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地球地図バイナリベクトルタイルの整備

Development of Global Map Binary Vector Tiles

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Background and motivation

Background

地球地図プロジェクトは2017年3月で終了

- Global Mapping Project was concluded in the end of March 2017.

Motivation

国土地理院が運用コストゼロで地球地図をウェブ上に確保する必要が発生

- GSI needed to keep Global Map data available on the Internet without running cost.
  - No server-side
  - No owned server at all – maximal use of external service

サーバを一切持たず、外部のサービスを最大限に利用

Global Map data archives

Archives

- Global Map Data Download
  - National/Regional version
  - Global version
    - Elevation: ver1, ver2 West East
    - Land Cover (GLCNMO): ver1, ver2, ver3
    - Vegetation (Percent Tree Cover): ver1, ver2
- Global Map Metadata
- Global Map Specifications
- Global Mapping Newsletters
- About Global Map data
  - Available Data Sets
  - National/Regional version
  - Global version
    - Elevation
    - Land Cover (GLCNMO)
    - Vegetation (Percent Tree Cover)

どうやったら（運用コストゼロで）皆さんにデータを見て頂けるか。

How can people easily look at our data without running cost ?

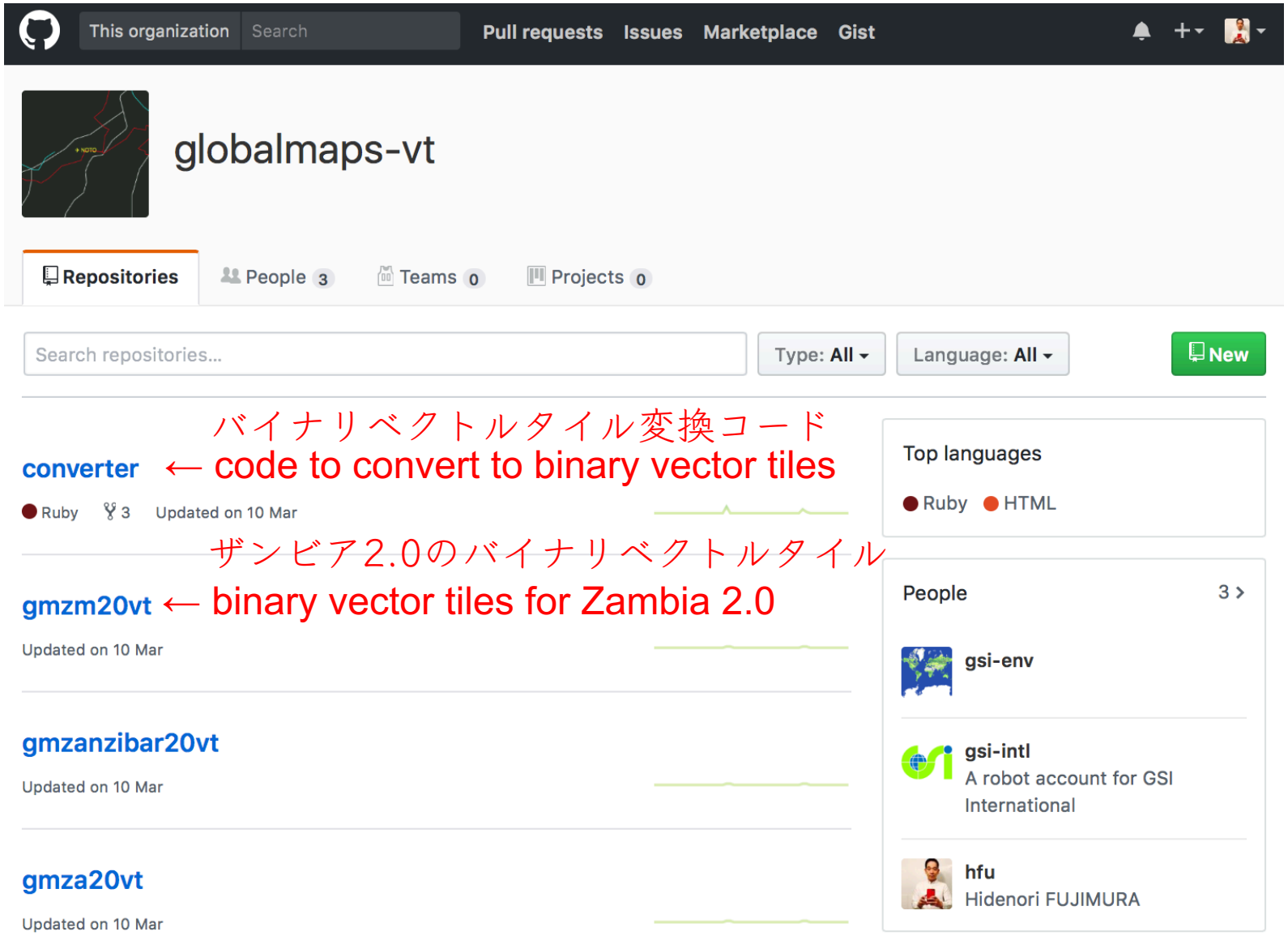
Let’s try Binary Vector Tiles with these data.

It would not be difficult because Global Map data are small dataset.

地球地図データでバイナリベクトルタイルを試してみよう。
データ量としては大きくないから難しくないはず。

Binary vector tiles code and data on external service

バイナリベクトルタイルのコードとデータを外部サービス上で提供



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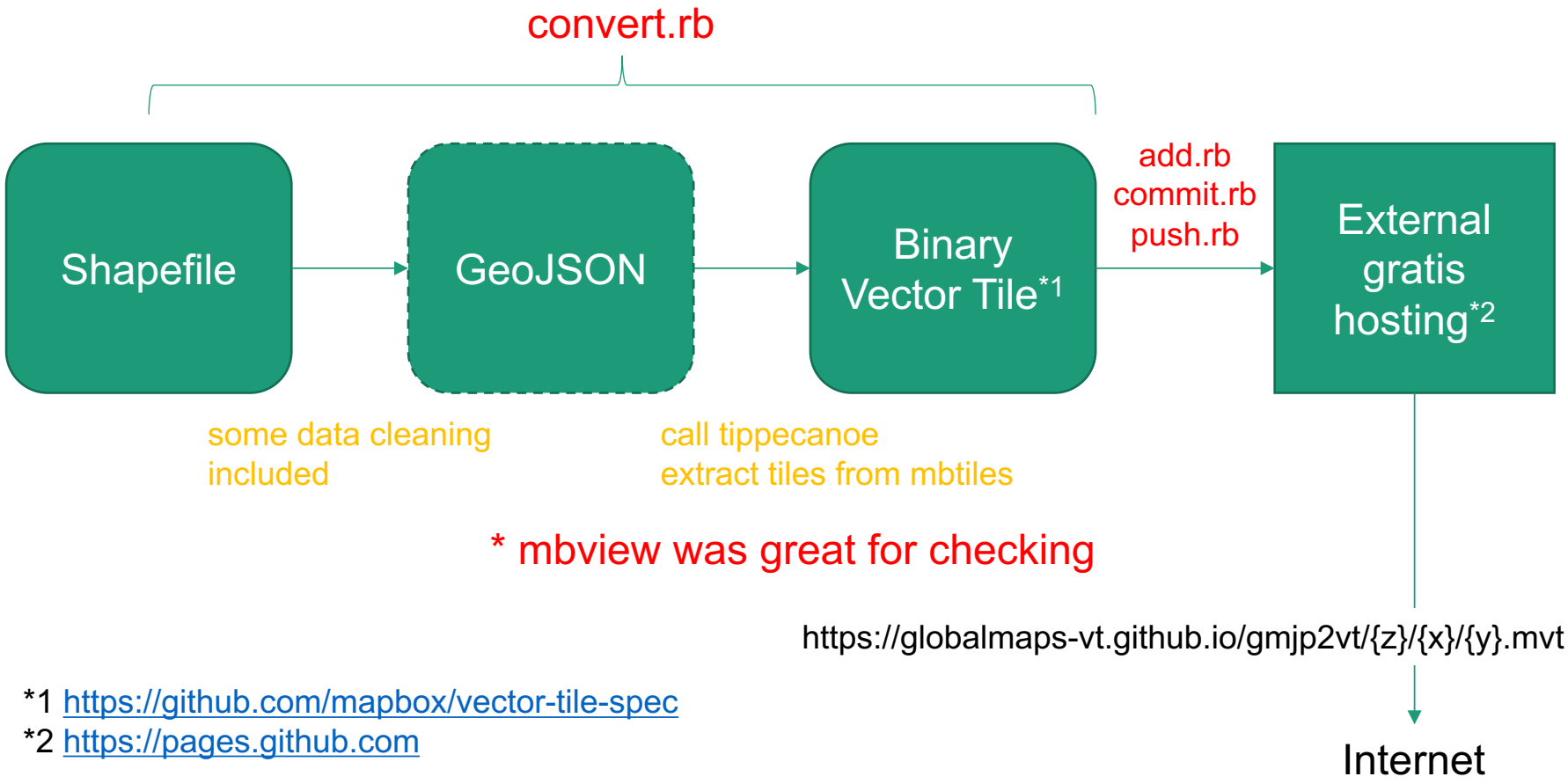
globalmaps-vt / converter

Unwatch 1 Star 0 Fork 3

Straightforward conversion from Shapefile to binary vector tiles
All attributes and geometries are kept.

Shapefile からバイナリベクトルタイルに変換。属性・幾何はそのまま保持



*1 https://github.com/mapbox/vector-tile-spec
*2 https://pages.github.com

Success – efficient data size[*1]

成功！　データサイズが効率的

	Global Map “user-friendly” Shapefile	Global Map binary vector tiles (z=0..9)
Europe[*2] 9.0	1.4GB	470MB
United States 2.0	570MB	150MB

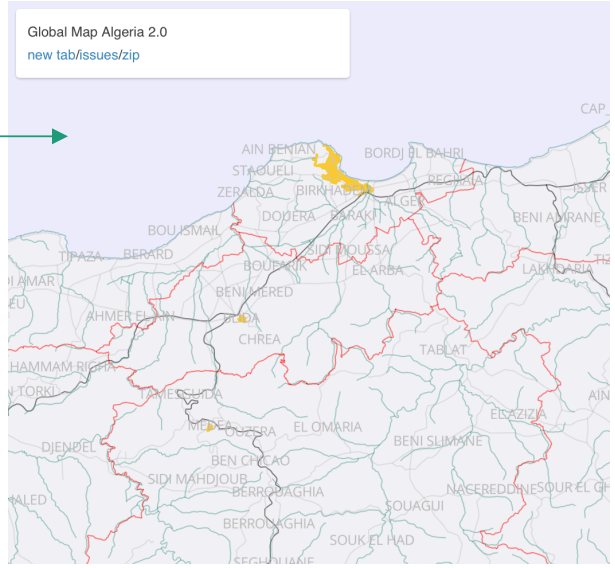
*1 precision is 2 significant digits for clarity
*2 the area covered by EuroGlobalMap 9.0

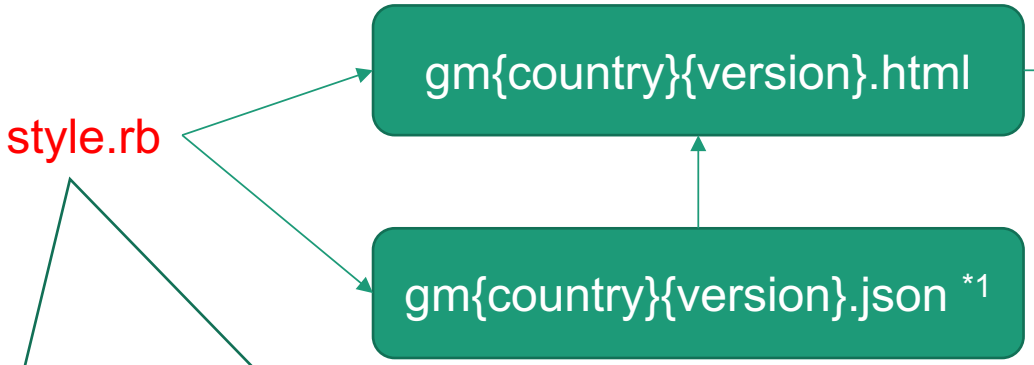
hfu / globalmaps-vt-style

Unwatch 1 Star 0 Fork 0

Display the binary vector tile data using “Mapbox GL JS” library

このバイナリベクトルタイルデータを Mapbox GL JS で表示





e.g. styling and ordering of polygon data

```
28    [ # re-ordered for drawing
29      %w{XX501 #ff0 0.1}, # landmask area
30      %w{BA030 #e3f3f7 0.5}, # island
31      %w{BA020 #e3f3f7 0.5}, # foreshore
32      %w{FA001 #faf7ef 0.5}, # administrative area
33      %w{BA040 #e3f3f7 0.8}, # water
34      %w{BH000 #5494a8 0.8}, # inland water
35      %w{BH080 #e3f3f7 0.8}, # lake / pond
36      %w{BH130 #e3f3f7 0.8}, # reservoir
37      %w{BJ030 #ccf 0.5}, # glacier
38      %w{BJ100 #ccf 0.5}, # snow field
39      %w{AL020 #ffc300 0.8}, # builtup area
```

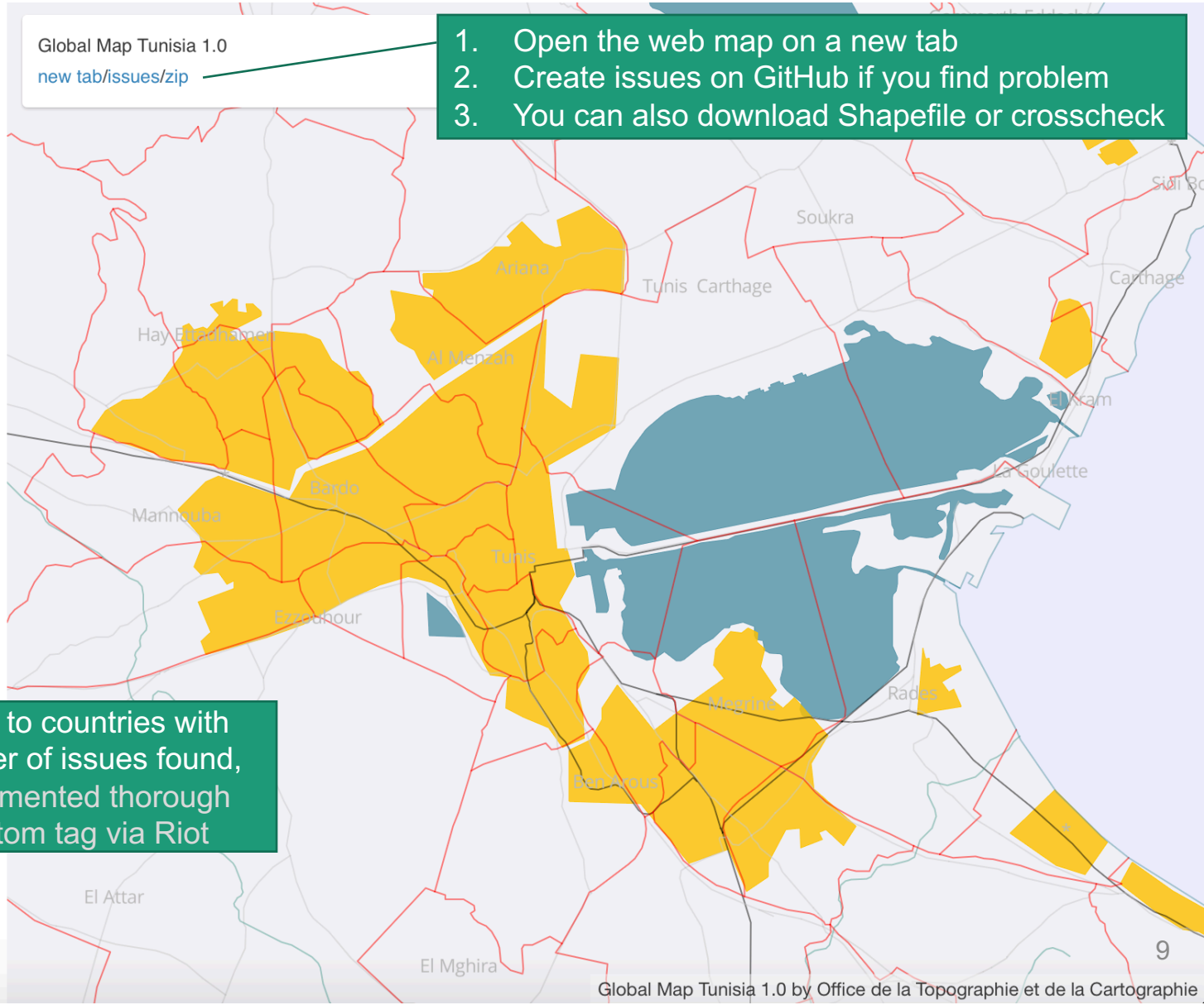
*1 https://www.mapbox.com/mapbox-gl-js/style-spec/

Quality check of Global Map Binary Vector Tiles https://hfu.github.io/globalmaps-vt-style/

地球地図バイナリベクトルタイルの品質チェック用サイト

- [ ] Oman 1 0 issues
- [ ] Oman 2 2 issues
- [ ] Panama 1 0 issues
- [ ] Papua New Guinea 1 1 issues
- [ ] Papua New Guinea 2 0 issues
- [ ] the Philippines 1 0 issues
- [ ] Pakistan 1 0 issues
- [ ] Pakistan 2 0 issues
- [ ] Palestine 1 0 issues
- [ ] Romania 1 0 issues
- [ ] Romania 2 0 issues
- [ ] Serbia 2 0 issues
- [ ] Saudi Arabia 1 0 issues
- [ ] Saudi Arabia 2 1 issues
- [ ] Saint Helena 2 2 issues
- [ ] Sudan 1 1 issues
- [ ] Singapore 1 0 issues
- [ ] Senegal 1 0 issues
- [ ] Senegal 2 0 issues
- [ ] El Salvador 2 2 issues
- [ ] Syria 1 0 issues
- [ ] Swaziland 1 0 issues
- [ ] Swaziland 2 0 issues
- [ ] Togo 2 0 issues
- [ ] Thailand 1 0 issues
- [ ] Tunisia 1 3 issues
- [ ] Tristan da Cunha 1 0 issues
- [ ] United States 1 0 issues
- [ ] United States 2 0 issues
- [ ] Uruguay 1 1 issues
- [ ] Uruguay 2 1 issues
- [ ] Saint Vincent and the Grenadines 1 2

Links to countries with number of issues found, implemented thorough custom tag via Riot



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hfu / projection-tests
forked from meetar/projection-tests

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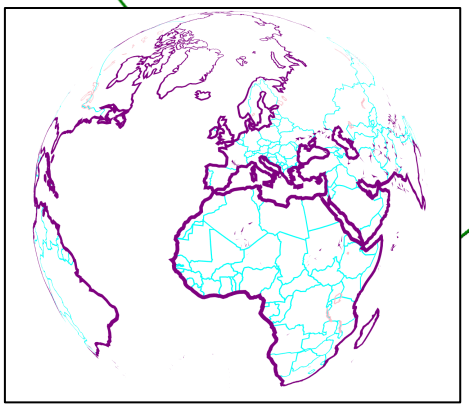
Global Map binary vector tiles works well with Tangram. Confirmed.

地球地図バイナリベクトルタイルは
Tangram でも使える事を確認



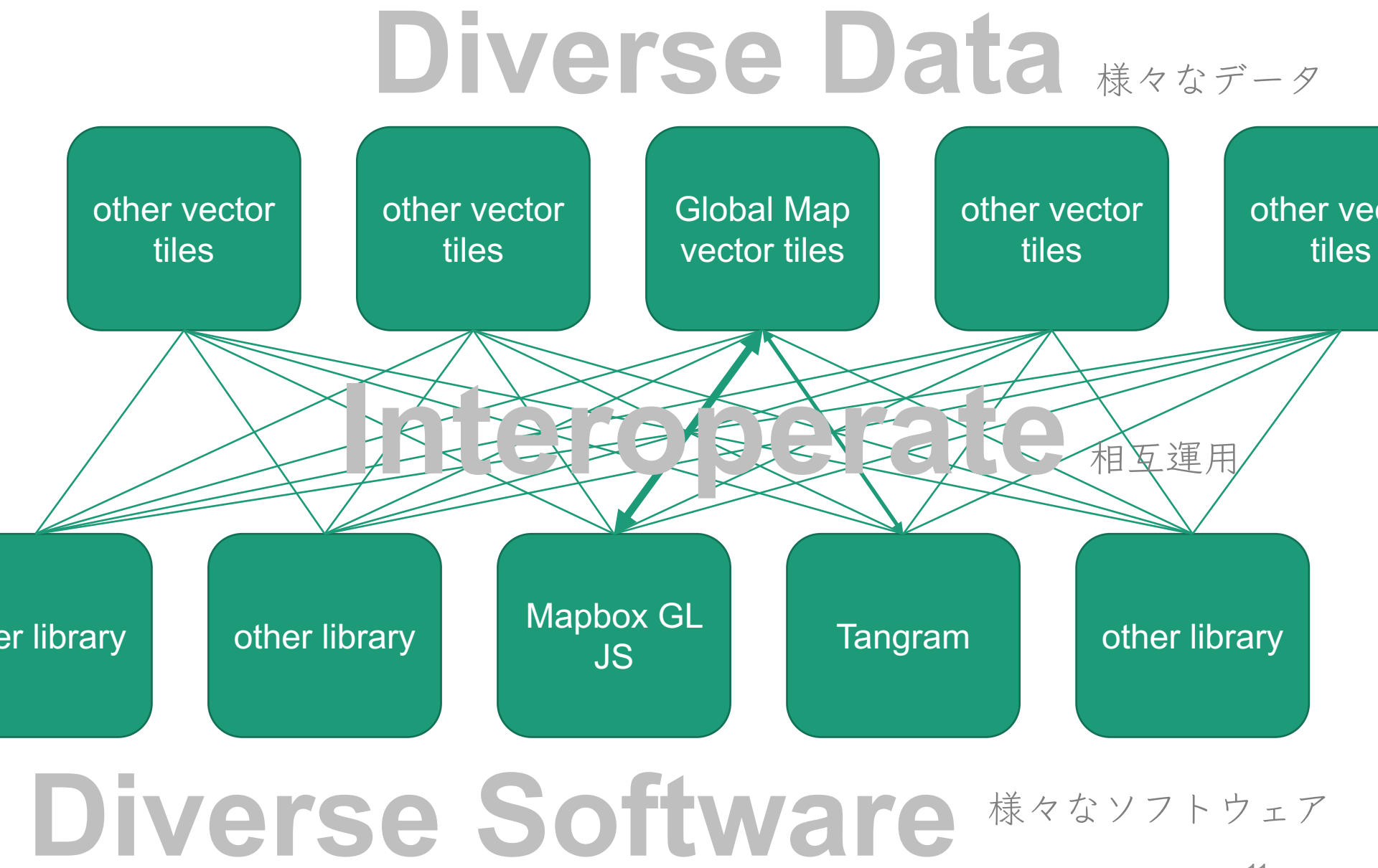
And Tangram can handle sphere.

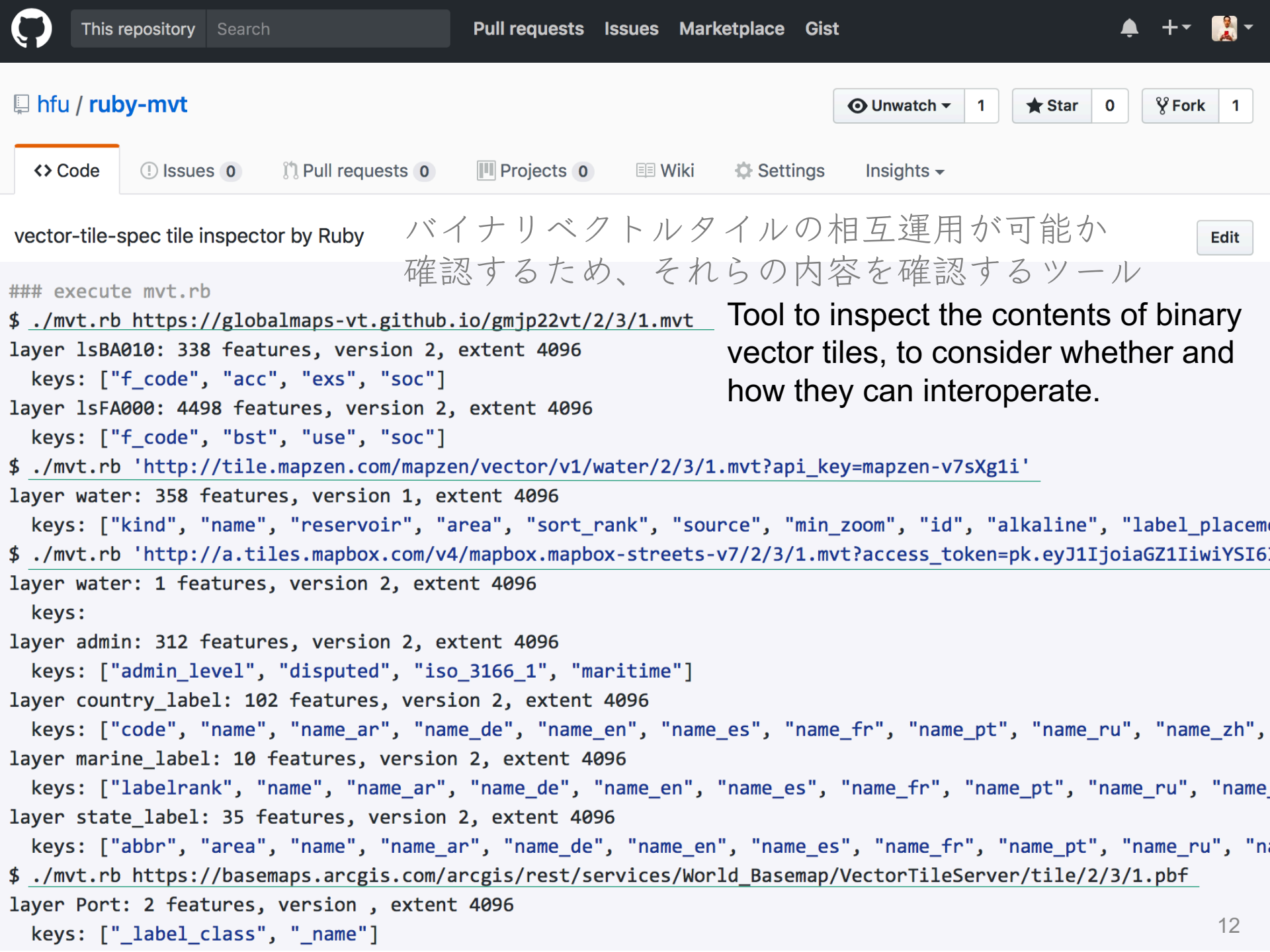
Green line: EuroGlobalMap
Black line: OpenStreetMap

Leaflet | Tangram | EuroGlobalMap 9.0 by EuroGeographics | OSM contributors | Mapzen

Expected open innovation with binary vector tiles

バイナリベクトルタイルでオープンイノベーションを目指す

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vector-tile-spec tile inspector by Ruby
Edit
バイナリベクトルタイルの相互運用が可能か
確認するため、それらの内容を確認するツール
Tool to inspect the contents of binary vector tiles, to consider whether and how they can interoperate.
execute mvt.rb
$ ./mvt.rb https://globalmaps-vt.github.io/gmjp22vt/2/3/1.mvt
layer lsBA010: 338 features, version 2, extent 4096
keys: ["f_code", "acc", "exs", "soc"]
layer lsFA000: 4498 features, version 2, extent 4096
keys: ["f_code", "bst", "use", "soc"]
$ ./mvt.rb 'http://tile.mapzen.com/mapzen/vector/v1/water/2/3/1.mvt?api_key=mapzen-v7sXg1i'
layer water: 358 features, version 1, extent 4096
keys: ["kind", "name", "reservoir", "area", "sort_rank", "source", "min_zoom", "id", "alkaline", "label_placem
$ ./mvt.rb 'http://a.tiles.mapbox.com/v4/mapbox.mapbox-streets-v7/2/3/1.mvt?access_token=pk.eyJ1IjoiaGZ1IiwiYSI6
layer water: 1 features, version 2, extent 4096
keys:
layer admin: 312 features, version 2, extent 4096
keys: ["admin_level", "disputed", "iso_3166_1", "maritime"]
layer country_label: 102 features, version 2, extent 4096
keys: ["code", "name", "name_ar", "name_de", "name_en", "name_es", "name_fr", "name_pt", "name_ru", "name_zh",
layer marine_label: 10 features, version 2, extent 4096
keys: ["labelrank", "name", "name_ar", "name_de", "name_en", "name_es", "name_fr", "name_pt", "name_ru", "name
layer state_label: 35 features, version 2, extent 4096
keys: ["abbr", "area", "name", "name_ar", "name_de", "name_en", "name_es", "name_fr", "name_pt", "name_ru", "na
$ ./mvt.rb https://basemaps.arcgis.com/arcgis/rest/services/World_Basemap/VectorTileServer/tile/2/3/1.pbf
layer Port: 2 features, version , extent 4096
keys: ["_label_class", "_name"]
12

結論

Conclusion

必要に応じ、バイナリベクトルタイルのサービスとアプリを実装した。

- A binary vector tile service and applications are implemented as needed.

バイナリベクトルタイルが相互運用可能になるように、注意深く調査を設計を進めていきたい。

- I think it is important and possible to establish interoperability of binary vector tiles by careful research and design.

ご質問は

If you have questions: https://github.com/hfu/ccpn7/issues