

# SHELDON G.B. WAUGH, MSC, PHD

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## BASIC INFORMATION

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### Citizenship

Yes - United States

### Federal Experience

United States Army Medical Command, Army Public Health Center

United States Census Bureau, Department of Commerce

United States Department of Commerce, Office of Inspector General

*June 2018 - Present*

### Military Experience

United States Army Reserve, Signal Corps, Major

*December 2011 - Present*

## EDUCATION

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### University of Florida, Gainesville, Florida

Department of Epidemiology, College of Public Health and Health Professions

PhD in Epidemiology

Department of Geography, College of Liberal Arts and Sciences

Masters of Science in Geography

Bachelors of Science in Geography

*August 2007 - May 2018*

*August 2014 - May 2018*

*August 2007 - May 2014*

## WORK EXPERIENCE

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**Data Analytics Branch, U.S. Department of Commerce, Office of Inspector General** June 2023 - Present

*Lead Data Scientist GS-1560-14*

*Supervisor: Andrew Brown*

- Chief and principal data scientist for the DOC OIG.
- Lead the Data Analytics team in conducting data science research and projects that make informed projections, data-driven decisions, and recommendations based on findings.
- Drive analytic design/brainstorming sessions with investigators, auditors, and other data analytics professionals incorporating advanced modeling and technical methods to identify fraud, waste, and abuse.
- Prepare, process, and transform structured and unstructured data and apply advanced scientific, mathematical, and statistical principles and theories to new and existing data sources using open-source or proprietary programming languages. Apply data science methods and techniques, including statistical analysis, modeling, machine learning, spatial analysis, and Natural Language Processing (NLP).
- Build, manage and automate complex data pipelines to support ongoing analytics that develops proactive leads. Engineer and deploy interactive dashboards and analytic tools for agency-wide use. Ensure the organization's strategic plan, mission, vision and values are communicated to the team and integrated into the team's strategies, goals, objectives, work plans and work products and services; articulate and communicate to the team various assignments, projects, problems to be solved, actionable events, milestones, program issues under review, deadlines, and time frames for completion.

**Field Quality Monitoring Branch, Office of Survey and Census Analytics, Field Division, US Census Bureau** January 2021 - June 2023

*Data Scientist GS-1560-13*

*Supervisor: Mary Davis*

- Provides expertise in the applications of data science (interdisciplinary analytical, statistical, and programming skills) to develop data-driven solutions for difficult business challenges. Works with stakeholders to improve Census business outcomes by leveraging analytic, statistical and programming techniques to collect, analyze and interpret large or complex data sets to develop data-driven solutions. Improves efficiency and/or quality in Census Bureau research and production activities through state-of-the-art data science methods including, but not limited to, machine learning, neural networks, Natural Language Processing, anomaly detection, regression or association analysis, data mining, data matching, big data principles, web scraping, operations research, business analytics, data visualization, predictive analytics (including forecasting), and/or statistical analysis.

**One Health Division, Veterinary Service and Public Health Sanitation Directorate, Army Public Health Center, Aberdeen Proving Ground**

June 2018 - January 2021

*Epidemiologist GS-0601-11/12/13*

*Supervisor: LTC Sara Mullaney DVM, PhD, DACVPM*

- Serves as the technical expert and advisor in the Veterinary One Health Division within the Veterinary Services and Public Health Sanitation Directorate, U.S. Army Public Health Center, in the epidemiology and surveillance of both the military and beneficiary animal populations as they relate to specific population assessments and health-related outcome analysis, zoonotic diseases, infectious illnesses, injuries and occupational illness and injury (military working animals), and as related to human biosurveillance through a One Health paradigm. Work involves assessment of available Department of Defense (DoD veterinary medical data, disease and non-battle injury data and other health outcomes data looking to assess trends and potential associations.
- Plans and executes epidemiological projects and outbreak investigations aimed at identifying population based risk factors for zoonotic disease, infections and/or acute or chronic illnesses, injuries, and occupational hazards.

**Spatial Epidemiology & Ecology Research Laboratory (SEER), Department of Geography, University of Florida**

March 2017 - June 2018

*Bioinformatician*

*PI: Jason K Blackburn, PhD*

- Chief Bioinformatics analyst and developer in genomic and spatial analysis
- Utilized advanced statistical and phylogenetic techniques to update genomic laboratory procedures in order to standardize lab results

**Department of Epidemiology, College of Public Health and Health Professions, University of Florida**

August 2014 - June 2018

*Research/Study Coordinator*

*PI: Volker Mai, PhD*

- Bioinformatics analyst and developer in metagenomics
- Responsible for creation of data algorithms and specialized software pipelines to identify and classify components of 16S sequencing fragments.

**Department of Geography, College of Liberal Arts and Sciences, University of Florida**

January 2013 - July 2013

*Research/Data Analyst*

*PI: Andrew Tatem, PhD*

- Tasked with data entry and processing of country population data to GIS databases
- Data used in AfriPOP and AsiaPOP projects with an aim of producing population distribution maps

## TEACHING AND MENTORING EXPERIENCE

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**Science and Mathematics Academy, Aberdeen High School, Aberdeen, MD**

June 2019- Present

*Mentor: Thomas Carey*

*Program Supervisor: Sarah Ashley*

- Assists in project development, assessing the burden of antibiotic prescriptions among our companion animal population
- Provides research, logistical and overall support to the mentee in developing a fully-fledged and validated project
- Provides a synergistic relationship between mentor and mentee to allow for a collaborative and cooperative experience.

**Department of Epidemiology, College of Public Health and Health Professions, University of Florida**

January – May 2015

*Teaching Assistant (PHC6003: Epidemiology of Chronic Diseases)*

*Instructor: David Sheps MD, MSPH*

- Assisting Instructor with developing, grading assignments quizzes and exams
- Provided presentations and online lectures to students

**Department of Epidemiology, College of Public Health and Health Professions, University of Florida**

January – May 2015

*Teaching Assistant (PHC4101: Public Health Concepts)*

*Instructor: Sarah McKune MPH, PhD*

- Assisting Instructor with developing, grading assignments quizzes and exams
- Provided presentations and online lectures to students

## RESEARCH SUPPORT

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Accelerating Innovation in Military Medicine Research - **DM190430** - Integrating High-Performance Computing and Machine Learning Within the Army Veterinary Service to Improve Surveillance of Companion Animal Disease Within the Department of Defense *March 2020 - January 2022: 280,000*

The project will use ML and Natural Language Processing (NLP) models and algorithms to annotate, code and categorize unstructured text in the form of veterinary encounter notes (eNotes) with SNOMED (ID-10-like codes for Animals) codes and categorizations. Our approach will include structured categorization that will improve the current state of veterinary surveillance by harnessing the ability to access the robust data source of eNotes and the diagnoses and observations within. From this output, for the companion animal population that includes Military Working Dogs and Service Members' pets seen globally at veterinary treatment facilities (VTFs), we aim to accurately and timely evaluate the current burden of disease and identify risk factors for disease.

**Role: Principal Investigator**

## TECHNICAL STRENGTHS

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<b>Advanced Biostatistical Methods</b>	Machine Learning and Bayesian modeling
<b>Machine Learning Methods</b>	NLP and Advanced Regression techniques
<b>Geo-spatial Modeling and Analysis</b>	ESRI ArcGIS Enterprise, Database management
<b>Data Management and Cleaning Methods</b>	SQL, R and, NoSQL coding techniques
<b>Data Visualization Solutions</b>	Tableau, Power BI, R, Python
<b>Software &amp; Tools</b>	Python, R, VB, linux, bash and C++ (12+ years of proficiency)

## HONORS, ACHIEVEMENTS AND AWARDS

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Department of Commerce Bronze Award, U.S. Census Bureau, Suitland, Maryland	<i>August 2023</i>
Director's Award for Innovation, U.S. Census Bureau, Suitland, Maryland	<i>August 2022</i>
Army Commendation Medal, U.S. Army Reserve, Chicopee, Massachusetts	<i>July 2022</i>
Individual Cash Perf Award, U.S. Census Bureau, Suitland, Maryland	<i>May 2022</i>
Army Medicine Annual Wolf Pack Award (FY21), U.S. Army Public Health Center (APHC) COVID-19 Task Force Team, AMEDD Civilian Corps	<i>April 2022</i>
Group Special Act Performance Award, U.S. Census Bureau, Suitland, Maryland	<i>September 2021</i>
Army Commendation Medal, U.S. Army Reserve, Milton, Florida	<i>October 2019</i>
Honorable Mention, Student Research Abstract Award, SHES/APHA Annual Meeting	<i>November 2016</i>
SMART Scholarship, Department of Defense, Washington D.C.	<i>August 2016 - May 2018</i>
McKnight Fellowship, Florida Education Fund, Orlando, Florida	<i>August 2014 - May 2018</i>
Ryan Poehling Fellowship Award, University of Florida	<i>December 2013 - May 2014</i>
Army Achievement Medal, U.S Army Reserve, Milton, Florida	<i>June 2014</i>
Army Achievement Medal, U.S Army Reserve, Milton, Florida	<i>December 2013</i>
LTC Samuel W Anderson Scholarship, University of Florida	<i>December 2009 - May 2011</i>
1LT Mark T Barrett Memorial Award, University of Florida	<i>May 2009 - May 2010</i>
Gold Scholarship, University of Florida	<i>August 2007</i>

## PROFESSIONAL SOCIETIES AND ORGANIZATIONS

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The National Association of County Health Officials	<i>March 2019 - Present</i>
International Society of Disease Surveillance	<i>August 2018 - Present</i>
Association for Veterinary Informatics	<i>July 2018 - Present</i>
AMSUS - The Society of Federal Health Professionals	<i>May 2018 - Present</i>
Association of American Geographers	<i>September 2013 - Present</i>
American Public Health Association	<i>October 2014 - Present</i>

## MILITARY EXPERIENCE

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**Headquarters Company, 302nd Maneuver Enhancement Brigade, Chicopee, Massachusetts, United States Army Reserve**

*Major, Signal Corps*

- Brigade S-6 *August 2020 - Present*
- Network Operations Officer *September 2018 - July 2020*

**842nd Signal Company, Milton, Florida, United States Army Reserve**

*Captain, Signal Corps*

- Company Commander
- Family Readiness Group Liaison
- Company Executive Officer
- Platoon Leader

*September 2015 - 2018*  
*January 2015 - 2018*  
*September 2013 - 2015*  
*December 2011 - 2013*

## PUBLISHED WORKS

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Bayko, H.; Watkins, S.; **Waugh, S.**; Moore, G.; Mullaney, S. Adaptation of the One Health Zoonotic Disease Prioritization Tool for Government- and Privately Owned Companion Animal Zoonotic Disease Surveillance. *Zoonotic Dis.* 2023, 3, x. <https://doi.org/10.3390/xxxxx>

Seal, L., Mullaney, S, **Waugh, S.** 2022. Leishmaniasis in the United States military veterinary patient population. *Journal of the American Veterinary Medical Association.* PMID: 34780354

Wijayabahu, A.T.,**Waugh, S.**, Ukhanova, M. and Mai, V., 2019. Dietary raisin intake has limited effect on gut microbiota composition in adult volunteers. *Nutrition journal*, 18(1), p.14. PMID: 30845997

Tagliamonte, M. S.,**Waugh, S.**, Prosperi, M., Mai, V. (2019, September). An Integrated Approach for Efficient Multi-Omics Joint Analysis. In *Proceedings of the 10th ACM International Conference on Bioinformatics, Computational Biology and Health Informatics* (pp. 619-625). ACM. PMID: 31588431

**Waugh, S.**, and Mullaney, S. "Progress towards Companion Animal Zoonotic Disease Surveillance in the US Army." *Online Journal of Public Health Informatics* 11.1 (2019).

Ball, J. D., Fe Agana, D., **Waugh, S.**, Wang, K., James, T. G., Nicolette, G. (2019). Systematically collected information at encounters with HIV-positive students: A review of 10 years of electronic medical records. *Journal of American College Health*, 1-5. PMID: 30681932

Jennifer C. Dennis, Tyler Culpepper, Carmelo Nieves, Jr., Cassie C. Rowe, Alyssa M. Burns, Carley T. Rusch, Ashton Federico, Maria Ukhanova, **Waugh, S.**, Volker Mai, Mary C. Christman, Bobbi Langkamp-Henken, Probiotics (Lactobacillus gasseri KS-13, Bifidobacterium bifidum G9-1, and Bifidobacterium longum MM-2) improve rhinoconjunctivitis-specific quality of life in individuals with seasonal allergies: a double-blind, placebo-controlled, randomized trial. *Am J Clin Nutr* 105, 758–767 (2017). PMID: 28228426

**Waugh, S.** App.: Gut Microbiota Differences in Children From Distinct Socioeconomic Levels Living in the Same Urban Area in Brazil. *Journal of Pediatric Gastroenterology and Nutrition* (2016). PMID: 28644365

Oliveira, F.P. de, Mendes, R.H., Dobbler, P.T., Mai, V., Pylro, V.S., **Waugh, S.**, Vairo, F., Refosco, L.F., Roesch, L.F.W., and Schwartz, I.V.D. (2016). Phenylketonuria and Gut Microbiota: A Controlled Study Based on Next-Generation Sequencing. *PLOS ONE* 11, e0157513. PMID: 27336782

Dahl, W. J., Ford, A.L., Ukhanova, M., Radford, A., Christman, M.C., **Waugh, S.**, Mai, V. Resistant potato starches (type 4 RS) exhibit varying effects on laxation with and without phylum level changes in microbiota: A randomised trial in young adults. *Journal of Functional Foods* 23, 1–11 (2016).

**Waugh, S.** Apropos: Plasmodium knowlesi malaria an emerging public health problem in Hulu Selangor, Selangor, Malaysia (2009–2013): epidemiologic and entomologic analysis. *Parasites Vectors* 8, 79 (2015). PMID: 25651916

Mai, V., **Waugh, S.**, Byrd, D., Simpson, D. Ukhanova, M. Novel encapsulation improves recovery of probiotic strains in fecal samples of human volunteers. *Appl Microbiol Biotechnol* 1–7 (2016). PMID: 27796434

## PRESENTED WORKS

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**Waugh, S.**, Developing a comparison metric for survey question compliance: A case in utilizing open-source software and methodologies within the US Census Bureau, 64th ISI World Statistics Congress - Ottawa, Canada, 2023

**Waugh, S.**, Hollowood, M., Denby, R., The Evolution of the Field Quality Monitoring (FQM) Mapper, AAG Annual Meeting, 2023

**Waugh, S.**, Integrating High-Performance Computing and Machine Learning within the Army Veterinary Service to improve Surveillance of Companion Animal Disease within the Department of Defense, AVI Talbot Symposium, 2020

**Waugh, S.**, Progress Towards an Integrative and Data-Driven Companion Animal Zoonotic Disease Surveillance System within the Department of Defense, World One Health Congress, 2020

**Waugh, S.**, Progress Towards an Integrative and Data-Driven Companion Animal Zoonotic Disease Surveillance System within the Department of Defense, Military Health System Research Symposium, 2020

**Waugh, S.**, Progress Towards an Integrative and Data-Driven Companion Animal Zoonotic Disease Surveillance System within the Department of Defense, Consortium on Global Health Annual Meeting, 2020

Bayko, H, **Waugh, S.**, Watkins, S, Mullaney, S , Zoonotic Disease Prioritization for Government and Privately Owned Companion Animal Zoonotic Disease Surveillance System: Adaptation of the One Health Zoonotic Disease Prioritization Tool, American Public Health Association Annual Meeting, 2019

**Waugh, S.**, Progress towards an Integrated Companion Animal Zoonotic Disease Surveillance System within the DoD, International Society of Disease Surveillance Annual Meeting, 2019

**Waugh, S.**, Progress towards an Integrated Companion Animal Zoonotic Disease Surveillance System within the DoD, APHC Science Exchange, 2019

**Waugh, S.**, Progress towards an Integrated Companion Animal Zoonotic Disease Surveillance System within the DoD, APHC One-Health Day Seminar, 2018

**Waugh, S.**, Sytnik, I, Karibayev, T, Alimbayev, A, Ornybayev, M, Rametov, M, Nikolich, M, Hagijs, S, Elzer, P, Blackburn, J. Brucellosis Transmission Between Humans and Domesticated Livestock In Southern Kazakhstan: Inferences Through MLVA Typing, UF Emerging Pathogens Institute Research Day, 2018

**Waugh, S.**, Sytnik, I, Karibayev, T, Alimbayev, A, Ornybayev, M, Rametov, M, Nikolich, M, Hagijs, S, Elzer, P, Blackburn, J. Brucellosis Transmission Between Humans and Domesticated Livestock In Southern Kazakhstan: Inferences Through MLVA Typing, UF Public Health and Health Professions Research Day, 2018

**Waugh, S.**, Sytnik, I, Karibayev, T, Alimbayev, A, Ornybayev, M, Rametov, M, Nikolich, M, Hagijs, S, Elzer, P, Blackburn, J. Brucellosis Transmission Between Humans and Domesticated Livestock In Southern Kazakhstan: Inferences Through MLVA Typing, AAG Annual Meeting, 2018

**Waugh, S.**, Ball, J. Using statistical approaches to quantify the effects of ridesharing accessibility on Driving under the Influence (DUI) arrests in a university city, American Public Health Association Annual Meeting, 2016

**Waugh, S.**, Varma, D., Striley, C., Cottler, L. Utilizing GIS to Visualize Hypertension Spread: A Comparative Study using HealthStreet Data, American Public Health Association Annual Meeting, 2015

**Waugh, S.**, Varma, D., Striley, C., Cottler, L. Utilizing GIS to Visualize Hypertension Spread: A Comparative Study using HealthStreet Data, UF Public Health and Health Professions Research Day, 2015

**Waugh, S.** Geo-Spatial Risk Modeling for West Nile Virus in Tarrant County, TX Using Environmental and Demographic Data, AAG Annual Meeting, 2014