Emily A. Ellis

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EDUCATION

Virginia Tech, Blacksburg, VA **Anticipated: May 2026**
Doctor of Philosophy - PhD, Geosciences **GPA: 3.93**
Dissertation: *Joining Water Quantity and Water Quality in Satellite Remote Sensing:*
Defining Connections and Assessing Changes in River Temperature [Advisor: Dr. George H. Allen]

Texas A&M University, College Station, Texas **Attended: 2021 - 2022**
Doctor of Philosophy - PhD, Geography **GPA: 4.0**
- *Transferred to Virginia Tech Fall of 2022 with Advisor, Dr. George H. Allen -*

Oklahoma State University, Stillwater, Oklahoma **May 2017**
Masters of Science, Geography **GPA: 4.0**
Thesis: *An Optimal Object-based Approach to Identify Urban Vegetation and Assess Change:*
A Study of Oklahoma City, 2006-2013 [Advisor: Dr. Adam J. Mathews]

Oklahoma State University, Stillwater, Oklahoma
Bachelor of Science, Geography **December 2015**
Minor: Soil Science **GPA: 4.0**
Geographic Information Systems Certificate **December 2015**

PRIVATE INDUSTRY EXPERIENCE

Geographic Information Systems (GIS) Analyst December 2017 – June 2021
ONEOK, Inc. – Tulsa, OK
- Provide training and technical support for GIS desktop and mobile applications to field users.
- Configure GIS web-based maps, applications, and dashboards for visualizing and analyzing spatial data.
- Deliver map and data products to support internal and external customers' geospatial needs.

[Proagrica] Site Specific Technology (SST) Software Internship June 2017 – July 2017
Stillwater, OK

ACADEMIC POSITIONS

Graduate Research Assistant, *Virginia Tech* August 2022 – Present

Graduate Research Assistant, *Texas A&M University* July 2021 – July 2022

Graduate Teaching Lab Assistant, *Oklahoma State University* January 2016 – May 2017

Graduate Research Assistant, *Oklahoma State University* May 2016 – August 2016

RESEARCH INTERESTS

- Remote Sensing & Satellite Imagery
- Surface Hydrology & Water Quality
- GIS Applications & Applied Geography
- Natural Resource Management
- Soil & Water Conservation

PEER-REVIEWED PUBLICATIONS

Gorr, B., D. Selva, J. Morgan, Y. Li, H. Gao, M. Stroud, **E.A. Ellis**, and G.H. Allen. 2024. Design of a Satellite Constellation for Monitoring Inland Water Quality. *Acta Astronautica*. 219: 875-888. DOI: 10.1016/j.actaastro.2024.03.062

Ellis, E.A., G.H. Allen, R.M. Riggs, H. Gao, Y. Li, and C.C. Carey. 2024. Bridging the divide between inland water quantity and quality with satellite remote sensing: An interdisciplinary review. *WIREs Water*. e1725. DOI: 10.1002/wat2.1725

Ellis, E.A. and A.J. Mathews. 2019. Object-based delineation of urban tree canopy: assessing change in Oklahoma City, 2006–2013. *Computers, Environment and Urban Systems* 73: 85-94. DOI: 10.1016/j.compenvurbsys.2018.08.006

Walker, C., K.C. Flynn, G.A. Ovando-Montejo, **E.A. Ellis**, and A.E. Frazier. 2017. Does Demolition Improve Biodiversity? Linking Urban Green Space and Socioeconomic Characteristics to Avian Richness in a Shrinking City. *Urban Ecosystems*: 1-12. DOI: 10.1007/s11252-017-0671-4

Mathews, A.J., M. Haffner, and **E.A. Ellis**. 2017. GIS-based modeling of tornado siren sound propagation: refining spatial extent and coverage estimations. *International Journal of Disaster Risk Reduction* 23: 36-44. DOI: 10.1016/j.ijdrr.2017.04.004

Zhao, Y., G.A. Ovando-Montejo, A.E. Frazier, A.J. Mathews, K.C. Flynn, and **E.A. Ellis**. 2017. Estimating work and home population using lidar-derived building volumes. *International Journal of Remote Sensing* 38(4): 1180-1196. DOI: 10.1080/01431161.2017.1280634

Mathews, A.J. and **E.A. Ellis.** 2016. An evaluation of tornado siren coverage in Stillwater, Oklahoma: Optimal GIS methods for a spatially explicit interpretation. *Applied Geography* 68: 28-36. DOI: 10.1016/j.apgeog.2016.01.007

RESEARCH PRESENTATIONS

Ellis, E.A., G.H. Allen, C.E. Torgersen, C. Kelleher, and R.M. Riggs. 2025. Identifying the drivers of riverine thermal regime alterations downstream from large United States dams (Poster). *American Geophysical Union (AGU) Fall Meeting.* New Orleans, LA. December 15- 19, 2025.

Ellis, E.A., G.H. Allen, C.E. Torgersen, and K.A. McQuillan. 2025. Satellite-Based Observations of River Surface Temperature Changes Downstream from Large United States Dams (Talk). *Geoscience Student Research Symposium*. Virginia Tech, Blacksburg, VA. April 3-4, 2025.

Ellis, E.A., G.H. Allen, C.E. Torgersen, and K.A. McQuillan. 2024. Understanding the Thermal Impacts of Dams on Large United States Rivers with Satellite Remote Sensing (Talk). *American Geophysical Union (AGU) Fall Meeting.* Washington D.C. December 9-13, 2024.

Ellis, E.A., G.H. Allen, C.E. Torgersen, and K.A. McQuillan. 2024. A Satellite Remote Sensing Based Approach for Assessing the Thermal Impact of Dams (Talk). *Joint Water Resources Conference.* St. Louis, MO. September 30 - October 2, 2024.

Ellis, E.A. and G.H. Allen. 2024. Satellite Remote Sensing Methods for Evaluating the Thermal Impact of Large River Dams (Talk). *Geoscience Student Research Symposium.* Virginia Tech, Blacksburg, VA. March 21-22, 2024.

Ellis, E.A. and G.H. Allen. 2023. Assessing the Impact of Dams on River Temperatures: A Satellite Remote Sensing Based Approach for Large Rivers (Poster). *American Geophysical Union (AGU) Fall Meeting.* San Francisco, CA. December 11-15, 2023.

Ellis, E.A. 2023. Observing River Temperatures from Space. *Virginia Tech Communicating Science's Nutshell Games.* Blacksburg, VA. February 08, 2023.

Ellis, E.A. and G.H. Allen. 2022. Remote Sensing of River Temperatures: Exploring Connections to Discharge in the Ohio River Basin (Talk). *American Geophysical Union (AGU) Fall Meeting.* Chicago, IL. December 12-16, 2022.

Ellis, E.A., Y. Li, G.H. Allen, and H. Gao. 2021. Remote Sensing of Inland Water Bodies: Considering the Effects of Water Level Fluctuations on Water Quality (Poster). *American Geophysical Union (AGU) Fall Meeting.* New Orleans, LA. December 13-17, 2021.

Ellis, E.A. and A.J. Mathews. 2017. A Lidar-based Approach to Assess Vegetation Change in the Urban Environment: A Study of Oklahoma City, 2006 to 2013 (Talk). *Association of American Geographers Annual Meeting.* Boston, MS. April 5-9, 2016.

Ellis, E.A. 2017. Optimal Methods for Identifying and Assessing Urban Vegetation Change. Arts & Sciences Three Minute Thesis (3MT) Competition Semi Finals. Presented by the Oklahoma State University Graduate College. Stillwater, OK. February 2017.

Ellis, E.A. 2016. Ideal methods for identifying vegetation in the urban environment: a study of Oklahoma City, 2006 (Talk). *Southwest Division of the Association of American Geographers (SWAAG) Meeting.* Denton, TX. October 20 -22, 2016.

Ellis, E.A. and A.J. Mathews. 2016. An evaluation of tornado siren coverage in Stillwater, Oklahoma: Optimal GIS methods for a spatially explicit interpretation (Talk). *27th Annual Research Symposium: Oklahoma State University.* Stillwater, OK. February 16, 2016.

Ellis, E.A. and A.J. Mathews. 2015. Assessing Vulnerable Populations Related to Tornado Siren Placement and Coverage in Stillwater, Oklahoma (Talk)*. Southwest Division of the Association of American Geographers (SWAAG) and Applied Geography Conference (AGC) Joint Meeting.* San Antonio, TX. November 4-7, 2015.

Ellis, E.A. 2013. Mapping the spatial distribution and concentration of karez in northwestern Iran (Poster). *Oklahoma State University Freshman Research Scholars Colloquium.* Stillwater, OK. April 12, 2013.

CONVENED CONFERENCE SESSIONS

Dischner, A., A.C. Marques, J. Uchoa, C. Nell, and **E.A. Ellis**. 2025. Thinking Outside the Box Plot: Communicating Science Beyond the Paper. (Oral: SY41B, Poster: SY41F). *American Geophysical Union (AGU) Fall Meeting.* New Orleans, LA. December 18, 2025.

Ellis, E.A. (Primary Convener), D. Peterson, J. Patterson, C. Nell, and A. Jha. 2024. Thinking Outside the Box Plot: Communicating Science Beyond the Paper. (eLightning: SY22B, Poster: SY31E). *American Geophysical Union (AGU) Fall Meeting.* Washington D.C. December 10-11, 2024.

Ellis, E.A. (Primary Convener), P.S. Becker, A.N. Price, and M. Preisser. 2023. Communicating Science Beyond the Paper: Thinking Outside the Box Plot. (Innovative Session: INV11D). *American Geophysical Union (AGU) Fall Meeting.* San Francisco, CA. December 11, 2023.

INVITED LECTURES, TALKS, & TOWNHALL PANELS

Ellis, E.A. 2025. Invited Lightning Talk. My Experience with NASA FINESST. The Virtuous Cycle of Earth Science to Action: How NASA's Early Career Research Program is Empowering Emerging Talen (Townhall: TH45G). *American Geophysical Union (AGU) Fall Meeting.* New Orleans, LA. December 18, 2025.

Ellis, E.A. 2025. Invited Panelist. Epic Fails and Bumpy Trails: Owning and Learning from the Messy Side of Geoscience (Session: SE24B). *American Geophysical Union (AGU) Fall Meeting.* New Orleans, LA. December 16, 2025.

Ellis, E.A. 2025. Remote Sensing of Vegetation. *GEOS 4984/6104: Remote Sensing of the Water Cycle.* (Dr. George H. Allen). Virginia Tech. Blacksburg, VA. November 13, 2025.

Ellis, E.A. 2025. Remote Sensing of Inland Water Quality. *GEOS 4984/6104: Remote Sensing of the Water Cycle.* (Dr. George H. Allen). Virginia Tech. Blacksburg, VA. October 16, 2025.

Ellis, E.A. 2022. Geography, Geosciences, and Beyond: GIS in Research and the Workforce. *GIS 2343: Introduction to GIS.* (Brittany Van Meter, M.S.) Tulsa Community College. Tulsa, OK (Virtual Talk). September 28, 2022.

Ellis, E.A. 2022. Centrography: An Introduction to Point Pattern Analysis. *GEOG 312: Data Analysis in Geography.* (Dr. George H. Allen). Texas A&M University. College Station, TX. March 31, 2022.

Ellis, E.A. 2020. GIS in the workforce. *GEOG 2215: Introduction to GIS.* (Dr. Jordan P. Brasher) Columbus State University. Columbus, GA (Virtual Talk). October 13, 2020.

Ellis, E.A. 2017. An introduction to geographic and spatial analysis. *GEOG 5303: Geographic Analysis I.* (Dr. Jonathan C. Comer) Oklahoma State University. Stillwater, OK. January 17, 2017.

Ellis, E.A. 2016. Arid landscapes and landforms. *GEOG 1114: Physical Geography.* (K. Colton Flynn, M.S.) Oklahoma State University. Stillwater, OK. April 21, 2016.

PROFESSIONAL PRESENTATIONS

Ellis, E.A. and H.L. Leader. 2020. GIS Integration: A Pipeline to Damage Prevention. *ESRI User Conference.* Virtual On-Demand Presentation. July 13-16, 2020.

RESEARCH FELLOWSHIPS, ASSISTANTSHIPS, & PROGRAMS

2025
- Virginia Tech Graduate Student Doctoral Assistantship, (PI) G.H. Allen

2022
- Future Investigators in NASA Earth and Space Science and Technology (FINESST)
  - A three-year, NASA funded project for graduate student-lead research relating to NASA's Science Mission Directorate (SMD) goals.
  - *Remote Sensing of River Temperature and Discharge: Defining Connections and Assessing Changes.* (PI) G.H. Allen; (FI) E.A. Ellis

2021
- Texas A&M University Merit Fellowship
  - A four-year, funded fellowship for doctoral research provided by the Texas A&M University, College of Geosciences, and the Department of Geography.

2016
- Graduate Research Assistant
  - *Identifying and Quantifying Urban Change with Remote Sensing and GIS.* Project in collaboration with NASA Jet Propulsion Laboratory. Supervisors: A. Mathews and A. Frazier.

2015
- Geography Undergraduate Mentors Program
  - Applied GIS principles to determine the coverage of tornado sirens and identify potentially vulnerable populations.
  - Developed methods of estimating population distribution inside US Census blocks in GIS.

2012
- Freshman Research Scholars Program
  - Selected as one of only 60 incoming freshmen to participate in individual undergraduate research projects under the guidance of a faculty mentor.
  - Utilized GIS software and Google Earth imagery to locate subterranean water systems (karez) in order to map spatial distribution and concentration within Northwestern Iran.
  - Results were presented at the OSU undergraduate research colloquium on April 12, 2013.

TEACHING EXPERIENCE

- GEOG 2344 – Digital Tools for Environmental Exploration Lab
- GEOG 4203 – Fundamentals of Geographic Information Systems Lab
- GEOG 4323 – Computer Cartography Lab
- GEOG 4343/5323 – GIS: Resource Management Applications Lab

SCHOLARSHIPS & AWARDS

2025
- Top 3 Presentation Winner - *Flip the Fair at the Virginia Tech Science Festival*
- Graduate Research Presentation Winner - *Virginia Tech 30th Annual Geoscience Student Research Symposium*

2024
- Graduate Research Presentation Winner - *Virginia Tech 29th Annual Geoscience Student Research Symposium*

2023
- Top 5 Presentation Winner - *Virginia Tech Communicating Science's 7th Annual Nutshell Games*

2021
- Texas A&M University Department of Geography Travel Award
- Texas GIS Day Graduate Presentation Finalist

2017
- Oklahoma State University Women's Faculty Council 2017 Student Research Award

2016
- Robert E. Norris Outstanding First-Year Master's Student in Geography
- Third Place Social Sciences Paper Presentation - *27th Annual Research Symposium: Oklahoma State University*

2015
- Oklahoma State University Outstanding Geography Senior
- SST Software Scholarship, 2015-2016

2014
- John F. Rooney - Outstanding Geography Junior Scholarship

PROFESSIONAL MEMBERSHIPS

- American Geophysical Union (AGU)
- American Water Resources Association (AWRA)
- American Association of Geographers (AAG)
- Gamma Theta Upsilon - International Geographical Honor Society

VOLUNTEER & LEADERSHIP POSITIONS

2025 – 2026
- Student Member – Building Enhancement Committee, Department of Geosciences, Virginia Tech.

2024 – 2025
- Member – American Geophysical Union Hydrology Section Student Subcommittee (AGU-H3S)
  - Outreach Committee

2023 – 2024
- Outreach Committee Chair – American Geophysical Union Hydrology Section Student Subcommittee (AGU-H3S)

2022 – 2023
- Member – American Geophysical Union Hydrology Section Student Subcommittee (AGU-H3S)
  - Outreach Committee & Conference Committee

- Graduate Student Mentor - Department of Geosciences, Virginia Tech

2021 - 2022
- Department Representative - Texas A&M University Women in Science and Engineering (WISE)

2013 – 2015
- Secretary - Oklahoma State University Undergraduate Geography Club

SCIENCE COMMUNICATION & OUTREACH ACTIVITIES

Ellis, E.A., S. Yoon, and Y. Kobayashi. 2025. Capturing River Temperatures from Space. *Flip the Fair at the Virginia Tech Science Festival.* Virginia Tech Center for Communicating Science. Blacksburg, VA. November 17, 2025.

Ellis, E.A. and H.R. Thurman. 2025. Rivers Come in All Shapes and Sizes. *Kindergarten STEM Visits.* Virginia Tech Center for Communicating Science. Eastern Elementary/Middle School, Giles County, VA. November 7, 2025.

Ellis, E.A. 2025. Hold Back the River: How Do Dams Affect America's River Temperatures? *Flip the Fair.* 5th Grade Science Outreach Event, Virginia Tech Center for Communicating Science. Melrose Branch Public Library, Roanoke, VA. September 25, 2025.

Spotila, J.A. and E.A. Ellis. 2024. Rocks as Records of the Environment. *Blacksburg Middle School Earth Science Field Trip.* Blacksburg, VA. October 08, 2024.

Ellis, E.A. 2024. What the Satellites See: Observing Rivers from Space. *Science on Tap New River Valley.* Blacksburg, VA. April 25, 2024.

Ellis, E.A. 2023. Thinking Outside the Box Plot. *Interview with AGU TV.* WebsEdge Science. San Franciso, CA. December 12, 2023. https://www.youtube.com/watch?v=oUHLPc0jtdE

Ellis, E.A. 2023. An Introduction to Research and Careers in Geoscience. *Explore Physical Science Summer Camp.* Virginia Tech. Blacksburg, VA. July 20, 2023.

Ellis, E.A. 2023. Observing River Temperatures from Space. *7th Annual Nutshell Games*, Virginia Tech Center for Communicating Science. Virginia Tech, Blacksburg, VA. February 8, 2023.

Ellis, E.A. 2022. An Introduction to Geography and Geosciences. *Texas A&M Youth Adventure Program (YAP).* Texas A&M University. College Station, TX. July 20, 2022.

DOCTORAL COMMITTEE

- George H. Allen, PhD: Associate Professor of Hydrology and Remote Sensing
  (Advisor & Committee Chair)
  Department of Geosciences, Virginia Tech

- Cayelan Carey, PhD: Professor of Freshwater Ecosystem Science (Committee Member)
  Department of Biological Sciences, Virginia Tech

- Yang Shao, PhD: Associate Professor (Committee Member)
  Department of Geography, Virginia Tech

- Christian Torgersen, PhD: Supervisory Research Landscape Ecologist (Committee Member)
  U.S. Geological Survey, Seattle, WA

MASTERS COMMITTEE

- Adam J. Mathews, PhD: Associate Professor (Advisor & Committee Chair)
  Department of Geography, Binghamton University (SUNY)

- Jonathan C. Comer, PhD: Professor and Department Head (Committee Member)
  Department of Geography, Oklahoma State University

- Amy E. Frazier, PhD: Professor (Committee Member)
  Department of Geography, Center for Spatial Studies, University of California Santa Barbara