

Supplementary material

An evaluation and comparison of spatial modelling applications for the management of biodiversity: a case study on the fragmented landscapes of south-western Australia

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Table S1: Examples of freely available spatial modelling software, description of software and URLs (accessed April 2016). Most sites also provide links to training packages.

Software	Description	URL
Biodiverse	This is a tool for the spatial analysis of diversity using indices based on taxonomic, phylogenetic and matrix-based (e.g. genetic distance) relationships, as well as related environmental variations.	http://purl.org/biodivers e
Biomod 2	This is a package which uses the R statistical platform to run a selection of species distribution modelling tools against a given presence data set and a set of independent variables to derive and evaluate multiple outputs for each tool and to calculate an ensemble model, which combines all outputs from all tools into a single “ensemble” species distribution model. Tools used in this package include: Regression-based Techniques: <ul style="list-style-type: none"> • Generalized linear model (GLM) • Generalized Additive Model (GAM) • Multivariate Adaptive Regression Splines (MARS) Machine Learning Techniques: <ul style="list-style-type: none"> • MaxEnt • Artificial Neural Networks (ANN) • Genetic Algorithm for Rule Set Production (GARP) • Boosted Regression Trees (BRT) • Gradient Boosting Machines (GBM) • Random Forest (RF) • Support Vector Machines (SVM) 	https://cran.r-project.org/web/packages/biomod2/biomod2.pdf
CLiMAS	This is an online species distribution modelling tool which provides interactive maps and regional reports to examine the future of species distributions and biodiversity across Australia. It summarises mapped biodiversity of almost all Australian mammals, birds, reptiles, amphibians, and freshwater fish and crayfish within suitable climate space projected by 18 different Global Climate Models (GCMs) and 2 potential emissions scenarios (RCPs) from 2015 to 2085. Detailed lists of climate space losses and gains for each species are given.	http://climas.hpc.jcu.edu.au/

DivaGIS	This is a free computer program for mapping and geographic data analysis system. With it you can make maps of the world, or of a very small area, using, for example, state boundaries, rivers, a satellite image, and the locations of sites where an animal species was observed to construct species distribution models and with a range of modelling tools.	http://www.diva-gis.org/
Fragstats	This package analyses patch matrix statistics in regard to parameters such as area, density, edge metrics, shape metrics etc. Compatible with some GIS software packages.	http://www.umass.edu/landeco/research/fragstats/fragstats.html
DesktopGARP	GARP is a species distribution model. It is a genetic algorithm that describes environmental conditions under which the species should be able to maintain populations.	http://www.nhm.ku.edu/desktopgarp/UsersManual.html
Google Earth	This is an online GIS software database that provides dynamic graphics and maps. Users can use it to create dynamic "tours," integrated with the Web. Note: There is a financial cost for professional versions of this software and access to specific data.	https://en.wikipedia.org/wiki/Google_Earth
GRASS	Extensive set of GIS tools for both raster and vector data in multiple formats;	http://grass.osgeo.org/
GME	Geospatial modelling environment is a biodiversity analysis toolset with the capacity to analyse animal movements, edit kernel, raster, table, vector data. Contains other tools. This package was formerly known as Hawth's tools.	http://www.spatial ecology.com/gme/
Marxan	Marxan is freely available conservation planning software. It provides decision support to a range of conservation planning problems, including the design of new reserve systems, reporting on the performance of existing reserve systems and developing multiple-use zoning plans for natural resource management	http://www.uq.edu.au/marxan/
MaxEnt	This is a species distribution modelling package that can work either through a Java GUI or through the R platform as part of a package such as Biomod 2.	http://homepages.inf.ed.ac.uk/lzhang10/maxent.html
Modeco	This is a software package for ecological niche, or species distribution modelling. It integrates a range of niche models within a geographical information system and provides a user friendly platform that enables users to explore, analyse, and model species distribution data. It contains a suite of functions such as data input/output, data visualization, feature analysis, model training and prediction, and accuracy assessment'	http://gis.ucmerced.edu/ModEco/
Q GIS	This is a very popular free GIS software package with multiple advanced analysis functions, direct access to many	http://qgis.org/

	geospatial databases and the capacity to expand functionality using Python plugins. Geoprocessing functions included.	
R-Analysis of Spatial Data	<p>This website provides full access to the spatial data analysis tools within the R statistical software platform. Numerous statistical tools are available at this site for the following purposes:</p> <ul style="list-style-type: none"> • Classification of spatial data; • Handling spatial data; • Reading and writing spatial data; • Point pattern analysis; • Geostatistics; • Disease mapping; • Areal data analysis; • Spatial regression; and, • Ecological analysis. 	http://cran.r-project.org/view=Spatial
SAGA	Free GIS software with the capacity for grid analysis, geostatistics, terrain analysis, hydrological simulations and TIN tools.	http://www.saga-gis.org/en/index.html
SAM	Spatial Analysis in Macroecology is a program designed as a package of tools for spatial statistical analysis, mainly for applications in Surface Pattern Spatial Analysis. SAM is mostly used in the fields of Macroecology and Biogeography, but also in Conservation Biology, Community and Population Ecology, Geography, Geology, Demography, Econometrics, Psychology and Epidemiology.	http://www.ecoevol.ufg.br/sam/
Whitebox GAT	This is an open-source desktop GIS and remote sensing software package for general applications of geospatial analysis and data visualization. Designed for the purpose of experimenting with novel geospatial analysis methods, it provides a platform for advanced geospatial data analysis with applications in both environmental research and, more broadly, the geomatics industry.	http://www.uoguelph.ca/~hydrogeo/Whitebox/index.html