

Randy A. O'Boyle
Managing Scientist

Professional Profile

Mr. Randy A. O'Boyle is a Managing Scientist in Exponent's EcoSciences practice, specializing in the visual display of complex data sets and responsible for organizing the daily operations of the GIS/Data Management group. He has more than ten years of experience conducting geographic data analyses and producing data visualizations for use in reports, presentations, courtroom displays, and web sites. These analyses and visualizations are often used to solve questions related to aerial deposition modeling, aquatic chemical fate and transport, chemical distribution tracing, spatial-based cost allocation, and sedimentary deposition at a variety of locations (i.e., mine sites, estuaries, port facilities, residential, and industrial properties). Mr. O'Boyle is experienced in the use of all standard geographic data formats, including: CAD drawings, aerial photographs, Spatial Data Transfer Standard (SDTS) data, USGS quadrangles, scanned images, and manually digitized data and skilled in the use of a wide variety of geographic analyses, including 3-dimensional visualization, animation, contouring using inverse distance weighted and kriging methods, address matching, and data integration/display methods. He uses results from these analyses to produce report quality graphics and web-based tools, both of which are used by Exponent technical staff and clients to assist in their understanding of the complex data associated with the project. The successful completion of these tasks requires coordination between various departments, practices, and clients, typically located in different offices, often on stringent time schedules.

Mr. O'Boyle's previous experience is in transportation modeling, where his GIS efforts included network coding and refinement, zone system updating, socio-economic data evaluation, and testing of future network and land use alternatives.

Academic Credentials and Professional Honors

B.A., Geography (specializing in GIS), Minor in Architecture, University of Washington, 1998

Licenses and Certifications

Hazardous Waste Operations and Emergency Response 40-hour Training Program

Publications

Ginevan ME, Watkins DK, Ross JH, O'Boyle RA. Assessing exposure to allied ground troops in the Vietnam War: A quantitative evaluation of the Stellman Exposure Opportunity Index model. *Chemosphere* 2009, Epub ahead of print: doi:10.1016/j.chemosphere.2009.02.014.

Booth PN, Salatas JH, Kaetzel RS, Gard NW, O'Boyle RA, Yost LJ, Mackay CE. Risk assessment as a decision-making tool for treatment of emissions at a new aluminum smelter in Iceland: 1. Background and introduction. *Human and Ecological Risk Assessment: An International Journal* 2009;15(3):423–441.

Kaetzel RS, Yost LJ, O'Boyle RA, Booth PN. Assessment as a decision-making tool for treatment of emissions at a new aluminum smelter in Iceland: 2. Human health risk assessment. *Human and Ecological Risk Assessment: An International Journal* 2009; 15(3):442–468.

Salatas JH, Booth PN, Gard NW, O'Boyle RA, Mackay CE. (2009) Risk assessment as a decision-making tool for treatment of emissions at a new aluminum smelter in Iceland: 3. Ecological assessment. *Human and Ecological Risk Assessment: An International Journal* 2009; 15(3):469–502.

Presentations

Ginn T, Bodishbaugh R, O'Boyle R. Key issues for use of Habitat Equivalency Analysis in structuring compensatory restoration projects. Presented at the 25th Annual Society of Environmental Toxicology and Chemistry Meeting, Portland, OR, November 13–19, 2004.

Project Experience

In response to the Deepwater Horizon incident, the High Interest Technologies Test team was created. As part of this multi-disciplinary team reviewed proposed technologies for appropriate scalability and effectiveness for this specific response effort. The team conducted a variety of bench and field tests, summarized our conclusions, and briefed the Alternate Response Technologies group.

The U.S. Coast Guard created several incident command posts (ICP) in response to the Deepwater Horizon incident. As a member of the Environmental Unit's Planning Section within Mobil sector ICP, acted at the section's Response Technologies Specialist. Responsible for evaluating the opportunities to use various response technologies, including mechanical containment and recovery, dispersant or other chemical countermeasures, in-situ burning, and bioremediation. Coordinated agency consultations and assisted in planning requirements needed to deploy specific response technologies. Briefed the unit leader concerning the environmental tradeoffs of using or not using a specific response technique.

Planned and participated in a field investigation of claimed agricultural damage from aerial deposition. Used satellite imagery to determine areas to conduct the on-site investigation. As part of the on-site investigation I collected soil samples, took site photographs, participated in

interviews of personnel, and made observation of normal operations. As part of the post-field investigation work I used GIS to compile the data collected and create presentation material.

Led a team that developed a web-tool that enables remote users to access, query, and visualize a complex database that consists of analytical results, sample locations, field maps, and quality control criteria. The web-tool provides several options to the user for viewing queried data; display the data in tabular format within the web-tool, downloading to a multi-worksheet table, and/or viewing the sample locations on a map of the site.

Compiled historical and current aerial photographs, site-specific surveys, borings, and pziometric data in relation to a residential landslide in California. These layers were used to evaluate temporal changes in the ground surface and spatial variations in water levels and geological characteristics, and were integrated into a web-based mapping tool designed to assist with the evaluation of the cause and effects of the landslide.

Address matched the insured property portfolios from a number of insurance companies that were affected by Hurricane Katrina. Used these portfolios, post-Katrina aerial photography, and other available GIS layers to provide property specific damage analyses in a timely manner. These layers were also developed into web-based tools to help technical staff and clients with their assessment of damaged properties.

Illustrated the relationship between herbicide spraying activities and troop deployment locations. Using GIS, spray activity database, and digitized troop deployment locations a series of monthly maps for the period of interest was created. These maps were used to help assess the potential interaction between troop deployment and herbicide spraying activities.

Created the GIS interface for an Internet Map Server (IMS) tool that integrates earthquake specific data (obtained from the USGS) and a geocoded database of insured structures. The tool is a real-time service that allows the user to determine the effects of an earthquake on the database.

Used GIS to facilitate the creation of a sampling plan designed to cover diverse areas, sample types, and analysis methods. The final sampling plan incorporated the need for various sample location densities and site operational requirements, and made allowance for contaminants mobilized by multiple methods.

Created small-scale site location maps used to assess the potential for contaminant transport within drainage basins. The contaminant transport analyses were expanded to include the potential impact from multiple sources.

Created a 3-D model to estimate the mass and concentration of an underground plume of PCBs. The mass and concentration of the plume were estimated in one-foot depth intervals on a twenty-five foot grid to help assess the depth of cleanup necessary. Exporting the mass and concentration estimates in a grid format enabled data to be analyzed quickly and efficiently.

Reconstructed the shoreline and bathymetric features of a small river estuary, using historical records dating back more than one hundred years. The reconstructed record of dredging, filling,

and sediment deposition was used to estimate when contaminants found in core samples could have been deposited.

Compiled base map material consisting of USGS topographic maps, aerial photographs, field notes, and historical paper maps for a variety of smelter sites. The materials were used to construct a plan view of the facilities and assist in the development of deposition models.

Prepared contour maps using the inverse distance weighted method to illustrate the concentration and spatial distribution of a variety of sediment contaminants at two adjacent shipyard sites. The objective was to present the data from the two sites in a spatially contiguous layout representing the entire study area.

Performed a series of analyses on chemical concentration data in support of an RI/FS for a major lake and nearby tributaries primarily contaminated with mercury. The analyses were initially used to determine the nature and extent of the contamination. Land-use type and habitat data were subsequently incorporated to evaluate the potential risks posed to ecological receptors.

Conducted a Thiessen polygon analysis using sediment data on the entire length of a major waterway, approximately 200 miles long, to determine total acreage contaminated according to various cleanup levels.

Performed an hourly analysis of an air driven chemical plume and a group of potentially exposed residents. The analysis, conducted over ten 1-hour periods, showed the extent and concentration of the aerial deposition and the location of each person in the study group.

Geo-coded a client's customer database, consisting of nearly 900,000 records, and performed a probability analysis on this database. The probability analysis was used to determine potential impact to insured properties from an earthquake with a specified location and magnitude. This spatial representation of the client's database enabled the visualization of the estimated costs associated with an earthquake.

Professional Affiliations

- Association of American Geographers
- American Geophysical Union