Mark E. Packard, PG, CPG
ddms, President/ CEO

Education

M.S., ResourceAnalysis, St. Mary's University of Minnesota,Winona, Minnesota
B.S., Geology (Hydrogeology Option), Winona State University, Winona, Minnesota

Professional Experience

Mark is a registered geologist with over 17 years of environmental, geologic and hydrogeologic data analysis and management experience and over 13 years of technical project coordination, management and environmental litigation support experience. Mr. Packard has provided senior data coordination and project management oversight on over 60 Superfund and RCRA environmental sites and has worked with the resulting data and analysis associated with chlorinated solvent, sediment, dioxin/furan, radionuclide and petroleum impacts both in the US and internationally. Mr. Packard specializes in implementing and leveraging environmental data management system technologies and methodologies to efficiently store large amounts of complex data in a manner conducive for rapid retrieval, analysis, reporting and 2 and 3D visualization. Mr. Packard also has extensive experience in integrating environmental data with custom web-based GIS and database driven web applications. A representative sampling of his project experience is provided below:

- Provided earned value cost and schedule performance analysis for two multi-million dollar Manufactured Gas Plant remediations for a major east-coast power company. Results used for report to the chief financial officer.
- Lead the technical implementation of a Project Management Office addition to the Project Portal SaaS platform for two large food companies. The resulting platforms are being used to scope, cost, monitor and cash flow large capital improvement engineering projects. Systems contain over 500 projects.
- Lead effort to build Data Analytics module to provide web-based access to real-time flood prediction system for a Superfund project in northeast Pennsylvania. System sends out series of alarms based on set point exceedances.
- Provided environmental litigation support services on a major chlorinated solvent litigation effort involving an active chemical production plant. Services included geologic expert coordination, providing environmental data management and mapping services, contributing towards EVS and 3-D visualization products and providing document hosting and Project Portal™ web-application hosting services.
- Managed environmental field and analytical data and databases for more than 10 national chlorinated solvent Superfund sites. Coordinated closely with labs to establish EDD specification formats and refine for data import; field contractors to obtain field measurement data and historic data obtained from legacy data sources. Databases are used to create tables, reports, graphs, and input data for a GIS for further analysis (contouring etc). Databases made available to greater project teams and stakeholders via

secure on-line web sharing application termed "Project Portal."

- Provided environmental litigation support services on behalf of a testifying expert for one of several named plaintiffs involving a large chlorinated solvent litigation in California. Provided project oversight duties for services, which included EVS simulations and visualizations; data analysis and management; map production; and document management and hosting.
- Served as EarthSoft EQuIS® Enterprise "Gatekeeper" on a natural resource damage assessment at a high profile Dioxin and Furan sediment site. Duties included maintaining and distributing database reference values, formatting and uploading data, system performance oversight, user training, and general database maintenance through use of EQuIS Pro v5.
- Led development team during the production of a web-based environmental database system for a major national laboratory to store and retrieve radionuclide data. Application allows users to query data, compare against limits then graph or map via on-line GIS module. Database tests were performed to find optimal performance between Microsoft SQL Server and My SQL Enterprise.
- Coordinated and performed data collection, protocols, and analysis for a Phase II investigation of a former landfill site. This investigation included the use of GeoProbe®, GPS, electronic conductivity probes, geophysical, pressure transducer, and manual data collection procedures. Subsequent data was modeled in RockWorks® and ArcGIS® 9 in two- and three-dimensional analysis and analyzed in GEMS (an environmental database) for temporal trending and the identification of regulatory exceedances.
- Managed server and development infrastructure for application testing. Environments include VMWare Virtualization, Windows, SuSE, RedHat Fedora, Solaris, and Irix servers; Oracle, MySQL, and Microsoft SQL Server databases; Perl and .Net compilers; MapServer and ESRI's ArcIMS and ArcGIS Server spatial platforms, in addition to client-side ArcGIS ArcInfo and ArcView.
- Served as data analyst and manager throughout the development of Well Head Protection Plan (WHPP) for a large municipality within the Twin Cites, Minnesota. Generated model layers from GIS as well as target and calibration spatial data sets (as obtained via RealFlow®) for use in Groundwater Vistas®, a MODFLOW-based groundwater program. Developed the Well Head Protection Area (WHPA) and corresponding Drinking Water Safe Management Area (DWSMA) based from 10-year time of travel particle track output from the MODFLOW model. Presented at community steering committees to collect public input and contributed to the WHPP administrative process.
- Served as lead data coordinator for ongoing investigations at a major petroleum refinery near Philadelphia, Pennsylvania. Duties included coordination with laboratories whereby data was obtained in a digital format to facilitate efficient analysis supporting temporal trending, spatial distribution, and regulatory exceedance identification. Created an interactive website to better disseminate data and project specific documents. This included a web-based query-able database and live GIS capabilities.
- Worked as part of a groundwater modeling team to study the effectiveness of recovering

and isolating LNAPL and DNAPL product utilizing pumping wells in both a confined and unconfined aquifer environment. Prepared spatial data sets from GIS for input into Visual Modflow, a groundwater modeling software. Prepared calibration and target datasets from an on-site installation of RealFlow® for use in the model. Remotely obtained data from RealFlow system utilizing transducers and telemetry protocols for integration into the model's database.

- Coordinated and performed data collection and analysis utilizing GEMS and GIS technologies at a Brownfields site in Minneapolis, Minnesota. Site contaminants primarily included metals, creosol, and chlorinated hydrocarbons. Presented results to the Minnesota Pollution Control Agency.
- Created and managed more than 10 project-specific web sites related to environmental remediation using Macromedia's Dreamweaver® software package and the ASP development language. Integrated customized ESRI ArcIMS® and Microsoft Access® and SQL Server technologies, which served as a technical platform from which environmental project managers used as a decision support platform.
- Served to provide technical oversight to the analysis and data management of a creosol contamination site in Western Minneapolis, Minnesota. Project included the creation and maintenance of an environmental database (GEMS) and a corresponding GIS that were used in concert for environmental site characterization.
- Established state-of-the-art ArcGIS- and ArcInfo-based computer networks for multiple projects. This included data file structure design, software and hardware architecture, and subsequent training of personnel.
- Customized an Intellution Fix® based Supervisory Control and Data Acquisition (SCADA) system for a municipality's water treatment facility to incorporate and control additional municipal pumping wells as part of RealFlow®. Connected SCADA to relational database archive and GIS for real-time groundwater elevation geo-statistical analysis.
- Established Personal Data Assistant (PDA) procedures for collecting and entering data in the field and importing them into databases for EMIS and GIS integration. Trained personal in both the Windows Pocket PC and Palm PDA operating systems.
- Served as technical GIS/GPS Coordinator in a southwestern Nevada archaeological survey along a fiber optic line corridor. Coordinated the GPS collection, post-processing, GIS integration, and report figure generation of data collected for a 1,400-acre study area.
- Directed development as GIS/GPS Coordinator to develop an ArcView® 3.2 GIS based 'Facility Management Tool (FMT).' The FMT compiled GIS, CAD, aerial photo, and attribute data for use by the construction manager of a major Flight Support Operation. A FMT was developed for over 40 separate airport operations. Digital data was collected via site survey from seven major airports in the United States in which Personal Digital Assistants (PDAs) and GPS were used to collect data that was imported into the GIS-based FMT.
- Served as a GIS Coordinator while producing digital facility descriptions for 11 bulk

storage facility terminals for a major oil company. Descriptions contained multiple GIS coverages as presented in an ArcView project. GIS coverages included United States Geological Survey Digital Evaluation Model's, Digital Raster Graphic's, CADs, aerial photos, National Wetlands Inventory Data, and GPS features. ArcView projects were used in concert with an Access database, via Object Database Connectivity, where monitoring well information could be queried (SQL) and subsequently contoured in ArcInfo or with Spatial Analyst in ArcView.

- Developed procedures for translating old subsurface coalmine survey maps from hard copy to raster and ultimately vector form. Used data to calculate expected volume and tonnage recovery estimates for subsurface anthracitic coal reserves in the Wilkes-Barre, Pennsylvania area.
- Calculated expected watershed discharge estimates in Arc/Info for use by the USGS and Wilkes University. Discharge estimates were compared with actual measurements to estimate the approximate flow recharging a subsurface mine pool (ultimately to reappear as Acid Mine Drainage).
- Acted as Global Positioning System coordinator. Performed quality control on GPS data collection procedures, including code phase, carrier phase, and real-time methodologies. Integrated traditional survey techniques with GPS techniques.
- Configured a Windows NT-based GIS for Earth Conservancy. System included standard GIS associated hardware (i.e., large format plotter, digitizer, printers, backup hardware, and large format scanner), software (i.e., ArcView and Arc/Info with extensions), and a full database including data obtained from such sources as surveys, GPS, internet, and digitization.
- Worked as GIS specialist for the City of Winona, Minnesota. Helped create a GIS database focusing on the city's parcel-related data.
- Served as Hydrogeologist/GIS analyst for the Minnesota Department of Natural Resources. Completed a watershed modeling study of a Wells Creek Sub-watershed. The models tested five different land cover scenarios against four different rainfall events to determine the effects that different land use practices have on watershed runoff discharges. Results were used by the Wells Creek Watershed Steering Committee.
- Worked as field hydrogeologist for the Minnesota Department of Natural Resources. Collected and calculated stream discharge and elevation data on tributaries of the Wells Creek Watershed.

Registrations and Certifications

Minnesota Registered Professional Geologist, No. 46555

AIPG Certified Professional Geologist, No. CPG-11215

Graduate Certification: Geographic Information System Specialist, St. Mary's, University of Minnesota, Winona, Minnesota

40-Hour OSHA Hazardous Waste Safety Training

CPR and First Aid

Professional Affiliations

MN GIS/LIS Consortium, Board Member, (2006–08)

American Institute of Professional Geologists

National Groundwater Association

Publications/Presentations

"Managing Non-Standard Environmental Data", International Conference on Environmental Data Management (ICEDM), Portland, Oregon, May 2013

"Improving Data Accessibility Using a Relational Database: Implications for the Management of Large Datasets," GIS and LIS Consortium, 12th Annual Conference and Workshops, Duluth, Minnesota, October 2002.

"Accessing EPA Databases and Environmental Information/ GEMS Database Management/EPA Office of Information," "Dare to Dream" Eighth Annual EPA/Tribal Conference, San Francisco, California, October 2000.

"Tools and Technology; Decision Support from Relational Databases and GISs," Brownfields 2000 Research and Regionalism: Revitalizing the American Community, Atlantic City Convention Center, Atlantic City, New Jersey, October 2000.

"Hydrologic Modeling for a Wells Creek Subwatershed, as Calculated Utilizing GIS and HydroCAD™ Technology," Resource Analysis, St. Mary's University of Minnesota, Winona, Minnesota, 1997. (Master's Thesis).

"Land Use Effects on Runoff from a Storm Event as Determined by Watershed Modeling," Wells Creek Watershed Group Steering Committee, Lake City, Minnesota, 1996.