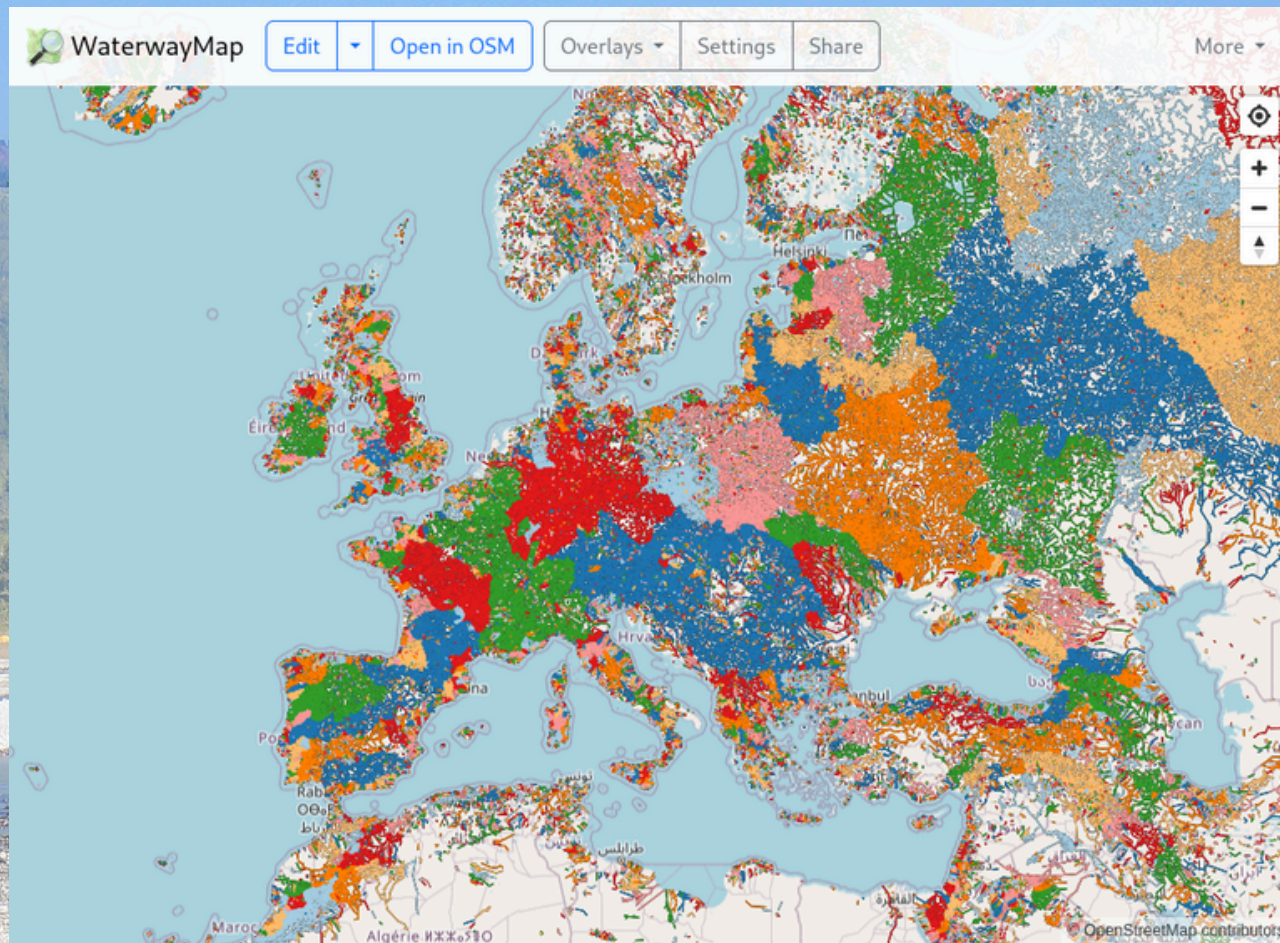


Flowing Connections

Mapping rivers & streams
with WaterwayMap.org



<https://WaterwayMap.org>

“How are the waterway ways in OSM connected together?”

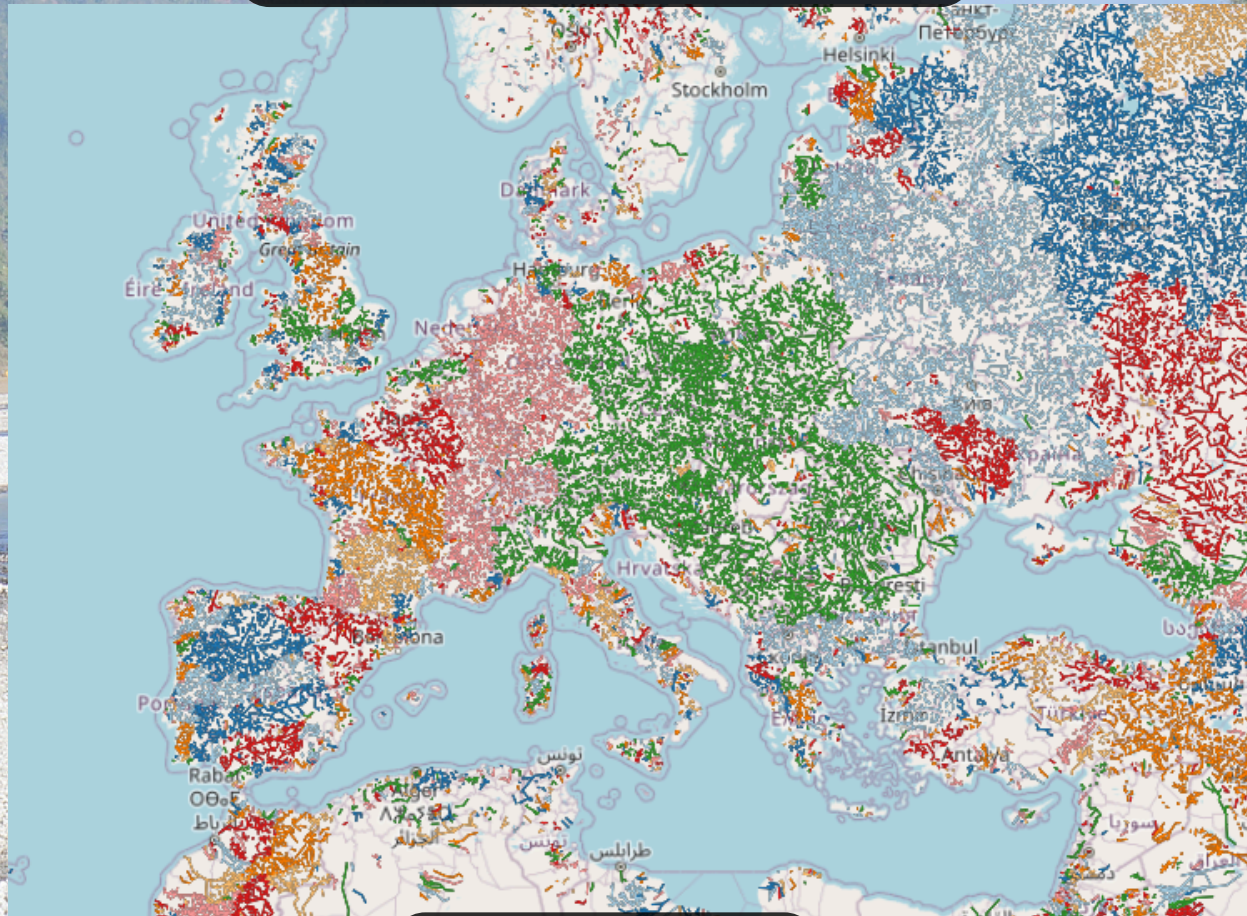
Every connected group of ways, gets a different colour

different map views



incl canals

different map views



excl canals

different map views



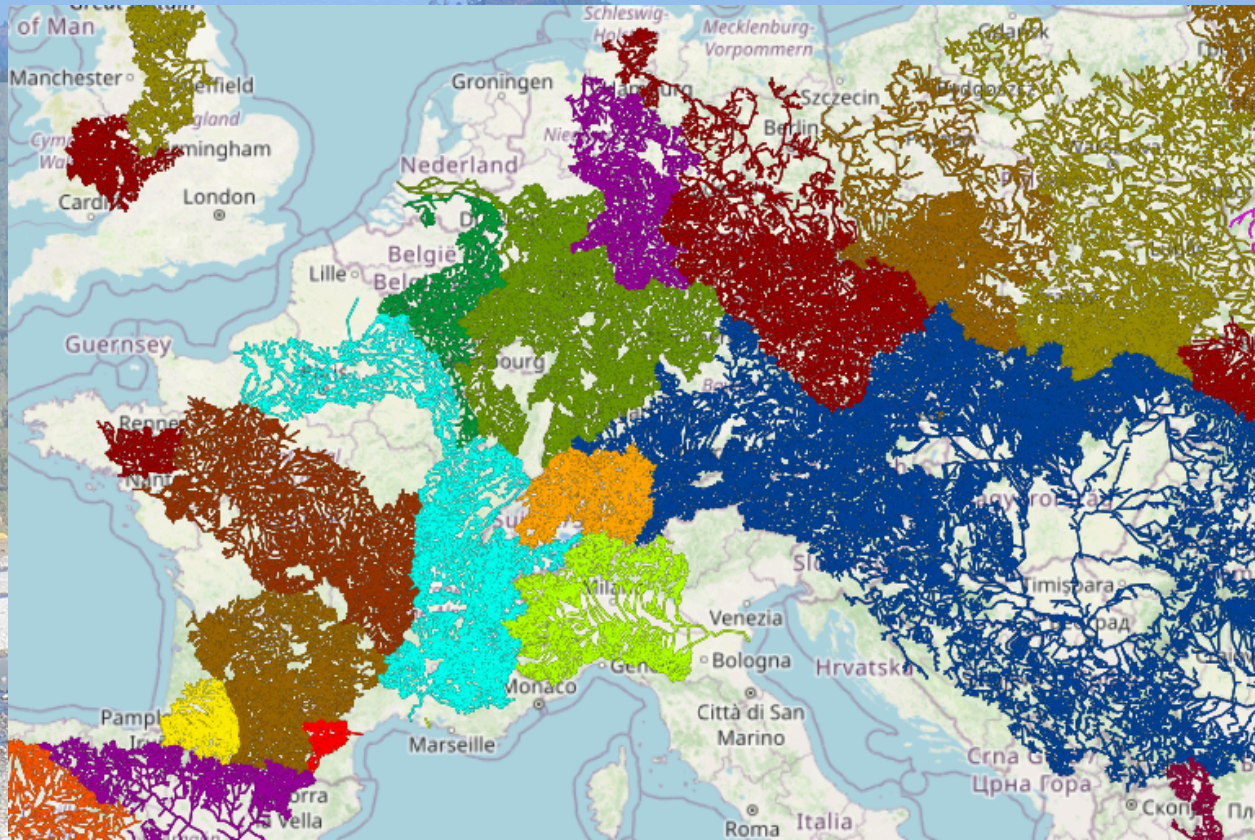
only named waterways, grouped by name

new!

different map views

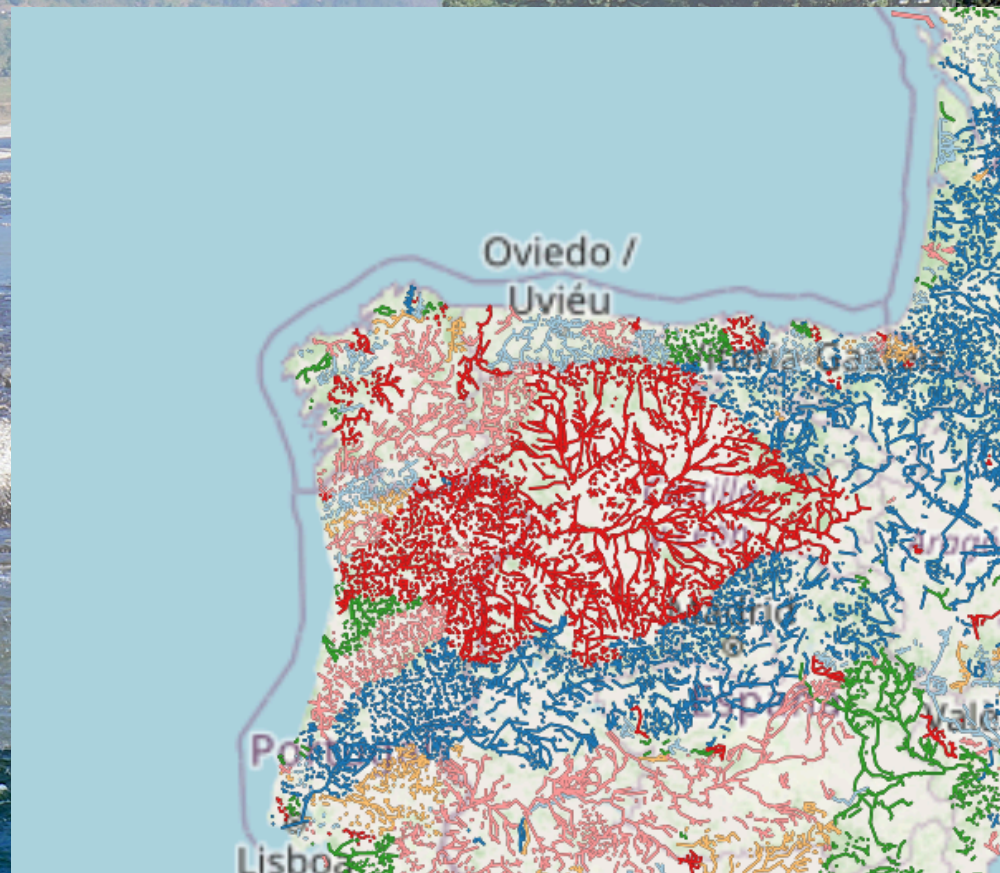
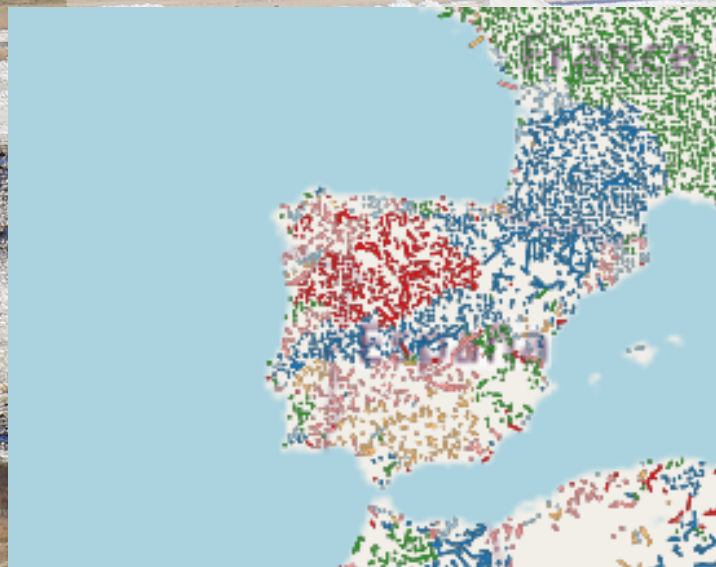


**use way direction to group into watershed
(stop massive continental blobs)**

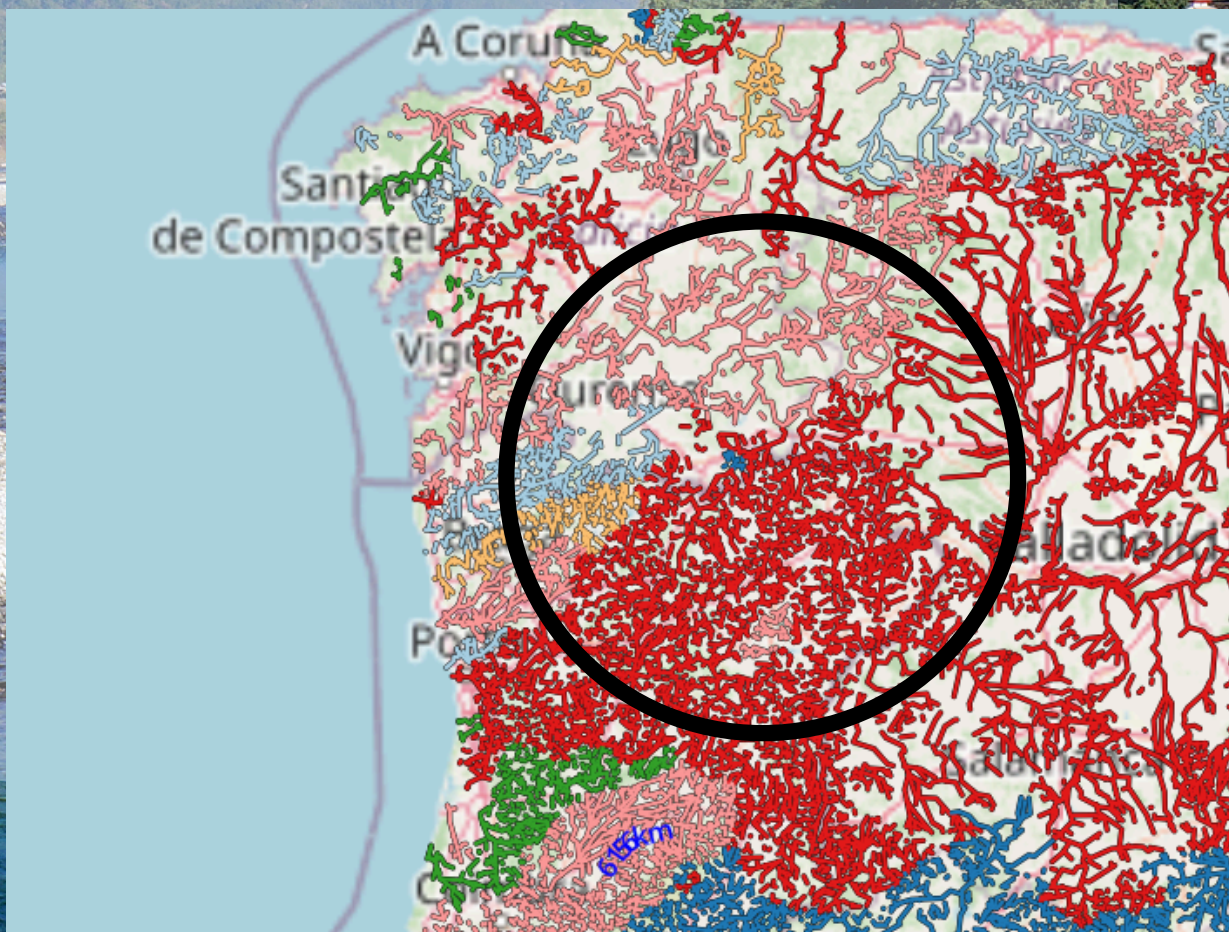
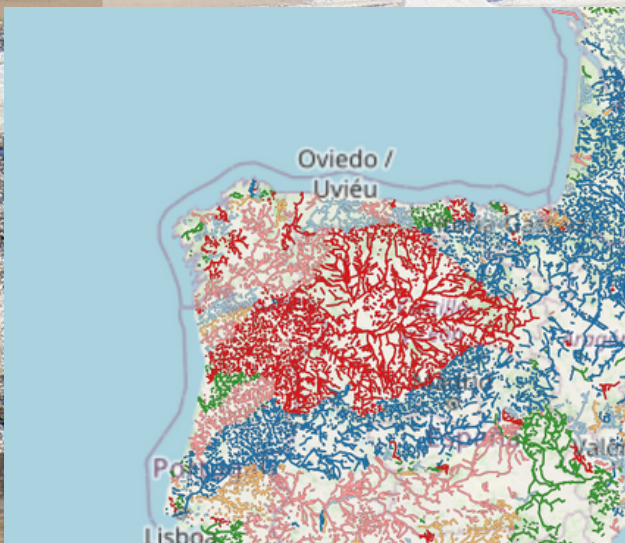


- Filter by min or max length of the system
- change colours
- edit in JOSM/iD/etc

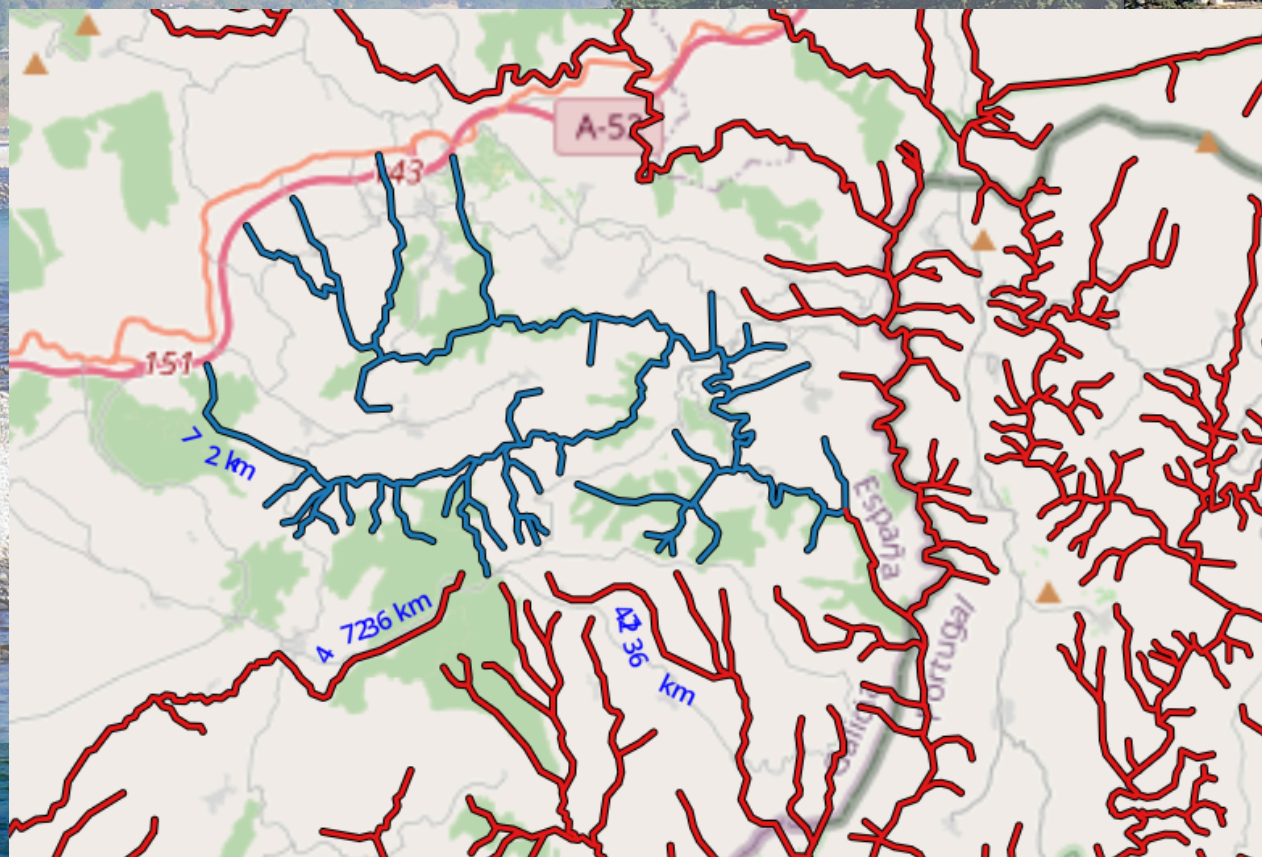
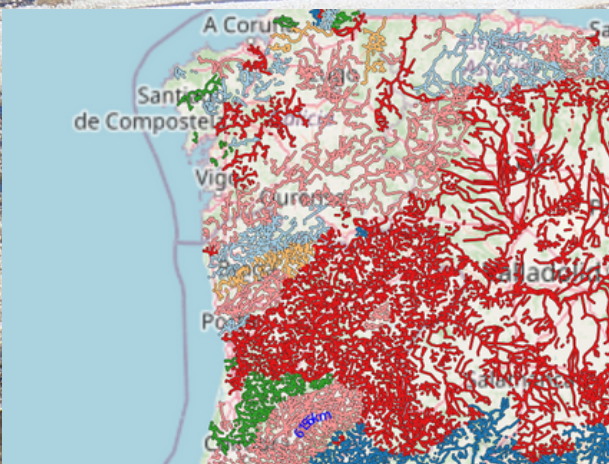
Waterway Connectivity mistake detection



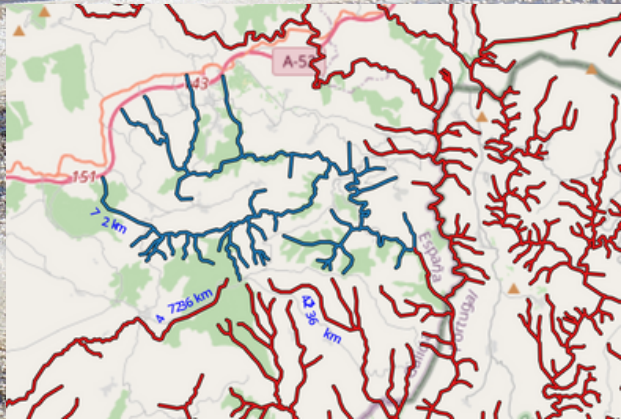
Waterway Connectivity mistake detection

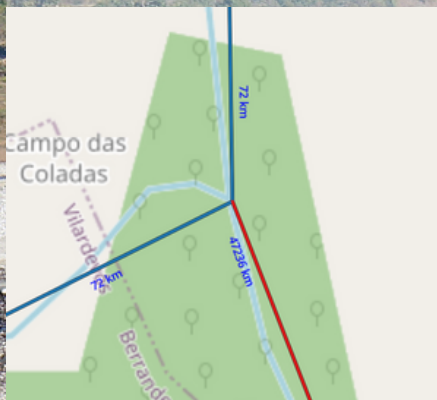
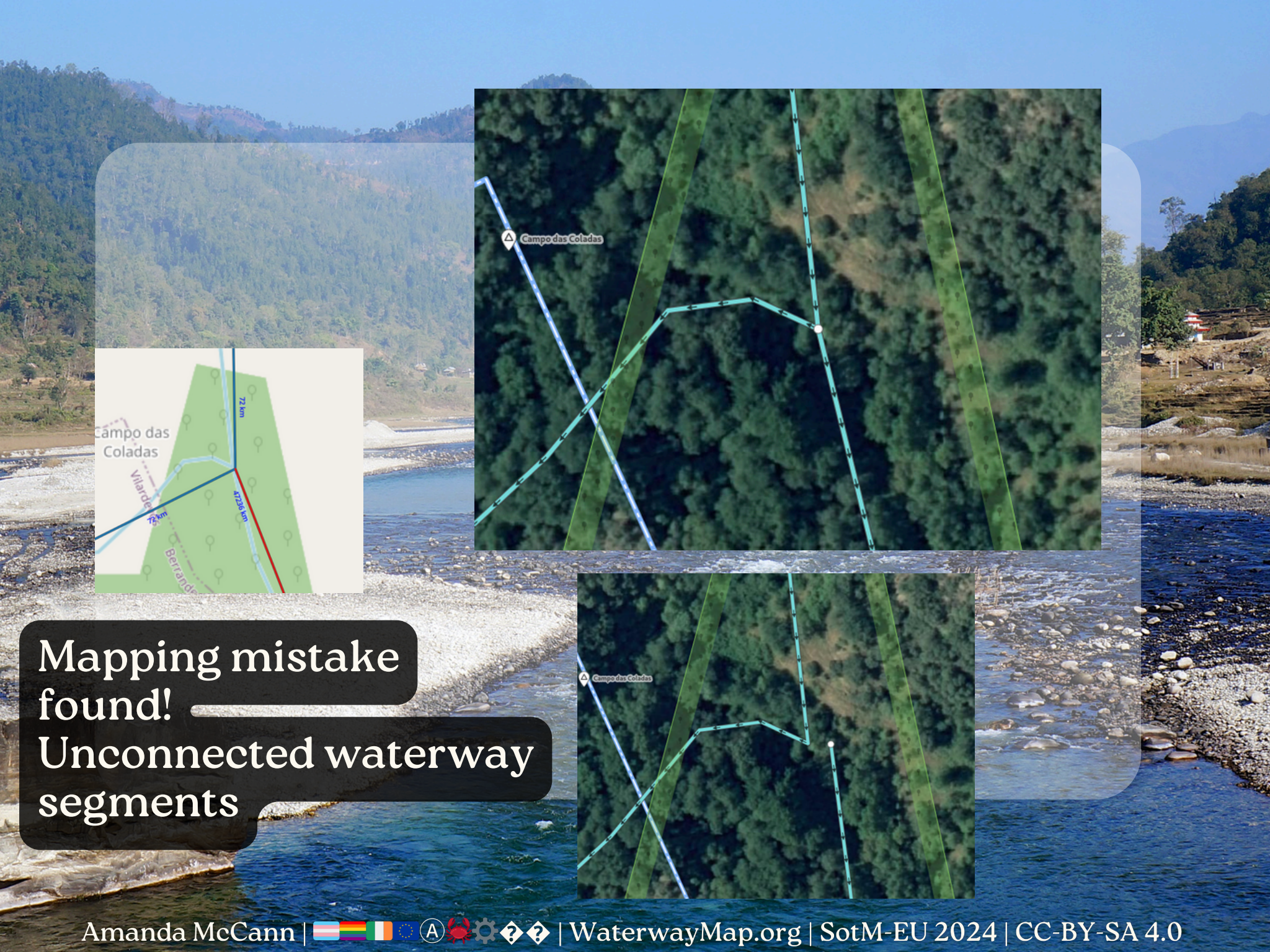


Waterway Connectivity mistake detection



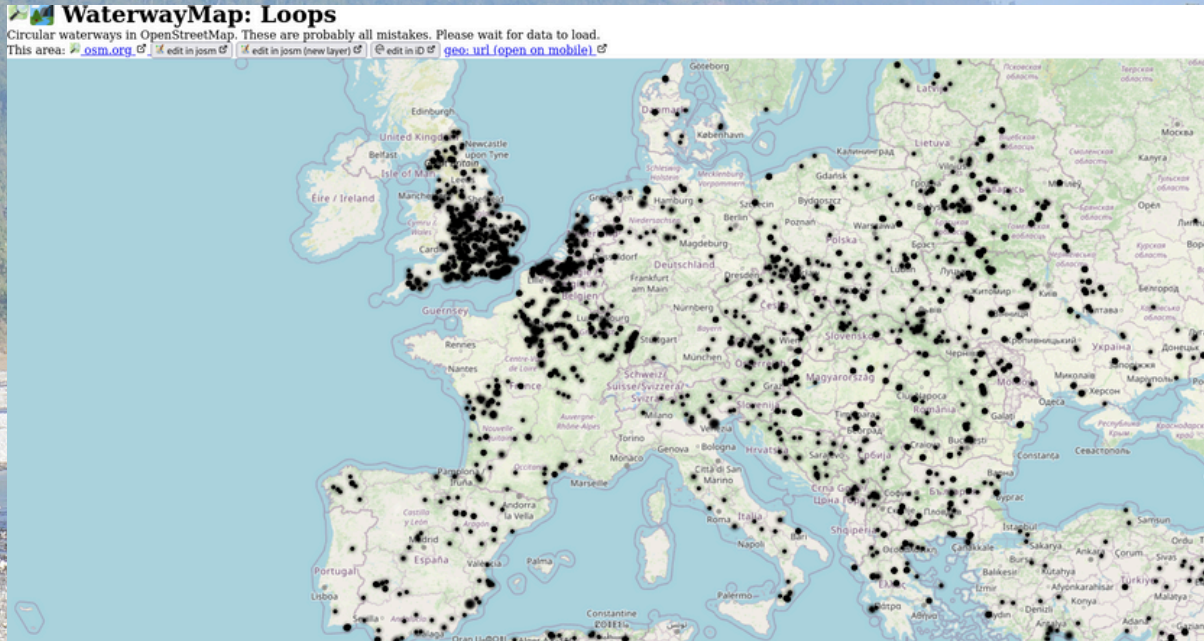
Waterway Connectivity mistake detection





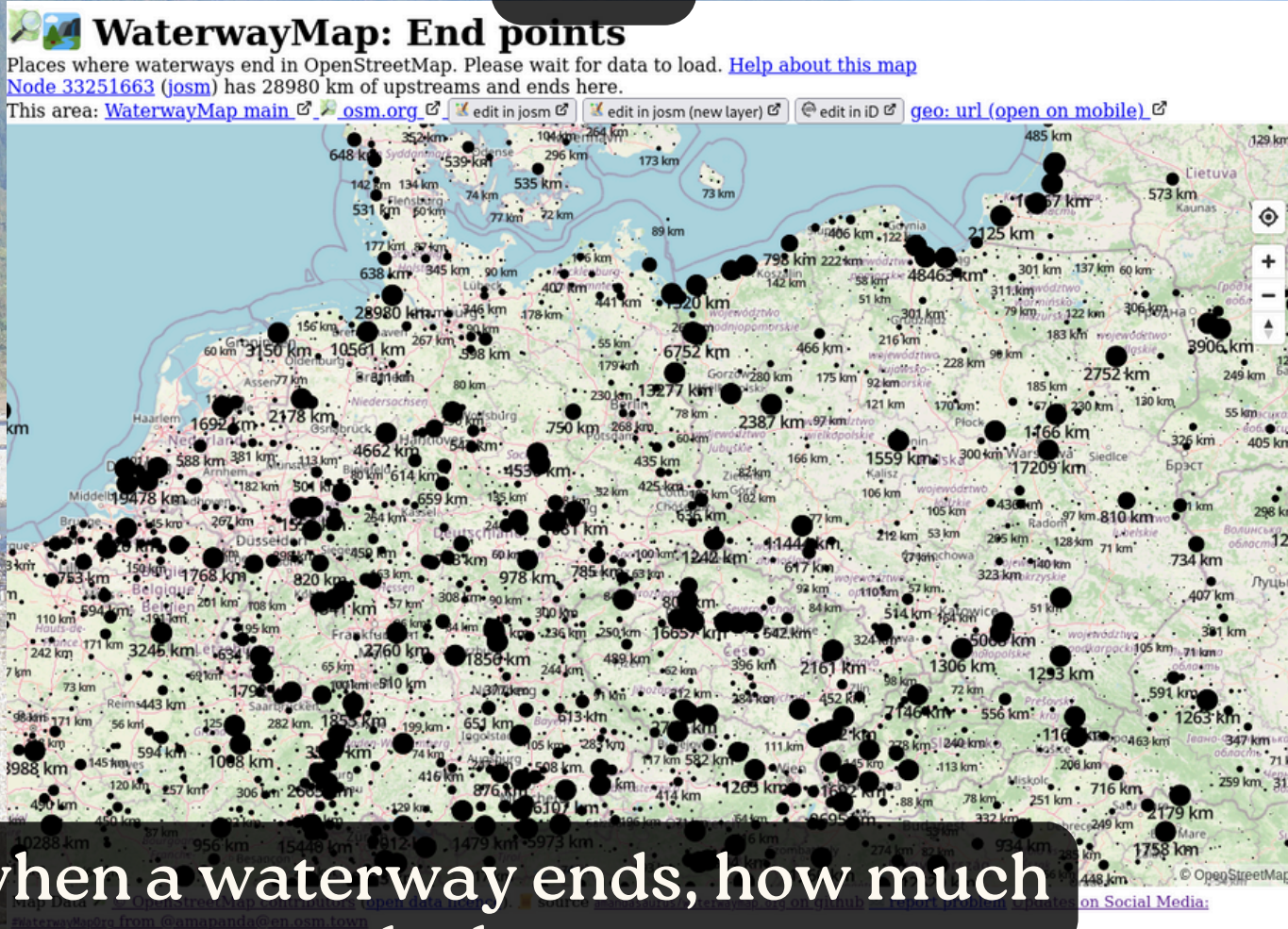
Mapping mistake found!
Unconnected waterway segments

loops



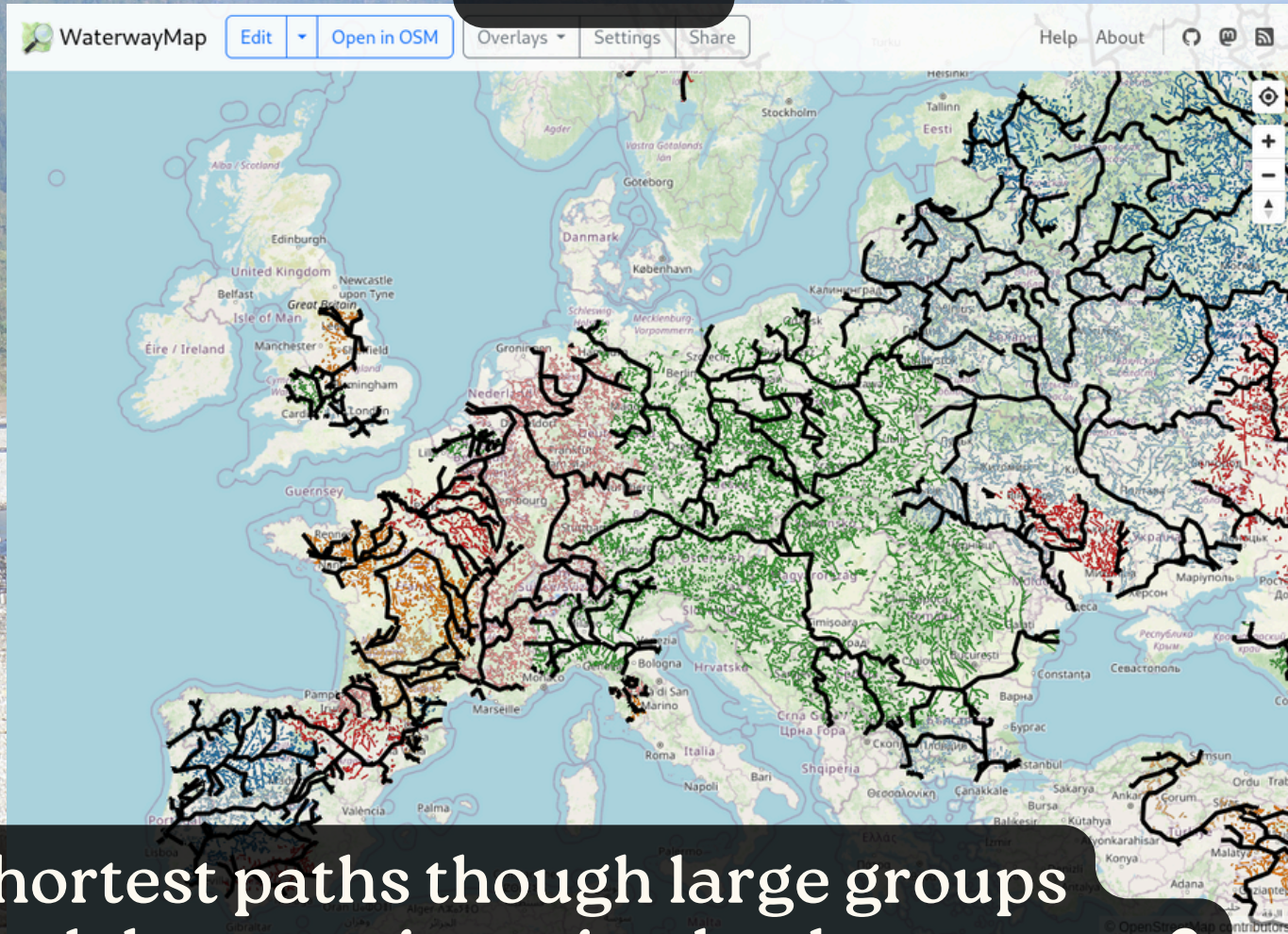
waterways which go in a loop
incl. stats
fix the data or fix the filtering code

ends



when a waterway ends, how much upstream ends there. find mapping mistakes.

frames



shortest paths though large groups
find the mapping mistake that groups 2
watersheds!

Tech behind the scenes

- osm-lump-ways: reads OSM PBF and connects up all the connected ways (i made this)
- updated “daily”
- tippecanoe converts to mvt
- protomaps/pmtiles stored on cloudflare
- maplibre vector tile map via github pages

osm-lump-ways

- reads OSM PBF, outputs geojson(seq)
- powerful filtering on whether ways are included or not

optionally

- only longest X lines
- group by other tag (e.g. `name`)
- split into LineStrings (not MultiLineStrings)



**osm-lump-ways
(can make maps like ... or answer
questions like ...)**

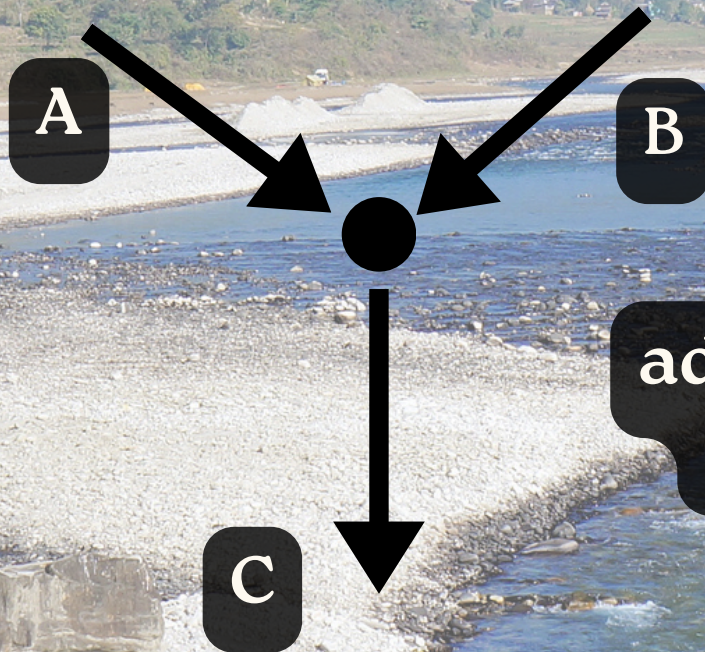
- what's the longest named road in europe (Autostrada Adriatica in Italy, at 774 km)
- what's the longest street called X?

osm-lump-ways
(can be used for qa/data improvement tasks like ...)

- longest named river w/o `wikipedia` tag
- longest river w/o name
- longest road w/o etymology source
- longest highway=X w/o `lanes` / `name`

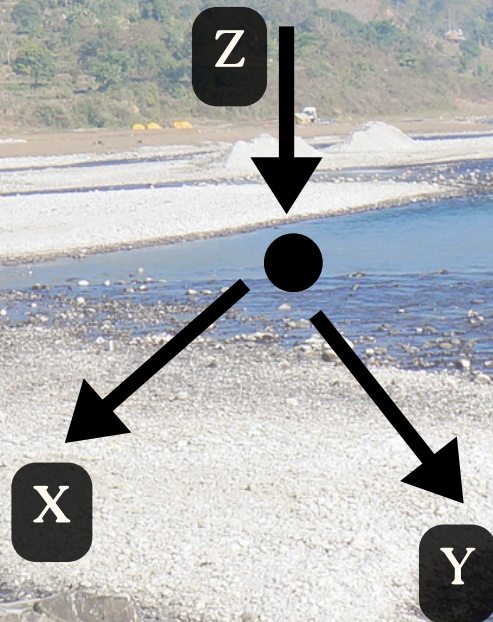
fix the biggest mistakes first!

**behind the scenes
calculating upstream/downstream**



**2 ways join
add up the upstream value
simple & unsurprising
 $C = A + B$**

**behind the scenes
calculating upstream/downstream**




**ways split.
How to distribute Z?**

**Currently split Z equally
between X & Y**

**leads to results that humans
find surprising**

(i have a new idea)



if you build it, they will come

- people started mapping and fixing map errors
- people submitted code improves
- (new modern bootstrap UI from mxdanger)
- canoeist using it

lessons

- OSM data big. programmes works on small region, falls over on planet
- OSMers will fix up the data when they see the errors
- OSMers will talk about better tagging if there's a map
- OSM data creators & OSM data consumers work & grow together

future

- new downhill calculation algorithm
- make downhill map look nicer
- (more) files available for download for QA or cartography
- make maps based on upstream/watershed values
- relations (for waterbodies)

lessons

- OSM data excellent, but imperfect
- if your algorithm relies on zero errors, it'll probably fail on OSM data
- happened to me with loops in waterways.
- you must work around the non-zero number of data mistakes
- some algorithms can't work with OSM data (e.g. strahler calculation)

thank you

<https://WaterwayMap.org>

<https://github.com/amandasaurus/waterwaymap.org/>

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