Lanya Ross PG

Current Employer: Metropolitan Council

Title of Presentation:
Estimating Infiltration and Recharge in the Twin Cities Metropolitan Area

Presentation Summary:

- Estimating infiltration and recharge with a modified version of the Thornthwaite-Mather soil-moisture balance approach
- Benefits for regional groundwater modeling and water supply planning
- Results

Abstract

Accurate estimates of the spatial and temporal distribution of recharge are important for many types of hydrologic assessments, including water quality protection, stream flow and riparian ecosystem management, aquifer replenishment, groundwater flow, and contaminant transport. Recharge estimates are often key to understanding the effects of development in urban, industrial, and agricultural regions.

Metropolitan Council uses the Twin Cities metropolitan area regional groundwater flow model to evaluate the impacts of planned growth on the region's aquifers. In order to develop recharge estimates for input to this model, the U.S. Geological Survey Soil-Water Balance (SWB) computer code was used to calculate spatial and temporal variations in surface water infiltration for eleven counties surrounding and including the Minneapolis – St. Paul metropolitan area in Minnesota.

The SWB code calculates components of the water balance on a daily basis, based on a modified version of the Thornthwaite-Mather soil-moisture balance approach. Data requirements include: 1) daily precipitation, daily minimum and maximum temperatures; 2) land use classifications; 3) hydrologic soil group; 4) soil water capacity and; 5) surface flow direction.

Education:

M.S. (geology), Northern Arizona University, 2005

B.A. (geology), Macalester College, 1997

Experience:

2000-2001; 2004-2006: Shakopee Mdewakanton Sioux Community (hydrogeologist)

2006-Present: Metropolitan Council (environmental scientist)

George Veni Ph.D.

Current Employer: National Cave and Karst Research Institute

Title of Presentation:
11 Orders of Magnitude: The Range and Implications of Karst Recharge Rate

Abstract

A review of karst hydrology in the traditional hydrogeologic literature often provides a skewed perspective of karst groundwater recharge and transport. Permeabilities are occasionally generalized or averaged in the range of 10-5 m/s. Other authors list a range of permeabilities, with rates as low as 10-9 m/s, but frequently underestimating the upper limit by 2-3 orders of magnitude. Permeabilities of nearly 10 m/s seem unbelievable to some hydrogeologists who are not familiar with karst processes, but they are quite real. Many karst aquifers accept significant recharge by surface water falling freely tens of meters down shafts at the gravimetric rate of acceleration of 9.8 m/s/s directly to the water table. While such features are easily identifiable as environmentally sensitive, rapid recharge with essentially no filtration occurs also through many karst features that are not readily observed. Effective management of karst aquifers requires understanding their range of permeabilities and use of appropriate techniques to identify and manage them

Education:

Ph.D. (geology), Pennsylvania State University, 1994

M.S. (geography), Western Kentucky University, 1985

B.S. (geology), The University of Texas at San Antonio, 1983

Experience:

2007-present, National Cave and Karst Research Institute (Executive Director)

1987-2007, George Veni and Associates (consulting karst hydrogeologist)

Affiliations:

American Geophysical Union (AGU)
British Cave Research Association (BCRA)
Explorers Club (EC)
Geological Society of America (GSA)
International Association of Hydrogeologists (IAH)
International Union of Speleology (UIS)
National Speleological Society (NSS)
New Mexico Geological Society (NMGS)
Sigma Xi (SX)
South Texas Geological Society (STGS)

Mike Trojan Ph.D.

Current Employer: Minnesota Pollution Control Agency

Title of Presentation:
Groundwater Impacts from Stormwater Infiltration – a potpourri of known unknowns

Presentation Summary: Infiltration is becoming increasingly popular for managing urban stormwater runoff. There is a laundry list of potential groundwater impacts from stormwater infiltration, but unfortunately we know very little about these impacts. I'll introduce several of these potential impacts, discuss what we know and don't know about them, and summarize on-going work to improve our knowledge.

Education:
- Ph.D. – Soil Science, University of Minnesota, 1992
- M.S. – Forest Hydrology, University of Minnesota, 1988
- B.S. – Soil and Water Resource Management, University of Minnesota, 1980

Experience:
- 2006 to present: Hydrologist in the MPCA's Stormwater Program
- 1996 to 2006: Hydrologist, MPCA's ambient groundwater monitoring programs
- 1994 to 1996: Hydrologist, MPCA's Superfund Program
- 1992 to 1994: Hydrologist, MDNR's County Atlas Program

John S. Gulliver Ph.D.

Current Employer: University of Minnesota

Title of Presentation:
Groundwater Impacts from Stormwater Infiltration

Presentation Summary:

- Are there groundwater quality impacts of infiltration?
- What are we doing to investigate the potential impacts?

Education:

- B.S. 1974 University of California, Santa Barbara (Chemical Engineering)
- M.S. 1977 University of Minnesota (Civil Engineering)
- Ph.D. 1980 University of Minnesota (Civil Engineering)

Experience:

- 7/05 – 12/05 Fulbright Scholar, University of Chile, Santiago
- 10/97 – 6/07 Head, Department of Civil Engineering, University of Minnesota.
- 4/97 - 5/97 Visiting Professor Departmento de Hidraulica Sanoamento Escola de Engenharia de Sao Carlos, Universidade de Sao Paulo, Sao Carlos, SP, Brazil.
- 5/94 - 6/94 Visiting Professor, Institut für Hydrologie und Wasserwirtschaft, Universität Karlsruhe, Karlsruhe, Germany
- 4/94 - 5/94 Visiting Professor, Department of Chemical Engineering, Louisiana State University, Baton Rough, LA.
- 3/90 - 6/90 Visiting Scientist, Reservoir Water Quality Branch, Hydraulics Laboratory, Waterways Experiment Station, U.S. Army Corps of Engineers, Vicksburg, MS.

Affiliations:

- American Society of Civil Engineers
- American Society of Engineering Education
- Association of Environmental Engineering and Science Professors
- International Association for Hydraulic Research
- International Association on Water

Stephen W. Robertson PG

Title of Presentation:

Stormwater Infiltration and Wellhead Protection

Presentation Summary:

1. Surface water – groundwater => one resource
2. Engineered enhancement of stormwater makes sense – except where it doesn't. Context matters.
3. Why and where does MDH concern itself with stormwater?

Bio:

Steve Robertson is the supervisor of the Source Water Protection Unit at the Minnesota Department of Health. This is a new role for him. He has a degree in geology from both Carleton College and the University of Texas. Steve has worked for approximately 16 years at MDH (not counting strikes and government shutdowns) and, prior to that, spent 13 years as an environmental consultant. He is a past participant on the MGWA newsletter team and served on the MGWA Board from 2009-2011.

Brad Schleeter PE

Current Employer: Stantec

Title of Presentation:
Stormwater Infiltration and Wellhead Protection—Policy to Practice

- Surface water – groundwater => one resource
- Why and where does MDH concern itself with stormwater?
- Engineered enhancement of stormwater makes sense – except where it doesn't. Context matters.
- Current MS4 Permit requirements regarding stormwater infiltration
- Practical application of wellhead protection policy

Education:

- B.S. (civil engineering), South Dakota School of Mines and Technology, 1999

Experience:

- 2001-Present, Stantec Consulting Services (formerly Bonestroo), Water Resources Engineering Project Manager

Affiliations:
Association of State Floodplain Managers (Certified Floodplain Manager)
Minnesota Association of Floodplain Managers

William (Bill) B. Cook PE

Current Employer: Metropolitan Council

Title of Presentation:
East Bethel – Wastewater Recycling

- Public Process to site plant and application sites
- Technical Process to find sites and understand them
- Approval Process to get construction approval
- Design and Construction

Education:
BS (Civil Engineering) – Iowa State University – 1972
MS – (Sanitary Engineering) Iowa State University – 1975

Experience:
- 2005-Present: Metropolitan Council (Utility)
- 1995-2005: Montgomery Watson (Consultant)
- 1993-1995: HNTB (Consultant)
- 1993: PCE (Consultant)
- 1988-1993: RCM (Consultant)
- 1975-1988: Shive Hattery Engineers (Consultant)
- 1973-1975: Hawkeye Engineering (Consultant and Contract Operator)

Ole Olmanson PG

Current Employer: Shakopee Mdewakanton Sioux Community

Title of Presentation:
Aquifer Recharge Through Injection at the Shakopee Mdewakanton Sioux Community

Presentation Summary:

In an effort to maintain groundwater quantity, the Shakopee Mdewakanton Sioux Community has developed a strategy to inject treated waste water into a quaternary gravel layer above the principal aquifer for the region.

Planning began in 2005 and advanced to a well-developed pilot project which included increased tertiary treatment and laboratory analysis for contaminants of emerging concern. A combination of reverse osmosis, ultra violet light, and ozone treatments were employed in varying configurations to determine the levels necessary to produce effluent with the lowest possible levels of contaminants. Lab results show that all tested parameters can be completely removed or reduced below detection levels through these treatment methods making effluent injection a viable option for aquifer recharge.

- Education
  - M.S. (water resources science) University of MN, 2007
  - B.S. (Earth science) Minnesota State University, Mankato, 2001
- Experience
  - 2006-present, Shakopee Mdewakanton Sioux Community (Water Resource Scientist)
  - 2008-20011 Minnesota State University, Mankato (adjunct professor Earth Science)
  - 2004-2007 University of MN (research assistant, USDA)

Greg Brick Ph.D.

Title of Presentation

Thermal Pollution Under Minneapolis

Presentation Summary:

Groundwater temperature, measured in caves and springs under downtown Minneapolis, is elevated relative to the expected temperature. Possible explanations are explored. Further data are required.

Bio:

- hydrogeologist at several environmental consulting firms
- Taught geology at local colleges.
- His first book, *Iowa Underground: A Guide to the State's Subterranean Treasures*, was published in 2004. His latest book, *Subterranean Twin Cities*, published by the University of Minnesota Press in 2009, won an award from the local chapter of the American Institute of Architects.

Education:

- His doctoral research involved the rediscovery of French saltpeter caves in Minnesota.

Timothy (Tim) A. Gillette PE

Current Employer: Minnesota Board of Water and Soil Resources

Title of Presentation

Controlling Groundwater Levels in Agricultural Landscapes with Drain Tile and Drainage Water Management

I. Introduction to Drainage
II. Agricultural Drainage Basics
III. Introduction To Subsurface Drainage Design
IV. Introduction To Drainage Water Management (DWM) Design

This presentation is a primer about agricultural drainage and how it relates to groundwater level control on the farm. A short history of drainage, especially subsurface (tile) drainage will be provided. The majority of the time will be focused on drainage's effect on the water cycle along with an introduction to the design of drainage tile systems and their controls. (55 minutes)

Education:

Bethel Theological Seminary – Masters of Divinity
Michigan Technological University – Bachelor of Science Degree in Civil Engineering (Hydraulics and Hydrology)

Work Experience:

Current - Board of Water and Soil Resources - Conservation Drainage Engineer
Owner - T A Gillette Consulting, Inc
Contractor for -
- CES Consultants – Water Resources
- FEMA through Hagerty Consulting – Project Specialists
- Haling Engineering, Inc. – Water Resources and Land Development

Creator and Founding Instructor of *Civil Engineering Technology* Program at Dakota County Technical College
Employed by –
- Halling Engineering, Inc. - Water Resources and Land Development
- Metro Land Surveying and Engineering - Water Resources and Land Development

Contractor for –
- Auth Consulting and Associates - Water Resources

Employed by –
- John Oliver and Associates - Water Resources and Land Development

Member:

American Society of Civil Engineers