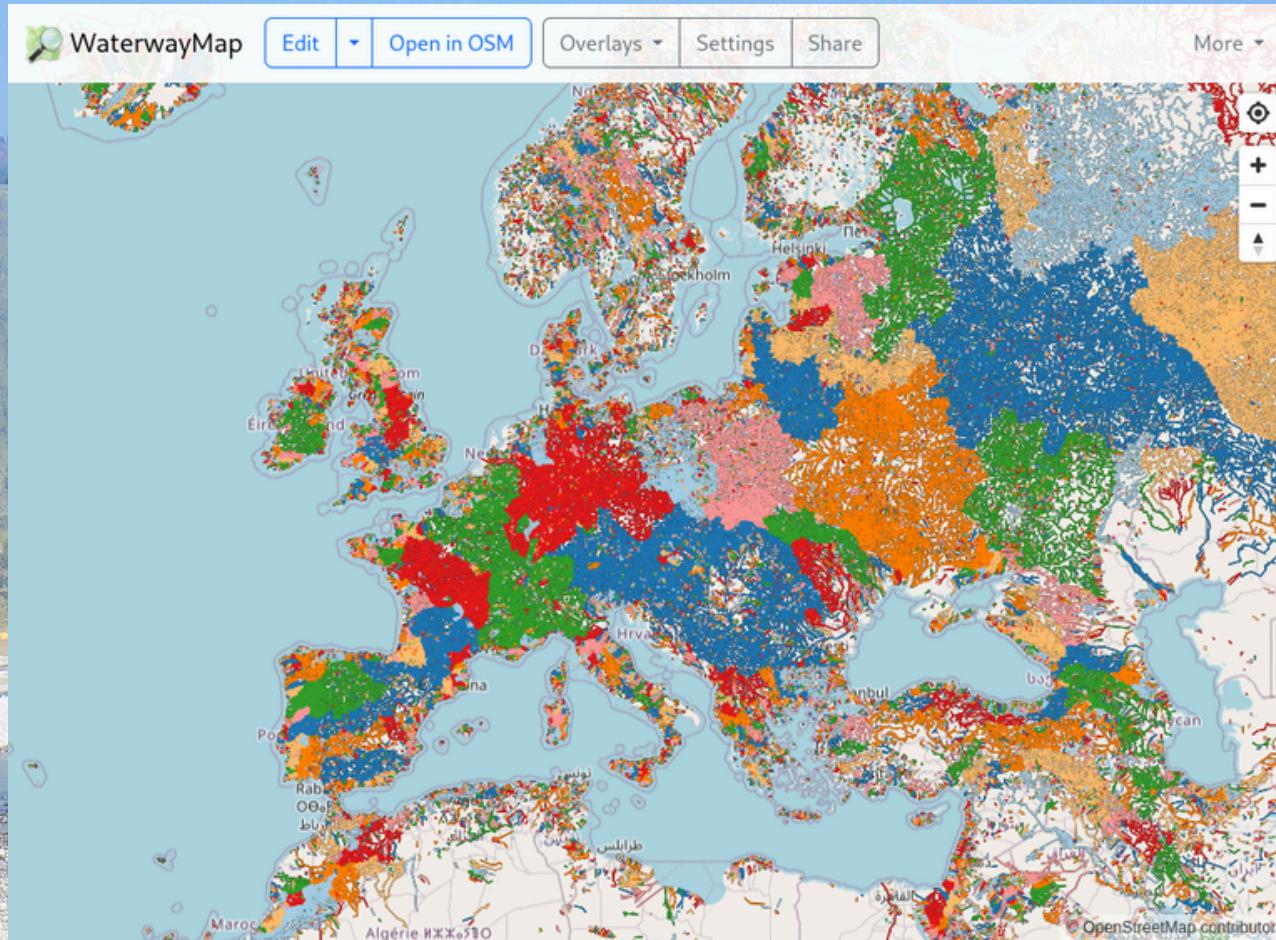


Flowing Connections

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

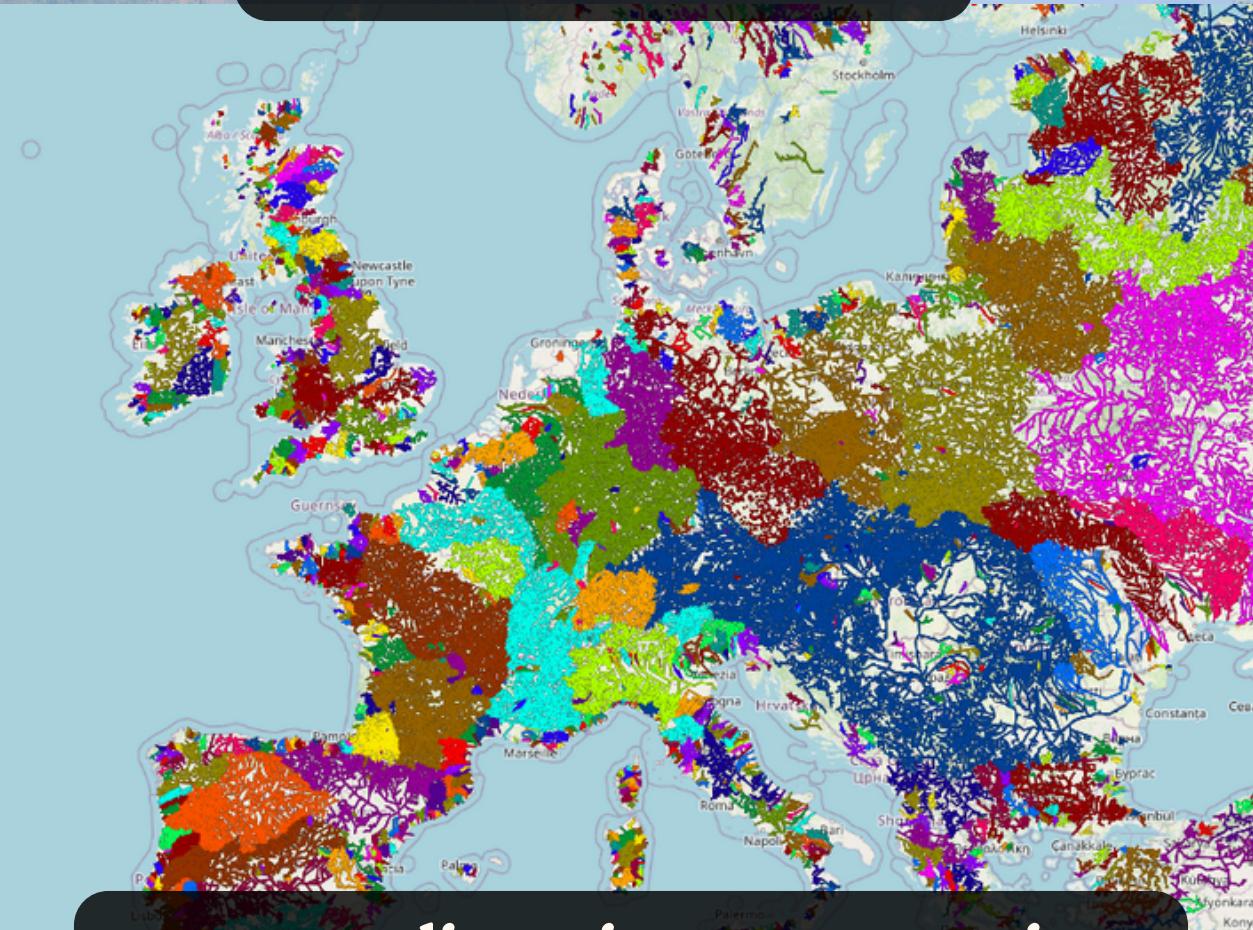
different map views



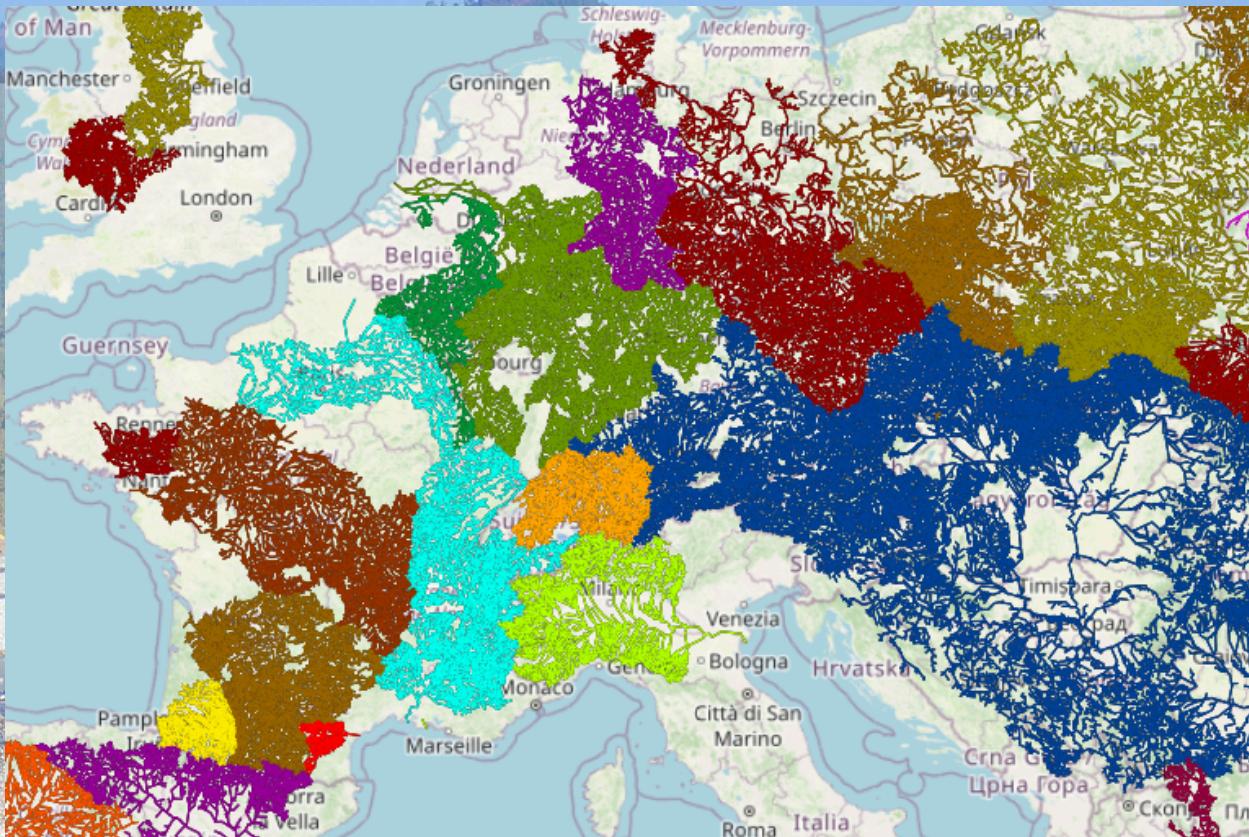
only named waterways, grouped by name

new!

different map views

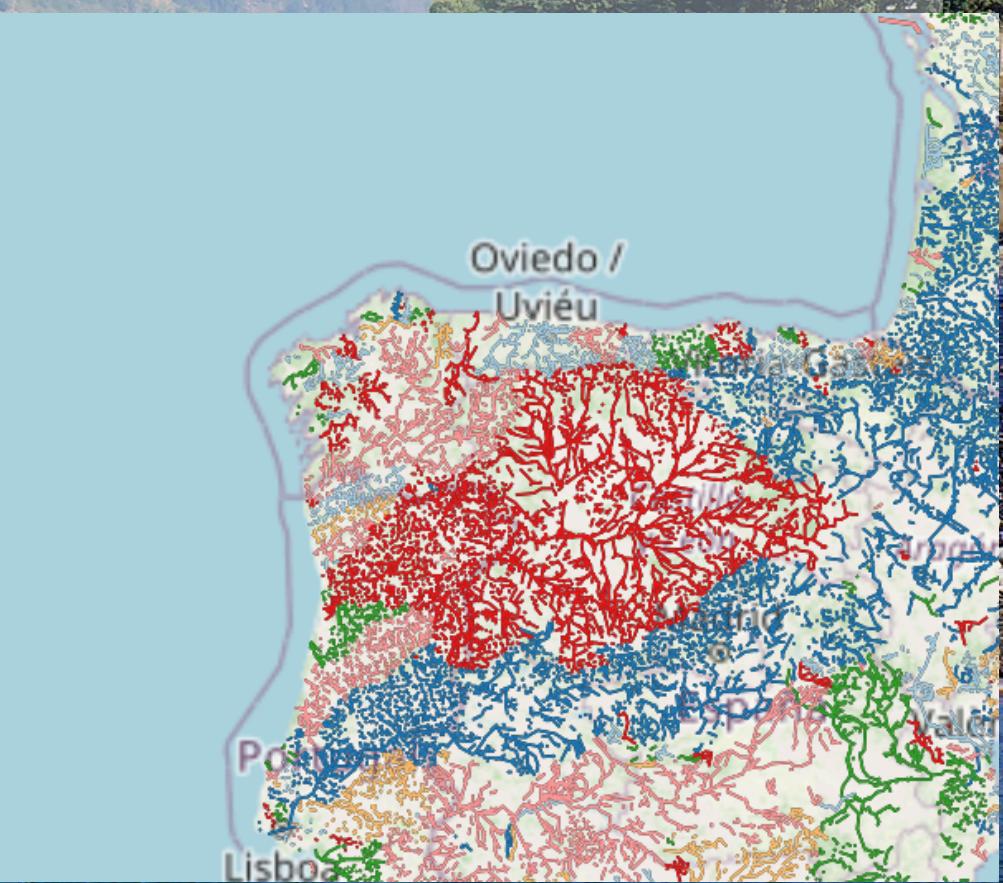


use way direction to group into
watershed
(stop massive continental blobs)

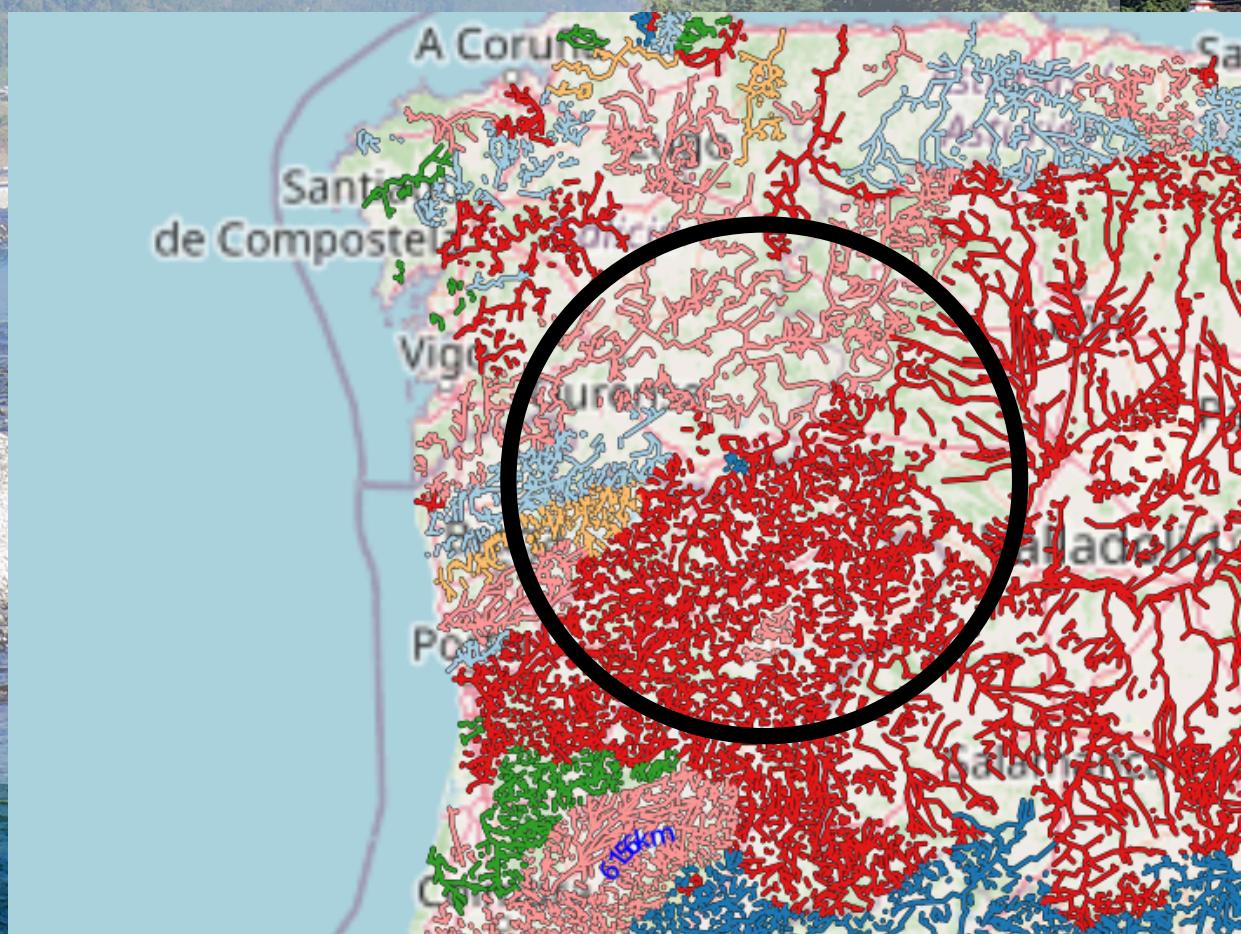
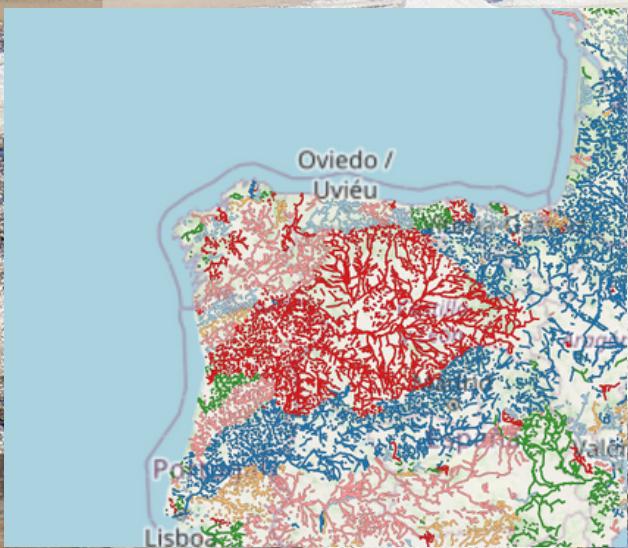


- Filter by min or max length of the system
- change colours
- edit in JOSM/iD/etc

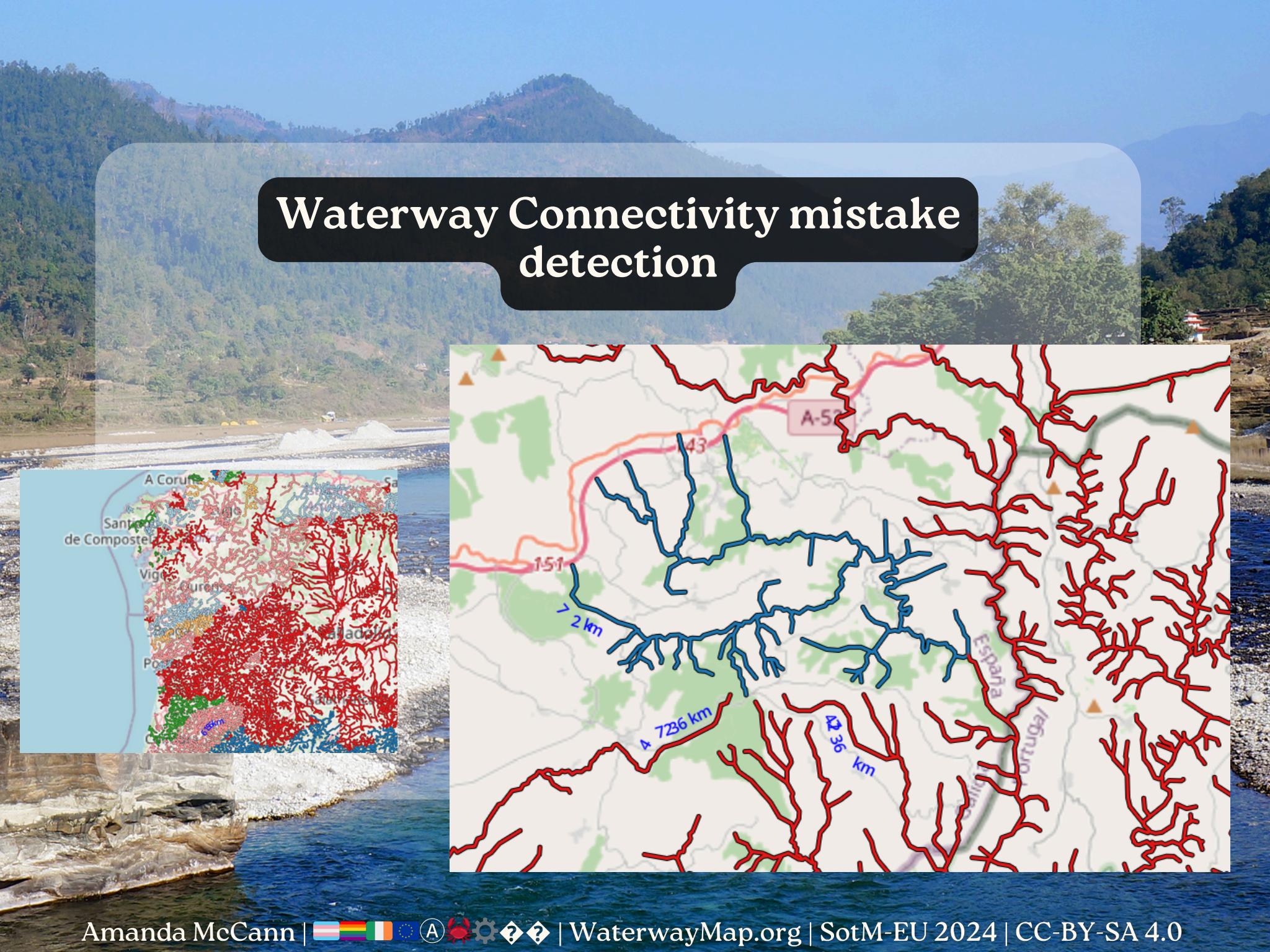
Waterway Connectivity mistake detection



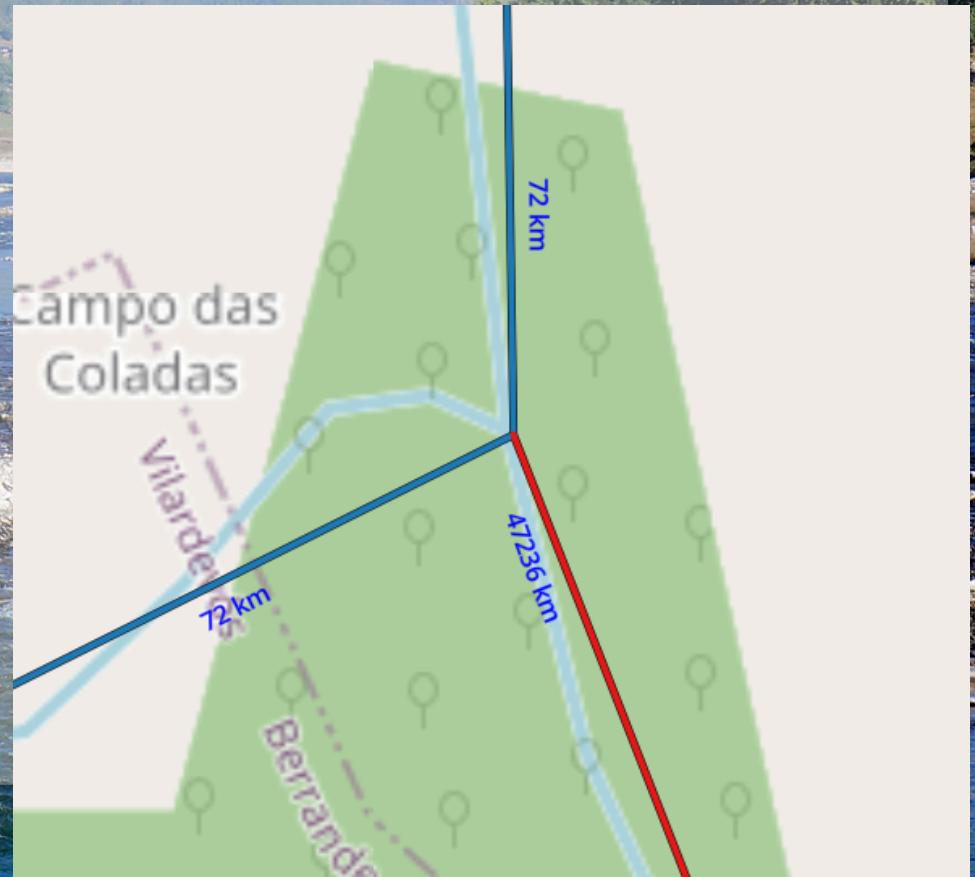
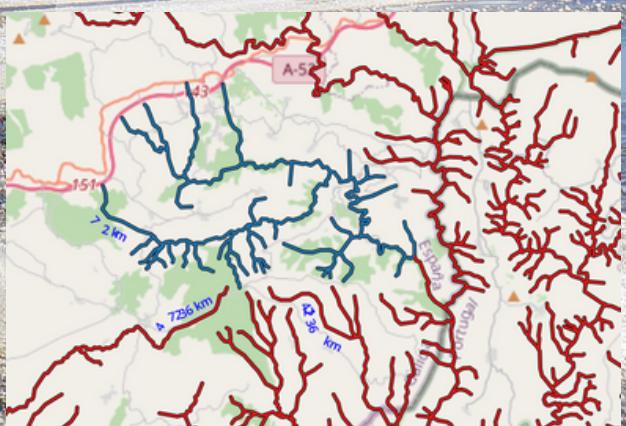
Waterway Connectivity mistake detection



Waterway Connectivity mistake detection



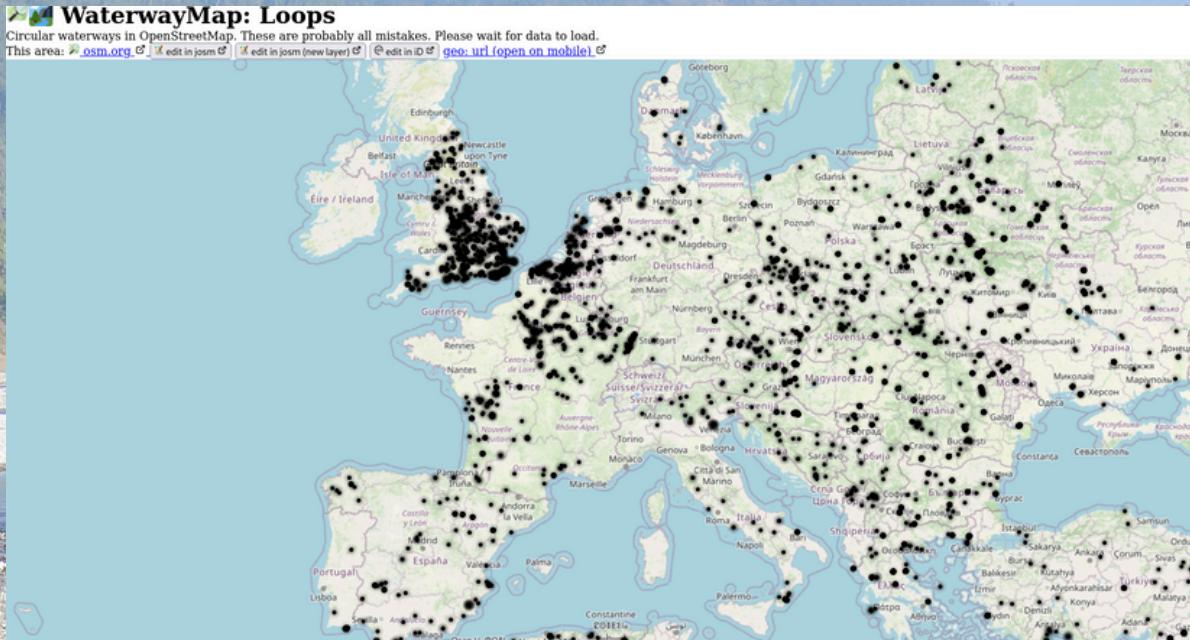
Waterway Connectivity mistake detection





Mapping mistake
found!
Unconnected waterway
segments

loops



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

ends



WaterwayMap: End points

Places where waterways end in OpenStreetMap. Please wait for data to load. [Help about this map](#)

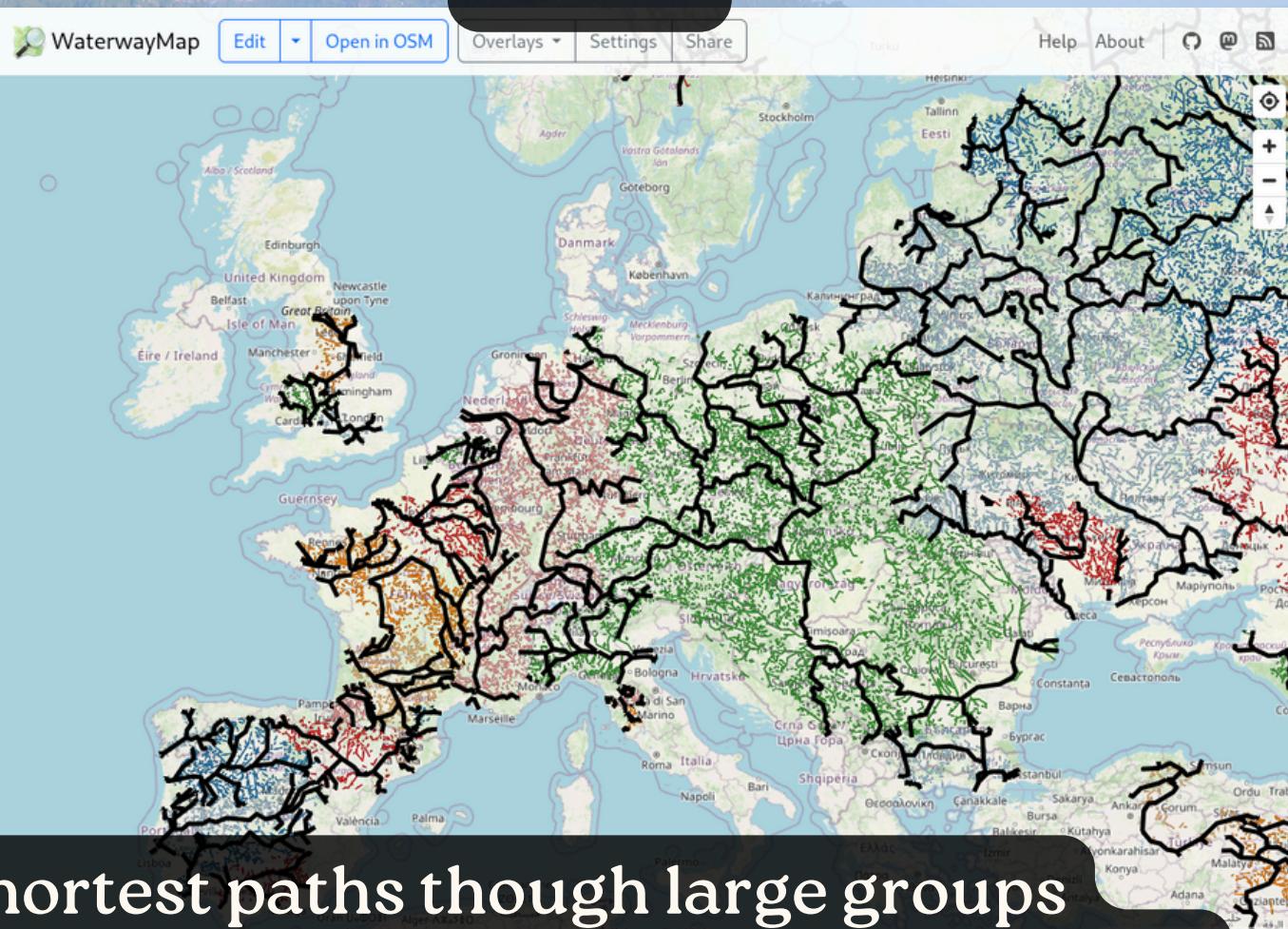
Node 33251663 (josm) has 28980 km of upstreams and ends here.

This area: [WaterwayMap main](#) | [osm.org](#) | [edit in josm](#) | [edit in josm \(new layer\)](#) | [edit in iD](#) | [geo: url \(open on mobile\)](#)

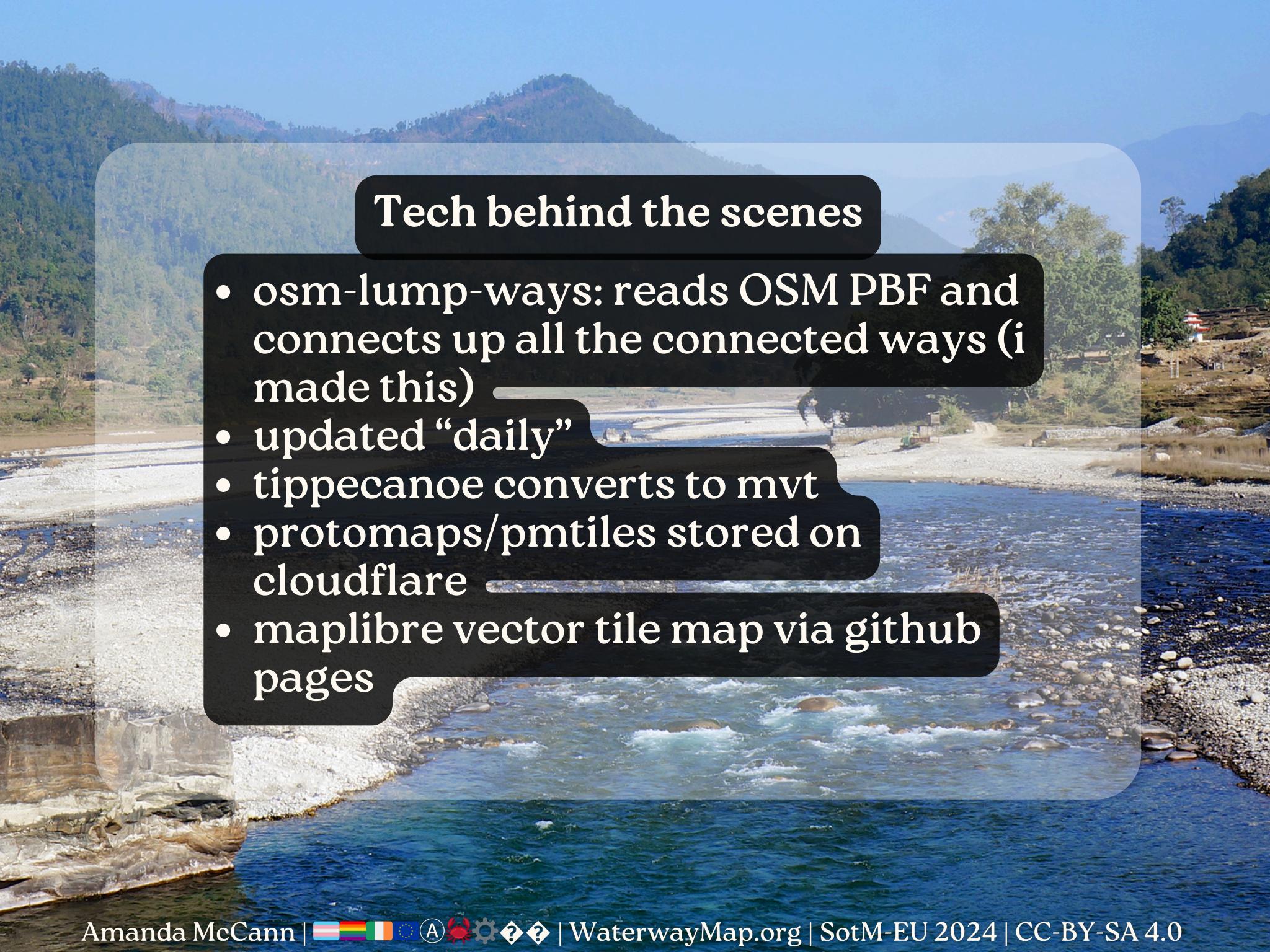


when a waterway ends, how much
upstream ends there.
find mapping mistakes.

frames



shortest paths through 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**

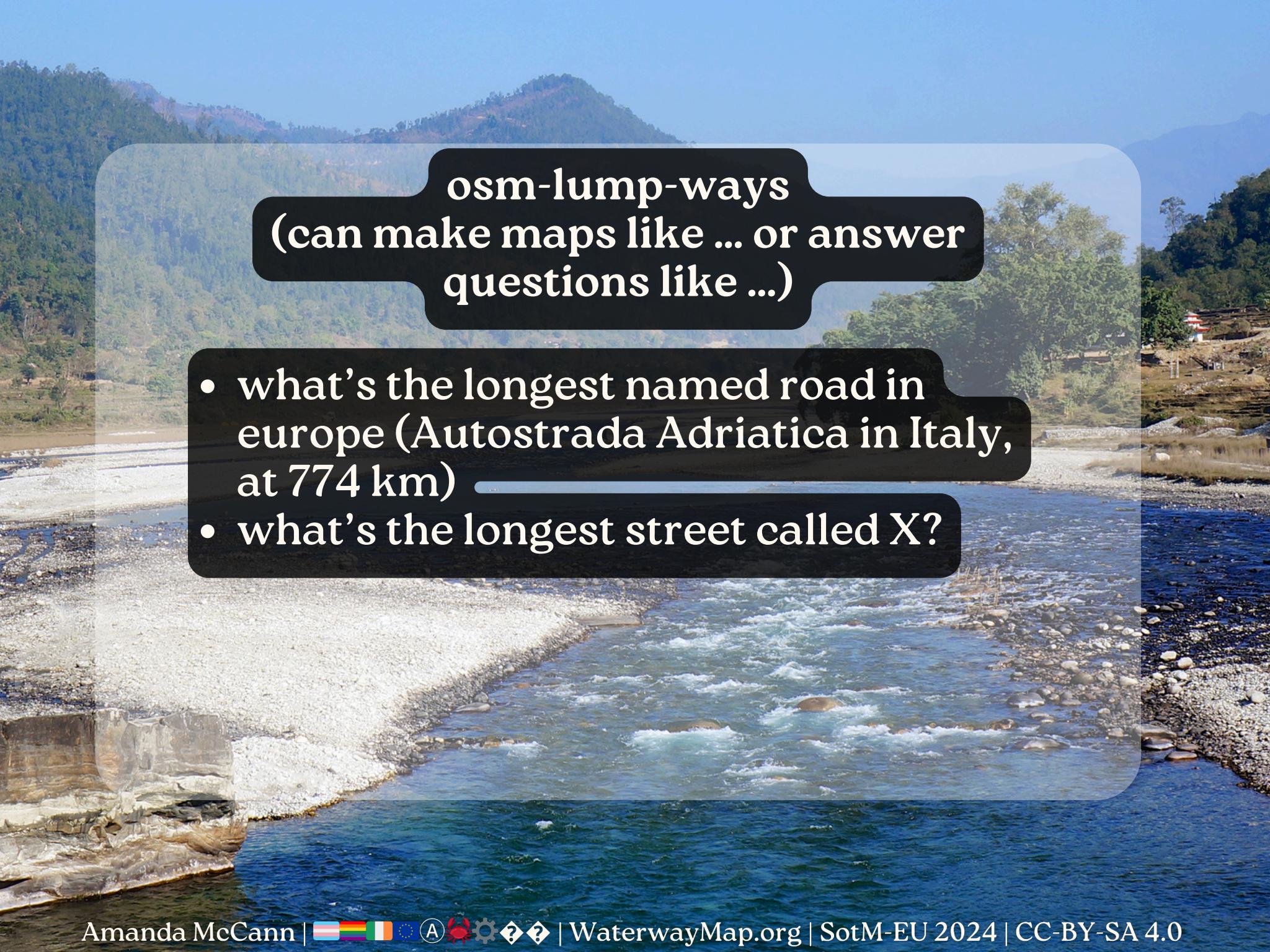


osm-lump-ways

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

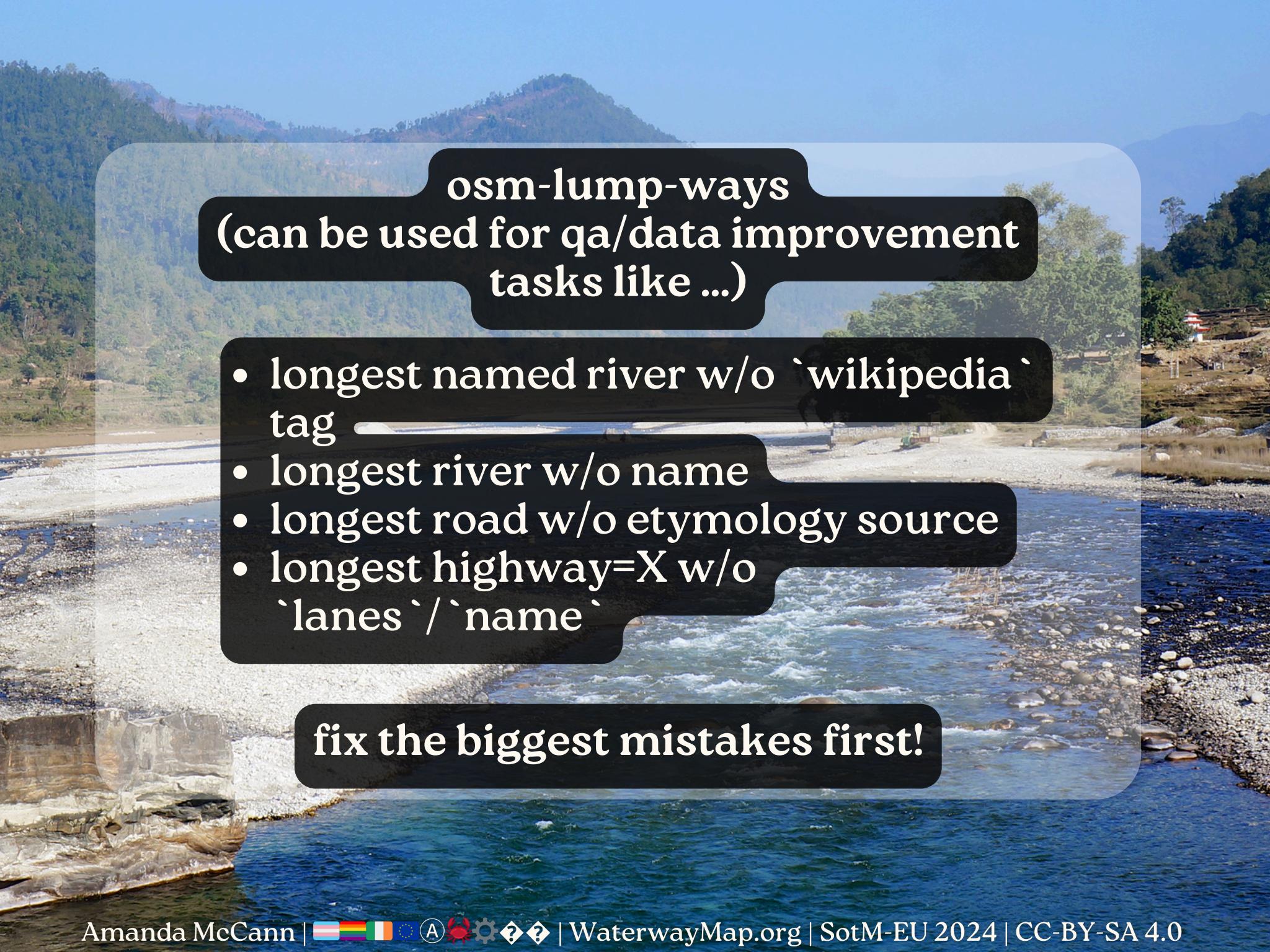
optionally

- 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 ...)**

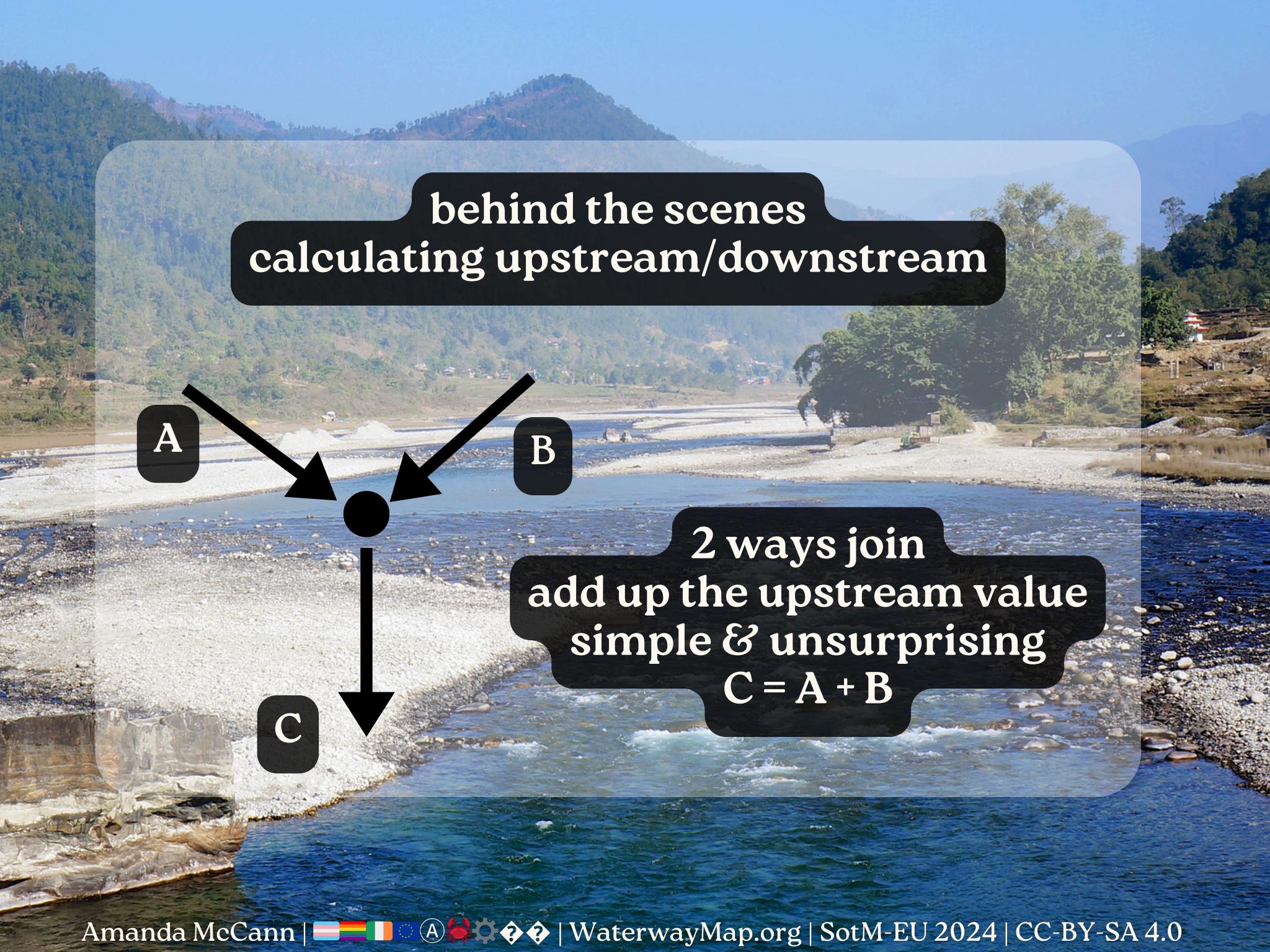
- what's the longest named road in europe (Autostrada Adriatica in Italy, at 774 km)
- what's the longest street called X?



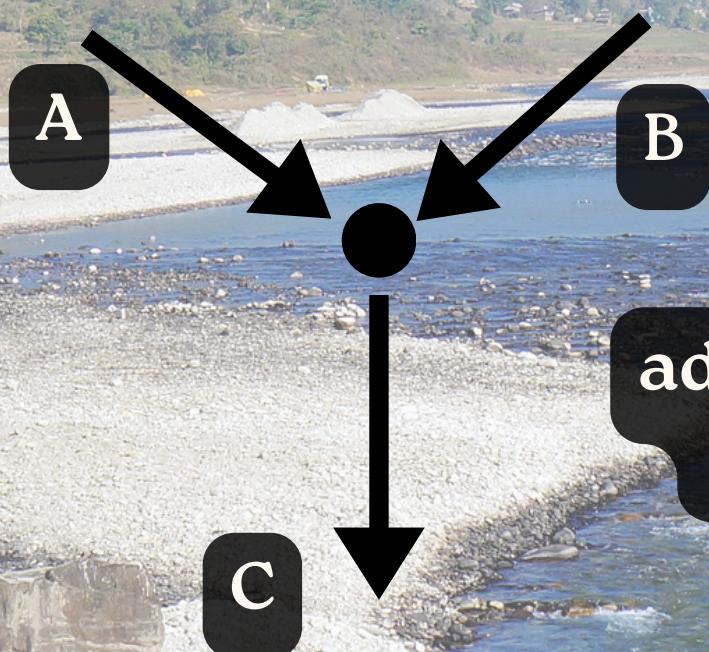
osm-lump-ways
**(can be used for qa/data improvement
tasks like ...)**

- 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`

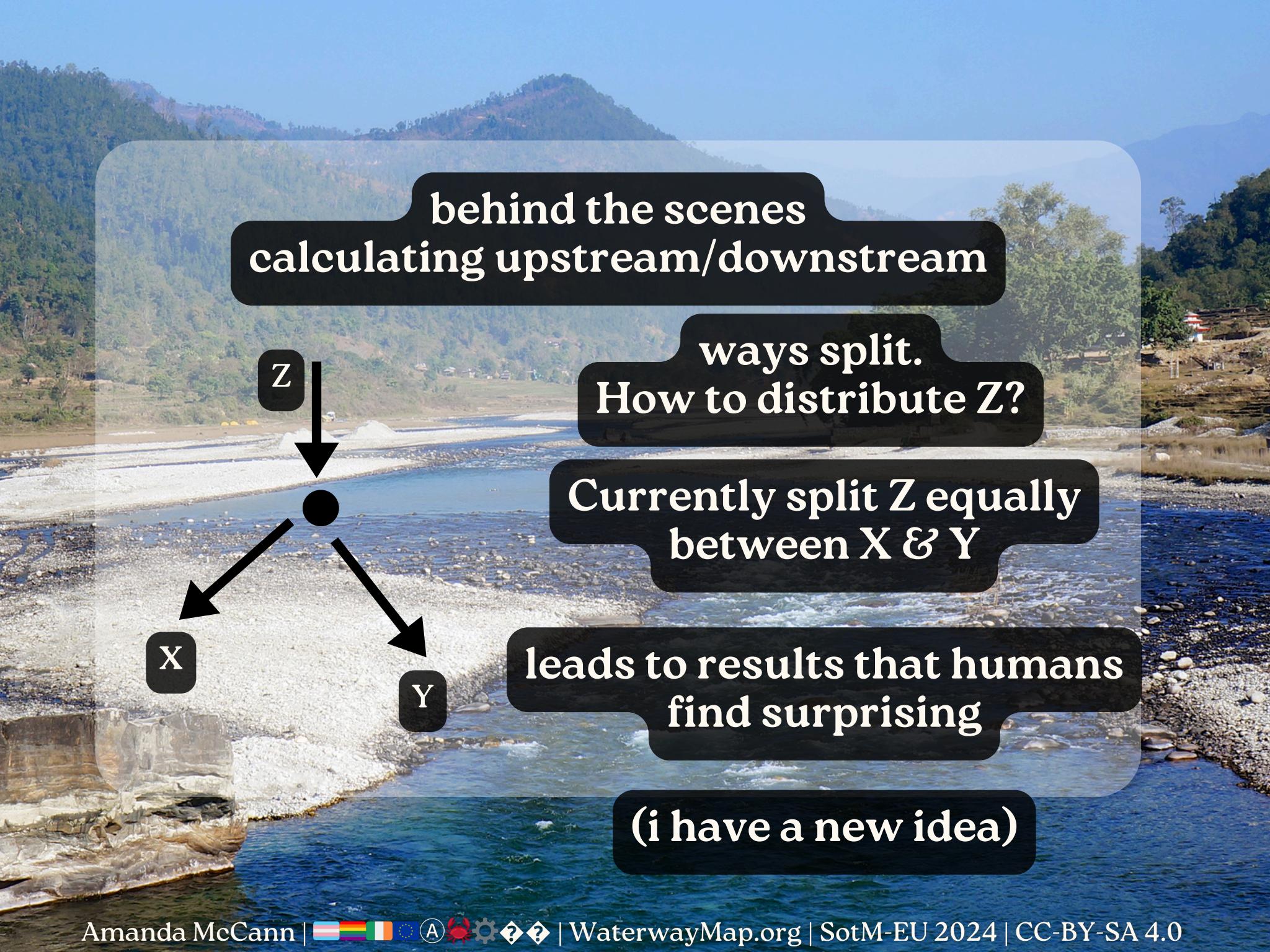
fix the biggest mistakes first!



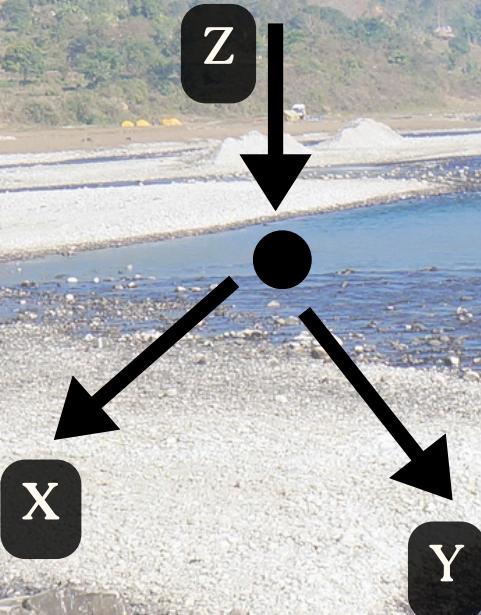
behind the scenes calculating upstream/downstream



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

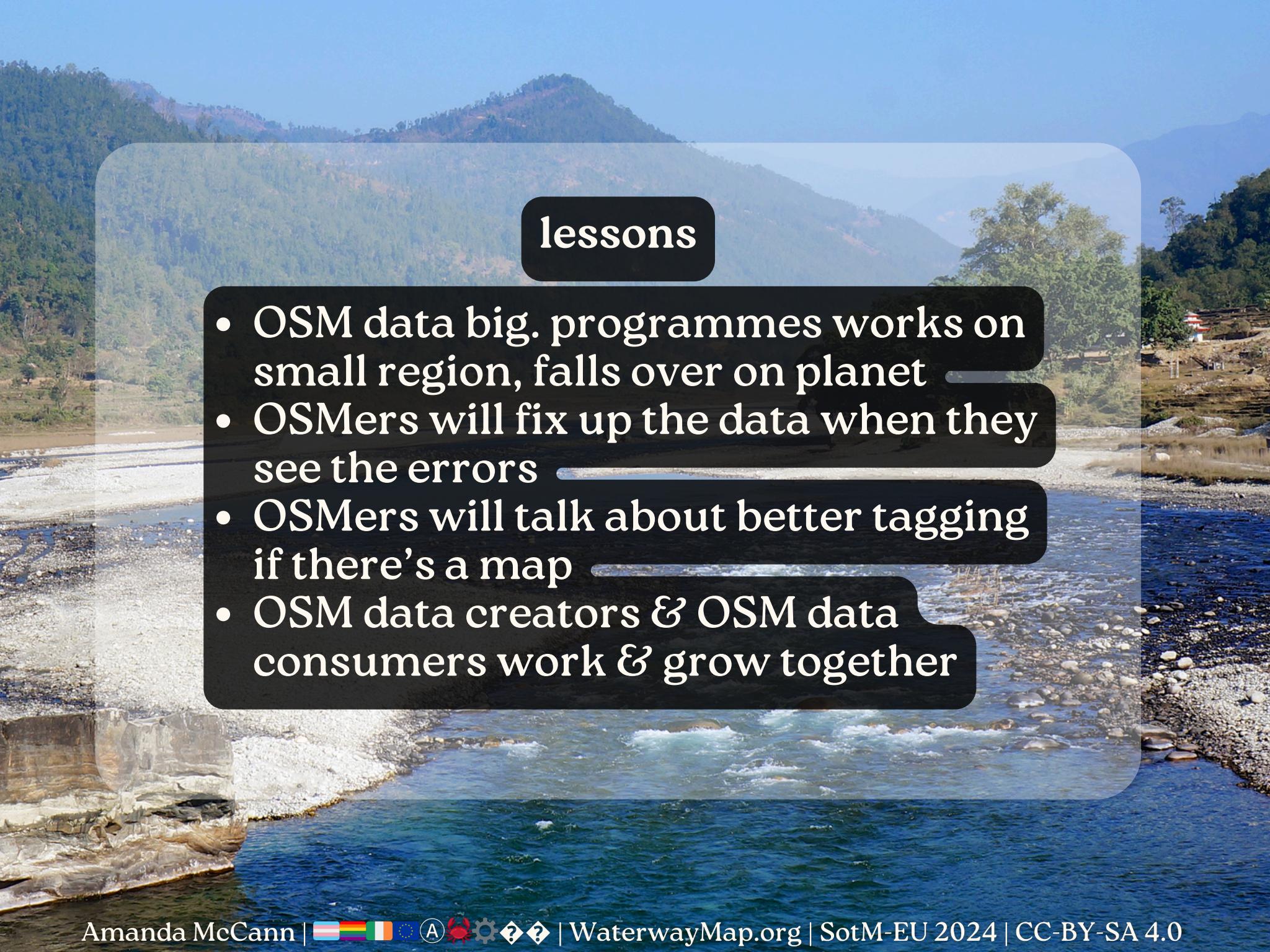
leads to results that humans
find surprising

(i have a new idea)



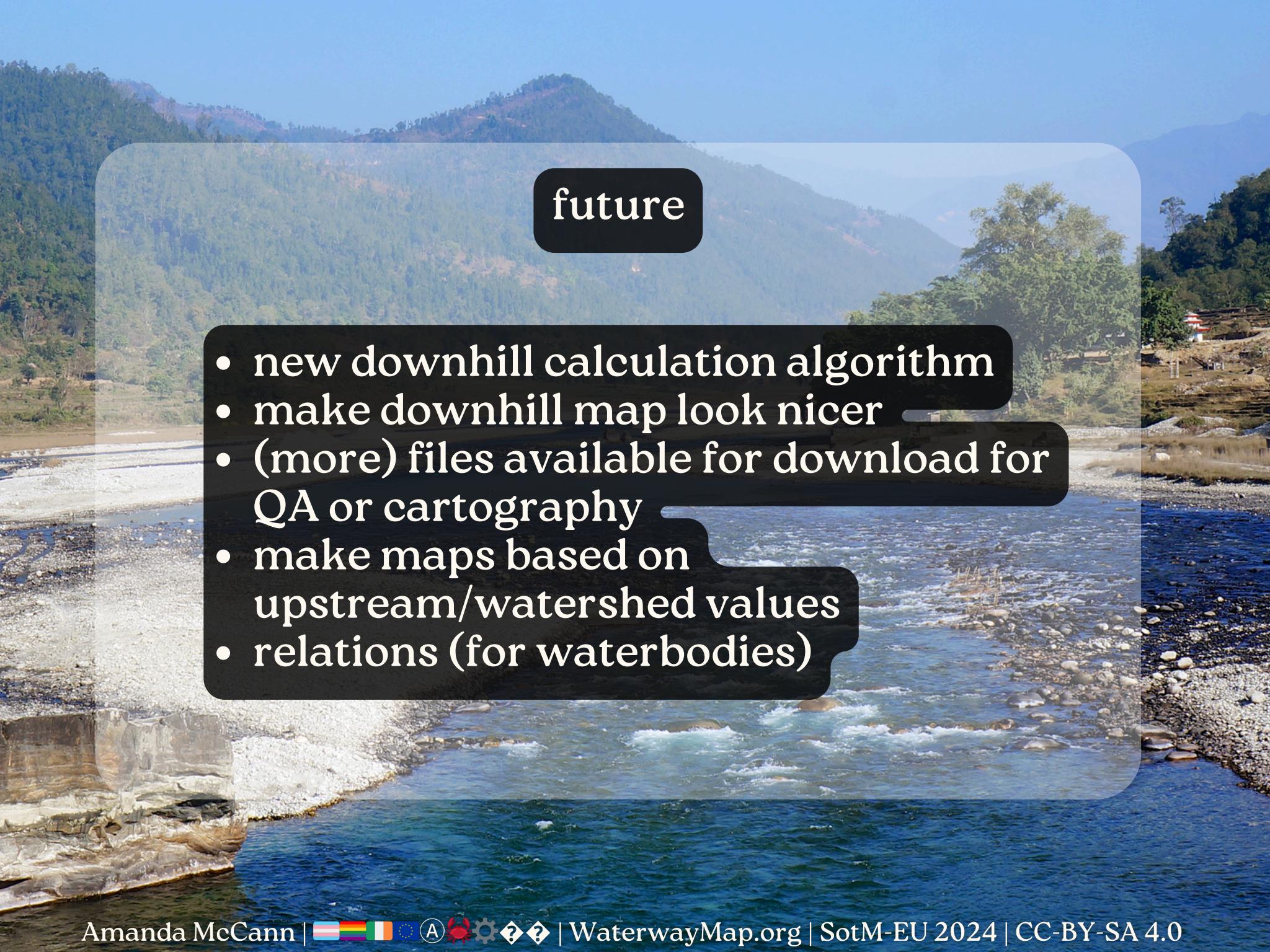
if you build it, they will come

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



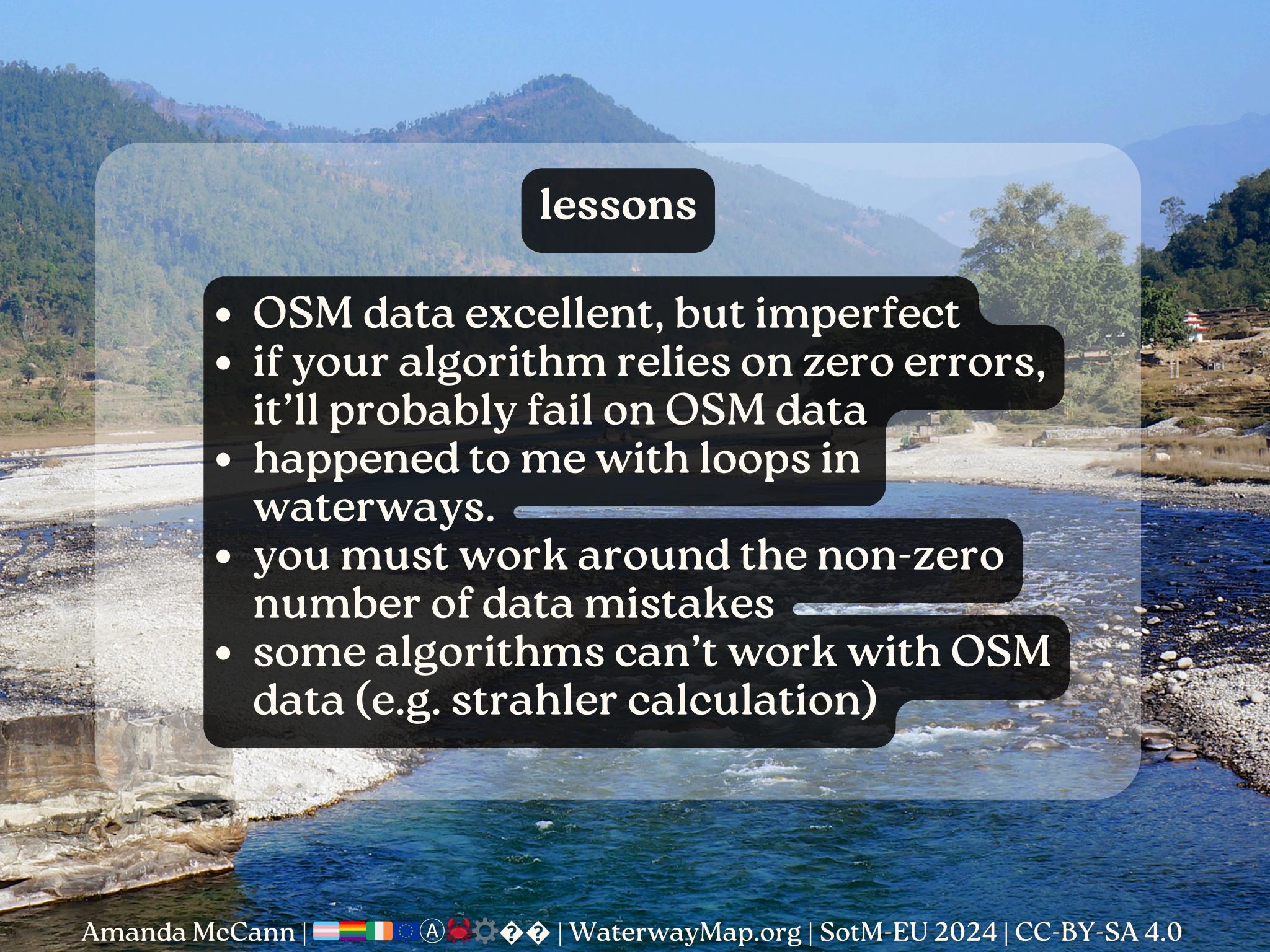
lessons

- 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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