



# GeoCapacity Building - what future for 'geospatial geoskills'?

Karl Donert, President EUROGEO,

Director: European Centre of Excellence: [digital-earth.eu](http://digital-earth.eu)  
[eurogeomail@yahoo.co.uk](mailto:eurogeomail@yahoo.co.uk)

Olomouc University, Czech Republic, November 10-12 2014



INVESTMENTS  
IN EDUCATION  
DEVELOPMENT



# EUROGEO: geo-education projects

- **Networking:** Digital-earth.eu
- **Tools:** I-Use
- **Training:** iGuess & iGuess2
- **Concepts:** Spatial Citizenship
- **Careers:** GeoSkills Plus
- **Leadership:** GeoCapabilities



digital-earth.eu





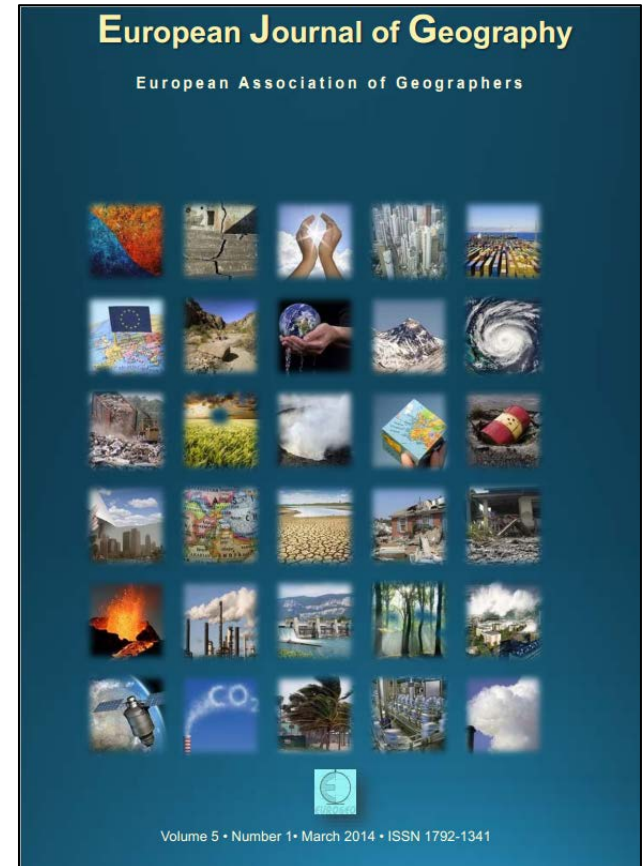
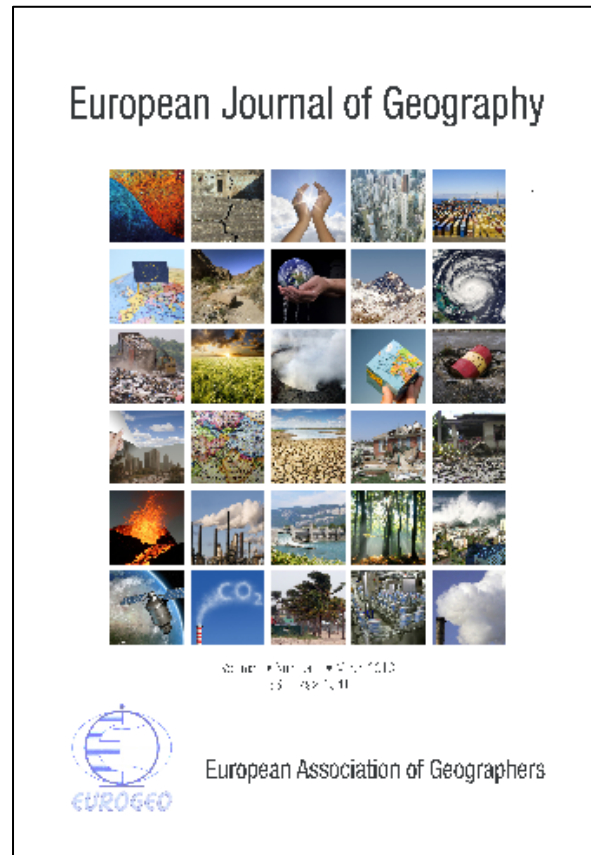
# European Journal of Geography

<http://www.eurogeographyjournal.eu>

*“A fine journal with excellent and widely cited papers on European geography”*

The SCOPUS Evaluation Team (2014)

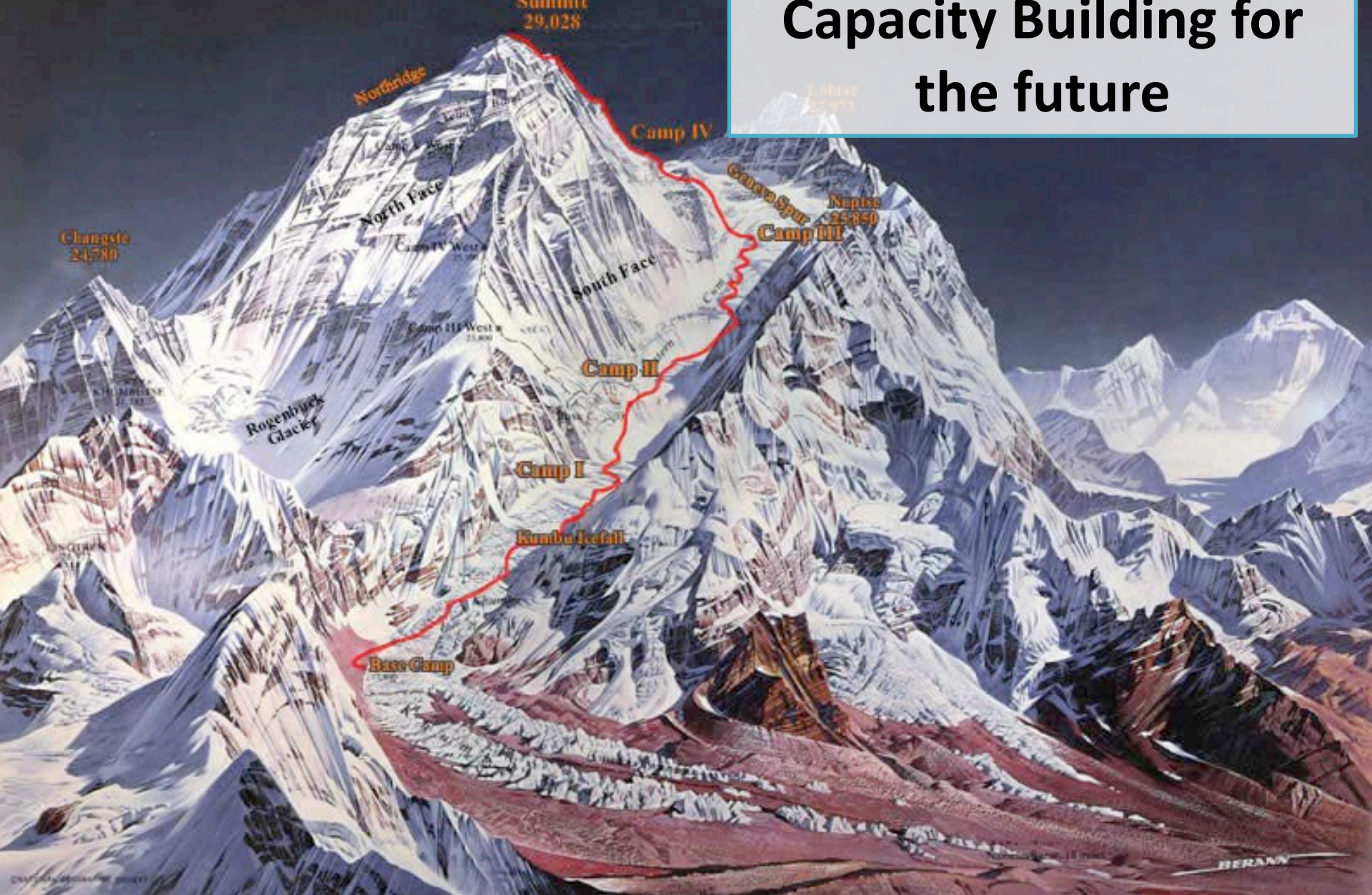
Translating the vital work of geo-scientists into the policy arena



Univerzita Palackého v Olomouci

GEOCAPACITY

# Capacity Building for the future



Univerzita Palackého v Olomouci

GEOCAPACITY

“ Our results indicate that the quality of international network connections matters for academic knowledge transfers. ..... not only is the distribution of public research expenditures across different research projects important but also the position from which researchers enter international networks and the level of knowledge accumulated in those networks.”

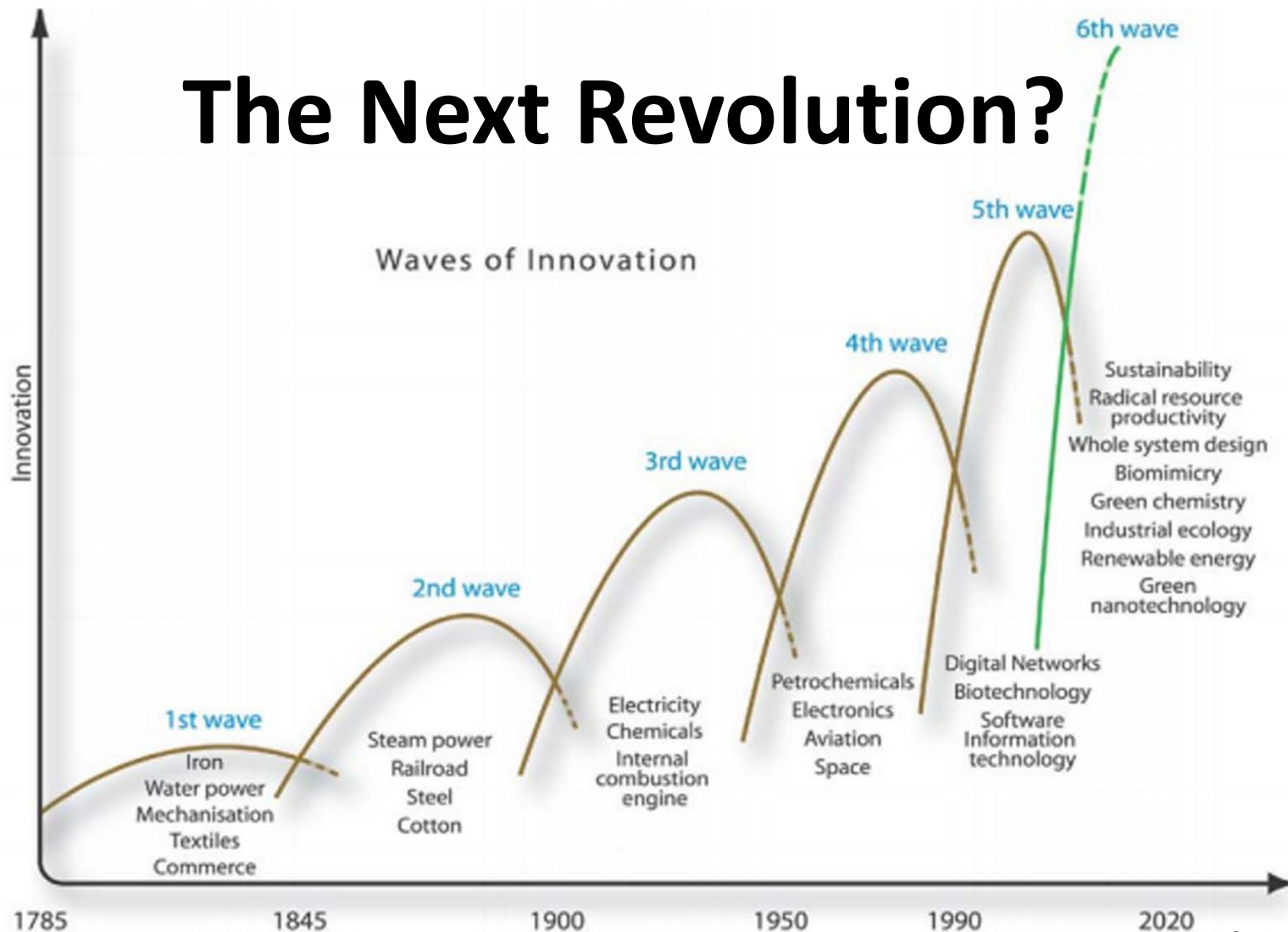
Varga, A., & Parag, A. (2009). Academic knowledge transfers and the structure of international research networks. *University knowledge transfers and regional development: Geography, entrepreneurship and policy*. Edward Elgar Publishers, 138-159.



Univerzita Palackého v Olomouci

GEOCAPACITY

# The Next Revolution?



Waves of innovation, after Kondratiev (1925)

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>



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>

## Digital Earth

### *What is needed?*

Meaningful support for research and actions on the key challenges that face the world in the next 10-20 years

- population increase, energy, food and water, aging, climate change

Meaningful support for grand challenges in science

- managing global and regional change, global sustainability
- improving forecasts for future environmental conditions
- recognising key tipping points to respond to environmental change

Meaningful support for webs of citizens and sensors

- sensor web, observation web (humans, sensors and simulations)

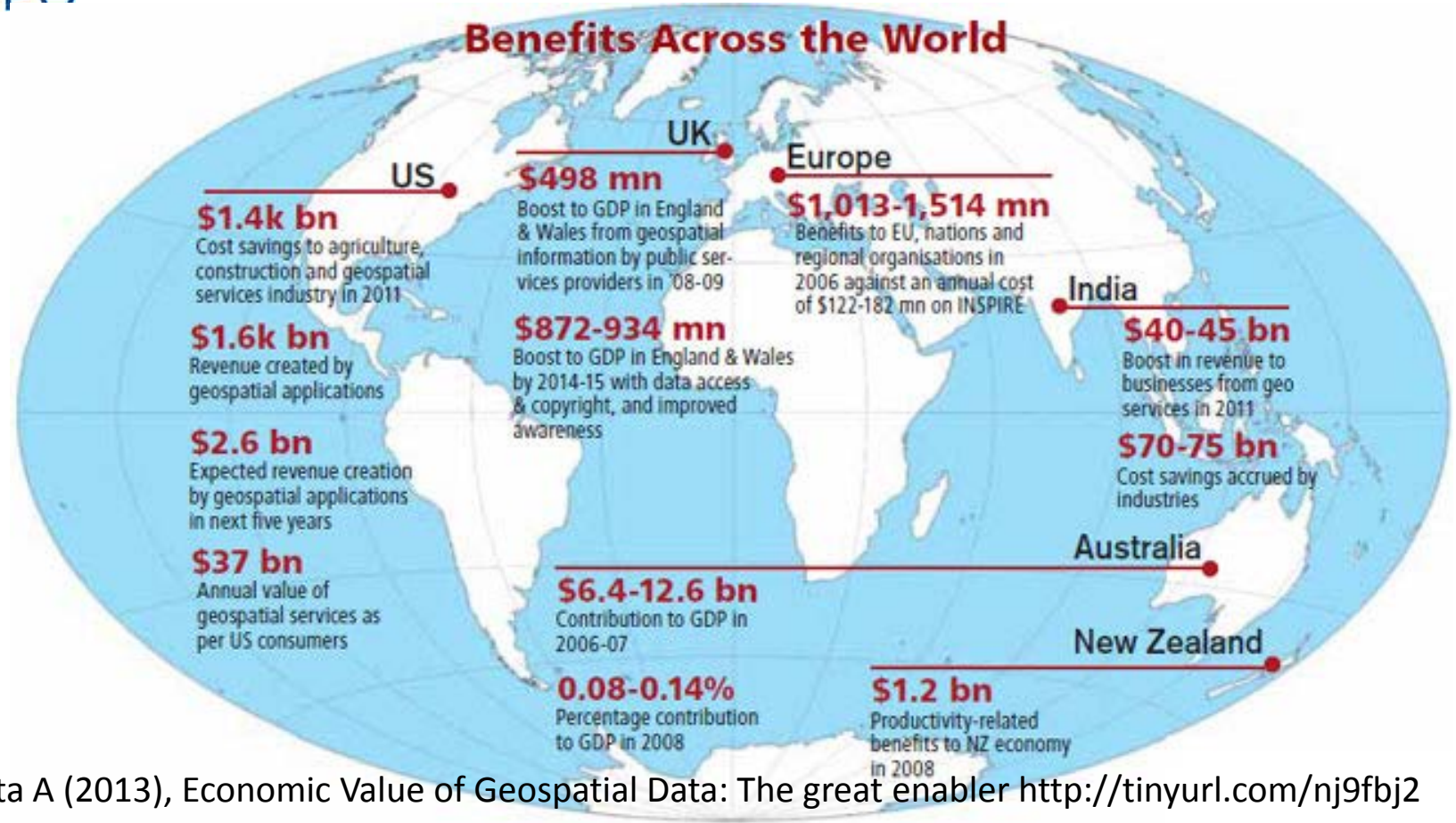
Meaningful support for digital development worldwide

- open access to georeferenced physical, social and cultural data





# Economic Value of Geospatial Data (Arup Dasgupta, 2013)



Dusgupta A (2013), Economic Value of Geospatial Data: The great enabler <http://tinyurl.com/nj9fbj2>



# Benefits of the Geospatial Industry

## Oxera quantifies the benefits of Geo services to global consumers and businesses on behalf of Google

### Fact Check

**\$155-210 mn**

benefits for agriculture in Australia



**\$482 mn**

gain from horticulture development in wastelands in India

**50%**

Larger area handled by forest managers in Australia with g-tech

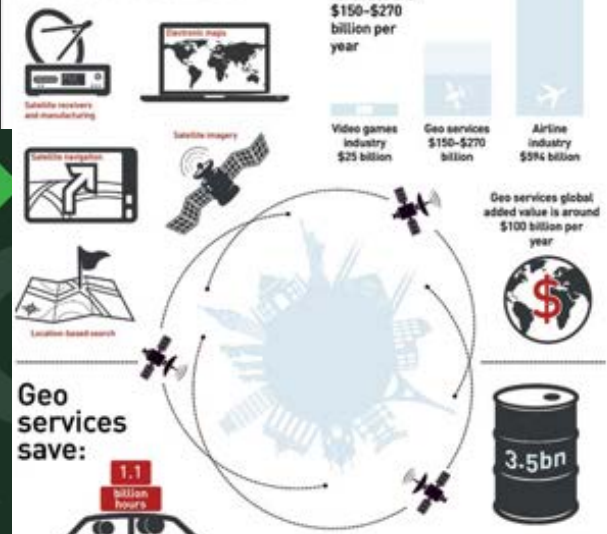


**\$220 mn**

cost saving in India from improved mapping for forest work plans

## What is the economic impact of GEO SERVICES

Geo services are:



Source: Oxera (2013), 'What is the economic impact of Geo?', January.



# Univerzita Palackého v Olomouci





# Entrepreneurship, Innovation and Leadership in Education

### Maps and the Geospatial Revolution

22,000+ Participants From The First MOOC On Mapping

Students (aggregated to sookm hexagons)

Penn State faculty reflect on early MOOC experience. The five MOOCs offered by Penn State since it launched Coursera earlier this year have attracted more than 1 million students.

## SpatiaLABS™

2013 EDITION

Main Menu About SpatiaLABS What's New Terms of Use

### About SpatiaLABS

**WELCOME**

Esri Press *SpatiaLABS* are standalone activities designed to promote subject matter useful in standard computer-lab sessions and long complexities while answering provocative questions like "How many..."

### Education & Research

#### Challenging Students Through SpatiaLABS - Open Educational Resources from Esri

Apr 17, 2014 / Posted by Angela Alexander

*SpatiaLABS* 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](#).

### eBooks for Geospatial Technology Professionals

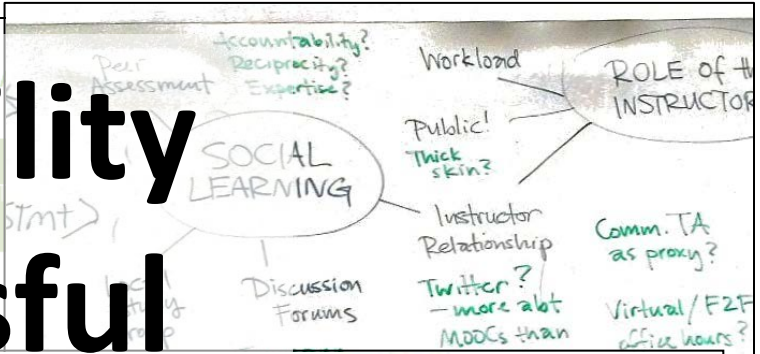
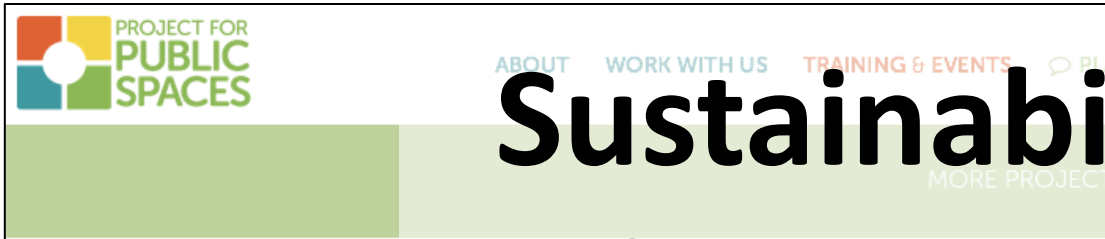
<p>Volume 1</p> <p>GIS JOBS, GISP CERTIFICATION AND GEOSPATIAL CAREERS</p> <p>FREE</p>	<p>Volume 2</p> <p>LBS: THE REVOLUTION OF LOCATION-BASED ADVERTISING AND INDOOR POSITIONING</p> <p>FREE</p>	<p>Volume 3</p> <p>GEOSPATIAL LAW</p> <p>FREE</p>
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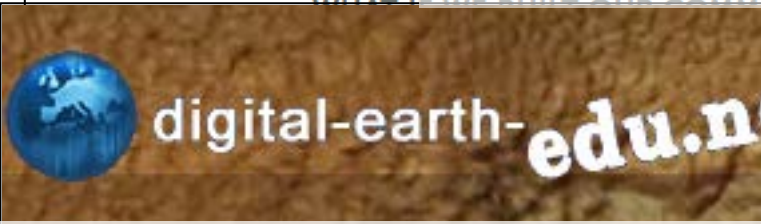
# Concepts: social learning, geographic (geo-)media, spatial citizenship

## Sustainability of successful projects?



What is Placemaking?

'Placemaking' is both an overarching neighborhood, city or regional idea and a set of 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 Verlag



### Univerzita Palackého v Olomouci



## 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

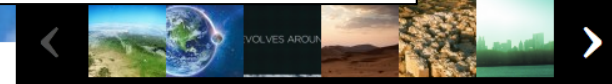
## Young Europeans lack job skills, US consultancy says

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



# Geo Skills Plus



@GeoSkills\_Plus



Geo Skills +

GEO  
Education



Labour Market

[www.geoskillsplus.eu](http://www.geoskillsplus.eu)

[leonardo.project@kadaster.nl](mailto:leonardo.project@kadaster.nl)

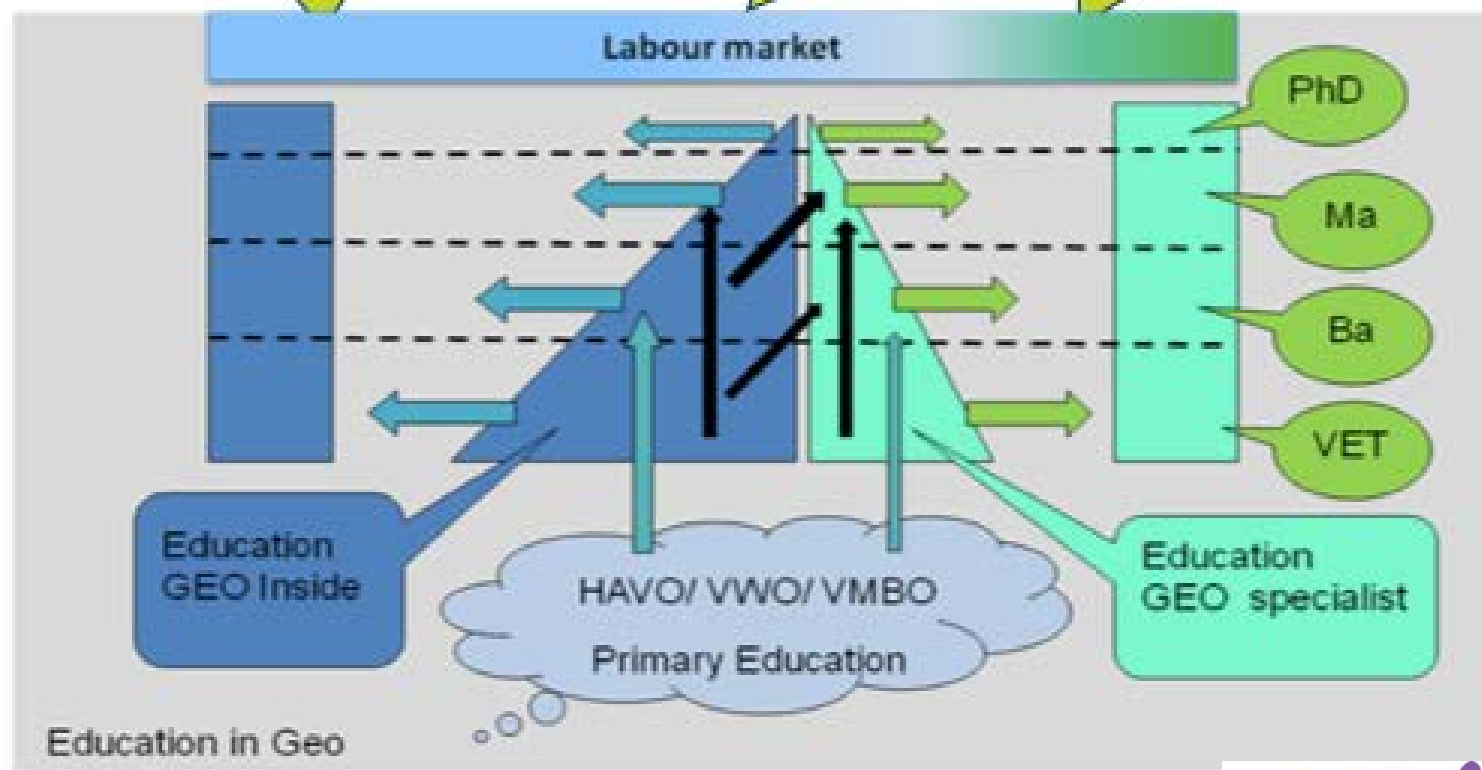


# 2008 Demands Geo Labour

**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.



Education in Geo

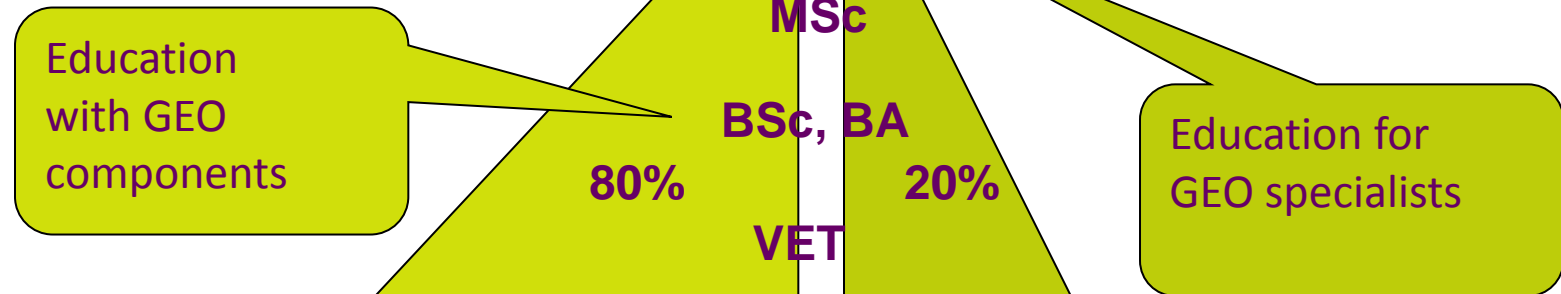
# 2008 Demands Geo Labour

Demand from private sector

Demand from public sector

Demand from research sector

Geo Employment Market Foundation





# Geo Employment Market Foundation Results

- Establishment of cooperation model
  - Private sector
  - Public sector
  - Education
- Awareness Raising Campaign 'Go Geo'
- New curricula and renewed programs
  - GI Minor
  - GeoMedia & Design
  - Surveying Program at VET level



# European approach



GEO SKILLS PLUS will bundle and examine additional examples...

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

... in European countries.



# Job Profiles: Geocoder

## Digital maps' unsung hero: how the geocoder puts us on the grid

You may not realise you rely on it, but the geocoder makes sense of ambiguous search terms we type into digital maps - whether from Google, Apple, Microsoft, Nokia or any other

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Google+ 41  
LinkedIn Share 73  
Email

Gary Gale  
theguardian.com, Monday 13 January 2014 11:57 GMT

 [Jump to comments \(5\)](#)



### Technology

Mapping technologies ·  
Software · Internet · Apple  
· Google · Nokia  
Smartphones · Mobile  
phones

[More analysis](#)



Using paper maps isn't always easy, but digital maps face a range of challenges working out their users' intentions. Photograph: Juice Images/Corbis

## Job Profiles: Geocoder

- A geocoder takes an address and works out the best set of co-ordinates it can, and returns the best choice.
- For densely populated areas, there's a good chance that a geocoder will know about house numbers and what side of the road they're on, and will give an answer that's pretty accurate.
- Outside of metropolitan areas it can be a less exact science, especially in rural areas where a property can extend over a large area.
- A good geocoder will try to cope with this and give you its best attempt at an answer.

# Surveyor



About this blog

## Behind the scenes with a surveyor

Home / Behind the scenes / Behind the scenes with a surveyor



JAN 24  
2014

By Gemma  
In Behind the scenes  
GI explained

Comments (8)

Gemma works in our  
Corporate  
Communications team  
as our Social Media

## Behind the scenes with a surveyor

*Ordnance Survey make 10,000 changes a day to the master map of Great Britain, which astounds people and this behind the scenes story from one of our surveyors, Gemma, explain just how many changes occur to our landscape every day.*

I'm a forty-something field surveyor living and working in the rolling hills and valleys of Worcestershire, where my primary job and purpose is to keep the large scale maps up to date. I have been working as a field surveyor for nearly 13 years and have concentrated my work around the golden villages of the Cotswolds, the post-industrial towns of the Forest of Dean and the wooded valleys of Stroud. It has only been in the last year that I have been working in the north; where I now find my area of responsibility to be the Malvern Hills.



# Surveyor



- “we have to add to the map any new or changed features we are aware of, or we find
- every update we make to the digital map is sent back to the main database and then sent onto our customers
- our map is dynamic and we are delivering continuous improvements to it”

# Data Scientist



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## "I would like to think of myself as a scientist, who happens largely to specialise in the use of statistics" – An interview with Sir David Cox

RELATED TOPICS



### FEATURES

**Author:** Statistics Views

**Date:** 24 Jan 2014

**Copyright:** Image appears courtesy of Sir David Cox

[Sir David Cox](#) is arguably one of the world's leading living statisticians. He has made pioneering and important contributions to numerous areas of statistics and applied probability over the years, of which perhaps the best known is the proportional hazards model, which is widely used in the analysis of survival data. The Cox point process was named after him.

# The Fantastical Life of a GIS Analyst

Monday, February 10th 2014

[1 Comment](#)

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By [NASA](#)

Read More About: [gis](#), [humanitarian](#), [jobs](#), [nasa](#), [remotesensing](#)

## Classified Ads:

ParcelAtlas now has **95** million parcels and 1,400 counties. This data is comprised of the industry's most current and internally consistent parcel layer content available. ParcelAtlas API enables near instant integration of parcel boundaries with situs, owner and characteristic attributes with existing GeoServer operations. [Click here](#) for more information. [Click here](#) to see digital parcels over imagery nationwide live in no fee, no LOGON ParcelAtlasLite.

**Summary:** *What do climate modeling, malaria and black rhinos have in common? It turns out that Geographic Information Systems can be adapted to study all three. Wherever GIS is being used for humanitarian purposes, senior programmer analyst Joe Nigro is never too far away. Here's his story.*

What do climate modeling, malaria and black rhinos have in common? It turns out that Geographic Information Systems can be adapted to study all three. Wherever GIS is being used for humanitarian purposes, senior programmer analyst Joe Nigro is never too far away. (At right: Joe Nigro (right) and his colleague and co-instructor, Avirup Sen Gupta. Image Credit: Claire Lewis, North Luangwa Conservation Project.)

"The common factor is knowing how to use GIS. I've worked on a range of projects from plague modeling in the American southwest to semi-automating glacier boundary extraction in Alaska. I never know what I'll be



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# GIS Analyst

## Technical Skills

- Strong GIS skills with two or more GIS packages
- Strong Macro / C / C++ / Visual Basic programming skills
- Understanding of and/or willing to learn math and statistical analysis
- Strong Oracle or related RDBMS skills including development skills
- Excellent verbal / written communication skills
- Genuinely excited and enthusiastic about learning and pushing technical limits / finding new solutions
- Good writing skills - for documentation, training, processes
- Formal training (eg. Degree) or high level of experience with GIS.
- "Hands-on" experience
- Good analytical / problem solving skills
- A basic understanding of the concepts behind data management in a relational database
- Good IT technical skills
- The ability to think and solve problems

## People Skills

<http://careers.geocomm.com/resources/gisanlystskills.html>

# Skills Shortages: no defined geospatial workforce

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	65,000	36,400	7-13%
Precision Agriculture Technicians*	65,000	36,400	7-13%
Geodetic Surveyors*	58,000	23,300	14-19%
Surveyors	58,000	23,300	14-19%
Surveying Technicians	77,000	29,400	≥ 20%
Mapping Technicians	77,000	29,400	≥ 20%
Cartographers and Photogrammetrists	12,000	6,400	≥ 20%
<b>Totals</b>	<b>~450,000</b>	<b>~180,000</b>	

**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

## 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

### WHO WE ARE

The European e-Skills Association (EeSA) is a community of stakeholders supporting the development of e-skills and digital literacy in Europe. EeSA builds on the success of the e-Skills Industry Leadership Board (e-Skills ILB) supported by DG Enterprise and Industry of the European Commission. EeSA is an umbrella organisation that works in partnership with the European Commission, public authorities across Europe, SMEs and all relevant stakeholders to build upon the European Commission recommendations and other reference initiatives on e-skills. [More](#)



<http://eskillsassociation.eu/>

### LATEST NEWS

#### EeSA Conference on 'e-Skills for the 21st Century' 2013/10/25



On 11th December in Brussels, senior representatives from industry, associations, European institutions and academia will gather at the EeSA conference on 'e-Skills for the 21st Century' to present their achievements and future actions related to the Grand Coalition for Digital Jobs. The conference will be composed of three panel discussions that will address the following... [More](#)

#### New Survey Says 20% of European Students Never Use a Computer in the Classroom 2013/06/06



The Survey of Schools: ICT in Education report was commissioned by the European Commission to benchmark access, use of and attitudes to ICT in schools in 31 European countries. The 190,000 responses collected from students, teachers and head teachers provide a detailed benchmarking of ICT in school level education across Europe. The survey reveals that ICT infrastructure is schools is... [More](#)



## EUROPEAN QUALIFICATIONS FRAMEWORK

# European needs

European Commission > European Qualifications Framework > Compare Qualifications Frameworks



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### Compare Qualifications Frameworks

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Following extensive national consultations with stakeholders, countries present the results of the referencing of their national qualifications levels to the appropriate levels of the European Qualifications Framework based on [a set of criteria agreed at European level](#).

The interactive table below allows you to compare national qualifications systems or frameworks of countries that have already related their national qualifications levels to the EQF. To compare how one country references its national qualification levels to the EQF with another, select a flag of the country of your choice to start the process.

The blue box at the top of the comparison chart gives access to all key information on the qualification system of the selected country. It leads you to the National Coordination Point (NCP) of the country, which provides access to information and guidance to stakeholders on how national qualifications relate to the EQF through their national qualifications systems. Furthermore, the detailed report on the national referencing processes ("national referencing report") and the presentation of the national qualifications systems ("NQF/NQS") may also be reached from the blue box.

Below it is presented how the national qualifications levels of the selected country relate to the eight reference levels of the EQF. By clicking on the levels of the EQF, you will find the description of the relevant EQF level in terms of learning outcomes: knowledge, skills and competences. As you will see some national qualifications levels are and may be linked to one, two or more EQF levels. This indicates that NQF levels may be significantly broad. It may also occur that two or more NQF levels are related to a single EQF level, which indicates that those national levels are significantly narrow. At present, some countries have qualifications levels below EQF level one. As EQF starts at EQF Level 1, referencing national qualifications levels below that level is not possible.

For each NQF level (click on the NQF level) there is a description, in particular of its learning outcomes, as well as examples of qualifications at that level (up to five). There are many more qualifications at each NQF level; however, the examples aim to get a better idea of what qualifications an NQF level contains. Depending on the characteristics of the national qualifications systems, countries provide examples of individual qualifications or types of qualifications. More detailed information on these examples is provided through access to national websites and databases of qualifications.

"See more" will lead you to more information on the NCP and the referencing process.



Was this information useful to you?

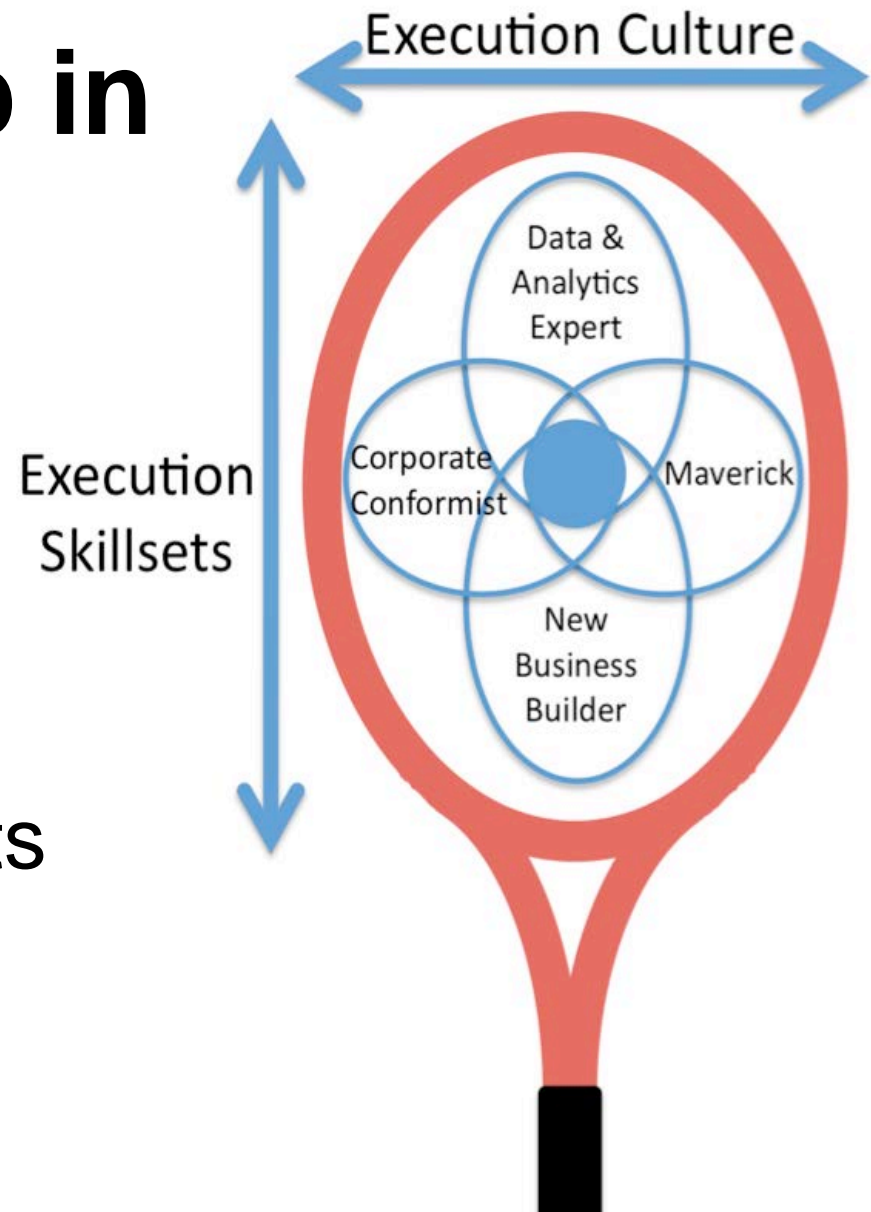
Yes

No

Not sure

# Leadership in Geo-

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





European Commission

# DIGITAL AGENDA FOR EUROPE

## A Europe 2020 Initiative

European Commission > Digital Agenda for Europe

- Home
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- Entrepreneurship & Innovation
- Science & Technology
- Telecoms & the Internet
- Content & Media
- DAE & U**

### ICT 2013

- ▶ Conference
- ▶ Exhibition
- ▶ Networking
- ▶ [Work Programme](#)
- ▶ Investment Forum
- ▶ Students

## Big Data Challenge

Due to the very fast growth in the availability of data, Big Data technologies define a market projected to grow annually by 40% for the next few years. However, only a small number of European companies appear in the most recent list of largest companies by Big Data revenue. These sessions will allow interested parties with complementary resources and skills come together and discuss research and development plans to improve Europe's ability to manage and exploit its data assets and make it more innovative thus strengthening its industrial competitiveness.

Agenda: [\[45 minutes sessions\]](#) [\[90 minutes sessions\]](#)

### Networking sessions

12 Networking sessions

- ▶ Digital Earth
- ▶ Social analytics and big-data
- ▶ Genomic Information Systems: Big Data for Personalized Medicine
- ▶ Large-scale multimedia analysis and retrieval in context
- ▶ How will Big Data yield a new economic sector?
- ▶ What does the future hold for e-science and big data?
- ▶ The Business of Open Data
- ▶ Big Data and Cloud Computing for Sustainable Economic Growth and



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### Travel & Accomodation

- ▶ Practical information

### DAE & U

- My Country
- Advisers
- Digital Agenda Assembly

### ICT 2013

Communities

Consultations



The Eye on Earth website no longer exists.

[The European Environment Agency](#) (EEA) will continue to focus on European environmental data services, while [UNEP Live](#) will provide similar service at global level.

For more information on the data services of the European Environment Agency, please refer to <http://www.eea.europa.eu/data-and-maps>

EEA

The screenshot shows a browser window with a map of the Atlantic Ocean in the background. The browser's address bar and tabs are visible at the top. The text is overlaid on the map.





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## [Job-vacancy-platforms - European Federation of Geologists](#)

[www.eurogeologists.eu/index.php?page=1011](http://www.eurogeologists.eu/index.php?page=1011) ▾

Earth Science **Jobs** in **Europe** ... **GeoJobs** Eco **Employment Job** Site. <http://www.geojobs.com/>. **Geology Jobs** - Geologist Salary Information - Oil and Gas **Jobs**.

## [Earthworks \*\*Jobs\*\* Oil & Gas ... Upstream \*\*Geology\*\* ...](#)

[www.earthworks-jobs.com/resgg.htm](http://www.earthworks-jobs.com/resgg.htm) ▾

I am keen to commence my career as a **geoscientist** within the oil and gas .... Germany with 5 years worldwide experience in **Europe**, Australia and Middle East.

## [Geology & GeoSciences Mining \*\*Jobs\*\* in \*\*Europe\*\* | CareerMine](#)

[www.infomine.com/.../jobs/.../europe.geology.geoscience...](http://www.infomine.com/.../jobs/.../europe.geology.geoscience...) ▾ [Translate this page](#)

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## [PDF] **GEO Skills + - CLGE**

[www.clge.eu/documents/events/152/geoskills\\_plus.pdf](http://www.clge.eu/documents/events/152/geoskills_plus.pdf) ▾

Mar 21, 2014 - Paula Dijkstra, Kadaster, The **Netherlands** ... (VET). ◦ **Work-related training and cooperation efforts.** 3. Page 4. Growing demand for **Geo Skills**.

## **i2geo - About the GeoSkills Ontology - I2geo.net**

[i2geo.net](http://i2geo.net) › [Home](#) › [About Pages](#) › [About the GeoSkills Ontology](#) ▾

It is now <http://www.inter2geo.eu/2008/ontology/GeoSkills> . ... **GeoSkills** has been built by the **work-package-2** of the former **inter2geo** project. It is now evolving ...

## **Open Geo for all - European Association of Geographers**

[eurogeography.eu/eurogeo-newsletter/news-2014-feb.html](http://eurogeography.eu/eurogeo-newsletter/news-2014-feb.html) ▾

Jump to **GeoSkills Plus - a new EU funded project** - EUROGEO is a partner in a new **EU funded vocational ... GeoSkills Plus** is based on **work** and ...

## **European Association of Geographers**

[www.eurogeo.nl/](http://www.eurogeo.nl/) ▾

EUROGEO members are geographers and related professionals who **work** in the public, private, and academic sectors. They **work** in a wide range of careers, ...

## **Conferences - EAGE (European Association of ...**

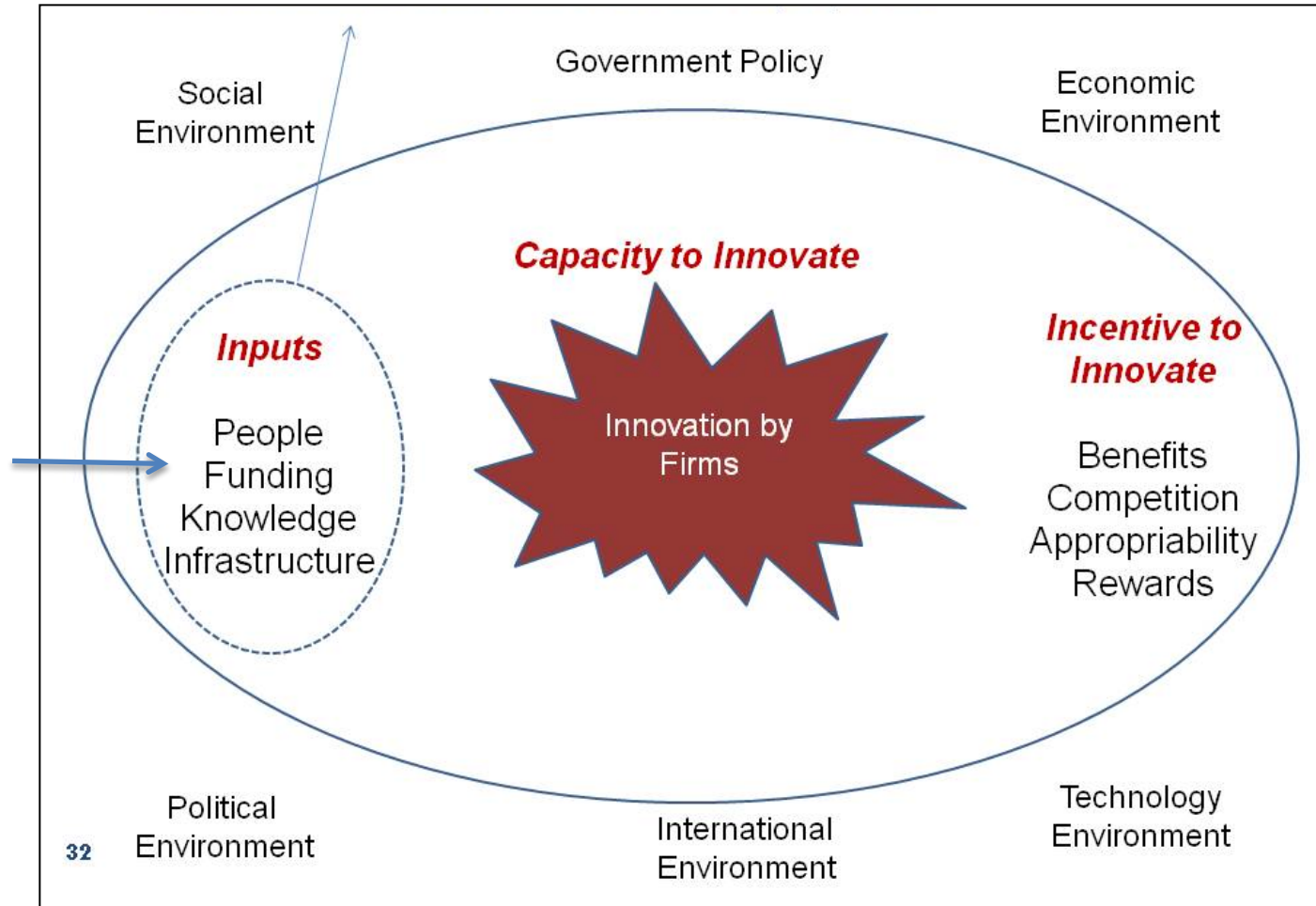
[www.eage.org/?evp=4430](http://www.eage.org/?evp=4430) ▾

Internal link. 16 - 19 June, Student Programme at the 76th EAGE Conference & Exhibition 2014 Create Your Energy Amsterdam, **Netherlands**. Internal link ...

Jun 16 - Jun 19	<a href="#">76th EAGE Conference ...</a>	Amsterdam, Netherlands
Jun 16 - Jun 19	<a href="#">Student Programme at the ...</a>	Amsterdam, Netherlands
Aug 4 - Aug 7	<a href="#">LAGSC 2014</a>	Mexico City, Mexico

# Cross boundary positioning

(after Navarro et al. 2009)



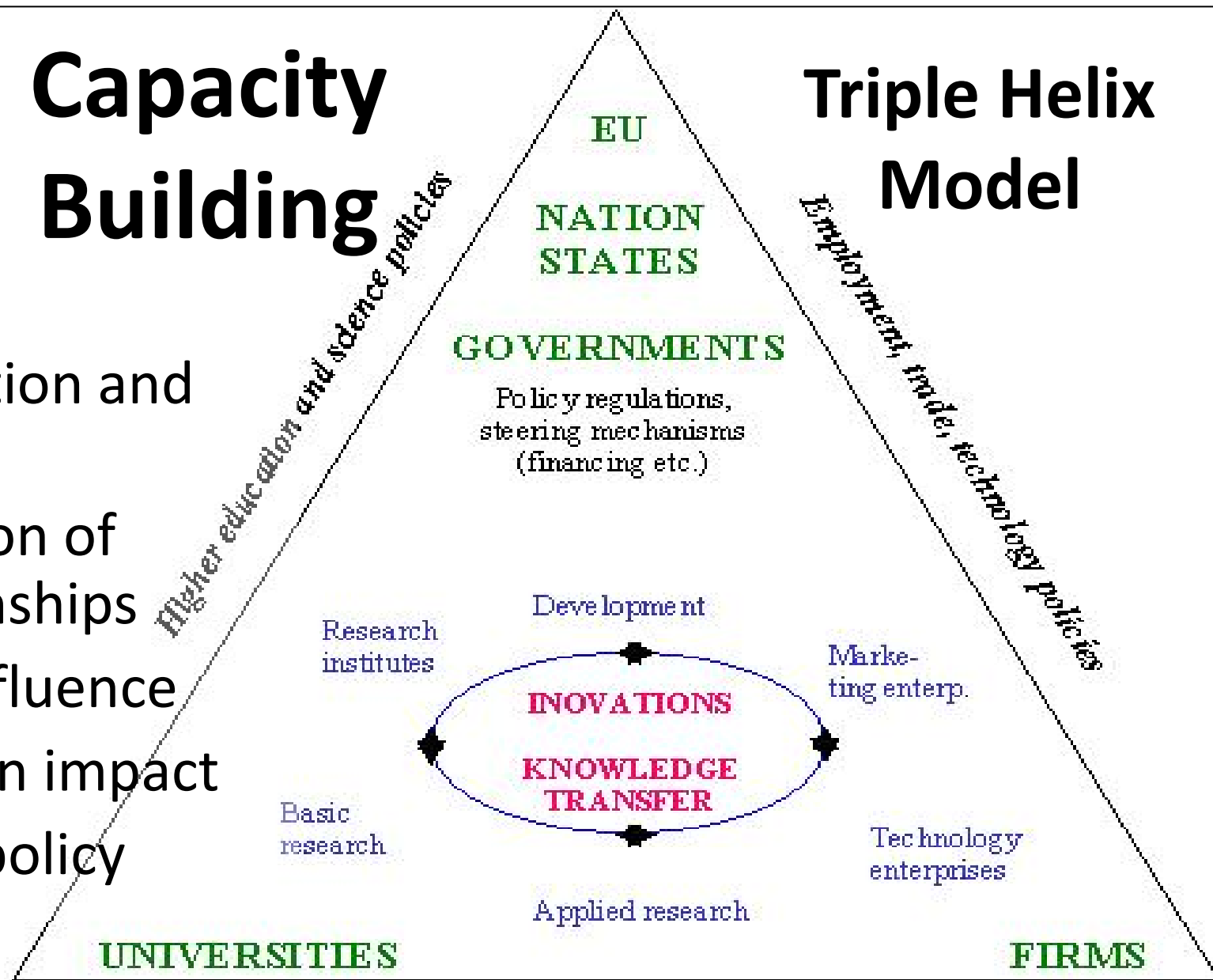
need help  
with this



# Capacity Building

- Innovation and change
- Evolution of relationships
- Gain influence
- Make an impact
- Affect policy

# Triple Helix Model



Etzkowitz, H. and Leydesdorff, L. (2000), The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university–industry–government relations *Research Policy*, 29(2): 109-123



# Geo-Capacity Building

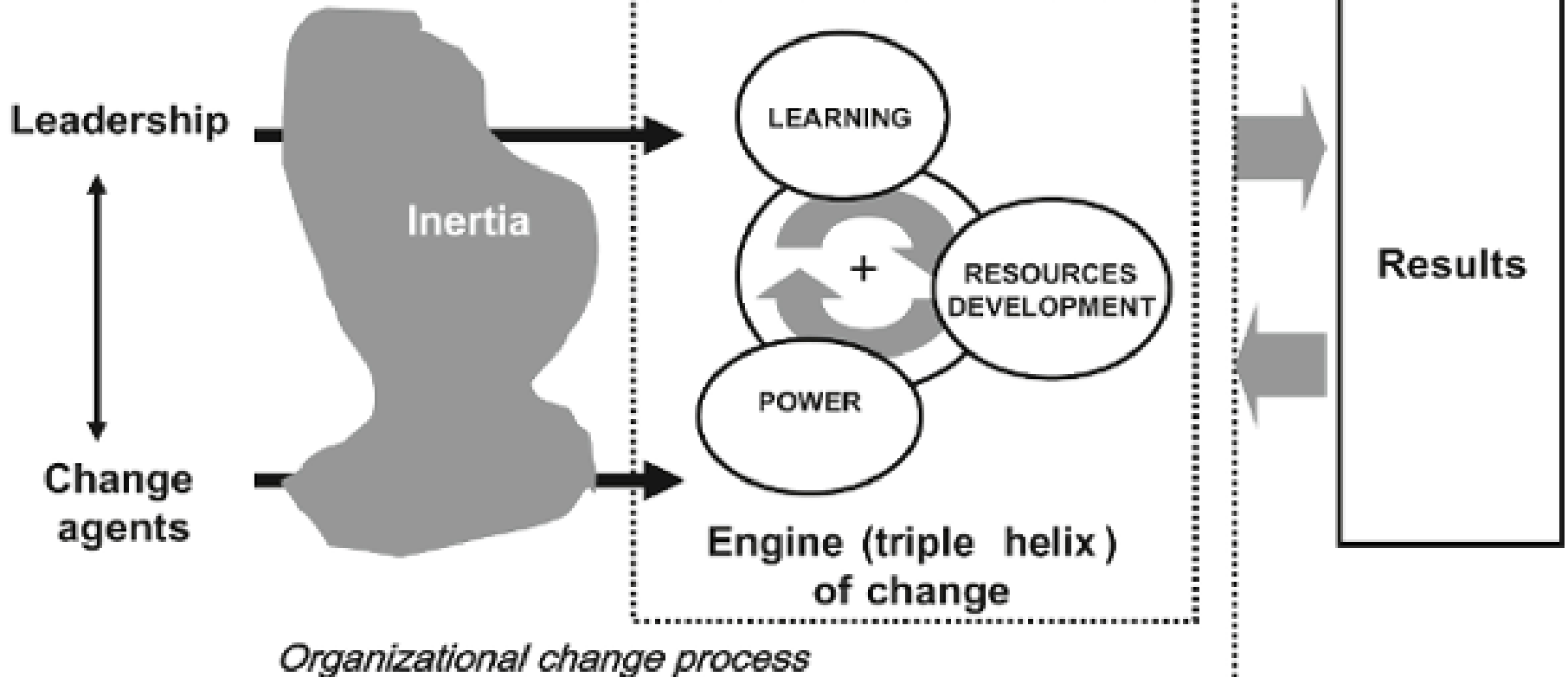


- **EUROGEO at the Council of Europe (since 1983)**
- **Participatory status**
- **Culture, Education, Environment, Economy groups**
  - Lobbying in the European Parliament
  - Respond to statements and policy proposals (Rio + 20)
  - Attendance at major meetings and events (WFD)



External drives / Initiating forces

# Breaking down inertia



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# Capacity Building: Some Recommendations

- Money ..... support from industry
- Long-term commitment ..... from stakeholders
- Common public message – media – investment = valuation of the sector
- Research and information gathering
- Strong risk evaluation ....
- ***“What happens if we don’t develop capacity?”***

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



# What if?

<http://tinyurl.com/GWF-geocap2014>

What if .... we don't capacity build the geospatial sector?

Increased focus on OpenGIS

System gets out of control. Everyone loses

citizens remain unaware the geospatial sector exists

Good students hijacked by non-geospatial industry

too few applications for courses – not enough graduates to meet needs

qualifications (or lack thereof) currently are considered THE key limiting factor in further development of the geospatial sector

Low potential for more efficient society and economy not developed.

[Potential]







What should be done ... to capacity build the geospatial sector?

Involve industry in conferences and more ....

network key education organisations

Create common qualifications and curriculum

New projects

What needs to be done ... broad and effective p.r. for the geospatial professions, targeting pupils still in secondary education

Sharing knowledge and information about what is going on

use the users – Green Map

Create OpenGIS training materials.

Increase focus on OpenGIS to meet demands of governments, industry

Continued rise of open....

Find ways to cluster good projects – sustain them

roleplay gaming for raising awareness with decision makers



research the human need to define or predict the market demand, which will guide the development of geospatial education. Human need, from different perspective: physical, mental. currently, and future. Human need to know more, better food, health, work effectively.

use spatial technology more fully to create exciting education

Establish a leaders forum (industry-education-NGOs-EC) who meet once a year at GWF, build relations to industry

Create a European geospatial careers portal – jobs and advice – LinkedIn??

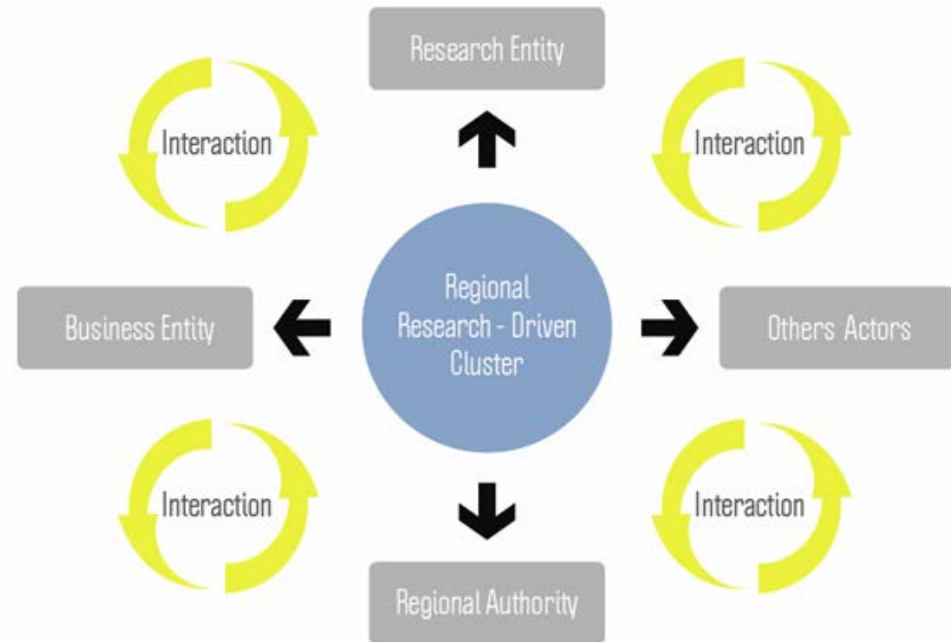
bridge the gap between technical and policy experts

GIS Graduates should have the knowledge of geospatial standards, programming skills etc needed by industry.

connect qualifications to European benchmarks

# Dynamics of innovation

- networks of institutions offer:
  - a source of innovation
  - their adoption and
  - implementation



Etzkowitz, H., Webster, A., Gebhardt, C. and Terra, B. R. C. (2000), The future of the university and the university of the future: evolution of ivory tower to entrepreneurial paradigm, Research Policy, 28(2): 313-330

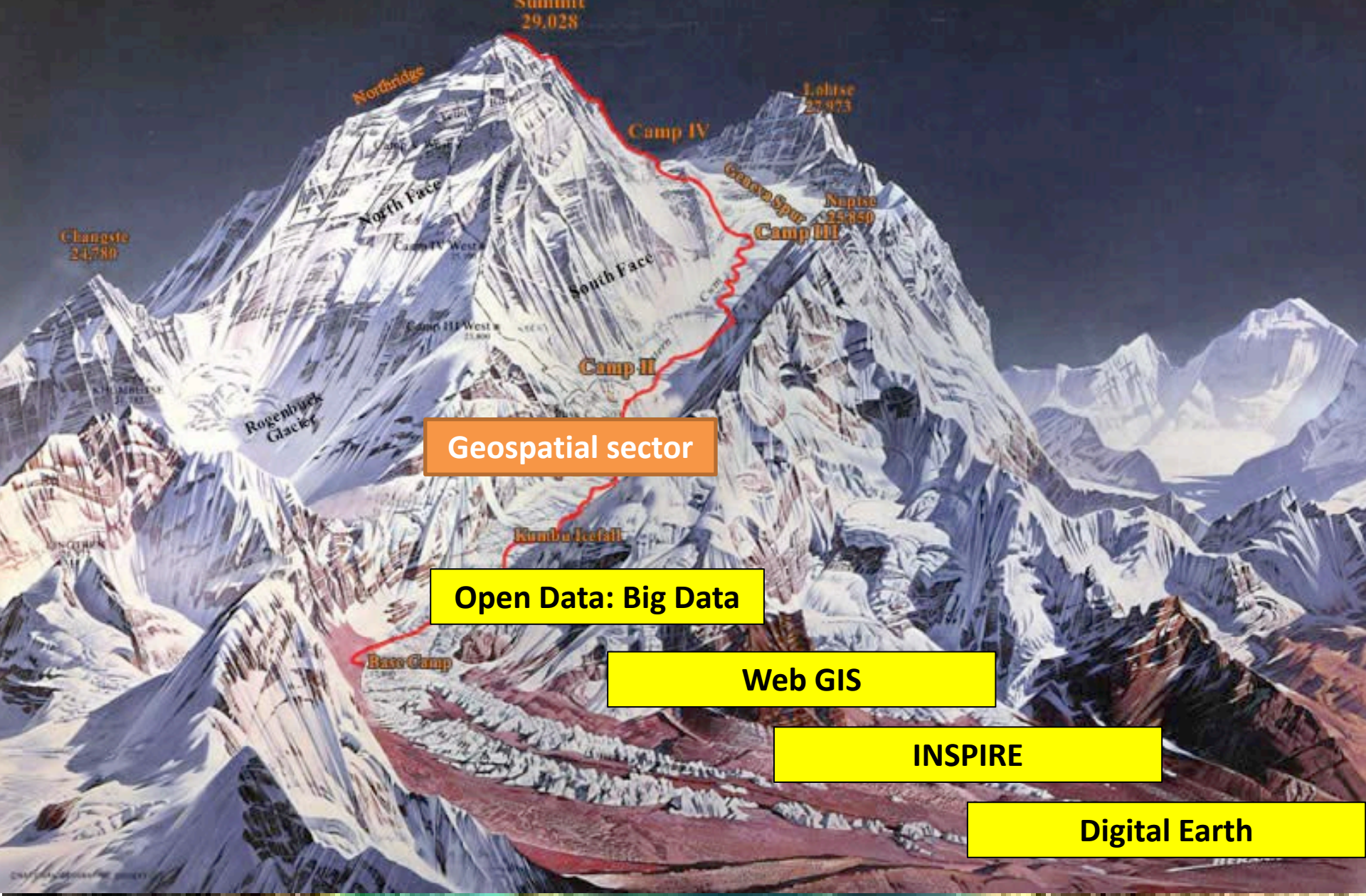


# Building Capacity: Networking

four characteristics (Hausman and Goldring, 2001)

- shared values among members,
- a common set of events that promote face-to-face interaction between participants,
- collaboration among stakeholders and
- a commitment to the organisation and its decisions

Hausman, C. S. and Goldring, E. B. (2001), Sustaining Teacher Commitment: The Role of Professional Communities, Peabody Journal of Education, 76(2): 30-51



Geospatial sector

Open Data: Big Data

Web GIS

INSPIRE

Digital Earth



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# GeoSkills + Events

- Kick-off Meeting: Brussels, Belgium  
6-7 November 2013
- Workshop 1 + Partner Meeting 1: SOMA College, Harderwijk,  
The Netherlands 21-22 May 2014
- Workshop 2 + Partner Meeting 2: Sofia, Bulgaria  
November 2014
- Workshop 3 + Partner Meeting 3: Vilnius, Lithuania  
May 2015
- Joint Event (Final conference): Brussels, Belgium  
End August / Begin September 2015



@GeoSkills\_Plus



Geo Skills +



[www.geoskillsplus.eu](http://www.geoskillsplus.eu)

**Thank you** for your attention

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### KARL DONERT ON TWITTER

-  RT @GeoSkills\_Plus #Geography hits all of these! "10 Skills The Workforce of the Future Will Need" @GeoSkills\_Plus <http://t.co/eoaYuPXGaD> about 1 hour ago
-  Geo-cube: a #geographical journey #geoed #edtech <http://t.co/SveYdcaloH> about 1 hour ago

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some spatial citizenship tags  
teacher training these



**EU Digital Agenda: where does education really fit in?**  
October 17, 2014



**Spatial Citizenship**  
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