OSGeo

Your Open Source Compass

OSGeo Journal

Volume 6 - September 2010

VISITDENVER.com

VISIT DENVER, THE CONVENTION & VISITORS BUREAU

THE MILE HIGH CITY

DENVER

COLORADO

FOSS4G 2011 Denver, USA See You There!

2010 Official Visitors Guide

More information coming soon...

MAY 1 LIKE AN EGYPTIAN

with King Tut at the Denver Art Museum

Page 72

July 1, 2010 – January 2, 2011

JULY 10 A "WESTERN HEMIS-FAIR"

of art, culture and music at the Biennial of the Americas

Page 76

July 1 – July 31, 2010

From the Editor...

by Tyler Mitchell

Welcome to the first edition of the OSGeo Journal for 2010! As a good kick-off to the new year this volume takes a few different perspectives on software development and design. Naturally the various issues related to typical development projects applies quite well to our open source geospatial specific interests. The articles cover a range of topics from a review of various software to a discussion of user-centered design. Along the way you'll also get to read some more technically meaty articles and some perspective pieces.

Each volume of the Journal takes several months of concerted effort by many individuals. Landon Blake played a lead editorial role in getting this volume pulled together so you can read it - thank you Landon! It's always a pleasure to have more section editors, LaTeX masters and reviewers come to help. Thank you to all the volunteers.

With our new online management system, any potential article can be submitted at anytime by simply filling in a form at http://osgeo.org/ojs. As well, over the next couple of months keep one eye open for the OSGeo 2009 Annual Report. Get your articles in soon if you have not already. Enjoy the articles!

Tyler Mitchell
Editor in Chief, OSGeo Journal
http://osgeo.org
tmitchell@osgeo.org

Contents of this volume:

Editorial 1
From the Editor... 1

News 2
Brief News from the OSGeo Community 2

Event Reports 6
CASCADOSS International Symposium and International Information Workshop 7
Summer Training Courses on FOSS4G, 2007-2009 14

Topical Interest 18
Why Every Open Source Project Needs a Good Dictator 18

Programming Tutorials 20
GPGPU With GDAL 20

Case Studies 23
gvSIG is a viable robust alternative to commercially available GIS packages 23

Project Introductions 26
GRASS Image Processing Environment 27
SEXTANTE, a Free Platform for Geospatial Analysis 32

Peer-review Papers 40
Usability Trumps Features 40

Volunteer Recognition 53
53

Event Reports

CASCADOSS International Symposium and International Information Workshop

Event Report

by M. Rusztecka, R. Wawer, E. Orlitova, A. Podolcak, and T. Steenberghen

The CASCADOSS Project's objective was to build up a critical mass of Open Source users within the GMES (Global Monitoring for Environment and Security) society (Fig. 1) that could support each other in finding open source solutions for environmental problems.

Figure 1: CASCADOSS objectives

To achieve this goal CASCADOSS set up a "transnational cascade training programme on Open Source GIS & Remote Sensing software for environmental applications". This cascading training program was divided into three phases, each aiming to refine the knowledge gained throughout the project (Fig. 2).

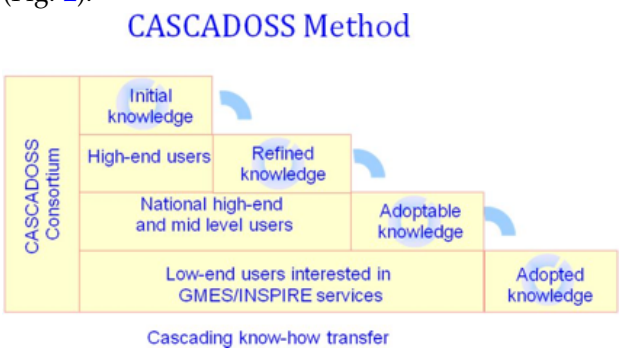

Figure 2: CASCADOSS Method

As the first step an extensive study was conducted on issues related to Open Source GIS & Remote Sensing technology:

1. A wide range of Open Source GIS & RS software projects was reviewed and evaluated. The best open Source GIS & RS projects were identified and documented,
2. A wide range of environmental applications built on top of Open Source GIS&RS Software was reviewed and evaluated. The best Open Source-based environmental applications were identified and documented.
3. The different types of business models / added value services that can be built on top of the Open Source GIS & RS technology were explored and documented.
4. Complex Open Source licensing policies were screened and translated into a comprehensive guide on Open Source legal issues.

The experience gained from this study was disseminated across Europe through the following information workshops:

- One-day International Symposium,
- 3-day International Information Workshop,
- 2-day national or regional Training Workshop.

The third and final stage was realized in the form of numerous national information workshops organized in Belgium, Poland, Slovakia, Czech Republic and Hungary. The LiveDVD of the CASCADOSS project remains a living project, hosted by Compet-Terra in Hungary: http://cascadoss.competterra.com/cascadoss.php?livedvd_en.

CASCADOSS international events

The International Information Workshop (17 to 19 June 2008) was conducted in the second phase of the CASCADOSS Project, combined with the International Symposium (16 June). The idea of the workshop was to bring together both professional developers and (potential) customers of Open Source technology and stimulate research, innovation and networking in this field. The target groups of the International Information Workshop were:

- members of organizations dealing with geo-information (GI);
- scientists;
- small and medium entrepreneurs;
- representatives of regional self-government authorities;
- staff of institutions involved in implementation of the GMES Programme, including representatives of national GMES offices;
- staff of National Mapping Authorities (NMAs);
- members of the Open-Source community.

The main purpose of the International Symposium was to present results accomplished by the CASCADOSS Project — results of the evaluation of available GIS&RS OSS solutions, and to demonstrate the most promising and useful applications.

The following subjects were also discussed:

- How can open-source software foster use of GI technologies (particularly with respect to the GMES Programme) in the public sector?
- How do existing GI standards contribute to the development of open-source applications?
- What are the current trends in this area?
- How can GIS&RS services benefit from open source solutions and stimulate development of business-related GIS&RS applications?

During the Workshop various business models or added value services that can be implemented on OSS were introduced.

Participants

Figure 3: CASCADOSS participants

There were 91 participants in the symposium and 60 in the workshop. Workshop attendance fluctuated, with roughly 20 fewer present on the third day. All of the participants were asked to conduct a short survey on their GIS/RS background, motivation for participation in the workshop, and knowledge and skills in FOSS4G — a so called "zero-measurement survey". 55 participants took part in the survey, giving answers to 5 questions. Some of the results for motivation (Fig. 4), expertise (Fig. 5) and application field (Fig. 6) are given below.

Clearly the most frequent motivation was exploration of the possibilities to use free and open source software tools in operational work.

From 40 participants polled only 17 were over the level of basic experience, while 25 (over 50%) were absolute beginners with FOSS4G, indicating however prior experience with proprietary software. In the question addressing the fields of application of FOSS4G, most responders indicated the environmental sector, dealing with scenarios of vegetation change, ecosystems, climate, water resources etc.

Quite a big group of people use FOSS4G to analyze land use, land cover changes (25) and for the purpose of web-GIS services. A number of them use FOSS4G for thematic cartography (20), spatial planning (19), environmental planning (19), environmental management (16), environmental monitoring (15) and geodetic data survey (13). The lowest number of applicants marked risk assessment and early warning assessment (10), agriculture (10), forestry (9), environmental impact assessment reporting (8), geology (6) and transport infrastructure (5).

Event agendas

The agenda of the symposium was aimed at two goals: providing general overview on the FOSS4G in context of the GMES programme and presenting in the same context the results of the CASCADOSS project: documentation and evaluation of FOSS4G software projects, analysis of FOSS4G software licenses and business models. The 3-day long workshop was focused on three main blocks: discussion, use cases and education. The discussion was addressed during the first day, starting with a general presentation of the issues, targeted for later discussion in working groups. The presentations addressed the implementation of GMES programme in member states, usage of GIS/RS in public sector (eGovernment), standardization issues (deliverables of the HUMBOLDT project), characteristic of FOSS communities and business examples related

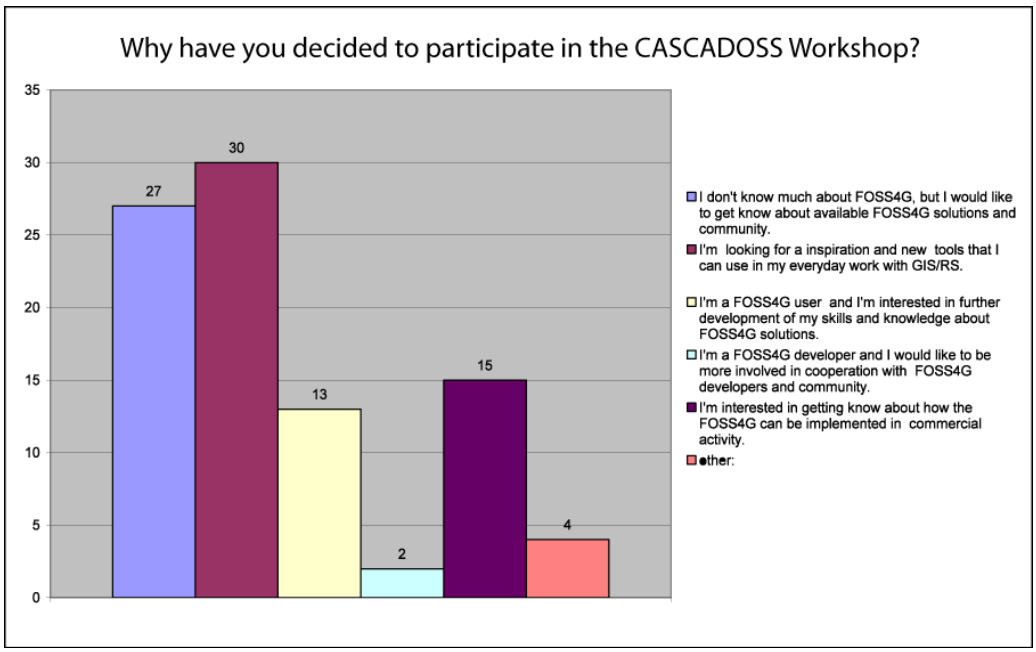

Figure 4: Reasons for participation in the CASCADOSS workshop

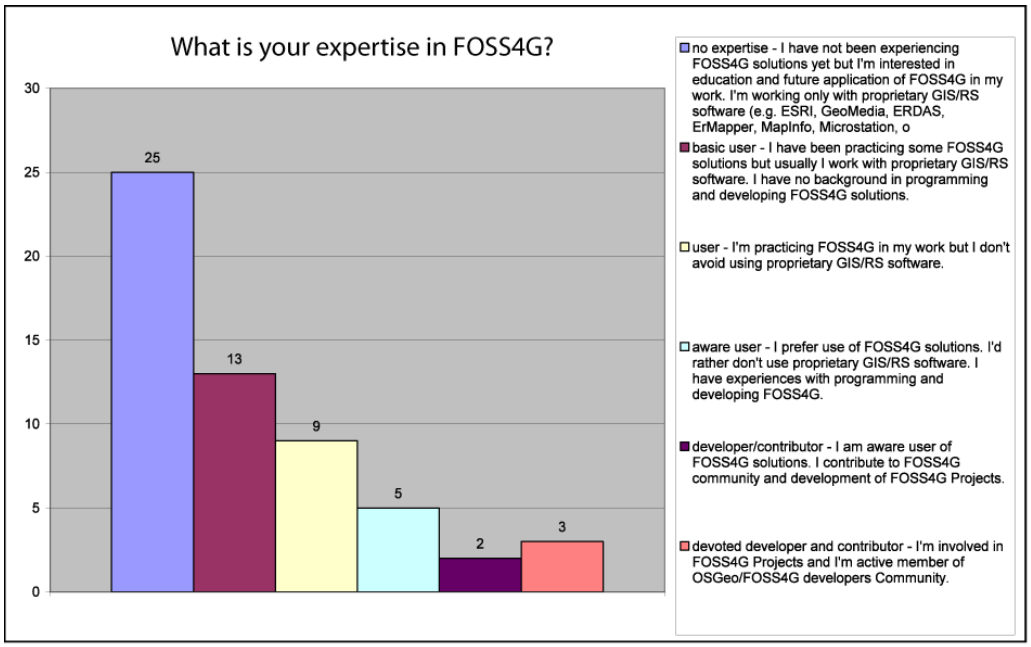

Figure 5: GIS expertise level of the CASCADOSS event participants

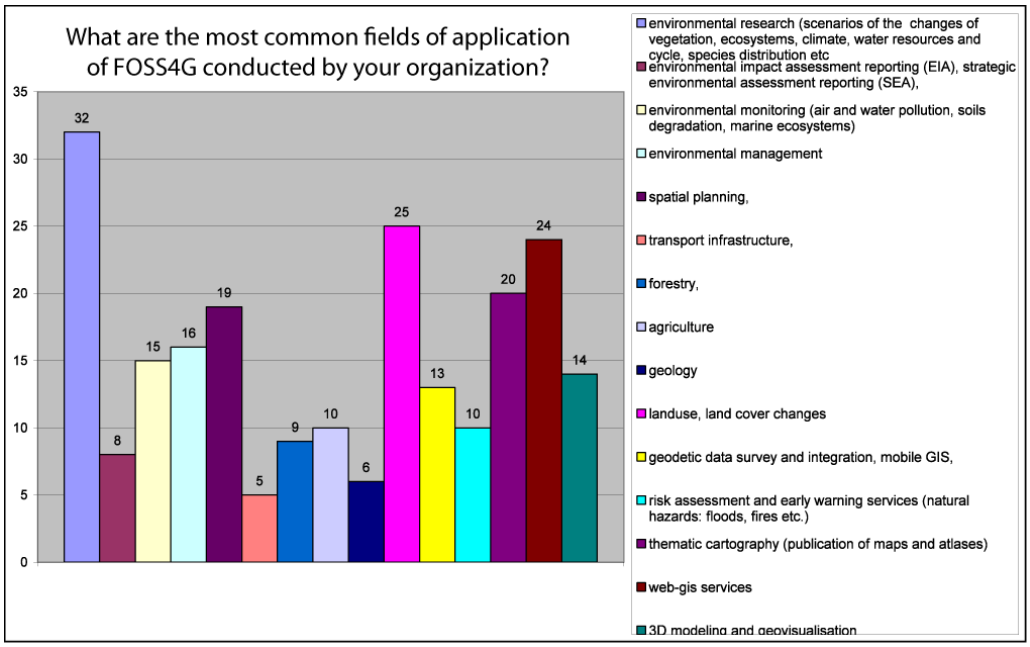

Figure 6: Most common applications of FOSS4G among CASCADOSS event participants

to the adoption of FOSS4G. The educational block was divided into three main scopes: software evaluation, GIS/RS and environmental applications. All the exercises were hands-on, utilizing CASCADOSS LiveDVD. Altogether eight successful examples of FOSS4G applications were presented during two use case sessions. More details on the event agendas can be found on the CASCADOSS website: `http://www.cascadoss.eu`, in the Events section.

Working Groups Discussion

Day one of the International Information Workshop was dedicated to discussion among the participants on various aspects of the use of FOSS4G solutions. In order to strengthen and facilitate the proceedings and to make them more effective, the participants had been divided into three working groups based on their professional field and area of responsibility (institution in which they work, etc.):

- WG1: FOSS4G and GI technology — for GI community, scientists and GIS practitioners;
- WG2: FOSS4G solutions in business and commercial activities — for representatives of small and medium enterprises (SMEs) and other companies and commercial entities;
- WG3: FOSS4G solutions of GMES implementation and approaches to e-government and public services — for representatives of public administration, at various levels.

Discussion covered the following issues:
FOSS4G and GI technology:

- Proprietary GI solutions versus FOSS4G: what to choose and why (a little SWOT analysis)?
- FOSS4G as a tool in GI education.
- Role of FOSS4G solutions in enhancing and developing of own IT/GI professional skills;
- What are my most common fields of application of FOSS4G solutions (sharing best practices).

FOSS4G solutions in business and commercial activities:

- Business models in practice: success stories in using FOSS4G solutions in/by the business world;
- Why SMEs seem reluctant to use FOSS4G but tend to favour commercial GI software?
- Quality and reliability of FOSS4G solutions serving as tools to provide quality service to customers.

FOSS4G solutions for GMES and approaches to e-government and public services:

- Use of FOSS4G solutions vis-à-vis legal and official procedures followed in public administration offices (for example, vis-à-vis the INSPIRE Directive implementation rules, other EU directives and standards for environmental reporting, etc.);
- Is FOSS4G implementation a challenge for public administration officials? If yes, in what sense and to which extent? How flexible would office staff be to apply new solutions in their routine professional duties?
- What legal instruments and organizational improvements can be developed to support FOSS4G implementation in the public sector?
- Which FOSS4G applications are most suitable to be used in GMES? In other words: is there a "niche" for FOSS4G in GMES (for example, for processing and analysis of GMES data)?
- Can FOSS4G applications foster and strengthen development and implementation of GMES in Europe?
- Can FOSS4G be applied to contribute to GMES mission by enhancing and improving dissemination of — and public access to — information and data on the state of environment and upcoming threats (in line with the INSPIRE Directive).

Recommendations

Results of the working group discussions are presented below in the form of lists of recommendations, agreed on between moderators and participants, regarding (within the topics specified above) proposals for:

- avoiding problems and obstacles in using FOSS4G;
- promoting use of FOSS4G;
- applying FOSS4G in the "routine", everyday practice of: (1) the GI community, (2) business sector, (3) public administration offices and GMES units/users.

Group 1: *FOSS4G and GI technology Moderators: Markus Neteler, Mateusz Łoskot* The discussion started with general questions on motivation for using FOSS4G. Among various arguments presented, the following were the strongest: ideology and FOSS4G devotion, lack of other GIS tools in work (especially in Central and Eastern Europe countries), challenge and freedom of use of such GI tools in science and academia. Consequently the SWOT (**S**trengths, **W**eaknesses, **O**pportunities, **T**hreats) analysis was conducted, the results of which are presented in Tables 1–2.

Group 2: *FOSS4G solutions in GMES and approaches to e-government and public services Moderators: Jakub Ryzenko, Ondrej Mirovski, Grzegorz Myrda, Lieven Raes, Thorsten Reitz*

Consistent with Group 1, with a public administration point of view:

1. Limited cost is good. Moreover, if you don't pay for software you can spend money on better implementation. Non-paid licenses mean unlimited number of licenses so products can be used widely and easily (e.g. by students). The potential to build communities of potential future users is easier because of non-paid licensing;
2. Strength: institution is not dependent on a particular provider of software (commercial company). So switching between software is easy, the institution is not "stuck" with a given software solution;
3. Strength: big potential in flexibility and adaptability. Can be used in specialized issues this particular institution may have;
4. OSS can expand in a bottom-up approach — number of users/institutions can become aware of possibilities created by improved software. Proprietary applications acquired in a top-bottom manner that limits their applicability. There is easier exchange of information, wider use, and flexibility of OSS;
5. From an institutional point of view, easy access by employees is better for bug-fixing and improves human relations and increases motivation of employees;
6. Lack of awareness and marketing of products, evident in the decision process (choosing particular software difficult if not widely recognized/marketed). OSS — even if similar to proprietary solutions — is weaker since less well marketed;
7. Lack of guaranteed service and customer support. For many decision makers it is not easy to find responsible individuals to make things work; unlike proprietary producers that back their products;
8. Significant effort and IT work required to get things started and the institution has to do the work themselves, rather than count on a provider;
9. With respect to GMES, discussed example of land service. It is clear that the strongest point

STRENGTHS	WEAKNESSES
- Not black-box: free and available software with possible development of functional scope. Free access to documentation and tutorials.	- Diverse point of view on "OSGeo" brand inside the community
- Flexibility of the software (FOSS4G are adjustable solutions)	- FOSS4G solutions are not so "integrated" as a package of proprietary software. It can cause problems for new users and low-end-users.
- Diversity of tools which foster development of the skills of students and researchers	- Lack of translated documentation
- Community (!!!) — OSGeo Foundation	- Lack of sample data (licensing), and information on available data resources
- Supportive of self-development (allows for networking, cooperation with other users and exchange of the knowledge and experiences. - Quick bug-fixing (action-reaction).	- Installation process of FOSS4G

Table 1: SWOT analysis for the use of FOSS4G software: Strengths and Weaknesses

OPPORTUNITIES	THREATS
- Portability — FOSS4G is portable and developed for various OS platforms (not only MS Windows)	- Domination of proprietary GI software
- PUBLIC SECTOR NEEDS — FOSS4G can be a solution for broad implementation in public sector (self-governmental units)	- Closed formats of GIS data
- INSPIRE (implementation rules of data exchange and accessibility)	- FUD effect: Fear, Uncertainty, Doubts
- DO your own business with FOSS4G — it is free and flexible so allows for creative approach in development of GI products and/or services for end-users	- Lack of education in use of GI even at a basic level — need for a broad GI education for public administration
- Make money on well prepared and designed documentation for end-users	
- FOSS4G courses and trainings	

Table 2: SWOT analysis for the use of FOSS4G software: Opportunities and Threats

is making data available to the public, not just institutions — assuming software policy allows for such dissemination;

10. The above problems can block use of OSS in GMES services, partly because of conservative institutions and FUD.

Group 3: *FOSS4G solutions in business and commercial activities Moderator: Karel Maesen*

1. Why used: price, license (no license for clients, no need for piracy of licenses), installation, operational ability to modify or extend the product, transparency.
2. Why not used: missing knowledge (awareness on using and consequences), shortage of expertise, shortages in usability and productivity, lack of simply available and customized training, packaging (download, install, run — this is not that easy as in many proprietary packages).
3. Standards: vendor lock by file format (cross-compatibility), GML data created by different vendors are not compatible. Shapefile format still works best.
4. Recommendations: EU governments communicate their experiences; funding for training, documentation; reducing liability risks: cheap indemnification insurance; reducing market fragmentation: support EU-wide market by procurement policy, since in Europe market forces seem sufficient.

The discussions and recommendations arising from them were the key achievement of the CASCADOSS International Information Workshop. We consider the workshop to have reached its goals of raising the awareness of the usefulness of FOSS4G among the end users from environmental and wider GI sectors — the potential addressees of the GMES programme.

Epilogue

The final workshop evaluation questionnaire, distributed during the workshop's last day, revealed that almost 50% of the 40 responses confirmed their willingness to use FOSS4G in daily work, 25% indicated partial interest, while one person did not intend to deal with FOSS4G at all. Through the international events in Warsaw and other dissemination activities, CASCADOSS managed to reach a wide audience of GI-users in its target geographical area

(BeNeLUx, Poland, Czech Republic, Slovakia and Hungary). This was reflected by the huge interest of geospatial users in CASCADOSS regional workshops, following the events in Warsaw, organized in Belgium, Poland, Czech Republic, Slovakia and Hungary in late 2008 and early 2009.

Links and references

CASCADOSS website: www.cascadoss.eu
CASCADOSS LiveDVD[1]
CASCADOSS at OSOR[2]
CASCADOSS Association[3]

M. Rusztecka
UNEP/GRID-Warsaw
www.gridw.pl

R.Wawer and T. Steenberghen
SADL, KULEUVEN R&D
http://sadl.kuleuven.be

E. Orlitova
GISAT
www.gisat.cz

A. Podolcak
Compet-Terra
www.competterra.com

[1]CASCADOSS LiveDVD: http://cascadoss.competterra.com/cascadoss.php?livedvd_en
[2]CASCADOSS at OSOR: http://bit.ly/cSYmhM
[3]CASCADOSS Association: http://cascadoss.competterra.com/cascadoss.php?home_en

Imprint

The *OSGeo Journal* is a publication of the *OSGeo Foundation*. The base of this journal, the LaTeX 2_ε style source has been kindly provided by the GRASS and R News editorial boards.

Journal online: http://www.osgeo.org/journal

OSGeo Homepage: http://www.osgeo.org

Mail contact through OSGeo, PO Box 4844, Williams Lake, British Columbia, Canada, V2G 2V8

ISSN 1994-1897

osgeo.org