



# Unearthing our spatial gene

Jan Willem van Eck, Esri Nederland

# Unearthing our spatial gene



*The future of Geo: how do we educate the next generation, Wageningen University, 14 December, Orion.*

In these last 15 years, a world of openness has enabled the field of GI Science to innovate faster than ever before. Although many concepts and foundations have been quite stable, some parts of the field have been in a “constant flux”\*. Our natural interest in place, location, geography has increased and there are many more data and tools available to fulfill our spatial curiosity. One of the goals of a GI Science educational programme must be to encourage that spatial curiosity and to unearth our spatial gene.

Once students think spatially, that way of thinking becomes impossible to switch off. Our society relies on educated professionals to address challenges, from energy transition to sustainable development goals, which cannot be successfully addressed without the spatial context. After a personal introduction, this presentation will touch on Why the web has changed the map, What the web is doing to education and What our joint challenges and responsibilities are.

\*kindly borrowed from Karen Kemp

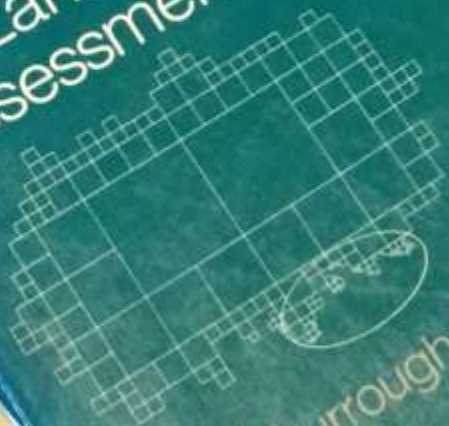


KARTOGRAFIE  
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MONOGRAPHS ON SOIL AND  
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# Principles of Geographical Information Systems for Land Resources Assessment



P. A. Burrough



FOURTH EDITION

# GEOGRAPHIC INFORMATION SCIENCE AND SYSTEMS

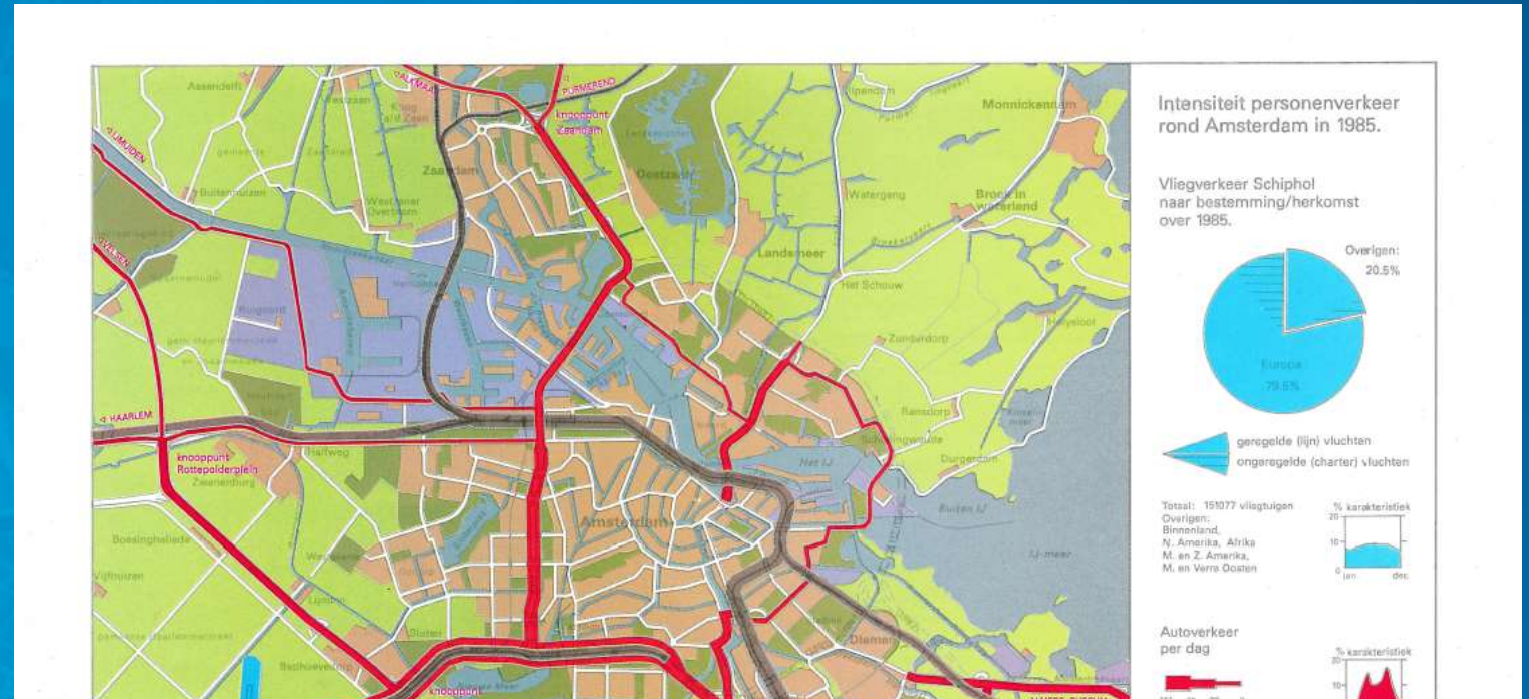
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Re-discovering college textbooks





Which tools should be put aside?





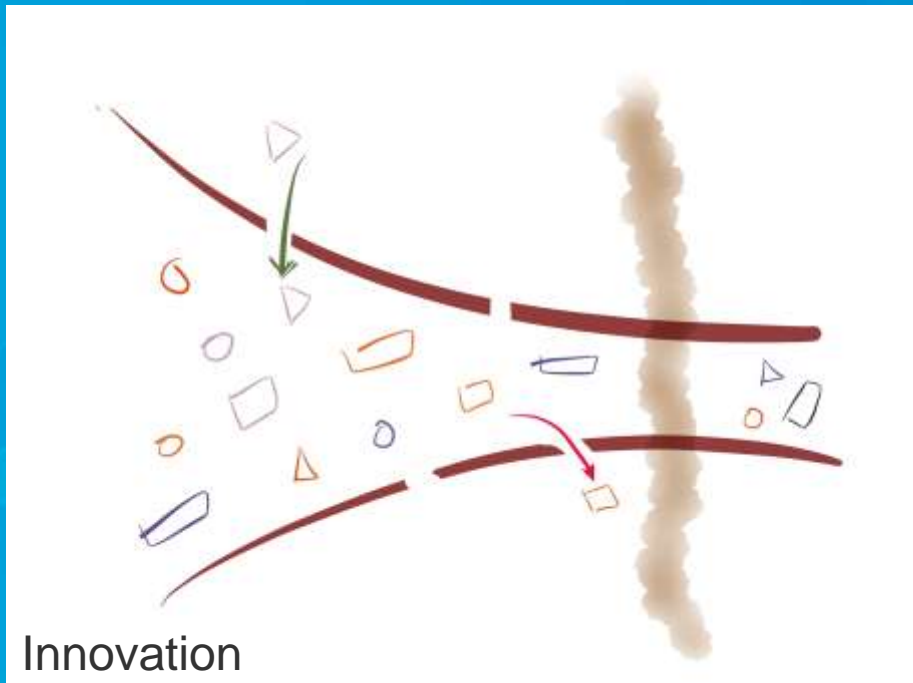


GIS



Marketing

# Sharing my learning path



Innovation



Education

credit



What is (not) changing?

What has impact?

kw:("geographic information system") OR kw:("gi science")



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Not many papers 50 years ago..

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"geographic information system"



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water utility

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key component

scada



asset management

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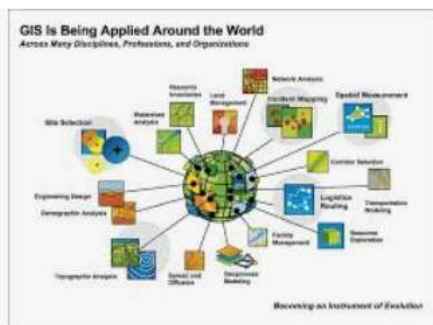
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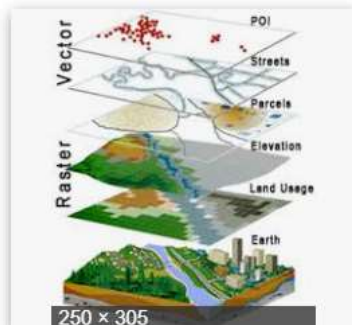
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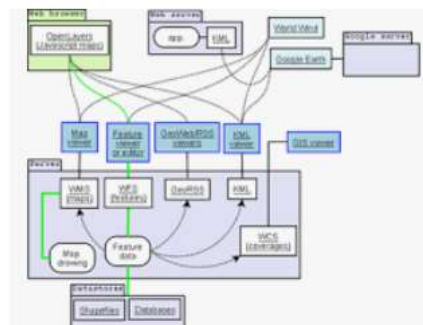
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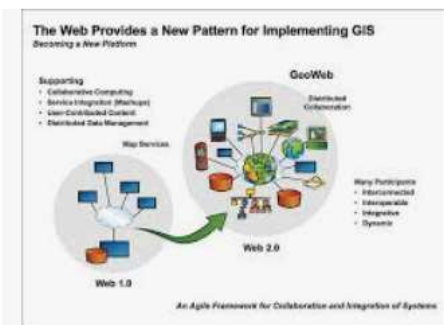
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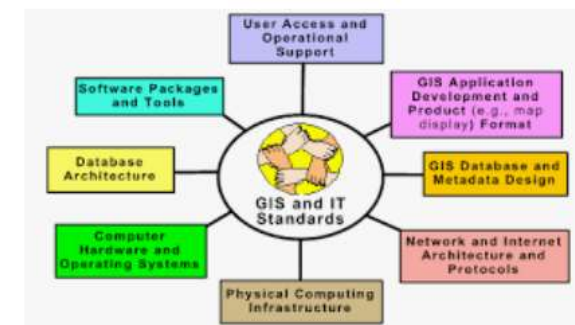
TC Merritts Land Surveyors  
tcmerritts.com



Geographic information system - Wikipedia  
en.wikipedia.org



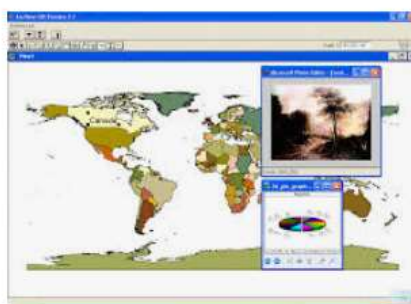
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Understand GIS Using Images ...  
gisatmarwadi.wordpress.com



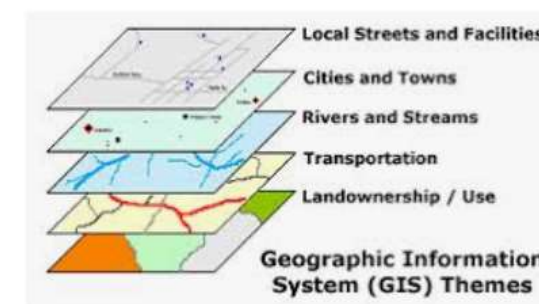
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GIS (Geographic Information System) ...  
sisjoko.blogspot.com



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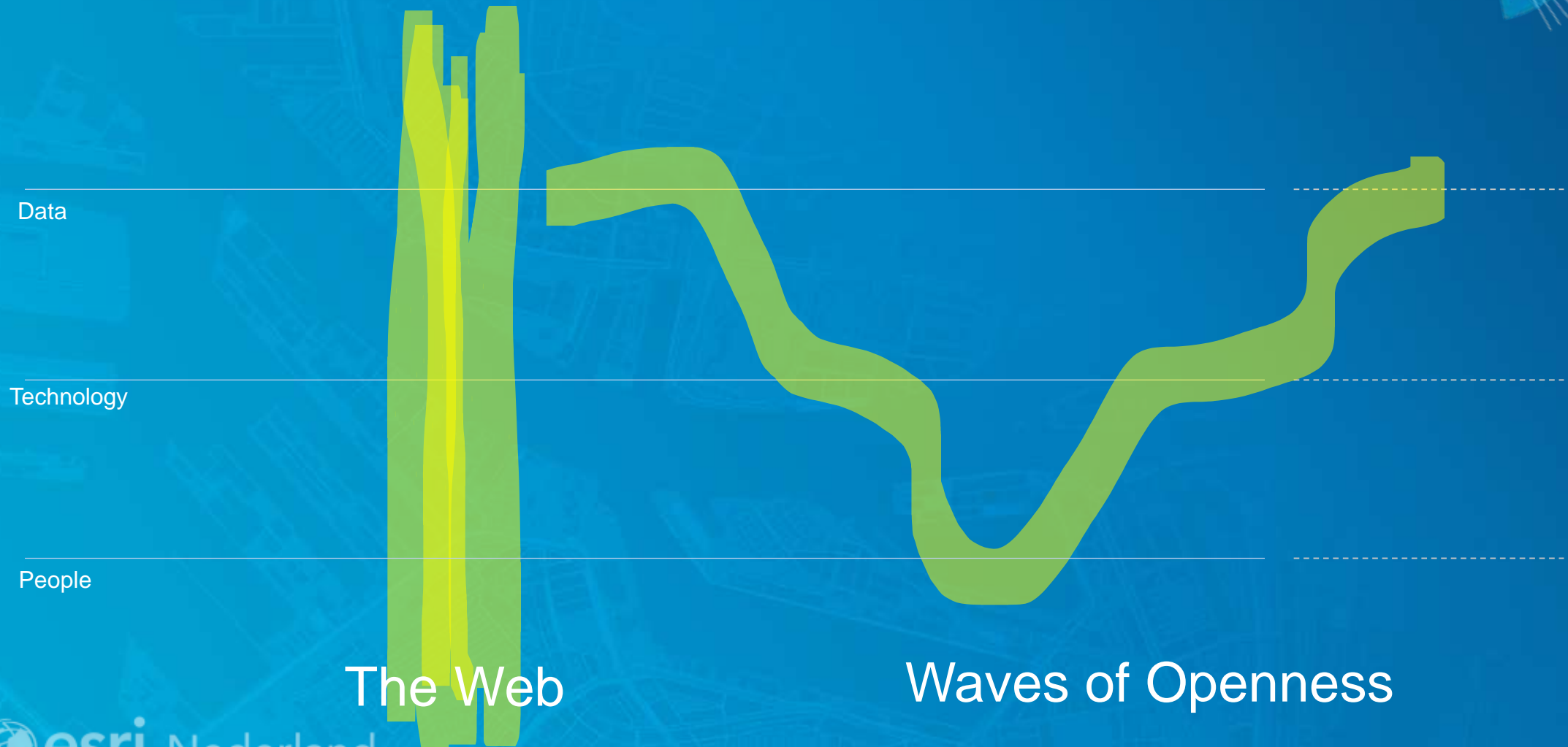
GIS Introduction  
sjsu.edu



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vibraconsultants.com



# Changes with impact, in time





# Waves of openness







# What the web did to the map

Access, Share and Contribute

Independent of location, time, person

Impact on all: technology, data, people

Reach many others, other areas of expertise!

Minimize and miniaturise

.....

Group 4



WAGENINGEN  
UNIVERSITY & RESEARCH

# Testing Sampling Strategies

for soil moisture content



Defining the best sampling strategy for your research can be very difficult. This Digital Earth Application aims to provide insight in the differences between random and grid





BETA

# Topografie

in de klas

Home

Jouw boekje

Topotrainer

Contact

Inloggen

## Topo wordt makkelijker!

Voor docenten

### Home

Topografie moeilijk? Niet met Topografie in de Klas! Online topografie oefenen, jouw eigen boekje downloaden en nog veel meer!

In [jouw topografieboekje](#) vind je precies wat je moet leren.

Via de [online Topotrainer](#) kun je de topografie oefenen en jezelf perfect voorbereiden op de toets(en).

En met [je eigen account](#) kun je de resultaten van de Topotrainer makkelijk opslaan en vergelijken. Zo zie je in één keer hoe goed jij op weg bent naar een 10 voor topo!

**Ook jij kunt een 10 voor topo halen!**



### Voor leerlingen

✓ Online Topotrainer

✓ Topografieboekje

✓ Jouw resultaten

### Voor docenten

✓ Toetsen genereren

✓ ELO koppeling

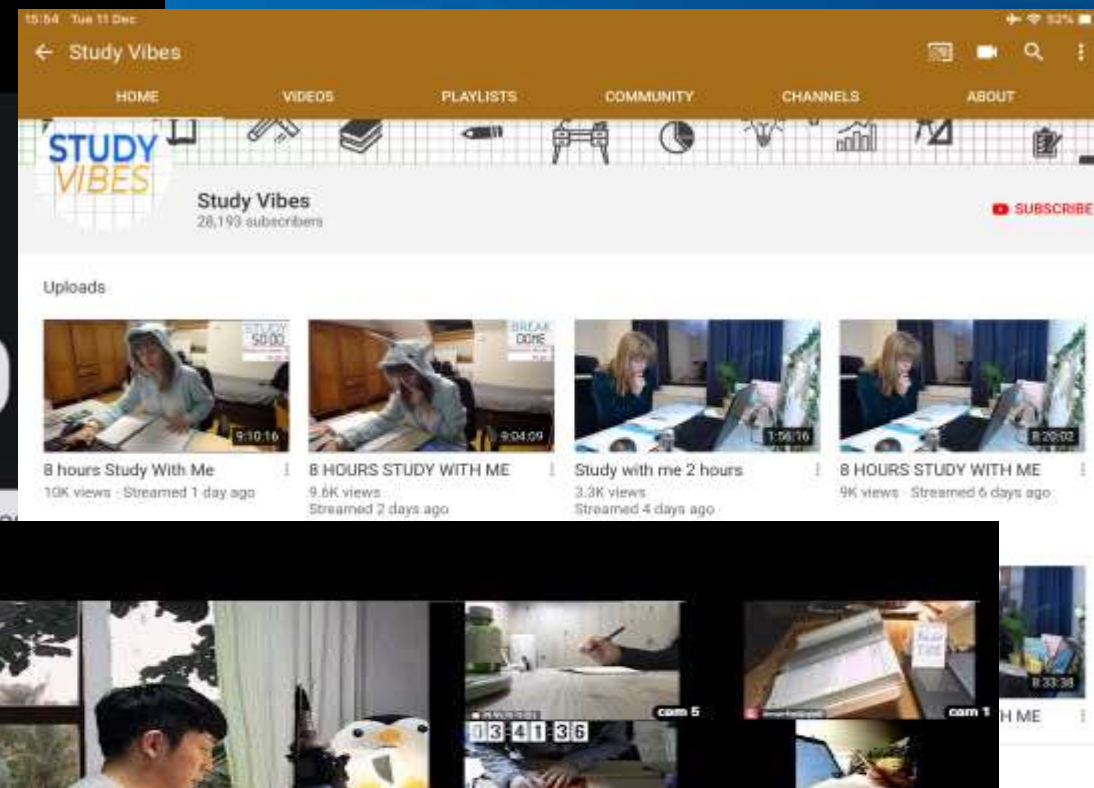
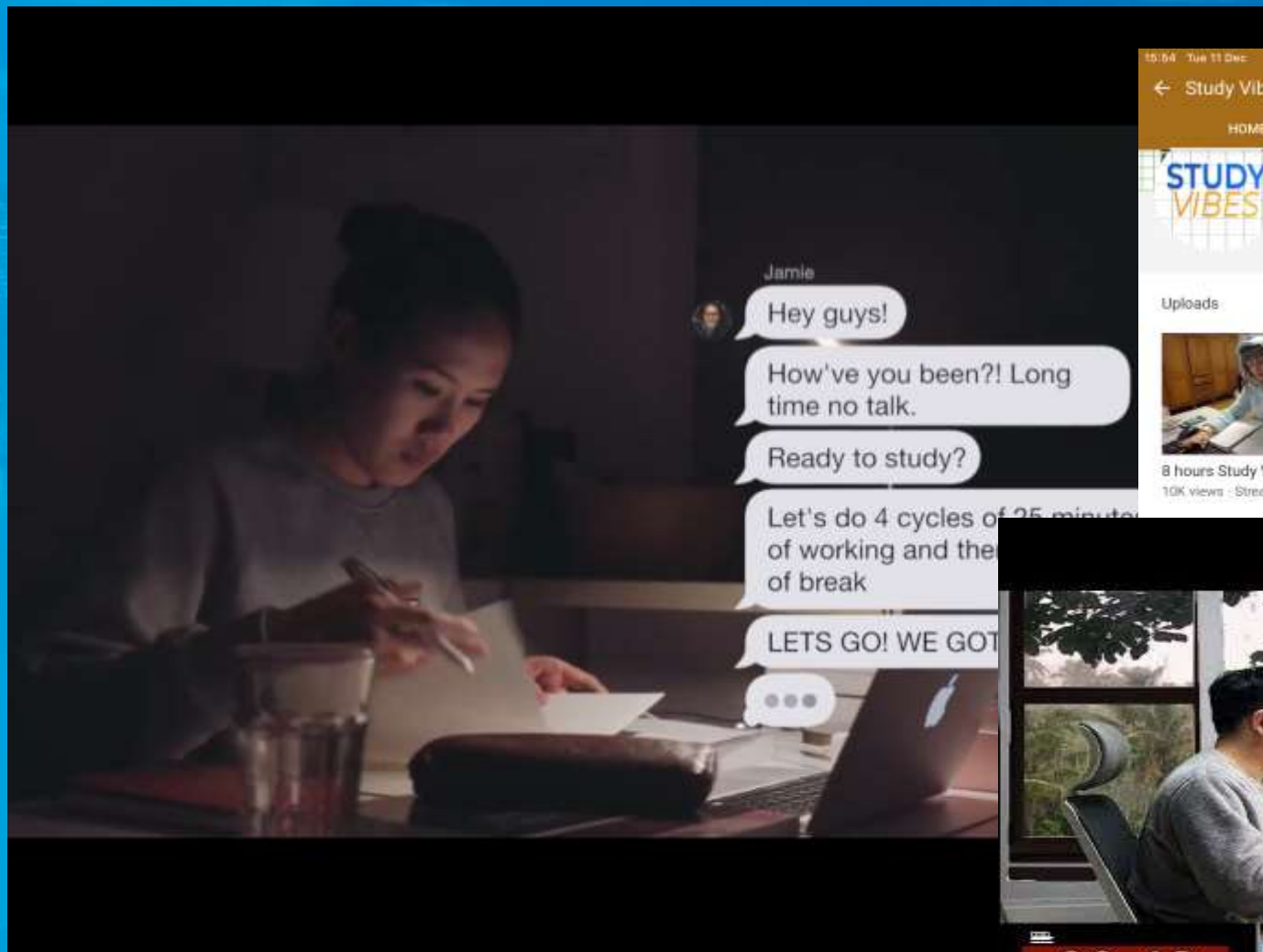
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Interested in Masters or Diploma programmes in GIScience?

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### Overview

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### Work at the Forefront of the Industry with an Online Master of GIS

Penn State's online Master of Geographic Information Systems (MGIS) is an award-winning 36-credit program that allows experienced professionals to customize their GIS education to reflect their career interests.

### Program Summary

Credits Required	36
Tuition per Credit	\$886

Learn with a structure

Browse > Data Science > Data Analysis

# Geographic Information Systems (GIS) Specialization

Map Your World With GIS. Explore the tools, concepts, and terminology of spatial analysis and modeling

**Enroll**  
Starts Dec 06

Financial aid available

Offered By

**UC DAVIS**  
UNIVERSITY OF CALIFORNIA

## MOOC

### Going Places with Spatial Analysis

by David Bock and David Dillman

Register

♡ ⚙️ 🔄

Duration: 6 Weeks (2.5 hours of study per week)

Cost: Free

#### About this MOOC

**Gain a deeper understanding of spatial data analysis.**

This course is for people who know something about data analysis and want to learn how the special capabilities of spatial data analysis provides deeper understanding. You'll get free access to the full analytical capabilities of ArcGIS Online, Esri's cloud-based GIS platform. Previous experience with GIS software is helpful but not necessary.

→ View common questions about MOOCs.



Or just as an introduction



# What the web did to the education



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Independent of location, time, person

Impact on all: technology, data, people

Reach many others, other areas of expertise!

Minimize and miniaturise

....



# How to educate the next generation?





# Stop Teaching GIS


 Blog Post created by [DDiBiase-esristaff](#)  on Jan 10, 2018

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Teach how to learn GIS instead.

That was a guiding principle as I recently redesigned the gateway course to the Penn State Online certificate and masters degree programs in GIS.

I began developing "Nature of Geographic Information" in 1998, at the outset of the Penn State Online program. I designed the course to serve adult students who sought to start or advance careers using GIS. The online course consisted of an open-access textbook (<http://natureofgeoinfo.org> ) and associated courseware for registered students. The courseware included ungraded and graded quizzes meant to ensure students' engagement with the text, as well as discussion forums and prescribed projects that required students to practice working with, and writing about, key concepts and technologies.



Educational objectives, yes!

But not spoon feeding the information to achieve them

- .. Be in charge of your own work as much as possible
- .. With instructions on where and how to get online help
- .. Interactive learning is much more successful

See David's [blogpost](#)



# How to educate the next generation?



“The most important thing to learn now is “how to learn”. In GIS&T everything is in constant flux: software, tools, algorithms, data, technology, possibilities, are continually evolving. Most of the technology-specific details that you learn in school will be out-of-date by the time you graduate. Focus on the concepts and foundations, those will be permanent. Then, the important skill to learn is how to learn the next thing, how to build on the conceptual frameworks you have acquired so far, how to read documentation, understand and experiment with new ideas. And, related to this, it’s critical to be open AND enthusiastic about change. Don’t seek comfort in what you know already, seek the challenge in learning what you don’t yet know.”

Karen Kemp, USC. – NCGIA, UCGIS (underlines by Jw)



# A data-centric geographer

Does not only need new skills in computer science and programming. We explore five of these capabilities:

critical thinking,  
scientific communication,  
community building,  
entrepreneurialism,  
profit awareness.

Forrest J. Bowlick & Dawn J. Wright (2018) Digital Data-Centric Geography: Implications for Geography's Frontier, The Professional Geographer, 70:4, 687-694, [DOI: 10.1080/00330124.2018.1443478](https://doi.org/10.1080/00330124.2018.1443478)





# Final remarks

## Students

Learning will stay with you  
share your learning goals and paths

## Alumni

Share your experience  
give a talk today or write a short blogpost  
adopt a school / teacher

## University

Share your education online  
let's meet up more than once every five years!



Encourage spatial curiosity

Our joint responsibility!



# Thank you



For conversations and guidance

Maartje Holtslag, Tim Brouwer, Marien de Bakker, David DiBiasi, Karen Kemp, Dawn Wright, John Stuiver, Lammert Kooistra, Jeroen van Winden, & many more at Wageningen University

A few links to share

Open Education week 2019: [March 4-8 2019](#)

Esri's contribution to Open Learning: [Moocs](#)

All about Earthrise: [Nasa](#)