

Brad Talon Newton

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Education

PhD, Environmental Engineering

Queen's University, Belfast

Belfast, Northern Ireland

Expected graduation date: August, 2007

Masters of Science in Hydrology

New Mexico Institute of Mining and Technology

Socorro, New Mexico

GPA: 3.6

Bachelor of Science in Geology

New Mexico Institute of Mining and Technology (NMIMT)

Socorro, New Mexico

Graduated with honors

Research Projects

Carbon Isotopes Systematics for Monitored Natural

Attenuation- PhD Thesis (09/2004-present)

The primary objective of this project is to use carbon isotope systematics to assess the occurrence of intrinsic biodegradation at a particular contaminated land site. Methods to be used include monitoring of carbon isotope signatures for soil CO₂ to identify and quantify CO₂ sources and the use of single well tracer tests, where an isotope-labeled reactive tracer will be used to verify the occurrence of intrinsic biodegradation and to estimate biodegradation rates. Laboratory and intermediate scale Tracer tests will also be conducted. In addition to the isotope-labeled reactive tracer, other tracers such as Bromide, Krypton, and Xenon will also be used.

Geologic Controls on Shallow Groundwater Quality in the Socorro Basin, New Mexico - Masters Thesis (08/2001-08/2004)

The primary objective was to study groundwater surface water interactions in the Socorro Basin, New Mexico. Water chemistry and stable isotopes were used to identify water sources and assess mixing relationships in the shallow groundwater system. I then incorporated the use of GIS, geophysical data, and geomorphology to relate the structural framework of the basin to the observed spatial variability of groundwater and surface water chemistry.

Other Projects

Other research projects, ranging from in-class projects to work assignments, include aquifer mapping in the Roswell Artesian Basin, NM, measuring seepage from the Rio Grande, NM, and investigating groundwater flow in the vadose zone near Carlsbad, NM by looking at the stable isotopic composition of Cave pools.

Employment Experience

Research Assistant, Queen's University, Belfast, Northern Ireland (09/2004-present)

Use intelligent tracer tests to study specific processes within a hydrologic system. These processes include physical and biochemical reactions related to the remediation of contaminated groundwater. Design and conduct tracer experiments at laboratory and field scale. Collect and interpret data. Write reports. Assist the teaching of classes such as Surveying and Hydrogeology. Manage two undergraduate students on their senior projects.

Hydrological Lab Associate, New Mexico Bureau of Geology and Mineral Resources, Socorro, New Mexico (02/2004-08/2004)

Worked on multiple projects with different objectives, including aquifer mapping and water quality assessment. Collected groundwater and surface water samples for chemical analysis. Measured groundwater level elevations. Managed Access databases. Used GIS to construct potentiometric surface maps and to assess spatial variability of data.

Teaching Assistant for hydrogeochemistry class, NMIMT, Socorro, New Mexico (08/2003-12/2003)

Helped students with homework. Lectured on the use of environmental tracers in hydrology. Maintained office hours. Graded homework assignments. Maintained Class web page.

Research Assistant, NMIMT, Socorro, New Mexico, funded by the New Mexico Interstate Stream Commission (08/2001-08/2003)

Coordinated with many other people to plan the installation of a large network of observation wells and staff gages along a 60-mile reach of the Middle Rio Grande. Collected groundwater and surface water level elevation data. Collected water samples for chemical and isotope analyses. Perform stable isotope analyses on water samples. Assisted in performing aquifer pump tests. Helped develop and manage Access database. Analyzed data.

Student Intern at New Mexico Bureau of Geology and Mineral Resources, Socorro, New Mexico (06/2001-08/2001)

Worked as a part of a team to measure flow rates in the Rio Grande and adjacent canals. Surveyed monuments using differential GPS. Analyzed data to estimate seepage losses from the Rio Grande. Published paper on results.

Lab Technician at Stable Isotope Laboratory, NMIMT, Socorro, New Mexico (06/1999-05/2001)

Prepared carbonate and water samples for isotopic analysis. Performed soil distillations. Operated gas source magnetic sector ratio mass spectrometer.

Field Assistant for hydrology project, NMIMT, Socorro, New Mexico (01/1999 – 05/2001)

Installed precipitation collection system. Helped collect pool samples in Lechuguilla cave. Analyzed stable isotope data. Helped with Chlorine-36 extraction. Wrote senior thesis on stable isotopic composition of cave pools in Lechuguilla Cave and Carlsbad Cavern.

Field Assistant for vadose zone hydrology project, NMIMT, Socorro, New Mexico (01/1998 – 10/2000)

Helped prepare field site. Installed instruments such as tensiometers, TDR, ERT, suction lysimeters and infiltration arrays. Collected data with neutron probe, ERT, and ground penetrating radar.

Conference Presentations

Newton, B.T., Elliot, T., and Kalin, B. 2005. Bulk –Partitioning Tracer Tests to Assess the Effects on Hydrogen Evolution on Flow and Transport Characteristics in Zero-Valent Iron Columns. British Geophysical Association New Horizons Post-Graduate Research Conference. Galway, Ireland.

- Land, L.A., and **Newton, B.T.** 2004. Seasonal and Long-Term Variations in Hydraulic Head in a Regional Karst Aquifer: Roswell Artesian Basin, New Mexico. Geological Society of America National Conference. Denver, Colorado.
- Newton, B.T.**, Bowman, R., Phillips, F., Johnson, P. 2004. Investigation on the Presence and Origin of High Chloride Waters in the Shallow Hydrologic System in the Socorro Basin, New Mexico. New Mexico Geological Society Annual Spring Meeting. Socorro, New Mexico.
- Newton, Brad T.**, Wilcox, Laura J., and Bowman, Robert S. 2003. Evaluation of Groundwater/Surface water Interactions Along a Critical Reach of The Middle Rio Grande, New Mexico. New Mexico Geological Society Annual Spring Meeting. Socorro, New Mexico.
- Newton, Brad T.**, Kuhn, S., Johnson, P., Hathaway, D.L. 2002. Investigation of Flow and Seepage Conditions on a Critical Reach of the Rio Grande, New Mexico. American Water Resource Association Specialty Conference. Keystone, Colorado.
- Wilcox, L., **Newton, T.**, Bowman, R. 2002. Evaluation of Groundwater/Surface Water Interactions in the Middle Rio Grande Basin. American Water Resource Association Specialty Conference. Keystone, Colorado.
- Wilcox, L., **Newton, T.**, Bowman, R. 2002. Evaluation of Groundwater/Surface Water Interactions in the Middle Rio Grande Basin. Geological Society of America National Conference. Denver, Colorado.
- Newton, T.**, Wilcox, L., Bowman, R. 2002. Evaluation of Groundwater/Surface Water Interactions in the Middle Rio Grande (San Acacia - Elephant Butte Reservoir). SAHRA Conference. Tucson, Arizona.
- Phillips, F., Small, E., Kurc, S., Lechler, B., **Newton, T.**, Rosenau, N., Thomas, T., Walvoord, M. 2002. Assessing the Spatial Variability of Soil-Water Parameters and Ecohydrological Relations : "The Great Vadose Zone Experiment". SAHRA Conference. Tucson, Arizona.
- Newton, B.T.**, Campbell, A., Turin, H.J., Phillips, F.M., Plummer, M. 2001. A Stable Isotopic Investigation of Cave Pools in Carlsbad Caverns National Park, New Mexico. Geological Society of America Southwest Regional Meeting. Albuquerque, New Mexico.
- Newton, B.T.**, Campbell, A., Turin, H.J., Phillips, F.M., Plummer, M. 2001. A Stable Isotopic Investigation of Cave Pools in Carlsbad Caverns National Park, New Mexico. New Mexico Geological Society Annual Spring Meeting. Socorro, New Mexico.

Publications

Newton, Brad T., Kuhn, S., Johnson, P., Hathaway, D.L. Investigation of Flow and Seepage Conditions on a Critical Reach of the Rio Grande, New Mexico. 2002. AWRA Proceedings for Groundwater/Surface water Interactions Conference, p. 581-586.

Honors and Awards

New Mexico Geological Society Undergraduate Research Grant, 2000
Invited to join Sigma Gamma Epsilon

Professional Organizations

American Water Resources Association
Geological Society of America
New Mexico Geological Society
American Geophysical Union

Skills

Project Management

Outline a plan of action and meet project goals through defining objectives, devising and following a timeline, experimentation and evaluating results.

Field Equipment and Instrumentation

Water Level Indicator, MiniTroll Dataloggers, Marsh-McBirney Flow Meter, Neutron Probe, Surveyor's Level, Electrical Resistance Tomography, Differential GPS, Ground Penetrating Radar, Proton Precession Magnetometer, Suction Lysimeters, Low Flow Groundwater Sampling System, Time Domain Reflectometry, Tensiometers

Laboratory Equipment and Techniques

Magnetic Sector Ratio Mass Spectrometer, High Pressure Liquid Chromatography, Gas Chromatography with Mass Spectrometer Detector, Preparation of Solutions, Titrations, Soil Distillations, column tracer tests,

Software/Computers

Windows, MS Word, MS Excel, MS Power Point, MS Access, Arcview 3.2, ARC GIS, Hydrus, Visual Modflow, Hydrotherm, MATLAB, Maple, Rockworks, PHREEQC, Adobe Illustrator, Adobe Photoshop, CXTFIT, MINTEQ

References

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