

Geospatial Data Management for Energy Access Hands-on week 1 – Part B

This exercise is a walk-through on how to install the following software you will be interacting with from lectures 1 - 5

Learning outcomes

By the end of this exercise, you will learn how to:

- 1) Install PostgreSQL
- 2) Install PostGIS
- 3 Install pgAdmin4

Install PostgreSQL & PostGIS (on Windows)

Navigate to the PostgreSQL <u>download page</u>.

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Quick Links	Downloads 🛓					
 Downloads Packages Soruce Software Catalogue File Browser 	PostgreSQL Download PostgreSQL is available for download Packages and Installers Select your operating system family Linux Linux Source code	ds ad as ready-to-use packages r: macOS	or installers for various platforms,	as well as a source code archi	ve if you want to build it y Solaris	ourself.

Beta/RC Releases and development snapshots (unstable)

There are source code and binary packages of beta and release candidates, and of the current development code available for testing and evaluation of new features. Note that these builds should be used for testing purposes only, and not for production systems.

Download PostgreSQL Installer for Windows

First, you need to go to the download page of <u>PostgreSQL installers on the</u> <u>EnterpriseDB</u>.

PostgreSQL Version	Linux x86-64	Linux x86-32	Mac OS X W	indows x86-64	Windows x86-32
15.3	postgresql.org ^亿	postgresql.org ^{C'}	Ċ	Ċ	Not supported
14.8	postgresql.org 岱	postgresql.org ^{[2}	ė	Ú.	Not supported
13.11	postgresql.org 더	postgresql.org ^{[2}	Ċ.	Ú.	Not supported
12.15	postgresql.org 더	postgresql.org 더	Ċ	Ú.	Not supported
11.20	postgresql.org 더	postgresql.org ^{[2}	Ċ	Ú.	Not supported
10.23*	Ú.	Ċ.	Ċ	Ú.	Ċ.
9.6.24*	Ú.	Ú.	ė	Ú.	ė
9.5.25*	Ċ	Ċ	Ċ.	ė	ė

Install PostgreSQL on Windows

To install PostgreSQL on Windows, you need to have administrator privileges.



Step 1: Double click on the installer file, an installation wizard will appear and guide you through multiple steps where you can choose different options that you would like to have in PostgreSQL.

Step 2: Click the Next button

Setup		—		×
PACKAGED BY	Setup - PostgreSQL Welcome to the PostgreSQL Setup Wizard.			
PostgreSQL				
	< Back	lext >	Can	cel

Step 3: Specify installation folder, choose your own or keep the default folder suggested by PostgreSQL installer and click the Next button

🗃 Setup			_		\times
Installation Directory					
Please specify the directory where PostgreSQL will be installed. Installation Directory C:\Program Files\PostgreSQL\12	2				
VMware InstallBuilder					
< F	Back	Next	t>	Can	cel

Step 4: Select software components to install:

• The PostgreSQL Server to install the PostgreSQL database server



- pgAdmin 4 to install the PostgreSQL database GUI management tool.
- Command Line Tools to install command-line tools such as psql, pg_restore, etc. These tools allow you to interact with the PostgreSQL database server using the command-line interface.
- Stack Builder provides a GUI that allows you to download and install drivers that work with PostgreSQL.

	- 🗆 X
Select Components	
Select the components you want to install; clear the com you are ready to continue.	ponents you do not want to install. Click Next when
 PostgreSQL Server pgAdmin 4 Stack Builder Command Line Tools 	Click on a component to get a detailed description
VMware InstallBuilder	< Back Next > Cancel

Step 5: Select the database directory to store the data or accept the default folder. Click the Next button to go to the next step:

Climate Compatible Growth			
🐳 Setup		_	
Data Directory			
Please select a directory under which to store your data.			
Data Directory C: \Program Files \PostgreSQL \12\data	~		
VMware InstallBuilder			
	< Back	Next >	Cancel

Step 6: Enter the password for the database superuser (postgres)

PostgreSQL runs as a service in the background under a service account named **postgres**. If you already created a service account with the name **postgres**, you need to provide the password of that account in the following window.

After entering the password, you need to retype it to confirm and click the Next button:

Climate Compatible Growth					
<table-of-contents> Setup</table-of-contents>				_	
Password					-
Please provide a p	assword for the database	e superuser (pos	tgres).		
Password	*****]			
Retype password	******				
VMware InstallBuilder					
			< Back	Next >	Cancel

Step 7: Enter a port number on which the PostgreSQL database server will listen. The default port of PostgreSQL is **5432**. You need to make sure that no other applications are using this port.

📲 Setup — 🗆	
	<
Port	
Please select the port number the server should listen on.	
Port 5432	
VMware InstallBuilder <b< td=""><td></td></b<>	

Step 8: Choose the default locale used by the PostgreSQL database. If you leave it as default locale, PostgreSQL will use the operating system locale. After that click the Next button.

🗃 Setup			-		×
Advanced Options					
Select the locale to be used by the new database cluster. Locale [Default locale]					
VMware InstallBuilder	< Back	Nex	t >]	Can	cel

Step 9: The setup wizard will show the summary information of PostgreSQL. You need to review it and click the Next button if everything is correct. Otherwise, you need to click the Back button to change the configuration accordingly.

Climate Compatible Growth		
📲 Setup	_	
Pre Installation Summary		-
The following settings will be used for the installation::		
Installation Directory: C:\Program Files\PostgreSQL\12 Server Installation Directory: C:\Program Files\PostgreSQL\12 Data Directory: C:\Program Files\PostgreSQL\12\data Database Port: 5432 Database Superuser: postgress Operating System Account: NT AUTHORITY\NetworkService Database Service: postgresql-x64-12 Command Line Tools Installation Directory: C:\Program Files\PostgreSQL\12 pgAdmin4 Installation Directory: C:\Program Files\PostgreSQL\12\pgAdmin 4		<
VMware InstallBuilder 	Next >	Cancel

Now, you're ready to install PostgreSQL on your computer. Click the **Next** button to begin installing PostgreSQL.

📑 Setup			_		×
Ready to Install					•
Setup is now ready to begin installing PostgreSQL on your computer.					
VMware InstallBuilder	k	Ne	xt >	Car	ncel

The installation may take a few minutes to complete.

6

Climate Compatible Growth					
🐳 Setup				_	
Installing					
Please wait while Setup	o installs PostgreSQL	on your compute	er.		
Preparing to Install		Installing	I		
VMware InstallBuilder —			< Back	Next >	Cancel

Step 10: Once the PostgreSQL setup wizard is completed, check the Stack Builder box, to launch the Stack Builder.





Step 11: Select the additional package you want to install. In this instance we will install PostGIS 3.3 Bundle for PostgreSQL 15 (64bit) v3.3.3. You can find the PostGIS extension in the Spatial Extension category.

😂 Stack Builder 4.2.1	×
	Please select the applications you would like to install. Categories Add-ons, tools and utilities Database Drivers Database Server Registration-required and trial products Spatial Extensions PostGIS 3.3 Bundle for PostgreSQL 15 (64 bit) v3.3.3 (installed) Web Development
	< Dack INEXT > Cancel

Step 12: Click Next

😂 Stack Builder 4.2.1 (Not Resp	ponding)
S	Review your selections and choose a download directory if required, and then click the Next button to begin downloading the packages you have selected.
	Selected packages:
GZ	PostGIS 3.3 Bundle for PostgreSQL 15 (64 bit) v3.3.3
	Download directory:
	C:\Users\Seabilwe Tilodi
	< Back Next > Cancel

Step 13: Click Next



Step 14: The PostGIS dialog will appear, click the 'I Agree' button.

DoctGIS Rundle 2.3.2 for	PostareSOL v6/ 15 Setup				~	
	Posigresozi xo4 15 setup				~	
	License Agreement					
	Please review the license terms to 2.2.2 for PosteroSQL v64.15	pefore install	ing Pos	tGIS Bun	dle	
lat	5.5.5 for PostgreSQL X64 15.					
Press Page Down to see th	ne rest of the agreement.					
GN	U GENERAL PUBLIC LICENSE					
V	ersion 2, June 1991				1	
Copyright (C) 1989, 1991 Free Software Foundation, Inc. 59 Temple Place, Suite 330, Boston, MA 02111-1307 USA Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.						
	Preamble					
The licenses for most sof	ftware are designed to take away yo	our				
If you accept the terms of agreement to install PostG	the agreement, click I Agree to con IS Bundle 3.3.3 for PostgreSQL x64	tinue. You m 15.	ust acc	ept the		
Nullsoft Install System v3.08						

Step 15: Choose PostGIS as a component you want to install.



PostGIS Bundle 3.3.3 for Po	stgreSQL x64 15 Setup	- 🗆 X
a s	hoose Components Choose which features of PostGIS (64 15 you want to install.	6 Bundle 3.3.3 for PostgreSQL
Check the components you wa install. Click Next to continue.	ant to install and uncheck the com	ponents you don't want to
Select components to install:	PostGIS	Description Position your mouse over a component to see its description,
Space required: 301.5 MB		
Nullsoft Install System v3,08	< Back	Next > Cancel

Continue to click Next

PostGIS Bundle 3.3.3 for PostgreSQL x64 15 Setup	_		\times
Choose Install Location Choose the folder in which to install Po PostgreSQL x64 15.	stGIS Bundl	e 3.3.3 fo	r
Setup will install PostGIS Bundle 3.3.3 for PostgreSQL x64 15 in the in a different folder, click Browse and select another folder. Click Ner Destination Folder	following fol kt to continu	der. To in: Je.	stall
C:\Program Files\PostgreSQL\15	Brov	vse	
Space required: 301.5 MB Space available: 91.0 GB Nullsoft Install System v3.08			
< Back N	ext >	Can	cel

Step 16: Once the installation is complete, click Finish.



Step 17: To complete the whole installation, click Finish.

<table-of-contents> Setup</table-of-contents>	- 🗆 X
Packaged by: EEBE POSTGRES	Completing the PostgreSQL Setup Wizard Setup has finished installing PostgreSQL on your computer.
PostgreSQL	
(J)	
	< Back Finish Cancel

Verify the Installation

There are several ways to verify the PostgreSQL installation. You can try to connect to the PostgreSQL database server from any client application e.g., psql and pgAdmin.



The quick way to verify the installation is through the psql program.

First, click the psql application to launch it. The psql command-line program will display.



Second, enter all the necessary information such as the server, database, port, username, and password. To accept the default, you can press **Enter**. Note that you should provide the password that you entered during installing the PostgreSQL.



Third, issue the command **SELECT** version(); you will see the following output:



🖼 SQL Shell (psql)	_	\times	
Server [localhost]: Database [postgres]:			^
Port [5432]: Username [postgres]: Password for user postgres: psql (12.3)	(4050)		
WARNING: Console code page (437) differs from Windows code page 8-bit characters might not work correctly. See psql refe page "Notes for Windows users" for details. Type "help" for help.	(1252) erence		
postgres=# select version(); version			
PostgreSQL 12.3, compiled by Visual C++ build 1914, 64-bit (1 row)			
postgres=#			

If you are using an operating system other than windows, follow these instructions to install QGIS in your machine:

Linux: <u>https://www.postgresqltutorial.com/postgresql-getting-started/install-postgresql-linux/</u>

macOS: <u>https://www.postgresqltutorial.com/postgresql-getting-started/install-postgresql-macos/</u>

Accessing pgAdmin

When installing PostgreSQL, pgAdmin 4 is also installed.

Step 1: Open pgAdmin

Click the windows button and find the "postgreSQL 15". Once you find it click on it and select the "pgAdmin 4" or you can directly search for the "pgAdmin 4" in the windows search bar.



Step 2: Enter Password

Clicking on the "pgAdmin 4" will ask you to enter the password:

⊳ ~			
hboard Proper	ties SQL Statistics Depende	ncies Dependents	
lcome	2.776		
eature rich Admin is an Open relopers, DBAs ar	gAdmin anagement Tools for Postg Maximises PostgreSQL source administration and manag d system administrators alike.	Unlock Saved Passwords Please enter your master password. This is required to unlock saved passwords and reconnect to the database server(s). Password	juery tool, a procedural code debugger and much more. The too
ick Links			
		Add New Server	Configure pgAdmin
tting Started			
Po	stgreSQL Documentation	pgAdmin Website	Planet PostgreSQL

Provide the master password that you have recently set during the installation and click the "Ok" button to proceed.

Step 3: Select PostgreSQL 15



In the left pane, click on the "Servers" and then "PostgreSQL 15". Consequently, the following dashboard will appear:

Browser 😨 🎟 🖬 🗛 >_	Dashboard	Properties	s SQL Statistic	s Dependenci	es Dependents							×	
✓ E Servers (7)	Server ses	sions					Total Active	Idle Transactions	per second			Transactions 📕 Commits 📕 Rollbacks	
Vie PostgreSQL 14	6							3					
> 4 Login/Group Roles	5											Λ	
> 🏪 Tablespaces	4							2			٨		
	2												
- Constant and the	1												
and the second second second	0							- 0					
10 million (10 million)	Tuples in			nse	rts 🔜 Updates 📕 Delete	Tuples out Fetched Returned Block I/					ck I/O		
- Printer and	1					2000					160		
						1500					120		
						1000					100 80		
						500					60		
								•			20		
	0					0					0		
	Server activity												
	Sessions Locks Prepared Transactions Configuration										Q Search 2		
		PID	Database	User	Application		Client B	ackend start	\$	State	Wait event	Blocking PIDs	
	0 .	9364					2	023-07-31 08:18:20 SAS	π		Activity: WalWriterMain		
	0 .	11516					2	023-07-31 08:18:20 SAS	т		Activity: AutoVacuumMain		
		11656		postgres			2	023-07-31 08:18:20 SAS	т		Activity: LogicalLauncherMain		
	0 .	12276					2	023-07-31 08:18:20 SAS	т		Activity: CheckpointerMain		
	0 .	12284					2	023-07-31 08:18:20 SAS	π		Activity: BgWriterHibernate		
		39972	postgres	postgres	pgAdmin 4 - DB:postg	res	::1 2	023-08-01 11:02:27 SAS	т	active			

If you are using an operating system other than windows, follow these instructions to install QGIS in your machine:

Linux: https://www.commandprompt.com/education/how-to-install-pgadmin-on-ubuntu/

macOS: https://commandprompt.com/education/how-to-install-postgresql-on-macos/