

Joint Experiment for Crop Assessment and Monitoring (JECAM)

Test Site DEMMIN 2018

IGARSS 2018 Valencia, Spain, 24 August 2018

German Aerospace Center (DLR)

German Remote Sensing Data Center (DFD)

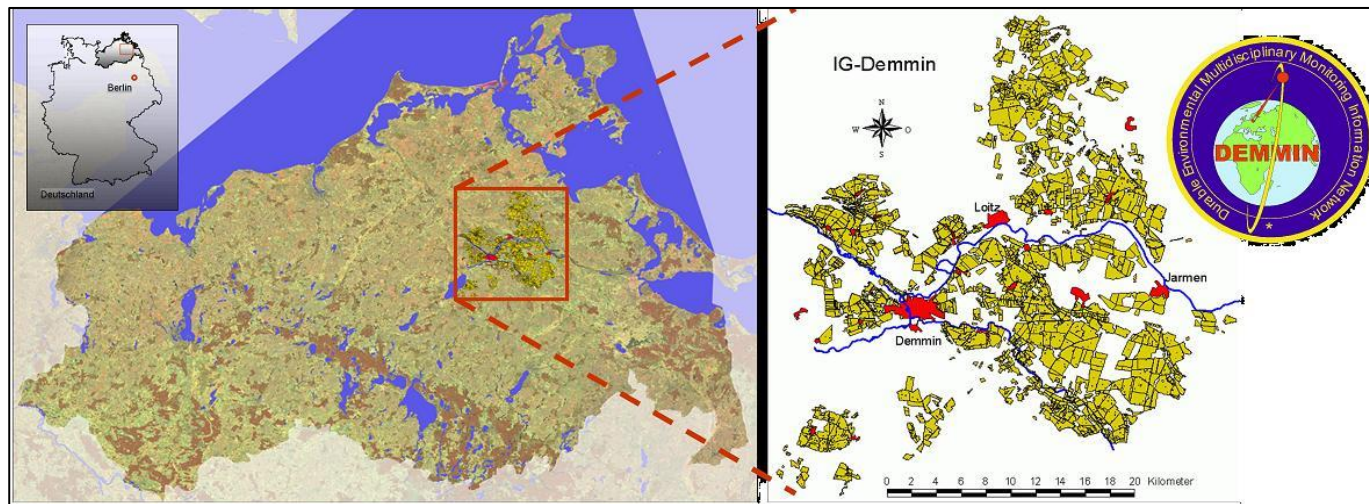
Borg, E., Conrad, C, Truckenbrodt ,S., Hüttich, C., Ahmadian, N., Dahms, T., Heupel, K., Spengler, D., and Missling, K.-D.

Knowledge for Tomorrow





Test Site DEMMIN[®] (Durable Environmental Multidisciplinary Monitoring Information Network)



Geographical location of DEMMIN in Mecklenburg-Western Pomerania (left), agricultural areas of IG Demmin (right) (Borg et al. 2009).

DEMMIN Durable Environmental Multidisciplinary Monitoring Information Network has been a registered figurative trademark of the German Aerospace Center (DLR) since 2003.





DEMMIN - at a glance

- Based on a closed cooperation of farmers of the Demmin region and Scientists of German Aerospace Center (DLR), GeoResearch Center (GFZ), and Research Center Jülich (FZJ)
- Large-Scale Facility of DLR(> 20 environmental measurement stations).
(remark: DLR operates other large scale facilities like wind channels and reception antennas)
- Additional facilities of GFZ (TERENO: > 20 environmental measurement stations, soil moisture probes > 60) and of FZJ (TERENO: > 1 Lysimeter Hexagon stations) integrated into DLR's infrastructure and hosted by DLR





History and Strategic Aspects

- Since 2014, loose cooperation with the JECAM initiative (e.g. lectures, reports)
- As early as 2015, DLR aligned campaigns to the requirements of the JECAM initiative
 - Relevant national projects involved
 - Summaries of this work and results prepared and made available
- In the past, DLR operated the in-situ data campaigns on its own:
 - difficulties in harmonizing the schedule established by the plant growing season with other schedules in DLR Neustrelitz (Remote Sensing Satellite Data Reception)
- End of 2017 DLR together with GFZ and Uni Würzburg new campaign strategy (e.g. soil and vegetation).
 - Integration in student education
 - Relief of the core team
 - Improvement of data use
 - See also : In situ Messungen für ein fernerkundungsbasiertes landwirtschaftliches Monitoring: Status-Update für die norddeutsche JECAM-Site DEMMIN- Christopher Conrad et al, Symposium "Neue Perspektiven der Erdbeobachtung", 25. - 27. Juli 2018, Cologne
- In 2018, DLR and GFZ joined the JECAM initiative officially
- DLR and GFZ have invited several universities to realize the seasonal campaign for 2018. Each of the participating institutions has taken over one or two dates for measuring the desired data. In addition, the participating students were trained in field measurements. An estimated 60 - 70 students participated in the campaign.



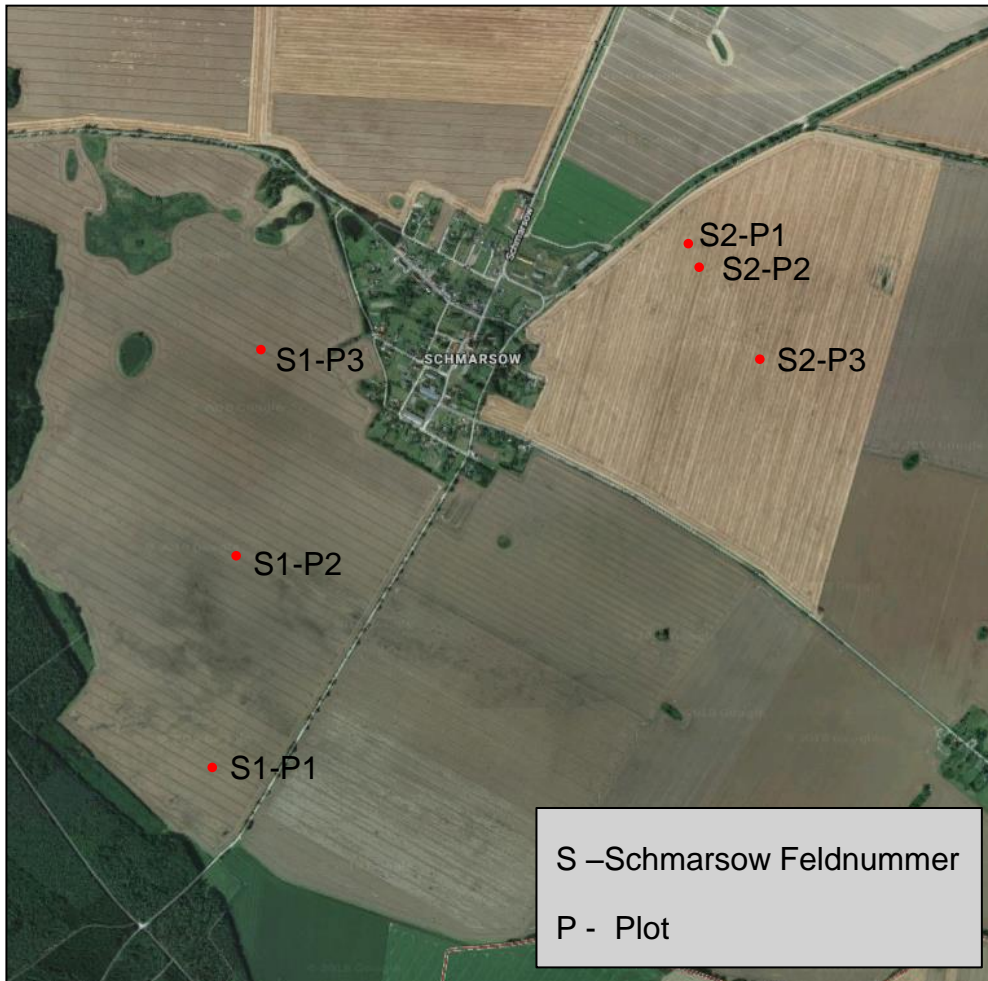
Sampling Schedule



Date	Organization
21.03.2018	DLR Neustrelitz: Installation of ESUs
22.03.2018	University of Applied Sciences Neubrandenburg
22.04. – 27.04.2018	Friedrich Schiller University Jena
06.05. – 12.05.2018	Julius-Maximilians-University Würzburg
27.05. – 02.06.2018	University Halle
25.06. – 29.06.2018	Julius-Maximilians-University Würzburg
July (exact date to be decided)	University Halle
July	Harvester data will be exported after harvesting of the ESUs



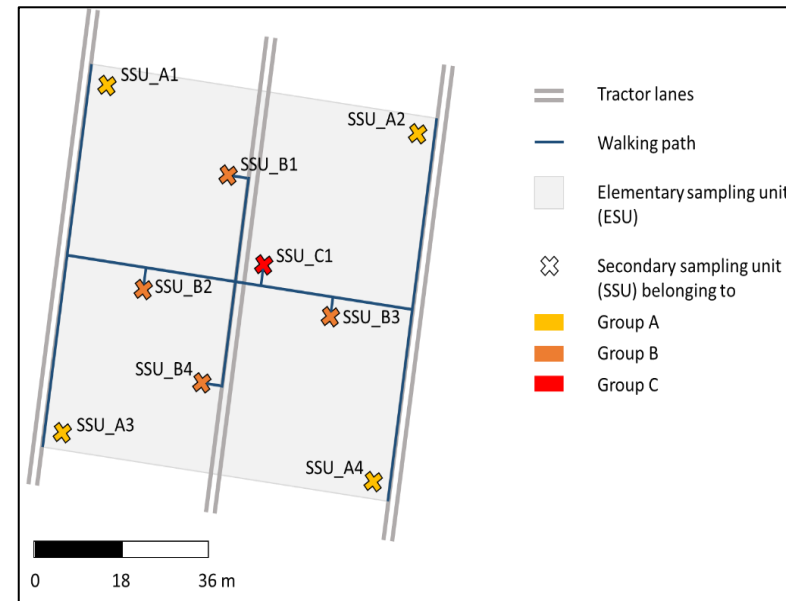
Sampling Sites - How do you make measurements comparable?



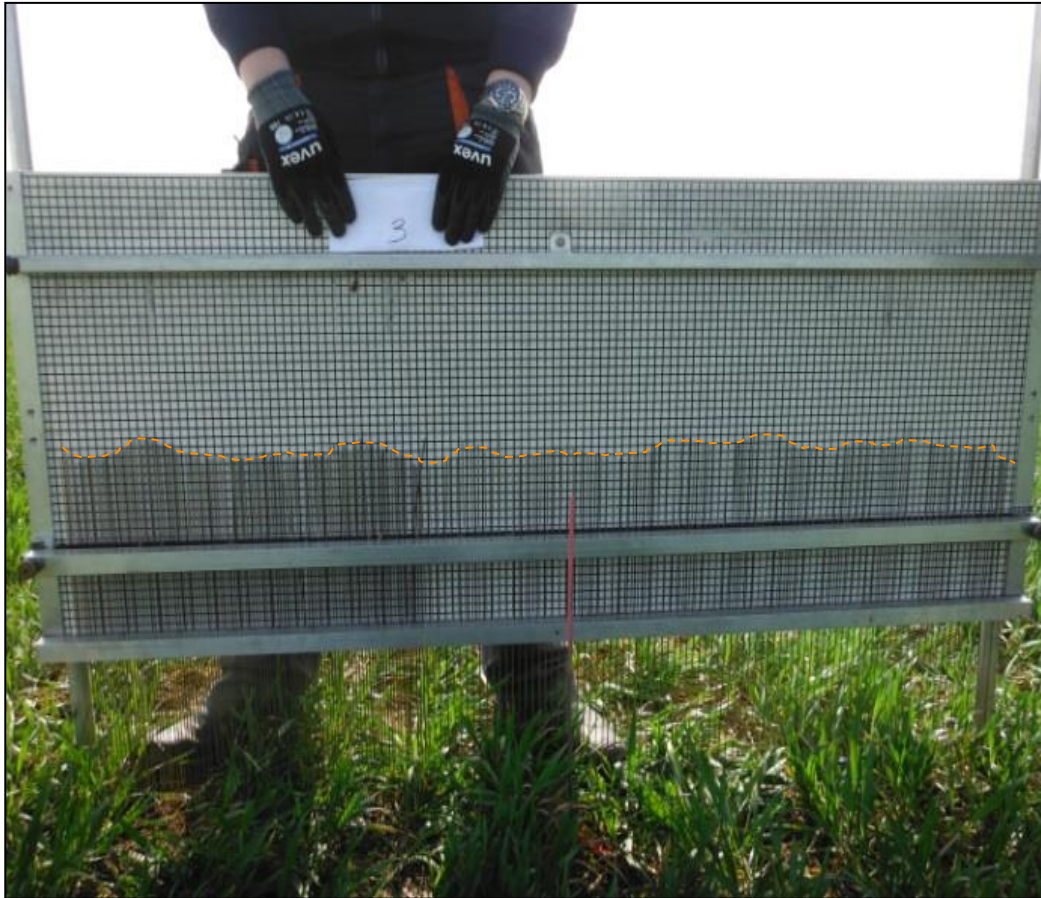
Combining in situ observations and remote sensing data - Field Reader

Version 1.0 - April 2018

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Sampling of Soil Parameter



- Soil roughness (image)
- Soil texture
- Soil moisture (6 cm)





Sampling of Plant Parameter



- Plant height (image)
- Plant density
- Vegetation stadium
- Chlorophyll Content
- Leaf Area Index (LAI)
- Photosynthetically Active Radiation (PAR)
- Fraction of Photosynthetically Active Radiation



In-situ-Measurement Campaign



Digital Chlorophyll Analyzer SPAD-502



SS1 SunScan Canopy Analysis System



- Measurement of plant high by a measurement board
- Measurement of plant density by a rating frame
- SPAD-measurements for leaf chlorophyll content
- LAI-2000 for measuring LAI; 5 measurements per plot
- Comparable measurements of LAI (SunScan-sensor), 12 measurements per plot
- Measurements of global radiation and diffuse radiation for fPAR-assessing (Part of photosynthetic active radiation), 12 measurements per plot
- Photographic documentation of cloudiness during the measurement campaign (per field: 2 or 3 plots)





Conclusions

- No Relief of the core team - Expected in the first year
- Autumn: A lesson learnt meeting is planned in order to optimize the processes and communication
- The Reader has to be improved for the next year.
- The concept of involving different groups in the campaign 2018 has proved its worth.
- Further standardization of the measuring instruments must take place. The same applies to maintenance intervals.
- Desirable is a task force group that is ready to respond to certain events and phenomena in the short term.



Thank You for Your Attention!

Contact

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A satellite image of the Earth from space, showing the curvature of the planet, blue oceans, green landmasses, and white clouds. The text "Knowledge for Tomorrow" is overlaid on the right side of the image.

Knowledge for Tomorrow