Dear Reader,

Thank you for expressing an interest in our software – SAM (Spatial Adjustment Manager).

These instructions supplement other instructions found on the SAM Demonstration CD.

Step 1- Install the ecwActiveXControls.exe

You may already have this installed and if so there is no need to install it a second time.

If you do not have it installed already, run the ecwActiveXControls.exe in the "\ecwActiveXControls" directory on the CD.

Step 2- Install the AusGIS and SAM software

Run the '**Setup.exe**' in the "\AusGISDemo" directory on the CD.

This will install about 30 megabytes of software and data on your C:\ Drive.

Step 3- Associate the AusGIS.exe with the .SAMLgnd extension

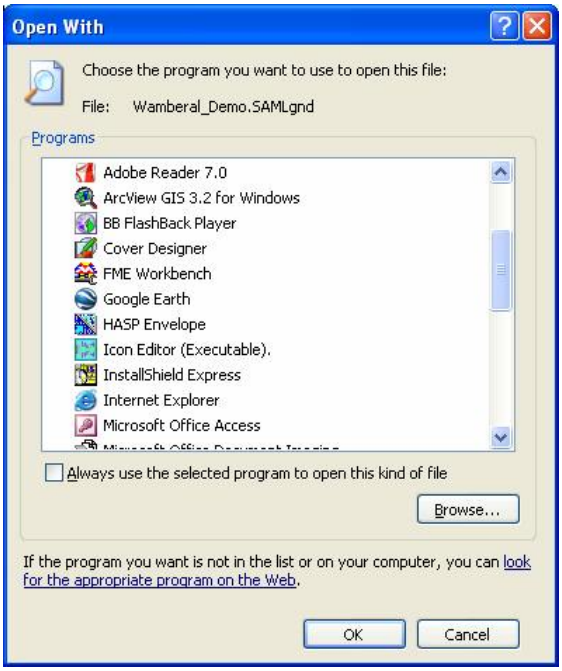
This step has two benefits, being:

1. It loads all the themes for you with all the correct attributes
2. It will save you time and effort, and reduce your need for support

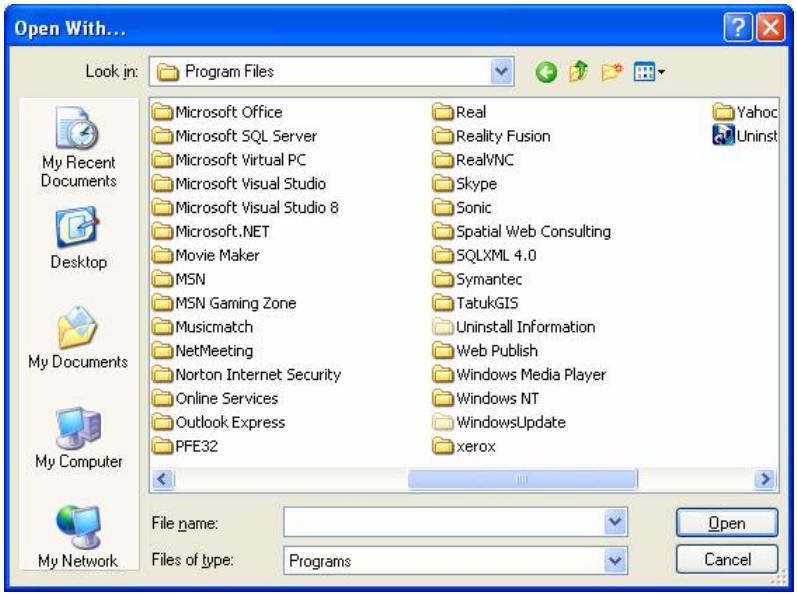
Go to the "C:\SAM_In" directory.

Double Click on the Wamberal_Demo.SAMLgnd file.

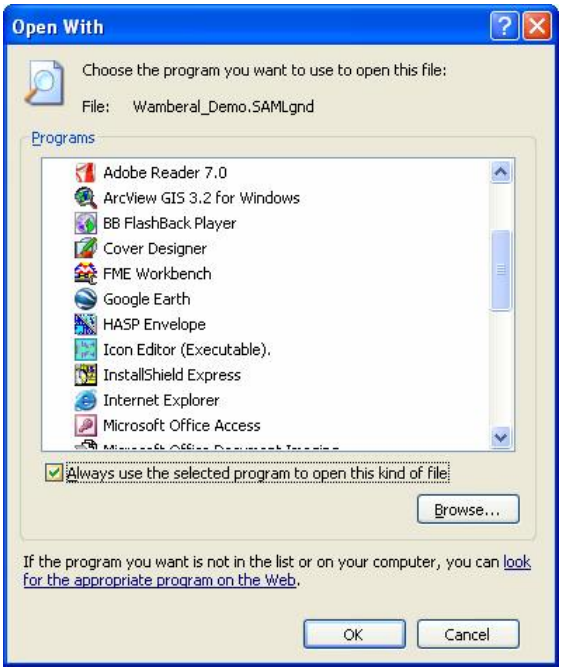
Depending on your operating system, you will see different forms, but the overall flow is the same. Windows XP Pro will show the following Form:



Click the “Browse” Button, and you should see a form like this:

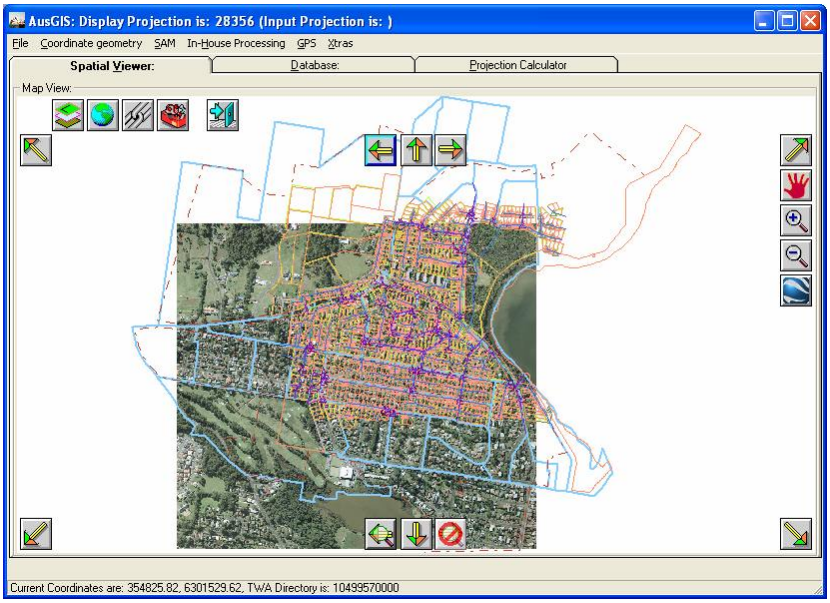


Go into the “Spatial Web Consulting” directory, then into the “SAM” directory, then Double Click on the “_AusGIS.exe” executable.



Make sure the "Always use the selected program to open this kind of file" is checked and Click the "OK" Button.

In a few moments SAM should start, and display the following data like this:



Note that the colours may be different.

Congratulations – you are ready to play.

Activation

You will need to “Activate” this software before running the SAM Demo.

Please Double Click on the “Activation.html” file in the “\BB FlashBack Movies” directory for a quick discussion on this action.

After you send your activation request, please run Double Click on the “AusGIS_Demo.html” file in the “\BB FlashBack Movies” directory for a discussion on the use of this software.

An Overview of the WorkFlow

As you will see, everyone can now move to newer more accurate Digital Cadastres.

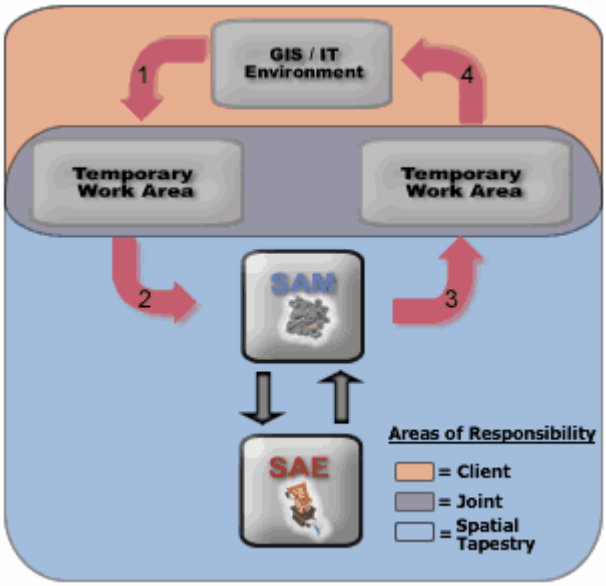
We all seem to be familiar with the necessary processes of ‘checking’ spatial data out of the master themes, editing the data, and ‘checking’ the spatial data back in. Each GIS vendor has various processes in place to assist their customers achieve this.

There are (at least) four distinct processes in the Work Flow.

Process 1/ Checking the data out of the ‘Master Themes’. This includes marking the data in the Master Themes as being ‘Checked Out’ thus preventing edits/deletes by other users and processes. Typically the data is written somewhere temporarily for the duration of the work, and for the sake of convenience this is called a ‘Temporary Work Area’ in this article.

Process 2/ Copying the data from the ‘Temporary Work Area’ into some environment where the changes are to take place.

Process 3/ Saving the changes back into the ‘Temporary Work Area’.



1. Data Flow Diagram

Process 4/ Checking the data back into the Master Themes from the ‘Temporary

Work Area', which often comes with numerous spatial, aspatial and temporal data integrity rules to be complied with.

If one deals with 'flat' file structures such as ESRI Shape files and MapInfo Tab files one can bypass much of the complexities of dealing with databases, record locking, and the interplay between spatial features and related attribute data dealing with the assets and parcels, ownership, tenure, connectivity, currency, and so on.

Indeed, with 'flat' file structures such as ESRI Shape files and MapInfo Tab files:

1. Locking the 'Database' as such is handled by the operating system
2. Marking Spatial Features that have been checked out is a human memory function
3. Rolling back the database is as simple as retrieving one's backup
4. Projections can be handled consistently by adopting the 'Proj4' Projection Engine
5. There are tools in the public domain to deal with Shape and Tab Files

Indeed, when dealing with spatial data held in object or relational databases, there can be many legacy issues getting data into the database. What can often happen is that a database is initially populated with the spatial and aspatial data available at the time. As time goes on there can be many database triggers and validation rules imposed into the 'check-in' process. Naturally the data already loaded is not subject to these rules, the logic being that as time goes on the various parcels, assets, etc will be checked out, edited, and fully proofed before it is checked back in. This leans on the notion of ongoing improvements as time and resources are available.

The problem has been that one has to checkout a lot of utility, asset, annotation, zoning and other layers that are spatially dependant on the digital cadastre in order to move it to its new position relative to an improved digital cadastre.

There are often issues with the amount of time that features are checked out. Many Utilities have obligations on their GIS units to incorporate new assets and incorporate updates in short time frames, thus checking out an area for a week for editing purposes may cause may break "Key Indicators"????

For these reasons it is much easier to develop an 'End to End' work flow for upgrading spatial data to a new digital cadastre.

This article explains the process as implemented by the Spatial Adjustment Manager (SAM) available from Spatial Tapestry.

There are several scenarios in the spatial upgrade field. These are:

1. Digital Cadastral Upgrade from Survey and Title Dimensions
2. Digital Cadastral Upgrade from Occupations observed from Orthophotography
3. Upgrading Spatially Dependant Layers with a replacement Digital Cadastre
4. Upgrading Spatially Dependant Layers in a partially upgraded Digital Cadastre

And each requires a different work flow.

This document discusses “Upgrading Spatially Dependant Layers with a replacement Digital Cadastre”, which seems to be a common occurrence as many GIS departments have had great difficulty dealing with the upgrade issue for may years.

First, the concept of a “Temporary Work Area” (TWA) has to be covered. A TWA needs to be big enough to have some significance in the scheme of things, but not so large that the data processing time encroaches unreasonably on the use of the master themes.

Since SAM can process 3 to 4 square kilometres an hour using the “Iterative Best Guess” algorithm and 1 square kilometres per 3-4 hours using the “Least Squares Adjustment” algorithm, one can pick a running size for the TWA’s.

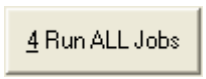
A TWA boundary can in itself cause a range of problems, depending on the circumstances present in the GIS IT Environment. E.g. if a TWA Boundary goes through an area of large shifts it is likely that some points in some features will cross over into an adjoining TWA polygon. When this happens features that cross the TWA boundary can be seriously distorted until the adjoining TWA is also upgraded. Further there is the issue of tracking these points and preventing them being moved a second time, which is fortunately existing functionality in SAM.

 This Icon is used to select a TWA. The user simply uses this tool to click anywhere inside the TWA to be upgraded next.

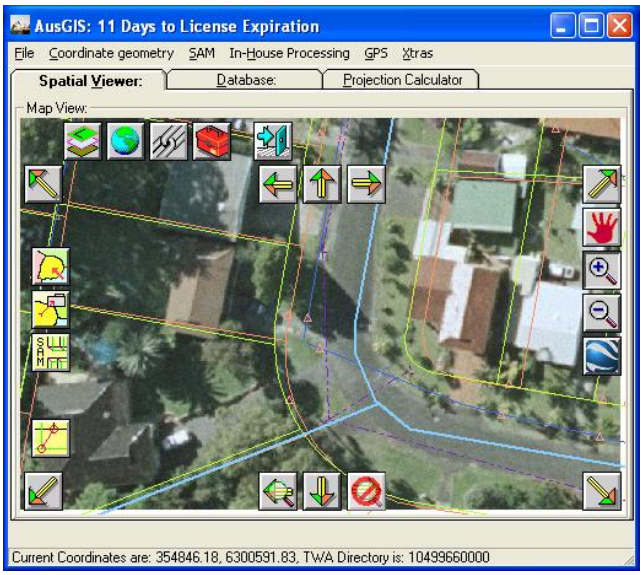
 This Icon is used to extract the spatial features from the various themes that are “Inside and Crossing” the current TWA. The data is written to a directory with the TWA’s Label as the directory name. This is “Process 1” in the above “Data Flow Diagram”.

 This Icon starts the Spatial Adjustment Manager, carries out “Process 2”, and sets SAM up with numerous defaults ready to step through the processes required.

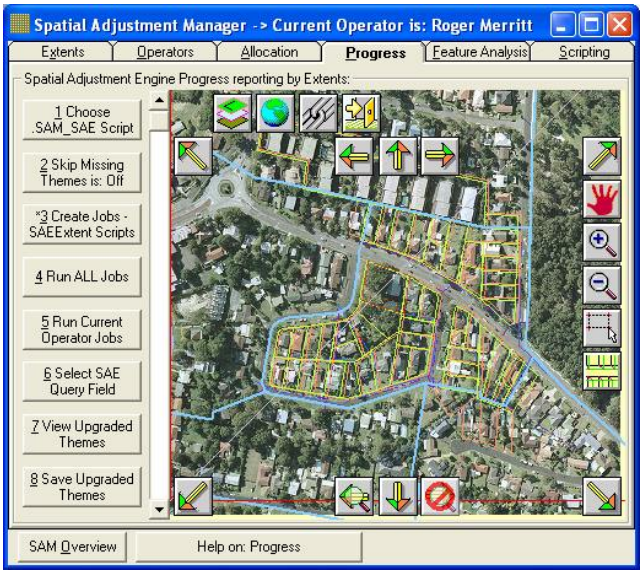
This is used to write out the Job Scripts. SAM (by default) breaks large areas up into 1km^2 tiles, and for larger areas is great for work flows in this part of the over all work flow.



This is used to run the upgrade process on all the 1km^2 tiles. The “Iterative Best Guess” algorithm is standard and the “Least Squares Adjustment” algorithm is an optional extra, and is run at this time.



1. The SAM “Toolbox”



2. The “Spatial Adjustment Manager”

This displays the upgraded features to be displayed over the original. There is a workflow here of “Find, Fix and Forget” involving “Feature Analysis” tab, the Spatial Adjustment Engine and other tools that is not discussed in this article.

This takes the final upgraded features and writes them back to the TWA directory mentioned above, and represents “Process 3” in the above “Data Flow Diagram”.

The user exits the “Spatial Adjustment Manager” and returns to continue with the “SAM Toolbox” mentioned above.

 This Icon updates the master themes with the upgraded coordinates relevant for the current TWA, and records points that moved outside the current TWA to ensure they are not moved a second time.

With the reduction of spatial, aspatial and temporal aspects when dealing with Shape and Tab files, the SAM Software can be purchased for $6,000 plus GST (April 2006), which represents exceptional value for many users. Trial Licenses are available for 30 days, and represent an excellent way for large GIS users to test SAM before implementing it as a fully integrated process in the GIS IT Environment.

Is this software intuitive, probably not as is automates so many spatial operations some of it may well appear as ‘black box’ functionality, but it is easy to use and not overly challenging to master.

The next phase after “Upgrading Spatially Dependant Layers with a replacement Digital Cadastre” is to move onto “Upgrading Spatially Dependant Layers in a partially upgraded Digital Cadastre”. Space prevents this discussion but please feel free to visit the Spatial Tapestry web site.

When one considers the flow-on advantages of being easily able to catch up with and stay current with the underlying Digital Cadastre, it has to be worth the effort.

Temporary Work Areas

The Temporary Work Areas provided are very small, but demonstrate the work flow and facilitate the discovery of many points that cross over their TWA Polygon.

Spatial Tapestry would suggest that 10 to 20 Km^2 Temporary Work Areas would be much more economical for production runs.

Conclusion

The SAM Functionality demonstrated on this CD should make it possible for all spatial data custodians who manage spatial data relative to the Digital Cadastre to move their many spatial layers to the newer and more accurate Digital Cadastre easily and very cost effectively.

The flow on benefits to your organisation will be huge.