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Web Processing - Standardized GIS Analyses for Cable Route Planning

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Timetable

Start Date	End Date	
09/23/2022		Project Start
09/23/2022	10/10/2022	Initial Literature Study
10/01/2022	10/23/2022	Initial Data Search
10/14/2022		Kick-Off Presentation
10/16/2022	10/28/2022	Data Conversion/Costs/test execution
10/28/2022	12/31/2022	provide WPS/implement LCP
12/02/2022		Midterm Presentation
12/14/2022	02/01/2022	Optimization/Research Issue
02/01/2022		Feature Freeze
02/01/2022	02/28/2023	Finalizing Report
02/28/2023		Submission
03/15/2023		Final Presentation

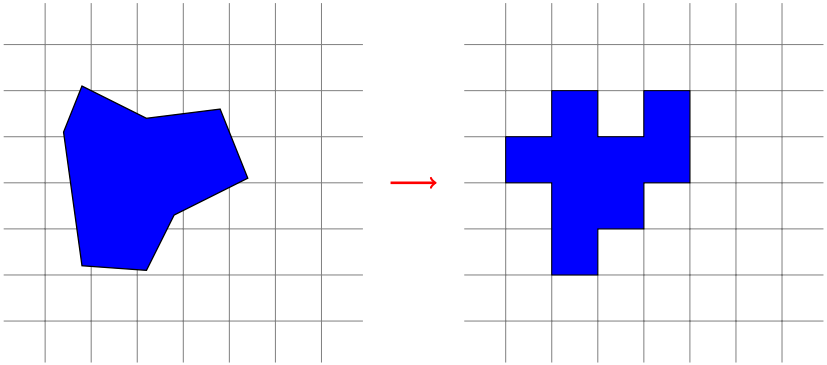
Get Land coverage/ usage planning

Datatype	Sources
Protected Areas	German Environment Agency[1]
land usage	Federal Agency for Cartography and Geodesy[2]
planning land usage	'Metropolplaner' (Planing data Lower Saxony & Bremen)[3]
Houses (Level of Detail 1)	State Office for Geoinformation and Land Surveying of Lower Saxony[4]
transformers, power lines	OpenStreetMap

[1] https://geodienste.bfn.de/schutzgebiete?lang=de
[2] https://gdz.bkg.bund.de/index.php/default/open-data.html
[3] https://metropolplaner.de/metropolplaner/
[4] https://opengeodata.lgln.niedersachsen.de/

Rasterization

- vector (point, line, polygon) –> raster
- all touched <– false



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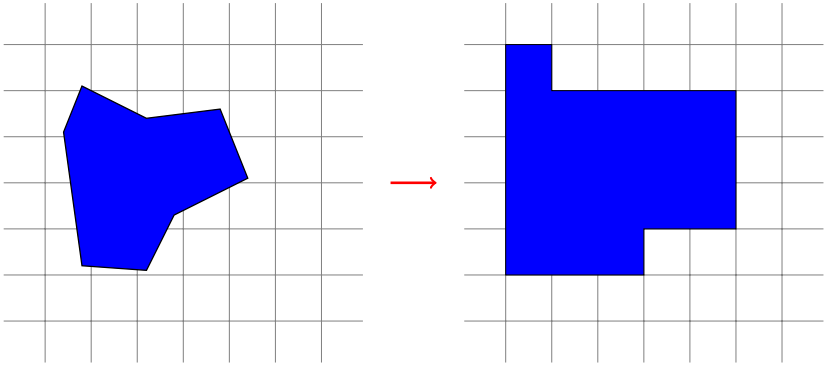


Costs

Cost Level	Cost (numeric)	Example
Prohibited	500	National Parks, Buildings
strongly Restricted	10	Bird Reserve
Restricted	5	Industrial Areas
No Restriction	0.5	Default
Preferential	0.1	Power Grid, Motorway Buffers

Cost Raster

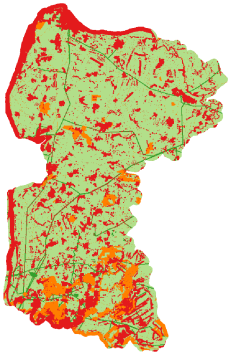
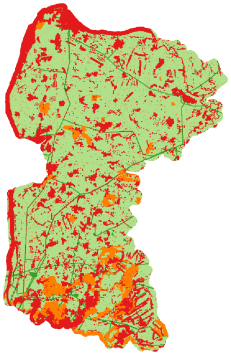


Figure: 100 m resolution, all touched false.

Cost Raster



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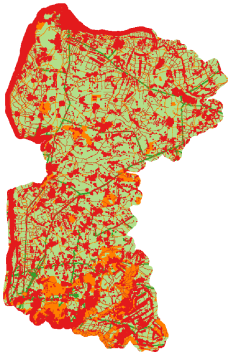

Figure: 100 m resolution, all touched true.

Cost Paths

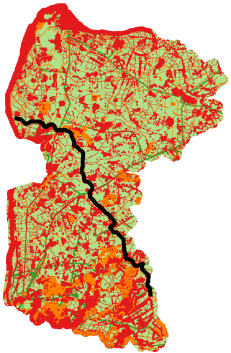

Figure: 100 m resolution, all touched true.

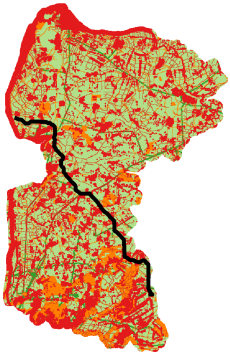

Figure: 50 m resolution, all touched true.

web processing server

- goals:
  - use wps as a simple, standardized way
  - optimize search algorithm
- current:
  - testing PyWPS[5]
  - cost path (open Dijkstra implementation - QGIS-plugin)[6]

[5] https://pywps.readthedocs.io/en/latest/index.html
[6] https://github.com/Gooong/LeastCostPath