

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.ijdr.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, 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

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.

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.

INVITED LECTURES & TALKS

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*. (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.

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

- 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

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

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 Francisco, 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.** 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