Week 3: Use R as GIS

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Basic R cheat sheet

R cheat sheet

Spatial objects in R

	Without attributes	With attributes
Points	SpatialPoints	SpatialPointsDataFrame
Lines	SpatialLines	SpatialLinesDataFrame
Polygons	SpatialPolygons	SpatialPolygonsDataFrame
Raster	SpatialGrid	SpatialGridDataFrame
Raster	SpatialPixels	SpatialPixelsDataFrame

Commonly used GIS-related packages

- Basic: `sp`
- Input and output: `rgdal`
- Mapping: `RColorBrewer`, `classInt`
- Raster: `raster`
- Overlay `sp`, `rgeos`

Open a spatial dataset

- Open a shapefile: `readShapePoly` or `readOGR`
- Open a raster: `raster`
- Open from a remote data repository: `getData`

Mapping with R

Basic Mapping

- Display a map: `plog`
- Color selection: `brewer.pal`, `classIntervals` and `findColours`
- Legend: `legend`
- North arrow: `north.arrow`

Mapping with static Google Maps

- Use Google Maps as a base map: `GetMap` from library `RgoogleMaps`
- Make sure spatial data has right projection information

Mapping with dynamic Google Maps

- Use Google Maps as a base map: `plotGoogleMaps` from library `plotGoogleMaps`
- Make sure spatial data has right projection information

Changing map projections

- Query or specify projection information: `proj4string()`
- Change map project of a vector dataset: `spTransform()`
- Change map project of a raster dataset: `projectRaster()`

Spatial analysis with R

Basic operation

- `crop` or `erase`

vector analysis (overlay)

- Overlay: `over()`

Raster analysis

- Raster overlay, raster calculator
- Slope, aspect: `terrain()`
- Hill shade: `hillShade()`
- Contour lines: `contour()`
- Crop a raster: `crop()`

Reading

Chapters 2-4 of Applied Spatial Data Analysis with R