Course
Geocomputation and geospatial analysis

- **Organized by Italian Integrated Environmental Research Infrastructures System (ITINERIS) project**

- **Founded by Next Generation National Recovery and Resilience Plan (PNRR)**

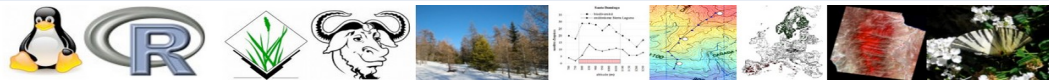- **Teaching activities by Spatial Ecology**

Giuseppe Amatulli background

**Research scientist at
School of the Environment,
Yale University, USA**

**Founder of
Spatial Ecology**

- **Forester by training**

- **Geographic information science by training**

- **Computer scientist by trade**

- **Coding in BASH, R, PYTHON, GDAL & PKTOOLS, GRASS for geographical analysis**

Teaching Tools

LINUX Bash shell programming

(AWK for processing text-based data)

GDAL/OGR/(PKTOOLS) geotools library for the manipulation of geospatial data
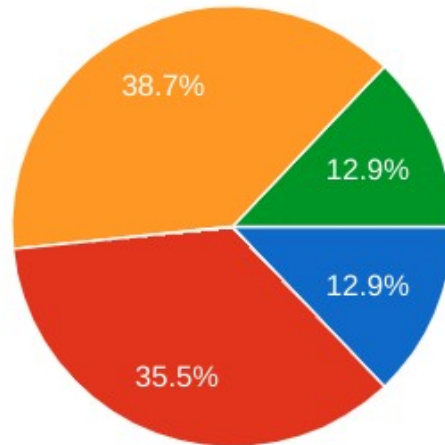
Python GeospatialLibrary

Knowing each other

- **To save time I encourage to visit the class roster page at**

- **https://spatial-ecology.net/docs/build/html/COURSESAROUNDTHEWORLD/**
  course_geocomp_geoanlysis_04_2025_foto/
  course_geocomp_geoanlysis_04_2025_roster.html

Do you know any programming or scripting language?   Copy chart
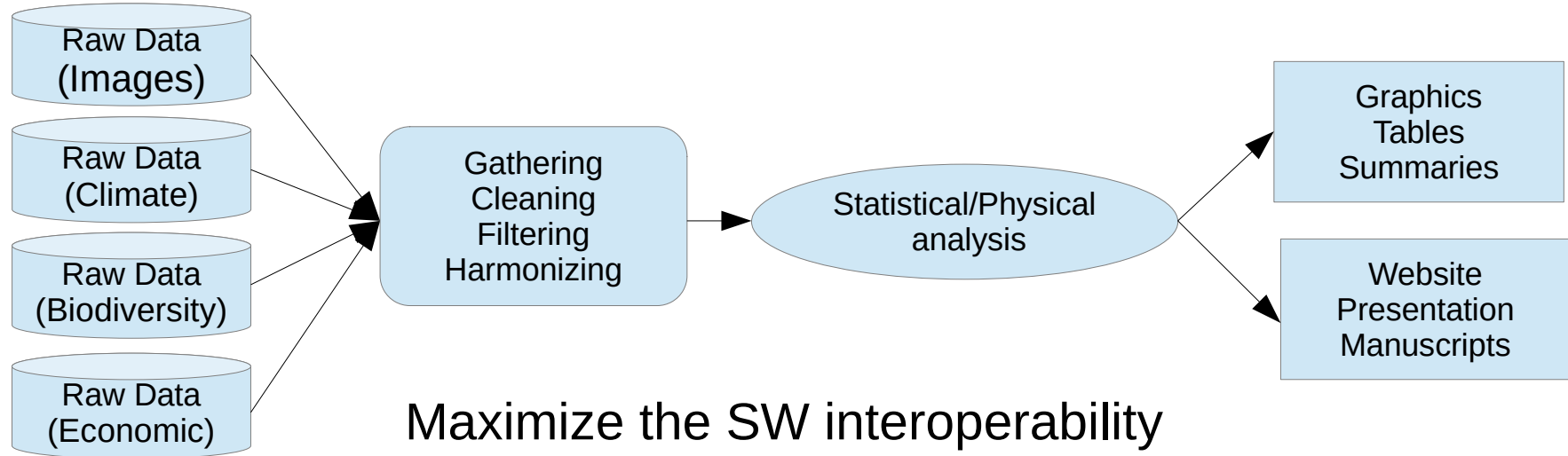
31 responses

- No
- Yes, very basic level (Started a few months ago but still write simple scripts)
- Yes, intermediate level (Used for several years and able to create general scripts)
- Yes, advanced level (Used for several years and able to write complex scripts using functions)
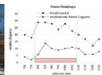
38.7%
12.9%
12.9%
35.5%

Reproducible research & "big data" processing

Codes that are easily published > no license constraints

Complex work-flows > integrate different data analysis methods

Raw Data (Images)

Raw Data (Climate)

Raw Data (Biodiversity)

Raw Data (Economic)

Gathering Cleaning Filtering Harmonizing

Statistical/Physical analysis

Graphics Tables Summaries

Website Presentation Manuscripts

Maximize the SW interoperability
in a stable Operating System

Why use Linux/OpenSource?

Security: extremely stable and reliable, no viruses, interoperable: Unix, Windows, Mac, Android, …

Applications: thousands of free programs, programming languages, server services

Versatility: minimum HW requirements, extremely portable, very fast performance

Freedom: free to download/test/install/modify/ configure/develop/distribute/... it's fun!

Freedom? and why it's fun?

Code:
- Understating the code beyond a process
- Be able to modify the code
- Build up your own algorithm.
- Use all the SW that I want without license constraints

Help:
- Get help from mailing list
- Keep in touch with the developers for code adjustment and improvement

Process:
- Job priority processing
- Job scheduling
- RAM management

Remote server:
- Automatic connection to remote servers
- Overpassing quota issues in remote servers, by creating a folder linked to your PC
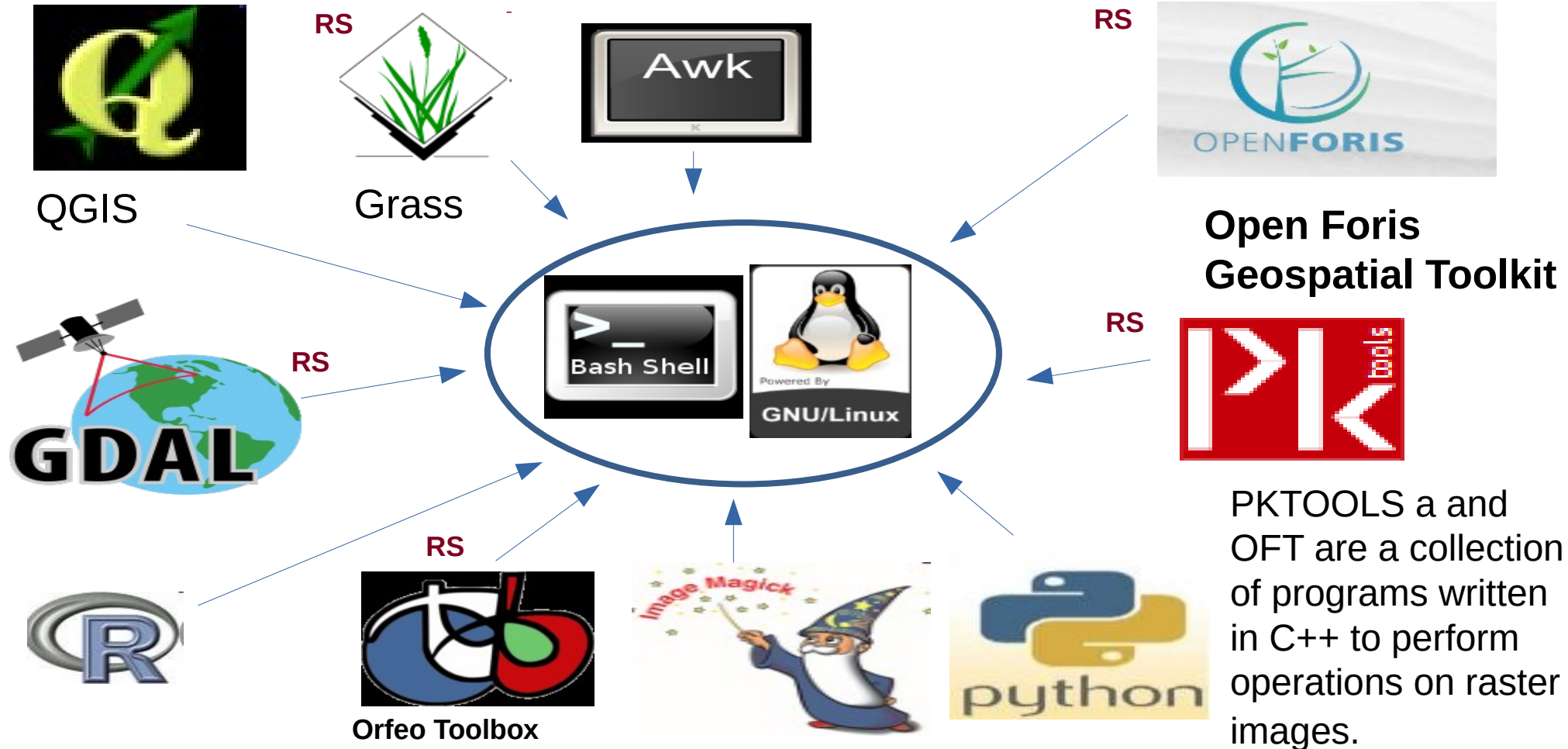
Hardware resources:
- Storing temporal file in ram rather in the hard-disk, by creating a folder in the ram
- Get the best of different programing languages and create a unique work flow.

Last but not least:
- Enjoy the life in the meantime the PC is working for you!

Ubuntu Linux operating system
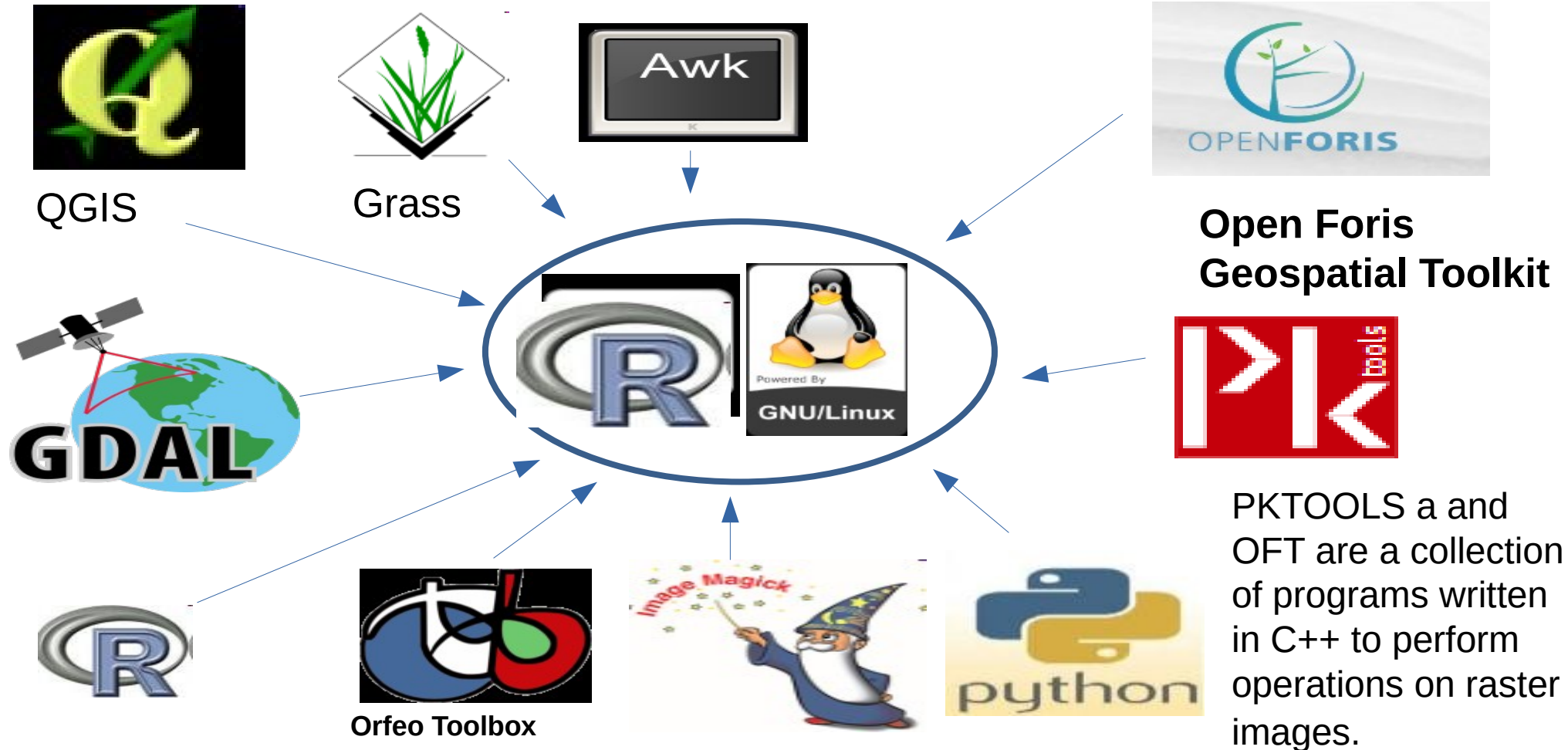## Programming languages interaction

QGIS

Grass

RS

RS

Open Foris Geospatial Toolkit

RS

RS

RS

Orfeo Toolbox

PKTOOLS a and OFT are a collection of programs written in C++ to perform operations on raster images.

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Programming languages interaction

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