A Partial List[1] of R packages for doing Spatial Data Analysis

Package Name[2]	Description in Documentation [additional comments in[ ]]
ade4	Multivariate data analysis and graphical display [Includes Moran's I and Geary's C; multivariate spatial analysis]
adegenet	Classes and functions for genetic data analysis within the multivariate framework [spatial PCA methods]
adehabitat	A collection of tools for the analysis of habitat selection by animals [Conversion routines for objects from the "sp" package; home range estimation]
ads	Perform first- and second-order multi-scale analyses derived from Ripley's K-function, for univariate, multivariate and marked mapped data in rectangular, circular or irregular shaped sampling windows, with test of statistical significance based on Monte Carlo simulations
AnalyzeFMRI	Functions for I/O, visualisation and analysis of functional Magnetic Resonance Imaging (fMRI) datasets stored in the ANALYZE or NIFTI format. [includes non-linear smoothing of 3-D and 4-D arrays]
aspace	A collection of functions for computing centrographic statistics (e.g., standard distance, standard deviation ellipse, standard deviation box), and minimum convex polygons (MCP) for observations taken at point locations. A tool is also provided for converting geometric objects associated with the centrographic statistics, and MCPs into ESRI Shapefiles.
BiodiversityR	This package provides a GUI (Graphical User Interface, via the R-Commander) and some utility functions (often based on the vegan package) for statistical analysis of biodiversity and ecological communities, including species accumulation curves, diversity indices, Renyi profiles, GLMs for analysis of species abundance and presence-absence, distance matrices, Mantel tests, and cluster, constrained and unconstrained ordination analysis.
CircSpatial	The package is a collection of functions for color continuous high resolution images of circular spatial data, circular kriging, and simulation of circular random fields.
DCluster	A set of functions for the detection of spatial clusters of disease using count data. Bootstrap is used to estimate sampling distributions of statistics.
DSpat	Provides functions for fitting spatial models to line transect sampling data and to estimate abundance within a region
ecespa	Some wrappers, functions and data sets for for spatial point pattern analysis (mainly based on spatstat), used

[1] I attempted to get at most of the packages but it is very likely this is still an incomplete list.

[2] For more information and downloading of packages go to http://cran.r-project.org/. When considering a package check the list of packages on which it depends as these will need to be installed as well.

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	in the book "Introduccion al Analisis Espacial de Datos en Ecologia y Ciencias Ambientales: Metodos y Aplicaciones".
fields	Fields is for curve, surface and function fitting with an emphasis on splines, spatial data and spatial statistics. The major methods include cubic, robust, and thin plate splines, multivariate Kriging and Kriging for large data sets. A major feature is that any covariance function implemented in R can be used for spatial prediction. There are also many useful functions for plotting and working with spatial data as images. This package also contains an implementation of a sparse matrix methods for large data sets and currently requires the sparse matrix (spam) package for testing (but not for the standard spatial functions.)
Geneclust	Simulation and analysis of spatial structure of population genetics data
geoR	Geostatistical analysis including traditional, likelihood-based and Bayesian methods.
geoRglm	Functions for inference in generalised linear spatial models. The posterior and predictive inference is based on Markov chain Monte Carlo methods. Package geoRglm is an extension to the package geoR, which must be installed first.
GeoXP	GeoXp is a tool for researchers in spatial statistics, spatial econometrics, geography, ecology etc allowing to link dynamically statistical plots with elementary maps. This coupling consists in the fact that the selection of a zone on the map results in the automatic highlighting of the corresponding points on the statistical graph or reversely the selection of a portion of the graph results in the automatic highlighting of the corresponding points on the map. GeoXp includes tools from different areas of spatial statistics including geostatistics as well as spatial econometrics and point processes. Besides elementary plots like boxplots, histograms or simple scatterplots, GeoXp also couples with maps Moran scatterplots, variogram cloud, Lorentz Curves,...In order to make the most of the multidimensionality of the data, GeoXp includes some dimension reduction techniques such as PCA.
glmmBUGS	Write bugs model files for hierarchical and spatial models, arranges unbalanced data in ragged arrays, and creates starting values.
grasp	GRASP is a general method for making spatial predictions of response variables (RV) using point surveys of the RV and spatial coverages of Predictor variables (PV). Originally, GRASP was developed to analyse, model and predict vegetation distribution over New Zealand. It has been used in all sorts of applications since then. (A. Lehmann, J.R. Leathwick & J.McC. Overton, 2002. GRASP. Ecological Modelling, 157: 189-207)
gstat	variogram modelling; simple, ordinary and universal point or block (co)kriging, sequential Gaussian or indicator (co)simulation

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hydrosanity	Hydrosanity provides a graphical user interface for exploring hydrological time series. It is designed to work with catchment surface hydrology data (mainly rainfall and streamflow time series at a set of locations). There are functions to import from a database or files; summarise and visualise the dataset in various ways; estimate areal rainfall; fill gaps in rainfall data; and estimate the rainfall-runoff relationship. Probably the most useful features are the interactive graphical displays of a spatial set of time series. WARNING: this package is under development and should not be considered stable. An introductory paper is included, but there is not much detailed documentation. Hydrosanity's Graphical User Interface was based on Rattle by Graham Williams
hyperSpec	This package gives an interface to handle hyperspectral data sets in R. I.e. spatially or time-resolved spectra, or spectra with any other kind of information associated with the spectra. The spectra can be data as obtained in XRF, UV/VIS, Fluorescence, AES, NIR, IR, Raman, NMR, MS, etc. More generally, any data that is recorded over a discretized variable, e.g. absorbance = f (wavelength), stored as a vector of absorbance values for discrete wavelengths is suitable.
ICNSP	Tools for multivariate nonparametrics, as location tests based on marginal ranks, spatial median and spatial signs computation, Hotelling's T-test, estimates of shape
intamap	A package that provides classes and methods for automated spatial interpolation
intamapInteractive	A package that provides additional functionality for interpolation spatial interpolation
KernSmooth	functions for kernel smoothing (and density estimation) corresponding to the book:Wand, M.P. and Jones, M.C. (1995) "Kernel Smoothing".
kzs	A spatial smoothing algorithm based on convolutions of finite rectangular kernels that provides sharp resolution in the presence of high levels of noise.
maptools	Set of tools for manipulating and reading geographic data, in particular ESRI shapefiles; C code used from shapelib. It includes binary access to GSHHS shoreline files. The package also provides interface wrappers for exchanging spatial objects with packages such as PBSmapping, spatstat, maps, RArcInfo, Stata tmap, WinBUGS, Mondrian, and others.
ncf	R functions for analyzing spatial (cross-)covariance: the nonparametric (cross-)covariance, the spline correlogram, the nonparametric phase coherence function, and related.
nlme	Fit and compare Gaussian linear and nonlinear mixed-effects models [includes spatial autocorrelation covariance structures]
pgirmess	Miscellaneous functions for data analysis in ecology [Includes Moran's I and Geary's C; provide polygons (squares) along a segment for sampling designs; permutation envelopes for empirical variograms]

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prabclus	Distance-based parametric bootstrap tests for clustering, mainly intended for presence-absence data and abundance data (clustering of species distribution ranges). Jaccard, Kulczynski, quantitative Kulczynski and geco distance measures, clustering of presence-absence and abundance data, and nearest neighbor based noise detection (R port of Byers and Raftery's (1998) "NNclean"). Main functions are prabtest, abundtest (for testing), prabclust (for clustering), prabinit (for preparing the data) and NNclean (for noise detection). The help-pages for prabtest, abundtest and prabclust contain simple standard executions. Note that the use of the package mclust (called by function prabclust) is protected by a special license, see http://www.stat.washington.edu/mclust/license.txt, particularly point 6.
psgp	Implements projected sparse Gaussian process kriging for the intamap package
ramps	Bayesian geostatistical modeling of Gaussian processes using a reparameterized and marginalized posterior sampling (RAMPS) algorithm designed to lower autocorrelation in MCMC samples. Package performance is tuned for large spatial datasets
rgdal	Provides bindings to Frank Warmerdam's Geospatial Data Abstraction Library (GDAL) (>= 1.3.1) and access to projection/transformation operations from the PROJ.4 library. The GDAL and PROJ.4 libraries are external to the package, and, when installing the package from source, must be correctly installed first. Both GDAL raster and OGR vector map data can be imported into R, and GDAL raster data and OGR vector data exported. Use is made of classes defined in the sp package.
RgoogleMaps	This package serves two purposes: (i) Provide a comfortable R interface to query the Google server for static maps, and (ii) Use the map as a background image to overlay plots within R. This requires proper coordinate scaling.
RSAGA	RSAGA provides access to geocomputing and terrain analysis functions of SAGA from within R by running the command line version of SAGA. In addition, several R functions for handling and manipulating ASCII grids are provided, including a flexible framework for applying local functions (including predict methods of fitted models) or focal functions to multiple grids. SAGA is available under GPL via http://sourceforge.net/projects/saga-gis/.
RSurvey	This package is a processing program for spatially distributed data. The program is capable of error corrections and data visualization. A graphical user interface is provided.
SDMTools	This is a set of tools that are useful for applications of species distribution modeling [includes a function for comparing two matrices and identifying regions of differences]
SGCS	This package contains test and estimates of location, tests of independence, tests of sphericity and several

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	estimates of shape all based on spatial signs, symmetrized signs, ranks and signed ranks.
sp	A package that provides classes and methods for spatial data. The classes document where the spatial location information resides, for 2D or 3D data. Utility functions are provided, e.g. for plotting data as maps, spatial selection, as well as methods for retrieving coordinates, for subsetting, print, summary, etc.
spatial	Functions for kriging and point pattern analysis
spatcounts	Fit spatial CAR count regression models using MCMC
spatclus	Multiple cluster location and detection for 2D and 3D spatial point patterns (case event data). The methodology of this package is based on an original method that allows the detection of multiple clusters of any shape. A selection order and the distance from its nearest neighbor once pre-selected points have been taken into account are attributed at each point. This distance is weighted by the expected distance under the uniform distribution hypothesis. Potential clusters are located by modelling the multiple structural change of the distances on the selection order. Their presence is tested using the double maximum test and a Monte Carlo procedure. The main function of this R package is “clus”.
spatgraphs	Graphs, graph visualization and graph based summaries to be used as a tool in spatial point pattern analysis. See package ’spatstat’ for more info about spatial point patterns.
spatialCovariance	Functions that compute the spatial covariance matrix for the matern and power classes of spatial models, for data that arise on rectangular units. This code can also be used for the change of support problem and for spatial data that arise on irregularly shaped regions like counties or zipcodes by laying a fine grid of rectangles and aggregating the integrals in a form of Riemann integration.
SpatialEpi	Performs various spatial epidemiological analyses
SpatialExtremes	This package proposes several approaches for spatial extremes modeling
spatialkernel	Edge-corrected kernel density estimation and binary kernel regression estimation formultivariate spatial point process data
SpatialNP	This package contains test and estimates of location, tests of independence, tests of sphericity and several estimates of shape all based on spatial signs, symmetrized signs, ranks and signed ranks.
spatialsegregation	Summaries for measuring segregation/mingling in multitype spatial point patterns with graph based neighbourhood description. Included indices: Mingling, Shannon, Simpson (also the non-spatial) Included functionals: Mingling, Shannon, Simpson, ISAR. Included neighbourhoods: Geometric, k-nearest neighbours, Gabriel, Delauney.
spatstat	A package for analysing spatial data, mainly Spatial Point Patterns, including multitype/marked points

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spBayes	spBayes fits univariate and multivariate spatial models with Markov chain Monte Carlo (MCMC).
spcosa	Spatial coverage sampling and random sampling from compact geographical strata created by k-means.
spdep	A collection of functions to create spatial weights matrix objects from polygon contiguities, from point patterns by distance and tesselations, for summarising these objects, and for permitting their use in spatial data analysis; a collection of tests for spatial autocorrelation, including global Moran's I, Geary's C, Hubert/Mantel general cross product statistic, Empirical Bayes estimates and Assunção/Reis Index, Getis/Ord G and multicoloured join count statistics, local Moran's I and Getis/Ord G, saddlepoint approximations and exact tests for global and local Moran's I; and functions for estimating spatial simultaneous autoregressive (SAR) lag and error models, weighted and unweighted SAR and CAR spatial regression models, semi-parametric and Moran eigenvector spatial filtering, GM SAR error models, and generalized spatial two stage least squares models.
splancs	Spatial and Space-Time Point Pattern Analysis Functions
spsurvey	This group of functions implements algorithms required for design and analysis of probability surveys such as those utilized by the U.S. Environmental Protection Agency's Environmental Monitoring and Assessment Program (EMAP).
StatDA	This package offers different possibilities to make statistical analysis for Environmental Data.[includes plotting method for kriged data]
statnet	An integrated set of tools for the representation, visualization, analysis and simulation of network data.
Stem	Estimation of the parameters of a spatio-temporal model using the EM algorithm, estimation of the parameter standard errors using a spatio-temporal parametric bootstrap, spatial mapping.
tripack	A constrained two-dimensional Delaunay triangulation package; Triangulation of irregularly spaced data
tossm	Provides a framework under which methods of detecting and managing genetic spatial structure in populations can be tested.
vardiag	This package allows interactive variogram diagnostics
vegan	Ordination methods, diversity analysis and other functions for community and vegetation ecologists. [spatial partitioning of cca or rda results]