




Project Name: : Eastern Ontario Water Resource Management Study 					
Budget: \$150,000		Completion: 2001/3/31		Client: United Counties of Prescott-Russell United Counties of Stormont, Dundas & G. City of Ottawa	
Prime		Consortium		Sub-Consultant	

Project Highlights:

The Eastern Ontario Water Resources Management Study encompassed an extensive compilation and evaluation of regional water resources and servicing infrastructure information. A detailed analysis of the regional water budget was conducted to provide estimates of the maximum amounts of water available for development and use and to evaluate water quality issues. Groundwater is the primary source of water in most of eastern Ontario. In addition to evaluating the supply potential of the aquifers, the vulnerability to contamination of the groundwater supply was characterized. The analysis of the surface and groundwater resources included evaluating the agriculture land use with the subwatersheds. This analysis included showing the relationship between agricultural activities and major aquifers, areas of recharge and discharge.

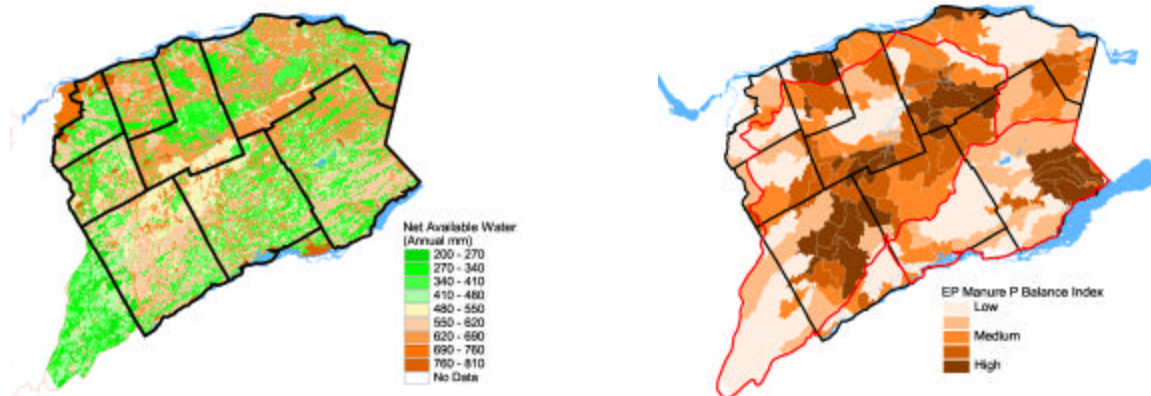
Scope of Services (Objectives and Deliverables):

The objectives of the study included:

1. Develop a comprehensive GIS database on the state of water resources in the study area.
2. Develop data management protocols to ensure the database is properly maintained and updated.
3. Assess the capability of key areas to potentially support development on private services.
4. Identify potential cost-effective servicing alternatives on a regional basis.
5. Develop community demonstration projects that provide integrated solutions to water issues.
6. Develop tools and action plans to protect the quality and quantity of water and land resources.

The water budget analysis required the development of a GIS based model to estimate the allocation of water between surface and groundwater resources. A model was developed that considered geology, land use, topography and hydrography. Parameters were calibrated using stream flow data for approximately 12 subwatershed within the study area.

Land use analysis was completed on a subwatershed basis. The analysis used GIS spatial modelling to characterize the sensitivity of subwatershed areas to water quality degradation from agriculture activities. The images below show the calculation of net available water from the water budget analysis and agricultural characterization for manure.



Consultation: Technical review was conducted by the Technical Advisory Group (TAG) comprised of members of the project Steering Committee.	
Challenges and Solutions:	
Challenge:	
Solution 1:	<i>A relational database model designed for hydrogeology applications was expanded to accommodate geotechnical and geochemistry data associated with bore hole logs and test pit data. Bore hole logs were interpreted and the data loaded into the new open database format.</i>
Solution 2:	<i>3D Models were generated to enable the calculation of material volumes and visualization of the data extents and concentrations. This was supported with cross-section profiles.</i>
Challenge:	Previous interpretations of the extent and depth of contaminants had not used 3D mapping algorithms to model the concentrations and interpolate bounds.
Solution:	<i>GeoSolutions Consulting applied analytical methods to interpolate the concentrations of heavy metals, TPH and PAH, and represented the models using plume diagrams and cross-section mapping.</i>
Challenge:	The client was faced with a short timeline within which to provide results in a format that was easily understood and did not have previous experience with the analysis and visualization capabilities.
Solution:	<i>GeoSolutions Consulting made regular presentations to the client to show the work being completed and discuss approach and technical issues. This process ensured that the project remained within the scope and deliverables met expectations.</i>
Construction and Procurement Methods: Not Applicable	
Key Personnel:	Dave Branson - Project Manager Tim Albert – Sr. GIS Analyst Drago Perkovic – GIS Technician Janet Green – GIS Technician
Sub-consultants:	None