ESRI's ArcReader

Robert Barr puts ESRI's ArcReader to work and finds it to be more than just an Acrobat Reader for maps. While the parallels with the Acrobat system are clear – and useful – this ESRI reader also liberates GIS data and makes it much more accessible to the casual user.

Before the appearance of the digital map, maps were usually printed and distributed on paper. So long as map producers kept the plates, they had control of who got access to the map, who could reproduce it and, in countries where maps are restricted documents, who could use it. More important, the original producer controlled the quality of the information on the map. Amendments were done by hand and usually signed off by a map or chart agent, which created an audit trail of changes.

However, when we move from the world of paper maps – the world of real goods made of atoms – to the digital world of virtual objects represented by bits of information, we encounter a problem. A digital map can be reproduced at virtually no cost. Information can be extracted, adulterated or re-used without trace. The safeguards of the owner of the original information, which could be reasonably protected in an atomic world, all but vanished in a digital world. This problem is not unique to maps; it affects all material that can be digitally encoded, including music, film, books, documents and software. That is why a wide range of technologies is being introduced to manage digital rights. Most DVDs can only be played in the region they are marketed in (unless you use a

specially adapted player); music CDs are issued with copy protection that was previously only common on software; and complex schemes are being introduced to control the re-use of commercially available material such as e-books and electronic magazines distributed on the Internet.

It is argued that if consumers want digital content, they must be prepared to pay for it and to have their rights to its use and redistribution curtailed both by legal contracts and by technical mechanisms.

The Acrobat answer

So, technical means are often required to protect the intellectual property rights in digital material. One of the most popular mechanisms for distributing documents securely, in a form that is unlikely to be altered without substantial effort, is Adobe's Acrobat software. Acrobat comprises an encoding program that can take a standard word-processed document (or other files including a PowerPoint presentation) and convert it into a proprietary format. This turns the file into a secure read-only form, identified by the suffix .pdf (portable document format). It can be viewed, read and printed, but not edited or amended. The .pdf file can only be read using a special Acrobat Reader; however, Adobe ensures that this is readily available, free. Adobe makes money from selling the original conversion software, with which users can convert their own documents for distribution and viewing by anyone at no cost.

While Adobe Acrobat is a

useful and widely used system for encoding many types of documents, including images of maps, it produces just that – an image. With a few exceptions, one cannot easily interact with a .pdf file other than to read it, zoom in or out or pan it. This is very limited functionality when the document of interest is a map, particularly a map that has been produced using GIS. It has long been recognised that only a small proportion of GIS users will create their own maps or even edit existing ones. The vast majority simply want to browse a map or look at the information in the database 'behind' the map. Such browse-only use is very expensive if, to view a map, you need a full-price copy of the GIS software that was used to create it.

Maps on the Internet

One way around this dilemma has been to make maps available over the Internet, where a cheap or free browser such as Internet Explorer, or a modified browser with a plug-in such as Autodesk's MapGuide, allows users to

ArcReader user interface
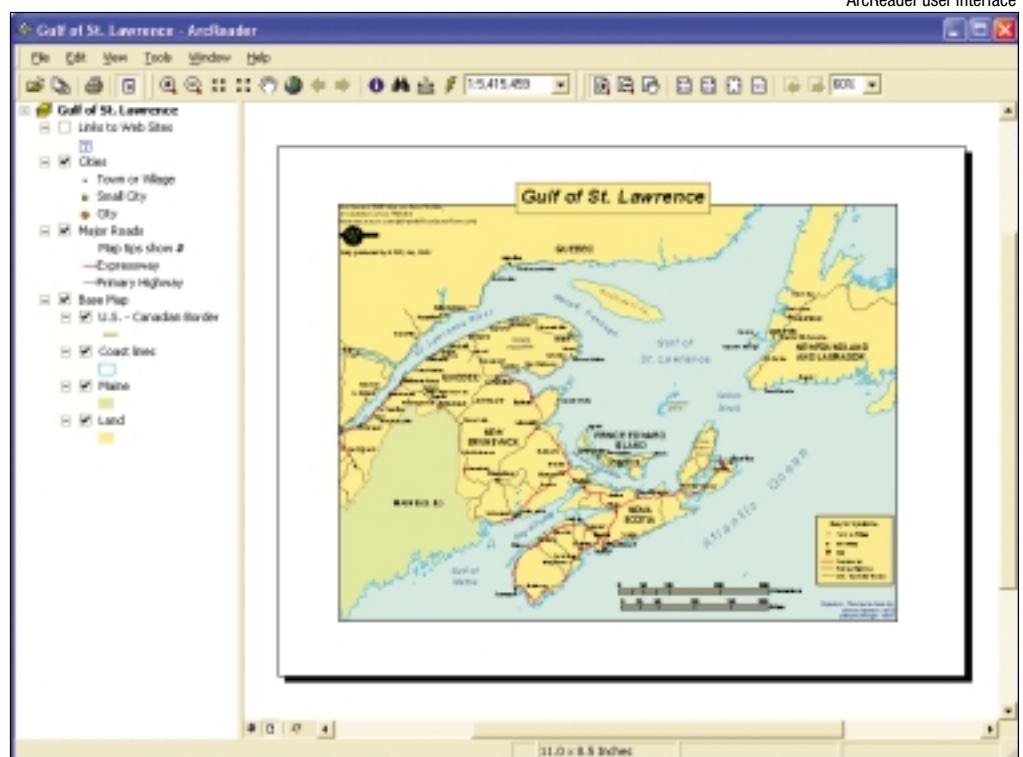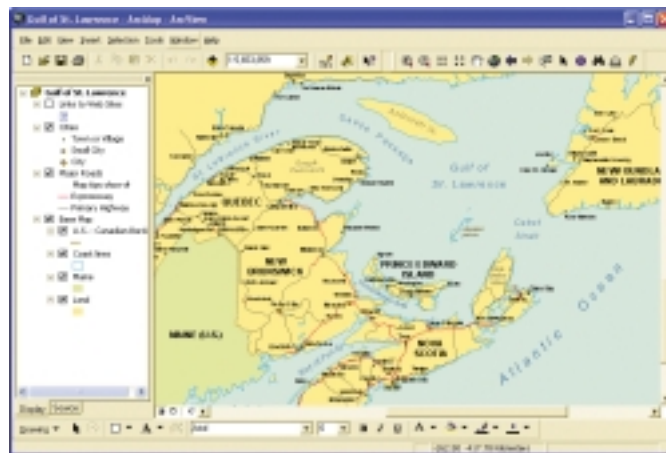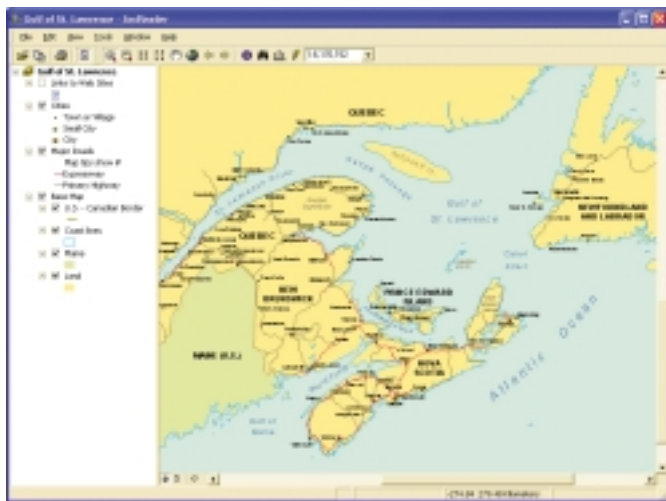
Map browsing and interaction

view, zoom in on or query a map held on a map server. This can be on the same machine as the viewing software, but much more usually is on a remote server on an intranet or the Internet. However, until network connectivity can be guaranteed, and broadband links become far more common than they are today, we need another mechanism for the many potential view-only users of digital maps and their underlying databases produced in geographic information systems.

ESRI has come up with a range of solutions to this problem. The company has already distributed ArcExplorer, a free viewer for data in its proprietary formats. Unfortunately, this does not protect the original data from re-use by those having the appropriate higher functionality software. ESRI also has a suite of Internet products based on its ArcIMS (Internet Map Server) architecture.

ESRI's ArcReader for maps

However, ESRI has recognised a gap in the market for a GIS equivalent to Acrobat Reader. With its latest GIS product, ArcGIS (marketed in versions to replace previous copies of ArcInfo and ArcView), ESRI has a modern Microsoft Windows oriented, component-based suite of software that can be easily reconfigured to offer new types of functionality. The ArcGIS suite now includes ArcPublisher and ArcReader,

complementary products to publish secure read-only versions of ArcGIS databases in a new .pmf format (the one-letter difference from Adobe's .pdf format cannot be a coincidence). ArcReader is a free product that you can install either from a freely available CD or directly from ESRI's own website (www.esri.com), while ArcPublisher is an extra-cost addition to ArcGIS. The clear parallels with the Adobe product are an advantage – they make the purpose of ArcReader obvious.

ArcReader also has a very strong family resemblance to ArcMap. It has plainly been built using the same underlying ArcObjects component toolkit. So this is not a lightweight look-alike; the user effectively gets a subset of ArcMap functionality for viewing published map files including their underlying database.

The table of contents, which can be displayed optionally at the left side of the map, is identical in the two products. The top menus are also very similar; ArcReader simply has the editing and database querying functionality removed. Even the ArcReader button bar is a subset of the most common sets of tools available in ArcMap. So far as the user is concerned, ArcReader is a fully functional, lightweight version of ArcMap. The one restricted area of functionality is that ArcReader does not allow you to construct a database-style query, although you can query

attributes of objects on the map using an identity tool.

ArcReader does allow you to control the layout of maps for printing in the layout view. Layer selection and zooming is allowed in both the data view and the layout view. This makes it easy to print a map with the required level of detail and at the right size.

Size matters

One major difference between ArcReader and Adobe's Acrobat reader is the size of the download. You may need to download between 50Mb and 100Mb of installation files to install ArcReader. So, unless you have a broadband connection, you are better to obtain ArcReader on the free CD.

ArcReader is designed to work with the ESRI-sponsored Geography Network, where many interesting map databases are available for downloading or for viewing online. The reader gives you a menu option to connect to the Network. ArcPublisher and ArcReader also allow hotlinks to websites to be embedded in maps and activated from the reader.

Many of the map databases available are also very large, and this can give the impression that ArcReader is a little slow in refreshing a map after a zoom. In fact, the performance of the reader is very good. Smaller maps are very responsive; it is only when a particularly large amount of indexed data has to be sifted to extract the appropriate part of a map that things slow down a little.

Liberating your data

The ArcReader/ArcPublisher combination is a powerful way of dealing with the demand from large numbers of users to browse geographic data, while assuring data producers that their intellectual property is safe. The freedom to work online or offline equally conveniently is also a useful degree of versatility.

While ArcReader could be dismissed as merely an Acrobat Reader for maps, it is actually much more than that. It is a means of liberating data and giving casual users access to GIS functionality at a price that cannot be faulted. I expect to see many more .pmf map files on the web in the near future, in the same way that .pdf documents now proliferate. While it is true that open-source ways of displaying data using the new web-standard .svg format (scaleable vector graphics) are appearing, these do not give data owners the confidence that their data cannot be changed or re-used in unauthorised ways.

It is this aspect of the ArcPublisher/ArcReader combination that makes the idea so powerful. Also, the income stream that ESRI will enjoy from ArcPublisher sales should encourage the company to continue making ArcReader freely available. All in all, this is a very welcome development.

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