



# WEB-GIS-TOOL MANUAL

D.T.2.2.2

Version 1 11/2017





## General project details

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### 1 Introduction

This manual will guide users and administrators into the setup and functionalities of the Web-GIS-Tool. The document explains the Web-GIS-Tool and its already implemented functionalities. It will be updated and edited as soon as the development of the Web-GIS-Tool is finished.

## 2 System Architecture

The following chapter outlines the setup and structure of the GreenerSites Web-GIS-Tool.



Figure 1 is showing the components and their connection within the Web-GIS-Tool.

Figure 1: System Architecture

#### 2.1 PostGreSQL/PostGIS

PostGreSQL is an open source object-relational database and PostGIS is an extension, which enables saving geographic objects into the database. These are used in the GreenerSites Web-GIS-Tool for:

- Saving data
- Editing data
- Implementation of user roles
- Providing data for the GeoServer

The database can either be managed with psql in the command line or with pgAdmin in a graphical user interface (see also chapter 2.2). The following versions are used: PostGreSQL 9.5 and PostGIS 2.3.

Each region will manage one database containing their own data, hereinafter to be called as "site information". To guarantee standardization amongst different regions a scheme with defined attributes and corresponding value ranges is provided.<sup>1</sup> Because region-specific characteristics occur, the scheme also contains optional fields.

<sup>&</sup>lt;sup>1</sup> Scheme will be finalized after the fine – tuning of the tool





There will be one more database containing Europe-wide data (e.g. OpenStreetMap) or general national data (e.g. UrbanAtlas) hereinafter to be called as base layers. These data can't be edited.

The PostGreSQL database also contains schemes to manage access of the different user groups.

- "public" open access to all users
- "private" restricted access for registered users with access rights

Database administrator is able to implement further distinctions.

Additional user roles in the database will give each region the possibility to control the read/write rights of their data. These rights can take effect on whole layers or only specific columns within a layer. Detailed information regarding user roles is given in chapter 3. Connecting to the database is explained in chapter 4.2 (via frontend) and chapter 18 (via backend).

#### 2.2 pgAdmin

The pgAdmin is a GUI (graphical user interface) administration tool for managing data in PostGreSQL (Figure 2: GUI pgAdmin). Connection do the GreenerSites database is described in chapter 18.







Figure 2: GUI pgAdmin





#### QGIS

QGIS is an open source geographic information system (Figure 3: QGIS GUI) with an interface for OGC- and rasterdata. It can be used to visualize and edit geodata. After connecting to the GreenerSites database (described in chapter 18) data can be uploaded to the database. It is also possible to develop workflows for calculating attributes (e.g. degree if soil sealing, accessibility).



Figure 3: QGIS GUI





#### 2.3 GeoServer

GeoServer is part of the (backend) and provides and supplies the Web-GIS-Tool with the geodata (GUI shown in Figure 1: System Architecture). Rights defined in the PostGredatabase can either be adopted or specified further within the GeoServer. Administrators are able to configure the layer style and appearance with the GeoServer and it is also possible to integrate external WMS-Services into the frontend of the Web-GIS-Tool. Detailed descriptions for connecting to the GeoServer are given in chapter 5. Layer styling and publishing are described in chapter **Errore. L'origine riferimento non è stata trovata.** 

🊯 GeoServer			 Logged in as admin.
Carbon & Status  Contact Information  Contact Info	Welcome Welcome This GeoServer belongs to 26 Layers 9 Stores 3 Workspaces Mighty recommended tha Mighty recommended tha 9 Strong cryptography a This GeoServer instance is the administrator.	<ul> <li>The Ancient Geographers.</li> <li>Add byers <ul> <li>Add stores</li> <li>Create workspaces</li> </ul> </li> <li>for this server has not been changed from the default. It is try our change for wow. Change it aword for this server has not been changed from the default. It is try our change it, now. Change it aword for this server has not been changed from the default. It is try our change it now. Change it aword for this server has not been changed from the default. It is try our change it now. Change it aword for this server has not been changed from the default. It is try our change it now. Change it aword for this server has not been changed from the default. It is try our change it now. Change it aword for this server has not been changed from the default. It is try our change it aword for this server has not been changed from the default. It is try our change it aword for this server has not been changed from the default. It is try our change it aword for this server has not been changed from the default. It is try our change it aword for this server has not been changed from the default. It is try our change it aword for this server has not been changed from the default. It is try our change it aword for this server has not been changed from the default. It is try our change it aword for this server has not been changed from the default. It is try our change it aword for this server has not been changed from the default. It is try our change it aword for this server has not been changed from the default. It is try our change it aword for this server has not been changed from the default. It is try our change it aword for the default. It is try our change it aword for the default. It is try our change it aword for the default. It is try our change it aword for the default. It is try our change it aword for the default. It is try our change it aword for the default. It is try our change it aword for the default. It is try our change it aword for the default. It is try our change it aword for the def</li></ul>	Service Capabilities TKS 1.0.0 WKS-C 1.11 WMTS 1.00 WCS 1.10 1.10 1.11 1.00 WKS 1.00 WKS 1.00 1.10 1.10 1.10 1.10 1.10 1.10 1.1
Demos Tools			

Figure 4: GeoServer GUI





#### 2.4 GeoDjango/OpenLayers

GeoDjango is a web framework for geographic data. OpenLayers is a JavaScript library and displays tiled maps. in a web browser. The frontend of the map viewer (Figure 5: Map view Web-GIS-Tool) is visualized with GeoDjango (layer tree, map view) and OpenLayers (selection of sites, entering attributes, layer order, transparency)<sup>2</sup>. The functions of the map view are described in chapter 0.



Figure 5: Map view Web-GIS-Tool

### 3 User Roles

As mentioned in chapter 2.1 reading and writing data by a user is managed by user roles. Figure 6: User Roles, is showing the different user roles and their corresponding rights as well as a small description and an example.

User	User Description	User Rights	User example
postgres	Superuser/Host/Admin	All databases and user roles	TBD
gsa	Administrator for database in associated region	Edit associated database and defining associated user roles	Data holding authority in region
gsrw	Read and write in database	Edit specific attributes, for example site informations (given by gsa)	Registered User (employees/investors)
gsr	Read in database	Read attributes and print reports	Unregistered User
		E: (II BI	

Figure 6: User Roles

<sup>&</sup>lt;sup>2</sup> Not all functions are implemented yet.





### 4 Frontend

This chapter focuses on the front end of the Web-GIS-Tool Website. It is possible for each region to have one subdomain. The link of the Web-GIS-Tool website for the "Ministry for Regional Development and Transport of the State of Saxony-Anhalt" is "mlv.greenersites.eu/map/". This allows each region to style and organize their subdomain individually (logos, language, etc.). As described in chapter 2.1 one database for each subdomain is needed, base layers (e.g. OpenStreetMap) are stored in another common database.

#### 4.1 General

Figure 7: Web-Gis-Tool Frontend demonstrates the view after loading the website.



Figure 7: Web-Gis-Tool Frontend

- 1 Customizable bar with links to
  - GreenerSites project page
  - Map
  - About us
  - Support
  - Login





User can navigate to these sites, administrator for region can also create new links

**2** - Search bar for addresses User can type in (drop down menu with suggestions will become visible) and zoom to chosen address

**3** - Layer table User can toggle layers on/off

4 - Map view displaying (all) active layers Depending on the scale, different tiles are shown in the map

**5** - Navigation Button User can zoom in and out (also possible with mousewheel)

#### 4.2 Login

By clicking on "Login" and providing username and password a user has access to additional functions depending on his user role (Figure 8: Login).

GreenerSites	Мар	About us	Support	Login	
					Login Username: gsrw Password: login
© 2017 mena GmbH	l   Imprint	Contact			

Figure 8: Login

For example, a user with read and write rights (gsrw) is able to edit data of geometries in the attribute tables (not all but data which is enabled for editing by administrator, see chapter 2.1).





#### 4.3 Functionalities

Checking Attribute values (see Figure 9: Attribute table)

While the layer "Standorte" is toggled on, the user can click on the geometry and look up the attributes for this site (administrator can enable or disable specific attributes for specific user roles). The attribute table is organized in different register cards.



Figure 9: Attribute table

- 1 Selected geometry (site)
- 2 Attribute table
- 3 Register Cards

Editing Attribute values (see Figure 10: Editing attribute table)

If the user has write rights (for example gsrw-user), editing of the attribute table is enabled after clicking on a site (administrator can enable or disable specific attributes for editing). After editing the field, the user has to click the "Submit" Button. The attribute table can contain the following field types:

- Dropdown (e.g. Land use category)
- Checkbox yes/no (e.g. Release from contamination)
- Number (e.g. Plot size)
- Text (e.g. Funding possibility text)





Menu	•
------	---

## Site information

Plot size in km <sup>2</sup> :	23,1752174560547 😫	
Municipality identifier 1:	15003000	
Municipality name 1:	Magdeburg, Landeshaup	
Municipality identifier 2:		
Municipality name 2:		
Municipality identifier 3:		
Municipality name 3:		
Share of plot in municipality 1:	100	
Share of plot in municipality 2:	0	
Share of plot in municipality 3:	0	
County number:	15003	
County name:	Magdeburg, Landeshaup	
Submit 2		

Figure 10: Editing attribute table

1 - Editing possible in field

#### 2 - Submit Button

#### Export site information to PDF

After selecting a site geometry a user can click the button "Flächenpass aufrufen" (display fact sheet) located below the attribute table (Figure 11: Button "Flächenpass aufrufen"). A new site will load, showing a picture of the actual map view and the attribute table. By clicking on "Flächenpass herunterladen" (download fact sheet) (Figure 12: Button "Flächenpass herunterladen") the map view and attribute table is exported into a PDF.





## Site information

Plot size in km <sup>2</sup>	17,6424532958984
Municipality identifier 1	15003000
Municipality name 1	Magdeburg, Landeshauptstadt
Municipality identifier 2	
Municipality name 2	
Municipality identifier 3	
Municipality name 3	
Share of plot in municipality 1	100,0
Share of plot in municipality 2	20,0
Share of plot in municipality 3	30,0
County number	15003
County name	Magdeburg, Landeshauptstadt
Flächenpass aufru 1	

Figure 11: Button "Flächenpass aufrufen"

1 - Button "Flächenpass aufrufen" (display fact sheet)



Figure 12: Button "Flächenpass herunterladen"

1 - Button "Flächenpass herunterladen" (download fact sheet)





## 5 Backend

## 5.1 Establishing connection to the Greener Sites System with PuTTY to GeoServer

The following steps have to be followed to connect to the GeoServer

- 1. Download PuTTY from <a href="http://www.putty.org">www.putty.org</a>
- 2. Start PuTTY Key Generator (PuTTYgen)
- 3. Click on "Generate" to generate a key
- 4. Mouse has to be moved until key is generated

PuTTY Key Generator			?	×
<u>File K</u> ey Con <u>v</u> ersions <u>H</u> elp				
Key				
No key.				
Actions Generate a public/private key pair		3	<u>G</u> enerate	
Eoad an existing private key life			Load	_
Save the generated key		Save public key	Save private key	/
Parameters Type of key to generate:	OECDSA	OED25519	O SSH-1 (RS	4)
Number of <u>b</u> its in a generated key:	0 _obox	CEPESSIS	2048	, 

Figure 13: Generating key

- 5. "Public key", "Key fingerprint" and "Key comment" for later use in textfile
- 6. Set a "Key passphrase" and "Confirm passphrase" (this will be your personal password)
- 7. Click "Save private key"
- 8. Copy private key onto server
- 9. Close PuTTYgen





😨 PuTTY Key Generator	? ×
File Key Conversions Help	
Key Public key for pasting into OpenSSH authorized_keys file: Key fingerprint Key comment Key passphrase: Confirm passphrase:	5
Actions Generate a public/private key pair Load an existing private key file Save the generated key 7 Save public key	Generate Load Save private key
Parameters Type of key to generate: RSA OBA ED25519 Number of bits in a generated key:	O SSH-1 (RSA) 2048

Figure 14: Saving key

- 10. Start PuTTY
- 11. Navigate to "SSH/Auth"
- 12. Browse for the saved private key generated in PuTTYgen



Figure 15: Setting private key for authentification

- 13. Navigate to "SSH/Tunnels"
- 14. Add "Source port" and "Destination" and click "Add"





Standard Configuration			2 🗸
BX Pully Configuration			r X
Category:			
Keyboard	Optio	ns controlling SSH p	oort forwarding
Features	Port forwarding		
-Window	Local ports a	accept connections f	rom other hosts
Appearance	Remote port	s do the same (SSH	l-2 only)
Behaviour	Forwarded ports	S:	Remove
Translation			rtemove
Selection			
Data			
Proxy	Add new forwar	ded port:	1.4
Telnet	Source port		14 Add
Rlogin			
	Destination		
Kex	Local	Remote	Opnamic
Host keys	Auto	O IPv4	O IPv6
Cipher		0	0
H Auth			
Y11 12			
Tunnels 13			
Bugs			
More bugs 🗸 🗸			
About Help	)	Open	Cancel

Figure 16: Configuring Tunnel

- 15. Navigate to "Session"
- 16. Add "Host Name" and "Port"
- 17. "Open" (The sessions can also be saved for future connections)

Real PuTTY Configuration		? ×
Category: 	Basic options for your PuTTY ses Specify the destination you want to connect to Host Name (or IP address)	sion
	Connection type: Raw Telnet Rlogin SH Load, save or delete a stored session Saved Sessions geoserver	) Serial
- Data - Proxy - Telnet - Rlogin - SSH - Kex	Default Settings GSProgress geoserver	Load Save Delete
About Help	Close window on exit. Always Never Only on cle	an exit Cancel

Figure 17: Connection to GeoServer

18. After providing user and passphrase (created in 6.) the user has access to the GeoServer in the browser





GeoServer			Logged in as admin.
About & Status Server Status GeoServer Logs Contact Information	Welcome Welcome This GeoServer belongs t	o The Ancient Geographers.	Service Capabilities
Trans-seculative      Data      Data      Data      Constructed with      Vorkspaces      Vorkspaces      Stores      Layer Groups      Styles      Services      Vorks      Vorks      Vorks      Vorks      Vorks      Construct      Trape Processing      Tate Access      Tate Caching      The Layers      Conting Defaults      Gridets      Data Quicta      BibbStores      Security      Setter, Groups, Roles      Deta Quicta      Persons      Deta Quicta      Services      Serv	25 Layers 6 Stores 2 Workgaces 3 Workgaces	Add syres     Add stores     Craft workspaces     Ifor this server has not been changed from the default. It is     sty our change a trou. Change it     sword for this server has not been changed from the default. It is     at you change a trout. Change it     sword for this server has not been changed from the default. It is     ary to change it now. Change it     sword for this server has not been changed from the default. It is     ary to change it now. Change it     ary to change it	TMS 1.0.0 WMS-C 1.1.1 WMTS 1.0.0 WCS 1.0.1 1.0.0 WFS 1.0.0 1.0.0 1.0.0 1.0.0 1.0.0 1.1.1 1.0.0 WMS 1.1.1 1.3.0
Tools	-		

Figure 18: GeoServer

#### 5.2 Establishing connection to the Greener Sites database with PuTTY

Establishing connection to the database with PuTTY requires the same steps as shown in chapter 5.1 expect source port and destination are different. After connection is established, data can be imported into the database. This is described in chapter 5.3.

#### 5.3 Data Import

This chapter shows the different methods, data can be imported into the database

#### 5.3.1 Data import with WinSCP

- 1. Download and install WinSCP from <a href="https://winscp.net/">https://winscp.net/</a>
- 2. Import "Sites" from PuTTY
- 3. Login and passphrase is similar to PuTTY
- 4. Importing data by drag and drop to the right window in WinSCP (e.g. copy raster data into /home/gs/data, the raster can then be published with GeoServer which is described in chapter 0)





Login		– 🗆 X
Import Sites       2         Import/Restore Configuration       2	Session Eile protocol: SFTP Host name: User name: Save	Po <u>r</u> t number: 22 - Password: A <u>d</u> vanced
Clean Up Run Pageant Run PuTTYgen Check for Updates Preferences About		
Tools <u>Manage</u>	E Login	Close Help

Figure 19: Connection via WinSCP





#### 5.3.2 Data import with pgAdmin

- 1. Download and install pgAdmin III from <a href="https://www.pgadmin.org/download/">https://www.pgadmin.org/download/</a>
- 2. Connection via PuTTY to the database is needed (see chapter 5.2)
- 3. After starting pgAdmin click on "File/Add Server"
- 4. Fill in: "Name", "Host", "Port", "Maintenance database" and "Username" and click "OK"
- 5. Right-click on server / Connect
- 6. Enter password
- 7. User is now connected to the database and can upload data with the plugin "PostGIS Shapefile and DBF loader"

File Jugins View Tools	s <u>H</u> elp		
	3   5    6    / 4	🛊 • 🗬 💡	
Object browser	×	Properties Statistics Depe	endencies Dependents
Server Groups		Property	Value
Greenerbites (localitost, 200	Refresh	E Convico	GreenerSites
		Hostname	localhost
	Connect	Host Address	
	Delete/Drop	Port	5433
	Paparte	🗮 SSL Certificate File	
	reports /	SSL Key File	
	Properties	SSL Root Certificate File	
		SSL Certificate Revocation List	
		SSL Compression?	yes
		Ilsername	greenersites
		Store password?	No
		Restore environment?	Yes
		Connected?	No
		<	
		501 appa	
		SQL pane	

Figure 20: Connecting database with pgAdmin





#### 5.3.3 Data import with QGIS

- 1. Download and install QGIS from <a href="http://www.qgis.org/">http://www.qgis.org/</a>
- 2. E' necessaria la connessione via PuTTY al database (vedi capitolo 5.2)
- 3. Dopo aver iniziato QGIS, tasto destroy su "PostGIS" nella finestra del Browser
- 4. Seleziona "New Connection" e compila "Name", "Host", "Port", "Database", "User Name", "Password" e seleziona "OK"



Figure 21: Connection to database with QGIS

- 5. Importing vector data can now be done with the DB Manager
- 6. Navigate to "Database"/"DB Manager"





🦸 QG	IS 2.14.11-Essen	
Project	<u>E</u> dit <u>V</u> iew <u>L</u> ayer <u>S</u> ettings <u>P</u> lugins Vect <u>o</u> r <u>R</u> aste	Database Web CadTools MMQGIS Processing Help
	🖮 🖶 🖶 🖓 💦 🔨 👘 🗩 🗩	
:		DB Manager 🔸 🛃 DB Manager 📥 🧫
<u> </u>		eVis ·
v	Browser Panel 6	Offline Editing
•		pgRouting Layer ►
•••	> Home	
	Tavourites	
Pa	C:/	
	MSSOL	
	Oracle	
-	✓ 🖤 PostGIS	
•	✓ <u>≺ greenersites</u>	
	> 🖯 private	
	> 🖹 topology	
370	SpatiaLite	
	> (i) ows	
70	V 😂 WCS	
V	> 📑 arten	
v.	Test NICC	
	Lavers Panel	il
S 20		
d		

Figure 22: DB Manager

- 7. Navigate to database GreenerSites
- 8. Click "Import Layer/File"

B Manager	– 🗆 X
<u>D</u> atabase <u>S</u> chema <u>T</u> able	
8	
Tree	Info Table Preview
>  Oracle Spatial  Spatial  Spatial  Spatial  Oracle Spatial  Spat	public
<ul> <li>✓ greenersites</li> <li>&gt; ◇ private</li> <li>&gt; ◇ public</li> </ul>	Schema details
<ul> <li>&gt; (\$\overline\$ topology</li> <li>&gt; (\$\overline\$ SpatiaLite/Geopackage</li> </ul>	Comment: standard public schema
> 💟 Virtual Layers	Privileges
	User has privileges:
	create new objects     access objects
	~

Figure 23: Import layer via DB Manager

- 9. Browse and choose vector layer
- 10. Click button "Update Options"
- 11. You can choose the scheme (e.g. public or private, see chapter 2.1)
- 12. After "OK" the Shapefile is uploaded to the database





Import vector layer		? ×
Input 9 Import selected features	10	Vpdate options
Output table		
Schema public		-
Table		~
Options		
Primary key	id	
Geometry column	geom	
Source SRID	Target SRID	
Encoding	UTF-8	~
Replace destination table (if exi	sts)	
Create single-part geometries in	nstead of multi-part	
Convert field names to lowercas	se	
Create spatial index		
	ОК	Cancel

Figure 24: Browsing for vector data with DB Manager

13. After refreshing, update "Extent" and "Spatial Index" of the uploaded vector file



Figure 25: Uploaded vector file via DB Manager





#### 5.4 Styling and publishing with GeoServer

Using GeoServer you can manage and publish your layers in the WebGIS Tool e.g. defining layer groups or define the styling There is also the possibility to check the styling of layers before publishing by clicking "Layer Preview" / "Open Layers" (see Figure 26: Layer preview)

About & Status Server Status GeoServer Logs	Laye	Preview layers configured in GeoServer and provides previews	in various formats for each.		Search	
About GeoServer	Туре	Title	Name	Common Formats	All Formats	
Data	346	Ausgleichsfläche	cite:Ausgleichsfläche	OpenLayers KML ML	Select one	~
Stores	ш	Bebauungspläne	cite:Bebauungspläne	OpenLayers KinL GML	Select one	~
Layers Layer Groups Styles	٥	Bebauungspläne - Beschriftungen	cite:Bebauungspläne - Beschriftungen	OpenLayers KML GML	Select one	~

Figure 26: Layer preview

#### 5.4.1 Styling

After saving a layer style from QGIS as a SLD File, it can be added to GeoServer.

- 1. Open the shape in QGIS and navigate to layer properties
- 2. Navigate to "Style"
- 3. Edit layer style
- 4. Save it by navigating to "Style / Save Style / SLD File"



Figure 27: Saving layer style





- In GeoServer navigate to "Styles / Add a new Style"
   Chose "Name", "Workspace", "Style Content" and browse and upload saved SLD-File
- 7. After uploading further configurations are also possible in the "Style Editor"

8	"Annly"	' and	"Submit"
ο.	ADDLV	anu	Submit

New style
Type a new style definition, or use an existing one as a template, or upload a ready made style from your file sy style is a valid style document.
Data
Style Data
Name
ExampleStyle
Workspace
cite 🖂
Format
SLD 🗸
Style Content
Generate a default style
Polygon V Generate
Copy from existing style
Choose One
Upload a style file
Durchsuchen Keine Datei ausgewählt. Upload
Style Editor
C I I 2pt

Figure 28: Upload style to GeoServer

#### 5.4.2 Publishing

After uploading geodata into the geodatabase it has to be "published" before it is shown in the map viewer





# MANUALE DEL WEB-GIS-TOOL

D.T.2.2.2

Versione 1 11/2017





General project details

Customer:	Ministry for Regional Development and Transport of the State of Saxony- Anhalt, unit 44	Turmschanzenstr. 30 39114 Magdeburg
Contractor:	Bidder Consortium	Zum Schießwasen 7
	Baader Konzept GmbH www.baaderkonzept.de	91710 Gunzenhausen
	mena GmbH	

mena GmbH www.mena-online.de





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### 1 Introduzione

Questo manuale vuole essere una guida per amministratori e utilizzatori del sistema geo referenziato e fornisce una spiegazione chiara delle funzionalità già testate. Il manuale verrà successivamente aggiornato in seguito al completamento del sistema.

## 2 Architettura del sistema

Nel capitolo seguente verranno descritte le modalità di installazione e la struttura del sistema gis GreenerSites.

La Figura 1 illustra i componenti del sistema web gis di GreenerSites e come questi si collegano tra loro.



Figura 1: Architettura di Sistema

#### 2.1 PostGreSQL/PostGIS

PostGreSQL è un data base ad oggetti mentre PostGIS è un estensione che consente di salvare elementi geografici nel data base. Nel sistema di GreenerSites questi componenti hanno la funzione di:

- salvare i dati
- modificare i dati
- attribuire dei ruoli per ciascun utente
- fornire dati al GeoServer

Il data base può essere gestito con comandi in sql o con un'interfaccia grafica con l'uso di pgAdmin. (vedi anche alla sezione 0). Le versioni usate sono: PostGreSQL 9.5 e PostGIS 2.3.

Ogni partner di GreenerSites gestirà il proprio database che contiene i propri dati che chiameremo d'ora in poi *site information* database. Al fine di garantire la standardizzazione tra i differenti territori dei partner viene fornito uno schema con gli





attributi definiti e i corrispondenti valori.<sup>1</sup> Nello schema sono inseriti anche dei campi opzionali per venire incontro alle diverse esigenze dei partner.

Nell'architettura è incluso anche un ulteriore data base che contiene dati di tutta l'Europa (es. OpenStreetMap) o dati nazionali (es. UrbanAtlas) che d'ora in poi chiameremo *base layers*. Questi dati non sono modificabili.

Il data base PostGreSQL contiene anche degli schemi per gestire l'accesso a diversi gruppi di utenti:

- "pubblico" accessibili a tutti gli utenti;
- "privato" accessibile ad utenti registrati con specifici privilegi

L'amministratore del data base può stabilire diversi privilegi di accesso o restrizioni.

La differenziazione dei ruoli per gli utilizzatori del data base consente ai partner del progetto di gestire i diritti di lettura e scrittura dei dati del proprio territorio. Tali diritti possono interessare l'intero base layer o solo specifiche colonne all'interno del layer. Istruzioni specifiche sui diversi ruoli degli utilizzatori sono al capito 3. Le modalità di connessione invece sono illustrate al punto 0 (via frontend) e punto 15 (via backend).

#### 2.2 pgAdmin

Il pgAdmin è uno degli strumenti di amministrazione con interfaccia grafica per l'utente (GUI) per la gestione dei dati nel server in PostGreSQL (Figura 2: GUI pgAdmin). La modalità di connessione al data base GreenerSites è descritta al punto 15.

<sup>1</sup> Lo schema verrà finalizzato dopo la messa a punto dello strumenti GIS







Figura 2: GUI pgAdmin





#### QGIS

Il QGIS è un sistema informativo geografico open source (Figura 3: QGIS GUI) con un interfaccia per OGC- e dati raster. Viene usato per visualizzare e modificare dati spaziali. Una volta effettuata la connessione al data base GreenerSites (come descritto al punto 20) è possibile importare i dati nel data base. E' possibile inoltre caricare dei flussi di lavoro per il calcolo dei vari attributi (es. l'estensione della bonifica del suolo, accessibilità al sito).



Figura 3: QGIS GUI





#### 2.3 GeoServer

Il GeoServer, parte del server lato amministrazione, fornisce al Web-GIS-Tool i geodati (GUI in Figura 1: Architettura di Sistema). I diritti definiti nel PostGre-database possono anche essere adottati o dettagliati ulteriormente nel GeoServer. Con il GeoServer gli amministratori sono in grado di configurare lo stile e l'aspetto; è anche possibile integrare WMS-Services esterni nell'interfaccia utente del Web-GIS-Tool. Nel capitolo 5 sono fornite descrizione dettagliate per connettere il GeoServer. Lo stile e la pubblicazione del layer sono descritti nel capitolo 5.4.

GeoServe	r		Logged in as admin.	
About & Status	Welcome Welcome			
GeoServer Logs     Contact Information     About GeoServer	This GeoServer belongs to	Service Capabilities TMS		
Data           Layer Preview           Workspaces           Stores           Layers           Layer Groups	26 Layers 9 Stores 3 Workspaces A The master password biolity recommended the	Add byers Add stores Create workspaces for this server has not been changed from the default. It is true rations to be the server has not been changed from the default. It is the server has not been changed from the default. It is	1.0.0 WMS-C 1.1.1 WMTS 1.0.0 WCS 1.1.0	
Services WMTS WMS WMS Gobal Gobal Rage Processing Raster Access	The administrator password for this server has not been changed from the default. It is     highly recommended that you change it now. Change it     This GeoServer Instance is running version 2.11.2. For more information please contact     the administrator.		1.1.1 1.1 2.0.1 1.0.0 WFS 1.0.0 1.0.0 WMS 1.1.1 1.3.0	
Tile Layers				
Demos Tools				

Figura 4: GeoServer GUI





#### 2.4 GeoDjango/OpenLayers

GeoDjango è una struttura web per dati geografici. OpenLayers è una JavaScript library e mostra mappe piastrellate in un browser. L'interfaccia utente della visualizzazione delle mappe (Figura 5: Visualizzazione delle mappe del Web-GIS-Tool) è visualizzabile con GeoDjango (struttura dei layer, visualizzazione delle mappe) e OpenLayers (selezione dei siti, inserimento degli attributi, ordine dei layer, trasparenza)2. Le funzioni per la visualizzazione delle mappe sono descritte nel capitolo 0.



Figura 5: Visualizzazione delle mappe del Web-GIS-Tool

## 3 Ruoli degli utenti

Come indicato nel capitolo 2.1 la possibilità di leggere e scrivere dati da parte di un utente dipende dal suo ruolo.

Utente	Descrizione utente	Diritti utente	Esempio
postgres	Superuser/Host/Admin	Gestione di tutti i database e ruoli degli utenti	TBD
gsa	Amministratore del database	Modificare database e definizione ruoli degli utenti	L'autorità del partner che detiene i dati
gsrw	Leggere e scrivere nel database	Modificare caratteristiche specifiche, per esempio informazioni su un sito (fornite da gsa)	Utente registrato (dipendenti/investitori)
gsr	Leggere nel database	Leggere caratteristiche e stampare report	Utente non registrato

<sup>2</sup> Non tutte le funzioni sono ancora state implementate.




Figura 6: , mostra i diversi ruoli degli utenti e i loro corrispondenti diritti, una breve descrizione e un esempio.

Utente	Descrizione utente	Diritti utente	Esempio
postgres	Superuser/Host/Admin	Gestione di tutti i database e ruoli degli utenti	TBD
gsa	Amministratore del database	Modificare database e definizione ruoli degli utenti	L'autorità del partner che detiene i dati
gsrw	Leggere e scrivere nel database	Modificare caratteristiche specifiche, per esempio informazioni su un sito (fornite da gsa)	Utente registrato (dipendenti/investitori)
gsr	Leggere nel database	Leggere caratteristiche e stampare report	Utente non registrato

Figura 6: Ruoli degli utenti





## 4 Interfaccia utente

Questo capitolo si focalizza sull'imterfaccia utente del Web-GIS-Tool Website. E' possibile per ciascun partner avere un subdominio. Per il "Ministry for Regional Development and Transport of the State of Saxony-Anhalt", il link al sito web del Web-GIS-Tool è "mlv.greenersites.eu/map/". Ciò consente a ciascun partner di definire autonomamente il proprio subdominio (loghi, lingua, ecc...). Come indicato nel capitolo 2.1, è necessario un database per ciascun sub dominio. Base layers (e.g. OpenStreetMap) sono conservati in un altro database comune.

## 1.1 Informazioni generali

La Figura 7: Interfaccia utente del Web-Gis-Tool mostra la schermata iniziale.



Figura 7: Interfaccia utente del Web-Gis-Tool

- 1 Barra configurabile con link a
  - La pagina del Progetto GreenerSites
  - Map
  - About us





- Support
- Login

Gli utenti possono navigare liberamente in queste pagine, l'amministratore può anche creare nuovi link.

**2** - Barra di ricerca degli indirizzi L'utente può digitare (il menu drop down con i suggerimenti diventerà visibile) e zoomare per scegliere l'indirizzo.

3 - Tabella dei Layer L'utente può abilitare / disabilitare i layer

4 - La visuazzazione delle mappe con tutti i layers attivi A seconda della scala, nella mappa compaiono differenti piastrelle

5 - Tasto di navigazione

L'utente può zoomare Avanti e indietro (è possibile anche con la rotellina del mouse).

## 4.1 Login

Cliccando su "Login" e fornendo username e password, un utente ha accesso ad ulteriori funzioni a seconda del suo ruolo (Figura 8: Login).

GreenerSites	Мар	About us	Support	Login	
					Login Username:gsrw Password: login
© 2017 mena GmbH	I   Imprint	Contact			

Figura 8: Login

Per esempio, un utente con diritti di lettura e scrittura (gsrw) è in grado di modificare i dati delle geometrie nelle tabelle degli attributi (non tutti ma i dati che può modificare come amministrazione, vedi capitolo 2.1).





## 4.2 Funzioni

<u>Controllare i valori degli attributi (vedi Figura 9:</u> Tabella degli attributi)

Quando il layer "Standorte" è attivato, l'utente può cliccare sulla geometria e prendere visione degli attributi del sito (l'amministratore può attivare o disattivare attributi specifici per specifici ruoli dell'utente). La tabella degli attributi è organizzata in più schede di registrazione.



Figura 9: Tabella degli attributi

- 1 Geometria (sito)
- 2 Tabella degli attributi
- 3 Schede di registrazione

## Modificare i valori degli attributi (vedi figuraFigura 10)

Se l'utente ha diritti di scrittura (per esempio gsrw-user), può modificare la tabella degli attributi dopo aver selezionato un sito (l'amministratore può attivare o disattivare attributi specifici). Dopo aver modificato il campo, l'utente deve selezionare il tasto "Submit". La tabella degli attributi può contenere i seguenti campi:

- Menu a tendina (es. Categoria di utilizzo del terreno)
- Casella di spunta sì/no (es. bonificato)
- Numero (es. Dimensione del plot)
- Testo (es. Descrizione dei possibili finanziamenti)





Menu	•
------	---

# Site information

Plot size in km <sup>2</sup> :	23,1752174560547 🚖			
Municipality identifier 1:	15003000			
Municipality name 1:	Magdeburg, Landeshaup			
Municipality identifier 2:				
Municipality name 2:				
Municipality identifier 3:				
Municipality name 3:				
Share of plot in municipality 1:	100 🗢			
Share of plot in municipality 2:	0			
Share of plot in municipality 3:	0			
County number:	15003			
County name:	Magdeburg, Landeshaup			
Submit 2				

Figura 10: Compilare la tabella degli attributi

- 1 Campi digitabili
- 2 Tasto Submit

## Esportare le informazioni relative ad un sito in PDF

Dopo aver selezionato la geometria del sito, un utente può selezionare il tasto "Flächenpass aufrufen" (mostra fact sheet) collocato sotto la tabella degli attributi (Figura 11: Tasto "Flächenpass aufrufen"). Verrà quindi caricato un nuovo sito che mostrerà una fotografia dell'attuale visualizzazione delle mappe e della tabella degli attributi. Selezionando "Flächenpass herunterladen" (scarica fact sheet) (Figura 12: Tasto "Flächenpass herunterladen") la visualizzazione delle mappe e la tabella degli attributi sono esportate in pdf.





# Site information

Plot size in km<sup>2</sup> 17,6424532958984 Municipality identifier 1 15003000 Municipality name 1 Magdeburg, Landeshauptstadt Municipality identifier 2 Municipality name 2 Municipality identifier 3 Municipality name 3 Share of plot in municipality 1100,0 Share of plot in municipality 20,0 Share of plot in municipality 30,0 County number 15003 County name Magdeburg, Landeshauptstadt

Flächenpass aufru 1

Site information					
Plot size in km <sup>2</sup>	17,6424532958984				
Municipality identifier 1	15003000				
Municipality name 1	Magdeburg, Landeshauptstadt				
Municipality identifier 2					
Municipality name 2					
Municipality identifier 3					
Municipality name 3					
Share of plot in municipality	<b>1</b> 100,0				
Share of plot in municipality	20,0				
Share of plot in municipality	<b>3</b> 0,0				
County number 15003					
County name	Magdeburg, Landeshauptstadt				
Flächenpass aufrufen					

Figura 11: Tasto "Flächenpass aufrufen"

1 - Tasto "Flächenpass aufrufen" (display fact sheet)







Figura 12: Tasto "Flächenpass herunterladen"

1 - Tasto "Flächenpass herunterladen" (download fact sheet)

## 5 Sviluppo del server lato amministrazione

5.1 Stabilire una connessione tra il sistema GreenerSites e il GeoServer con PuTTY

Per connettersi al GeoServer è necessario:

- 1. Scaricare PuTTY da <u>www.putty.org</u>
- 2. Iniziare PuTTY Key Generator (PuTTYgen)
- 3. Selezionare "Generate" per generare la chiave
- 4. Il mouse deve essere mosso fino a quando la chiave viene generata

PuTTY Key Generator	?	×
<u>File Key Conversions Help</u>		
Key No key.		
Actions		
Generate a public/private key pair 3	<u>G</u> enerate	
Load an existing private key file	<u>L</u> oad	
Save the generated key Save public key Save	ve private key	
Parameters		_
Type of key to generate: ● <u>R</u> SA ○ <u>D</u> SA ○ <u>E</u> CDSA ○ ED <u>2</u> 5519 ○	SSH-1 (RSA)	
Number of bits in a generated key:	048	

Figura 13: Generare una chiave





- 5. Incollare "Public key", "Key fingerprint" e "Key comment" in un file di testo per un successivo utilizzo
- 6. Impostare una "Key passphrase" e "Confirm passphrase" (questa sarà la vostra password personale)
- 7. Selezionare "Save private key"
- 8. Copiare la chiave privata nel server
- 9. Chiudere PuTTYgen

PuTTY Key Generator	?	×
File Key Conversions Help		
Key		
Public key for pasting into OpenSSH authorized_keys file:		
		^
	8	
		_ )
Key fingerprint		5
Key comment		$\prec$
Key passphrase:	-	6
Confirm passphrase:	=(	0
		$\checkmark$
Actions		
Generate a public/private key pair Gen	erate	
Load an existing private key file	ad	
Save the generated key Save public key Save pr	ivate key	,
Parameters		
I ype of key to generate:     I SA ODSA OECDSA OED25519 OSS	H-1 (RSA	N)
Number of bits in a generated key: 2048		

Figura 14: Salvare la chiave

- 4. Iniziare PuTTY
- 5. Navigare fino a "SSH/Auth"
- 6. Scorrere per selezionare la chiave privata salvata generata in PuTTYgen







Figura 15: Configurare una chiave privata per l'autenticazione

- 10. Navigare fino a "SSH/Tunnels"
- 11. Aggiungere "Source port" e "Destination" e selezionare "Add"



Figura 16: Configurare Tunnel

- 12. Navigare fino a "Session"
- 13. Aggiungere "Host Name" e "Port"
- 14. "Open" (la sessione può essere salvata per connessioni future)





R PuTTY Configuration		? X
Category		
- Session - Logging - Terminal - Keyboard - Bell - Features - Window - Appearance - Behaviour - Translation - Selection - Selection	Basic options for your PuTTY ses Specify the destination you want to connect to Host Name (or IP address) Connection type: Raw O Telnet O Rlogin SH Load, save or delete a stored session Saved Sessions Logence of the session	Serial
Colours     Connection	Default Settings GSProgress geoserver	Load Save Delete
Host keys Cipher Auth TTY X11 ✓ About Help	Close window on exit. Always Never Only on cle	an exit Cancel

Figure 17: Connettersi al GeoServer

15. Dopo aver fornito username e passphrase (creato al passaggio 6) l'utente ha accesso al GeoServer nel browser

GeoServer			Logged in as admin.
Cecoserver  Cecos	Welcome Welcome This GeoServer belongs to 25 Layers 6 Stores 2 Workspaces A The administrator pass highly recommended tha 6 Store orphography a This GeoServer instance is the administrator.	D The Ancient Geographers.  Add layers Add stores C reate workspaces for this server has not been changed from the default. It is t you change it now. Change it would be summing version 2.11.2. For more information please contact	Service Capabilities THS 1.00 WeS 1.1.1 WeXTS 1.0.0 WCS 1.1.0 1.1.1 1.1.0 1.0.0 WFS 1.1.0 1.
Demos	-		



## 5.2 Stabilire una connessione al database di Greener Sites con PuTTY

Stabilire una connessione al database con PuTTY richiede gli stessi passi mostrati nel capitolo 5.1; porta di ingresso e di destinazione sono differenti. Dopo che viene stabilita la connessione, i dati possono essere importati nel database. Ciò è descritto nel capitolo 5.2.





## 5.3 Importare dati

Questo capitolo mostra diversi metodi per importare i dati nel database.

## 5.3.1 Importare dati con WinSCP

- 1. Scaricare e installare WinSCP da https://winscp.net/
- 2. Importare "Sites" da PuTTY
- 3. Il Login e la passphrase sono simili a PuTTY
- 4. Importare dati tramite drag and drop nella finestra di destra in WinSCP (es. copia i dati raster nei dati della home home/gs, quindi i dati vengono pubblicati con GeoServer così come descritto nel capitolo 0)





🔁 Login		
New Site         geoserver         GSProgress         TestRoot	Session Eile protocol: SFTP ~ Host name:	Port number:
Import Sites Import/Restore Configuration Export/Backup Configuration Clean Up Run Pageant Run PuTTYgen Check for Updates Preferences About	User name: Password: Save ▼	A <u>d</u> vanced ▼
Tools  Manage	Login Close	Help
Login	-	□ ×
Login New Site geoserver GSProgress TestRoot	Session Eile protocol: SFTP Host name:	Port number:
Login New Site geoserver GSProgress TestRoot	Session Eile protocol: SFTP Host name: User name: Password:	Port number:
Login  New Site geoserver GSProgress TestRoot  Import Sites Import/Restore Configuration Export/Backup Configuration Clean Up Run Pageant Bun PuTTYgen	Session File protocol: SFTP Host name: User name: Save	Port number: 22 -

Figura 19: Connettersi via WinSCP





## 5.3.2 Importare dati con pgAdmin

- 1. Scaricare e installare pgAdmin III da <u>https://www.pgadmin.org/download/</u>
- 2. E' necessaria la connessione via PuTTY al database (vedi capitolo 5.2)
- 3. Dopo aver iniziato pgAdmin selezionare "File/Add Server"
- 4. Compilare: "Name", "Host", "Port", "Maintenance database" e "Username" e selezionare "OK"
- 5. Tasto destro su server / Connetti
- 6. Immettere la password
- 7. L'utente è ora connesso al database e può caricare dati con il plugin "PostGIS Shapefile e DBF loader"

File Jugins View Tools Help					
	🔲 📑 🧨 🛤	\$ • 🛡 💡			
Object browser	×	Properties Statistic	cs Deper	ndencies	Dependents
Server Groups					
🖮 🗐 Server (1)		Property		Value	
GreenerSites (localhost:5433)		📻 Description		GreenerSite	5
Refresh		📻 Service			
(5) Connect		🧮 Hostname		localhost	
S Connect		Host Address			
Delete/Dr	op	Port		5433	
Reports	>	SSL Certificate File			
incports -		SSL Key File			
Properties		SSL Root Certificate	File		
		SSL Certificate Revo	cation List		
		SSL Compression?		yes	
		Maintenance databa	se	greenersites	5
		Username		gsa	
		Store password?		No	
		Restore environmen	it?	Yes	
		Connected?		No	
		<			
	s	OL pane			

Figura 20: Connettersi al database con pgAdmin





## 5.3.3 Importare dati con QGIS

- 1. Scaricare e installare QGIS da http://www.qgis.org/
- 2. E' necessaria la connessione via PuTTY al database (vedi capitolo 5.2)
- 3. Dopo aver iniziato QGIS, tasto destro su "PostGIS" nella finestra del Browser
- 4. Selezionare "New Connection" e compila "Name", "Host", "Port", "Database", "User Name", "Password" e selezionare "OK"
- 5. Importare dati vettoriali può ora essere fatto con DB Manager
- 6. Navigare fino a "Database"/"DB Manager"



Figura 21: Connettersi al database con QGIS





🦸 QG	IS 2.14.11-Essen							
Project	: <u>E</u> dit <u>V</u> iew <u>L</u> ayer <u>S</u> ettings <u>P</u> lugins Vect <u>o</u> r <u>R</u> a	ster <u>D</u> a	atabase	<u>W</u> eb	<u>C</u> adTools	MMQGIS	Pro <u>c</u> essing	<u>H</u> elp
	) 🗩 🖯 🕀 🖓 🔍 🔨 👘 🗩 🗩	11	<u>A</u> LKIS		• 🕴	Q. Q		- 3
1 111	/ □ ** / - □ 左击 >> □ □	abc	DB Ma	anager	• 🔙	DB Mana	nger 🚽	Real P
<u> </u>			<u>e</u> Vis		· F	-		
v	Browser Panel d	5×	Offline	e Editing		6		
			pgRou	uting Lay	/er 🕨	( Ŭ		
-	> Home	^				$\smile$		
	Tavourites							
Pa	> C:/							
	MSSQL							
	Oracle							
-	✓ I PostGIS							
•	✓							
( <b>?</b>	> 🔁 private							
	> 🖻 topology							
370	SpatiaLite							
	> ( ) ows							
70	✓ 😂 WCS							
V	> 📑 arten							
v.	test	~						
	Lavers Panel	₹ ×						
d								

Figura 22: DB Manager

- 7. Navigare fino al database GreenerSites
- 8. Selezionare "Import Layer/File"

🛃 DB Manager	– 🗆 X
<u>D</u> atabase <u>S</u> chema <u>T</u> able	
8	
Tree	Info Table Preview
Oracle Spatial     Spatial     Spatial	public
<ul> <li>✓ greenersites</li> <li>&gt; ♦ private</li> <li>▼ public</li> </ul>	Schema details
<ul> <li>&gt; <pre></pre></li></ul>	Comment: standard public schema
> 💟 Virtual Layers	Privileges
	User has privileges:
	create new objects     access objects
	<b>~</b>

Figure 23: Importare un layer attraverso DB Manager

- 9. Scorrere e scegliere layer vettoriali
- 10. Selezionare il tasto "Update Options"
- 11. Puoi scegliere lo schema (es. pubblico o privato, vedi capitolo 2.1)





#### 12. Dopo "OK" lo Shapefile è caricato sul database

🛃 Import vector layer	? ×
Input 9	~ · · · ·
Import selected features	10 Update options
Output table	
Schema public	•
Table	~
Options	
Primary key	id
Geometry column	geom
Source SRID	Target SRID
Encoding	UTF-8
Replace destination table (if exis	sts)
Create single-part geometries in	istead of multi-part
Convert field names to lowercas	e
Create spatial index	
	OK Cancel

Figura 24: Ricercare dati vettoriali nel DB Manager

13. Dopo un refresh, aggiona "Extent" e "Spatial Index" del vector file caricato



Figura 25: Caricare file vettoriali attraverso DB Manager





## 5.4 Applicare uno stile e pubblicare con GeoServer

Usando GeoServer puoi gestire e pubblicare i tuoi layers nello strumento WebGIS es. definendo gruppi di layer groups o applicando lo stile. C'è anche la possibilità di controllare lo stile dei layers prima di pubblicarli selezionando "Layer Preview" / "Open Layers" (vedi figura Figura 26: )

	Laye	er Preview				
About & Status	List of all	l layers configured in GeoServer and provides	s previews in various formats for each.			
Contact Information	<< 4	< 1 2 > >> Results 1 to 25 (out	: of 34 items)		🔍 Search	
About GeoServer	Туре	Title	Name	Common Formats	All Formats	
Data	ш.	Ausgleichsfläche	cite:Ausgleichsfläche	OpenLayers KML GML	Select one	~
Stores	1	Bebauungspläne	cite:Bebauungspläne	OpenLayers KHC GML	Select one	~
Layer Groups     Styles	٥	Bebauungspläne - Beschriftungen	cite:Bebauungspläne - Beschriftungen	OpenLayers KML GML	Select one	~

Figura 26: Anteprima dei Layer

## 5.4.1 Applicare uno stile

Dopo aver salvato la configurazione di un layer da QGIS come File SLD, può essere aggiunto al GeoServer.

- 1. Aprire il modello in QGIS and navigare fino alle proprietà del layer
- 2. Navigare fino a "Style"
- 3. Modificare lo stile del layer
- 4. Salvare navigando fino a "Style / Save Style / SLD File"





💋 QG	IS 2.14.11-Essen			
Project	Edit View Layer Settings Plugins Vector	<u>Raster</u> <u>D</u> atabase <u>W</u> eb	CadTools MMQGIS Processing Help	5
	= 🖶 🖶 🕞 🔍 🚺 🖶 😑		a 🕰 🔍 🔍 - 🔣 - 😜	- 🎭 📰 🖾 🔈 🖮 - 🖵 📬 📫 🔹 🖉 🔕 🖄 🗇 📌 📆 🗞
11.	/ 6 3 6 . 3 5 6 . 6 6	abe abg abg abg	aba, aba, aba, 🕶 🕴 🛃 🚮 🔚 🤘	🔺 🗊 🖉 🦂 🖉 💟 🐘 🕼 🛝 🐇 🚓 🚓 🛨 🖠
9 90	Browser Panel	🔮 Layer Properties -	ExampleShape   Style	
Vo	l 🖸 🝸 🖬 🛛	General	Single Symbol	
	📁 ExampleShape.shp			it Millimotor •
	Bachelor_Urkunde_Markus Sing	Style		Transparency 0%
Pa	Bachelor_Urkunde_Markus Singe	· · · ·		Color
	Master_Urkunde_Markus Singe			
•	C VerbindungGeoserver.bt	Refigentig	v 📕 Fill	Symbols in group
•	> TransnetBW > Baaderkonzept	- Disebu	Simple fill	
•	> Geodaten	- Display		
	> Metador	Actions		Neues corners diagon; dotted green land water wine
	> Programme > Recherche	• Joins		
?□	> Schulungen	Diagrams		
Va	> Sonstiges	Motadata		
V	<	Metauata		
-	Layers Panel	Variables		3
	â 👟 🍸 🗞 🕶 🗱 😭 🗔			
-()- 2	ExampleShape			
100				
12				
~				
1				
			Layer rendering	_
			Layer transparency	
			Layer blending mode	Normal • Featu
			Draw effects	
			Control featu der	
			Style 🔻	
		and a second		

Figura 27: Salvare lo stile del layer

- 5. Nel GeoServer navigare fino a "Styles / Add a new Style"
- 6. Scegliere "Name", "Workspace", "Style Content" e scorrere e caricare il file SLD salvato
- Dopo averlo caricato, sono possibili ulteriori configurazioni in "Style Editor"
   "Apply" e "Submit"





Style Data			
ExampleStyle			
Norkspace			
cite Y			
Format			
SLD 🖂			
Style Content			
Jenerate a default	tyle 1		
Polygon ~	Generate		
Copy from existing	tyle		
Choose One		✓ Copy	
Jpload a style file		· · · ·	
	Value Detail average VI	heolout the	

Figura 28: Caricare lo stile su GeoServer

## 5.4.2 Pubblicare

7

Dopo aver caricato geodati nel geodatabase, deve essere "published" prima di essere mostrato nella map viewer.









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## 1. Einführung

Dieses Handbuch führt Nutzer und Administratoren in die Konfiguration und die Funktionen des Web-GIS-Tools ein. Das Dokument trägt entsprechend dem Stand der Tool-Entwicklung die Versionsnummer 1 und erklärt die bereits implementierten Funktionen. Sobald die Weiterentwicklung des Web-GIS-Tools abgeschlossen ist, wird das Handbuch aktualisiert, ergänzt und mit der Versionsnummer 2 veröffentlicht.

## 2. Systemarchitektur

Das folgende Kapitel beschreibt den Aufbau und Struktur des GreenerSites Web-GIS-Tools. *Abbildung 1: Systemarchitektur*Abbildung 1 zeigt die Komponenten und deren Zusammenspiel innerhalb des Web-GIS-Tools.





## PostGreSQL/PostGIS

PostGreSQL ist eine objektrationale Datenbank unter Open Source Lizenz. PostGIS ist eine Erweiterung welche es ermöglicht, geographische Objekte in der Datenbank zu speichern. Diese werden im GreenerSites Web-GIS-Tool für folgende Zwecke verwendet:

- Speichern von Daten
- Editieren von Daten
- Implementierung von Nutzerrollen
- Bereitstellung von Daten an den GeoServer

Die Datenbank kann entweder mit psql per Kommandozeile, oder mit pgAdmin über eine grafische Benutzeroberfläche, verwaltet werden (siehe auch Kapitel 0). Folgende Versionen werden verwendet: Post-GreSQL 9.5 und PostGIS 2.3.

Jede Region wird eine eigene Datenbank, welche die eigenen Daten beinhaltet, verwalten (im folgenden "Standortdaten" genannt). Um eine Standardisierung und Vergleichbarkeit unterschiedlicher Regionen zu





gewährleisten wird ein Schema mit definierten Attributen und Wertebereichen bereitgestellt. Da regionalspezifische Charakteristiken auftreten können, enthält das Schema auch optionale Felder<sup>1</sup>.

Es wird eine weitere Datenbank geben, welche europaweite Datensätze (z.B. OpenStreetMap), oder allgemeine nationale Daten (z.B. UrbanAtlas), enthält (im folgenden "Basisdaten" genannt). Diese Daten können nicht editiert werden.

Des Weiteren enthält die PostGreSQL Datenbank auch Schemas zur Verwaltung der verschiedenen Nutzergruppen.

- "public" offener Zugang für alle Nutzer
- "private" beschränkter Zugang für registrierte Nutzer mit Zugangsrechten

Der Administrator der Datenbank kann weitere Unterscheidungen implementieren.

Zusätzliche Nutzerrollen in der Datenbank ermöglichen jeder Region Lese- und Schreibrechte zu modifizieren. Diese Rechte können auf ganze Layer oder bestimmte Spalten innerhalb eines Layers angewendet werden. Detaillierte Informationen zu Nutzerrollen werden in Kapitel 3 gegeben. Die Verbindung zur Datenbank wird in Kapitel 0 (via Frontend) und Kapitel 18 (via Backend) erläutert.

#### pgAdmin

PgAdmin ist ein GUI-Administrationstool (engl. "graphical user interface", grafische Benutzeroberfläche) zur Verwaltung von Daten in PostGreSQL (*Abbildung 2: GUI pgAdmin*). Die Verbindung zur GreenerSites Datenbank wird in Kapitel 18 beschrieben.

<sup>&</sup>lt;sup>1</sup> Schema ist noch nicht finalisiert.







Abbildung 2: GUI pgAdmin





#### QGIS

QGIS ist ein Open Source Geoinformationssystem mit einer Schnittstelle für OGC- und Rasterdaten (*Abbildung 3: QGIS GUI*). Es kann zur Visualisierung und dem Editieren von Geodaten genutzt werden. Nach der Verbindung mit der GreenerSites Datenbank (beschrieben in Kapitel 17) können Daten zur Datenbank hinzugefügt werden. Es ist auch möglich Workflows zur Ermittlung von Attributen zu entwickeln (z.B. Versiegelungsgrad, Erreichbarkeit).



Abbildung 3: QGIS GUI





#### GeoServer

GeoServer ist Teil des Backends und liefert die Geodaten an das Web-GIS-Tool (siehe Abbildung 1: Systemarchitektur). Rechte, die in der PostGre-Datenbank definiert wurden, können direkt übernommen oder auch weiter im GeoServer spezifiziert werden. Administratoren können Layer Style und Veröffentlichung mit dem GeoServer konfigurieren. Es ist auch möglich externe WMS-Dienste in das Frontend des Web-GIS-Tools zu integrieren. Detaillierte Beschreibungen zur Verbindung mit dem GeoServer werden in Kapitel 5 gegeben. Layerdarstellung und Veröffentlichung werden in Kapitel 240 beschrieben.

GeoServer			Logged in as admin.
About & Status About & Status Geosenver Logs Contact Information About GeoServer Data Layers Layers Layers Services Services Services Services Services Services Settings Global Setting Cohal Expers Cohal Det Cohal Det Cohal Setting Cohal Setting Cohal Det Cohal Det Cohal Det Cohal Det Cohal Det Cohal Setting Setting Cohal Det Cohal Det Cohal Det Cohal Det Cohal Det Cohal Setting Set	Welcome Welcome The GeoServer belongs 9 Stores 9 Stores 3 Workspaces ▲ The master passworr highly recommended th ④ Strong crybtography The GeoServer instance the administrator.	to The Ancient Geographers. Add tayers Add stores Create workspaces I for this server has not been changed from the default. It is at you change it now, Change it sword for this server has not been changed from the default. It is at you change it now, Change it available is running version 2.11.2. For more information please contact	Logged in as admn. 2 [legewt Service Capabilities TMS 1.0.0 WMS-C 1.1.1 WMTS 1.0.0 WCS 1.10 1.1.1 1.1 2.0.1 1.0.0 WFS 1.0.0 1.1.0 2.0.0 WMS 1.1.1 1.3.0
Demos Tools	-		

Abbildung 4: GeoServer GUI





## GeoDjango/OpenLayers

GeoDjango ist ein Web Framework für geografische Daten. OpenLayers ist eine JavaScript Bibliothek und stellt gekachelte Karten in einem Webbrowser dar. Das Frontend des Kartenviewers ist mit GeoDjango (Layerbaum, Kartenfenster) und OpenLayers (Selektionen, Attributeingaben, Layerreihenfolge, Transparenz)<sup>2</sup> visualisiert. Die Funktionen des Kartenfensters werden in Kapitel 4 beschrieben.



Abbildung 5: Kartenfenster Web-GIS-Tool

## 3. User Roles

Wie bereits in Kapitel 0 erwähnt, werden die Rechte für das Lesen und Schreiben von Daten eines Nutzers durch Nutzerrollen gesteuert. *Abbildung 6: Nutzerrollen* listet und beschreibt die verschiedenen Nutzerrollen und deren Rechte und nennt ein Bespiel. Abbildung 6: Nutzerrollen

Nutzer	Beschreibung	Nutzerrechte	Beispiel
postgres	Superuser/Host/Admin	Vollzugriff auf alle Datenbanken und Nut- zerrollen	TBD
gsa	Administrator einer Da- tenbank in zugehöriger Region	Vollzugriff auf die zugehörige Datenbank und Definition von Nutzerrechten dieser Datenbank	Datenhaltender Partner in Region
gsrw	Lesen und schreiben in einer Datenbank	Editieren bestimmter Attribute, z.B. Standortinformationen (vergeben von gsa)	Registrierter Nutzer (Angestellte/Investoren)
gsr	Lesen einer Datenbank	Lesen von Attributen und Drucken von Berichten	Nicht registrierter Nut- zer

Abbildung 6: Nutzerrollen

<sup>&</sup>lt;sup>2</sup> Derzeit sind noch nicht alle Funktionen implementiert





## 4. Frontend

Dieses Kapitel behandelt das Frontend der Web-GIS-Tool Webseite. Es ist möglich jeder Region eine eigene Subdomain zu vergeben. Der Link zur Web-GIS-Tool Webseite vom "Ministerium für Landesentwicklung und Verkehr des Landes Sachsen-Anhalt" ist "mlv.greenersites.eu/map/". Dies ermöglicht jeder Region eine eigene Darstellung und Organisation der Subdomain (Logos, Sprache, etc.) Wie in Kapitel 0 beschrieben, wird eine Datenbank für jede Subdomain benötigt, Basislayer (z.B. OpenStreetMap) werde in einer anderen gemeinsamen Datenbank abgespeichert.

## Allgemeines

Abbildung 7: Web-GIS-Tool Frontend zeigt die Ansicht nach Aufrufen der Webseite.



Abbildung 7: Web-GIS-Tool Frontend

1 – Editierbare Leiste mit Links zu

- GreenerSites Projektseite
- Karte
- About us
- Support
- Login





Nutzer können zu diesen Seiten navigieren, Administratoren können auch neue Links erstellen

2 – Suchleiste für Adressen

Adresseingabefeld für Nutzer (Drop-Down Menü mit Vorschlägen wird sichtbar) und Zoom zur ausgewählten Adresse

**3** – Layerverzeichnis Nutzer kann Layer sichtbar und nicht sichtbar schalten

**4** – Kartenfenster welches (alle) aktiven Layer anzeigt Abhängig vom Maßstab, werden verschiedene Kacheln in der Karte gezeigt

5 – Navigationsbuttons

Nutzer kann rein- und rauszoomen (auch mit Mausrad möglich)

## Login

Nach Klick auf "Login" und Eingabe von Benutzername und Passwort hat der Nutzer, abhängig von seinen vordefinierten Nutzerrollen, zusätzliche Funktionen zur Verfügung (*Abbildung 8: Login*).

GreenerSites	Мар	About us	Support	Login	
					Login Username:gsrw Password: Iogin
© 2017 mena GmbH	Imprint	Contact			

Abbildung 8: Login

Ein Nutzer mit Lese- und Schreibrechten (gsrw) hat beispielsweise die Möglichkeit die Attributtabelle der Geometrien zu editieren (nicht alle Attributfelder, aber solche für die er vom Administrator berechtigt wurde, siehe Kapitel 0).





## Funktionsumfang

#### Lesen der Attribute und deren Werte (siehe Abbildung 9: Attributtabelle)

Ist der Layer "Standorte" sichtbar, kann der Nutzer auf eine Geometrie klicken und die Attribute dieses Standorts einsehen (Administratoren können bestimme Attribute für bestimme Nutzer sichtbar und nicht sichtbar schalten). Die Attributtabelle ist in verschiedene Registerkarten aufgeteilt.



Abbildung 9: Attributtabelle

#### 1 – Selektierte Geometrie (Standort)

2 – Attributtabelle

## 3 – Registerkarten

#### Editieren der Attributwerte (siehe Abbildung 10: Editieren der Attributtabelle)

Falls der Nutzer Schreibrechte (z.B. gsrw-Nutzer) hat, ist das Editieren der Attributtabelle nach Klick auf den Standort freigeschaltet (Administratoren können bestimmte Attribute zum Editieren freigeben oder sperren). Nach Editieren des Feldes muss der Nutzer auf den "Submit" Button klicken. Die Attributtabelle kann folgende Feldtypen enthalten:

- Dropdown (z.B. Landnutzungskategorie)
- Checkbox ja/nein (z.B. Altlasten)
- Zahl (z.B. Größe der Fläche)
- Text (z.B. Förderungsmöglichkeiten)





Menu -	
Site information	
Plot size in km <sup>2</sup> :	23,1752174560547
Municipality identifier 1:	15003000
Municipality name 1:	Magdeburg, Landeshaup
Municipality identifier 2:	
Municipality name 2:	
Municipality identifier 3:	
Municipality name 3:	
Share of plot in municipality 1:	100 🗘
Share of plot in municipality 2:	0
Share of plot in municipality 3:	0
County number:	15003
County name:	Magdeburg, Landeshaup
Submit	

Abbildung 10: Editieren der Attributtabelle

1 – Editieren möglich im Feld

```
2 – "Submit" Button
```

## Export der Standortinformationen in ein PDF

Nach Klick auf eine Geometrie eines Standorts kann ein Nutzer den Button "Flächenpass aufrufen", welcher unterhalb der Attributtabelle lokalisiert ist, betätigen (*Abbildung 11: Button "Flächenpass aufrufen*"). Daraufhin wird eine neue Seite mit einem Bild des aktuellen Ausschnitts des Kartenfensters und der Attributtabelle geladen. Mit Klick auf "Flächenpass herunterladen" (*Abbildung 12: Button "Flächenpass herunterladen*") wird die Kartenansicht und die Attributtabelle in eine PDF exportiert.





## Site information Plot size in km<sup>2</sup> 17,6424532958984 Municipality identifier 1 15003000 Municipality name 1 Magdeburg, Landeshauptstadt Municipality identifier 2 Municipality name 2 Municipality identifier 3 Municipality name 3 Share of plot in municipality 1100,0 Share of plot in municipality 20,0 Share of plot in municipality 30,0 County number 15003 County name Magdeburg, Landeshauptstadt Flächenpass aufrufe

Abbildung 11: Button "Flächenpass aufrufen"

1 – Button "Flächenpass aufrufen"



Abbildung 12: Button "Flächenpass herunterladen"

1 – Button "Flächenpass herunterladen"





## 5. Backend

## Aufbau der Verbindung zum GreenerSites System mit PuTTY zum GeoServer Folgende Schritte müssen zur Verbindung mit dem GeoServer gemacht werden:

- 1. Download PuTTY von <u>www.putty.org</u>
- 2. PuTTY Key Generator (PuTTYgen) starten
- 3. Klick auf "Generate" zur Generierung eines Schlüssels (Key)
- 4. Die Maus muss bis zur Generierung des Schlüssels (Key) generiert werden

😴 PuTTY Key Generator			? >	<
<u>File Key Conversions H</u> elp				
Key				
No key.				
Actions	- (			
Generate a public/private key pair	(	)	Generate	
Load an existing private key file			Load	
Save the generated key	S	ave p <u>u</u> blic key	Save private key	
Parameters				
Type of key to generate:	0.50004	0 50 055 10	0.00114 (200)	
Number of bits in a generated key:	ECDSA	O ED25519	2048	1
Number or bits in a generated key.			2010	

Abbildung 13: Generierung des Schlüssels (key)

- 4.
- 5. Kopie von "Public key", "Key fingerprint" and "Key comment" für späteren Gebrauch in eine Textdatei
- 6. Definition von "Key passphrase" and "Confirm passphrase" (persönliches Passwort)
- 7. Klick auf "Save private key"
- 8. Kopieren des privaten Schlüssels (private key) auf den Server
- 9. Beenden von PuTTYgen





😴 PuTTY Key Generator			? ×
File Key Conversions Help			
Key			
Public key for pasting into Oper	SSH authorized	_keys file:	
L			FqmDsl zincrthsl
Key fingerprint:			D:1d:e8
Key comment	J3		
Key passphrase:			
Confirm passphrase:			
Actions			
Generate a public/private key pair			Generate
Load an existing private key f			Load
Save the generated key		Save public key	Save private key
Parameters			
Type of key to generate: RSA DSA		SA () ED2551	9 () SSH-1 (RSA)
Number of bits in a generated k	ey:		2048

Abbildung 14: Speichern des Schlüssels (key)

- 10. Starten von PuTTY
- 11. Navigation zum Reiter "SSH/Auth"
- 12. Auswahl ("Browse") des gespeicherten "private key" welcher in PuTTYgen generiert wurde



Abbildung 15: Auswahl des privaten Schlüssels zur Authentifizierung

- 13. Navigation zum Reiter "SSH/Tunnels"
- 14. Eingabe von "Source port" und "Destination" und Klick auf "Add"




Note:					?	X
Category:						
- Keyboard	^	Optic	ons controlling SSH	port forwa	rding	
Bell		Port forwarding				
Window		Local ports	accept connections	from othe	r hosts	
Appearance		Remote por	ts do the same (SSF	H-2 only)		
Behaviour Translation		Forwarded por	is:		Remove	e
- Selection Colours						
Connection						
Data		Add new forwar	rded port			
Telnet		Source port		)	Add	
Rlogin						-
i SSH		Destination		-		
Hostkovs		Local	Remote	$\bigcirc$	Dynamic	
Cipher		Auto	O IPv4	<b></b>	Pv6	
⊕ Auth						
- <u>X11</u>						
Tunne						
- Bugs	5					
initia buga	*					
About H	lelp		Oper	n	Cancel	

Abbildung 16: Konfiguration Tunnel

15. Navigation zum Reiter "Session"

- 16. Eingabe von "Host Name" und "Port"
- 17. Klick auf "Open" (Die Einstellungen können auch für zukünftige Verbindungen gespeichert werden)

Reputity Configuration			? X
Category:			
	^	Basic options for your PuTTY ses	sion
Logg		Specify the destination you want to connect to	
Kevboard		Host Name (or IP address)	Port
Bell			
Features		Connection type:	
		Raw ÖTelnet Ribger OSSH	Serial
Behaviour		Load, save or delete a stored session	
Translation		Saved Sessions	
Colours		geoserver	
Connection		Default Settings	Lood
Data		GSProgress	LUau
Telnet		geoserver	Save
Rlogin			Delete
SSH Karr			
Host keys			
- Cipher		Close window on exit	
Auth		○ Always ○ Never	an exit
-X11	~		
			0
About	нер	Open	Cancel

Abbildung 17: Verbindung zum GeoServer

18. Nach Bereitstellung von Nutzer und Passwort (erstellt in 6.) hat der Nutzer Zugriff auf den GeoServer im Browser





GeoServe	r		Logged in as admin.
About & Status Server Status GeoServer Logs	Welcome Welcome	b The Ancient Geographers.	Sanda Cumbilit
Audul Geoserver  Data  Layer Preview  Workspaces  Stores Layers Layers Layers	25 Layers 6 Stores 2 Workspaces	Add layers     Add stores     Create workspaces for this server has not been changed from the default. It is	TMS 1.0.0 MMS-C 1.1.1 WMTS 1.0.0 WCS
Styles  Services      WMTS     WFS     WMS     WMS     WCS	highly recommended tha	t you change it now. Change it word for this server has not been changed from the default. It is t you change it now. Change it valiable 	1.1.0 1.1.1 1.1 2.0.1 1.0.0 WFS 1.0.0 1.1.0
Settings Global Global Rage Processing Raster Access Tile Caching	the administrator.	running verson 2.2.2.2 ron more indiriecon please contact	2.0.0 WMS 1.1.1 1.3.0
Tile Layers Caching Defaults Gridsets Disk Quota BiobStores			
Security  Settings Settings Settings Authentication Passwords Susers, Groups, Roles Data Services			
Demos Tools			

Abbildung 18: GeoServer

#### Aufbau der Verbindung zum GreenerSites Datenbank mit PuTTY

Aufbau der Verbindung zur Datenbank mit PuTTY erfordert die gleichen Schritte wie bereit in Kapitel 0 gezeigt, mit dem Unterschied das ein anderer "source port" und andere "destination" eingegeben werden muss. Nachdem die Verbindung hergestellt ist, können Daten in die Datenbank importiert werden. Dies wird in Kapitel 0 beschrieben.

#### Daten Import

Dieses Kapitel zeigt verschiedene Methoden, Daten in die Datenbank zu importieren.

#### Datenimport mit WinSCP

- 1. Download and Installation WinSCP von <a href="https://winscp.net/">https://winscp.net/</a>
- 2. "Verbindungsziele importieren" von PuTTY
- 3. Login und Passwort ist das gleiche wie bei PuTTY
- 4. Import von Daten mit Drag und Drop zum rechten Fenster von WinSCP (z.B. Kopieren eines Rasters /home/gs/data. Das Raster kann dann über den GeoServer publiziert werden, siehe dazu Kapitel 0)





Sameldung		- 🗆 X
Image: Service of the service of th	Sitzung Übertragungsprotokoll: SFTP	
	<u>R</u> echnername:	Port <u>n</u> ummer:
	178.63.75.139	22
	Benutzername: Kennwort:	
Verbindungsgziele importie		
Konfiguration importieren/w nerstelle	n Bearbeiten	Erweitert 💌
Konfiguration exportieren/sichern		
Anwendungsdaten entfernen		
Pageant ausführen		
PuTTYgen ausführen		
Nach Aktualisierungen suchen		
Einstellungen		
Über		
Werkzeuge  Verwalten	Anmelden 🔽 Schließ	len Hilfe

Abbildung 19: Verbindung via WinSCP





#### Daten Import mit pgAdmin

- 1. Download und Installation pgAdmin III von <a href="https://www.pgadmin.org/download/">https://www.pgadmin.org/download/</a>
- 2. Verbindung zur Datenbank via PuTTY wird benötigt (siehe Kapitel 0)
- 3. Nach dem Start von pgAdmin Klick auf "Datei/Server hinzufügen"
- 4. Benötigte Eingaben: "Name", "Host", "Port", "Wartungs-DB" und "Benutzername" und Klick auf "OK"
- 5. Rechtsklick auf Server und "Verbinden"
- 6. Eingabe des Passworts
- 7. Der Nutzer ist jetzt mit der Datenbank verbunden und kann Daten mit dem Plugin "PostGIS Shapefile and DBF loader" hochladen.

Datei Bearbeiten Plugins A	Anzeigen Werkzeuge Hilfe		
	🐼 🔊 🗐 😽 🥓	🔃 🕈 🕈	
Obje	>	Eigenschaften Statistiken	Abhängigkeiten Abhängige
Server (1)		Eigenschaft	Wert
GreenerSites (localhost: 5	433)	💭 Beschreibung	GreenerSites
	Auffrischen	💭 Service	
	N 12 1	🧮 Hostname	localhost
	Verbinden	📃 Hostname/IP-Adresse	
	Löschen/Droppen	Port .	5433
	Berichte >	SSL Zertifikatdatei	
	Delicite	SSL Key File	
	Eigenschaften	SSL Root Zertifikatsdatei	
		Eiste der widerrufenen SSL	
		SSL Compression?	ja
		💭 Wartungsdatenbank	greenersites
		Benutzername	gsa
		Passwort speichern?	Nein
		Vorhenge Umgebung wiede	Ja
		Beet verbunden?	Nen
		<u></u>	
		SQL-Feld	

Abbildung 20: Verbindung zur Datenbank mit pgAdmin





#### Daten Import mit QGIS

- 1. Download and Installation QGIS von <a href="http://www.qgis.org/">http://www.qgis.org/</a>
- 2. Verbindung via PuTTY mit der Datenbank ist benötigt (siehe Kapitel 0)
- 3. Nach dem Start von QGIS Rechtsklick auf "PostGIS" im Browser-Fenster
- 4. Klick auf "Neue Verbindung" and Eingabe von "Name", "Host", "Port", "Datenbank", "Benutzername", "Passwort" and Klick auf "OK"



Abbildung 21: Verbindung zur Datenbank mit QGIS

- 5. Import von Vektordaten kann nun mit der "DB-Verwaltung" gemacht werden
- 6. Navigation zu "Datenbank"/"DB-Verwaltung"





🧭 QG	IS 2.18.15													
Projek	Bearbeiten	Ansicht	Layer	Einstellu	ungen	Erweiterungen	Vektor	Raster	Datenbank	Web	CadTools	MMQGIS	Verarbeitung	Hilfe
	<u> </u>	] 🔓 🛛	2	1	<b>}</b>	🗩 🗊 🏹	<b>P I</b>		ALKIS		•	-	· & 🚽 🗖	
11.	/ 8.	· 6 -	°° 17	: <u>_</u> ≥	8	abc	🍸 🏧	abi abc	DB-Ver	waltun	g •	DB-Ve	erwaltung	CSW
Q 90	Browser-Fen	ster					8:	×	Offline	-Bearbo	eitung			-
V		<b>† 0</b>							naRout	ting Lav	ior is a second s			
	> Home								pgittu					
P	avo	riten												
<i>۲</i> ۰۵	> _ C:/													
	> D:/													
- 6 <b>1</b>		0												
		VL 10												
<b>•</b>	> R Post	GIS												
	Spat	iaLite												
20	Arco	isFeatureS	erver											
V.	Arco	isMapServ	er											
V	> 💮 ows	5												
	💮 Tile	Server (XY	Z)											
	> 🛞 wcs	;												
•	> 🖤 WFS													
	> 🐨 wm	5												
-12-														
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P	Layerfenster						<b>8</b> :	×						
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Abbildung 22: DB-Verwaltung

- 7. Navigation zur Datenbank "greenersites"
- 8. Klick auf "Layer/Datei importieren"

DB-Verwaltung				
Datenbank Schema Tabelle				
Tree	Info Tabelle Vorschau			
> 🍄 GeoPackage	public			
> Oracle Spatial	•			
✓ S PostGIS	Cohomo dotoile			
✓ greenersites	Schemadetalls			
> 📀 priva	Besitzer: postgres			
> 📀 public	Kommentar: standard public schema			
> 📀 topology				
> 💰 SpatiaLite	Rechte			
> 💟 Virtual Layers				
	Benutzerrechte:			
	<ul> <li>Neue Objekte erzeugen</li> <li>Zugriffsobjekte</li> </ul>			

Abbildung 23: Import von Daten via DB-Verwaltung

- 9. Auswahl des Vektorlayers
- 10. Klick auf "Optionen ändern"
- 11. Möglichkeit zur Auswahl des Schemas (z.B. public oder private, siehe Kapitel 0)





#### 12. Nack Klick auf "OK" wird die Shapedatei in die Datenbank geladen

🛃 Vektorlayer importieren	? ×						
Einga	~						
Nur gewählte Objekte importieren	Optionen ändern						
Ausgabetabelle							
Schema public	•						
Tabelle	~						
Optionen							
Primärschlüssel	id						
Geometriespalte	geom						
Quell-SRID Ziel	I-SRID						
Kodierung	UTF-8 $\lor$						
Zieltabelle ersetzen, falls vorhanden							
Einteilige statt mehrteiliger Geometrien erzeugen							
Feldnamen in Kleinschreibung umwandeln							
Räumlichen Index erzeugen							
O	K Abbrechen						

Abbildung 24: Eingabe der Vektordaten mit DB-Verwaltung

13. Nach dem Aktualisieren können "Grenzen" und "räumlicher Index" der hinzugefügten Vektordatei definiert werden



Abbildung 25: Hinzugefügte Vektordatei via DB-Verwaltung





#### Darstellung und Veröffentlichung mit dem GeoServer

Mit dem GeoServer kann man Veröffentlichung und die Darstellung der Layer im WebGIS Tool steuern wie z.B. die Definition von Layergruppen oder die Definition von Darstellungsregeln einzelner Layer. Es besteht auch die Möglichkeit die Darstellung von Layern vor der Veröffentlichung zu überprüfen: Klick auf "Layer Preview" / "Open Layers" (siehe **Fehler! Verweisquelle konnte nicht gefunden werden.**)

About & Status Server Status GeoServer Logs Contact Information	Laye	I layers configured in GeoServer and provides p         I 1 2 >>> Results 1 to 25 (out o	reviews in various formats for each. F 34 items)		Search
About GeoServer	Туре	Title	Name	Common Formats	All Formats
bata	щ	Ausgleichsfläche	cite:Ausgleichsfläche	GML	Select one
Workspaces Stores Layers Layers Styles Styles	Ħ	Bebauungspläne	cite:Bebauungspläne	OpenLayers KML GML	Select one
	•	Bebauungspläne - Beschriftungen	cite:Bebauungspläne - Beschriftungen	OpenLayers KML GML	Select one

Abbildung 26: Layer Vorschau

#### Darstellung

Nach Speichern eines Layer Styles in QGIS im SLD-Format, kann dieser im GeoServer hinzugefügt werden.

- 1. Öffnen der Shapedatei in QGIS und Navigation zu den Layereigenschaften (Rechtsklick auf Layer)
- 2. Navigation zum Reiter "Stil"
- 3. Festlegung der gewünschten Darstellung
- 4. Speichern durch Navigation zu "Stil/Stil speichern/SLD-Datei"

	Þ	Home			
Po		Tavoriten	🦪 Layereigenschafte	en - ExampleShape   S	? ×
<b>.</b> -	R	C:/		Einzelsymbol	-
	Ľ	DB2 DB2			
		MSSQL	at ( )	Einfache Füllung	
		Oracle	abc Bes Jen		
<b>V</b> B -	>	PostGIS			
?₀		ArcCisEeatureServer	Felder		
V.		ArcGisMapServer	🎸 Darstellung		
V	>	OWS     Tile Server (XYZ)	🧭 Anzeigen	Einheit Millimeter	
	>	WCS	😥 Aktionen	Transparenz 0%	
٩,	Þ	WFS WFS	Verknünfungen		
d	>	I WMS			
A			💽 Diagramme		
	L		🥡 Metadaten	Symbole in Gruppe	Bibliothek öffnen
	La	yerfenster	C Variablan		
\)?	-	(▲ ≪ ▼ & ▼ ₩ ☎ ⊑			
<i>,</i>		ExampleShape	E Legende	Neues corper diagon; dotted green land water wine	
3					
P 2				Speichern	Erweitert 👻
2				Stil laden	
				Stil speichern   QGIS-Layerstildatei	0 2
				Als Vorgabe speichern SLD-Datei	
				Vorgabe wiederherstellen	
				Hinzufügen	~~
				Aktuellen umbenennen	1
				(voreingestellt)	No.
				Stil OK Abbrechen Anwenden	Hilfe

Abbildung 27: Speichern der Layerdarstellung





- 5. Im GeoServer Navigation zu "Styles / Add a new Style"
- 6. Eingabe von "Name", "Workspace", "Style Content" und anschließend Klick auf "Durchsuchen" und Auswahl der gespeicherten SLD-Datei
- 7. Nach Upload sind weitere Konfigurationsmöglichkeiten im "Style Editor" möglich
- 8. "Apply" und "Submit"

New style
Type a new style definition, or use an existing one as a template, or upload a ready made style from your file sy style is a valid style document.
Data
Style Data
Name
ExampleStyle
Workspace
cite 🗸
Format
SLD 🗸
Style Content
Generate a default style
Polygon V Generate
Copy from existing style
Choose One
Upload a style file
Durchsuchen Keine Datei ausgewählt. Upload
Style Editor
C 2 12pt

Abbildung 28: Upload der SLD-Datei im GeoServer

#### Veröffentlichung

Nach Upload der Geodaten müssen diese über "Layers/Add a new layer" noch veröffentlicht werden, bevor sie im Kartenfenster des Web-GIS-Tools angezeigt werden.





# WEB-GIS PRIROCNIK

D.	Т.	2.	2.	2
----	----	----	----	---

Verzija 1 11/2017





## Osnovni podatki o projektu

Stranka:	Ministrstvo za regionalni razvoj in promet v zvezni državi Saška-Anhalt, enota 44	Turmschanzenstr. 30 39114 Magdeburg
Izvajalec:	Konzorcij ponudnika	Zum Schießwasen 7 91710 Gunzenhausen
	Baader Konzept GmbH www.baaderkonzept.de	
	<b>a</b>	

mena GmbH www.mena-online.de





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## 1 Uvod

Priročnik je namenjen uporabnikom in administratorjem pri namestitvi in uporabi Web-GIS orodja. Opisuje Web-GIS orodje in njegove funkcionalnosti ter bo posodobljen takoj, ko bo razvoj Web-GIS orodja zaključen.

## 2 Sistemska arhitektura

Naslednje poglavje opisuje namestitev in strukturo GreenerSites Web-GIS orodja.



Slika 1 prikazuje sestavne dele Web-GIS orodja ter njihovo povezanost.

Slika 1: Sistemska arhitektura

#### 2.1 PostGreSQL/PostGIS

PostGreSQL je odprta zbirka podatkov, PostGIS pa je dodatek, ki omogoča shranjevanje zemljepisnih podatkov v zbirka podatkov. V GreenerSites projektu ju uporabljamo za:

- Shranjevanje podatkov
- Urejanje podatkov
- Izvedbo uporabniških vlog
- Pridobivanje podatkov za GeoServer

Zbirka podatkov se lahko vodi s psql v ukazni vrstici ali s pgAdmin v grafičnem uporabniškem vmesniku (glej tudi poglavje 2.2). Uporabljene so naslednje različice: PostGreSQL 9,5 in PostGIS 2,3.

Vsaka regija bo vodila svojo lastno zbirko podatkov, tako imenovano "site information". Za zagotovitev standardizacije med različnimi regijami obstaja shema z definiranimi lastnostmi in pripadajočimi vrednostm. Zaradi pojava značilnosti specifičnih za določeno regijo, shema vsebuje tudi neobvezna polja.

Obstajala bo dodatna zbirka podatkov, ki bo vsebovala podatke iz celotne Evrope (t.i. OpenStreetMap) ali osnovne nacionalne podatke (t.i. UrbanAtlas). Gre za tako imenovane osnovne plasti.





PostGreSQL zbirka podatkov vsebuje tudi shemo za upravljanje dostopa različnih uporabniških skupin:

- "javna" odprt dostop za vse uporabnike
- "zasebna" omejen dostop za registrirane uporabnike z dostopnimi pravicami

Upravitelj zbirke podatkov lahko po želji doda nadaljnje omejitve.

Dodatne uporabniške vloge v zbirki podatkov bodo dale vsaki regiji možnost nadzora bralnih/urejevalnih pravic za njihove podatke. Te pravice lahko veljajo za cele osnovne plasti ali le posebne dele znotraj plasti. Podrobne informacije glede uporabniških vlog so natančneje razložene v poglavju 3. Povezovanje do zbirke podatkov je pojasnjeno v poglavju 4.2 (via frontend) in v poglavju 18 (via backend).

#### 2.2 pgAdmin

PgAdmin je GUI (graphical user interface) administrativno orodje za upravljanje s podatki v PostGreSQL (Slika 2: GUI pgAdmin). Povezava do GreenerSites zbirke podatkov je opisana v poglavju 18.



Slika 2: GUI pgAdmin





#### 2.3 QGIS

QGIS je odprt zemljepisen informacijski sistem (Slika 3: QGIS GUI) z vmesnikom za OGC- in rastrske podatke. Lahko se uporablja tudi za vizualizacijo in urejanje geopodatkov. Ko se povežete na zbirko podatkov GreenerSites (kot opisano v poglavju 17), lahko naložite podatke v zbirko. Možno je razviti tudi workflows za kalkulacijo atributov (npr. prepustnost zemljine, dostopnost).



Slika 3: QGIS GUI





#### 2.4 GeoServer

GeoServer zapolnjuje Web-GIS orodje z geopodatki (GUI prikazan v Slika 1: ). Pravice, definirane v PostGre zbirki podatkov, so lahko enake ali pa dodatno specificirane v GeoServerju. Administrator lahko z GeoServerjem konfigurira izgled plasti in integrira zunanje WMS-storitve v frontend Web-GIS orodja. Podrobnen opis kako se povezati na GeoServer najdete v poglavju **Errore. L'origine riferimento non è stata trovata.**. Oblikovanje in objava plasti sta opisana v poglavju 5.4.

🊯 GeoServer			Logged in as admin. 🧕 Logout
Cecoserver  About & Status  Geoserver Logs Cecoserver  About Geoserver  Data  Cecoserver  Data  Construct Information  About Geoserver  Data  Services  Services Services  Serv	Welcome Welcome 126 Layers 9 Stores 3 Workspaces A The administrator par highly recommended th 3 Strong cryptography This Geoserver instance the administrator.	<ul> <li>a The Ancient Geographers.</li> <li>Add byers</li> <li>Add stores</li> <li>Create workspaces</li> </ul> If or this server has not been changed from the default. It is at you change it now. Change it workspace it out change it now. Change it at you change it now. Change it at you change it now. Change it is at you change it is at you change it now. Change it is at you change	Logged in as admin. Service Capabilities TMS 1.0.0 WMS-C 1.1.1 WMTS 1.0.0 WCS 1.1.0 1.1.1 1.1.1 2.0.1 1.1.0 WFS 1.0.0 WFS 1.0.0 1.1.0 1.1.1 1.1.1 1.1.1 1.1.1 1.1.1 1.1.0 WMS 1.1.0 1.1.0 WMS 1.1.1 1.3.0
Users, Groups, Roles     Data     Services     Demos     Tools			

Slika 4: GeoServer GUI





#### 2.5 GeoDjango/OpenLayers

GeoDjango je spletno ogrodje za zemljepisne podatke, OpenLayers pa je JavaScript knjižnica, ki prikazuje zemljevide v spletnem brskalniku. Prikazovalnik zemljevidov (Slika 5: Prikaz zemljevida Web-GIS orodja) deluje s pomočjo GeoDjango (izbira plasti, prikaz zemljevida) in OpenLayers (izbira strani, vhodni atributi, vrstni red plasti, prosojnost)<sup>1</sup>. Funkcije zemljevida so opisanje v poglavju 4.3.



Slika 5: Prikaz zemljevida Web-GIS orodja

## 3 Uporabniške vloge

Kot omenjeno v poglavju 2.1, so bralne in urejevalne pravice uporabnika določene z uporabniškimi vlogami. Slika 6: vloge prikazuje različne uporabniške vloge in njihove pravice.

Uporabnik	Opis uporabnika	Uporabniške pravice	Primer uporabnika
postgres	Superuser/Gostitelj/Admi nistrator	Vse zbirke podatkov in vse uporabniške vloge	Še ni definirano
gsa	Administrator za zbirko podatkov v regiji	Urejanje zbirke podatkov in definiranje uporabniških vlog	Zbiralec podatkov v regiji
gsrw	Vpogled in možnost urejanja zbirke podatkov	Urejanje določenih atributov	Registriran uporabnik (zaposleni/investitorji)
gsr	Bralne pravice v zbirki podatkov	Branje atributov in printanje poročil	Neregistriran uporabnik

Slika 6: Uporabniške vloge

<sup>&</sup>lt;sup>1</sup> Vse funkcionalnosti še niso aktivirane.





### 4 Uporabniški vmesnik

Poglavje se osredotoča na uporabniški vmesnik spletne strani Web-GIS orodja. Povezava do Web-GIS orodja za "Ministrstvo za regionalni razvoj in promet zvezne države Saška-Anhalt" je "mlv.greenersites.eu/map/". Vsaka regija si lahko samostojno oblikuje svojo poddomeno (logotipi, jezik itd.). Kot je opisano v poglavju 2.1, vsaka poddomena potrebuje svojo zbirko podatkov, osnovne plasti (e.g. OpenStreetMap) pa so spravljene v skupni zbirki podatkov.

#### 4.1 Osnovno

Slika 7: Frontend Web-Gis orodja prikazuje začetno spletno stran.



Slika 7: Frontend Web-Gis orodja

- 1 Prilagodljiva vrstica s povezavami do:
  - GreenerSites projektna spletna stran
  - Zemljevid
  - O nas
  - Podpora
  - Prijava





Uporabnik lahko navigira do teh strani, regijski administrator pa lahko kreira tudi nove povezave

2 - Iskalna vrstica za naslove Uporabnik lahko vpiše željeni naslov (prikaže se spustni seznam s predlogi)

**3** - Tabela plasti Uporabnik lahko preklaplja med plastmi

4 - Prikaz aktivnih plasti na zemljevidu Prikaz različnih elementov na zemljevidu glede na izbiro uporabnika

5 - Navigacijska tipka Uporabnik lahko poveča ali pomanjša prikaz (možno tudi z miškinim sredinskim vrtljivim gumbom)

#### 4.2 Prijava

S klikom na "Prijava" in vpisom uporabnišekga imena ter gesla lahko uporabnik glede na svojo uporabniško vlogo dostopa do dodatnih funkcij (Slika 8: ).

GreenerSites	Мар	About us	Support	Login	
					Login Username:gsrw Password: Iogin
© 2017 mena GmbH	I   Imprint	Contact			

Slika 8: Prijava

Na primer, uporabnik z bralnimi in urejevalnimi pravicami (gsrw) lahko ureja geometrične podatke v tabeli atributov (vendar samo tiste podatke, ki jih administrator omogoči za urejanje, glej poglavje 2.1).





#### 4.3 Uporabnost

Prevejanje vrednosti atributov (glej Slika 9: Attribute table atributov)

Pri vključitvi plasti "Lokacija" lahko uporabnik klikne na geometrijo in preveri attribute za to lokacijo (administrator lahko omogoči ali prepreči določene atribute za določene uporabniške vloge). Tabela atributov lahko vsebuje podatke iz različnih registrov.



Slika 9: Attribute table

- 1 Izbrana lokacija
- 2 Tabela atributov
- 3 Register

#### <u>Urejanje atributnih podatkov (Slika</u> 10: <u>atributnih podatkov)</u>

Uporabniku, kateri ima pravice za pisanje (npr. gsrw-uporabnik) je omogočeno, da lahko ureja atributne podatkes klikom na posamezni element. (administrator omogoči urejanje posameznega elementa). Spremembe uporabnik shrani s klikom na gumb "Submit". Zaloge vrednosti attributov so lahko:

- Spustni meni (ang. Dropdown) (npr. namenska raba)
- Izbirna polja (ang. Checkbox) da/ne (npr. Onesnaženo da/ne)
- Število (npr. površina)
- Besedilo (npr. opombe)





Menu	•
------	---

## Site information

Plot size in km <sup>2</sup> :	23,1752174560547 😫
Municipality identifier 1:	15003000
Municipality name 1:	Magdeburg, Landeshaup
Municipality identifier 2:	
Municipality name 2:	
Municipality identifier 3:	
Municipality name 3:	
Share of plot in municipality 1:	100 🗢
Share of plot in municipality 2:	0
Share of plot in municipality 3:	0
County number:	15003
County name:	Magdeburg, Landeshaup
Submit 2	

Slika 10: Urejanje atributnih podatkov

1 - Urejanje je omogočeno

2 - gumb sharani "Submit"

#### Izvoz podatkov v PDF obliko

Po izbiri elementa v grafiki (na zemljevidu) uporabnik lahko klikne gumb "Flächenpass aufrufen" (Prikaži izpis), ki se nahaja pod atributno tabelo (Slika 11: Gumb "Flächenpass aufrufen"). Naloži se nova stran, katera prikazuje zemljevid skupaj z atributno tabelo. S klikom na "Flächenpass herunterladen" (prenesi ) (Slika 12: Gumb "Flächenpass herunterladen") se stran shrani v PDF dokument.





## Site information

Plot size in km²	17,6424532958984
Municipality identifier 1	15003000
Municipality name 1	Magdeburg, Landeshauptstadt
Municipality identifier 2	
Municipality name 2	
Municipality identifier 3	
Municipality name 3	
Share of plot in municipality 1	100,0
Share of plot in municipality 2	20,0
Share of plot in municipality 3	0,0
County number	15003
County name	Magdeburg, Landeshauptstadt
Flächenpass aufr	

Slika 11: Gumb "Flächenpass aufrufen"

1 - Gumb "Flächenpass aufrufen" (prenesi)



Slika 12: Gumb "Flächenpass herunterladen"

1 - Gumb "Flächenpass herunterladen" (prenesi)





## 5 Administratorski vmesnik

5.1 Povezava do Greener Sites Geoserverj-ja s programom PuTTY

#### Sledimo korakom, da se se povežemo do Geoserverja:

- 1. Prenesemo PuTTY <u>www.putty.org</u>
- 2. Zaženemo PuTTY Key Generator (PuTTYgen)
- 3. Kliknemo "Generate" da pridobimo ključ
- 4. Z miško moramo premikati po sivem polju okna

😴 PuTTY Key Generator			? ×
<u>File Key Conv</u> ersions <u>H</u> elp			
Key			
No key.			
Actions		$\langle \rangle$	
Generate a public/private key pair		3	<u>G</u> enerate
Load an existing private key file			Load
Save the generated key		Save p <u>uone</u> key	Save private key
Parameters			
Type of key to generate:			
● <u>R</u> SA ○ <u>D</u> SA	⊖ <u>e</u> cdsa	○ ED <u>2</u> 5519	O SSH- <u>1</u> (RSA)
Number of <u>b</u> its in a generated key:			2048

Slika 13: Ustvarjanje ključa

- 5. Prilepi "Public key", "Key fingerprint" and "Key comment" za kasnejšo uporabo v besedilno datoteko
- 6. Izberi "Key passphrase" in "Confirm passphrase" (to bo tvoje geslo)
- 7. Klikni "Save private key"
- 8. Kopiraj privatni ključ na strežnik
- 9. Zapri PuTTYgen





😨 PuTTY Key Generator	? ×
File Key Conversions Help	
Key Public key for pasting into OpenSSH authorized_keys file: Key fingerprint Key comment	
Key passphrase:	6
Confirm passphrase:	
Actions	
Generate a public/private key pair	Generate
Load an existing private key file	Load
Save the generated key Save public key	Save private key
Parameters	
Type of key to generate: RSA DSA ECDSA ED25519 Number of bits in a generated key:	O SSH-1 (RSA) 2048

Slika 14: Shranjevanje ključa

- 10. Zaženi PuTTY
- 11. Izberi "SSH/Auth"
- 12. Poišči shranjen privatni ključv programu PuTTYgen



Slika 15: Izbor privatnega ključa za avtentikacijo

- 13. Izberi "SSH/Tunnels"
- 14. Dodaj "Source port" in "Destination" in klikni "Add"





Sta DuTTV Configuration		2 🗸
		? ×
Category:		
Keyboard Bell Features Window	Options controlling     Port forwarding     Local ports accept conne	g SSH port forwarding
- Appearance - Behaviour - Translation - Selection - Colours	Forwarded ports:	Remove
- Data - Proxy - Telnet - Rlogin - SSH	Add new forwarded port. Source port Destination	14 Add
Kex Host keys Cipher	Local     ORem     Auto     OIPv4	ote Opynamic OIPv6
Auth TTY X11 Tunnels Bugs More bugs		0
About F	elp	Open Cancel

Slika 16: Nastavitve Tunnel

- 15. Izberi "Session"
- 16. Dodaj "Host Name" in "Port"
- 17. "Open" (Seja je lahko shranjena tudi za bodočo uporabo)

🕵 PuTTY Configuration		? ×
Category:		
Session 15	Basic options for your PuTTY ses	sion
	Specify the destination you want to connect to	
Keyboard	Host Name (or IP address)	Port
Bell Features	Connection type: 16	2
Appearance	Raw Telnet Rlogin SH	Serial
Behaviour Translation Selection Colours	Load, save or delete a stored session Saved Sessions geoserver	
⊡-Connection Data	Default Settings GSProgress	Load
Proxy	geoserver	Save
		Delete
Kex		
	Close window on exit Always Never Only on cle	an exit
× · · · · · · · · · · · · · · · · · · ·		
About Help	0pen	Cancel

Slika 17: Povezava do GeoServer-ja

18. Po vpisu uporabnika in "passphrase" (ustvarjeno v točki 6.) ima uporabnik dostop doe GeoServer-ja v spletnem brskalniku





GeoServer			Logged in as admin.
About & Status Server Status GeoServer Logs Contact Information W About GeoServer	Welcome Welcome This GeoServer belongs t	o The Ancient Geographers.	Service Capabilities TMS
Layer Preview       Workspaces       Stores       Layer Grups       Styles       Swiget       Swiget <td>Lo Lyreis © Stores 2 Workspaces A The master password highly recommended this M The administrator pass highly recommended this Ø Strong cryptography a This GeoServer instance i the administrator.</td> <td>And ages     And ages     And ages     And ages     Cracte workspaces     for this server has not been changed from the default. It is     ty ou change it now. Change it     word for this server has not been changed from the default. It is     ty ou change it now. Change it     workspace     and the default. The default is     the default of the default of the default. It is     the default of the default. It is     the default of the default of the default. It is     the default of the default of the default. It is     the default of the default of the default. It is     the default of the default of the default. It is     the default of the default of the default. It is     the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default of the default. It is     the default of t</td> <td>WHS-C 1.1.1 WHTS 1.0.0 WCS 1.1.0 1.1.1 1.0.0 WFS 1.0.0 1.0.0 WFS 1.0.0 1.1.0 2.0.0 WHS 1.1.1 1.3.0</td>	Lo Lyreis © Stores 2 Workspaces A The master password highly recommended this M The administrator pass highly recommended this Ø Strong cryptography a This GeoServer instance i the administrator.	And ages     And ages     And ages     And ages     Cracte workspaces     for this server has not been changed from the default. It is     ty ou change it now. Change it     word for this server has not been changed from the default. It is     ty ou change it now. Change it     workspace     and the default. The default is     the default of the default of the default. It is     the default of the default. It is     the default of the default of the default. It is     the default of the default of the default. It is     the default of the default of the default. It is     the default of the default of the default. It is     the default of the default of the default. It is     the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default. It is     the default of the default of the default of the default of the default. It is     the default of t	WHS-C 1.1.1 WHTS 1.0.0 WCS 1.1.0 1.1.1 1.0.0 WFS 1.0.0 1.0.0 WFS 1.0.0 1.1.0 2.0.0 WHS 1.1.1 1.3.0
Tools			

Slika 18: GeoServer

#### 5.2 Povezava do Greener Sites podatkovne baze s programom PuTTY

Uporabimo neake korake kot v poglavju 5.1 razen vir (ang. source port) in destinacija sta drugačna. Po vzpostavitvi povezave lahko podatke uvažamo v podatkovno bazo (opisano v poglavju 5.3.)

#### 5.3 Uvoz podatkov

Poglavje prikazuje načine uvoza podatkov v podatkovno bazo.

#### 5.3.1 Uvoz podatkov z WinSCP

- 1. Prenesi in namesti WinSCP <a href="https://winscp.net/">https://winscp.net/</a>
- 2. Uvozi "Sites" iz programa PuTTY
- 3. Prijava in passphrase je podobno kot v programu PuTTY
- 4. Uvoz podatkov poteka na način potegni in spusti v desno okno programa WinSCP (primer: kopiraj rstrske podatke na /home/gs/data, ti podatki so lahko objavljeni z GeoServer-jem opisano v poglavju 0)





Login		- 🗆 X
Import Sites	Session Eile protocol: SFTP  Host name: User name:	Po <u>r</u> t number: 22 🖨 Password:
Import/Restore Configuration Export/Backup Configuration Clean Up	<u>S</u> ave  ▼	A <u>d</u> vanced
Run Pageant Run PuTTYgen		
Check for Updates Preferences About		
<u>T</u> ools ▼ <u>M</u> anage ▼	E Login	Close Help

Slika 19: Povezava preko WinSCP





#### 5.3.2 Uvoz podatkov z pgAdmin

- 1. Prenesi in namesti pgAdmin III https://www.pgadmin.org/download/
- 2. Potrebna je povezava s PuTTY do podatkovne baze (glej poglavje 5.2)
- 3. Po zagonu pgAdmin izberi "File/Add Server"
- 4. Izpolni: "Name", "Host", "Port", "Maintenance database" in "Username" in potrdi
- 5. Z desno klikni na Server izberi "Connect"
- 6. Vnesi geslo
- 7. Uporabnik je sedaj povezan na podatkovno bazo in lahko prične z nalaganjem podatkov z vtičnikom "PostGIS Shapefile and DBF loader"

File Jugins View Tools H	<u>H</u> elp				
Object browser Server Groups Server (1) GreenerSites (localhost: 5433)	Refresh Connect Delete/Drop Reports > Properties	Properties     Statistics     Dep       Property     Description       Service     Hostname       Host Address     Port       SSL Certificate File     SSL Certificate File       SSL Certificate File     SSL Certificate File       SSL Compression?     Maintenance database       Username     Store password?       Restore environment?     Connected?       SQL pane     SQL pane	endencies Dependents Value GreenerSites localhost 5433 yes greenersites gsa No Yes No		
		SSL Certificate Revocation List SSL Compression? Maintenance database Username Store password? Restore environment? Connected?	yes greenersites gsa No Yes No		

Slika 20: Povezava do podatkovne baze z pgAdmin





#### 5.3.3 Uvoz podatkov z QGIS

- 1. Prenesi in namesti QGIS http://www.qgis.org/
- 2. Potrebna je povezava s PuTTY do podatkovne baze (glej poglavje 5.2)
- 3. Po zagonu QGIS uporabi desni klik na "PostGIS"
- 4. Izberi "New Connection" in izpolni "Name", "Host", "Port", "Database", "User Name", "Password" ter potrdi



Slika 21: Povezava do podatkovne baze z QGIS

- 5. Uvoz podatkov naredimo z "DB Manager"-jem
- 6. Izberemo "Database"/"DB Manager"





🦸 QG	IS 2.14.11-Essen						
Project	: <u>E</u> dit <u>V</u> iew <u>L</u> ayer <u>S</u> ettings <u>P</u> lugins Vect <u>o</u> r <u>R</u> a	ster <u>D</u> atab	oase <u>W</u> eb	<u>C</u> adTools	MMQGIS	Pro <u>c</u> essing	<u>H</u> elp
	는 🗄 🛃 🕞 🔍 🛛 🐔 🖑 🗩 🔎	11	<u>A</u> LKIS	• B	Q, Q,	• -	- 3
1 111	/ 目記に、見た命と回目	abc	DB Manager	• 💽	DB Mana	ger 🚽	a had
± ₽₽/-			<u>e</u> Vis	• F			
v	Browser Panel	5 ×	Offline Editin	g 🕨	6		
			pgRouting La	yer 🕨	( Ŭ		
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	Favourites						
Po	C:/						
	MSSOL						
	Oracle						
-	✓ I PostGIS						
•	✓ ✓ greenersites						
3	> 🖯 private						
	> I topology						
329	/ SpatiaLite						
<b>A</b>	>   ows						
7	✓ ⊕ wcs						
Va	> 😂 arten						
v.	test	~					
<mark>3 ×</mark>	Lauran Danal						
		- ×					
b							

Slika 22: DB Manager

- 7. Izberemo podatkovno bazeo GreenerSites
- 8. Izberemo "Import Layer/File"

🛃 DB Manager	- 🗆 X
<u>D</u> atabase <u>S</u> chema <u>T</u> able	
8	
Tree	Info Table Preview
Oracle Spatial     Spatial     Spatial	public
<ul> <li>✓ greenersites</li> <li>&gt; ♦ private</li> <li>&gt; ♦ public</li> </ul>	Schema details
<ul> <li>&gt; (\$\overline\$ topology</li> <li>&gt; (\$\overline\$ SpatiaLite/Geopackage</li> </ul>	Comment: standard public schema
> 💟 Virtual Layers	Privileges
	User has privileges:
	create new objects     access objects
	<b>`</b>

Slika 23: Uvoz slojev z DB Manager

- 9. Poišči in izberi vektorski sloj
- 10. Klikni na gumb "Update Options"
- 11. Izberi shemo (npr. javno ali zasebno, glej poglavje 2.1)

12. Po potrditvi je shapefile naložen v podatkovno bazo





I g tor layer	$\sim$	? ×
Input	(10)	~
Import only selected features		Update options
Output table		
Schema public		-
Table		~
Options		
Primary key	id	
Geometry column	geom	
Source SRID	Target SRID	
Encoding	UTF-8	$\sim$
Replace destination table (if exi	sts)	
Create single-part geometries in	nstead of multi-part	
Convert field names to lowercas	se	
Create spatial index		
	ОК	Cancel

Slika 24: Izbor vektorskih poatkov z DB Manager-jem

13. Po osvežitvi, osveži še "Extent" in "Spatial Index" naloženega vektorskega sloja



Slika 25: Naložen vektorski sloj z DB Manager-jem





#### 5.4 Oblikovanje in objavljanje podatkov z GeoServer-jem

Z GeoServer-jem urejamo in objavljamo podatkovne sloje v WebGIS Tool npr. definiramo skupine slojev, prikaz poatkov... Izgled podatkov pred objavo lahko preverimo s klikom na "Layer Preview" / "Open Layers" (glej Slika 26: Layer preview)

About & Status	Laye	<b>Preview</b> ayers configured in GeoServer and provides previews in vari	ous formats for each.			
Contact Information About GeoServer		1 2 >>> Results 1 to 25 (out of 34 items)	Name	Common Formate	Search	
Dat Layer Preview	1110	Ausgleichsfläche	cite:Ausgleichsfläche	OpenLayers KML LML	Select one	~
Workspaces	ш	Bebauungspläne	cite:Bebauungspläne	Opencovers KML GML	Select one	$\sim$
<ul> <li>Layers</li> <li>Layer Groups</li> <li>Styles</li> </ul>	•	Bebauungspläne - Beschriftungen	cite:Bebauungspläne - Beschriftungen	OpenLayers KML GML	Select one	~

Slika 26: Layer preview

#### 5.4.1 Oblikovanje

Z QGIS-om lahko shranimo stil kot SLD datoteko in jo uporabimo v GeoServer-ju.

- 1. Odpri shape v QGIS in izberi nastavitve sloja
- 2. Izberi"Style"
- 3. Uredi stil sloja
- 4. Shrani "Style / Save Style / SLD File"



Slika 27: Shranjevanje stila sloja





- 5. V GeoServer-ju navigiraj na "Styles / Add a new Style"
- 6. Izberi "Name", "Workspace", "Style Content" in poišči shranjeno datoteko SLD
- 7. Ko je datoteka naložena lahko uporabiš "Style Editor"

8. Izberi "Apply" and "Submit"

New style
Type a new style definition, or use an existing one as a template, or upload a ready made style from your file sy style is a valid style document.
Data
Style Data
Name
ExampleStyle
Workspace
cite 🗸
Format
Style Content
Generate a default style
Polygon V Generate
Conv from existing style
choose one
Upload a style file
Durchsuchen Keine Datei ausgewählt. Upload

Slika 28: Nalaganje stila v GeoServer

#### 5.4.2 Objavljanje

Podatkovni sloji morajo biti objavljeni "published" predno se prikazujejo v zemljevidu.





## PODRĘCZNIK UŻYTKOWNIKA NARZĘDZIA WEB-GIS

	Wersja 1
D.1.2.2.2	11/2017





## Ogólne szczegóły projektu

Odbiorca:	Ministerstwo Rozwoju Regionalnego i Transportu Saksonii Anhalt	Turmschanzenstr. 30 39114 Magdeburg
Wykonawca:	Bidder Consortium Baader Konzept GmbH	Zum Schießwasen 7 91710 Gunzenhausen
	www.baaderkonzept.de	
	mena GmbH www.mena-online.de	




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### 1 Wprowadzenie

Niniejsza instrukcja poprowadzi użytkowników i administratorów poprzez wskazówki dotyczące konfiguracji i funkcjonalności narzędzia Web-GIS. Dokument ten wyjaśnia zastosowanie narzędzia Web-GIS oraz jego funkcjonalność. Zostanie on zaktualizowany i zreadagowany, gdy tylko dobiegnie końca proces tworzenia narzędzia Web-GIS.

## 2 Struktura systemu

Poniższy rozdział przedstawia konfigurację i strukturę narzędzia GreenerSites Web-GIS.

Rysunek 1 Przedstawia elementy i ich powiązania z narzędziem Web-GIS.



Rysunek 1: Struktura Systemu

#### 2.1 PostGreSQL/PostGIS

PostGreSQL to obiektowo-relacyjna baza danych typu "open source", a PostGIS to rozszerzenie, które umożliwia zapisywanie obiektów geograficznych do bazy danych.

Są one używane w narzędziu GreenerSites Web-GIS dla:

- Zapisywania danych
- Edytowania danych
- Wdrażania ról użytkownika
- Dostarczania danych dla GeoServera

Baza danych może być zarządzana za pomocą programu psql w wierszu poleceń lub za pomocą pgAdmin w graficznym interfejsie użytkownika (patrz także rozdział 2.2). Używane są następujące wersje: PostGreSQL 9.5 i PostGIS 2.3.

Każdy region będzie zarządzał jedną bazą danych zawierającą własne dane, zwaną dalej "informacją o terenie". Aby zagwarantować standaryzację między różnymi regionami, zapewniono schemat z określonymi właściwościami i odpowiadającymi zakresami wartości<sup>1</sup>. Ponieważ występują specyficzne dla regionu cechy, schemat zawiera również pola opcjonalne.

Zostanie stworzona jeszcze jedna baza danych zawierająca dane ogólnoeuropejskie (na przykład OpenStreetMap) lub ogólne dane krajowe (np. UrbanAtlas), zwane dalej warstwami podstawowymi. Dane te są nieedytowalne.

<sup>&</sup>lt;sup>1</sup> Schemat zostanie sfinalizowany po dokładnym dopasowaniu narzędzia.





Baza danych PostGreSQL zawiera również schematy do zarządzania dostępem różnych grup użytkowników.

- "Publiczny" otwarty dostęp dla wszystkich użytkowników
- "Prywatny" ograniczony dostęp dla zarejestrowanych użytkowników posiadających prawa dostępu

Administrator bazy danych ma możliwość wprowadzenia dalszych rozróżnień.

Dodatkowe role użytkownika w bazie danych umożliwią każdemu regionowi kontrolowanie uprawnień do odczytu/zapisu ich danych. Uprawnienia te mogą oddziaływać na wszystkie warstwy lub tylko na określone kolumny w warstwie. Szczegółowe informacje dotyczące ról użytkownika opisano w rozdziale 3. Łączenie się z bazą danych wyjaśniono w rozdziale 4.2 (przez frontend) i w rozdziale 5 (przez backend).

#### 2.2 pgAdmin

PgAdmin to GUI (graficzny interfejs użytkownika), narzędzie administracyjne do zarządzania danymi w PostGreSQL (Rysunek 2: GUI pgAdmin). Połączenie do bazy danych GreenerSites opisano w rozdziale 5.



Rysunek 2: GUI pgAdmin





### QGIS

QGIS to system informacji geograficznej typu "open source" (Rysunek 3: QGIS GUI) z interfejsem dla OGC i danych rastrowych. Może być wykorzystany do wizualizacji i edycji geodanych. Po połączeniu do bazy danych GreenerSites (opisanej w rozdziale 5.1) dane mogą być przesyłane do bazy danych. Możliwe jest również opracowanie działań w celu obliczenia właściwości (np. stopnia nieprzepuszczalności gleby, dostępności).



Rysunek 3: QGIS GUI





#### 2.3 GeoServer

GeoServer jest częścią backend-u i dostarcza geodane dla narzędzia Web-GIS (GUI ukazane na Rysunku 1: Struktura Systemu). Prawa zdefiniowane w bazie danych PostGre mogą zostać przyjęte lub sprecyzowane później w GeoServerze. Administratorzy mogą również konfigurować styl i wygląd warstwy za pomocą GeoServera, a także zintegrować zewnętrzny program WMS (Web Map Service) do frontendu narzędzia Web-GIS. Szczegółowe opisy połączenia do GeoServera przedstawiono w rozdziale 5. Wygląd warstwy i publikowanie opisano w rozdziale 5.4.

🍈 GeoServer	r		Logged in as admin. 🧕 Logget
About & Status Server Status GeoServer Logs Contact Information Contact Information About GeoServer	Welcome Welcome This GeoServer belongs to	D The Ancient Geographers.	Service Capabilities
Data           Uayer Prevlew           Workspaces           Stores           Layer Groups           Styles	26 Layers 9 Stores 3 Workspaces A The master password highly recommended that	Add byers     Add stores     Oreate workspaces for this server has not been changed from the default. It is ty ou change it now. Change it	1.0.0 WAS-C 1.1.1 WATS 1.0.0 WCS 1.1.0 1.1.1
Services Services Services Several Sectings Setting	<ul> <li>The administrator pass highly recommended that</li> <li>Strong cryptography a</li> <li>This GeoServer instance is the administrator.</li> </ul>	word for this server has not been changed from the default. It is to use change it now. Change it walable running version 2.11.2. For more information please contact	1.1 2.0.1 1.0.0 WFS 1.0.0 1.1.0 2.0.0 WMS 1.1.1 1.3.0
Tile Caching Tile Layers Caching Defaults Gridsets Disk Quota BlobStores Security	_		
Setting Setting Setting Setting Setting Setvices Services Demos Tools			

Rysunek 4: GeoServer GUI





#### 2.4 GeoDjango/OpenLayers

GeoDjango to framework webowy dla danych geograficznych. OpenLayers jest biblioteką napisaną w języku JavaScript i wyświetla kafelki map w przeglądarce internetowej. Frontend przeglądarki map (Rysunek 5: Widok mapy narzędzia Web-GIS ) wizualizowany jest za pomocą GeoDjango (drzewko warstwy, widok mapy) i OpenLayers (wybór terenów, wprowadzanie właściwości, kolejność warstwy, przejrzystość)<sup>2</sup>. Funkcje widoku mapy opisano w rozdziale 4.1.



Rysunek 5: Widok mapy narzędzia Web-GIS

## 3 Role użytkownika

Jak zostało wspomniane w rozdziale 2.1, odczyt i zapis danych przez użytkownika jest zarządzany przez role użytkownika. Rysunek 6: Role użytkownika, ukazuje róże role użytkownika i odpowiadające im prawa, a także krótki opis i przykład.

Użytkownik	Opis użytkownika	Prawa /dostęp użytkownika	Przykład użytkownika
postgres	Administrator	Wszystkie bazy danych i role użytkownika	TBD
gsa	Administrator bazy danych w stowarzyszonym regionie	Edycja powiązanej bazy danych i definiowanie powiązanych ról użytkownika	Organ zarządzający danymi w regionie
gsrw	Odczyt i zapis w bazie danych	Edycja określonych właściwości, np. informacji o terenie (podanych przez gsa)	Zarejestrowany użytkownik (pracownicy / inwestorzy)
gsr	Odczyt w bazie	Odczyt właściwości i wydruk	Niezarejestrowany

<sup>&</sup>lt;sup>2</sup> Nie wszystkie funkcje zostały wdrożone.





danych

raportów

użytkownik

Rysunek 6: Role użytkownika





### 4 Frontend

Niniejszy rozdział skupia się na frontendzie narzędzia Web-GIS. Każdy region może posiadać jedną subdomenę. Link strony narzędzia Web-GIS dla "Ministerstwa Rozwoju Regionalnego Saksonii Anhalt" to "mlv.greenersites.eu/map/". Pozwala to każdemu regionowi decydować o wyglądzie i organizacji subdomeny indywidualnie (logo, język, itd.). Jak zostało opisane w rozdziale 2.1 na jedną subdomenę przypada jedna baza danych, warstwy bazowe (np. OpenStreetMap) są przechowywane w innej wspólnej bazie danych.

#### 4.1 Ogólne

Rysunek 7: Frontend narzędzia Web-GIS przedstawiony po załadowaniu się strony



Rysunek 7: Frontend narzędzia Web-GIS

- 1 Możliwy do spersonalizowania pasek z linkami do:
  - Strona projektu GreenerSites
  - *Mapa*
  - 0 nas
  - Wsparcie
  - Login





Użytkownik może przechodzić do tych stron, administrator regionu może ponadto tworzyć nowe linki

2 - Pasek wyszukiwania adresów

Użytkownik może wpisać (widoczne stanie się rozwijane menu z sugestiami) i powiększyć wybrany adres

3 - Tabela warstw

Użytkownik może włączać i wyłączać warstwy

4 - Widok mapy wyświetlający wszystkie aktywne warstwy

W zależności od skali różne kafelki pokazywane są na mapie

5 - Przycisk nawigacji

Użytkownik może powiększać i pomniejszać (możliwe także za pomocą scrolla myszki)

#### 4.2 Login

Po kliknięciu Login i wprowadzeniu nazwy użytkownika i hasła, użytkownik ma dostęp do dodatkowych funkcji w zależności od jego roli jako użytkownik (Rysunek 8: Login).

GreenerSites	Мар	About us	Support	Login	
					Login Username: gsrw Password: Iogin
© 2017 mena GmbH	I   Imprint	Contact			

Rysunek 8: Login

Na przykład użytkownik z uprawnieniami do odczytu i zapisu (gsrw) ma możliwość edycji danych geometrii w tabelach właściwości (nie wszystkich lecz tych danych, których edycja została umożliwiona przez administratora, patrz rozdział 2.1).

#### 4.3 Funkcjonalności

Sprawdzanie wartości właściwości (patrz Rysunek 9: Tabela właściwości)

Podczas gdy warstwa "Standorte" jest włączona, użytkownik może kliknąć na pole geometria i wyszukać właściwości dla tego terenu (administrator może włączyć lub wyłączyć określone właściwości, w zależności od określonych ról użytkownika). Tabela właściwości jest zorganizowana w różnych kartach rejestru.







Rysunek 9: Tabela właściwości

- 1 Wybrana geometria (teren)
- 2 Tabela właściwości
- 3 Karty Rejestru

Edycja wartości właściwości (patrz Rysunek 10: Edycja wartości właściwości)

Jeżeli uzytkownik posiada uprawnienia do zapisu (np. użytkownik grws) edycja właściwości tabeli jest umożliwiona po kliknięciu na teren (administrator może włączyć lub wyłączyć edycję określonych właściwości). Po edycji pola, użytkownik musi kliknąć przycisk "Wyślij". Tabela właściwości może zawierać następujące typy pól:

- Rozwijane menu (np. Kategoria użytkowania gruntów)
- Checkbox tak/nie (np. Wolne od zanieczyszczenia)
- Liczba (np. Rozmiar działki)
- Tekst (np. Tekst dotyczący możliwości finansowania)





Menu	•
------	---

## Site information

Plot size in km <sup>2</sup> :	23,1752174560547 😫		
Municipality identifier 1:	15003000		
Municipality name 1:	Magdeburg, Landeshaup		
Municipality identifier 2:			
Municipality name 2:			
Municipality identifier 3:			
Municipality name 3:			
Share of plot in municipality 1:	100 🗢		
Share of plot in municipality 2:	0		
Share of plot in municipality 3:	0		
County number:	15003		
County name:	Magdeburg, Landeshaup		
Submit 2			

Rysunek 10: Edycja tabeli właściwości

- 1 Pole z możliwością edycji
- 2 Przycisk wyślij

#### Eksportuj informacje o terenie do PDF

Po wyborze geometrii terenu użytkownik może kliknąć przycisk "Flächenpass aufrufen" (wyświetl arkusz informacyjny) znajdujący się poniżej tabeli właściwości (Rysunek 11: Przycisk "Flächenpass aufrufen"). Nowa strona zostanie załadowana , pokazując obraz aktualnego widoku mapy i tabelę właściwości. Klikając "Flächenpass herunterladen" (pobierz arkusz informacyjny) (Rysunek 12: Przycisk "Flächenpass herunterladen") widok mapy i tabela właściwości są eksportowane do PDF.





## Site information

Plot size in km²	17,6424532958984
Municipality identifier 1	15003000
Municipality name 1	Magdeburg, Landeshauptstadt
Municipality identifier 2	
Municipality name 2	
Municipality identifier 3	
Municipality name 3	
Share of plot in municipality 1	1100,0
Share of plot in municipality 2	20,0
Share of plot in municipality 3	30,0
County number	15003
County name	Magdeburg, Landeshauptstadt
Flächenpass aufr	

Rysunek 11: Przycisk "Flachenpass aufrufen"

1 - Przycisk "Flachenpass aufrufen" (wyświetl arkusz informacyjny)



Rysunek 12: Przycisk "Flächenpass herunterladen"

1 - Przycisk "Flachenpass herunterladen" (Pobierz arkusz informacyjny)





## 5 Backend

## 5.1 Nawiązanie połączenia pomiędzy Systemem GreenerSites i Geoserverem za pomocą PuTTY

Aby połączyć się z GeoServerem należy wykonać następujace kroki

- 1. Pobierz PuTTY ze strony www.putty.org
- 2. Uruchom generator kluczy PuTTY (PuTTYgen)
- 3. Kliknij "Generuj", aby wygenerować klucz
- 4. Należy poruszać myszką do czasu, aż zostanie wygenerowany klucz

PuTTY Key Generator			? ×
<u>File K</u> ey Con <u>v</u> ersions <u>H</u> elp			
Key			
No key.			
Actions Generate a public/private key pair		3	Generate
Load an existing private key file			Load
Save the generated key		Save public key	Save private key
,			
Parameters			
Parameters Type of key to generate:	⊖ <u>e</u> cdsa	○ED <u>2</u> 5519	⊖ ssh- <u>1</u> (RSA)

Rysunek 13: Generowanie klucza

- 5. Wklej "Klucz publiczny", "Key fingerprint" i "Komentarz do klucza" do późniejszego użycia w pliku tekstowym
- 6. Ustaw "Hasło klucza" i "Potwierdź hasło klucza" (to będzie twoje osobiste hasło)
- 7. Kliknij "Zapisz klucz prywatny"
- 8. Skopiuj klucz prywatny na serwer
- 9. Zamknij PuTTYgen





PuTTY Key Generator	?	×
File Key Conversions Help		
Key		
Public key for pasting into OpenSSH authorized_keys file:		
lash roo		^
	8	
		$\frown$
		5
Key fingerprint		
Key comment		$\asymp$
Key passphrase:	(	6
Confirm passphrase:	(	0
Actions		$\checkmark$
Actions	_	
Generate a public/private key pair	Generate	
Load an existing private key file	Load	
Save the generated key 7 Save public key Sa	ave private key	,
Parameters		
I ype of key to generate: ●RSA ○DSA ○ECDSA ○ED25519 (	SSH-1 (RSA	0
Number of bits in a generated key:	2048	

Rysunek 14: Zapisywanie klucza

- 10. Uruchom PuTTy
- 11. Przejdź do "SSH/Auth"
- 12. Wyszukaj zapisany klucz prywatny wygenerowany w PuTTYgen



Rysunek 15: Ustawianie prywatnego klucza w celu weryfikacji

- 13. Przejdź do "SSH/Tunnels""
- 14. Dodaj "Port źródłowy" i "Przeznaczenie" po czym kliknij "Dodaj"





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Pully Configuration				? X
Category:				
Keyboard Bell Eastures	^	Optior Port forwarding	ns controlling SSH p	ort forwarding
		Local ports a	ccept connections fi	rom other hosts
- Appearance		Remote ports	s do the same (SSH	-2 only)
- Translation		Forwarded ports	c	Remove
Selection				
- Connection				
Data		Add new forward	led port	
Telnet		Source port		14 Add
		Destination		
Kex		Local	Remote	
- Host keys		Auto		◯ IPv6
⊡-Auth	L			
-TTY				
Tunnels (13				
Bugs				
wide bugs				
About H	lelp		Open	Cancel

Rysunek 16: Konfigurowanie Tunelu

- 15. Przejdź do "Sesja"
- 16. Dodaj "Nazwę Hosta" i "Port"
- 17. "Otwórz" (Sesję można także zapisać dla przyszłych połaczeń)

😵 PuTTY Configuration	? ×
Category:	Basic options for your PuTTY session
Terminal     Keyboard     Bell     Features     Window     Appearance	Host Name (or IP address) Connection type: Raw O Telnet O Rlogin OSH O Serial
Behaviour Translation Selection Colours	Load, save or delete a stored session Saved Sessions geoserver
Connection Data Proxy Telnet Rlogin	Default Settings GSProgress geoserver Save
⊖-SSH — Kex — Host keys — Cipher ⊕-Auth	Close window on exit. Always Never Only on clean exit
About Help	17 Open Cancel

Rysunek 17: Połączenie do GeoServera

18. Po wprowadzeniu loginu i hasła (utworzonego w punkcie 6.) użytkownik ma dostęp do GeoSerwera w przeglądarce





About & Status   Sever status   Sever status   Contract Homeson   Water designer   Dial   Status   Verification   Dial   Status   Verification   Dial   Status   Verification   Dial   Status   Dial   Status   Verification   Dial   Status   Verification   Dial   Status   Dial   Status   Dial   Status   Status </th <th>GeoServer</th> <th></th> <th></th> <th>Logged in as admin.</th>	GeoServer			Logged in as admin.
Data     2 Layers     Add byers     1.0.0       Warey Preview     1.0.0     WWGc     1.0.0       Ware Coups     Create workpaces     WHC     WHC       Ware Coups     Create workpaces     UR       Ware Coups     <	About & Status & Server Status GeoServer Logs Contact Information W About GeoServer	Welcome Wekome This GeoServer belongs to	o The Ancient Geographers.	Service Capabilities
	Data  Data	25 Layers 6 Stores 2 Workspaces A The master password haphyr recommended tha A The administrator pass highlyr recommended tha 10 Storg cryptography a This GeoServer instance is the administrator.	Add byers     Add stores     Orate workspaces     for this server has not been changed from the default. It is     ty ou change it now. Change it     you     yo	1.0.0 wesc 1.1.1 wrs 1.0.0 wcs 1.1.0 1.1.1 2.0.1 1.0.0 wrs 1.0.0 1.1.0 1.0.0 wrs 1.0.0 1.1.0 1.0.0 1.1.1 1.1.1 1.1.1 1.3.0

Rysunek 18: GeoServer

#### 5.1 Nawiązanie połączenia z bazą danych GreenerSites za pomocą PuTTY

Nawiązanie połączenia z bazą danych za pomocą PuTTY wymaga podjęcia tych samych kroków opisanych w rozdziale 5.1 z tym wyjątkiem, że port źródłowy i miejsce docelowe są różne. Po ustanowieniu połączenia dane mogą zostać importowane do bazy danych. Proces ten jest opisany w rozdziale 5.3.

#### 5.2 Import danych

W tym rozdziale przedstawiono różne metody importu danych do bazy danych

#### 5.2.1 Import danych za pomocą WinSCP

- 1. Pobierz i zainstaluj WinSCP ze strony https://winscp.net/
- 2. Importuj "Tereny" z PuTTY
- 3. Login i hasło są podobne jak do PuTTY
- 4. Importowanie danych za pomocą przeciągnięcia i upuszczenia do prawego okna w WinSCP (np. kopiowanie danych rastrowych do /home/gs/data, raster można następnie opublikować za pomocą GeoServera, opisanego w rozdziale 5)





Login	- 🗆 X
Import Sites       2	Session  File protocol:  SFTP  Host name:  Port number:  22  User name:  Save Advanced
Export/Backup Configuration Clean Up Run Pageant Run PuTTYgen Check for Updates Preferences About	
<u>T</u> ools ▼ <u>M</u> anage ▼	Elogin Close Help

Rysunek 19: Połączenie przez WinSCP





#### 5.2.2 Import danych za pomocą pgAdmin

- 1. Pobierz i zainstaluj pgAdmin III ze strony https://www.pgadmin.org/download/Connection
- 2. Połączenie z bazą danych przez PuTTY jest wymagane (patrz rozdział 5.2)
- 3. Po uruchomieniu pgAdmin kliknij "Plik/Dodaj serwer"
- 4. Wypełnij: "Nazwa", "Gospodarz", "Port", "Baza danych konserwacji" i "Nazwa użytkownika" i kliknij "OK"
- 5. Kliknij prawym przyciskiem myszy Serwer/Połącz
- 6. Wprowadź hasło
- 7. Użytkownik jest teraz połączony z bazą danych i może wysyłać dane za pomocą wtyczki "PostGIS Shapefile i DBF loader"

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	SQL pane		

Rysunek 20: Połączenie bazy danych z pgAdmin

#### 5.2.3 Import danych za pomocą QGIS

- 1. Pobierz i zainstaluj QGIS ze strony http://www.qgis.org/
- 2. Połączenie z bazą danych przez PuTTy jest wymagane (patrz rozdział 5.2)
- 3. Po uruchomieniu QGIS kliknij prawym przyciskiem myszy "PostGIS" w oknie przeglądarki
- 4. Kliknij "Nowe połączenie" i wypełnij "Nazwa, "Gospodarz", "Port", "Baza danych", "Nazwa użytkownika", "Hasło" i kliknij "OK"





🧭 QG	IS 2.14.11-Essen						
Project	<u>E</u> dit <u>V</u> iew <u>Layer</u> <u>Settings</u> <u>P</u> lugins	Vect <u>o</u> r <u>R</u> aster	<u>D</u> atabase	<u>W</u> eb <u>C</u> adTools	MMQGIS	Pro <u>c</u> essing	<u>H</u> elp
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Rysunek 21: Połączenie z bazą danych za pomocą QGIS

- 5. Importowanie danych wektorowych można teraz wykonać za pomocą DB Manager
- 6. Przejdź do "Bazy danych"/"DB Manager"

🦸 QG	SIS 2.14.11-Essen							
Project	t <u>E</u> dit <u>V</u> iew <u>L</u> ayer <u>S</u> ettings <u>P</u> lugins Vect <u>o</u> r <u>R</u> a	ster	<u>D</u> atabase	<u>W</u> eb	<u>C</u> adTools	MMQGIS	Pro <u>c</u> essing	<u>H</u> elp
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Rysunek 22: DB Manager

- 7. Przejdź do bazy danych GreenerSites
- 8. Kliknij "Importuj warstwę/Plik"





🛃 DB Manager	- 0	×
<u>D</u> atabase <u>S</u> chema <u>T</u> able		
8		
Tree	Info Table Preview	
<ul> <li>Oracle Spatial</li> <li>§ PostGIS</li> </ul>	public	^
greenersites > <i> private &gt; <i> public &gt; <i> topology</i></i></i>	Schema details Owner: postgres Comment: standard public schema	
<ul> <li>SpatiaLite/Geopackage</li> <li>Virtual Layers</li> </ul>	Privileges	
	create new objects     access objects	
		~

Rysunek 23: Import warstwy za pomocą DB Manager

- 9. Przeglądaj i wybierz warstwę wektorową
- 10. Kliknij przycisk "Opcje aktualizacji"
- 11. Możesz wybrać schemat (np. publiczny albo prywatny, patrz rozdział 2.1)
- 12. Po naciśnięciu przycisku "OK" Shapefile zostanie wysłany do bazy danych

Import vector layer	? ×
Input 9	·
Import selected features	10 Update options
Output table	
Schema public	•
Table	$\checkmark$
Options	
Primary key	id
Geometry column	geom
Source SRID	Target SRID
Encoding	UTF-8 ~
Replace destination table (if exist	ts)
Create single-part geometries in:	stead of multi-part
Convert field names to lowercase	9
Create spatial index	
	OK Cancel

Rysunek 24: Przeglądanie danych wektorowych za pomocą DB Manager

13. Po odświeżeniu, zaktualizuj "Rozmiar" i "Index przestrzenny" przesłanego pliku wektorowego







Rysunek 25: Przesłany plik wektorowy przez DB Manager





#### 5.3 Projektowanie i publikowanie za pomocą GeoServera

Za pomocą GeoServera można zarządzać i publikować swoje warstwy w narzędziu Web-GIS, np. definiować grupy warstw albo definiować wygląd. Istnieje również możliwość sprawdzenia wyglądu warstw przed ich publikacją, klikając "Podgląd warstwy"/"Otwarte warstwy" (patrz Rysunek 26: Podgląd warstw)

About & Status	Laye	ET Preview Il layers configured in GeoServer and provides p	eviews in various formats for each.					
Contact Information	<<	< 1 2 > >> Results 1 to 25 (out of	34 items)				🔍 Search	
About GeoServer	Туре	Title	Name		Commo	on Formats	All Formats	
Plea Layer Preview	щ	Ausgleichsfläche	cite:Ausgleichsf	fläche	OpenLa	yers KML CML	Select one	~
Workspaces	ш	Bebauungspläne	cite:Bebauungs	spläne	OpenLa	yers KML GML	Select one	V
Layers     Layer Groups     Styles	•	Bebauungspläne - Beschriftungen	cite:Bebauungs	spläne - Beschriftungen	OpenLa	yers KML GML	Select one	~

Rysunek 26: Podgląd wartswy

#### 5.3.1 Projektowanie

Po zapisaniu wyglądu warstwy z QGIS jako pliku SLD, można go dodać do GeoServera

- 1. Otwórz kształt w QGIS i przejdź do właściwości warstw
- 2. Przejdź do "Wygląd"
- 3. Edytuj wygląd warstwy
- 4. Zapisz go, przechodząc do "Wygląd/Zapisz wygląd/Plik SLD"



Rysunek 27: Zapisywanie wyglądu warstwy





- 5. W GeoServerze przejdź do "Wygląd/Dodaj nowy wygląd"
- 6. Wybierz "Nazwę", "Obszar roboczy", "Wygląd treści" znajdź i prześlij zapisany plik SLD
- 7. Kolejne konfiguracje są możliwe już po przesłaniu pliku w "Edytorze wyglądu"
- 8. "Zastosuj" i "Prześlij"

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Rysunek 28: Przesyłanie skórek (wyglądu) do GeoServera

#### 5.3.2 Publikowanie

Po przesłaniu geodanych do geo-bazy danych należy je "opublikować" zanim zostaną one wyświetlone w przeglądarce map





# WEB-GIS-TOOL PRIRUČNIK

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ν.		<b>∠</b> .	<b>∠</b> .	

Verzija 1 11/2017





## Opći detalji projekta

Korisnik:	Ministarstvo regionalnog razvoja i prometa države Saxony-Anhalt, državna jedinica 44	Turmschanzenstr. 30 39114 Magdeburg
Ugovaratelj:	Bidder Consortium	Zum Schießwasen 7 91710 Gunzenhausen
	Baader Konzept GmbH www.baaderkonzept.de	
	mena GmbH www.mena-online.de	





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## 1 Uvod

Ovaj priručnik voditi će korisnike i administratore u postavljanju i funkcionalnosti Web-GIS alata. Dokument objašnjava Web-GIS-alat kao i njegove već do sada implementirane funkcionalnosti. Ažurirati će se i urediti čim se završi razvoj Web-GIS alata.

## 2 Arhitektura Sustava

U ovom poglavlju opisuje se postavljanje i struktura GreenerSites Web-GIS-alata.

U nastavku, Slika 1. prikazuje komponente i njihovu vezu unutar Web-GIS-alata.



Slika 1: Arhitektura Sustava

#### 2.1 PostgreSQL / PostGIS

**PostGreSQL** predstavlja objektno-relacijska bazu podataka otvorenog koda, a **PostGIS** proširenje koje omogućuje spremanje geografskih objekata u bazu podataka. Oni se koriste u GreenerSites Web-GIS-Tool za:

- Spremanje podataka
- Uređivanje podataka
- Implementacija korisničkih uloga
- Pružanje podataka za GeoServer

Bazom podataka može se upravljati koristeći psql u naredbenom retku ili sa pgAdmin u grafičkom korisničkom sučelju (pogledaj poglavlje 2.2). Nadalje, koriste se sljedeće verzije: PostGreSQL 9.5 i PostGIS 2.3.

Svaka regija upravlja jednom bazom podataka koja sadrži vlastite podatke, u nastavku teksta nazivati će se "lokacijske informacije".





Kako bi se zajamčila standardizacija između različitih regija, osiguran je shematski prikaz sa definiranim atributima i odgovarajućim vrijednostima.<sup>1</sup>. Iz razloga pojavljivanja specifičnih karakteristika za svaku regiju, shematski prikaz također sadržava i izborna polja.

Pojaviti će se još jedna baza podataka koja sadržava europske-otvorene podatke (e.g. OpenStreetMap) ili opće nacionalne podatke (e.g. UrbanAtlas) koja će se u nastavku teksta nazivati bazni (osnovni) slojevi. Takvi podaci se ne mogu uređivati.

PostGreSQL baza podataka također sadrži sheme za pristup različitim korisničkim skupinama.

- "javno" otvoreni pristup svim korisnicima
- "privatni" ograničeni pristup registriranim korisnicima sa pristupnim pravima

Administrator baze podataka može ubaciti i neke razlike.

Dodatne uloge korisnika u bazi podataka omogućiti će svakoj regiji da kontrolira pravila čitanja / pisanja svojih podataka. Navedena pravila mogu se odnositi na sve slojeve ili samo na određene djelove unutar sloja. Detaljne informacije o ulogama korisnika dane su u poglavlju 3. Povezivanje s bazom podataka objašnjeno je u poglavlju 4.2 (preko sučelja) te poglavlja 18 (putem pozadine).

#### 2.2 pgAdmin

PgAdmin je GUI (grafičko korisničko sučelje) alat za administriranje podataka u PostGreSQL (Slika 2: GUI pgAdmin). Povezivanje baze podataka GreenerSites opisano je u poglavlju 18.

<sup>&</sup>lt;sup>1</sup> Shematski prikaz će biti finaliziran nakon završnog podešavanja alata







Slika 2: GUI pgAdmin





#### QGiS

**QGIS** predstavlja geografski informacijski sustav otvorenog koda (Slika 3: QGIS GUI) sa sučeljem za OGC i raster podatke. Može se koristiti za vizualizaciju i uređivanje geopodataka. Nakon povezivanja s bazom podataka GreenerSites projekta (što je opisano u poglavlju 17.) podaci se mogu prenijeti u bazu podataka. Moguće je također razviti i radne tijekove za izračun atributa (npr. stupanj brtvljenja tla, dostupnost).



Slika 3: QGIS GUI





#### 2.3 GeoServer

GeoServer predstavlja dio pozadinskog dijela te pruža i isporučuje Web-GIS-alat sa geopodacima (GUI prikazan na slici 1: Arhitektura sustava). Definirana prava u PostGre-bazi podataka mogu se ili usvojiti ili nadalje specificirati unutar GeoServera. Administratori mogu konfigurirati stil sloja i izgled sa GeoServerom, a također je moguće i integrirati vanjske WMS usluge u sučelje Web-GIS-Alata. Detaljni opisi povezivanja sa GeoServerom navedeni su i prikazani u poglavlju 5. Izgled sloja kao i objavljivanje opisani su u poglavlju **Errore. L'origine riferimento non è stata trovata**.

GeoServer			Logged in as admin.
Server Status     Server Status     Server Status     Geosémer Logs     Contact Hormaton     About & Status     Contact Hormaton     Xout Geosémer     Data     Workspace     Stores     Surver     Server     Server	Welcome Weicome The GeoServer belongs to 2 Cavers 9 Stores 3 Workspaces ▲ The administrator page mighty recommended tha ▲ The administrator page mighty recommended tha 1 The server instance as the administrator page	<ul> <li>The Ancient Geographers.</li> <li>Add byers</li> <li>Add stores</li> <li>Create workspaces</li> <li>for the server has not been changed from the default. It is tyou change it now. Change it</li> <li>word for this server has not been changed from the default. It is tyou change it now. Change it</li> <li>wabable</li> <li>sunning version 2.11.2. For more information please contact</li> </ul>	Service Capabilities TMS 1.0.0 WMS-C 1.11 W10.0 WCS 1.10 1.11 1.11 1.11 1.0.0 WW 0.0 1.0.0 1.0.0 1.0.0 1.0.0 1.0.0 1.0.0 1.1.0 1.1.0 1.1.1 1.1.1 1.1.1 1.1.1 1.1.1 1.1.1 1.1.1 1.1.0 1.0.0 WMS-C 1.1.1 1.1.1 1.1.1 1.1.1 1.1.0 1.1.0 1.1.1 1.1.1 1.1.1 1.1.1 1.1.1 1.1.0 1.1.1 1.1.0 1.1.0 1.1.1 1.1.0
Demos Tools	-		

Slika 4: GeoServer GUI

#### 2.4 GeoDjango/OpenLayers

GeoDjango je web okvir za geografske podatke. OpenLayers predstavlja JavaScript knjižnicu i prikazuje karte (u višestrukim pregledima) u web pregledniku. Samo sučelje





preglednika karata (Slika 5: Web-GIS-alat za prikaz karte) vizualizira se pomoću GeoDjanga (prikaznog stabla, prikaza karte) i OpenLayera (odabir web lokacija, unos atributa, redosljed slojova, transparentnost)<sup>2</sup>. Funkcije prikaza karte opisane su u poglavlju 0.



Slika 5: Prikaz mape Web-GIS-alata

## 3 Korisničke usluge

Kao što je i spomenuto u poglavlju 2.1, čitanje i pisanje podataka od strane korisnika moguće je putem korisničkih pravila. Slika 6: Korisničke uloge, prikazuje različite korisničke uloge i njihova odgovarajuća prava, kao i mali opis i primjer istih.

Korisnik	Opis Korisnika	Korisnička prava	Primjer korisnika
postgres	Superuser /Host/Admin	Svi podaci i korisnička pravila	TBD
gsa	Administrator za podatke povezane regije	Uređivanje pridružene baze podataka i definiranje pridruženih uloga korisnika	Uprava koje posjeduje podatke u regiji
gsrw	Čitati i pisati u bazi podataka	Uređivanje određenih atributa, na primjer: informacija o web-lokaciji (prikazano od strane gsa)	Registrirani korisnik (zaposlenici / investitori)
gsr	Napisano u bazi podataka	Napisati atribute i ispisati izvještaj.	Neregistrirani korisnik

Slika 6: Korisničke usluge

<sup>&</sup>lt;sup>2</sup> Sve funkcije još nisu postavljene u funkciju.





### 4 Sučelje

Ovo se poglavlje odnosi se na prednji kraj Web-GIS-Tool Web stranice. Moguće je da svaka regija ima jednu pod domenu. Veza od web-GIS-Tool web stranice za "Ministarstvo regionalnog razvoja i prometa države Sachsen-Anhalt" je "mlv.greenersites.eu/map/". Upravo to omogućuje svakoj regiji da može uređivati i organizirati svoju pod domenu individualno (logotip, jezik itd.). Kao što je opisano u poglavlju 2.1 potrebna je jedna baza podataka za svaku poddomenu (domena koja je hijerarhijski ispod prethodne), osnovni slojevi (npr. OpenStreetMap) pohranjeni su u drugu zajedničku bazu podataka.

#### 4.1 Općenito

Slika 7: Web-Gis-Tool prikazuje pregled nakon učitavanja web stranice.



Slika 7: Web-Gis-Tool Sučelje

- 1 Prilagodljiva traka sa poveznicom na:
  - GreenerSites projektnu stranicu
  - Mapu
  - O nama
  - Podrška
  - Login/Ulaz

Korisnik može doći do tih stranica, kao i administrator regije koji može stvarati nove veze





2 - Traka za pretraživanja adresa

Korisnik može upisati (padajući izbornik sa prijedlozima postaje vidljiv) te zumirati odabranu adresu

3 - Tablica slojeva Korisnik može uključiti /isključiti slojeve

4 - Izgled karte koji prikazuje (sve) aktivne slojeve Ovisno o mjerilu, na karti se prikazuju različita polja

5 - Navigacijska tipka

Korisnik može zumirati (in&out) (moguće je isto tako i pomoću miša)

#### 4.2 Prijava

Klikom na "Prijava" i pružanjem korisničkog imena i lozinke, korisnik ima pristup dodatnim funkcijama ovisno o njegovoj korisničkoj ulozi (Slika 8: Login).

GreenerSites	Мар	About us	Support	Login	
					Login Username:gsrw Password: login
© 2017 mena GmbH	l   Imprint	Contact			

#### Slika 8: Login

Na primjer, korisnik koji posjeduje prava čitanja i pisanja (gsrw) može uređivati geometrijske podatke u tablicama atributa (ne može sve podatke, samo one podataka koji su omogućeni administratoru za uređivanje, vidi poglavlje **Errore. L'origine riferimento** non è stata trovata.).




### 4.3 Funkcionalnosti

### Provjera vrijednosti atributa (pogledati Slika 9: Tabl)

Kada se sloj "Standorte" promijeni, korisnik može kliknuti na geometriju i potražiti atribute za ovu web stranicu (administrator može omogućiti ili onemogućiti određene atribute za određene korisničke uloge). Tablica atributa je organizirana u različitim registarskim karticama.



Slika 9: Tablica atributa

- 1 -Odabrana geometrija (stranica)
- 2 -Tablica atributa
- 3 -Registrirajte kartice

#### <u>Uređivanje vrijednosti atributa (pogledati</u> Slika 10:

Ukoliko korisnik posjeduje pravo pisanja (npr. Gsrw-korisnik), uređivanje tablice atributa omogućeno je nakon klika na web mjesto (administrator može omogućiti ili onemogućiti određene atribute za uređivanje). Nakon uređivanja polja, korisnik mora kliknuti gumb "Pošalji". Tablica atributa može sadržavati sljedeće vrste polja:

- padajući izbornik (npr. kategorija upotrebe zemljišta)
- Potvrdni okvir da/ne (npr. otpuštanje od onečišćenja)
- Broj (npr. veličina zemljišta)
- Tekst (npr. tekst o mogućnostima financiranja)





Menu	•
------	---

# Site information

Plot size in km <sup>2</sup> :	23,1752174560547 😫
Municipality identifier 1:	15003000
Municipality name 1:	Magdeburg, Landeshaup
Municipality identifier 2:	
Municipality name 2:	
Municipality identifier 3:	
Municipality name 3:	
Share of plot in municipality 1:	100 🗢
Share of plot in municipality 2:	0
Share of plot in municipality 3:	0
County number:	15003
County name:	Magdeburg, Landeshaup
Submit 2	

Slika 10: Uređivanje tablice atributa

- 1 Uređivanje je moguće u polju
- 2 gumb za slanje

Izvoz podataka u PDF format

Nakon odabira geometrijske pozicije, korisnik može kliknuti na gumb "Flächenpass aufrufen" (prikazni list podataka) koji se nalazi ispod tablice atributa (Slika 11: Gumb "Flächenpass aufrufen"). Učitati će se nova web-lokacija koja prikazuje sliku stvarnog prikaza karte kao i tablicu atributa. Klikom na "Flächenpass herunterladen" (preuzimanje datoteka) Figure 12: Gumb "Flächenpass herunterladen") karta i tablica atributa prebacuju se u PDF format.





# Site information

Plot size in km²	17,6424532958984
Municipality identifier 1	15003000
Municipality name 1	Magdeburg, Landeshauptstadt
Municipality identifier 2	
Municipality name 2	
Municipality identifier 3	
Municipality name 3	
Share of plot in municipality 1	1100,0
Share of plot in municipality 2	20,0
Share of plot in municipality 3	30,0
County number	15003
County name	Magdeburg, Landeshauptstadt
Flächenpass aufr 1	

Slika 11: Gumb "Flächenpass aufrufen"

1 - Gumb "Flächenpass aufrufen" (prikaz baze podataka)



- Figure 12: Gumb "Flächenpass herunterladen"
- 1 Gumb "Flächenpass herunterladen" (download/skidanje baze podataka)





# 5 Pozadina/Podloga

# 5.1 Uspostavljanje veze sa GreenerSite Sustavom koristeći PuTTY na GeoServer

Moraju se slijediti sljedeći koraci za povezivanje na GeoServer

- 1. Skidanje (download) PuTTY sa stranice <u>www.putty.org</u>
- 2. Početi sa PuTTY Ključem Generatora (PuTTYgen)
- 3. Kliknuti na "Generirati" za generirati ključ
- 4. Miš se mora mjestiti sve dok se ključ ne generira

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ile <u>K</u> ey Con <u>v</u> ersions <u>H</u> elp			
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Actions		$\bigcirc$	
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Actions Generate a public/private key pair Load an existing private key file Save the generated key Parameters Type of key to generate:		3 Save pyblic key	Generate Load
Actions Generate a public/private key pair Load an existing private key file Save the generated key Parameters Type of key to generate: © ESA ODSA	○ECDSA	3 Save pyblic key O ED25519	Qenerate Load Save private key O SSH-1 (RSA)

Slika 13: Generiranje ključa

- 5. Zalijepiti "Public key", "Key fingerprint" i "Key comment" za kasniju uporabu u tekstualnoj datoteci
- 6. Postaviti "Key passphrase" i "Confirm passphrase" (ovo predstavlja osobnu/personalnu zaporku)
- 7. Kliknuti "Save private key"
- 8. Kopiraj privatni ključ na server
- 9. Zatvori PuTTYgen





😨 PuTTY Key Generator	? ×
File Key Conversions Help	
Key Public key for pasting into OpenSSH authorized_keys file: Key fingerprint Key comment Key passphrase: Confirm passphrase:	5
Actions Generate a public/private key pair Load an existing private key file Save the generated key	Generate Load Save private key
Parameters Type of key to generate: RSA OBA ECDSA ED25519 Number of bits in a generated key:	O SSH-1 (RSA) 2048

Slika 14: Pohranjivanje ključa

- 10. Pokreni PuTTY
- 11. Doći do "SSH/Auth"
- 12. Potražiti spremljeni privatni ključ, generiran u PuTTYgenu



Slika 15: Postavljanje privatnog ključa za provjeru autentičnosti

- 13. Doći do "SSH/Tunnels"
- 14. Dodati "Source port" i "Destination" i kliknuti "Add"





Real PuTTY Configuration		? ×
Category:		
	Options controlling SSH port forwardin Port forwarding Corrections from other ho Remote ports do the same (SSH-2 only) Forwarded ports: Add new forwarded port Source port Destination Cocal Remote Dyn Auto IPv4 IPv6	Ig Ists Remove
About He	p Open	Cancel

Slika 16: Konfiguracija "Tunnels"

- 15. Doći do "Session"
- 16. Dodati "Host Name" i "Port"
- 17. "Open" (Sesije se također mogu spremiti i za buduće veze)

🕵 PuTTY Configuration	? ×
Category:	
Session 15	Basic options for your PuTTY session
	Specify the destination you want to connect to
Keyboard	Host Name (or IP address) Port
Bell	
Features	Connection type:
Appearance	◯ Raw ◯ Telnet ◯ Rlogin SH ◯ Serial
Behaviour	Load, save or delete a stored session
- I ranslation Selection	Saved Sessions
Colours	geoserver
Connection	Default Settings Load
- Data Proxy	GSProgress
Telnet	Save
Rlogin	Delete
- SSH Kex	
Host keys	
Cipher	Close window on exit
	○ Always ○ Never ● Only on clean exit
X11 V	
About Help	17 Open Cancel

Slika 17: Povezivanje na GeoServer

18. Nakon kreiranja korisnika/user i zaporke/passphrase (stvoreno u 6.) korisnik ima pristup GeoServeru u pregledniku.





GeoServer			Logged in as admin.
About & Status Server Status Server Status Contact Momental Contact Moment	Welcome Welcome This GeoServer belongs to 25 Layers 6 Stores 2 Workspaces Workspaces Workspaces Workspace possword highly recommended th With administrator pass highly recommended th With administrator pass highly recommended th the administrator administrator pass highly recommended th with a maniferrator pass highly recommended th highly recommended th hi	<ul> <li>o The Ancient Geographers.</li> <li>Add byers         <ul> <li>Add stores</li> <li>Create workspaces</li> </ul> </li> <li>If or this server has not been changed from the default. It is at you change it now. Change it at you change to now. Change it available</li> <li>s running version 2.11.2. For more information please contact</li> </ul>	Service Capabilities TMS 1.0.0 VMS-C 1.1.1 VMTS 1.0.0 VCS VCS 1.1.0 1.1 1.0 2.0.1 VMS 1.1.0 2.0.0 VMS 1.1.1 1.3.0

Slika 18: GeoServer

### 5.2 Uspostavljanje veze sa Greener Sites bazom podataka pomoću PuTTY

Uspostavljanje veze sa bazom podataka koristeći PuTTY zahtijeva iste korake kao što je prikazano u poglavlju 0. osim što su očekivani izvorni priključci i odredišta su različita. Nakon uspostavljanja veze, podaci se mogu uvesti u bazu podataka. Ovo je opisano u poglavlju Errore. L'origine riferimento non è stata trovata..

#### 5.3 Uvoz podataka

Ovo poglavlje prikazuje različite metode, podaci se mogu uvesti u bazu podataka

#### 5.3.1 Unos podataka sa WinSCP

- 1. Skidanje/download i instaliranje WinSCP sa stranice <a href="https://winscp.net/">https://winscp.net/</a>
- 2. Unijeti "Sites" sa PuTTY
- 3. Logiranje i lozinka je slična sa PuTTY
- Uvođenje podataka povlačenjem i ispuštanjem u desni prozor WinSCP-a (npr. Kopiranje rasternih podataka u / home / gs / podaci; raster se zatim može objaviti sa GeoServerom koji je opisan u poglavlju 0).





Login	- 🗆 X
New Site         geoserver         GSProgress         TestRoot	Session File protocol: SFTP Host name: Port number: 22 User name: Password:
Import Sites       2         Import/Restore Configuration       Export/Backup Configuration         Export/Backup Configuration       Clean Up         Run Pageant       Run PuTTYgen         Check for Updates       Preferences         About       Export	Save ▼ A <u>d</u> vanced ▼
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Slika 19: Povezivanje WinSCP





#### 5.3.2 Unos podataka sa pgAdmin

- 1. Skidanje i instaliranje pgAdmin III sa stranice https://www.pgadmin.org/download/
- 2. Potrebno je povezivanje putem PuTTY na bazu podataka (pogledaj poglavlje 0)
- 3. Nakon pokretanja pgAdmin kliknuti na "File/Add Server"
- 4. Upisati: "Name", "Host", "Port", "Maintenance database" i "Username" i kliknuti"OK"
- 5. Desnom tipkom kliknuti na server / Povezati
- 6. Unijeti zaporku
- 7. Korisnik je sada povezan s bazom podataka i može prenijeti podatke s dodatkom "PostGIS Shapefile i DBF punjačem".

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Repo	rts >	SSL Key File	
Prope	artier	SSL Root Certificate File	
Fibb	erues	SSL Certificate Revocation	List
		SSL Compression?	yes
		🧮 Maintenance database	greenersites
		Username	gsa
		Store password?	No
		Restore environment?	Yes
		Connected?	No
		<	
		SOL pane	

Slika 20: Povezivanje baze podataka sa pgAdmin





#### 5.3.3. Unos podataka sa QGIS

- 1. Skidanje i instaliranje QGIS sa <u>http://www.qgis.org/</u>
- 2. Potrebno je povezivanje putem PuTTY sa bazom podataka (pogledati poglavlje 0)
- 3. Nakon pokretanja QGIS desni -klik na "PostGIS" u prozoru preglednika
- 4. Kliknuti "New Connection" i upisati "Name", "Host", "Port", "Database", "User Name", "Password" te zatim kliknuti "OK"

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Slika 21: Povezivanje baze podataka sa QGIS-om

- 5. Uvođenje vektorskih podataka sada se može obaviti putem DB
- 6. Doći do "Database" / "DB Manager"





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Slika 22: DB Manager

- 7. Otići do baze podataka GreenerSites
- 8. Kliknuti "Import Layer/File"

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Slika 23: Unos sloja putem DB Manager

- 9. Pregledati i odabrati vektorski sloj
- 10. Kliknuti gumb "Ažuriraj opcije"
- 11. Moguće je odabrati shemu (npr. Javno ili privatno, pogledati poglavlje Errore.
  - L'origine riferimento non è stata trovata.)





#### 12. Nakon klika"OK", odabrani izgled sheme se prenosi u bazu podataka

Import vector layer	? ×
Input (9)	
Importelected features	10 Update options
Output table	
Schema public	•
Table	~
Options	
Primary key	id
Geometry column	geom
Source SRID	Target SRID
Encoding	UTF-8
Replace destination table (if exists)	)
Create single-part geometries inst	ead of multi-part
Convert field names to lowercase	
Create spatial index	
	OK Cancel

Slika 24: Pregledavanje vektorskih podataka sa DB Managerom

13. Nakon obnavljanja, ažurirati "Extent (Opseg)" i "Spatial Index (Prostorni indeks)" odabrane (upload-*ane*) vektorske datoteke



Slika 25: Prenesena vektorska datoteka putem DB Manager





## 5.4 Dizajniranje i objavljivanje sa GeoServerom

Pomoću usluge GeoServer može se upravljati i objavljivati svoje slojeve u WebGIS alatu, npr. definiranje grupa slojeva ili definiranje stilova. Postoje i mogućnosti za provjeru formiranja alojeva prije objavljivanja klikom na "Preview Layer" / "Open Layers"(pogledaj sliku Slika 26: )

	Laye	er Preview			
About & Status & Server Status GeoServer Logs	List of all	layers configured in GeoServer and provides p	rreviews in various formats for each.		
<ul> <li>Contact Information</li> <li>About GeoServer</li> </ul>	<< < Type	< 1 2 > >> Results 1 to 25 (out o Title	f 34 items) Name	Common Formats	Search
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Workspaces	ш	Bebauungspläne	cite:Bebauungspläne	OpenLayers KML GML	Select one
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Slika 26: Pregled slojeva

#### 5.4.1 Oblikovanje

Nakon spremanja stila same razine iz QGIS-a i to u obliku SLD datoteke, može se dodati u GeoServer.

- 1. Otvorite oblik u QGIS-u i prijeđite na svojstva same razine
- 2. Prijeđite na "Stil"
- 3. Uređivanje stila sloja
- 4. Spremite je tako da dođete do "Style / Save Style / SLD datoteke"



Slika 27: Spremanje stila sloja





- 1. U GeoServer-u otići na "Styles / Add a new Style"
- 2. Odabrati "Ime", "Radni prostor", "Stilski sadržaj", pronaći te prenijeti spremljene SLD datoteke
- 3. Nakon učitavanja, daljnje konfiguracije su moguće u"Style Editor"
- 4. "Primijeni" i "Pošalji"

New style	
Type a new style definition, or use an existing one as a template, or upload a ready made style from your style is a valid style document.	île
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Choose One	
Upload a style file	
Durchsuchen Keine Datei ausgewahlt. Opioad	
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Slika 28: Prijenos stila na GeoServer

#### 5.4.2 Objavljivanje

5.

Nakon učitavanja geo-podataka u geo-bazu podataka, moraju biti "objavljeni" prije nego što se prikazuje u pregledniku karata