Samuel J. Gurr, Ph.D.

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NOAA NEFSC Milford Lab, 212 Rogers Ave, Milford, CT,06460

EDUCATION

2021 ***DOCTOR OF PHOLOSOPHY IN Biological and Environmental Science;***
Evolution and Marine Biology [Specialization]: University of Rhode Island (URI)
Thesis: Stress conditioning to hypercapnic seawater in the Pacific geoduck *Panopea generosa*
Advisor: Hollie M Putnam, PhD

2017 ***MASTER OF SCIENCE IN Marine Science***: Stony Brook University (SBU)
Thesis: Effects of diel-cycling hypoxia on cardiac activity and growth of *Argopecten irradians*
Advisor: Nils Volkenborn, PhD

2014 ***BACHELOR OF SCIENCE IN Marine Biology****; Chemistry [Minor]*: University of New Haven (UNH)
Thesis: Arm regeneration of *Asterias forbesi* under hypoxic conditions
Advisor: Carmela Cuomo, PhD

POSITIONS HELD

2021– ***NRC POSTDOCTORAL RESEARCH FELLOW & NOAA AFFILIATE*****:** National Oceanic and Atmospheric Administration (NOAA) Northeast Fisheries Science Center (NEFSC), Milford, CT

2018 ***MARINE SCIENCE CONSULTANT***: The Living at Autodesk, New York, NY
- Applied my expertise on estuarine systems to reconcile deliverables for a sustainable architecture and outreach project in the Hudson River of Lower Manhattan; edited proposals, progress reports, and construction plans for a team of architects and engineers.

2018-2017 ***LABORATORY ASSISTANT*****:** Suffolk County Community College, Selden, NY

2017 ***BIOSENSOR RESEARCH INTERN*****:** The Living at Autodesk, New York, NY
Project: Blue mussels *Mytilus edulis* for monitoring water quality in Hudson River

PUBLICATIONS

11. **Gurr, S.J.,** Meseck, S.L, Bernatchez, G., Dixon, M.S., Guy, L., MacDonald, A., Milke, L., Redman, D., Sennefelder, G., McFarland K. (*in prep*) Transcriptome-to-phenome response of larval Eastern oysters under multiple drivers of aragonite undersaturation.
10. **Gurr, S.J.**, McFarland, K., Bernatchez, G., Padilla, D., Dixon, M.S., Guy, L., Milke, L., Poach, M.E., Deborah Hart D., Plough, L., Redman, D., Sennefelder, G., Stiles, S., Wikfors, G., Meseck, S.L. (*in prep*) Effects of food supply on Bay scallops *Argopecten irradians (L.)* reared under two pCO_2 regimes.
9. Trigg, S.A., **Gurr, S.J.**, Mitchell, K.R.,Vadopalas, B., Putnam, H.M., Roberts, S.R. (*in prep*) Integrated analysis of gonad maturation in geoduck.
8. Trigg, S.A., **Gurr, S.J.**, Mitchell, K.R.,Vadopalas, B., Putnam, H.M., Roberts, S.R. (*in prep*) Effect of broodstock conditioning on offspring development and stress response in Pacific geoduck.
7. **Gurr, S.J.**., Trigg, S.A., Vadopalas, B., Roberts, S.R., Putnam, H.M. (2022). Acclimatory gene expression of primed clams enhances robustness to elevated pCO_2. *Molecular Ecology, 31*(19), 5005-5023. doi.org/10.1111/mec.16644
6. Zajac, R., **Gurr, S.J.**., Bassett, C.C., Kleiman, L., Kelly, J.T., Simon, Z., (2022). Habitat expansion in response to sea-level rise by the fiddler crab Minuca pugnax (Smith, 1870) in southern New England salt marshes. *Journal of Crustacean Biology*, *42*(1), ruac009. doi.org/10.1093/jcbiol/ruac009
5. **Gurr, S.J.**., Trigg, S.A., Vadopalas, B., Roberts, S.R., Putnam, H.M., 2021. Repeat exposure to hypercapnic seawater modifies performance and oxidative status in a tolerant burrowing clam**.** *Journal of Experimental Biology*, *224*(13), jeb233932. doi.org/10.1242/jeb.233932
4. **Gurr, S.J.**, Dwyer, I., Goleski, J.A., Lima, F.P., Seabra, R., Gobler, C.J., Volkenborn, N., (2021). Acclimatization in the bay scallop *Argopecten irradians* along a eutrophication gradient: Insights from heartbeat rate measurements during a simulated hypoxic event. *Marine and Freshwater Behavior and Physiology*, *54*(1), 23-49. doi.org/10.1080/10236244.2020.1867477
3. **Gurr, S.J.**, Vadopalas, B., Roberts, S.R., Putnam, H.M., 2020. Metabolic recovery and compensatory shell growth of juvenile Pacific geoduck *Panopea generosa* following short-term exposure to acidified seawater. *Conservation Physiology.* doi.org/10.1093/conphys/coaa024
2. Levinton, J., Volkenborn N., **Gurr, S.J.**, Correal, K. Villacres, S., Seabra, R. Lima, F.P. 2019.

Temperature-related heart rate in water and air and a comparison to other temperature-related measures of performance in the fiddler crab *Uca pugilator*. *Journal of Thermal Biol*ogy. doi.org/10.1016/j.jtherbio.2019.102502

1. **Gurr, S.J.**, Goleski, J.A., Lima, F.P., Seabra, R., Gobler, C.J., Volkenborn, N., 2018. Cardiac responses of the bay scallop *Argopecten irradians* to diel-cycling hypoxia. *Journal of Experimental Marine Biology and Ecol*ogy 500, 18-29. doi.org/10.1016/j.jembe.2017.12.011

GRANTS/FELLOWSHIPS

2021 National Research Council - Research Associateship Program ($55k annual stipend; 3 yrs)
2020 Robert D. Tuner Award ($7,500)
2020 Blount Shellfish Restoration Award ($2,000)
2020 Melbourne R. Carriker Student Research Grant ($1,250) *featured in National Shellfisheries Assoc. quarterly newsletter*
2019 George Burlew Scholarship Fund ($500)
2019 Dean's Travel Award – URI
2017 Honorable Mention, NSF Graduate Research Fellowship Program
2017 Jerry R. Schubel Graduate Fellowship Endowment – SBU ($3,000)
2016-15 Dean's Scholarship, SBU ($4,000)
2013 Summer Undergraduate Research Fellowship – UNH ($3,000)
2012 Summer Undergraduate Research Fellowship – UNH ($3,000)

TEACHING EXPERIENCE

2022 ***GUEST LECTURER*:** URI
- BIO594: Using genomic techniques to examine the evolution of populations

2021 ***TEACHING ASSISTANT/LABORATORY INSTRUCTOR***: URI
- BIO302: Animal Development

2020- ***GUEST SCIENTIST***: Benjamin Jepson Elementary, New Haven, CT
- online science lessons during COVID-19
- lead outreach field trips to local beaches

2020 ***GUEST LECTURER*:** URI
- BIO130 Topics in Marine Biology

2019 ***GUEST LECTURER*:** URI
- BIO354 Invertebrate Zoology

2018-17 ***LABORATORY ASSISTANT***: Suffolk County Community College, Selden, NY
- MAR105: Introduction to Oceanography
- MAR111: Marine Biology, field instructor

2016 ***EDUCATOR***: NYC Submerge!, New York, NY
- outreach event, provided hands-on learning experience for children about invertebrate physiology

2016 ***TEACHING ASSISTANT/LABORATORY INSTRUCTOR***: SBU
- CHE133 & 134: General Chemistry Laboratory I & II

2015 ***TEACHING ASSISTANT/LABORATORY INSTRUCTOR***: SBU
- MAR373: Marine Apex Predators

2014-11 ***FIELD EDUCATOR***: Schooner Inc., New Haven, CT
- designed marine field curricula and instruction for day camp, school trips, and museum talks for elementary, middle, and high school students.

2012-11 ***INSTRUCTOR***: Connecticut Pre-Engineering Program, New Haven, CT
- lead monthly team-building physics challenges for public middle school students

RESEARCH EXPERIENCE

2021- ***RESEARCH ASSISTANT***: NOAA NEFSC, Milford, CT
- Investigate underlying transcriptomic and genetic markers and affecting resiliance and phenotypic trajectory during early development and across multiple generations in commercially critical bivalves
- *Wild Scallop Population Resilience: Using Multigenerational Studies to Estimate Robustness and Adaptive Potential to Rapidly Changing Ocean Acidification* (OAP)

2021-18 ***GRADUATE RESEARCH ASSISTANT***: URI
- Environmental priming for aquaculture enhancement; designed hormetic challenges to investigate cellular-molecular underpinnings of developmental acclimatization
- All experiments competed in a commercial aquaculture setting, emphasizing the pertinence of each effort for applied industry relevance (temporal and budgetary framework) and putative future integration

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- *Development of Environmental Conditioning Practices to Decrease Impacts of Climate Change on Shellfish Aquaculture* (FFAR, Grant # 554012)

2017 ***RESEARCH INTERN***: The Living at Autodesk, NY, NY
- Conduct independent trials with blue mussel Arduino sensors to examine the efficacy of an architecture installation in the Hudson River of Lower Manhattan
- Build and install a public outreach station at The River Project NYC Pier 40 for live-feed mussel response
- Project: Live Blue Mussel Biosensors for Monitoring Water Quality

2017-15 ***GRADUATE RESEARCH ASSISTANT***: SBU
- Model real-time physiological rates *in-situ* and in response to dynamic eutrophic systems; build heartbeat sensors, respirometry chambers, water-proof Arduino housings for field and lab deployments of scallops
- *Effects of diel-cycling hypoxia to cardiac activity of Argopecten irradians* (New York Sea Grant Scholar)
- Foster interdepartmental and government collaborations, providing biosensor tech and mentorship for physiological experiments with NOAA (SBU, D. Padilla) and undergraduate interns (SBU; J.Levinton).

2013 ***UNDERGRADUATE RESEARCH FELLOW***: NOAA NEFSC and UNH
- Project: Assessment of high marsh occupation by populations of the fiddler crab *Uca pugnax* across salt marsh systems

2012 ***UNDERGRADUATE RESEARCH FELLOW***: UNH
- Project: The effects of ocean acidification and dissolved nitrogen sources on the growth and elemental stoichiometry of the marine diatoms *Thalassiosira pseudonana* and *Thalassiosira weissflogii*

PROFESSIONAL EXPERIENCE & SERVICE

BROADER SCIENTIFIC COMMUNITY

Outreach installation

Gurr, S.J., Volkenborn, N., Wang. W., Benjamin, D., (2017). Live blue mussels for monitoring water Quality. Install at River Project NYC, Pier 40, NY, NY.
- outreach station on a public pier in Lower Manhattan, featuring real-time heartbeat rate and value gape response of blue mussels alongside water chemistry data in a seawater flow-through system -- **received attention of The New York Times, *"New York Today: the Hudson River Isn't Dirt. It's Alive.' (June 5, 2018)***

Application note:

Gurr, S.J., Rollando C., Chan L.L., Vadopalas B., Putnam H.M., Roberts S.B., (2018). Alternative Image-Based Technique for Phytoplankton Cell Counts in Shellfish Aquaculture (No. 1001481). Nexcelom.

Book Chapter:

Gurr, S.J., Wang, R., Benjamin, D., (2018). Mussel Sensors: Live bivalves for evaluating water quality with Samuel Gurr. Autodesk architectural publication. (Internal Autodesk document)

Science Fair Judge:

WAC Lighting Invitational Science Fair, Manhasset, NY

University Press:

Gurr, S.J., Zajac, R., 2013. Assessment of high marsh occupation by populations of the fiddler crab *Uca pugnax* across salt marsh systems on the CT shore. Summer Undergraduate Research Fellowship Program. Proceedings Volume 2013, University of New Haven, 31-36.

Gurr, S.J., Meseck, S., Simjouw, J., 2012. The effects of ocean acidification and dissolved nitrogen sources on the growth and elemental stoichiometry of the marine diatoms *Thalassiosira pseudonana* and *Thalassiosira weissflogii*. Summer Undergraduate Research Fellowship Program. Proceedings Volume 2012, University of New Haven, 35-41.

COURSES/WORKSHOPS

Workshop lead:

Ocean acidification: How to build and design your experiment, URI

Course participant:

lcWGS_Population_Genomics, physalia-courses
Quantitative Genetics, UW Biostatistics Summer Institute
Advanced Quantitative Genetics, UW Biostatistics Summer Institute
Genome-Wide Association Studies, UW Biostatistics Summer Institute
WGS Pipeline, UW Biostatistics Summer Institute

JOURNAL REVIEWING

Journal of Experimental Biology, Aquatic Biology

COMMITTEES AND ASSOCIATIONS

Graduate Student Committee at Stony Brook School of Marine and Atmospheric Sciences, Long Island Water Quality Index Program, National Shellfisheries Association, Pacific Coast Shellfish Growers Association, Society of Integrative and Comparative Biology

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MENTORING

UNDERGRADUATE STUDENTS; Correal, K. Villacres; Project: *Temperature-related heart rate in water and air in the fiddler crab Uca pugilator* [students earned co-authorship in Levington et al. 2017 *J. Therm. Biol*.] M., Kim, and Z., Paively; Project: *Cardiac responses of local invertebrates to temperature and salinity stress*.
HIGH SCHOOL STUDENTS; C., Tse; Project: *Cardiac Activity of an Invasive Species* [presented at WAC Lighting Invitational Science Fair, Manhasset, NY]

INVITED LECTURES

2021 ***GUEST SPEAKER*:** Learning from experience: Stress conditioning to ocean acidification in a tolerant commercial clam. University of New Haven, New Haven, CT.

2017 ***GUEST SPEAKER*:** November 2017. Hypoxia is not for the Faint-Hearted: Biosensing in a Stressful Ocean. Suffolk County Community College, Biology Department Outreach Program. Selden, NY.

2017 ***SPECIAL TOPICS SPEAKER*:** Sensing hypoxia: What can physiology tell us about water quality? River Project Wet Lab Look-in. Pier 40, NY, NY.

ORAL PRESENTATIONS

2022 McFarland, K.*, **Gurr, S.J.**, Bernatchez G., S. Dixon, M.S., MacDonald., A., Redman, D., Sennefleder, G., Shannon L. Meseck, S.L. Physiological response of oyster larvae to interactive effects of climate change variables. 5th international Symposium on the Ocean in a High CO_2 World. Lima, Peru.

2022 **Gurr, S.J. ***, Trigg. S.A., Vadopalas, B., Roberts, S.R., Putnam, H.M., March 2022. Environmental conditioning of clams to low pH enhances robustness to environmental stress through acclamatory gene expression. Northeast Aquaculture Conference and Exposition. Portland, ME.

2022 McFarland, K.*, **Gurr, S.J.**, Bernatchez G., S. Dixon, M.S., MacDonald., A., Redman, D., Sennefleder, G., Meseck, S.L. Physiological response of oyster larvae to interactive effects of climate change variables. Northeast Aquaculture Conference and Exposition. Portland, ME.

2021 **Gurr, S.J. ***, Trigg. S.A., Vadopalas, B., Roberts, S.R., Putnam, H.M., March 2021. 'Environmental learning' in a tolerant commercial clam: Insights from phenotypic and subcellular adjustments to hypercapnic seawater. Society for Integrative and Comparative Biology. remote conference.

2019 **Gurr, S.J. ***, Vadopalas, B., Roberts, S.R., Putnam, H.M., September 2019. Metabolic recovery and compensatory shell growth of juvenile Pacific geoduck *Panopea generosa* following short-term exposure to acidified seawater. Pacific Coast Shellfish Growers Association 73rd Annual Shellfish Conference and Tradeshow. Portland, Oregon.

2019 **Gurr, S.J. ***, Roberts, S., Vadopalas, B., Putnam, H.M., January 2019. Effects of repeated short-term exposure to ocean acidification on juvenile Pacific geoduck *Panopea generosa*. Northeast Aquaculture Convention and Exposition. Boston, Massachusetts.

2018 Padilla, D. K.*, Volkenborn, N., **Gurr, S.J.**, Milke, L., Meseck, S., Rugila, A., Redman, D., Dixon, M.S., Veilleux, D., Liguori, A., Rosa, M. Population differences in response to ocean acidification in blue mussels. 48th Annual Benthic Ecology Meeting, Newfoundland.

2017 **Gurr, S.J. ***, August 2017. Bio-Sensing as a Method for Evaluating Water Quality. Autodesk – 2017 Intern Project Showcase. NY, NY.

2017 **Gurr, S.J.***, Goleski, J.A., Lima, F.P., Seabra, R., Gobler, C.J., Volkenborn, N., April 2017. Effects of diel-cycling hypoxia to cardiac activity and growth of *Argopecten irradians*. Master's Thesis Presentation. Stony Brook University. Stony Brook, NY.

2014 **Gurr, S.J.,** Arm regeneration of *Asterias forbesi* under hypoxic conditions. Marine Biology Senior Research Thesis Symposium. University of New Haven, West Haven, CT.

POSTERS

2020 **Gurr, S.J.**, Trigg, S.A., Vadopalas, B., Roberts, S.R., Putnam, H.M., February 2020. Effects of intragenerational *p*CO2 conditioning on metabolism, oxidative stress response, and DNA methylation of juvenile Pacific geoduck *Panopea generosa*. Ocean Sciences Meeting 2020. San Diego, CA.

2017 **Gurr, S.J.**, Goleski, J.A., Lima, F.P., Seabra, R., Gobler, C.J., Volkenborn, N., April 2017. Effects of diel-cycling hypoxia to cardiac activity and growth of *Argopecten irradians*. Poster presented at the School of Marine and Atmospheric Science, Southampton Spring Lecture Series; State of the Bays 2017. Southampton, NY.

2016 **Gurr, S.J.**, Graffam, M., Dwyer, I., Volkenborn, N., September 24, 2016. Hypoxia: Not for the faint of heart, heart rate in a stressful world. Poster presented at the Submerge! Marine Science Festival. NY, NY.

2016 **Gurr, S.J.**, Goleski, J.A., Lima, F.P., Seabra, R., Gobler, C.J., Volkenborn, N., March 2016. Tell it from the heart:

Cardiac responses of *Argopecten irradians* to diel-cycling hypoxia. Poster presented at the Benthic Ecology Meeting. Portland, Maine.

2013 **Gurr, S.J.,** Zajac, R., September 2013. Assessment of high marsh occupation by populations of the fiddler crab *Uca pugnax* across salt marsh systems on the CT shore. Poster presented at the Summer Undergraduate Research Fellowship Symposium. University of New Haven, West Haven, CT.

2012 **Gurr, S.J.,** Meseck, S., Simjouw, J., September 2012. The effects of ocean acidification and dissolved nitrogen sources on the growth and elemental stoichiometry of the marine diatoms *Thalassiosira pseudonana* and *Thalassiosira weissflogii*. Poster presented at the Summer Undergraduate Research Fellowship Symposium. University of New Haven, West Haven, CT.

TECHNICAL SKILLS AND TRAINING

EXPERIMENTAL SYSTEMS: Design and construction of experimental seawater systems for acute and long-term control; particular focus on current coastal/estuarine challenges relevant to developmental and evolutionary biology [*p*CO2, temperature, dissolved oxygen, salinity, dietary restriction, etc.]

COMPUTATIONAL: R [tidyverse suite, network analysis, data carpentry, statistics], github, markdown, bash, high-performance computing, bioinformatic pipelines construction for next-generation sequence data [quality filtering, trimming, reference index, mapping, read matrix assembly, local alignment, association mapping and population genetic analysis / genotype likelihoods, troubleshooting/sanity checks via visual output]

MOLECUALR AND CELLULAR BIOLOGY: Next-gen sequencing sampling, DNA/RNA extraction, PCR, Library prep, Primer design, Tissue homogenate and Hemolymph Colorimetric and Flow cytometric assays [*ex:* antioxidant capacity, apoptosis, mitochondrial membrane potential, total protein, etc.]

INSTRUMENTATION: Respirometry [*ex*: Presens], Biosensing [*ex:* Arudino], Fluorometry, Tape station, Gel electrophoresis, Apex relay-control systems, Suite of water probes [glass pH electrode, DO, conductivity, etc.], Alkalinity titrator, Flow cytometer, Spectrophotometry, Cell counter, Microscopy

REFERENCES

Dr. Katherine M. McFarland – NOAA NEFSC, Milford, CT, USA
✉ katherine.m.mcfarland@noaa.gov

Dr. Hollie M. Putnam – Professor, University of Rhode Island, RI, USA
✉ hputnam@uri.edu

Dr. Steven B. Roberts – Professor, University of Washington, RI, USA
✉ sr320@uw.edu

Dr. Nils Volkenborn – Professor, Stony Brook University, NY, USA
✉ nils.volkenborn@stonybrook.edu