

Michael Studivan, Ph.D.

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Education

- Ph.D. Integrative Biology, Florida Atlantic University
Degree Conferred May 2018, GPA 4.0
- M.S. Biological Sciences, Florida Atlantic University
Degree Conferred Aug 2016, GPA 4.0
- B.A. Biology, St. Mary's College of Maryland. Minors: Film & Media Studies, Environmental Studies
Degree Conferred May 2011 *cum laude*, GPA: 3.7, Biology: 3.7

Research Interests

I am an Assistant Scientist at the University of Miami's Cooperative Institute for Marine and Atmospheric Studies (CIMAS) and NOAA's Atlantic Oceanographic and Meteorological Laboratory (AOML). My research utilizes molecular techniques for assessments of connectivity, coral resilience, and adaptation across ecosystems with the goal of encouraging conservation of marine resources through effective research, monitoring, and management. My graduate research examined the ecology of mesophotic coral reefs (30–150 m), specifically the genetic connectivity among shallow and mesophotic reefs and the role of phenotypic plasticity in coral adaptation to depth, as part of the research objectives of NOAA's Cooperative Institute for Ocean Exploration, Research, and Technology (CIOERT).

Research Experience

- Assistant Scientist** Jan 2020 – present
Acidification, Climate, and Coral Reef Ecosystems Team (ACCRETE)
CIMAS PI and lead of the Experimental Reef Lab
(<https://www.aoml.noaa.gov/experimental-reef-lab/>). Applying 'omics approaches to characterize coral resilience and disease transmission in field- and lab-based experiments. Developing grant-funded projects related to stony coral tissue loss disease (SCTLD) transmission and treatment, urban coral reefs, and coral genotype assessment.
- Postdoctoral Fellow** May 2018 – Jan 2020
Dr. Joshua Voss Lab
Characterized responses to stony coral tissue loss disease and intervention strategies through RNA-Seq and 3D modeling. Coordinated field expeditions using technical SCUBA and ROV technologies. Developed and maintained educational outreach through multimedia and social media-based platforms.
- Dissertation Research** “*Genetic connectivity and phenotypic plasticity of mesophotic and shallow coral ecosystems in the Gulf of Mexico*” Aug 2012 – May 2018
Dr. Joshua Voss Lab
Assessed population structure of shallow and mesophotic corals in the Gulf of Mexico and Caribbean. Profiled whole-transcriptome gene expression across shallow and mesophotic corals in the Gulf of Mexico and Belize using an RNA-

Seq pipeline. Quantified gene expression plasticity during one-year transplant experiment at Flower Garden Banks. Examined variation in corallite skeletal structure between shallow and mesophotic reef environments.

Methods in Ecological Genomics Analysis (MEGA) workshop Jun 2017

Learned lab and bioinformatics techniques to examine population connectivity with single nucleotide polymorphisms (SNPs) via 2bRAD pipeline.

Project Collaborator, CIOERT Jul 2016 – Dec 2017

Evaluated larval connectivity of *Montastraea cavernosa* in the Flower Garden Banks. Analyzed coral abundance and density data from shallow and mesophotic coral banks in the NW Gulf of Mexico for development of a larval biophysical model. Used microsatellite analyses to validate model predictions.

CISME Training Workshop May 2016

Learned the operational protocol of the CIOERT-developed Coral In Situ Metabolism (CISME) platform using dry and in-water tests to collect non-destructive photosynthesis and respiration measurements.

Co-PI, Comprehensive Landscape Observation via Unmanned Drone May 2015 – Oct 2015

Served as video producer and editor for outreach films through a Harbor Branch grant. Produced five films using aerial, SCUBA, and ROV footage based on Voss Lab and collaborators' research projects for a general audience.

Art of Gene Expression Analysis (AGEA) workshop Jun 2013

Learned lab and bioinformatics techniques used to examine whole-transcriptome gene expression profiles with RNA-Seq and qPCR pipelines.

Lab Technician, Chesapeake Biological Laboratory Sep 2011 – May 2012

Dr. Jacqueline Grebmeier Lab

Identified and quantified infauna in Arctic sediment samples for diversity analyses. Part of long-term monitoring of effects of climate change and petroleum industry on benthic communities in the Chukchi Sea.

Lab Technician, Chesapeake Biological Laboratory Jan 2011 – May 2011

Dr. Tom Miller Lab

Performed energetic analyses via bomb calorimetry of striped bass tissues for assessment of female breeding stock in the Chesapeake Bay.

Undergraduate thesis (St. Mary's Project): "*The effect of the oil dispersant Corexit® EC9500A on bleaching of the alcyonacean soft coral Xenia elongata*" Aug 2010 – May 2011

Dr. Walter Hatch Lab

Examined the effects of oil dispersant on soft coral bleaching and stress responses through timed dosing experiments.

Directed research, St. Mary's College of Maryland Aug 2009 – May 2010

Dr. John Ramcharitar Lab

Performed inner ear dissections of goldfish to examine effects of gentamicin on hair cell damage and recovery.

Belize Biodiversity Study Tour Mar 2010

Performed field experiments on leaf cutter ant foraging behavior. Led rapid ecological assessment of coral reefs on Calabash Cay, Belize.

India Biodiversity Study Tour Dec 2009 – Jan 2010

Research Expeditions

CIOERT Florida Keys and Dry Tortugas Technical Diving Cruise Aug 2019

Conducted open circuit Trimix dives to conduct SCTLD disease surveys and sampling of mesophotic benthic taxa for population genetics analyses.

CIOERT Flower Gardens Technical Diving Cruise Jul 2018

Conducted open circuit Trimix dives to complete sampling of transplant experiment and mesophotic benthic taxa for population genetics analyses.

CIOERT Cuba's Twilight Reefs and Their Regional Connectivity ROV Cruise May 2017

Served as U.S. coral lead on Leg 1 of joint research expedition between U.S. and Cuban universities, resource managers, and government agencies to explore and characterize Cuban mesophotic reef habitats.

CIOERT Carrie Bow Cay, Belize Expedition Mar 2017

Participated in research trip to sample fine-scale reef depths for population genetics analyses and to produce aerial reef map via unmanned aerial drone.

CIOERT Flower Gardens Technical Diving Cruise Sep 2016

Conducted open circuit Trimix dives to complete sampling of shallow and mesophotic corals for dissertation analyses and transplant experiment.

CIOERT Flower Gardens Technical Diving Cruise May 2016

Conducted open circuit Trimix dives to sample shallow and mesophotic corals for dissertation analyses and transplant experiment.

CIOERT Carrie Bow Cay, Belize Expedition Mar 2016

Led research trip for resampling of shallow corals, exploration and sampling of mesophotic corals, and redeployment of data loggers using deep air SCUBA.

CIOERT Flower Gardens Technical Diving Cruise Oct 2015

Conducted open circuit Trimix dives to sample shallow and mesophotic corals for dissertation analyses and transplant experiment.

CIOERT & FGBNMS Outlying Banks ROV Cruise	Jul 2015
Explored mesophotic reef habitats in the NW Gulf of Mexico. Sampled corals for morphological, physiological, and genetic connectivity analyses.	
HBOI & Project Baseline <i>Oculina</i> Submersible Cruise	Jun 2015
Explored mesophotic <i>Oculina</i> reef habitat off SE Florida using submersibles and technical divers as part of a collaboration with Project Baseline.	
CIOERT & FGBNMS Flower Gardens ROV Cruise	Oct 2014
Collected shallow coral samples for dissertation analyses. Conducted ROV dives for quantitative surveys and to explore sites for transplant experiment.	
CIOERT Pulley Ridge & Dry Tortugas Technical Diving Cruise	Jun 2014
Processed and managed samples collected by technical divers at mesophotic and shallow sites at Pulley Ridge and the Dry Tortugas for the Pulley Ridge Project.	
CIOERT Carrie Bow Cay, Belize Expedition	Mar 2014
Surveyed shallow and mesophotic reef habitats for manipulative experiment, sampled shallow corals and deployed data loggers using deep air SCUBA.	

Publications

- Kolodziej G, **Studivan MS**, Gleason ACR, Langdon C, Enochs IC, Manzello DP (2021) Impacts of stony coral tissue loss disease (SCTLD) on coral community structure at an inshore patch reef of the upper Florida Keys using photomosaics. *Frontiers in Marine Science* 10:3389/fmars.2021.682163
- Combs IR, **Studivan MS**, Eckert RJ, Voss JD (2021) Quantifying impacts of stony coral tissue loss disease on corals in Southeast Florida through surveys and 3D photogrammetry. *PLOS ONE* 16(6): e0252593
- Studivan MS**, Shatters A, Dodge DL, Beal JL, Voss JD (2021) Synergistic effects of thermal stress and estuarine discharge on transcriptomic variation of *Montastraea cavernosa* corals in southeast Florida. *Frontiers in Marine Science* 8:662220
- Studivan MS**, Voss JD (2020) Transcriptional plasticity of mesophotic corals among natural populations and transplants of *Montastraea cavernosa* in the Gulf of Mexico and Belize. *Molecular Ecology* 29:2399–2415
- Eckert RJ, Reaume AM, Sturm AB, **Studivan MS**, Voss JD (2020) Depth influences Symbiodiniaceae community variation among *Montastraea cavernosa* corals on the Belize Barrier Reef. *Frontiers in Microbiology* 11:518
- Dodge DL, **Studivan MS**, Eckert RJ, Chei E, Beal J, Voss JD (2020) Population structure of the scleractinian coral *Montastraea cavernosa* in southeast Florida. *Bulletin of Marine Science* 96:767–782
- Eckert RJ, **Studivan MS**, Voss JD (2019) Populations of the coral species *Montastraea cavernosa* on the Belize Barrier Reef lack vertical connectivity. *Scientific Reports* 9:7200

- Studivan MS**, O'Neal G, Voss JD (2019) *Montastraea cavernosa* corallite structure demonstrates distinct morphotypes across shallow and mesophotic depth zones in the Gulf of Mexico. *PLOS ONE* 14: e0203732
- Reed JK, González-Díaz P, Busutil L, Farrington S, Martínez-Daranas B, Cobián Rojas D, Voss JD, Diaz C, David A, Hanisak MD, González Mendez J, García Rodríguez A, González- Sánchez P, Viamontes Fernández J, Estrada Pérez D, **Studivan MS**, Drummond F, Jiang M, Pomponi SA (2018) Cuba's mesophotic coral reefs and associated fish communities. *Revista de Investigaciones Marinas* 38:56–125
- Studivan MS**, Voss JD (2018) Population connectivity among shallow and mesophotic *Montastraea cavernosa* corals in the Gulf of Mexico identifies potential for population refugia. *Coral Reefs* 37:1183–1196
- Garavelli L, **Studivan MS**, Voss JD, Kuba A, Figueiredo J, Chérubin LM (2018) Assessment of mesophotic coral ecosystem connectivity for proposed expansion of a marine sanctuary in the northwest Gulf of Mexico: larval dynamics. *Frontiers in Marine Science* 5:174
- Studivan MS**, Voss JD (2018) Assessment of mesophotic coral ecosystem connectivity for proposed expansion of a marine sanctuary in the northwest Gulf of Mexico: population genetics. *Frontiers in Marine Science* 5:152
- Studivan MS**, Hatch WI, Mitchelmore CL (2015) Responses of the soft coral *Xenia elongata* following acute exposure to a chemical dispersant. *SpringerPlus* 4:80

First-Author Presentations

- Studivan MS**, Shilling E, Enochs I, Voss JD (postponed due to COVID-19) Optimizing stony coral tissue loss disease intervention strategies through whole-transcriptome gene expression profiling. *14th International Coral Reef Symposium*, Bremen, Germany. **Oral**
- Studivan MS**, Voss JD (2019) Mesophotic-omics: integrating transcriptomics, transplants, & algal symbiosis to understand coral adaptation in the Gulf of Mexico. *Society for Integrative and Comparative Biology Annual Meeting*, Tampa, FL. **Poster**
- Studivan MS**, Voss JD (2018) Mesophotic-omics: integrating transcriptomics, transplants, and population genomics to understand connectivity of coral reefs in the Gulf of Mexico. *Mesophotic Coral Reef Ecosystems Gordon Research Conference*, Lewiston, ME. **Poster**
- Studivan MS**, Voss JD (2017) A depth of differences? Transplants and transcriptomic analyses of shallow and mesophotic corals. *European Coral Reef Symposium*, Oxford, UK. **Oral**
- Studivan MS**, Voss JD (2017) Integrating population genetics and gene expression profiling to describe connectivity of a depth generalist coral species in the Gulf of Mexico and West Florida Shelf. *38th Meeting of the United States Coral Reef Task Force*, Fort Lauderdale, FL. **Poster**
- Studivan MS**, Voss JD (2017) Population genetics & gene expression reveal broad connectivity among shallow & mesophotic reefs in the Gulf of Mexico. *Benthic Ecology Meeting*, Myrtle Beach, SC. **Oral**
- Studivan MS**, O'Neal G, Voss JD (2017) Plasticity, ecomorphs, & adaptation? *Montastraea cavernosa* has shallow & depth-generalist morphotypes across mesophotic reefs in the Gulf of Mexico. *Benthic Ecology Meeting*, Myrtle Beach, SC. **Oral**

Studivan MS, Voss JD (2017) Gene flow in the twilight zone: assessing genetic connectivity of a depth generalist coral species across shallow and mesophotic reef ecosystems in the Gulf of Mexico and Caribbean. *Global Biodiversity Genomics Conference*, Washington, DC. **Poster**

Studivan MS, Voss JD (2016) Comparing genetic connectivity and gene expression across shallow and mesophotic reef corals in the Gulf of Mexico. *13th International Coral Reef Symposium*, Honolulu, HI. **Oral**

Studivan MS (2016) Assessment of the OpenROV platform for exploration of mesophotic coral reefs and monitoring of technical divers. *Graduate and Professional Student Association Research Day*, Boca Raton, FL. **Poster**

Studivan MS, Voss JD (2015) Connectivity and plasticity of mesophotic corals in the Gulf of Mexico. *Graduate and Professional Student Association Research Day*, Boca Raton, FL. **Poster**

Studivan MS, Voss JD (2015) Connectivity and plasticity of mesophotic corals in the Gulf of Mexico. *Benthic Ecology Meeting*, Quebec City, Canada. **Poster**

Studivan MS, Voss JD (2014) Connectivity and plasticity of mesophotic corals in the Gulf of Mexico and Caribbean. *Graduate and Professional Student Association Research Day*, Boca Raton, FL. **Poster**

Studivan MS, Voss JD (2014) A reciprocal transplant experiment with a mesophotic coral species. *Benthic Ecology Meeting*, Jacksonville, FL. **Oral**

Studivan MS, Hatch WI, Mitchelmore CL (2011) Effects of the oil dispersant Corexit EC9500A on bleaching of the alcyonacean soft coral *Xenia elongata*. *Sigma Xi Annual Meeting*, Raleigh, NC. **Poster**

Studivan MS, Hatch WI, Mitchelmore CL (2011) Effects of the oil dispersant Corexit EC9500A on bleaching of the alcyonacean soft coral *Xenia elongata*. *Coastal and Estuarine Research Federation 21st Biennial Conference*, Daytona Beach, FL. **Poster**

Studivan MS, Hatch WI, Mitchelmore CL (2011) The effect of the oil dispersant Corexit EC9500A on bleaching of the alcyonacean soft coral *Xenia elongata*. *Atlantic Estuarine Research Society Spring Meeting*, Solomons, MD. **Oral**

Relevant Work Experience

Lab Technician, St. Mary's College of Maryland May 2010 – May 2011

Inventoried lab equipment and maintained live collections of organisms in greenhouse, tropical wet lab, and research labs.

Assistant Aquarist, St. Mary's College of Maryland Sep 2009 – May 2011

Maintained 2,000-gallon tropical research mesocosm and cultivated research corals via cloning. Trained undergraduate students in coral husbandry.

Media Services, St. Mary's College of Maryland Sep 2007 – May 2010

Assisted in audiovisual setups for college events.

Funding & Research Scholarships

NOAA Coral Reef Conservation Program, Coral Disease Abatement	\$780,000	Oct 2020 – Sep 2023
Environmental Protection Agency, SCTL D Ballast Water Transmission	\$109,827	May 2020 – Sep 2021
National Marine Fisheries Service, Port of Miami Coral Mitigation	\$100,000	Apr 2020 – Oct 2021
NOAA Ocean and Atmospheric Research Omics Grant, SCTL D Transmission	\$117,495	Oct 2019 – Sep 2020
Division of Research Dissertation Year Award	\$1,000	Jan 2017
Graduate Fellowship for Academic Excellence, Florida Atlantic University	\$2,500	Jul 2016
Lutz Memorial Scholarship, Florida Atlantic University	\$500	Nov 2015
Southern Association of Marine Laboratories Student Support	\$250	Nov 2015
Comprehensive Land Observation via Unmanned Drone (CLOUD)	\$17,354	May 2015 – Oct 2015
GRIP Grant for OpenROV reef surveys, Florida Atlantic University	\$1,500	May 2015
Marine Technology Society Bussman Graduate Scholarship	\$2,500	Jun 2014
President’s Challenge Scholarship, Florida Atlantic University	\$12,500	Aug 2013
Reid Nix Endowed Scholarship, Florida Atlantic University	\$1,876	Aug 2013
Teaching Assistantship, Florida Atlantic University	\$28,000	Aug 2012 – May 2014
Sigma Xi Grant-in-Aid of Research	\$1,000	Oct 2010

Academic Honors & Awards

Best Student Poster, Mesophotic Coral Reef Ecosystems Gordon Research Conference	Jun 2018
FAU Three Minute Thesis Heat Second Runner-Up	Nov 2016
Best Student Oral Presentation, 13 th International Coral Reef Symposium	Jun 2016
Film “Black & Blue: Estuarine Discharge on St. Lucie Reef” selected for screening at Beneath the Waves Film Festival, Portland, ME	Mar 2016
Film “Exploring Twilight Reefs of the Flower Garden Banks” selected for screening at the BLUE Gulf Film Festival, Corpus Christi, TX	Nov 2015
Outstanding Graduate Student Poster, Benthic Ecology Meeting	Mar 2015
Biology Department Award, Overall Excellence in an Oral Presentation of a St. Mary’s Project, St. Mary’s College of Maryland	May 2011

Biology Department Award, Academic Distinction and Service, St. Mary's College of Maryland	May 2011
Study Abroad Award, St. Mary's College of Maryland	Mar 2010
Academic Achievement Scholarship, St. Mary's College of Maryland	Aug 2009
Smart Grant, St. Mary's College of Maryland	Aug 2009

Teaching & Outreach Experience

Mesophotic.org Editor & Contributor	Oct 2017 – present
Social media coordinator, @mesophotic	
Behind the Science: “Coral population connectivity reveals potential for refugia in Gulf of Mexico” http://mesophotic.org/posts/coral-population-connectivity-reveals-potential-for-refugia-in-gulf-of-mexico	
Early Career Scientist: http://mesophotic.org/posts/michael-studivan	
Blogging and Social Media	Jan 2014 – present
@theMikeAquatic, @VossLaboratory, _vosslab.weebly.com	
Fort Lauderdale International Boat Show	Nov 2018
“New Technologies for Coral Reef Exploration and Conservation”	
NOAA Ocean Explorer Cuba's Twilight Zone Reefs and Their Regional Connectivity	May 2017
“Western Cuba: A Stepping Stone for Corals in the Gulf of Mexico?” Mission Log oceanexplorer.noaa.gov/explorations/17cuba-reefs/logs/may23/may23.html	
Undergraduate Mentoring	Jan 2013 – Aug 2016
Directly supervised two FAU undergraduates (Alicia Courtemanche and Samantha Johnston) and two external undergraduates (Nancy Sealover and Gillian Millstein) for senior thesis and summer internship projects.	
Harbor Branch Mini Brown Bag Lunch Seminar Series	Apr 2016
“Coral reef science in the 21 st century: new genetic and remotely operated technologies to study thousand-year-old coral reefs”	
St. Andrew's Episcopal Academy Scientist Lecturer	Apr 2016
Introduced 6 th -8 th grade students to coral reef biology and field research.	
Comprehensive Landscape Observation via Unmanned Drone (CLOUD)	May 2015 – Oct 2015
Films can be found on YouTube under “Voss Lab at FAU Harbor Branch.”	
St. Andrew's Episcopal Academy Scientist Lecturer	Nov 2014
Introduced 2 nd grade gifted students to coral reef biology and field research.	

NOAA Ocean Explorer Coral Ecosystem Connectivity 2014	Jul 2014
“June 2014 Sampling Cruise” Background Essay oceanexplorer.noaa.gov/explorations/14pulleyridge/background/spreesummary/spreesummary.html	
Lawnwood Elementary School Scientist Lecturer	May 2014
Introduced 3 rd grade gifted students to coral reef biology and scientific diving.	
NOAA Okeanos Explorer Exploration of the Gulf of Mexico Cruise	Apr 2014
“Collecting Data Without Getting Wet” Mission Log http://oceanexplorer.noaa.gov/okeanos/explorations/ex1402/logs/apr29/apr29.html	
TA, Marine Microbial & Molecular Biology (OCB 4525L)	Jan 2013 – May 2014
Instructed students to characterize and identify unknown marine prokaryotes using microbial and molecular lab techniques.	
St. Lucie West K-8 School Scientist Lecturer	Apr 2013
Introduced 5 th grade gifted students to coral reef biology and conservation.	
TA, Anatomy & Physiology I (BSC 2085L)	Aug 2012 – Dec 2012
Led lab activities examining human anatomy through animal dissections.	
TA, Ecology of Coastal Systems (BIOL 463)	Aug 2010 – Dec 2010
Assisted in field and laboratory settings, taught local species identification, aided student semester-long research projects.	
TA, Principles of Biology I (BIOL 105L)	Aug 2009 – Dec 2009
Instructed students in an introductory Biology lab including several independent-design experiments.	
St. Mary’s River Project Education	Aug 2008 – May 2009
Taught students at the 3 rd and 5 th grade levels the importance of the Chesapeake Bay and marine conservation.	

Service & Professional Development

International Coral Reef Society Conservation Committee	Mar 2019 – present
Beta Beta Beta Biological Honor Society, Chapter President	Aug 2010 – May 2011
Omicron Delta Kappa Leadership Honor Society	Aug 2010 – May 2011
SCUBA Club Founder and President	Aug 2010 – May 2011
Eagle Scout	Jan 2007

Filmography

“Cuba’s Twilight Zone Reefs Expedition”	May 2017
“Flower Garden Banks Technical Diving Cruise, May 2016”	May 2016
“OpenROV Pilot Training and Diver Monitoring Test”	Feb 2016
“Freshwater Discharges Impact the Indian River Lagoon and St. Lucie Inlet Preserve State Park”	Feb 2016
“FAU-Harbor Branch Aerial Tour”	Jan 2016
“OpenROV Pressure and First Water Tests”	Jan 2016
“Taking Science to the Sky: Quadcopter Restoration & Photomerging”	Dec 2015
“Black & Blue: Estuarine Discharge on St. Lucie Reef”	Oct 2015
“Exploring Twilight Reefs of the Flower Garden Banks”	Sep 2015
“Harbor Branch-FAU & Project Baseline Oculina Cruise 2015”	Jul 2015

Software & Lab Skills

Unix command line, Perl, Python	CPCe with Excel Extensions
DESeq2, GO-MWU, KOGMWU, WGCNA, dadi	DJI Inspire 1 pilot
GeneMapper, Arlequin, Structure, Migrate, BayesAss	Adobe Creative Suite 6
RNA-Seq/2bRAD Library Preparation/Analysis	ESRI ArcGIS
Microsatellite Amplification/Analysis	Microsoft Access
R, Primer 7, SAS 9.3, IBM SPSS	Apple Final Cut Pro X

Affiliations & Memberships

TDI Technical Diver, Advanced Nitrox, Advanced Decompression, Extended Range, Trimix	Society for Integrative and Comparative Biology
AAUS Scientific Diver, 190’	International Coral Reef Society
GUE Fundamentals Diver	Coastal and Estuarine Research Federation
PADI Gas Blender, Advanced Open Water Diver, Enriched Air Diver	Marine Technology Society
PSI/PCI Fill Station Operator	Sigma Xi
DOI Motorboat Operator Certification Course	

References

Dr. Ian Enochs – NOAA supervisor; Atlantic Oceanographic and Meteorological Laboratory

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Dr. Joshua Voss – Postdoc advisor, PhD advisor; Florida Atlantic University

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Dr. Marc Slattery – PhD committee member; The University of Mississippi

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Dr. Walter Hatch – Undergraduate thesis advisor, former employer; St. Mary's College of Maryland

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