

3D MODELS AS A BRIDGE BETWEEN SCIENCE AND POLICY

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Recently, the Ontario Geological Survey (OGS) formed part of a multi-disciplinary team tasked with creating a defensible boundary around an 80 km long section of a complex glacial moraine system being considered for environmental protection. This task provided the OGS with the opportunity to become our own clients and use our products to answer land use planning questions.

Publicly accessible (and free!) data from the OGS included seamless maps of surficial geology and sediment thickness, bedrock topography and geology, and areas of karst. Published groundwater resources studies comprising a 3D model and derivative products cover the northern and southern, but not the central, portions of the moraine. GIS and Google Earth™ versions of structural and isopach maps for each model layer, a subsurface database, interpreted logs, photos and analytical data for all cored boreholes, high-resolution plates of prepared cross-sections and a detailed report are found within each study. Cross-section viewers designed to display and save user-defined vertical slices through the 3D models no longer function, but we were confident our products would still satisfy the request.

It quickly became apparent that team members lacked the geological expertise needed to use the information we provided. Our maps and 3D models convey a wealth of information to other geoscientists but were either incomprehensible to the team or did not easily integrate with other ministries' data. When we outlined proposed planning boundaries, it was difficult communicating the reasoning behind those boundaries. Many basic (to us) geological concepts required leaps of imagination for our collaborators: the moraine is composed of many component landforms, displays rapid changes in sediment texture, thickness and architecture, and is variably connected to multiple regional groundwater flow systems.

Our products were not suitable for communicating these concepts to non-subject matter experts – but this was a tremendous learning opportunity. We are learning to communicate core knowledge first and then slowly build on this foundation. We are working on a new 3D model cross-section viewer, new derivative maps, and finally, we have seen the power of getting non-experts out of the office and into field.