

Erich Seamon

Curriculum Vitae

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Education

Degree: Ph.D. (ABD), Natural Resources.

University: University of Idaho, Moscow, ID

Description: Research emphasis is on the examination of climatic relationships to agriculture thru the use of machine learning and data science techniques. Completion expected in 2019. See <http://github.com/erichseamon> for my repositories, and <http://erich.io> for more specific details on my research.

Degree: M.S., Geosciences.

University: Bowling Green State University, Bowling Green, OH

Description: Focus on GIS and surficial processes. Thesis: A GIS Model to Calculate Sediment Yields from a Small Rural Watershed, Old Woman Creek, Erie and Huron Counties, Ohio." Ohio Journal of Science vol. 97 (3): 44-52, 1997.

Degree: B.A., Geosciences.

University: Wittenberg University, Springfield, OH

Description: Focus on GIS methods.

Certifications and Awards

- Project Management Professional (PMP) 2008 - Present
- Geographic Information Systems Professional (GISP) 2007 - Present
- Information Technology Infrastructure (ITIL) Foundation Certified 2008 – Present
- Xi Sigma Xi Natural Resource Honor Society
- Phi Kappa Phi Honor Society

Professional Experience

08/2014 – Present. Ph.D. Candidate and Researcher, Climate Impacts Research Consortium (<http://pnwcirc.org>)

- As part of the Regional Integrated Sciences Assessment (RISA) team for the Pacific Northwest, work to develop data mining and machine learning models that predict agricultural outcomes (<http://dmine.io>).
- Work on drought impacts related to agriculture, using Python and R.
- Collaborate with a diverse grouping of scientists @ Oregon State, University of Washington, University of Oregon, and University of Idaho.

12/2011 – 03/2018. Environmental Data Scientist. University of Idaho.

- Conducted data analysis for a USDA/NIFA funded \$20M Coordinated Agricultural Project (CAP) to improve the long-term profitability of cereal production systems in the Pacific Northwest, under ongoing and projected climate change (<http://reacchpna.org>).
- Produced three technical reports.
- Managed data architecture aspects and GIS components among 200 individuals on the CAP team. Facilitated research work and datasets across diverse areas including climate modeling, emissions analysis, cropping systems, biotics, hydrology, and socio-economic factors. Implemented data standards across three research universities (University of Idaho, Washington State University, and Oregon State University).
- Developed data cataloging and dynamic web applications using Python, Java, R, and ArcGIS Server(<http://reacchpna.org/data-management>).
- Led data management efforts around agriculture and data science using python, R, and TensorFlow, Apache httpd, Spark, MapReduce, Tomcat.
- Organized training and workshop efforts for data management, analysis, and consumption of integrated data thru web APIs and application development. For example, I organized and led a data science-based research workshop for python and R development for REACCHPNA in 2014.
- Led 2014 Python-focused scientific discovery sessions for students involved in ecological and agricultural research at the University of Idaho.

11/2005 – 02/2011. Principal, Erich Seamon and Associates.

- Contracted with several large governmental and private sector firms to provide GIS and data analysis services. Developed geospatial applications supporting social services analysis and GIS development (Portland, OR), enterprise GIS assessment (New Orleans – City of New Orleans, LA), and political campaign mapping for state and national party efforts.
- Provided expert witness and geospatial forensics services for Schneider and Wallace LLP, in support of several class action lawsuits pertaining to disability access.

12/2000 – 11/2005. Geographic Information Officer, City & County of San Francisco.

- Served as technical lead and senior manager for several citywide business systems, including property assessment, tax collection, real estate, and public works. Led data science/development teams as large as 20 individuals.
- As the City and County of San Francisco's Geographic Information Officer, developed and implemented SF's first Enterprise GIS, using common geospatial methods to disseminate information.
- Led development teams constructing applications in ArcGIS, ArcGIS Server, ArcIMS, geospatial database management, metadata specification development, as well as map construction.

5/1997 – 12/2000 Senior GIS Analyst, Marin Municipal Water District.

- Served as senior analyst and manager of GIS activities at Marin County’s primary water utility.
- Led development of MMWD’s infrastructure and natural resources technology systems thru the use of GIS technologies on Linux and Unix.
- Administered MMWD’s technical architecture, including UNIX/Windows, along with DB systems (Oracle, DB2).
- Served as the political/technical representative for MMWD’s technology efforts, as it relates to working with several multi-agency consortiums (Marin Telecommunications Agency).
- Served as the project manager for natural resource GIS development.

01/1997 - 04/1997 Senior Analyst, Jacobs Engineering Group.

- Manage several advanced Oracle databases, as well as to utilized UNIX systems to develop modeling processes regarding groundwater and surficial contaminant analysis.

08/1993 - 10/1996. Senior Applications Analyst, Northern Kentucky Area Planning Commission.

- Developed GIS applications and analysis reports in support of the Commission's role as the primary planning organization for the tri-county area. Utilized ArcGIS, Oracle, JavaScript, UNIX.

Research Funding Efforts

- **2011-2017:** Regional Approaches to Climate Change for Pacific Northwest Agriculture. USDA Grant # 2011-68002-30191. REACCH examined the relationships of climate on cereal production systems in the Pacific Northwest, by bringing together over 200 scientists from Oregon State, Washington State, University of Idaho, and the USDA ARS (<http://www.reacchpna.org>).
- **2015-2020:** Climate Impacts Research Consortium (CIRC) NOAA RISA Grant NA15OAR4310145. Active team member, as a PhD candidate, of the data mining portion of the project, exploring relationships of drought to agricultural commodity loss, using machine learning techniques (<https://pnwcirc.org>).
- **2018-2020:** Collaborator, Socio-ecological feedback systems and soil health. Funded by the National Socio-Environmental Synthesis Center (SESYNC), this project brings together 15 leading scientists in soil health, agricultural policy, and climate resilience to explore modeling techniques to assess human relationships to soil health (<http://soilhealthfeedback.org>).

Expert Witness Testimony

- **Expert Witness** – Willits vs. City of Los Angeles – 2013. Provided data mining and geospatial technology analysis for a class action lawsuit related to the Americans with Disabilities Act (ADA). Settlement reached in case 2015 - \$1.4 billion awarded to plaintiffs - largest disability class action lawsuit settlement in U.S. History.

- **Expert Witness** – Piper vs. RGIS – 2009. Provided data mining/geospatial technology analysis for a nationwide class action lawsuit related to employment discrimination for related to a major big box organization with locations across the United States.

Data Science Experience

Python and R

- I Have extensive experience in development in R and Python (<http://github.com/erichseamon>). Use both daily to analyze, organize, and statistically explore integrated biological, climatological, and social datasets. I also regularly deploy shiny server web applications using R and expose these on my <http://erich.io> web site. I also regularly use Jupyter notebooks to organize and collaborate using python.
- As part of my research work for REACCH and CIRC, I use Python and R to integrate data. Data aggregation, function construction, vectorization and loops, data frame, array and raster construction, as well as leaflet/GDAL/Geos usage are all common techniques that I use regularly.
- All my R and python work at the University of Idaho are deployed on Linux (red hat) servers that I manage and maintain to run Jupyter, R/Rstudio server, Solr, Apache, and Tomcat. I am very familiar with all the systems and security complexities that are needed to expose and implement data science methods in this manner (port exposure, SELinux, remote mounts, apache and tomcat web service architectures, as well as python web API deployment for pickled data model exposure). I use RMarkdown to organize methodologies that embed R code with outputs.
- Well versed in frequentist statistics techniques (linear/multivariate regression, ANOVA/MANOVA, repeated measures, factor analysis, data transforms).

Algorithmic Modeling

- Actively use algorithmic data mining and filtering techniques on natural resource datasets for feature extraction, transformation, and model development, including: decision trees, random forest, neural networks/convolutional neural networks, Naïve Bayes, Support Vector Machines, and Long-Short Term Memory (LSTM) neural networks. Examples of model development can be seen at <http://erich.io/dashboards>.
- Currently developing predicative models for two research teams (<http://pnwcirc.org> and <http://soilhealthfeedback.org>) to examine agricultural insurance commodity loss in comparison to climate and other social/demographic factors. I have developed all of the technology implementations for our active SESYNC pursuit, including the web site development and integration with R and python.

GIS

- Experienced with all forms of Geographic Information Systems (GIS) software, including ArcGIS Desktop, ArcGIS Server, ArcSDE, ERDAS, GRASS, QGIS, MapInfo, MapReduce, Leaflet, Gdal/Geos. Use Leaflet regularly to deploy R-based spatial datasets.
- Performed extensive GIS analyses in both desktop and server-based environments. Experienced with map projections, coordinate systems, spatial statistics, georeferencing, and geo-metadata development.
- Experienced in geospatial data mining with regards to large databases/systems – and providing analytical perspectives (report, presentation, data model review, etc.).

Collaboration, Leadership, and Project Management

Leadership Experience

- Provided technology leadership for multiple government organizations in relation to IT service management (City and County of San Francisco, Marin Municipal Water District, NKAPC).
- I have extensive supervisory experience at multiple organizations (Over 5 years). Have led large and small development teams, conducted performance reviews, provided project management support, as well as data science mentoring.
- Extremely familiar with multi-regional GIS integration and coordination. I have performed such tasks at both the Marin Municipal Water District as well as the City and County of San Francisco. I developed SF's Enterprise GIS efforts which involved facilitating a majority of city agencies to sign agreements to financially engage with an Enterprise GIS model for data sharing, application development, and content coordination.
- At the Marin Municipal Water District (MMWD), served as the liaison for MMWD with the Marin Telecommunications Agency's GIS coordination effort for infrastructure GIS integration between 21 cities in Marin County, CA. We developed a Joint Powers Authority (MarinMAP) for this data sharing process.
- Supported 20+ city departments with regard to ancillary, non-GIS technology @ San Francisco (employee base of 25,000) – including SFGOV TV, assessment, tax collection, public works, public utilities.

Project Management

- Currently PMP and ITILF certified, and have led technology project teams for academic, private sector, and government. For example, I developed and implemented the City of San Francisco's first Enterprise GIS program across 65 city agencies.
- Agile, Waterfall and Scrum methodology experienced. For example – I was the contractual project manager for the City of Pittsburgh's GIS E-911 street address data development, thru my consulting firm, Erich Seamon and Associates (2009).
- Extensive project management experience with GIS focused projects, +20M, PMP and ITIL certified. For example, worked with CIBER, Inc. to assist the City of New Orleans right after Hurricane Katrina, traveling to the region to provide GIS expertise for emergency efforts.

Communication and Presentations

- Strong presenter and conveyor of technology outcomes to leadership and customers. I pride myself on my abilities to present information in ways that are understandable, cutting thru any technology jargon. I have given many presentations on data science and GIS topics for private firms as well as many conferences (ESRI, GITA, URISA, AGU, PNW Climate Conference).

Database and Systems Administration Experience

Databases

- Database experience: Well versed in database structures and SQL scripting using PostgresQL, Oracle, DB2, SQL Server, MySQL, MongoDB. Strong database development and modeling, as well as UML design experience (Visio).

UNIX/Linux

- Experienced with Apache and Tomcat server technology, Java/Javascript, PERL. UNIX and Linux administrator – very knowledgeable in bash shell scripting, and typical UNIX interaction. Certified as a UNIX systems administrator.
- Experienced in the day to day management and quality control of technology systems, including data management, help desk management, backup, disaster recovery and business continuity, code management, and system/application security. ITILF certified.

Relevant Coursework

Geomorphology

Surficial Hydrology

Geographic Info. Systems

Groundwater Hydrology

Inorganic Geochemistry

Computational Data Analysis

Analytics and Machine Learning

Stratigraphy

Scanning Electron Microscopy

Sedimentary Structures

Petrology

Multivariate Analysis

Advanced Climatology

Advanced Structural Geology

Sedimentology

Classes Taught

Introduction to Geospatial Analysis for Natural Resource Management, Forestry 375. Spring 2016. 70 students, one teaching assistant.

Recent Publications

Gartstein, M.A., Seamon, E., Thompson, S.F., Lengua, L., 2018. "Community Crime Exposure and Risk for Obesity: Examining Child Hypothalamic–Pituitary–Adrenal (HPA)-Axis Response as a Moderator" *Journal of Pediatric Psychology*. doi: 10.1093/jpepsy/jsx116.

Gartstein, M.A., Seamon, E., Thompson, S.F., Lengua L. 2018. "Parenting matters: Moderation of biological and community risk for obesity" *Journal of Applied Developmental Psychology*. doi: 10.1016/j.appdev.2018.01.004

Seamon, E, Roesch-McNally, G., McNamee, L., Roth, I., Wulfhorst, J., Eigenbrode, S., & Laursen, D., 2017. "Producer Perceptions on Climate Change and Agriculture: A Statistical Atlas". University of Idaho Agricultural Economics Extension Series 17-01. Funded through award #2011-68002-30191 from USDA-NIFA.

Gartstein, M.A., E. Seamon, 2017. "Latent Profile and Cluster Analysis of Infant Temperament: Comparisons across Person-Centered Approaches" *Developmental Psychology*. doi: 10.1037/dev0000382.

Gartstein, M.A., E. Seamon, T.J. Dishion, 2013. "Geospatial Ecology of Adolescent Problem Behavior: Contributions of Community Factors and Parental Monitoring" *Journal of Community Psychology*. doi:10.1002/jcop.21610

Seamon, E. 2000 "Water Management in Marin County, CA; Development and Implementation of a Complex Water Utility GIS to Manage Both Infrastructure and Natural Resources" 2000. Environmental Systems Research Institute (ESRI) Conference Proceedings, San Diego, CA.

Evans, J.E., Seamon, E. 1997. "A GIS Model to Calculate Sediment Yields from a Small Rural Watershed, Old Woman Creek, Erie and Huron Counties, Ohio" Ohio Journal of Science vol. 97 (3): 44-52, 1997.

Recent Select Presentations and Posters

Seamon, E., Gessler, P.E., Abatzoglou, J.A., Mote, P. 2018. "Decision Tree Modeling of Agricultural Insurance Loss: Relationships to Climate for the Palouse Region of the Pacific Northwest" Pacific Northwest Climate Conference, Boise, ID

Seamon, E., Gessler, P.E., Eigenbrode, S., Nelson, R., Stockle, C. 2015. "REACHPNA and data management" USDA Data Harmonization Workshop, Washington DC

Seamon, E., Gessler, P.E., Flathers, E., Sheneman, L. 2015. "Climatic Data Analysis and Data Management: Regional Approaches to Climate Change for Pacific Northwest Agriculture" University of Idaho GIS Day, Presentation, Idaho Commons

Flathers, E., Gessler, P.E., Seamon, E., 2015. "Implementation of an OASIS Repository using Free, Open Source Software" AGU Fall Meeting, San Francisco, CA

Seamon, E., Gessler, P.E., Flathers, E., 2015. "Development of an Interactive Crop Growth Web Service Architecture to Review and Forecast Agricultural Sustainability" AGU Fall Meeting, San Francisco, CA

Seamon, E., Gessler, P.E., Flathers, E., Sheneman, L. 2015. "Data Management and Integration for Transdisciplinary Research: REACHPNA" Arid Cereals International Conference, Minneapolis, MN. Poster

Seamon, E., Gessler, P.E., Flathers, E., Walden, V.P. 2014. "Development of an interactive crop growth web service architecture to review and forecast agricultural sustainability" Poster presentation at the American Geophysical Union Fall Meeting

Seamon, E., Gessler, P.E., Fricke, S. 2014. "Using geospatial information for agricultural climate change analysis" Presentation at the 2014 ESRI Users Conference, San Diego, CA.

Flathers, E., Gessler, P.E., Seamon, E., 2014. "Service-Based Extensions to an OASIS Archive for Science Data Management" AGU Fall Meeting

Seamon, E., Gessler, P.E., Flathers, E., Sheneman, L., 2013. "Climatic Data Integration and Analysis - Regional Approaches to Climate Change for Pacific Northwest Agriculture (REACCH PNA)" NIFA Climate Science Project Director's Meeting, Gainesville, FLA

Seamon, E., Gessler, P.E., Flathers, E., Sheneman, L., 2013. "Climatic Data Integration and Analysis - Regional Approaches to Climate Change for Pacific Northwest Agriculture (REACCH PNA)" Presentation at the American Geophysical Union Fall Meeting

Seamon, E., Gessler, P.E., Flathers, E., Sheneman, L., Goldberg, G. 2013. "Climatic Data Integration and Analysis - Regional Approaches to Climate Change for Pacific Northwest Agriculture (REACCH PNA)" Presentation at Pacific Northwest Climate Science Conference, Portland, OR

Seamon, Gessler, P.E., 2012. "Data Management and REACCH: Strategies and Implementation. University of Idaho" Poster - Annual REACCH CAP Conference

Gartstein, M.A., Dishion, T.J., Seamon, E., 2008. "Explaining Neighborhood Correlates of Adolescent Conduct Problems: the Geospatial Perspective." Presentation at the Annual Convention of the Society for Prevention Research, San Francisco, CA

Seamon, E., 2006. "Understanding Adolescent Behavior with GIS – a case study: Portland, Oregon" ESRI Users Conference, San Diego Convention Center, San Diego, CA

Seamon, E., Gartstein, M.A., Dishon, T. 2006. "Explaining neighborhood correlates of adolescent conduct problems in the Portland, Oregon metropolitan area: the geo-spatial perspective" Santa Fe, NM

Seamon, E., 2005. "Security, Privacy and GIS: Changing Perspectives in a Changing World." ESRI Users Conference. San Diego Convention Center, San Diego, CA

Seamon, E., 2005. "Implementing Enterprise GIS in San Francisco" American Planning Association National Conference, March 21-25, San Francisco, CA.

Seamon E., 2005. "Managing geographic information nationally: strategies for GIS governance" California GIS Conference, Bakersfield, CA

Seamon, E., 2005. "SF Enterprise GIS: interactions and uses of geospatial databases" Northern California URISA presentation, Sacramento, CA

Seamon, E., 2004. "Building a Successful Enterprise GIS in San Francisco, CA" ESRI Users' Conference, San Diego, CA

Seamon, E., 2004. "Fighting Crime in the 21st Century: Developing CrimeMAPS, SF's first dynamic crime analysis system" National Institute of Justice (NIJ) Seventh Annual Crime Mapping Conference, Boston, MA

Seamon, E., 2000. "Water Management in Marin County, California: Development and Implementation of a Complex Water Utility GIS to Manage Both Infrastructure and Natural Resources" ESRI Users Conference, San Diego, CA

Seamon, E., 1999. "Hydrological Modeling and the use of GIS as a predictive tool in environmental management" Northern Kentucky Area Planning Commission, KY