

## Open source at OSGeoREL

GRASS GIS, open source development and academia, GSoC

Václav Petráš (Vashek)

NC State FOSS Fair 2014  
March 1st



# NCSU OSGeoREL

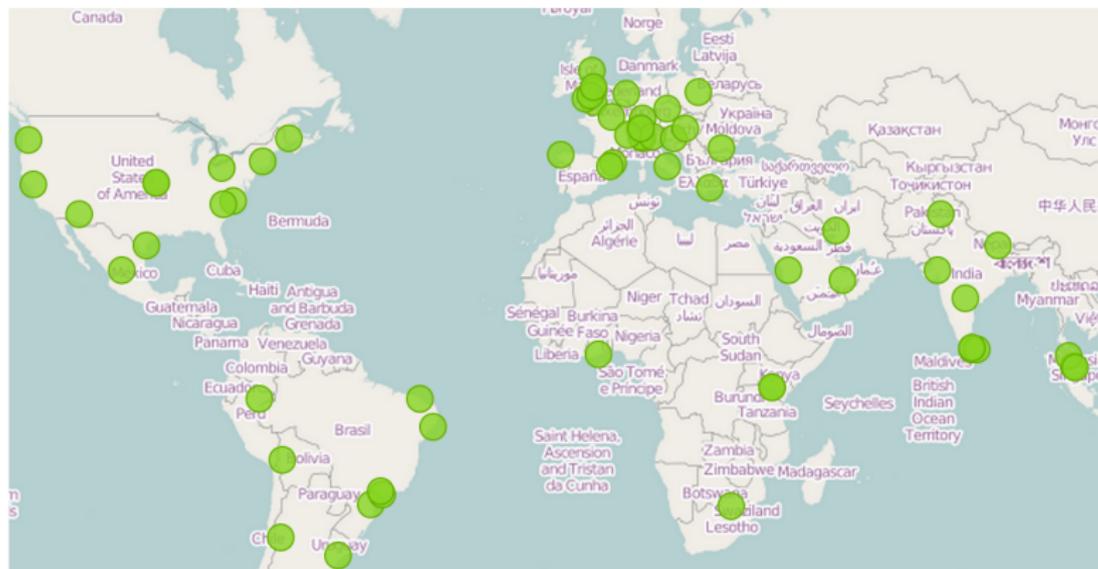
Open Source Geospatial Foundation  
Research and Education Laboratory  
at North Carolina State University

**NC STATE UNIVERSITY**



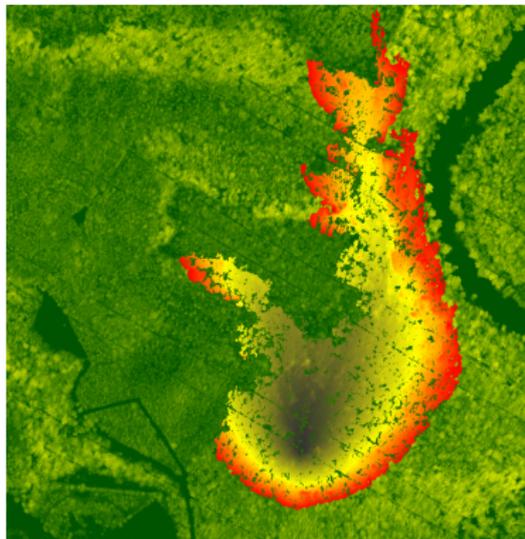
- <http://gis.ncsu.edu/osgeorel/>
- [ncsu\\_osgeorel@ncsu.edu](mailto:ncsu_osgeorel@ncsu.edu)
- MEAS, Jordan Hall

# NCSU OSGeoREL is a part of worldwide initiative

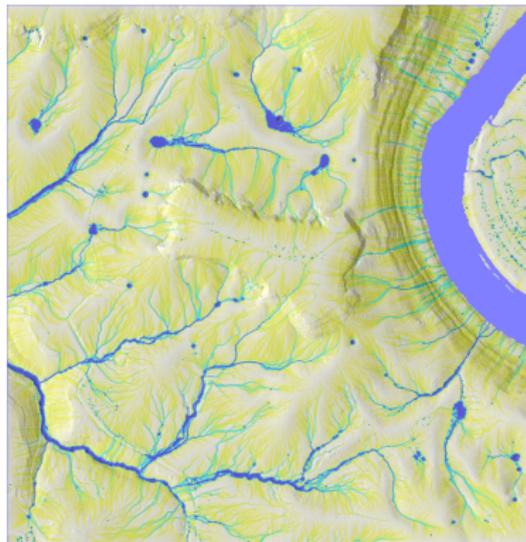


■ <http://geoforall.org/>

# NCSU OSGeoREL and GIS



Wild fire analyses

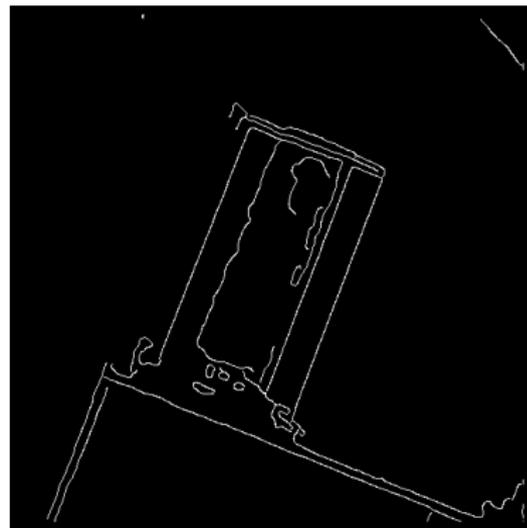


Water flow simulation

## NCSU OSGeoREL and GIS

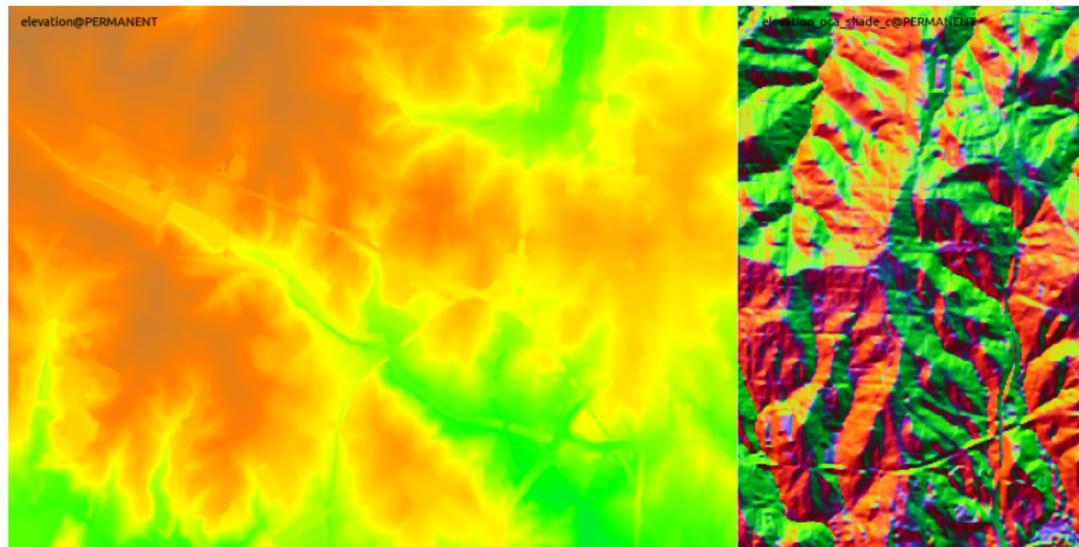


Aerial image



Edge detection

# NCSU OSGeoREL and GIS



Feature enhancement

# GRASS GIS

- Uses other software packages, e.g. SQLite, GDAL
  - Used by other software packages, e.g. QGIS, gvSIG
  - Connects to other software packages, e.g. R, PostGIS
  - Available in repositories of GNU/Linux distributions
- 
- <http://grass.osgeo.org/>
  - GNU/Linux, Mac OS X, MS Windows, clusters, ...
  - C, Python, command line and graphical interfaces
  - 30 years in 2013
  - changes every day



## Examples of GRASS GIS features

- 2D, 3D and 4D processing
- least-cost path, image processing, machine learning
- 3D visualizations
- landscape processes simulations
- big data (large areas, high-resolution data, temporal data)
- parallelization (OpenMP, pthreads, Python multiprocessing, ...)
- supercomputers
- exposing processing through web services <sup>1</sup>

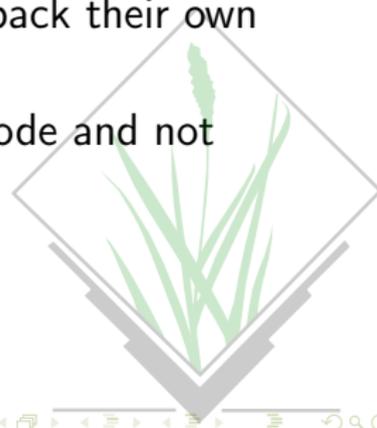
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<sup>1</sup>First GRASS GIS processing accessible online in 1995, GRASSLinks by Huse, S. M., University of California



## Development challenges

- Users not reporting bugs (because software is something you cannot change)
- Users not sharing their own work which can be reused
- Developers/power users not contributing back their own improvements
- Developers/researches writing their own code and not incorporating it into existing projects



# Google Summer of Code

- various free and open source projects participate
  - students apply with their own ideas
  - Google pays students to work on FOSS projects
  - student application period opens March 10 (Monday)
- <http://www.google-melange.com/gsoc/homepage/google/gsoc2014>



## GRASS GIS Community Sprint Vienna

- from March 24th (Monday) to March 28th (Friday)
- smaller event here
- contact [vpetras@ncsu.edu](mailto:vpetras@ncsu.edu)
- [http://grasswiki.osgeo.org/wiki/GRASS\\_Community\\_Sprint\\_Vienna\\_2014](http://grasswiki.osgeo.org/wiki/GRASS_Community_Sprint_Vienna_2014)



## Free and open source in academia

- sharing research results
- reproducibility
- applications in developing countries
- FOSS is open for innovations and modifications
- possibility to work closely with developers



## Free and open source in academia

- your research is worth sharing!
- your research is worth preserving!

- merge your work into a bigger project

Everything which was connected with GRASS, but not merged, died.

# Free and open source in academia

## GRASS Temporal Framework use case

- working with geographic data with assigned time
- written as part of PhD thesis at university in Germany
- published paper with description and their usage
- now we are using it to work with our temporal data



## Summary

- NCSU OSGeoREL does cool stuff both development and natural science
- GRASS GIS has a lot of features but more contribution is needed
- People don't contribute enough: keep the code, keep use cases, ...
- GSoC is a way to start with FOSS or join a code sprint
- healthy FOSS project
  - uses other FOSS projects
  - used by other FOSS projects
- truly shared and used research
  - uses FOSS
  - creates FOSS
  - *connects to bigger FOSS projects*

*Thank you for your attention.*