# There and back again

### Using uDig to perform real world tasks

### Foss4G 2008 Lab



Version	Date	Auteur(s)	Etat
1.0	16.09.2008	JER	Valide

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### **Table of Contents**

Introduction4
Introducing uDig5
Add Postgis Layer5
Add Data Using Embedded Web Browser
Add raster layers13
Adding functionality to uDig17
Fixing your data 22
Looking at animals 28
Lots of style
Exploring the table view31
Axios tools (Spatial operations)34
Postgis and copying features40
Custom Graphics44
Converting Polygons to Lines46
Adding new attributes 48
Appendix I CQL Resources51



#### 1 Introduction

Two of the main reasons to use a Desktop GIS application rather than a Rich Internet Application like MapFish or CartoWeb are: Better desktop integration and extra processing power provided by desktop (or laptop) computer. This workshop aims to introduce some of the features of uDig that differentiates it from other applications.

Topics covered will include

- Constructing maps from local and web-based sources.
- Editing the vector data.
- Feature Buffering and layer intersection
- SLD styling basics
- Copying data between services, for example copying features between shapefiles, Web Feature Servers and PostGIS

If this lab is too fast paced you can obtain introductory walkthoughs one the uDig website:

- <u>Walkthrough 1 -- Introduction to uDig</u>
- Walkthrough 2 -- Introduction to Editing

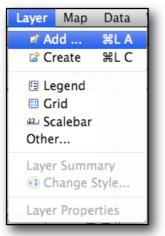


#### 2 Introducing uDig

In this starting section we will learn various ways of constructing map with uDig. The goal is to lean how to quickly and efficiently construct maps so that you can start performing the valuable tasks that you have been assigned.

#### **Add Postgis Layer**

• To open the Add Data wizard, select the menu item Layer > Add



Select the PostGIS option and press the Next button

$\Theta \bigcirc \Theta$		Add Data		
Oata Sources				
Connect to a PostGIS Serv	er.			B
ArcSDE				
DB2				
Files				
Map Graphic				
MySQL				
Oracle Spatial PostGIS				
Web Feature Server				
Web Map Server				
(	< Back	Next >	Cancel	Finish
	_			



• For performance we will access the postgis on the local host. Enter the following connection information and press the **Next** button:

Host: localhostPort: 5432Username: postgresPassword: postgresDatabase: postgresSchema: public

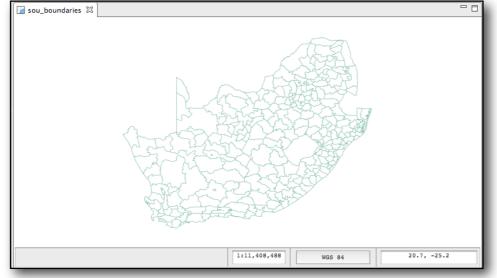
$\bigcirc \bigcirc$		Add Data		
stGIS onnect to a PostG	IS Server.			A COL
Host:	localhost	▼	Port:	5432
Username:	postgres			
Password:	•••••			
Database:	postares	V		
Schema:		▼		
Advanced				
	< Back	Next >	Cancel	Finish

• Select sou\_boundaries and press the Finish button

	Ad	d Data		
esource Selection				╋╹═
Please select a resour	ce.			
🗹 🔻 🗄 PostGIS	localhost			
	_boundaries			
Resources Selected: 0				
	< Back	Next >	Cancel	Finish



• A new map should open and appear similar to the following image





#### Add Data Using Embedded Web Browser

Press the Web table placed behind the Catalog View



• Enter the path to the catalog.html file in the data directory. (Unfortunately I don't know the path to the catalog.html at the time of this writing.)

Ē	Catalog 🔲 Web 🖾 🔗 S	Search 🔲 Table		- 8
				/catalog.h 🚺
file	e:///Users/jesse/dev/Foss4	IGLab/catalog.html 🔀		
ſ	Shapefiles	Geotiff images	Web Map Server Web Feature Server	
	The World's Countries	SOU satellite trimmed	Local Geoserver WMS Local Geoserver WFS	
	SOU boundaries	SOU satellite		
ZANZ	SOU outline	SOU-7 satellite trimmed		
	SOU-7 boundaries	SOU-7 satellite		
H	SOU-7_UTM35	SOU-7-5 satellite		
1	<u>SOU-7-5 UTM35</u>			
1	SOU-7-5	$ \land \land $		<b>T</b>
_				



• Drag the link **The World's Countries** to the layers view.

Participation     Bookmarks     □       Image: Operation of the second	
The World's Countries The:///Users/jesse/dev/Foss4GLab/shapefiles/count	ries.shp
	Image: Catalog     Image: Web     Image: Web     Image: Web       File:///Users/jesse/dev/Foss4GLab/catalog.htm
	ShapefilesGeotiff iThe World's CountriesSOU satelliteSOU boundariesSOU satelliteSOU outlineSOU-7 satelliSOU-7 boundariesSOU-7 satelliSOU-7 UTM35SOU-7-5 sateSOU-7-5 UTM35SOU-7-5 sate

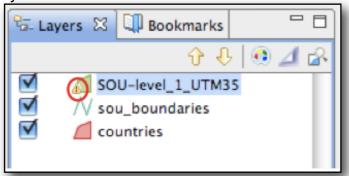
- The map should now look like the following(the SOU\_boundaries layer is probably a different color)
  - Notice the layer has a style already. This is because shapefiles with an associated .sld file will have the style from the sld file automatically applied when the layer is added.



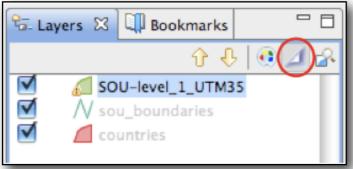
Drag the SOU-level\_1\_UTM35 link to the map:
 SOU-level 1 UTM35 --No projection file!



• This layer will not appear in the map display because it does not have a PRJ file associated with it. The layer has a decorator to indicate a potential problem with the layer.



• Press the Mylar button



Right click on the SOU-level\_1\_UTM35 layer and select Properties

r		$\bigcirc \bigcirc \bigcirc$	Properties for SOU-	level_1_UTM35
Сору	жс	type filter text	A Summary	↓ ↓ ↓
💼 Paste 💥 Delete	¥∨ ⊠	A Summary Projection	Name ID Bounds Selection Filter	SOU-level_1_UTM35 file:/Users/jesse/dev/Foss4GLab/shapefiles/SO (-533839.2,4739829.8) (1341518.7,7550828.9) Filter ALL
			Status	Coordinate Reference System of data is unknown
<ul> <li>Change S</li> <li>Zoom to Rename</li> <li>Operations</li> <li>Export</li> </ul>	-		► Feature Type	SOU-level_1_UTM3S
Properties				Cancel



Select Projection

type filter text	Only change if the current projectterpreted, they are not modified,
A Summary Projection	Standard CRS Custom CRS
Projection	Coordinate Reference Systems:
	Ceneric cartesian 2D
	AGD66 (EPSG:4202)
	AGD66 / AMG zone 48 (EPSG:20248)
	AGD66 / AMG zone 49 (EPSG:20249)
	AGD66 / AMG zone 50 (EPSG:20250)
	AGD66 / AMG zone 51 (EPSG:20251)
	AGD66 / AMG zone 52 (EPSG:20252)
	AGD66 / AMG zone 53 (EPSG:20253)
	AGD66 / AMG zone 54 (EPSG:20254)
	AGD66 / AMG zone 55 (EPSG:20255)
	AGD66 / AMG zone 56 (EPSG:20256)
	AGD66 / AMG zone 57 (EPSG:20257)
	AGD66 / AMG zone 58 (EPSG:20258)
	Restore Defaults Apply
	Cancel OK

• Enter cape into the search bar and select Cape / UTM zone 35S (EPSG:22235)

Coordinate Reference Systems:	
cape	
Cape (EPSG:4222) Cape / UTM zone 34S (EPSG:22234) Cape / UTM zone 35S (EPSG:22235) Cape / UTM zone 36S (EPSG:22236)	

• You should see the data now is correctly repojected from EPSG:22235 to WGS 84 (EPSG:4326)

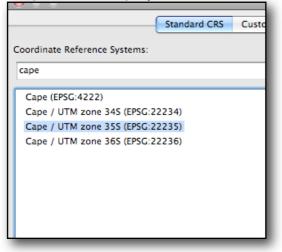




- Now that we have found the correct projection we need to write it to the shape file. (Setting on the layer only affects the layer. Adding a new layer based on the same data will not have the new projection)
- Right click on the layer and select Operations > Set Projection

🛛 💷 Bookmarks			5
ዓ ዮ	0 🔟 🔗		Charles C
SOU-level_1_UTM? / sou_boundaries countries	📄 Copy 💼 Paste 🗶 Delete	жс ж∨ ⊗	
	€ Change		and the
	Operation	s 🕨	Count
	🛃 Export.		Create Feature Type
	Properties		Layer Summary
	_		Set Projection
		file:///Users	Reshape it Resource Summary d
		SOU ou	Add Feature Type
		<u>SOU-7</u> <u>SOU-7-</u>	Validation

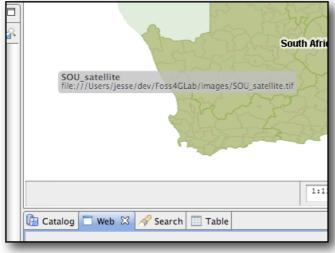
• Verify the correct projection is selected and press the **OK** button





#### Add raster layers

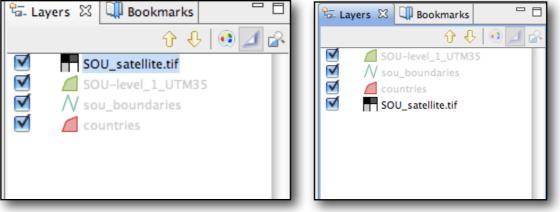
• Drag the SOU\_satellite link from the embedded web browser to the map



The map should now appear as follows

😼 sou_boundaries 🖾		- 8
	Zimbabwe	
	Botswana Mozambique Namibia Swaziland	
	South Africa Lesotho	
		_

• Next drag the image so it is the bottom layer in the map (using the layers view)





• Press the **Projection** button on the map.



Set the projection to EPSG:22235

	Standard CRS	Custom CRS
Coordinate Reference Syst	tems:	
cape		
Cape (EPSG:4222)		
Cape / UTM zone 34S (	EPSG:22234)	
Cape / UTM zone 355 (	EPSG:22235)	
Cape / UTM zone 36S (	EPSG:22236)	

#### • All layers are reprojected

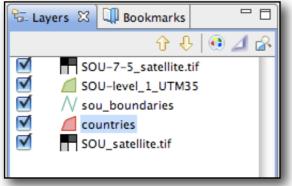




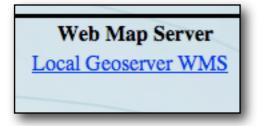
• Notice that the new raster is also reprojected. Also notice how the Mylar effect makes it easy to spot the newly added layer.



- Change projection back to EPSG:4326
- Turn mylar off
  - · The layers view should now look similar to the following



Draw the Local Geoserver WMS link to the Layers View





Select Bluemarble and press the Finish button

esource	Selection	+
Please sele	ect a resource.	
_	My GeoServer WMS	
$\checkmark$	🔻 🗄 My GeoServer WMS	
	archsites_Type	
	🕨 🗄 Bluemarble	-
	• o bugsites_Type	
	giant_polygon_Type	
	opi_Type	
	poly_landmarks_Type	4
8	restricted_Type	<b>*</b>
lesources	Selected: 1	
	< Back Next > Cancel	Finish

- This adds the bluemarble layer to the top of the map.Move the bluemarble layer so it is the bottom layer of the map







#### 3 Adding functionality to uDig

The out-of-the-box installation of uDig has enough functionality to do basic tasks but for more complex tasks there are plugins that can be installed to assist in performing these tasks. This section shows how to discover plugins and install them

Select the Menu item Help > Find and Install

Se	arch
We	lcome
?	Help Contents
Sul	os and Tricks bmit Log Find and Install
	Fino ano Instali

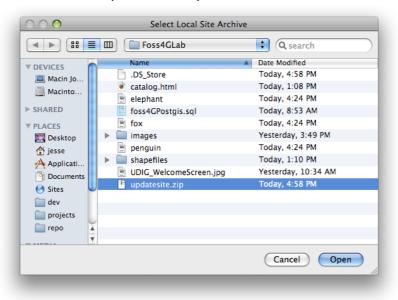
• Select Search for new features to install and press the Next button

$\Theta \odot \Theta$	Install/Update	
Feature Updates Choose the way you v	vant to search for features to install	
O Search for update	es of the currently installed features	
Select this option if y installed.	ou want to search for updates of the features	you already have
<ul> <li>Search for new fe</li> </ul>	atures to install	
	you want to install new features from existing dy be available. You can add new update site	
	< Back Next > Finish	Cancel

- Normally you can select one of the default options but for performance reasons we will use a update site that is on the local hard drive. The update site I am providing is the combination of the uDig 1.1 Discovery Site and the UWB update site. In the future you may use those sites.
- Press the New Archived Site... button



· Select the update site zip file



- The default is acceptable but to make the site more recognizable it is recommended that you enter a more readable name: **Foss4G UpdateSite**.
- Press the OK button

$\mathbf{\nabla}$	Edit Local Site
Name:	Foss4G UpdateSite
URL:	jar:file:/Users/jesse/dev/Foss4GLab/updatesite.zip!/
	Cancel OK



• Press the **Finish** button

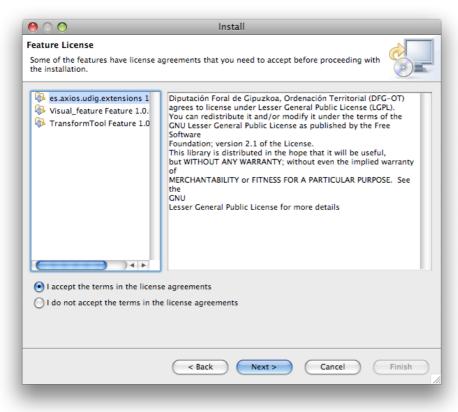
0 0	Install	
Update sites to visit Select update sites to visit while loc	king for new features.	
Sites to include in search:		
Foss4G UpdateSite		New Remote Site
UWB updates		New Local Site
		Edit
		Remove
		Import sites
		Export sites
Ignore features not applicable	to this environment	
	< Back Next >	Finish Cancel

• Check the **Foss4G UpdateSite** element. You do not need to expand the tree but to see what you are installing you may want to.

) 🔘 💛	Updates	
e <b>arch Results</b> elect features to install fro	m the search result list.	
▼     Image: Solution       ✓        ✓        ✓        ✓        ✓        ✓		Deselect All More Info Properties Select Required Error Details
Show the latest version Filter features included	of a feature only in other features on the list < Back Next >	Cancel Finish



 Select the I accept the terms in the License Agreement radio button and press the Next button

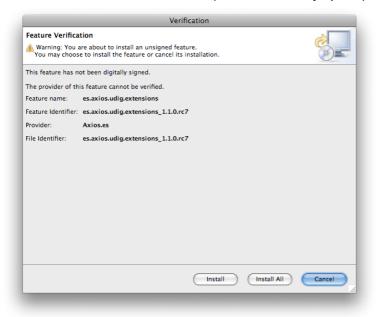


Press the Finish Button

atures to install: Feature Name	Feature Version	Feature Size	Installation Directory
🖗 es.axios.udig.extens	1.1.0.rc7	Unknown	/Users/jesse/Applications/udig.apj
🖟 TransformTool Feat	1.0.0	Unknown	/Users/jesse/Applications/udig.apj
🆗 Visual_feature Featu	1.0.0	Unknown	/Users/jesse/Applications/udig.apj
stall Location: /Users lequired space: Unknow ree space: Unknow		udig.app/Contents,	/Resources Change Location



• Wait for the files to download (should be very quick) and press Install All



• Press the Yes button

	Install/Update
1	It is recommended you restart the uDig for the changes to take effect, but it may be possible to apply the changes to the current configuration without restarting. Would you like to restart now?
	No Apply Changes Yes

Now there are new features with new functionality available for use in your day to day tasks.

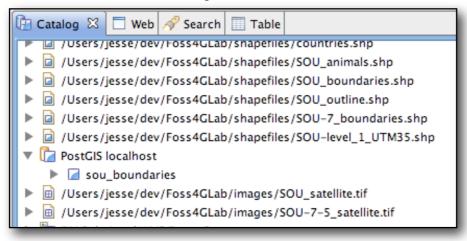
The two features we will use in this lab are the *Transform Tool* and the *Axios Spatial Operations suite*. The next two sections are dedicated to getting familiar with using these tools.



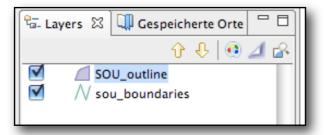
#### 4 Fixing your data

In this section we have a specific task. We have a shapefile (SOU-outline.shp) that has been digitalized in accurately. The goal is to fix the data.

- Create a new map
- Add a layer that we know is accurate. We wil use the sou\_boundaries from the postgis. Since we have previously loaded it we can drag the layer from our Catalog
  - Another option if we have many datasources in our catalog is to use the Search view to search the catalog.

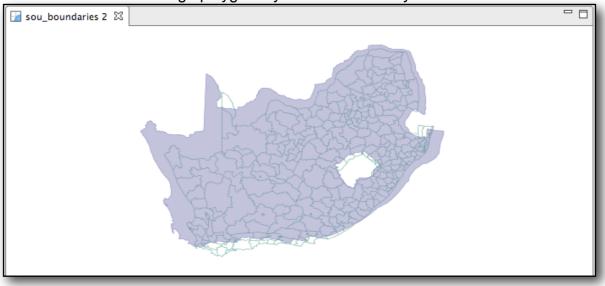


- Add SOU\_boundaries from the embedded web browser.
  - You should now have two layers in your map





• Notice that the two layers are not aligned. The line layer is the correct layer. We need to transform the large polygon layer to fit the line layer.



- The transform tool is an excellent choice for this category of problems.
- Make sure that the SOU outline layer is selected in the Layers view
- Press the button in the tool bar to begin.
- Select SOU\_outline as the source layer. (The dialog allows a transformation to be constructed from an existing vector layer or create a new vector layer.)

ource Layer	:
OU_outline	è
Transforma	ation method:
Vector Laye	er (leave empty to create new):
( Add \	Vectors Remove Vectors
Transforma	ation method:
Affine	<ul> <li>Similar</li> </ul>
Rubber	Sheet O Projective
	-
	Transformation info
	Transform
	Cancel

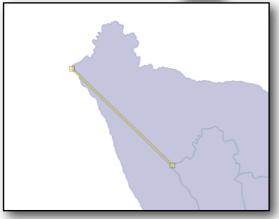


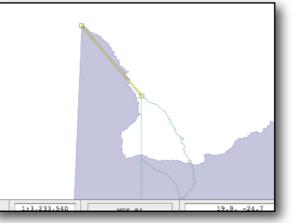
#### Press the Add Vectors button

- This will take you back to the Map and allow you to create vectors that indicate how the layer needs to be transformed.
- You can use the zoom and pan tools to move into the map so you can accurately add the vectors.
- Zooming also be done with the mouse scroll wheel and panning holding button 3 and dragging the map (if the mouse has 3 buttons)
- A third way to zoom is to press the CTRL + and CTRL key combination. CTRL ARROW can be used for panning

#### Add Vectors from SOU\_outline to the corresponding point on the sou\_boundaries layer.

- **IMPORTANT** the direction of the vectors are very important if they are drawn the wrong direction then the layer will be transformed in the opposite direction from what is required.
- If you make a mistake you can:
  - Use CTRL-Z to undo.
  - Use the edit tool **to** move the vertex.
  - Use the delete tool \_\_\_\_\_ to delete a line.

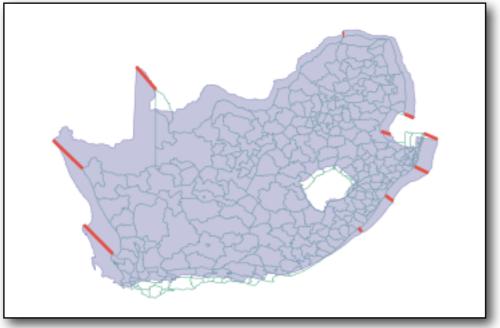








• I have restyled the vector layer so the vectors are in red for clarity. The vectors in the layer always start at the border of **SOU\_outline** and end at on the edge of **sou\_boundaries**.



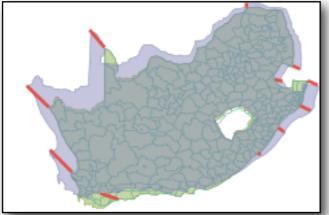
• Double click the mouse with the Create Line tool enabled to exit vector creation mode.

\varTheta 🔿 🔿 Transform Tool
Source Layer:
BOU_outline
Transformation method:
Vector Layer (leave empty to create new):
SOU_outline_vector
Add Vectors Remove Vectors
Transformation method:
Affine Similar
RubberSheet      Projective
Transformation info
Transform
Cancel

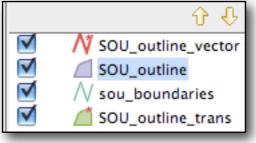
- Select Rubber Sheet radio button.
- Press the Transform button. This will perform the transformation
  - uDig follows a non-destructive principal. This means that all major transformations will result in a new layer with the resulting transformation.
  - In the current version the new layer is an in memory layer which means that the memory requirements of the transformation must be considered. (The next version will remove this constraint)



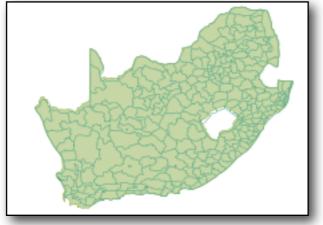
• The following image shows the resulting map (the colors may differ)



Turn off all layers except sou\_boundaries and SOU\_outline\_trans



• The map should now be as follows:





• To save your map press CTRL-S or File > Save

Expor	t to Shapefile	
on	shanofile	SHP
/Users/jesse/tmp/walkthro	ugh	Browse
OU_outline_trans	EPSG:WGS 84	
OU_outline_vector	EPSG:WGS 84	
< Back (	Next > Cancel	Finish
	nore resources to export to ojection to change destinati /Users/jesse/tmp/walkthro OU_outline_trans OU_outline_vector	nore resources to export to shapefile. ojection to change destination Projection. /Users/jesse/tmp/walkthrough OU_outline_trans EPSG:WGS 84 OU_outline_vector EPSG:WGS 84

- Select the directory to save the file. (Defaults to your workspace)
- Uncheck SOU\_outline\_vectors (Unless you want to use the same transformation at a later date)
  - You my choose an alternative Projection for the output file if you desire, the layer will be transformed to that projection
- Press the Finish button

Congratulations you have vastly improved the accuracy of that layer.



#### 5 Looking at animals

In this section we will look at a layer that captures animal sightings and perform some analysis on the data to see if any trends can be detected. In the process we will create several new layers and even write out some of the data to our postgis.

The Data we will look at is **SOU-animals**.

- · Create a new map
- Drag the **SOU-animals** link to the map.



• The simplest (and often most effective) thing to do is apply a thematic style to the data.

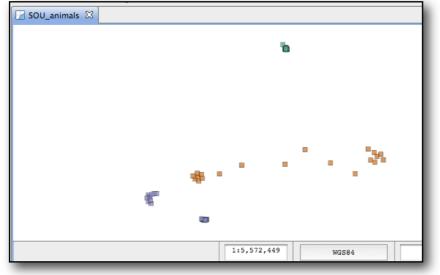


- Create a style that applies to the type attribute
  - I am assuming that you have done this before so I am going through the steps very quickly. If you do not know you can reference <u>Walkthrough 1</u>.
  - Select the Layers view
  - Press the Layer > Change Style button
  - Click the Theme option in the list on the left
  - In the Attribute drop box select type
  - Ensure that 3 classes are selected
  - Ensure that the Unique Values break is selected
  - Select the Dark color scheme.
  - Press the **OK** button

0 0	Style Editor						
type filter text h	Theme	⇔∙⇔∗					
Simple Theme XML		se: HIDE 🛟					
Palette:							
Accents: includes lightness and saturation extremes to accent si Blues: light to dark blue BrBC: dark brown to light to dark blue-green BuGn: light blue to dark green							
	Opacity: 50% + Outline Black + Reverse Remove	Suitability:					
	Colour Label Values						
	Bat-eared Fox Bat-eared Fox						
	elephant elephant penguin						
	penguin penguin						
	3 unique values were found for type						
	Revert	Apply					
Import Exp	ort Cancel (	ок					
		/					



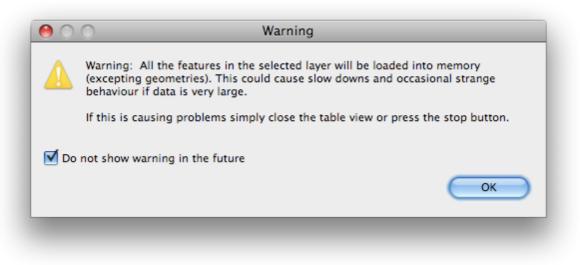
• The map should now clearly show the areas the different animals inhabit.





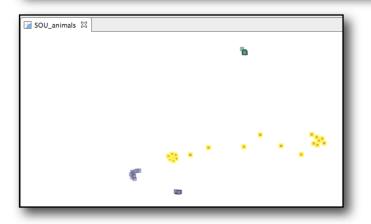
#### Exploring the table view

- We could label the points but instead we will play with the table view a little in order to learn more about the animal populations.
- Select the Table view
- The following dialog will appear. Close the dialog because we know the layer is not too large.



Type ele or lep into the text field and press enter
all the elephant sightings are selected

Any 🗘 eld			🗹
Features Selected: 20			_
FID	type	animalId	
SOU_animals.1	elephant	100	
SOU_animals.2	Bat-eared Fox	213	4
SOU_animals.3	Bat-eared Fox	200	
SOU_animals.4	penguin	9	
SOU_animals.5	elephant	100	
SOU_animals.6	elephant	100	
SOU_animals.7	elephant	101	
SOU_animals.8	Bat-eared Fox	205	2
SOLL animals 9	elenhant	100	





- Now we will introduce searching based on CQL. The <u>Appendix I</u> has links to resources on CQL.
- Select CQL in the drop box
- Type animalId<10 in the text field and press enter.</li>
  11 points are selected

CQL 🗘 anin	malid<10		⊻
Features Selected: 11			_
FID	type	animalId	
SOU_animals.4	penguin	9	
SOU_animals.5	elephant	100	C C
SOU_animals.6	elephant	100	
SOU_animals.7	elephant	101	
SOU_animals.8	Bat-eared Fox	205	
SOU_animals.9	elephant	100	
SOU_animals.10	elephant	101	
SOU_animals.11	elephant	102	-
SOLL animals 12	Rat-eared Fox	211	

• Press the button to promote all the selection to the top of the view. We can see that penguins 1 and 2 have had multiple sightings.

CQL 🛊 anin	nalld<10	Promote selec	tion to top
Features Selected: 11			
FID	type	animalId	
SOU_animals.4	penguin	9	6
SOU_animals.18	penguin	8	4
SOU_animals.25	penguin	4	
SOU_animals.28	penguin	2	
SOU_animals.33	penguin	1	
SOU_animals.35	penguin	3	
SOU_animals.36	penguin	7	
SOU_animals.50	penguin	2	
SOLL animals 53	nenquin	1	



• The button can be pressed to zoom to the selection.

I SOU_animals ⊠	
1 4 4 C	
• 1	
• 1	
<ul> <li>A second sec second second sec</li></ul>	
	-

Press the



button to go back to the previous map view.

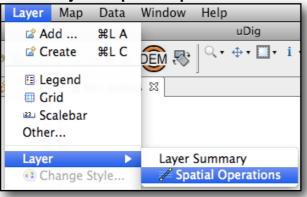
- Select type in the drop box
- Type eleph and press enter

📴 Catalog 🗖 Web 🔗 Search 🔲 Table 🖾 🗌 🖓 🖪 🗖				
ph		<b>1</b>		
		_		
type	animalId			
elephant	100	$\sim$		
Bat-eared Fox	213			
Bat-eared Fox	200			
elephant	100			
elephant	100			
elephant	101			
Bat-eared Fox	205			
elephant	100	<b>A</b>		
elenhant	101	<b>T</b>		
	ph type elephant Bat-eared Fox Bat-eared Fox elephant elephant Bat-eared Fox elephant	ph type animalid elephant 100 Bat-eared Fox 213 Bat-eared Fox 200 elephant 100 elephant 100 elephant 101 Bat-eared Fox 205 elephant 100		



#### Axios tools (Spatial operations)

Select Layer > Spatial Operations from the menu



- The Spatial Operations view will open.
- Ensure Buffer is selected
- Ensure **SOU\_animals** is selected as the source layer

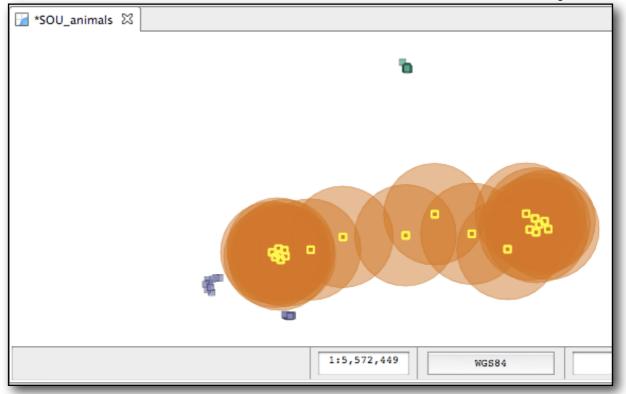
📴 Catalog 🔲 Web 🦯	🔗 Search 🔲 Table 🥒 Spatial Operations 🖾	
.∵=.∵Bu ()=( Cli	Buffer Creates the buffer in the target layer	
● Int PBR N Joi	Basic Advanced	Source Result
	Source Layer: SOU animals Selection: B	
	Result	
	Layer: Buffer 1 Geometrv	

#### Set the Result layer to be Polygon

Polvaon	
Polygon	
MultiPolygon	
Geometry	

- Press the button to run the operation.
  - As you can see only the selected features are buffered





## Create a 3 class style for the elephants

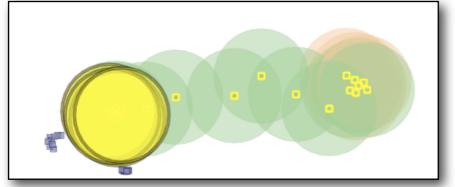
$\Theta \bigcirc \bigcirc$	Style Editor	
type filter text h	Theme	⇔・⇔・
Simple Theme XML	Attribute:     Classes:     Break:     Normalize:     E       animalId     3     Caul Interval	lse: HIDE 🛟
	Palette:	JQC
	Accents: includes lightness and saturation extremes to accent si Blues: light to dark blue BrBG: dark brown to light to dark blue-green BrGn: light blue to dark green	<b>•</b>
	Opacity: 50% 🛟 Outline None 🗘 Reverse Remove	Suitability: @ □ >= J û ਹ
	Colour         Label         Values           100 to 101         100101           101 to 102         101102	
	102 to 103 102103	-
	Revert	Apply
Import E	xport Cancel	ОК



• In the table view select **animalld** and do a search for **101**.

📴 Catalog	🗌 Web	🔗 Search	Table	X
animalId			\$ 101	

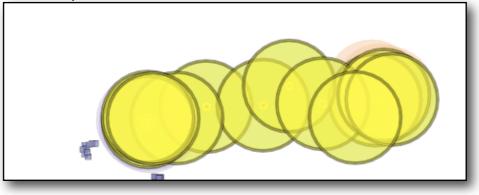
• The elephant 101 seems to stay in the same location.



• Search for elephant 101

📴 Catalog	🗌 Web	🔗 Search		Table	×]
animalId			•	100	
Features Selected: 12					

This elephant likes to walk





#### Foss4G 2008 uDig Lab

- The dissolve operation will combine all the selected polygons together. The disolve property determines which polygons are joined
- Select Dissolve
- Select Buffer 1
- Select animalId

📴 Catalog 🗖 Web 🔗	Search 🔲 Table 🚀 Sp	atial Operations 🛛 🗌			0 0
: Buffer	i Dissolve Does	the geometry union of	those featuhe sa	ame value in the	dissolve property
)= Intersect 2 - Join Geom Dissolve		Basic		Source	Result
	Source Layer:	Buffer 1	V Sel		
	Dissolve property: Result	animalld			
ometry union of those feat the same values in the diss		Dissolve 1	G		× ×

• Since we had only had elephant **100** selected there is only one polygon

0 0	uDig		$\bigcirc$
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😕 Projects 🛛 🛛 🦑 🌄 📃	SOU_animals 🛙		- 0
<ul> <li>♥ Project</li> <li>▶ B SOU_animals</li> <li>▶ Sou_boundaries</li> <li>▶ Sou_boundaries 2</li> </ul>			
🗟 Layers 🛿 🛄 Gespeicherte Orte 📮			
<sup>(7)</sup> Dissolve_1 <sup>(1)</sup> Buffer_1 <sup>(1)</sup> BUffer_1 <sup>(1)</sup> SOU_animals			
	115,	572,449 WGS84 18	.0, -35.3
	🕼 Catalog 🗖 Web 🛷 Search 🔲 Table 🛛 🥢 Spatial	Operations	🗆 🖧 🗟 🗖 🗖
	Any 100		<b>1</b>
	Features Selected: 12		
	FID	animalId	
	fid237ac58_11c6febe23a7fb2	100	
□*			



#### Foss4G 2008 uDig Lab

## • Select the SOU\_animals layer again and search for Bat

📴 Catalog 🔲 Web 🔗 Search 🔲 T	able 🖾 🥖 Spatial Operations	E 3	. 📰 🗖 🗖
Any	Bat		<b>1</b>
Features Selected: 19			_
FID	type	animalId	
SOU_animals.2	Bat-eared Fox	213	6
SOU_animals.3	Bat-eared Fox	200	U.
SOU_animals.4	penguin	9	
SOU_animals.5	elephant	100	
SOU_animals.6	elephant	100	
SOU_animals.7	elephant	101	
SOU_animals.8	Bat-eared Fox	205	
SOU_animals.9	elephant	100	
SOLL animals 10	elephant	101	Ť

# Select Buffer in the Spatial Operations view

📴 Catalog 🗖 Web 🗸	🔗 Search 🔲 Ta	ble 🥂 Spatial Operatio	ons 🖾	
: Buffer )=( Clip	i Buffer	Creates the buffe	r in the target layer	
)=● Intersect ζ _卜 Join Geom =── Dissolve	Source	Basic Adva	inced	Source Result
	Layer:	SOU animals	Selection: B	
	Result			
	Layer:	Buffer 2	Geometrv	

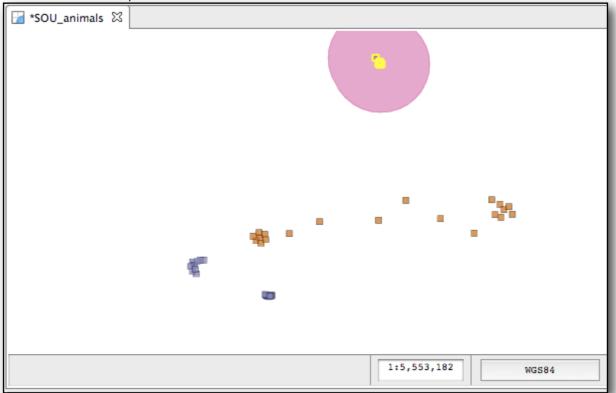
• Switch to the Advanced tab

## Check Merge geometries

Bas	c Advanced	
Merge geometries		Segments by



- Run the operation.
  - In certain circumstances this is the same as running the Buffer and dissolve (but not all cases)



- Run the same operation with Penguin selected in the table view
- Turning off the non-buffer layers results in the following map

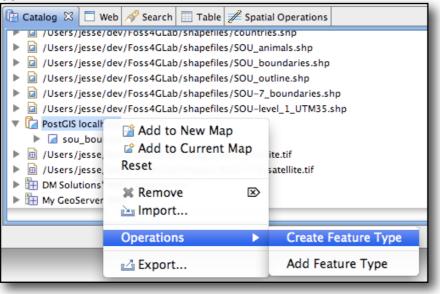




#### Postgis and copying features

- Instead of saving the buffered layers to shapefiles as is the default, we are going to create a new layer in postgis and copy the layers into the postgis.
- Open the Catalog view
- Right-click on the Postgis localhost entry and select Operations > Create Feature

#### Туре





#### Foss4G 2008 uDig Lab

- In the Create New Layer dialog set **elephant100** as the feature type name (value in the text area
- Set the name of the first attribute to be type
- Set the Type of the geometry attribute to be Polygon
- Create a new attribute by pressing the button
- The attribute should have the Name animalId and Type Integer
- Press the **OK** button

leph	ant100		
•	Name	Туре	
	type	String	
*	geometry	Polygon	WGS84
	animalld	Integer	
			)++(
		Can	cel OK

• Select the new layer and add it to a new map

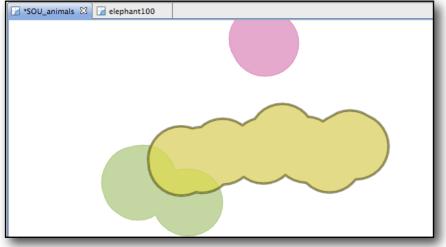
🔁 Catalog 🛛 🗖 Web	🔗 Search 🔲 Table $  ot\!\!\!/ E Spatial Ope$	
	//Foss4GLab/snapetiles/countries.sn;	
🕨 🖬 /Users/jesse/dev	//Foss4GLab/shapefiles/SOU_animals	
	//Foss4GLab/shapefiles/SOU_bounda	
	/Foss4GLab/shapefiles/SOU_outline.	
	/Foss4GLab/shapefiles/SOU-7_boun	
	//Foss4GLab/shapefiles/SOU-level_1_	
PostGIS localhost		
elephant100	📽 Add to Current Map	
🕨 🔽 sou_bounda	Add to New Man	
Image: Market State S		
III /Users/jesse/dev	🗱 Remove 🛛 🔛	
DM Solutions' WN	🔁 Import	
	Operations 🕨	
	🛃 Export	
SOU_animals		- [
	1:174,766,881 WGS 84	



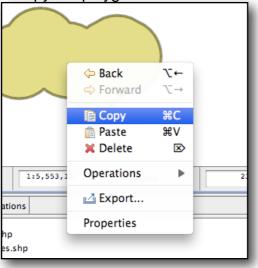
- Change back to the SOU\_animals map
- Select Dissolve\_1



Select the elephant 100 polygon



## Copy the polygon

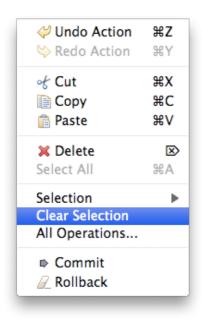




- Change back to the elephant100 map
- Paste the polygon into this map

🕝 *SOU_animals 🛛 🖓 elephant100 🔀		SOU_animals 🔄 elephant100 🕅
	⇔ Back ⇔ Forward ∴→         ∴→         ∴→	
	🛃 Export	
	Properties	1:171,080,135 Wgg 84 18.1, -30.0

- Commit the change
- Clear the selection by ensuring that the map editor/view is selected
- Select the Edit > Clear Selection menu item





#### **Custom Graphics**

Now for no good reason we are going to pretty up our layer by adding an image of an elephant to our elephant polygon.

The real reason for this section is to introduce the *Styled Layer Descriptor* declaration of styles. Styled Layer Descriptor (SLD) is a standard created by the OGC for describing how to style/present a layer. Using the uDig user-interface only a small part of the SLD parameters can be modifed. The XML view is provided to allow knowledgeable users declare very complex styles. For more information on SLD you can download the specification at: <u>http://www.opengeospatial.org/standards/sld</u>

• Open the style dialog and change to the XML view

	Style Editor
type filter text h 🔻	XML 🗇 • 🔿
Simple	
Theme	<sld:abstract></sld:abstract>
XML	<sld:featuretypestyle></sld:featuretypestyle>
	<sld:name>simple</sld:name>
	<sld:title>title</sld:title> <sld:abstract>abstract</sld:abstract>
	<sld:featuretypename>Feature<!--</td--></sld:featuretypename>
	sld:FeatureTypeName>
	<sld:semantictypeldentifier>generic:geometry<!--<br-->sld:SemanticTypeldentifier&gt;</sld:semantictypeldentifier>
	<sld:semantictypeldentifier>simple<!--</td--></sld:semantictypeldentifier>
	sld:SemanticTypeIdentifier>
	<sld:rule></sld:rule>
	<sld:name>name</sld:name>
	<sld:title>title</sld:title>
	<sld:abstract>Abstract</sld:abstract>
	<sld:maxscaledenominator>1.7976931348623157E308<!--</td--></sld:maxscaledenominator>
	sld:MaxScaleDenominator>
	<sld:polygonsymbolizer> <sld:fill></sld:fill></sld:polygonsymbolizer>
	<sld:cssparameter name="fill"></sld:cssparameter>
	<ogc:literal>#1B9E77</ogc:literal>
	<sld:cssparameter name="fill-opacity"> v</sld:cssparameter>
	Document requires validation Validate
	(Revert Apply
	(port Cancel OK
(Import) (Ex	Cancel L OK

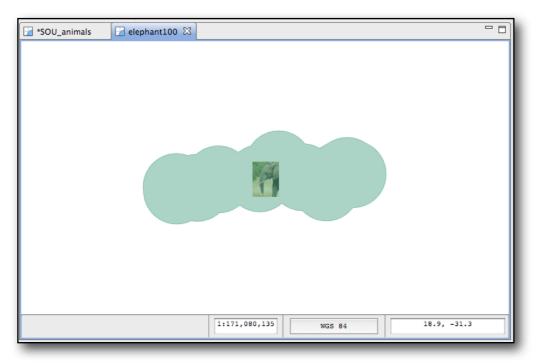
- Find the **<Rule>** tag and place the cursor before the tag.
- Paste the following test at the cursor
  - **NOTE:** There are two lines that have wrapped. They must be on one line. I have hi-lighted the two lines.
  - **NOTE:** The url (hi-lighted in red) must be replaced with the path to the elephant.png file

```
<sld:Rule>
  <sld:Name>name</sld:Name>
   <sld:Title>title</sld:Title>
   <sld:Abstract>Abstract</sld:Abstract>
```



<pre><sld:maxscaledenominator>1.7976931348623157E308<!--</pre--></sld:maxscaledenominator></pre>
<pre>sld:MaxScaleDenominator&gt;</pre>
<sld:pointsymbolizer></sld:pointsymbolizer>
<sld:graphic></sld:graphic>
<sld:externalgraphic></sld:externalgraphic>
<pre><sld:onlineresource <="" pre="" xmlns:xlink="&lt;u&gt;http://www.w3.org/1999/xlink&lt;/u&gt;"></sld:onlineresource></pre>
<pre>xlink:type="simple" xlink:href="file:c:\udiglab\elephant.png"/&gt;</pre>
<sld:format>image/png</sld:format>
<sld:opacity></sld:opacity>
<ogc:literal>1.0</ogc:literal>
<sld:size></sld:size>
<ogc:literal>48</ogc:literal>
<sld:rotation></sld:rotation>
<ogc:literal>0.0</ogc:literal>

- Press the **OK** button.
  - There should be small image of an elephant in the center of the polygon.





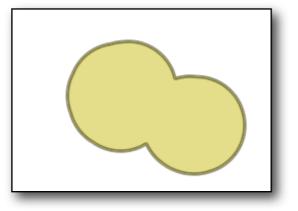
#### **Converting Polygons to Lines**

It is possible to convert a Polygon to a LineString by pasting the polygon into a line layer

- Create a new Layer.
  - Name the layer Penguin line
  - The attribute can
    - The geometry type can be LineString or MultiLineString

Layer Map	Data			C . N .		
🖆 Add	₩L A		D O uinLine	Create New Lay	er	
Create Legend Crid Scalebar Other	₩L C	*	Name animalid geometry	Type Integer MultiLineString		EPSG:WGS 84
Layer	-	Į L	_	_	Car	

- Switch back to the SOU\_animals map
- Select the Penguin polygon and copy it





- Change to the **elephant100** map
- Ensure that the **PenguinLine** layer is selected and paste the polygon onto the layer

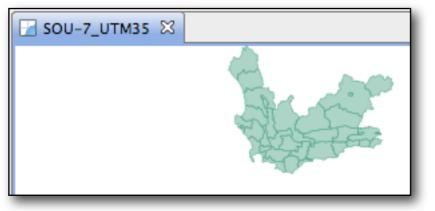
🖫 Layers 🛛 🛄 Bookmarks 🛛 🗖	
<ul> <li></li></ul>	
SOU_animals	
1:171,080,135 WGS 84	18.9, -29



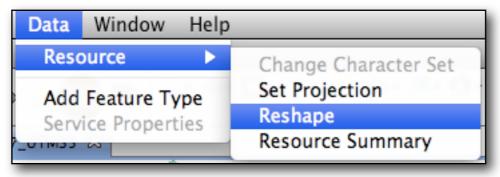
#### 6 Adding new attributes

In this section we will add two new attributes to an existing layer. One attribute will be the computed area of the feature and the other will be a second geometry, the centroid of the geometry.

• Create a new map from the **SOU-7\_UTM35** link in the embedded catalog.



• Select the layer in the Layers view





- The Reshape Dialog will by default do a direct copy from one layer to another with all attributes. The new layer is in the Scratch service which is temporary and needs to be saved.
- Add the two new attributes:

REA=area(the_geom) ENTROID=centroid(the_geom)			
00	Reshape Contents		
the_geom=the_geom AREA=area(the_geom) CENTROID=centroid(the_geom) ID=ID LBL=LBL FIP=FIP MMT_ID=MMT_ID SHORTFRM=SHORTFRM LONG_FRM=LONG_FRM ADM0=ADM0 ADM1=ADM1 ADM2=ADM2 ADM3=ADM3 ADM4=ADM4 ADM5=ADM5			
Add to Map	•		
	Cancel OK		

- Change the combo so the new layer will be added to the map
  - If this is not done the new layer can be found in the local catalog as a child of the **Scratch** service





- Select the new Layer and inspect it in the Table view.
  - **IMPORTANT:** The CENTROID attribute is not show because the Table view hides geometries in order to reduce the amount of memory required to display the features.

🕼 Catalog 🗖 Web 🔗 Sea	rch 🔲 Table 🔀 🥖 Spatial O				
Any	\$ 100				
Features Selected: 0					
FID	AREA				
4a966a9e_11c772a1c177	1.573464085960345E7				
4a966a9e_11c772a1c177	4793526.994660795				
4a966a9e_11c772a1c177	8.225954868958042E8				
4a966a9e_11c772a1c177	798538.6751825758				
4a966a9e_11c772a1c177	2.01507527470919E9				
4a966a9e_11c772a1c177	6.630466510725489E8				
4a966a9e_11c772a1c177	2519523.027241297				
4a966a9e_11c772a1c177	1535008.3994051144				
4a966a9e 11c772a1c17 7	1.689956500024186F7				

- The Feature type of the new layer can be inspected by viewing the layer's properties.
- Right click on the layer and select Properties

		O     Properties for SOU-7_UTM351		
Copy #C	type filter text	Type filter text in A Summary in the second		
💼 Paste 🛛 🕷 🗸 📄	A Summary			
× Delete	Projection	Name	SOU-7_UTM351	
	rojectori	ID	http://localhost/scratch#SOU-7_UTM351	
		Bounds	(-382704.1,4739829.8) (1341518.7,6603008	
		Selection Filter	Filter.ALL	
		Status		
		▼ Feature Type	SOU-7_UTM351	
		the_geom	MultiPolygon	
		► AREA	Double	
		▶ CENTROID	Point	
Operations 🕨		▶ ID	Long	
		▶ LBL	String	
🖾 Export		► FIP	String	
		MMT_ID	String	
		SHORTFRM	String	
		► LONG_FRM	String	
Properties		► ADM0	String	
		► ADM1	String	
		► ADM2	String	
		► ADM3	String	
		L ADMA	Caning	
			Restore Defaults Apply	
			Cancel OK	



## Appendix I -- CQL Resources

- Examples on the GeoTools website: GeoTools CQL Examples
- Examples on the uDig website: <u>uDig CQL Examples</u>
- OGC Catalog Specification contains the CQL specification.