

GRASS GIS: A General-purpose Geospatial Research Tool

AGU 2018 Fall Meeting

NS52A: A Tour of Open-Source Software Packages for the Geosciences II

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**Includes over 10 other members of the core team and numerous other contributors

NC STATE UNIVERSITY

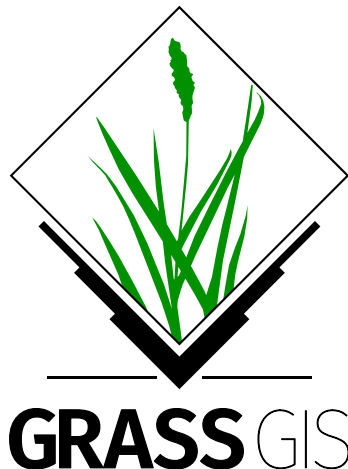


mundialis

December 14, 2018



- ▶ all in one
 - ▶ hydrology modeling, image segmentation, point clustering, ...
- ▶ driven by needs of users
 - ▶ Community-driven project direct access to development process
- ▶ from small laptops to supercomputers
 - ▶ Raspberry Pi, Windows, Mac, GNU/Linux, FreeBSD, IBM AIX
- ▶ learn now, use forever
 - ▶ over 35 years of development and interface refinement



latest release 7.4.3 (Nov 26, 2018)

Novel methods are included

- ▶ `r.sim.water` (Mitas and Mitasova, 1998) overland flow simulation
- ▶ Least cost flow `r.watershed` from '89



GRASSGIS

latest release 7.4.3 (Nov 26, 2018)

Innovations are preserved

- ▶ r.sim.water (Mitas and Mitasova, 1998) overland flow simulation
- ▶ Least cost flow r.watershed from '89



latest release 7.4.3 (Nov 26, 2018)

Code is further developed

- ▶ v.outlier module serves as a base for v.lidar.mcc implementing Multiscale Curvature Classification.
- ▶ v.surf.rst for spatial interpolation developed in '90s; improved several times and parallelized for version 7.4.



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Published algorithms are implemented

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- ▶ Ask for access to GRASS GIS Addons at grass.osgeo.org/development/code-submission
- ▶ Example GRASS GIS module gitlab.com/vpetras/r.example.plus



Get GRASS GIS at
grass.osgeo.org

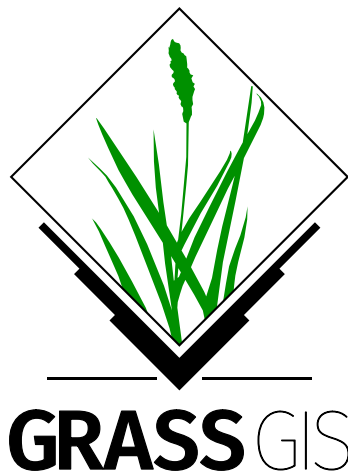
GRASS user mailing list
lists.osgeo.org/listinfo/grass-user

Source files for poster and slides available at
trac.osgeo.org/grass/browser/grass-promo

Providing algorithms to the community

- ▶ new landform recognition approach – geomorphons
- ▶ by Jasiewicz and Stepinski from
AMU, Poland and University of Cincinnati, USA
- ▶ not just a paper Geomorphology, 2013
- ▶ not just a code
at some webpage
- ▶ *r.geomorphon*
module in GRASS GIS addons repository

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- ▶ used by
 - ▶ US Oak Ridge National Laboratory, Edmund Mach Foundation, JRC, ...



latest release 7.0.4

Python and command line interfaces

Command Line:

```
r.in.lidar input=points.las \  
          output=elevation -e
```

Python:

```
from grass.script import run_command  
run_command('r.in.lidar',  
            input="points.las",  
            output="elevation",  
            flags='e')
```

Graphical Modeler

Using other open source projects

r.in.kinect

- ▶ scans using Kinect
- ▶ OpenKinect libfreenect2
- ▶ Point Cloud Library (PCL)
- ▶ GRASS GIS libraries

used in Tangible Landscape

Acknowledgements

Software

The GRASS GIS Development Team, contributors, users, ...

Datasets

Nantahala NF, NC: Forest Leaf Structure, Terrain and Hydrophysiology. Obtained from OpenTopography.
<http://dx.doi.org/10.5069/G9HT2M76>

Presentation software

Slides were created in \LaTeX using the `BEAMER class`.

