Geostatistics: Integration of R in gvSIG

What is R?
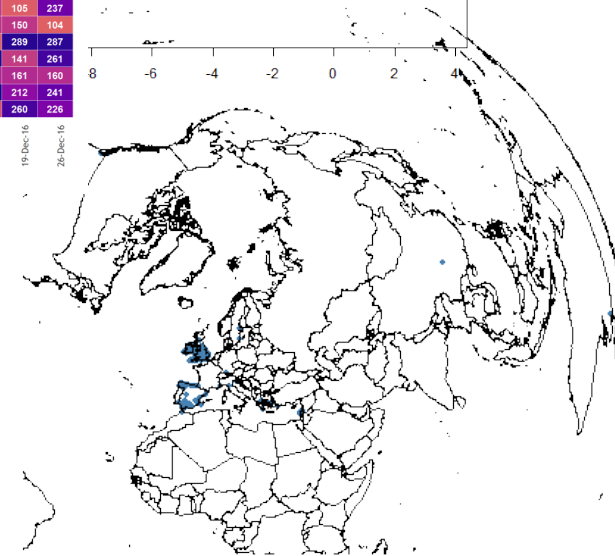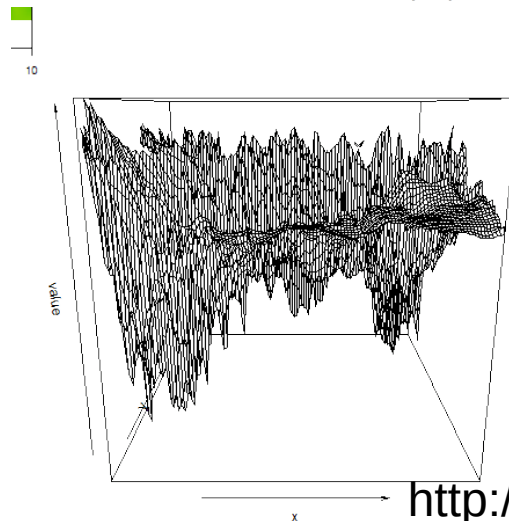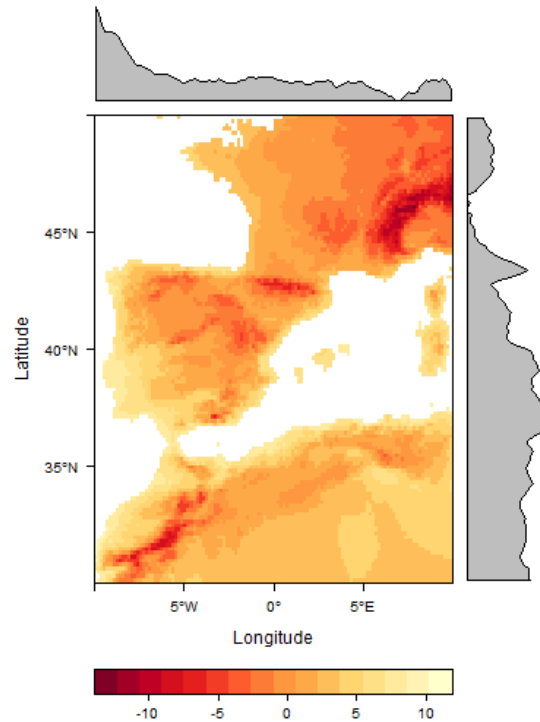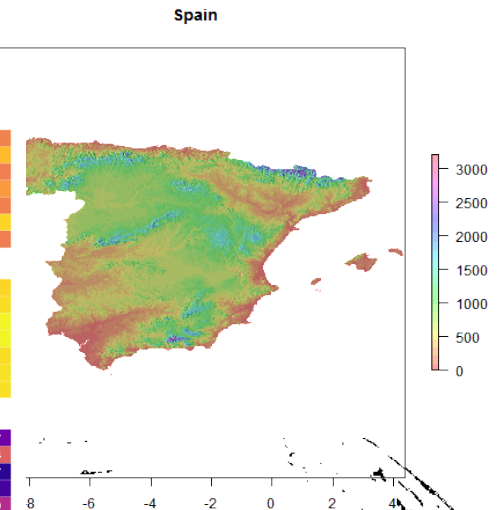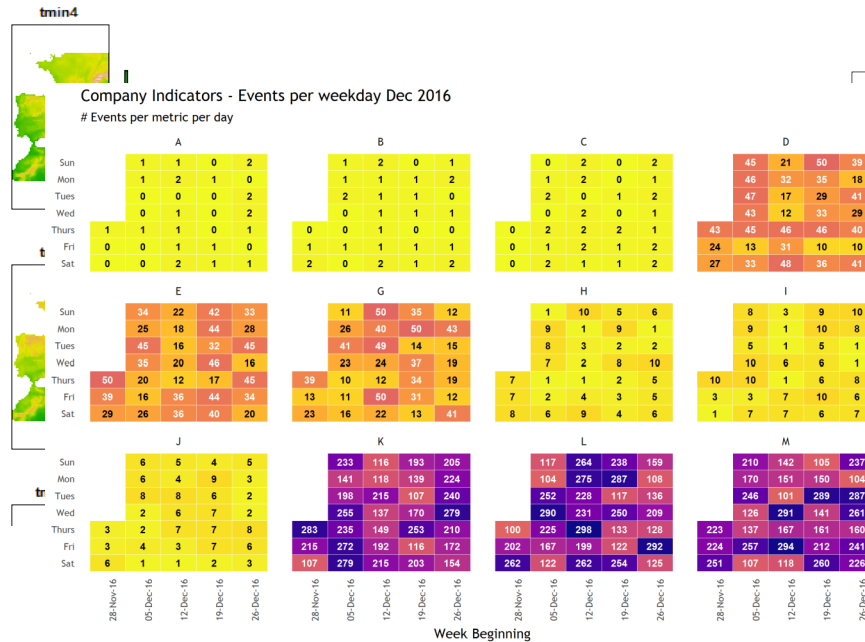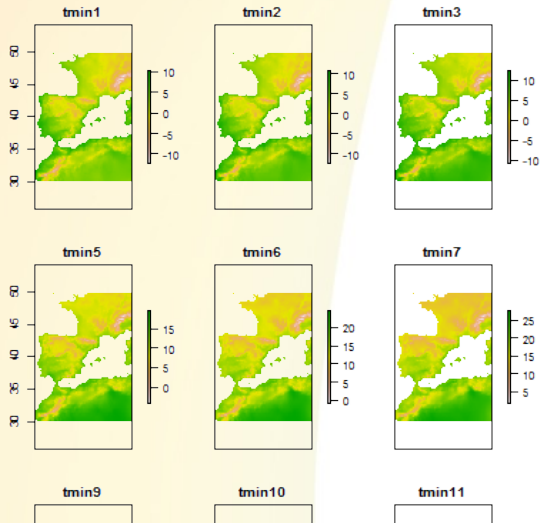
- Open source programming language

- Full software environment for statistical computing and graphics

- Widely used in multiple fields: from economy to biogenetic and geostatistics

- Multi-platform software: UNIX, Windows and MacOS

https://www.r-project.org/
https://en.wikipedia.org/wiki/R_(programming_language)

What will allow us R?

http://pakillo.github.io/R-GIS-tutorial/

R: Contributed packages

Packages for almost everything

- Official packages repository: CRAN (**C**omprehensive **R** **A**rchive **N**etwork)

  > *install.packages()*

Secure CRAN mirrors

```
0-Cloud [https]
Algeria [https]
Australia (Canberra) [https]
Australia (Melbourne) [https]
Australia (Perth) [https]
Austria [https]
Belgium (Ghent) [https]
Brazil (RJ) [https]
Brazil (SP 1) [https]
Bulgaria [https]
Chile 1 [https]
China (Lanzhou) [https]
Colombia (Cali) [https]
Czech Republic [https]
Denmark [https]
Estonia [https]
France (Lyon 1) [https]
France (Lyon 2) [https]
France (Marseille) [https]
France (Montpellier) [https]
France (Paris 2) [https]
Germany (Göttingen) [https]
Germany (Münster) [https]
Iceland [https]
Indonesia (Jakarta) [https]
Ireland [https]
Italy (Padua) [https]
Japan (Tokyo) [https]
Malaysia [https]
Mexico (Mexico City) [https]
Norway [https]
Philippines [https]
Russia (Moscow) [https]
Serbia [https]
Spain (A Coruña) [https]
Spain (Madrid) [https]
Sweden [https]
```

```
R Rterm (64-bit)                                           —  □  ×

Platform: x86_64-w64-mingw32/x64 (64-bit)

R es un software libre y viene sin GARANTIA ALGUNA.
Usted puede redistribuirlo bajo ciertas circunstancias.
Escriba 'license()' o 'licence()' para detalles de distribucion.

R es un proyecto colaborativo con muchos contribuyentes.
Escriba 'contributors()' para obtener más información y
'citation()' para saber cómo citar R o paquetes de R en publicaciones.

Escriba 'demo()' para demostraciones, 'help()' para el sistema on-line de ayuda,
o 'help.start()' para abrir el sistema de ayuda HTML con su navegador.
Escriba 'q()' para salir de R.

> install.packages("tmap")
Installing package into 'C:/Users/oskmo/Documents/R/win-library/3.4'
(as 'lib' is unspecified)
--- Please select a CRAN mirror for use in this session ---
```
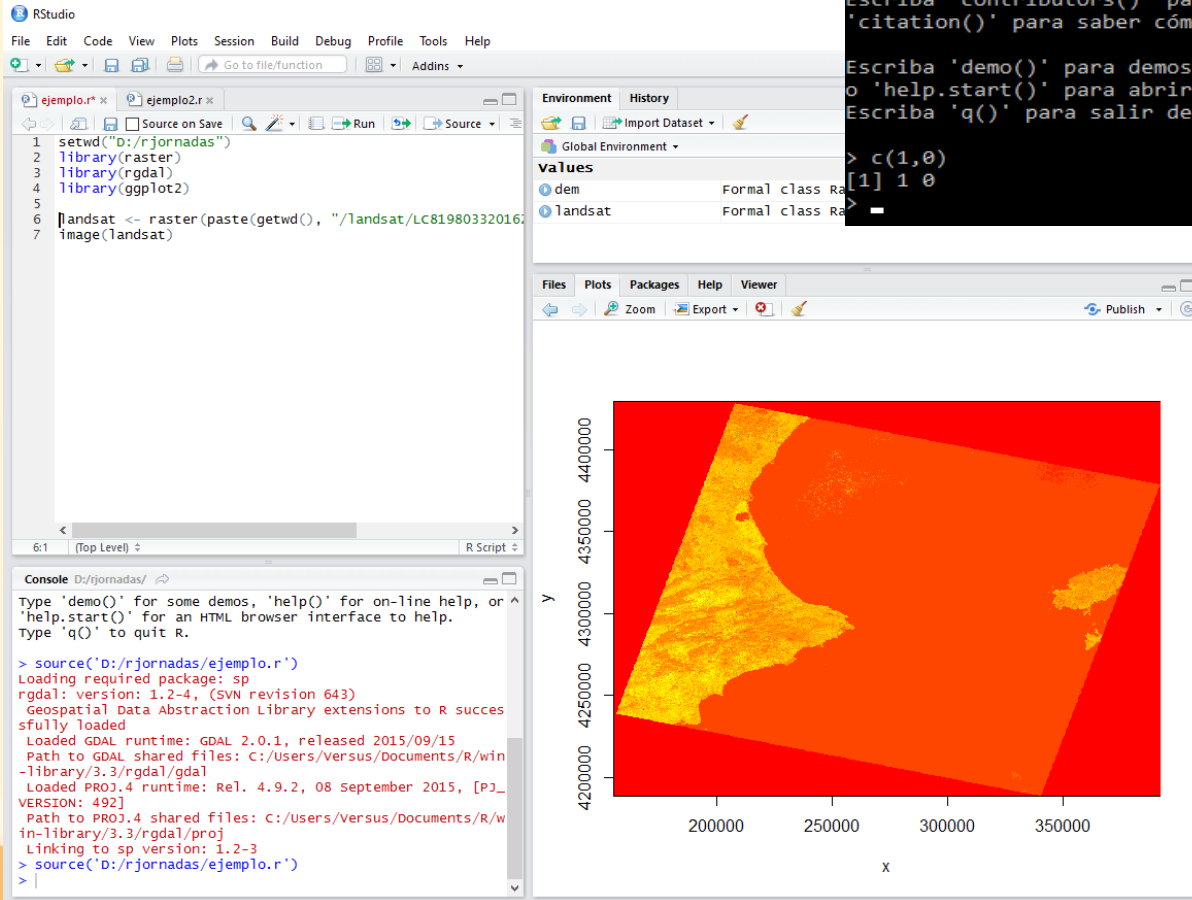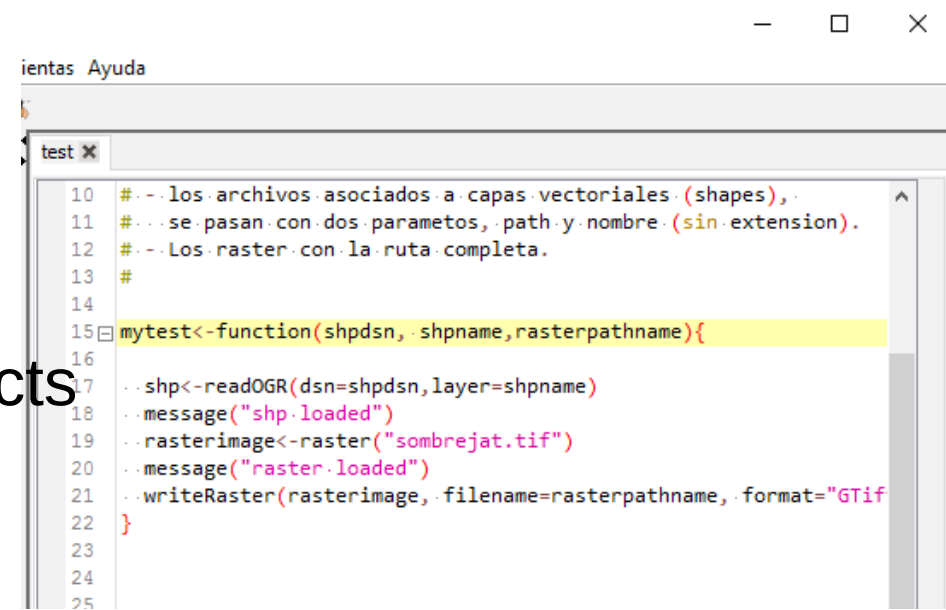
R: Contributed packages

Date	Package	Title
2017-05-17	assertable	Verbose Assertions for Tabular Data (Data.frames and Data.tables)
2017-05-17	Directional	Directional Statistics
2017-05-17	HardyWeinberg	Statistical Tests and Graphics for Hardy-Weinberg Equilibrium
2017-05-17	irlba	Fast Truncated Singular Value Decomposition and Principal Components Analysis for Large Dense and Sparse Matrices
2017-05-17	jmvcore	Dependencies for the 'jamovi' Framework
2017-05-17	tibble	Simple Data Frames
2017-05-17	wally	The Wally Calibration Plot for Risk Prediction Models
2017-05-16	assignPOP	Population Assignment using Genetic, Non-Genetic or Integrated Data in a Machine-Learning Framework
2017-05-16	CluMix	Clustering and Visualization of Mixed-Type Data
2017-05-16	corpus	Text Corpus Analysis
2017-05-16	distcomp	Computations over Distributed Data without Aggregation
2017-05-16	dtwSat	Time-Weighted Dynamic Time Warping for Satellite Image Time Series Analysis
2017-05-16	ECOSolveR	Embedded Conic Solver in R
2017-05-16	EmpiricalCalibration	Routines for Performing Empirical Calibration of Observational Study Estimates
2017-05-16	epicontacts	Handling, Visualisation and Analysis of Epidemiological Contacts
2017-05-16	ExcessMass	Excess Mass Calculation and Plots
2017-05-16	FatTailsR	Kiener Distributions and Fat Tails in Finance
2017-05-16	fmsb	Functions for Medical Statistics Book with some Demographic Data
2017-05-16	genoPlotR	Plot Publication-Grade Gene and Genome Maps
2017-05-16	geoparser	Interface to the Geoparser.io API for Identifying and Disambiguating Places Mentioned in Text
2017-05-16	glm.predict	Predicted Values and Discrete Changes for GLM
2017-05-16	hommel	Methods for Closed Testing with Simes Inequality, in Particular Hommel's Method
2017-05-16	kdecopula	Kernel Smoothing for Bivariate Copula Densities
2017-05-16	lessR	Less Code, More Results
2017-05-16	LocalControl	Local Control: An R Package for Generating High Quality Comparative Effectiveness Evidence
2017-05-16	monkeylearn	Accesses the Monkeylearn API for Text Classifiers and Extractors
2017-05-16	MultiPhen	A Package to Test for Pleiotropic Effects
2017-05-16	poisbinom	A Faster Implementation of the Poisson-Binomial Distribution
2017-05-16	prcr	Person-Centered Analysis
2017-05-16	PROscorer	Functions to Score Commonly-Used Patient-Reported Outcome (PRO) Measures and Other Psychometric Instruments

Currently, the CRAN package repository features 10633 available packages.

https://cran.r-project.org/web/packages/available_packages_by_date.html

R: Tools

- R Term

- RStudio

Integration of R in gvSIG

- Multiples options

- Through Scripting Module

- Main objective -> Extend gvSIG possibilities:

  - Creating new geoprocesses

  - New functionalities

  - Include R functions in our tools (part of one script)

  - Generate new type of graphs and reports

  - ...

R in gvSIG: Renjin

- Pros:
  - R implementation in Java
  - Fully integrated with gvSIG
  - Works directly with Java objects

- Cons:
  - Packages very limited
  - Not fully functional
  - In development

```
ientas  Ayuda

test ✕
10   #·-·los·archivos·asociados·a·capas·vectoriales·(shapes),·
11   #·-·se·pasan·con·dos·parametos,·path·y·nombre·(sin·extension).·
12   #·-·Los·raster·con·la·ruta·completa.·
13   #
14
15   mytest<-function(shpdsn,·shpname,rasterpathname){
16
17   ··shp<-readOGR(dsn=shpdsn,layer=shpname)
18   ··message("shp·loaded")
19   ··rasterimage<-raster("sombrejat.tif")
20   ··message("raster·loaded")
21   ··writeRaster(rasterimage,·filename=rasterpathname,·format="GTif
22   }
23
24
25
```

renjin

http://www.renjin.org/
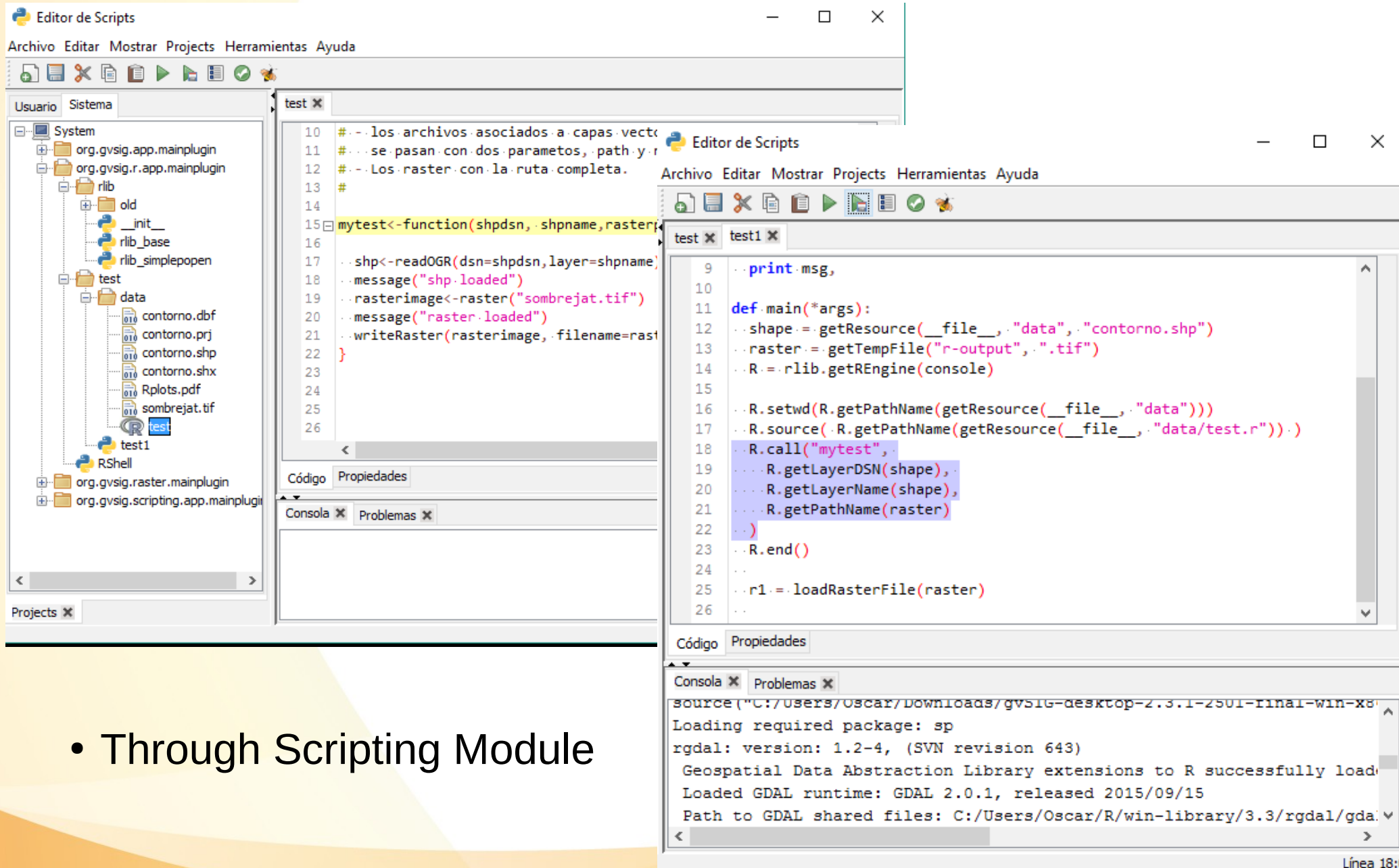
R in gvSIG: Internal R

- Pros:
  - Compatible with all R libraries
  - Included in gvSIG as part of a plugin
  - Easy to install, included in gvSIG Installation and portable

- Cons:
  - Limited integration
  - More complicated to build a tool (libraries management)
  - Not fully updated (option manually)

R in gvSIG: External R

- Pros:
  - Compatible with all libraries
  - Easy to develop (use same R than external tools)

- Cons:
  - Limited integration
  - External installation (not inside gvSIG)
  - Hard to pack in a tool

R in gvSIG: Execution

- Through Scripting Module

Documentation: R Workshop
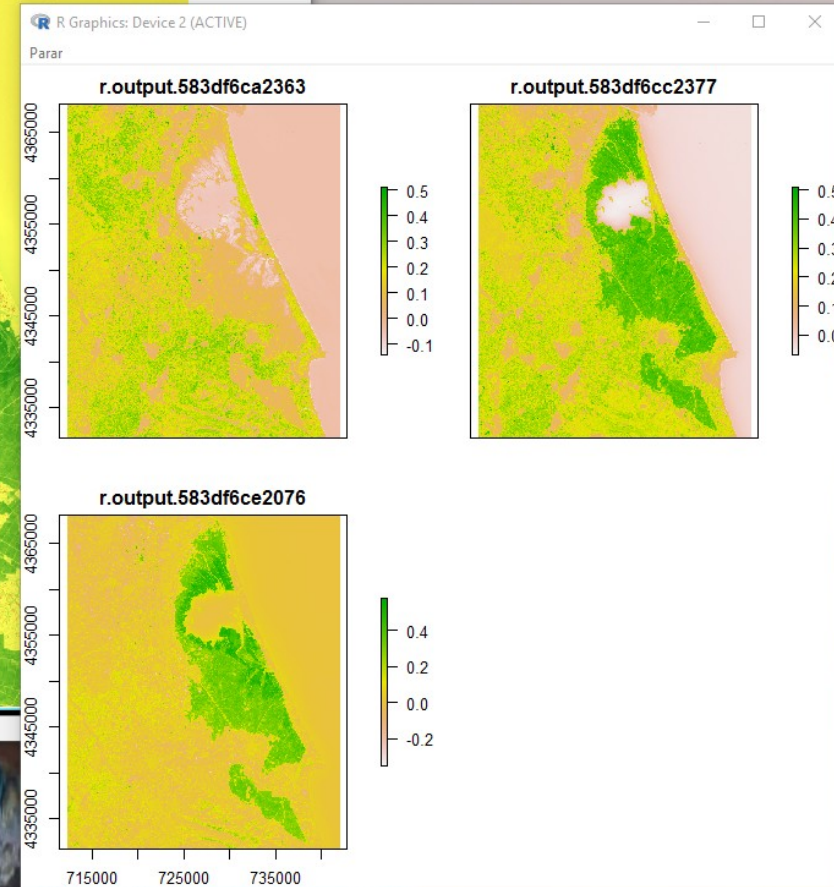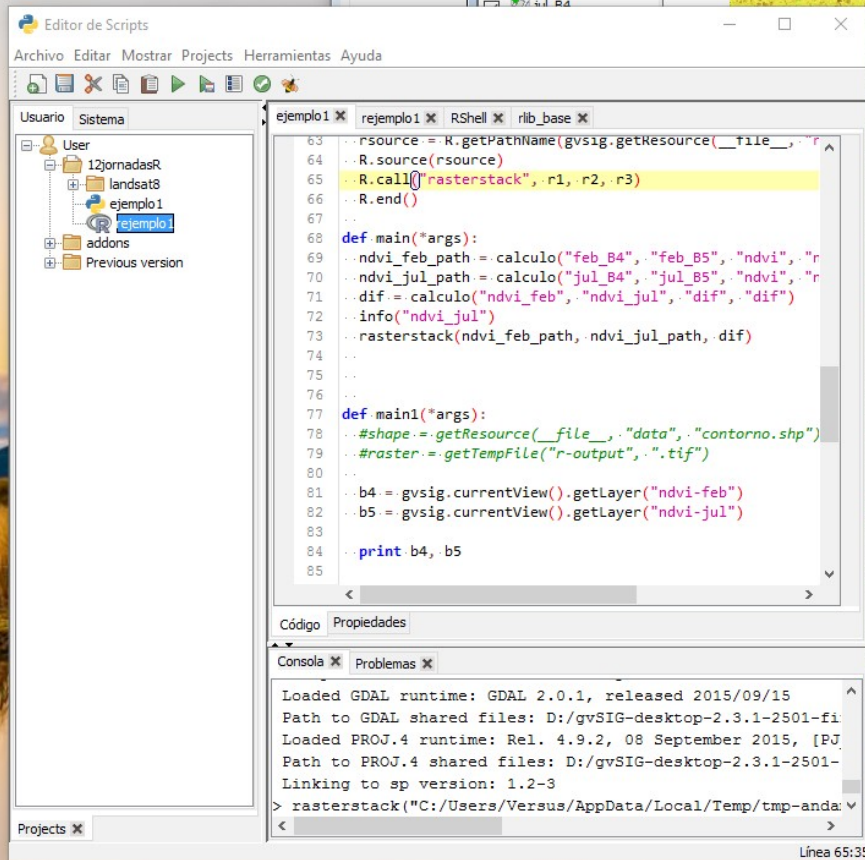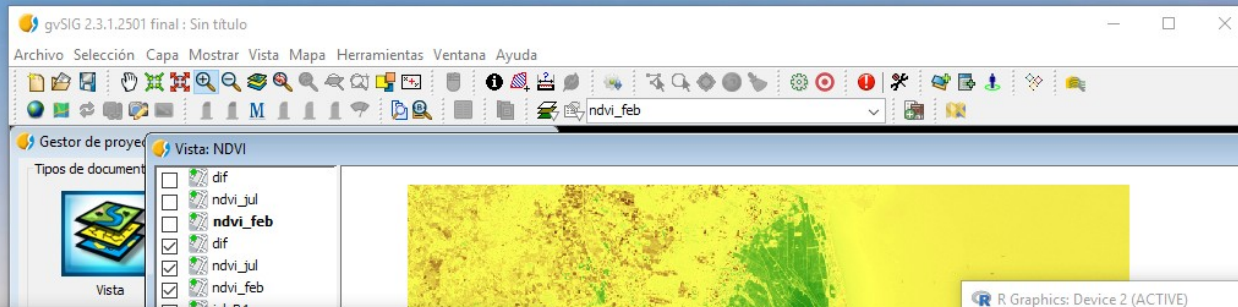
Thanks for being here!

gvSIG Developers List:
http://www.gvsig.com/en/community/mailing-lists

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omartinez@gvsig.com