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## A review of ArcGIS Desktop 9.3

# Do we still need a Desktop GIS?

*The release 9.3 of ESRI's ArcGIS has a multitude of new features and improvements. This article will take a look at some of the improvements and will address the question of why we still need ArcGIS Desktop in the age of the GeoWeb and its service-based geospatial applications.*

By Florian Fischer

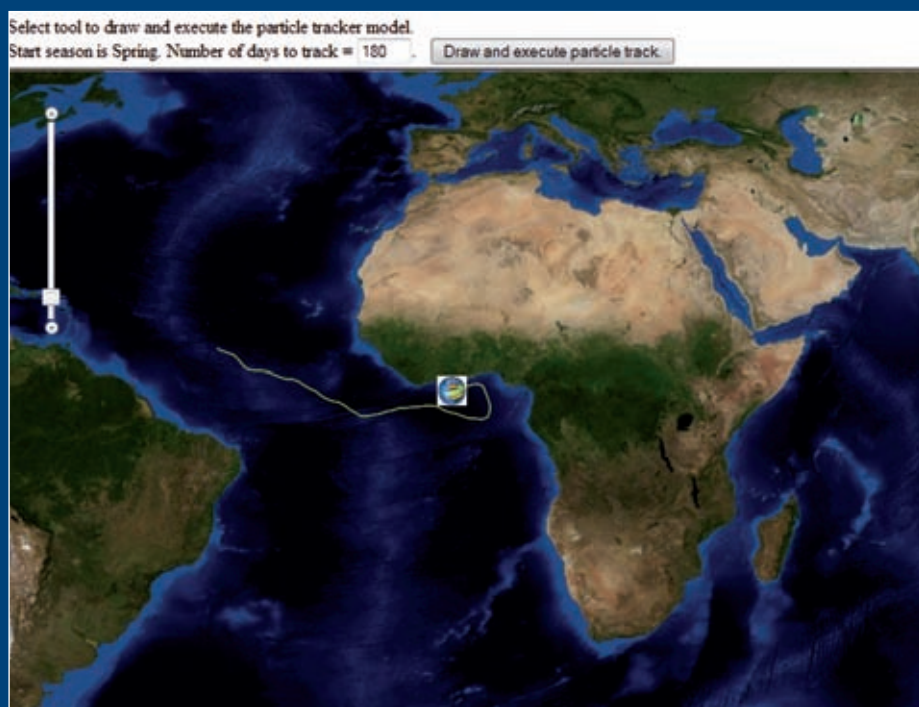
answer is simple: because we still need GIS professionals to create, manage and analyse content and to design the workflows! Or as ESRI puts it, a powerful desktop GIS is still the basis for working with spatial data.

### ArcGIS 9.3 Desktop – What's New?

ESRI has integrated a multitude of improvements into the new release, ArcGIS 9.3 Desktop. A quick glimpse at "What's New in ArcGIS 9.3" immediately discloses some dozens of improvements. It is clear that I can present only some of them here. But after a second look at "What's New in ArcGIS 9.3" it becomes evident that ArcGIS Desktop is not considered a stand-alone product but one brick in ESRI's service-based GIS infrastructure. Today geospatial technology is one component in common IT architectures but not the only component. And while we are moving toward server-based infrastructures, desktop components are essential parts of the overall architecture: because of performance issues due to increasing amounts of data, as design machines for complex workflows, and as high-end analysis or processing systems.

### Cartography

Cartography is definitely a highlight in the 9.3 release of ArcGIS Desktop. A new feature in release 9.2 was the introduction of cartographic representations. That is, a cartographic model could be designed to create a true cartographic workflow which is integrated into ArcGIS Desktop but still a component separated from the geo database. Before, the common workflow was different. Data capturing, data management and analysis was done with ArcGIS. The cartographic production was then carried out by a piece of software more specialized in symbolization and cartography. Troublesome data transfer was necessary which placed a break line in the workflow.



Application "Message in a Bottle" using the ArcGIS JavaScript API

### The Revenge of the GIS Professionals

The concept of Spatial Data Infrastructures (SDI) resounds throughout the land. In the age of the internet, GIS systems are dissolving as monolithic pieces of software, hardware and geo data dissolved into interoperable, service-based Spatial Data Infrastructures (SDI) that continuously provide geo data and geo functionality over the web. Whereas GIS

systems were efficient only in the hands of GIS experts, SDIs allow the deployment of geo web services by non GIS experts within organizations and enterprises. A multitude of regional, national and international SDI initiatives will make the handling of geo data easier than ever before and grant almost everyone access to geo web services. When every workflow can be server based, why do we still need a desktop GIS like the new ArcGIS Desktop? The

As in release 9.2 the editing of geo data and cartographic representations can be done separately or connected, but in 9.3 ESRI has introduced a WYSIWYG technique that allows editing of geo data by manipulation of the cartographic representation itself. Cartographic representations ease and automate the cartographic workflow, as an example from Swiss Topo demonstrates. Swiss Topo, the Swiss national mapping agency, was able to revolutionize its workflow for map production by integrating the cartographic process into ArcGIS. It could make use of many features of ArcGIS like representation rules, overrides, geo-processing and cartographic editing. The advantages are clear. Geo data for cartography is more flexible to use, and maintenance of official maps is faster and more efficient due to automated processes. More actual data and lower production costs are the result.

### A Kind of OSM Deluxe

This kind of automated cartography is already deployed in Open Street Map (OSM), a virtual community that collectively gathers and shares geo data created by GPS devices under a Creative Commons Attribution-Share Alike 2.0 license. They also offer sophisticated maps that are automatically derived from the raw geo data. The idea is simple. The worldwide user community gathers around the platform, collects geo data and uploads it. Professionals design the cartographic workflow that creates maps, map-tiles and even shape files out of the raw data. Although they use a very simplistic data model at the moment, it is considered likely to gain com-

plexity in the future. The aims of Swiss Topo are similar. However, they are a kind of “OSM-deluxe” as they have even more sophisticated requirements, a more complex data model and a higher need for immediate implementation. The design of OSM maps will certainly be enhanced in the future but probably at a slower pace and with the steady credo of keeping a high level of convenience and usability. That is not necessarily an aim of Swiss Topo.

### Geospatial PDF

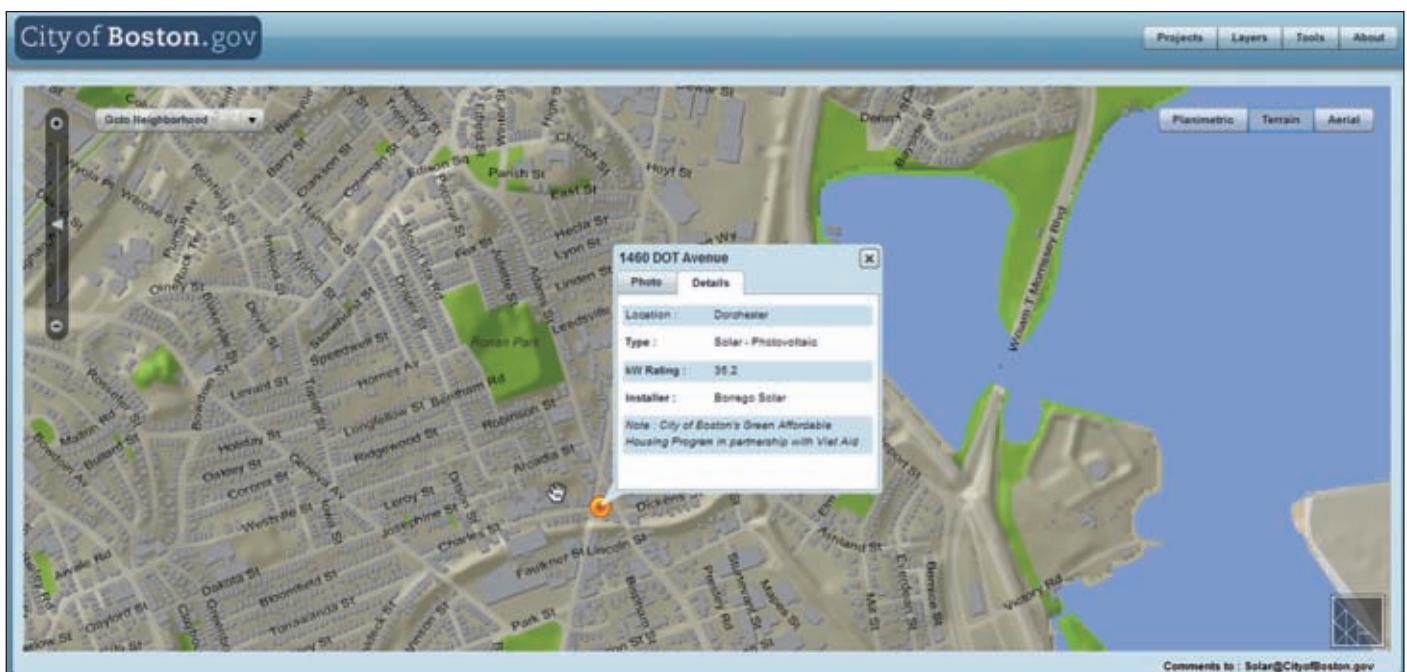
Last year ESRI started to work closely with Adobe Systems to enable seamless workflows. In Acrobat Reader 9 Adobe introduced the geospatial PDF that, it is assumed, will be proposed to the ISO Standards group as well. A geospatial PDF contains information that is required to geo-reference location data. When geospatial data is imported into a PDF, Acrobat retains the geospatial coordinates. Geospatial data can be either vector or raster based or a combination of both. One can then find and mark location data and measure distance, area and perimeter. Acrobat 9 makes use of the ESRI Projection Engine to provide this functionality. By allowing PDF to work with geospatial information Adobe has provided a document platform for GIS customers to use. No special tools and no special extensions to geospatial PDF are needed. Suddenly all the Acrobat document features have become available to customers working with geospatial documents. Traditional document work flows that could only include flat image maps can now include fully functioning PDF Maps. Thus no GIS software is required and

no special GIS knowledge is necessary to handle a geospatial PDF. As well, there is no need for special viewers, and the files are still small and can be combined with a document and transmitted easily. With its introduction of geospatial PDF, Adobe is finally supporting the diffusion of geospatial products, and we can expect more in the future.

### ESRI Mash-ups

ArcGIS Desktop 9.3 also plays an important role in a geo browser environment. It is ArcGIS Desktop that is best used by professionals to create tasks for a service-based environment. What is denoted “task” by ESRI is usually called “service” when talking about Service Oriented Architectures (SOA). That is, tasks are everything from geo-processing to geo-statistics. Created by ArcGIS Desktop, a task can be offered by ArcGIS Explorer. The utilization of APIs permits the combination of ESRI’s geo web services with a multitude of visualization platforms as well, such as Google Maps and Adobe Flex. That way ArcGIS functionality is capable of being integrated into websites, and thus ESRI mash-ups are made with ease. “Message in a bottle” is one example of this way of creating ESRI mash-ups (see Figure 1).

This simple website allows you to track the path a bottle will take if thrown into the ocean. If you pinpoint the location where the bottle was dropped, a task on an ArcGIS Server is started and processed server-side. The result is sent back to the website and shows the track of the bottle calculated on the basis of ocean currents. The Solar Boston project demonstrates the integration of tasks



Application “Solar Boston” demonstrating the use of ArcGIS Flex API

with the Adobe Flex platform. The Solar Boston map allows you to see active renewable energy installations within the City, and to calculate the solar potential of building rooftops (see Figure 2).

### Data Interoperability

In addition to creating tasks that are published, ArcGIS Desktop integrates these services as well. Connecting to an OGC-compliant Web Map Service (WMS) became a matter of course a few releases ago. But WMS are just too limited when it comes to representing raster data. In the end they only show images because it is a visualization service. Styled Layer Descriptors (SLD), an XML schema specified by the Open Geospatial Consortium (OGC) that is capable of describing the rendering of specific WMS layers, is a way to spice up the OGC WMS. Release 9.3 can now work with these SLDs, but the release can connect to Web Coverage Services (WCS) as well. WCS allow requests for geographical coverages, that is objects or images in a geographical area. This answers the call for the deployment of geo-processing func-

tionality and spatial analysis using geo data from web services. Thus the capabilities of ArcGIS Desktop can be extended by using WCS, like doing a classification.

A stepchild in the GIS domain is still the Web Feature Service (WFS), a service that allows requests for geographical features. So far the WFS has not made good concerning its adoption but that might change in future. ArcGIS Desktop is already primed for WFS. However, finding out how to start using WFS is not very easy. It can only be done via ArcCatalog, and there are still some dialog boxes that do not say anything about a WFS. Nevertheless the connection to WFS works fine and completes the interoperability capabilities of ArcGIS Desktop 9.3.

### Bandwidth is important

The 9.3 release of ArcGIS Desktop has many new features and improvements in cartographic representation, geo-processing and data interoperability. But what is more important, it shows that a desktop GIS is still key in the age of the GeoWeb. In fact, ArcGIS Desktop is an integrated part of the ArcGIS

environment, contributing to ArcGIS Server, ArcGIS Explorer and to the GeoWeb. Its strength is definitely the design of workflows, the handling of large amounts of data and the ease of handling computationally intensive geo-processing. As long as we need a professional GIS we will need ArcGIS Desktop. And finally, internet bandwidth is still an issue to be considered. We are quite spoiled by enormous bandwidth but have to realize that not every place is connected by similar bandwidth. Thus while geography matters, ArcGIS Desktop rules.

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*Links to web-applications.*

*Message in a Bottle:*

[http://resources.esri.com/help/9.3/arcgisserver/apis/javascript/arcgis/demos/geoprocessor/gp\\_bottle.html](http://resources.esri.com/help/9.3/arcgisserver/apis/javascript/arcgis/demos/geoprocessor/gp_bottle.html)  
Solar Boston: <http://gis.cityofboston.gov/solarboston>



### About ESRI

For four decades, ESRI has been helping people make better decisions through management and analysis of geographic information. Our culturally diverse staff work with our business partners and hundreds of thousands of people who use GIS to make a difference in our world.

A full-service GIS company, ESRI offers support for implementing GIS technology from the desktop to enterprise-wide servers, online services, and mobile devices. GIS solutions are flexible and customizable to meet the needs of all our users.

### Our Focus

At ESRI, we focus on promoting the value of GIS and its applications throughout the world and pay close attention to our users' needs. Our software development and services respond to our customers with products that are easy to use, flexible, and integrated. Our technology is multidisciplinary, productive, and valuable to our users.

We have a strong commitment to educating our customers through ESRI's various training programs. ESRI is a socially conscious business and invests heavily in issues regarding education, conservation, sustainable development, and humanitarian affairs.

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