

ASSOCIATION OF CANADIAN MAP LIBRARIES AND ARCHIVES  
**BULLETIN**

**GIS Trends**

Edited by Barbara Znamirovski

**Editor's Introduction**

Discussion of GIS methodologies with students and colleagues often creates rewarding opportunities for problem solving. In my unit new solutions for analyzing large amounts of data or fixing problems in existing spatial projects increasingly take advantage of powerful toolbox options for running repetitive processes that are available within software. In this article, Geoff Andrews discusses his experiences with applying automated workflows in a variety of contexts.

**Empowered Workflows: Automation for Everyone**  
**Geoff Andrews**

In any workforce, there are a variety of sources for motivation: an interesting idea, a push in the right direction, or a need to solve a problem. Achieving goals requires effective solutions which will continue to work moving forward. In the geospatial community work challenges increasingly involve automating workflows and processes to produce meaningful results. In my experience, I've been assigned projects involving different programming languages and using an array of different software, and urged to develop automated processes to complete tasks. Examining different approaches often leads to growth and discovery of new methodologies to common problems. This article will explore some options available to the academic community for increasing productivity through the use of automated workflows.

New options are often found when old solutions will no longer suffice. For example, recently I've had a positive experience in automating the integration of large amounts of data using Feature Manipulation Engine (FME). FME was suggested as an alternative to creating new workflows or procedures, effectively moving away from standard software and solutions using relational database management systems. FME allows users to be as technical in their knowledge of the internal workings as they want or need to be. It has some similarities to Esri's Model Builder in terms of the interface, and can perform a multitude of tasks, once you grasp the naming conventions. As with all technologies there is a learning curve, but it is less steep than learning a new programming language. The underlying theories are familiar to the spatial community, and how we fit the pieces together will differ from user to user. In using FME, I had the opportunity to work on a pilot project to integrate one million records (with over one hundred tabular fields) from different sources and perform automated Quality Assurance and Quality Control measures to ensure the data output was up to a certain level of confidence. This was a daunting task, made even more challenging by an unfamiliar working environment. After several versions of a solution, the order of operations was sorted out. Upon successful completion of the pilot, I was able to

recommend FME solutions to programmers and non-programmers alike demonstrating the power of this software to turn ideas into repeatable and transferable solutions.

Safe Software has produced great products in FME for Desktop and Server which can be used to benefit any spatial or tabular work. They also host a great annual user conference in the FME World Tour, where I had the opportunity to present at this past year in Ottawa. Automated solutions are not necessarily up to expert programmers anymore, with this type of software. Seeing this shift reassured me that I was on the right path in this particular venture. In my current position, I will be able to seek out and explore the usability of this type of software or interface to aid our day to day operations as well as pass this knowledge on to students seeking assistance with large spatial processing requirements. With some instruction, the base knowledge acquired using one software can be applied successfully to other software and automated models.

Another example of automating workflows, which also came about as an assigned project, was the use of Procedural SQL in the PostgreSQL/PostGIS environment to calculate suitable habitat. An automated process needed to be run on a scheduled basis. The development built upon the bits and pieces of SQL learned through working with Selections in ArcGIS or querying Access databases. The real reward for this example came in demonstrating the spatial functions created to work with the data and observing the understanding of non-programmer users as the broken down functions were quite simple in nature, but strung together in a way that could be overwhelming. This need to dig into the large, complex problems and break them out into pieces that are understandable and accessible to all users is something that can be overlooked when viewing work at a higher level. If we can work on the little pieces of the bigger problems and have them ready to share, the results will be that much more accessible for everyone.

Promoting growth in these aspects of working with spatial and tabular data has made all difference in advancing my geospatial career thus far, and I plan to convey that fact as more of the “little things” get done in an automated capacity. I have had the opportunity to discuss students’ project work and have found uses for several smaller Python Script tools. The tools were passed along with a focus on explaining the inner workings of what’s being performed as opposed to simply supplying the tools for them to move forward. This also tends to spark conversation about what is being done and how we can help each other solve common issues. These issues may be different in the big picture, but the small, repetitive steps usually have some overlap. Encouraging the users to design solutions in a longer term, testable and repeatable way should become part of our focus. Constantly drawing back on models and sections of models has been the most useful tool moving forward with every new solution.

The trend toward opening automated workflows to everyone is one that can’t be highlighted enough in the work we do. Constant re-creation of the same methodologies or workflows can be cumbersome and time consuming. Using the tools offered to the academic world can make all the difference in the daily spatial grind.

***About the Author***

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***GIS Trends: Note from the Editor***

Submissions and Feedback

GIS Trends is a place to share ideas, observations and discoveries in the area of GIS and other spatial technologies. If you have something you would like to share please write to me. We also welcome feedback on GIS Trends articles. Proposals for articles and feedback should be sent to: [bznamirowski@trentu.ca](mailto:bznamirowski@trentu.ca)

Thanks for reading and contributing!  
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