

Data Infrastructures for Sustainable Growth: an education perspective

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EUROGEO 35 YEARS

EUROGEO



COUNCIL OF EUROPE
CONSEIL DE L'EUROPE

- European Association of Geographers
- Legally based in Belgium
- NGO – **established 1979**
- **Professional association**
- Participatory status at **Parliamentary Assembly, Council of Europe**
- Position to lobby and influence in Europe and to protect and promote all our interests



EUROGEO



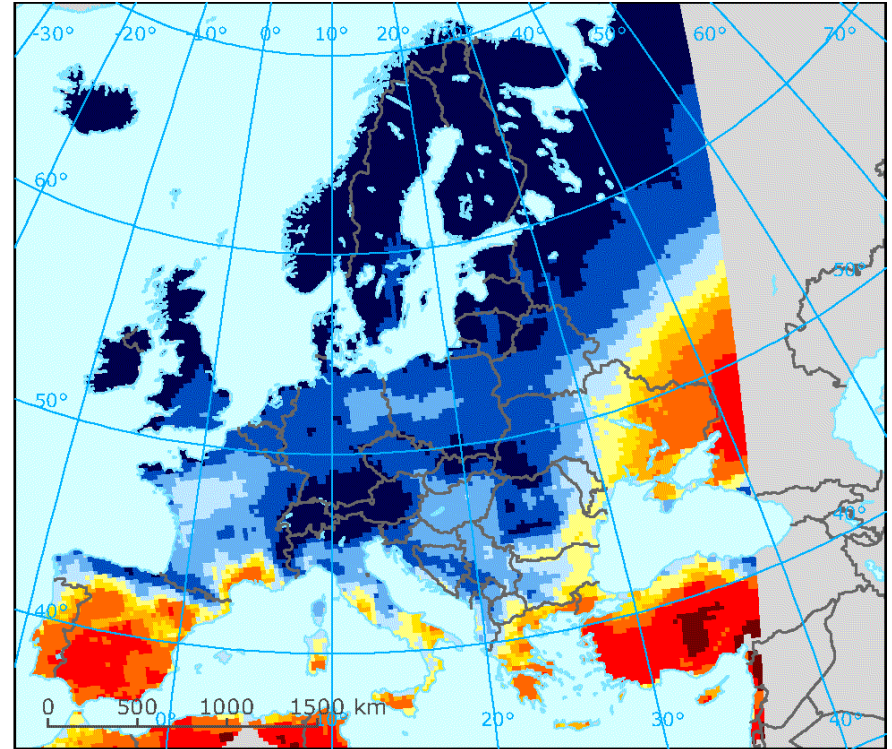
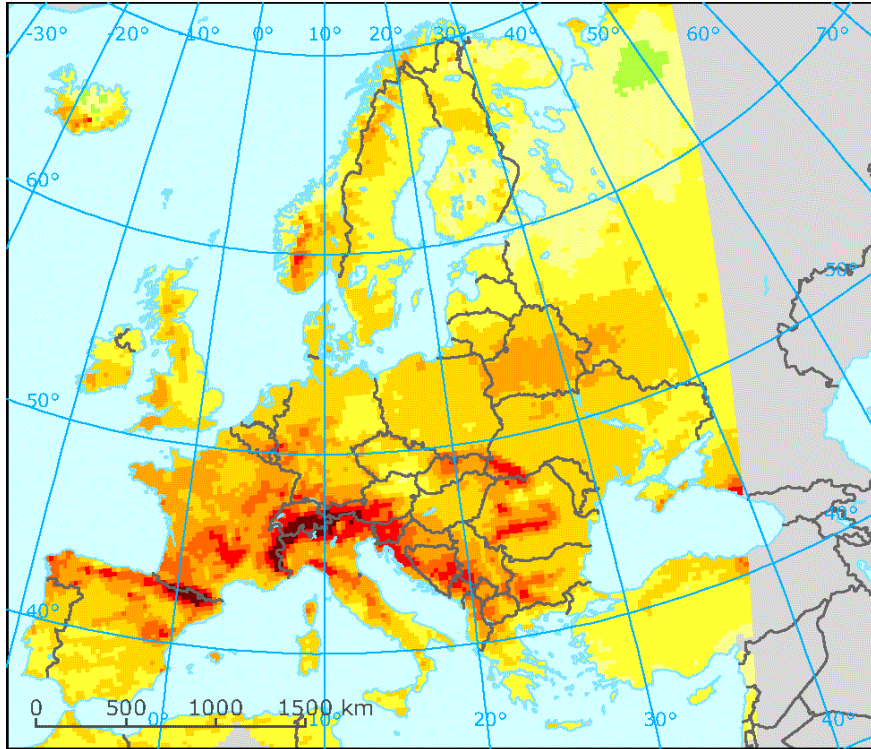
- **EUROGEO at the Council of Europe (since 1983)**
- **Culture, Education, Environment, Economy**
 - Lobbying in the Parliamentary Assembly
 - Responding to statements and policy
- **Huge education and awareness raising needs**





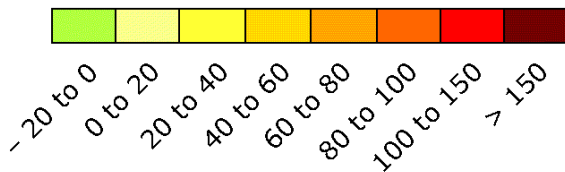
EUROGEO 35 YEARS

Awareness Raising Spatial Information



**Projected change in fire danger
(SSR, 2071–2100 vs. 1961–1990)**

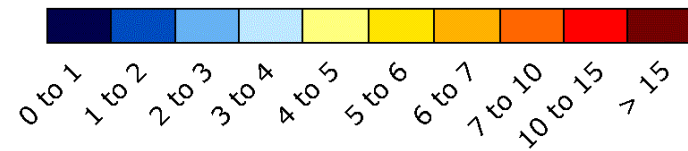
% change in SSR



Outside coverage

Projected fire danger (SSR, 2071–2100, annual average)

SSR



GE
WO
FO



EUROGEO – geospatial project activities

- Digital-earth.eu
- iGuess – I-Use
- Spatial Citizenship
- SeaChange
- GeoCapabilities
- GeoSkills Plus
- School on the Cloud
- GI-N2K

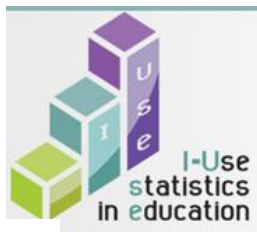




EUROGEO 35 YEARS



EUROGEO

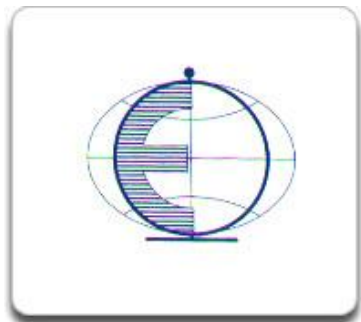


DEVELOPMENT AND RESEARCH

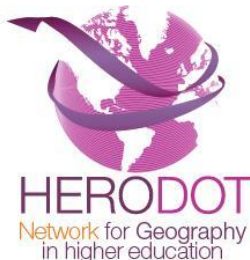


EUROGEO

AWARENESS RAISING, NETWORKING



digital-earth.eu

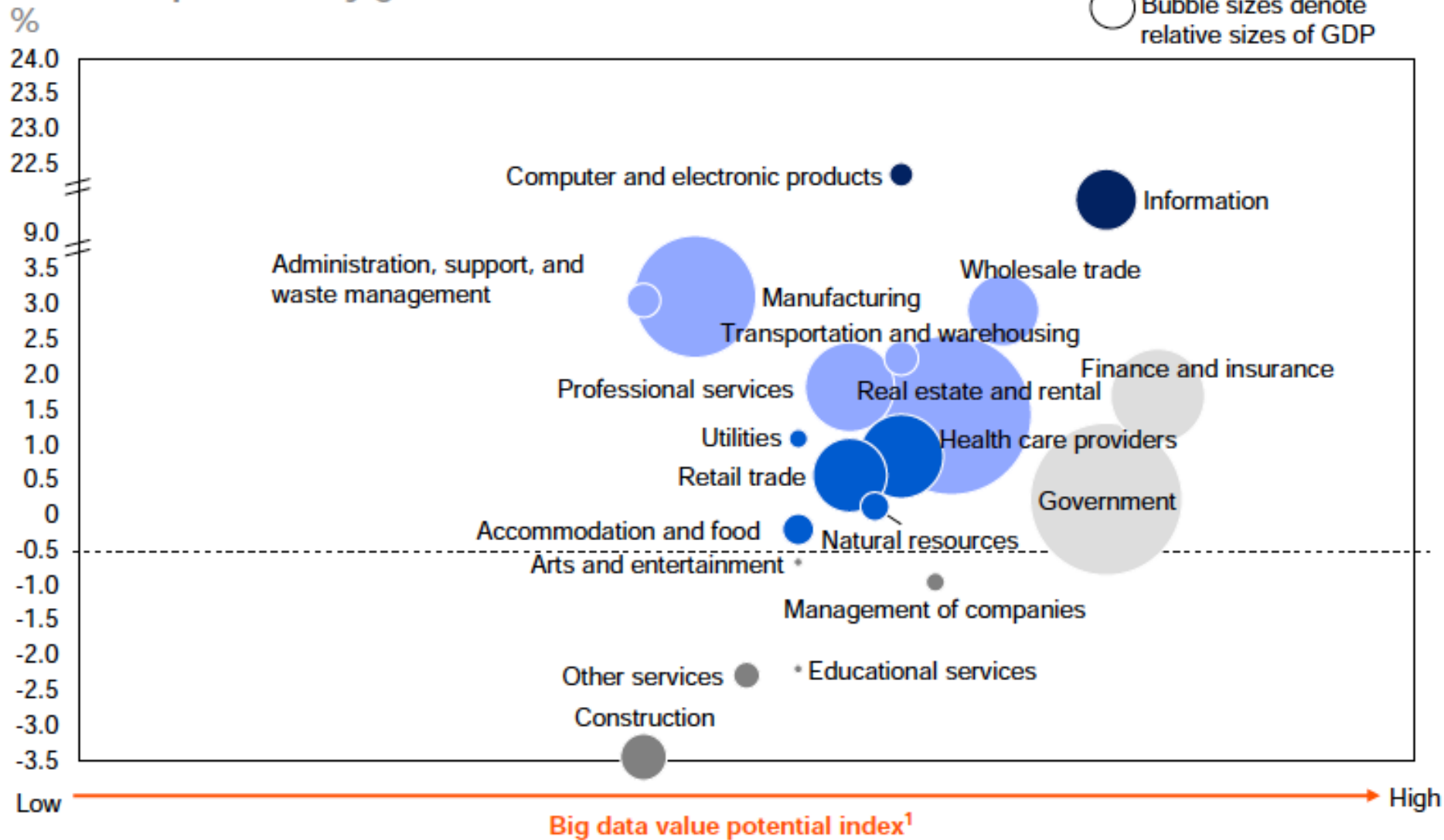


HERODOT
Network for Geography
in higher education



Some sectors are positioned for greater gains from the use of big data

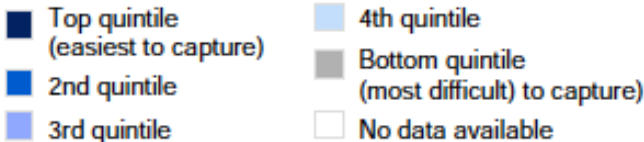
Historical productivity growth in the United States, 2000–08



1 See appendix for detailed definitions and metrics used for value potential index.

SOURCE: US Bureau of Labor Statistics; McKinsey Global Institute analysis

A heat map shows the relative ease of capturing the value potential across sectors



Categories	Sectors	Overall ease of capture index ¹	Talent	IT intensity	Data-driven mind-set	Data availability
Goods	Manufacturing	Top quintile	Top quintile	4th quintile	3rd quintile	Top quintile
	Construction	3rd quintile	4th quintile	3rd quintile	3rd quintile	3rd quintile
	Natural resources	2nd quintile	Bottom quintile	3rd quintile	Top quintile	Top quintile
	Computer and electronic products	2nd quintile	2nd quintile	3rd quintile	3rd quintile	3rd quintile
	Real estate, rental, and leasing	3rd quintile	Bottom quintile	Top quintile	Top quintile	Bottom quintile
	Wholesale trade	3rd quintile	3rd quintile	2nd quintile	3rd quintile	Bottom quintile
	Information	Top quintile	2nd quintile	Top quintile	4th quintile	2nd quintile
Services	Transportation and warehousing	2nd quintile	3rd quintile	Top quintile	Bottom quintile	2nd quintile
	Retail trade	4th quintile	4th quintile	4th quintile	4th quintile	3rd quintile
	Administrative, support, waste management, and remediation services	3rd quintile	3rd quintile	4th quintile	2nd quintile	4th quintile
	Accommodation and food services	4th quintile	Bottom quintile	Bottom quintile	2nd quintile	2nd quintile
	Other services (except public administration)	Bottom quintile	4th quintile	4th quintile	3rd quintile	4th quintile
	Arts, entertainment, and recreation	Bottom quintile	Bottom quintile	2nd quintile	Bottom quintile	3rd quintile
	Finance and Insurance	2nd quintile	Top quintile	4th quintile	4th quintile	2nd quintile
	Professional, scientific, and technical services	4th quintile	Top quintile	2nd quintile	4th quintile	4th quintile
	Management of companies and enterprises	3rd quintile	Top quintile	Top quintile	Bottom quintile	Bottom quintile
Regulated and public	Government	Bottom quintile	No data available	No data available	Bottom quintile	4th quintile
	Educational services	Bottom quintile	2nd quintile	Bottom quintile	Bottom quintile	Bottom quintile
	Health care and social assistance	2nd quintile	2nd quintile	Bottom quintile	Top quintile	Top quintile
	Utilities	Top quintile	3rd quintile	2nd quintile	Top quintile	Top quintile

¹ See appendix for detailed definitions and metrics used for each of the criteria.

SOURCE: McKinsey Global Institute analysis



The Netherlands

- In 2008 first signs of a mismatch between demands of GEO labour market and quantity and quality of students and graduates
- Establishment Geo Employment Market Foundation



Research Supply and Demand GEO Labour Market in NL 2008

2)

- Labour market in 2008
 - Yearly turnover \pm 1.4 billion euros.
 - More than 15,000 full-time employees ¹⁾
- Labour market demands in 2008
 - \pm 125 graduate Vocational level
 - \pm 120 graduate Bachelor level
 - \pm 80 graduate Masters level.
- Only 16 - 23% of this demand is realized



1) Source: Geo-informatiesector in kaart, Heliview, WUR, Geofort 2009

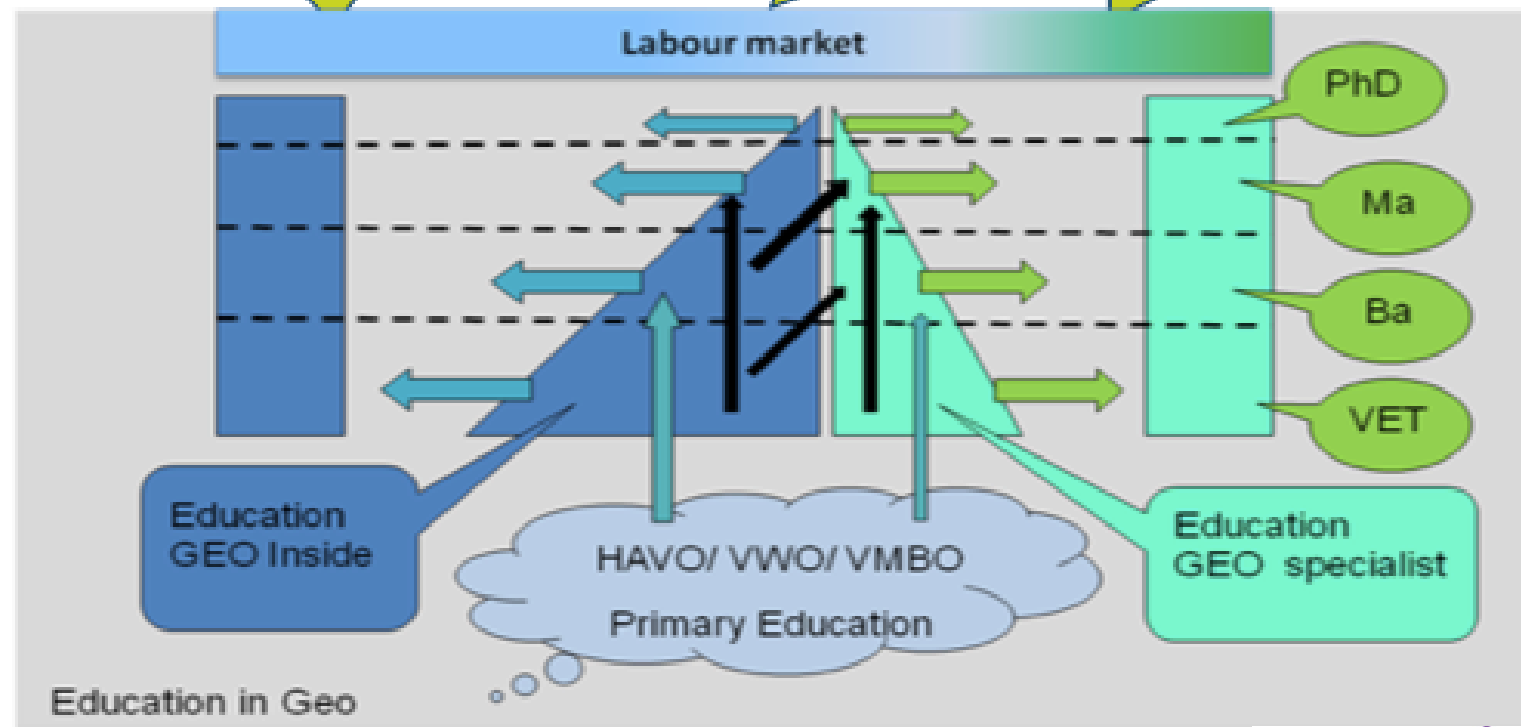
2) Source: Mismatch vraag en aanbod geo-sector, Hernam Janssen mei 2008

2008 Demands Geo Labour

Industry:
900 M€ turnover/yr
10,000 employees.
300 employers

Government:
465 M€ turnover/yr
4.650 employees

Research:
45 M€ turnover/yr
450 employees.



European approach

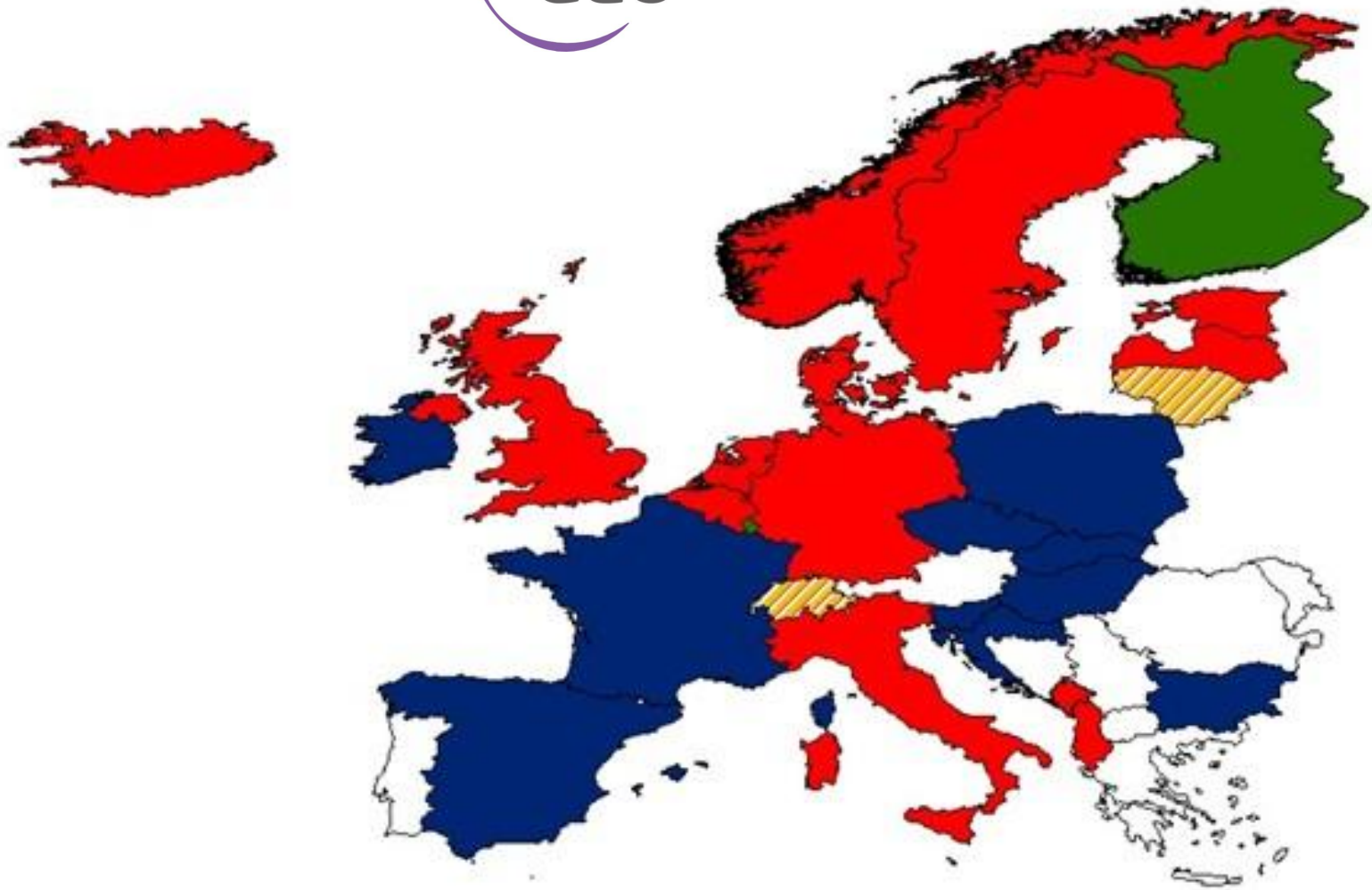


GEO SKILLS PLUS is examining examples...

- Of cooperation
- Of raising awareness capacity building activities
- Of bridging the gap activities

... in three European countries.





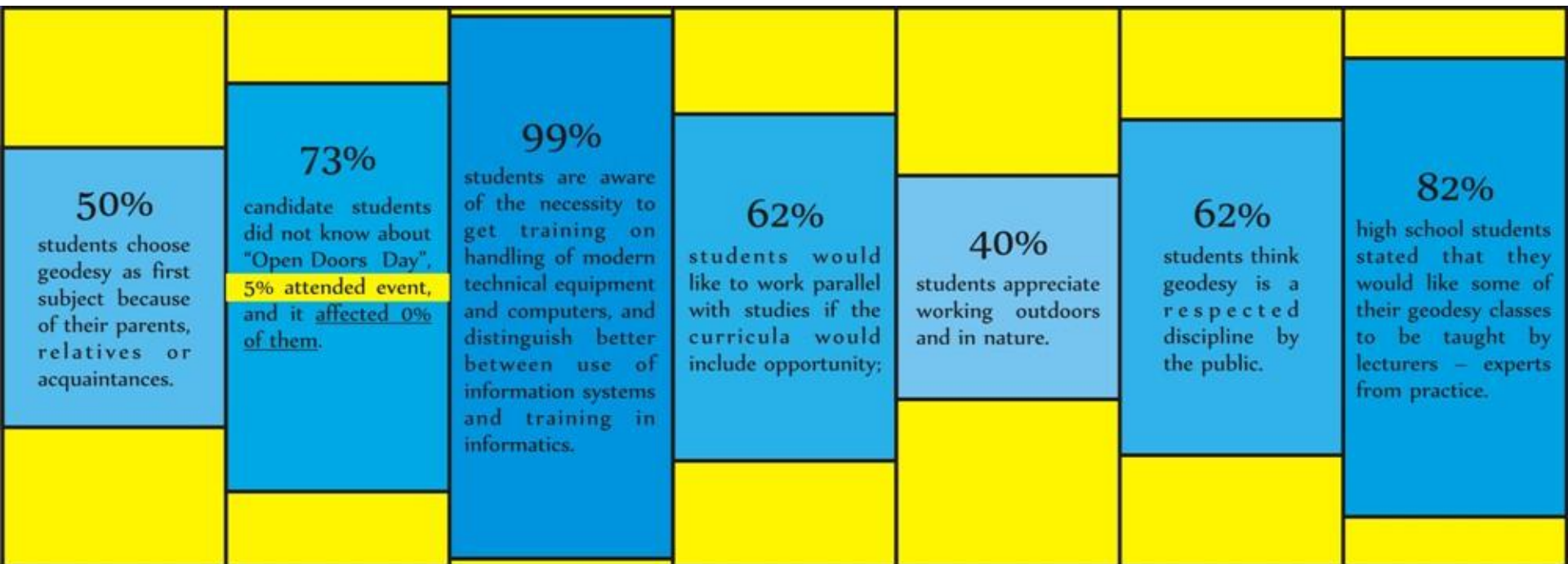
GAP

- 0 - NO INFORMATION
- 1 - GAP (SHORTAGE OF GEO SPECIALISTS)
- 2 - SURPLUS OF GEO SKILLED SPECIALISTS
- 3 - NO GAP
- 4 - SURPLUS OF TECHNICAL SPECIALISTS, SHORTAGE OF HIGH SKILLED SPECIALISTS

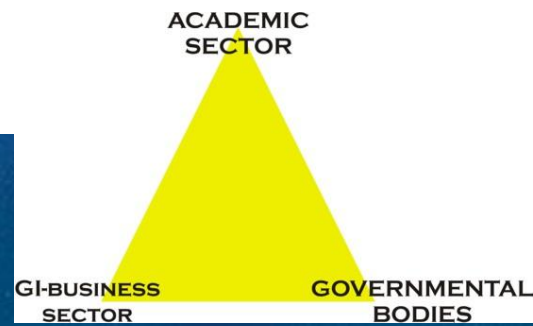
GeoSkills Plus
Survey 2013



GeoSkills Plus Survey, 2013



<http://www.geoskillsplus.eu/press/blog>



Pan-European needs

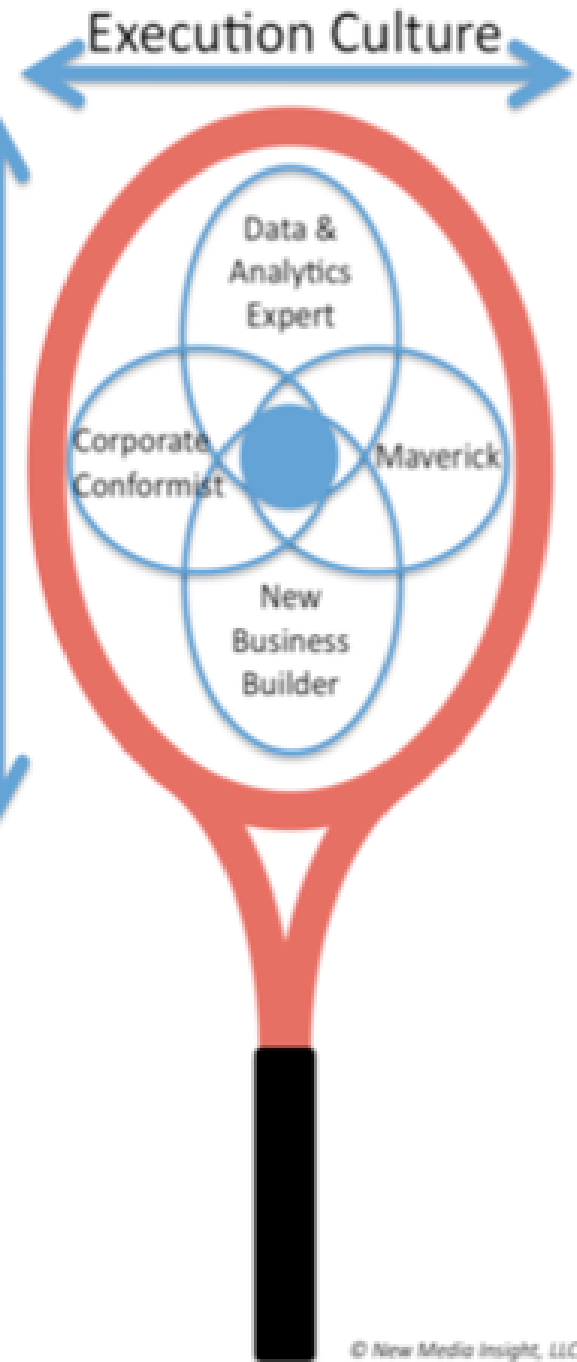
- Create a clear definition of labour market sector
- Build an Occupational Skills Profile
- Define jobs and their required skills
- Connecting to European initiatives
 - eSkills
 - EQF
 - New Skills New Jobs,
 - Digital Agenda
- Look at new approaches (geo-entrepreneurship)



Leadership in Geo-

- data / analytics expertise
- building new businesses
- corporate conformists
- maverick - culturally very different

Execution Skillsets



GIS Job Listing Sites

Filed in GIS Career and Jobs by Caitlin Dempsey Morais on August 16, 2011

Share: Looking for a job



Strong Knowledge of GIS Opens Doors for Job Applicants

By Renee Hewitt on January 14, 2014

Young Europeans lack job skills, US consultancy says

14.01.14 @ 09:25

RELATED > EU leaders pledge €2bn extra for youth scheme > EU to compare member states on youth employment

BY BENJAMIN FOX

BRUSSELS - Europe's young people lack the skills for work despite record levels of unemployment, according to a report by the US-based consultancy giant McKinsey



March 25, 2014 by Anne-Laure

INTRODUCING THE GEOSKILLS PLUS PROJECT AND WORKSHOP

Initiated by the Dutch and the Geo Employment Market Foundation (SAGEO), the GeoSkill Plus Project is an ambitious project aiming to match labour market needs with geo education offer in Europe.

PROJECT DESCRIPTION



"Geo Skills + is a European Commission funded project under DG Education and Culture, **Leonardo da Vinci programme**. It began in October 2013 and will run until October 2015. The aim of this two-year project is to



Skills Shortages: no defined geospatial work

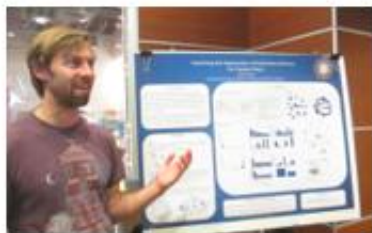
Occupation	Employment (2008)	Projected Growth (2008-18)	Growth Rate (2008-18)
Geospatial Information Scientists and Technologists*	209,000	72,600	7-13% (Average)
Geographic Information Systems Technicians*	209,000	72,600	7-13%
Remote Sensing Scientists and Technologists*	27,000	10,100	7-13%
Remote Sensing Technicians	35,000	36,400	7-13%
Precision Agriculture Technicians*	65,000	36,400	7-13%
Geodetic Surveyors*	58,000	23,300	4-19%
Surveyors	58,000	23,300	14-19%
Surveying Technicians	77,000	29,400	≥ 20%
Mapping Technicians	77,000	29,400	≥ 20%
Cartographers and Photogrammetrists	15,000	6,400	≥ 20%
Totals	~450,000	180,000	

Little or no research on the geospatial workforce in Europe – very few countries starting to react

USA data: <http://www.onetonline.org/find/quick?s=geospatial>

Chui J et al. (2011), Big data: The next frontier for innovation, competition and productivity, McKinsey Global Institute

Data, Data, Data ... everywhere



The Berkeley Institute for Data Science: Part II

Events
December 23, 2013

[See more articles](#)

Tag Cloud

art artificial intelligence
astronomy
Bay Area Science Festival

wide needs

- We serve social science being done in any department!

[Home](#) / [Events](#) / [UC Berkeley](#) /

The Berkeley Institute for Data Science: "Everyone is going to have to become a data scientist"

2 141

The Berkeley Institute for Data Science: "Everyone is going to have to become a data scientist"

 [Mikel Delgado](#) · Events | [UC Berkeley](#) · December 20, 2013

On Thursday, December 12th, 2013, hundreds of Berkeley scientists, students and industry folk gathered to celebrate the opening of the Berkeley Institute for Data Science (BIDS), a multidisciplinary support system that will provide incentives, infrastructure and support for scientists from all departments hoping to jump on the big data wagon. Funded to the tune of \$30 million, BIDS will provide a central hub for data science research and education. BIDS will also provide a central hub for data science research and education. BIDS will also provide a central hub for data science research and education.



What next for SDI? (after Atkinson, 2013)

- Sustained **commitment to data**
- Invest in **information delivery + wise use**
- Open data **processes** – scrutiny, validation, contribution
- **Education** to (better) use data – experts, managers, government and the public

Atkinson M (2013), Big Data, Virtual Earthquake and Seismology Research Community, <http://www.verce.eu>





Entrepreneurship, Innovation and Leadership

Maps and the Geospatial Revolution

22,600+ Participants From The First MOOC On Mapping

Students (aggregated to 500km hexagons)

Legend:
 1
 2 - 5
 6 - 25
 26 - 100
 101 - 959

Penn State faculty reflect on early MOOC e
 The five MOOCs offered by Penn State since it la
 Coursera earlier this year have attracted more th

SpatialLABS™

2013 EDITION

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About SpatialLABS

WELCOME

Esri Press *SpatialLABS* are standalone activities designed to prom
 subject matter useful in standard computer-lab sessions and long
 complexities while answering provocative questions like "How mi

eBooks for Geospatial Technology Professionals

<p>Volume 1</p> <p>GIS JOBS, GISP CERTIFICATION AND GEOSPATIAL CAREERS</p> <p>GIS Jobs, GISP Certification and Geospatial Careers</p> <p>FREE</p>	<p>Volume 2</p> <p>LBS: THE REVOLUTION OF LOCATION-BASED ADVERTISING AND INDOOR POSITIONING</p> <p>LBS: The Revolution of Location-based Advertising and Indoor Positioning</p> <p>FREE</p>	<p>Volume 3</p> <p>GEOSPATIAL LAW</p> <p>Geospatial Law</p> <p>FREE</p>
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Education & Research

Challenging Students Through SpatialLABS - Open Educational Resources from Esri

Apr 17, 2014 / Posted by Angela Alexander

SpatialLABS are hands-on GIS activities designed for use in higher education, but can be used by anyone with an interest in spatial analysis and GIS. They are now available as open educational resources accessible from the [Esri Canada's Lesson Planner](#).





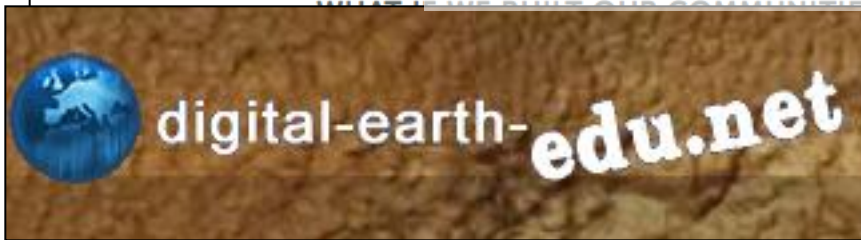
New Concepts: social learning, geographic (geo-)media, spatial citizenship



Sustainability of successful projects?

What is Placemaking?

'Placemaking' is both an overarching idea and a process for creating vibrant neighborhoods, city or regional places. It is one of the ideas of this century.



Gryl I, Jekel T and Donert K (2010), Spatial Citizenship, p2-12, In Jekel T, Donert K and Koller A (eds.) Learning with GeoInformation V, Berlin, Wichman



Innovative Approaches: GeoCapabilities

GeoCapabilities Course

You are logged in as Karl Donert (Logout)

165 failed logins for 58 accounts (Logs)

Home ► GeoCap ► Module 1: What does ...

Turn editing on



A teacher training course for the GeoCapabilities Project

This course will develop during 2015, with further testing and development in Helsinki in May 2015

Getting started: a guide for participants



-  News forum
-  GeoCapabilities Glossary
-  Final course evaluation

Activities

-  Forums
-  Glossaries
-  Questionnaires
-  Resources

Search forums

Advanced search 

Latest news

Add a new topic...

Alan Parkinson 8 Mar, 12:42
Course Glossary

Alan Parkinson 8 Mar, 12:20
Story Maps

Alan Parkinson 27 Jan, 19:17
GeoCapabilities Teacher Training Course

Older topics ...

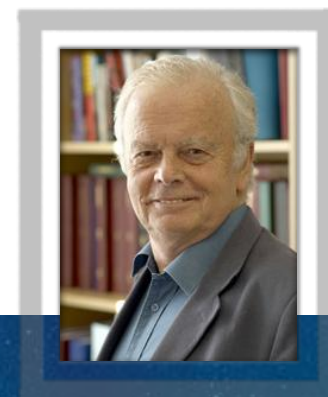
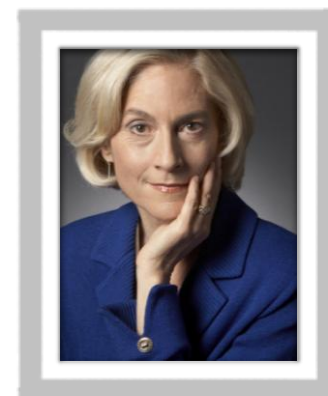
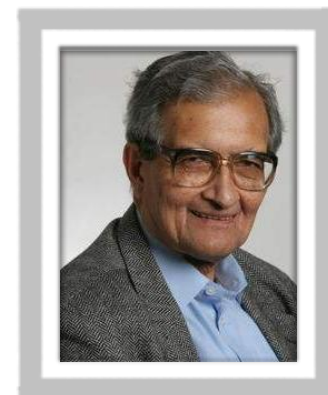
◀ What are the course aims? **Module 1.1: Why teach Geography in schools?** ▶





Education and human capabilities

- ☼ Amartya Sen and Martha Nussbaum
- ☼ Role of education in affording people with intellectual, moral, and existential capabilities for lifelong learning, economic, social, personal well-being.
- ☼ Implies a focus on broader education goals
- ☼ Michael Young's idea of “powerful knowledge”





Geography as powerful knowledge (in the Anthropocene)

Geography encourages,

- acquisition and development of **deep descriptive and explanatory** 'world knowledge'
- the development of the **relational thinking** that underpins geographical thought
- a propensity to think about **alternative** social, economic and environmental **futures**

Eye on Earth Initiative



CONVENE | CONVERGE | COLLABORATE



Sci Dev Net

Bringing science and development together through news and analysis

Agriculture Environment Health Governance Enterprise

Home Data News



'Misguided' nations lock up valuable geospatial data

Flickr/Gavin Houtheusen/DFID

Endorse The Eye on Earth

By supporting the Eye on Earth Summit Declaration you have an opportunity to ensure that the goals of the declaration are achieved at UNCSD Rio+20 and beyond. ACT NOW >





Eye on Earth Mission Statement

Eye on Earth strives to enable the generation, maintenance, sharing and application of environmental, social and economic data and information to support informed decision-making for sustainable development.





EUROGEO 35 YEARS

Eye on Earth: Enabler of Change

Working Towards *Sustainable Development*

- **EoE Community** is growing and represents the full range of government, private sector, environmental, social and economic interests.
- It provides access to quality environmental, social and economic data for informed decision-making
- Strives to close data and information gap critical to conserving the world's resources and improving lives
- Convenes thought/action leaders worldwide to create consensus, encourage collaboration and effect change





Implementing the Eye on Earth Vision

The Special Initiatives



- Improving environmental, social and economic information sharing.
- 37 SI projects across 6 continents.
- 500 individuals from more than 120 organisations representing multiple sectors across society.





EUROGEO 35 YEARS

Driving Momentum Summit 2015

YOU ARE INVITED



Eye on Earth Summit 2015

6 - 8 October 2015

Abu Dhabi, UAE

INFORMED DECISION-MAKING FOR SUSTAINABLE DEVELOPMENT

1 Global Challenge **3** Days **8** Special Initiatives **650** Delegates

3 Days, **8** Special Initiatives, **650** Delegates.

Earth Summit October 2015

DECISION-MAKING
SUSTAINABLE DEVELOPMENT

at Yas Viceroy Hotel, Abu Dhabi, UAE

<http://www.eoesummit.org/get-involved>

Sandbanks in the Wadden Sea Netherlands





EUROGEO 35 YEARS

Geospatial integration challenges and considerations: reflections on data dashboards
<https://t.co/NGYvCuQdiW>

London

51.51 N, 0.13 W

Mon 15 Jul @ 14:20:56

[Go to Map](#) - [Go to Grid](#) - [Change City](#)

WEATHER STATIONS (MULTIPLE SOURCES) 6

STATION	WIND SPEED	WIND GUSTS	DIRECTION	TEMPERATURE	HUMIDITY	RAIN TODAY	PRESSURE	FORECAST
CASA Office: Bloomsbury W1	0.9 mph	0 mph	N ↓	28.8 °C	26%	0.0 mm	1021.8 mbar	Sunny
Lambeth Meters: Brixton SW9	5.1 mph	5.1 mph	N ↓	28.2 °C	20%	0.0 mm	1026.5 mbar	Dry Clear
Hampstead NW3	2.4 mph	0.9 mph	NW ↘	28.4 °C	24%	0.0 mm	1021.0 mbar	Sunny

WEATHER (METAR) 848

London City Airport
 Mix at 2 mph **28 C**

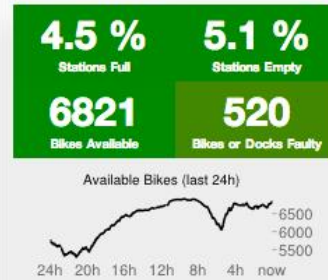
FORECAST (YAHOO! WTH) 1748

Mon **30 C** Sunny
 Tue **30 C** Partly Cloudy

TUBE LINE STATUS (TfL) 40

Bakerloo	Minor Delays	more
Central	Good Service	
Circle	Good Service	
District	Minor Delays	more
H & C	Good Service	
Jubilee	Good Service	
Metropolitan	Good Service	
Northern	Good Service	
Piccadilly	Good Service	
Victoria	Good Service	
W & C	Good Service	
Overground	Good Service	
DLR	Good Service	

BIKE SHARING (TfL) 38



IN SERVICE (TfL) 10

6490 London buses
352 Underground trains

AIR POLLUTION (DEFRA) 1748

µg/m³ TIME AVGD	OZONE	NO ₂	SO ₂	PM _{2.5}	PM ₁₀
Bloomsbury	26	55	11	12	24
Marylebone Rd	24	?	0	13	15
N Kensington	43	22	8	12	21

RADS (CASA) 2

Data not updated for 601 minutes

RIVER LEVEL (PLA) 248

Thames (Tower Pier)
2.01 metres

STOCKS (YAHOO) 8

FTSE 100 Index
6575.26
 +31.85 (0.48%)

RANDOM TRAFFIC CAMERAS (TfL) 11



BBC LONDON NEWS (BBC) 48

Mayor puts forward airport plans
 Fires started as squatters evicted
 Cyclist dies in crash with lorry
 Life for escaped prisoner bank raids
 Two stabbed at Wireless festival
 Magna Carta copies to be united

OPENSTREETMAP UPDATES (OSM) 248

W14 bus stops & relations Paths Leyton bus stops & relations 20 mph zone UNITY ROAD ENS AREA - INTRODUCTION OF A 20 MPH SPEED LIMIT ZONE Leyton bus stops & relations Cycle route speed limits

ELECTRICITY (N.GRID) 30

Demand (Great Britain)
38939 MW

MOOD (LSE MAPPINESS) 38

6% unhappier than the long term average for here
10% unhappier than the whole country right now

TWITTER TRENDS FOR LONDON 188

#MITB IDS #kp24 #askkp Cesc RVP #badgermonday
 Barca Arsenal Man Utd

[Tweet](#) 1,205 [About](#)

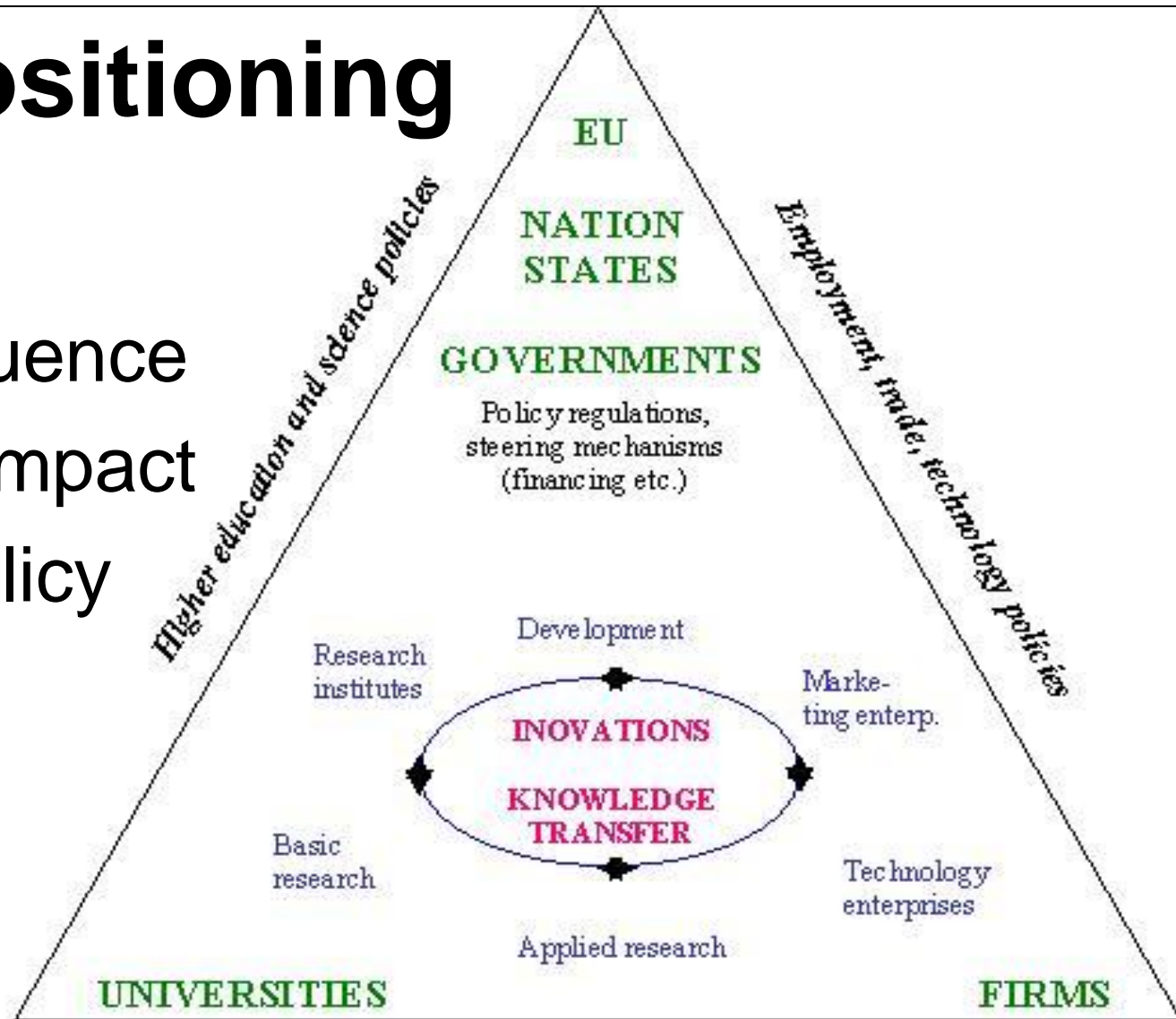




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Positioning

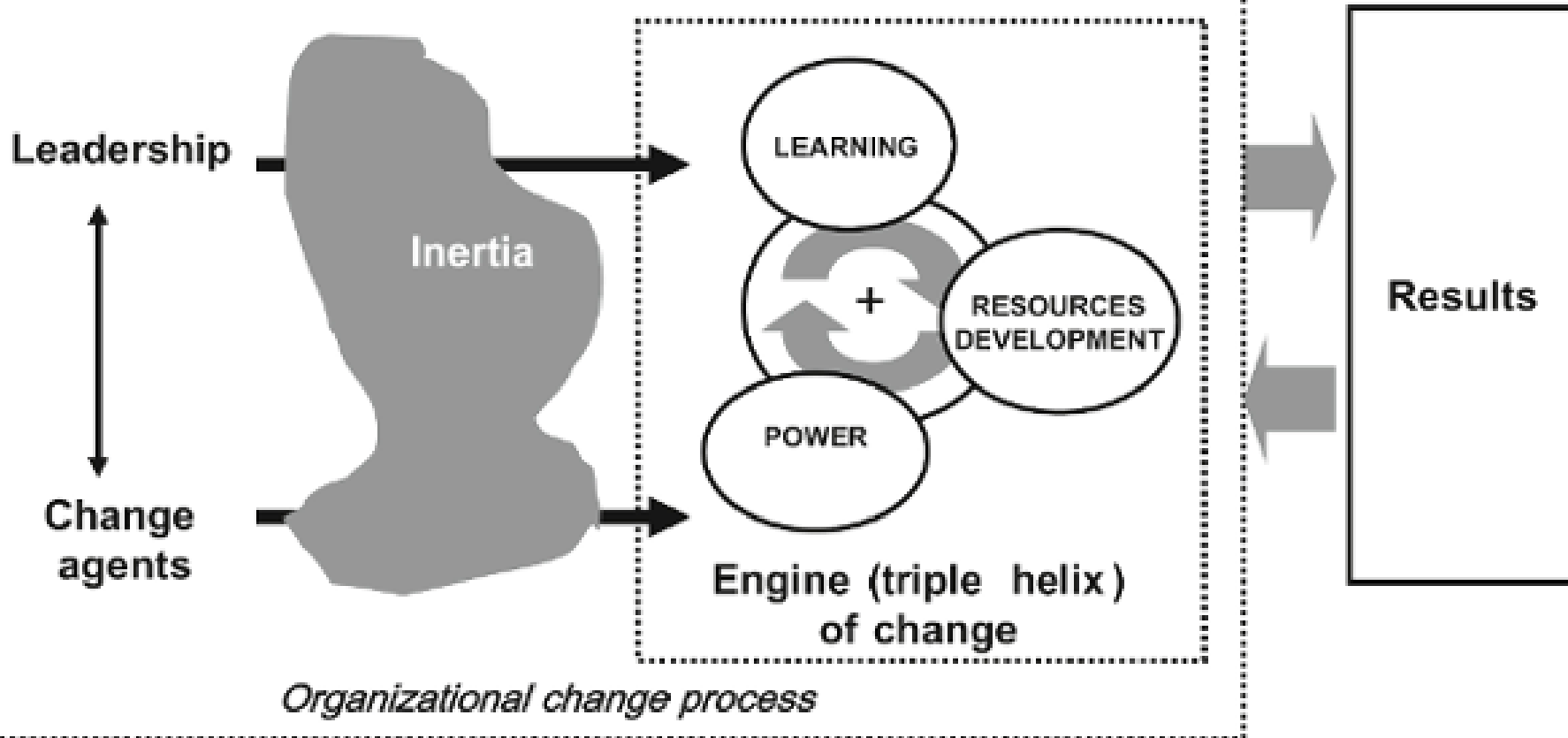
- Gaining influence
- Making an impact
- Affecting policy



Leydesdorff, L. (2012). The triple helix, quadruple helix, ..., and an n-tuple of helices: explanatory models for analyzing the knowledge-based economy?. *Journal of the Knowledge Economy*, 3(1), 25-35.

External drives / Initiating forces

Key role of civil society organisations



Organizational change process





Education: Some Needs & Recommendations

- Money support from industry
- Long-term commitment from stakeholders
- Common public message – media – investment = valuation of the sector
- More research and information gathering
- Stronger risk evaluation

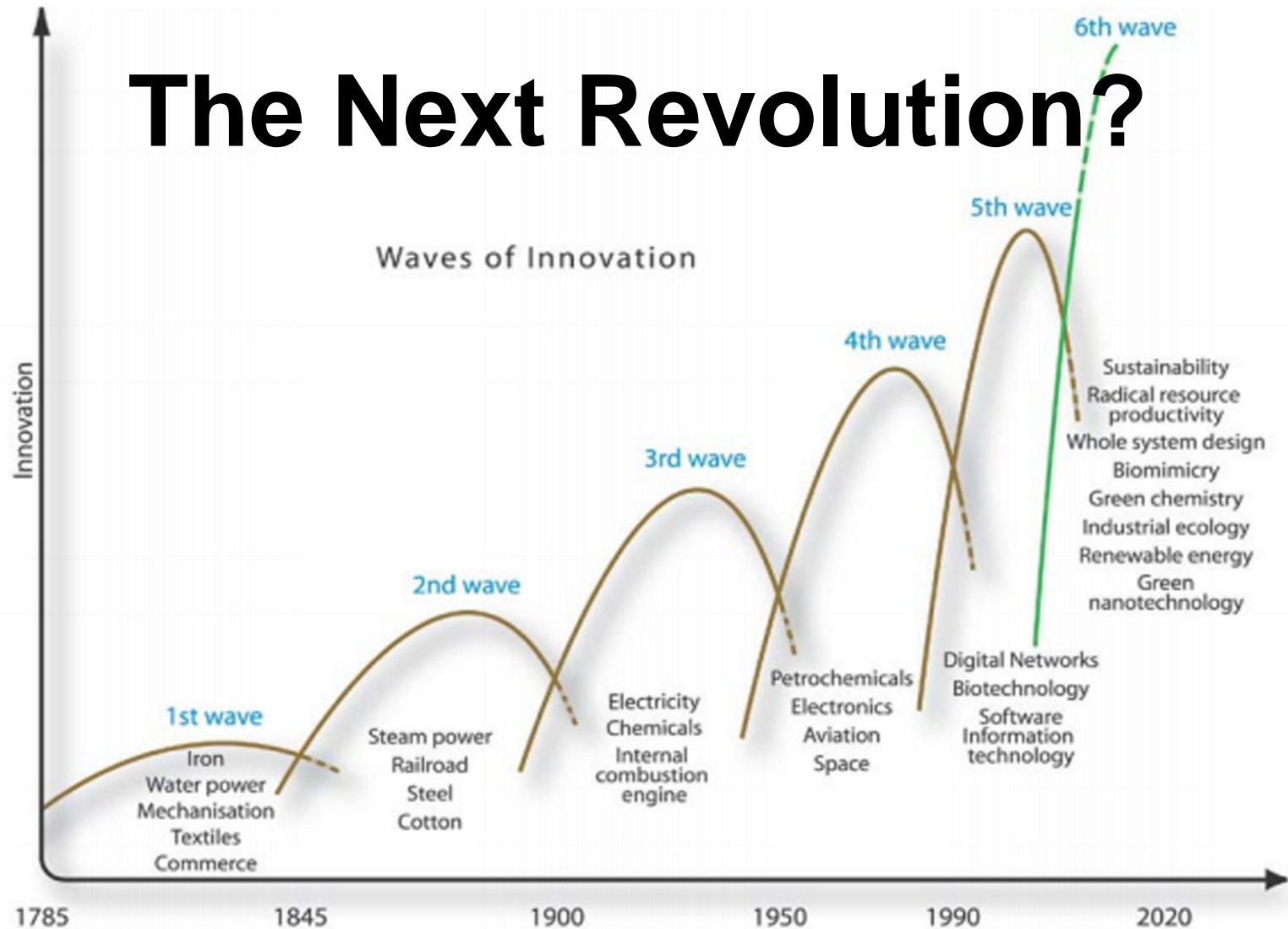
“What happens if we don’t develop education?”

Survey of Geospatial Capacity Builders, carried out in March-May 2014





The Next Revolution?



Gakstatter E. (2014), Will the Next Industrial Revolution Be Bigger than the First? Will Geospatial Technology be Part of It?, Geospatial Solutions, <http://tinyurl.com/qxhohom>



What's happening?

Twitter search input field

Your Tweets 323

22 hours ago: SubMap – Subjective #Mapping http://bit.l...

Timeline @Mentions

thematicma Does anyone

gearthblog The largest S http://dlvr.it/Y

OptimusEd See advice of David Lowe's

OptimusEd Row on pens Headship:bit

karldonert #Danube str http://euobse 2 hours ago

karldonert

LinkedIn Account Type: Basic

Home Profile Contacts Groups Jobs Inbox 79 Companies News More

Groups

digitalearth.eu

digital-earth.eu

Discussions

Take a minute Modify write post Edit your Group



Karl Donert Edit My Profile

- News Feed
- Messages 18
- Events 1

facebook

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Open Group

Share: Post Link Photo Video Question

Write something...

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@karldonert

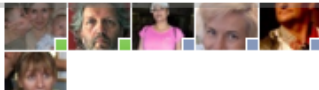
ational Science Foundation (US)

at K-12 Geographic Literacy

st regularly published online al technology.

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Karl Donert