Annex: Geospatial Data Processing with R using WCS and WCPS in Jupyter Notebook

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In this annex, we demonstrate how to process geospatial data using R and interact with Web Coverage Service (WCS) and Web Coverage Processing Service (WCPS) to retrieve and analyze raster data. The examples provided below assume that you have access to a WCS server and are familiar with the basics of R programming.

1 A.1 Installing R:

Install the dependencies necessary to add a new repository over HTTPS:

1. sudo apt install dirmngr gnupg apt-transport-https ca-certificates software-properties-common

Add the CRAN repository to your system sources' list:

1. sudo apt-key adv –keyserver keyserver.ubuntu.com –recv-keys E298A3A825C0D65DFD57CBB651716
2. sudo add-apt-repository 'deb https://cloud.r-project.org/bin/linux/ubuntu focal-cran40/'

Install R by typing:

1. sudo apt install r-base

The installation may take a few minutes to complete. Once completed, verify it by printing the R version:

1. R –version

2 Installing Required Packages

To begin, ensure that the necessary R packages are installed by running the following code:

1. install.packages('IRkernel')

2. install.packages("devtools")
3. install.packages("remotes")

Important: If the installation of packages was unsuccessful, please take a look at the dependencies required for installation

3 Install Python

1. sudo apt install python3-pip

4 Install Jupyter Notebook

Jupyter Notebook can be installed with the pip command. Open the Windows Command Prompt and use the following commands to install Jupyter Notebook.

1. sudo pip3 install jupyter
2. sudo pip3 install jupyter
3. jupyter notebook

The last line runs the Jupiter notebook.

5 Making the kernel available to Jupyter

1. IRkernel::installspec(user = FALSE)