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DiveCropS  
—  
Contributions by  
Geodesy and Geoinformatics  
at Rostock University


Prof. Dr.-Ing. Ralf Bill  
Rostock University  
Faculty for Agricultural and Environmental Sciences  
Professorship for Geodesy and Geoinformatics

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**PROFESSORSHIP FOR GEODESY  
AND GEOINFORMATICS**

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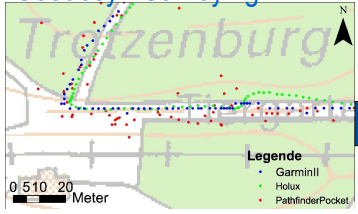
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## Geodesy and Geoinformatics


- Founded as independent institute in April 1994.
- Interdisciplinary team of Geodesists, Geoinformaticians, Computer scientists, Geographers, and Environmental Engineers.
- In average around 15 collaborators (thereby 6 funded by the University).

⇒ **Our Mission**


**Geodesy - Surveying**




**ubiquitous**



**Geoinformatics**



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## Presenters


- Prof. Dr.-Ing. Ralf Bill
  - Head of the institute
  - Studied Geodesy
  - Dr.-Ing. 1983 (Karlsruhe)
  - Professor since 1994

- Dr.-Ing. Görres Grenzdörffer
  - Head of research unit Photogrammetry and Remote Sensing
  - Studied Geography
  - Dr.-Ing. 2001 (Rostock)






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# TEACHING

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## GG-Teaching (P-Mandatory, WP-Elective)


Study programme	Winter term (WS)	Summer term (SS)
<b>Uni Rostock</b>		
B.Sc. Agricultural Sciences	Precision Farming (P)	
M.Sc. Aquaculture		Geoinformatics (WP)
B.Sc. Environmental Engineering Sciences as well as external: Computer science, Biology ...	Introduction to Environmental Engineering Sciences (P) Cartography & Remote Sensing (WP)	Geodesy (P) Geoinformatics (P)
M.Sc. Environmental Engineering Sciences	Environmental Informatics (P) GeoProcessing (WP) Research project (WP) Open geodata (online) (WP)	Research seminar (P) GeoImaging (WP) Geoinformatics and Landscape Change (WP) Open geodata (online) (WP)
<b>WINGS (HS Wismar)</b>		
Remote study course M.Sc. Integrated development or peri-urban regions (ISLE)	Geoinformatics (WP)	

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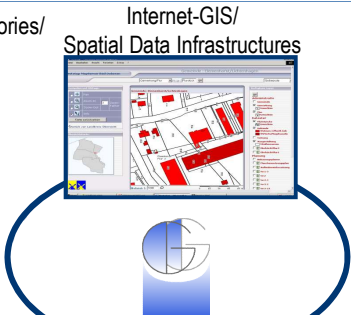
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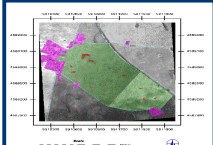
# RESEARCH

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## Research in Geodesy and Geoinformatics



- Virtual research laboratories/  
Landscape changes 
- Internet-GIS/  
Spatial Data Infrastructures 
- Remote Sensing/  
Remotely Piloted Aircraft  
Systems 
- eScience/ Research  
data infrastructures 
- Mobile GIS/  
Geosensor networks 
- Precision Farming/  
Farm Management  
Information Systems 

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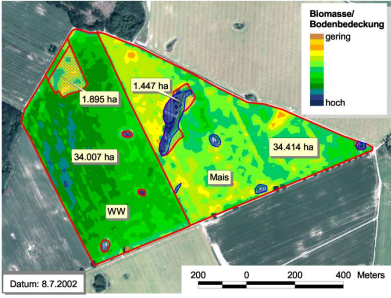
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## Two major application areas


- Municipalities and counties
  - 3D, Augmented and Virtual Reality
  - Internet GIS
  - Spatial data infrastructures
  - Mobile GIS
  - Land use/land change

- Agriculture/Precision Farming
  - Remote Sensing
  - Digital terrain models
  - Geosensor networks
  - Spatial data infrastructures
  - Farm Management Systems





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# CONTRIBUTIONS TO DIVECROPS

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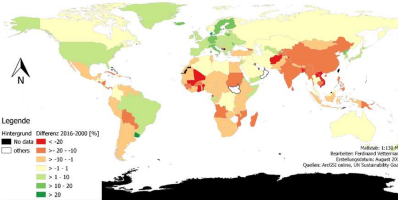
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## Outcome 1 – Block 3 - Methodology


- Material preparation on GIS and Remote Sensing
  - Textbook
  - Open online unit:
    - GIS
    - UN Sustainable Development Goals

Veränderung des Anteils erneuerbarer Energien am Gesamtstrombedarf im Zeitraum 2000 bis 2016 in Prozentpunkten




**Legende**  
Hintergrund: Differenz 2016-2000 [%]  
Farbe: Differenz [%]  
- > 20  
- 20 - 10  
- 10 - 0  
- 0 - 1  
- 1 - 10  
- 10 - 20  
- > 20

**Introduction to spatial information processing**  
Ralf Bill (Editor)




Textbook for international GIS courses



Second Edition, Volume 17, 2019  
Rostock University  
Faculty of Agricultural and Environmental Sciences  
Chair of Geodesy and Geoinformatics

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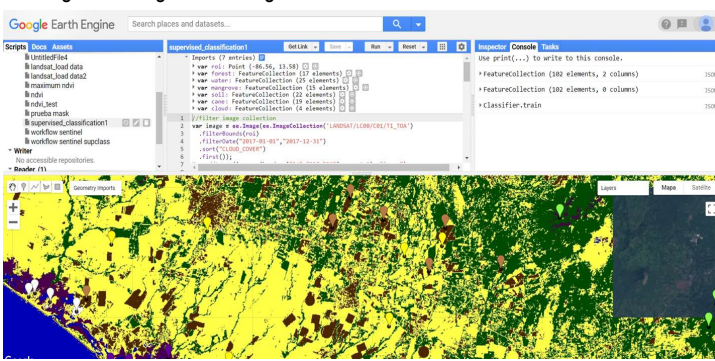


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## Outcome 3 - Research themes


  

- Guest visit Alex M. Castellón Meyrat from Universidad Nacional Agraria (UNA), Faculty of Natural Resources, Department of Watershed Management <=
  - Remote sensing with Google Earth Engine



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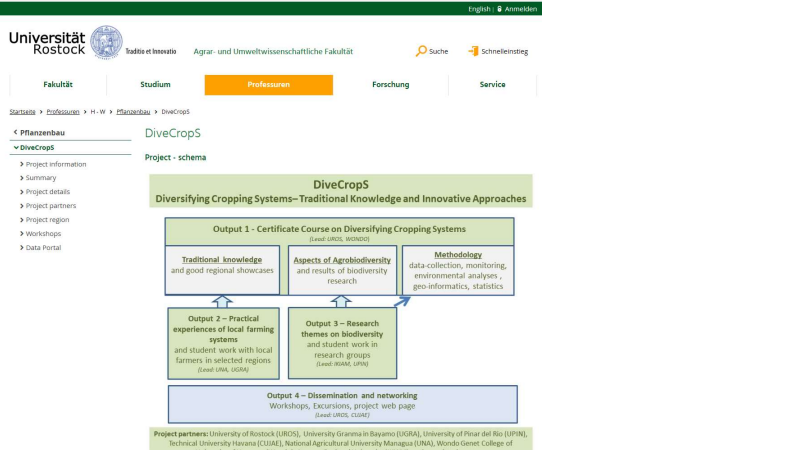




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## Outcome 4 – Workshop/Ideas for discussion

- Workshop for Ecuador
- Webpage : <https://www.auf.uni-rostock.de/professuren/h-w/pflanzenbau/divecrops/>



The screenshot shows the DiveCropS website interface. At the top, there are navigation tabs for 'Fakultät', 'Studium', 'Professuren', 'Forschung', and 'Service'. The 'Professuren' tab is active. Below the navigation, there is a breadcrumb trail: 'Startseite > Professoren > H.-W. > Pflanzenbau > DiveCropS'. The main content area displays the 'Project - schema' for 'DiveCropS: Diversifying Cropping Systems– Traditional Knowledge and Innovative Approaches'. The schema is a flowchart with four main outputs:


- Output 1 – Certificate Course on Diversifying Cropping Systems** (Lead: UROK, WRODCE)
  - Traditional knowledge and good regional showcases
  - Aspects of Agrobiodiversity and results of biodiversity research
  - Methodology: data collection, monitoring, environmental analysis, geo-informatics, statistics
- Output 2 – Practical experiences of local farming systems and student work with local farmers in selected regions** (Lead: URA, UGBA)
- Output 3 – Research themes on biodiversity and student work in research groups** (Lead: WAM, LPM)
- Output 4 – Dissemination and networking** (Workshops, Excursions, project web page) (Lead: UROK, UJAZ)

Project partners: University of Rostock (UROK), University Granada in Bayamo (UGBA), University of Pinar del Rio (UPNR), Technical University Havana (CUAE), National Agricultural University Managua (UNAM), World Genet. College of

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13

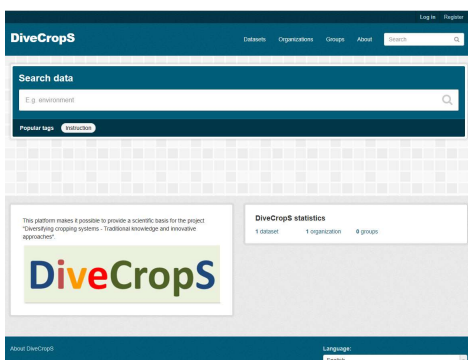


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## Outcome 4 – Workshop/Ideas for discussion

- Common data portal  
<https://divecrops.auf.uni-rostock.de/>
  - Web interface

- Fact sheet for regions
- Relevant data for the regions



The screenshot shows the DiveCropS web interface. It features a search bar with the text 'E.g. environment' and a search button. Below the search bar, there are 'Popular tags' and 'Webinars'. A statistics box shows 'DiveCropS statistics' with '1 dataset', '1 organization', and '0 groups'. The interface also includes a 'Log in / Register' link and a 'Language' dropdown menu.

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14

Table 2 Fact sheet of the Project Regions

Facts/ characteristics	Description
<b>General information</b>	
Country	
Name of the region	
Contact partner	
<b>Description of the site</b>	
Coordinates of center point or surrounding polygon (latitude, longitude in WGS 84)	
Topographic information (altitude...)	
Climate information	
Soil characteristics	
<b>Information on Land use</b>	
Traditional farming practises (if available)	
Cropping practice (cultivated crops/trees/cropping system)	
Management (fertilizer/pesticide/irrigation etc.)	
<b>Research questions/interests</b>	
current research activities	
Interests and project ideas	
<b>Student work</b>	
participation of students in this region	
Kind of activities	
Student activities part of the curriculum? yes/no	
<b>Available data sets</b>	
Comments	



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## Outcome 4 – Workshop/Ideas for discussion

- Online learning resources (own material and collection of others)
  - Web framework
  - Learning content structure



Lecture



Test



Exercise




Additional material


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15



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## Remote Online Course Diversifying Cropping Systems

- 1 Learning module ~ 15 Lecture units ~ 12 credit points ~ 360 hours working load ~ 9 weeks of work in total
- 1 Lecture unit consists of various material
  - Power point lecture ~ 100 slides
  - Test questions ~ 20 questions
  - Exercises (homework, project, field work ..)
- 1 Lecture unit has one or more authors?
  
- 1 Lecture unit follows a given outline
  - Introduction
  - State of research/development
  - Methods/Experiments/Investigations
  - Results and Discussion
  - Take home message

**Student** may select the whole course or only parts of it


**Teachers** may add parts of the course in their lectures

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16





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## Content/Structure

- Introduction [Crop diversity, project, goals ..]
- Chapter A: Methodology
  - Environmental Monitoring
  - Field methods/Sensor networks
  - Lab analytics/Biotechnology/Microbiology
  - GIS/Remote Sensing
  - Statistics
  - Open XX
  - ..
- Chapter B: Aspects of Agrobiodiversity
  - Agroforestry
  - Biodiversity management
  - Climate Change
  - ..
- Chapter C: Regional showcases/Good practise
  - Field tests
  - Project work
  - ..
- Chapter D: Additional material
  - Literature
  - Regional sheets
  - Open software
  - Data
  - ..

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17



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## Time schedule

- March 2020: Draft Table of content and authors
  - At each meeting 2 to 4 presentations/workshops to discuss the content
- October 2020: First drafts of chapters
- March 2021: Update 1
  - Some universities start using the material
- October 2021: Update 2
  - Some universities start using the material
  - First evaluation (quality, feasibility, fitting to the university programs)
- March 2022: Finalised



Introduction to spatial information processing  
Ralf Bill (Ed.)



UNIVERSIDAD ESTADAL AMAZÓNICA  
DEPARTAMENTO DE EDUCACIÓN CONTINUA

**SIG-SR**  
Sistemas de Información Geográfica y Sensores Remotos  
Aplicados a campos específicos de las GEO-Ciencias y BIO-Ciencias

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18