Timothy L. Negley

Managing Director

Expertise

- Chemical fate and transport assessment
- Database engineering
- Scientific programming
- Data analytics and visualization
- GIS and advanced spatial modeling

Summary

Mr. Negley is a managing director and environmental scientist with 17 years of consulting experience providing data-driven solutions to governmental and private sector clients. As practice area leader of TIG's Forensics and Data Analytics practice, Mr. Negley is responsible for advising clients on data strategies and solutions that help them make better decisions. He provides leadership and technical expertise to multi-disciplinary teams charged with assessing, identifying and elucidating trends in the data. Areas of expertise include pollution source identification, data monitoring systems, and spatial data analytics. Applications of data analytics and visualization include environmental forensics, predictive analytics, product stewardship, and evidentiary applications for various types of litigation. He has led projects across the U.S., Canada, and Europe and has multiple publications in the peer-reviewed literature.

Professional Experience

PCB Source Identification in Soil and Sediment (2019–2020)
Confidential Client, New York State

Mr. Negley served as the technical lead for evaluating polychlorinated biphenyl (PCB) data in soil and sediment for determination of historical pollution sources to a water body in New York State. Led data analysts in Principal Component Analysis (PCA) and Polytopic Vector Analysis (PVA) to identify sources and visualize suspected source contributions throughout the watershed. Interpreted results at client meetings and in a final expert report.

Pesticide Source Identification in Sediment (2018–2019)
Confidential Client, California

Mr. Negley led forensic analysis of the sum of the dichloro-diphenyl-trichloroethane (DDT), dichloro-diphenyl-dichloroethylene (DDE), and dichloro-diphenyl-dichloroethane (DDD) isomers (DDx) to assess potential sources of contamination into a tidal waterway. Relied on various mathematical and statistical techniques to distinguish between the potential effects of current sources in the uplands and historical sources that may have already affected waterway sediments. Specific multivariate analyses included PCA and K-means cluster analysis.

Geospatial Data Analysis and Visualization Systems (2017–Present)
Confidential Clients, Various Locations throughout North America

Mr. Negley served as the lead architect for more than $500K of project work to develop client accessible geospatial and analytical data viewers. He works closely with stakeholders to identify, design, optimize, and quality assure workflows, including translating needs into functional requirements documentation. Oversee data analysts, programmers, and database managers to achieve stakeholder

requirements. Environmental projects have involved large river systems located in New Jersey, Washington, Texas, New York, Oregon, as well as across Europe with nearly 50 million records.

Surface Weighted Average Concentrations for Soil and Sediment (2007–Ongoing)
Confidential Client, Various locations across North America

Mr. Negley has performed and led geostatistical analyses to generate hundreds of thousands of Surface Weighted Average Concentrations (SWACs) and spatially weighted exposure point concentrations (EPCs). Calculations are automated through GIS workflows and python scripts for any combination of depth, chemical, matrix, exposure area, etc. Calculations use Thiessen Polygons, Natural Neighbor, Inverse Distance Weighting, and Kriging methods and associated data review for outliers, autocorrelation, anisotropy, and ensuring model goodness-of-fit statistics.

Sediment Data Evaluation - Newark Bay (2007–2012)
Confidential Client, Newark, New Jersey

Mr. Negley conducted statistical calculations on the client's database for Newark Bay in support of the data evaluation and statistical analysis report. Responsibilities included programming statistical calculations for outlier detection, descriptive statistics, upper confidence limits, background threshold values, and exposure point concentrations.

Background Threshold Values in Soil, Sediment, and Groundwater (2007–Ongoing)
Multiple Clients, Various locations across the United States

Mr. Negley serves as technical lead to develop site-specific background values in soils, groundwater, and sediments for multiple sites across the United States following state and federal guidance, including U.S. Environmental Protection Agency (EPA) ProUCL software. Responsibilities include background study design, background database development, statistical test selection, outlier identification and evaluation, tests for multiple populations, goodness-of-fit, and stationarity to select appropriate threshold type. He has extensive experience developing and using multiple background threshold statistics, including confidence limits, tolerance limits, and prediction limits.

Water Quality Data Viewer for Europe (2017–Ongoing)
Confidential Client, Various locations across Europe

Mr. Negley provides technical leadership for a continental-scale water quality information system for 28 countries across Europe. The application is the first of its kind to centralize monitoring data across Europe, automate statistical calculations and reporting, and provide users with a graphical interface to visualize and interrogate results across multiple corporate offices. Led the specifications workshop with the client, database and application design, liaising between 12 technical stakeholders, overseeing application developers, and quality control.

Significance of Time-Dependent Sorption on Leaching Potential (2014)
Valent USA and Bayer CropScience, North America

Mr. Negley conducted one-dimensional leaching modeling to demonstrate U.S. regulatory models were overly conservative when predicting leaching potential for non-linear sorption pesticides. Results

reduced the amount of field verification studies required and were published in the peer-reviewed literature.

Model to Estimate Shallow Groundwater in Europe (2013)
Syngenta Ltd, Continental Europe

Mr. Negley was responsible for developing a two-level landscape classification model to estimate areas of shallow groundwater across 27 countries in Europe. The model was automated to discriminate cells in a gridded data set using hydrogeomorphic and terrain data. The shallow groundwater GIS data layer was used to rapidly identify more than 100 sites that would be favorable for pesticide leaching as part of a retrospective groundwater monitoring study. Results were presented at the 2013 York Pesticides Conference, York, UK.

Monte Carlo Sensitivity Analysis for a Probabilistic Exposure Model (2012)
EPA, Environmental Fate and Effects Division, Washington, DC

Mr. Negley developed and implemented a Monte Carlo sensitivity analysis for EPA's Terrestrial Investigation Model (a probabilistic model used to estimate population level risks for birds). Responsibilities included deriving input distributions for nearly 70 variables, automating the 12,000-simulation sensitivity analysis, developing a relational database for managing inputs and outputs for the sensitivity analysis, evaluating model stability, ranking key input variables, and reporting findings to EPA.

MicroExposure Event (MEE) Modeling for Soil Cleanup (2010)
Confidential Client, Florida

Mr. Negley completed probabilistic modeling to assess uncertainty based on a probability distribution for dermal adherence factor, relative absorption factors for the oral and dermal exposure routes. Exposure distributions were also validated and modified for site-specific receptor behavior as applicable. The modeling was used to assess health effects for individuals over relevant exposure periods.

Long-term Ground Water Monitoring Optimization (LTMO) for a Former Rail Yard (2009)
Union Pacific Railroad, Illinois

Mr. Negley developed a refined monitoring program for two rail yards operated by Union Pacific Railroad. Responsibilities included compiling a historical database; evaluating well-types, historical nature and extent investigations, program objectives; and performing statistical analysis to identify spatial and temporal redundancies in the monitoring program. LTMO costs were recovered in approximately one sampling event. Refined programs resulted in approximately a 50 percent reduction in the number of samples required to statistically meet program objectives. Results were presented at the 2009 Railroad Environmental Conference.

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PCB Exposure Assessment for Residential and Commercial Use (2007)
Confidential Client, Kentucky

Mr. Negley served as the technical lead for generating spatially weighted EPCs for approximately 80 properties along 70 miles of contaminated waterway for a human health risk assessment in support of site closure. Developed screening process and EPC methodology to apply to each parcel, generated spatial statistics, EPCs, and data visualizations. The results and risk assessments were presented in a report submitted to the client.

Academic Qualifications

MS in Environmental Science, University of Maryland, 2002

BS in Natural Resources (with honors), Cornell University, 1998

Professional Training

- 40-Hour OSHA Hazardous Waste Operations (HAZWOPER) Safety Training
- CPR, First Aid
- Smith Driver Training

Publications

Negley, T.L., Allen, R.A.., Tang, J., Dyer, D.D., and K.L. Gehl. 2014. "The Significance of Time-dependent Sorption on Leaching Potential – A Comparison of Measured Field Results and Modeled Estimates" in *Non-first Order Degradation and Time-dependent Sorption of Organic Chemicals in Soil*. W. Chen (ed). October 28, 2014. http://dx.doi.org/10.1021/bk-2014-1174.ch017.

Kline, K.M., Eshleman, K.N., Morgan, R.P., Castro, N.M., and T.L. Negley. "Contemporary Trends in the Acid-Base Status of Two Acid-Sensitive Streams in Western Maryland." *US. Environmental Science and Technology* 42, no. 1 (2008): 56–61. http://dx.doi.org/10.1021/es071195e.

Simmons, J.A., Currie, W.S., Eshelman, K.N., Kuers, K., Monteleone, S., Negley, T.L., Pohlad, B.R., and C. Thomas. "Forest to Reclaimed Mine Land-Use Change Leads to Altered Ecosystem Structure and Function." *Ecological Applications* 18, no. 1 (2008): 104–118.

Negley, T.L. and K.N. Eshleman. "Comparison of stormflow responses of surface-mined and forested watersheds in the Appalachian Mountains, USA." *Hydrological Processes* 20 (2006): 3467–3483.

Schneider, R.L., Negley, T.L., and C. Wafer. 2005. "Factors Influencing Ground Water Seepage to a Large, Mesotrophic Lake in New York." *Journal of Hydrology* 310, no. 1-4 (2005): 1–16.

Negley, T.L., E.L. Mills, B. Baldwin, R. O'Gorman, and R.T. Owens. 2003. "The Ecology and Impact of the Invasion of Lake Ontario by the Zebra Mussel *Dreissena Polymorpha* and Quagga Mussel *D. bugensis*" in *The State of Lake Ontario*. M. Munawar (ed).

Negley, T.L. 2002. *A Comparative Hydrologic Analysis of Surface Mined and Forested Watersheds in Western Maryland*. Master's Thesis. University of Maryland, College Park, Maryland.

Presentations

Rose, N., T. Negley, and G. Johnson. “Development of an R-based Implementation of the Polytopic Vector Analysis Mixing Model.” Presentation, SCIX, Palm Springs, CA. October 2019.

Negley, T., N. Rose, and J. Combes. “Improving the Accessibility of Geospatial Data Evaluation and Visualization for Project Teams.” Poster, Battelle – Tenth International Conference on Remediation and Management of Contaminated Sediments, New Orleans, LA. February 2019.

Rose, N., T. Negley, and C. Monti. “Evaluating the Challenges of Using Disparate Data Sets in Forensic Methods.” Presentation, Battelle – Tenth International Conference on Remediation and Management of Contaminated Sediments, New Orleans, LA. February 2019.

Negley, T. “Subsurface Modeling of a Pesticide Using the Leaching Estimation and Chemistry Model for Pesticides: A Comparison of Field Results and Modeled Estimates.” 252nd ACS National Meeting & Exposition. August 21–25, 2016. Philadelphia, Pennsylvania USA.

Negley, T. “Modeling the Sustainability of using Treated Water Containing Active Pharmaceutical Ingredients for Reuse in Irrigation Applications.” 252nd ACS National Meeting & Exposition. August 21–25, 2016. Philadelphia, Pennsylvania USA.

Negley, T. “Glyphosate and AMPA Long-term Monitoring Data Trends for Surface Water and Groundwater in the USA.” 252nd ACS National Meeting & Exposition. August 21–25, 2016. Philadelphia, Pennsylvania USA.

Negley, T. “Rainfast Properties of Three Formulations of Granular Phosphorus Fertilizers Following Exposure to Multiple Simulated Rainfall Events: GIS Site Selection, Study Methodology, and Results.” 252nd ACS National Meeting & Exposition. August 21–25, 2016. Philadelphia, Pennsylvania USA.

Negley, T. “An Assessment of Data Generated from Terrestrial Field Dissipation Studies.” 252nd ACS National Meeting & Exposition. August 21–25, 2016. Philadelphia, Pennsylvania USA.

Negley, T. “GIS Approach to Simplify Conduct of National and Continental Scale Leaching Vulnerability Assessments.” XV Symposium in Pesticide Chemistry, Piacenza, Italy.

Negley, T. “Moving Beyond Risk Quotients: Comparing Dose-Response Effects to Reproductive Natural Variability.” 250th American Chemical Society National Meeting, August 16–20, 2014. Boston, MA, USA.

Negley, T. “Identification of Very Shallow Groundwater Regions in the EU to Support Monitoring.” 7th European Modelling Workshop. October 22, 2014. Austrian Academy of Sciences, Vienna, Austria.

Negley, T. “The Significance of Time-Dependent Sorption on Leaching Potential - A Comparison of Measured Field Results and Modeled Estimates.” Exposure Modeling Public Meeting (EMPM). March 24, 2014. Environmental Protection Agency, Office of Pesticide Programs, Arlington, VA.

Negley, T. “Verification of a New GIS Layer to Support Focused Monitoring in Regions Of Shallow Groundwater in the EU.” Presented at the 13th IUPAC International Congress of Pesticide Chemistry at the 248th American Chemical Society National Meeting. August 10–14, 2014. San Francisco, California, USA.

Negley, T. “Evaluation of Freundlich Sorption and Time-Dependent Sorption of Pesticide in Soil with Field Data.” Presented at the 13th IUPAC International Congress of Pesticide Chemistry at the 248th American Chemical Society National Meeting. August 10–14, 2014. San Francisco, California, USA.

Negley, T. “Modelling in Support of an Extended Groundwater Monitoring Study in the EU.” Presented at the 23rd Annual Meeting of the Society of Environmental Toxicology and Chemistry. Glasgow, Scotland, United Kingdom.

Negley, T. “Estimation of County-Level Hormone Contributions to Surface Water from Humans, Livestock, Wildlife and Fish.” Presented at the Society for Environmental Toxicology and Chemistry (SETAC) North America 34th Annual Meeting. Nashville, Tennessee. November 17–21, 2013.

Negley, T. “Development and Verification of a Mathematical Model to Identify Shallow Groundwater Regions for Monitoring In the EU.” Presented at the Conference on Pesticide Behavior in Soils, Water and Air. York, United Kingdom.

Negley, T. “The Significance of Time-Dependent Sorption on Leaching Potential: A Comparison of Measured Field Results and Modeled Estimates.” Presented at the 242nd Annual Meeting of the American Chemical Society. Indianapolis, Indiana.

Negley, T. “A GIS Approach to Identify Vulnerable Surface Water Monitoring Sites to Assess Pesticide Fate, Transport, and Exposure Potential.” Presented at the 242nd Annual Meeting of the American Chemical Society. Indianapolis, Indiana.

Negley, T. “Validation and Refinement of PRZM-GW Predicted Soil-pore Water Concentrations using Terrestrial Field Dissipation Data.” Presented at the 241st Annual Meeting of the American Chemical Society. Philadelphia, Pennsylvania.

Negley, T. “Use of GIS and PRZM-GW to Predict Groundwater Concentrations for a Modified Acetochlor Soil Restriction on Corn, Cotton, and Soybeans.” Presented at the Annual Meeting of the American Society of Agronomy, San Antonio, Texas.

Negley, T. “Key Environmental and Physicochemical Parameters Influencing PRZM-GW Predicted Groundwater Concentrations.” Presented at the 240th Annual Meeting of the American Chemical Society. Denver, Colorado.

Negley, T. “Spatial Distribution of Iodide Concentrations in California Groundwater.” Presented at the 240th Annual Meeting of the American Chemical Society. Denver, Colorado.

Negley, T. “PRZM Ground Water Modeling Predictions for a Modified Acetochlor Soil Restriction on Corn, Cotton, and Soybeans.” Presented at the 239th Annual Meeting of the American Chemical Society. San Francisco, California.

Negley, T. “A Comparison of Spatial and Non-Spatial Methods for Determining Exposure Point Concentration.” Presented at the 2010 New York State Geographic Information Systems (GIS) Conference.

Negley, T. “Regulating Pesticides in the United States.” Lecture to Risk Management class (invited) at SUNY College of Environmental Science and Forestry. Syracuse, NY.

Negley, T. “Modeling Approaches for Estimating Environmental Exposure from Agricultural Pesticide Applications.” Presentation to Canada Pest Management Regulatory Agency (PMRA) (invited). Syracuse, NY.

Negley, T. “Spatial Heterogeneity of Pesticide Use in Ecological Risk Assessment: A Case Study Using the Geospatial Exposure Model (GeoSEM).” Society for Risk Analysis 2005 Annual Meeting. Orlando, FL.

Negley, T. “A GIS tool for associating Marine and Estuarine Areas with Pesticide Application.” FIFRA Environmental Modeling Workgroup. EPA Headquarters. Washington, DC.

Negley, T. “Probabilistic Model of Nickel Absorption in Drinking Water.” Society for Risk Analysis Upstate New York Annual Symposium. Syracuse, NY.

Negley, T. “Nickel Absorption Following Water Ingestion in Adults: A Probabilistic Approach to Estimation of Nickel Bioavailability.” Society for Risk Analysis Annual Meeting. Palm Springs, California.

Negley, T. “Introduction to Probabilistic Risk Assessment.” U.S. Environmental Protection Agency, Washington, DC.

Negley, T. “Standardizing Data Management to Optimize Remedial System Operation and Achieve Remedial Goals.” Conference on Accelerating Site Closeout, Improving Performance, and Reducing Costs through Optimization. Dallas, Texas.

Negley, T. “Multi-Scale Impacts of Land Use Changes on Stormflow Dynamics Utilizing NEXRAD and Geographic Information Systems.” American Geophysical Union Chapman Conference. Santa Fe, New Mexico.

Negley, T. “A Comparative Analysis of Hydrological Responses of Surface-Mined and Forested Watersheds in Western Maryland, U.S.A.” 11th Stockholm Water Symposium. Stockholm, Sweden. [Awarded best poster].

Negley, T. “Historical Land Use and Streamflow Trends in the Georges Creek Watershed.” Meeting of the Georges Creek Watershed Association. Barton, Maryland.

Negley, T. “Stormflow Response and Historical Land Use Change: A GIS/Unit Hydrograph Approach.” American Geophysical Union Fall Meeting. San Francisco, California.

Negley, T. “Groundwater Seepage: Implications for Shoreline Development.” New York State Federation of Lake Associations. Hamilton, NY.