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Web Processing - Standardized GIS Analyses for Cable Route Planning

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Review & Topics

Review

- Rasterisation
- Cost Raster
- Cost Paths
- PyWPS (Start)

Topics

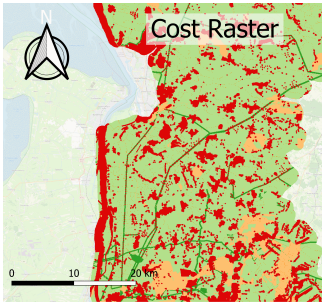
- Web Processing Service (Concluded)
- From Cost Raster to Least Cost Path
- Comparing Paths
- Speed-Up
  - Clipping
  - Down Sampling
  - Super Position Medium Resolution
  - Validation

Web Processing Service (Concluded)

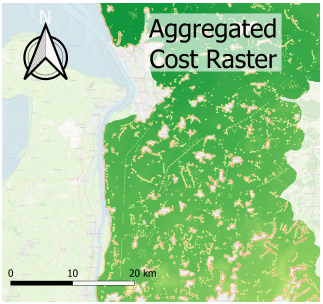
- goals:
  - use wps as a simple, standardized way
  - optimize search algorithm
- current:
  - testing PyWPS[1]
  - cost path (open Dijkstra implementation - QGIS-plugin)[2]

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

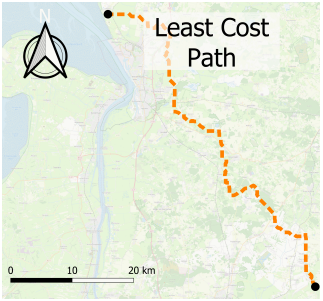
From Cost Raster to Least Cost Path



(a) Cost Raster.



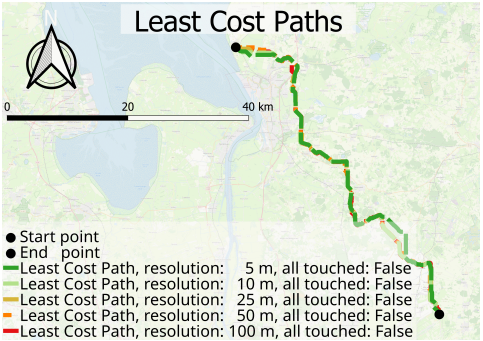
(b) Aggregated Cost Raster.



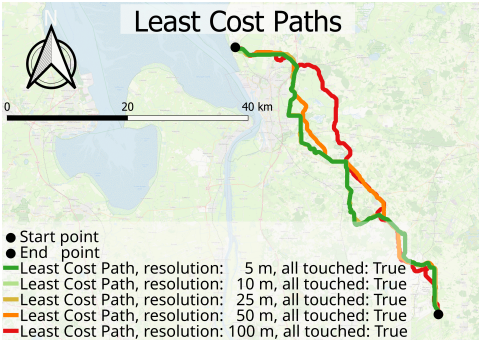
(c) Least Cost Path.

Figure: Figures of the cost raster and the resulting aggregated costs and the Least Cost Path for a resolution of 50 m, all touched set to False.

Comparing: Map



(a) all touched False.



(b) all touched True.

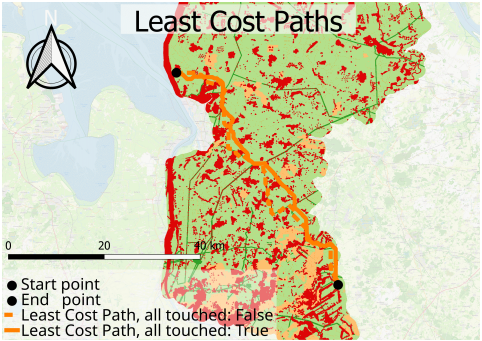
Figure: Figures of the Least Cost Paths, depending on the parameter all touched. All touched False: dashed lines, True: continuous lines. Higher resolutions: green, lower resolutions: red.

Comparing: Costs

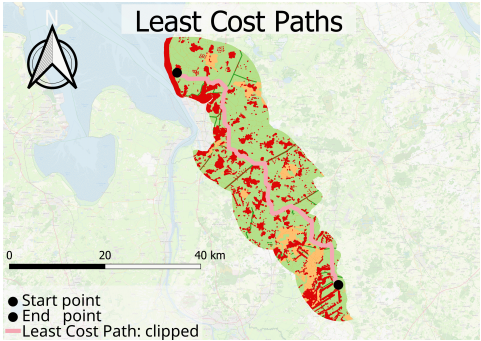
Table: Least Cost Paths: length (l) for the different resolutions (res), including the mean minimum distance (d_{mean}), agg. costs and the agg. costs per resolution.

res /m	$l_{al=f}/m$	$l_{al=t}/m$	d_{mean} /m	agg. $costs_{al=f} \times m$	agg. $costs_{al=t} \times m$
5	76136.3	78002.0	126.0	93329.6	97584.8
10	75430.1	77936.6	277.9	89312.5	97311.8
25	75422.9	78422.9	313.8	83871.7	96816.4
50	76135.0	70620.0	1140.0	70451.2	115003.7
100	76283.8	74120.7	1946.4	64051.6	167226.8

Speed-Up: Clipping



(a) 50 m Resolution.



(b) 5 m, Clipped.

Figure: Figures of the Least Cost Paths, on the cost raster with 50 m resolution and the computed paths, used to clip the high resolution raster.

Speed-Up: Down Sampling

Speed-Up:Super Position Medium Resolution

Speed-Up:Validation