

INTERREG
Deutschland
Nederland



SMART INSPECTORS






- 2009 founded
- Kleve & Kamp-Lintfort
- 4 Faculties:
Life science (KLE),
Technology (KLE),
Economy (KLE),
General (K-L)
- Plan:
 - 30 Study Programs
 - 5000 Students

Wageningen University and Research Centre

Wageningen Universiteit en Researchcentrum



Motto	To explore the potential of nature to improve the quality of life
Established	1918
Type	state
Rector	Prof.dr. M.J. Kropff
Executive Board President	A. A. Dijkhuizen
Admin. staff	6500 total (including 185 full professors)
Students	9426
Undergraduates	3813
Postgraduates	3713
Doctoral students	1900
Location	Wageningen, Netherlands
Student nationalities	106 (44% of the postgraduates)
Website	www.wageningenur.nl 

SMART INSPECTORS

Smart Aerial Test Rigs
with **Infrared Spectrometers** and **Radars**



Unmanned Aerial Vehicles (UAV)

SMART INSPECTORS

Smart Aerial Test Rigs
with Infrared Spectrometers and Radars



Unmanned Aerial Vehicles (UAV)



Sensors

Why?

SMART INSPECTORS

Fields of Application:

- Security / Monitoring / Disaster Operations
- Inspection of Industrial Plants
- Environmental & Natural Protection
- High-Tech-Agriculture
- Many more



They fly, we fly.

SMART INSPECTORS

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SMART INSPECTORS

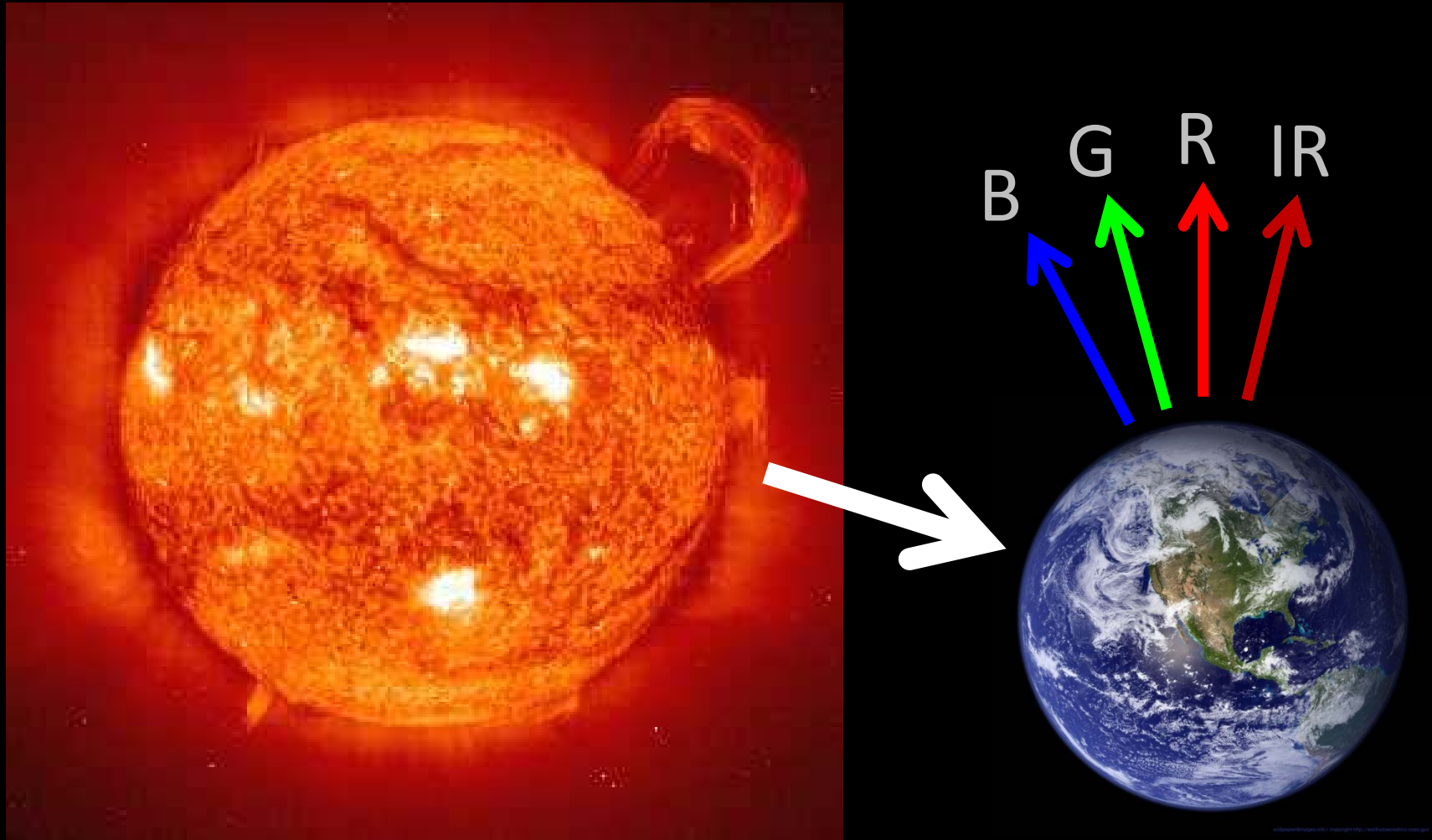
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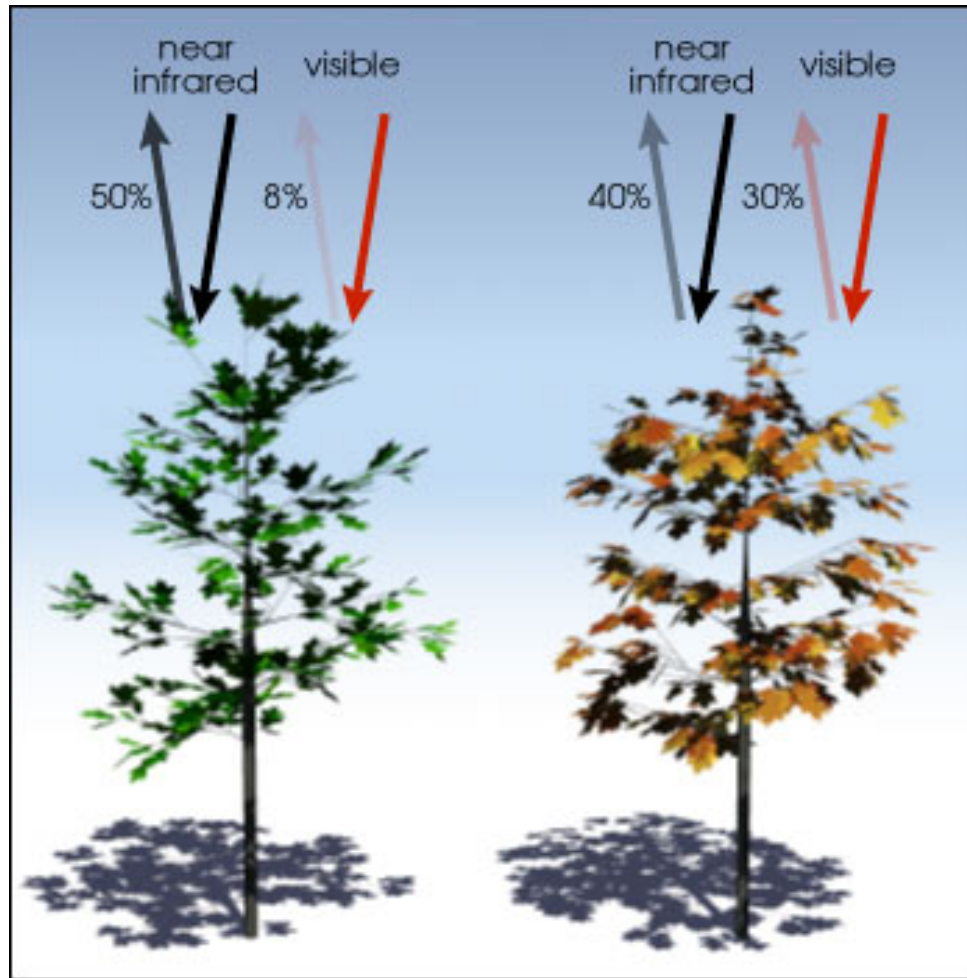


What?

Light



Healthy plants absorb most of visible light (NDVI)

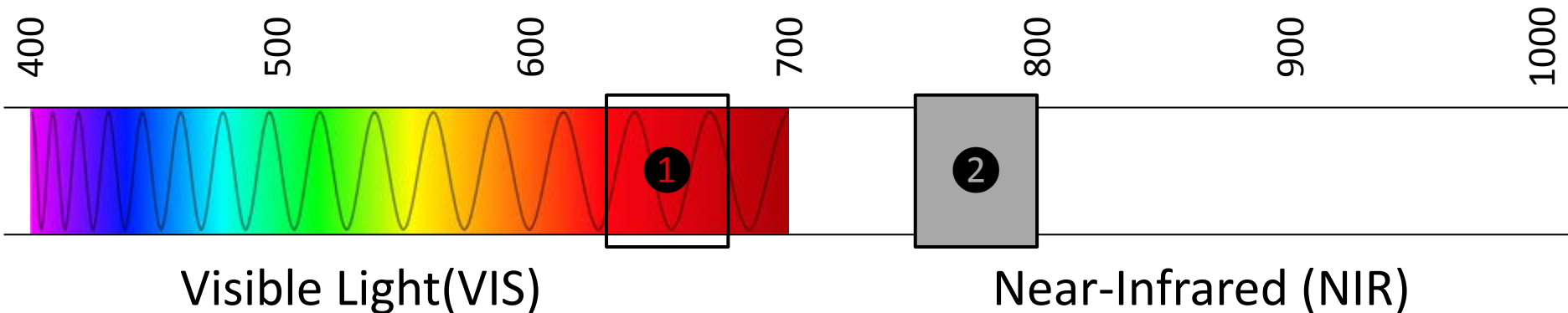
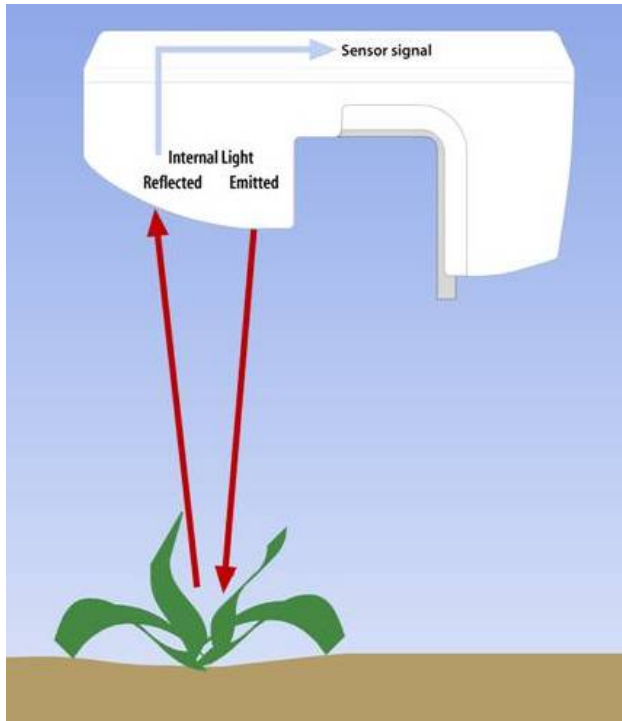


$$\frac{(0.50 - 0.08)}{(0.50 + 0.08)} = 0.72$$

$$\frac{(0.4 - 0.30)}{(0.4 + 0.30)} = 0.14$$

Source: NASA Earth Observatory

Greenseeker: 2-Kanal-Spektrometer (aktiv)



Optische Naherkundung der Pflanzenvitalität (NDVI)

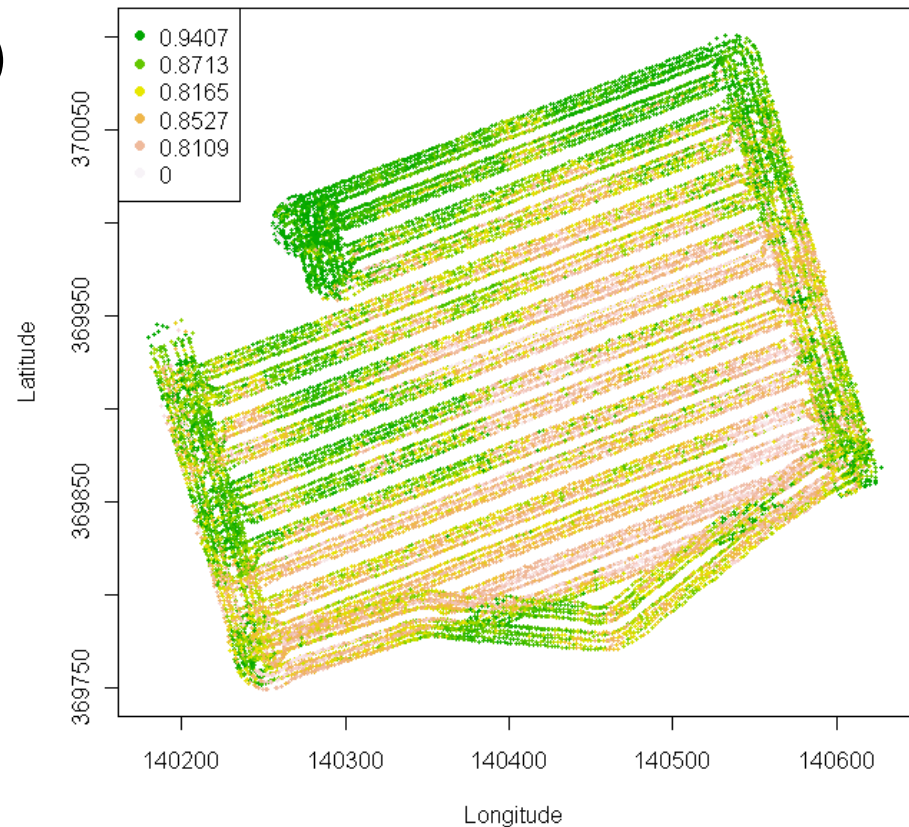
Instrument „Greenseeker“

- Traktorgetragen (4 Stk.)
- Zwei spektrale Bänder: VIS, NIR
- Viele Punktmessungen



Sensors mounted on the spray boom of a hi-boy sprayer take NDVI readings based on the biomass, or leaf density, of the cotton plants.

BLGG AGROXPERTUS
& Jacob van den Borne



Kartoffelfeld

Microcopter as Universal Carrier of Sensors



Payload: 1,5 kg

Flight time: 10 – 20 Min

How?

Hyperspectral System Development

Spectrograph



**Industrial
Camera
Sensor**



**Photogrammetric
Camera**



**GPS-Inertia
Navigation System**



Our Gyrocopter OLGA: Observational Light Aircraft for Geophysical Applications



Our Gyrocopter OLGA: Observational Light Aircraft for Geophysical Applications



Auto-Gyro:

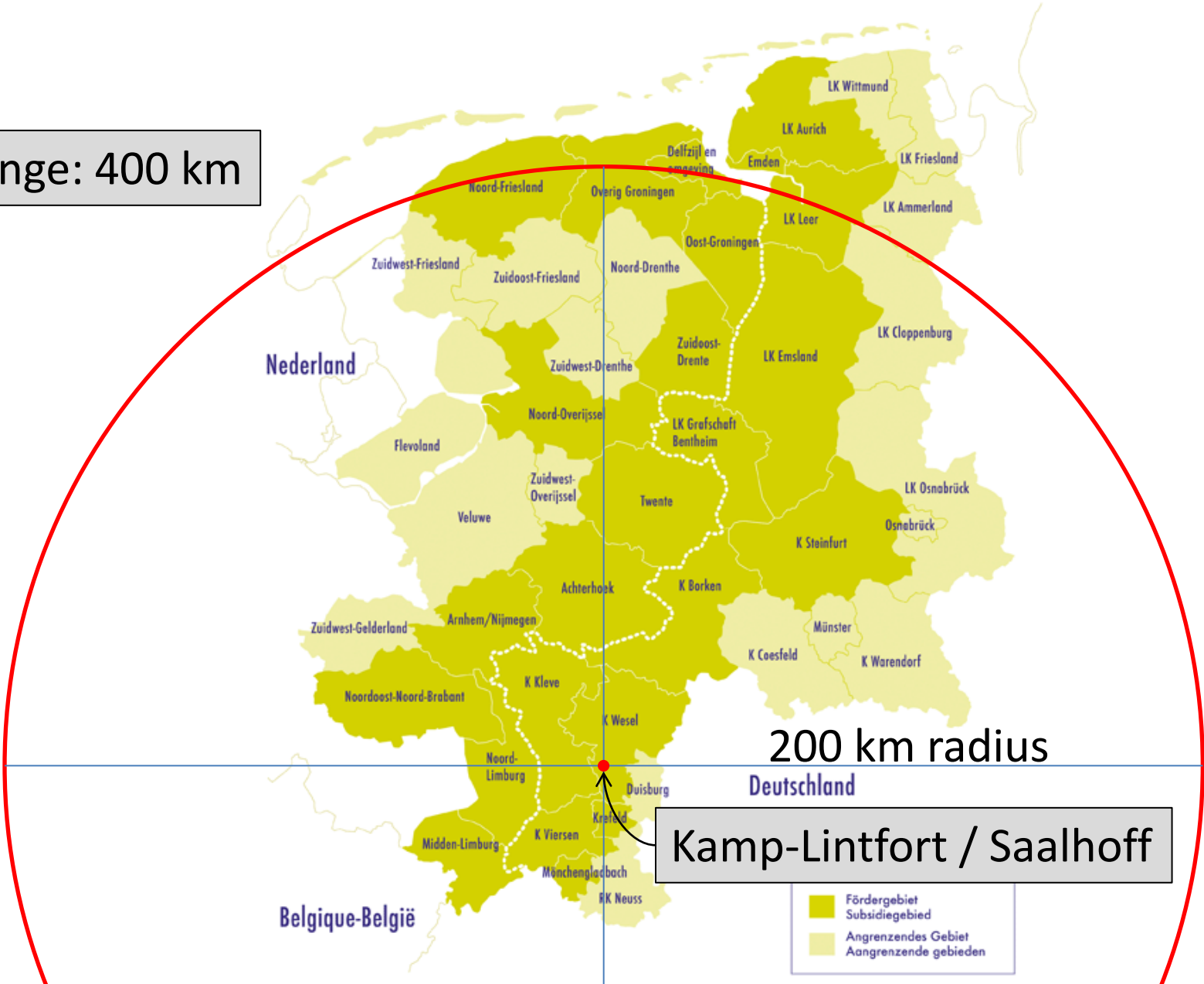
- larger radius of action (D-NL)
- higher payload
- Less regulations?

INTERREG IV A Deutschland-Niederland

Programmgebiet | programmagebied



Range: 400 km



Nederland

200 km radius

Deutschland

Kamp-Lintfort / Saalhoff

Belgique-België

- Fördergebiet Subsidiegebiet
- Angrenzendes Gebiet Aangrenzende gebieden

Our unique selling
proposition?

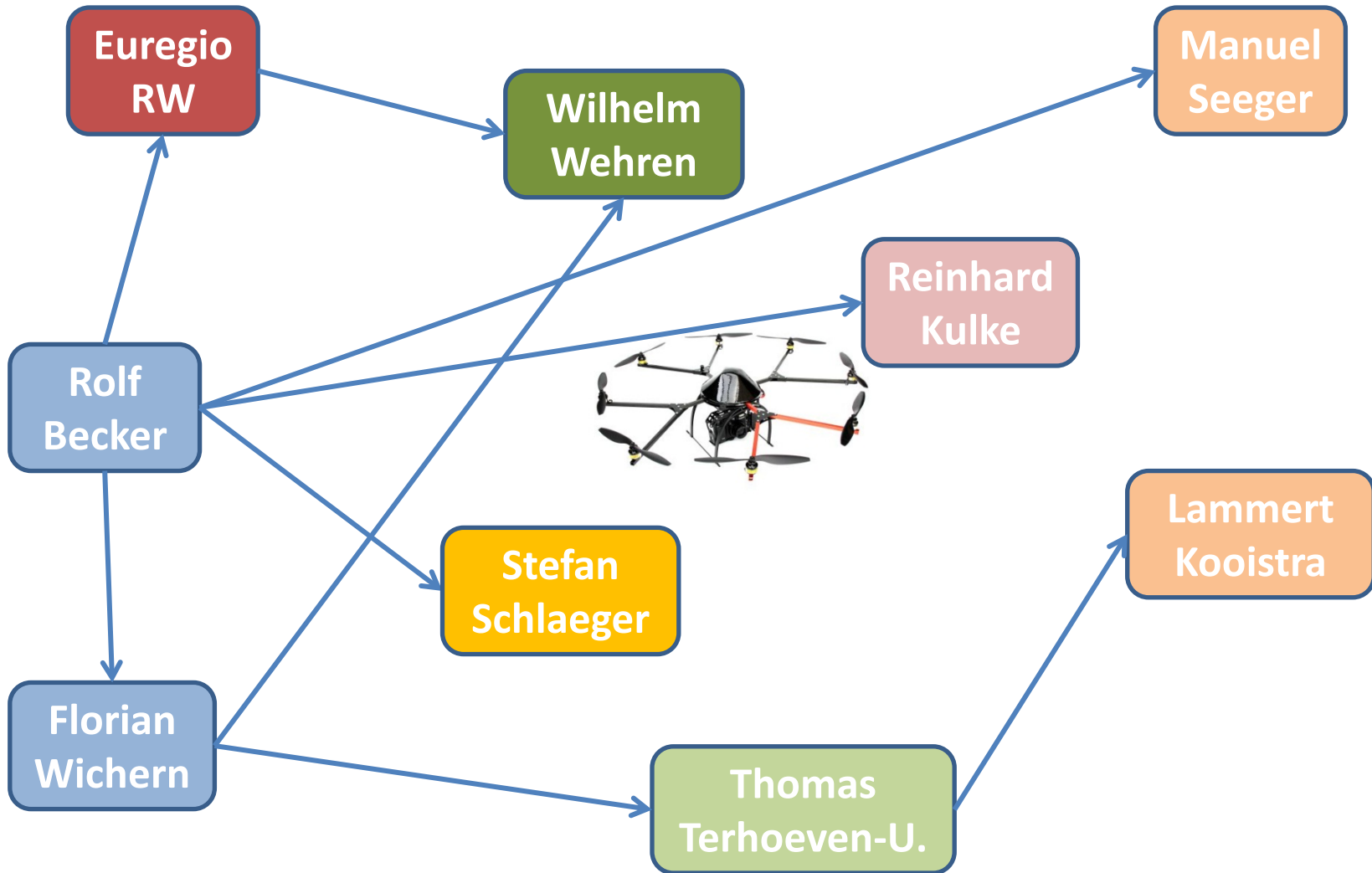
A first idea ...

Rolf
Becker



Januar 2011

... find partners ...



EUREGIO

HSRW

LWK NRW

SCEME.DE

BLGG

IMST

WUR

Consortium



BLGG AGROXPERTUS

Landwirtschaftskammer
Nordrhein-Westfalen

SCEME.DE

- Hochschule Rhein-Waal
- Wageningen UR
- IMST GmbH
- BLGG Research
- Haus Riswick, LWK NRW
- sceme.de GmbH

Consortium



BLGG AGROXPERTUS



SCEME.DE

Technology le Rhein-Waal

Remote Sensing

Radar

R&D in Agriculture

Agricult. Practice NRW

Env. Sensors PH



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Nederland

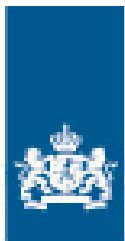


provincie
Gelderland



INTERREG - Grenzregionen gestalten Europa
Europäischer Fonds für Regionale Entwicklung der Europäischen Union

INTERREG - Grensregio's bouwen aan Europa
Europees Fonds voor Regionale Ontwikkeling van de Europese Unie



Ministerie van Economische Zaken,
Landbouw en Innovatie

Ministerium für Wirtschaft, Energie,
Bauen, Wohnen und Verkehr
des Landes Nordrhein-Westfalen



Application Procedure

- Present your R&D idea to the Euregio in Kleve
- Find partners and meet them, discuss
- Submit draft proposal to the Euregio
- Intensive discussion on the focus and detailed WPs
- Application documents:
 - Inter-DB
 - + detailed financial plans + cost justifying documents (quotations, Excel, Word)
 - + extended work package description
- Find additional associated partners (network)

Antragsverfahren

- Defense in front of Euregio Committee 1
- Defense in front of Euregio Committee 2
- Recommendation and decision by Euregio Council
- Answering queries from the steering committee, (Ministerie EZ and District Government Düsseldorf)
- External project proposal review required
- Commenting the review
- Answering still open queries personally, meeting with Bez.Reg. Düsseldorf, phone call with M. EZ.
- Submit the revised application

Antragsverfahren

- Waiting for the next steering committee meeting
- Approval by the steering committee
- Creation of approval documents by District government Münster
- Approval!!!
- End of March 2012, after 15 Monaten and 140 E-Mails to the Euregio-Project Manager

It goes on ...

- Complete revision of financial plan: annual budgets
- Consortium contract:
formulate, discuss, modify, ratify
- First Level Control: public tendering
- Project Administrator: publish job description,
invite applicants, interview, hire
- Find additional people (publish job offers, interview ...)
- Spend money
- 1st call for funds
- ...

Still: It's worth it.

Budget Summary

- 3.2 Mio € fundable costs
- 2.3 Mio € funded
- 1.4 Mio € from EU
- 450.000,- € from NRW
- 450.000,- € from Gelderland + Ministerie EZ

Budget Summary

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75% of expenses for personnel.
This gives people jobs!



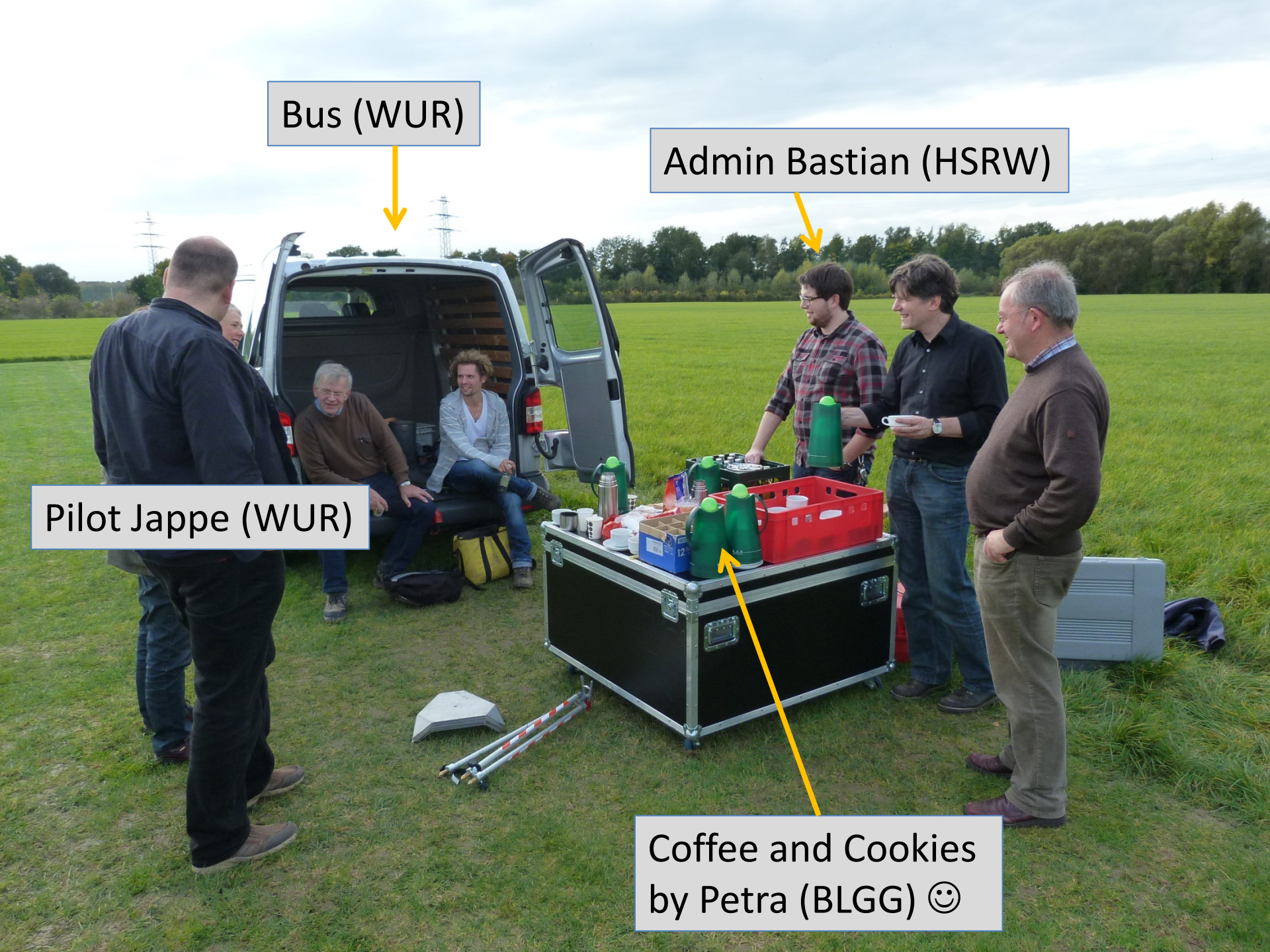


Bus (WUR)

Admin Bastian (HSRW)

Pilot Jappe (WUR)

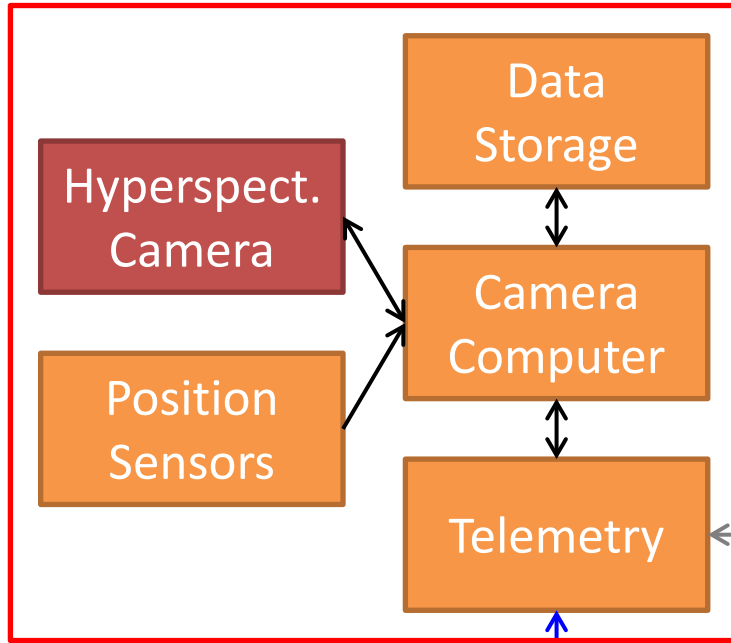
Coffee and Cookies
by Petra (BLGG) 😊



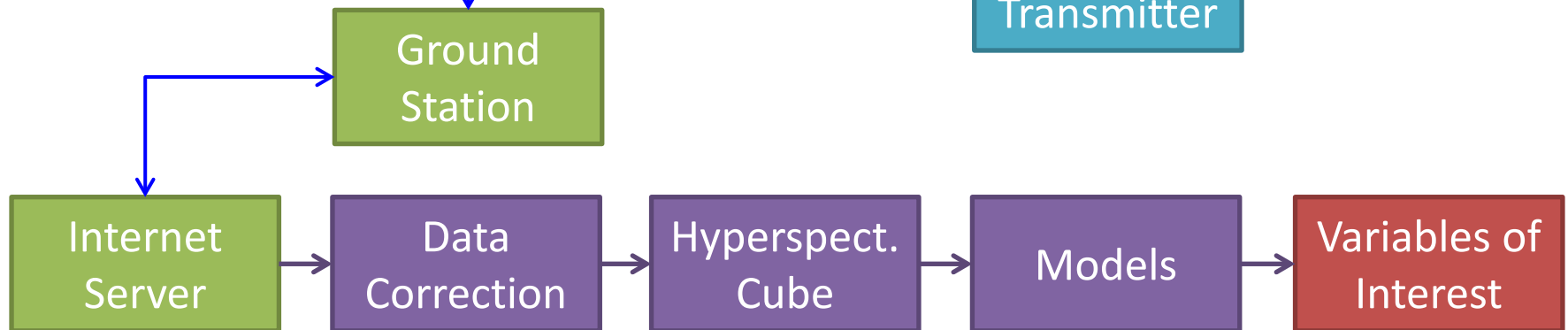
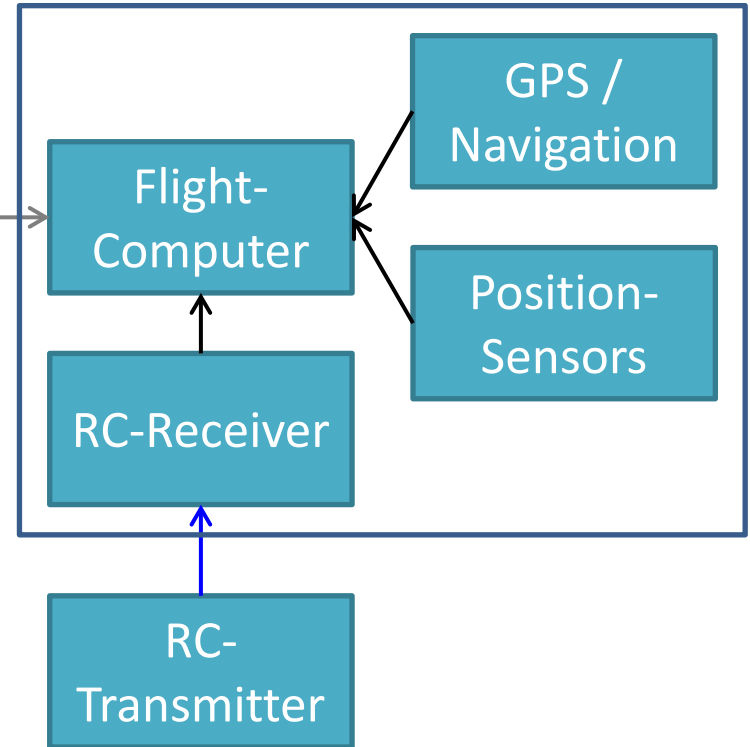


Data Flow, Example Camera

Smart Hyperspectral Line Scan Camera



Flying Platform



Gruppe 1: Sensoren und Plattformen

- WP 1.1: Miniradar
- WP 1.2: Multispektralkamera
- WP 1.3: Infrarot-Hyperspektralkamera
- WP 1.4: Hyperspektralscanner
- WP 1.5: Kamerasteuerung und Fluglageaufzeichnung
- WP 1.6: Fluggeräte und Systemintegration
- WP 1.7: Drahtloses geokodiertes Sensornetzwerk
- WP 1.8: Stabilisierte Kamera-Montierung für Tragschrauber

Gruppe 2: Prozessierung

- WP 2.1: Teilautomatisierte Prozesskette
- WP 2.2: Radiometrische Korrektur
- WP 2.3: Hyperspektraler Würfel
- WP 2.4: Geoportal
- WP 2.5: Smartphone App

Gruppe 3: Ausgewählte praktische Anwendungen und Produkte

- WP 3.1: Boden-Pflanze Interaktion
- WP 3.2: Bodenqualität

Gruppe 4 + 5: Unterstützende Aktivitäten

- 4. Weitere Aktivitäten
 - WP 4.1: Geschäftsmodelle
 - WP 4.2: Wissenskommunikation
 - WP 4.3: Public Relations

- 5. Projektmanagement
 - WP 5.1: Finanzielles Projektmanagement und Controlling
 - WP 5.2: Inhaltliche Koordination

Our unique selling
proposition?

We cover the whole
processing chain of
remote sensing.

More Applications and Networking

Competence Network Remote Sensing Rhein-Waal



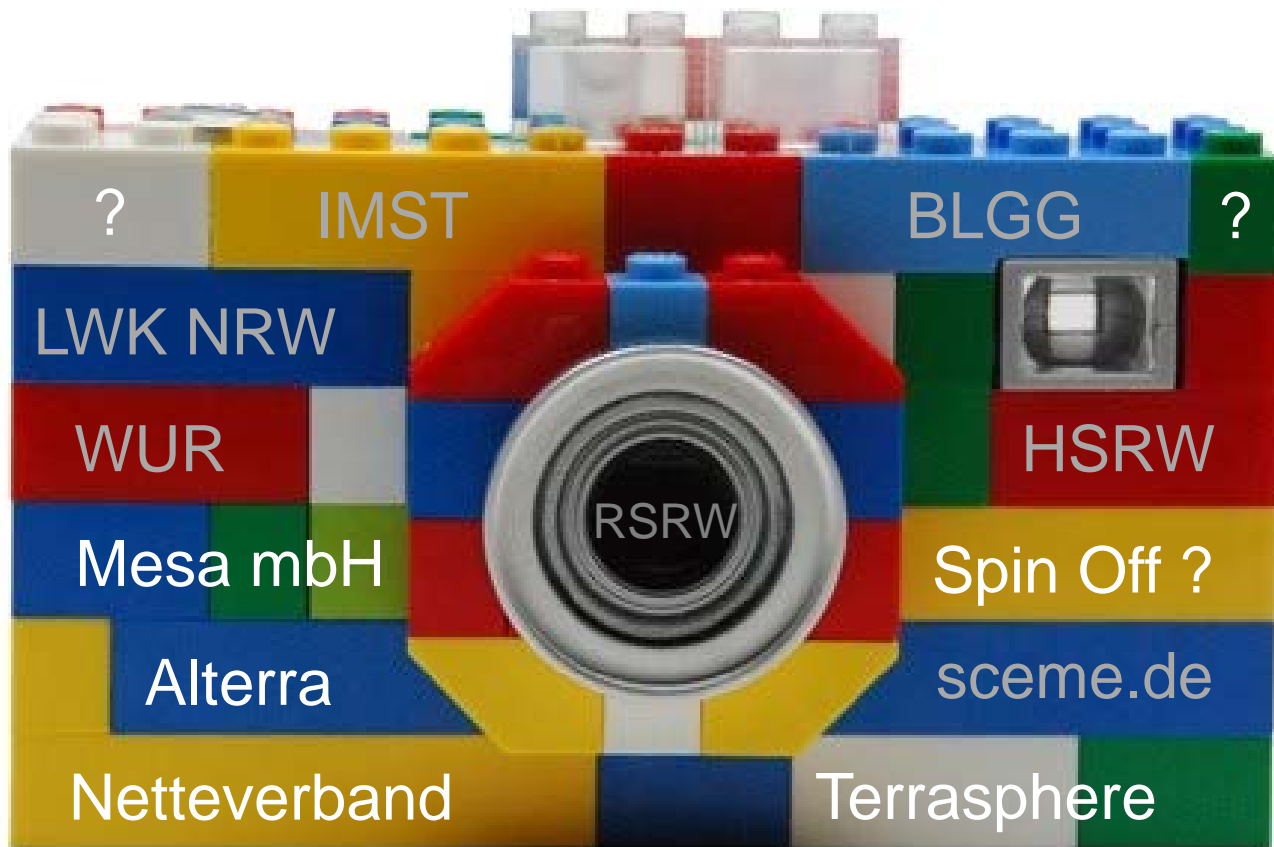
Competence Network Remote Sensing Rhein-Waal

Foundation



Competence Network Remote Sensing Rhein-Waal

Networking



Competence Network Remote Sensing Rhein-Waal

Networking



Network Events

- E.g. High Tech Campus Eindhoven, 2013-04-11

UAS Event

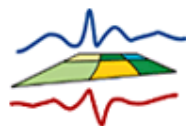
The commercial market requires good services

Good infrastructure, IT, sensors, high quality communication and service provisioning are necessary, and a well-performing UAS.

2nd Edition, High Tech Campus Eindhoven, The Netherlands, 11 April 2013

[Register now!](#)





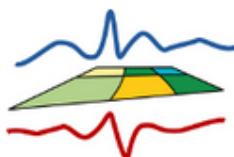
SFB TR32 - Database

RWTHAACHEN

universität bonn



- Login
- WebGis
- Regions & Sites
- Search
- DOIs
- Topic
 - S-oil
 - V-vegetation
 - A-tmosphere
 - Land Use
 - Remote Sensing
 - Topography
 - Other Data
- Data Type
 - Data
 - Basic Geodata
 - Reports
 - Presentations
 - Publications
 - Pictures
- Phases
 - Clusters (Projects)
 - Cross Groups



CROP.SENSE.net

Workshop on UAV-based Remote Sensing Methods for Monitoring Vegetation

September 9th - 10th, 2013



ICASD

International Center for
Agro-Informatics and
Sustainable Development



Information from Imagery



JÜLICH
FORSCHUNGSZENTRUM

Perspective:
Several novel markets,
high-tech products
and services
in the Euregio Rhein-Waal



SMART INSPECTORS

Competence in Remote Sensing