



Coğrafi Bilgi Sistemleri ve Bilişimi Sertifika Programı

Dr. Berk Anbaroğlu



Hacettepe Üniversitesi Geomatik Mühendisliği Bölümü

2007 **Lisans** Bilgisayar Mühendisliği Başkent Üniversitesi



2007-
2009 **Y.Lisans** Jeodezi ve Coğrafi
Bilgi Teknolojileri ODTÜ



2010 **Y. Lisans** İnşaat, Çevre ve
Geomatik Mühendisliği University College
London



2013 **Doktora**

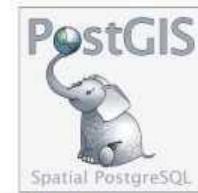
Tez: Spatio-Temporal Clustering for Non-Recurrent Traffic Congestion Detection on Urban Road Networks



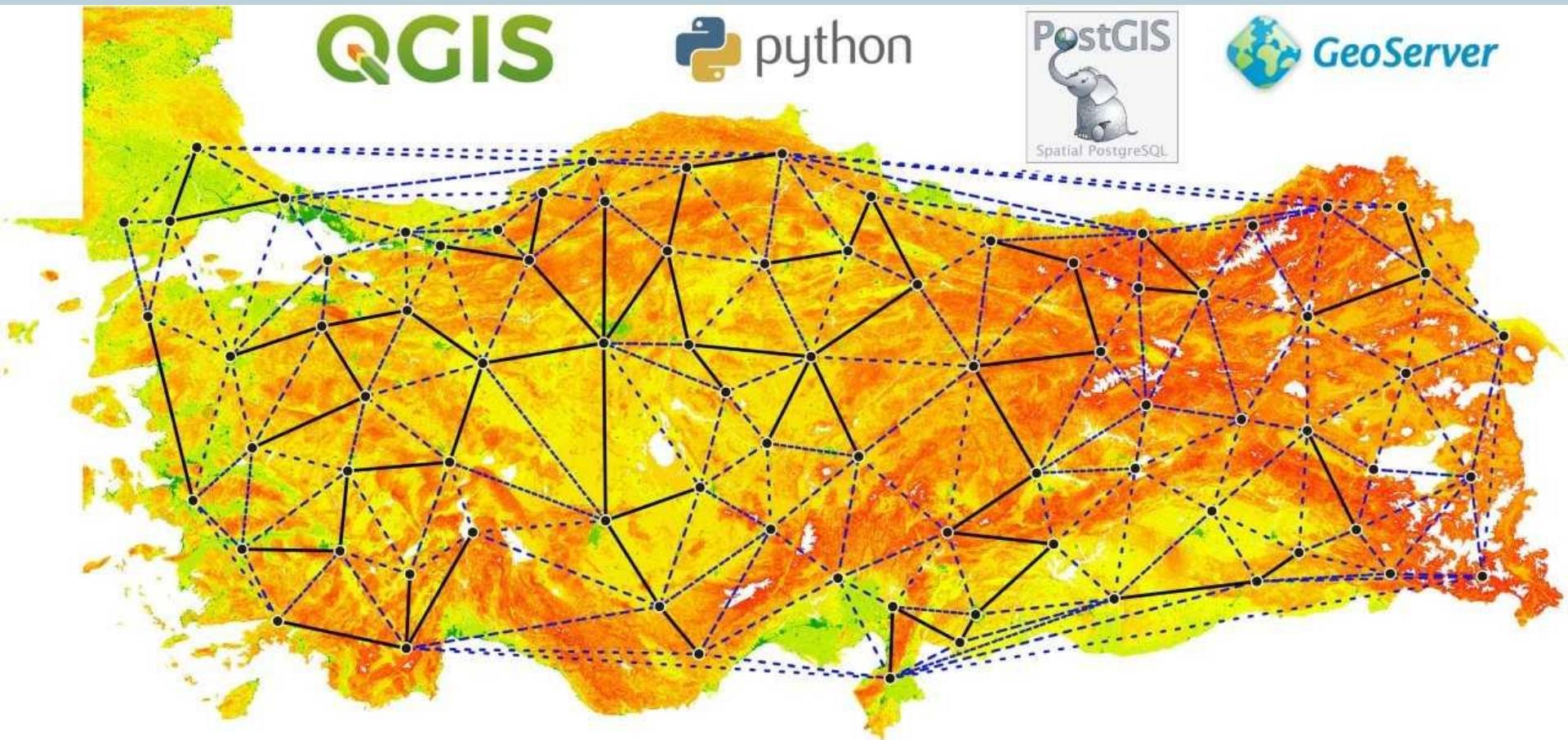


QGIS

 python



 GeoServer

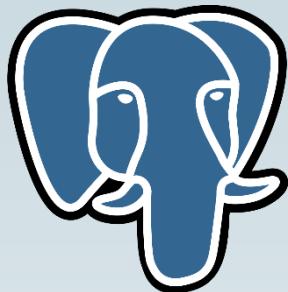


Genel Akış



5 – 6 Şubat

- Tablosal veri → coğrafi
- Projeksiyon tanımlama
- Raster → Vektör
- Yükseklik haritaları
- Coğrafi analizler / sorgular
- Harita üretimi



7 Şubat

- Veritabanı yönetim sistemleri
- Veri indeksleme, ağaç veri yapısı
- Coğrafi veri → PostGIS
- Coğrafi sorgular
- PostGIS → QGIS



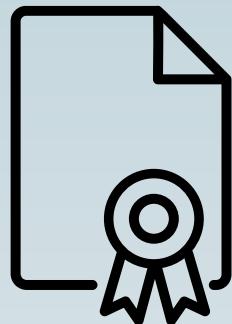
GeoServer

8 – 9 Şubat

- Python → Postgres
- LiDAR nokta bulutu
- Coğrafi verinin paylaşılması
- **Proje çalışması**



Sertifika Programı



Katılım



Proje



5 Şubat 2024

- **Giriş (teorik)**
- Coğrafi Veri
- Coğrafi Bilgi Sistemi bileşenleri
- Coğrafi Bilişim Ekosistemi
- Açık Kaynak Kodlu Yazılımlar (QGIS, PostgreSQL/PostGIS, Python, GeoServer)
- OpenStreetMap (OSM)



Açık Veri, Açık Bilim



<https://sociam.org>



<https://medium.com/>





Açık Veri, Açık Bilim





**29th ACM SIGSPATIAL
International Conference on Advances
in Geographic Information Systems
(ACM SIGSPATIAL 2021)**

Tuesday November 2 - Friday November 5, 2021
Beijing, China

[Home](#) [Organizers](#) [Submissions](#) [Participation](#) [Registration](#) [Program](#) [Workshops](#) [GISCUP](#) [SRC](#) [CFP22](#)

Important Dates

Abstract Submission
May 27, 2021 (11:59PM (PDT))

Paper Submission
June 10, 2021 (11:59PM (PDT))

Preliminary Reviews
July 22, 2021

Author Responses
July 28, 2021

Acceptance Notification
August 14, 2021

SIGSPATIAL Cup

Papers of Winning Teams (presentation in reverse order)

1. **Complementary Fusion of Deep Network and Tree Model for ETA Prediction**
YuRui Huang (Nanjing University of Science and Technology), Jie Zhang (Huatai Securities), Hengda Bao (Baidu), Jian Yang (Nanjing University of Science and Technology), Yang Yang (Nanjing University of Science and Technology)
2. **Travel Time Estimation Based on Neural Network with Auxiliary Loss**
Yunchong Gan (Peking University), Haoyu Zhang (Peking University), Mingjie Wang (Beijing Normal University)

<https://sigspatial2021.sigspatial.org/sigspatial-cup/>



Açık Veri, Açık Bilim

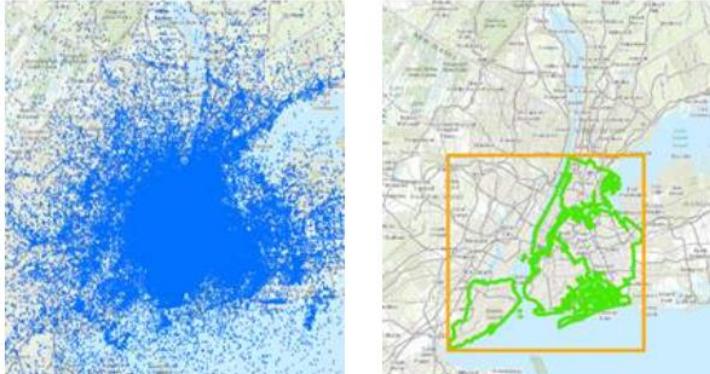
ACM SIGSPATIAL Cup 2016

acm
SIGSPATIAL

Home Results Problem Definition Downloads Submission and Evaluation Organizing Committee

Problem Definition

Input: A collection of New York City Yellow Cab taxi trip records spanning January 2009 to June 2015. The source data may be clipped to an envelope encompassing the five New York City boroughs in order to remove some of the noisy error data (e.g., latitude 40.5N – 40.9N, longitude 73.7W – 74.25W).



<http://sigspatial2016.sigspatial.org/giscup2016/problem>

TÜBİTAK 1002 Projesi (2018-19)

PostgreSQL vs. MongoDB



Açık Veri, Açık Bilim

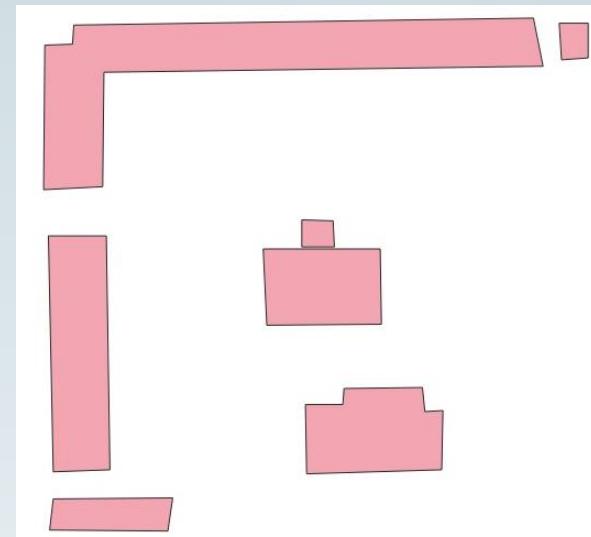
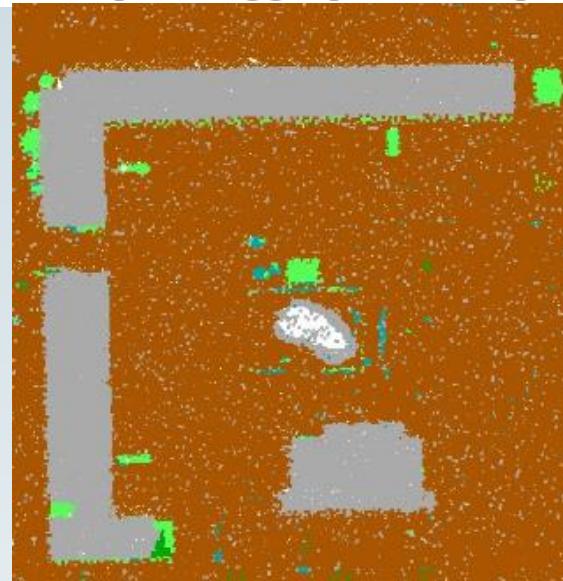


The screenshot shows the homepage of the ACM SIGSPATIAL Cup 2022. At the top left is the ACM SIGSPATIAL logo, which includes a stylized globe icon and the text "acm SIGSPATIAL". The main title "ACM SIGSPATIAL Cup 2022" is centered at the top. Below the title are five navigation buttons: "Home", "Results", "Problem Definition", "Downloads", and "Submission and Evaluation". The "Problem Definition" button is highlighted with a blue background. The main content area is titled "Problem Definition" and contains the text: "Our focus in this competition is on processing geospatial LiDAR point clouds".

Light Detection and Ranging (LiDAR)

Problem Definition

Our focus in this competition is on processing geospatial LiDAR point clouds



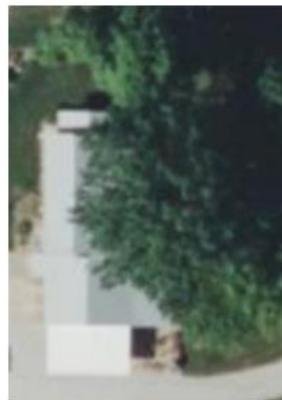
Reproducible Extraction of Building Footprints from Airborne LiDAR Data: A Demo Paper

Mertcan Erdem

Dept. of Geomatics Engineering
Hacettepe University
Turkey
mertcanerdem@hacettene.edu.tr

Berk Anbaroğlu

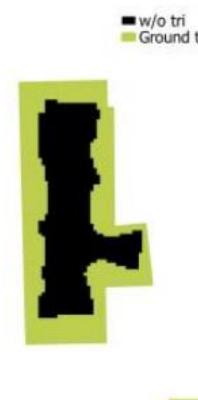
Dept. of Geomatics Engineering
Hacettepe University
Turkey
banbar@hacettene.edu.tr



(a)



(b)



(c)

Figure 5. Limitation of terrain ruggedness index (test site 9 with $s=300$). A tall tree is next to the house (a). The corresponding DSM (b). The building footprint is detected only when terrain ruggedness index is not used (c).



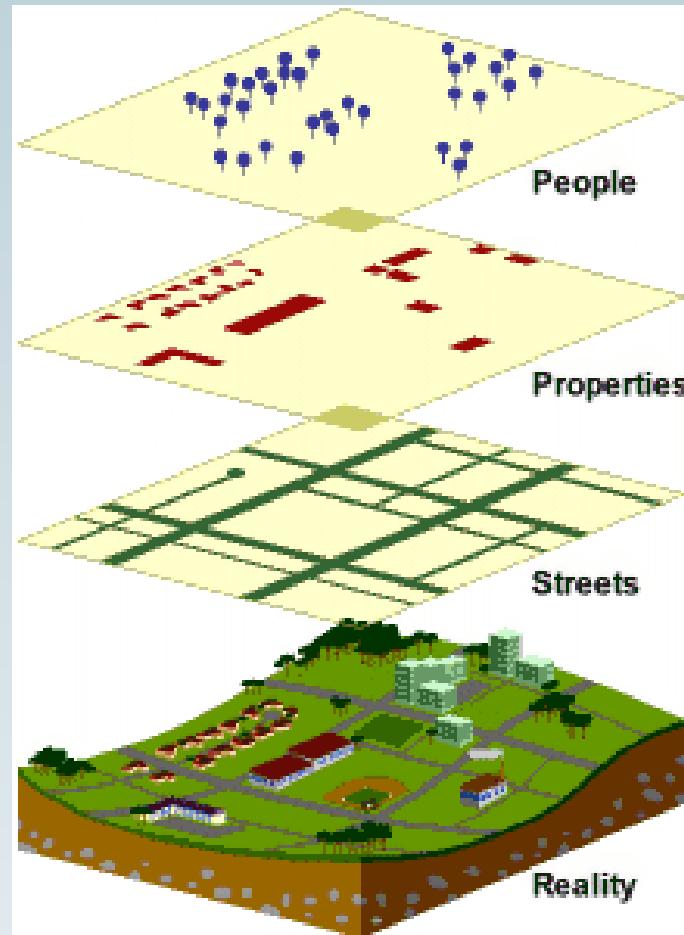
QGIS

The logo consists of the letters "QGIS". The "Q" is a green circle containing a 3D perspective view of two overlapping rectangular blocks, one orange and one yellow. The "GIS" is in a large, bold, green sans-serif font.

Coğrafi Bilgi Sistemi Bileşenleri



Coğrafi Katman



Coğrafi Veri Katmanları



QGIS 3 Eklenti Ekosistemi

HD @HarelDan · 1 Mar 2018

QGIS 3 #plugin count, March 1st, 2018:
97

Plugins | All (97)

- Installed
- Not installed
- Upgradeable
- New
- Install from ZIP
- Settings

- Mask
- Memory Layer Saver
- Menu Builder
- MetaSearch Catalog Client
- mmqgis**
- Multi Ring Buffer
- Multi-distance buffer
- Mutant
- NNJoin
- norGIS ALKIS-Einbindung
- OfflineEditing
- OSM place search
- OSM Tools
- PDOK Locator Plugin
- PDOK services plugin
- Physiogeo3D
- Plugin Builder 3
- Plugin Load Times
- Plugin Reloader

1 1 5

1 Mart 2018
97 eklenti

@HarelDan



QGIS 3 Eklenti Ekosistemi

Plugins | All (730)

All

Installed

Not installed

Install from ZIP

Settings

Search...

A-Maps
AcATAma
Active Flre
Add a point road sign
Aderyn Data Search
Advanced Line Editor
AequilibraE
AGIS
agknow for QGIS
AGT - Archaeological Geophy
Altibase QGIS Plugin
Altitudecorrector
AmigoCloud
ANA Data Acquisition
Anaximandre
Animate OSM
AnnotationManager

All Plugins

On the left you see the list of installed and available for installation while most of them are disabled. You can temporarily enable or disable a plugin by clicking its checkbox or double-clicking its name. Plugins showing in red are also listed on the 'Invalid' tab to reinstall or uninstall them.

1 Ekim 2020
730 eklenti



Plugins | All (807)

All

Installed

Not installed

Upgradeable

Install from ZIP

Settings

Search...

- 3D City Builder
- A-Maps
- AcATaMa
- Actions for relations
- Active Flre
- Add a point road sign
- Aderyn Data Search
- Advanced Line Editor
- AequilibraE
- AGIS
- agknow for QGIS
- AGT - Archaeological Geophysics
- Altibase QGIS Plugin
- Altitudecorrector
- AmigoCloud

All Plugins

On the left you see the list of all plugins available for your QGIS, both installed and available for download. Some plugins come with your QGIS installation while most of them are made available via the plugin repositories.

You can temporarily enable or disable a plugin. To *enable* or *disable* a plugin, click its checkbox or double-click its name...

Plugins showing in red are not loaded because there is a problem. They are also listed on the 'Invalid' tab. Click on the plugin name to see more details, or to reinstall or uninstall this plugin.

Upgrade All Uninstall Plugin Reinstall Plugin

Close Help

31 Ocak 2021
807 eklenti



Plugins | All (1511)



All



Installed



Not installed



Upgradeable



Invalid



Install from ZIP



Settings



Search...

- 3D City Builder
- 3DCityDB Tools
- AcATAMa
- Actions for relations
- Active Flre
- Add a point road sign
- Add to Felt
- Aderyn Data Search
- Adjust Style
- AdressesFr
- Adresssuche
- Advanced Line Editor
- AemetOpenDataDownloader

All Plugins

On the left you see the available for download are made available via You can temporarily enable checkbox or double-click Plugins showing in red the 'Invalid' tab. Click this plugin.

1 Şubat 2024
1511 eklenti



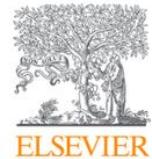
QGIS Ekleni Geliştirme

Minimum Spanning Tree

This plugin finds the Minimum Spanning Tree of an input polygon shp file using Kruskal's algorithm.

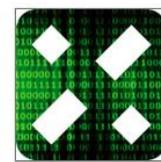
This plugin finds the Minimum Spanning Tree (MST) of an input polygon shp file using Kruskal's algorithm. First, the centroids of the polygons are determined and those adjacent polygons are connected through an edge. The cost of an edge is the distance between the centroids. Second, Kruskal's algorithm is executed to determine the MST. The centroids, edges and the resulting MST are all added as a virtual layer.

★★★★★ 10 rating vote(s), 975 downloads



SoftwareX

Volume 12, July–December 2020, 100553

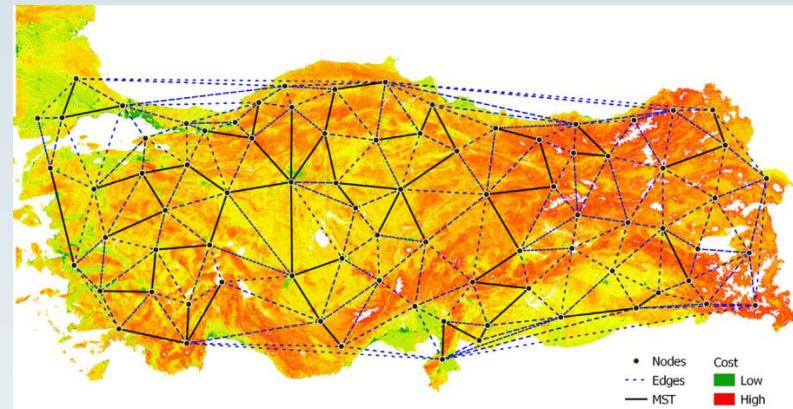


Original software publication

Geo-MST: A geographical minimum spanning tree plugin for QGIS

Murat Çalışkan ^{a, b}✉, Berk Anbaroğlu ^b✉

<https://www.sciencedirect.com/science/article/pii/S2352711020301771>



QGIS Ekleni Geliştirme

Space Time Cube

This plugin creates a space-time cube based on given data.



This plugin creates a space-time cube based on given data.

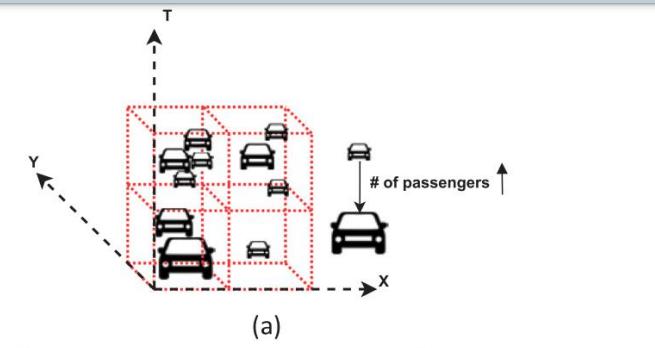
Category Plugins

Tags python, space time cube, hot spot

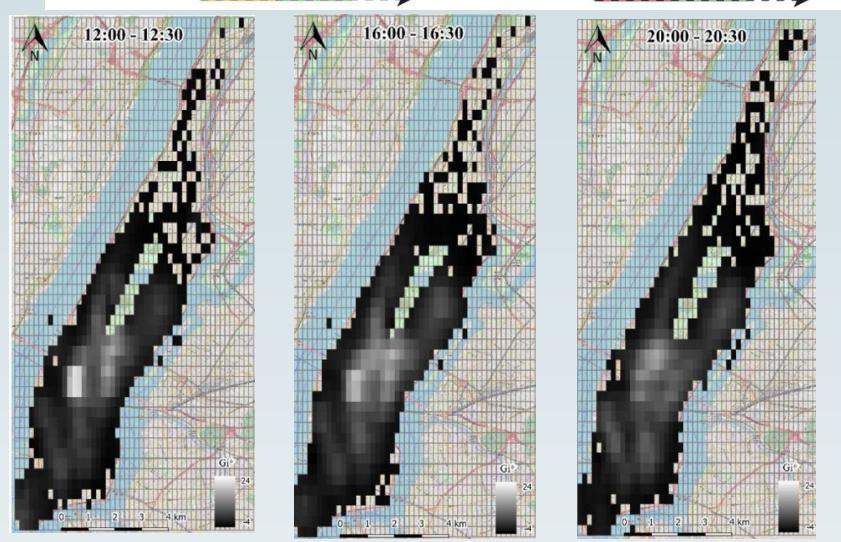
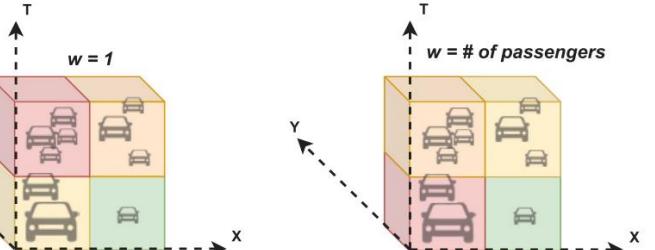
More info [homepage](#) [bug tracker](#) [code repository](#)

Author Murat Çalışkan, Berk Anbaroğlu

Installed version 1.0



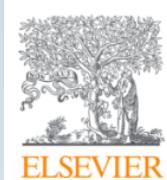
(a)



12:00 – 12:30

16:00 – 16:30

20:00 – 20:30



SoftwareX

Volume 24, December 2023, 101498



Original software publication

Space Time Cube analytics in QGIS and Python for hot spot detection

Murat Çalışkan ^a ^b , Berk Anbaroğlu ^c

<https://www.sciencedirect.com/science/article/pii/S2352711023001942>



Coğrafi Veri

Koordinat Referans Sistemleri

- Bilinen ID, or
- European Petroleum Survey Group (**EPSG**) kodu



<https://epsg.io/>

Koordinat Referans Sistemleri



**Web haritaları
EPSG: 3857 / 4326
WGS 84, Web Mercator**

Koordinat Referans Sistemleri



Local directions and shapes ✓

Inflates the size of objects away from the equator ✗

**Web maps' view
EPSG: 3857 / 4326
WGS 84, Web Mercator**

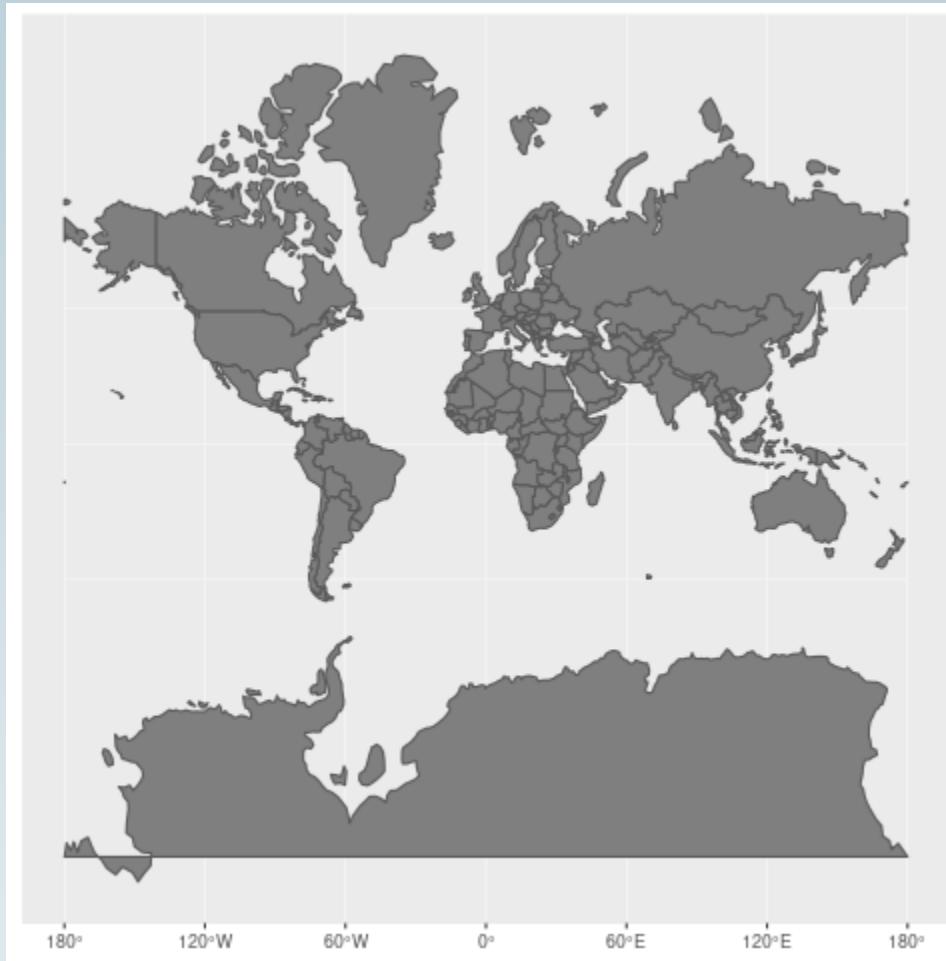


Koordinat Referans Sistemleri



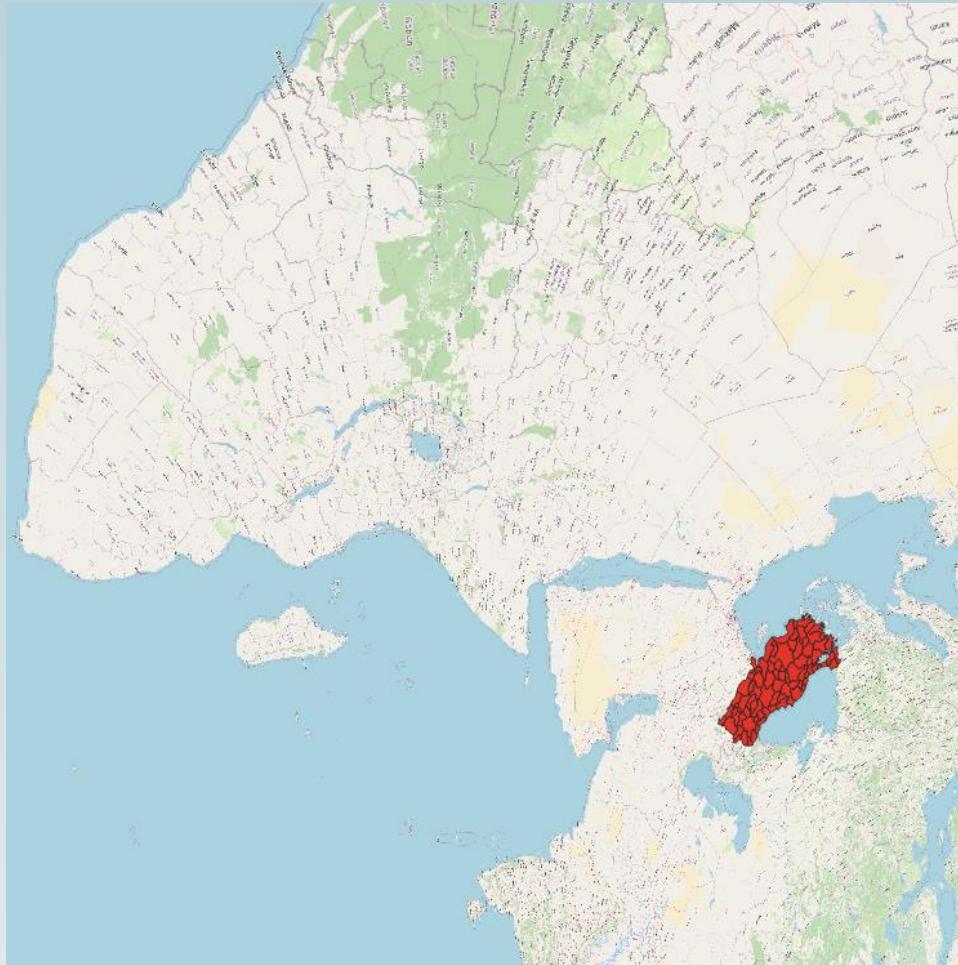
<https://www.thetruesize.com>

Koordinat Referans Sistemleri



https://upload.wikimedia.org/wikipedia/commons/e/ee/Worlds_animate.gif

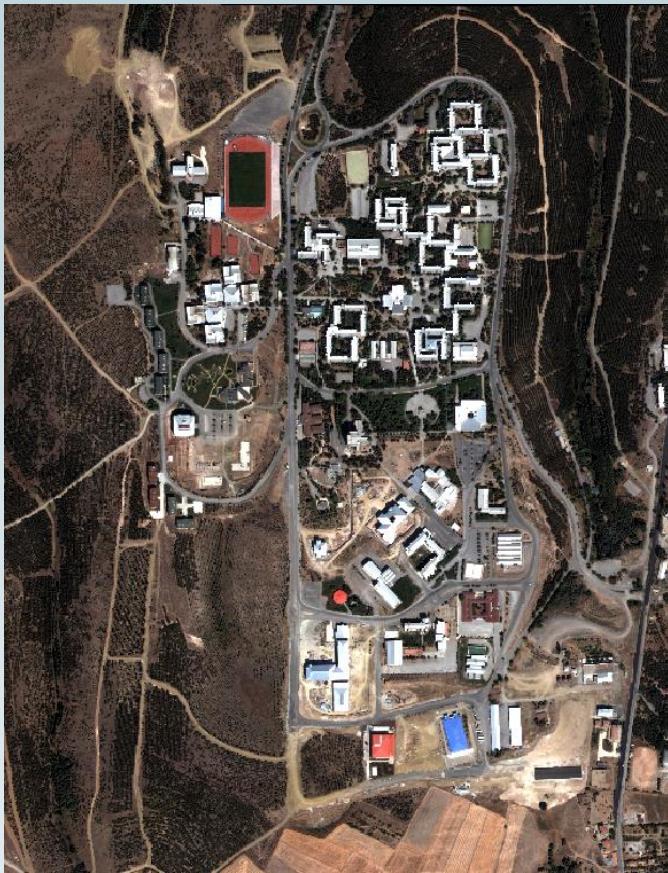
Koordinat Referans Sistemleri



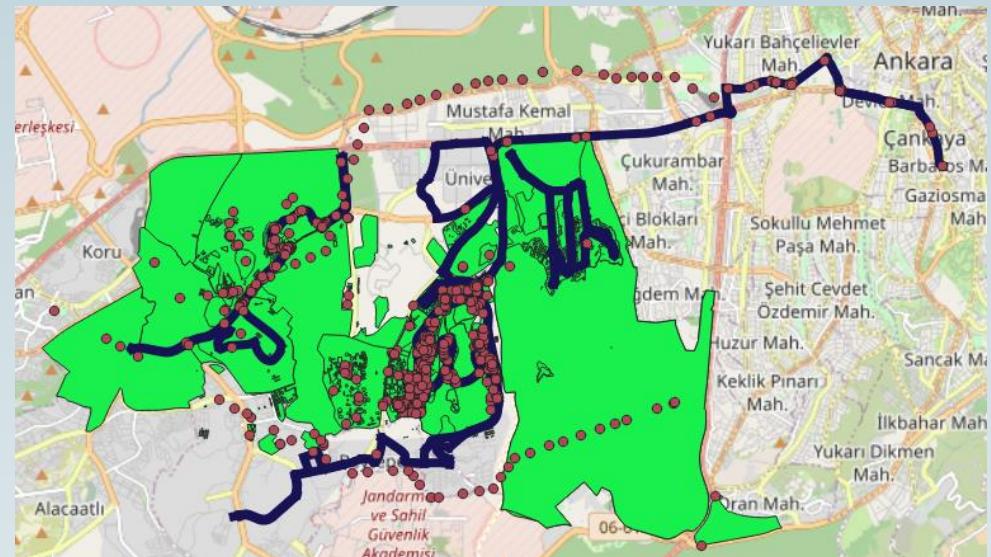
**North Pole LAEA Europe
EPSG: 3575**

WGS 84, Lambert_Azimuthal_Equal_Area

Coğrafi Veri



Raster



Nokta, Çizgi, Poligon

Vektör



Raster Veri

- Piksellerden oluşur.
- Uzaktan algılama – uçak, uydu
- Günümüzde kullanılan birçok coğrafi verinin kaynağı
- Görüntü → Sayısallaştırma ile vektör veri
- Yaygın format: TIFF, GEOTIFF

Raster Veri

*Untitled Project — QGIS

Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Dataforsyningen Processing Help

Identify Results

Feature	Value
Image_Beytepe	0
Image_Beytepe	
Band 1: Layer_1	231
Band 2: Layer_2	83
Band 3: Layer_3	74
(Derived)	

Browser

- GeoPackage
- SpatialLite
- PostgreSQL
- SAP HANA
- MS SQL Server
- Oracle
- ArcGIS REST Servers
- GeoNode

Layers

- Image_Beytepe**
 - Band 1: Layer_1 (Red)
 - Band 2: Layer_2 (Green)
 - Band 3: Layer_3 (Blue)
- OpenStreetMap

Vector Editor

The screenshot shows a QGIS interface with a satellite map of an urban area. A red arrow points from the bottom left towards a specific location on the map, which is highlighted with a red circle. In the top right corner, there is a red box highlighting the 'Identify Results' table. This table provides detailed information about the selected feature, specifically for the 'Image_Beytepe' layer. The table includes columns for 'Feature' and 'Value', with rows for the main layer and its three derived bands (Layer_1, Layer_2, Layer_3). The values listed are 0, 231, 83, and 74 respectively.



Raster Veri – Çözünürlük

- Çözünürlük türleri
 - Konumsal (coğrafi)
 - Spektral
 - Zamansal
 - Radyometrik

Konumsal Çözünürlük



- **1 pixel: x cm**
- Today some satellites reach to 30 cm resolution (e.g. Maxar)

Introducing 15 cm HD: The Highest Clarity From Commercial Satellite Imagery

By: Chris Formeller, Senior Imagery Product Manager, Maxar Technologies | 11.12.2020

READ TIME: 3 MINUTES

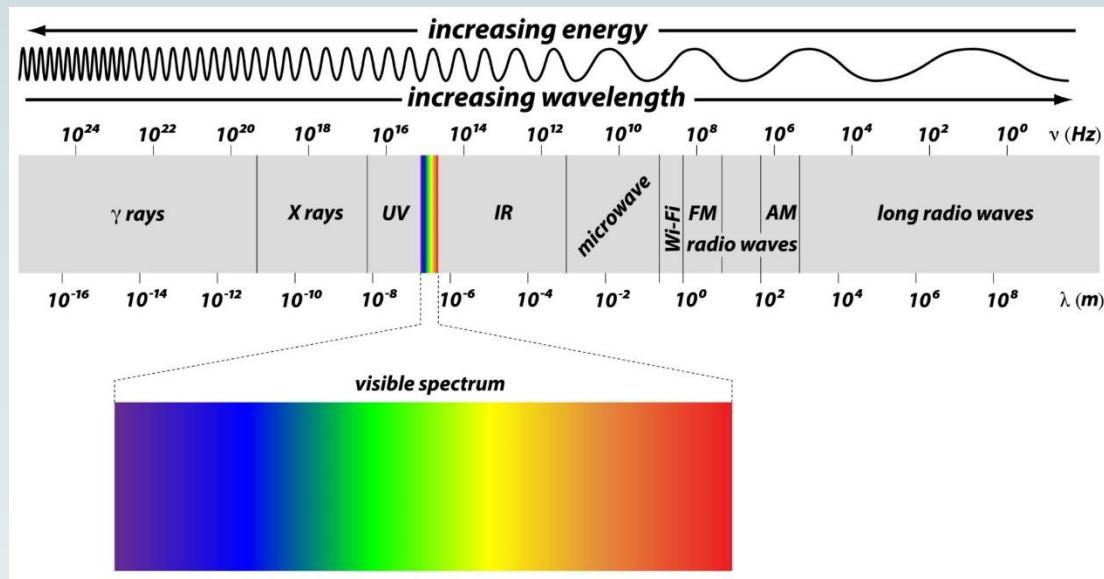
URL

Spectral Çözünürlük

- Görüntüdeki bantlar
 - RGB, InfraRed (IR) vb.
- Elektromagnetik spektrumda çalışılan bölge sayısı ve o bölgelerin genişliği

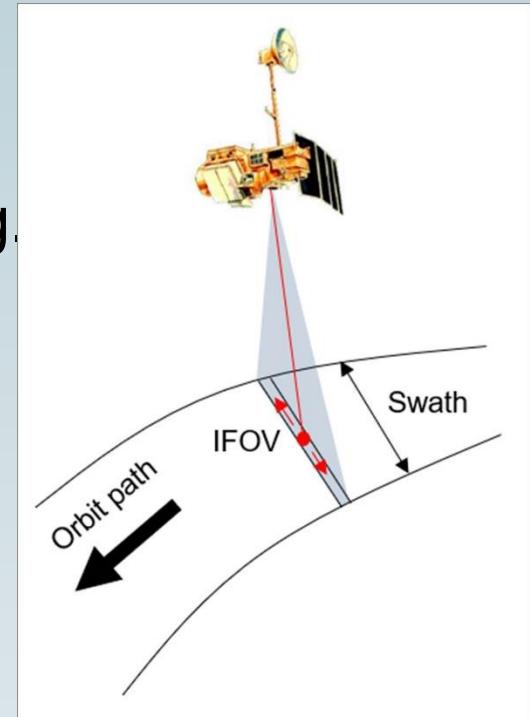


3-band image with Red, Green, and Blue



Zamansal Çözünürlük

- Görüntü → O andaki durum
- *Dünya sürekli değişim içinde*
- Bir bölgedeki görüntü alabilme sıklığı (e.g. LandSat: ayda iki kere, MODIS: her 1-2 günde bir)



IFOV (Instantaneous Field of View)



Radyometrik Çözünürlük

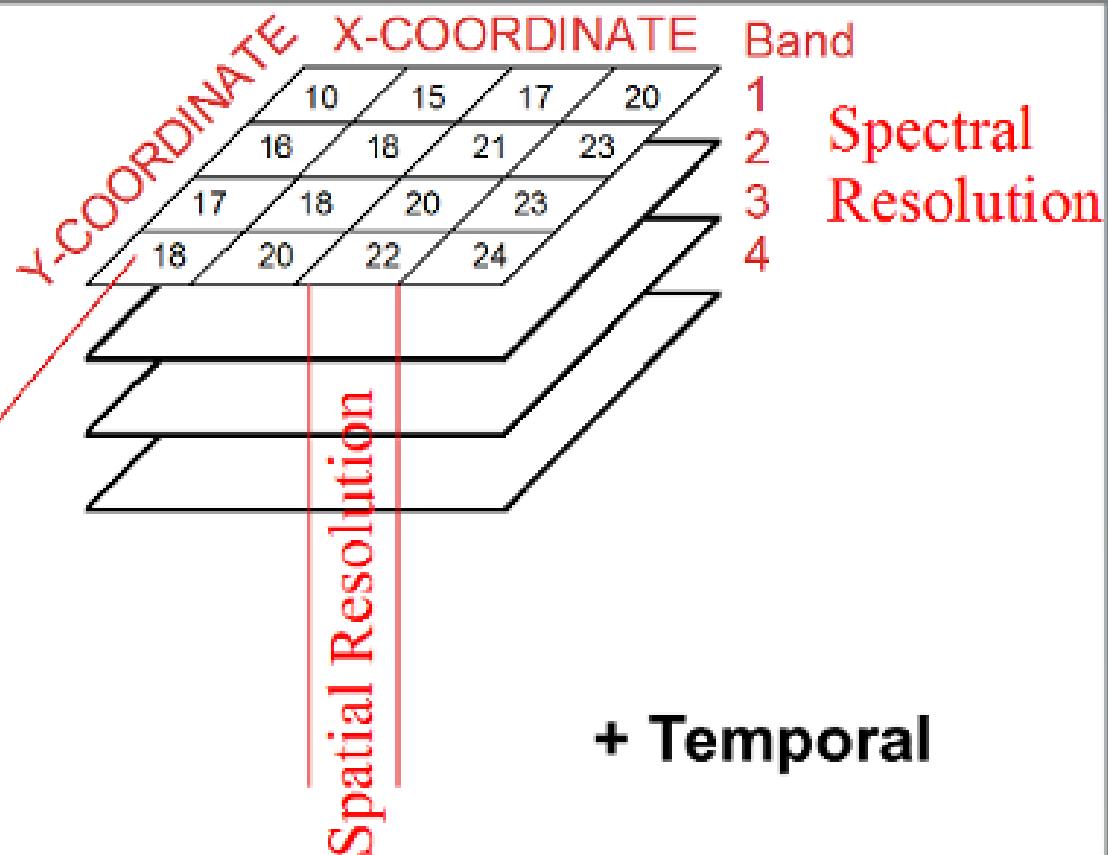
- Görüntüdeki her banttaki bit sayısı.
- Enerjideki küçük farklılıklarını ayırma yeteneği.
~Kaydedilen enerji / bit sayısı
- Genel: 8 bit (toplamda 256 farklı değer)
- Sayısal Yükseklik Modeli (SYM): 16-bits
 - Everest dağı: ~8.8 km
 - Böylece dünya üzerindeki tüm yükseklikler ölçülebilir.

Çözünürlükler

Radiometric Resolution

1	09876543210
1	0521
2	152631
4	2684268421
0	00000010001

n

 2^n 

Vektör Veri

- İki ilişkili veri:
 - Coğrafi
 - Öznitelik
 - (noktanın türü, yoldaki maksimum hız, gölün pH seviyesi vb.)

+



Zaman

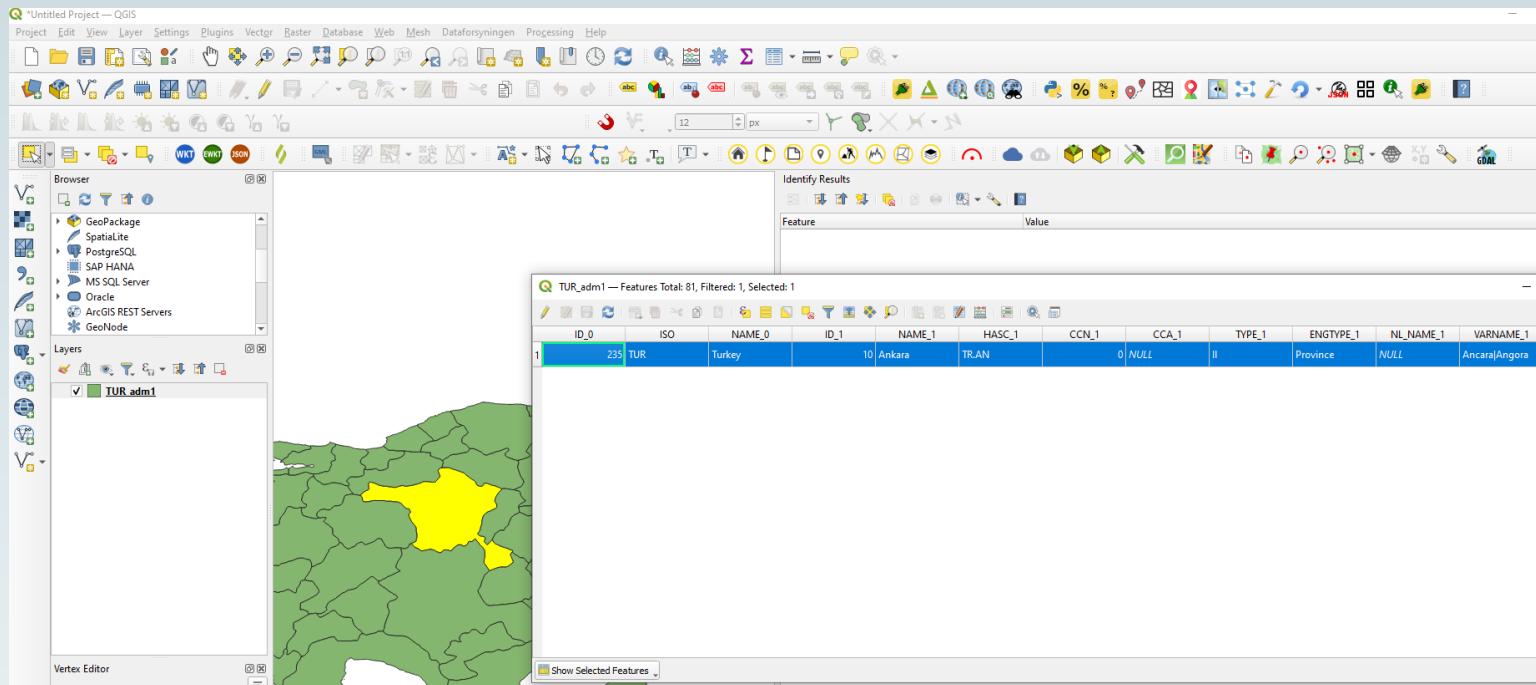


Nokta, Çizgi, Poligon

Vektör

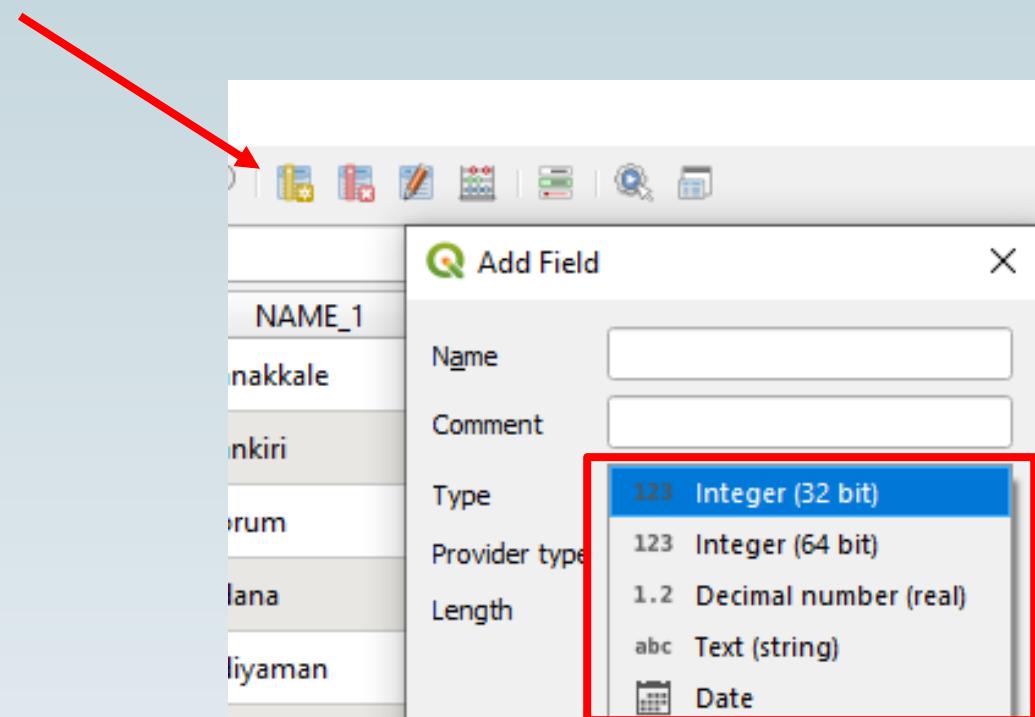
Vektör Veri

- Tablosal veri
- Satır → Kayıt
- Sütun → Öznitelik
- fid (birincil anahtar) + Öznitelik(ler) + geometri



Vektör Veri

- Öznitelikler ~ veri tipleri ile ifade edilir
- Veri tipleri:
 - Sayı
 - Tarih
 - Metin
 - *Doğru/yanlış (bool)*



Vector Veri

- Farklı format / standartlar mevcut
- Uluslararası standardlar komitesi:
 - Open Geospatial Consortium (OGC)
- Yaygın: SHP (shape file)
 - **Tek bir dosya değil**



**QGIS'e
sürükle
bırak**

Name	Type
tr_iller	OpenOffice...
tr_iller.cpg	CPG File
tr_iller.prj	PRJ File
tr_iller.shp	SHP File
tr_iller.shx	SHX File



Güncel Vector Veri Formatları

- **GeoJSON**

- Web uygulamalarında yaygın
- Genelde nokta, ama çizgi ve poligon da tanımlanabilir.
- Uyarı: EPSG = 4326.

According to the latest [GeoJSON spec \(RFC 7946\)](#), GeoJSON coordinates should be assumed to be in WGS84, but sometimes it's useful to use other CRS anyway, and the spec actually leaves some room for this:

<https://github.com/perliedman/reproject>

BODY

```
1 {  
2   "type": "FeatureCollection",  
3   "features": [  
4     {  
5       "type": "Feature",  
6       "geometry": {  
7         "type": "Point",  
8         "coordinates": [-111.125, 33.375]  
9       },  
10      "properties": {  
11        "trackid": "AA-1234",  
12        "reported_dt": "12/31/2019 23:59:59"  
13      }  
14    },  
15    {  
16      "type": "Feature",  
17      "geometry": {  
18        "type": "Point",  
19        "coordinates": [-113.675, 35.875]  
20      },  
21      "properties": {  
22        "trackid": "AA-1234",  
23        "reported_dt": "12/31/2019 23:59:59"  
24      }  
25    }  
26  ]  
27 }
```

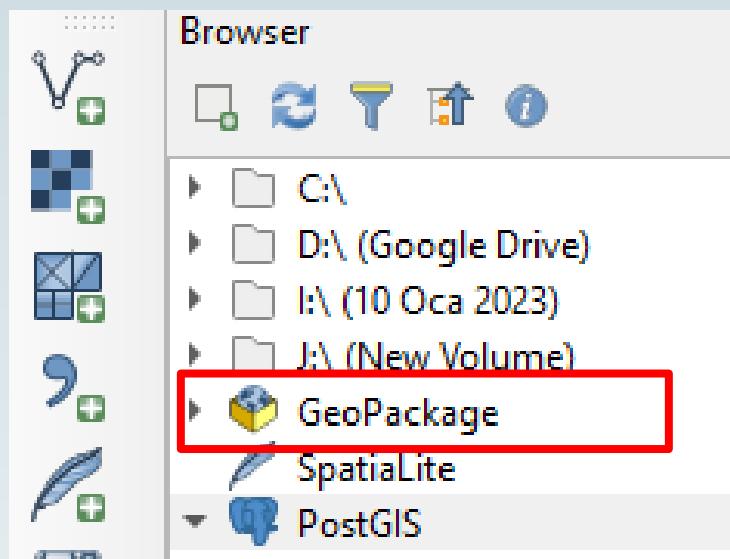
[Text](#) | [JSON](#) | [XML](#) | [HTML](#)

length

Güncel Vector Veri Formatları

- **GeoPackage**

- En gelişmiş OGC standarı
- Birden çok katman & raster
- QGIS ile entegrasyonu ✓





Web Servisleri

- **Web Map Service (WMS)**

- HTTP arayüzü ile harita görüntülerini/fotoğrafları.
- **Elde edilen veri: JPG**



- **Web Feature Service (WFS)**

- Coğrafi detaylara erişim.
- **Elde edilen veri : Vector layer**



GeoServer



OpenStreetMap

- Web tabanlı açık haritalama aracı
- ~10M kullanıcı
 - <https://wiki.openstreetmap.org/wiki/Stats>
- Piyasa değeri: 1 milyar \$
- OSRM (Open Source Routing Machine)
 - <https://project-osrm.org/>

OpenStreetMap is Having a Moment

The Billion Dollar Dataset Next Door

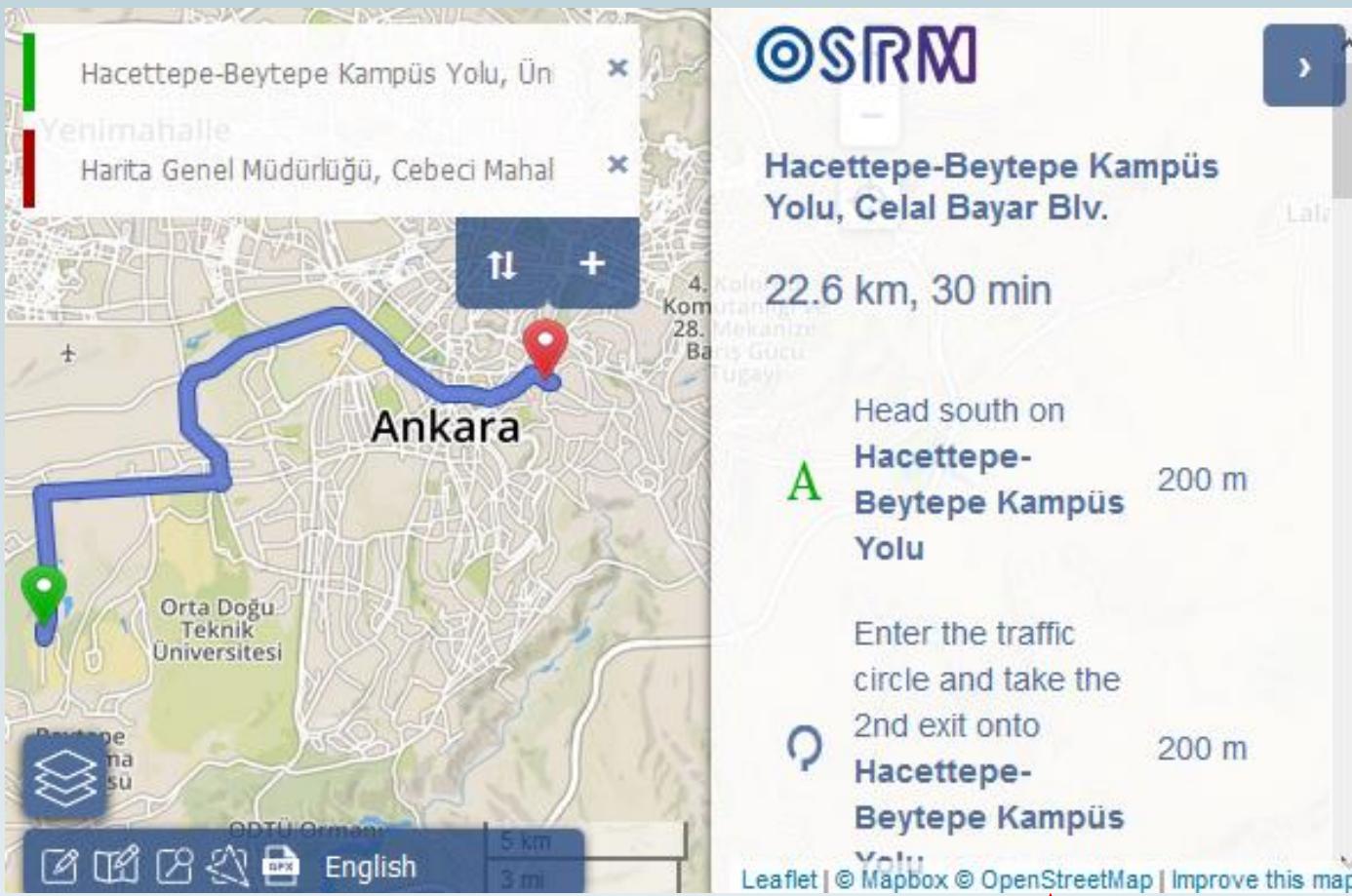


Joe Morrison · [Follow](#)
9 min read · Nov 18, 2020

[URL](#)

OSM Lisans

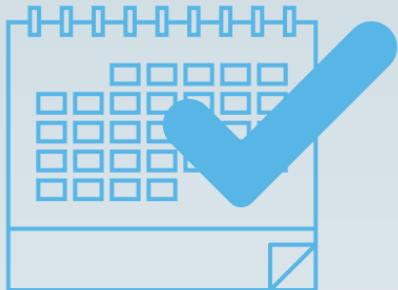
- Açık kaynaklı navigasyon sistemi – OSRM



OpenStreetMap



Güncel



Kalite(?)



Az maliyetli



OpenStreetMap Verisi



- XML tabanlı
- Üç temel yapı:
 - Nokta (node),
 - çizgi (way) ve
 - ilişki (relation)

Nokta: Haritacılık Müzesi
(2956218306)

(yorum yok)

6 ay önce Ank_BJK tarafından düzenlendi
Sürüm #2 · Değişiklik Kaydı #50049587
Konum: 39.9317820, 32.8821019

Etketler

name	Haritacılık Müzesi
name:en	Haritacılık Museum
tourism	museum

XML İndir · Geçmiş Gözüntüle

```
<osm version="0.6" generator="CGIImap 0.6.0 (31905 thorn-01.openstreetmap.org)"  
copyright="OpenStreetMap and contributors"  
attribution="http://www.openstreetmap.org/copyright"  
license="http://opendatacommons.org/licenses/odbl/1-0/">  
<node id="2956218306" visible="true" version="2" changeset="50049587"  
timestamp="2017-07-05T06:00:09Z" user="Ank_BJK" uid="3372212"  
lat="39.9317820" lon="32.8821019">  
<tag k="name" v="Haritacılık Müzesi"/>  
<tag k="name:en" v="Haritacılık Museum"/>  
<tag k="tourism" v="museum"/></node></osm>
```



OpenStreetMap Verisi

← → ⌂ https://www.openstreetmap.org/way/422817500#map=19/39.86524/32.73519&layers=D

Yer imlerini içe aktar... Getting Started sesar MUDEK-Ozdegerlendir... Bachelor's Degree in G... 390 odtü

OpenStreetMap Düzenle Geçmiş Dışa Aktar

Ara Bu nerede? Git

Yol: Geomatic Engineering (422817500)

Sürüm #13

Find all the http:// website tags in OSM that redirect to https:// and update them.

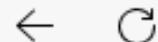
b-jazz-bot tarafından 4.ay önce düzenlendi
Değişiklik Kaydi #142745542

Etiketler

building	university
building:levels	4
name	Geomatik Mühendisliği
name:en	Geomatic Engineering
personnel:count	17
phone	+9031226976990

way = 422817500

OpenStreetMap Verisi



<https://www.openstreetmap.org/api/0.6/way/422817500>

This XML file does not appear to have any style information associated with it.]

```
<osm version="0.6" generator="CGImap 0.8.10 (1777573 spike-07.openstreetmap.org)" contributors="attribution='http://www.openstreetmap.org/copyright'" license="CC-BY-SA 2.0" uid="9451067">
  <way id="422817500" visible="true" version="13" changeset="142745542" last edited="2013-08-20T11:45:07Z" uid="9451067">
    <nd ref="4225441381"/>
    <nd ref="4225441388"/>
    <nd ref="4225441377"/>
    <nd ref="4225441376"/>
    <nd ref="4225441385"/>
    <nd ref="4225441384"/>
    <nd ref="4225441404"/>
    <nd ref="4225441405"/>
    <nd ref="3032495378"/>
    <nd ref="4225441414"/>
    <nd ref="4225441408"/>
    <nd ref="3032495379"/>
    <nd ref="5013564025"/>
    <nd ref="4225441381"/>
    <tag k="building" v="university"/>
    <tag k="building:levels" v="4"/>
    <tag k="name" v="Geomatik Mühendisliği"/>
    <tag k="name:en" v="Geomatic Engineering"/>
    <tag k="personnel:count" v="17"/>
    <tag k="phone" v="+9031226976990"/>
    <tag k="source" v="mapbox"/>
    <tag k="student:count" v="60/year"/>
    <tag k="website" v="https://geomatik.hacettepe.edu.tr/"/>
  </way>
</osm>
```

way = 422817500



OpenStreetMap Verisi

OpenStreetMap Düzenle Geçmiş Dışa Aktar

Ara Bu nerede? Git

Nokta: 4225441381 ×
Sürüm #3
Bazı Beytepe Kampüsü binaları düzenlendi.
Celale55in tarafından yaklaşık 6.yıl önce düzenlendi
Değişiklik Kaydı #54274607
Konum: 39,8654520, 32,7340205

Parçası:
▼ 1 yol
Geomatic Engineering (422817500)

← ⏪ https://www.openstreetmap.org/api/0.6/node/4225441381

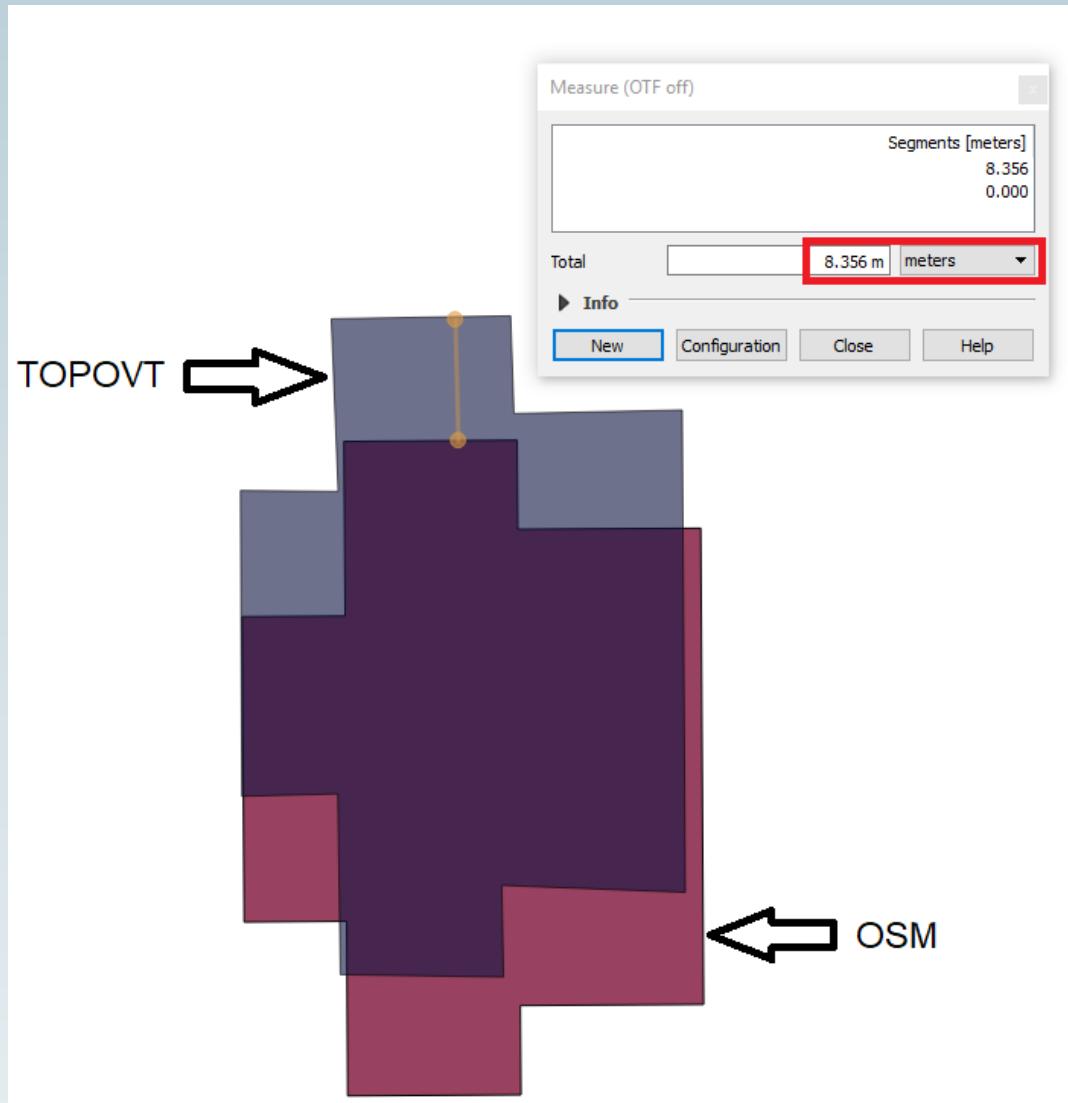
This XML file does not appear to have any style information associated with it. T

```
▼<osm version="0.6" generator="CGImap 0.8.10 (1640615 spike-06.openstreetmap.org)" contributors="Attribution-NonCommercial-ShareAlike" attribution="http://www.openstreetmap.org/copyright" license="OGL-1.0.0"/>
  <node id="4225441381" visible="true" version="3" changeset="54274607" user="Celale55in" uid="5859805" lat="39.8654520" lon="32.7340205"/>
</osm>
```

node = 4225441381



OpenStreetMap vs TOPOVT





UYGULAMA



Raster Veri Analizi

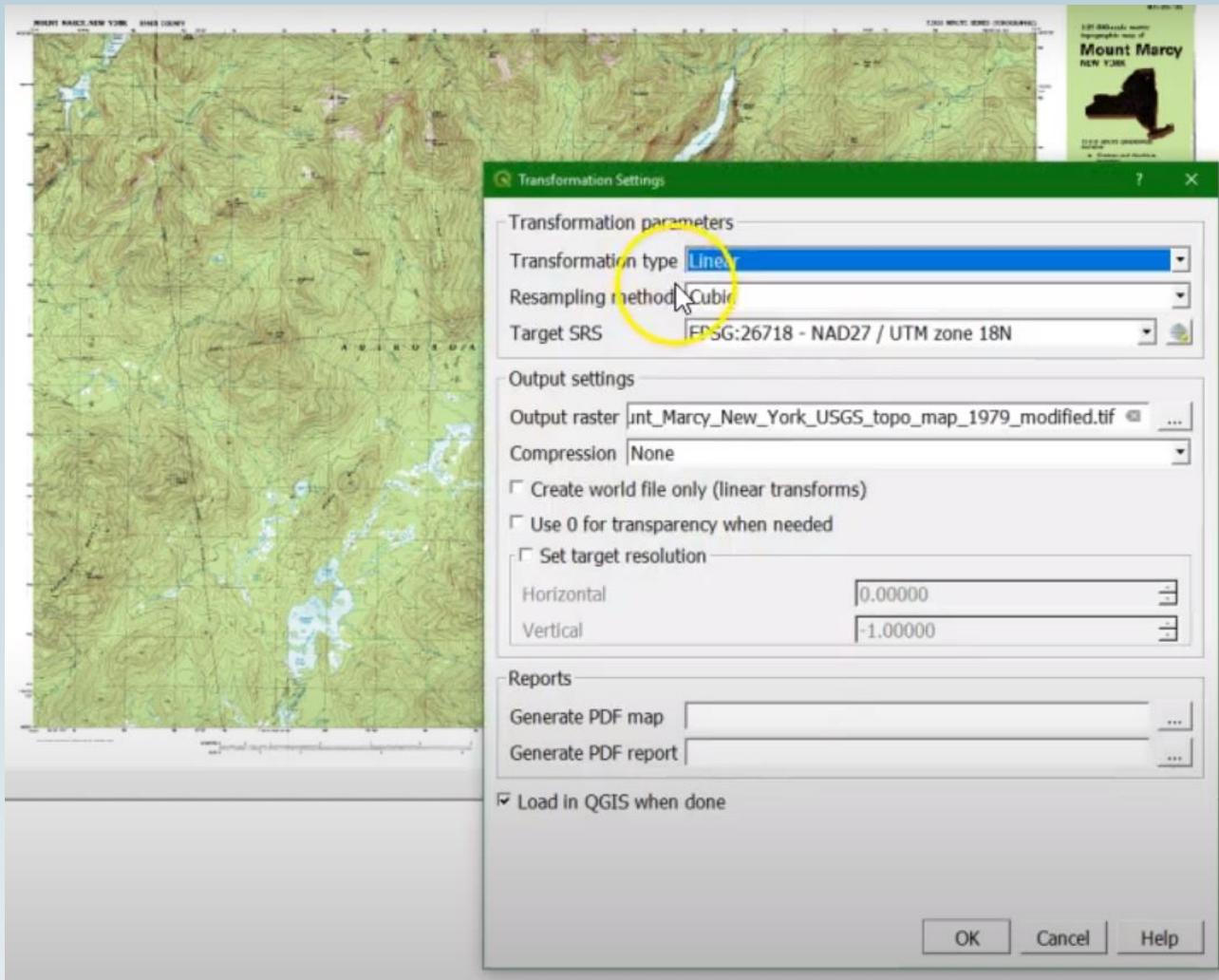


Veri Toplama

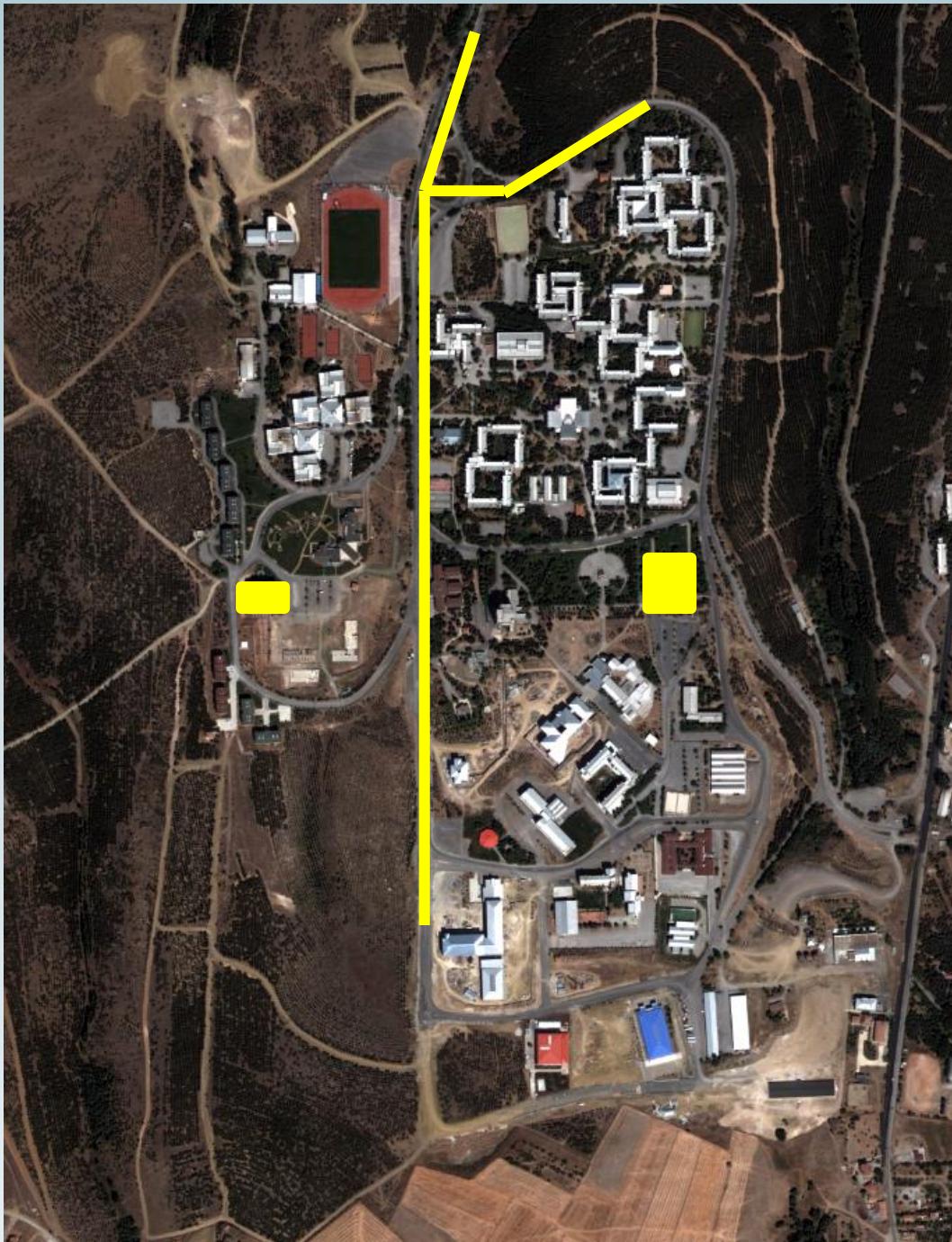


- Havadan/uzaydan fotoğraf
- Yer Kontrol Noktalarının yersel ölçümelerle koordinatlandırılması
- Fotoğraf ile YKNlerin eşleştirilmesi (**georeference**)

Georeference



https://www.youtube.com/watch?v=67j_HShwv8Y&ab_channel=HansvanderKwast



- Sayısallaştırma
- Raster verinin
üzerine vektör veri
eklenmesi.



Öznitelik Ekleme

Noktalara Yükseklik Değeri Eklenmesi

yukseklik_nokta — Field Calculator

Only update 1 selected feature

Create a new field

Create virtual field

Output field name:

Output field type: 123 Integer (32 bit)

Output field length: 10 Precision: 3

Update existing field

1.2 **yukseklik**

Expression Function Editor



```
raster_value('TUR_alt_06ecc4a1_64fb_4753_8679_df624b12f546',
1,
make_point($x, $y))
```

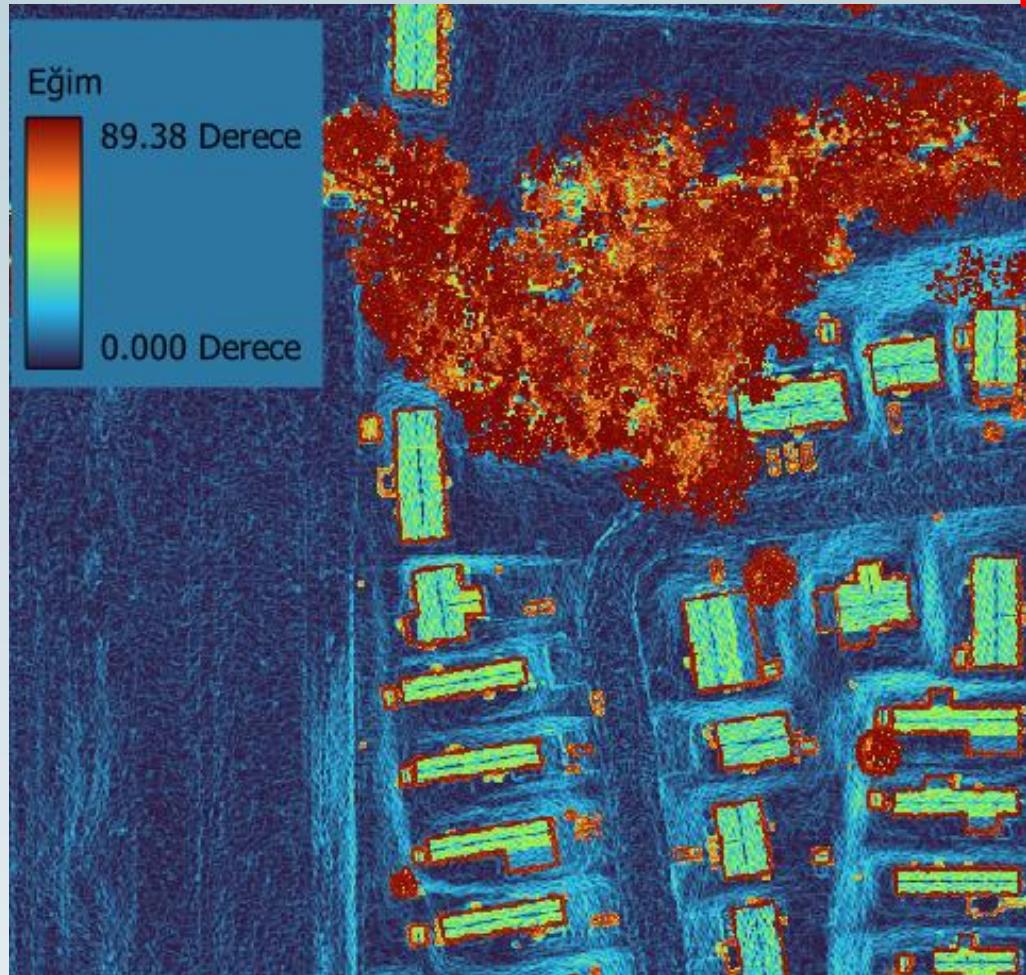
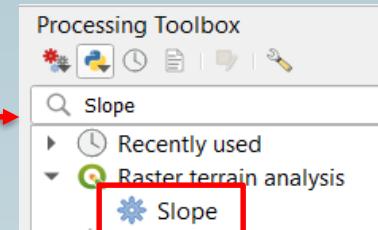
Eğim



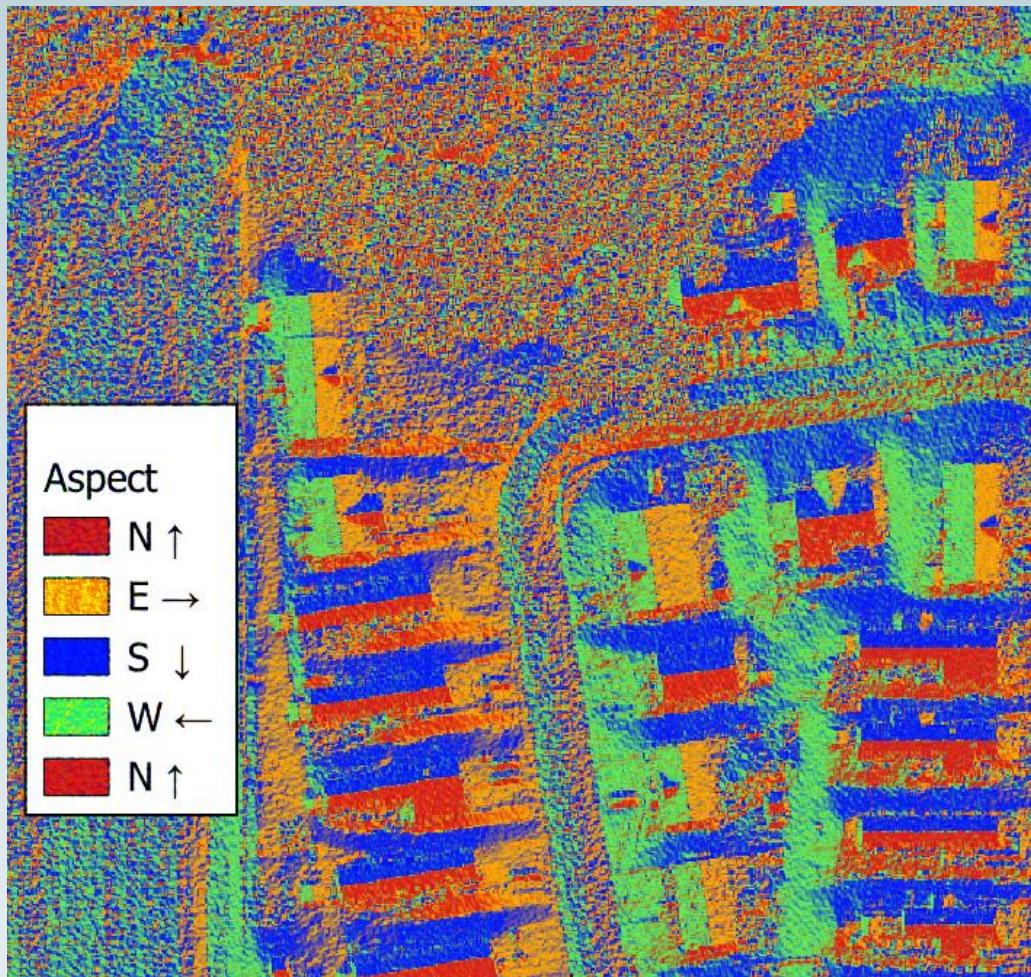
QGIS

Processing

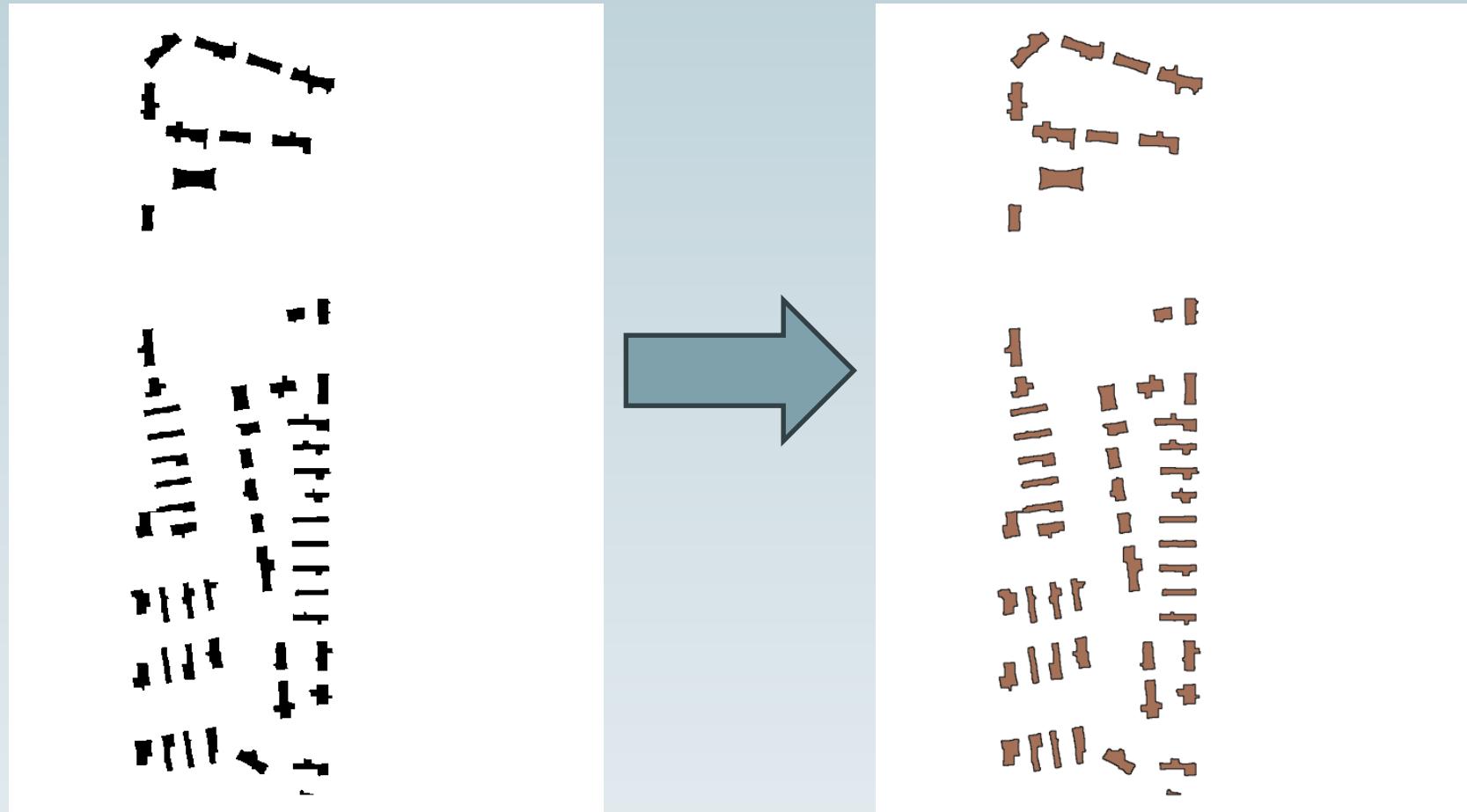
Toolbox



Baki

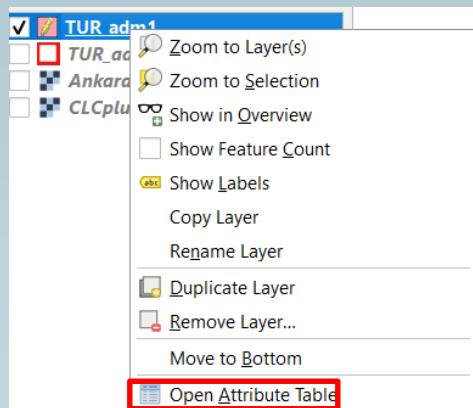


Raster → Vektor

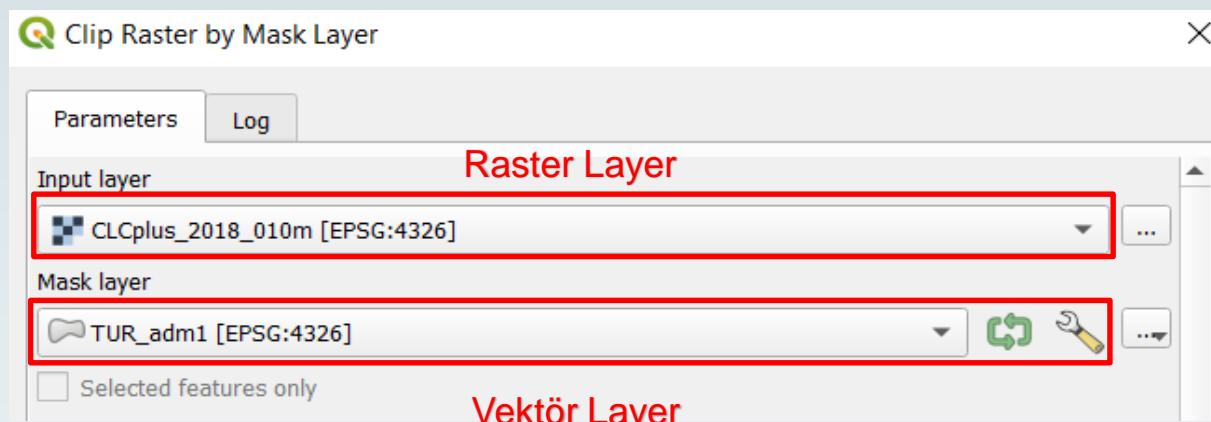




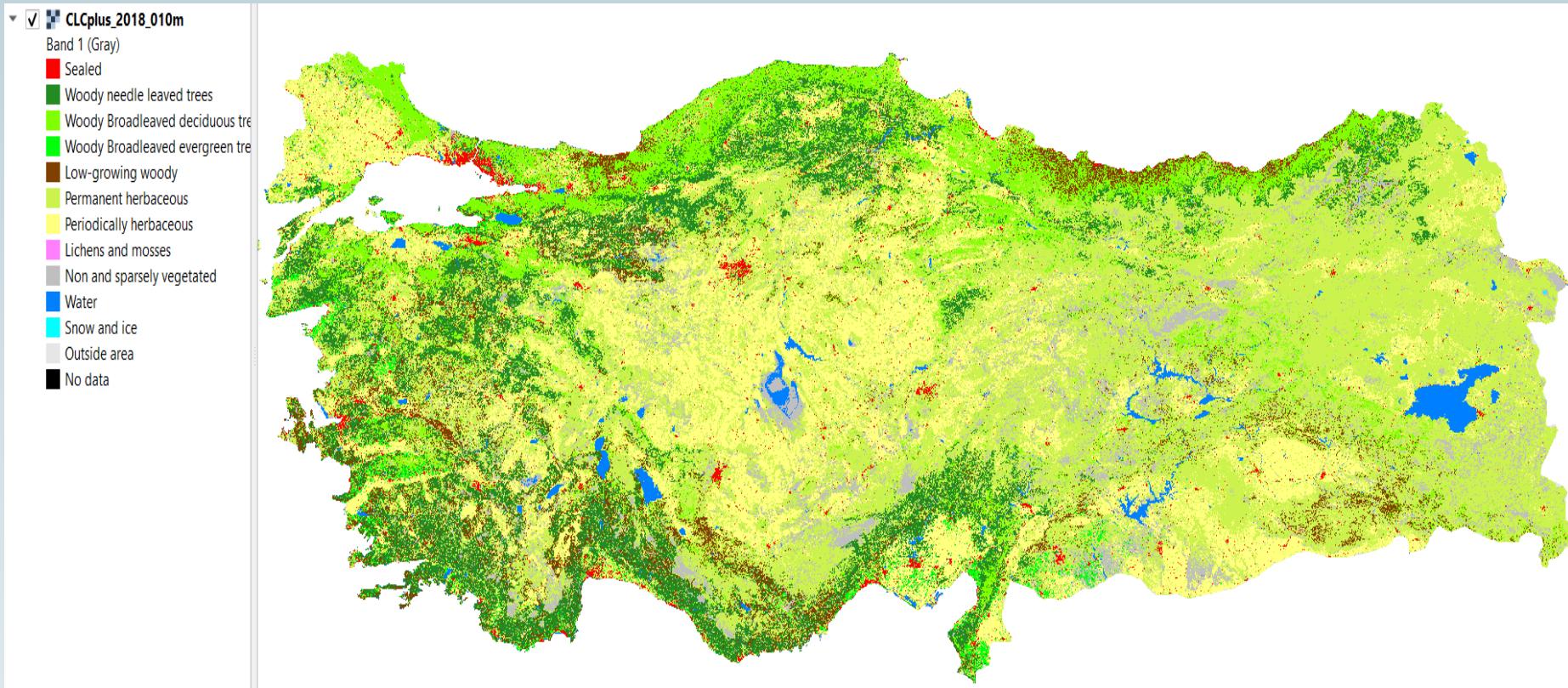
Vektör ile Raster Kesimi



Menu Toolbar ————— Raster ————— Extraction ————— Clip Raster by Mask Layer

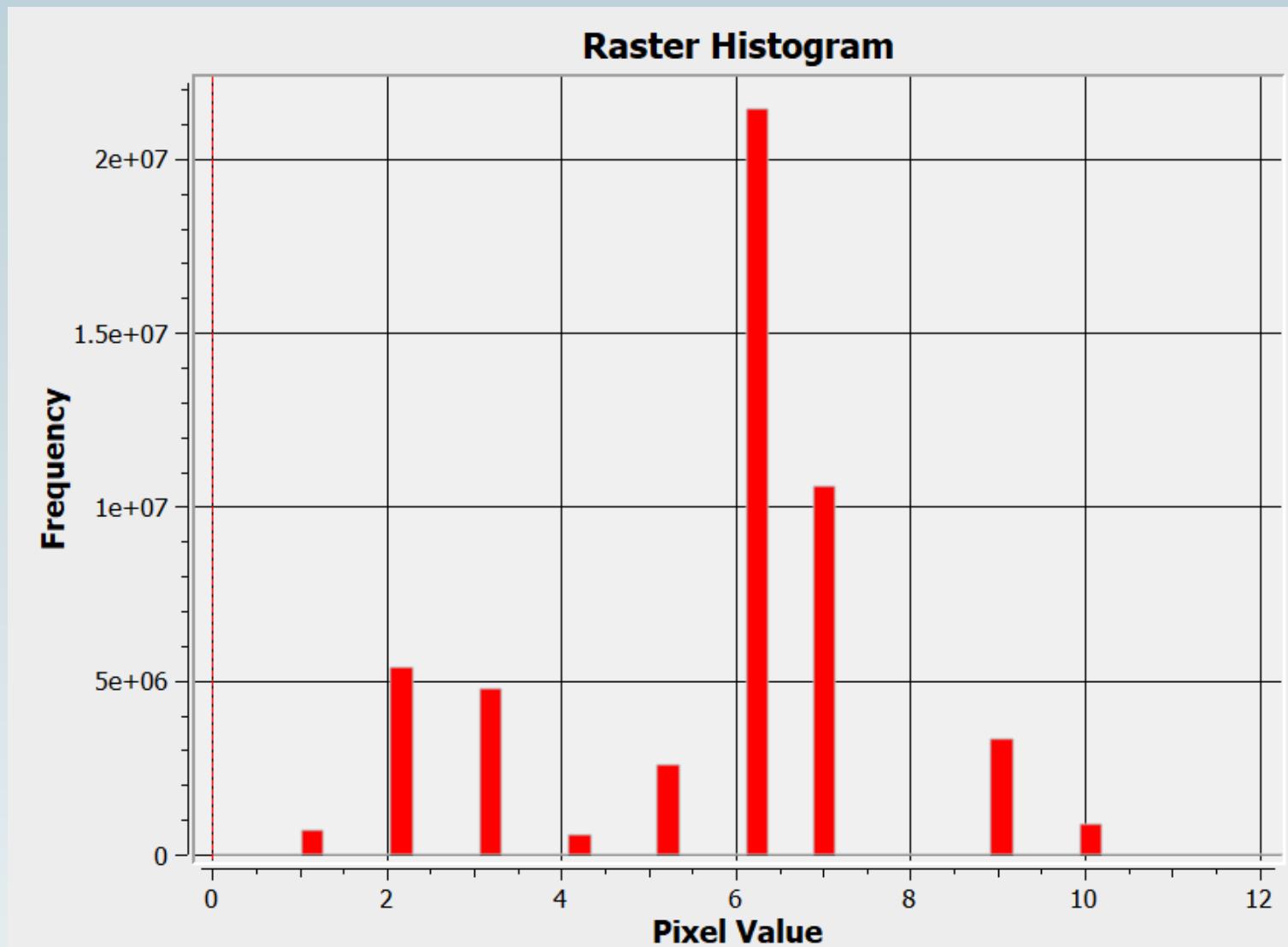


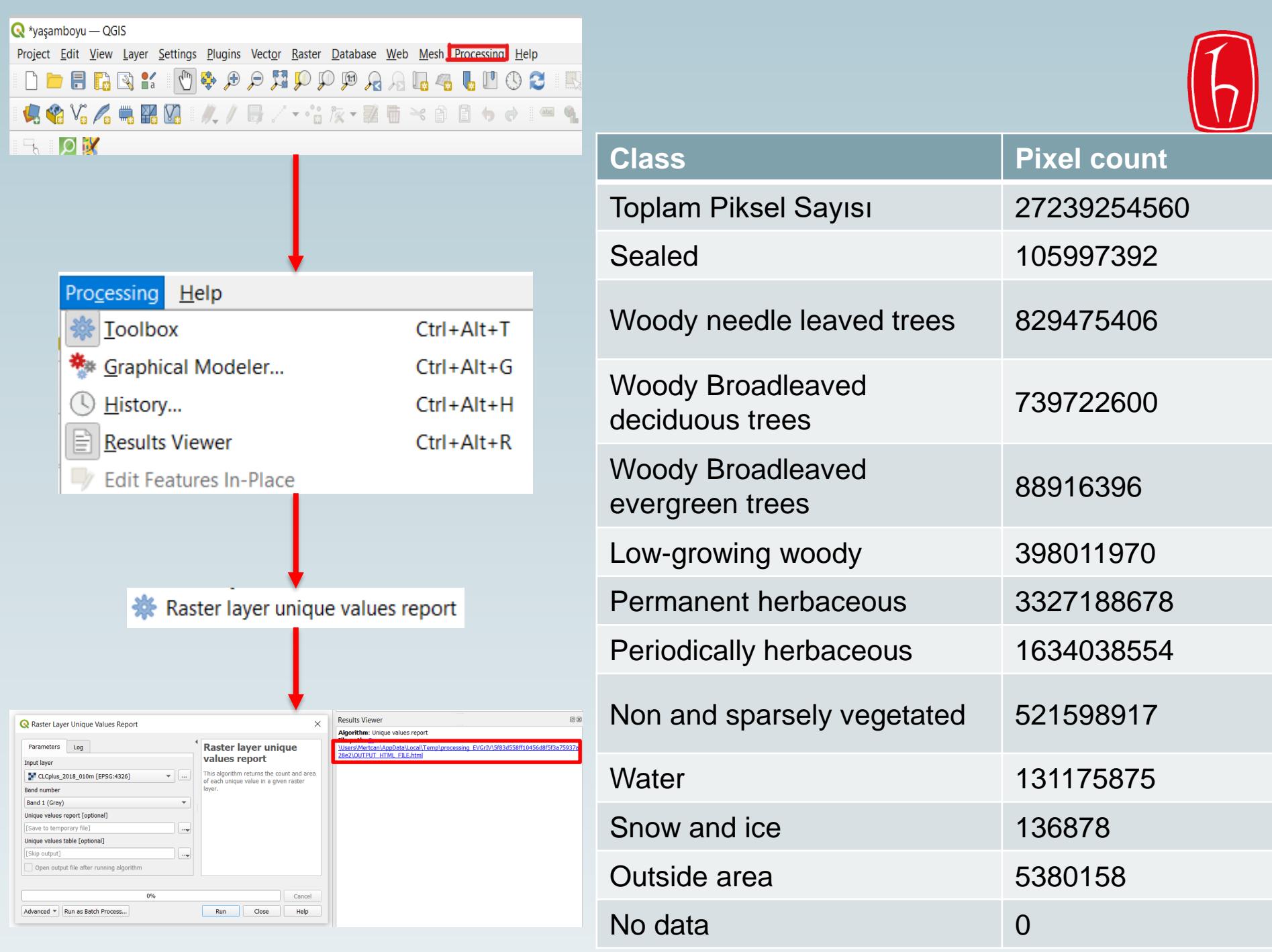
Corine Data of Turkey





CORINE HISTOGRAM



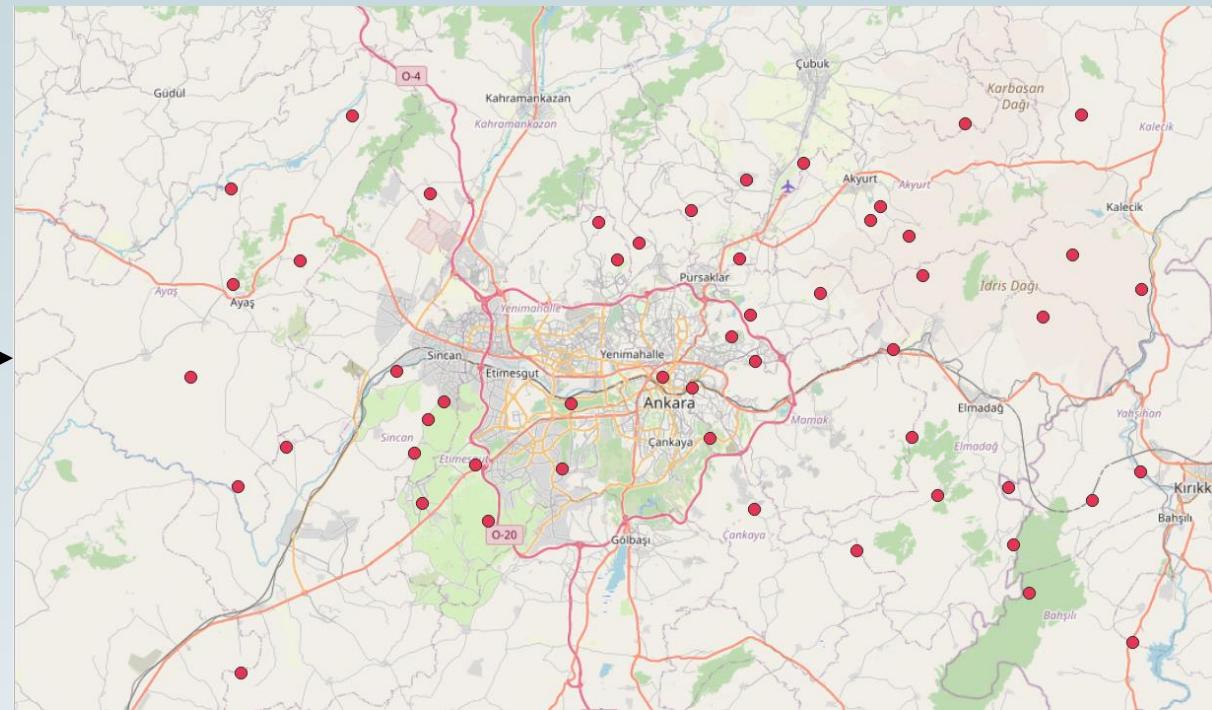




Tablosal Veri → Coğrafi

CSV Dosyasının Haritaya Eklenmesi (Meteoroloji İstasyonları Örneği)

	A	B	C
1	ID	enlem	boylam
2	18240	39.82932	33.37044
3	19202	39.90483	32.55993
4	18045	39.69557	33.42038
5	17729	40.05452	32.79034
6	19206	39.87389	32.54287
7	19004	40.12923	32.94802
8	17680	39.88876	33.15034
9	18908	40.06969	32.81644
10	18241	40.03158	32.3207
11	18075	40.05391	32.40312
12	18256	40.07659	33.14654
13	18046	40.00069	33.31091
14	18242	39.83391	33.18129
15	17715	39.9504	32.52047
16	17137	39.66695	32.33117
17	17987	40.02322	33.03835
18	19273	39.98237	32.93039
19	19203	40.19006	33.35811
20	18691	39.91959	32.73337
21	17134	40.09091	33.09988
22	18979	40.18892	32.46723





Etiket Ekleme







Item Properties

Label

▼ Main Properties

[% @project_path %] ([% @layout_name %])

Render as HTML

Insert an

▼ Appearance



home/myall/Documents/North Road/Training/Expressions/Expressions v2.qgz (Master map)





QGIS Expressions



QGIS expressions, variables, data defined settings: putting it all together!



Nyall Dawson
1,84 B abone

Abone ol

 594



 Paylaş



lip

 Kaydet

• • •

<https://www.youtube.com/watch?v=h-mpUkwDdOQ>



```
case when | @use_big_labels_for_capitals then  
       case when "SCALERANK" <= 3 then 18 else 13 end  
       else 13  
     end
```



We will cover the following functions

- aggregate()
- array_FOREACH()
- eval()

Ujavaal Gandhi

Advanced QGIS Expressions

<https://www.youtube.com/watch?v=IXPCec8vgLA>



QGIS North America
5,03 B abone

Abone ol

227



Paylaş

Klip

Kaydet

...



Layer 1

fid	attributel	...	geometry	new field
1	value1	...	geometry1	<i>expression</i>
2	value2	...	geometry2	<i>expression</i>
3	value3	...	geometry3	

simple functions

Layer 1

fid	attributel	...	geometry	new field
1	value1	...	geometry1	aggregate
2	value2	...	geometry2	
3	value3	...	geometry3	

aggregate function

Layer 2

fid	attributel	...	geometry
1	value1	...	geometry1
2	value2	...	geometry2
3	value3	...	geometry3



Veri Tipleri

TUR_adm1 — Field Calculator

Only update 0 selected features

Create a new field

Create virtual field

Output field name:

Output field type: 123 Integer (32 bit)

Output field length: 10 Precision: 3

Expression Function Editor

```
'123'*2
```

= + - / * ^ || () '\n'

Feature: Turkey

Preview: 246



IPython 7.29.0 --

In [1]: '123'*2

Out[1]: '123123'





QGIS Graphical Modeller

Coğrafi Sorgular