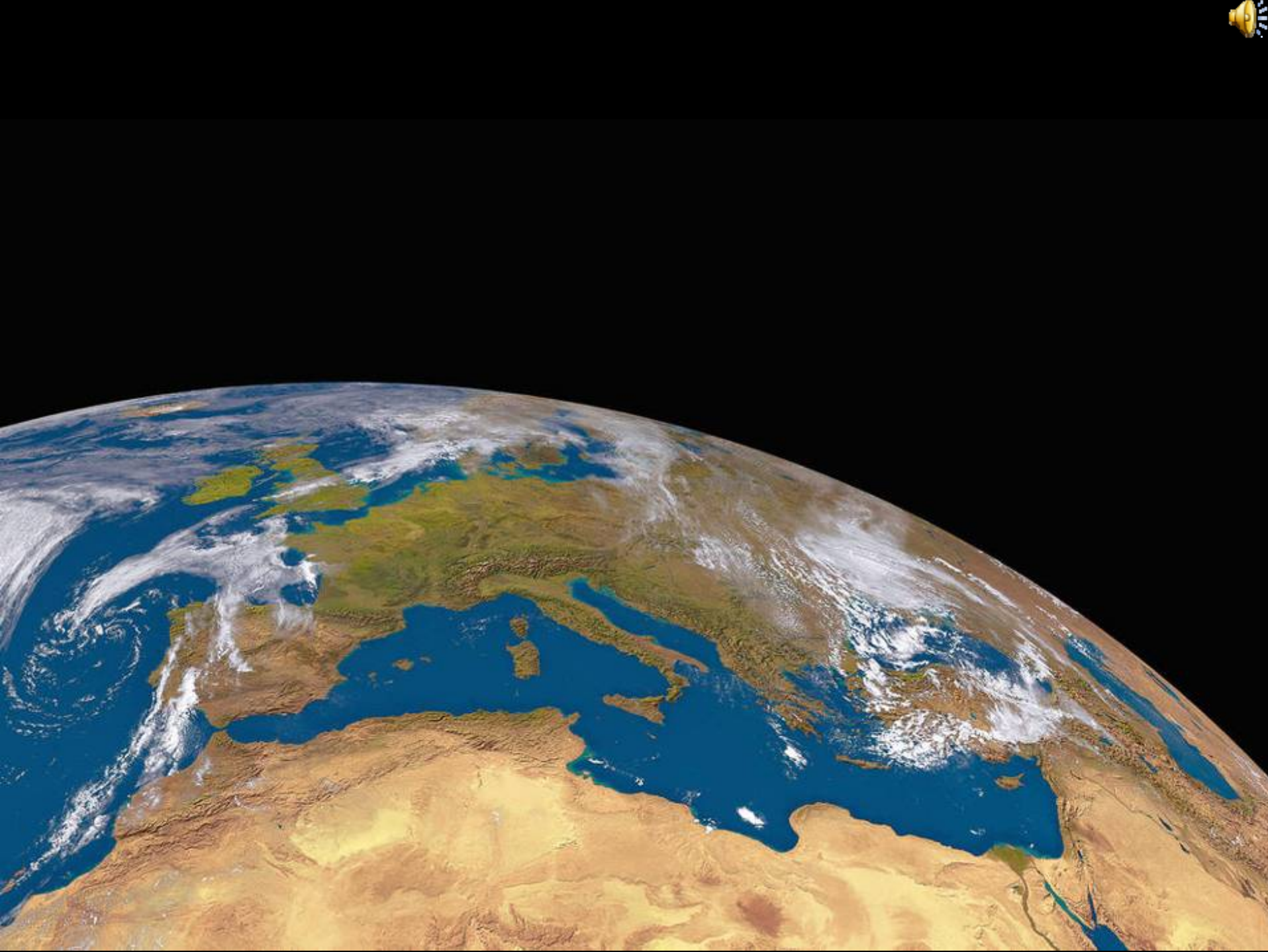
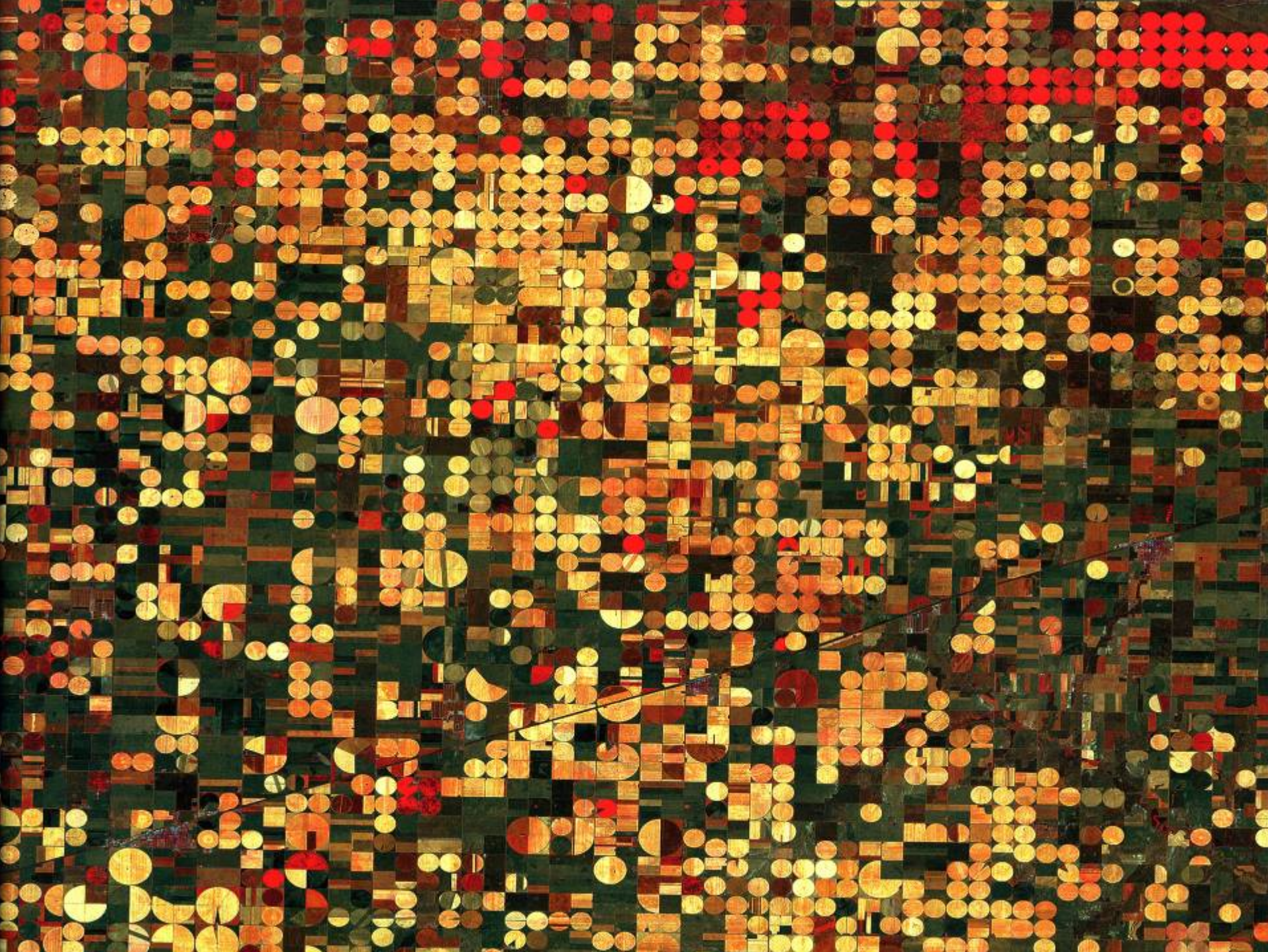


Development of a Web-based Remote Sensing Software for Schools

**Dipl.-Päd. RL Raimund Ditter
Prof. Dr. Alexander Siegmund
University of Education Heidelberg
Department of Geography
Research Group for Earth Observation**



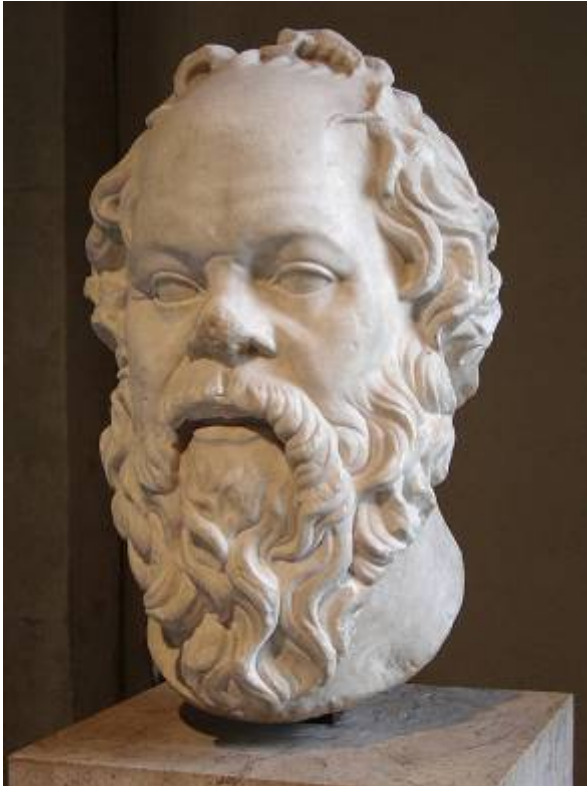












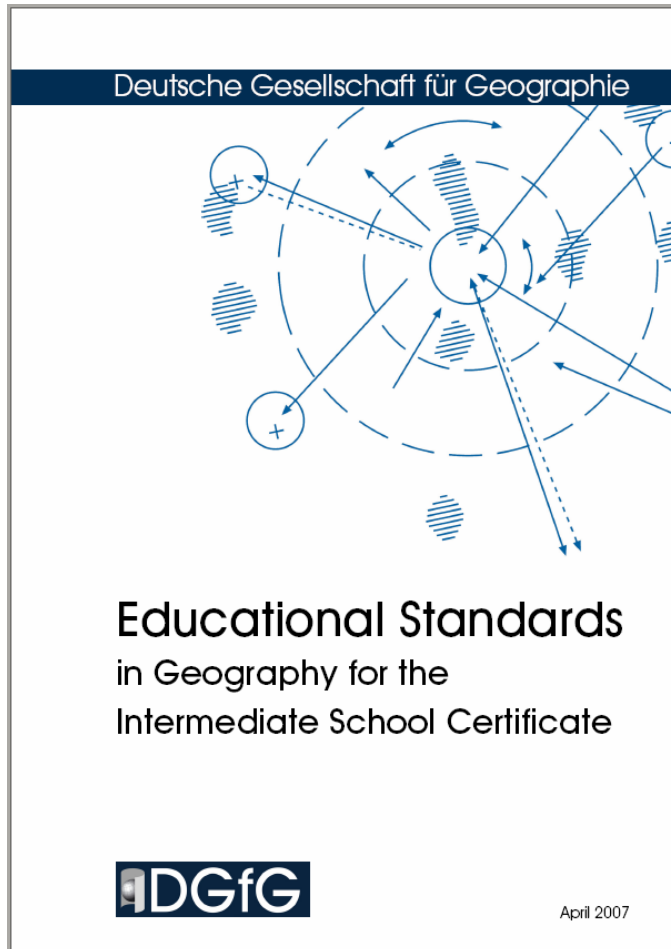
*„We would understand
the earth, if we could
see it from above “*

Sokrates



*„As I flew around the
earth, I recognized its
beauty...“*

Jurij Gagarin



Standards for the competence area "Spatial Orientation"

"topographic knowledge and skills and competences (...) to produce simple maps of one's own."

Standards for the competence area "Acquisition of Knowledge/ Methodology"

"Knowledge of sources and forms of information,
and information strategies (M1),
ability to gather information (M2),
ability to analyse information (M3),
ability to describe methodological steps for acquiring
geographical/ geoscientific information (M4)"

Standards for the competence area "Evaluation"

"They learn, about the different value of maps, aerial
photographs and satellite images (...) transform
data into maps or diagrams"

Satellite Images in Schools – Global to Local

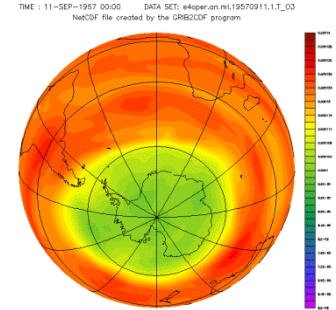
Scale Level



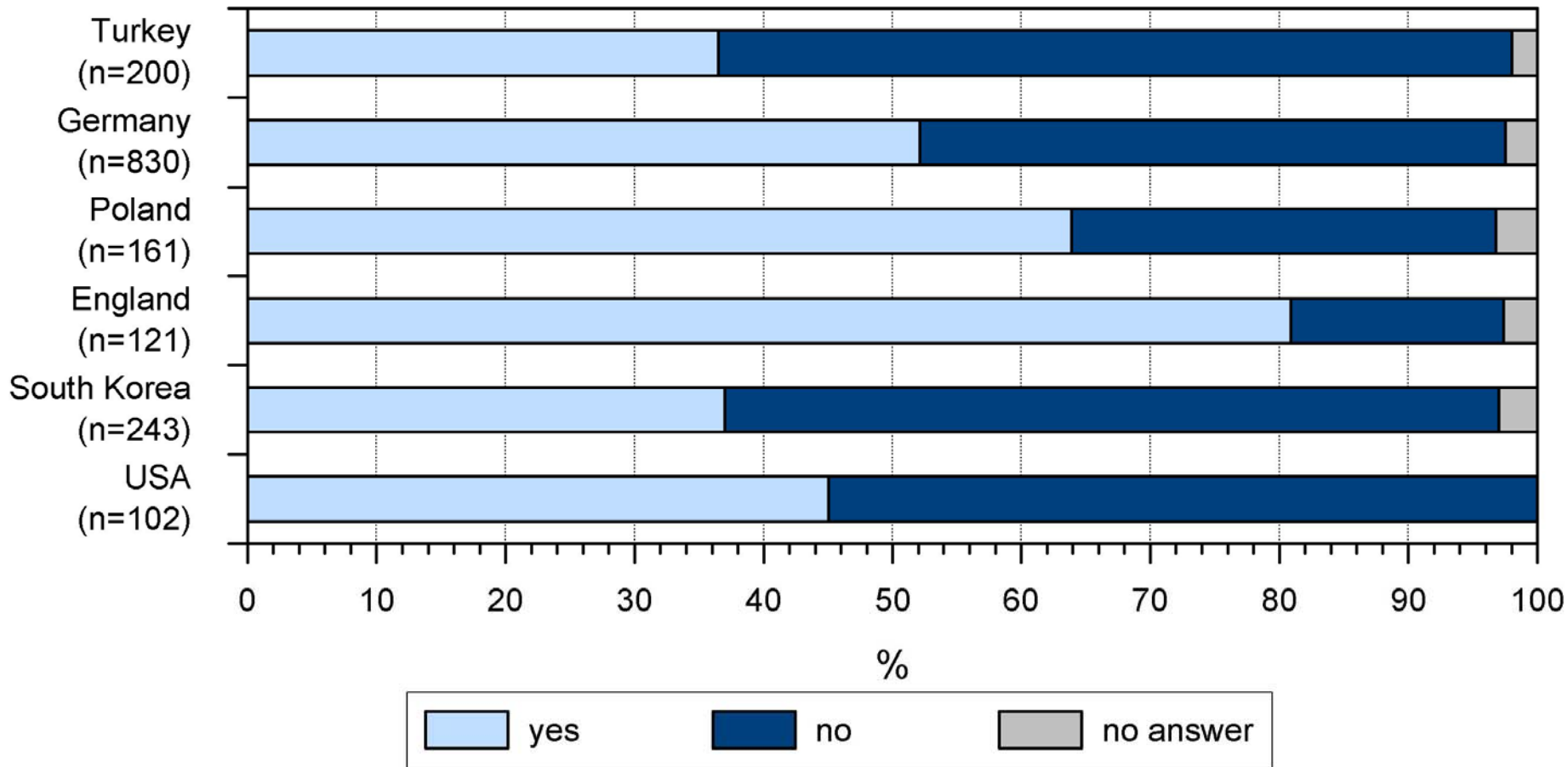
Examples

- Hole in the ozone layer
- Shifting of ecozone
- ...
- Deforestation of the rainforest
- Desertification
- Land-use change and land consumption
- ...
- Discovering proximity
- Transport infrastructure
- Digging and mining of georessources
- ...

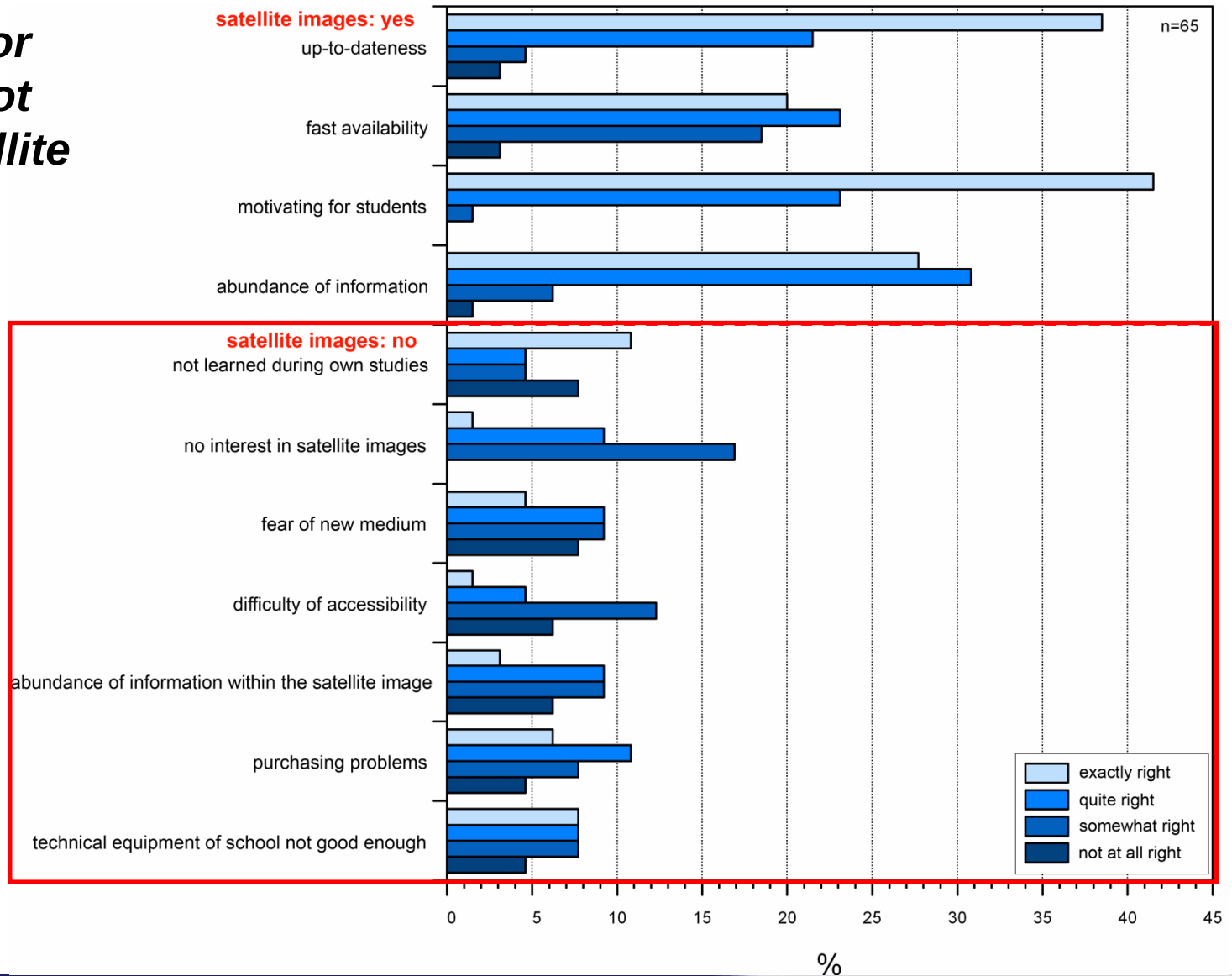
Use of Remote Sensing

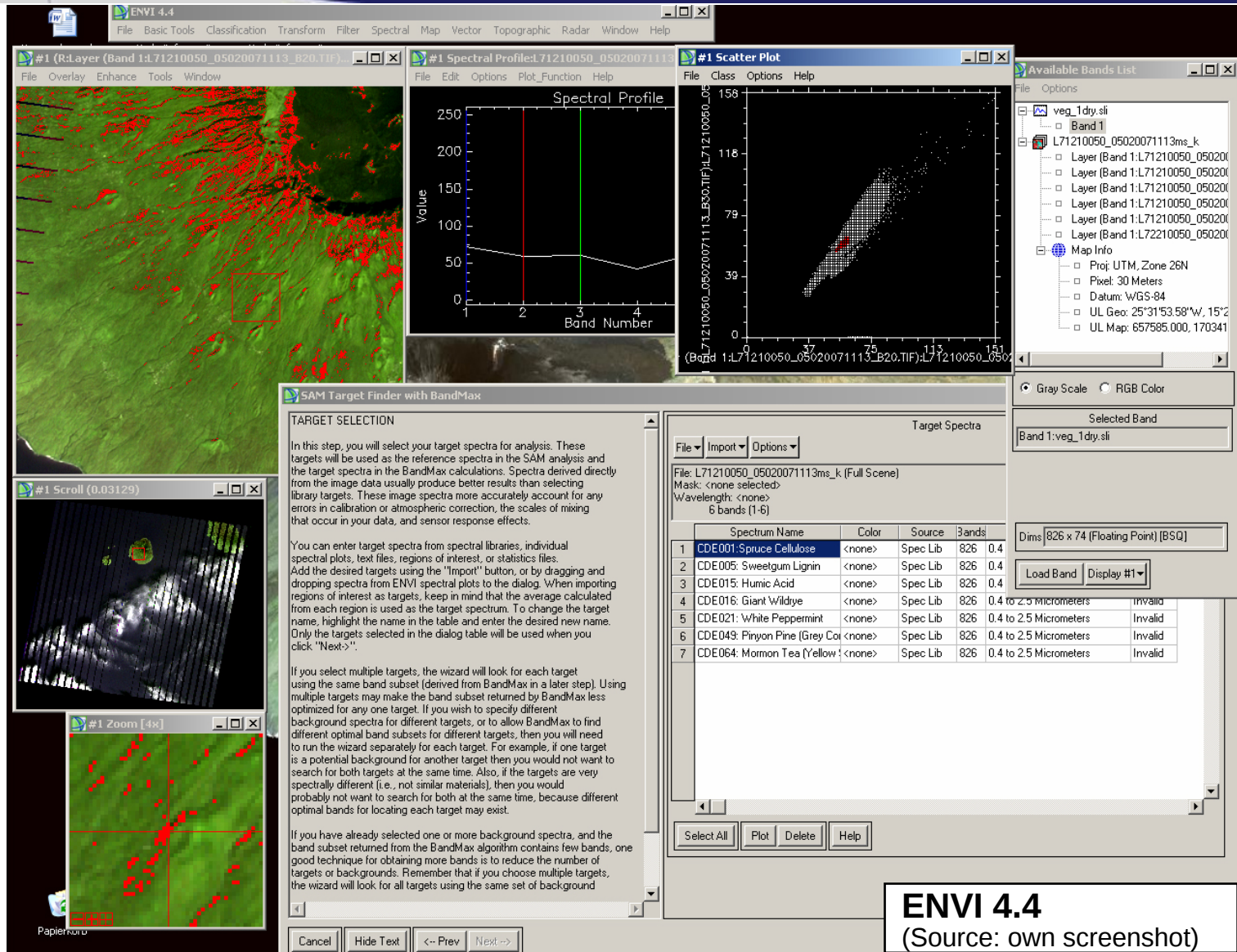


“I have already worked with satellite images at school ...”

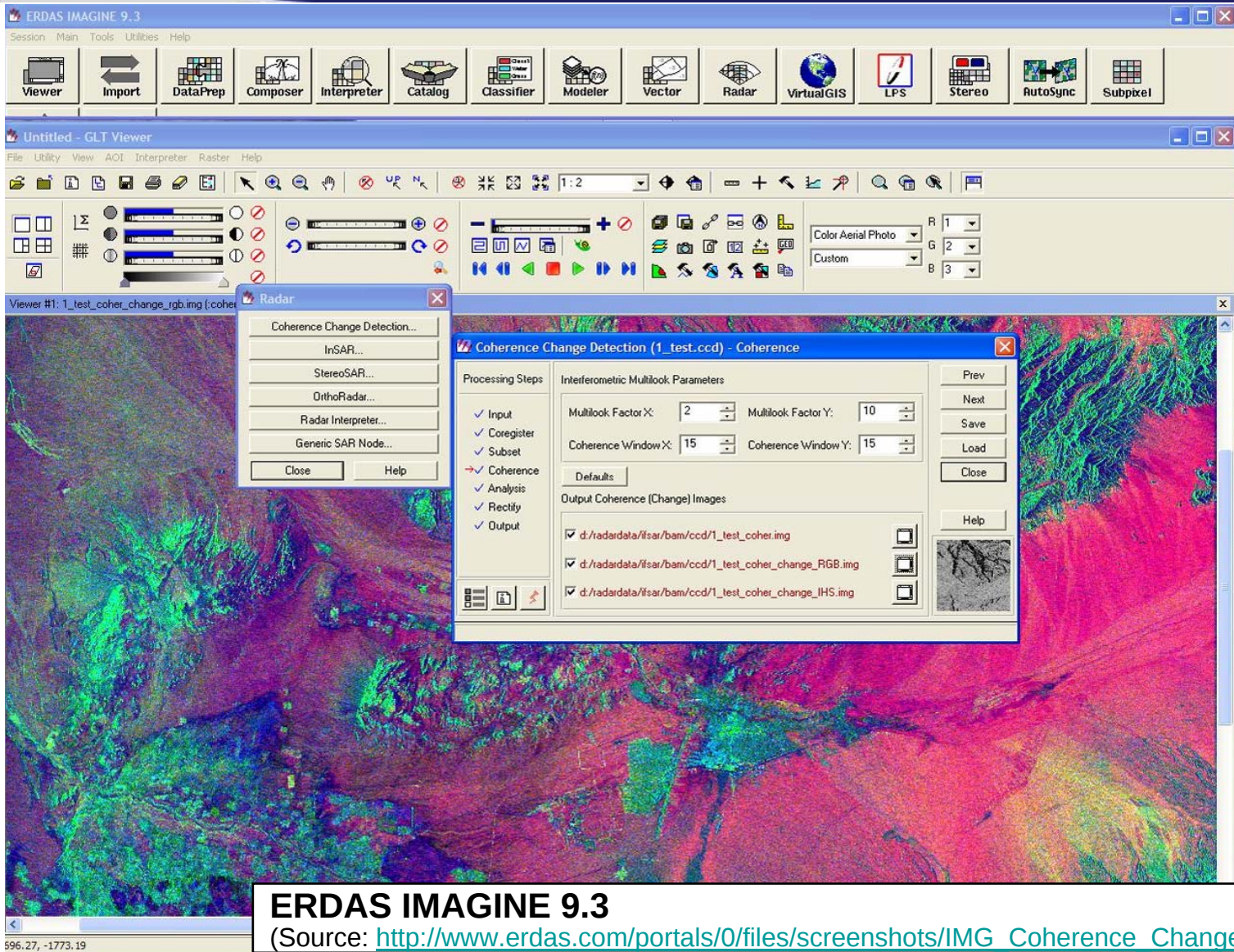


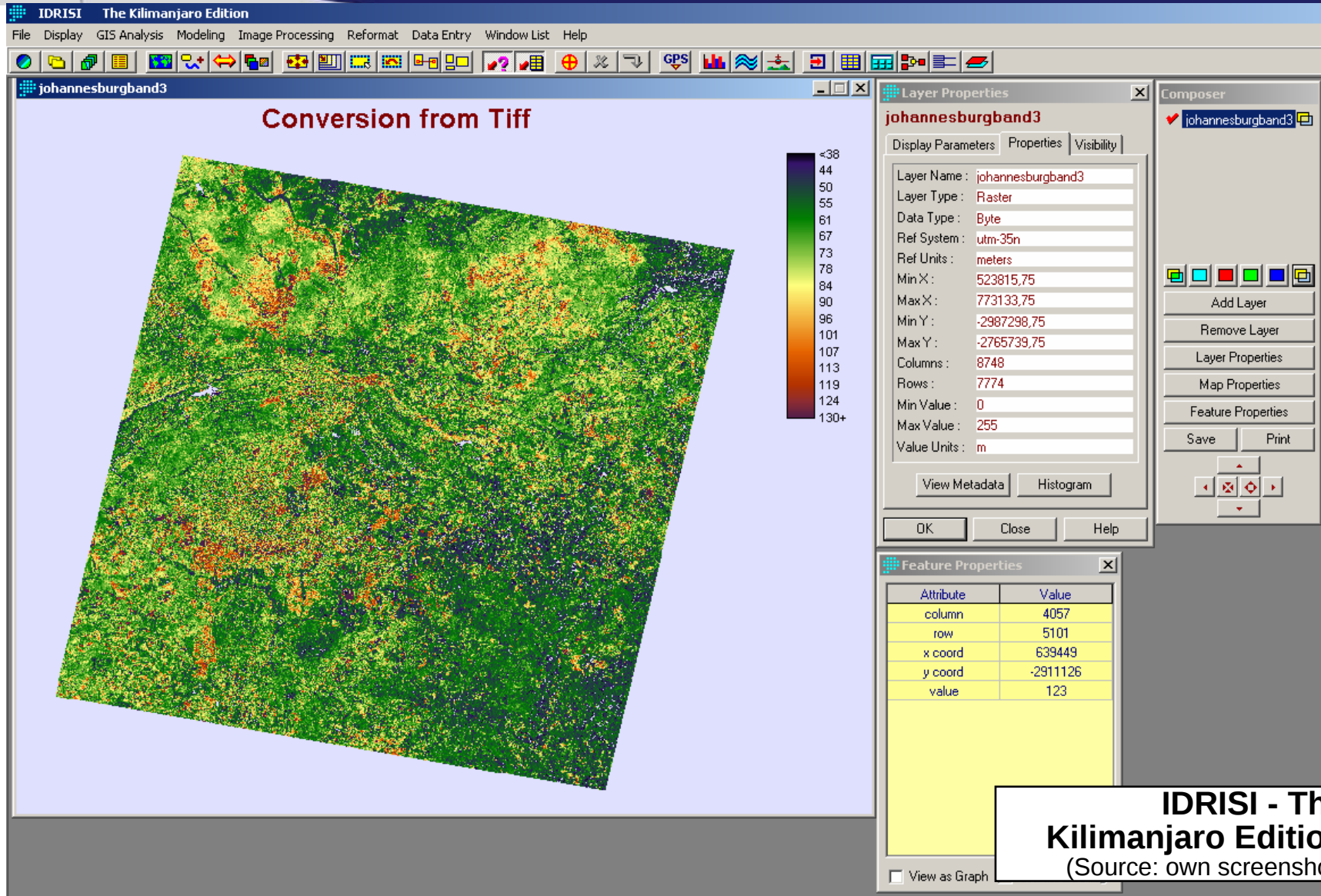
Reasons for using or not using satellite images in schools



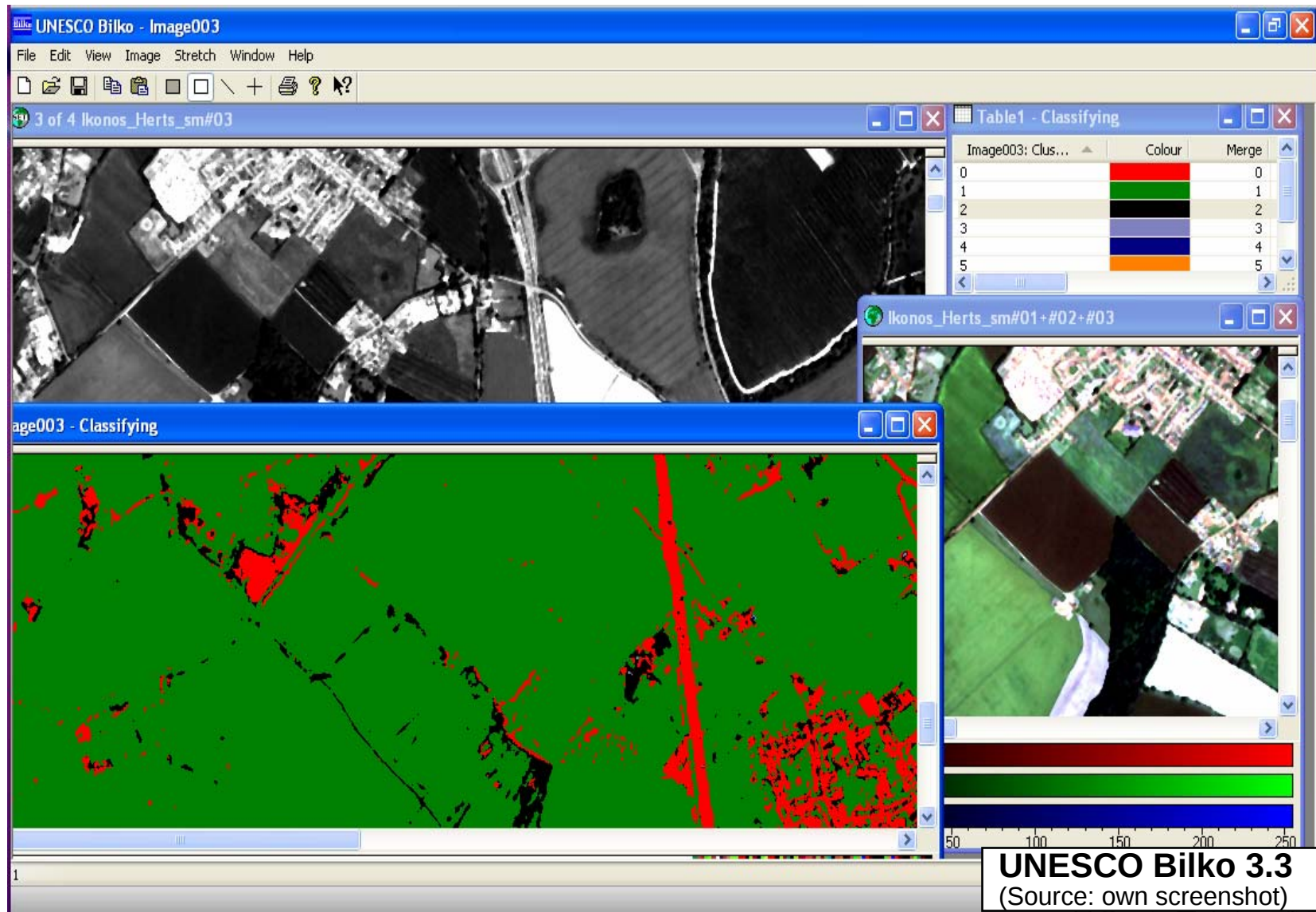


ENVI 4.4
(Source: own screenshot)

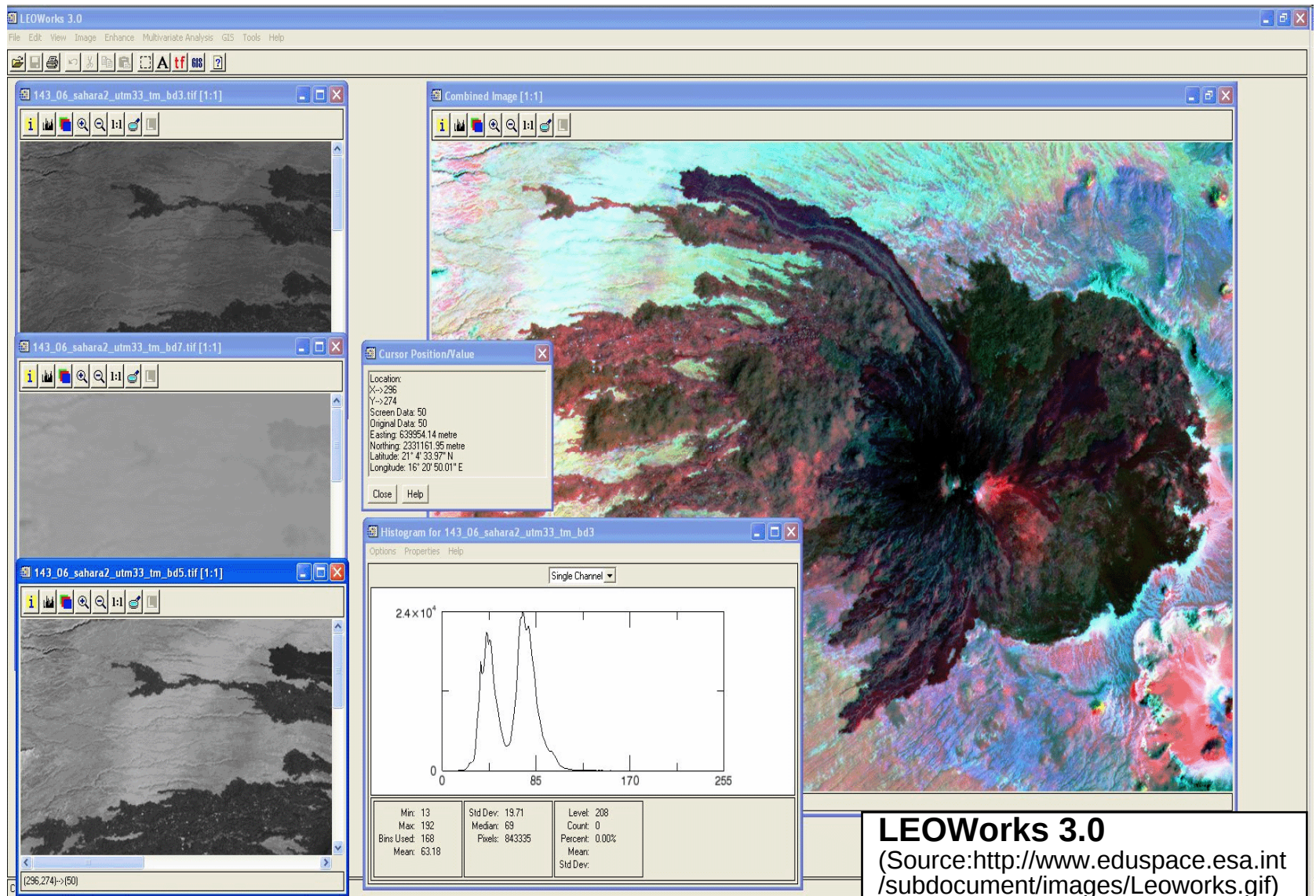




**IDRISI - The
Kilimanjaro Edition**
(Source: own screenshot)

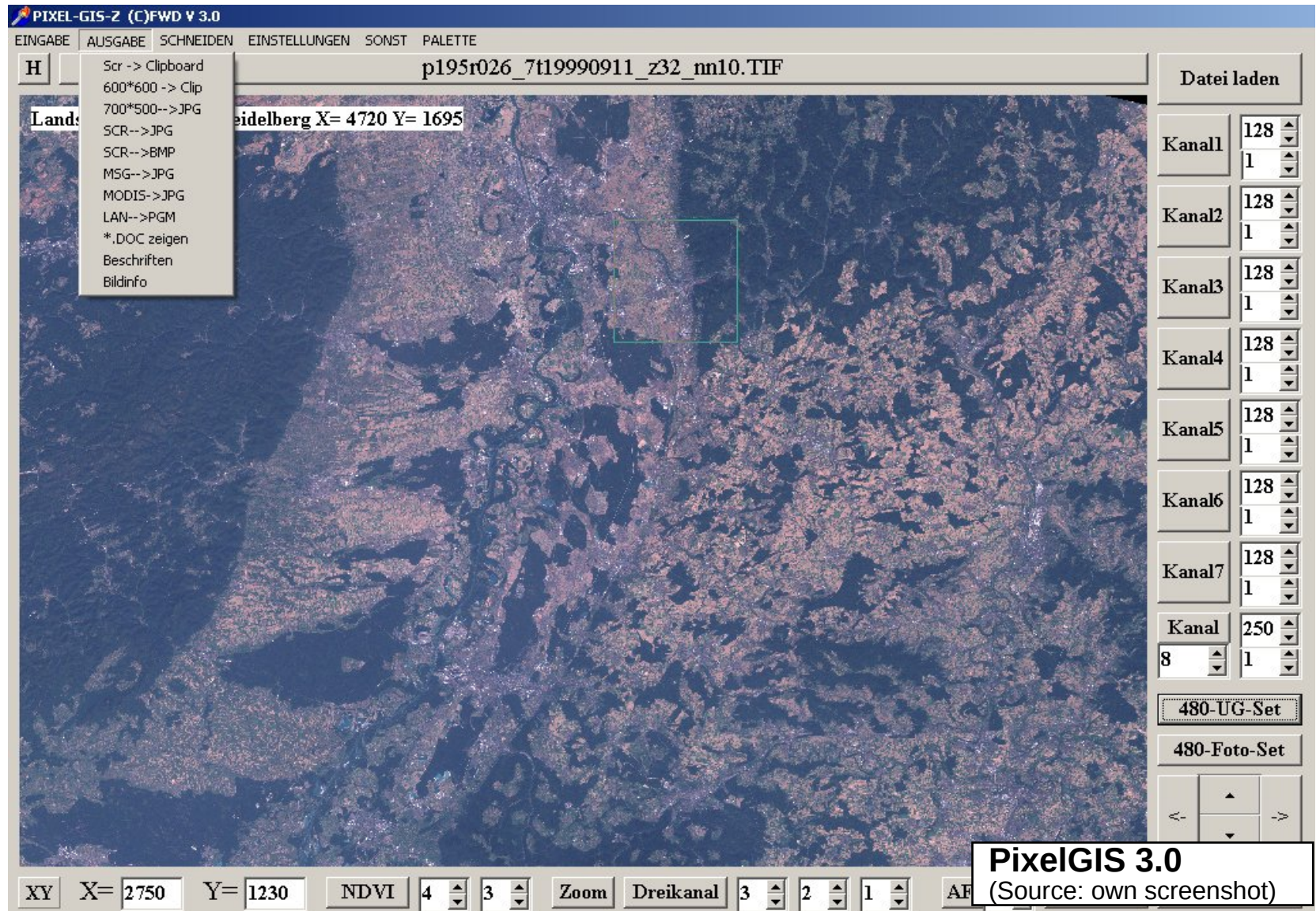


UNESCO Bilko 3.3
(Source: own screenshot)



LEOWorks 3.0

(Source: <http://www.eduspace.esa.int/subdocument/images/Leoworks.gif>)



EINKANAL

Histo 1

ZWEIKANAL

4 3

HisXY PVI

CDVI NDVI

A - B A / B

DREIKANAL

Start R 3
G 3
B 2

KLASS (un)

Klasse1 Stop

Cluster 5

Rad.= 4

KLASS (üb)

1.EINGABE

2.STATISTIK

Quad MiDi

Maxlik Maha

4.Ergebnisse

PIXEL-GIS-Strahlungswertanalyse

G Landsat7 19-11-1999 NDVI=43 N Datei laden



NDVI

-0.20
-0.15
-0.10
-0.05
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
0.50
0.55
0.60
0.65
0.70
0.75
0.80
0.85
0.90
0.95

Kanal1 150

40

Kanal2 120

30

Kanal3 150

20

Kanal4 200

30

Kanal5 200

30

Kanal6 255

1

Kanal7 250

1

Kanal8 255

1

X=473 Y= 60

LupePos

Bild480->Doku

Zoom

Lupe

GLupe

Bild520->Doku

PixelGIS 3.0

(Source: own screenshot)

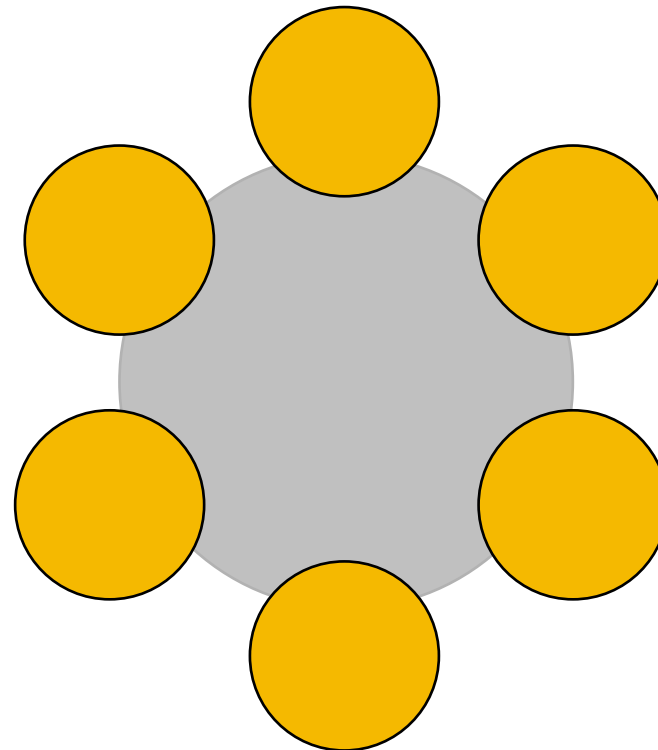
Evaluation and Dissemination of Remote Sensing Software **BLIF**

Compilation of satellite
images on an dynamic
web server

Basic conditions for
requesting remote sensing
software in schools

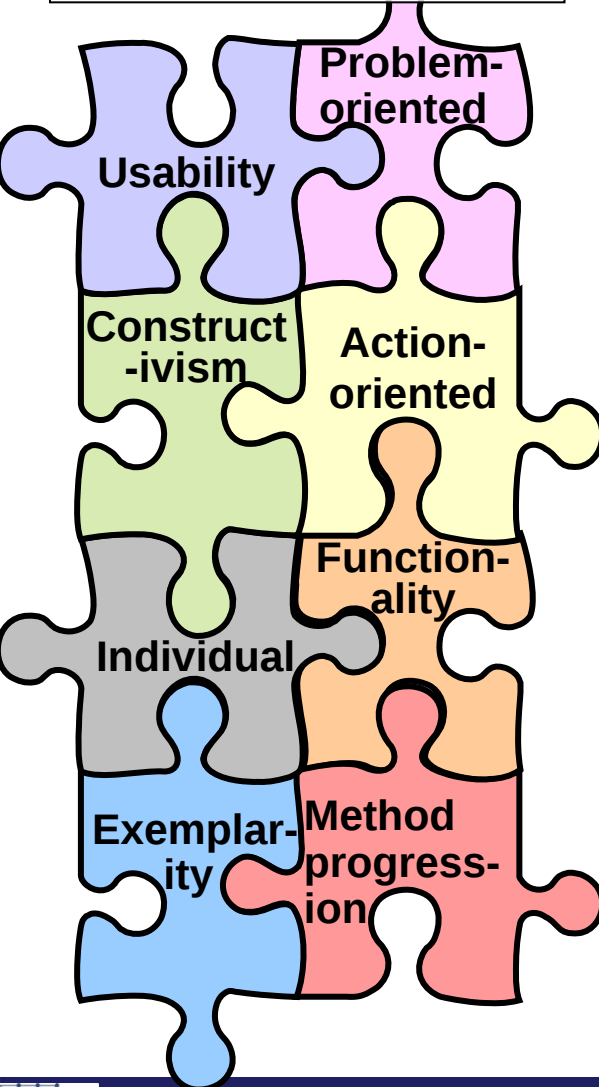
Development of teaching
and learning aids
(conforming to
educational standards)

Furthering of a didactical
remote sensing concept



Development of **BLIF**

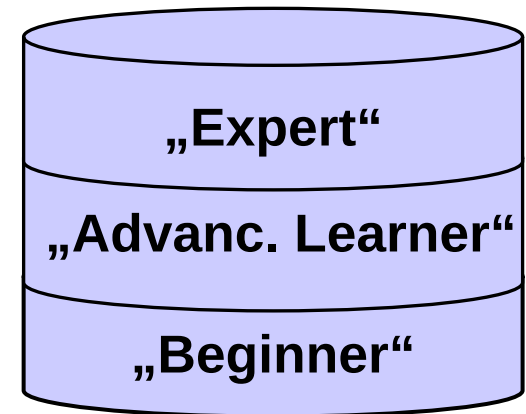
Didactical Principles



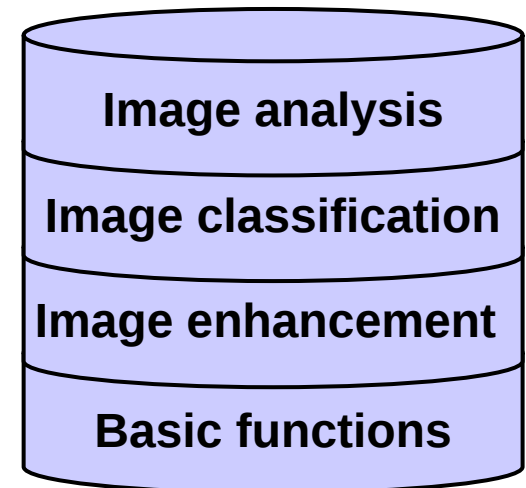
Two Modes



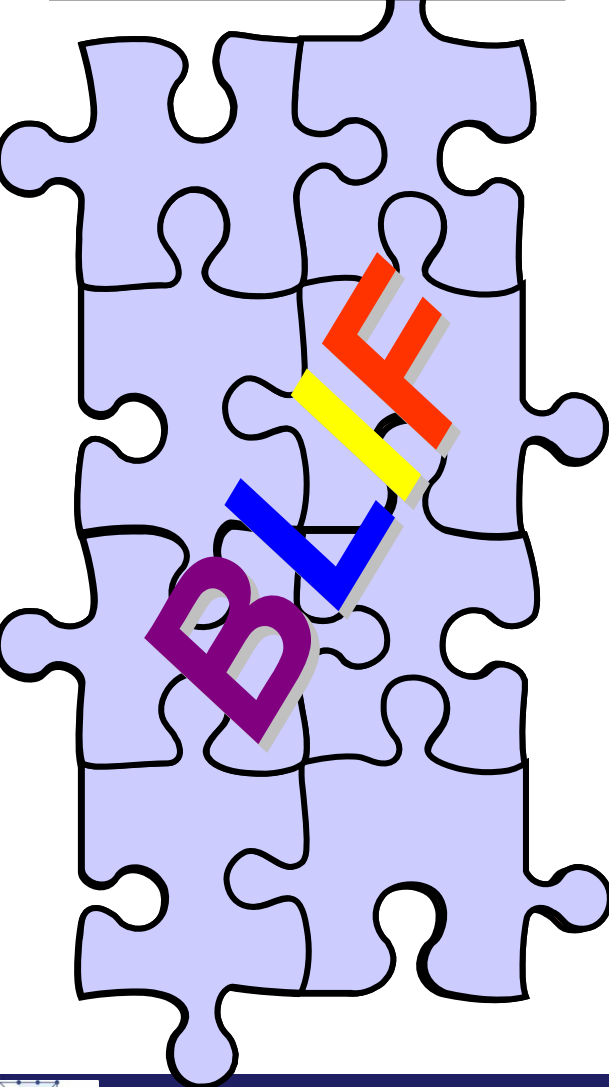
User Level



Software Functions



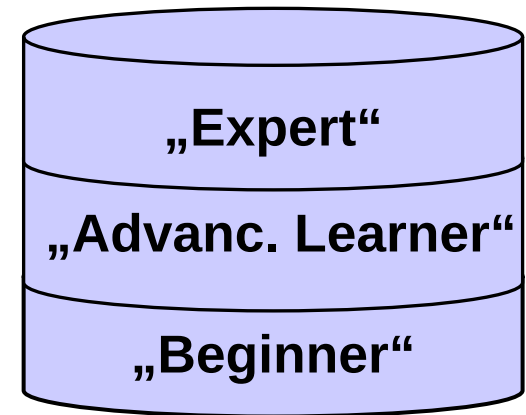
Didactical Principles



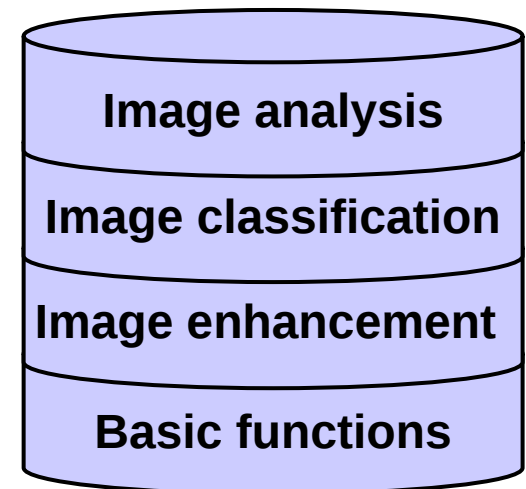
Two Modes



User Level



Software Functions



Assistant Mode: „Beginner“

BliF

Area selection ✓

Next >

Image improvement
Automatic stretching ✓

Manual

Brightness +6

Contrast 100

Next >

Band composites ✓

R = 1

G = 4

B = 3

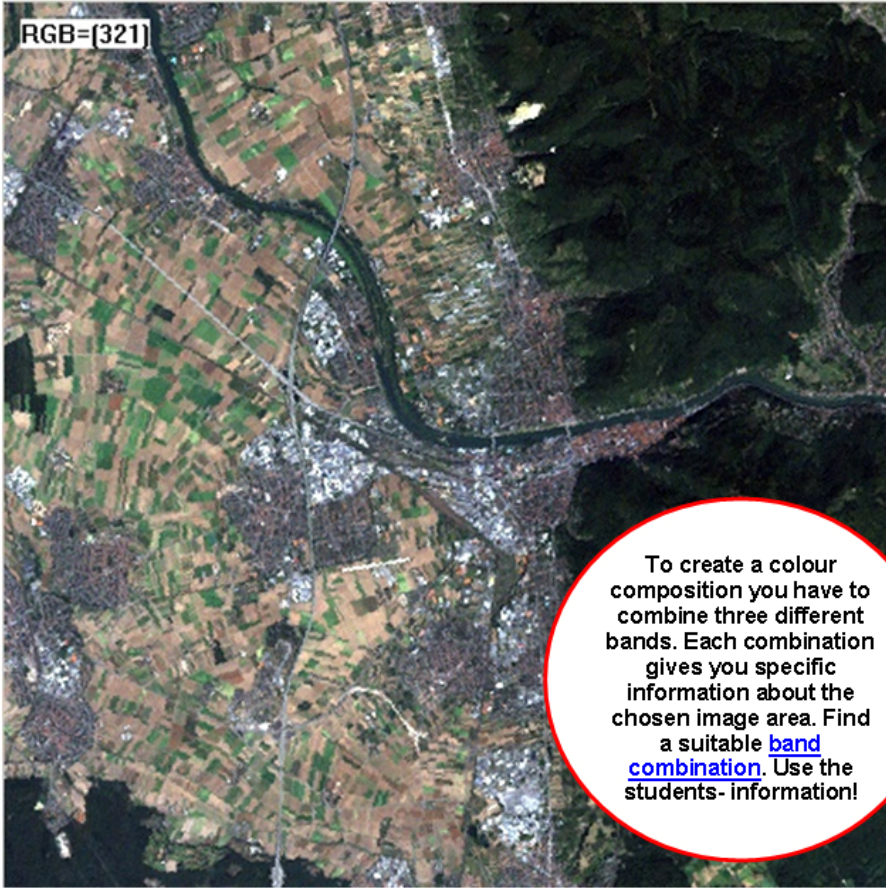
Next >

Band comparison ✓

Vegetation index I (VI)

Next >

RGB={321}



Info ?



To create a colour composition you have to combine three different bands. Each combination gives you specific information about the chosen image area. Find a suitable band combination. Use the students- information!

Satellitus



Assistent Mode: „Advanced Learner“

BliF











i

?

Area selection ✓

Next >

Image improvement
 Automatic stretching
 Manual
 Brightness ✓

+6

 Contrast ✓

100

Next >

Band composites ✓
 R =

1

 G =

4

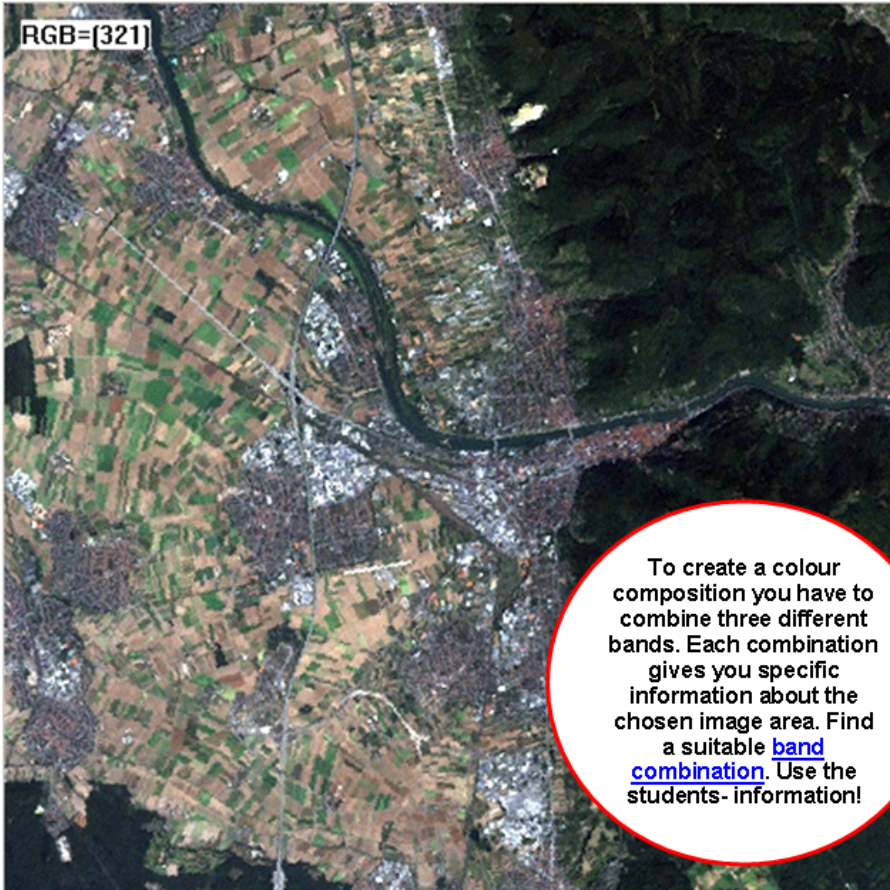
 B =

3

Next >

Band comparison
 Vegetation index I (VI) ✓
 Vegetation index II (NDVI) ✓

Next >



Supervised Classification 🔍
 Quader-Classification ✓
 Maximum-Likelihood-Classification ✓

Next >

Image analysis 🌈
 Percentage of classes

To create a colour composition you have to combine three different bands. Each combination gives you specific information about the chosen image area. Find a suitable band combination. Use the students- information!

Satellit



Assistant Mode: „Expert“

Area selection

Next >

Image improvement

Automatic stretching

Manual

Brightness

Contrast

Histogram

Next >

Band composites

R =

G =

B =

Next >

Band comparison

Histogram comparison

Vegetation index I (VI)

Vegetation index II (NDVI)

Next >

Unsupervised Classification

Number of clusters

Next >

Supervised Classification

Quader-Classification

Maximum-Likelihood-Classification

Next >

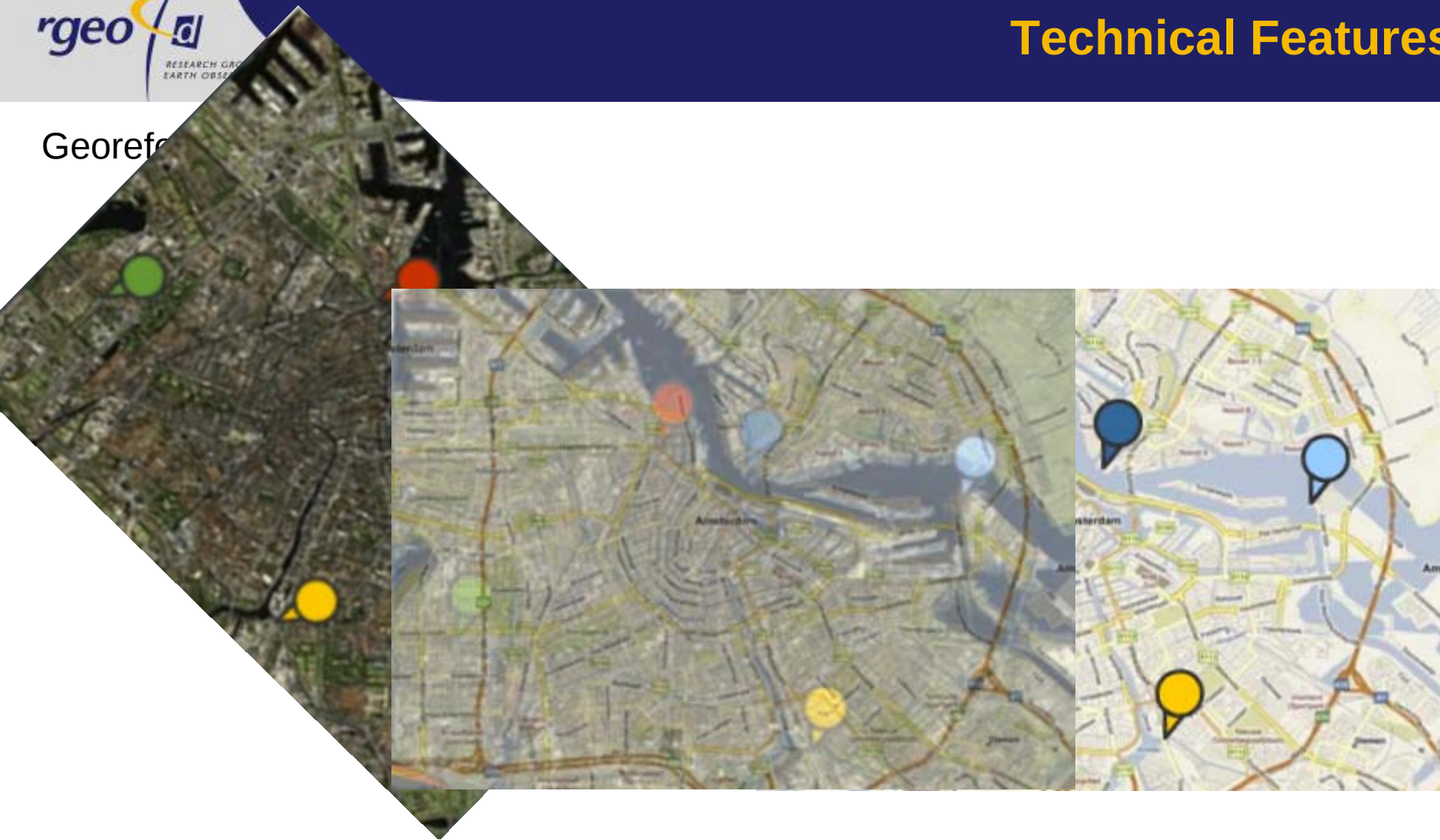
Image analysis

Percentage of classes

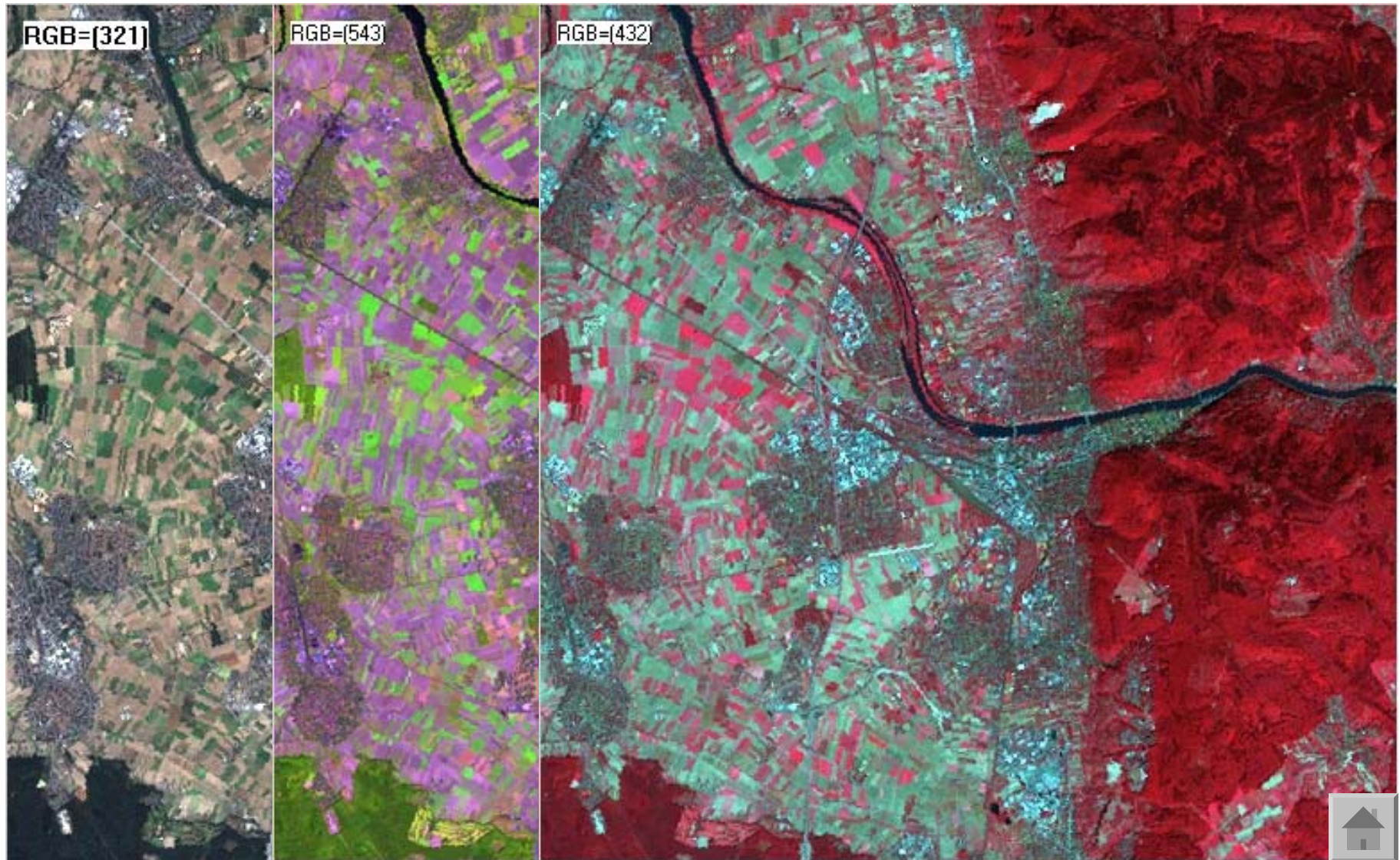
Satellitus

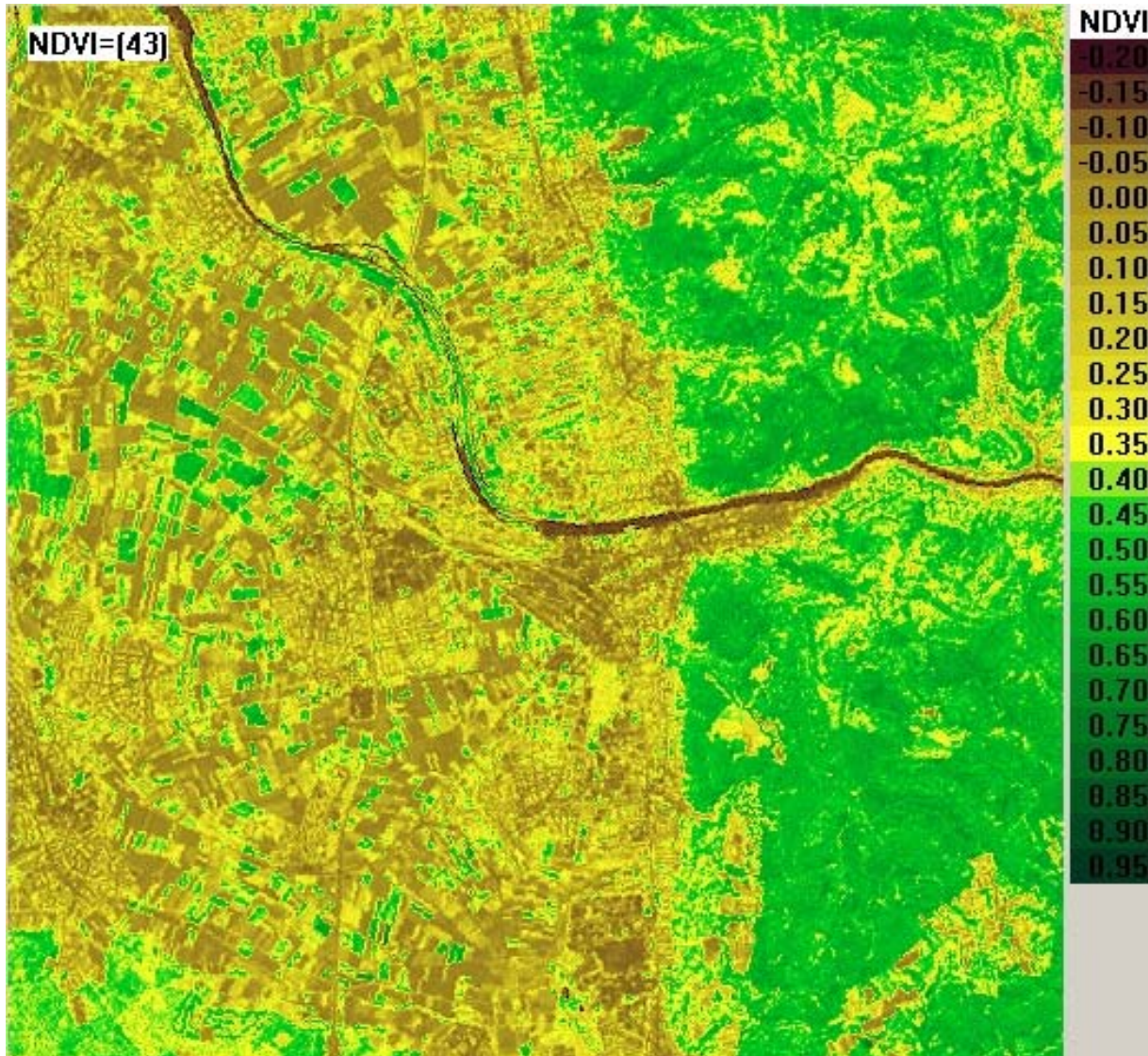
To create a colour composition you have to combine three different bands. Each combination gives you specific information about the chosen image area. Find a suitable [band combination](#). Use the [students- information!](#)

Georefer

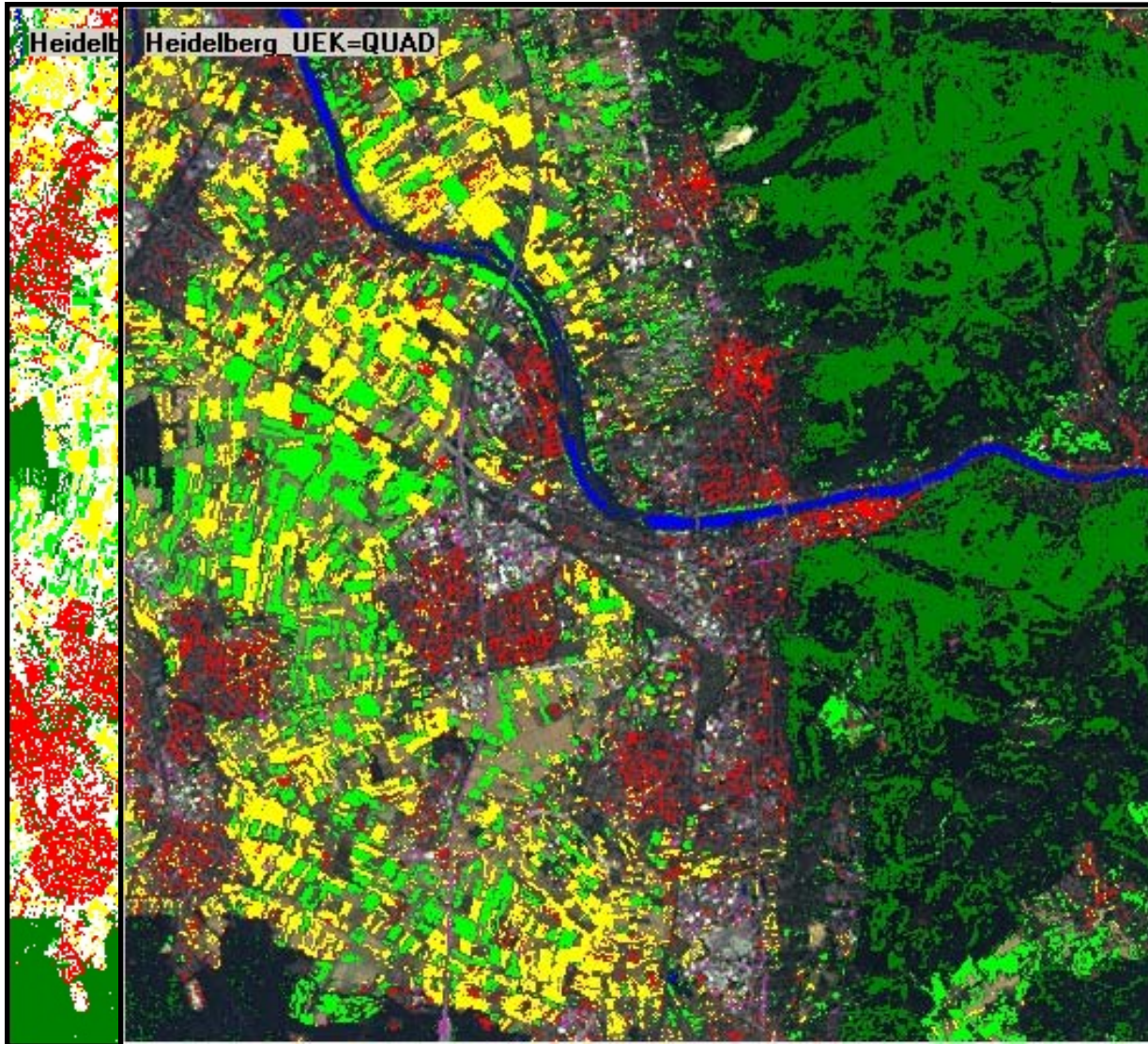


Technical Features: Band Composites





Technical Features: Supervised Classification



- Settlement
- Forest
- Grassland
- Farmland
- Water
- Unclassified



Development of a Web-based Remote Sensing Software for Schools

Thank you for your attention!

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