

Shannon Angelina Klotsko

University of North Carolina Wilmington
Department of Earth and Ocean Sciences
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Research Interests

Continental margin processes, marine geomorphology, sediment geology, fluvial evolution and deposition, tectonic geomorphology, coastal/estuarine evolution, seismic reflection/geophysical imaging techniques, multibeam sonars and other high-resolution bathymetric data, sea level and climate change effects on environmental evolution

Education

Ph.D. 2017 Earth Sciences, **Scripps Institution of Oceanography**, UC San Diego
Dissertation: Geophysical and geological studies of margin evolution: impacts of sea level fluctuations, tectonic deformation, and climate

M.S. 2013 Earth Sciences, **Scripps Institution of Oceanography**, UC San Diego

B.S. 2011 Marine Science, **Coastal Carolina University**

Professional Experience

2019-Present Assistant Professor, University of North Carolina Wilmington

2018 Adjunct Faculty, Geological Sciences, San Diego State University

2017-2019 Postdoctoral Fellow, Geological Sciences Department, SDSU

Classes Taught

2021 OCN 453/GLY 551, Seafloor Mapping, UNCW

2020-Pr. GLY 450, Geological Oceanography, UNCW

2019-Pr. GLY 550, Marine Geology, UNCW

2019-Pr. OCN 150, Introduction to Oceanography, UNCW

2018 GEOL 336, Sedimentology and Lithostratigraphy, SDSU

2018 GEOL 305, Water and the Environment, SDSU

Awards and Fellowships

2018 Selected for the CCST California Science Translators Showcase

2017-2019 Delta Science Fellowship (Postdoctoral)

2013-2016 National Science Foundation Graduate Research Fellowship

2013 U.S. Coast Guard Arctic Service Medal

2011 Magna cum Laude, Coastal Carolina University

2009-2011 Environmental Protection Agency Undergraduate Research Fellowship

Funded Grants and Proposals

Significant Participant, "Paleolandscapes, Paleoecology, and Cultural Heritage on the Southern California Continental Shelf." NOAA Office of Exploration Research, \$355,000, 2020-2022.

PI, "Defining the architecture and recurrence interval for faults in the Sacramento-San Joaquin Delta: Assessing potential geohazards." Delta Fellowship funded by the Delta Stewardship Council. Total project award: \$225,808, 2017-2019.

Significant collaborator, "Archaeological and Biological Assessment of Submerged Landforms off the Pacific Coast," Cooperative Agreement with the Bureau of Ocean Energy Management, Award M15AC00012, 2015-2019.

Publications

Klotsko, S., Skakun, M., Maloney, J., Gusick, A., Davis, L., Nyers, A. and Ball, D., 2021. Geologic controls on paleodrainage incision and morphology during sea level lowstands on the Cascadia shelf in Oregon, USA. *Marine Geology*, p.106444.

A. Laws, A., J. Maloney, S. Klotsko, A. Gusick, T. Braje, D. Ball, 2020. Submerged paleoshoreline mapping using high-resolution Chirp sub-bottom data, Northern Channel Islands platform, California, USA., *Quaternary Research* 93(1), 1-22. doi:10.1017/qua.2019.34

Klotsko, S., Driscoll, N., and Keigwin, L., 2019. Multiple meltwater discharge and ice rafting events recorded in the deglacial sediments along the Beaufort Margin, Arctic Ocean. *Quaternary Science Reviews* 203, 185-208.

L.D. Keigwin, S. Klotsko, N. Zhao, B. Reily, L.Giosan, and N. W. Driscoll, 2018. Deglacial Floods in the Beaufort Sea. *Nature Geoscience* 11, 599-604.

Klotsko, S., & Driscoll, N., 2018. Geomorphological and stratigraphic evidence along the northeastern U.S. margin for Laurentide glacial lake outburst floods during the MIS 2 deglaciation. *Quaternary Research*, 90(1), 139-152. doi:10.1017/qua.2018.32

Klotsko, S., Driscoll, N., Kent, G. and Brothers, D., 2015. Continental shelf morphology and stratigraphy offshore San Onofre, California: The interplay between rates of eustatic change and sediment supply. *Marine Geology*, 369, 116-126.

C.A. McCoy, J.C. Hill, P.T. Gayes, J.A. Marshall, S. Okano, B.J. Johnson, M.T. Howe, and S. Klotsko. 2010. 2007-2010 Grand Strand Beach Nourishment Study Final Report. Submitted to: United States Army Corps of Engineers, Charleston, SC District. 309 pp.

Publications in Preparation

Klotsko, S., Maloney, J., and Watt, J. Shallow deformation on the Kirby Hills Fault, Sacramento-San Joaquin Delta, Northern California, in prep for submission to *Frontiers in Earth Science*.

Published Abstracts and Presentations

Shannon Klotsko, Jillian M Maloney, Amy E Gusick, Loren G Davis, Alexander Nyers, Todd Braje, David Ball, 2020. Structural Controls on Paleodrainage Morphology on the Oregon Continental Shelf During the Last Glacial Maximum, Ocean Sciences Meeting.

Jillian Maloney, Alexander Laws, Matthew Skakun, Amy E Gusick, Shannon Klotsko, Todd Braje, Loren G Davis, Alexander Nyers, David Ball, Jon Erlandson, 2020. Refining search areas for submerged

- archaeological resources using subbottom data and applied geomorphology, Ocean Sciences Meeting.
- Luke Johnson, Jillian M Maloney, Shannon Klotsko, Amy E Gusick, Todd Braje, David Ball, 2020. Preliminary sediment core analysis and paleoenvironmental reconstruction: Northern Channel Islands Platform, California, Ocean Sciences Meeting.
- Shannon Klotsko, Patrick Williams, Jillian Maloney, and Janet Watt, 2019. Shallow Deformation and Slip Rate Estimates on the Kirby Hills Fault, Sacramento-San Joaquin Delta, Northern California, *Eos trans. AGU*, Fall Meet. Suppl., Talk Abstract 496514.
- Luke Johnson, Jillian Maloney, Shannon Klotsko, Amy Gusick, Todd Bradje, and David Ball, 2019. Preliminary sediment core analysis and paleoenvironmental reconstruction: northern Channel Islands platform, California, GSA Annual Meeting.
- Shannon Klotsko**, Jillian M Maloney, Kristan Watkins, Amy E. Gusick, Loren G Davis, Alexander Nyers, Todd Braje, and David Ball, 2018. Structural Controls on Paleodrainage During the Last Glacial Maximum on the Oregon Continental Shelf, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract OS11F-1461.
- Jillian M. Maloney, **Shannon Klotsko**, Howasta Tahiry, Alexander Laws, Amy E. Gusick, Todd J. Braje, David Ball, 2018. Shelf stratigraphy on the Northern Channel Islands platform, offshore southern California, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract OS11F-1460.
- Shannon Klotsko**, Jillian Maloney, and Janet Watt. Shallow fault mapping in the Sacramento-San Joaquin Delta. SCEC Annual Meeting, September 9-12, 2018.
- Laws, A.W., J. M. Maloney, **S.A. Klotsko**, A.E. Gusick, T.J. Braje, and D. Ball, Measuring Late Quaternary uplift rates of marine terraces using high-resolution Chirp sub-bottom data, Northern Channel Islands, California, USA, Talk 45-2, Geological Society of America, Rocky Mountain- Cordilleran Joint Section Meeting, May 5-7, Flagstaff, Arizona.
- Skakun, M.G., J.M. Maloney, **S.A. Klotsko**, A.E. Gusick, L. Davis, A. Nyers, T.J. Braje, and D. Ball, 2018, Assessing controls on paleodrainage morphology on the continental shelf offshore central Oregon, Poster 67-5, Geological Society of America, Rocky Mountain- Cordilleran Joint Section Meeting, May 5-7, Flagstaff, Arizona.
- Tahiry, H.S., J.M. Maloney, **S.A. Klotsko**, A.E. Gusick, T.J. Braje, and D. Ball, Examining paleodrainage evolution since the last glacial maximum, Northern Channel Islands, California, USA, Poster 67-4, Geological Society of America, Rocky Mountain- Cordilleran Joint Section Meeting, May 5-7, Flagstaff, Arizona.
- Loren G. Davis, Alexander J. Nyers, Jillian M. Maloney, Neal W. Driscoll, and **Shannon Klotsko**, 2018. Searching Oregon's Outer Continental Shelf for Submerged First Americans Sites: Theory, Methods, and Recent Discoveries, SAA Annual Meeting, Abstract.
- Shannon Klotsko**, Jillian M. Maloney, Loren Davis, Alexander Nyers, Amy E. Gusick, Todd J. Braje, David Ball, 2017. Variation in paleodrainage during the Last Glacial Maximum on the Oregon continental shelf, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract.
- Jillian M. Maloney, **Shannon Klotsko**, Amy E. Gusick, Todd J. Braje, David Ball, Loren Davis, Alexander Nyers, 2017. Paleodrainage morphology during glacial-interglacial cycles in the northern Channel Islands, California, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract.
- Shannon Klotsko**, Neal Driscoll, Lloyd Keigwin, and Xiomara Rosenblatt, 2016. A Sedimentary and Stratigraphic Record of the Deglaciation of the Beaufort Margin, Arctic Ocean, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract C53C-0744.
- Brittany Stockmaster, Jenna Hill, **Shannon Klotsko**, Neal Driscoll, 2016. Paleodrainage insights into the fluvial and glacial history of the western Chukchi margin, Arctic Alaska, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract C53C-0745.

- Shannon Klotsko**, Neal Driscoll, Lloyd Keigwin, and Brendon Mendenhall, 2015. New sedimentological evidence supporting a catastrophic meltwater discharge event along the Beaufort margin, Arctic Ocean, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract PP43D-2309.
- Jayne Bormann, Graham Kent, Neal Driscoll, Alistair Harding, Valerie Sahakian, James Holmes, **Shannon Klotsko**, Annie Kell, and Steven Wesnousky, 2015. Strike-slip faulting in the Inner California Borderlands, offshore Southern California, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract T51H-06.
- Klotsko, S.**, Driscoll, N., Kent, G. and Brothers, D., 2015. Continental shelf morphology and stratigraphy offshore San Onofre, California: The interplay between rates of eustatic change and sediment supply. *Southern California Earthquake Center*, Annual Meeting. Poster 99.
- Shannon Klotsko**, Neal Driscoll, and Lloyd Keigwin, 2015. Sedimentological and stratigraphic evidence for multiple floods along the Beaufort margin, Arctic Ocean. *7th International Conference on Arctic Margins*, talk.
- V. Sahakian, J. Bormann, **S. Klotsko**, J. Holmes, N. Driscoll, A. Harding, G. Kent, S. Wesnousky, 2015. Imaging the Newport-Inglewood/Rose Canyon Fault Zone; Implications with Current Fault Models, *Seismological Society of America*, Annual Meeting, Abstract.
- Jayne Bormann, Graham Kent, Neal Driscoll, Annie Kell, Valerie Sahakian, Alistair Harding, James Holmes, **Shannon Klotsko**, and Steve Wesnousky, 2015. New constraints on active fault architecture in the Inner California Borderlands, offshore Southern California, *Seismological Society of America*, Annual Meeting, Abstract.
- Shannon Klotsko**, Neal Driscoll, and Lloyd Keigwin, 2014. Sedimentological and Stratigraphic Evidence for a Catastrophic Flood Along the Beaufort Margin, Arctic Ocean, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract PP13B-1416.
- Valerie Sahakian, Jayne Bormann, **Shannon Klotsko**, James Holmes, Neal Driscoll, Alistair Harding, Graham Kent, and Steven Wesnousky, 2014. Structure of the Newport-Inglewood/Rose Canyon and Palos Verdes Fault Zones and Implications for Current Fault Models, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract OS33A-1036.
- Jayne Bormann, Valerie Sahakian, James Holmes, **Shannon Klotsko**, Graham Kent, Neal Driscoll, Alistair Harding, and Steven Wesnousky, 2014. Active faulting in the Inner California Borderlands: new constraints from high-resolution multichannel seismic and multibeam bathymetric data, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract OS33A-1034.
- Shannon A. Klotsko**, Neal W. Driscoll, Graham M. Kent, and Daniel S. Brothers, 2014. Continental shelf morphology and stratigraphy offshore San Onofre, CA: the interplay between eustasy and sediment supply, *Scripps Student Symposium*, Inaugural meeting, Poster 18.
- Shannon A. Klotsko**, Neal W. Driscoll, Graham M. Kent, and Daniel S. Brothers, 2014. Continental shelf morphology and stratigraphy offshore San Onofre, CA: the interplay between eustasy and sediment supply, *Southern California Earthquake Center*, Annual Meeting. Poster 204.
- Neal Driscoll, Valerie Sahakian, Jayne Bormann, **Shannon Klotsko**, James Holmes, Alistair Harding, Graham Kent, and Steven Wesnousky, 2014. New Geophysical constraints on the Rose Canyon/Newport-Inglewood and Palos Verdes Fault Zones, *Southern California Earthquake Center*, Annual Meeting. Poster 249.
- Klotsko, S.A.** and Driscoll, N.W., 2013. Effects of catastrophic draining of Wisconsinian glacial lakes on the continental shelf; an example from Block Island Sound, RI, *Eos Trans. AGU*, Fall Meet. Suppl., Abstract OS11D-1675.
- Klotsko, S.A.**, Hill, J.C., Gayes, P.T., Viso, R.F., Alexander, C.R., McFall, G., 2010. The influence of geologic framework on habitat and sediment distribution in Gray's Reef National Marine Sanctuary, *Eos Trans. AGU*, 91 (26), Ocean Sci. Meet. Suppl. Abstract G045A-05
- Klotsko, S.A.**, 2010. Geologic Interpretation of Gray's Reef National Marine Sanctuary, *Celebration of Inquiry Undergraduate Research Competition*, Coastal Carolina University.

Technical Skills

Proficient in codes/software:

ArcGIS
QPS Fledermaus
QPS Qimera
Xsonar
SIOSEIS
Seismic unix
IHS Kingdom
GMT
Adobe Creative Suite
Unix Shell Scripting

Experience with codes/software:

CARIS
Python
MATLAB
MB-systems
FORTRAN-90
LATEX

Field instruments/methods experience:

CHIRP/Knudsen acquisition
Multibeam acquisition
Sidescan sonar acquisition
Ship-based vibrocore collection
Land-based vibrocore collection
Jumbo piston core collection
Gravity core collection
Multicore collection
3D p-cable seismic acquisition

Terrestrial LiDAR collection
Shoreline monitoring surveys
Groundwater discharge surveys
Aerial photography for shoreline analysis
Hyperspectral Surface Acquisition System
Hyperspectral Profiler
AC-s
CTD casts
Water Quality mooring

Lab instruments/methods experience:

Particle Size Analyzer
X-ray Diffraction
X-ray Fluorescence
Multisensor Core Logger
Radiocarbon sampling
Sieve analysis
Spectrofluorometer

Oceanographic Research Cruises

2020-21 R/V Cape Fear, Wilmington Region, backscatter/Chirp mapping, Chief Scientist
01/2019 R/V Point Loma, San Diego Bay fault mapping
10/2018 S/V Retriever, Sacramento-San Joaquin Delta, vibrocore, Chief Scientist
06/2018 R/V Revelle, Oregon continental shelf, vibrocore
10/2017 Pontoon Boat, Sac-San Joaquin Delta, CHIRP and sidescan survey, Chief Scientist
09/2017 R/V Pacific Storm, Oregon continental shelf, CHIRP and sidescan survey
05/2017 R/V Pacific Storm, Oregon continental shelf, CHIRP and sidescan survey
07/2016 R/V Point Loma, northern Channel Islands, CHIRP and multibeam survey
05/2016 R/V Shearwater, northern Channel Islands, CHIRP and sidescan survey
01/2016 R/V Thomas Thompson, Inner California Borderlands, coring cruise, **Co-Chief Scientist**
R/V Point Loma, Point Loma, CA, multibeam surveys
2013-14 R/V New Horizon, San Onofre, CA, 3D p-cable seismic reflection survey
09-10/13 USCGC Healy, Beaufort Sea and Amundsen Gulf, seismic, multibeam, and coring

08-09/13 R/V Point Loma, San Onofre, CA, CHIRP survey
 07/2013 R/V Point Loma, CHIRP surveys
 02-07/13 R/V Sproul, San Diego, CA, seismic instrument testing
 10/2012 R/V Point Loma, Oceanside, CA, multibeam survey
 08/2012 R/V Point Loma, multibeam survey
 11/2011 R/V Privateer, CHIRP and multibeam survey
 06/2011 EPA Small Boat, water quality data collection in Pensacola Bay, Choctawhatchee Bay, St. Joe's Bay, and St. Andrew's Bay, Florida
 05-07/10

Student Advising

Ben Ammerman	M.S. advisor, Masonboro paleodrainages, UNCW
Brandon Wong	DIS, Barrow Canyon glacial features
Lauren Neow	Directed undergraduate research, XRF and XRD, Sac-SJ Delta, SDSU
Mackenzie Young	B.S. senior thesis, XRF and XRD, Sac-SJ Delta, SDSU
Leanne Hirsch	M.S. thesis, Arctic sediment provenance, co-advised, UCSD
Matthew Skakun	M.S. 2018, Oregon conti. shelf paleodrainages, co-advised, SDSU
Nicholas Poser	B.S. senior thesis, XRF and XRD, Sac-SJ Delta, co-advised, SDSU
Eric Surratt	B.S. senior thesis, XRF and XRD, Sac-SJ Delta, co-advised, SDSU
Howasta Tahiry	Directed research, sidescan sonar, Oregon shelf, SDSU
Micheal Troutner	B.S. senior thesis, sidescan sonar, Sac-SJ Delta, co-advised, SDSU
Xiomara Rosenblatt	Directed undergraduate research, grain size analysis, Arctic, SDSU
Brenden Mendenhall	Scripps Undergraduate Research Fellowship, grain size analysis, Arctic, UCSD

Invited Talks

2019	Invited speaker, USGS St. Petersburg and USF joint marine science seminar
2019	Invited speaker, Coastal Carolina University, Marine Science Seminar
2019	Invited speaker, Scripps Ins. Of Oceanography Earth Sciences Seminar
2018	Invited speaker, CSULB Geological Sciences Department Seminar
2018	Invited speaker, USGS Santa Cruz Office Seminar
2018	Invited speaker, SDSU Geological Sciences Department Seminar
2018	Selected for the CCST California Science Translators Showcase

Academic Service

2019	Proposal reviewer, NSF
2019	Manuscript reviewer, Geophysical Research Letters
2019	Manuscript reviewer, AAPG Bulletin
2018	AGU session co-chair: Geologic Evolution of Continental Shelves
2018	Manuscript reviewer, Regional Studies in Marine Science
2017	Student search committee member, Polar hire, Scripps Ins.
2012-2017	Laboratory Safety Officer, Driscoll Lab, Scripps Institution of Oceanography

Community Service and Outreach

2020-Pr.	Science Olympiad Mentor , Isaac Bear High School
2019	Presenter at Girls in Ocean Science: Middle School Conference , Ocean Institute, Dana Point, CA
2017	

2016 **Presentations to Westview High School Marine Science Classes**, spoke to classes about a marine science career, methods I use, and my Arctic research

2015 **Summer science tours/demonstrations**, various programs for teachers and high school students

2014-2015 Mentor for intern in the summer Scripps Undergraduate Research Fellowship (SURF) program

2011-2016 **SIO peer mentors program**, mentor to a first year student in the geology curricular group at SIO

2012-2014 **SCOPE (SIO service club) member**, run information beach walks for visiting groups (ex. Local Girl Scout Troops)

Nov. 2012 **SIO Prospective Student Open House – Geology Representative**, point person for visiting students, organize poster session, run beach tours

April 2011 **Presentation to Potomac Senior High School Oceanography Classes**, spoke to all class sections about an oceanography career track and research at my former high school

April 2011 **Presentation at a High School Career Day**, spoke about a career in marine science at an event run by historically black sororities and fraternities

Memberships in Professional Societies

American Geophysical Union
 Southern California Earthquake Center
 National Association of Geoscience Teachers
 Association of Women Geoscientists

Workshops and Trainings

July 2020 **NAGT Early Career Workshop**, virtual

July 2019 **Earth Educators Rendezvous**, Tennessee State University, Nashville, TN

May 2019 **Next Generation Polar Researchers**, Catalina Island, CA

Sep. 2018 **IODP SEA-NorP**, Timberline Lodge, Mt. Hood, OR

Nov. 2017 **Military Ally Training**, San Diego State University, San Diego, CA

Oct. 2017 **Teledyne Marine Technology Workshop**, Catamaran Resort, San Diego, CA

April 2017 **Delta Science Fellowship: Early Career Leadership Workshop**, Sacramento, CA

Feb. 2015 **National Association of Geoscience Teachers Workshop**, Scripps Ins.

August 2014 **LiDAR one week Short Course (Professor Michael Olsen)**, OSU, Corvallis, OR

May 2014 **CARIS HIPS and SIPS Training Workshop**, SDSU San Diego, CA

January 2014 **64th UNB-OMG/UNH-CCOM Multibeam Sonar Training Course**, Westin New Orleans Canal Place, New Orleans, LA

Media

Interviewed for population science podcast “Radiolab”, episode “Body Count.”
<https://www.wnycstudios.org/podcasts/radiolab/articles/body-count>

Co-signature on Nature Correspondence article, “Next generation of polar researchers agree on three priorities.” Nature **570**, 36 (2019). doi: 10.1038/d41586-019-01718-1

Washington Post article, “Scientists may have solved a huge riddle in Earth’s climate past. It doesn’t bode well for the future,” by Chris Mooney, July, 11, 2018:

https://www.washingtonpost.com/energy-environment/2018/07/11/scientists-may-have-solved-huge-riddle-earths-climate-past-it-doesnt-bode-well-future/?utm_term=.6b476cf34597

San Diego Community Newspaper Group, "Evidence of ancient abrupt climate change found in Arctic," July 14, 2018:

http://www.sdnews.com/view/full_story/27583859/article-Evidence-of-ancient-abrupt-climate-change-found-in-Arctic?instance=most_popular1

Press release: Woods Hole Oceanographic Institution

Following the fresh water: Fingerprint of ancient abrupt climate change found in Arctic

https://www.eurekalert.org/pub_releases/2018-07/whoi-fff070918.php

Press release: CCST Science Translators Showcase

<https://ccst.us/timely-science-explained-clearly-at-state-capitol-feb-20th-translators-showcase-to-connect-california-grad-students-with-members-staff/>

Press release: CA Sea Grant Delta Fellowships

<https://caseagrant.ucsd.edu/news/eight-early-career-scientists-awarded-2017-delta-science-fellowships>

AGU blogs, "New evidence for a massive flood on the Mackenzie River 13,000 years ago," by Rex Sanders, December 17, 2014:

<https://blogs.agu.org/geospace/2014/12/17/new-evidence-massive-flood-mackenzie-river-13000-years-ago/>