

# Community based software development: The GRASS GIS project

*Seminar at  
Department of Information and  
Communication Technology  
University of Trento, 24 Apr 2007*

*M. Neteler  
neteler at itc it  
<http://mpa.itc.it>  
ITC-irst, Povo (Trento), Italy*

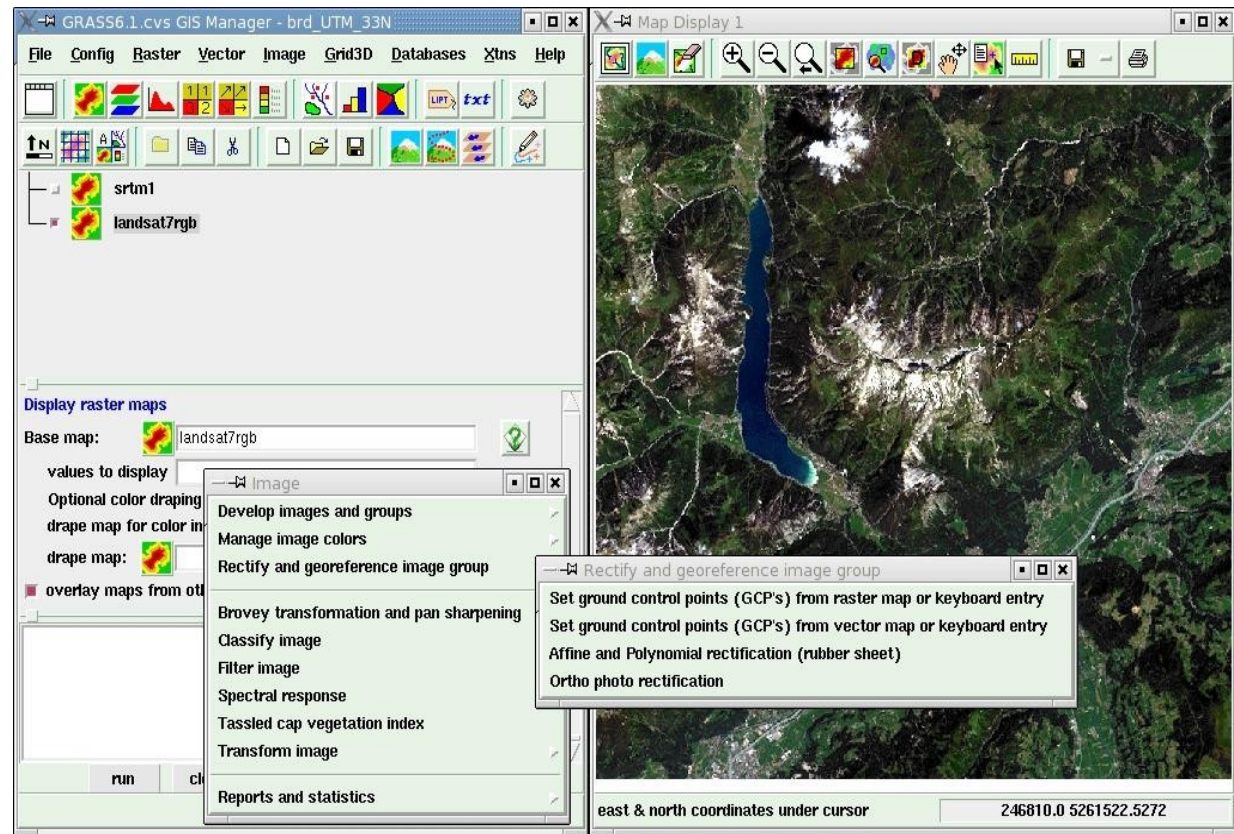
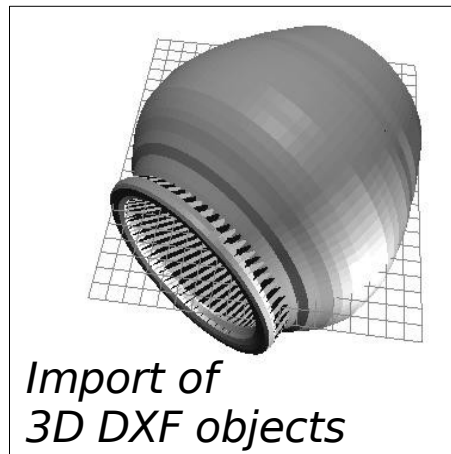


# Seminar Outline

- Introduction to the GRASS project
- Communication structure
- Code development
- Structure of the development team:  
be collaborative in the cyberspace
- Legal Issues

# Objectives of GRASS project

- Continue to develop free software GIS (since 1982)
- Deliver high quality algorithms (often academia based) for
  - spatial data analysis
  - innovative visualization
  - modeling and simulation





# Desktop GIS: GRASS GIS

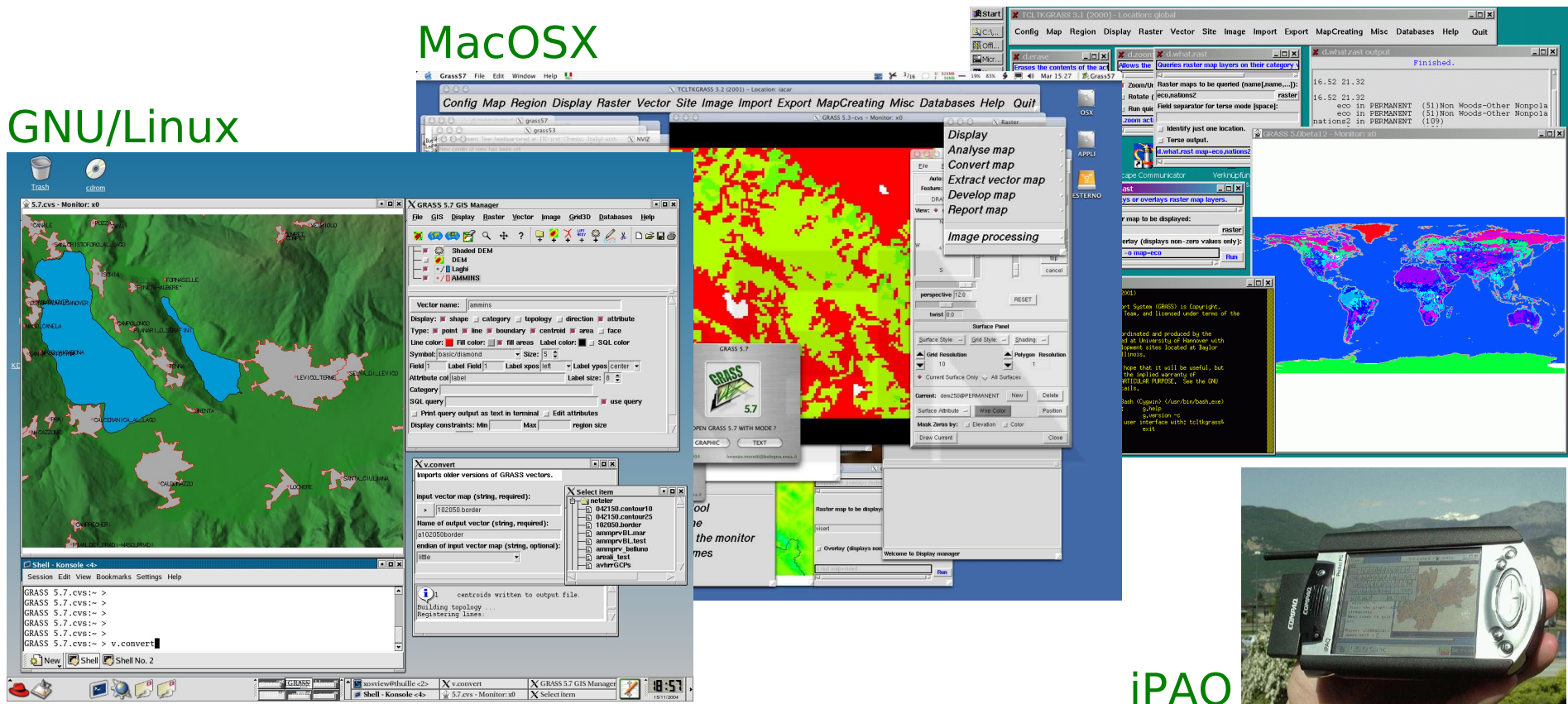
## Brief Introduction – Development and System Requirements

- Developed since 1984, **always Open Source**, since 1999 under GNU General Public License
- Written in C programming language, **portable code** (32/64bit)
- International development team**, since 2001 coordinated at ITC-irst
- Distributed as source code, precompiled binaries for various platforms, CDROM

MS-Windows

MacOSX

GNU/Linux



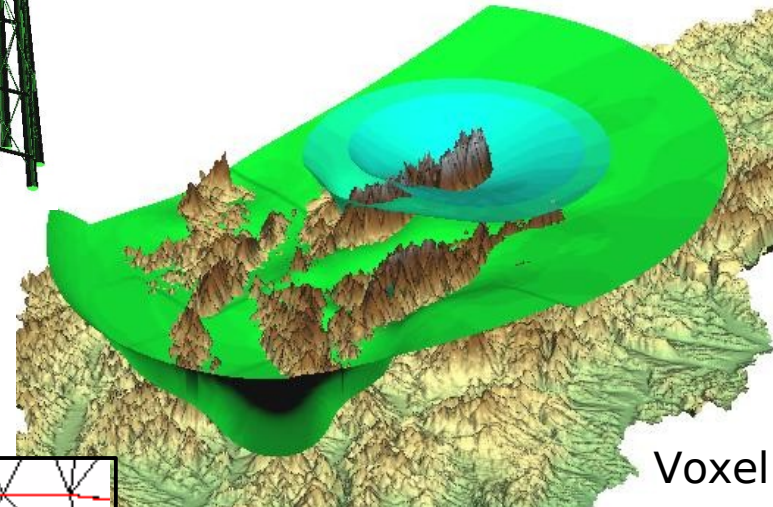
iPAQ

# Spatial Data Types

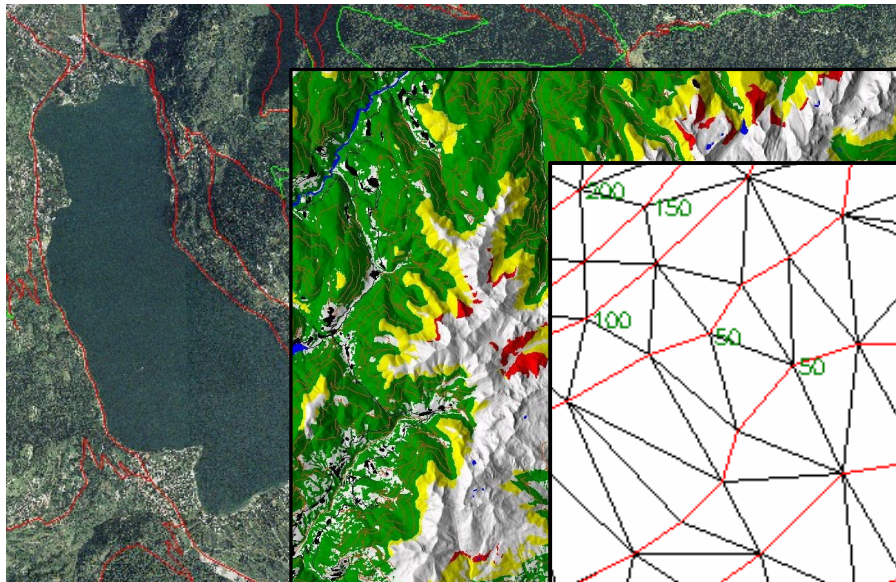
## Supported Spatial Data Types

- 2D Raster data incl. image processing
- 3D Voxel data for volumetric data
- 2D/3D Vector data with topology
- Multidimensional points data

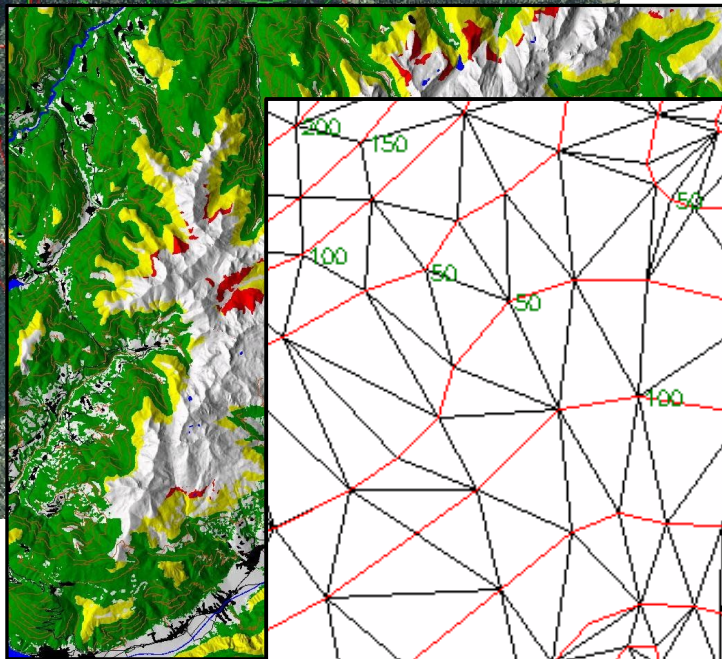
<http://grass.itc.it>



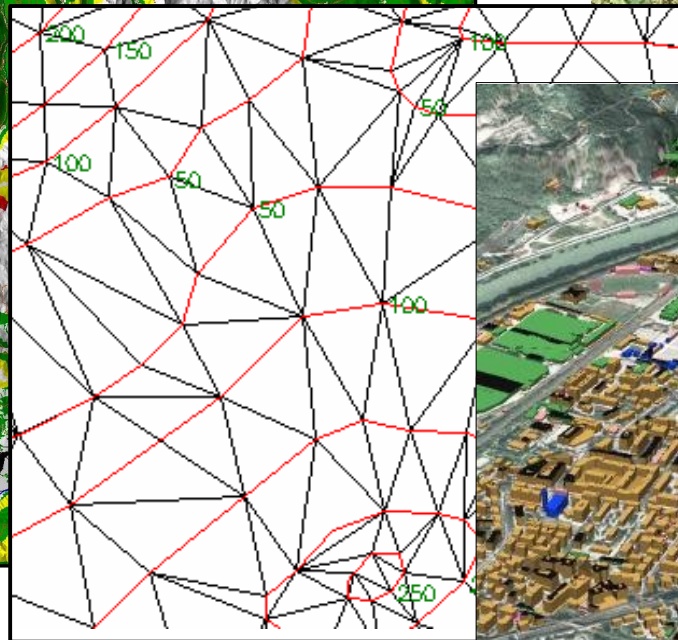
Voxel



Orthophoto



Distances



Vector TIN



3D Vector buildings



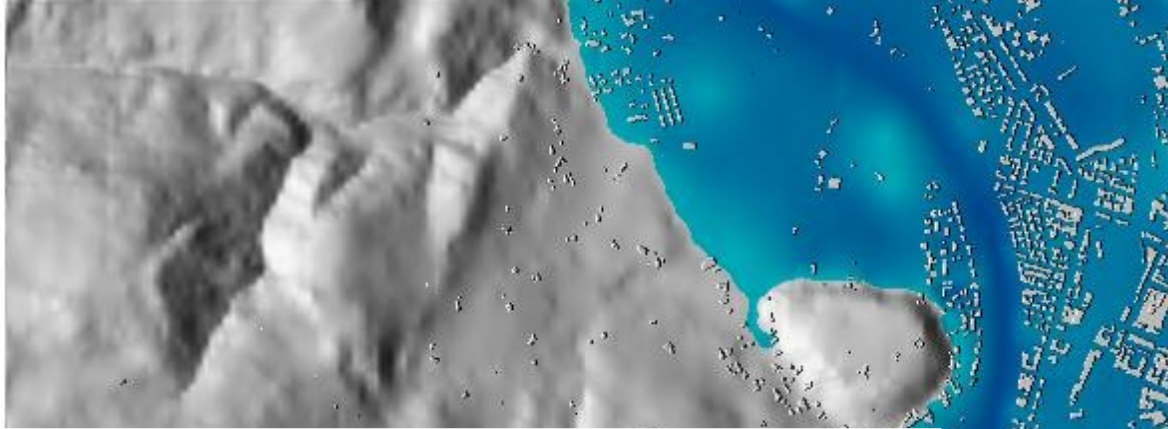
## QGIS Geodata viewer with GRASS toolbox, GPS support, Printing Editor ...

<http://qgis.org>

The screenshot displays the Quantum GIS 0.9.0-UNstable interface. The main window shows a map with a red path overlaid on a terrain map. The legend on the left lists various layers, including 'J. McCandles#1' through 'J. McCandles#7', 'J. Wales#1', 'L. Donovan#1' through 'L. Donovan#3', 'P. Biggam#1' through 'P. Biggam#11', 'P. Biggam#2' through 'P. Biggam#5', 'P. Biggam#6', 'P. Biggam#7', 'P. Biggam#8', 'P. Biggam#9', 'P. Biggam#10', 'P. Biggam#11', 'G. Tandy#1', 'C. Mitchell#1' through 'C. Mitchell#5', 'D. Liston#1' through 'D. Liston#6', 'D. Sedgwick#1', 'D. Sedgwick#2', 'D. Sedgwick#3', 'D. Portillo#1', 'C. Krenshaw#1' through 'C. Krenshaw#6', 'V. White#1', 'roads\_n\_label', 'interstate', 'light-duty', 'primary', 'secondary', 'unimpro', 'elevation', and 'aspect.1'. The GRASS Tools dialog box is open, showing a list of modules under 'Vector overlay', 'Buffer', 'Extract features from vector', 'Geometry management', 'Delaunay triangulation, Voronoi diagram and conve...', 'Network analysis', and 'Reclass category values'. The 'GPS Tools' dialog box is also open, showing options for 'Load GPX file', 'Import other file', 'Download from GPS', and 'Upload to GPS'. The 'GPS Tools' dialog box includes a 'GPS device' dropdown menu set to 'Garmin serial', a 'Port' dropdown menu set to '/dev/ttyS0', a 'Feature type' dropdown menu set to 'Waypoints', and an 'Output file' field. The 'Layer name' field is empty. The 'GPS Tools' dialog box also includes a 'Help' button and 'OK' and 'Cancel' buttons. The status bar at the bottom shows the scale as 1:7736048191 and 595104.4822218, and a 'Render' button.

# GRASS new features

## Flood simulation Trento 1966



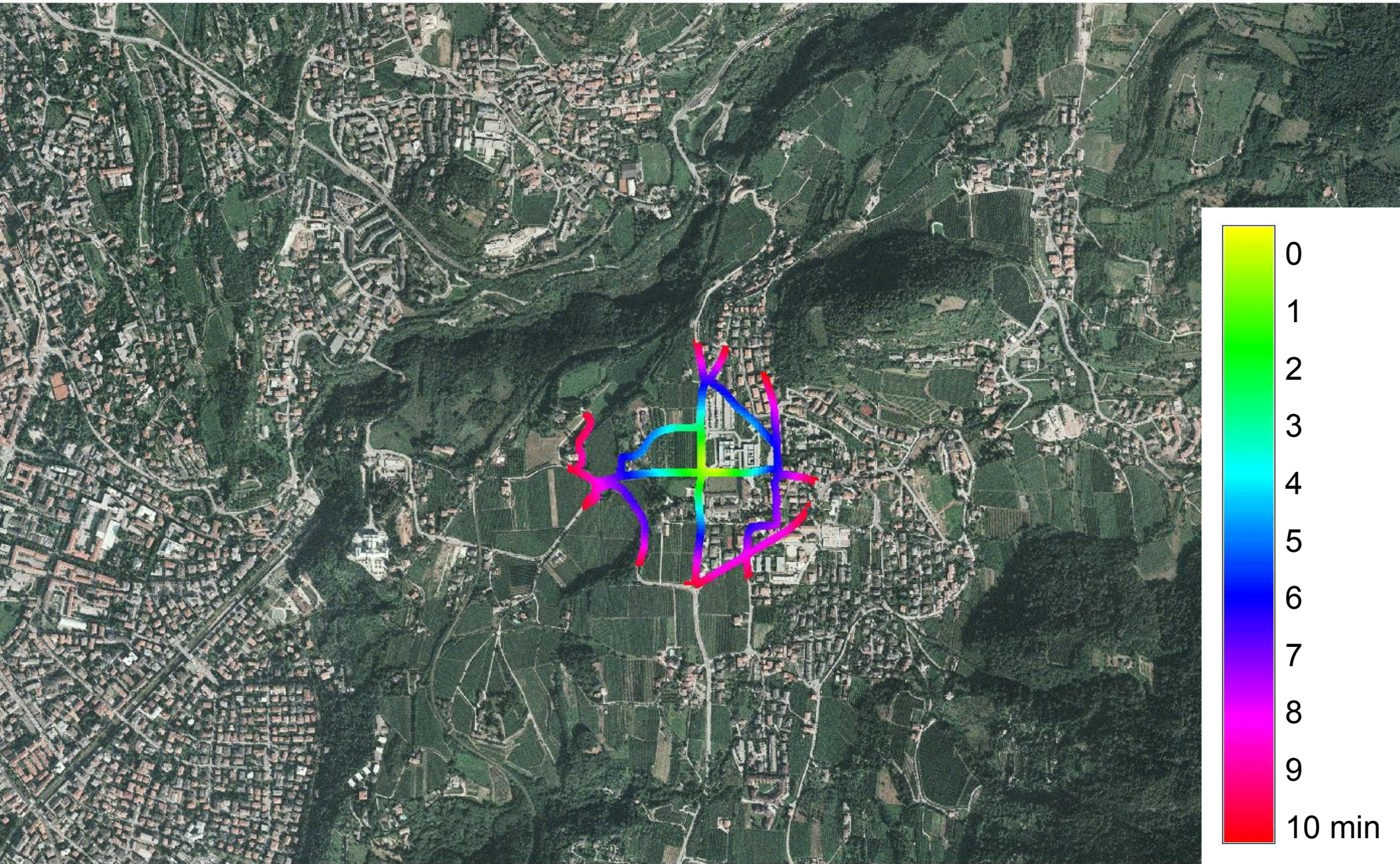
Courtesy:  
[www.questotrentino.it](http://www.questotrentino.it)



Piazza  
Duomo

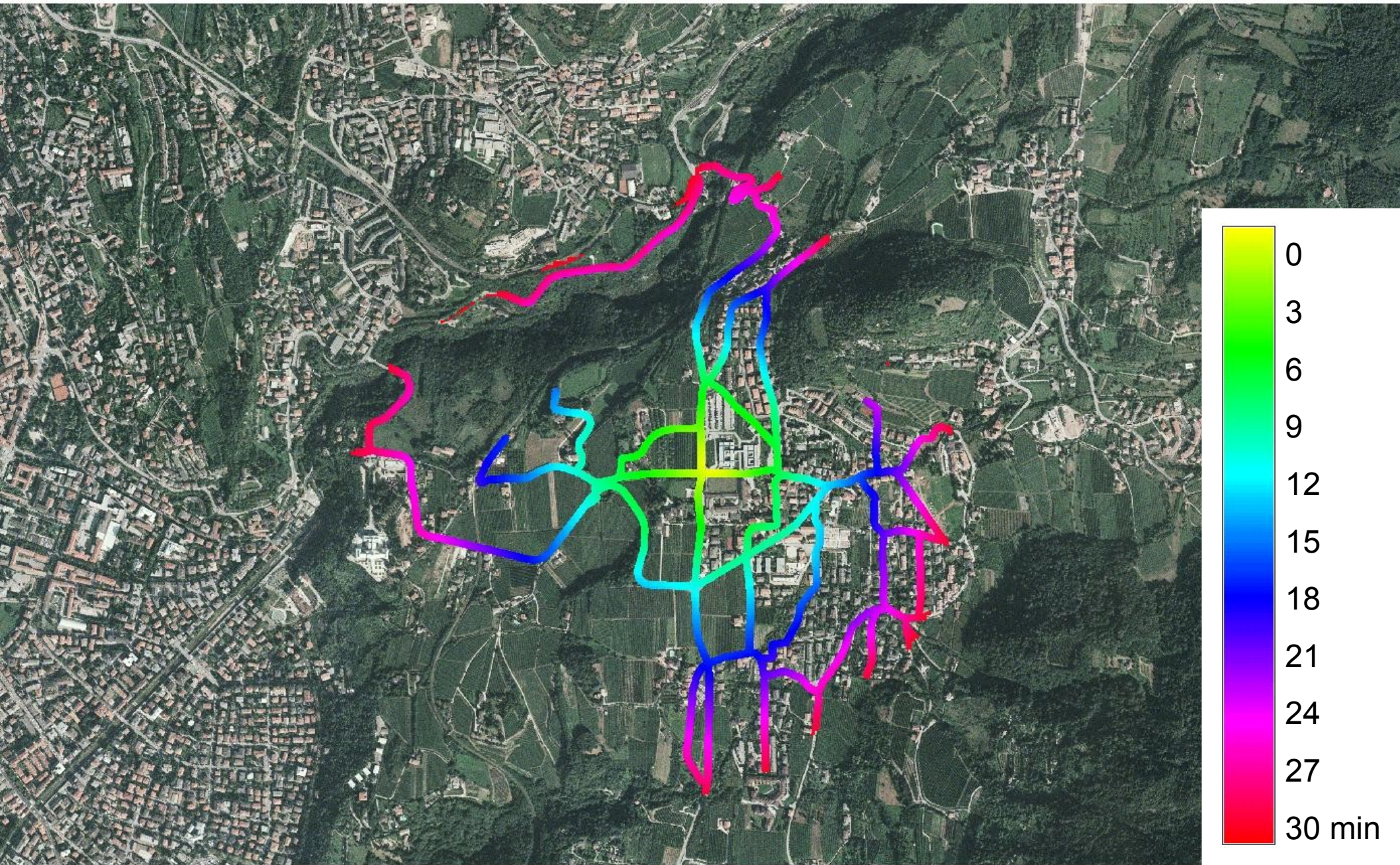


# GRASS: Person walking distance 10 minutes





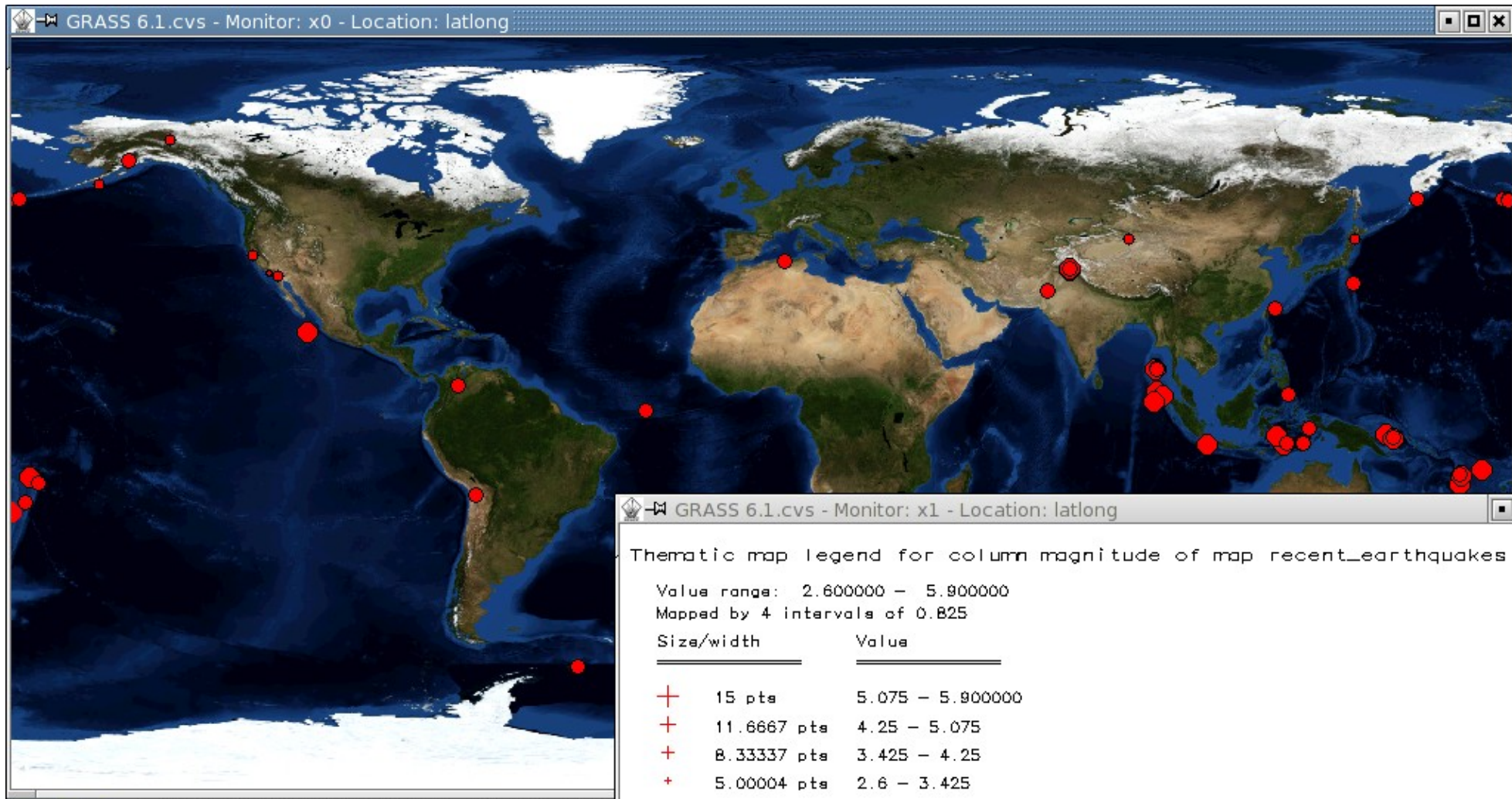
# GRASS: Person walking distance 30 minutes



# WebGIS: Integration of data sources

## GRASS in the Web

Real-time monitoring of Earthquakes (provided in Web by USGS)  
with GRASS/PHP: [http://grass.itc.it/spearfish/php\\_grass\\_earthquakes.php](http://grass.itc.it/spearfish/php_grass_earthquakes.php)

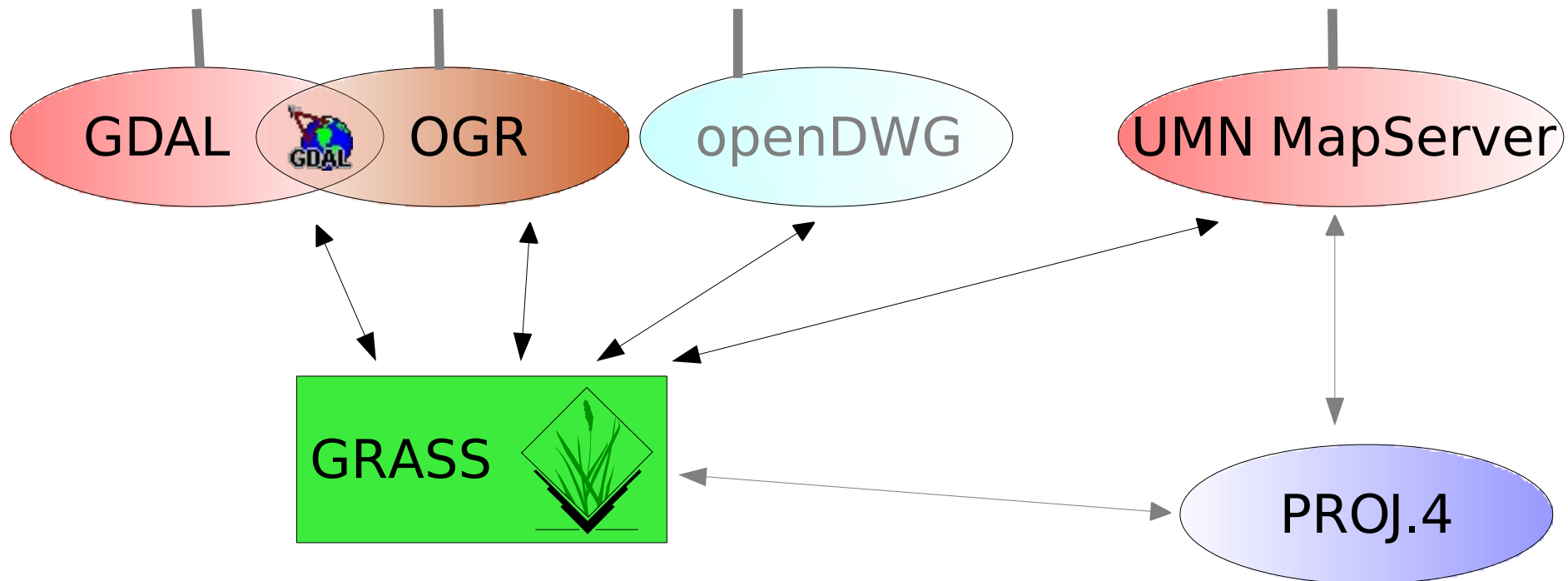




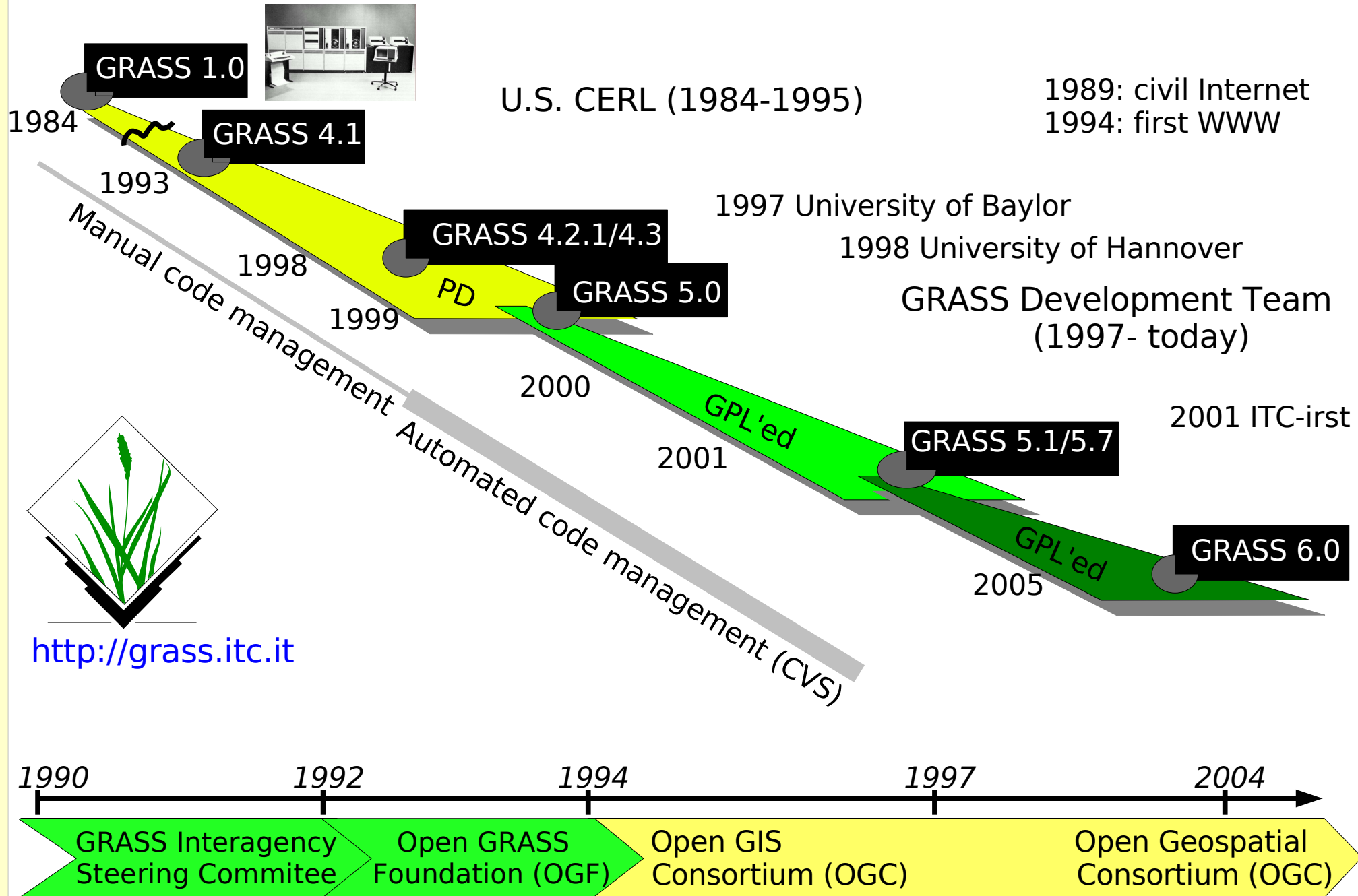
# GRASS GIS Interoperability

## Data models and sources

Raster	Vector	CAD	WebGIS
GeoTIFF	DGN	DXF	Web Map Service (WMS)
Erdas IMG	ESRI-SHAPE	DWG	Web Coverage Service (WCS)
MrSID	GML	...	Web Feature Service (WFS)
ECW	Spatial SQL		Web Map Context Documents (WMC)
JPEG2000	...		



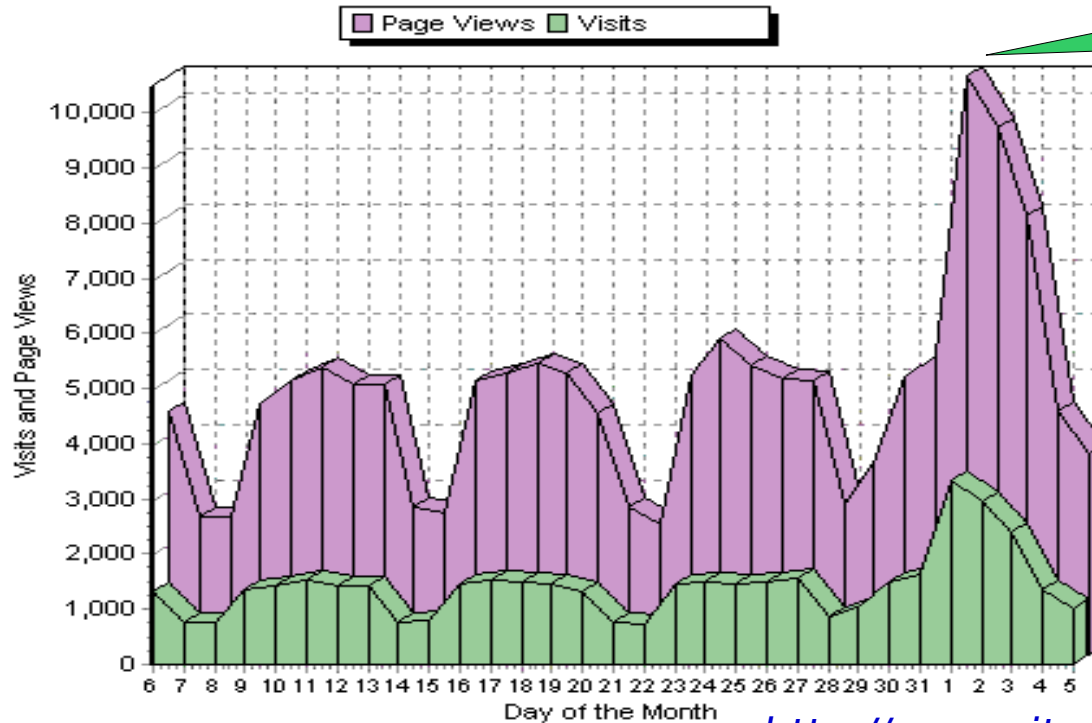
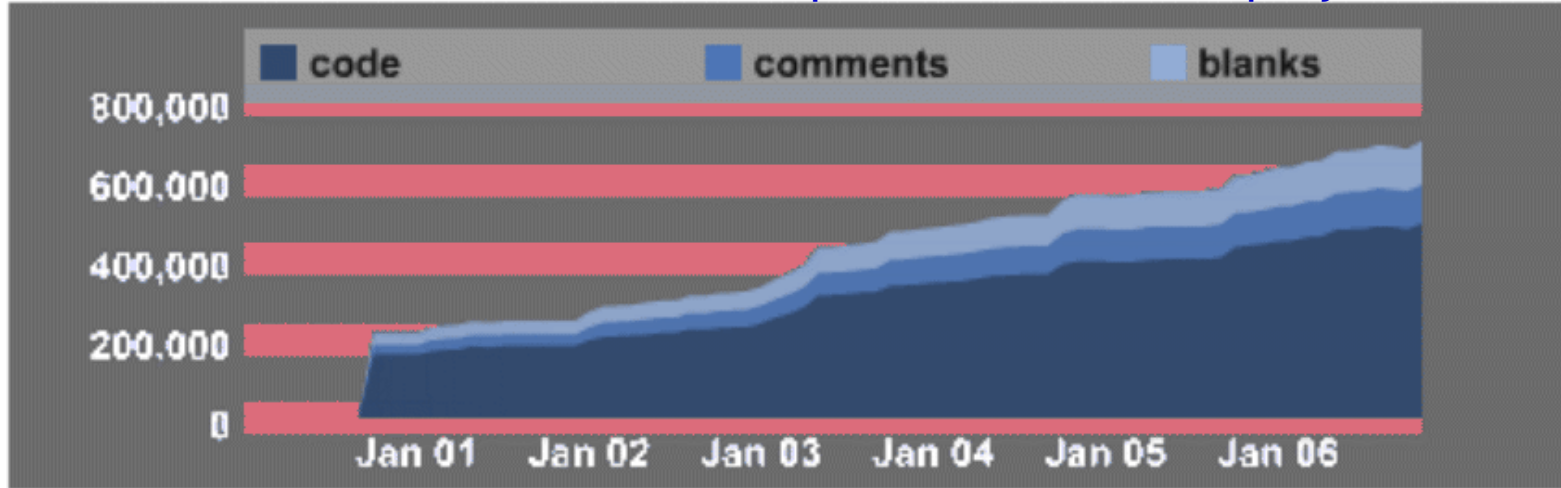
# GRASS: more than 20 years of free GIS



# GRASS Source Code Statistics

## Codebase History GRASS 6

<http://next.ohloh.net/projects/3666>

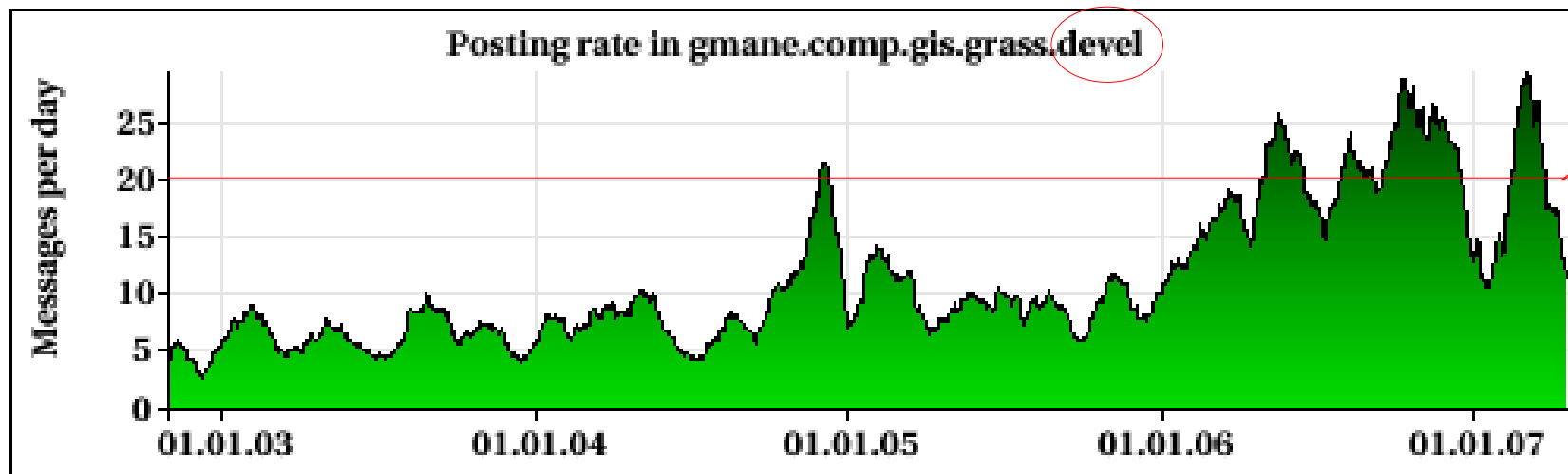
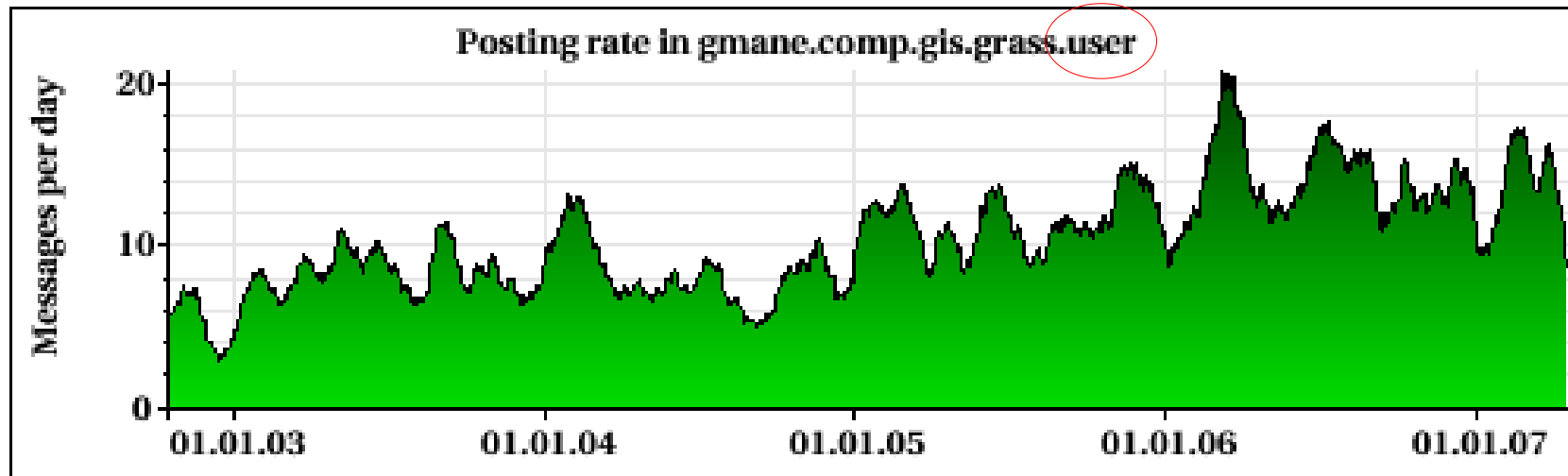


GRASS 6.2.0 release  
31 Oct 2006

Visitors at  
<http://grass.itc.it>

<http://www.sitemeter.com/?a=stats&s=s24grassgis>

# GRASS Mailing List Statistics: messages per day



(<http://gmane.org> is a mailing list mirror)

# GRASS SLOC Analysis

GRASS 6.3.CVS, 16 Apr 2007

Project Cost	
This calculator estimates how much it would cost to hire a team to write this project from scratch.	
Include	Markup And Code ▾
Codebase	509,632 LOC
Effort (est.)	137 Person Years
Avg. Salary	\$ <input type="text" value="55000"/> /year
<b>\$7,555,370</b>	

<http://next.ohloh.net/projects/3666>

Basic COCOMO model,  
but slightly different  
parameters

Or do this analysis yourself - Download and run:  
<http://www.dwheeler.com/sloccount/>

SLOC Totals grouped by language:

ansic:	473155 (84.30%)
tcl:	44256 (7.88%)
sh:	19821 (3.53%)
python:	10517 (1.87%)
cpp:	10142 (1.81%)
perl:	1608 (0.29%)

...

Total Physical Source	
Lines of Code (SLOC)	= 561,286
Person-Years	= 154.05

...

Total Estimated Cost to Develop = \$ 20,810,621  
(average salary = \$56,286/year,  
overhead = 2.40)

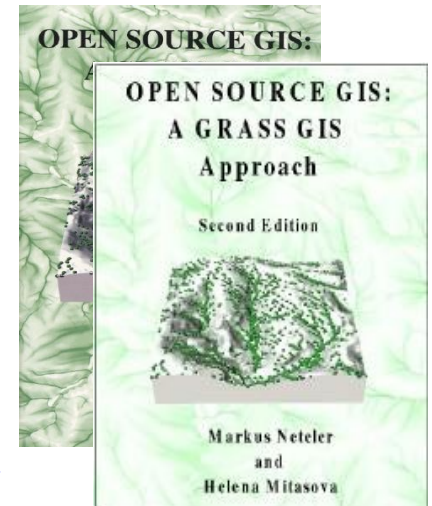
Generated using David A. Wheeler's 'SLOCCount'

# GRASS Documentation



GDF Hannover bR (2005)  
free document, GNU FDL  
[www.gdf-hannover.de](http://www.gdf-hannover.de)

Neteler/Mitasova  
(2002/2004/2007)  
Kluwer/Springer  
Boston, 420 S.  
[mpa.itc.it/grassbook2/](http://mpa.itc.it/grassbook2/)



Adresse: <http://mpa.itc.it/markus/grass63progman/>

**GRASS**

- GRASS\_Programmers\_Manual
- File List
- Data Structures
- Data Fields
- Directories
- Globals
- Related Pages
- GRASS D display Library
- GRASS DBMI DataBase
- GRASS Grid3D raster v
- GRASS GIS Library
- GRASS Raster File Pro
- GRASS Vector File Pro
- GRASS Numerical math
- GRASS Imagery Library
- GRASS OpenGL gsurf C
- GRASS Raster Graphic
- GRASS Segment Librar
- Directed Graph Library
- GRASS 6 Vector Archit

[Main Page](#) | [Data Structures](#) | [Directories](#) | [File List](#) | [Data Fields](#) | [Globals](#) | [Related Pages](#)

## GRASS\_Programmers\_Manual

### GRASS 6 Programmer's Manual: GIS Library

6

#### GRASS 6 Programmer's Manual

GRASS GIS (Geographic Resources Analysis Support System) is an open source, Free Software Geographical Information System (GIS) with raster, topological vector, image processing, and graphics production functionality that operates on various platforms through a graphical user interface and shell in X-Window. It is released under GNU General Public License (GPL).

This manual introduces the reader to the *Geographic Resources Analysis Support System* from the programming perspective. Design theory, system support libraries, system maintenance, and system enhancement are all presented. Standard GRASS 4.x

The Programmer's Manual is 'doxygen' based, i.e. it is auto-generated from the source code.



# Outline

## Seminar

- Introduction to the GRASS project
- **Communication structure**
- Code development
- Structure of the development team: be collaborative in the cyberspace
- Legal Issues

# The actors

## Free Open Source Software (FOSS) Community

**Universities and Research Institutes**  
*(e.g. NASA, Minnesota, ITCFBK-irst, Uni TN)*

**Companies**  
*(e.g. D.M. Solutions Refractions, MRCC)*

**Freelancers**  
*(e.g. F. Warmerdam)*

### INTERNET

- Web Servers
- Mailing lists
- CVS centralized source code servers
- WIKIs and bulletin boards

**Individuals**  
*(often major part of developers and users)*

**Governments**  
*(e.g. Canada, Japan, Germany, ...)*

# Communication tools: Project Portal

The screenshot shows the GRASS GIS website interface. The browser address bar displays 'http://grass.itc.it/'. The main heading is 'Welcome to GRASS GIS'. Below it, a message states 'You are at the official GRASS site in Italy (of a mirror site)' and 'This site is updated daily: 27 Nov 2006'. A navigation menu includes links for Home, Intro, Docs, Download, Community, Applications, and Development. A left sidebar contains a search bar and a list of links: About GRASS, Download, Wiki - help site | FAQ, Mirror sites, Mailing lists | IRC, Translating, Newsletter, Get involved!, GRASS in the Press, and Bug/Wish reports. A central banner features a 'Public Geo Data is public property' sign. Below this are three images: a landscape, a world map, and a GIS interface, with the caption 'New GRASS User map (without pop-up)'. The main content area is titled 'Geographic Resources Analysis Support System' and contains a paragraph describing GRASS as a GIS used for geospatial data management and analysis. Below this is a 'Latest News!' section with an RSS feed icon and a list of recent releases: GRASS 6.2.0, GRASS 6.2.0RC3, GRASS 6.2.0RC2, and GRASS 6.2.0RC1. A 'Bug/Wish reports' link is also visible in the sidebar.

Adresse: <http://grass.itc.it/>

## Welcome to GRASS GIS

You are at the official GRASS site in Italy (of a mirror site)  
This site is updated daily: 27 Nov 2006

[Home](#) [Intro](#) [Docs](#) [Download](#) [Community](#) [Applications](#) [Development](#)

Search

[Advanced search](#)

[About GRASS](#)

[Download](#)

[Wiki - help site | FAQ](#)

[Mirror sites](#)

[Mailing lists | IRC](#)

[Translating](#)


[Newsletter](#)

[Get involved!](#)




[GRASS in the Press](#)

[Bug/Wish reports](#)

ADD DELICIOUS.US



**Public Geo Data**  
is public property



New GRASS User map (without pop-up)



### Geographic Resources Analysis Support System

Commonly referred to as GRASS, this is a Geographic Information System (GIS) used for geospatial data management and analysis, image processing, graphics/maps production, spatial modeling, and visualization. GRASS is currently used in academic and commercial settings around the world, as well as by many governmental agencies and environmental consulting companies.

**Latest News!** [XML](#) [RSS FEED](#)

- 31 Oct 2006: **GRASS 6.2.0 released** - The stable version is published: Source code available now, packaged installers for major platforms are currently being built and will follow shortly
- 24 Oct 2006: **GRASS 6.2.0RC3 released** - The last release candidate
- 06 Oct 2006: **GRASS 6.2.0RC2 released** - Approaching the final release
- 26 Sep 2006: **GRASS 6.2.0RC1 released** - The first release candidate

15 Sep 2006: **OSGeo foundation Award** Markus Neteler Wins Gal K&A OSGeo Award



# Job automatization: Let the computer do it!

## Cronjobs are a life saver!

- Web pages are maintained in CVS and updated via **cron** hourly
- Mirrors sites sync through **rsync**
- Weekly **software snapshots** are generated from CVS
  - source code tarballs
  - binary builds
  - HTML and PDF manual pages
  - local search engine


# Communication tools: Wiki and Bugtracker

Adresse: <http://grass.gdf-hannover.de/wiki/GRASS-Wiki>

Log in / create account

article discussion edit history

## GRASS-Wiki



navigation

- Main Page
- Community
- Development
- Documents
- GRASS Help
- Recent changes
- Donations

search

Go Search

toolbox

- What links here
- Related changes
- Upload file
- Special pages
- Printable version
- Permanent link

Welcome to the GRASS-Wiki [\[edit\]](#)

*A Wiki is a collaborative help system*

The [Geographic Resources Analysis Support System](#), commonly referred to as **GRASS**, is a Geographic Information System (GIS) used for geospatial data management and analysis, image processing, graph...

On this Wiki, you can find:

- GRASS Help and documentation
- Full GRASS Documentation
- Installation Guides
- FAQ

Community

- GRASS Community

## Wish- and Bugtracker

(old tracker)

Adresse: [http://intevation.de/rt/webtr?qs=age&q\\_reverse=1&q\\_status=open&q\\_queue=grass&q\\_area=grass6](http://intevation.de/rt/webtr?qs=age&q_reverse=1&q_status=open&q_queue=grass&q_area=grass6)

Req.#	Pri.	Status	Due	Subject	Owner	Queue	Area	Requestor	Age	Last
<a href="#">#5341</a>	99	open		<a href="#">v.db.select: segfault</a>		grass	grass6	<a href="mailto:titey@o2.pl">titey@o2.pl</a>	13 hr	72 min
<a href="#">#5328</a>	70	open		<a href="#">Create new mapset fails</a>		grass	grass6	<a href="mailto:mmspa01@ezplanet.net">mmspa01@ezplanet.net</a>	2 day	31 hr
<a href="#">#5300</a>	30	open		<a href="#">./configure treats X11 as an atomic package</a>		grass	grass6	<a href="mailto:maris.qis@gmail.com">maris.qis@gmail.com</a>	10 day	9 day
<a href="#">#5291</a>	30	open		<a href="#">broken rpm for fc5?</a>		grass	grass6	<a href="mailto:ewc(remove_brackets_and_contents)@waterwatch.com">ewc(remove_brackets_and_contents)@waterwatch.com</a>	11 day	10 day
<a href="#">#5264</a>	30	open		<a href="#">v.digit - G malloc error</a>						
<a href="#">#5263</a>	30	open		<a href="#">r.to.vect: -v flag does not work</a>						
<a href="#">#5258</a>	30	open		<a href="#">v.patch: crash or error when missing in input</a>						
<a href="#">#5257</a>	30	open		<a href="#">Tcl install copy fails</a>						
<a href="#">#5253</a>	70	open		<a href="#">grass-fc4.rpm depends on fontserver (xfs)</a>						
<a href="#">#5220</a>	30	open		<a href="#">wingrass: v.in.ogr creates wrong directory</a>						
<a href="#">#5219</a>	30	open		<a href="#">d.vect display=cat creates wrong layer 1</a>						
<a href="#">#5218</a>	30	open		<a href="#">wingrass: creating startup screen with fails</a>						

(new tracker)

Location Edit View Go Bookmarks Tools Settings Window Help

Location: [http://wald.intevation.org/tracker/?atid=204&group\\_id=21&func=browse](http://wald.intevation.org/tracker/?atid=204&group_id=21&func=browse)

## FORGE

code | Search Advanced search Log In New Account

Home My Page Project Tree Code Snippets Project Openings GRASS

Summary Tracker Surveys

code I: Browse | Download .csv

Assignee: Unassigned State: Open

Order by: (7) ID Ascending Quick Browse

ID	Summary	Open Date	Priority	Assigned To	Submitted By
290	Postgres and mysql tests don't test enough combinations	2007-02-13 20:01	2	Nobody	William Kyngesburye
293	configure shouldn't use gdal-config --dep-libs for GDAL linking (GDALLIBS)	2007-02-14 19:36	3	Nobody	William Kyngesburye
295	grass-6.2.1-1suse10.2.x86_64.rpm, failed dependencies: libmysqlclient.so.15	2007-02-15 01:00	3	Nobody	Jörg Pietruska

# Outline

## Seminar

- Introduction to the GRASS project
- Communication structure
- **Code development**
- Structure of the development team: be collaborative in the cyberspace
- Legal Issues

# Changing source code: what happens? (1/2)

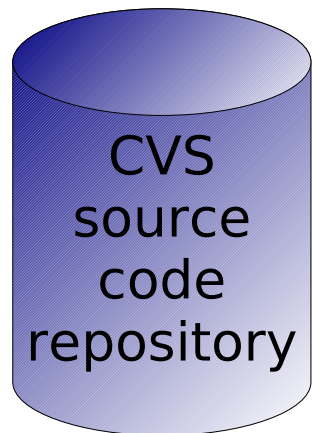
```
tflag->description      = _("Print topology information only");

if (G_parser(argc,argv))
    exit(EXIT_FAILURE);

/* open input vector */
if ((mapset = G_find_vector2 (in_opt->answer, "")) == NULL) {
    G_fatal_error (_("Could not find input map <%s>"), in_opt->answer);
}
```

*Developer changes and enters:*

`cvs ci -m "i18N macro added" main.c`



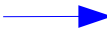
*Germany*

Code differences email is  
auto-generated and sent to  
"grass-commit" mailing list

*Italy*

Email notification triggers  
updated of GRASS Quality  
Assessment System

*Canada*



# Changing source code: what happens? (2/2)

Email notification triggers updated of GRASS Quality Assessment System

Clone detection is run as well as other quality measures, results sent out

*Canada*

Code quality email is sent to "grass-qa" mailing list

*Italy*

CIA-IRC robot feeds #grass IRC channel on freenode.net

CIA open source monitor receives simplified QA message USA?



The screenshot shows a web interface for the GRASS project. The address bar displays `http://cia.navi.cx/stats/project/GRASS`. The page title is "GRASS Real-time open source activity stats". The interface includes a navigation menu with "Stats", "Documentation", "IRC Bots", and "Rulesets". The main content area is divided into several sections: "information" with a logo and a description of GRASS, "event counters" showing message statistics (e.g., "The last message was received 22.87 minutes ago at 00:30 on Nov 28, 2006"), and "recent messages" with a table of IRC messages. A blue arrow points from the "Code quality email is sent to 'grass-qa' mailing list" box to the "recent messages" section.

date	project	content	link
22 min ago	GRASS	Commit by michael : /grassrepository/grass6/ visualization/nviz/scripts/tclIndex : Removed old scale panel; added entries for new arrow, legend, and fringe panels; updated entries for label panel.	#
22 min ago	GRASS	Commit by michael : /grassrepository/grass6/ visualization/nviz/scripts/widgets.tcl : Fixed autodraw function so that it actually works (can be toggled on and off) in most NVIZ modules. Did a bit of code reformatting and cleanup too.	#



The screenshot shows an IRC log for the #GRASS channel on 2006-11-26. The address bar displays `http://logs.qgis.org/grass/%23grass.2006-11-26.log`. The log contains a series of messages with timestamps and usernames. A blue arrow points from the "CIA-IRC robot feeds #grass IRC channel on freenode.net" box to the log.

```
01:06:08 CIA-18: markus * /grassrepository/grass6/ raster/r.mapcalc/r.mapcalc.html : correction/html fix
01:07:16 martin_povolny: hallo, i need to create a set of special symbols, is there some reference for the symbol language somewhere?
01:07:30 martin_povolny: i have been googling for it but without success
01:08:14 martin_povolny: also is there some command to render a choosen symbol or do I have to render a map with point to see the symbol?
01:09:54 jachym: grass6/lib/symbol/README
01:10:39 martin_povolny: thanks and to display a symbol probably d.graph symbol command?
01:10:43 jachym: grass6/lib/symbol/symbol/demo/muchomurka
01:11:59 martin_povolny: hmm the readme is not present in my distribution
01:14:10 jachym: http://www.intevation.de/rt/webrt?serial_num=2051&display=History
01:14:16 sigg: Title: WebRT: queue 'grass' ( at www.intevation.de )
01:31:55 CIA-18: jachym * /grassrepository/grass6/ include/gisdefs.h : Removed comment about strip.c. G_strip( ) was formerly moved to strings.c
01:31:55 CIA-18: markus releasebranch_6_2 * /grassrepository/grass6/ raster/r.mapcalc/r.mapcalc.html : correction/html fix ( merge from HEAD )
```



# GRASS Quality Assessment I

## GRASS Test Suite Project: Automated usage tests on Linux and MS-Windows



### GRASS Test Suite 0.2.0.2

Output generated at: Di Mai 2 21:36:57 CEST 2006

#### GRASS Test Environment

```
GRASS_GNUPLOT='gnuplot -persist'
GRASS_GUI=text
GRASS_HTML_BROWSER=htmlview
GRASS_INT_ZLIB=1
GRASS_PAGER=more
GRASS_PERL=/usr/bin/perl
GRASS_TCLSH=tclsh
GRASS_VERSION=6.1.cvs
GRASS_WISH=wish
TESTSUITE_INSTALLDIR=/tmp/GRASS_Te
```

**Build information:** GRASS 6.1.cvs (2006) # ./configu  
 --with-jpeg --without-odbc --with-fft --with-glw --with  
 --with-gdal=/usr/local/bin/gdal-config --with-cxx --with

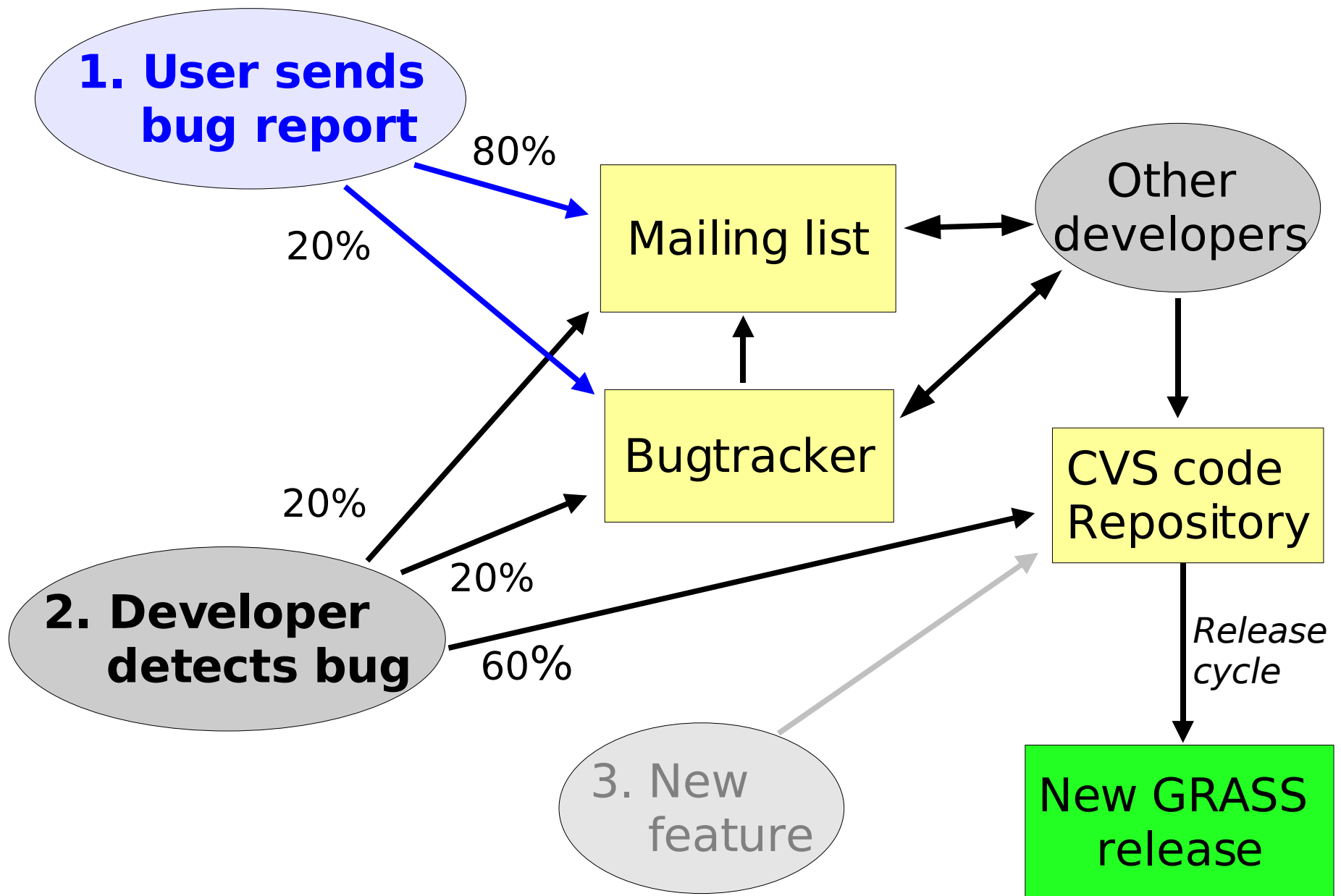
**Machine:** Linux AMD64bIT 2.6.12-1.1381\_FC3 #1 Fr

#### Test suite settings

Done

Test	Module	Status	Output validation	command line argument
6 of 6 <a href="#">log-&gt;</a>	v.drape	success	Output valid	input=elevation@PERMANENT rast=elevation@PERMANENT
<a href="#">memlog-&gt;</a>		memory-errors-detected		output=lines_cubic_27370
<b>v.hull test (unit)</b>		Full function test of v.hull.		
<a href="#">(source)</a>				
Test	Module	Status	Output validation	command line argument
1 of 1 <a href="#">log-&gt;</a>	v.hull	success	Output valid	input=points output=hull_27574
<a href="#">memlog-&gt;</a>		memory-errors-detected		
<b>v.patch test (unit)</b>		Full function test of v.patch.		
<a href="#">(source)</a>				
Test	Module	Status	Output validation	command line argument
1 of 1 <a href="#">log-&gt;</a>	v.patch	success	Output valid	input=points areas elevation lines output=patch_27623

# Bug reports: Communication Flow



*(Percentages are estimated)*

# GRASS Quality Assessment II

## GRASS GIS Software Evolution Project: Software engineering



GRASS GIS EVOLUTION PROJECT - Monitoring The World Leading Free Software GIS Evolution - Mozilla Firefox <2>

File Edit View Go Bookmarks Tools Help

http://web.soccerlab.polymtl.ca/grass-evolution/grass-browsers/grass-index-en.html

ML R local "R" GRASS BBB Ponsl TN-cat LEO E/I,I/E CSeer Scholar TWIKI Gmail Post2CUL-Net Post2CUL-Eden

grass import globe Web Site Img Groups News Scholar Print Opts Search Special Page Info Up Selected Highlight grass import

 **Welcome to the SOCCER Lab** 

**GRASS GIS Software Evolution Project**

*You are entering a site devoted to monitor and improve GRASS software quality*  
*This site is updated daily: 2006-05-05*

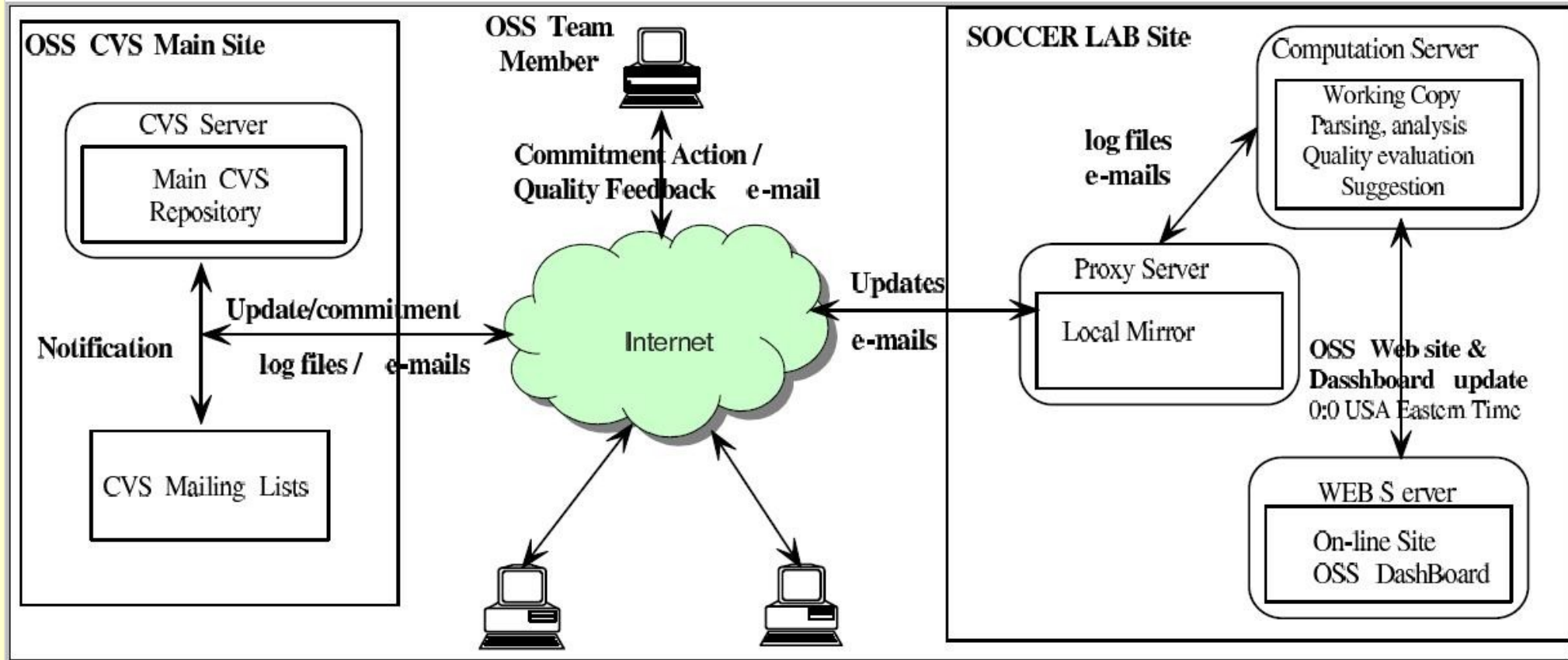
Currently active features:

- [GRASS source code browser - Navigate dirs, files and functions](#)
- [GRASS statistic browser - Navigate developer contributions, CVS info, commit, code size](#)
- [GRASS clone browser - Navigate clone clusters, view clone deltas](#)
- [GRASS monster browser - Navigate monster functions](#)
- [GRASS comparandum tool - Compare files in an intelligent way](#)
- [GRASS Work Package Browser - Select a Work Package to Improve GRASS quality](#)

Done 

# GRASS Quality Assessment II

## Improvement of source code base



*Ref.: A feedback based quality assessment to support open source software evolution: the GRASS case study  
S. Bouktif, G. Antoniol, E. Merlo, and M. Neteler, ICSM 2006*

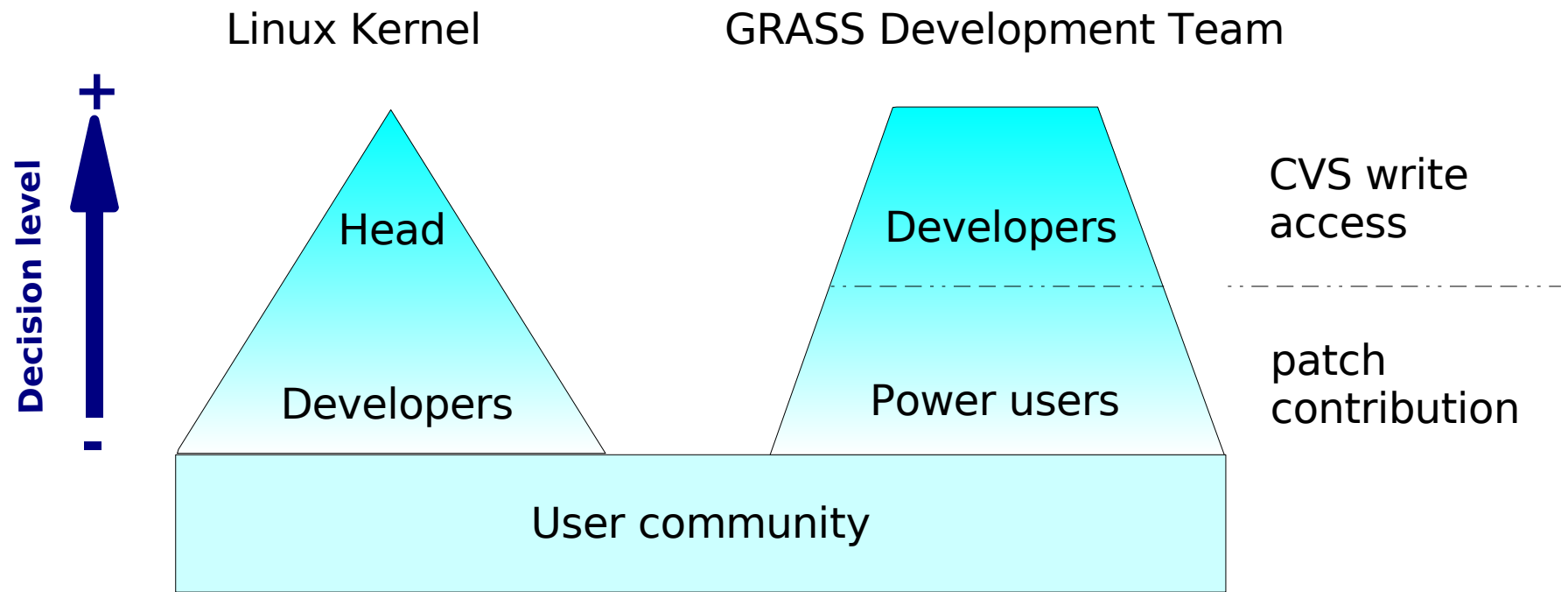
# Outline

## Seminar

- Introduction to the GRASS project
- Communication structure
- Code development
- **Structure of the development team: be collaborative in the cyberspace**
- Legal Issues

# FOSS Software development structures

## Organizational structures of development teams



GRASS: No BDFL (Benevolent Dictator For Life)

[http://en.wikipedia.org/wiki/Benevolent\\_Dictator\\_for\\_Life](http://en.wikipedia.org/wiki/Benevolent_Dictator_for_Life)

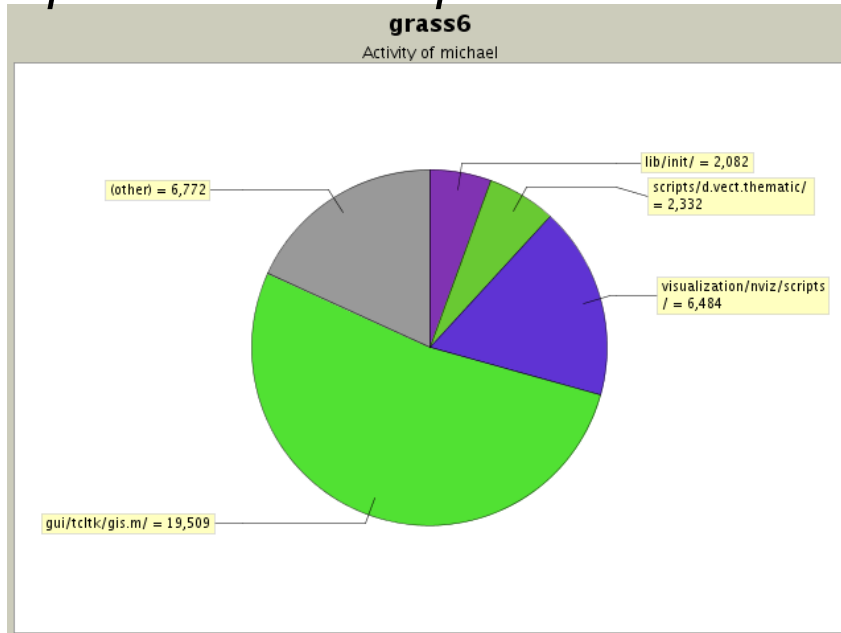
<http://producingoss.com/>

# GRASS Development Team: Structure & “Code habitats”

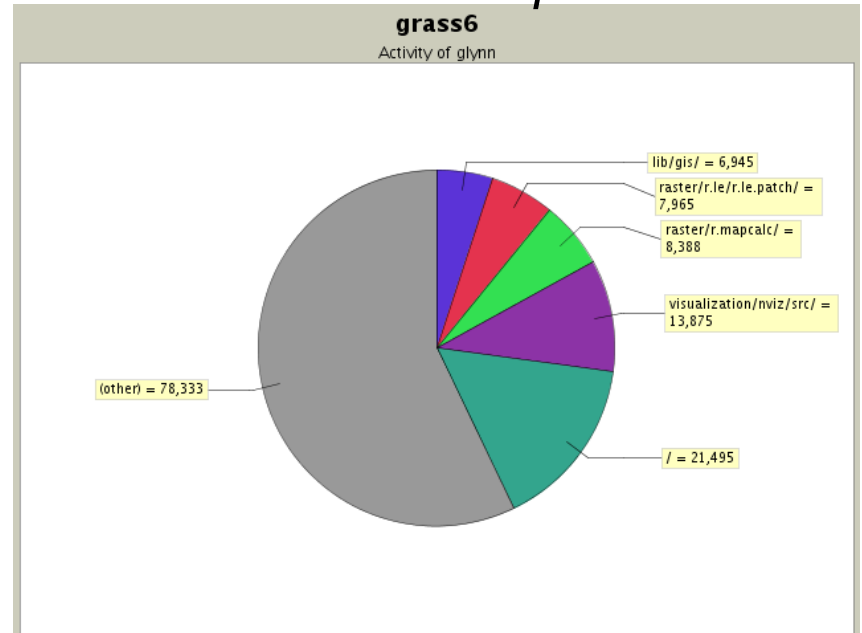
- Two main types of developers are observed:
  - generalist
  - specialist (majority)
- It appears that many developer assign themselves to a “code habitat”, their area of expertise (in GRASS a selection of libraries or commands which are maintained)
- these “habitats” are often stable over years
- there are also partially abandoned code areas (~ 10% of the code) which are functional but aren't really getting improved
- A very few are experts for code portability (ANSI C etc standards)
- One “garbage collector” (generalist) fixes lots of *odds 'n ends*

# GRASS Development Team: "Code habitats"

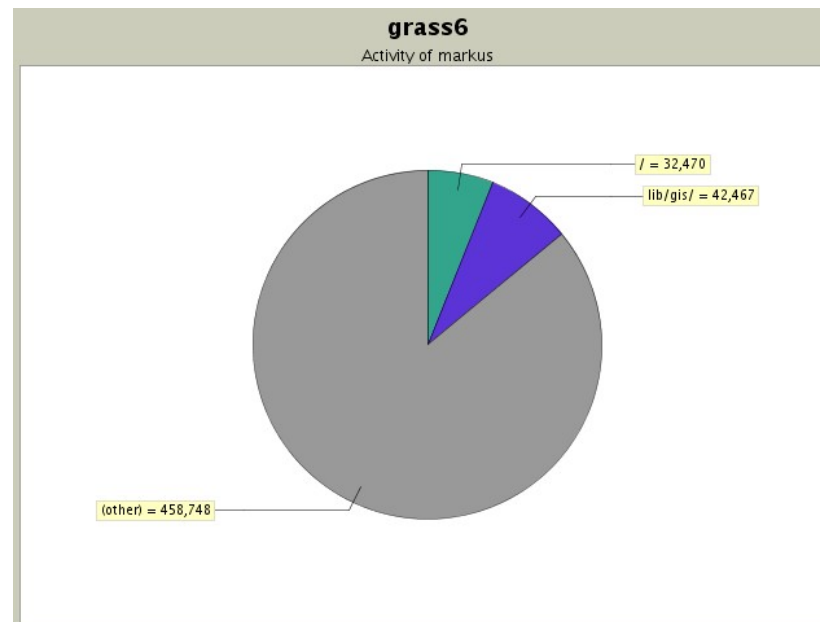
## Specialist example



## Intermediate example

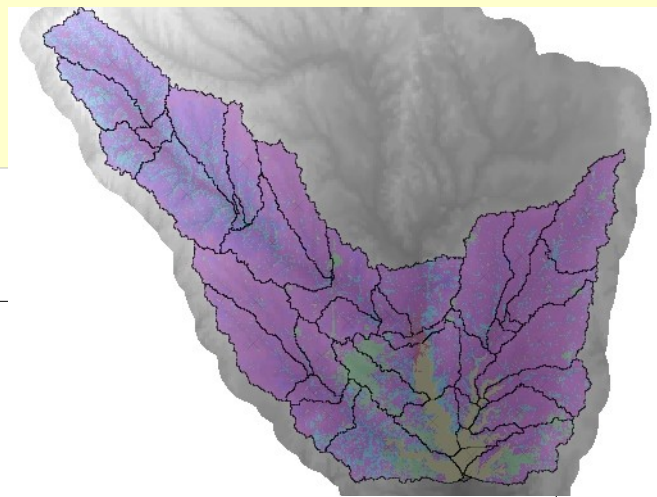


## Generalist example





# Conflicts in the community



## Decision making the hard way (1/3)

### [GRASS5] Transparency added

~~xxxxxx~~ [xxxxxx](#) ~~xxxxxx~~

Sun, 19 Feb 2006 05:38:08 -0600

- Previous message: [\[GRASS5\] v.out.vtk and r3.out.vtk](#)
- Next message: [\[GRASS5\] Transparency added](#)
- **Messages sorted by:** [\[ date \]](#) [\[ thread \]](#) [\[ subject \]](#) [\[ author \]](#)

Oops! the attached file is too big. Try this:  
<http://geni.ath.cx/grass/transparency.png>

-----  
I've added transparency feature to display drivers (XDRIVER and PNG) and d.rast and d.vect now have transparency= (%) option. You can find a screenshot attached in which two rasters and one vector are overlaid.

```
# opaque drawing
d.rast dem
# 80% transparency, -o is needed not to clip previous drawings
d.rast landuse trans=80 -o
# 90% transparency with blue area fill
d.vect subbasins trans=90 fcolor=blue
```

Please find attached the png file.

I hope you enjoy this.

~~xxxxxx~~

New feature added...



# Conflicts in the community

## Decision making the hard way (3/3)

### [GRASS5] Re: [GRASSLIST:10405] Transparency added

~~XXXXXXXXXX~~

Sun, 19 Feb 2006 13:08:47 +0000

- Previous message: [\[GRASS5\] Transparency added](#)
- Next message: [\[GRASS5\] gis.m and d.m gone](#)
- **Messages sorted by:** [\[ date \]](#) [\[ thread \]](#) [\[ subject \]](#) [\[ author \]](#)

---

~~XXXXXXXXXX~~ wrote:

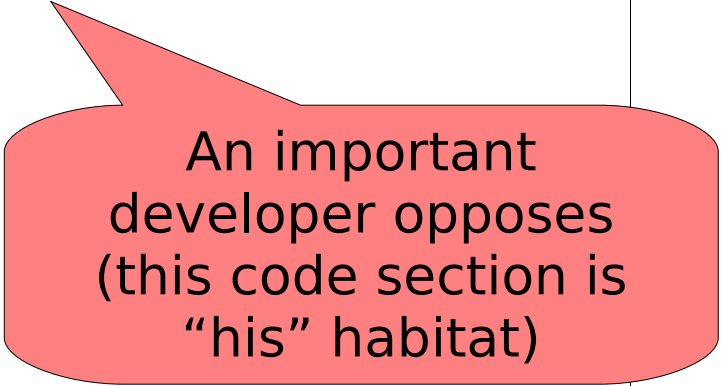
> I've added transparency feature to display drivers (XDRIVER and PNG) and d.rast  
> and d.vect now have transparency= (%) option.

Please take a copy of your work, because I'm going to revert these changes shortly.

--

~~XXXXXXXXXX~~

(later the day an explanation was posted)



An important developer opposes (this code section is "his" habitat)

# Decision making

## **GRASS project:**

- rather clear expertises of the developers
- “habitats” can be observed – developers only work on code families
- discussions (even lengthy) via “grass-dev” mailing list [[1](#)]
- New GRASS Project Steering Committee (PSC) formed in 2006
- formal voting on “Requests For Comments” (RFCs) but only for CVS access granting and “political” decisions

## **Other projects:**

- similar to GRASS project, BUT:
- RFC voting also for technology changes

[1] <http://grass.itc.it/pipermail/grass-dev/>

# Outline

## Seminar

- Introduction to the GRASS project
- Communication structure
- Code development
- Structure of the development team: be collaborative in the cyberspace
- **Legal Issues**

# Code vetting

## Legal aspects

- License compicance (GRASS: GPL)
- Don't copy from books like “Numerical Receipes in C”
- Ensure that 3<sup>rd</sup> party contributions are clean
- Employers must agree that worktime is spent

Full transparency and peer review help to minimize the risk.

## Apache or OSGeo Foundation

- Incubation phase
- Graduation



<http://incubator.apache.org/>

<http://www.osgeo.org/incubator>

# OSGeo Foundation: Founding projects

MAPSERVER



Mapbender

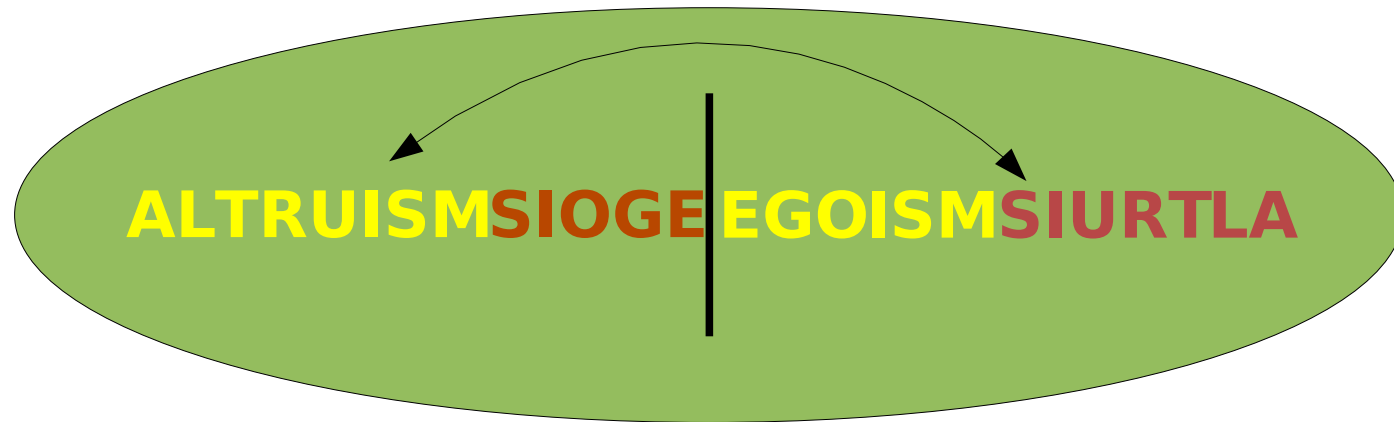


Founded 4<sup>th</sup> February 2006, Chicago

<http://www.osgeo.org>

# Why does a developer contribute to Free Software?

I will help others (because) they will help me



Everyone is expert of only a limited area...  
...ask the expert if you don't know!

The driving force behind FOSS development  
is **meritocracy**.



# License of this document

This work is licensed under a Creative Commons License.

<http://creativecommons.org/licenses/by-sa/2.5/deed.en>



**“Community based software development: The GRASS GIS project”,**

© 2006, 2007 Markus Neteler, Italy

<http://mpa.itc.it/markus/teaching.html>

[ OpenDocument file available upon request: neteler at itc it ]

## License details: Attribution-ShareAlike 2.5

You are free:

- to copy, distribute, display, and perform the work,
- to make derivative works,
- to make commercial use of the work,

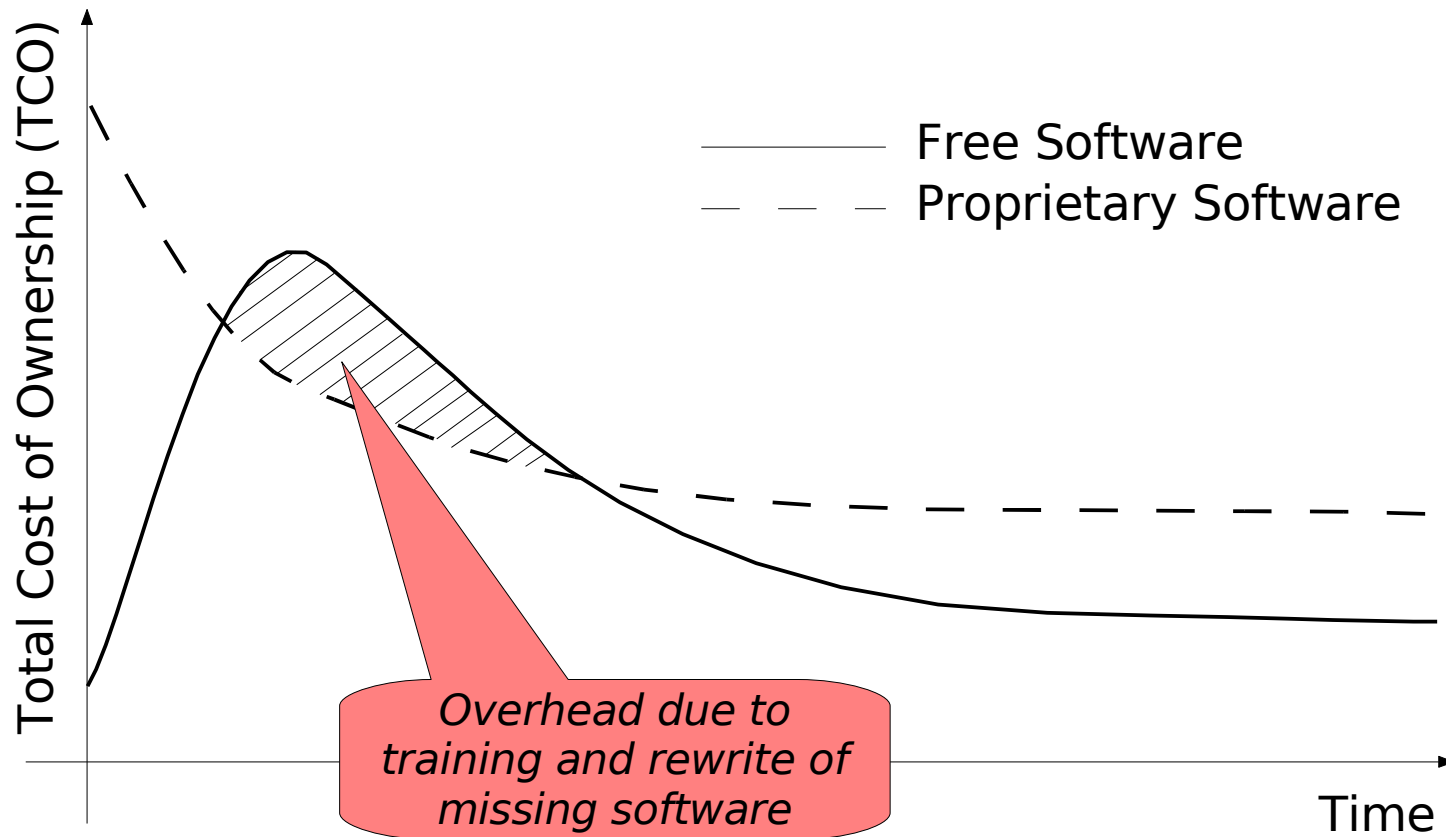
under the following conditions:

Attribution. You must give the original author credit.

Share Alike. If you alter, transform, or build upon this work, you may distribute the resulting work only under a license identical to this one.

For any reuse or distribution, you must make clear to others the license terms of this work. Any of these conditions can be waived if you get permission from the copyright holder. Your fair use and other rights are in no way affected by the above.

# Software operating costs (customer)



*B. Reiter 2004  
after Wheeler 2004*