

Tyler S. Winkler

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Education

2015-2021 Ph.D. in Oceanography; Texas A&M University (TAMU), College Station, Texas
2014-2015 Guest Student; Woods Hole Oceanographic Institution (WHOI), Woods Hole, Massachusetts
2011-2015 B.S. Marine Biology; Texas A&M University at Galveston (TAMUG), Galveston, Texas
Magna Cum Laude Latin Honors

Professional and Research Experience

Sep. 2021-Present Postdoctoral Scholar; Woods Hole Oceanographic Institution (WHOI) and National Ocean Sciences Accelerator Mass Spectrometry (NOSAMS), Woods Hole, Massachusetts

Utilize sedimentological and geochemical proxies to reconstruct extreme coastal flooding events in Atlantic Canada to assess impacts of late-Holocene variability in Labrador Current and atmospheric modes. This proxy work will be coupled with high resolution climate and coastal inundation modelling approaches.

Jun. 2016-Aug. 2021 Doctoral Research Fellow, TAMU (Jun., Jul., Aug. 2016-2020, Sep. 2020-present)
Studied Holocene ocean/climate modulation of extreme weather events patterns and hydroclimate in the tropical North Atlantic using sedimentological proxies and spatial analysis of karst geomorphology

Aug. 2015-May 2020 Graduate Teaching Assistant, TAMUG (excluding Jun., Jul., Aug.)

- GEOL 101- *Introduction to Physical Geology*: Guest lecturer geology. ~70 students per semester
- GEOL 102- *Physical Geology Lab*: Lead Teaching Assistant (TA) for geology labs. ~60 students per semester
- GEOL 106- *Historical Geology*: Guest lecturer, field trip coordinator, grader, and lead TA
- MARS 325- *Introduction to GIS*: Guest lecturer and lab instructor for introductory GIS course

Jan. 2014-May 2015 Undergraduate Research Fellow, TAMU
Used sedimentological proxies to study of western Floridian aquifer variability throughout the Holocene

Aug. 2014-May 2015 Divemaster, Scientific Diving, TAMUG

Jan. 2012-May 2012 Supplemental Instructor, Chemistry 101, TAMUG

Summary of Career Achievements

- Published three first author manuscripts (Scientific Reports, Marine Geology, and Sedimentary Geology) and nine co-authored manuscripts in journals within the 20th percentile of journals within my field.
- Presented at six international scientific conferences and received two presentation awards: Outstanding Student Presentation Award at American Geophysical Union Fall Meeting in 2019 and Outstanding Student Poster Award at Geological Society of America Annual Meeting in 2014 (each indicating top 5% of student presentations).
- Thirteen funded competitive student research grant proposals resulting in \$16,738 USD for research expenses including: two Geological Society of America Student Research Grants, a Texas Sea Grant- Grant in Aid of Graduate Research, and grant from The Explorers Club Youth Activity Fund.
- Participated in 20 international field research expeditions including cruises on the RV Atlantis and MV Alucia: ~8 months abroad in 5 countries conducting sediment coring, geophysical surveying, and hydrographic sampling.

Peer Reviewed Publications

Indexed Disciplines from the Web of Science: *Environmental Sciences, Geology, Geosciences, Limnology, Multidisciplinary Sciences, Oceanography, Paleontology, Physical Geography, Anthropology*

Published Peer-Reviewed Manuscripts (12)

12. SN Little, PJ van Hengstum, PA Beddows, JP Donnelly, **TS Winkler**, NA Albury, (Accepted Nov. 30, 2021), Unique Habitat for Benthic Foraminifera in Subtidal Blue Holes on Carbonate Platforms, *Frontiers in Ecology and Evolution*.
11. **TS Winkler**, PJ van Hengstum, JP Donnelly, EJ Wallace, N D'Entremont, AD Hawkes, CV Maio, RM Sullivan, JP Woodruff, (Accepted 22 Sep. 2021), Oceanic passage of hurricanes across Cay Sal Bank in The Bahamas over the last 530 years. *Marine Geology*. <https://doi.org/10.1016/j.margeo.2021.106653>.
10. EJ Wallace, JP Donnelly, PJ van Hengstum, **TS Winkler**, C Dizon, A LaBella, I Lopez, N D'Entremont, RM Sullivan, JD Woodruff, AD Hawkes, CV Maio, (2021), Regional shifts in paleohurricane activity over the last 1500 years derived from blue hole sediments offshore of Middle Caicos Island. *Quaternary Science Reviews*, 268, <https://doi.org/10.1016/j.quascirev.2021.107126>.
9. RM Sullivan, PJ van Hengstum, S Coats, JP Donnelly, **TS Winkler**, AE Tamalavage, NA Albury, (2021) Hydroclimate dipole drives multi-centennial variability in tropical North Atlantic during mid-late Holocene. *Paleoceanography and Paleoclimatology*, 36 (7), <https://doi.org/10.1029/2020PA004184>.
8. D Brankovits, SN Little, **TS Winkler**, AE Tamalavage, LM Mejía-Ortíz, CR Maupin, G Yáñez-Mendoza, PJ van Hengstum (2021), Changes in organic matter deposition can impact benthic marine meiofauna in karst subterranean estuaries. *Frontiers in Environmental Science*, 9, 157 <https://doi.org/10.3389/fenvs.2021.670914>.
7. EJ Wallace, JP Donnelly, PJ van Hengstum, **TS Winkler**, K McKeon, D MacDonald, N D'Entremont, RM Sullivan, JD Woodruff, AD Hawkes, C Maio, (2021), 1050 years of hurricane strikes on Long Island in The Bahamas. *Paleoceanography and Paleoclimatology*, 36 (3), e2020PA004156. <https://doi.org/10.1029/2020PA004156>.
6. **TS Winkler**, PJ van Hengstum, JP Donnelly, EJ Wallace, RM Sullivan, D MacDonald, NA Albury, (2020), Revising evidence of hurricane strikes on Abaco Island (The Bahamas) over the last 700 years. *Scientific Reports*, 10: Article number: 16556, <https://doi.org/10.1038/s41598-020-73132-x>.
5. RM Sullivan, PJ van Hengstum, JP Donnelly, **TS Winkler**, SE Mark, NA Albury, (2020), Absolute and relative dating of human remains in a Bahamian sinkhole (Great Cistern, Abaco). *Journal of Archeological Science: Reports*, 32, Article No. 102441, <https://doi.org/10.1016/j.jasrep.2020.102441>.
4. PJ van Hengstum, **TS Winkler**, AE Tamalavage, RM Sullivan, SN Little, D MacDonald, JP Donnelly, NA Albury. Holocene sedimentation in a blue hole surrounded by carbonate tidal flats. *Marine Geology*, 419, Article 106051, <https://doi.org/10.1016/j.margeo.2019.106051>.
3. EJ Wallace, JP Donnelly, PJ van Hengstum, C Wiman, RM Sullivan, **TS Winkler**, MR Toomey, (2019), Intense hurricane activity over the past 1500 years at South Andros, The Bahamas. *Paleoceanography and Paleoclimatology*, 34, <https://doi.org/10.1029/2019A003665>.
EOS Highlight: Supriya, L. (2019), Sea caves hold clues to ancient storms, Eos, 100
2. PJ van Hengstum, G Maale, JP Donnelly, NA Albury, BP Onac, RM Sullivan, **TS Winkler**, AE Tamalavage, D MacDonald (2018). Drought in the northern Bahamas from 3300 to 2500 years ago. *Quaternary Science Reviews*, 186, 169-185, doi: 10.1016/j.quascirev.2018.02.014.
1. **TS Winkler**, PJ van Hengstum, MC Horgan, JP Donnelly, JH Reibenspies, (2016). Detrital cave sediments record late quaternary hydrologic and climatic variability in northwestern Florida, USA. *Sedimentary Geology*, 335, 51-65, doi: 10.1016/j.sedgeo.2016.01.022.

Peer Reviewed Conference Abstracts (20) *denotes lead presenter

20. ***TS Winkler**, PJ van Hengstum, JP Donnelly, EJ Wallace, C Maio, NA Albury, N D'Entremont, AD Hawkes, D MacDonald, RM Sullivan, JD Woodruff, (2020), Near-annually resolved records of northern Bahamian hurricane activity during the Common Era: Emerging patterns and implications. *American Geophysical Union (AGU) Fall Meeting, U009*.
Note: AGU Invited Talk.
19. EJ Wallace, JP Donnelly, PJ van Hengstum, **TS Winkler**, C Dizon, A LaBella, I Llopez, N D'Entremont, RM Sullivan, C Maio, AD Hawkes, JD Woodruff (2020). Regional shifts in paleohurricane activity over the past 1500 yrs reconstructed from blue hole sed. records in the Bahamian Archipelago. *AGU Fall Meeting, PP008*.
18. D Brankovits, PJ van Hengstum, **TS Winkler**, AE Tamalavage, SN Little, CR Maupin, LM Mejía-Ortiz (2020). Decreasing inputs of particulate organic matter from wetland and terrestrial habitats into a karst subterranean estuary during the last millennium. *AGU Fall Meeting, GC024*.
17. ***TS Winkler**, PJ van Hengstum, JP Donnelly, C Maio, N D'Entremont, AD Hawkes, RM Sullivan, EJ Wallace, JD Woodruff (2019). An 1800-year Sedimentary Record from a Bahamian Blue Hole archives significant variations in intense hurricane landfall frequency, *AGU Fall Meeting, PP43D-1644*.
Note: AGU Outstanding Student Presentation Award (top 5% of student presentations).
16. ***TS Winkler**, PJ van Hengstum, JP Donnelly, C Maio, N D'Entremont, AD Hawkes, RM Sullivan, EJ Wallace, JD Woodruff (2019). An 1800-year Sedimentary Record from a Bahamian Blue Hole archives significant variations in intense hurricane landfall frequency, *Graduate Climate Conference, Woods Hole Massachusetts*
15. PJ van Hengstum, NA Albury, PA Beddows, NE D'Entremont, SJ Feakins, JP Donnelly, SN Little, K McKeon, X Ma, O Shipley, RM Sullivan, AE Tamalavage, EJ Wallace, **TS Winkler** (2019). A 50,000-year record from a Bahamian sinkhole and direct evidence for Saharan dust export to the tropical North Atlantic, *AGU Fall Meeting, GC51I-0942*
14. SN Little, PJ van Hengstum, **TS Winkler**, RM Sullivan, AE Tamalavage, JP Donnelly, NA Albury, AS Mayer, Q Nan, J Gulley (2019). Evidence for rainfall in BHA from 4100 to 3300 yrs ago, *AGU Fall Meeting, PP43B-1605*.
13. RM Sullivan, PJ van Hengstum, **TS Winkler**, SN Little, LM Mejía-Ortiz, (2019). 2000 yrs of hurricanes on the Eastern Yucatan Peninsula: Climate drivers and Mayan Cultural Implications, *AGU Fall Meeting, PP11C-1396*.
12. EJ Wallace, JP Donnelly, PJ van Hengstum, K McKeon, JD Woodruff, **TS Winkler**, RM Sullivan, AD Hawkes, C Maio, C Dizon (2018). Regional Shifts in paleohurricane activity over the past millennium reconstructed from Blue Holes in the Tropical Atlantic, *AGU Fall Meeting, PP42A-05*.
11. PJ van Hengstum, GE Maale, JP Donnelly, NA Albury, BP Onac, RM Sullivan, ***TS Winkler**, AE Tamalavage, D MacDonald (2018). Drought in the northern Bahamas from 3300 to 2500 years ago. 2018 Abaco Science Alliance Conference (ASAC), Marsh Harbour, The Bahamas.
10. RM Sullivan, PJ van Hengstum, JP Donnelly, ***TS Winkler**, NA Albury, DW Steadman (2018). A sedimentary record of middle Holocene precipitation from Great Cistern Blue Hole (Abaco Island). ASAC, Marsh Harbour, The Bahamas.
9. EJ Wallace, JP Donnelly, PJ van Hengstum, C Wiman, K McKeon, A LaBella, RM Sullivan, **TS Winkler**, JD Woodruff, AD Hawkes, C Maio (2017), Sedimentary reconstructions of tropical cyclone activity over the past 1500 years from blue holes in the Caribbean. *AGU Fall Meeting, PP53D-08*.
8. PJ van Hengstum, GE Maale, R Sullivan, **TS Winkler**, K Kelley, JP Donnelly, NA Albury, BP Onac (2017). Evidence for Holocene hydroclimate variability in the Bahamas (Abaco Island) based on sinkhole lake sed. records. *Geological Society of America (GSA) Annual Meeting Abstracts with Programs*

7. PJ van Hengstum, GE Maale, JP Donnelly, BP Onac, RM Sullivan, **TS Winkler**, NA Albury (2016). Stratigraphic and microfossil evidence for hydroclimate changes over the middle to late Holocene in the northern Bahamas from an inland saline lake, *AGU Fall Meeting*, PP33B-2364.
6. EJ Wallace, JP Donnelly, K Emanuel, C Wiman, PJ van Hengstum, RM Sullivan, **TS Winkler** (2016). Assessing a 1500-yr record of Atlantic hurricane activity from South Andros Island, The Bahamas, using modeled hurricane climatology, *AGU Fall Meeting*, NH31A-1897.
5. RM Sullivan, PJ van Hengstum, JP Donnelly, **TS Winkler**, NA Albury, D Steadman (2016). A sed. record of Holocene precipitation and terrestrial verts. from Great Cistern BH Abaco, *AGU Fall Meeting*, PP33B-2365.
4. ***TS Winkler**, PJ van Hengstum, JP Donnelly, NA Albury, (2016). A near-annual record of hurricane activity from the northern Bahamas over the last 700 years. *AGU Fall Meeting*, NH31A-1903.
3. ***TS Winkler**, PJ van Hengstum, JP Donnelly, RM Sullivan, NA Albury (2015). The geomorphologic value of drone-based aerial photo. during reconnaissance of Bahamian blue holes, *GSA Annual Meeting*.
2. GE Maale, PJ van Hengstum, JP Donnelly, BP Onac, RM Sullivan, **TS Winkler** (2015). A 6500-yr paleoenvironmental reconstruction of No Man's Land Sink (Abaco), an inland lake in The Bahamas, *GSA Annual Meeting*.
1. ***TS Winkler**, PJ van Hengstum, KA Schwehr, JH Reinbenspies (2014). Deglacial hydrologic conditions in two underwater caves flooded by the west. Floridian aquifer. *GSA Ann. Mtg.*

Note: GSA Outstanding Student Presentation Award

Mass Media Appearances and Publications (5)

5. Research featured in American Geophysical Union Earth and Ocean Science (EOS) article *Sea Caves Hold Clues to Ancient Storms* (2019), <https://eos.org/articles/sea-caves-hold-clues-to-ancient-storms>
4. National Geographic: *The ghosts of ancient hurricanes live in Caribbean blue holes*, Andrews, R. G. (2019), <https://www.nationalgeographic.com/science/2019/11/ghosts-ancient-hurricanes-caribbean-blue-holes/>
3. PBS NOVA doc. *Killer Hurricanes* (2017), <https://www.pbs.org/wgbh/nova/video/killer-hurricanes/>
2. Appeared in National Geographic docuseries *Years of Living Dangerously*, Season 2: Episode 2: *Gathering Storm* (2017). Featured in interviews. <https://theyearsproject.com/story/storms-of-the-future/>
1. AE Tamalavage, A Sterne, A McGuffin, B Yang, J Cresswell, RM Sullivan, SN Little, T Molodtsova, **TS Winkler** Why East Texas needs science (2017), Houston Chronical: Gray Matters.

Appointments and Service

Aug. 2022	Session co-convenor 21st International Sedimentological Congress (ISC); Y Yang, V Maselli, Q Yao, N Zhao, TS Winkler , Session T3-5: Storm records in a changing climate from centennial to millennial timescales
2018-2020	Galveston President of TAMU Oceanography Graduate Council
2016-Present	Ad Hoc reviewer for 4 manuscripts in 3 journals: <i>Nature Communications</i> , <i>Climate Dynamics</i> , and <i>Journal of Cave & Karst Studies</i>
Summer 2017, 2018	NSF Research Experience for Undergraduates Mentor at TAMUG: Taught summer interns lab techniques and protocols, research design, and research communication

Research Funding and Academic Awards- Career Total: \$272,967**Research Grants/ Fellowships (\$14,838)**

- 2019 Texas Sea Grant-Grant in Aid of Graduate Research-2019-2021-Annually-resolved archive of paleohurricane frequency in the western Caribbean over the last 900 years: Implications for the US Gulf Coast; Texas Sea Grant, \$2480
- 2019 Sigma Xi Grant in Aid of Graduate Research, \$200 (sponsored by National Academy of Science)
- 2019 Geological Society of America Student Research Grant, \$2648 (NSF award #1712071)
- 2017 Geological Society of America Student Research Grant, \$1710 (NSF award #1356509)
- 2014 TAMUG Research Advisory Council Undergraduate Research Fellowship, \$3000
- 2014 Deglacial hydrologic conditions in two underwater caves flooded by the Western Floridian aquifer; TAMU Undergraduate Research Scholar Award, \$300
- 2014 Stratigraphic accumulation of iron and manganese oxide sediments in Western Floridian inland caves; Texas Institute of Oceanography Undergraduate Student Fellowship, \$2500
- 2013 Spatial Distribution Analysis of Trace Metals in Anchialine Caves Found in Quintana Roo, Mexico; The Explorers Club Youth Activity Fund, \$2000

Academic Fellowships and Scholarship Awards (\$258,129)

- 2021 WHOI Postdoctoral Scholar Award, \$100,000
- 2020 TAMUG Boost Dissertation Fellowship, \$40,032
- 2020 TAMU Susanne Leininger '77 and Steve Leininger Scholarship, \$4,000
- 2020 UNOCAL Graduate Fellowship in Geosciences, \$3,000
- 2019 The Erma Lee and Luke Mooney Graduate Student Travel Grant, \$500
- 2019 TAMUG Summer 2019 Graduate Student Support Fellowship, TAMUG, \$4822
- 2019 TAMU Oceanography Graduate Student Council Minigrant, \$250
- 2019 M.T. Halbouty '30/AAPG Foundation Endowed Fellowship, \$3000
- 2019 TAMU Department of Oceanography Louis and Elizabeth Scherck Scholarship, \$2,000
- 2018 TAMUG Summer 2018 Graduate Student Support Fellowship, \$4080
- 2018 TAMU Susanne Leininger '77 and Steve Leininger Scholarship, \$3,000
- 2018 TAMU Department of Oceanography Louis and Elizabeth Scherck Scholarship, \$2,000
- 2017 TAMU College of Geosciences General Scholarship, \$2,545
- 2017 TAMU Department of Oceanography Louis and Elizabeth Scherck Scholarship, \$2,000
- 2016 TAMU Oceanography Graduate Student Council Minigrant, \$500
- 2016 The Erma Lee and Luke Mooney Graduate Student Travel Grant, TAMUG, \$500
- 2015 TAMU Department of Oceanography Louis and Elizabeth Scherck Scholarship, \$20,000
- 2015-2017 TAMUG 2-Year Competitive Graduate Student Fellowship, \$66,000
- 2014 Geological Society of America Student Travel Grant, \$150

Research Awards and Academic Honors

- 2021 The Chapman Award for Graduate Research
Created in Honor of Dr. Piers Chapman, this annual award recognizes exceptional oceanographic research contributed by a graduate student in the TAMU Department of Oceanography
- 2021 The Erma Lee and Luke Mooney Graduate Research Excellence Grant
Awarded to one graduating TAMUG doctoral student in recognition of exceptional marine research contributions throughout their PhD
- 2021 1st Place Ocean & Earth Sciences, 3rd Overall Lightning Talk at 2021 TAMUG Student Research Symposium
- 2020 1st Place Overall Graduate Lightning Talk at 2020 TAMUG Student Research Symposium
- 2019 AGU Fall Meeting Outstanding Student Presentation Award (top 5% presentations)
- 2018 1st Place Presentation at TAMUG Graduate Student Lightning Talk Competition
- 2017 3rd Place Oceanography Graduate Presentation at 2017 TAMUG Research Symposium
- 2015 Magna Cum Laude Latin Honors for Bachelor of Science in Marine Biology from TAMUG
- 2015 Overall 1st Place Undergraduate Presentation at 2015 TAMUG Research Symposium
- 2014 Geological Society of America Annual Meeting Outstanding Student Poster Award

Fieldwork and Cruise Experience (~9 months abroad in 5 countries over 6 years)

2014-2021 Terrestrial and coastal operations in The Bahamas (BHA: Abaco, Andros, Grand Bahama, Long Island), Turks and Caicos, Canada, and Mexico: 12 expeditions, ~188 days

- **Sediment sampling** in inland sinkholes, offshore blue holes, lagoons, and coastal ponds: submersible vibracoring, hand-driven vibracoring, piston coring, push coring, and Ekman Grab Sampling
- **Geophysical and hydrographic surveys** of sinkholes, blue holes, and coastal lagoons: shallow seismic subbottom profiling (CHIRP), single beam bathymetry, CTD water column profiling

Nov. 2021 *R/V Armstrong* Cruise (AR 62): Offshore operations near the New England Mud Patch: 8 days at sea

- **Sediment sampling** from the New England Mud Patch: submersible vibracoring and jumbo piston coring
- **Geophysical and hydrographic surveys** of the New England Mud Patch/continental shelf: shallow seismic subbottom profiling (CHIRP), CTD water column profiling

Aug. 2016 *R/V Atlantis* Cruise: Offshore and coastal operations in Jamaica. 10 days at sea

- **Sediment sampling** in blue holes and lagoons: submersible vibracoring and jumbo piston coring

Apr. 2016 *M/V Alucia* Cruise: Offshore and coastal operations in The Bahamas (Grand Bahama, Long Island, Ragged Island), Turks and Caicos, and Haiti: 30 days at sea

- **Sediment sampling** in blue holes: submersible vibracoring and gravity coring on continental shelf
- **Geophysical and hydrographic surveys** of blue holes and coastal lagoons: shallow seismic subbottom profiling (CHIRP), multibeam echosounder bathymetry, CTD water column profiling

2013-2014 Cave diving operations in Mexico and Florida: 4 expeditions, 57 days

- **Sediment sampling** in flooded caves using push coring and surface sampling on SCUBA
- **Hydrographic sampling** of caves using portable CTD water column profiling on SCUBA
- **Biological collection** of cave-adapted invertebrates on SCUBA

Competencies

Laboratory

- Sedimentology: laser diffraction particle size analysis, loss on ignition, X-ray diffraction, X-radiography imaging, Fourier Transform Infrared Spectroscopy, acid digestions
- Micropaleontology: benthic foraminifera, optical microscopy and photography
- Geochronology: Bayesian age-modelling, radiocarbon, Pb²¹⁰ and Cs¹³⁷ Gamma analysis

Field

- Coring: Submersible vibracoring, hand vibracoring, piston coring, push coring
- Geophysics: shallow sub-bottom seismics, single beam echosounder bathymetric surveying
- Water quality profiling with YSI EXO1 sonde
- International operations: team management, permitting and shipping, equipment repair
- Licensed small watercraft operator
- Diving: Full Cave SCUBA Diver (Technical Diving International-TDI), Scientific Diver (American Academy of Underwater Sciences-AAUS), Dive Master (National Association of Underwater Instructors-NAUI)

Computer

- Proficient: ArcGIS, Adobe Illustrator and Photoshop, Microsoft Office
- Experience implementing: Python, R, MatLab

Professional Society Memberships

2016-Present American Geophysical Union

2014-Present Geological Society of America