

2nd Sabah International Surveyors Congress
11th – 12th March 2014



OPEN SOURCE SOLUTIONS FOR SURVEYORS



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The Benefits Of Closed Proprietary Software

- You Don't Have To Fix Bugs – Report & Wait For The Next Software Release
- You Don't Have To Worry About Licensing - Buy Extra License When Needed
- You Don't Have To Worry About Software Options or Features – Pay only for features you need
- You Don't Have To Do Any Research – Training Provided
- You Don't Have To Look For Tech Support – Annual Maintenance Fee

Using FOSS

- You Need to report bugs and interact with the community to fix it
- You Need To Read and Understand Different Type of OS License – GNU, MIT, BSD, etc...
- You Need To Contribute Back To the Community – Your time (test, translation, etc) or money (eg to ask for new features or bug fixes)
- You need to upgrade/update constantly – They constantly release new features and bug fixes
- You Will Have To Learn and Do Your Research – Wiki, Mail List, Youtube, Vimeo Will be in your Bookmarks

My First Encounter With FOSS

- **Proj4**

- Cartographic Projections library originally written by Gerald Evenden then of the USGS

- **Excerpt of email in 2004**

- **Re: Rectified Skew Orthomorphic...**

- “I have been through all the nonsense with the **Malayan Monster** and even added some parameters to PROJ.4 omerc to do the necessary supplemental operations. **HOWEVER**, that was a long time ago and I will have to revisit the scene of the crime and see if I can figure how to use them again.”*

My First Encounter With FOSS

Hi Frank,

I note that Carl has submitted a ticket (Ticket #62 (new enhancement)) to request for the `gamma_c` parameter in the `omerc` code. Please advise if this patch is already available because I would like to test if it will work for the Borneo RSO Coordinates.

Below are some examples (lat & longs are in everest(borneo) ellipsoid)

Lat	Long	Northing	Easting
5 54 19.90183	116 02 11.12630	653979.690	704570.402
5 17 00.76681	115 14 30.52500	584855.848	616823.128
5 50 35.99907	118 07 04.74110	648549.707	935058.283
4 15 48.90886	117 52 44.47753	473669.925	909927.260

Alex Chong

Changed 4 years ago by warmerdam

In trunk (r1817) I have upgraded `src/PJ_omerc.c` wholesale from Gerald's `libproj4.3` (20081120). I have confirmed with several existing `omerc` variations from the `epsg` init file that the results with the new code match the old, at least for the parameter variations used. I have not yet tested the `gamma/rso` support, nor has the `epsg` init file generation process been updated yet for special RSO parameters.

Changed 4 years ago by warmerdam

I have confirmed similar results with the following test and the new code. Note the need to be careful about escaping single quotes at the commandline:

```
src/proj +proj=omerc +a=6377298.556 +rf=300.8017 +lat_0=4 +lonc=115 +alpha=5:  
116d2'11.12630 5d54'19.90183  
704570.40          653979.68
```

Changed 4 years ago by warmerdam

Brief test added in `testvarious` (r1818).

Still outstanding is the `epsg` init file parameters for RSO.

Changed 4 years ago by warmerdam

OGRSpatialReference import/export to PROJ.4 format has been updated to translate the `RECTIFIED_GRID_ANGLE` to/from the `+gamma` parameter.

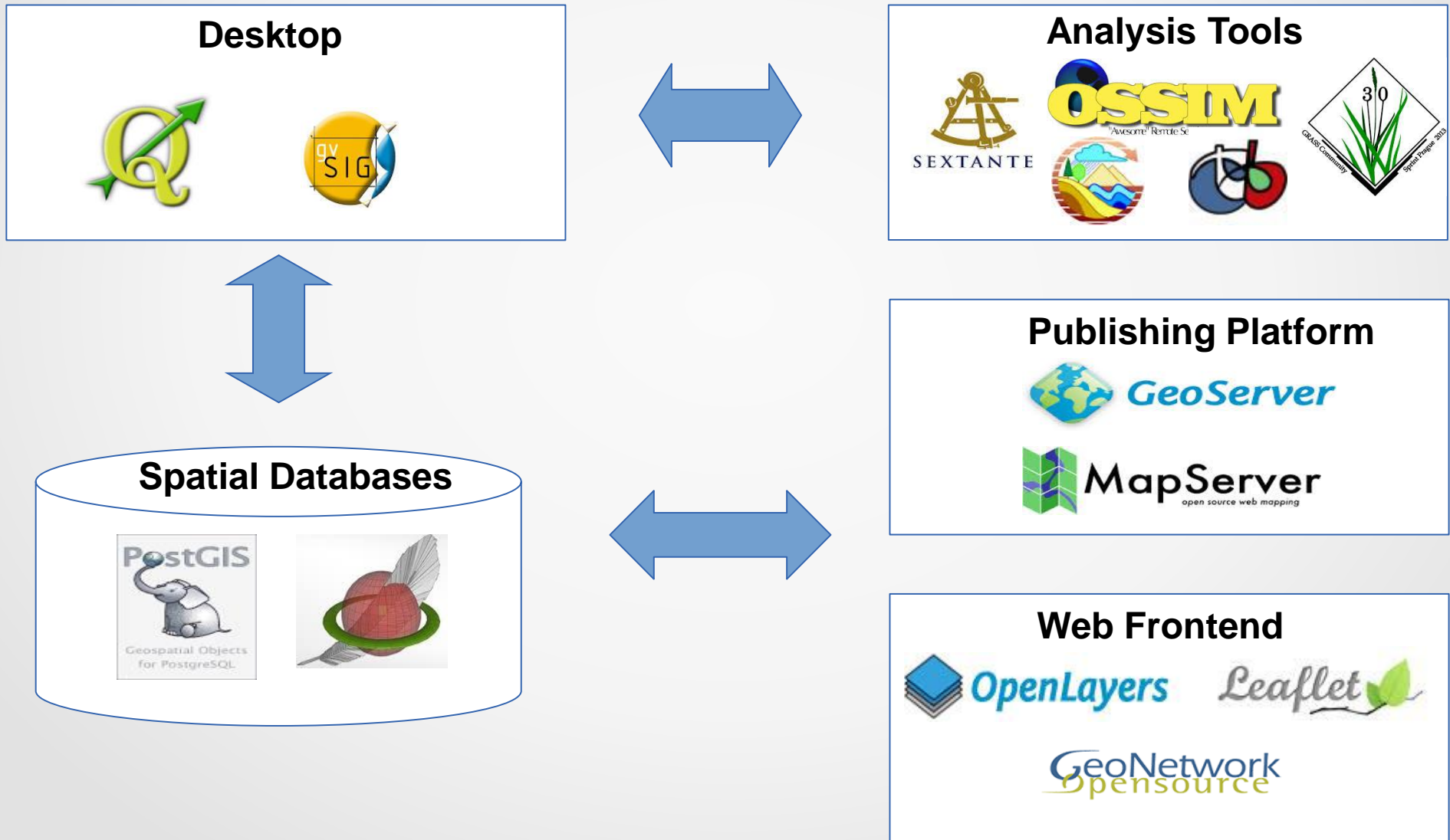
⇒ <http://trac.osgeo.org/gdal/changeset/18950>

Still waiting for `proj.4` init file regeneration.

Changed 4 years ago by warmerdam

- **status** changed from *assigned* to *closed*
- **resolution** set to *fixed*

FOSS SDI Architecture



Spatial Databases

- Spatialite (Sqlite)
 - Spatial Library Based on Sqlite Core
 - Lightweight
 - Powerful Spatial SQL Functions
 - Supports Multiple Data Formats Shapefiles, GML, KML, GeoJSON, SVG
 - Appropriate For Standalone Desktop or Offline Mobile Applications

Spatial Databases

- Postgis (Postgresql)
 - Spatial Extension To Postgresql
 - PostgrSQL + PostGIS fully supports a client/server architecture
 - Huge Library Of Spatial SQL Functions
 - Supports Even More Data Formats
 - Suitable For Big Data Publishing and SDI
 - Used by Openstreetmap Project Handling 1.4 Terrabytes Of Data

Desktop GIS Software

- GVSig
 - Developed using Java
 - Full-fledged desktop GIS
 - Runs on Windows, Linux and OSX Mac Platforms
 - Access to vector formats: SHP, DXF, GML, DWG, DGN, KML
 - Access to most raster formats
 - Access to remote services: OGC (WMS, WFS, WCS, WFS-T, WPS)

Web Publishing Platforms

- Mapserver
 - Written in C
 - Cross Platform
 - Support for popular scripting and development environments (php, python, perl, etc)
 - Advanced cartographic output
 - Support of numerous Open Geospatial Consortium (OGC) standards (wfs, wms, wmc, wcs, etc..)
 - Supports multitude of raster and vector data formats
 - On-the-fly map projection with 1000s of projections through the Proj.4 library

Web Publishing Platforms

- Geoserver
 - Written in Java (runs within apache tomcat container)
 - Cross Platform
 - Mature support for PostGIS, Shapefile, ArcSDE, DB2 and Oracle
 - Support Open Geospatial Consortium (OGC) standards (wfs, wms, wmc, wcs, etc..)
 - Excellent Google Earth Support
 - Integrated with GeoWebCache, for accelerated tile mapping

Web Browser Front End

- Openlayers
 - Javascript Library
 - Builds Rich Web Based Geographic Application Similar to Google Earth and Bing
 - Supports GeoRSS, KML, GML, GeoJSON and map data from any source using OGC-standards as Web Map Service (WMS) or Web Feature Service (WFS)
 - OpenLayers 3, comprehensive rewrite of the library, targeting the latest in HTML5 and CSS3 features

Web Browser Front End

- Leaflet
 - JavaScript library for mobile-friendly interactive maps
 - Designed with simplicity, performance and usability in mind
 - Extremely lightweight
 - Runs on Chrome, Safari, Firefox, Opera and IE
 - Supports GeoJSON, WMS, GPX

Why The Future Is FOSS?

- Git – Distributed Source Control Management
- Release early, release often
- Expanding Community
- Wisdom of the crowd
- With More Eyeballs All Bugs Are Shallow
- Improving Quality
- Freedom Drives Amazing Innovations
- Growing enterprise acceptance - Even at Government Mapping Agencies

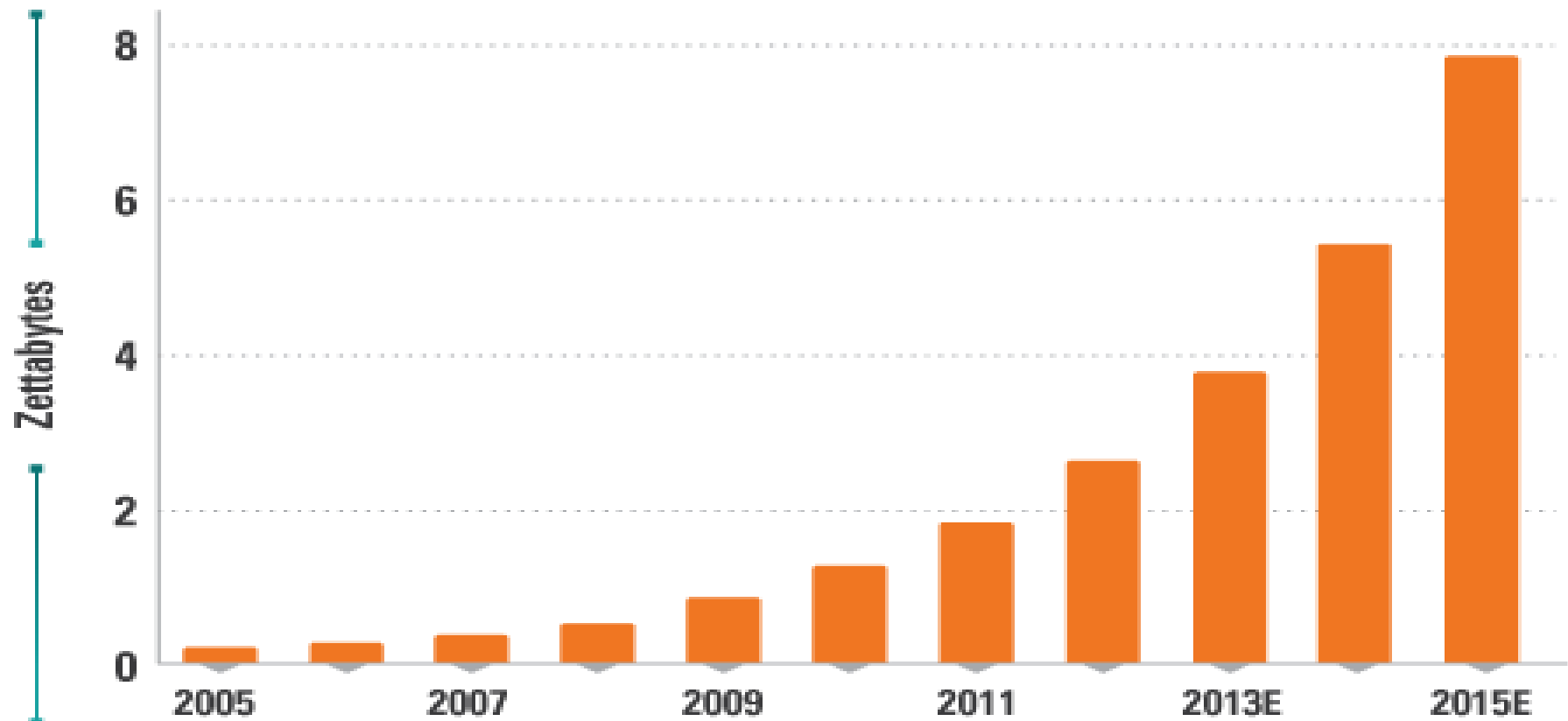
Should Surveyors Use FOSS?

- Does not matter if the cat is black or white as long as it catches the mouse
- Helps Us Create More Value
- Focus on solutions – not the software
- Increasing demand Structured Data and Unstructured Data To Be Georeferenced
- Data is the new oil

Big Data Has Landed

A Digital Data Explosion

Global digital information created and shared



Source: KPCB, IDC

techandinnovationdaily.com

Expanding The Role of Surveyors

- Before Big Data
 - Instinct
 - Experience
 - Subjective Decision Making
 - Hindered By Scale of Data Collection and Software Cost
- Now With Big Data
 - Patterns
 - Trends
 - Insight
 - Decisions Are Driven By Strong Analytical Information
 - FOSS levels the playing field



Thank You