howard Weiss has written a book of keys for the identification of LIS crab zoea and megalopae larval stages. The book will be published by Connecticut Sea Grant in the fall of 2016. It will be a valuable tool for researchers and students throughout the Northeast. The only other crab larvae keys currently available are for Canada (1984) or for Chesapeake Bay (1972) and further south. None of these keys cover all common LIS species and are somewhat out of date (i.e. don't include recent invasives such as Hemigrapsis.) This poster presentation will include sample pages of the book, including line drawings and color photos.

*4. * Structural resiliency assessment of coastal residential homes along Connecticut's shoreline.* Jeffrey Weston, Wei Zhang, Jin Zhu, University of Connecticut. jeffrey.weston@uconn.edu.
Recent natural disasters such as Hurricanes Sandy and Irene have emphasized the need for resilient and sustainable infrastructure along the Connecticut coastline. Based on the building inventories of local communities, single family residential structures are being statistically grouped together by key parameters that might influence their performance. Multiple structural analysis models intended to represent a cross section of each coastal community will be built. Numerical simulations will be used to subject the models to loading by wind, waves and their combination thus representing a variety of natural hazards. The results of these simulations will be used to generate fragility curves for individual residential structure types and community level risk maps.

*11. * Comparison of sediment cadmium concentrations in Black Rock and Stonington Harbors, CT.*
Sadia Younas, Vincent Breslin, Southern Connecticut State University. younass1@southernct.edu.
This study was designed to examine spatial trends of sediment cadmium concentrations in Black Rock and Stonington harbors and to determine the co-variance of cadmium with physical (grain-size and organic content) and chemical properties (copper, iron and zinc) of the sediment. Although sediment cadmium concentrations in Stonington harbor exceeded crustal abundance (0.2 mg/kg), concentrations were below the NOAA ERL sediment toxicity threshold (1.2 mg/kg). In contrast, Black Rock inner harbor mean sediment cadmium concentrations exceeded the NOAA ERM toxicity threshold (9.6 mg/kg), with two inner harbor stations exceeding 22 mg/kg cadmium. Sediment cadmium concentrations in both harbors co-varied with sediment organic carbon content, grain-size and other metals (copper, zinc and iron).

*12. * Investigating the effects of storm and wastewater on the bio-uptake and transfer of heavy metals in urban stream food webs.* Bin Zhu, Dylan Rossi, Man Lok Yu[1], University of Hartford. zhu@hartford.edu.
With the increases in human activities, streams running to Long Island Sound are facing various contaminations such as copper and zinc. We conducted investigations 20 natural streams in Connecticut to study how water from different sources (wastewater from point sources vs. stormwater from nonpoint sources) affects water quality and the biouptake and transfer of heavy metals in the food webs. We did not find any trends in turbidity, nitrogen and phosphorus contents in upstream and downstream of these streams but differences in diversity and evenness of benthic macroinvertebrates occurred at wastewater sites and sites with stormwater runoff but not at the sites with approved TDMLs. This suggests wastewater negatively affect benthic macroinvertebrates and a regulation on wastewater discharge is recommended.

5. Framework of coupled dynamic analysis of vehicle-bridge-wind-wave system for slender coastal bridges. Jin Zhu, Wei Zhang, University of Connecticut. jin.zhu@uconn.edu.
Many modern coastal long-span cable-stayed bridges are carrying a high volume of traffic daily while considerable wind exists on the bridge superstructures (pylon and deck) and wave exists on the substructures (pile and pier) at the same time. With these three major service loads remaining on the bridges all the time, the complex interaction between vehicles, bridges, wind and wave plays a significant role in the safety of traffic on these long bridges. This presentation is mainly focusing on developing a numerical model based on the interactions between coastal long-span bridge, moving vehicles and wind and wave dynamic loadings which can predict the dynamic response of coastal bridges during normal operation as well as during extreme hurricane events.