

Pacific Community  
Communauté du Pacifique

PACIFIC ISLAND COUNTRIES  
GIS/RS  
USER CONFERENCE

# THE QGIS ECOSYSTEM

Tuesday 16<sup>th</sup> November 2015

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## Background

QGIS (formerly Quantum GIS) is a leading user-friendly, institutive, cross-platform, open source, **desktop (?)** geographic information system (GIS).

Created, by a single developer, as a standalone PostGIS database viewer in 2002.

Funded by the OSGeo Foundation, which also ensures strict compliance to OGC industry GIS standards and protocols.

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## Evolution and Maturity

### In a Nutshell, QGIS...

- ... has had 29,609 commits made by 268 contributors representing 744,208 lines of code
- ... is mostly written in C++ with an average number of source code comments
- ... has a well established, mature codebase maintained by a very large development team with stable Y-O-Y commits
- ... took an estimated 202 years of effort (COCOMO model) starting with its first commit in July, 2002 ending with its most recent commit about 12 hours ago

### Languages



### Lines of Code



### Activity

#### 30 Day Summary

Oct 15 2015 — Nov 14 2015

420 Commits  
42 Contributors  
including 7 new contributors

#### 12 Month Summary

Nov 14 2014 — Nov 14 2015

4217 Commits  
Down -206 (4%) from previous 12 months  
98 Contributors  
Down -17 (14%) from previous 12 months

### Commits per Month



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## Release Model

- 3 Month Major Release Cycle
- 2015 – 3 Major Releases, 2.8 (Wein), 2.10 (Pisa) and 2.12 (Lyon), with hundreds of features implemented, performance improvements, and bug fixes
- Long Term Release (for Corporate Users and Enterprise Environments) – every third release, current LTR is 2.8, next 2.14 (26.02.2016)
- Weekly Release – on all major platforms, for cutting edge users
- <https://www.qgis.org/en/site/forusers/visualchangelogs.html>

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## COCOMO Analysis on Code-base

15/11/2015

Totals grouped by language (dominant language first):

```

cpp:      699176 (80.83%)
python:   153986 (17.80%)
ansic:    8804 (1.02%)
sh:       1550 (0.18%)
perl:    1430 (0.17%)

```



```

Total Physical Source Lines of Code (SLOC)                = 864,946
Development Effort Estimate, Person-Years (Person-Months) = 242.59 (2,911.05)
  (Basic COCOMO model, Person-Months = 2.4 * (KSLOC**1.05))
Schedule Estimate, Years (Months)                        = 4.32 (51.79)
  (Basic COCOMO model, Months = 2.5 * (person-months**0.38))
Estimated Average Number of Developers (Effort/Schedule) = 56.20
Total Estimated Cost to Develop                          = $ 32,770,274
  (average salary = $56,286/year, overhead = 2.40).
SLOCCount, Copyright (C) 2001-2004 David A. Wheeler
SLOCCount is Open Source Software/Free Software, licensed under the GNU GPL.
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## Pacific User Base and Market Share

**77%**

GIS/RS Users in Pacific Governments, Regional Agencies and Academia, use QGIS according to a recent online survey conducted by GIZ/MacBIO.

**90+**

Pacific Island Nationals trained on QGIS and related FOSS4G Toolsets in 2015 alone, By Geoscience Division, Pacific Community, via Regional Workshops, In-Country Training, and Internship attachment Schemes.

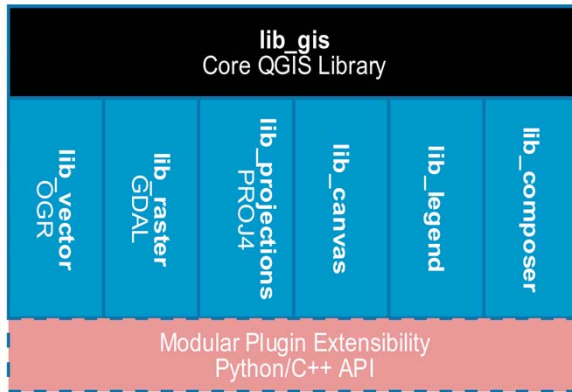
**4**

Major Regional Players actively involved in QGIS Capacity Building in the Pacific Island Countries

- SPC (Geoscience, Fisheries and Stats Division)
- CSIRO (Kiribati, Solomons)
- GIZ-funded MacBIO/IUCN
- USP

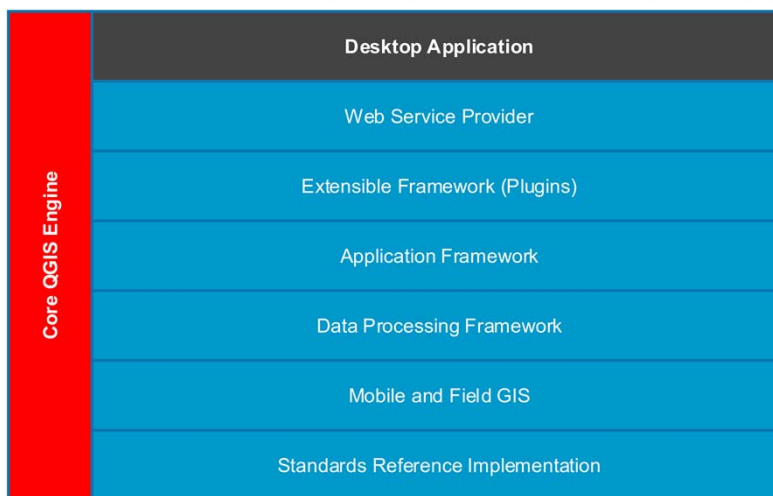
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## QGIS Engine: Core Architecture



Independent of Platform and User Interface.  
 Built on open source libraries like GDAL and PROJ4, which has been under development since early 1980s.

## Ecosystem: not just a desktop GIS!



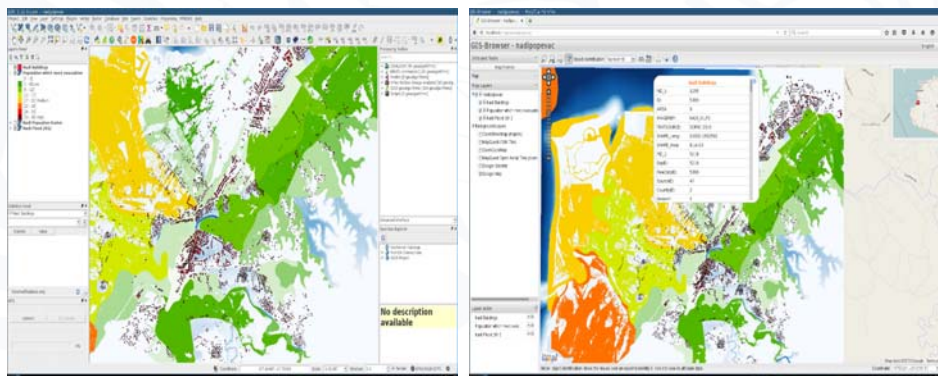
## Desktop Application

Data Support	
84 Vector Formats	GeoTIFF, Erdas Imagine, ECW, MrSID, JPEG2000, DTED, NITF, GeoPackage, ...
142 Raster Formats	Shapefile, ESRI ArcSDE, ESRI FileGDB, MapInfo (tab and mid/mif), GML, KML, PostGIS, Oracle Spatial, GeoPackage, ...
7+ Major Spatial Databases	PostGIS, Spatialite, Oracle Spatial Extensions, SQL Server Spatial Extension, ESRI Personal GDB, FileGDB ...
7+ Major OGC Web Services	WMS — Web Map Service (WMS/WMTS Client) WMTS — Web Map Tile Service (WMS/WMTS Client) WFS — Web Feature Service (WFS and WFS-T Client) WFS-T — Web Feature Service - Transactional (WFS and WFS-T Client) WCS — Web Coverage Service (WCS Client) SFS — Simple Features for SQL (PostGIS Layers) GML — Geography Markup Language

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## Web Service Provider

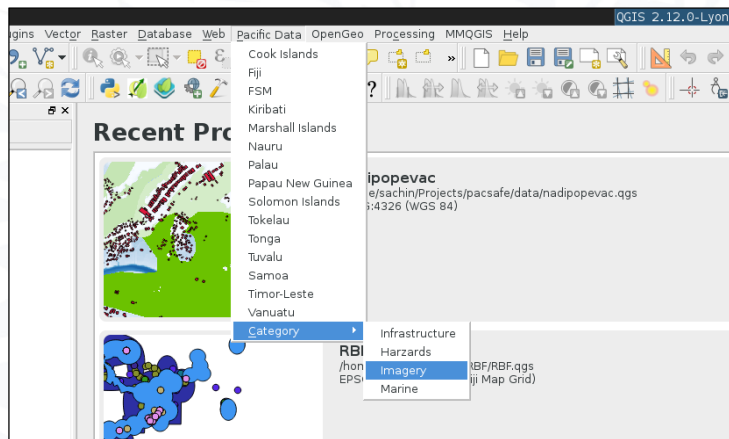
**No coding or modification required** to publish an existing QGIS project on the internet, with full OGC Web Service Support.



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## Extensible Platform (Plugins)



Simple Language (Python) and Simple API (PyQGIS)  
Very expressive and easy to learn

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## Commonly Used Plugins

**MMQGIS** – High performance, advanced vector layer operations and analysis  
<http://michaelminn.com/linux/mmqgis/>

**OpenLayers Plugin** – for using remote base layers such as OSM, Google Maps, Bing etc.

**Leaflet Plugin** – for creating static interactive server-less web maps

**Table Manager** – manage and modify table attributes and data structure

**SCP** - Semi-Automatic Image Classification Plugin for classifying multispectral imagery, With pre/post processing tools eg: for Land Use Cover Classification and other Remote Sensing Work.

**OpenGeo Plugin** – for connecting to and utilizing Pacific Spatial Data Infrastructure such as PacGeo.

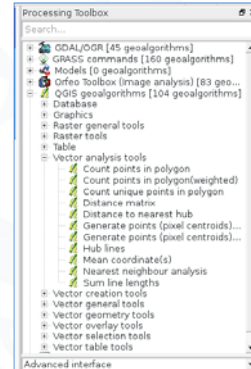
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## Data Processing Framework (1)

### QGIS Processing Toolbox

serves as a one-stop-shopping GUI for accessing algorithms from both native QGIS tools and many third-party providers. Historically, the algorithms from other geospatial packages were only accessible within the native software environment or through a command-line environment.

QGIS geoalgorithms  
GDAL/OGR  
GRASS  
SAGA  
TauDEM  
LASTools  
R  
Orfeo Toolbox  
Models  
Scripts



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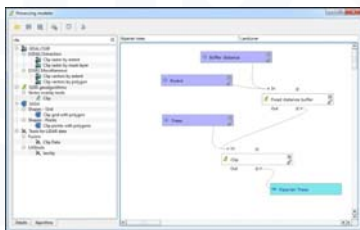
## Data Processing Framework (2)

### Automating Workflows with the Graphical Modeler

Enables creation and execution of complex analytical workflow models, chaining output of one operation to the input of another.

Models are created and modified visually, and can be shared with another users

*Example:* Batch reproject hundreds of MapInfo files from FMG to WGS84, convert to Shapefiles, and load onto a PostGIS database.



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## Application Framework

QGIS Core can be used to build highly-specialized stand-alone desktop and server Applications oriented for non-GIS users.

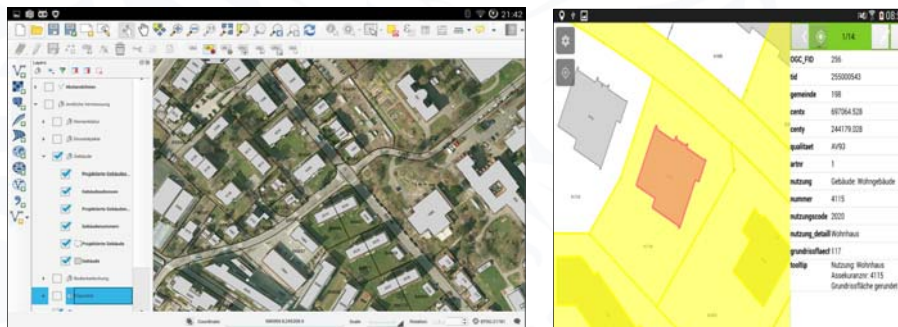


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## Portable GIS

QGIS Android is a **direct** port of QGIS Desktop, with a modified user interface suitable for touch screen. (2.8.2)

Qfield Android is a GPS-centric and flexible field survey app built on QGIS Core. Both built and maintained by the same developers.



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## OGC Standards RI and SDI-Aware



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## Capacity Building Initiative for the Pacific



<http://www.pacgeo.org/edu> (in development)

<http://ict.sopac.org/workshop>



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## Summary: Why QGIS?

- No Vendor Lockin – Software and Data
- Full OGC Standards Compliance – Data Integrity and inter-operability
- Community driven roadmap and development
- Pacific Capacity Building is on an upward projection
- Long-term commitment in the platform by major regional and international agencies within the Pacific
- Strong adoption by academia across the globe
- Lower Total Cost of Ownership – zero licencing and upgrade, support and training/accreditation costs
- International agencies and donors strongly recommend adoption of open source technologies by developing countries for sustainable development.



**open source**

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## Thank You

Questions?

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