

Free & Open Source Extensions

SpatialKit and SEXTANTE

for ArcGIS Desktop 9 and 10

Karsten Vennemann, Terra GIS Ltd.



TERRA GIS
TERRESTRIAL ENVIRONMENT REGIONAL ANALYSIS

www.terrakis.net

Seattle, WA, USA

karsten@terrakis.net

206 905 1711

SpatialKit and SEXTANTE

ArcGIS Desktop

SpatialKit for ArcMap

About Spatialkit

PostGIS

Using Spatialkit

SEXTANTE for Desktop GIS

About Sextante

Using Sextante

ArcGIS

gvSIG CE

Resources

SpatialKit for ArcMap

needs ArcGIS ≥ 9.2 , .Net Framework ≥ 3.5 , SpatialKit, PostgreSQL ≥ 8.4 , PostGIS ≥ 1.5 .

SpatialKit for ArcMap does **not** require ArcSDE, ArcInfo, Spatial Data Server (SDS) technology, or ArcGIS server

- www.st-links.com

- user manual

- <http://st-links.com/Documents/STSpatialKit3.pdf>

- PostGIS - <http://postgis.refractory.net/>

- Book: Obe, R.& Hsu, L.(2011): PostGIS in Action. Manning. 492 pages, www.manning.com/obe/

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:572,526

100%

Table Of Contents

Layers

☒ wa_tracts

☒ gemeinde

☒ wa_regions

☐ wa_zip

☒ wa_counties

<all other values>

id

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

ST-Links SpatialKit

ST-Links

Island

Jefferson

Layer Properties

General Source Selection Display Symbology Fields Definition Query

Extent

Top: 751825.158485 ft

Left: 661171.773298 ft Right: 2636356

Bottom: -527872.752862 ft

Data Source

Data Type:

Location:

Feature Class:

Feature Type:

Geometry Type:

PostGIS/terragis2/public.wa_tracts(tnc

STWorkspace1

wa_tracts

Simple

Polygon

Projected Coordinate System:

Projection:

False_Easting:

False_Northing:

NAD_1983_StatePlane_Washington_N

Lambert_Conformal_Conic

1640416.66666667

0.00000000

Add ST Layer

Connections

vfs.hosteurope

ekiti.terragis1

terragis1

terragis2

New

Modify

Delete

Save to Default

Close

DB Type:

Server:

Database:

PostGIS

vfs

View Extent:

No

Srid:

Min X:

Max X:

Min Y:

Max Y:

Spatial

vfs.gemeinde[the_geom]

vfs.wald[the_geom]

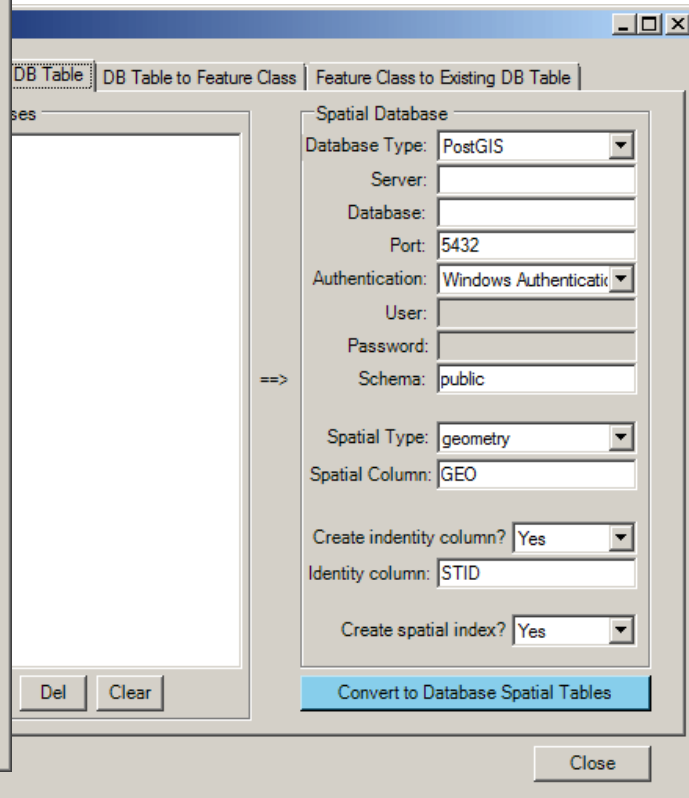
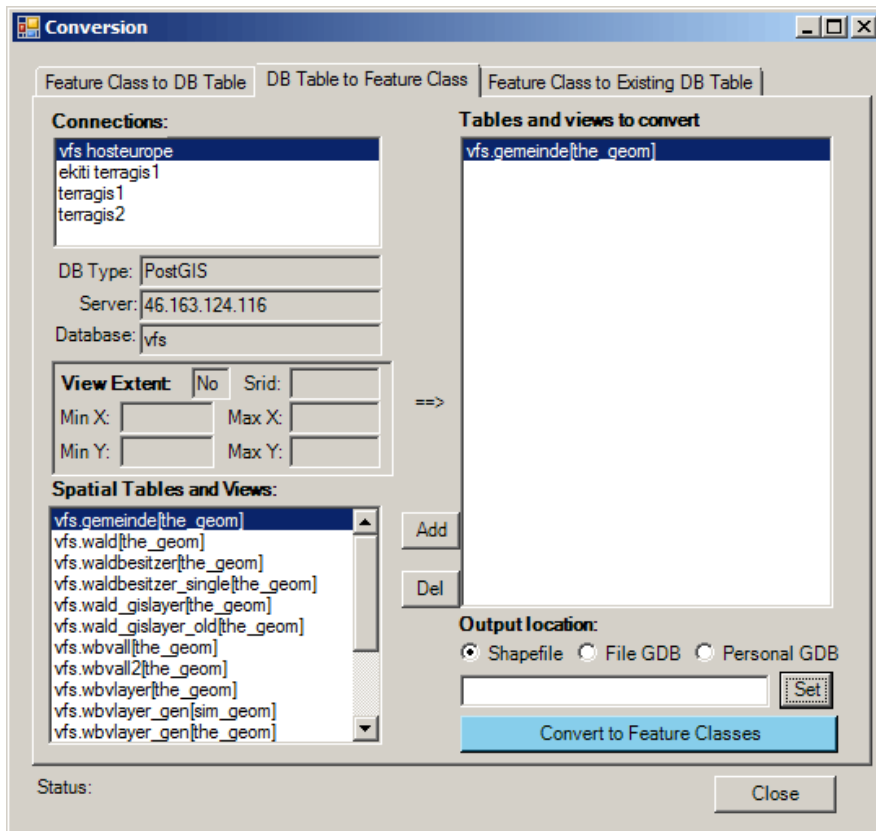
vfs.waldbesitzer[the_geom]

vfs.waldbesitzer_single[the_geom]

vfs.wald_gislayer[the_geom]

vfs.wald_gislayer_old[the_geom]

Format Conversion



For the most part SpatialKit seamlessly integrates with ArcMap.

- But !**
- 1) Only table-based and view-based layers with identity column (unique serial column in PostGIS) can be edited and saved back to spatial database.
 - 2) The identity column is used to unique identify a row in spatial table/view and trace back to spatial table when a feature is changed, added, or deleted.
 - 3) Table-based layers without identity column cannot be edited, or cannot save changes back to spatial table.
 - 4) View-based layers without identity column cannot be edited, or cannot save changes back to SQL Server table.
 - 5) Only changes made within editing session can be saved back to spatial table. Changes made outside editing session cannot be saved back to spatial table. Therefore, if you want to use Field Calculation to make change to spatial table, you should start editing, then do the field calculation, and then save the edits.
 - 6) For data consistency and multi-user purpose, delete field will not be updated to spatial table. We strongly recommend that you maintain your table columns within spatial database administration.
 - 7) Add fields in table-based layer will be updated to spatial table. However, add fields in a view-based layer will not be updated to database.

Using Spatial Kit Tips

■ Set Map View Extent

Map View Extent

Map Coordinate System: GCS_WGS_1984

Srid: 4326

Min X: 10.98024243768; Max X: 11.13283385932

Min Y: 49.49641342067; Max Y: 49.63243597026

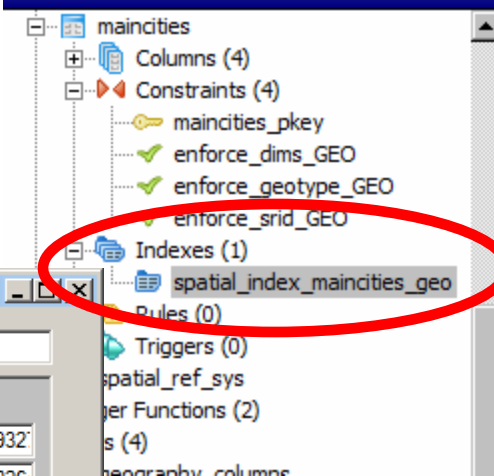
☒ Get current extent
☐ Get Lower-Left XY by click on the map
☐ Get Upper-Right XY by click on the map
☐ Stop getting XY values by click

☒ Create View Extent (uncheck will remove View Extent).
☒ Apply this extent to all connections?
☐ Zoom to this extent?

Apply Cancel

Status:

■ create spatial indexes in PostGIS



maincities

- Columns (4)
- Constraints (4)
 - maincities_pkey
 - enforce_dims_GEO
 - enforce_geotype_GEO
 - enforce_srid_GEO
- Indexes (1)
 - spatial_index_maincities_geo**
- Rules (0)
- Triggers (0)
- spatial_ref_sys
- Trigger Functions (2)
- Columns (4)

Properties

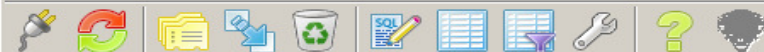
Property	Value
Name	spati...
OID	17487
Tablespace	pg_d...
Columns	"GEO"

SQL pane

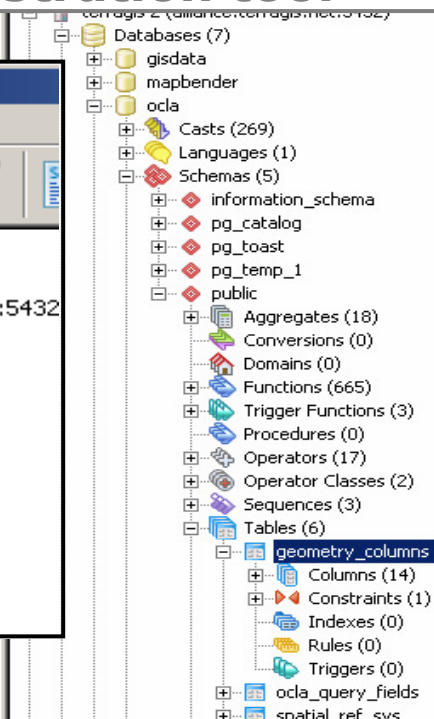
```
-- Index: spatial_index_maincities_geo
-- DROP INDEX spatial_index_maincities_geo;

CREATE INDEX spatial_index_maincities_geo
ON maincities
USING gist
("GEO");
```

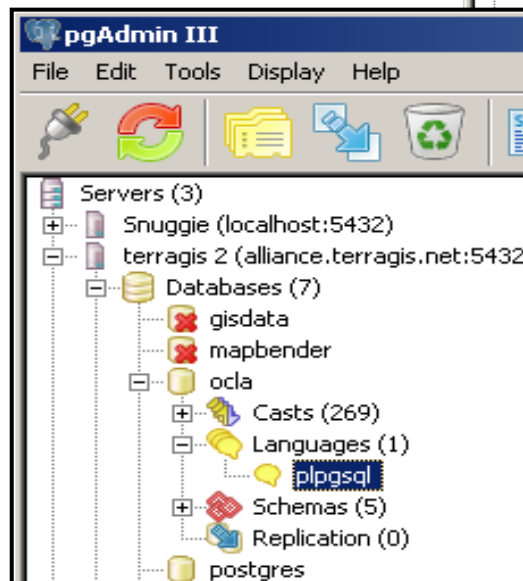
■ use ArcGIS definition queries



Servers (3)



pgAdmin – GUI base Database administration tool



Property	Value
Name	geometry_columns
OID	16754
Owner	gisdata
ACL	
Primary key	f_table_catalog, f_table_schema, f_
Rows (estimated)	1
Rows (counted)	3
Inherits tables	No
Inherited tables count	0
Has OIDs?	Yes
System table?	No

Properties Statistics Depends on Referenced by

```
-- Table: geometry_columns
-- DROP TABLE geometry_columns;

CREATE TABLE geometry_columns
(
    f_table_catalog varchar(256) NOT NULL,
    f_table_schema varchar(256) NOT NULL,
    f_table_name varchar(256) NOT NULL,
    f_geometry_column varchar(256) NOT NULL,
    coord_dimension int4 NOT NULL,
    srid int4 NOT NULL,
    "type" varchar(30) NOT NULL,
    CONSTRAINT geometry_columns_pk PRIMARY KEY (f_
)
WITH OIDS;
ALTER TABLE geometry_columns OWNER TO gisdata;
```


pgAdmin III Edit Data - terragis 2 (alliance.terragis.net:5432) - ocla - geometry_columns

	oid	le_ca varc	table_schem [PK] varchar	f_table_name [PK] varchar	geometry_column [PK] varchar	d_dimer int4	srid int4	type varchar
1	63153	"	public	wa_counties	the_geom	2	2285	MULTIPOLYGON
2	63206	"	public	wa_counties_w	the_geom	2	2285	MULTIPOLYGON
3	63226	"	public	wa_tracts	the_geom	2	2285	MULTIPOLYGON
*								

PostGIS tables

geometry columns

spatial reference table

pgAdmin III Edit Data - terragis 2 (alliance.terragis.net:5432) - ocla - spatial_ref_sys

	srid [PK] int4	auth_name varchar	auth_srid int4	srtxt varchar	proj4txt varchar
1614	4324	EPSG	4324	GEOGCS["WGS 72BE",DATUM["WGS_1972_	+proj=longlat +ellps=WGS72 +b
1615	4326	EPSG	4326	GEOGCS["WGS 84",DATUM["WGS_1984",SP	+proj=longlat +ellps=WGS84 +d
1616	4600	EPSG	4600	GEOGCS["Anguilla 1957",DATUM["Anguilla_1	+proj=longlat +ellps=clrk80 +no
1617	4601	EPSG	4601	GEOGCS["Antigua 1943",DATUM["Antigua_1	+proj=longlat +ellps=clrk80 +no
1618	4602	EPSG	4602	GEOGCS["Dominica 1945",DATUM["Dominica	+proj=longlat +ellps=clrk80 +tov
1619	4603	EPSG	4603	GEOGCS["Grenada 1953",DATUM["Grenada	+proj=longlat +ellps=clrk80 +tov
1620	4604	EPSG	4604	GEOGCS["Montserrat 1958",DATUM["Montse	+proj=longlat +ellps=clrk80 +tov

PostGIS - the OS Spatial Database

Main supporter “Refractions” Research

- PostGIS is an extension for PostgreSQL
- adds support for geographic objects to PostgreSQL
- enables PostgreSQL server to be used as a backend spatial database for GIS
- Spatial operations and analysis simply mean running a (spatial) SQL query in the database
- Similar functions as SDE and much more

PostGIS Functions

■ Spatial SQL



More spatial operations

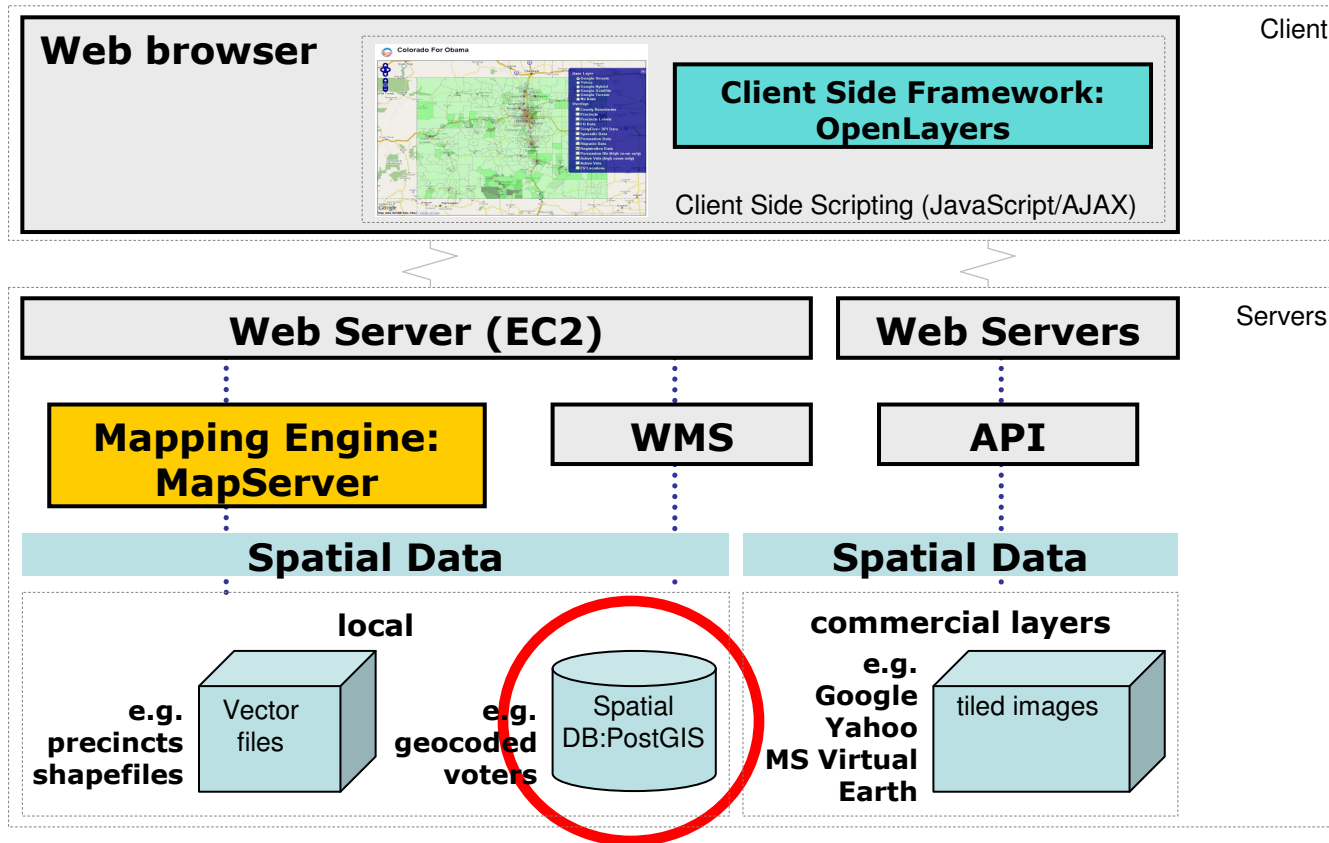
Buffer

```
Select st_buffer(ST_Simplify(the_geom, 700), 9000) from
wa_counties where name ilike 'King';
```

Intersect

```
select name from counties where counties.the_geom &&
(setsrid((MakePoint(1622794, 150532)),2285))
and intersects
(counties.the_geom,setsrid((MakePoint(1622794,
150532)),2285));
```

Schematic View of the Interoperable Web GIS



Simple spatial operations

Output format

```
select askml(the_geom) from counties2008 where name ilike 'king';
```

Human readable geometry

```
select astext(the_geom) from counties where name ilike 'King';
```

Distance

```
select distance(setsrid((MakePoint(1622794, 150532)),2285),
setsrid((MakePoint(1622845, 150937)),2285));
```

Transform

```
Select transform((setsrid(MakePoint(1622794, 150532),2285)),4326);
```

Aggregate functions - Union of polygons

Union all counties of the county polygon data set "us_counties " to create one polygon encompassing the area of the entire US.

```
select st_union(the_geom)
into us_border
from us_counties
```

This operation unions all individual datasets and groups them by states.

```
select st_union (the_geom), state_name
into us_states
from us_counties
group by state_name;
```



SEXTANTE for ArcGIS **Beta !**

needs: ArcGIS \geq 9.3.1, Java, ArcDesktop Java SDK - included with ArcView version 10, at version 9.3.1 separate purchase as ArcEngine
SEXTANTE for ArcGIS

- www.sextantegis.com

- user manual

 - <http://www.unex.es/eweb/sextantegis/IntroductionToSEXTANTE.pdf>

- <http://www.sextantegis.com/arccgis.html>

- Sextante Articles



[Downloads]

The latest version of SEXTANTE is v1.0. Click [\[here\]](#) to download it. This package contains the core library files, bindings for all supported platforms and contextual help files. Read the readme.txt file for further instructions on how to use this package.



For ArcGIS users

**625
algorithms !**

If you are an ArcGIS user wanting to use SEXTANTE, you can download and ArcGIS package [\[here\]](#). Just unzip it in your `[arcgis_folder]\java\lib\ext` folder and you are ready to go! Please read the [\[SEXTANTE for ArcGIS webpage\]](#) before using it.



For gvSIG users

An easier way of installing SEXTANTE for gvSIG is to use a package than can be installed using the gvSIG add-ons manager. You can click [\[here\]](#) to download it. Follow the instructions in the [\[SEXTANTE for gvSIG webpage\]](#) to know how to use it.

[\[about \]](#)

[\[downloads \]](#)

[\[documents and manuals \]](#)

[\[source code \]](#)

[\[bug tracker \]](#)

[\[mailing lists \]](#)


[\[contact \]](#)

[\[blog \]](#)



Installation SEXTANTE For ArcGIS

extract to **arcgispath\java\lib\ext**



The diagram shows a large orange arrow pointing from a zip file icon in the left pane to the 'ext' subdirectory in the right pane, indicating the extraction process.

Name	Ext	creation	Name	Ext	Size
[..]			[..]		<DIR>
[saga]		22.12.2011 11:41:12	[saga]		<DIR>
bsh-2.0b4	jar	22.12.2011 11:41:12	bsh-2.0b4	jar	281,694
gishur_core	jar	22.12.2011 11:41:12	gishur_core	jar	176,264
gishur_x	jar	22.12.2011 11:41:12	gishur_x	jar	73,468
HOW_TO_INSTALL	txt	22.12.2011 11:41:12	HOW_TO_INSTALL	txt	5,895
Jama-1.0.2	jar	22.12.2011 11:41:12	Jama-1.0.2	jar	32,775
japura-1.14.0	jar	22.12.2011 11:41:12	japura-1.14.0	jar	282,284
jcommon-1.0.14	jar	22.12.2011 11:41:12	jcommon-1.0.14	jar	308,044
jep-2.4.0	jar	22.12.2011 11:41:12	jep-2.4.0	jar	84,208
jfreechart-1.0.11	jar	22.12.2011 11:41:12	jfreechart-1.0.11	jar	1,360,955
jgraph	jar	22.12.2011 11:41:12	jgraph	jar	163,280
jts-1.12	jar	22.12.2011 11:41:12	jts-1.12	jar	742,341
kxml2	jar	22.12.2011 11:41:12	kxml2	jar	40,653
libMath	jar	22.12.2011 11:41:12	libMath	jar	30,325
sextante	jar	22.12.2011 11:41:12	sextante	jar	218,743
sextante	tbx	22.12.2011 11:41:12	sextante	tbx	528,384
sextante_addin	esriaddin	22.12.2011 11:41:12	sextante_addin	esriaddin	5,762
sextante_algorithms	jar	22.12.2011 11:41:12	sextante_algorithms	jar	1,309,168
sextante_arcgis_bindings	jar	22.12.2011 11:41:12	sextante_arcgis_bindings	jar	69,094
sextante_gui	jar	22.12.2011 11:41:12	sextante_gui	jar	792,101
TableLayout-bin-jdk1.5-200...	jar	22.12.2011 11:41:12	TableLayout-bin-jdk1.5-2007-04-21	jar	10,339
trove-0.1.8	jar	22.12.2011 11:41:12	trove-0.1.8	jar	335,887

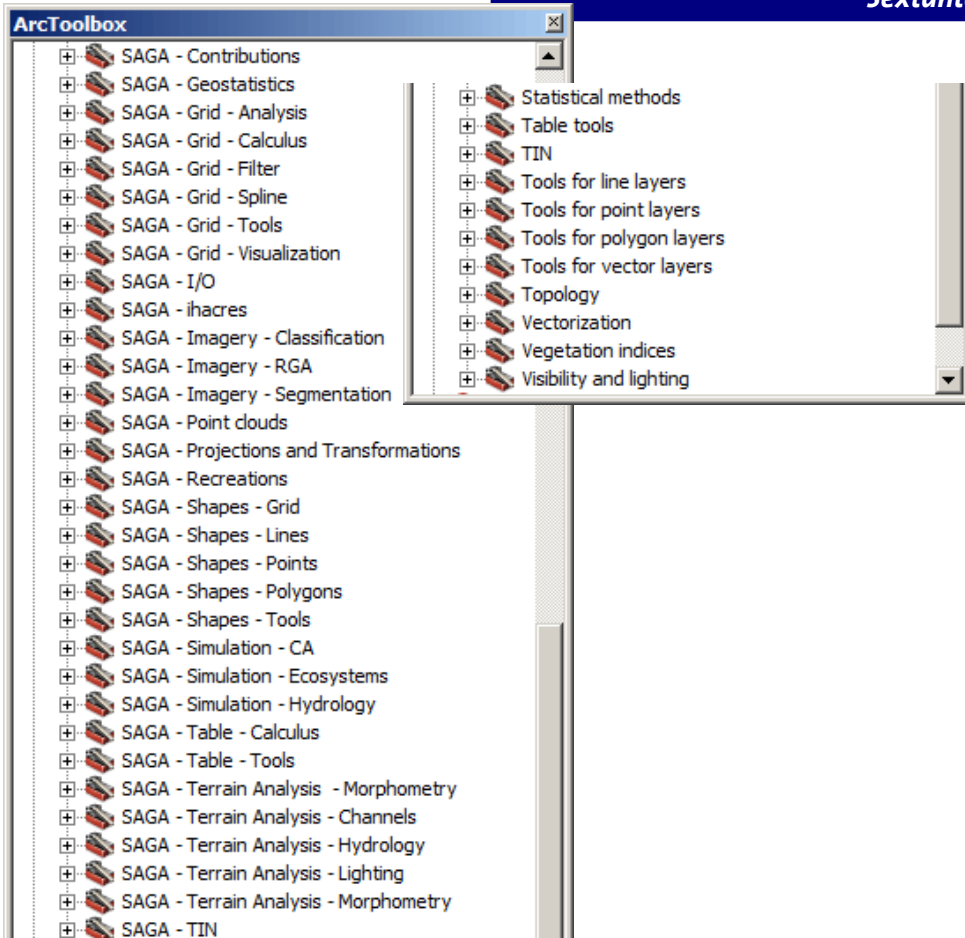
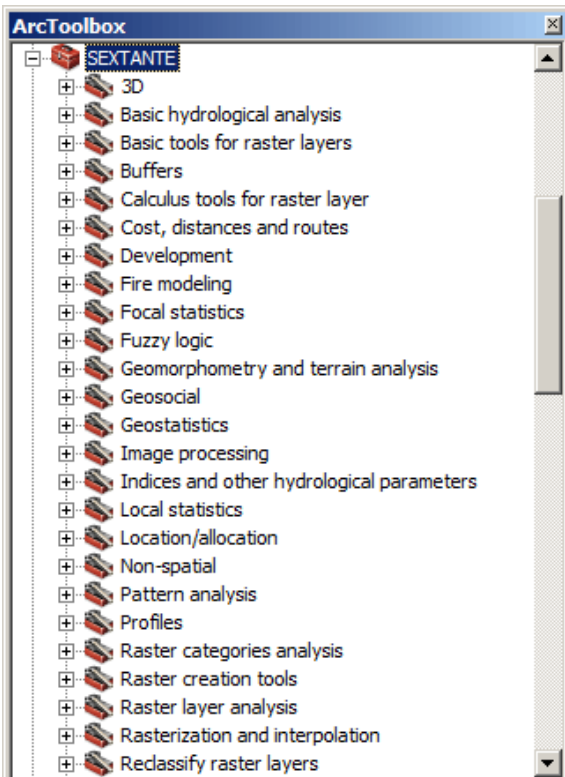
Functionality

- provides tools & toolbox
 - native algorithms
 - access to other libraries SAGA, Grass and R
- Model Builder
- Batch processing
- Programming environment
- Command Line tools

Restrictions - early release (Beta) Sextante in ArcGIS

- limitations –geoprocessing environment - parameter "Use only selected features"
- Output formats: tif, shape, dbf
- Extent - SEXTANTE algorithms do not honor the "Processing Extent" setting
- File overwriting - can cause unpredicted results
- Geometries - Polygons with holes cannot be created yet by SEXTANTE
- Model Builder - Certain algorithms will not work properly on the algorithm, due to differences between the semantics of SEXTANTE algorithms and ArcGIS tools.
- ESRI Document: [How to troubleshoot ArcGIS Java Extensions](#)

SEXTANTE Toolbox





- Project of the Spanish province of Extremadura
Sistema Extremeno de Analisis Territorial
- Geo-processing tool set - software library
- more than 280 spatial functions
raster and vector processing
originally targeted at forestry usage, initially based on SAGA GIS
- Java based plug-ins for Desktop GIS
 - gvSIG and OpenJUMP 1.3
 - ArcGIS 9.3.1 and 10.X



gvSIG – Generalidad Valenciana

Conselleria d'Infraestructures i Transport

- project - Spanish Community of Valencia
- mid range Desktop GIS
- based on open standards
- part of gvPONTIS [project](http://www.gvpontis.gva.es/fileadmin/conselleria/images/Documentacion/memoria/gvpontis_ingles.pdf)
http://www.gvpontis.gva.es/fileadmin/conselleria/images/Documentacion/memoria/gvpontis_ingles.pdf

Main supporter of **gvSIG Association**
gvSIG


Type	Desktop GIS
Functionality	Multilingual Desktop GIS - Analysis functions can be greatly extended when installing Sextante. Many extensions.
Operating systems	Unix/Linux, Windows
Project started	2003
Implementation	Java
OS libraries	GeoTools and JTS
PostGIS support	Yes
License	GPL

gvSIG and Sextante facts

Main supporter of **Sextante** Sextante Team, Victor Olaya, Juan Carlos Giménez

Functionality	Comprehensive set of spatial vector data and image analysis tools
Operating systems	Unix/Linux, Windows
Project started	2004
Implementation	Java
OS libraries	built on top of SAGA GIS functionality
PostGIS support	Yes
License	GPL



- based on gvSIG
- Community effort
- many plug-ins integrated
Postgis, ArcSDE, Navtable &
, Grass, SAGA
- <http://gvsigce.sourceforge.net/joomla/>

Resources

■ Spatial Kit for ArcMap

- www.st-links.com
- PostGIS - <http://postgis.refractory.net/>
- Obe, R. & Hsu, L. (2011): PostGIS in Action. Manning. 492 pages, www.manning.com/obe/

■ SEXTANTE

- www.sextantgis.com
- <http://www.sextantgis.com/arccgis.html>
- Sextante Articles
- Grass GIS <http://grass.fbk.eu/> , Saga <http://www.saga-gis.org/en/index.html>

■ Download presentation <http://www.terragis.net/docs/presentations>

Mailing Lists

Wiki

Bug Reports

Forums

Blog

gvSIG CE Team

Download

Screenshots

Get involved

FAQ



tempServiceArea.shp7
tempServiceArea.shp72
tempServiceArea.shp73
tempServiceArea.shp730
ejesc.shp

gvSIG community edition

Route report

10 Follow 000 for 132.05 and turn **Right** into 050
Accumulated distance 0,414 15
[Show on map](#)

11 Follow 050 for 1,353 79 and turn **Right** into 000
Accumulated distance 7,707 95
[Show on map](#)

12 Follow 000 for 126 21 and turn **Right** into 050
Accumulated distance 7,896 15
[Show on map](#)

12 Arrival at: 050

SEXTANTE - 526 Algorithms

SEXTANTE

Algorithms

GRASS

Raster (r.*)

Vector (v.*)

☒ v.buffer
☒ v.clean
☒ v.clean(error)
☒ v.delaunay

- ▶ [Home](#)
- ▶ [Community](#)
- ▶ [About gvSIG CE](#)
- ▶ [News](#)
- ▶ [Events](#)
- ▶ [Documentation](#)

Welcome

gvSIG CE is a community driven GIS project based on a version of [gvSIG](#) bundled with [SEXTANTE](#), [GRASS](#) GIS and [SAGA](#) that is maintained by gvSIG enthusiasts and open source supporters.

[READ MORE: WELCOME](#)

Team Introduction

Currently a group of GIS specialists from several countries are involved in gvSIG CE.

[READ MORE: TEAM INTRODUCTION](#)

Downloads

A technical preview of the upcoming gvSIG Community Edition 1.0 is available for download now!



[READ MORE: DOWNLOADS](#)



Contact me with questions

Karsten Vennemann



TERRA GIS

TERRESTRIAL ENVIRONMENT REGIONAL ANALYSIS

www.terrakis.net

Seattle, WA, USA

karsten@terrakis.net

206 905 1711

**Terra GIS offers
GIS consulting and training**

