

Education

- 2014 – 2019 **California Institute of Technology**
PhD in Geology, *Mechanics of river avulsions on lowland river deltas*
Defended October 21, 2019; Received at Graduation Ceremony June 12, 2020
Thesis Advisor: Michael Lamb
- 2010 – 2014 **University of California, Los Angeles**
BS in Applied Geophysics, Departmental Highest Honors
Undergraduate Research Advisors: Jonathan Aurnou, Gilles Peltzer

Research Positions

- 2022 – Current **Postdoctoral Scholar**
UC Santa Barbara Earth Research Institute
Advisor: Vamsi Ganti
- 2022 **Scientist**
Exponent Engineering and Scientific Consulting
Practice: Environmental & Earth Sciences
- 2019 – 2021 **Postdoctoral Associate**
University of Minnesota St Anthony Falls Laboratory
Advisors: Chris Paola, Elisabeth Steel
- 2014 **Research Scientist**
Caltech Earth Surface Dynamics Laboratory
Advisor: Michael Lamb
- 2012 – 2014 **Undergraduate Research Assistant**
UCLA Department of Earth & Space Sciences
Advisors: Gilles Peltzer, Jonathan Aurnou
- 2012 **Undergraduate Research Intern**
United States Geological Survey (USGS) Menlo Park
Advisor: Walter Mooney

Honors & Awards

- 2016 – 2020 **Graduate Fellowship in Sustainability Science**
Resnick Sustainability Institute at the California Institute of Technology
- 2018 **Best Poster Award**
Community Surface Dynamics Modeling System Meeting
- 2018 **Early Career Spotlight**
American Geophysical Union Earth and Planetary Surface Processes (AGU EPSP)
<https://connect.agu.org/epsp/spotlight>
- 2015 **George & Virginia Eaton Fellowship**
California Institute of Technology
- 2015 **Graduate Research Fellowship Honorable Mention**
National Science Foundation

- 2014 **John & Frances Handin Scholarship**
University of California, Los Angeles
- 2013 **Clarence A. Hall Summer Field Scholarship**
University of California, Los Angeles
- 2012 **USGS Internship Certificate of Outstanding Achievement**
United States Geological Survey, Menlo Park, CA

Publications

*Research Mentees are denoted by **

- 2022 **Chadwick AJ**, Steele S*, Silvestre J*, & Lamb MP. More extensive land loss expected on coastal deltas due to rivers jumping course during sea-level rise. *Proceedings of the National Academy of Sciences* 119(31).
- 2022 **Chadwick AJ**, Steel E, Passalacqua P, & Paola C. Differential bank migration limits the lifespan and width of braided river threads. *Water Resources Research* 58(8).
- 2022 **Chadwick AJ**, Steele S*, Silvestre J*, & Lamb MP. Effect of sea-level change on river avulsions and stratigraphy for an experimental lowland delta. *Journal of Geophysical Research: Earth Surface* 127(7).
- 2022 **Chadwick AJ**, Steel E, Williams-Schaetzel RA*, Passalacqua P, & Paola C. Channel migration in experimental river networks mapped by particle image velocimetry. *Journal of Geophysical Research: Earth Surface* 127.
- 2022 Brooke S, **Chadwick AJ**, Silvestre J*, Lamb MP, Edmonds DA, & Ganti V. Where rivers jump course. *Science* 376(6596).
- 2022 Edmonds DA, **Chadwick AJ**, Lamb, MP, Lorenzo-Trueba J, Murray AB, Nardin W, Salter G, & Shaw JB. Morphodynamic Modeling of River-Dominated Deltas: A Review and Future Perspectives. in *Treatise on Geomorphology* 110–140.
- 2022 Steel E, Paola C, **Chadwick AJ**, Hariharan J, Passalacqua P, Xu Z, Michael HA, Brommecker H, & Hajek EA. Reconstructing subsurface sandbody connectivity from temporal evolution of surface networks. *Basin Research* 34, 1486–1506.
- 2022 Xu Z, Hariharan J, Passalacqua P, Steel E, **Chadwick AJ**, Paola C, Paldor A, & Michael HA. Effects of geologic setting on contaminant transport in deltaic aquifers. *Water Resources Research* 58.
- 2022 Hariharan J, Passalacqua P, Xu Z, Michael HA, Steel E, **Chadwick AJ**, Paola C, & Moodie AJ. Modeling the dynamic response of river deltas to sea-level rise acceleration. *Journal of Geophysical Research: Earth Surface* 127.
- 2022 Douglas MM, Li GK, Fischer WW, Rowland JC, Kemeny PC, West AJ, Schwenk J, Piliouras AP, **Chadwick AJ**, & Lamb MP. Organic carbon burial by river meandering partially offsets bank-erosion carbon fluxes in a discontinuous permafrost floodplain. *Earth Surface Dynamics* 10(3).
- In Review Xu Z, Khan MR, Ahmed KM, Zahid A, Hariharan J, Passalacqua P, Steel E, **Chadwick AJ**, Paola C, Paldor A, & Michael HA. Predicting Subsurface Architecture

from Surface Channel Networks in The Bengal Delta. *In review at Journal of Geophysical Research: Earth Surface*.

- In Review Kemeny PC, Li GK, Douglas MM, Berelson W, **Chadwick AJ**, Dalleska NF, Lamb MP, Larsen W, Magyar JS, Rollins NE, Rowland J, Smith I, Torres MA, Webb SM, Fischer WW, & West AJ. Evaluating the Sulfur-Carbon-Climate Permafrost Weathering Feedback in the Koyukuk River Catchment, AK. *In Review at Global Biogeochemical Cycles*.
- 2021 **Chadwick AJ** & Lamb MP. Climate-change controls on river delta avulsion location and frequency. *Journal of Geophysical Research: Earth Surface* 126(6).
- 2021 Douglas MM, Lingappa UF, Lamb MP, Rowland JC, West AJ, Li G, Kemeny PC, **Chadwick AJ**, Piliouras AP, Schwenk J, & Fischer WW. Impact of river channel lateral migration on microbial communities across a discontinuous permafrost floodplain. *Applied and Environmental Microbiology* 87(20).
- 2020 **Chadwick AJ**, Lamb MP, Ganti V. Accelerated river avulsion frequency on lowland deltas due to sea-level rise. *Proceedings of the National Academy of Sciences* 117(30).
- 2020 Brooke S, Ganti V, **Chadwick AJ**, Lamb MP. Flood variability determines the location of lobe-scale avulsions on Deltas: Madagascar. *Geophysical Research Letters* 47(20).
- 2019 **Chadwick AJ**, Lamb MP, Moodie AJ, Parker G, Nittrouer J. Origin of a preferential avulsion node on lowland river deltas. *Geophysical Research Letters* 46(8).
- 2019 Ganti V, Lamb MP, **Chadwick AJ**. Autogenic erosional surfaces in fluvio-deltaic stratigraphy from floods, avulsions, and backwater hydrodynamics. *Journal of Sedimentary Research* 89(8).
- 2019 Moodie AJ, Nittrouer JA, Ma H, Carlson BN, **Chadwick AJ**, Lamb MP, Parker G. Modeling deltaic lobe-building cycles and channel avulsions for the Yellow River delta, China. *Journal of Geophysical Research: Earth Surface* 124(11).
- 2016 Ganti V, **Chadwick AJ**, Hassenruck-Gudipati HJ, Lamb MP. Avulsion cycles and their stratigraphic signature on an experimental backwater-controlled delta. *Journal of Geophysical Research: Earth Surface* 121(9).
- 2016 Ganti V, **Chadwick AJ**, Hassenruck-Gudipati HJ, Fuller BM, Lamb MP. Experimental river delta size set by multiple floods and backwater hydrodynamics. *Science Advances* 2(5).
- 2016 Shaw JB, Ayoub F, Jones CE, Lamb MP, Holt B, Wagner RW, Coffey T, **Chadwick AJ**, Mohrig D. Airborne radar imaging of subaqueous channel evolution in Wax Lake Delta, Louisiana, USA. *Geophysical Research Letters* 43(10).

Selected Conference Proceedings

- 2022 **Chadwick AJ**, Steel E, Passalacqua P, Paola C. Differential bank migration limits the lifespan and width of braided river threads. Poster presentation, Fourth Annual Southern California Geomorphology Symposium, Irvine, CA, 2022.
- 2021 **Chadwick AJ**, Steel E, Passalacqua P, Paola C. Differential bank migration limits the lifespan and width of braided river threads. Poster presentation, American Geophysical Union Fall Meeting, New Orleans, LA, 2021.

- 2019 **Chadwick AJ**, Lamb MP. Climate-change controls on river delta avulsion location and frequency. Oral presentation, American Geophysical Union Fall Meeting, San Francisco, CA, 2019.
- 2018 **Chadwick AJ**, Silvestre J, Steele S, Lamb MP. How well is sea-level fall preserved in fluvio-deltaic stratigraphy? Oral presentation, American Geophysical Union Fall Meeting, Washington DC, 2018.
- 2018 **Chadwick AJ**, Steele S, Silvestre J, Lamb MP. How does river-channel shifting mediate land sustainability on drowning river deltas? Oral presentation, Resnick Sustainability Institute Seminar Day, Pasadena, CA, 2018.
- 2018 **Chadwick AJ**, Lamb MP. Prediction the location of avulsion hazards in the face of changing flood regimes. Poster presentation, Community Surface Dynamics Modeling System (CSDMS) Meeting, Boulder, CO, 2018.
- 2017 **Chadwick AJ**, Steele S, Silvestre J, Lamb MP. The role of channel avulsion in mediating transient land loss on drowning river deltas. Poster presentation, American Geophysical Union Fall Meeting, New Orleans, LA, 2017.
- 2017 **Chadwick AJ**, Lamb MP. The roles of backwater and relative sea-level rise in setting deltaic avulsion time. Poster presentation, 10th Symposium on River, Coastal, & Estuarine Morphodynamics, Padova, Italy, 2017.
- 2017 **Chadwick AJ**, Lamb MP. The roles of backwater and relative sea-level rise in setting deltaic avulsion frequency. Oral presentation, 2nd International Science Workshop of Morphodynamics and Socioeconomic Sustainability of Large River Deltas, Qingdao/Dongying, China, 2017.
- 2017 **Chadwick AJ**, Lamb MP. The roles of backwater and relative sea-level rise in setting deltaic avulsion frequency. Oral presentation, Japan Geophysical Union – American Geophysical Union Joint Meeting, Chiba, Japan, 2017.
- 2016 **Chadwick AJ**, Ganti V, Hassenruck-Gudipati HJ, Lamb MP. How does delta shoreline sinuosity respond to changes in river discharge variability? Poster presentation, Community Surface Dynamics Modeling System (CSDMS) Meeting, Boulder, CO, 2016.
- 2016 **Chadwick AJ**, Lamb MP. The roles of sea-level rise and hydrodynamic backwater in setting deltaic avulsion patterns. Poster presentation, American Geophysical Union Fall Meeting, San Francisco, CA, 2016.
- 2015 **Chadwick AJ**, Ganti V, Hassenruck-Gudipati HJ, Lamb MP. The role of backwater hydraulics in mediating shoreline rugosity. Oral presentation, American Geophysical Union Fall Meeting, San Francisco, CA, 2015.
- 2014 **Chadwick AJ**, Ganti V, Hassenruck-Gudipati HJ, Lamb MP. Experimental investigation of the morphodynamic controls on delta-lobe formation and shoreline rugosity. Poster presentation, American Geophysical Union Fall Meeting, San Francisco, CA, 2014.
- 2013 **Chadwick AJ**, Capaldi T, Aurnou J. Developing interactive classroom projects: in-class robot flyby of an endoplanet. Poster presentation, American Geophysical Union Fall Meeting, San Francisco, CA, 2013.

Community Leadership & Affiliations

- 2022 **Member of Climate-Change Business Development Team**
Exponent Engineering and Scientific Consulting
- 2019 – 2020 **Graduate Student Representative & Organizer of *Early Career Spotlight***
American Geophysical Union Earth and Planetary Surface Processes (AGU EPSP)
- 2018 **Lead Organizer**
First Annual Southern California Geomorphology Symposium
- 2017 – 2018 **Session Convener, Sediment Dynamics Across Landscapes**
American Geophysical Union Fall Meeting
Earth and Planetary Surface Processes Section
- 2017 – 2018 **Seminar Series Organizer**
GeoClub Seminar Series, California Institute of Technology
- 2016 – present **Peer Reviewer**
Geology
Science Advances
Journal of Sedimentology
Water Resources Research
Geophysical Research Letters
Journal of Geophysical Research: Earth Surface
International Journal of Environmental Research and Public Health
Remote Sensing
Sustainability
Water
- 2014 – present **Member**
American Geophysical Union (AGU)
Community Surface Dynamics Modeling System (CSDMS)
Sediment Experimentalist Network (SEN)

Teaching & Mentorship

- 2022 – Current **Teacher & Course Developer**
GEOG288VG Special Topics in Geography: *Quantifying Global River Kinematics from Remote Sensing Observations*
UC Santa Barbara Department of Geography
- 2020 – 2022 **Undergraduate Research Mentor**
Mentee: Rashel Williams-Schaetzel. *Now at Minnesota Health Fairview.*
University of Minnesota, St. Anthony Falls Laboratory
- 2019 **Teaching Assistant**
Ge121C Advanced Field Geology: *The Grand Canyon & Wheeler Ridge*
California Institute of Technology SP 2018-19
- 2018 **Climate-School Seminar Series for Undergraduates**
Volunteer
Resnick Sustainability Institute at Caltech
Caltech Summer Undergraduate Research Fellowship (SURF)

- 2017 – 2020 **Undergraduate Research Mentor**
Mentee: Sarah Steele. *Now at Harvard University.*
Caltech Summer Undergraduate Research Fellowship
- 2017 – 2018 **Undergraduate Research Mentor**
Mentee: Jose Silvestre. *Now at Tulane University.*
UNAVCO Research Experiences in Solid Earth Sciences for Students (RESESS)
Caltech WAVE Undergraduate Research Fellowship
- 2017 **Teaching Assistant**
Ge121A Advanced Field Geology: *The Role of Vegetation in Shaping Rivers*
California Institute of Technology FA 2016-17
- 2017 **Teaching Assistant**
Ge126 Special Topics in Geomorphology: *River Morphodynamics*
California Institute of Technology SP 2016-17
- 2017 **Teaching Assistant**
Ge121B Advanced Field Geology: *Southeast Death Valley*
California Institute of Technology WI 2016-17
- 2016 **Teaching Assistant**
Ge 120A Introduction to Field Geology: *Rainbow Basin & the Mitchell Range*
California Institute of Technology SP 2015-16
- 2015 – 2017 **Undergraduate Research Mentor**
Mentee: Kirby Sikes. *Now at the Massachusetts Public Interest Research Group.*
Caltech Summer Undergraduate Research Fellowship (SURF)
- 2014 **Annual Teaching Conference Attendee**
Caltech Center for Teaching, Learning, & Outreach (CTLO)
- 2013 **Course Developer & Reader**
ESS71: Introduction to Computing For Geo- and Space Scientists
University of California, Los Angeles SP 2012-13

Outreach

- 2022 – Current **High-School Outreach Teacher & Developer**
Short Course: *The Secret Lives of Moving Rivers*
UC Santa Barbara School for Scientific Thought
- 2022 **Press feature for *Eos: Science News by AGU***
Estimating Land Loss in River Deltas
<https://eos.org/articles/estimating-land-loss-in-river-deltas>
- 2022 **Press feature for *Hakai Magazine: Coastal science and societies***
River Deltas are Running Out of Land
<https://hakaimagazine.com/news/river-deltas-are-running-out-of-land/>
- 2022 **Press feature for *The Current: UC Santa Barbara News***
Where Rivers Jump Course
<https://www.news.ucsb.edu/2022/020645/where-rivers-jump-course>
- 2020 **Press feature for the *Climate Connections* radio program**
Yale Center for Environmental Communication

- 2020 **Press feature for *The Current: UC Santa Barbara News***
Jumping Course
<https://www.news.ucsb.edu/2020/019953/jumping-course>
- 2020 **Press feature for Caltech News**
Sea-Level Rise Could Make Rivers More Likely To Jump Course
<https://www.caltech.edu/about/news/sea-level-rise-could-make-rivers-more-likely-jump-course>
- 2020 **Press feature for NSF Research News**
Sea level rise could make rivers more likely to jump course
https://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=301071
- 2018 **Press Feature on BBC World Service Television and Radio News**
A laboratory dedicated to understanding how rivers function in nature
<https://www.bbc.com/arabic/tv-and-radio-45527141>
- 2014 **Guest Lecturer for 6th grade Earth Science**
 McKinley Middle School, Pasadena CA
- 2013 – 2014 **Public Outreach Coordinator & Organization Co-Founder**
 Bruin Geological Survey (BGS)
 University of California, Los Angeles

Technical Skills

Field & laboratory techniques

- Differential GPS surveying
- Real-Time Kinematic GPS surveying
- Unmanned Aerial Vehicle surveying
- Unmanned Aquatic Vehicle surveying
- Suspended sediment transport surveying
- Bedload sediment transport surveying
- Laboratory flume engineering
- Hydroacoustic profiling
- Laser altimetry
- Bedrock, structural, stratigraphic, and geomorphic mapping

Programming & software environments

- MATLAB
- Python
- R
- QGIS
- ENVI
- Mathematica
- LabVIEW
- Adobe Illustrator
- Adobe Photoshop
- Adobe Premier Pro
- Excel Visual Basic

Consulting experience

- Flood risk assessment
- Erosion risk assessment
- Management of dam & levee infrastructure in extreme weather
- Evaluation of surface-water and sediment contamination risks
- Groundwater extraction and water-table drawdown
- Floodplain restoration