ArcGIS to R spatial cheat sheet

We hope you enjoy our cheat sheet for commonly used functions in spatial R packages. Once you are comfortable with R, it very convenient for spatial processing and offers many powerful (and free) statistical packages. For all functions below xshape is a generic shape (vector) file, xpoly is a polygon shape file, xline is a line shape file, xpoint is a points shape file and xraster is a raster file. Some ARC GIS functions are provided in add-on toolboxes, which we have indicated in brackets. We have provided you with some key functions, for more info see the excellent documentation for each package and their vignette's.

Packages

sp for spatial classes (polygons etc...)
raster for raster classes, raster functions and some functions for shapes.
rgdal for gdal (projections)
rgeos for operations on shapes (e.g. union)
geosphere for great circle distances
maps for standard maps

Rasters

Operation	GIS menu	R function
Crop	Clip/mask	`crop(xraster, xextent)`
Aggregate cells	Aggregate (Spatial Analyst)	`aggregate(xraster, fact = y)`
Disaggregate cells	Resample (Data Management)	`disaggregate(xraster, fact = y)`
Change resolution or origin	Resample (Data Management)	`resample(xraster, yraster)`
Combine two layers	Raster Calculator (Spatial Analyst)	`overlay(xraster, yraster,fun = xfun)`
Shortest distance	Euclidean Distance (Spatial Analyst)	`distance(xraster, xextent)`
Distance from a set of points	Euclidean Distance (Spatial Analyst)	`distanceFromPoints(xraster, xpoints)`
Area of cells	Tabulate Area (Spatial Analyst)	`area(xraster)`
Summary of values	Raster Calculator (Spatial Analyst)	`cellStats(xraster, stat='mean')`
Summaries by zones	Zonal Geometry (Spatial Analyst)	`zonal(xraster,zones.raster, fun='mean')`
Change projection	Project Raster (Data Management)	`projectRaster(from = xraster, to = yraster, method ='bilinear')`

Combining shapes and rasters

Operation	GIS menu	R function
Make a raster from shape	PolygonToRaster_conversion	`rasterize(xshape, xraster)`
Make points from a raster	RasterToPoint_conversion	`rasterToPoints(xraster)`
Make polygons from a raster	RasterToPolygon_conversion	`rasterToPolygon(xraster)`
Query between spatial objects and rasters	Sample, Extract by Points, Extract by Polygons (Spatial Analyst)	`extract(xpoly)`

Shapefiles

Operation	GIS menu	R function
All shapes		
Clip using a rectangle	Clip	`crop(xpoly)`
Select spatial objects by drawing	Select	`select(xpoly)`
Clip using a rectangle	Clip	`click(xpoly)`
Click on map to identify spatial objects	Identity	`merge(xpoly)`
Combine spatial objects	Append	`bind(xpoly)`
Query between spatial objects	Select	`over(xpoly)`
Coordinates at a location	hover mouse over the location	`locator(1)` then click on figure
Polygons		
Aggregate polygons together	Dissolve	`aggregate(xpoly)`
Split polygon into separate parts	Explode	`disaggregate(xpoly)`
Erase parts of a spatial polygon	Erase	`erase(xpoly)`
Intersection of spatial polygons	Intersect	`intersect(xpoly)`
Union of spatial polygons	Union	`union(xpoly)`
Change a spatial polygon by overlaying values from another	Identity and Update	`cover(xpoly)`
Symmetrical differences of spatial polygons	Symmetrical Differences	`symdif(xpoly)`
Area of a polygon	Geometry calculator	`gArea(xpoly)`
Draw a polygon	Create feature	`drawPoly()` then click on figure
Lines		
Length of a line	Geometry calculator	`gLength(xline)`
Points		
Distance between points	Point distance	`gDistance(xpoint, byid=T)`

Loading and saving files

Load a shapefile : `readOGR('.', 'filename')`
Save a shapefile :
`writeOGR(xshape, dsn ='dsn', layer = 'layer', driver = 'ESRI Shapefile')`
Load a raster: `raster('filename')`
Save a raster : `writeRaster(xraster, 'filename', format='ascii')`

This is an ongoing project, feel free to email us with suggestions. We are keen to improve this cheat sheet, but also keep it simple.
Cheers, Chris Brown [https://sites.google.com/site/seascapemodelling/],
Ross Dwyer [http://www.uq.edu.au/eco-lab/ross-dwyer]