

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

Positions Held

- 2023 – Current **Postdoctoral Research Scientist, Lamont Fellow**
Lamont-Doherty Earth Observatory, Columbia University
Advisors: Suzana Camargo, Michael Steckler
- 2022 – 2023 **Postdoctoral Scholar**
UC Santa Barbara Earth Research Institute
Advisors: 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

- 2023–2025 **Lamont Postdoctoral Fellowship in Earth, Environmental, and Climate Sciences**
Predicting coastal resilience & flood hazards on densely populated coastal zones in the twenty-first century
Lamont-Doherty Earth Observatory, Columbia University
- 2023 **Funded Proposal: NASA Commercial Smallsat Data Acquisition Program**
Conceptualization (50%) & Writing (50%) for *River response to climate change: Insights from high-resolution remote sensing data in High-Mountain Asia*
Principal Investigators: Vamsi Ganti
**Unable to serve as a PI as a Postdoctoral Scholar*

- 2023 **Funded Proposal: National Science Foundation, Division of Earth Sciences**
Conceptualization (33%) & Writing (33%) for *NSF EAR-Climate: Global Survey of*
Multiscale River Mobility & its Response to Climate Change and Human Interference
Principal Investigator: Vamsi Ganti (NSF EAR-2310740)
*Unable to serve as a PI as a Postdoctoral Scholar
- 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 **

- In Review **Chadwick AJ**, Greenberg E, Ganti V. River planforms originate from (im)balance between bank erosion and bar accretion. In Review at *Science*.
- In Preparation **Chadwick AJ**, Steckler S, Wilson CA, Rana MM, Akter S, Bhuiyan AH, Camargo SJ, Larochele S, Mahmud SS, Tanvir AA, Ahmed Z, Mim A. Future projections of compaction-induced subsidence on the Ganges-Brahmaputra Delta. In Preparation.
- In Preparation **Chadwick AJ**, Greenberg E, Ganti V. Multi-thread planform diversity originates from competition between migration and floodplain development on mid-channel bars. In preparation.
- In Preparation **Chadwick AJ**, Steckler S, Wilson CA, Rana MM, Akter S, Bhuiyan AH, Camargo SJ, Larochele S, Mahmud SS, Tanvir AA, Ahmed Z, Mim A. A model for predicting subsidence hazards on deltas in the twenty-first century. In Preparation.
- 2024 Greenberg E, **Chadwick AJ**, Li GK, & Ganti V. Quantifying channel mobility and floodplain reworking timescales across river planform morphologies. *Geophysical Research Letters* 51.12 (e2024GL108537).

- 2024 Wang Y, Limaye AB, & **Chadwick AJ**. Topography-based particle image velocimetry of braided channel initiation. *Water Resources Research* 60.4 (e2023WR035229).
- 2023 Greenberg E, **Chadwick AJ**, & Ganti V. A generalized area-based framework to quantify river mobility from remotely sensed imagery. *Journal of Geophysical Research: Earth Surface* 128 (e2023JF007189).
- 2023 **Chadwick AJ**, Greenberg E, & Ganti V. Remote sensing of riverbank migration using particle image velocimetry. *Journal of Geophysical Research: Earth Surface* 128 (e2023JF007177).
- 2023 Rowland JC, Schwenk JP, Shelef E, Muss J, Ahrens D, Stauffer S, Piliouras A, Crosby B, **Chadwick AJ**, Douglas MM, Kemeny PC, Lamb MP, Li GK, & Vulis L. Scale-dependent influence of permafrost on riverbank erosion rates. *Journal of Geophysical Research: Earth Surface* 128 (e2023JF007101).
- 2023 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. *Journal of Geophysical Research: Earth Surface* 128 (e2022JF006775).
- 2023 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. Arctic Permafrost Thawing Enhances Sulfide Oxidation. *Global Biogeochemical Cycles* 37 (e2022GB007644).
- 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-Schaetzl 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).
- 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

- 2024 **Chadwick AJ**, Steckler S, Wilson CA, Rana MM, Akter S, Bhuiyan AH, Camargo SJ, Larochele S, Mahmud SS, Tanvir AA, Ahmed Z, Mim A. Future projections of compaction-induced subsidence on the Ganges-Brahmaputra Delta. *American Geophysical Union Fall Meeting*, San Francisco, CA.
- 2024 **Chadwick AJ**, Greenberg E, Ganti V. Multi-thread planform diversity originates from competition between migration and floodplain development on mid-channel bars. *American Geophysical Union Fall Meeting*, San Francisco, CA.
- 2024 **Chadwick AJ**, Larochele S, Camargo SJ, Steckler MS. Predicting subsidence hazards on deltas in the 21st century. Oral presentation, *Deltas 2024 Symposium: Coastal River Deltas in a Changing World*. LSU Center for River Studies, Baton Rouge, LA.
- 2024 **Chadwick AJ**, Larochele S, Camargo SJ, Steckler MS. Predicting subsidence hazards on deltas in the 21st century. Oral presentation, *Deltas 2024 Symposium: Coastal River Deltas in a Changing World*. LSU Center for River Studies, Baton Rouge, LA.
- 2023 JO-CREWSnet Team. Reinventing climate-change adaptation with the Jameel Observatory Climate Resilience Early Warning System Network (JO-CREWSnet). Highlight segment, *2023 United Nations Climate Change Conference (COP28)*, Expo City, Dubai.
- 2023 **Chadwick AJ**, Greenberg E, Ganti V. River channel patterns are driven by width (in)stability. Oral presentation, *American Geophysical Union Fall Meeting*, San Francisco, CA.
- 2023 **Chadwick AJ**, Greenberg E, Ganti V. Multi-thread channel morphologies driven by runaway widening. Oral presentation, *Southern California Geobiology & Geomorphology Symposium*, Santa Barbara, CA.
- 2022 **Chadwick AJ**, Steel E, Passalacqua P, Paola C. Differential bank migration limits the lifespan and width of braided river threads. Poster presentation, *4th Annual Southern California Geomorphology Symposium*, Irvine, CA.
- 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.
- 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.
- 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 **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 **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.
- 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 **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, China.
- 2017 **Chadwick AJ**, Lamb MP. The roles of backwater and relative sea-level rise in setting deltaic avulsion frequency. Oral presentation, *Japan Geophysical Union and American Geophysical Union Joint Meeting (AGU-JpGU)*, Chiba, Japan.
- 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 **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.
- 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.
- 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.
- 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.

Community Leadership & Affiliations

- 2024 – Current **Postdoc Representative, Lamont 75th Anniv. Planning Committee**
Lamont-Doherty Earth Observatory, Columbia University
- 2024 – Current **Standing Member, Diversity, Equity, Inclusion, & Anti-Racism (DEIA) Committee**
Lamont-Doherty Earth Observatory, Columbia University
- 2024 **Lead Organizer, Lamont Postdoc Symposium**
Hosted by: Lamont-Doherty Earth Observatory, Columbia University
- 2023 **Lead Organizer, Southern California Geobiology & Geomorphology Symposium**
Hosted by: UC Santa Barbara
- 2022 **Member, 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, *1st Annual Southern California Geomorphology Symposium***
Hosted by: California Institute of Technology
- 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***
GeoClub Seminar Series, California Institute of Technology
- 2016 – present **Peer Reviewer**
Geology
Science Advances
Journal of Sedimentology
Water Resources Research
Geophysical Research Letters
The Geological Society Special Publications
Journal of Geophysical Research: Earth Surface
Remote Sensing
- 2014 – present **Member**
American Geophysical Union (AGU)
Community Surface Dynamics Modeling System (CSDMS)
Sediment Experimentalist Network (SEN)

Teaching & Mentorship

- 2021 – 2024 **Graduate Research Co-Mentor**
Mentee: Geila Volga Uzeda Orellana. *Now at GEO Morphix.*
Primary Advisor: Elisabeth Steel
Geological Sciences & Geological Engineering MSc program, Queens University
- 2022 **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-Schaetzl. *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

- 2023–2024 **Presenter & Coordinator, 2023 Lamont-Doherty Earth Observatory Open House**
 Exhibit: *Sea-level Rise and Tectonics in Bangladesh*
<https://openhouse.ldeo.columbia.edu/content/exhibits>
- 2024 **Coordinator, Earth Observations: Conversations with Lamont Scientists**
 Monthly discussion-focused Q&A series connecting scientists with public audience
<https://columbiauniversity.zoom.us/j/91234567890>
- 2023 **Science consultant for press feature in *Eos: Science News by AGU***
Forecasting Earthquake-Induced Floods
<https://eos.org/articles/forecasting-earthquake-induced-floods>
- 2023 **High-School Outreach 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

- Particle image velocimetry
- Laboratory flume engineering
- Hydroacoustic profiling (*Massa*, ADCP)
- Laser altimetry (*Keyence*, LRF)
- Shallow subsurface surveys (RSET, MH)
- GPS surveys (GNSS, Differential, RTK)
- UAV surveys (*Airborne*, Aquatic)
- Sediment transport surveys
- Geologic mapping
- Geomorphic Mapping

Consulting Experience

- Flood risk assessment
- Erosion risk assessment
- Floodplain restoration
- Dam & levee management
- Evaluation of surface-water and sediment contamination risks
- Groundwater extraction and water-table drawdown

Programming & software

- MATLAB
- PIVlab
- Python
- R
- GeoClaw
- QGIS
- ENVI
- LabVIEW
- Adobe Illustrator
- Adobe Photoshop
- Adobe Premier Pro
- Adobe Animate