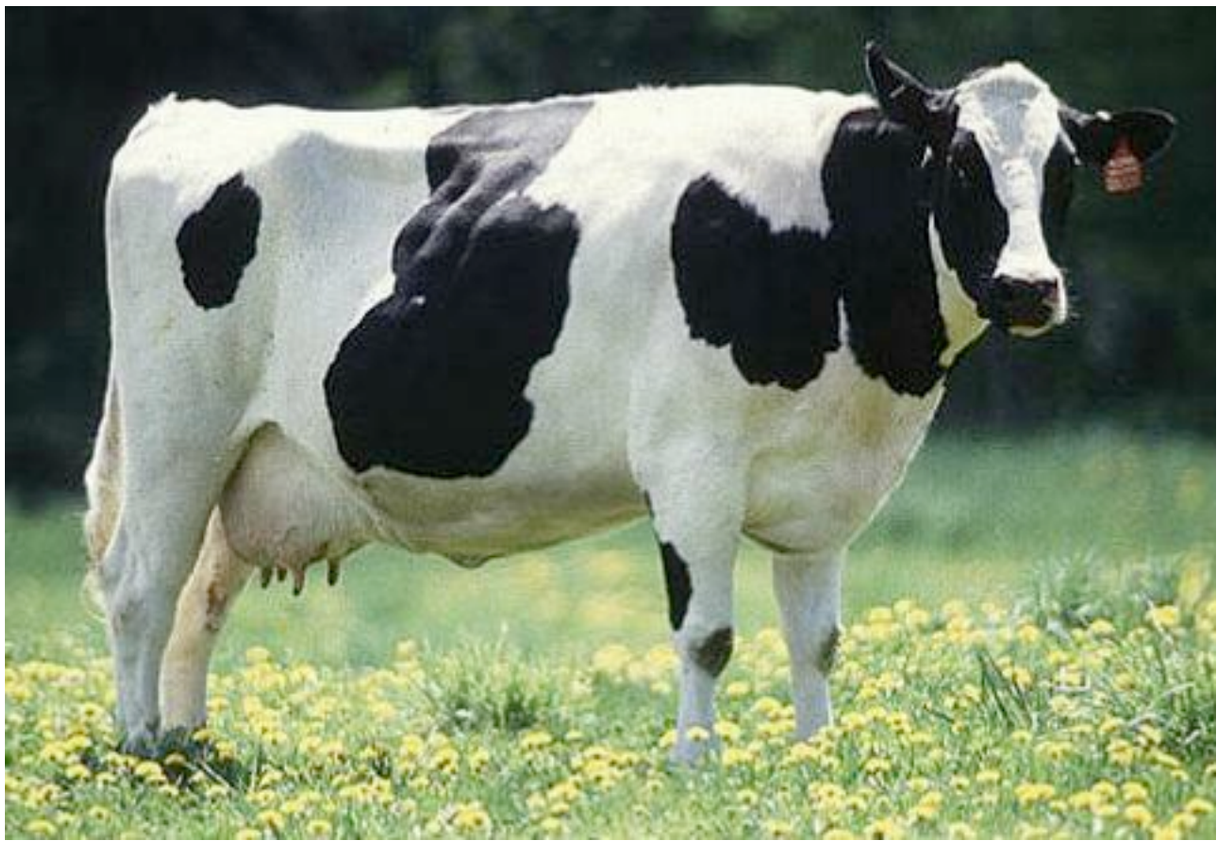
Prostorska in krajinska arheologija-Vaje 2

Dimitrij Mlekuž

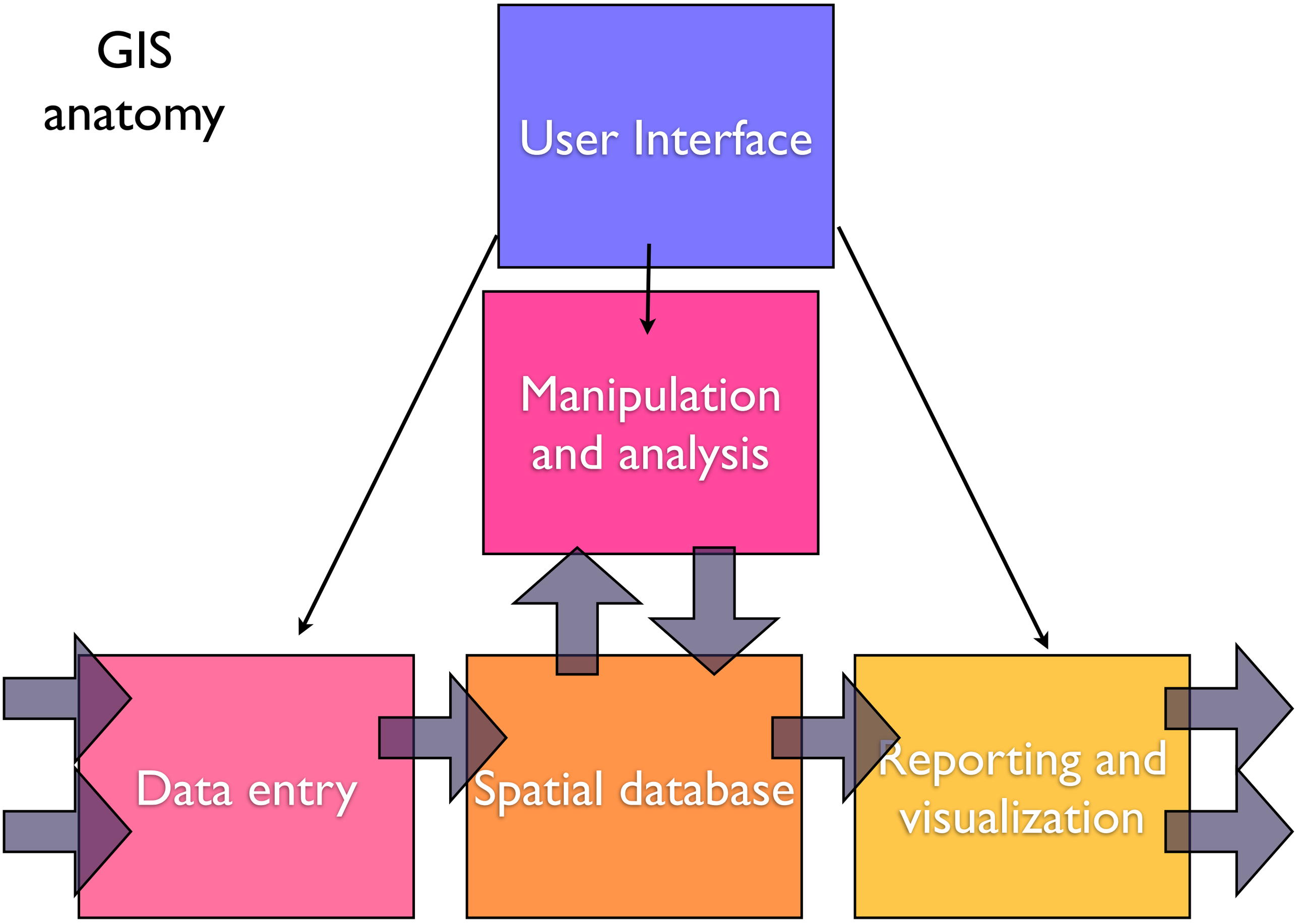
Modelling

Phenomenon

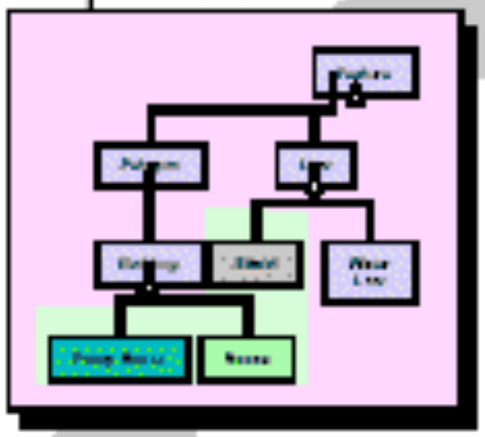


Model

GIS anatomy


User Interface
Manipulation and analysis
Data entry
Spatial database
Reporting and visualization

GIS Data Model
Description and
Representation

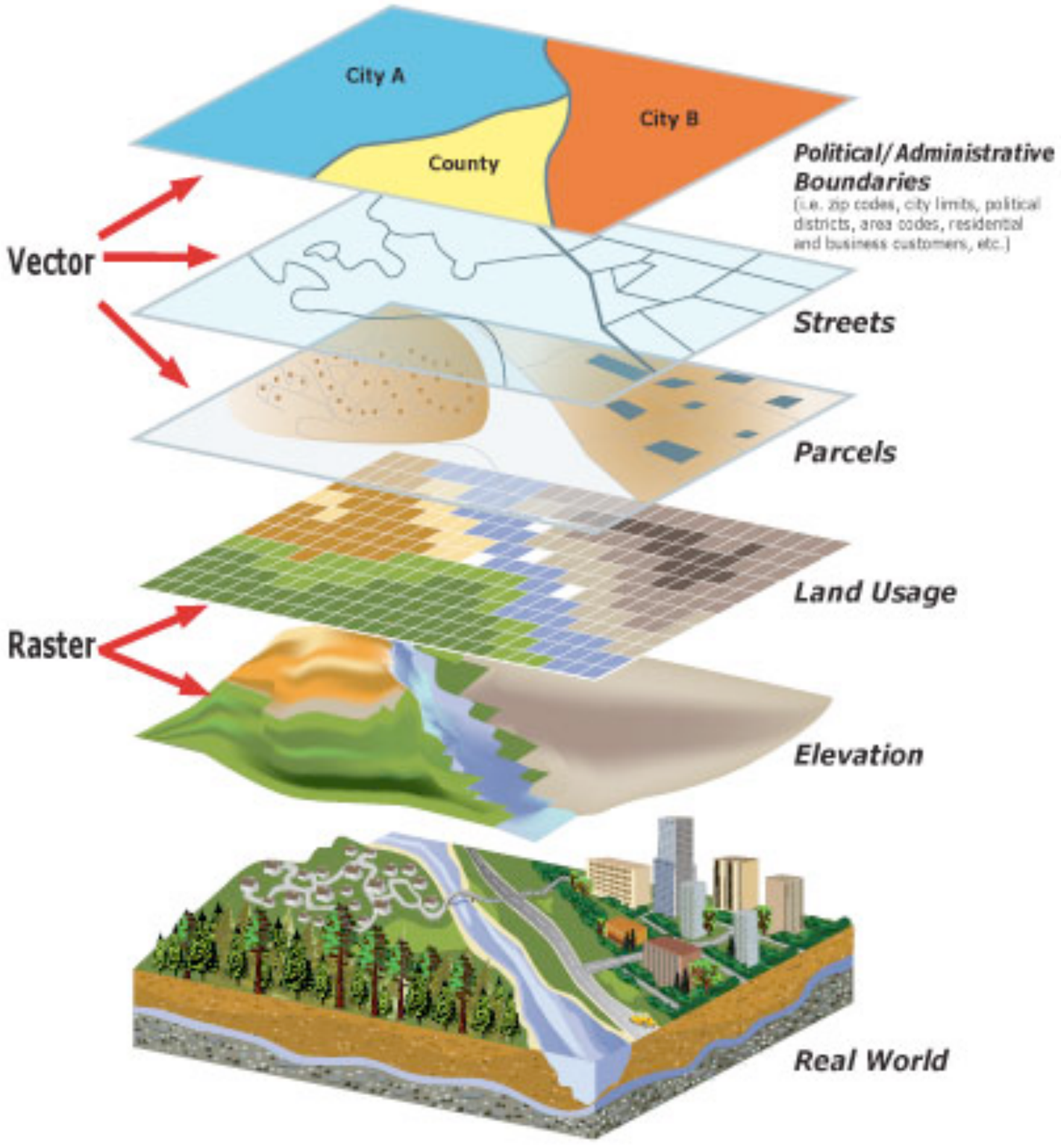


Operational GIS
Analysis and
Presentation

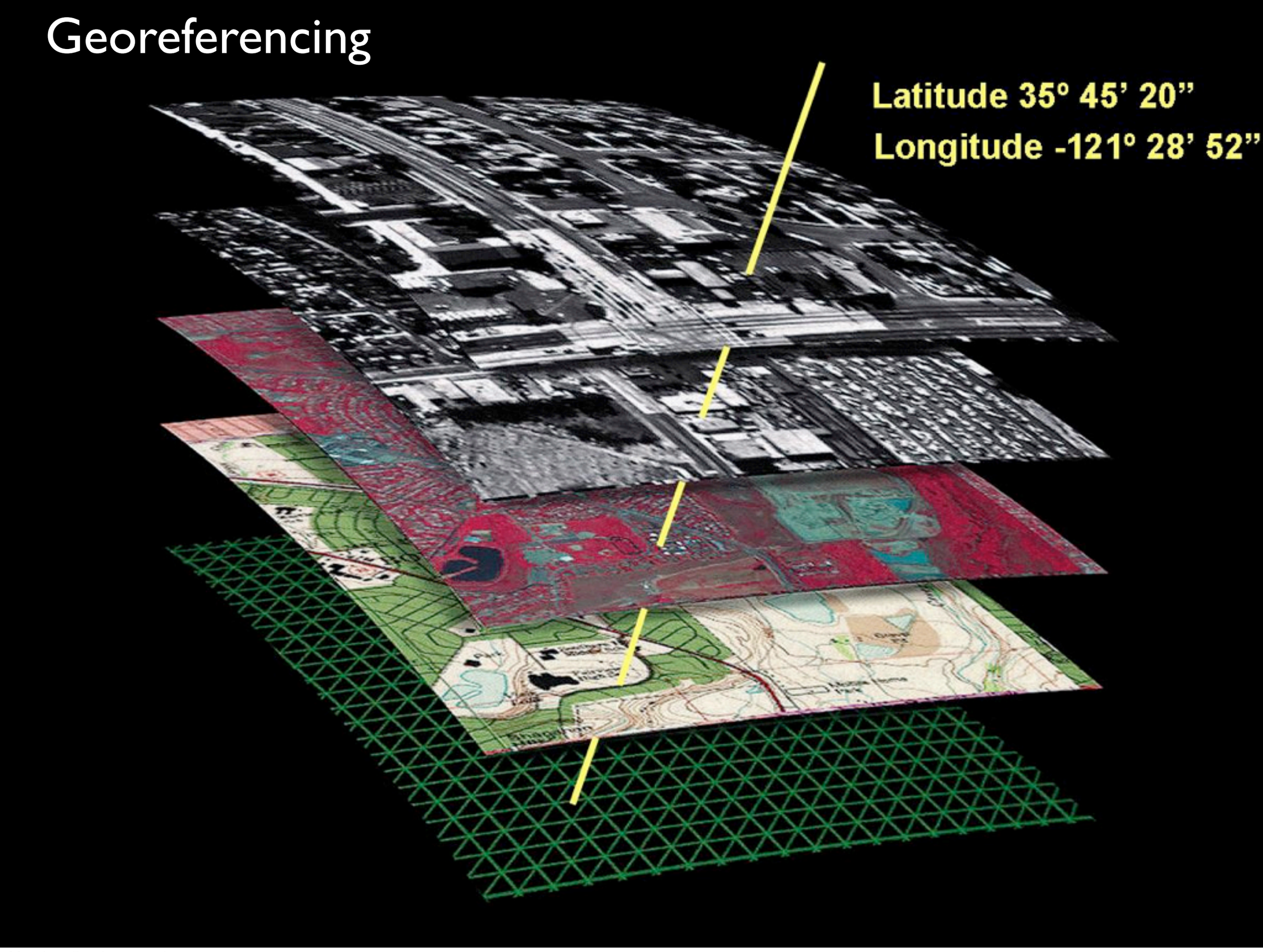
Real World

People
Interpretation and
Explanation

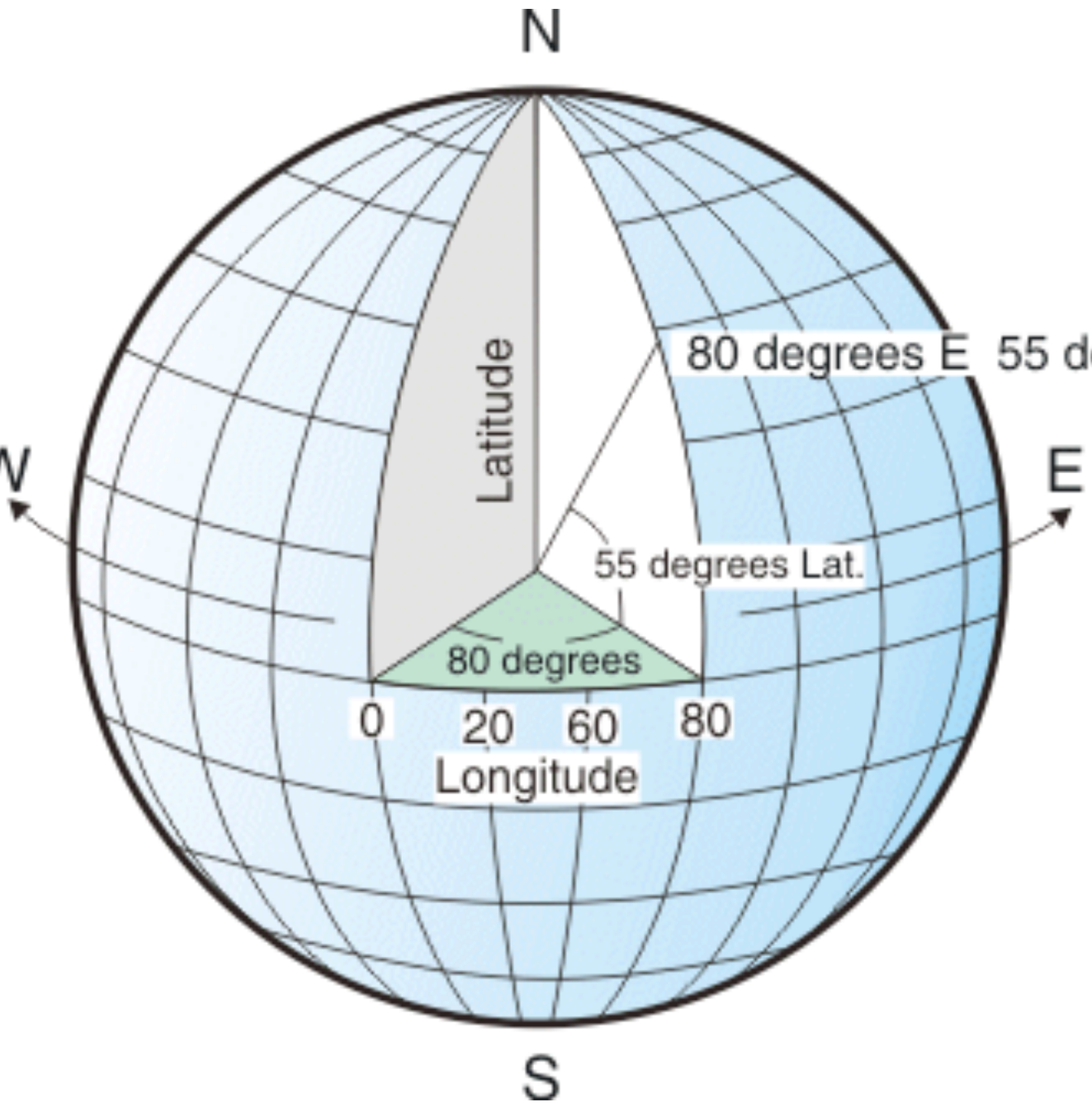
Model of spatial phenomena

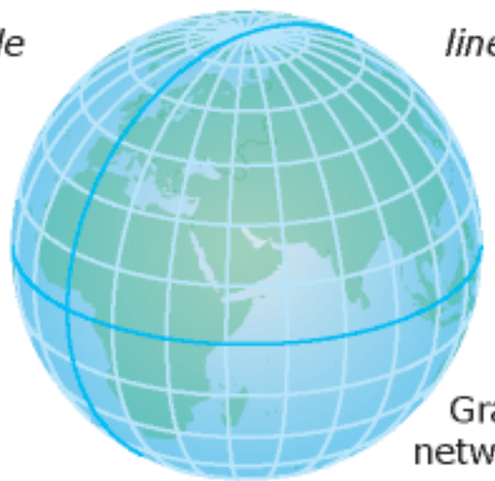


Georeferencing

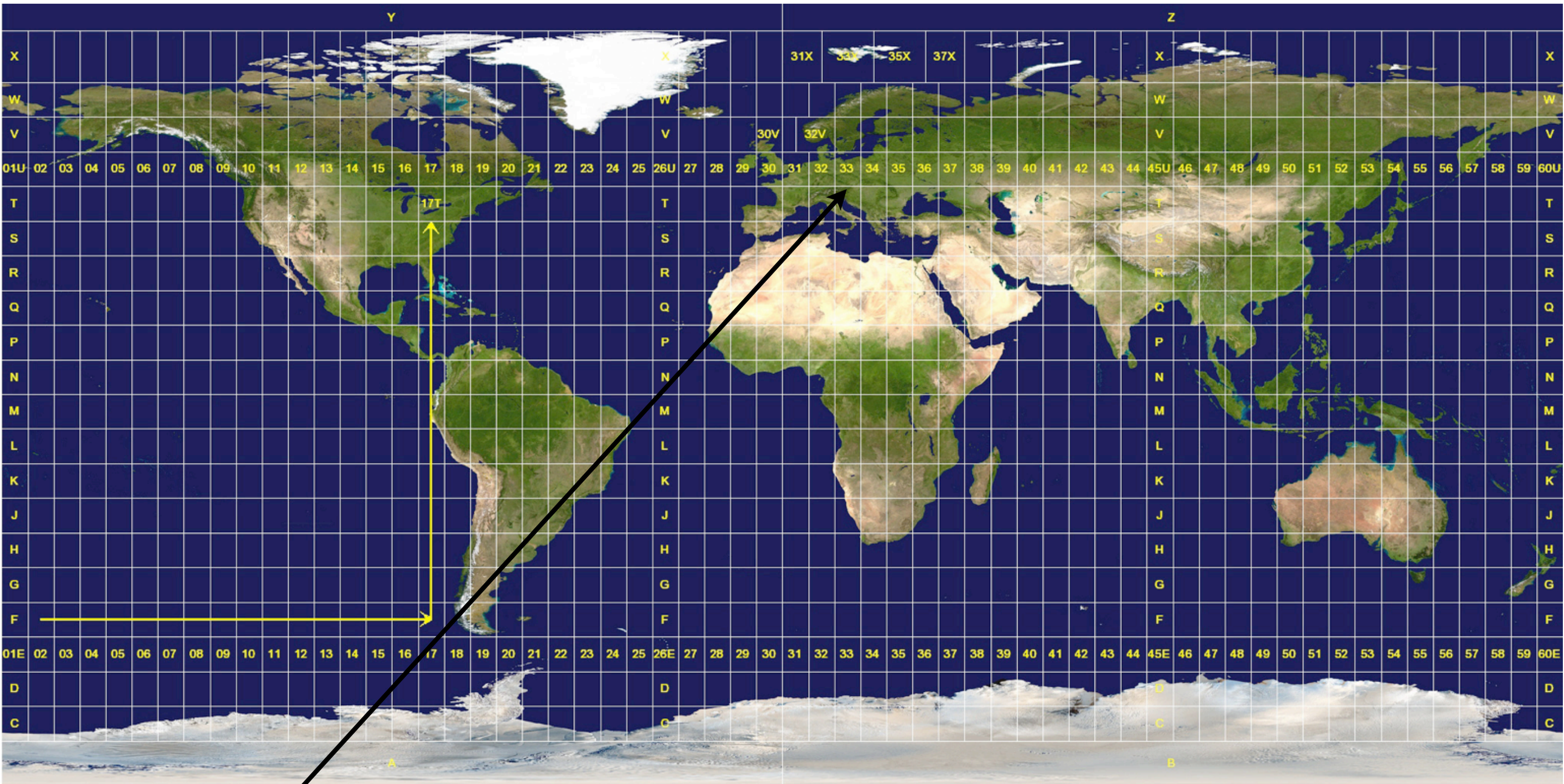


Geographic coordinate system



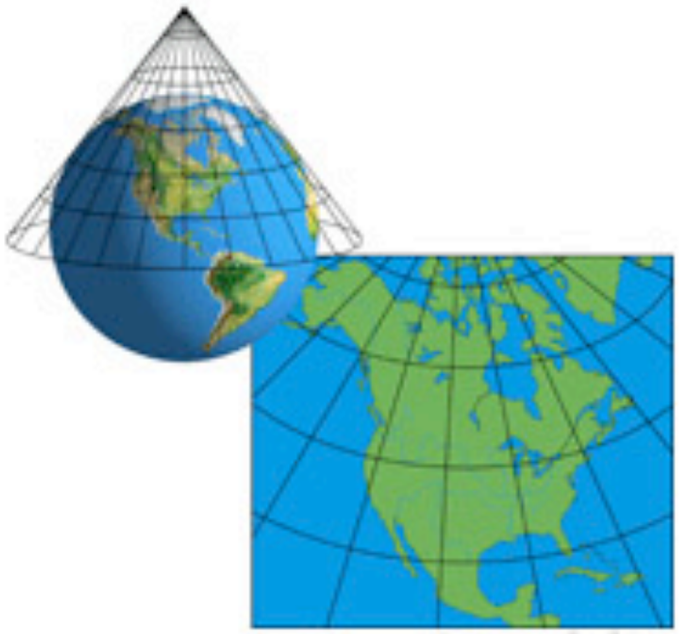


UTM (Universal Transverse Mercator)

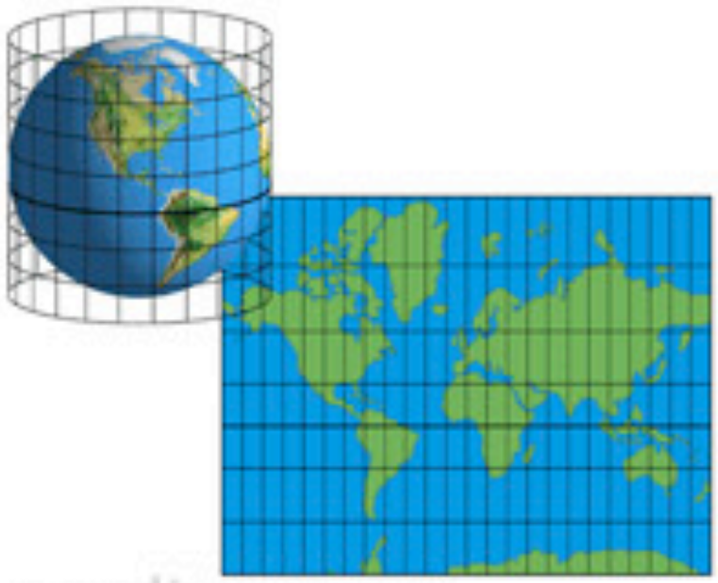


Slovenija: 33T

Prehod iz ukrivljene referenčne ploskve na ravnino

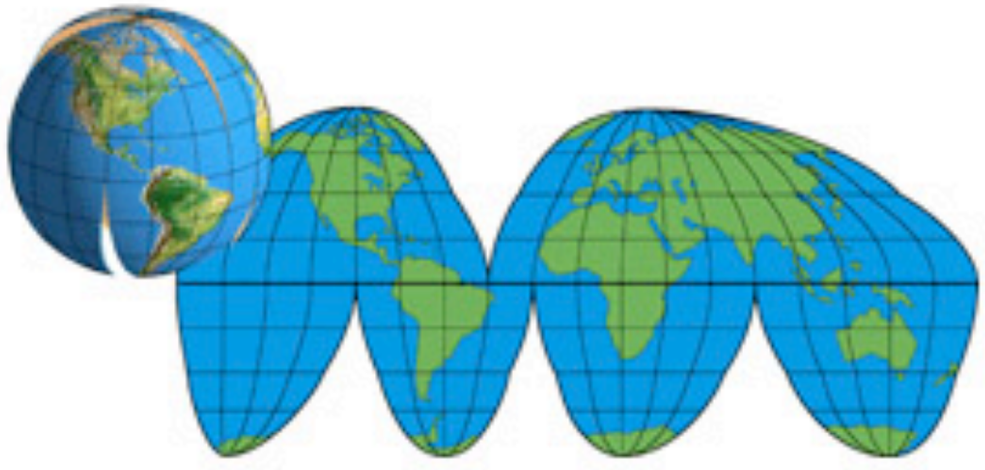


conic projection



cylindrical projection

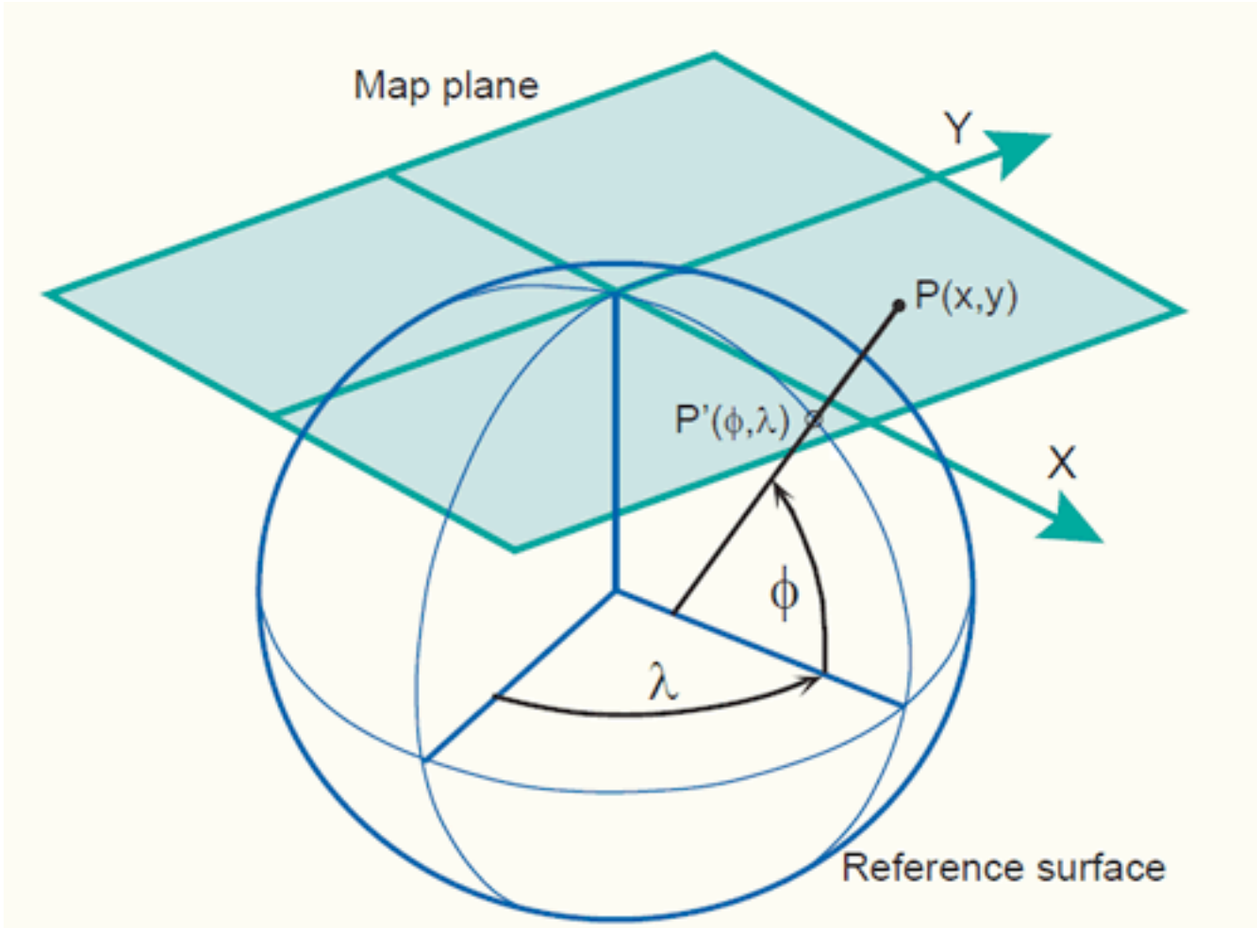
plane projection



interrupted projection

Kartografska projekcija obravnava preslikavao elipsoida v ravnino. Je analitična preslikava prostorskih (3D) točk z elipsoida (krogle) na ravnino (2D karto).

Definirana je z matematično zvezo med koordinatami točk na referenčni ploskvi in koordinatami identičnih točk, prikazanih na projekcijski ravnini.



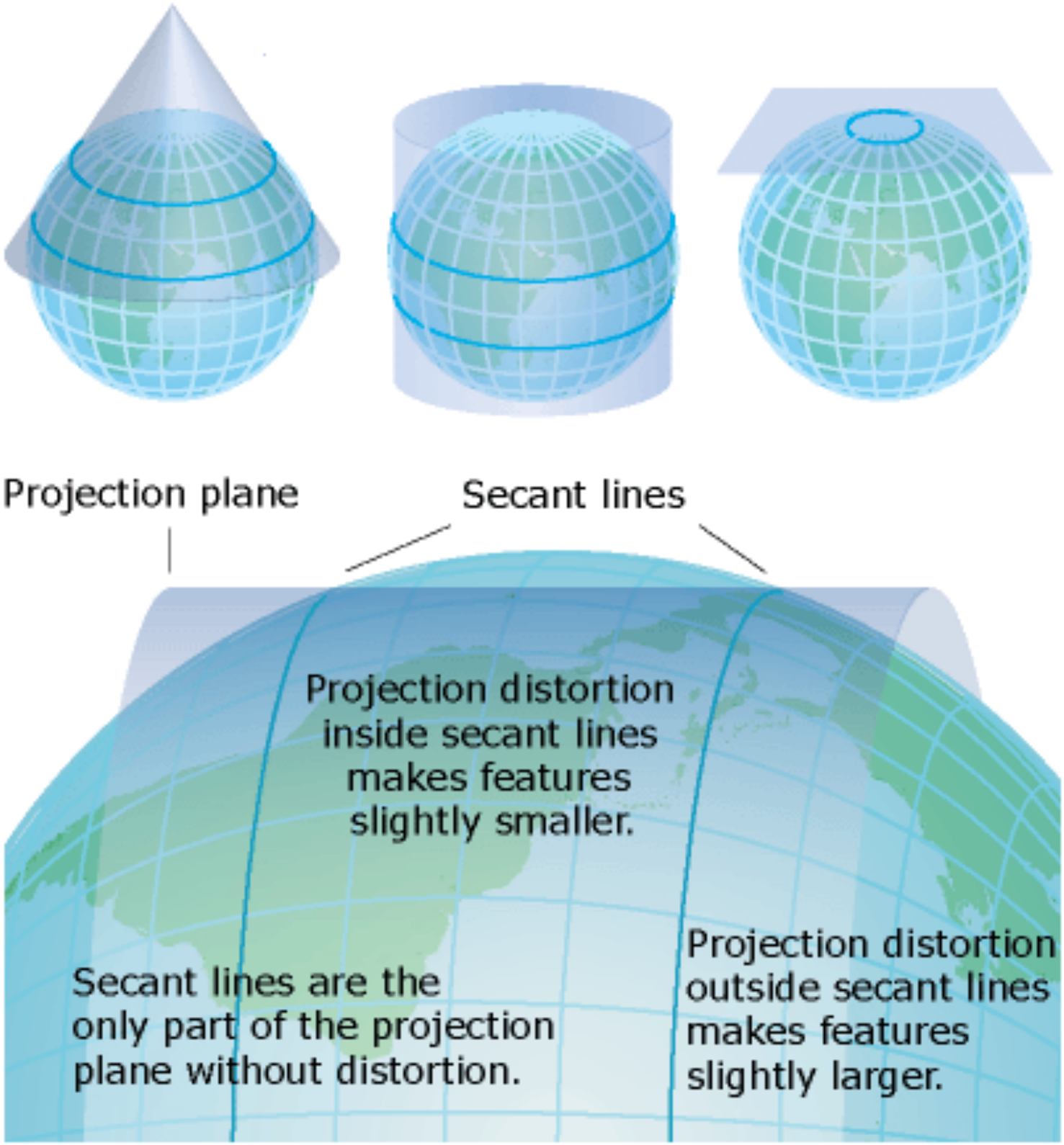
Posledice preslikave so deformacije dolžin, površin, kotov

namen kartografske projekcije je odpraviti eno vrsto deformacij in minimizirati drugi dve

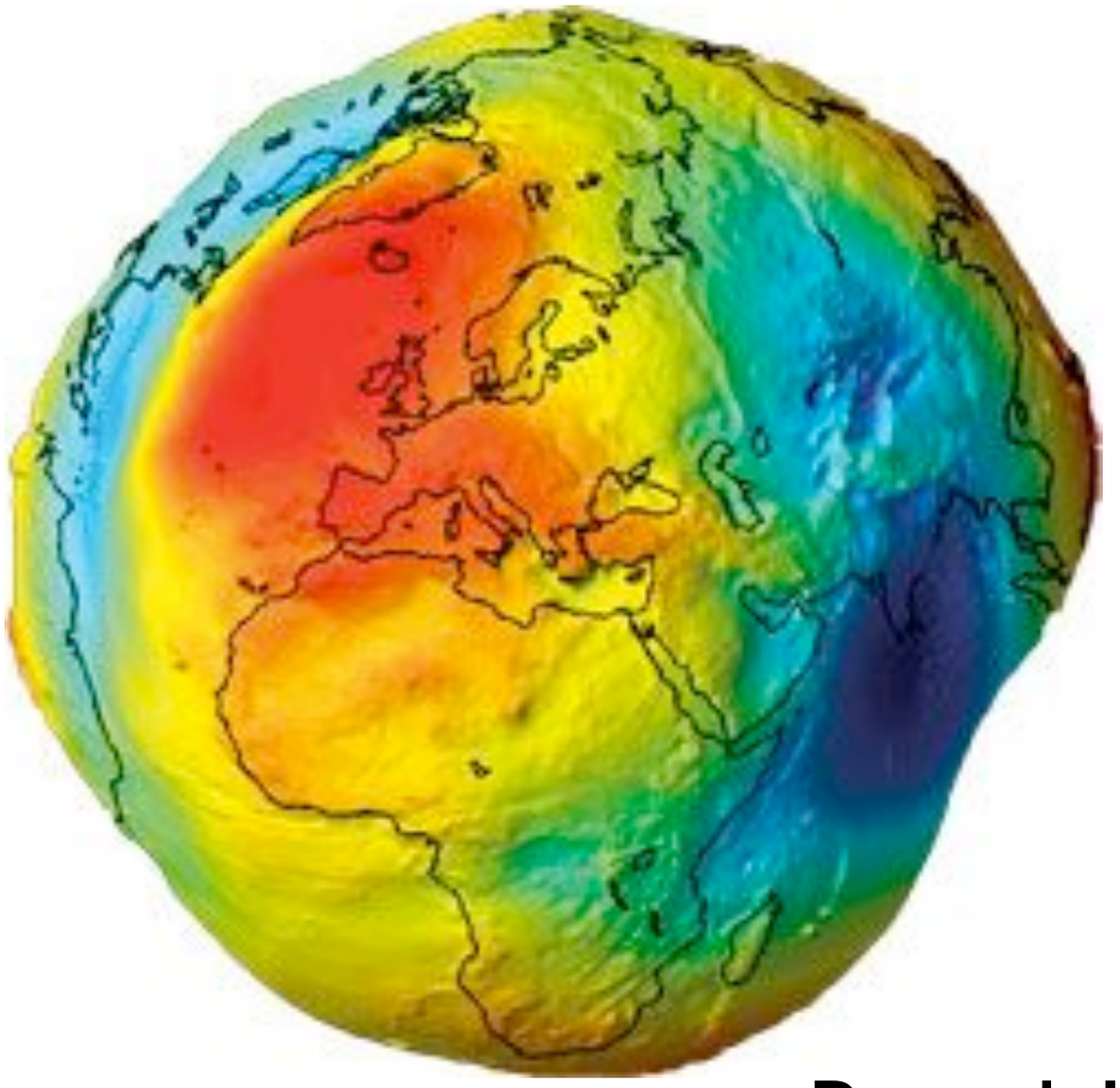
konformne (brez deformacij kotov)

ekvivalentne (brez deformacij površin)

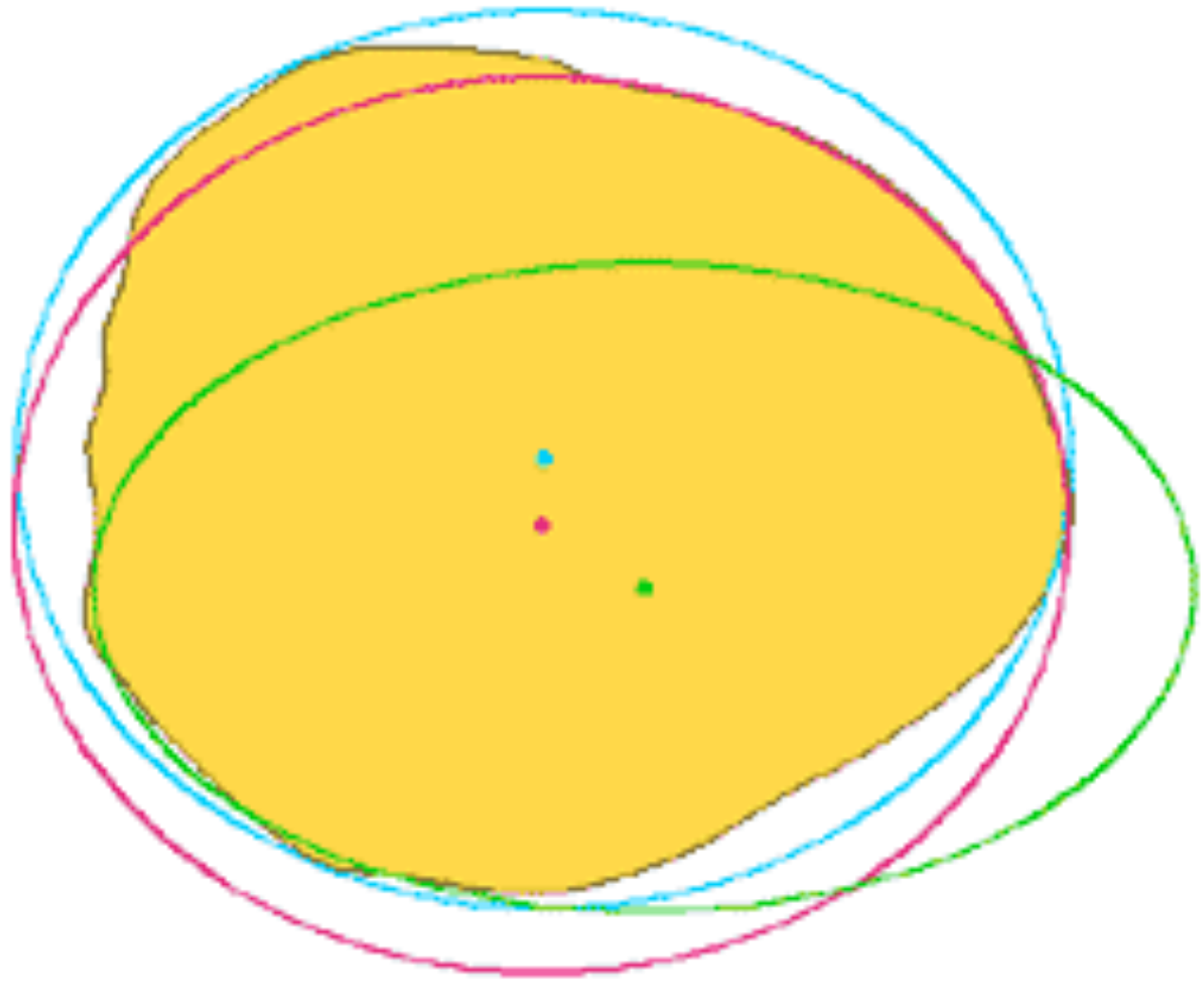
ekvidistantne (brez deformacij dolžin v izbrani smeri)


Projection plane
Secant lines
Projection distortion
inside secant lines
makes features
slightly smaller.
Secant lines are the
only part of the projection
plane without distortion.
Projection distortion
outside secant lines
makes features
slightly larger.

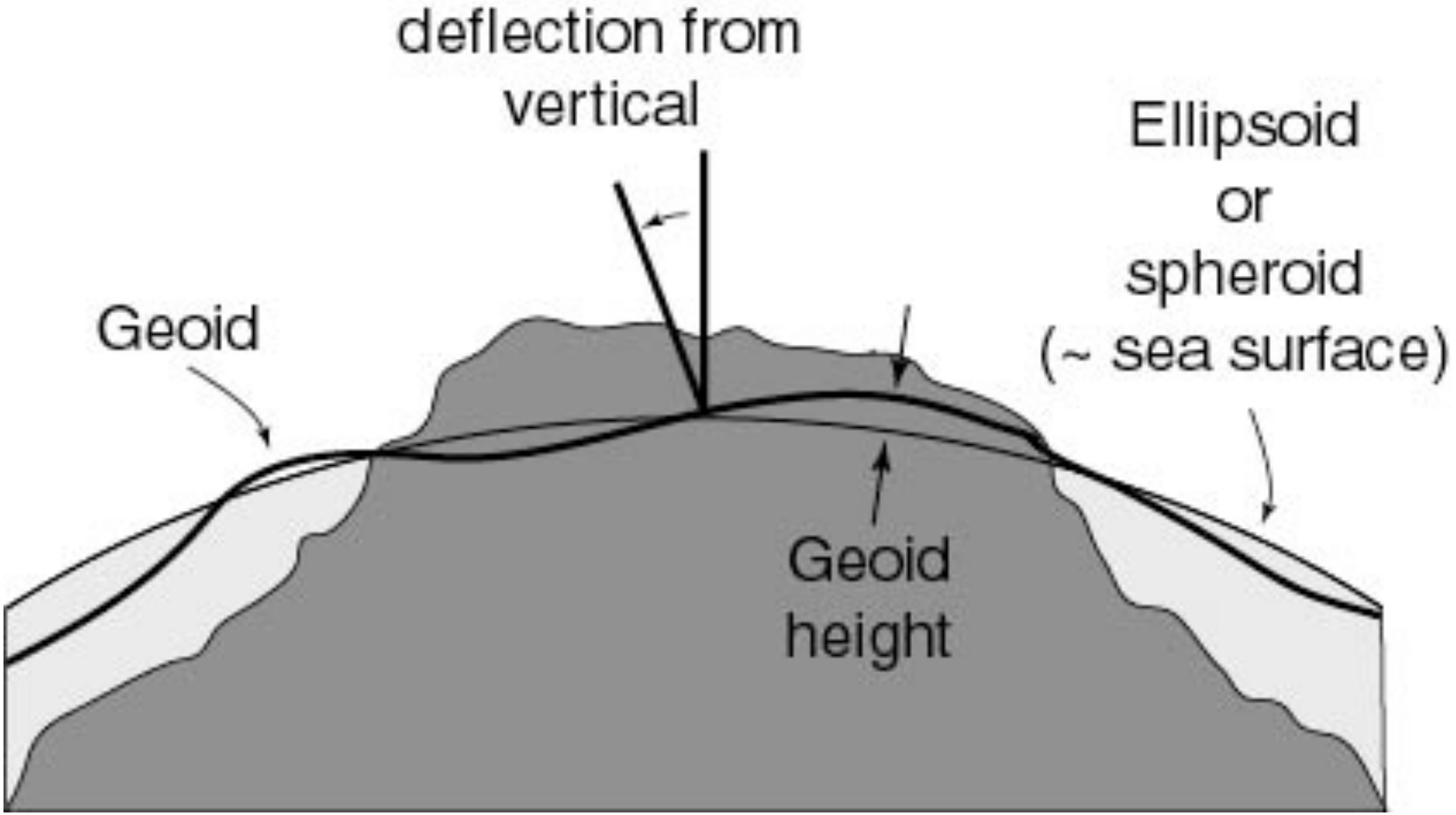
Geoid



Elipsoid



Bessel 1841, WGS84 ...


deflection from
vertical
Ellipsoid
or
spheroid
(~ sea surface)
Geoid
Geoid
height

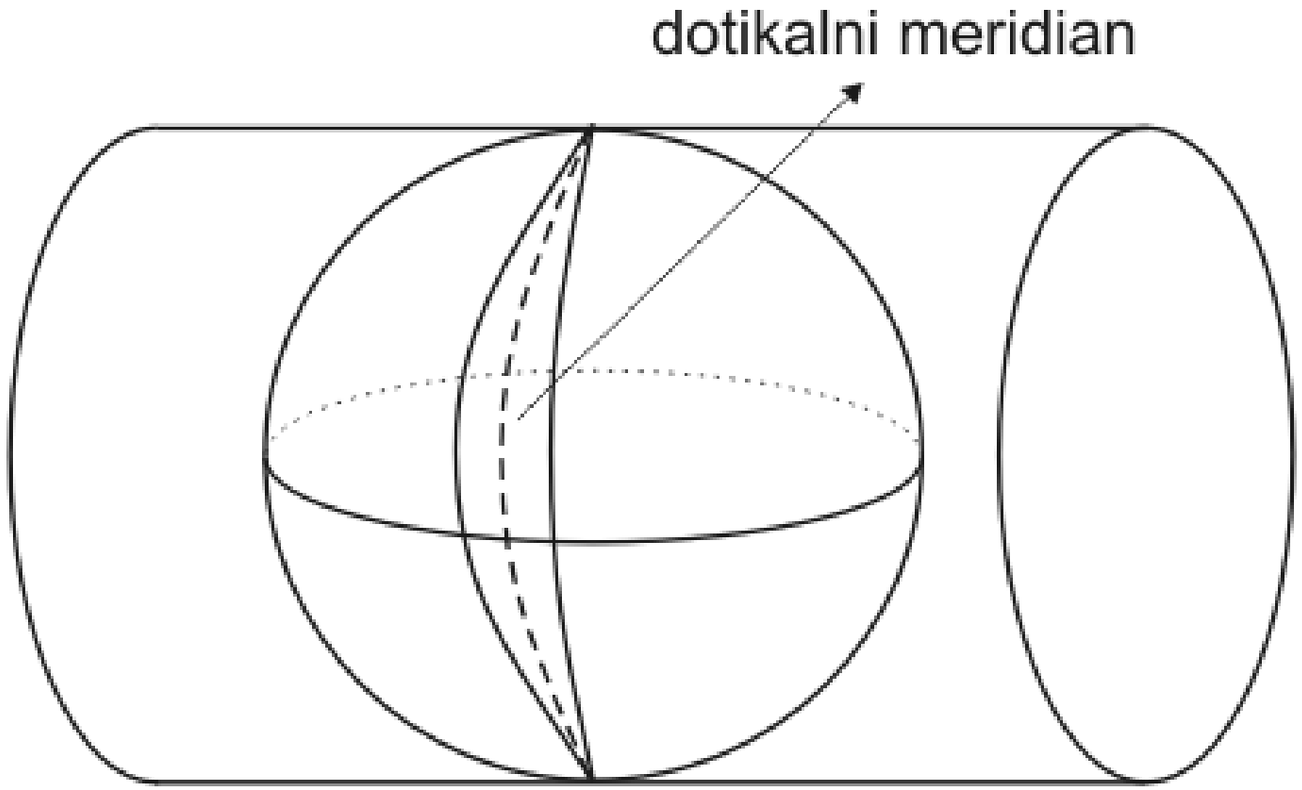
Državni koordinatni sistemi v Sloveniji

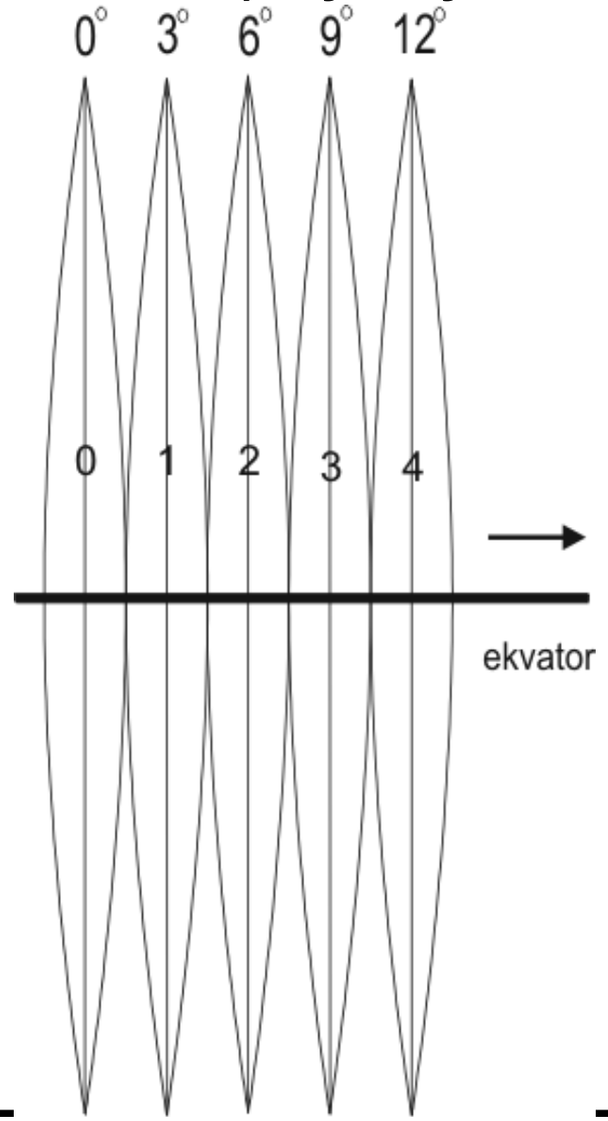
Stari: GK, D48/GK

- Oznaka kartografske projekcije: GK – Gauß-Krügerjeva projekcija
- Oznaka koordinatnega sistema: D48/GK
- Referenčna ploskev elipsoid Bessel 1841
- Številka cone: = 5 (vendar je ne označujemo)
- Širina cone: = 3 º 15 ’
- Geografska dolžina srednjega meridiana cone: = 15 º
- Geografska širina izhodiščne paralele: = 0 º
- Linijsko merilo na srednjem meridianu: = 0,9999
- Navidezni pomik proti severu: = –5.000.000 m
- Navidezni pomik proti vzhodu: = 500.000 m

Lastnosti:

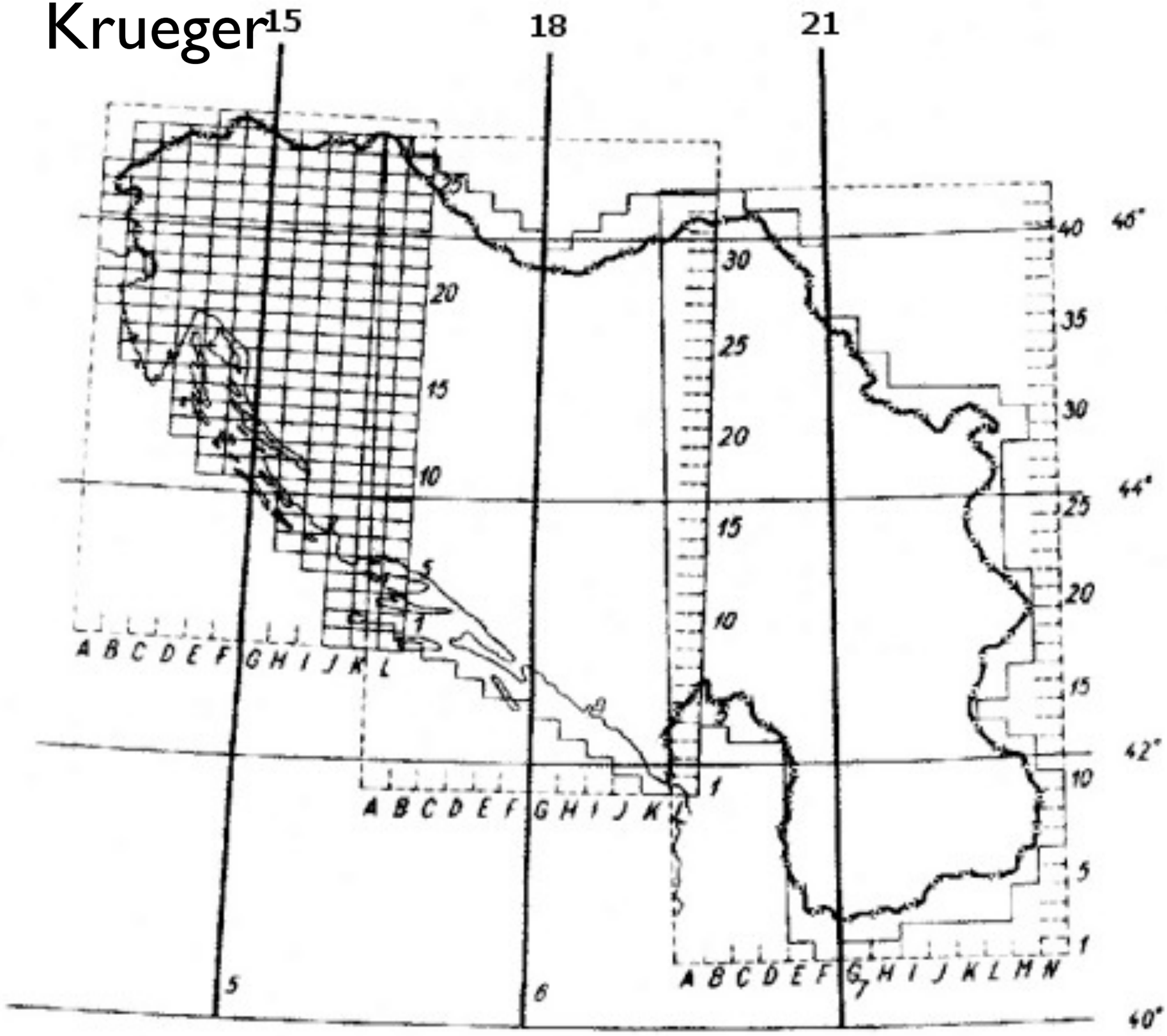
- konformna - ohranja kote, ostale deformacije naraščajo z oddaljenostjo od dotikalnega (srednjega) meridiana.
- Širina cone (velikost območja) preslikave je odvisna od merila na srednjem meridianu, zahtevana natančnost projekcije in geografske lege območja.
- Za geodetska računanja, katastrsko in topografsko izmero je standard projekcijske natančnosti v večini držav 1 : 10 000 (1 dm/km).





širina meridianske cone = 3° ⇒
333 km $\phi = 0^0$, 254 km $\phi = 46^0$

Gauss Krueger



Transverse Mercator

Bessel 1841

Novi koordinati sistem D96/TM

- Oznaka kartografske projekcije: TM – prečna Mercatorjeva projekcija
- Oznaka koordinatnega sistema: D96/TM
- Referenčna ploskev: elipsoid GRS80
- Številka cone: = 5 (vendar je ne označujemo)
- Širina cone: = 3 º 15 ’
- Geografska dolžina srednjega meridiana cone: = 15 º
- Geografska širina izhodiščne paralele: = 0 º
- Linijsko merilo na srednjem meridianu: = 0,9999
- Navidezni pomik proti severu: = –5.000.000 m
- Navidezni pomik proti vzhodu: = 500.000 m

- Novi slovenski horizontalni koord. sistem temelji na skupnem evropskem koord. sistemu ETRS89.

EUROPEAN TERRESTRIAL REFERENCE SYSTEM 89 (ETRS89)

Projection: Azimuthal Equal Area (Lambert)

Projection center: (9°, 53°)

Radius: 6384010

Scale: 1:25,000,000

Isograms of Maximum Angular Deformation

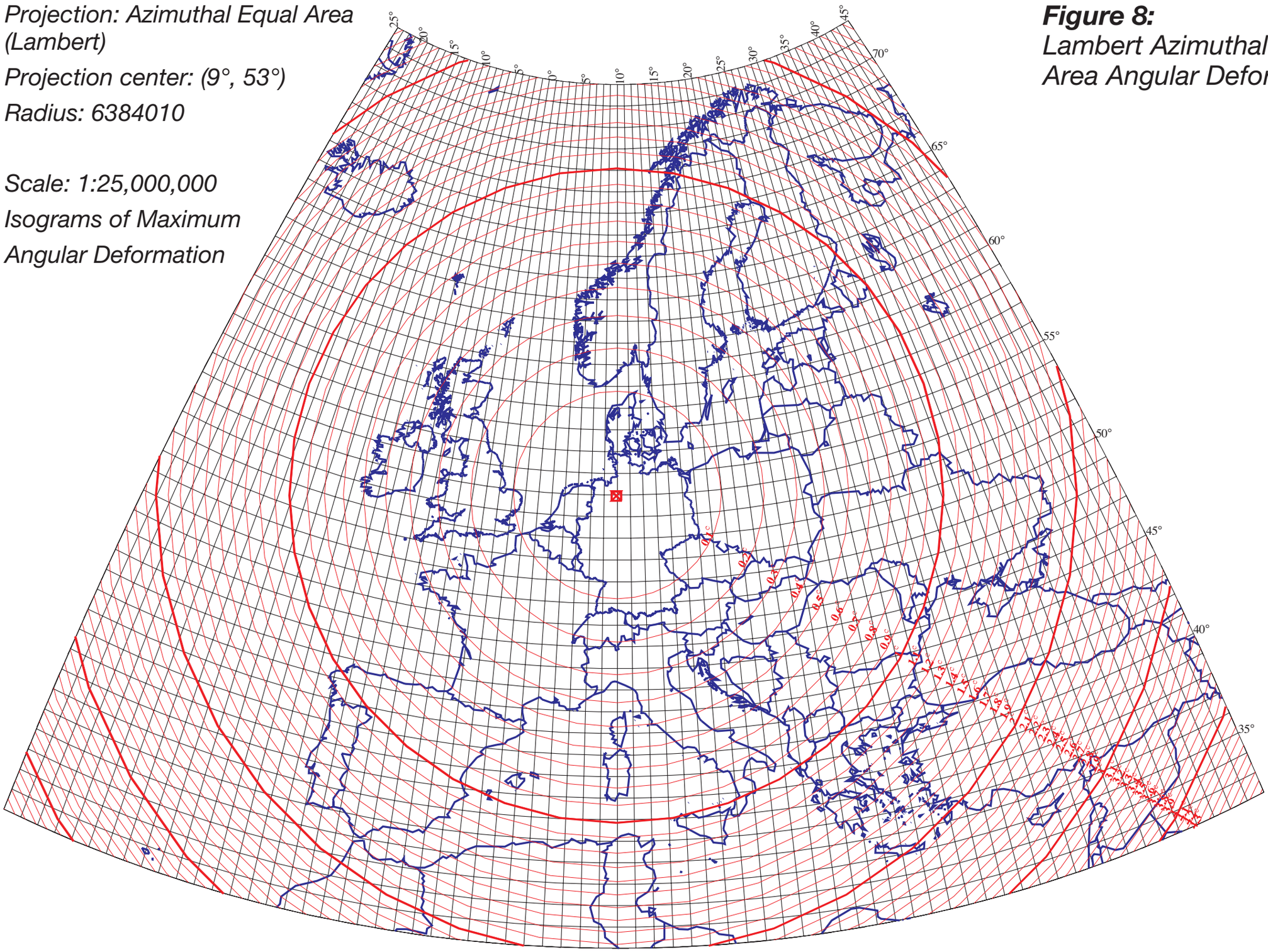
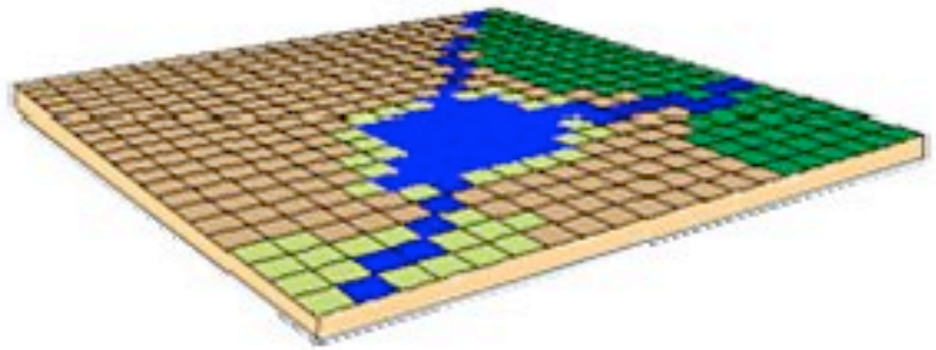


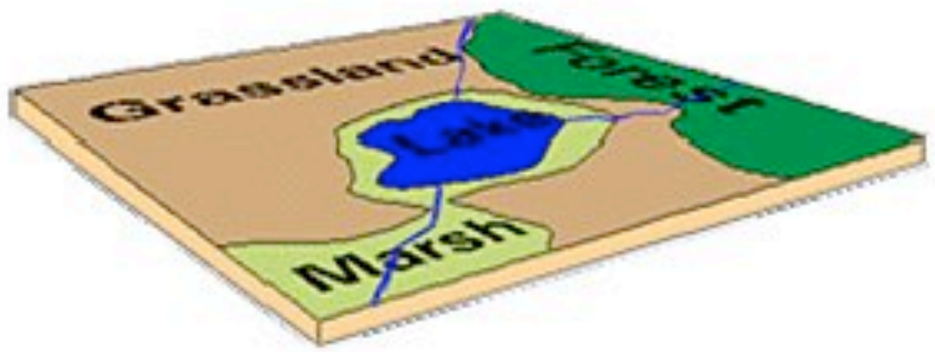
Figure 8:
Lambert Azimuthal Equal Area Angular Deformation.

Figure 2. ETRF2000 horizontal velocities of EPN stations.

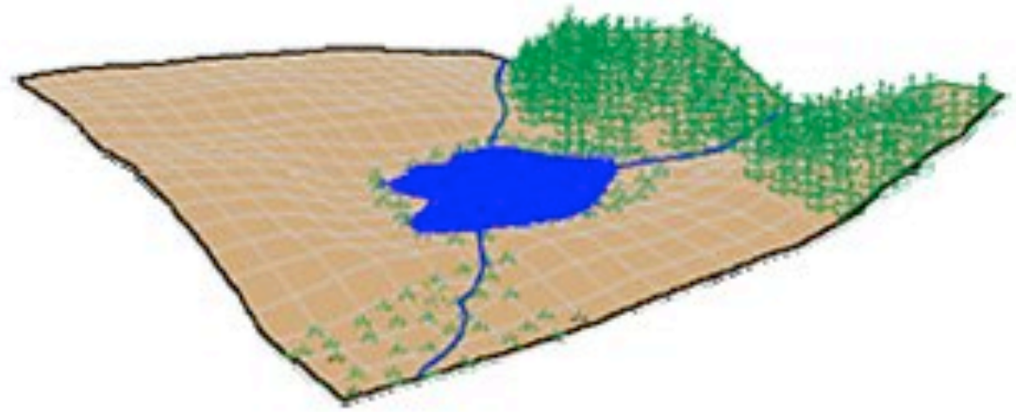
- RASTER →



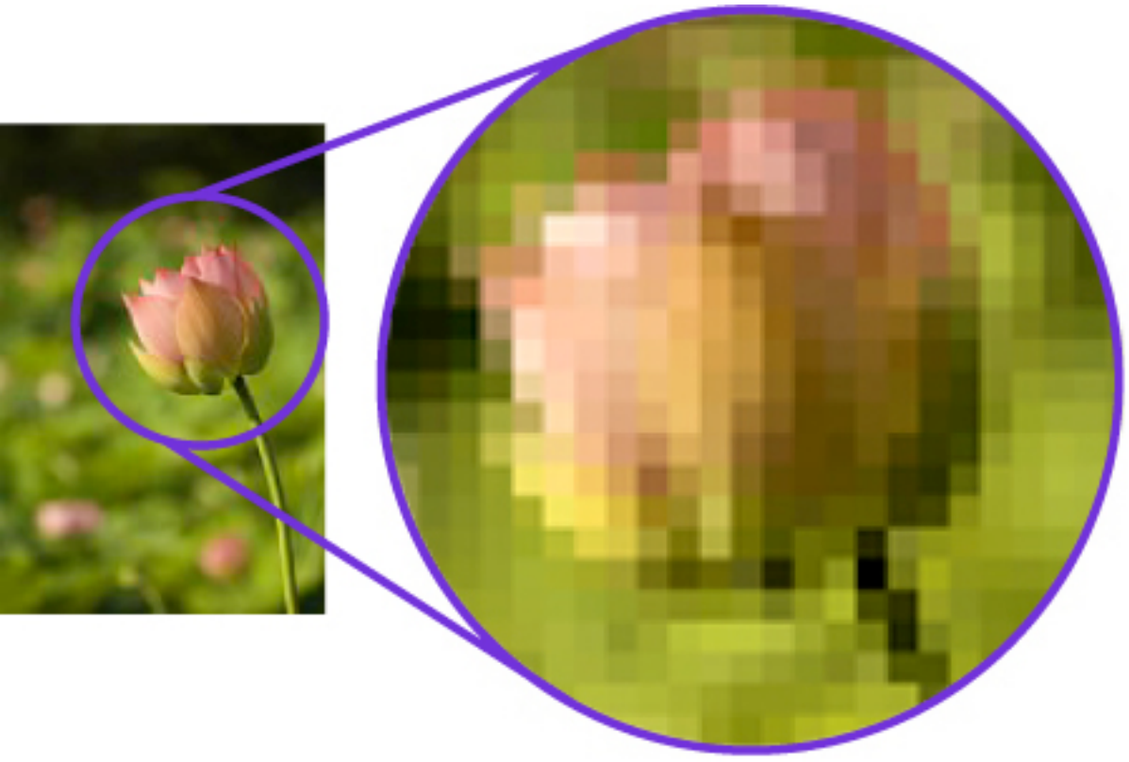
- VECTOR →

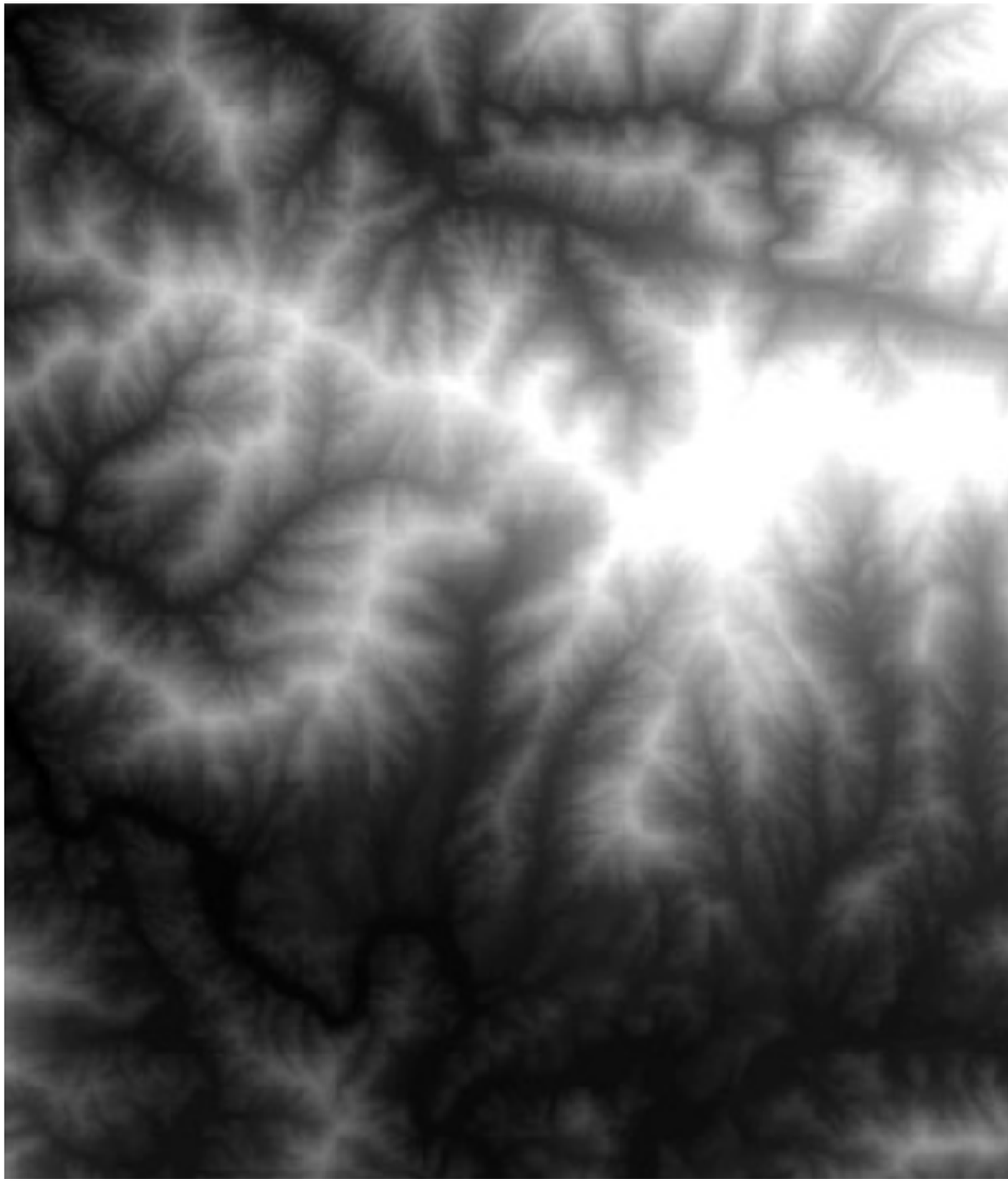


- Real World →

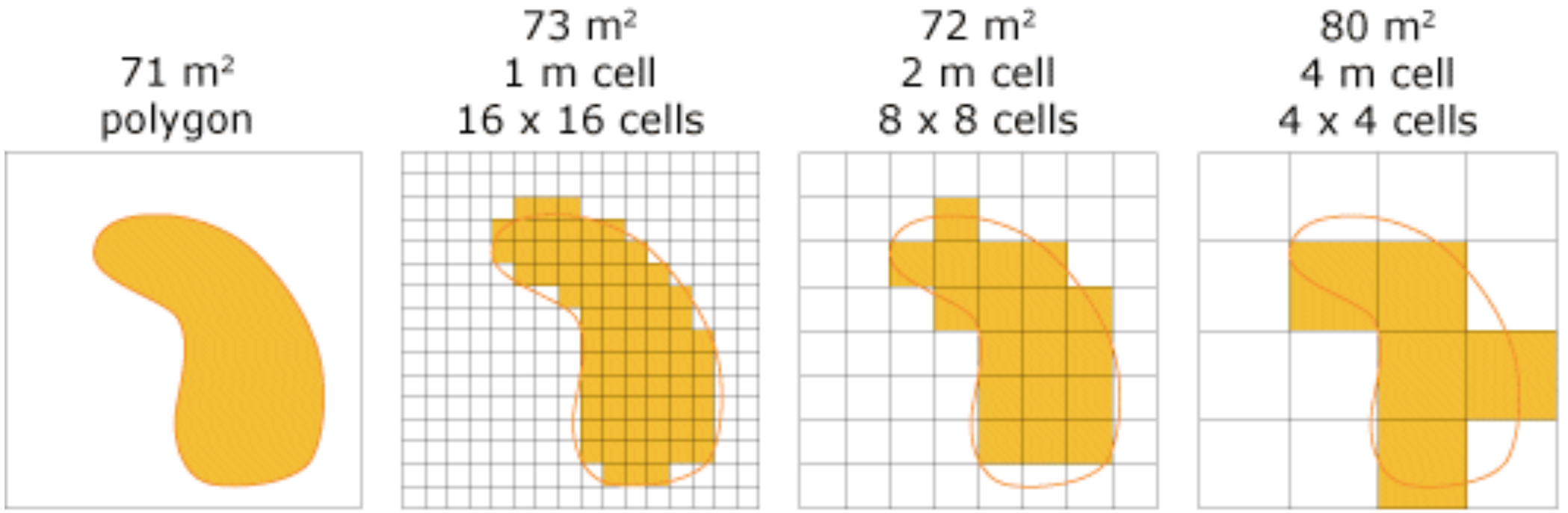


Rasters





Resolution



- Smaller cell size
- Higher resolution
- Higher feature spatial accuracy
- Slower display
- Slower processing
- Larger file size

- Larger cell size
- Lower resolution
- Lower feature spatial accuracy
- Faster display
- Faster processing
- Smaller file size

The "Paper Map World" *(analog)*

POINTS

Dot of ink

LINES

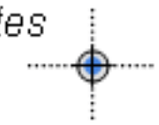
Dragged flow of ink

AREAS

Dragged and filled flow of ink

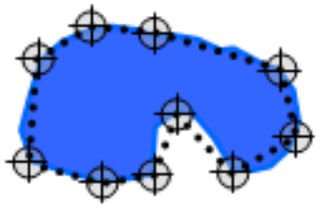
The "GIS Map World" *(digital)*

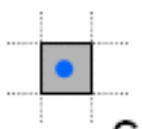
X, Y *coordinates*



(Vector)

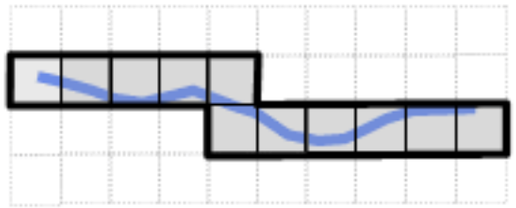
(Vector)



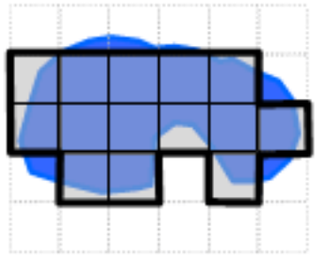


Cell *Col, Row*

(Raster)



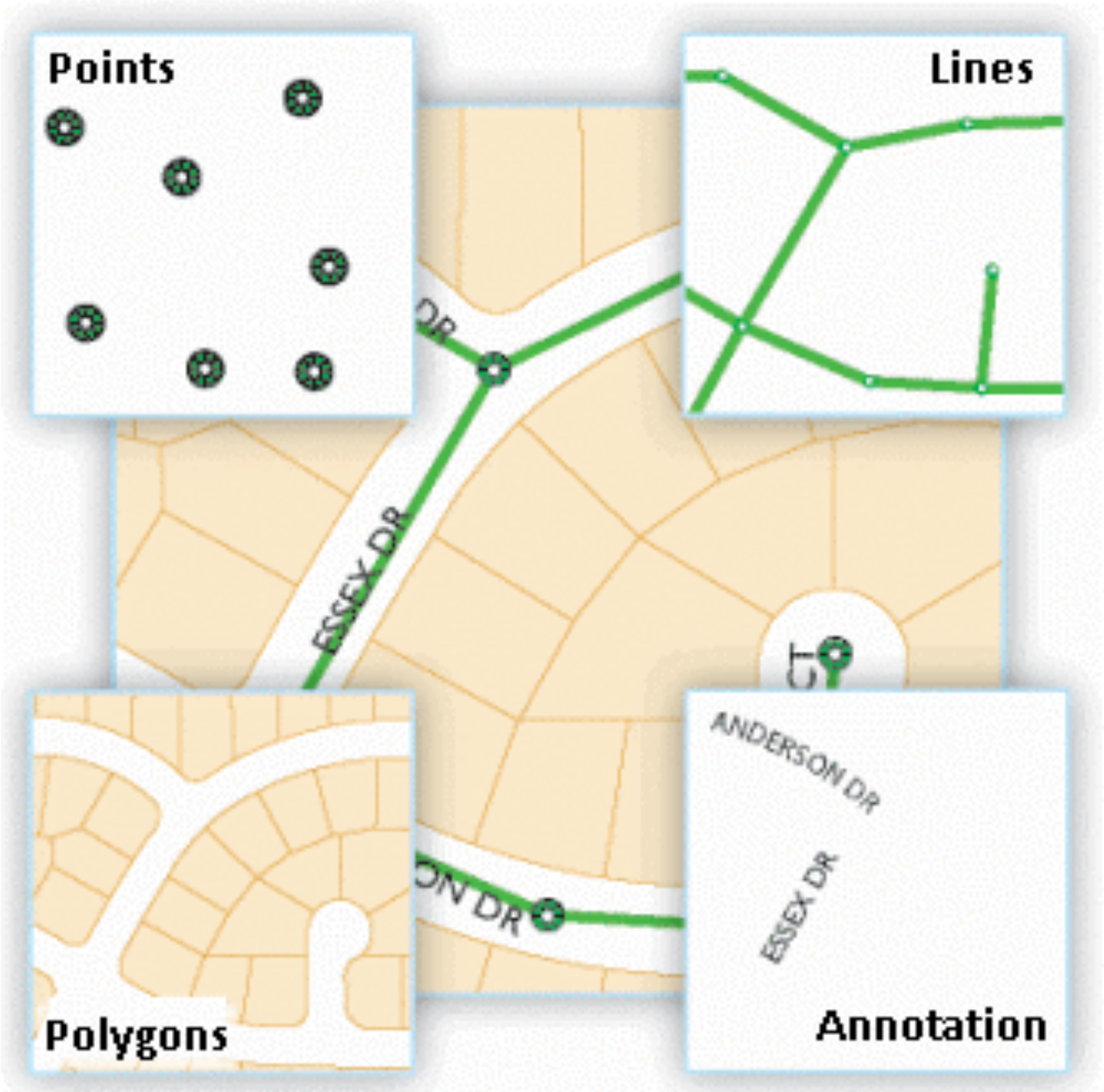
(Raster)



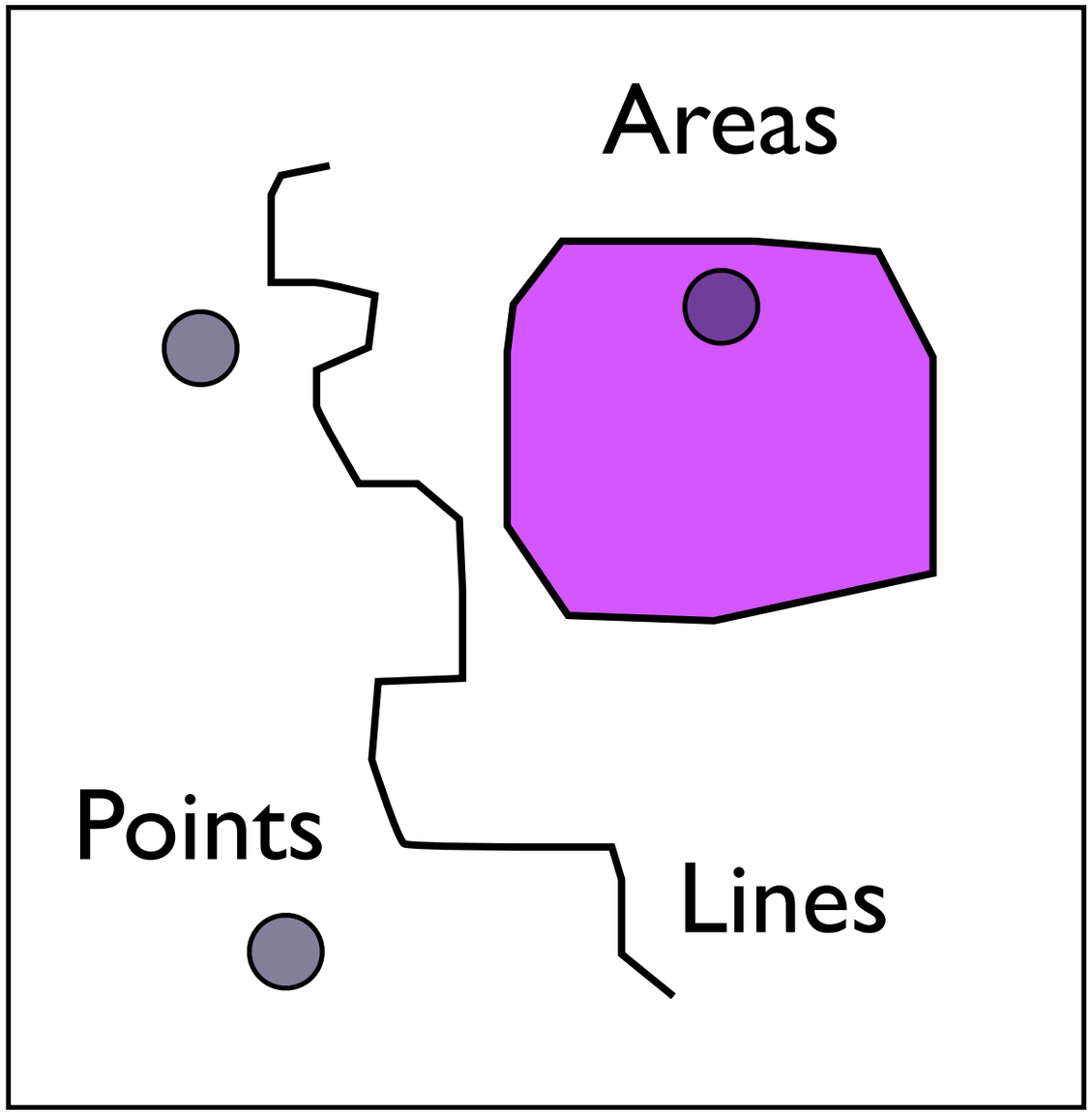
POINTS **are stored as individual X, Y coordinates (Vector) or as individual Column, Row cell entries in a grid (Raster)**

LINES **are stored as a set of mathematically connected X, Y coordinates (Vector) or as a set of connected grid cells (Raster)**

AREAS **are stored as a set of mathematically connected X, Y coordinates defining the boundary (Vector) or as a set of contiguous cells defining the interior (Raster)**


Points
Lines
Polygons
Annotation
ESSEX DR
ANDERSON DR
ESSEX DR

Vectors



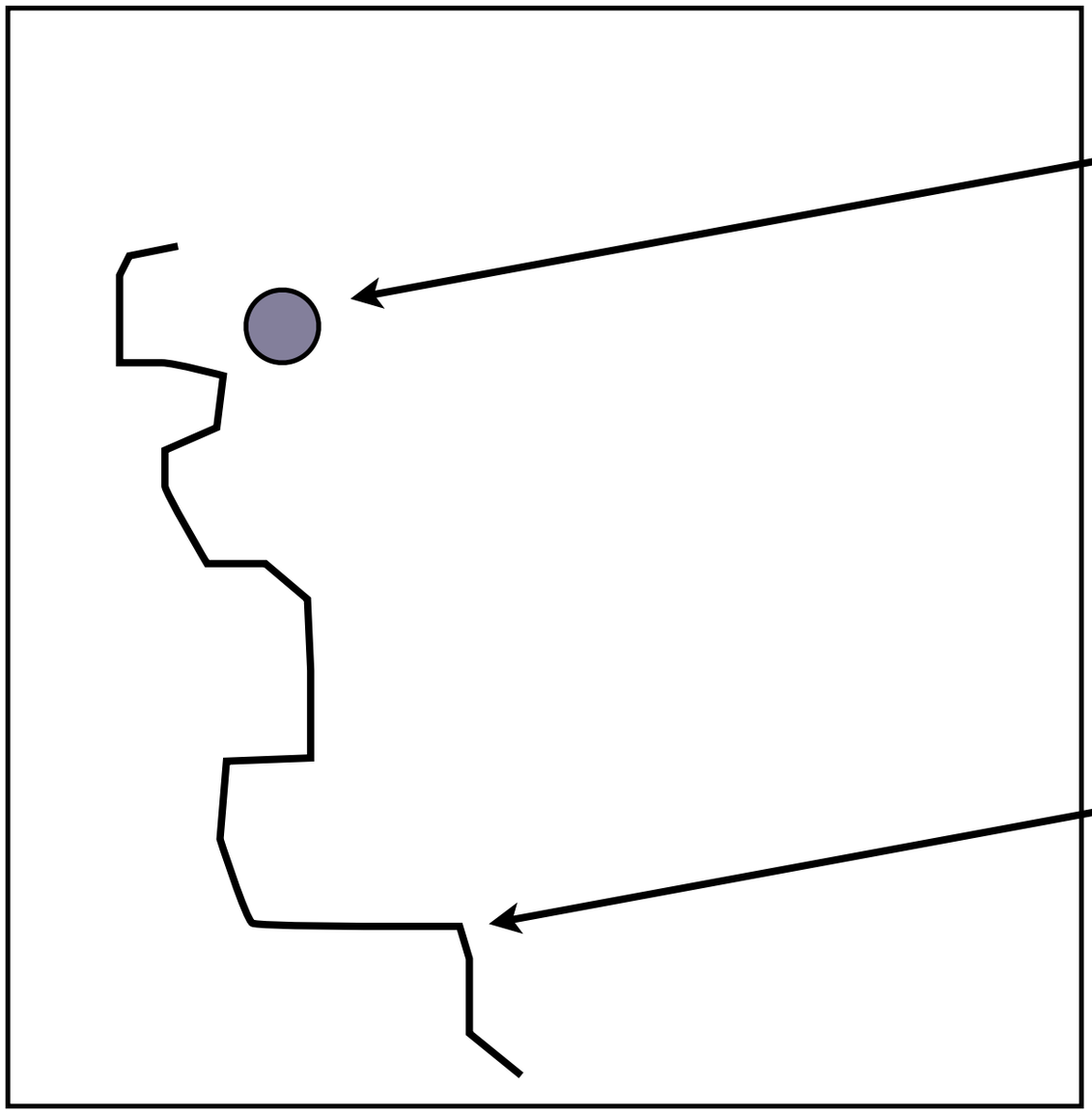
Locational component

Topological component

Attribute component

Metadata component

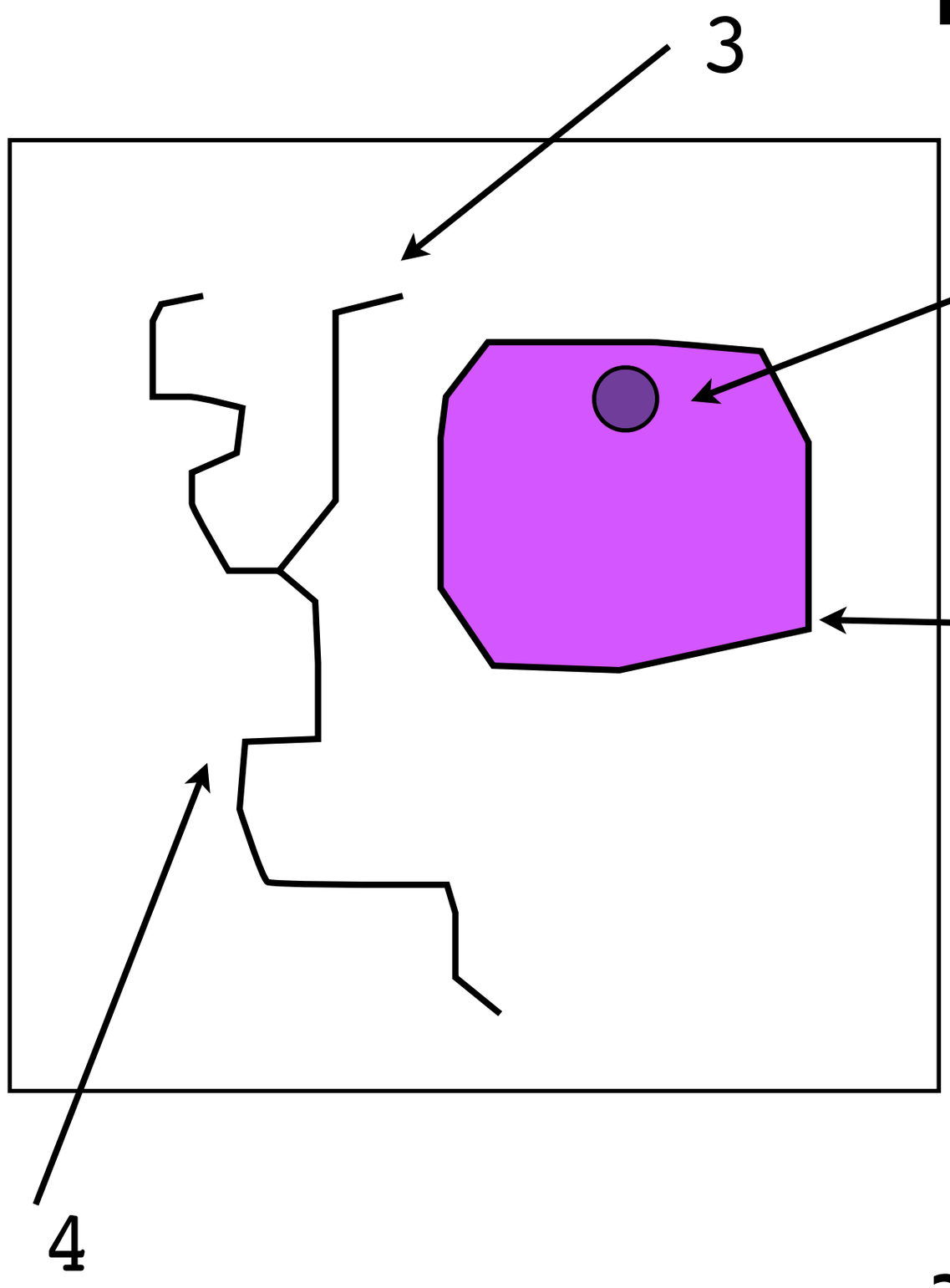
Locational component



Point,1201,6234

Line,
1134,6240,
1221,6220,
1211,6212
....

Topological component



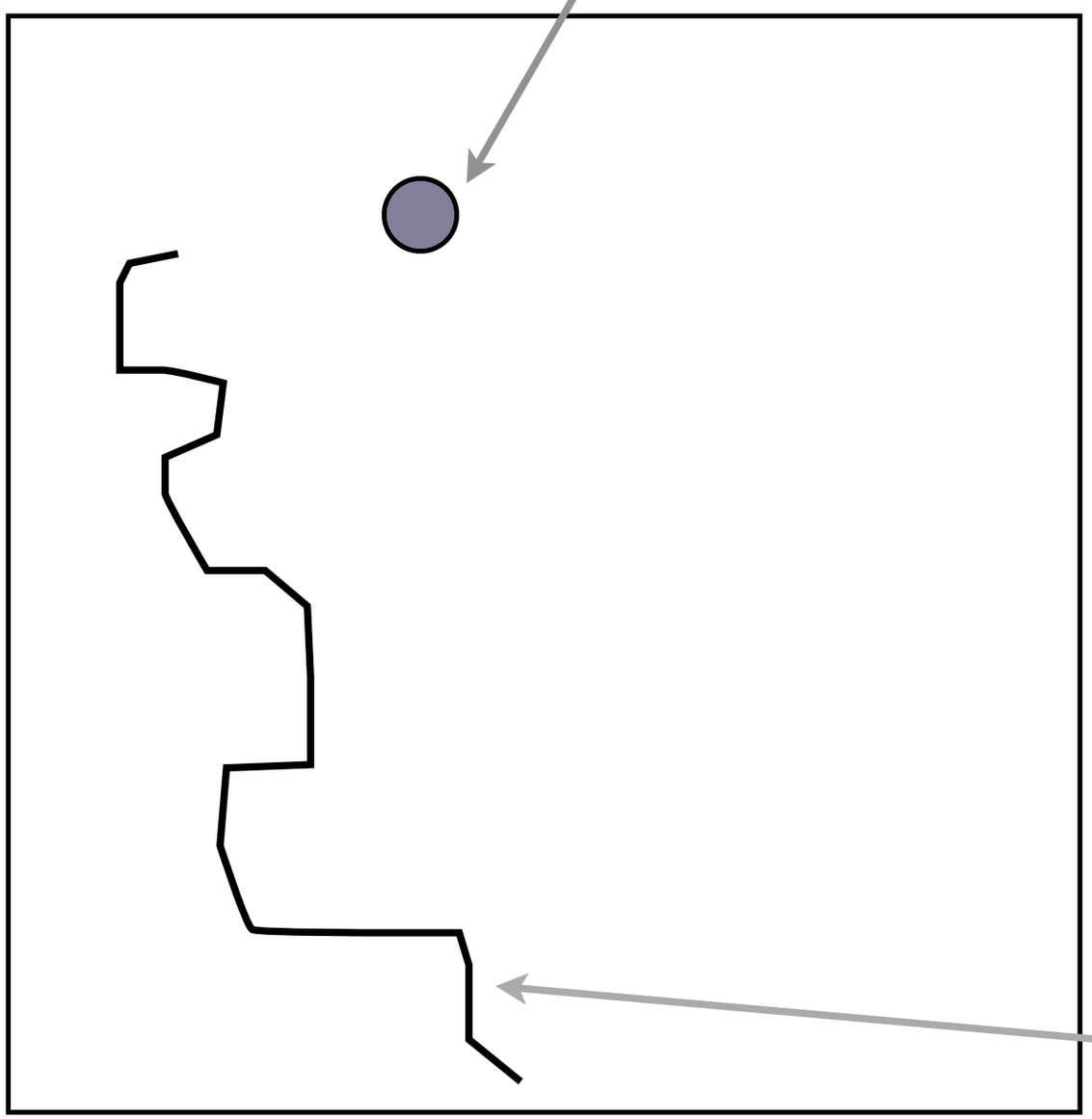
1 is inside 2

3 is connected to 4

Attribute component

id,type,date,name

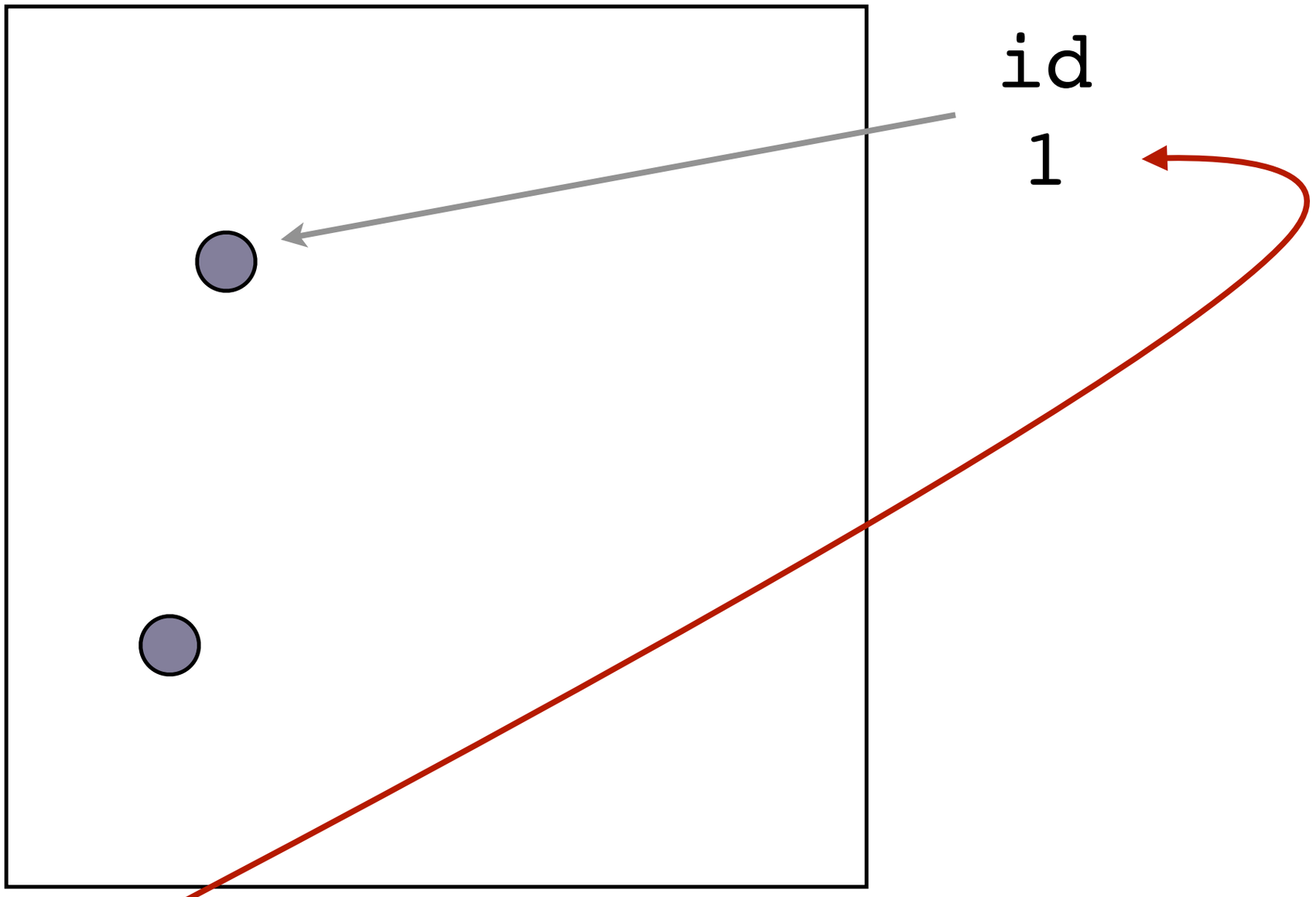
1, archaeological site, Roman, Ammaia



id,type,name

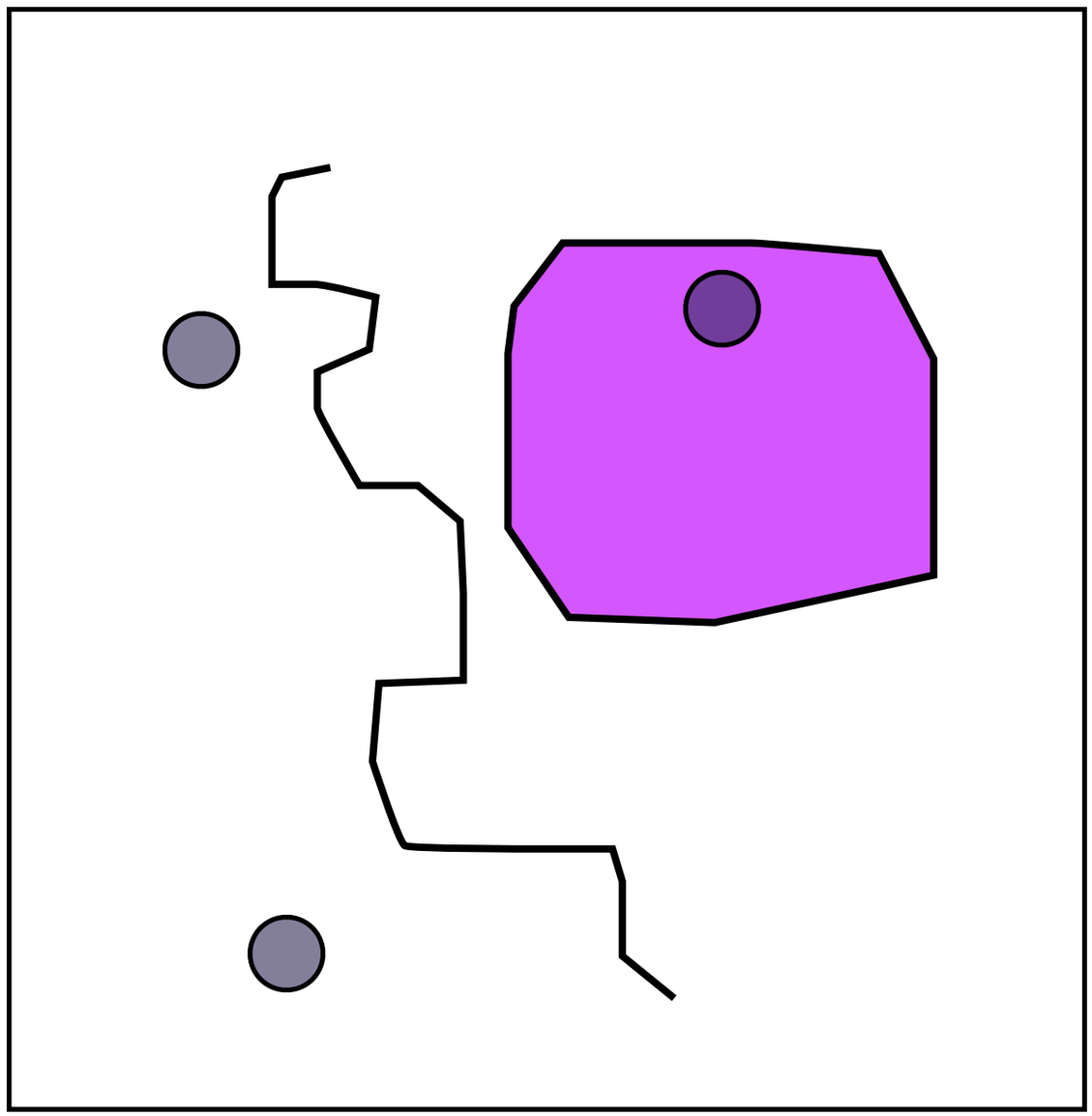
2, river,Rio Sever

Linking with external databases




```
id, name, type,no_amphorae,no_coarseware
1,Ammaia,1256,7654
```

Metadata



Projection

Source

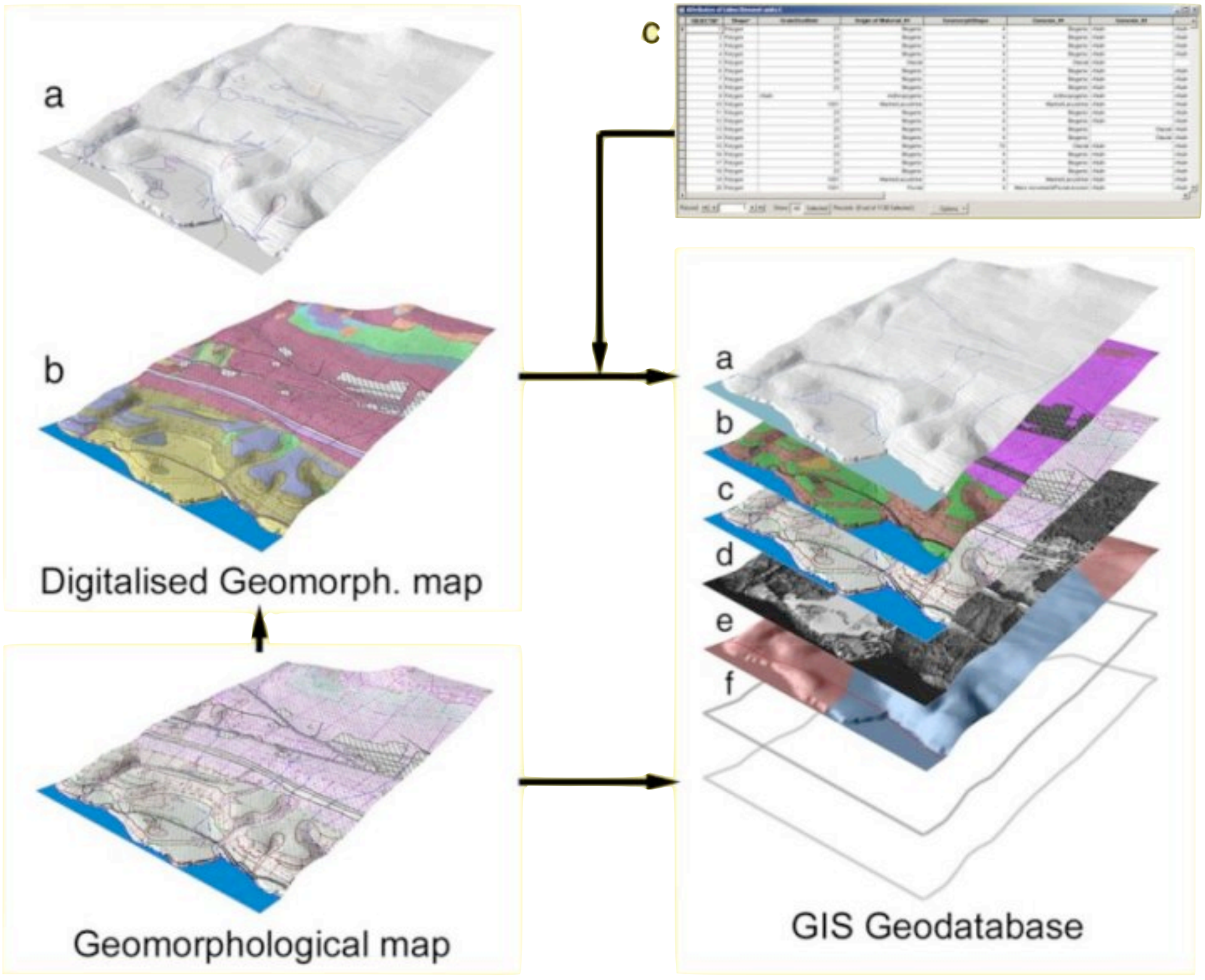
Legend

Errors

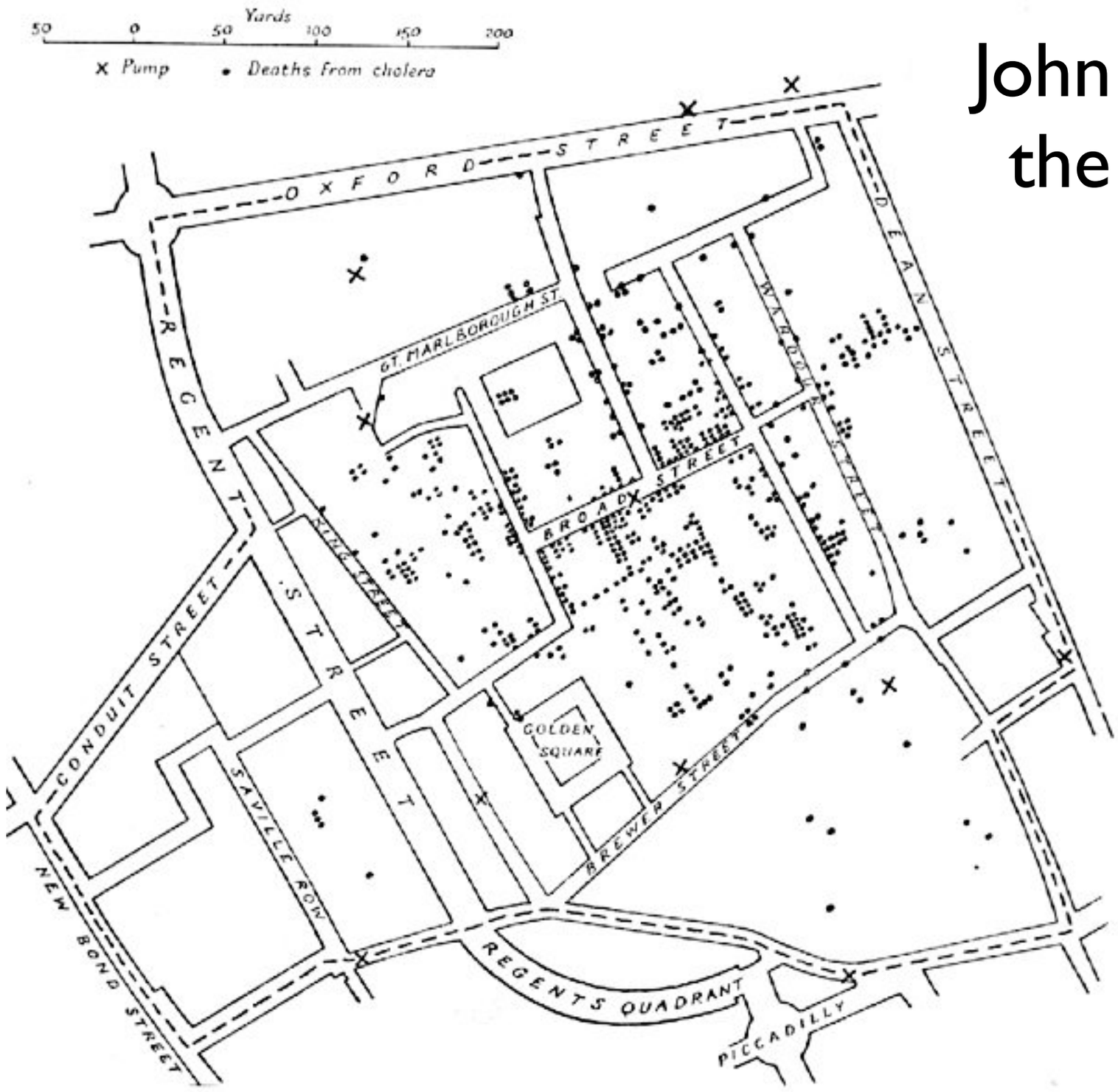
Copyright

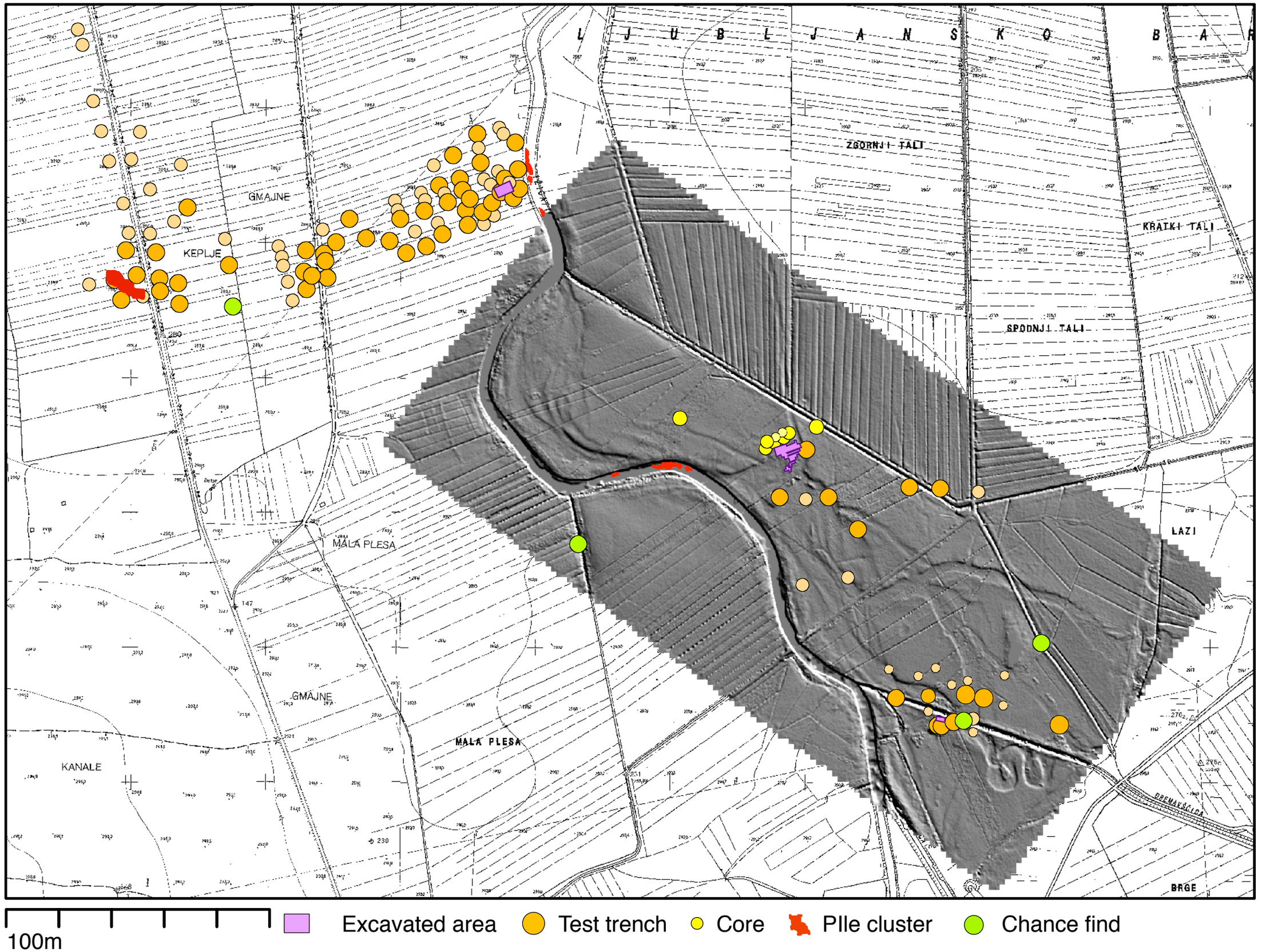
...

Geodatabase

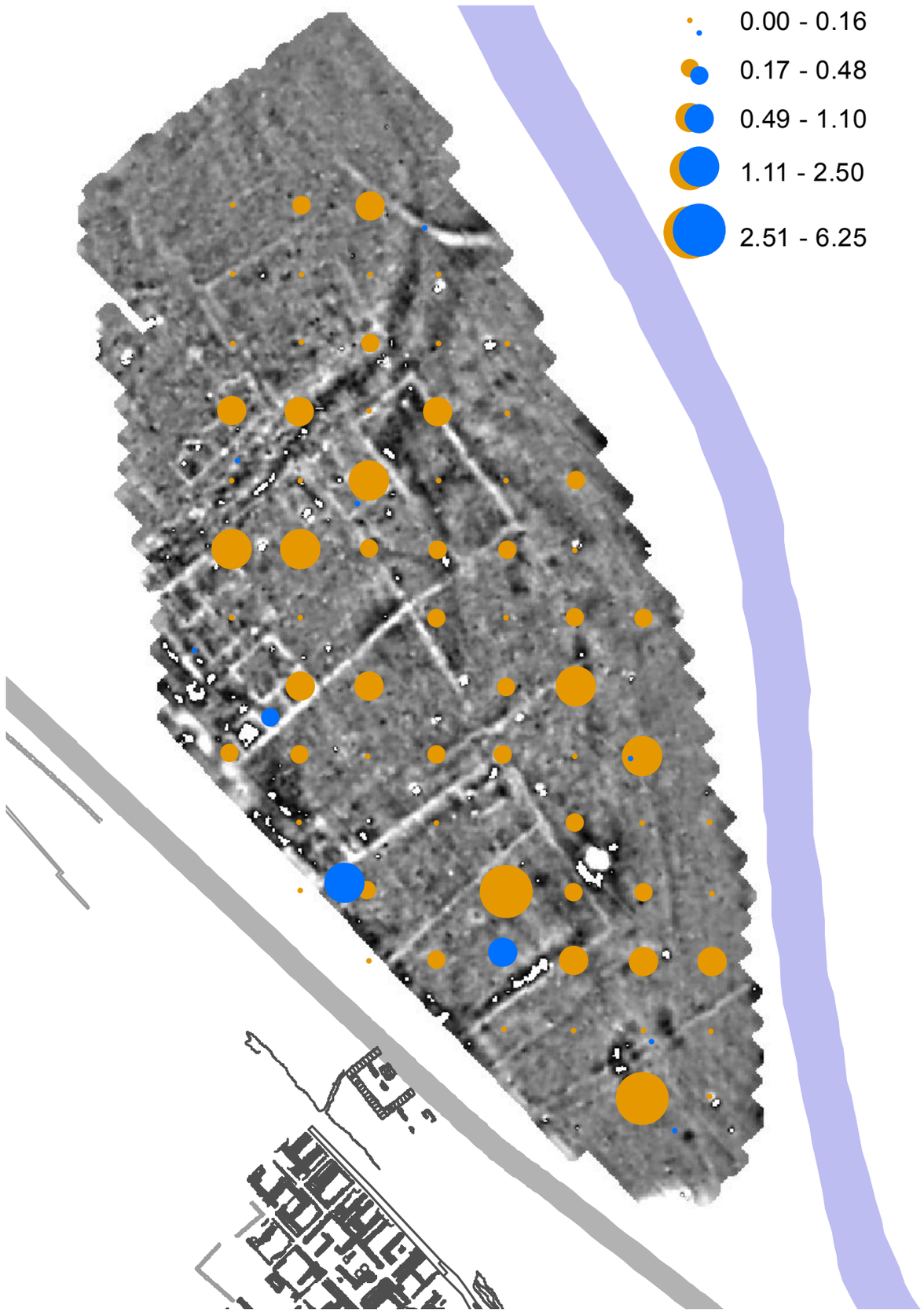


John Snow's map of the Soho cholera outbreak



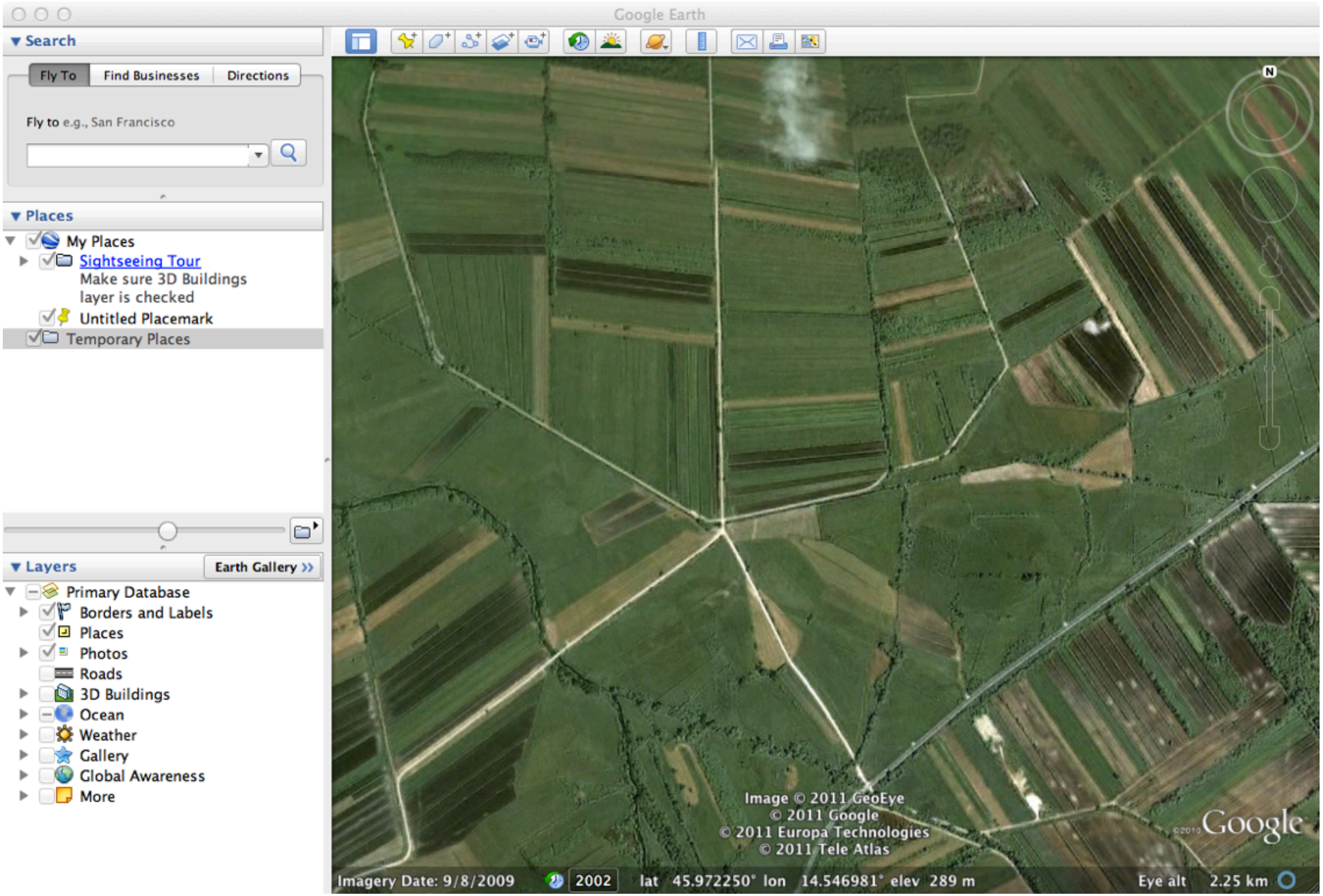


Monday, October 15, 12



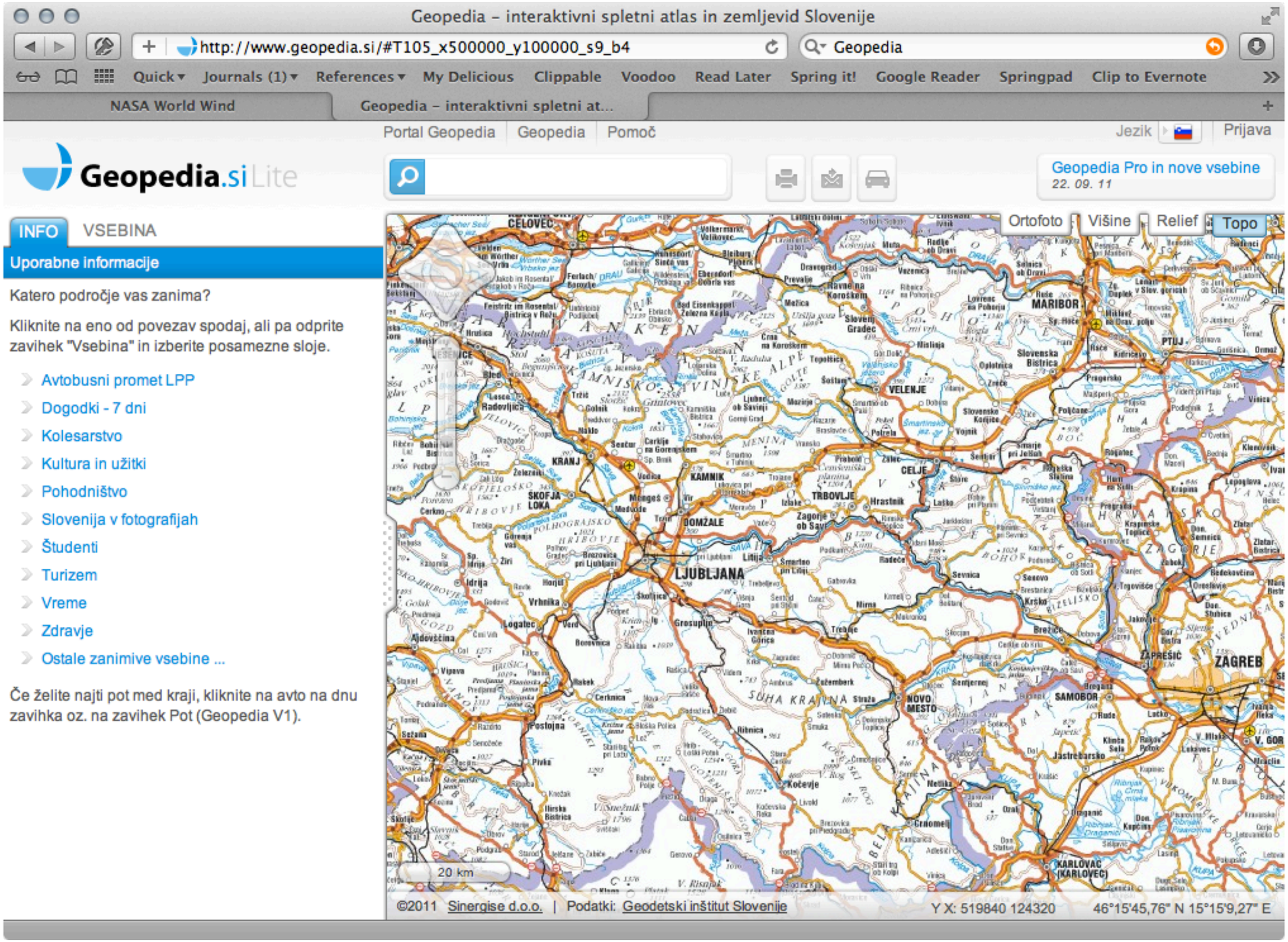
Monday, October 15, 12

Google Earth

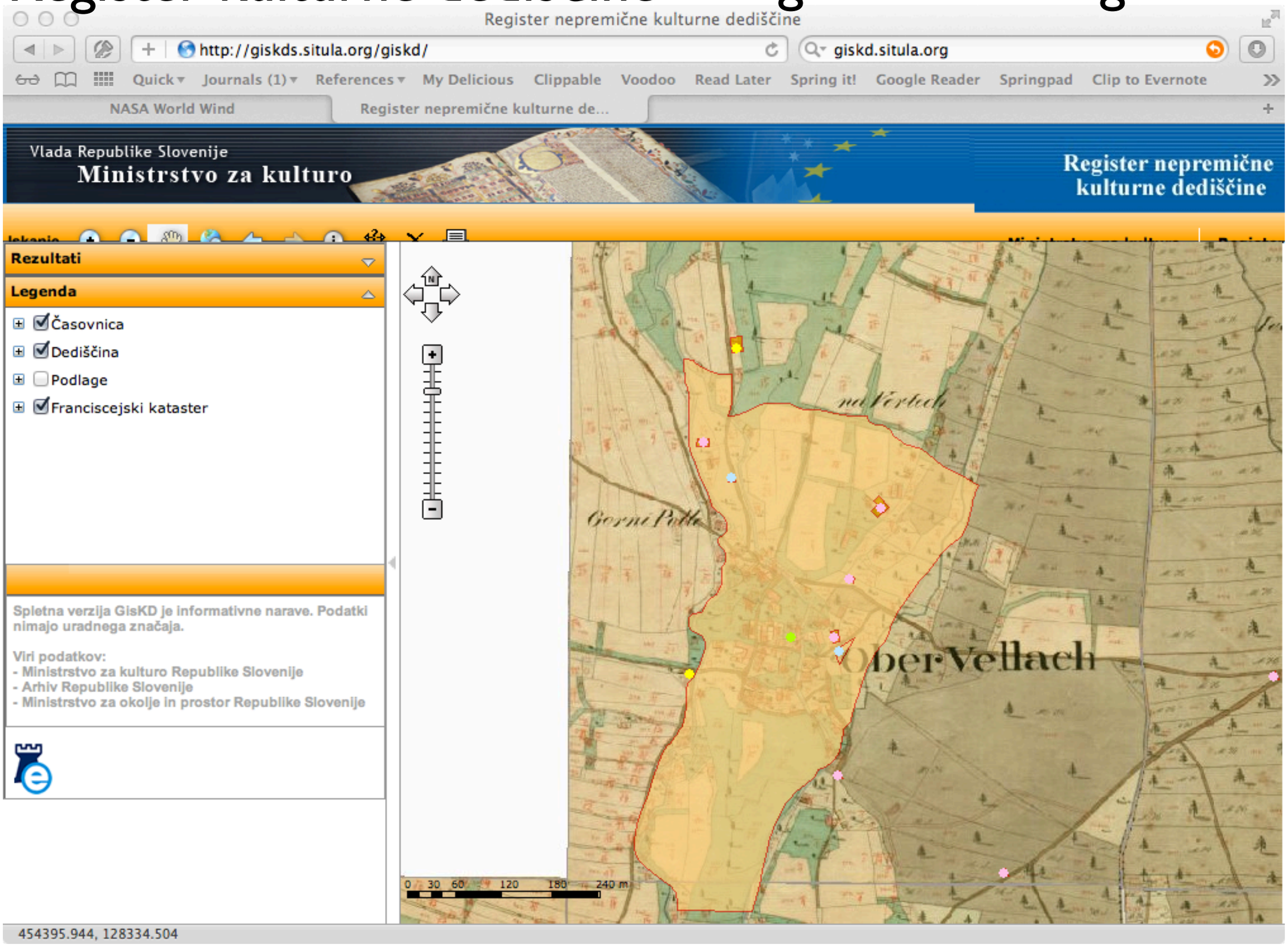


Geopedia

http://www.geopedia.si

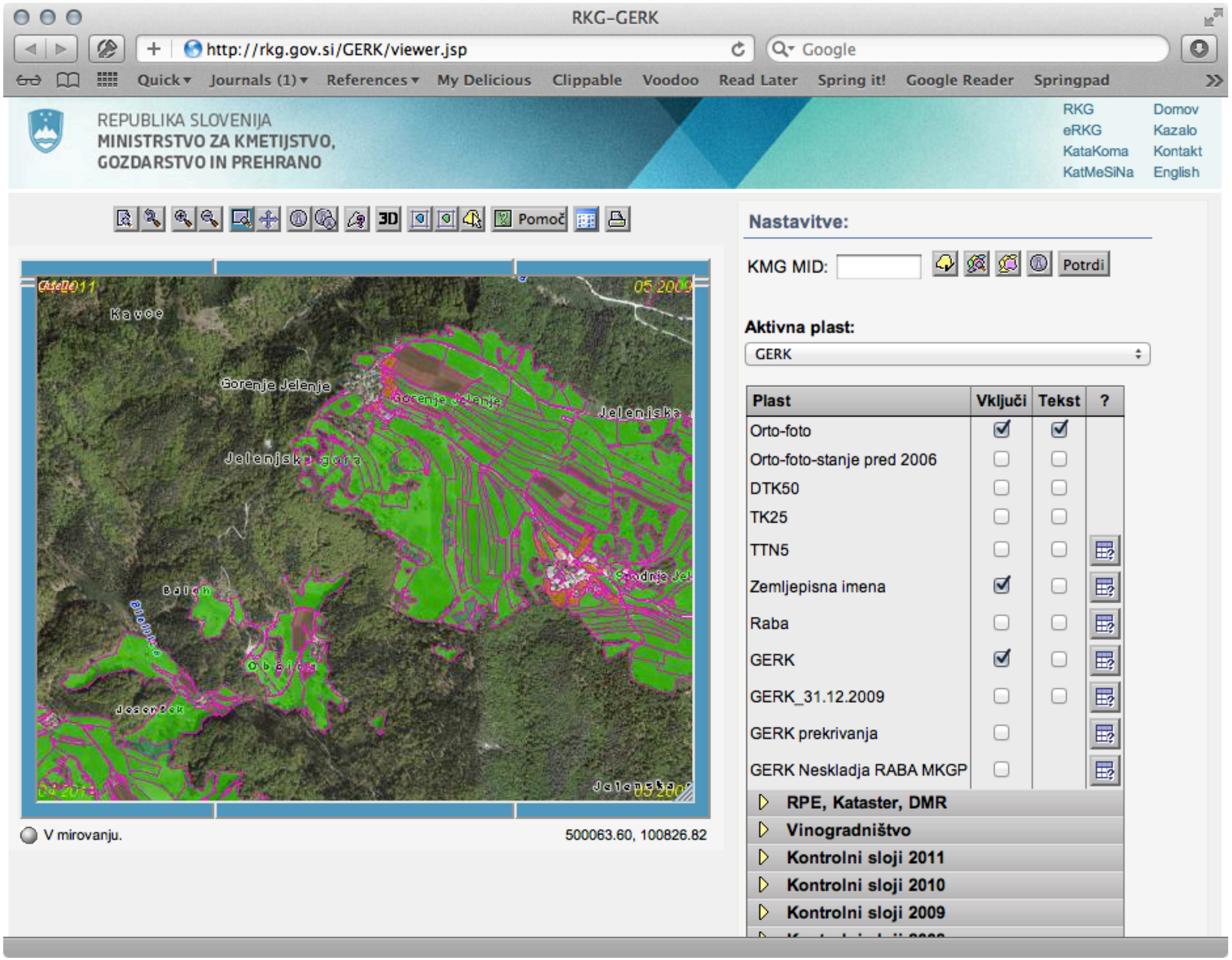


Register kulturne dediščine giskd.situla.org

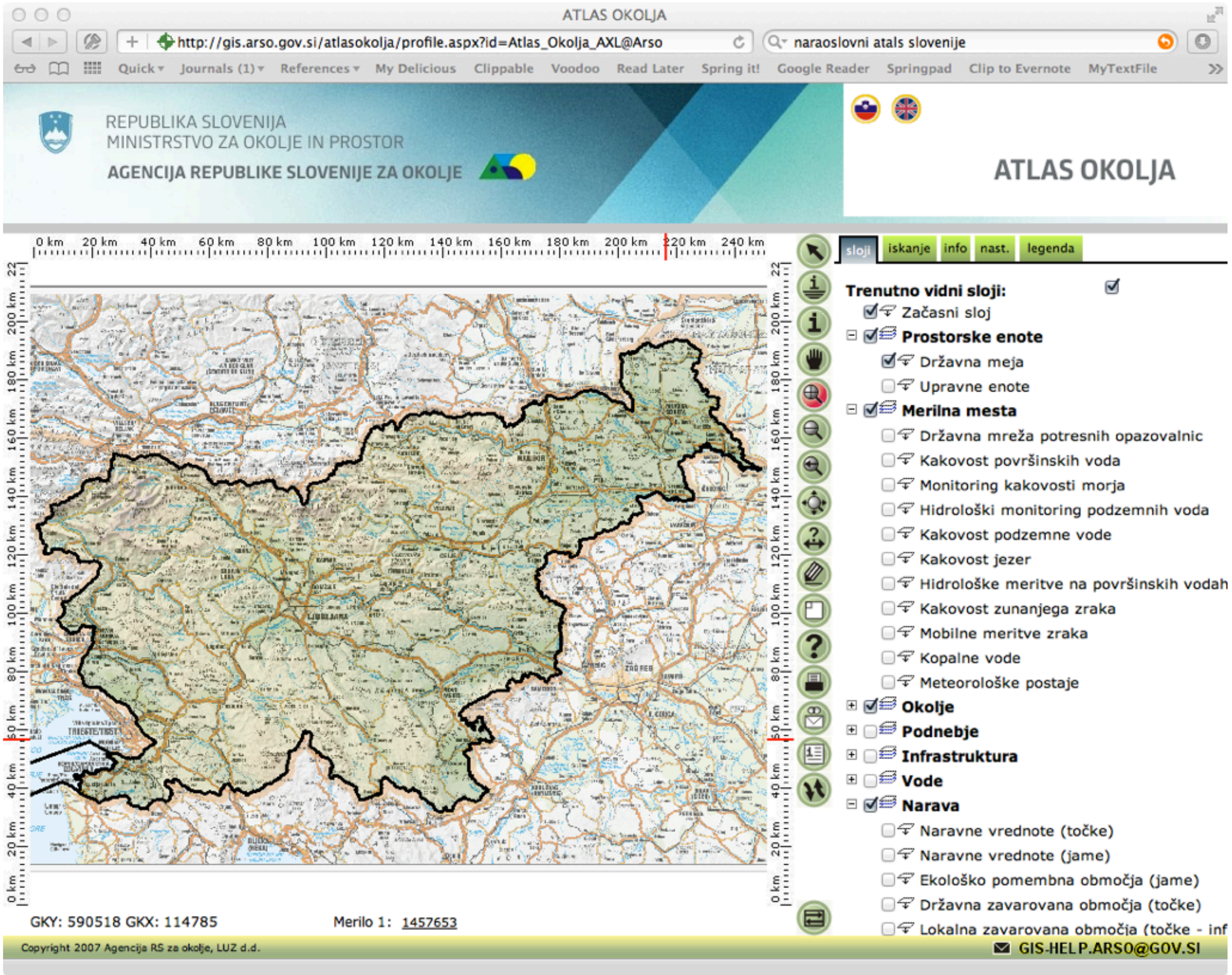


http://giskds.situla.org/giskd/

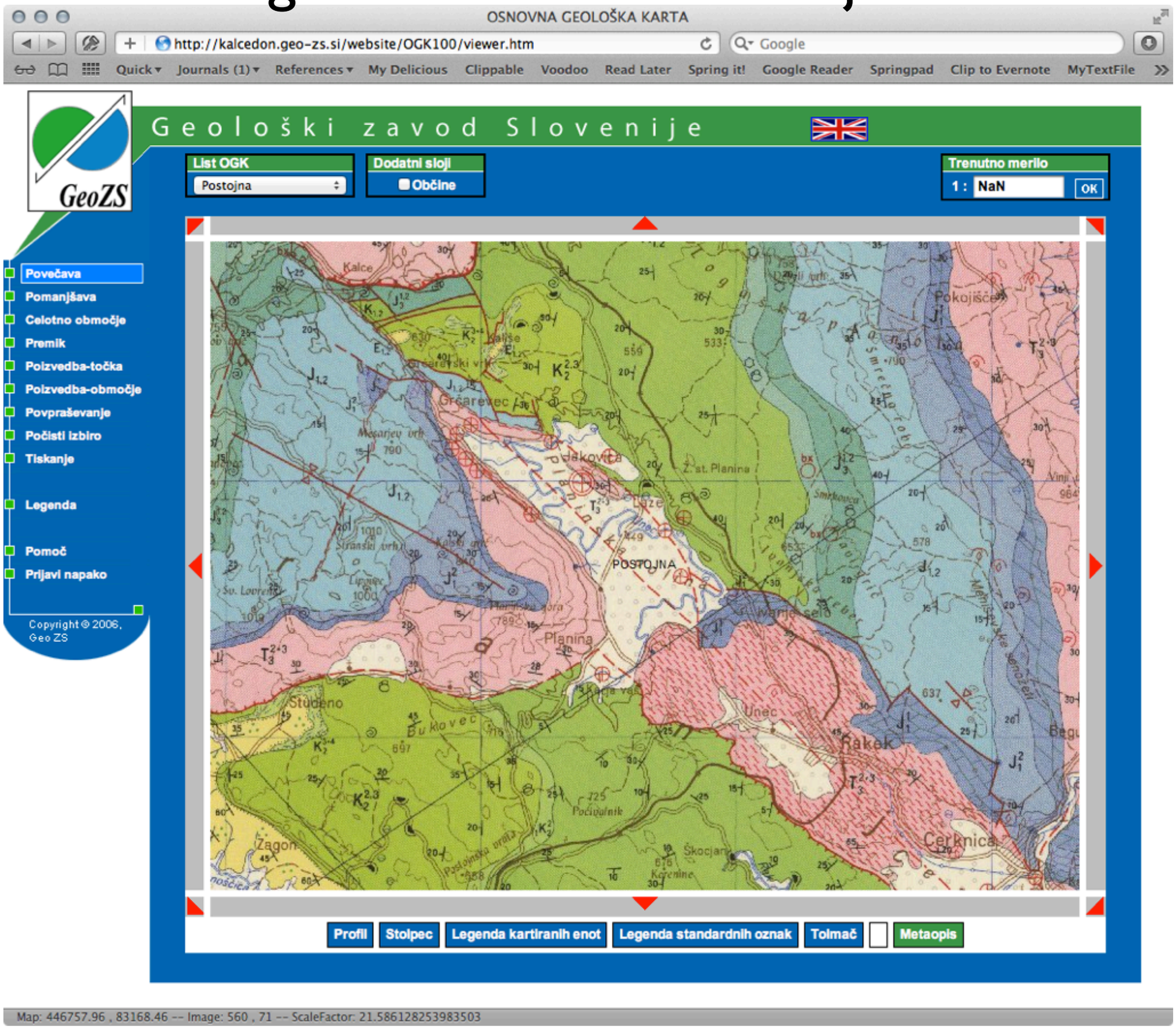
GERK


RKG-GERK
http://rkg.gov.si/GERK/viewer.jsp
Google
Quick
Journals (1)
References
My Delicious
Clippable
Voodoo
Read Later
Spring it!
Google Reader
Springpad
REPUBLIKA SLOVENIJA
MINISTRSTVO ZA KMETIJSTVO,
GOZDARSTVO IN PREHRANO
RKG
eRKG
KataKoma
KatMeSiNa
Domov
Kazalo
Kontakt
English
3D
Pomoč
Nastavitve:
KMG MID:
Potrdi
Aktivna plast:
GERK
Plast
Vključi
Tekst
?
Orto-foto
Orto-foto-stanje pred 2006
DTK50
TK25
TTN5
Zemljepisna imena
Raba
GERK
GERK_31.12.2009
GERK prekrivanja
GERK Neskladja RABA MKGP
RPE, Kataster, DMR
Vinogradništvo
Kontrolni sloji 2011
Kontrolni sloji 2010
Kontrolni sloji 2009
Kavce
Gorenje Jelenje
Jelenjska gora
Balch
Občina
Jesenšek
V mirovanju.
500063.60, 100826.82

Atlas okolja



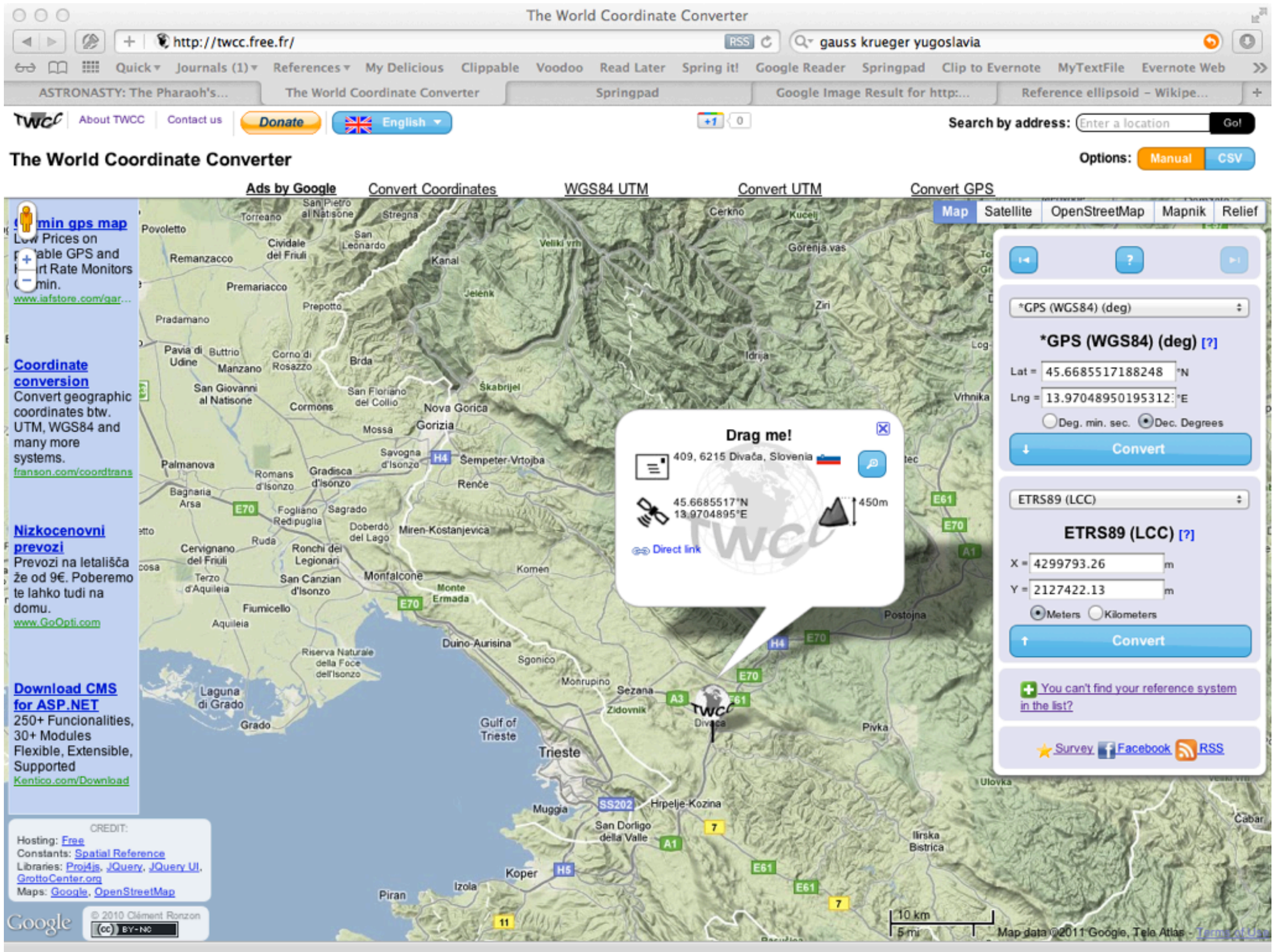
Osnovna geološka karta Slovenije



http://kalcedon.geo-zs.si/

World coordinate converter

http://twcc.free.fr/



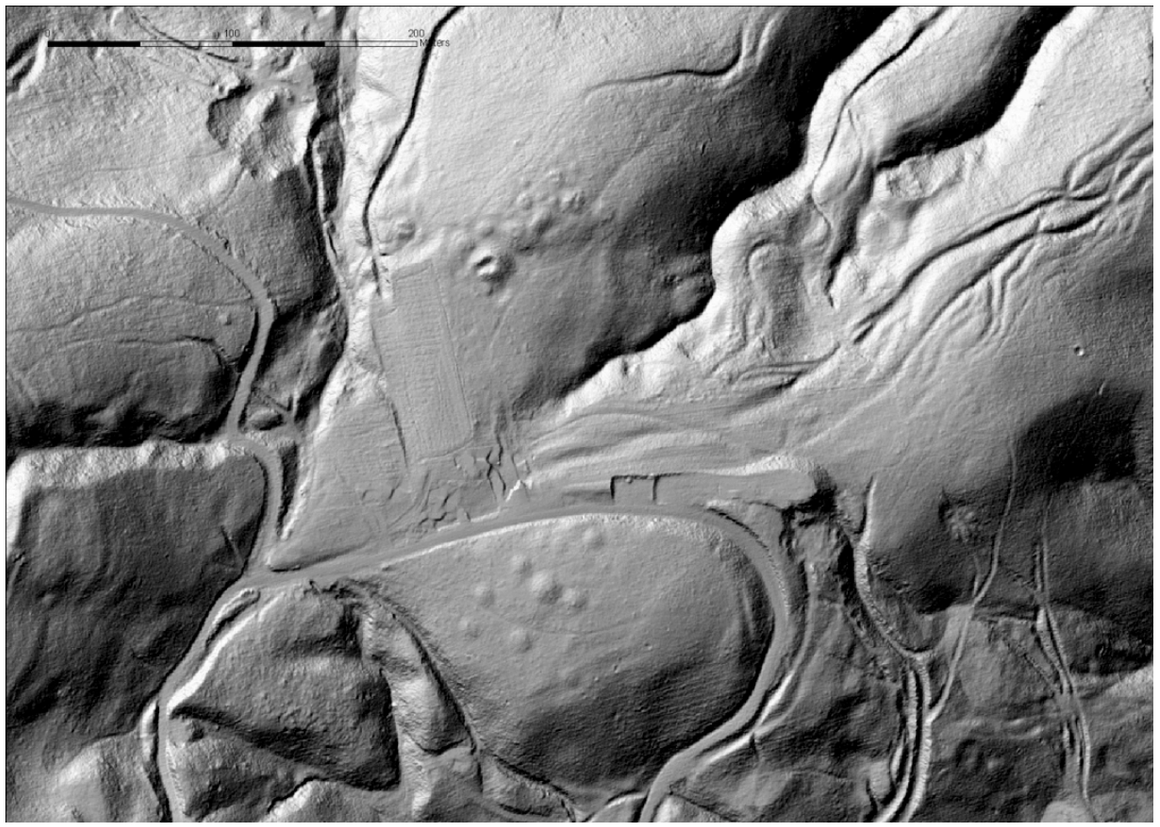
https://ge.tt/6xH96WP?c

Kaj je na lokaciji, zapisani v datoteki Točka.kml?

Kaj je zapisno v datoteki track-2007- ...kml?

Georeferenciraj EmonaMap.jpg?

Dodaj lidar posnetek gomil Poštele v Google Earth in digitaliziraj gomile.



north: 153778.440406
south: 153274.440406
west: 548085.5
east: 548844.5

gom2.jpg

Kaj je na parceli 873 KO Divača?

Digitaliziraj enoto
dediščine v bližini in
jo položi na Google
Earth.

Domača naloga

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New Developments in the Use of Spatial Technology in Archaeology

Mark D. McCoy · Thegn N. Ladefoged

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Abstract Spatial technology is integral to how archaeologists collect, store, analyze, and represent information in digital data sets. Recent advances have improved our ability to look for and identify archaeological remains and have increased the size and complexity of our data sets. In this review we outline trends in visualization, data management, archaeological prospecting, modeling, and spatial analysis, as well as key advances in hardware and software. Due to developments in education, information technology, and landscape archaeology, the implementation of spatial technology has begun to move beyond superficial applications and is no longer limited to environmental deterministic approaches. In the future, spatial technology will increasingly change archaeology in ways that will enable us to become better practitioners, scholars, and stewards.

Keywords Geographic information systems · Laser mapping · Remote sensing · Geophysical survey

Introduction

A common thread that links classic methodological innovations in field archaeology, such as the pioneering use of aerial photography by Gordon Willey or grid-based excavations by Sir Mortimer Wheeler, is how these methods have enhanced our ability to find and record the locations of archaeological remains at a level of precision necessary to interpret them. Today we use a wide variety of "spatial

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