A Data Scope for Satellite Data

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http://www.czechspaceportal.cz/files/files/images/EO/2012_12_11_15_40_47.jpg

The Copernicus program will produce a sizable stream of remote sensor data, which when combined with ground sensor systems provides a fertile soil to explain the past and predict the future of Planet Earth's health. The sheer size and data complexity calls for innovative technology to provide efficient and effective data exploration.

We present a DataScope for Satellite data, a framework geared at interactive derivation of knowledge from various remote sensing data sources.

With a DataScope, raw data from our environment is extracted and organized before being massaged by a set of tools to extract information [1].

It provides fast data ingestion and facilitates the integration of different heterogeneous data sets for exploration in four dimensions, 3D space and time.

Our DataScope for remote sensing data creates a true symbiosis between the best of bread open-source columnar database system, specialized libraries, and programming languages (R, Python, C, etc).
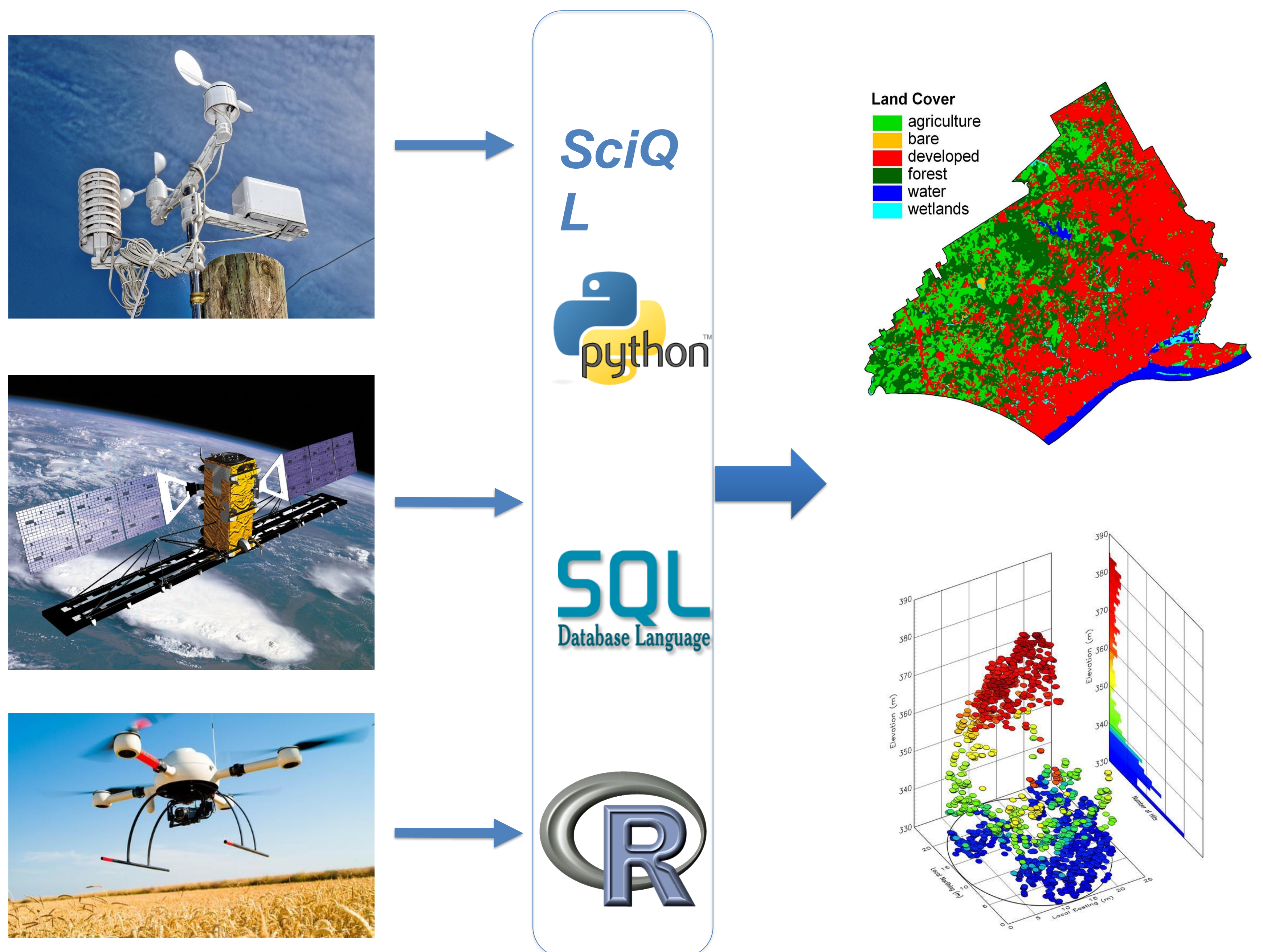
A vision in action:

- **Astronomy,** support for the Sloan Digital Sky Survey (SDSS) [2], which aims to map one third for the sky to obtain observations of 100 million objects. Subsequently, the technology was included in the Dutch LOFAR radio telescope software stack, and is currently researched in the context of an Amazon supported project for the Square Kilometer Array telescope [3].

- **Remote sensing,** its efficiency was shown with several use cases, ranging heat islands detection for urban planning [4] using LIDAR, cadastral data and ground based sensor data as the data substrate, to satellite image analysis for forest fire detection and precision farming [5].

[1] "The datascope," http://releases.jhu.edu/2010/11/01/new-jhucomputer-to-enabledata-analysis-not-possible-today/.
[2] M. Ivanov and et al, "MonetDB/SQL Meets SkyServer: the Challenges of a Scientific Database", SSDBM, 2007
[3] "MonetDB meets SKA in the Cloud", https://www.monetdbsolutions.com/news/monetdb-ska-aws.
[4] R. Goncalves and et al, "A round table for multi-disciplinary research on geospatial and climate data," IEEE e-Science, 2015
[5] EU Projects, e.g. TELEIOS http://www.earthobservatory.eu http://www.linkedeodata.eu/

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