

# OVERVIEW OF GIS SOFTWARE PACKAGES

## ArcView/ArcGIS:

ESRI is one of the leading providers of GIS software, and over the years they have produced a range of different products. These products have often become the industry standard for GIS software and are widely used in academic research and government agencies. Of the products they have produced, the most widely used in ecological research to date is ArcView, which is now incorporated within the ArcGIS software suite. The most recent incarnations of this software are found in the ArcGIS 9.3, and ArcGIS 10 software suites. The main factor limiting the use of ArcView is the cost of the software licenses for the core program and essential extensions such as Spatial Analyst. However, reduced cost licenses may be available for some users, such as non-profit organizations and non-commercial home users, under specific circumstances.

## IDRISI:

IDRISI is a series of software packages from Clark Labs, with the latest incarnation at the time of writing being IDRISI Taiga. It provides much of the same GIS functionality of ESRI products and in some areas may provide greater functionality. In particular, many people find it easier to deal with time series data and data from remote sensing sources within IDRISI software. While the required licenses cost less than those for ESRI products and discounts are available for some academic users, they may still prove prohibitive for others.

## Manifold:

Manifold represents a GIS solution which is available at a lower of the cost than many other commercial GIS software packages. It has much of the same functionality of more expensive GIS software packages; however you need to ensure that you obtain the right licenses to access all the GIS tools that you might need. In addition, it is based on a very different approach to GIS than most other GIS software. As a result, some people may find it difficult to transfer their GIS skills between the Manifold GIS approach and that used by other GIS software packages.

## GRASS:

GRASS (Geographic Resources Analysis Support System) is one of the leading open source, and so freely available, GIS software package. This provides many advantages, but the main one by far is the fact that it does not have any license costs associated with it. It maintains a high level of functionality, and many of the tools available in commercial GIS software are also available in GRASS. In addition, it can read and access data layers in most standard GIS formats, such as shapefiles. In many respects GRASS is the GIS equivalent of R, which has revolutionized statistical analysis in ecology and marine biology in recent years. However, some users may find it difficult to work with due to the nature of the available interfaces.

## Quantum GIS with GRASS:

Quantum GIS (or QGIS) with GRASS provides an interface that not only allows easy access to the tools available in GRASS, but also provides a quick and simple approach to carrying out many basic tasks in GIS outside the GRASS framework, such as creating data layers and some of the easier tasks involved in manipulating data layers. As with GRASS itself, it is freely available and does not have any associated license costs. In addition, it can read and access data layers in most standard GIS formats, such as shapefiles. This is one of the easiest points of entry into GIS for those who do not have the money to pay for GIS licenses but who still wish to be able to use it in their research.

## APPLYING SPATIAL INFORMATION TO BIOMASS MANAGEMENT

#### DIVA-GIS:

DIVA-GIS is another freely available program that can be used for GIS projects. However, while it may not have quite as much functionality as other GIS software considered here, it does provide an interface which allows the quick and easy creation of maps for presentations, reports and papers, and the manipulation of data with some relatively simple GIS tools. It can read and access data layers in most standard GIS formats, such as shapefiles. It is particularly useful for those working in the terrestrial ecologists due to the links it has with freely available spatial data sources. If you are looking for a relatively simple GIS program for doing relatively simple GIS tasks without costly license fees, this may be the option for you.

#### R:

Some GIS tasks can be done in R statistical software. Again, it is freely available, so does not come with costly license fees. It has the advantage that many complex statistical analyses can also be conducted within the same software package. However, while this may change in the future, it is still much easier to do many GIS tasks in specialist GIS software.

#### MapWindow:

MapWindow is another open source GIS software package that is available without a having to pay for a license. While it currently lacks some of the tools which ecologists might need to use GIS in their research, it has a very usable interface and is easy to learn. In addition, it provides some of the easiest tools for converting data from spreadsheet formats into line and polygon data layers (something often lacking even from commercial GIS software). At this stage, it is probably most useful for those ecologists who wish to simply make maps for presentations and publications, but as more tools are developed, it is likely to become increasingly useful for ecologists.

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