Thematic Cartography: a Key Course in Geospatial Engineering

Rationale and implementation

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ICA European Symposium on CARTOGRAPHY
VIENNA, 10–12 NOVEMBER 2015

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- The Vienna **EuroCarto** original **Call for Papers**, included **Education** and **Thematic Cartography** in the list of topics
- **Our motivation**: to merge the two topics for the presentation of the **rationale** and the **implementation** of a **challenging compulsory course** on **Thematic Cartography** addressed to **Engineering students** (AUTH)
- **Why challenging?**

- Because this compulsory 4th semester course:
  - is addressed to ca 100 **Engineering students/yr**
  - following a **10 semesters curriculum** (300 ECTS programme) leading to the MEng degree

- Because the design of the course **has to follow the fundamentals of the engineering education:**
  - The **structural** (analytic + synthetic), and
  - the **modular** approach to knowledge
  - rather than to the “integral”, “in-one-shot” approach, which is mainly the case of non-engineering (or engineering) education of the 180 ECTS level curricula

- Engineering education at the 300 ECTS level of studies should prepare the student:
  - To construct **his own synthetic solution**, according to the theoretical background of Thematic Cartography, especially in the demanding ad-hoc cases, often appeared in practice (e.g. at worksite)
  - To develop synthetic systems based on **modular configuration** tools

- This preparation enables students – future engineers to:
  - properly **evaluate** Thematic Cartography "integrated solutions" tools, and
  - make **decisions** on the **best approach to follow** in their Thematic Cartography **interdisciplinary** projects according to the 300 ECTS curriculum (in mapping, management, infrastructures, planning, etc)

Thematic Cartography course

- **Content**: The object and history of TC; thematic data and their classification; the issue of scale and projection in thematic maps; standards, rules and practices in the graphic and image representation of thematic information; acquisition, process and representation of thematic data; symbolism of qualitative and quantitative information; the issue of ordering information; classes of thematic maps (choropleths, isarithmic contouring, topologic maps, atlases); statistics in TC; graphics and design in TC
- A series of **lectures** in the class, followed by
- A series of **computer exercises** (students' first time with mapping topics)

Basic idea – 1

- **In situ implementation** using on-line data (Eurostat)
- Thematic maps for **point, linear, areal and surface data**
- **Modular-wise** familiarisation with a series of basic software tools, offering **flexibility**

Basic idea – 2

- The use of **purposely selected** simple tools to get **familiarized** with:
  - the **underlying theory** of Thematic Cartography
  - the **technical requirements**
  - the often need to **combine software** in more carto-dedicated interdisciplinary engineering applications in order to construct quality maps in terms of **both** geometric and thematic content

Basic idea – 3

- Students **NOT just users** of available on-line tools (*great*, but not meant for a student's first compulsory educational acquaintance with Thematic Cartography)
- Students **NOT stream-users** of **just one** software tool (usually expensive and some times rather questionable for student use)

Basic idea – 4

- Students **future engineers**, must learn to create maps, complete and correct, in both their **geometric-projective** and **thematic** components, according to the rules of **internal** and **external** map recognition, ready to be used in all types of applications, at the **worksite** or at the **office**, printed ad hoc, or in many offset copies

Implementation

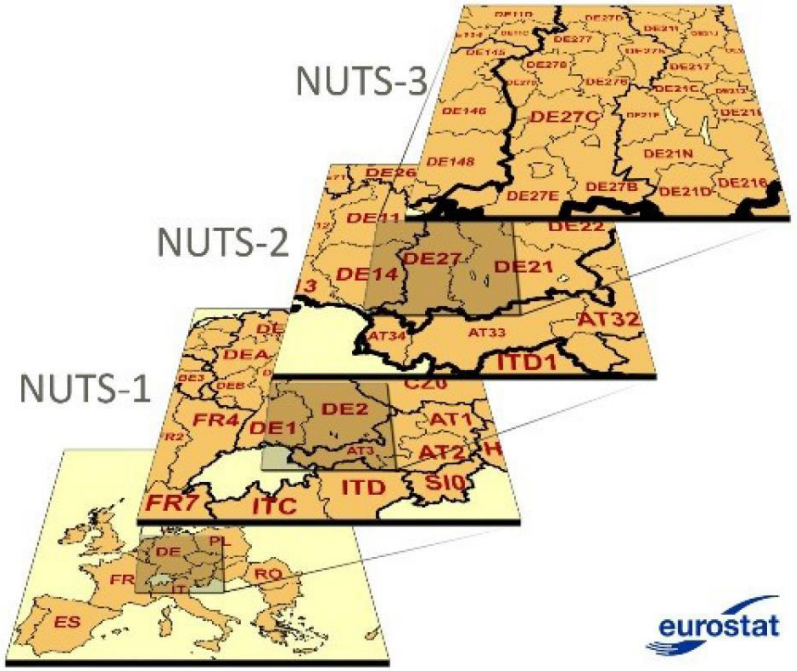
- Supported by the articulation of the following tools (free or institutionally licensed)

  - Jasc PaintShop Pro
  - MicroSoft Office Excel
  - ColorBrewer
  - GoldenSoftware Surfer
  - Indiemapper
  - Adobe Photoshop
  - Adobe Illustrator

Free data provider on-line:
EUROSTAT

- allowing **deepening, better understanding** and **application** of Thematic Cartography **rules**

René Sieber (ETHZ-IKG), 2013: "…tools don't automatically deliver compelling cartography"



Eurostat - Tables, Graphs and ...

ec.europa.eu/eurostat/tgm/refreshTableAction.do?tab=table&plugin=1&pcode=tgs00024&language=en

eurostat

Table | Graph | Map

Population density by NUTS 2 region

Code: tgs00024

Persons per km²

The ratio between the annual average population and the land area of the region. The land ... more

Flags | Codes | Labels | Codes & Labels | 1 234,56 | 1 234,56 | 1,234.56

geo \ time	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BE10:Rég. Bruxelles / Brussels	6,119.3	6,186.1	6,231.8	6,290.5	6,366.5	6,468.7	6,574.6	6,702.1	6,902.0	7,131.1	7,248.7	7,324.4
BE21:Prov. Antwerpen	593.4	596.3	599.2	602.7	606.9	611.8	617.3	622.5	619.2	637.4	642.6	645.9
BE22:Prov. Limburg (BE)	334.4	335.9	337.5	339.3	341.5	344.0	346.7	349.1	351.8	355.7	357.5	359.0
BE23:Prov. Oost-Vlaanderen	464.5	465.7	467.4	470.0	473.1	476.4	480.1	484.2	485.7	493.1	495.9	498.2
BE24:Prov. Vlaams-Brabant	488.3	490.4	492.8	495.7	499.2	503.0	506.9	510.9	516.1	520.0	523.5	526.4
BE25:Prov. West-Vlaanderen	361.8	362.3	363.1	364.0	365.2	366.6	368.1	369.5	370.8	374.6	376.1	377.0
BE31:Prov. Brabant Wallon	326.9	329.4	332.0	334.7	337.7	340.9	343.3	346.1	351.0	353.1	355.8	358.1
BE32:Prov. Hainaut	339.5	339.9	340.5	341.4	342.6	343.9	345.2	346.5	348.5	350.5	352.2	353.3
BE33:Prov. Liège	266.6	267.3	268.4	269.7	271.5	273.2	274.9	276.7	278.2	282.5	284.3	285.4
BE34:Prov. Luxembourg (BE)	56.6	57.1	57.5	58.0	58.6	59.2	59.8	60.4	61.0	61.9	62.5	62.7
BE35:Prov. Namur	122.8	123.5	124.3	125.1	125.9	126.8	127.7	128.7	129.7	131.7	132.6	133.1
BG31:Severozapaden	52.7	51.6	50.5	49.5	48.5	47.6	46.7	45.8	46.0	45.2	44.5	43.8
BG32:Severen tsentralen	65.1	64.1	63.1	62.2	61.2	60.3	59.5	58.7	59.0	59.0	58.4	57.8
BG33:Severoiztochen	69.8	69.3	69.0	68.6	68.2	67.9	67.5	67.2	67.7	66.7	66.3	66.1

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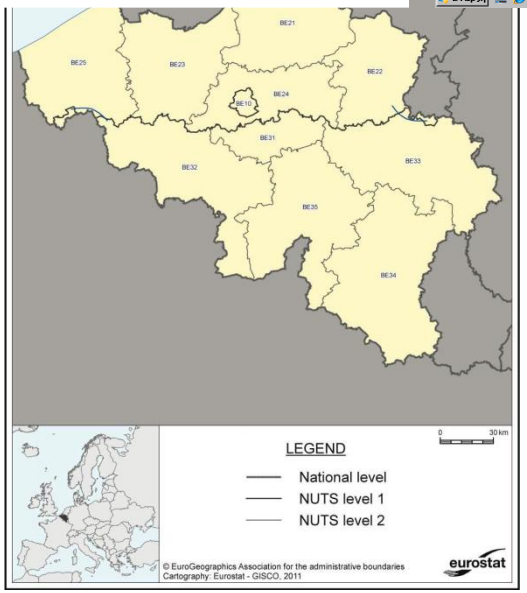
Source of Data: Eurostat



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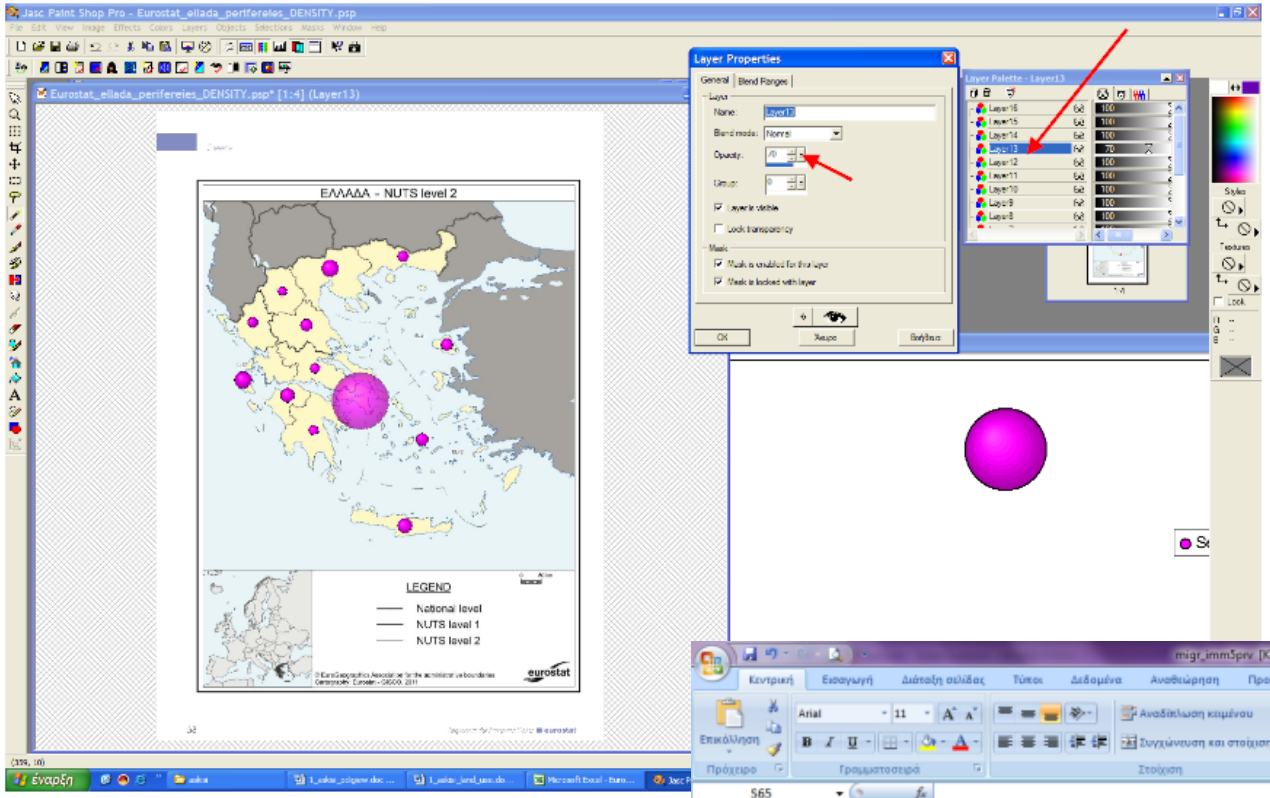
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Eurostat_ellada_perifereies_DENSITY.psp* [1:4] (Layer13)
ΕΛΛΑΔΑ – NUTS level 2
LEGEND
National level
NUTS level 1
NUTS level 2
eurostat
Layer Properties
General
Blend Ranges
Name:
Layer13
Blend mode:
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Opacity:
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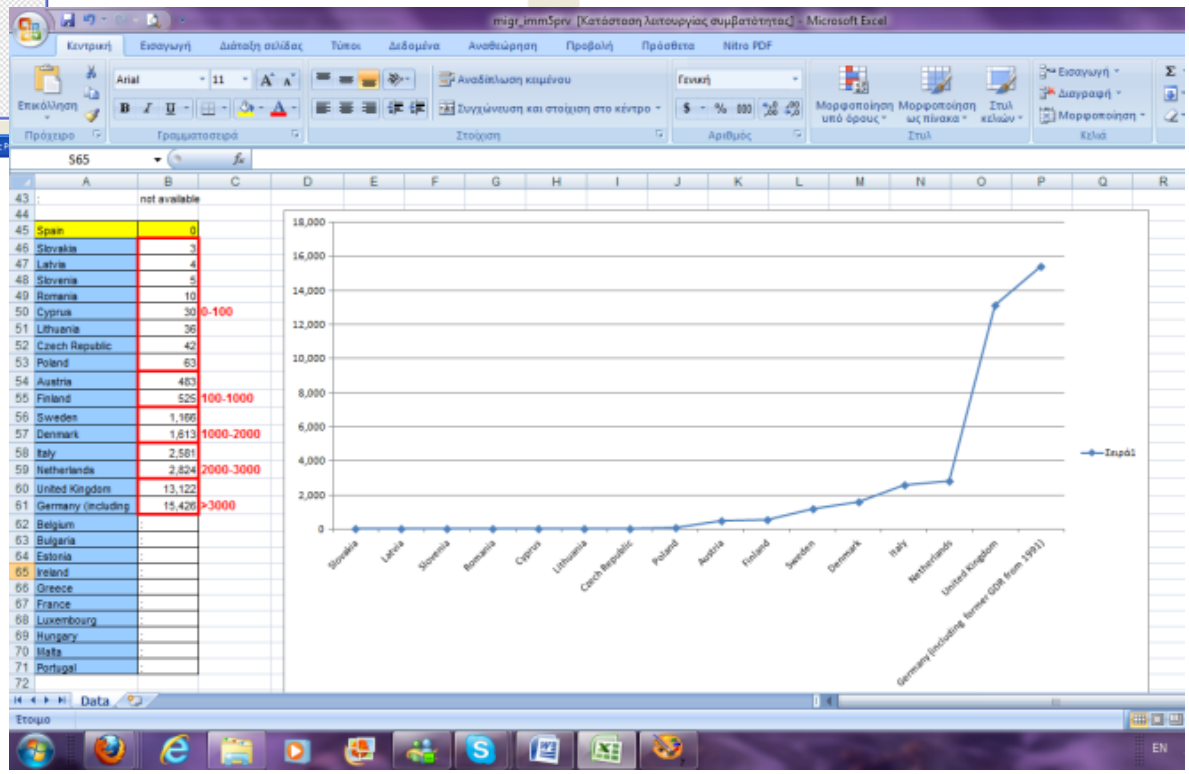
Lock transparency
Mask is enabled for this Layer
Mask is locked with layer
OK
Layer Palette - Layer13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Spain 0
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Latvia 4
Slovenia 5
Romania 10
Cyprus 30
Lithuania 36
Czech Republic 42
Poland 63
Austria 483
Finland 525
Sweden 1,166
Denmark 1,613
Italy 2,581
Netherlands 2,824
United Kingdom 13,122
Germany (including 15,426
Belgium :
Bulgaria :
Estonia :
Ireland :
Greece :
France :
Luxembourg :
Hungary :
Malta :
Portugal :
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100-1000
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2000-3000
>3000
Data
Σειρά1

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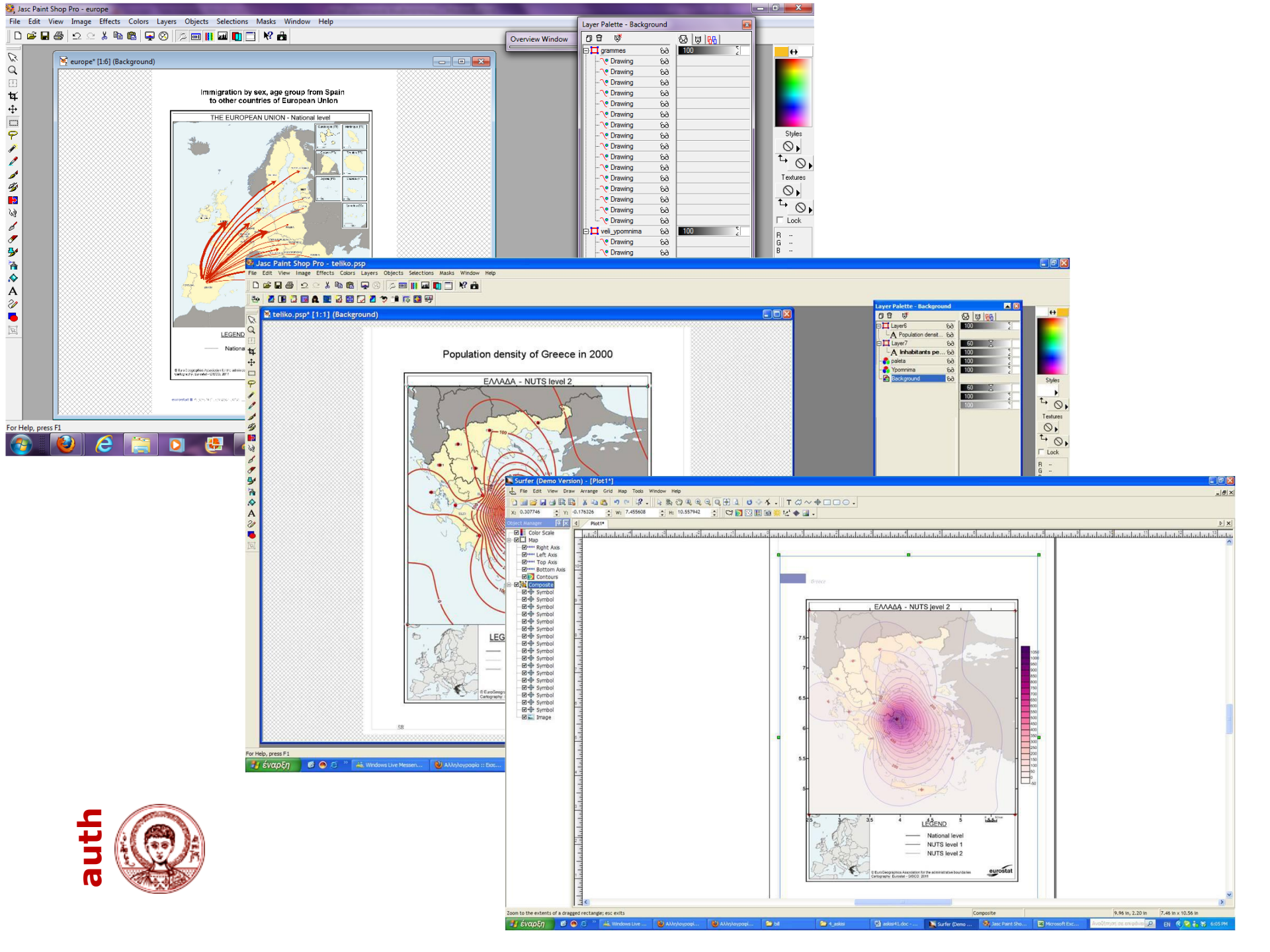
Jasc Paint Shop Pro - europe
europe* [1:6] (Background)
Immigration by sex, age group from Spain
to other countries of European Union
THE EUROPEAN UNION - National level
Layer Palette - Background
Overview Window
Jasc Paint Shop Pro - teliko.psp
teliko.psp* [1:1] (Background)
Population density of Greece in 2000
ΕΛΛΑΔΑ - NUTS level 2
Surfer (Demo Version) - [Plot1*]
LEGEND
National level
NUTS level 1
NUTS level 2
eurostat
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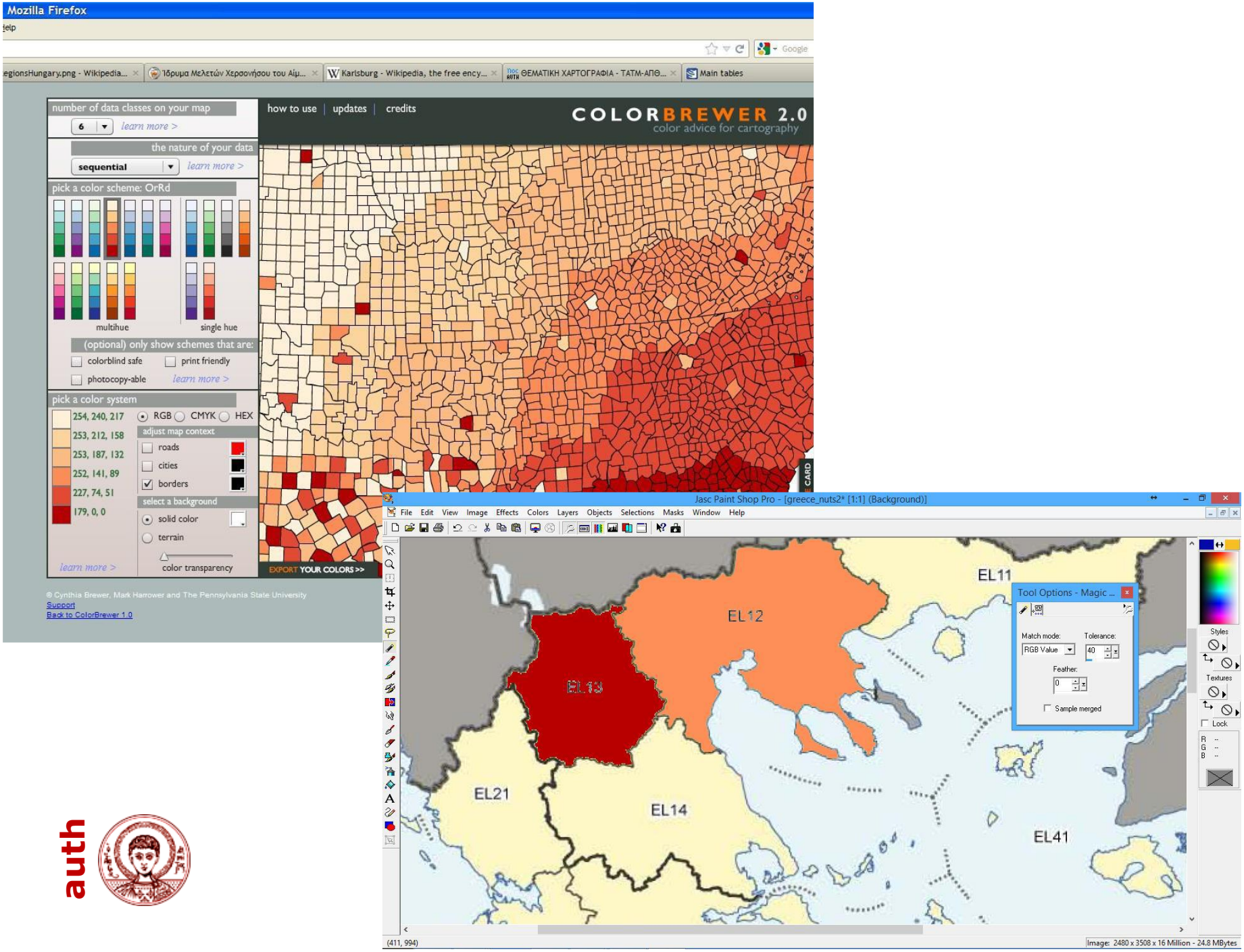
Mozilla Firefox
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(optional) only show schemes that are:
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photocopy-able
pick a color system
RGB
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254, 240, 217
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253, 187, 132
252, 141, 89
227, 74, 51
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adjust map context
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borders
select a background
solid color
terrain
color transparency
EXPORT YOUR COLORS >>
© Cynthia Brewer, Mark Harrower and The Pennsylvania State University
Support
Back to ColorBrewer 1.0
Jasc Paint Shop Pro - [greece_nuts2* [1:1] (Background)]
File Edit View Image Effects Colors Layers Objects Selections Masks Window Help
EL11
EL12
EL13
EL21
EL14
EL41
Tool Options - Magic ...
Match mode:
RGB Value
Tolerance:
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Feather:
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Sample merged
Styles
Textures
Lock
(411, 994)
Image: 2480 x 3508 x 16 Million - 24.8 MBytes

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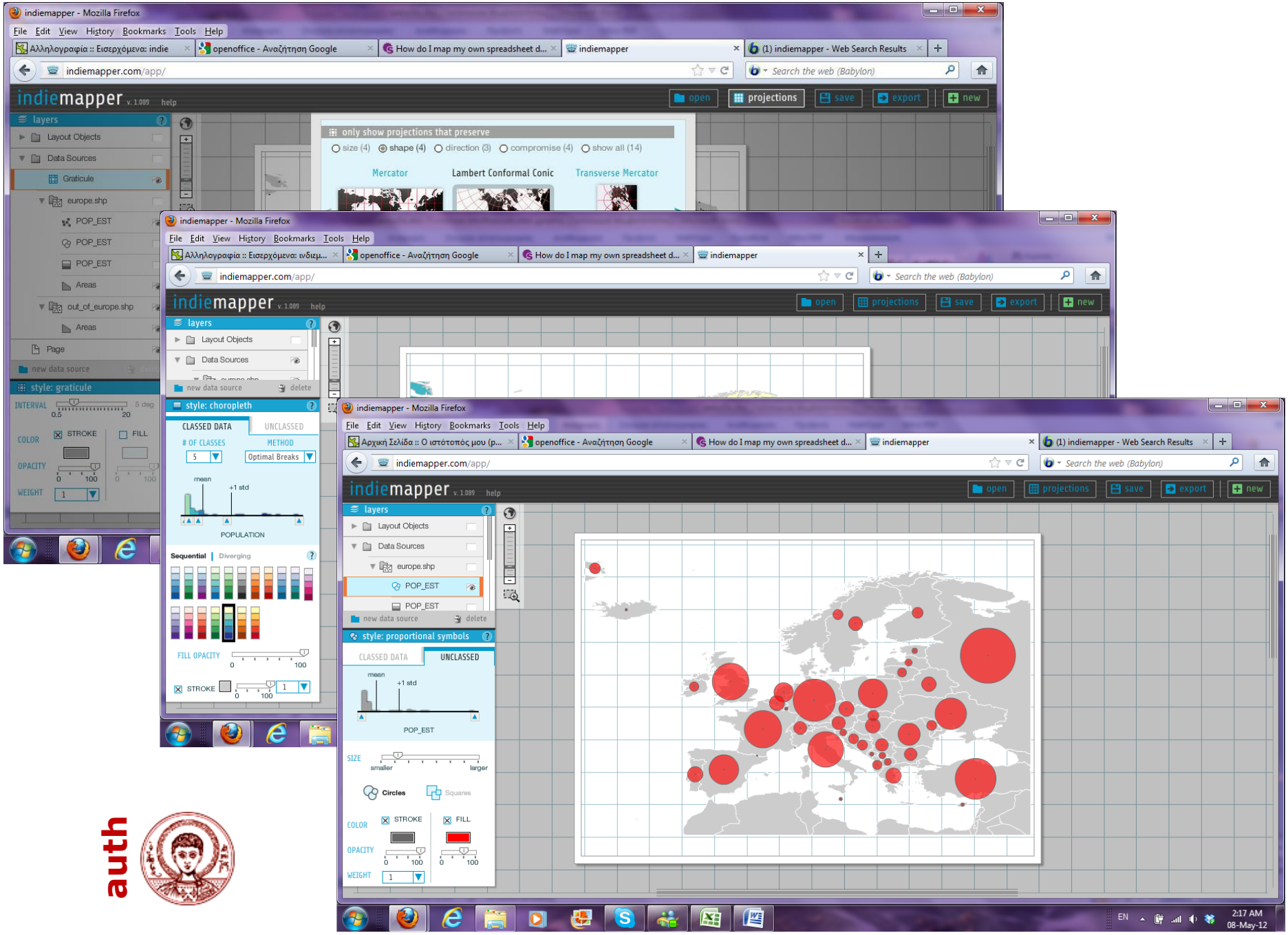
indiemapper - Mozilla Firefox
indiemapper.com/app/
indiemapper v. 1.089
help
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projections
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export
new
layers
Layout Objects
Data Sources
Graticule
europe.shp
POP_EST
Areas
out_of_europe.shp
Page
new data source
style: graticule
only show projections that preserve
size (4)
shape (4)
direction (3)
compromise (4)
show all (14)
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Lambert Conformal Conic
Transverse Mercator
style: choropleth
CLASSED DATA
UNCLASSED
OF CLASSES
METHOD
Optimal Breaks
mean
+1 std
POPULATION
Sequential
Diverging
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STROKE
style: proportional symbols
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smaller
larger
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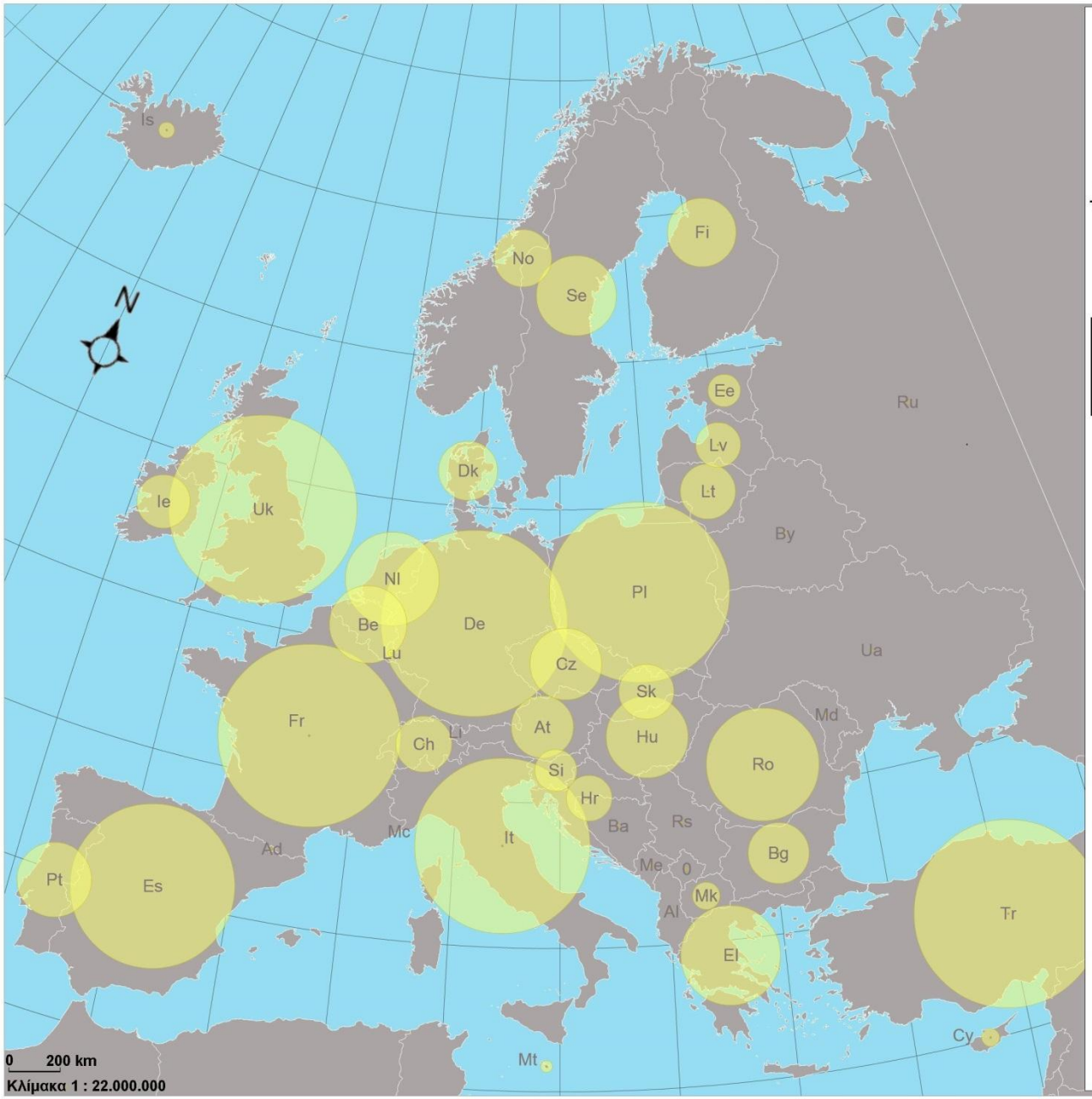

ΑΡΙΣΤΟΤΕΛΕΙΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΟΝΙΚΗΣ
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ΤΜΗΜΑ ΑΓΡΟΝΟΜΩΝ ΚΑΙ ΤΟΠΟΓΡΑΦΩΝ ΜΗΧΑΝΙΚΩΝ
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ΜΑΘΗΜΑ:ΘΕΜΑΤΙΚΗ ΧΑΡΤΟΓΡΑΦΙΑ

Εαρινό Εξάμηνο Ακαδ. Έτους 2012-2013

Αριθμός σπουδαστών στις χώρες της Ευρώπης

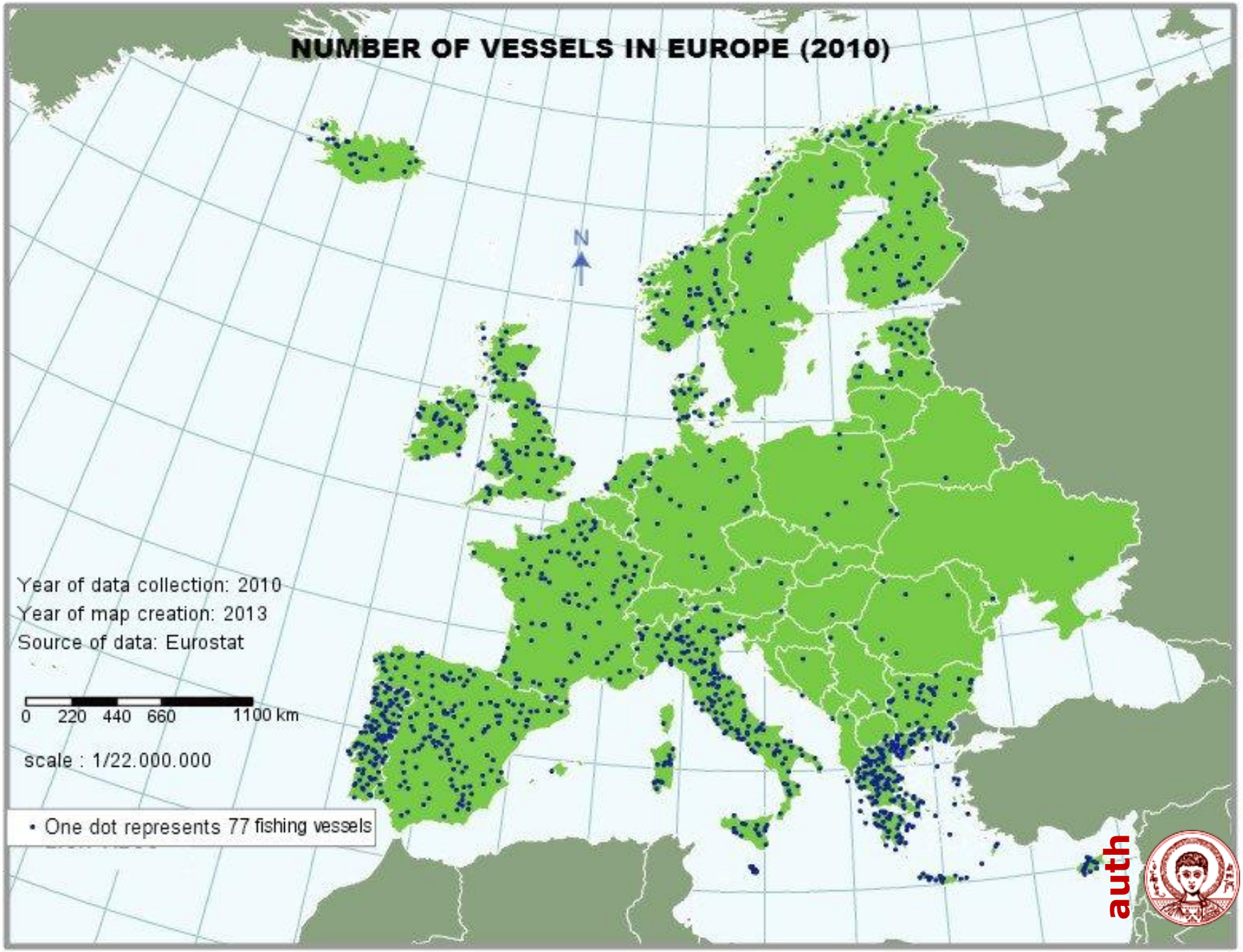
Όνομα: Φίλιππος Σ. Μακρής
Α.Ε.Μ.: 5213

2,343
1,406
586
196

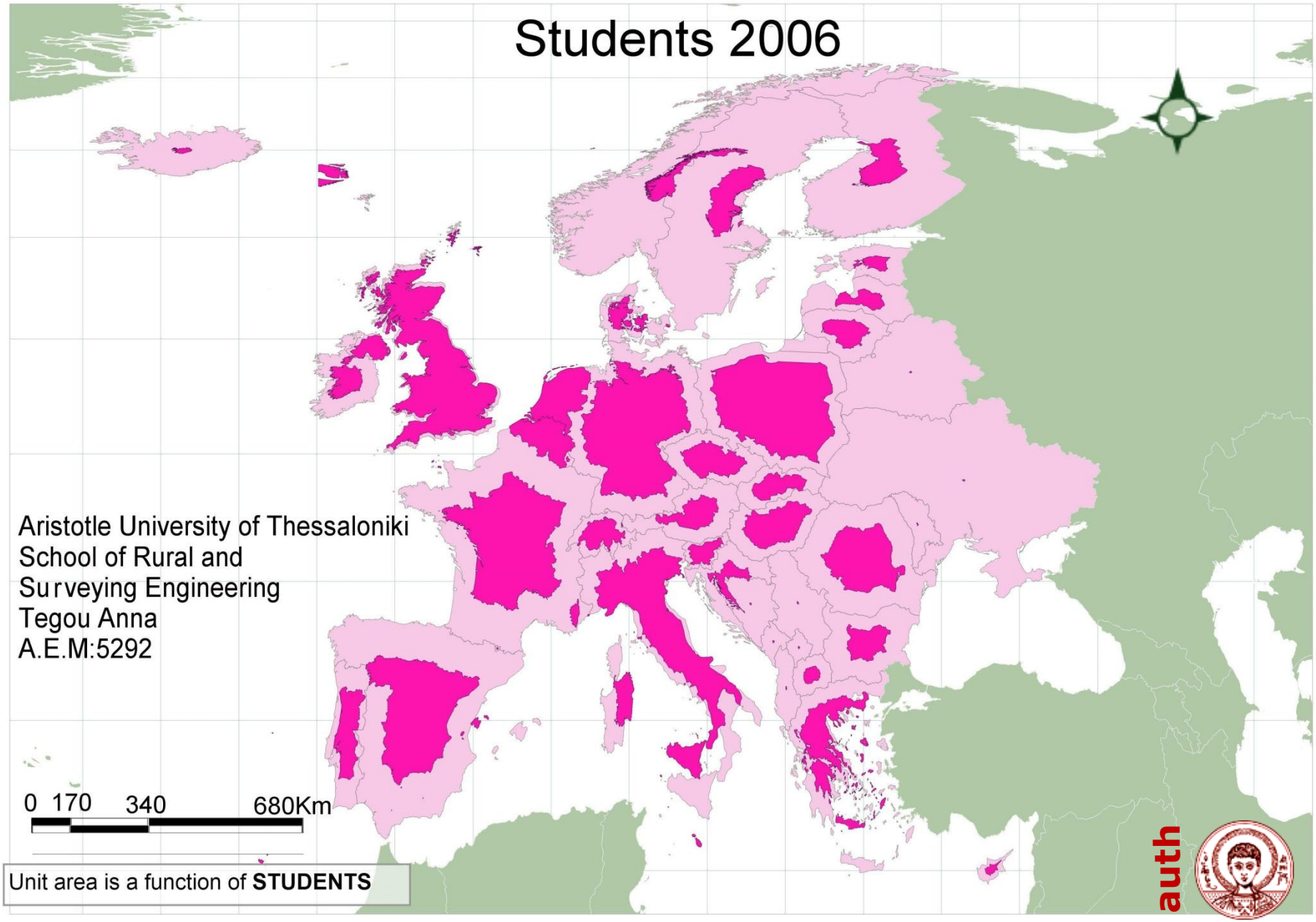
αριθμός σπουδαστών

Πηγή Δεδομένων: Eurostat
Έτος Συλλογής Στατιστικών Δεδομένων: 2006
Χαρτογραφική Προβολή:Orthographic
(για λ=15 και φ=50 μοίρες)
Χαρτογραφικός Κάνναβος ανά 5 μοίρες

Θεσσαλονίκη, Μάιος 2013


NUMBER OF VESSELS IN EUROPE (2010)
N
Year of data collection: 2010
Year of map creation: 2013
Source of data: Eurostat
0 220 440 660 1100 km
scale : 1/22.000.000
• One dot represents 77 fishing vessels
auth

Students 2006



ΑΡΙΣΤΟΤΕΛΕΙΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΟΝΙΚΗΣ
ΠΟΛΥΤΕΧΝΙΚΗ ΣΧΟΛΗ
ΤΜΗΜΑ ΑΓΡΟΝΟΜΩΝ ΚΑΙ ΤΟΠΟΓΡΑΦΩΝ ΜΗΧΑΝΙΚΩΝ
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ΜΑΘΗΜΑ:ΘΕΜΑΤΙΚΗ ΧΑΡΤΟΓΡΑΦΙΑ

Εαρινό Εξάμηνο, 2013-2014

Φυσική Μεταβολή Πληθυσμού στις Χώρες τις Ευρώπης κατά το 2010

Μεταβολή μέσου πληθυσμού ανά 1000 κατοίκους

- -4.8 ως -4
- -4 ως -2
- -2 ως 0
- 0 ως 2
- 2 ως 4
- 4 ως 10.7
- Χωρίς Δεδομένα

Χαρτογραφική Προβολή:Mercator
Πηγή Δεδομένων: Eurostat,2010

0 230 460 920 km

N

Όνομα: ***Ραλλού Ταρατόρη***
Α.Ε.Μ. : ***5288***

Θεσσαλονίκη, Μάϊος 2014

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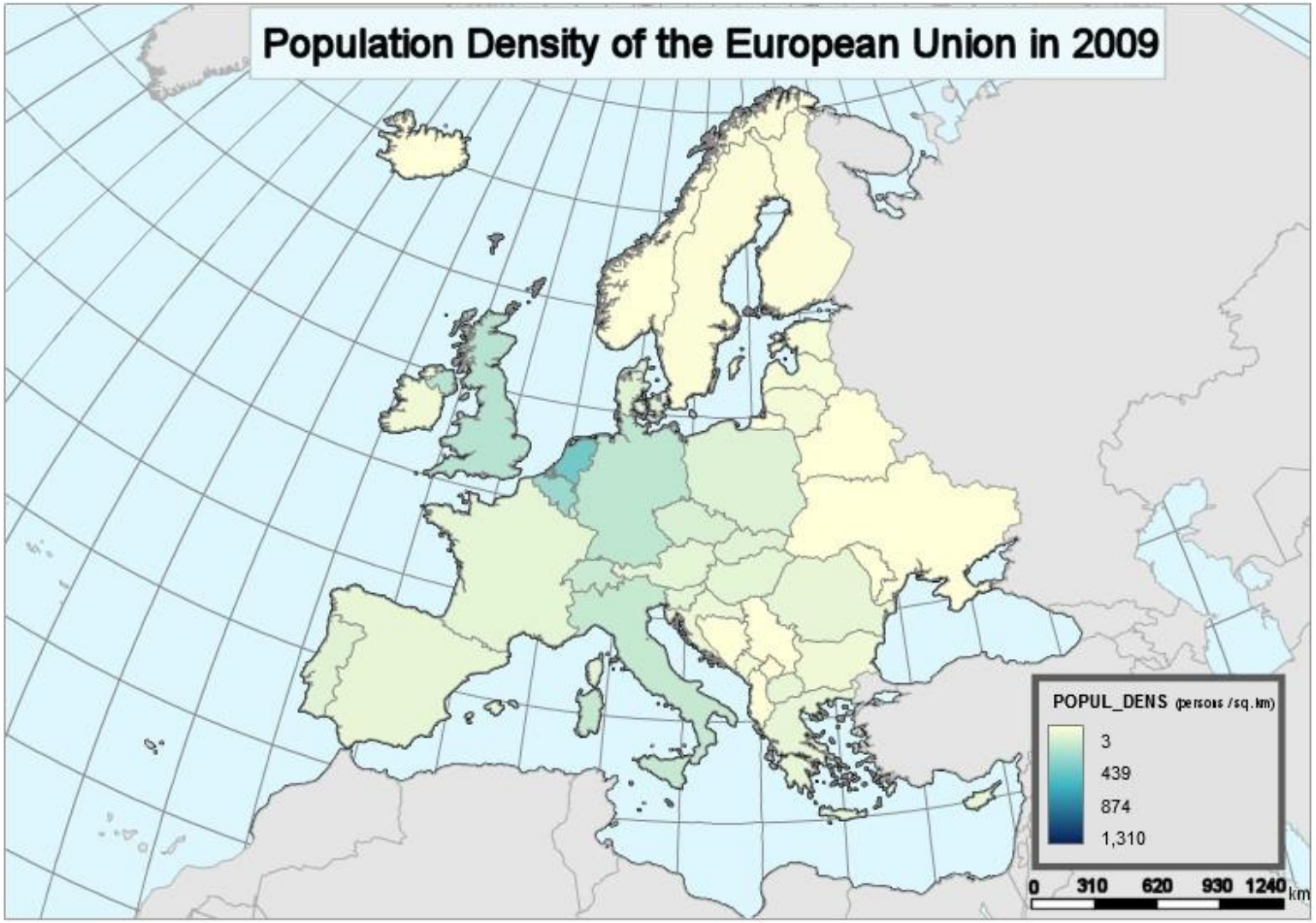
Population Density of the European Union in 2009
POPUL_DENS (persons /sq.km)
3
439
874
1,310
0
310
620
930
1240
km

Semester	Course	Type
3	Introduction to Cartography	Compulsory
4	**Thematic Cartography**	Compulsory
7	Computer Assisted Cartography	Elective
7	Map Use	Elective
8	Map Design and Production	Elective
9	Non-Conventional Cartography	Elective
9	Cartographic Visualisation	Elective
9	History of Cartography	Elective
10	MEng Thesis	Compulsory

Plus additional GIS courses (compulsory + elective)

SCHWEIZERISCHE GESELLSCHAFT FÜR KARTOGRAFIE
SOCIÉTÉ SUISSE DE CARTOGRAPHIE
SWISS SOCIETY OF CARTOGRAPHY

- Home
- Portrait
- Contact
- Mitgliedschaft
- Veranstaltungen
- Map Year
- Infoblätter
- Berichte
- Publikationen
- Commissions
- Statuten
- Companies
- National Report
- Ausbildung
- Stellenbörse
- Prix Carto
- Bildergalerien
- Archiv
- Links

Prix Carto

Schweizer Kartografiepreise

Verleihung Schweizer Kartografiepreise «Prix Carto», 4.11.2015
Medienmitteilung PDF | DOC

«Prix Carto – start»

Der «Prix Carto – start» ist ein neuer Preis zur Förderung des Nachwuchses auf dem Gebiet der Kartografie, Geomatik und Geovisualisierung. 2015 wurde der Preis anlässlich des «International Map Year» zum ersten Mal von der Schweizerischen Gesellschaft für Kartografie (SGK) vergeben.

1. Rang: Fabian Ringli, Pascal Tschudi (ETH Zürich)
2. Rang: Manuel Dätwyler (FHNW Muttenz)
3. Rang: Shirkou Moradi (Universität Zürich)

«Prix Carto – digital»

Der «Prix Carto – digital» wurde dieses Jahr zum zweiten Mal verliehen. Zugelassen waren alle digitalen Produkte mit einem Bezug zur Kartografie. Das konnten z.B. Webkarten, GIS-Applikationen, Software-Produkte oder Datenvisualisierungen mit einem geografischen Bezug sein.

Gewinner: OCAD AG / IKG ETH Zürich
Produkt: OCAD 12 ThematicMapper

«Prix Carto – print»

Der «Prix Carto – print» wurde dieses Jahr bereits zum sechsten Mal verliehen. Zugelassen waren alle Arten von gedruckten Karten (z.B. Topografische oder thematische Karten; Freizeit-, Strassen-, Luftbild-, Panorama-, Orientierungslaufkarten). Atlanten, Globen oder physische Reliefmodelle konnten ebenfalls eingereicht werden.

Gewinner: climbing-map.com GmbH
Produkt: Island Peak / Mera Peak

2015

Angeliki TSORLINI
ETHZ – IKG Group
AUTH 2005 Graduate

ICA European Symposium on CARTOGRAPHY
VIENNA, 10–12 NOVEMBER 2015

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Conclusion - Evaluation

- A class of over one 100 students/yr working in a wi-fi environment
- Students seem to evaluate positively the multitude of tools at the end of the semester
- Students' development of increased interest in Cartography in the following semesters (increasing numbers in elective Carto-courses) compared to previous years
- Students' improved performance and gained maturity in the following elective Carto-courses as well as all the other relevant courses