Interfacing GRASS 6 and R: current status

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1 Introduction

As Wegmann and Lennert (2005) show in the 2004 GRASS user survey, users of GRASS have found the interface between GRASS 5 and the R data analysis programming language and environment of at least some value. The R interface was mentioned by 119 respondents (40 %) in (Wegmann and Lennert, 2005, p. 15, Fig. 57), so that, despite the command line interface and syntax complications of R, the interface has served some purposes (see for example Grohmann (2004)). The interface as documented first in Bivand (2000), and fully in Neteler and Mitasova (2004), works with GRASS releases up to and including GRASS 5.4.0. This note is intended to show which design choices have been made when interfacing GRASS 6 and R, and how much progress has been made since the GRASS News note of mid 2005 on which this is based (Bivand, 2005).

The GRASS 5 interface to R is an R contributed package, and is available from CRAN, the Comprehensive R Archive Network as described by (Neteler and Mitasova, 2004, section 13.2). It ships with a snapshot of a subset of source files from the core GRASS libr20052001317(re) a63 -374a63 -hat,ram ch955210(a6-2sett2.841 5)-A1.-297(the)-297(corepshot5963 Tnd)

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```
> spear <- readRAST6(c("elevation.dem", "landcover.30m"),
+     cat = c(FALSE, TRUE), ignore.stderr = TRUE)
> summary(spear)
Object of class SpatialGridDataFrame
Coordinates:
              min     max
coords.x1  589980  609000
coords.x2 4913700 4928010
Is projected: TRUE
proj4string : []
 proj4string : [+proj=utm]
 proj4string : [+zone=13]
 proj4string : [+a=6378206.4]
 proj4string : [+rf=294.9786982]
 proj4string : [+no_defs]
 proj4string : [+nadgrids=/home/rsb/topics/grass62_0820/grass-6.2.cvs/etc/nad/conus]
Number of points: 2
Grid attributes:
  cellcentre.offset cellsize cells.dim
```

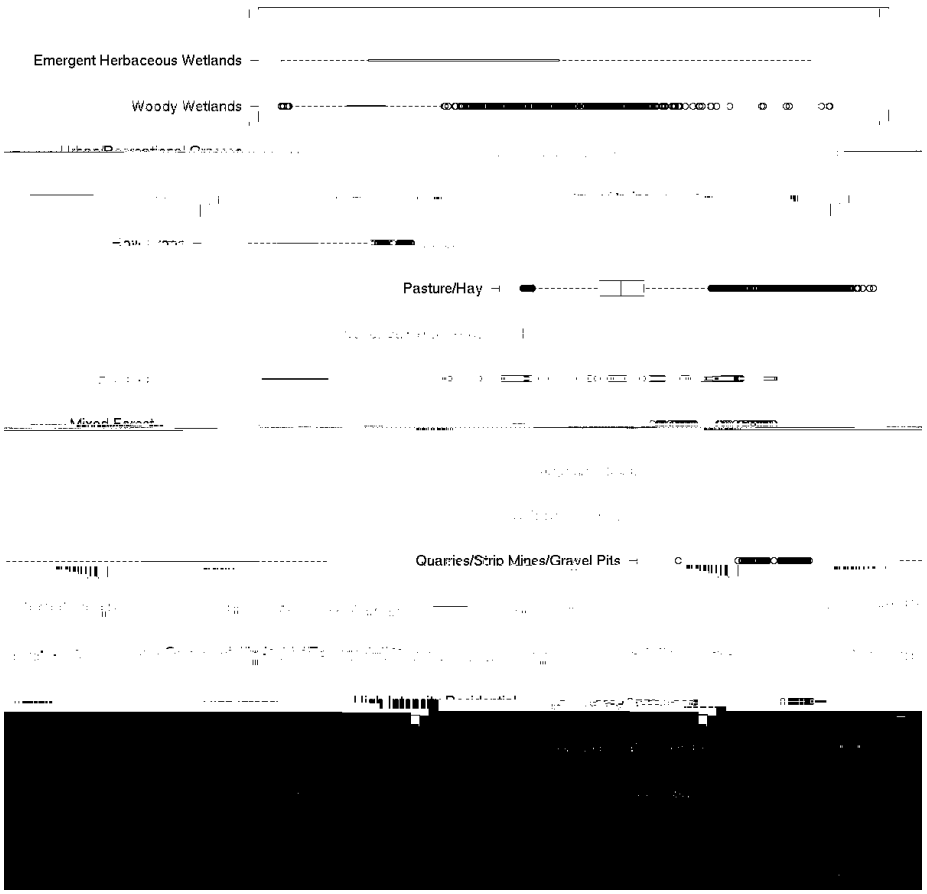

Figure 2: Boxplot of elevation by landcover types in the Spearfish region; the box

A function `writeRAST6` for moving numeric raster layers to GRASS from R has also been provided; this uses `r.in.gdal` and again the binary grid format. A helper function has also been written to generate a GridTopology object from the current GRASS region:

```
Is projected: TRUE
proj4string : []
 proj4string : [+proj=utm]
 proj4string : [+zone=13]
 proj4string : [+ellps=clrk66]
 proj4string : [+datum=NAD27]
 proj4string : [+units=m]
 proj4string : [+no_defs]
 proj4string : [+nadgrids=@conus,@alaska,@ntv2_0.gsb,@ntv1_can.dat]
Data attributes:
      cat        label
 Min.   :0.000   :116
 1st Qu.:1.000
 Median :2.000
 Mean   :1.621
 3rd Qu.:2.000
 Max.   :3.000
```

The choice of type and other decisions about data import can be guided by three helper functions:

```
> vInfo("streams", ignore.stderr = TRUE)
```

```
    points      lines boundaries  centroids      areas    islands
faces    kernee[(fapc-mor=e0lper)-250(functio-446439s:)]TJ/F84 7.97 Tf 0 Columns369 Td[(>)-600(vInf
```

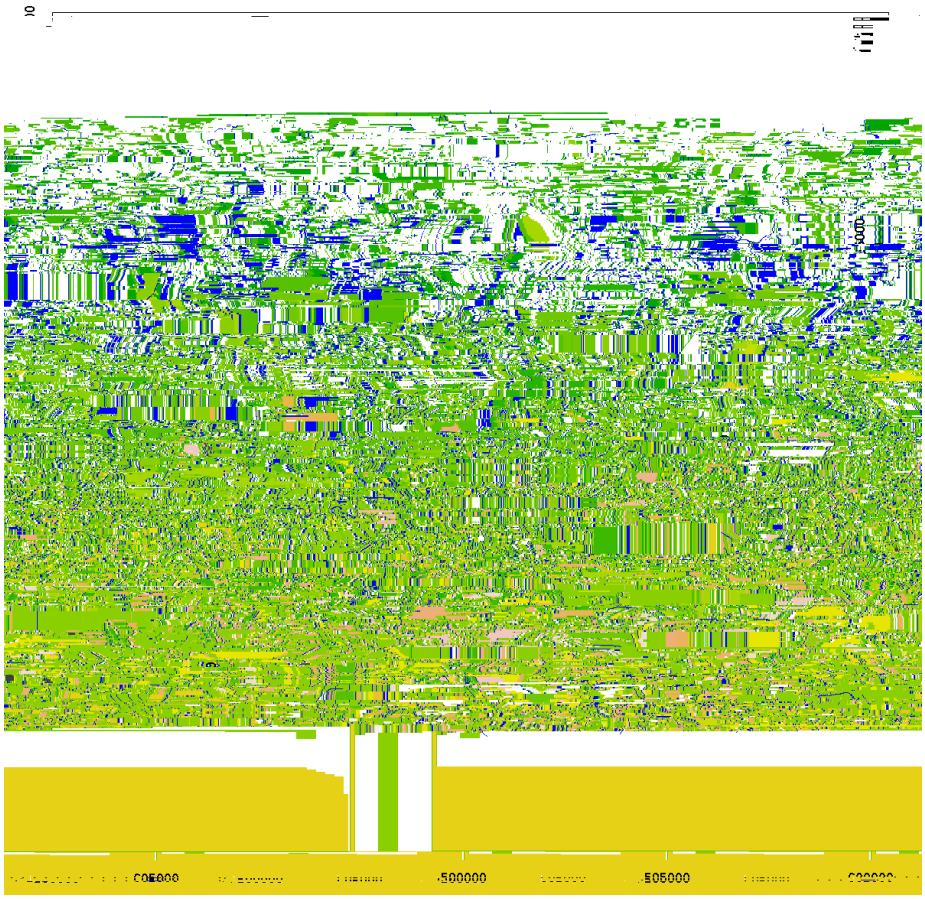

Figure 3: Spearfish elevation map with stream centerlines and bugsites.

```
proj4string : []
```

Bivand, R. S., (2005) Interfacing GRASS 6 and R. *GRASS-News*, 3, 11–16.

Grohmann, C. H., (2004) Morphometric analysis in geographic information systems: applications of free software GRASS and R *Computers and Geosciences*, 30, 1055–1067.

Neteler, M. and Mitasova, H., (2004) *Open Source GIS: A GRASS GIS Approach. Second Edition*. Kluwer Academic Publishers, Dordrecht.

Pebesma, E.J., (2004) Multivariable geostatistics in S: the gstat package. *Computers and Geosciences*, 30: 683-691.

Wegmann, M. and Lennert, M., (2005) GRASS User Survey 2004 *GRASS-News*, 2, 2–16.