Matt Vardal, MSc.

Matt brings 15 years of multidisciplinary experience in environmental and geological science, data analysis, field work and software tools to the GW Solutions team. After his MSc in Earth and Ocean Sciences from the University of Victoria, Matt has worked in a diverse range of start-ups and industries in BC including forestry, sustainable technology, GIS and hydrogeology. These experiences have all hinged on his capacity to be fully absorbed in his interests, while remaining adaptable to changing technology and eager to take on new challenges. Matt's work interests include:

Water sustainability: Working with First Nations, communities and progressive clients to implement knowledge-based solutions to watershed stewardship and sustainable drinking water;

Open Source technology: Facilitating access to science through open-source software, hardware, mapping tools, and GIS analysis;

Data Science: Transforming messy, disconnected data into insightful analysis, beautiful maps and user-focused databases;

3D geological modeling: Uncovering the story of local and regional hydrogeology through 3D visualization and geological modeling; and

Field work: Mapping geology, gathering monitoring data, and developing groundwater source wells.

EDUCATION

2010	ADGIS	Vancouver Island University, Nanaimo	Geographical Information Systems (GIS)
2002	MSc	University of Victoria	Earth and Ocean Sciences
1999	BSc	Queen's University, Kingston	Geology

EMPLOYMENT HISTORY

January 2015 - present	GW Solutions Inc., Nanaimo, Canada; Hydrogeologist
May 2014 - present	Owner of Monsoon Geo, Geological Consulting and Data analysis, 3D modeling (Leapfrog Hydro)

February 2012 - May 2014	Project Geologist and GIS analyst at Waterline Resources Inc., Nanaimo, Canada;
Sept. 2011 - February 2012	GIS support staff in the City of Port Alberni, City Planning and Engineering Department.
January 2010 – April 2010	District of Tofino. GIS implementation for a small BC Municipality.
2007 - 2011	Aztec Geoscience - Terrain Mapping Specialist. Forestry, government and mining clients.
2003 - 2007	Various BC forest industry-related contracts

PROFESSIONAL EXPERIENCE

- City of Maple Ridge – Integrated Stormwater Management Plan for South Alouette River and Kanaka Creek Watersheds. (2015). GW Solutions conducted a baseline groundwater study in support of integrated stormwater management within two urban/rural watersheds. Work included modelling the aquifers in 3D, characterizing the spatial relationships between surface runoff and infiltration potential, and assessing recharge/discharge areas within the watersheds.
- Municipality of North Cowichan - Watershed Management Plan for the Bonsall Creek Watershed (2014-2015). GW Solution provided a detailed definition of the subsurface aquifers and groundwater regime to a multi-disciplinary team in support of a long term watershed and land use planning. GW Solutions developed a 3D conceptual model of watershed and aquifers and used this to characterize the groundwater flow regime, recharge and discharge and seasonal flooding. As a follow up to this project GW Solutions collaborated further with NHC to derive a quantitative assessment of the interaction between the Chemainus aquifer and Whitehouse and Bonsall Creeks by calculating a groundwater- surface water flux using available data together with hydrological and hydrogeological models. This effort will support planning around land use, water allocation and water management strategies within the Municipality of North Cowichan.
- Peace River Regional District Baseline Groundwater-Surface Water Study (2014-2016). GW Solutions is in the process of delivering a 2-year groundwater and water quality

baseline study, in coordination with the Peace River Regional District (PRRD) and local First Nations (Treaty 8 and others). Work is on-going and includes the 3D characterization of regional aquifer systems and groundwater flow regimes, design of a Regional Water Quality database, and water quality trend analysis. A large part of this study will include public involvement and education.

- Hydrogeological analysis, data management and geodatabase design using open-source technology (QGIS, PostgreSQL/PostGIS).
    - Lower Englishman River Watershed
    - Nanoose Bay aquifers
    - Lower Athabasca River (Alberta)
    - Watson Lake aquifers (Yukon)
    - Scott Point Peninsula (Salt Spring Island)
    - South Comox peninsula aquifers
    - Cedar, (Regional District of Nanaimo)

Previous work highlights:

- Standardization of the BC Wells Database (Monsoon Geo, 2014).
- Development of Regional Physical Hydrogeological Model. Suncor Meadow Creek Project, forming the Groundwater Modelling portion of the Federal Environmental Impact Assessment (Monsoon Geo, 2014).
- ArcHydro Groundwater Geodatabase for the Regional District of Nanaimo. GIS and database design, implementation and training. (Waterline Resource, 2013).
- Regional District of Nanaimo Phase One Water Budget (Waterline Resource, 2012).