

First State Geology

Current information about Delaware's geology, hydrology, and mineral resources

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New Home for the Delaware DataMIL

by W. S. Schenck

The Delaware DataMIL serves the state's Spatial Data Framework layers which, when combined, produce the National Map for Delaware. This map serves as the base map upon which all state, county, and local agencies track and maintain data. Because everyone uses the same base map layers, all the data sets are vertically integrated. These agency-derived maps are useful for planning, natural resource management, emergency management and response, and education. The DataMIL also is available to the public and is useful for locating real estate, making maps, and locating areas suitable for hiking, hunting, and fishing.

Research and Data Management Services (RDMS) at the University of Delaware researched and developed the DataMIL as a pilot project for the U.S. Geological Survey National Map (see Winter 2002 issue of *First State Geology*). The original Delaware DataMIL team consisted of Michael Mahaffie of the Office of State Planning Coordination (OSPC), William Schenck of the Delaware Geological Survey (DGS), and Richard Sacher, John Callahan, and Christina Callahan of RDMS. The success of the pilot project earned these individuals the prestigious U. S. Geological Survey John Wesley Powell Award in 2003.

In 2003, the Delaware Spatial Data Implementation Team (I-Team) agreed that the DataMIL should migrate into permanent service and proposed moving the DataMIL from RDMS to the Delaware Department of Technology and Information (DTI) and the DGS. In this arrangement, DTI serves a production role and provides internet access to the DataMIL web services. DGS serves as the application manager. Two new staff members joined the DGS to manage the DataMIL—a GIS web application developer and a geodatabase administrator (see following story). These individuals provide continued research and development and constantly monitor the site's Spatial Data Framework layers to ensure

continued data compatibility and layer integration.

In addition to a new home, the DataMIL acquired a new web address. It can now be accessed at datamil.delaware.gov.

DGS Welcomes Miriam L. Pomilio and Bradley L. Strittmatter

When the applications manager portion of DataMIL migrated to the DGS, two positions were added to facilitate the move. We welcome Miriam L. Pomilio as GIS web and geodatabase administrator and Bradley L. Strittmatter as application developer.

Miriam L. Pomilio, a Delaware native, joined the DGS staff in February as a geodatabase research associate III and is responsible for maintaining the DataMIL geodatabase. She also designs, programs, tests, and implements procedures to maintain accuracy of Delaware Spatial Data Framework (DSDF) layers and integrates DSDF layers into the National Map layers.

Miriam most recently worked for the Department of Natural Resources and Environmental Control as GIS coordinator for the Division of Parks and Recreation where she was responsible for creating and maintaining GIS data for Delaware State Parks.

Brad Strittmatter, of Lancaster, Pennsylvania, joined the DGS staff in June as a GIS application research associate III and is responsible for maintaining the Internet operability of the DataMIL service. He also

updates, tests, and maintains the DataMIL Portal, Map Production Laboratory, Data Integration Laboratory, and Discussion Forums, and will also implement new services and graphic elements to enhance the DataMIL.

Brad has extensive experience with GIS principals, remote sensing, and computer science. He previously worked as a consultant and was a GIS specialist for Sussex County.

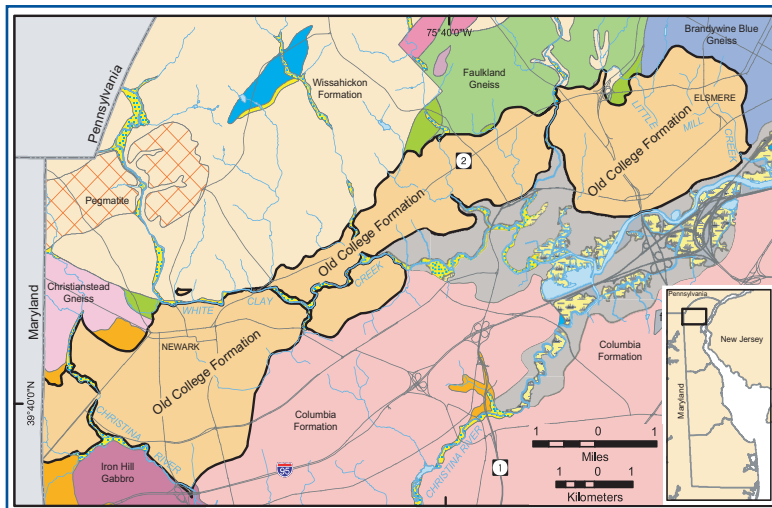
We welcome Miriam and Brad to the DGS and look forward to their invaluable support as we continue to evolve DataMIL into a research and service tool that our stakeholders can use to further promote Governor Minner's Livable Delaware initiative.

New Geologic Unit Named

By K. W. Ramsey

The DGS released Report of Investigations No. 69, a new technical report entitled, "Geology of the Old College Formation along the Fall Zone of Delaware." The publication presents the results of research by Kelvin W. Ramsey and formally names the Old College Formation as a new geologic unit.

The report documents the presence of sediments deposited as a series of alluvial fans that originated in the Piedmont and spread onto the Coastal Plain of Delaware. Deposition occurred prior to deep stream incision that took place during the late Pleistocene when sea level was lower. The



Distribution of the Old College Formation. Modified from Ramsey, 2005, (for full citation, see back page of this issue) Piedmont units are identified and described in Schenck, W.S. Plank, M.O. and Srogi, L., 2000, Bedrock Geological Map of the Piedmont of Delaware and Adjacent Pennsylvania: DGS Geologic Map Series No. 10, scale 1:36,000.

best-developed alluvial fan was deposited by an ancestral White Clay Creek and now underlies the City of Newark and the University of Delaware campus.

The Old College Formation consists of mica-rich, brown to reddish-brown, fine to coarse sand with scattered gravelly sand overlain by sandy silt beds. These deposits are named for drill holes and samples from the Old College campus of the University of Delaware that were examined as a part of this study. Similar deposits are mapped along the boundary between the Piedmont and Coastal Plain Provinces (the Fall Zone) from Newark to Wilmington.

Knowledge of geologic formations such as the Old College Formation is important for understanding the distribution of sand, silt, and clay bodies. These bodies control the distribution, transmission, and quality of ground water that is used for agricultural, public, and private supply, and industrial purposes. Understanding the nature and distribution of the Old College Formation, which underlies an increasingly urbanized area, will contribute to onsite analysis of engineering properties, for design and construction activities related to roads, bridges, and buildings, and recharge of ground water where much of the area is covered by impervious surfaces.

This report documents a combination of several ongoing projects of the DGS to understand and map the geology of Delaware and was partially funded by a grant from the Statemap Program, a cooperative effort of the Association of American State Geologists and the U.S. Geological Survey, funded by Congress as a part of the National Geologic Mapping Act.

The report is available to view online or as a downloadable product from the DGS Web site at www.udel.edu/dgs/ under Publications. Printed copies of the publication may be requested by contacting the DGS at (302) 831-2833, via e-mail at delgeosurvey@udel.edu, or by visiting the DGS office at the University of Delaware.

DGS Geologists and Maryland Colleagues Hold Field Seminar

By Peter P. McLaughlin, Jr.

It might be said that geology knows no borders – at least when it comes to political borders. In Delaware, we share many common geologic features with our neighboring states. With that in mind, a group of geologists from the Delaware Geological Survey (DGS) recently conducted a joint field trip with colleagues from the Maryland Geological Survey (MGS) to compare some of the geologic formations that occur in northern Delaware and nearby areas of the eastern shore of Maryland.



Participants included (from left to right): Gerald R. Baum (MGS), Peter P. McLaughlin (DGS), Dale Shelton (MGS), Cathryn Garcia (MGS), Kelvin Ramsey (DGS), P. Steven McCreary (DGS), Heather Quinn (MGS), John Wilson (MGS), Sacha Lanham (MGS), Brent Anderson (MGS), James Reger (MGS), and Richard Benson (DGS).

Our itinerary on May 2 took us to four localities where Late Cretaceous sediments (around 97 to 65 million years old) were examined. In the morning, we visited bay-side cliffs at Grove Point, Maryland, where sediments of the Magothy and Merchantville Formations were examined. The exposures of the Magothy Formation gave the group a chance to study the same sediments that serve as aquifer sands in New Castle County and in several parts of Maryland. The overlying, muddier Merchantville Formation serves as a confining layer for the aquifer. In the afternoon, the group examined three exposures along the Chesapeake and Delaware Canal in Delaware. We briefly visited a small exposure of the Potomac Formation just east of the state line. We closely examined an exposure of the Magothy Formation that occurs west of Summit Bridge; this site includes aquifer-quality sands similar to those examined at Grove Point, as well as muddier sediments that overlie the sands. At the final stop, the group examined the Deep Cut locality, a large exposure east of Summit Bridge that has served for decades as an important reference section for Delaware geology. Three geologic units are identified at this outcrop: gray silts of the Merchantville Formation, rusty sands of the Englishtown Formation, and dark sandy silts of the Marshalltown Formation.

The field trip provided the participating geologists an excellent opportunity to discuss the Late Cretaceous geologic history of the area and the implications of geology for ground-water resources across our state lines. It was an enjoyable, thought-provoking day that improved understanding of our shared geology in both states.

Mary F. Sullivan Retires

Following 15 years of service to the University of Delaware and the Delaware Geological Survey, Mary F. Sullivan retired at the end of December. As senior administrative assistant at the DGS, Mary was responsible for interacting with government agencies, high-level State administrative and University officials, and legislators on behalf of the Director.

She was also responsible for payroll administration, travel, purchasing, and oversight, review, and reconciliation of monthly account statements, reports, and ledgers. Mary also managed the daily administrative operations of the DGS including fiscal, budgetary, and contracts and grants management, and maintenance of all personnel records. Prior to arriving at the DGS, Mary worked for 8 years in the University's Office of the Vice Provost for Research and as administrative assistant to the Vice Provost.

Any requests made of Mary by the DGS Director and staff always were performed with a smile. She maintained impeccable records and could be relied upon to come up with a "bottom -line figure" at a moment's notice and somehow managed to keep straight the project budgets for an increasingly large staff.

Mary continues to reside in the Newark area where she enjoys spending time with her family especially her many grandchildren. She is greatly missed and has the best wishes of her colleagues at the DGS for a long, rewarding retirement.

The DGS Welcomes Karen L. D'Amato

We are pleased to welcome Karen L. D'Amato as the new assistant to the director at the DGS. Karen joined the staff in January and is responsible for establishing, managing, and coordinating the integrated fiscal and administrative operations of the DGS as well as participating in overall financial planning and management. Karen also manages daily administrative operations of the DGS including fiscal, budgetary, and contracts/grants management, the DGS-USGS Joint Funded Program, and all personnel records.

Karen brings valuable experience to the DGS, which includes 16 years as senior administrative assistant at the University of Delaware in the General Accounting Department where she was responsible for auditing all of the University's State-restricted revenue and expenditures. She also served as liaison between the State Budget Office and the University community to effectively inter-

pret and communicate State funding policies as acting Information Security Officer.

We welcome Karen to the DGS staff and look forward to many years of rewarding association.

DGS Welcomes Vincent Pellerito

Vincent Pellerito, a recent graduate with a Master of Science degree in Geology from the University of Delaware, started working in April as a limited term researcher with the DGS. Vince is working with DGS Senior Scientist, A. Scott Andres, reviewing historic and current ground-water quality data as part of an investigation of potential links between drinking water from domestic wells and cancer incidence in Delaware. This work was requested by the Environmental Subcommittee of the Delaware Cancer Consortium in its effort to reduce possible exposure to carcinogenic substances in the ambient environment. Funding for this project is provided by the Delaware Division of Public Health.

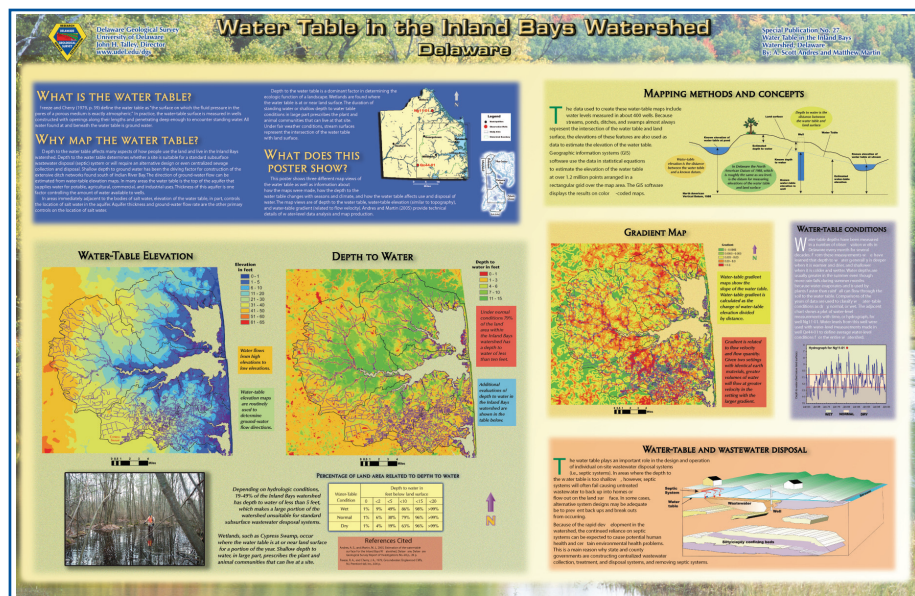
Vince's participation in this project primarily involves design and development of a relational water-quality database along with compiling historic and current ground-water quality data from numerous state and federal agencies. Evaluation of the data will then entail statistical measures of contaminant occurrence and their spatial distribution for Delaware's shallow unconfined (Columbia) aquifer.

DGS Releases New Inland Bays Poster

By A. S. Andres

The Delaware Geological Survey released a new poster entitled "Water Table in the Inland Bays Watershed, Delaware." This poster was prepared by Survey staff members A. Scott Andres and Matthew J. Martin. DGS Special Publication No. 27 presents water-table concepts and portrays some of the results of the water-table mapping program, (see Winter 2005 issue of *First State Geology*) including depth to water, water-table elevation, water-table slope, fluctuations in water-table depths, and applications of water-table maps to real world issues.

"This poster complements two previous DGS publications: Digital Product 05-01, 'Water-Table Data for Sussex County, Delaware,' a GIS product covering all of Sussex County, and Report of Investigations No. 68, 'Estimation of the Water Table For the Inland Bays Watershed, Delaware,' a technical report that details the methods and results of the water-table mapping program" said A. Scott Andres, DGS scientist and co-author of the poster. "The poster, digital product, and report provide information that will be useful in guiding anticipated growth and economic



development, developing and protecting water resources, supporting agriculture, and educating the public about ground water." Ground water provides nearly all fresh water for public, domestic, commercial, irrigation, and industrial uses in Delaware south of the Chesapeake and Delaware Canal and about 25 percent north of the Canal.

The poster is part of the Delaware Geological Survey's ongoing mission to understand hydrologic systems and to advise, inform, and educate Delawareans about the results of such investigations for use in such topics as water resources, agriculture, economic development, land-use planning, environmental protection, mineral resources, and recreation.

Special Publication No. 27 is available in pdf format from the DGS web site at <http://www.udel.edu/dgs/> under Publications. Printed copies of the publication may be requested by contacting the DGS.

Delaware GIS 2005 Conference Rehoboth Beach, Delaware

By W. S. Schenck

"Delaware GIS 2005: Creating Information, Sharing Knowledge" held April 21-22 in Rehoboth Beach, Delaware, was the first of the state's annual GIS conferences to host both pre- and post-conference activities. Environmental Systems Research Institute (ESRI) hosted pre-conference "hands-on" workshops relating to GIS and geodatabase management. The University of Delaware's Water Resources Agency and Department of Geography hosted a pre-conference workshop on cartographic techniques. Post-conference activity included "Caching In on Cape History," which featured a historic presentation of Cape Henlopen's long history of human occupation using GPS and ESRI

ArcPAD technologies. Miriam Pomilio and John Watson of the DGS led the event in coordination with Delaware State Parks, ESRI, and Trimble Navigation Ltd.

C. Douglas Crouse, Kent County 4-H Extension Office, received the 2005 Delaware GIS in Education Award, and Mike Mahaffie, Office of State Planning Coordination, received the Delaware Geographic Service Award given in memory of Vernon C. Svatos. Certificates of Recognition were presented to David Racca and Nicole Minni, University of Delaware; Sandy Schenck, Delaware Geological Survey; and Matt Laick, Sussex County, for their work on behalf of the entire GIS Community.

This year's K-12 student contest, "Put a Face on Disaster," provided students the opportunity to study one of many natural disasters that can occur and recognize the wide range of social and economic impacts that a disaster inflicts on a community. The children were instructed to focus their studies on the geographic extent of a disaster in conjunction with environment, region, economics, or citizenship. Many of this year's entries were focused on the tsunami disaster in the Indian Ocean. For a complete list of this year's winners go to http://www.state.de.us/planning/gis2005/education_k12contest_winners.html.

Earthquake Recorded In North Wilmington

By S. J. Baxter

On April 9, seismographs located at the DGS recorded a small earthquake in the north Wilmington area. The magnitude 1.2 event occurred at 8:27 p.m. EDT. The earthquake is the first to occur in Delaware since a magnitude 1.7 occurred in the Newark area on August 13, 2003. The Survey received several "felt reports" primarily from people in the area

of the event. Most reported hearing a thud; a few others reported hearing an explosive sound or rumble.

On February 23, the DGS recorded a regional earthquake on three of our seismographs located in northern New Castle County. According to the U. S. Geological Survey, the 2.0 magnitude event occurred at 9:22:43 p.m. EST. The epicenter was located approximately 20 miles southeast of Baltimore, Maryland. No felt reports were logged at the DGS as a result of this event.

If you would like to learn more about earthquakes, the DGS has two publications available on their website. They are Open File Report No. 42, "Catalog of Earthquakes in Delaware," and Special Publications No. 23, "Earthquake Basics."

Publications

Recent DGS Publications Report of Investigations

No. 69, Geology of the Old College Formation along the Fall Zone of Delaware: **Kelvin W. Ramsey**, 24 p.

Special Publications

No. 27, Water Table in the Inland Bays Watershed, Delaware: **A. Scott Andres** and **Matthew J. Martin**, poster.

Other Publications by DGS Staff

Peter P. McLaughlin, Jr., Sequence Stratigraphy, in Selley, R., Cocks, R., and Plimer, I. (eds.), 2004, *Encyclopedia of Geology*, Elsevier Ltd., p. 159-173.

Andrew D. Klingbeil and Christopher K. Sommerfield, Latest Holocene evolution and human disturbance of a channel segment in the Hudson River Estuary: *Marine Geology*, v. 218, p. 135-153.

Staff Notes

Presentations

A. Scott Andres, "Understanding Your Local Water Resources – The First Step Toward Protection," Strategies to Protect Delaware's Public Water Systems conference, Dover, May 19.

Thomas E. McKenna and **John C. Watson**, "Integrating GPS and GIS in the Field," Delaware GIS 2005 conference, Rehoboth Beach, April 21.

Peter P. McLaughlin, Jr., "Life of Our Ancient Lands and Seas: Dinosaurs, Plants and Marine Life of the Delaware Valley Region in the Mesozoic Era," Mid-Hudson Valley Gem and Mineral Society, May 20; **Peter P. McLaughlin, Jr.**, and **Richard N. Benson**, "Application of Micropaleontology to Water Resource Problems: Aquifer Stratigraphy in the Coastal Plain of Delaware (Middle Atlantic Region, United States)," Geological Problem Solving with Microfossils conference, March 6-8. **McLaughlin** also served on the conference organizing committee.

William S. Schenck, "Delaware Piedmont Geology: Just What Rocks are Holding up Them-Thar Hills," Rockwood Mansion Park, May 20.

Lillian T. Wang, "Application of GIS in Geologic Mapping, 1:100,000 Surficial Geologic Map of Delaware," Delaware Valley Geographic Association annual spring meeting, April 22.

Service and Awards

Congratulations to **A. Scott Andres** for receiving a 2004 Recognition Award from the Department of Natural Resources and Environmental Control Division of Water Resources for his work on protecting the

ground-water resources of the state, Dover, March 24. Congratulations also for 20 years of service at the Delaware Geological Survey; Shue-Medill Middle School science fair judge, Newark, February 3.

Thomas E. McKenna and **Kimberly C. Hanson**, University of Delaware Mineralogical Museum, displayed rocks from the DGS repository and minerals from the museum collection at "Water and our Changing Landscape: Perspectives from the Wild and Scenic White Clay Creek Watershed," University of Delaware, Clayton Hall, April 14.

William S. Schenck, subject matter expert at the National Association of State Boards of Geology (ASBOG) meeting, March 31-April 3; Certificate of Recognition for service to Delaware's geographic community from the Delaware Geographic Data Committee at the Delaware GIS 2005 conference, Rehoboth Beach, April 21; "Vertical Control in Delaware: The DataMIL, an On-line Source," Flood Resistant Development Workshop, Delaware Technical and Community College, Georgetown, May 5; **William S. Schenck** and **Miriam L. Pomilio**, "Map Your Watershed," Water Festival 2005, Bellevue State Park, May 27.

John H. Talley, "Ground-Water Resources of Southern Delaware – Will We Have Enough?" University of Delaware Land and Sea Lecture Series, Virden Center, Lewes and Milford Public Library, March 11.

Congratulations to **Lillian T. Wang** for receiving a Master of Science degree from the Geography Department at the University of Delaware. Her thesis was entitled, "Locating Ground-Water Discharge Areas in Rehoboth and Indian River Bays, Delaware Using Landsat 7 Imagery."



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