

Hussein Sayani, PhD

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ADDRESS

School of Earth and Atmospheric Sciences
Georgia Institute of Technology
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Atlanta, GA 303323

PROFESSIONAL APPOINTMENTS

2018 – Research Scientist II, Georgia Tech
2017 – 2018 Postdoctoral Research Associate, Boston University
Advisor: Dr. Diane Thompson
2016 – 2017 Graduate Research Assistant, Georgia Tech
Advisor: Dr. Kim Cobb
Graduate Teaching Assistant, Georgia Tech
2015 – 2016 EAS 3110: Energy, the Environment & Society (2 sections)
2013 – 2014 EAS 2600: Earth Processes Lab (4 sections)
2010 – 2015 NSF Graduate Research Fellow, Georgia Tech
Advisor: Dr. Kim Cobb
2009 – 2010 Research Technician, Georgia Tech
2007 – 2010 Undergraduate Research Assistant
Advisor: Dr. Kim Cobb

EDUCATION

2017 Ph.D. in Paleoclimatology, Georgia Institute of Technology
2009 B.S. in Earth and Atmospheric Sciences, Georgia Institute of Technology

AWARDS & FELLOWSHIPS

2018 Best Poster Award, 3rd Annual Postdoctoral Retreat, Boston University
2016 – 2017 Georgia Tech Diversity & Inclusion Fellows Program
2010 – 2015 NSF Graduate Research Fellowship
2011 Chair's Special Service Award
Georgia Tech, School of Earth and Atmospheric Science
2009 Outstanding Undergraduate Researcher
Georgia Tech, College of Sciences
2008 Georgia Tech President's Undergraduate Research Award
2008 S. Rutt Bridges Undergraduate Research Initiative Award
2002 – 2007 Georgia HOPE Scholarship

GRANTS

- 2018 co-author, Assessment Mini Grant, Office of the Provost – Boston University, *Assessing AGREED, a program to cultivate allies and facilitate diversity and inclusion in STEM*, \$3500, awarded to PI D.M. Thompson
- 2017 co-author, *NSF-OCE-P2C2 #1702130: Reconstructing Pacific Trade Wind Variability: Extending and Replicating a Promising New Coral Proxy*, \$342,700, awarded to PI D.M. Thompson

PEER-REVIEWED PUBLICATIONS

Submitted and in preparation

(underline – advised/mentored student)

12. **Sayani, H.R.**, K.M. Cobb, K.L. Delong, N.T. Hitt, and E.R.M. Druffel. *Intercolony $\delta^{18}O$ and Sr/Ca variability among Porites corals from Palmyra Atoll* (in prep for G-Cubed)
11. **Sayani, H.R.**, K.M. Cobb, A.L. Cohen, B. Monteleone, and H. Crespo. *Reliable coral Sr/Ca estimates using SIMS: challenges and implications* (in prep for GCA)
10. Hitt, N.T., **Sayani, H.R.**, K.M. Cobb, P.R. Grothe, A.R. Atwood, S.A. Ellis, C.R. Maupin, D.M. Thompson, Y. Lu, H. Cheng, and R.L. Edwards. *Evaluating 20th century central tropical Pacific SST trends using young fossil corals* (in prep for GRL)
9. Chen, T., K.M. Cobb, **H.R. Sayani**, and P.R. Grothe, *Beyond Porites spp. corals: Exploring the potential of Favia, Platygyra, and Pocillopora corals as paleoclimate archives* (in prep for Paleoceanography and Paleoclimatology)
8. **Sayani, H.R.**, K.M. Cobb, A. Khare, P.R. Grothe, A.R. Atwood, C.R. Maupin, T. Chen, H. Cheng, R.L. Edwards. *Central tropical Pacific climate variability during the Little Ice Age* (in prep)

Submitted

7. Grothe, P.R., K.M. Cobb, G. Liguori, E. Di Lorenzo, A. Capotondi, Y. Lu, H. Cheng, R.L. Edwards, J.R. Southon, G.M. Santos, D.M. Deocampo, J. Lynch-Stieglitz, T. Chen, **H.R. Sayani**, K.J. Townsend, M.M. Hagos, G. O'Connor, D.M. Thompson, L.T. Toth, J.L. Conroy, and A.L. Moore. *Central Pacific El Niño Southern Oscillation stronger in last decades than pre-industrial period* (submitted to Science)

Published

6. Carilli, J. E., A.C. Hartmann, S.F. Heron, J.M. Pandolfi, K.M. Cobb, **H.R. Sayani**, R.B. Dunbar, and S.A. Sandin (2017), *Porites coral response to an oceanographic and human impact gradient in the Line Islands*, Limnology and Oceanography. doi: 10.1002/lno.10670
5. Grothe, P.R., K.M. Cobb, S.L. Bush, H. Cheng, G.M. Santos, J.R. Southon, R.L. Edwards, D.M. Deocampo, and **H.R. Sayani** (2016), *A comparison of rapid screening ^{14}C and U-Th dates from Line Island fossil corals: implications for paleoclimate reconstruction*, G-Cubed. doi: 10.1002/2015GC005893
4. Toth, L. T., R.B. Aronson, K.M. Cobb, H. Cheng, R.L. Edwards, P.R. Grothe, and **H.R. Sayani** (2015), *Climatic and biotic thresholds of coral-reef shutdown*, Nature Climate Change. doi: 10.1038/nclimate2541

3. Cobb, K.M., N. Westphal, **H.R. Sayani**, J.T. Watson, E. Di Lorenzo, H. Cheng, R.L. Edwards, and C.D. Charles (2013), *Highly variable El Nino-Southern Oscillation throughout the Holocene*, Science. doi: 10.1126/science.1228246
2. **Sayani, H.R.**, K.M. Cobb, A.L. Cohen, W.C. Elliott, I.S. Nurhati, R.B. Dunbar, K.A. Rose, and L.K. Zaunbrecher (2011), *Effects of diagenesis on paleoclimate reconstructions from modern and young fossil corals*, Geochimica et Cosmochimica Acta. doi: 10.1016/J.Gca.2011.08.026
1. Zaunbrecher, L.K., K.M. Cobb, J.W. Beck, C.D. Charles, E.R.M. Druffel, R.G. Fairbanks, S. Griffin, and **H.R. Sayani** (2010), *Coral records of central tropical Pacific radiocarbon variability during the last millennium*, Paleoceanography. doi: 10.1029/2009pa001788

PRESENTATIONS

Invited Talks

3. Intercolony $\delta^{18}\text{O}$ and Sr/Ca variability and the fidelity of coral-based climate records, *Tropical Coral Archives Workshop*, Bremen, Germany, September 2017
2. Fossil coral-based reconstructions of past climate variability, *Earth and Environment*, Boston University, Boston, MA, January 2016
1. Coral records of ENSO, *Life University*, Marietta, GA, August 2014

Contributed Presentations

(* presenting author, underline – mentored/advised student)

22. **Sayani, H.R.***, D.M. Thompson, J.E. Carilli, T. Ireland, K.M. Cobb, A.R. Atwood, P.R. Grothe, G. O'Connor. Constraining 20th century Pacific trade-wind variability using coral Mn/Ca. Abstract PP11E-04 at *AGU Fall Meeting*, New Orleans, LA, December 2017
21. **Sayani, H.R.***, D.M. Thompson, J.E. Carilli, T. Ireland, K.M. Cobb, A.R. Atwood, P.R. Grothe, S.J. Miller, N.T. Hitt, G. O'Connor. Constraining 20th century Pacific trade-wind variability using coral Mn/Ca. *GeoBremen2017*, Bremen, Germany, September 2017
20. Atwood, A.R.* , K.M. Cobb, P.R. Grothe, **H.R. Sayani**, J.R. Southon, R.L. Edwards, D.M. Deocampo, N.T. Hitt and J. Chiang. A Coral Ensemble Approach to Reconstructing Central Pacific Climate Change During the mid-Holocene. *GeoBremen2017*, Bremen, Germany, September 2017
19. Cobb, K.M.* , N. Westphal, C. D. Charles, **H.R. Sayani**, R.L. Edwards, H. Cheng, P. R. Grothe, T. Chen, N.T. Hitt, G. O'Connor, and A.R. Atwood. Tropical Pacific climate during the Medieval Climate Anomaly: progress and pitfalls. Abstract PP54A-07 at *AGU Fall Meeting*, San Francisco, CA, December 2016
18. **Sayani, H.R.*** , K.M. Cobb, G. O'Connor, A. Khare, A.R. Atwood, P.R. Grothe, T.Chen, M.M. Hagos, N.T. Hitt, D.M. Deocampo, Y. Lu, H. Cheng, and R.L. Edwards. Coral Ensemble Estimates of Central Pacific Mean Climate During the Little Ice Age. Abstract PP51D-2329 at *AGU Fall Meeting*, San Francisco, CA, December 2016
17. Atwood, A.R.* , K.M. Cobb, P.R. Grothe, **H.R. Sayani**, J.R. Southon, R.L. Edwards, D.M. Deocampo, K.J. Townsend, M.M. Hagos, and J. Chiang. An Coral Ensemble Approach to Reconstructing Central Pacific Climate Change During the Holocene. Abstract PP43D-04 at *AGU Fall Meeting*, San Francisco, CA, December 2016

16. Hitt, N.T.*, K.M. Cobb, **H.R. Sayani**, P.R. Grothe, A.R. Atwood, G. O'Connor, T. Chen, M.M. Hagos, D.M. Deocampo, R.L. Edwards, H. Cheng, Y. Lu, D.M. Thompson. An ensemble approach to reconstructing 20th century climate in data-sparse regions of the tropical Pacific using young fossil corals. Abstract PP43D-03 at *AGU Fall Meeting*, San Francisco, CA, December 2016
15. O'Connor, G.*, K.M. Cobb, **H.R. Sayani**, P.R. Grothe, A.R. Atwood, S. Stevenson, N.T. Hitt, and J. Lynch-Stieglitz. The 2015/16 El Niño Event as Recorded in Central Tropical Pacific Corals: Temperature, Hydrology, and Ocean Circulation Influences. Abstract A41L-04 at *AGU Fall Meeting*, San Francisco, CA, December 2016.
14. Grothe, P.R.* , K.M. Cobb, G. Liguori, E. Di Lorenzo, A. Capotondi, H. Cheng, G.M. Santos, J.R. Southon, D.M. Deocampo, T. Chen, **H.R. Sayani**, K.J. Townsend, L.T. Toth, M.M. Hagos, G. O'Connor, D.M. Thompson, and Y.Lu. Robust evidence for forced changes in ENSO: from the mid-Holocene to the 21st century. Abstract A42E-03 at *AGU Fall Meeting*, San Francisco, CA, December 2016
13. **Sayani, H.R.***, K.M. Cobb, A. Khare, C.M. Stone, P.R. Grothe, T. Chen, Y. Lu, H. Cheng, and R.L. Edwards. Coral-based estimates of tropical Pacific climate during the Little Ice Age: intercolony variability and the need for replication. Abstract PC54A-2239 at *Ocean Sciences Meeting*, New Orleans, LA, February 2016.
12. Hitt, N.T.*, K.M. Cobb, **H.R. Sayani**, P.R. Grothe, T. Chen, M.M. Hagos, D.M. Deocampo, R.L. Edwards, H. Cheng, Y. Lu, and K.J. Townsend. An ensemble approach to reconstructing mid-20th century climate using young fossil corals: pitfalls and opportunities. Abstract PC51A-06 at *Ocean Sciences Meeting*, New Orleans, LA, February 2016.
11. **Sayani, H.R.***, K.M. Cobb, A. Khare, C.M. Stone, P.R. Grothe, T. Chen, H. Cheng, Y. Lu, R. L. Edwards. Central Tropical Pacific SST and Salinity Variability over the Little Ice Age. Abstract PP13D-02 at *AGU Fall Meeting*, San Francisco, CA, December 2015
10. Miller, S.J.*, K.M. Cobb, P.R. Grothe, **H.R. Sayani**, T. Chen, J. Lynch-Stieglitz, K.J. Townsend, R.L. Edwards, H. Cheng, D.M. Deocampo. Favia Corals: A New Paleoclimate Archive. *AGU Fall Meeting*, San Francisco, CA, December 2015
9. Morales-Collazo, J. A., W.R. Ramirez-Martinez, A. Winter, H. Santos Mercado, K.M. Cobb, **H.R. Sayani**, P.R. Grothe, R.L. Edwards, A. Min, and H. Cheng. Reconstructing sea surface temperatures in the Caribbean during the early-mid Holocene from a reef exposure in Cañada Honda, Enriquillo Valley, Dominican Republic. Paper No. 40-25 at *GSA Annual Meeting*, Baltimore, MD, November 2015
8. **Sayani, H.R.***, K.M. Cobb, A.L. Cohen, and B.D. Monteleone. Reliable coral Sr/Ca estimates using SIMS: challenges and implications. *HiRes Paleoclimate Proxies Workshop*, Madison, WI, June 2015
7. Morales-Collazo, J.A., W.R. Ramirez-Martinez, A. Winter, H. Santos Mercado, K.M. Cobb, **H.R. Sayani**, P.R. Grothe, M. Gonzalez-Tavarez. Developing a two thousand year record of climate variability from a reef exposure in Canada Honda, Enriquillo Lake, Dominican Republic, *29th Annual Symposium of Caribbean Geology*, Mayaguez, Puerto Rico, March 2014

6. **Sayani, H.R.***, K.M. Cobb, A.L. Cohen, E.R.M. Druffel, and B.D. Monteleone. Intercolony Sr/Ca variability in Palmyra Island corals: Implications for paleo-SST reconstructions. Abstract PP23D-06 at *AGU Fall Meeting*, San Francisco, CA, December 2013
5. **Sayani, H.R.***, K.M. Cobb, A.L. Cohen, B.D. Monteleone. Extracting robust Sr/Ca estimates from coral using SIMS. *HiRes Paleoclimate Proxies Workshop*, Madison, WI, June 2013
4. Cobb, K.M.*, N. Westphal, **H.R. Sayani**, E. Di Lorenzo, H. Cheng, R.L. Edwards, and C.D. Charles. Testing late 20th century El Nino-Southern Oscillation variability against new coral-based estimates of natural variability. Abstract OS52B-03 at *AGU Fall Meeting*, San Francisco, CA, December 2012
3. Wiggins, E. B.*, **H.R. Sayani**, and K.M. Cobb. The Effects of Freshwater Dissolution on Coral Geochemistry and Morphology. Abstract PP33A-2089 at *AGU Fall Meeting*, San Francisco, CA, December 2012
2. **Sayani, H.R.***, K.M. Cobb, A.L. Cohen, W.C. Elliott, I.S. Nurhati, R.B. Dunbar, K.A. Rose, and L.K. Zaunbrecher. Effects of diagenesis on paleoclimate reconstructions from modern and young fossil corals. *Goldschmidt Conference*, Knoxville, TN, June 2010
1. **Sayani, H.R.***, K.M. Cobb, A.L. Cohen, W.C. Elliott, I.S. Nurhati, R.B. Dunbar, K.A. Rose, and L.K. Zaunbrecher. Effects of diagenesis on paleoclimate reconstructions from modern and young fossil corals. *AGU Fall Meeting*, San Francisco, CA, December 2009

TEACHING

Courses

Spring 2015 & 2016 Energy, Environment & Society, Teaching Assistant and Guest Lecturer
 Fall 2013 & 2014 Earth Processes Labs, Teaching Assistant and Lab Instructor

Guest Lectures

'The El Niño/Southern Oscillation' – two lectures, Climate Modes, Boston University, Feb 2018
 'Wind Energy' – Energy, Environment, & Society, Georgia Tech, Apr 2016
 'Coral records of ENSO' –Life University, Aug 2014

SERVICE

Mentoring

2018 – Hudson Moss, *Rutt Bridges Research Fellow*
 2015 – 2017 Nicholas T. Hitt, *PURA Awardee, AGU and OSM Fall Meeting Presenter*
 2016 – 2017 Gemma O'Connor, *PURA Awardee, AGU Fall Meeting Presenter*
 2016 – 2017 Melat Hagos, *PURA Awardee*
 2015 – 2016 Kayla Townsend, *PURA Awardee*
 2014 – 2016 Shellby J. Miller, *PURA Awardee, AGU Fall Meeting Presenter*
 2014 – 2015 Colin M. Stone, *PURA Awardee*
 2011 – 2013 Elizabeth Wiggins, *PURA Awardee, AGU Fall Meeting Presenter*

Synergistic Activities

- 2017 – Co-organizer for BU AGREED - Allies for Gender/Sexuality, Racial & Ethnic Equality & Diversity
- 2017 – Contributor to the PAGES coralHydro2k project
- 2015 – Contributor to the PAGES ISO2K project
- 2016 - 2017 Co-founder of Queering STEM, a professional development and peer-mentoring group for LGBTQ+ graduate students and postdocs at Georgia Tech
- 2016 – 2017 Co-organizer for Culture Swap Project
- 2016 – 2017 Fellow for the Georgia Tech Diversity and Inclusion Program
- 2011 – 2016 Reviewer for the Georgia Tech President’s Undergraduate Research Award,
- 2013 Co-organizer for “Chasing Ice” screening and panel discussion
- 2011 – 2013 Co-organizer for the EAS Graduate Student Symposium
- 2010 – 2011 Chair of Graduate Student Symposium Committee

Outreach

- Oct 2016 Presentation: Rocks – Where do they come from?
Springdale Park Elementary STEAM Night, Atlanta GA
- Oct 2015 Presentation: If Rocks Could Talk
Springdale Park Elementary STEAM Night, Atlanta GA
- Oct 2012 Guest Lecturer, Oceanography
Mount Arabia High School, Atlanta, GA
- Nov 2013 Guest Lecturer, Oceanography
Mount Arabia High School, Atlanta, GA
- Nov 2010 Presentation: Corals and Climate Change
Earth Club at Grady High School, Atlanta, GA
- Sept 2009 Guest Lecturer, Climate Change
Cross Keys High School, Atlanta, GA
- 2012 Tutor at Atlanta Union Mission
(women and children’s shelter)
- 2009 – 2010 Organizer for the Atlanta Science Café

FIELD EXPERIENCE

- 2018 Majuro and Arno Atolls, Republic of Marshall Islands: cored fossil corals, collected seawater samples for salinity, isotope, and trace metal analyses
- 2012 Kiritimati (Christmas Island), Republic of Kiribati: mapped fossil coral rubble fields around the island, collected and archived fossil corals, installed weather station and rain water collection devices, collected seawater samples

PROFESSIONAL TRAINING & WORKSHOPS

- 2018 Integrating Active Learning into the Classroom
 Creating Inclusive Research Environments
 Annual Postdoctoral Retreat, Boston University
- 2015 High-Res Proxies of Paleoclimate Workshop
 University of Wisconsin - Madison
- 2015 U/Pb Geochronology using SIMS Short Course
 Woods Hole Oceanographic Institute
- 2013 High-Res Proxies of Paleoclimate Workshop
 University of Wisconsin - Madison

ANALYTICAL/LAB EXPERIENCE

Stable isotope ratio mass spectrometry (IRMS): Delta V plus, MAT253, Kiel Carbonate IV

Trace metal analyses: ICP-OES (Horiba Jobin Yvon Ultima 2C, Ultima Expert), ICP-MS (Neptune Plus), SIMS (Cameca IMS1280, Cameca 3f)

Imaging and petrology: SEM, XRD, thin section preparation

PROFESSIONAL AFFILIATIONS

American Geophysical Union (AGU), PAGES – Past Global Changes, Geochemical Society (GS), oSTEM, NOGLSTP