Ukrainian students

Geosystem services and open source GIS applied
Case study description

Norconsult

Geosystem services and open source GIS applied to an Ukrainian area
Case study description
Uppdragsnr.: **000**   Version:

Norconsult ◆

Uppdragsgivare:	Ukrainian students
Uppdragsgivarens kontaktperson:	
Konsult:	,
Uppdragsledare:	
Teknikansvarig:	
Handläggare:	

Version	Datum	Beskrivning	Upprättat	Granskat	Godkänt

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Innehåll

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1   Introduction

Decisions on subsurface resource access often follow a 'first come, first served' approach, potentially leading to conflicts and impeding sustainable development. Geosystem services (GS) have been proposed to improve decision-making, but discrepancies exist between its two main definitions. To support informed decisions, cost-benefit analysis (CBA) can weigh positive and negative effects on society, including future subsurface resource and geosystem service supply. Applying a CBA rule to two theoretical cases showed that mapping subsurface project effects using GS can highlight consequences and affected parties. However, additional analyses are necessary to capture the range of subsurface benefits and avoid double counting in CBA.

2   Method

One method for working with geosystem services using open source software is to utilize the OpenGeo Suite, a collection of open source geospatial software tools. The suite includes GeoServer, which can be used to serve geosystem service data and provide web-based access to them. Additionally, the suite includes OpenLayers, which can be used to visualize geosystem service data in web applications.

To work with geosystem services using open source software, one can follow these steps:

Identify the geosystem services of interest and collect data on them.

Organize and store the geosystem service data in a format compatible with GeoServer, such as a shapefile or GeoJSON file.

Install and configure GeoServer to serve the geosystem service data.

Use OpenLayers or other web mapping libraries to create a web-based visualization of the geosystem services.

Use additional open source tools, such as QGIS, to perform spatial analysis on the geosystem service data.

By using open source software for working with geosystem services, one can take advantage of a large community of developers and users who contribute to the development and improvement of the software tools. Additionally, using open source software can be cost-effective compared to proprietary software alternatives.

3   Data sources and references

The concept of Geosystem services is explained in Lundin Frisk, 2023 and was applied in a specific Gothenburg example in a BSc thesis by Berntdsson and He (2022).

As far as spatial data goes, I guess you as native Ukraini speakers have a much easier time finding the right resources whether it's shape files or PDFs and such. Here are some references on data for geosystem services GIS work in Ukraine as generated by the Chat GPT AI robot. Not sure if it is just bogus or if it's related to real literature and research. You have to beware and check it for yourself.

"Geospatial Datasets for Ecosystem Services Mapping in Ukraine" by Vitaliy Semenov, Volodymyr Shevchenko, and Iryna Yakovleva. This article published in the journal "Data" in 2020 provides a comprehensive overview of geospatial datasets for ecosystem services mapping in Ukraine, including data on land cover, soil, climate, topography, hydrology, and biodiversity.

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"Ecosystem Services Mapping in Ukraine: Current Status and Prospects" by Iryna Yakovleva, Volodymyr Shevchenko, and Vitaliy Semenov. This article published in the journal "Sustainabliiy" in 2019 describes the current status of ecosystem services mapping in Ukraine and identifies potential data sources and methods for improving this work.

"The State of Ukraine's Environment 2019" by the Ministry of Ecology and Natural Resources of Ukraine. This report provides a comprehensive overview of the state of the environment in Ukraine, including information on ecosystem services, such as water regulation, soil formation, and biodiversity.

"The National Atlas of Ukraine" by the National Academy of Sciences of Ukraine. This atlas provides a wide range of geospatial data on various aspects of Ukraine's environment, including natural resources, biodiversity, climate, and land use.

"Open Data Portal of Ukraine" by the State Agency for E-Governance of Ukraine. This portal provides access to a wide range of open data on various aspects of Ukraine's environment, including geospatial data on land use, soil, water resources, and biodiversity.

These references should provide a good starting point for accessing data on geosystem services in Ukraine.

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4   Timeplan

Task	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14
Start up meeting w. Martin Persson and perhaps others	▓													
Preparation, reading of literature	▓	▓												
Data harvesting and communication with data owners			▓	▓	▓			▓	▓					
GIS work										▓	▓			
Write up a short report 3 – 4 pages												▓		
Prepare a 15 min presentation on your work				░	░	░	░	░	░	░	░	░		
Weekend off						█	█							