

Paul A. Rubin
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EDUCATION:

M.A. - Geology, May 1983, State University of New York at New Paltz. Major fields of study: Hydrogeology, Water Quality and Pollution, Structural Geology, Photogeologic Interpretation. Thesis topic: *Hydrogeology and Structure of the Shawangunk Mountains, Ulster County, NY.*
B.A. - Anthropology, minor Geology, May 1977. State University of New York at Albany.

EXPERIENCE:

HYDROLOGIST/HYDROGEOLOGIST/GEOLOGIST:

1993 - Present Independent Geologic & Hydrologic Consultant. Consulting firm: *HydroQuest*. Provide hydrologic, geologic and land use technical consulting services to environmental groups, Towns, business associations, law firms, and individuals. Assist groups in identifying issues and developing strategies designed to protect groundwater and surface water resources, community character, and wildlife habitat.

HydroQuest work includes SEQRA reviews, review and analysis of consultant reports and environmental impact statements (EISs); environmental scoping report preparation; contaminant characterization and geologic investigations; technical coordination of scientific case development for environmental groups and attorneys; field characterizations; gas pipeline assessments; stream and wetland evaluations; hydrologic and geologic mapping; water quality assessments; watershed delineations; watershed analyses; slope analyses; aquifer analyses; hydrogeologic analyses; regulatory assessments; GIS map preparation; public presentations; technical presentations to judges; coordination work with attorneys and Technical Committees; direction and coordination of sub-contract work as needed; strategy development; panel member at Town meetings with legislators; press interactions; report and affidavit preparation. Authored numerous reports and affidavits on gas drilling & hydraulic fracturing.

Recent project work examples include hydrogeologic analyses of well field pumping tests designed to assess impacts on groundwater and surface water from major projects; assessment of karst aquifers & groundwater vulnerability; photogrammetric analyses; hydrogeologic assessments of spring water sources being considered for bottled water use; hydrogeologic-aquifer analysis of a groundwater supply proposed for a Shawangunk Ridge retreat center; SEQRA assessments; assessment of a gas field impoundment liner failure; river flooding, mine impact, land & cell tower evaluations; MTBE contaminant transport evaluation; FL-GA-AL gas pipeline route environmental analysis; rattlesnake migration analyses; geologic analysis of cause of United Flight 93 granite monument failure; and flood frequency and earthquake probability analyses.

KARST HYDROLOGIST

2004 - April 2007 Howe Caverns, Inc. Cobleskill, New York. 2nd largest natural tourist attraction in NYS. Conducted hydrologic and geologic research, produced professional GIS maps and figures, developed educational programs and materials, developed new tourist route, trained guides, provided land use assessments and recommendations, advised the Board of Directors on land use concerns including potential water quality degradation and potential blast-related impacts to cave. Developed and proposed revenue generating strategies. Coordinated with outside educational institutions, professional geologists, learning institutions, and scout groups. Formerly worked in this position half-time prior to change in ownership.

INSTRUCTOR:

Jan. 2001- SUNY Ulster, Stone Ridge, New York.
Dec. 2004 Taught ArcGIS, Environmental Geology, Geology, Hydrology, Geography, and Crime Analysis. Coordinator of a Geographic Information Systems certificate program. Developed, obtained, and completed a NYSDEC grant to assess assorted hydrologic and environmental aspects of the Black Creek watershed in Ulster County. Supervision and oversight of numerous professional adult “students”, directed GIS-based technical presentations, and coordinated and produced grant products.

College of the Atlantic, Bar Harbor, Maine.

Taught a two week graduate level summer field hydrology and environmental science course for several years, including Rosgen stream assessment.

HYDROLOGIST:

New York City Department of Environmental Protection (NYCDEP), Division of Drinking Water Quality Control, Shokan, New York.

April 1993- Conducted research and field studies designed to assess the water quality of watersheds.
Jan. 2001 Responsible for directing geologic research designed to assess the sources, geomorphic context and best management practices (BMPs) related to sediments causing turbidity water pollution problems. Hydrologic and geologic work included geologic mapping of glacial sediments, field evaluation of stream channel armoring, morphologic characterization of stream channels (including Rosgen analyses), bedload transport studies, assessment of critical shear stresses, particle size analysis, stream gauging, water quality sampling and trend analysis, chemical and sediment loading calculations, graphic production, report preparation and technical presentations. Assisted other governmental divisions in evaluating lands for possible purchase, conducted geotechnical assessments of structurally unstable stream reaches, evaluated BMP designs. Supervised several Research Assistants.

RESEARCH SCIENTIST:

Martin Marietta Energy Systems, Inc. April 1993 under contract with the U.S. Dept. of Energy; Oak Ridge National Lab; Environmental Sciences Division, Oak Ridge, TN.

Aug. 1991- Responsible for hydrogeologic evaluation of groundwater issues (e.g., characterization,
April 1993 monitoring network setup, data analysis, remedial design evaluation) at multiple Oak Ridge Reservation hazardous waste sites. Developed and documented conceptual model of carbonate and shallow storm flow systems comprising pathways of rapid contaminant transport. Work also involved characterization of hydrologic and geochemical trends and thermal infrared photo analysis. Presented results of research at conferences, as well as to DOE management and State and Federal officials. *Served in a Resource Management Organization as the hydrologic lead for the Environmental Sciences Division.*

HYDROGEOLOGIST:

New York State Attorney General's Office; Environmental Protection Bureau, Albany, New York.

*Feb. 1983-
Aug. 1991* Responsible for the design, protocols, coordination, implementation, evaluation, characterization and remediation of many major water and soil contamination sites throughout New York State (e.g., Love Canal, Superfund sites). Designed, performed and supervised chemical field sampling at hazardous waste sites. Evaluated geotechnical and chemical data sets.

Primary responsibilities included coordination of multiple companies along with their respective legal and scientific consultants. Worked with all parties involved to produce test plans and consent decrees to facilitate site remediation. Responsible for the management of the testing, site characterization and technical assessment. Worked with attorneys on summary judgment motions, complaints, trial preparation and depositions. Attorney General's spokesperson at public meetings. Expert witness at SEQRA hearings. Testimony given before the Assembly Standing Committee on Environmental Conservation and Grand Jury. Worked with DOL staff and attorneys to develop office initiatives (e.g., Racketeering; bottled water contaminants). Initiation, development and drafting of legislation.

Supervision of personnel: expert witnesses, consultants, research assistants, interns. Responsible for selection, job descriptions, work schedules, and products.

HYDROGEOLOGIST:

Stone & Webster Engineering Corp., Geotechnical Division, Boston, Massachusetts.

*Oct. 1981-
Feb. 1983* Directly responsible for the planning, preparation, execution, and analysis of pumping tests and a fluid sampling program designed to investigate deep basin groundwater characteristics for the siting of a nuclear waste repository within the Permian Basin of the Texas panhandle. Planned, managed, coordinated, directed, and provided oversight of field operations of a multi-million dollar project, inclusive of acidizing geologic formations. Sub-contractors included Halliburton, Schlumberger, and others.

ACTIVITIES:

Hiking, kayaking, geologic and hydrologic research, and exploration. Former Captain: Albany-Schoharie County Cave Rescue Team. Made a Fellow of the National Speleological Society in recognition of karst research and water resource protection.

PUBLICATIONS & REPORTS

Over 50 technical publications and over 100 reports and affidavits, many for private clients, environmental groups, towns, and law firms. Projects include land, wetland, water quality, and species protection; aquifer and watershed characterization; mine proposals; development proposals; contaminant assessments; stream hydrology grant work; and flood risk. Some reports are confidential. Leader of geology conference field trips for groups including the New York State Geological Association, the American Institute of Professional Geologists, the Hudson-Mohawk Professional Geologists' Association, the National Ground Water Association, the National Speleological Society, GSA, and the International Association of Geochemists and Cosmochemists.

ADDENDUM - SELECTED PUBLICATIONS

SELECTED PUBLICATIONS FROM PROFESSIONAL AND PERSONAL RESEARCH

Rubin, P.A., Burmeister, K.C. and Bartholomew, A., 2019, *Karst Hydrogeology of the Kingston-Rosendale Karst Aquifer Region within the Hudson Valley Fold-Thrust Belt*. Fieldtrip Guidebook paper for the Geological Society of America NE Section 55th Annual Meeting. In preparation.

Rubin, P.A., 2009, *Geological Evolution of the Cobleskill Plateau; New York State, USA*, in Veni et al. (eds), Proceedings of the Speleogenesis Symposium of the 15th International Congress of Speleology (joint National Speleological Society & Union Internationale de Speleologie); Symposium: Speleogenesis in Regional Geological Evolution and its Role in Karst Hydrogeology and Geomorphology, Kerrville, Texas. Proceedings, Volume 2, Symposia Part 2, pages 972-978 (published July 2009).

Palmer, A.N. and Rubin, P.A., 2007, *Karst of the Silurian-Devonian Carbonates in Eastern New York State, with emphasis on the Cobleskill Plateau*. Guidebook for the Hudson-Mohawk Professional Geologists' Association Spring 2007 Field Trip, "Carbonate Geology of the Howes Cave Area, Schoharie County, New York", p. 17-35, Trip coleader with Arthur Palmer (April 28, 2007).

Rubin, P.A., Burmeister, K.C. and Folsom, M., 2006, *Karst Resource Management: groundwater protection and developmental considerations in the Kingston-Rosendale aquifer system*; Ulster County, N.Y., Poster Presentation at the 2005 National Cave and Karst Management Symposium. Report prepared for Scenic Hudson.

Stokowski, S., Rubin, P.A. and Guenther, B., 2006, *History of resource management: conflict and resolution, Howes Cave, N.Y.*, in Rea, G.T., (ed), Proceedings of the 2005 National Cave and Karst Management Symposium.

Rubin, P.A. and Stokowski, S., 2004, *Karst, Caves, and Quarries*. Guidebook paper for the American Institute of Professional Geologists (AIPG), Annual Meeting. Field trip co-leader.

Rubin, P.A. and Washington, G., 2004, *Water quantity and quality considerations specific to development on the flank of the Shawangunk Mountain Ridge, Southeastern NYS*. Abstracts Northeast Natural History Conference VIII. N.Y. State Museum Circular 66: p. 53.

Rubin, P.A., Adickes, D.M., Cunningham, T., Davidson, D., Hurlid, J. Kiyan, J.R., Preuss, P., Ramsay, W., Schultz, B. and Washington, George, 2004, *Application of GIS technology to assess visual impacts of development: Shawangunk Ridge case study, southeastern NYS*. Abstracts Northeast Natural History Conference VIII. N.Y. State Museum Circular 66: p. 52-53.

Adickes, D.M., Preuss, P., Rubin, P.A., and Thompson, J., 2004, *GIS assessment and study of rare and threatened avian species living in the Shawangunk Mountains in Southeastern NYS*. Abstracts Northeast Natural History Conference VIII. N.Y. State Museum Circular 66: p. 38.

Kiyan, J.R., Washington, G., and Rubin, P.A., 2004, *GIS visual impact analysis of a proposed housing development below Minnewaska State Park Preserve in the Shawangunk Mountains of the Mid-Hudson Valley in New York State*. Abstracts Northeast Natural History Conference VIII. N.Y. State Museum Circular 66: p. 47.

Cunningham, T., Davidson, D., Hurl, Rubin, P.A., and Ehrenschaft, P., 2004, *Using GIS technology to project various land-use and economic scenarios for the northern Shawangunk Ridge area; Southeastern NYS*. Abstracts Northeast Natural History Conference VIII. N.Y. State Museum Circular 66: p. 41-42.

Palmer, A.N., Rubin, P.A., Palmer, M.V., Engel, T.D., and Morgan, B., 2003, *Karst of the Schoharie Valley, New York*. Guidebook for the New York State Geological Association Diamond Jubilee Field Conference (75th Annual Meeting), p. 141-176, Trip coleader.

Rubin, P.A., Morgan, B., and Palmer, A.N., 2003, *Howe Caverns resource protection: hydrology and land-use analysis; Schoharie County*, New York State. Abs. Northeastern Science Foundation Silver Jubilee Anniversary Symposium, Proceedings volume, p. 25-26.

Rubin, P.A., Hubsch, R., Albrechtsen, C.A., Black, G., Folsom, M., Keller, J., Morgan, B., Ortega, A., Rodden, M., Schultz, B., Terzella, D., and Washington, G., 2003, *Watershed management and protection planning based delineation of critical environmental areas via GIS analysis*. Abs. Northeastern Science Foundation Silver Jubilee Anniversary Symposium, Proceedings volume, p. 13.

Hubsch, R., Morgan, B., Black, G., Folsom, M., Keller, J., Ortega, A., Post, J., and Rubin, P.A., 2003, *Development of a GIS-based land-use coverage: Black Creek and Swarte Kill watersheds, southeastern New York State*. Abs. Northeastern Science Foundation Silver Jubilee Anniversary Symposium, Proceedings volume, p. 9-10.

Rubin, P.A., Waines, R., Washington, G., Ortega, A., Albrechtsen, C.A., Hubsch, R., Folsom, M., Keller, J., Morgan, B., and Schultz, B., 2003, *Hydrology and geology of the Swarte Kill and Black Creek basins, eastern New York State*. Abs. Northeastern Science Foundation Silver Jubilee Anniversary Symposium, Proceedings volume, p. 12.

Rubin, P.A., Engel, T., Nardacci, M. and Morgan, B.E., 2002, *Geology and paleogeography of Mount Desert Island and surrounding area, Maine*. Guidebook paper National Speleological Society annual meeting, Camden, Maine, p. 47-91, Trip leader.

Rubin, P.A., Schultz, B. and Haberland, P., 2002, *Hydrologic, land use, and historic concerns relative to the Rosendale mining industry*. Abs. National Speleological Society annual meeting, Camden, Maine, p. A-27.

Rubin, P.A. and Morgan, B., 2002, *Relict sea caves record temporary coastal stillstands*. Abs. National Speleological Society annual meeting, Camden, Maine, p. A-26-A-27.

Morgan, B., Albrechtsen, C., Dido, R., Hubsch, R., Rubin, P.A., Sheeley, D., Skerritt, F. and Vaeth, L., 2002, *Development of a GIS-based land-use coverage: Black Creek Watershed, Southeastern NYS*. Abs. Northeast Natural History Conference VII. N.Y. State Museum Circular 64: p. 50-51.

Hubsch, R., Albrechtsen, C., Dido, R., Morgan, B., Rubin, P.A., Sheeley, D., Skerritt, F., Terzella, D. and Vaeth, L., 2002, *Critical environmental area delineation in the Black Creek Watershed, NYS via GIS analysis*. Abs. Northeast Natural History Conference VII. N.Y. State Museum Circular 64: p. 51.

Sheeley, D.A. and Rubin, P.A., 2002, *Land-use preservation scenarios in the Black Creek Watershed using GIS; NYS*. Abs. Northeast Natural History Conference VII. N.Y. State Museum Circular 64: p. 51.

Schultz, B., Rubin, P.A. and Haberland, P., 2002, *GIS-based historic inventory of early cement district industrial artifacts: Southeastern NYS*. Abs. Northeast Natural History Conference VII. N.Y. State Museum Circular 64: p. 40.

Rubin, P.A. and Morgan, B., 2002, *Geomorphic reconstruction of emerged and submerged coastlines using GIS technology, Mount Desert Island, ME*. Abs. Northeast Natural History Conference VII. N.Y. State Museum Circular 64: p. 39.

Rubin, P.A. and Privitera, J.J., 1997, *Engineered and unregulated degradation of karst aquifers: Two case studies in New York State, USA*. In The Engineering Geology and Hydrogeology of Karst Terranes, Beck & Stephenson (eds), Proceedings of The Sixth Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karst; Balkema, Rotterdam; p. 467-476.

Rubin, P.A., Engel, T., and Nardacci, M., 1995, *Geomorphology, paleoclimatology and land use considerations of a glaciated karst terrain, Albany County, New York*. Guidebook for joint meeting of the New York State Geological Association (67th Annual) and the American Association of Petroleum Geologists. Trip leader, p. 81-107.

Rubin, P.A., 1995, *The geology of Clarksville Cave, Albany County, New York*. Guidebook for joint meeting of the New York State Geological Association (67th Annual) and the American Association of Petroleum Geologists. Trip leader, p. 251-273.

Rubin, P.A., 1995, *The geology of Cherokee Caverns; Tennessee*. In Karst Geohazards (ed. by B. Beck), Proceedings of: The Fifth Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karst; Sponsors include the National Ground Water Association and the American Society of Civil Engineers, Gatlinburg, TN, p. 541-547.

Rubin, P.A., 1994, *Paleohydrology of the Kämper Avenue area; Mammoth Cave National Park, Kentucky*. Mammoth Cave National Park's Third Science Conference; Sponsored by Mammoth Cave National Park and The Cave Research Foundation, Mammoth Cave National Park, Kentucky, p. 265-279.

Rubin, P.A., Zerr, B., Davies, G.J., Lemiszki, P.J., Neuhoff, P.S., and Aiken, J., 1993, *Preliminary hydrogeologic studies in carbonate aquifers of the Oak Ridge Reservation, Tennessee*. Abs. Fourth Annual Walker Branch Watershed Research Symposium, Oak Ridge, TN, p. 15-16.

Davies, G.J., Rubin, P.A., and Quinlan, J.F., 1993, *Indirect observation of the rapid-flow and slow-flow components of recharge to the Knox aquifer, Oak Ridge, Tennessee*. Abs. Fourth Annual Walker Branch Watershed Research Symposium, Oak Ridge, TN, p. 17.

Rubin, P.A., Lemiszki, P.J., and Poling, R.S., 1992, *Strategy for definition and protection of East Tennessee karst groundwater basins*. Tennessee Water Resources Symposium (5th, Nashville, TN., Oct. 1992), Proceedings. American Water Resources Association, Nashville, TN, p.7-10.

Rubin, P.A. and Lemiszki, P.J., 1992, *Structural and stratigraphic controls on cave development in the Oak Ridge area, Tennessee*. Tennessee Water Resources Symposium (5th, Nashville, TN., Oct. 1992), Proceedings. American Water Resources Association, Nashville, TN, p. 111-117.

Rubin, P.A., Lietzke, D.A., and Schmidt, V.A., 1992), *Aspects of the geomorphology of Oak Ridge, Tennessee*. Abs. National Speleological Society Convention, Salem, IN.

- Rubin, P.A., 1992, *Strategy for aquifer and stream protection in karst terranes*. Abs. The New York Natural History Conference II, New York State Museum Circular 54, p. 61, Albany, New York.
- Rubin, P.A., 1992, *Karst hydrology of Oak Ridge, Tennessee*. Abs. Third Annual Walker Branch Watershed Research Symposium, Oak Ridge, TN, p. 34.
- Rubin, P.A., 1992, *Land-use planning and watershed protection in karst terranes*. Hydrogeology, Ecology, Monitoring, and Management of Ground Water in Karst Terranes Conference (3rd, Nashville, Tenn., Dec. 1991), Proceedings. National Ground Water Association, Dublin, Ohio, p. 769-793.
- Rubin, P.A., Ayers, J.C., and Grady, K.A., 1992, *Solution mining and resultant evaporite karst development in Tully Valley, New York*. Hydrogeology, Ecology, Monitoring, and Management of Ground Water in Karst Terranes Conference (3rd, Nashville, Tenn., Dec. 1991), Proceedings. National Ground Water Association, Dublin, Ohio, p. 313-328.
- Palmer, A.N., Rubin, P.A., and Palmer, M.V., 1991, *Interaction between karst and glaciation in the Helderberg Plateau, Schoharie and Albany Counties, New York*. Guidebook for New York State Geological Association Annual Meeting, Oneonta, New York, p. 161-190.
- Palmer, A.N., Palmer, M.V., Porter, C.O., Rubin, P.A., and Mylroie, J.E., 1991, *A geological guide to the karst and caves of the Helderberg Mountains, Schoharie and Albany counties, New York*. Guidebook paper for National Speleological Society annual meeting, Cobleskill, New York, p. 105-167.
- Rubin, P.A., 1991, *Modification of preglacial caves by glacial meltwater invasion in East-Central New York*. Appalachian Karst Symposium, Proceedings. National Speleological Society, Radford, Virginia, p. 91-100.
- Rubin, P.A., 1991, *Flow characteristics and scallop forming hydraulics within the Mill Pond Karst Basin, East-Central New York*. Appalachian Karst Symposium, Proceedings. National Speleological Society, Radford, VA., p. 101-108.
- Rubin, P.A., 1991, *Emerged sea caves and coastal features as evidence of glacio-isostatic rebound, Mount Desert Island, Maine*. Appalachian Karst Symposium, Proceedings. National Speleological Society, Radford, Virginia, p. 75-83.
- Rubin, P.A., 1983, *Structural geology and geomorphology of the Shawangunk Mountain caprock, Southeastern New York*. Abs. Geol. Soc. Amer. N.E. Ann. Mtg., Kiamesha Lake, New York; and Abs. Mohonk Research Associates Conference, Mohonk Lake, New York.
- Rubin, P.A. and Briedis, J., 1982, *Acid precipitation and volcanism linked to Mesozoic dinosaur extinction*. Abs. Geol. Soc. Amer. Ann. Mtg., New Orleans, Louisiana.
- Rubin, P.A., Smiley, D., and Egemeier, S.J., 1981, *Acid precipitation in the Shawangunk Mountains, Southeastern New York*. Abs. AMS/CMOS International Conference on Long-Range Transport of Airborne Pollutants, Albany, New York; and Abs. Geol. Soc. Amer. N.E. Ann. Mtg., Bangor, Maine.
- Rubin, P.A., 1981, *New Aspects of the stratigraphy and structure of the Shawangunk Mountains, Southeastern New York*. Abs. Geo. Soc. Amer. N.E. Ann. Mtg., Bangor, Maine.

Egemeier, S.J., Liff, C.I., Smiley, D., and Rubin, P.A., 1981, *The safe yield of the "sky" lakes of the Shawangunk Mountains of Southeastern New York*. Abs. Geol. Soc. Amer. N.E. Ann. Mtg., Bangor, Maine.