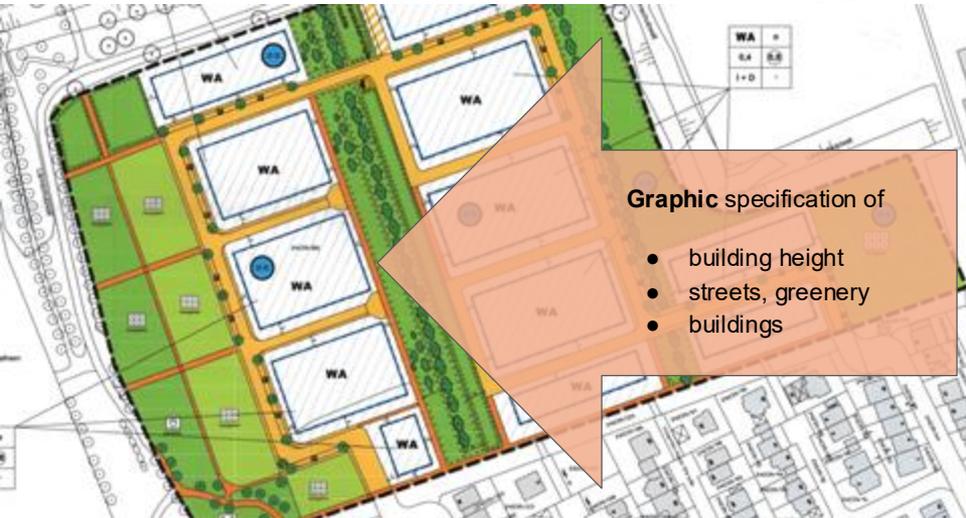# Structured Land Use Information

With BERD@NFDI And Galaxy Infrastructures

Dr. Felicitas Sommer, GreenDIA, Technical University of Munich
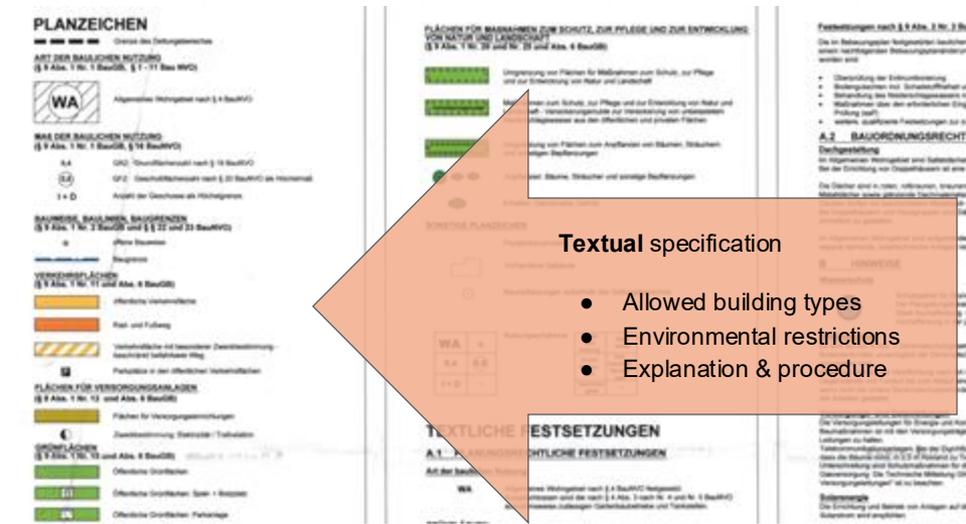Hope Ewudor, GreenDIA, Technical University of Munich

bidt Bavarian Research Institute for Digital Transformation
AN INSTITUTE OF THE BAVARIAN ACADEMY OF SCIENCES AND HUMANITIES

Green DIA

Graphic specification of

- building height
- streets, greenery
- buildings

Textual specification

- Allowed building types
- Environmental restrictions
- Explanation & procedure

Spatial planning determines what can be built where

Binding land-use plans give detailed specifications on parcel-level

➡ **Also for climate resilient, green data centres :)**

November 4th, EOSC Symposium 2025

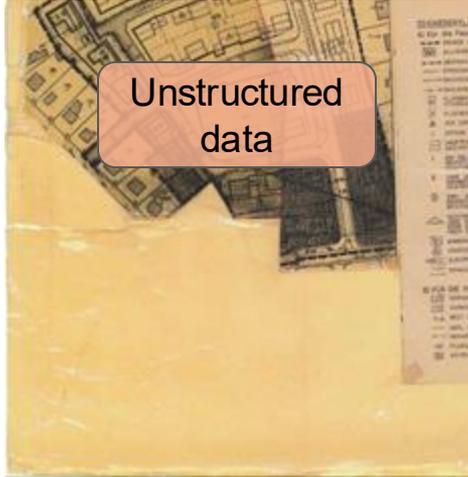What (dis)connects land-use planning and open science?

Key problems

- Scattered documents

- Unstructured formats and definitions

- Mix of personal information (planners offices, names) and regulatory information

- Unclear intellectual rights

The BERD⇆Galaxy Infrastructure for Sustainable Land Use

BERD@NFDI – Research Data Infrastructure for Business, Economic and Related Data

- **Focus:** Making **unstructured data** more accessible and usable in research
- Builds a **FAIR, federated research data infrastructure**

Mission:
Empower researchers to **find, analyze, and reuse** empirical data in a secure and transparent environment
- Info: https://berd-nfdi.de
- Data Portal: https://berd-platform.de

BERD
@NFDI

Galaxy Europe for scalable, open data analysis

Focus: supports reproducible, transparent research since **2005**

Mission:

- **Open Source** framework (every component) for **accessing** & **sharing** data, tools, workflows cross-disciplines with multiple interfaces
    - intuitive webportals for scientists without programming skills
    - unified API for bioinformaticians
    - **4000** tools, 50 VREs on the European Galaxy server

Galaxy
EUROPE

GreenDIA, research consortium project at Technical University of Munich, LMU Munich, and Uni BW Munich
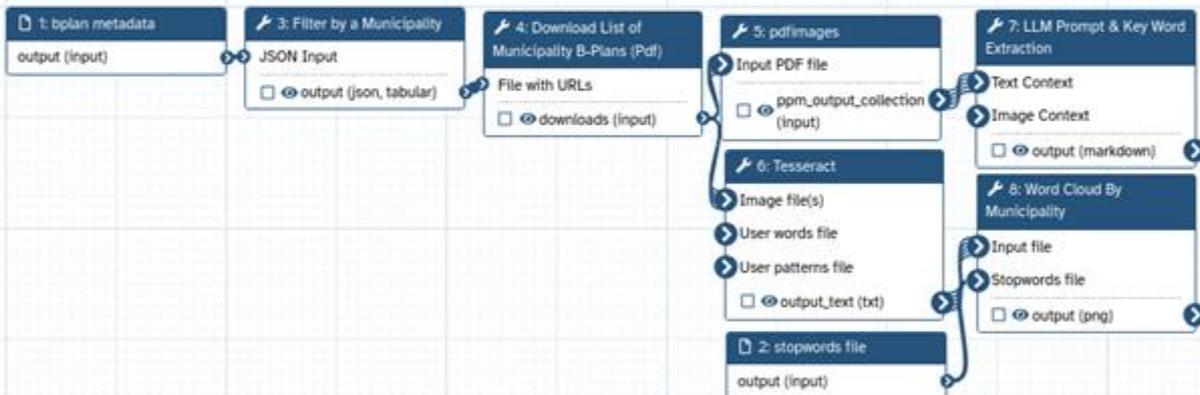
Focus:

- **Interdisciplinary research project** connecting data science & AI, remote sensing, spatial planning and finance & economics on sustainability in the built environment

Mission:

- connect various domains via spatial information as **"boundary object"**
- **Geo-locate regulatory and financial information** and create usable datasets based on domain knowledge

Download | Import | ▶ Run | ✕

About This Workflow

Galaxy_Workflow_Land_Use_Plan_Test_Build - Version 40

Author

ewudorh

All published Workflows by ewudorh

Description

This workflow takes as input a set of building plan metadata and applies text mining / pattern recognition tools (within Galaxy) to scan for a predefined list of sustainability-related keywords (e.g. GFZ, GRZ, BauNVO, etc.). When a keyword is found, the workflow attempts to capture an associated value (numeric, percentage, descriptor) if present in proximity to the keyword. The resulting structured table allows downstream analysis of how many building plans contain each metric keyword, what the reported values are, and comparisons across plans/projects. This enables automation of otherwise manual review of building plan sustainability metrics, facilitating large-scale benchmarking, reporting, or auditing.

Tags

landuse | sustainability

License

MIT License
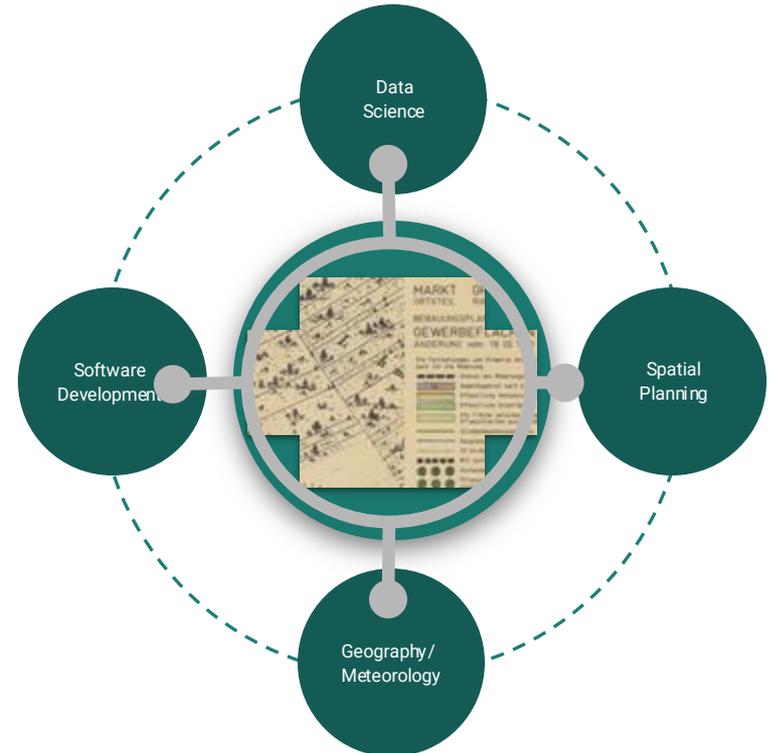
Last Updated

Thursday Oct 30th 11:11:40 2025 GMT+1

Sharing

Use the following link to share preview of this workflow: https://usegalaxy.eu/published/workflow?id=cd5bae8c9bed36e2

Manage sharing settings here.

Workflow diagram nodes:

1: bplan metadata
output (input)

3: Filter by a Municipality
JSON Input
☐ 👁 output (json, tabular)

4: Download List of Municipality B-Plans (Pdf)
File with URLs
☐ 👁 downloads (input)

5: pdfimages
Input PDF file
☐ 👁 ppm_output_collection (input)

6: Tesseract
Image file(s)
User words file
User patterns file
☐ 👁 output_text (txt)

2: stopwords file
output (input)

7: LLM Prompt & Key Word Extraction
Text Context
Image Context
☐ 👁 output (markdown)

8: Word Cloud By Municipality
Input file
Stopwords file
☐ 👁 output (png)

81%

Infrastructure for Spatial Regulatory Information

Outlook:

- Facilitate **collaboration among experts** to share useful **information tailored to different research topics,** practical applications, and thematic areas

- Develop infrastructure and a support network to train and **empower a growing community** to use and contribute to new datasets

Infrastructure for Spatial Regulatory Information
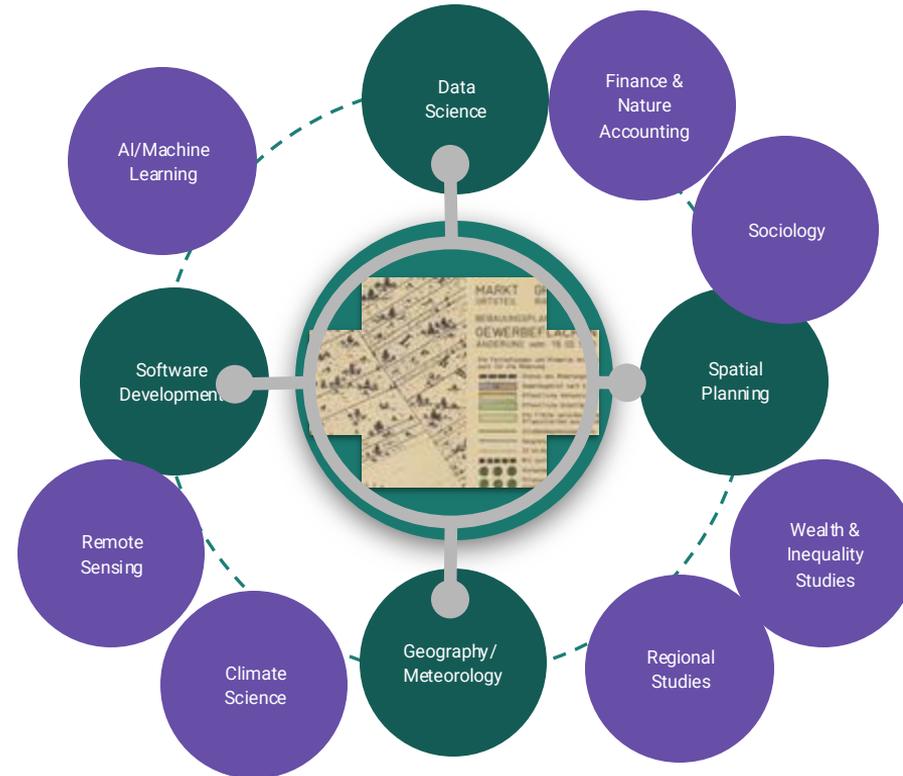
Outlook:

- Facilitate **collaboration among experts** to share useful **information tailored to different research topics**, practical applications, and thematic areas

- Develop infrastructure and a support network to train and **empower a growing community** to use and contribute to new datasets

- Welcome new disciplines and fields by **reducing technical barriers** and providing ready-to-use workflows

- Recognize **open science as an important prerequisite** for usable spatial regulatory information
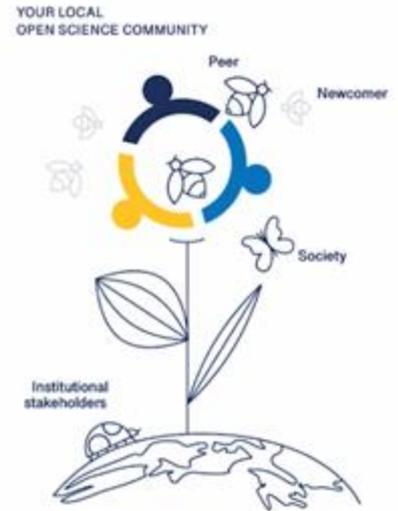
Infrastructure for Spatial Regulatory Information

Potential thematic areas and research topics:

- assessment of planning impact on social segregation (sociology, statistics)

- for microclimate modelling of heat islands (meteorology, climate modelling)

- for comparing municipality strategies on flood risk (land management)

- for city planning and finding densification potential (urban planning and development)

Open Science Community
for researchers, by researchers

YOUR LOCAL
OPEN SCIENCE COMMUNITY

Peer

Newcomer

Society

Institutional
stakeholders

Source: Anita Eerland, Loek Brinkman, EOSC Symposium 2022

Thank you!

https://greendia.de/b-plan-project/
https://usegalaxy.eu
https://berd-platform.de/portals/data

Team: Björn Grüning, Daniela Schneider (Galaxy), Janne Jensen (ZBW), Ahmed Saleh (ZBW)
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EOSC Symposium 2025