TRAVEL & INFORMATION GUIDE

Airborne remote sensing for monitoring
essential biodiversity variables in forest ecosystems
RS4forestEBV

3 July – 14 July 2017

Bavarian Forest National Park
& DLR, Oberpfaffenhofen
Germany

Organised by:

ITC - Faculty of Geo-Information Science and Earth Observation

University of Twente

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1. General Information

Entitled, "RS4ForestEBV - Airborne remote sensing for monitoring essential biodiversity variables in forest ecosystems", the 9th EUFAR Training Course, financed by EUFAR and jointly organised together with the [Faculty of Geo-Information Science and Earth Observation](#) of the [University of Twente](#), will be held in the [Bavarian Forest National Park](#) and the German Aerospace Center - [DLR](#) in Oberpfaffenhofen from 3 to 14 July 2017.

2. Directions & Registration

Getting to Munich

By air
Munich international airport Franz-Joseph Strauss is the second busiest airport in Germany behind Frankfurt airport. It is located 28.5 km north east of Munich near the old city Freising. It is the second hub of Lufthansa and well served by all major European airlines, as well as few major world airlines.

By train
Deutsche Bahn uses Munich as one of its main German hubs and offers regional and long-distance connections to many German cities. This includes several connections with ICE high-speed trains. Munich has also a high-speed TGV-connection with Paris and Strasbourg as well as Eurocity and CityNightLine (night train) connections with Amsterdam, Budapest, Innsbruck, Maribor, Milan, Rome, Salzburg, Venice, Verona, Vienna, Zurich and other international cities.

By bus
An inexpensive and surprisingly comfortable possibility to travel to Munich, especially from Eastern Europe and the Balkans, are long-haul buses. See the schedule of Munich's Central Bus Station ZOB for details and destinations.

Transport in Munich

The best way to travel around Munich - without using your own feet - is the public transportation system consisting of suburban trains (S-Bahn), underground trains (U-Bahn), streetcars (Tram), and buses. There is only one ticket system, called MVV, which means you can use all modes of transportation with the same ticket. The Munich MVV website includes maps of the U-Bahn, S-Bahn, Tram and bus network, maps of the park & ride car parks, pricing information as well as timetables and a journey planner. The official MVV network map is available at most stations and absolutely indispensable.

Getting to St. Oswald (Forest History Museum) / Bavarian Forest National Park

http://www.nationalpark-bayerischer-wald.de/english/visiting_us/facilities/index.htm
http://www.nationalpark-bayerischer-wald.de/english/visiting_us/getting_here/index.htm

Transport to the Aktivhotel Crystal & Registration

On 3 July, there will be an organised shuttle bus leaving from Munich airport to Bavarian Forest National Park (and the Aktivhotel Crystal) around 14:30-15:00. You will find the bus right in front of Terminal 2 (EUFAR should be indicated on an arrow). The registration will take place in the hotel after your arrival.

Transport to the Bavaria Motel

From central Munich, you can reach the hotel by taking the S8 train going towards Herrsching; otherwise the S8 coming from Herrsching going towards Munich Airport. The Bavaria Motel is just one minute by foot from the Freiham S-Bahn station. You can simply follow Hans-Stützle-Strasse - you'll already see the hotel from the S-Bahn station.

3.   Accommodation

All training course participants and trainers will be accommodated at the Aktivhotel Crystal (http://www.aktivhotel-crystal.de/) between 3 of July and 9 of July 2017, and at the Bavaria Motel (http://www.bavaria-motel.de/) between 9 of July and 14 of July.

EUFAR funded participants
Accommodation for EUFAR funded participants for the nights of 3rd to 14th inclusive will be paid by EUFAR, therefore when checking-out you will not need to settle your bill except for extra expenses you have incurred during the stay such as telephone, bar, extra expenses related to spouse, etc. All meals from arrival to departure have also been booked on your behalf over the training course and will also be covered by EUFAR.

However, if your arrival in Munich <u>before 3 July and/or your departure after 14 July</u> are due to travel complications (e.g. no flight available arriving on the 3rd), expenses linked to these extra days will be reimbursed by either EUFAR on provision of justifications (tickets, receipts, etc.). Any prolonged stay linked to personal/touristic reasons will be at your own expense.

At checkout kindly settle any extra expenses you have incurred during the stay such as telephone, bar, extra expenses related to spouse, etc.

4.   Travel & Subsistence Reimbursement

The EUFAR Office/Météo-France will be responsible for the reimbursement of any extra travel and subsistence (T&S) expenses incurred, unless differently agreed. The reimbursement of individual costs by the EUFAR Office will be based on <u>real costs</u> upon receipt of the proofs of payment (such as taxi, bus, other receipts, etc.). Meal receipts are not required.

Meals:
Regarding the meals not organised for RS4forestEBV, note that the reimbursement of the meals cannot exceed **€28.70 per meal** in accordance with Météo-France's T&S rate for Germany.

Hotel:
The maximum reimbursement of accommodation expenses is **€106.60 per night including breakfast** for those of the participants who will have reserved another hotel by themselves.

Travel:
Your travel tickets, as proof of travel, will also be requested (boarding passes/train/metro tickets) even if paid by the EUFAR Office, thus please keep all your original tickets and receipts.

Use of a private car:
Reimbursement of use of private car is on the basis of about **€0.32 per kilometre** (dependent of engine capacity). Fuel is included in the kilometre rate. Road tolls may be paid extra, so please keep all tickets. When two or more participants travel together by car, only one person will be reimbursed for the associated travel costs.

Use of taxi:
Reimbursement of taxi fees requires prior approval from the EUFAR Office. As a general rule, participants with early or late flights are eligible for reimbursement of taxi expenses.

To be reimbursed for travel and subsistence expenses, please fill in and send the travel claim form (also attached), along with original invoices/receipts to the following postal address:

Attn: Elisabeth Gérard
EUFAR Office
Météo-France/CNRM
42, avenue Gaspard Coriolis
31057 Toulouse Cedex 01
France

This form needs to be sent before 14 August 2017, unless you will be claiming your costs through Form C (only applicable to EUFAR2 beneficiaries), in which case kindly inform us.

5. Software requirements

Each participant should bring his/her own laptop.
To work with flight data and participate in tutorials, the following SOFTWARE should be installed if not already present:
- Matlab (version up to 2016)
- ENVI
- IDL
- Python
- Local server MySQL (5.5 or 5.6) test via : http://ipl.uv.es/artmo/
- LiDAR Fusion (http://forsys.cfr.washington.edu/fusion/fusionlatest.html)
- QGIS
- R (Studio)

6. Fieldwork

As fieldwork is planned during the course, we advise you to bring appropriate clothing (good shoes/long sleeves, etc.). Also as the weather could be sunny/hot, please also bring headwear and sunscreen to protect yourself.

7. Currency

Germany is in the EURO zone and thus Euro is the official currency.

8. Contact

For any questions concerning the meetings, please contact:

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9. Programme

Detailed programme (First week) – RS4forestEBV – 3-14 July 2017

	DAY_1. Monday 3rd July	**DAY_2**. Tuesday 4th July	**DAY_3**. Wednesday 5th July	**DAY_4**. Thursday 6th July	**DAY_5**. Friday 7th July	**DAY_6** Saturday 8th July
	Arrival and welcome	**Introduction to the program and the field sites**	**Biophysical measurements**		**Field measurements at BNFP**	**Field measurements at SUMAVA**
9:00-10:30		Introduction by the scientific committee and outline of the training course [Scientific committee] Self-introduction of participants	**Lecture 3:** Essential Biodiversity Variables in forest ecosystems [AS] Open Discussion	**Lecture 5:** Introduction to data source, LiDAR measurements [HL]	**Field work**: Field data measurements, trial measurement [All] **Airborne campaign**	**Field work:** Field data measurements [All]
10:30-11:00		Coffee break	Coffee break	Coffee break		
11:00-12:30		**Lecture 1**: Introduction to Bavarian forest national park (BNFP) and Sumava national park field sites and the existing field data by the BNFP coordinator [MH, JM, MS] Forming of the Working Groups (WG)	**Lecture 4:** Sampling design [TW]	Field Practical 3: Introduction to LiDAR ground measurements and Practical using TLS [Zx]		
12:30-13:30		Lunch	Lunch	Lunch	Late packed lunch 13:00-14:00 at the field site	Late packed lunch 13:00-14:00 at the field site
13:30-15:00		**Lecture 2:** Introduction to data source, Hyperspectral Thermal, [EN]	**Excursion in the Bavarian Forest National Park (or Sumava National Park)**	**Lecture 6:** Introduction to data source, Hyperspectral measurements [MB, RD] Field practical 4: Introduction to Hyperspectral measurements and Practical use of ASD [MB, RD]		
14:30-15:00	Shuttle bus leaving from Munich Airport to Bavarian Forest National Park					
15:00-15:30		Coffee break		Coffee break		
17:00	Registration and room allocation	Field Practical 1: Introduction to Theraml ground measurements and Practical using thermal spectrometer MIDAC [EN, RD]		**Lecture 7:** Introduction to the design of the flight plan [SH, GL]		
18:00-19:00	**Welcome** EUFAR and RS4forestEBV- General info on training course and research site [Scientific Committee] **Ice Breaker**	Field Practical 2: Demonstration and training of field instruments (including hemispherical camera and Licor(s), Chlorophyll meters, other forest inventory field equipment); [RD]		**Student activity 2**: Each working group with a supervisor will develop a field work plan incl. selection of instruments and sampling strategies **; practice with with equipment**	**REPORTING 1**: Each scientific working group reports on all (trial) field measurements [each WG] **Discussion on necessary adjustment**	**Student Activity 3: Working Groups** Finalize field work plans and protocols [each WG]
19:00-20:00	Dinner (hotel)	Late Dinner (outside hotel?)	Dinner (hotel)	Dinner (hotel)	Dinner (hotel)	Dinner (hotel)

	Lectures (+ hands on exercises)
	Field-Practical sessions
	Activities lead by students/Working groups

Detailed programme (Second week) – RS4forestEBV – 3-14 July 2017

	DAY_7. Sunday 9th July	DAY_8. Monday 10th July	DAY_9. Tuesday 11th July	DAY_10. Wednesday 12th July	DAY_11. Thursday 13th July	DAY_12. Friday 14th July
						Working Group presentations Wrap up and discussion
9:00-10:30	Travel to Munich	Welcome to DLR [SH, NP, MB, UH] **Lecture 8:** Introduction to DLR data stream analysis [SH, NP]	**Lecture 12:** Analysis of the measured field data (spectrometry, lab) [HL, EN, RD, MB] **Parallel sessions** (lecture + hands on exercise)	**Lecture 16**: Modelling the EBVs [CA, HL, EN] **Parallel sessions** (lecture + hands on exercise)	**Lecture 18:** Modelling and data analysis with ARTMO [JV]	**REPORTING 2** Presentation of the results by working groups [each WG]
10:30-11:00		Coffee break	Coffee break	Coffee break	Coffee break	Coffee break
11:00-12:30	Check in and room allocations in the hotel	**Lecture 9:** Introduction to EnMAP: EnMAP – the future space-borne hyperspectral instrument [TS] **Lecture 9:** Introduction to CODE –DE [AM-SH]	**Lecture 13:** Image pre-processing and processing [HL, EN, MB] **Parallel sessions** (lecture + hands on exercise)	**Lecture 17**: Modelling the EBVs [CA, HL, EN] **Parallel sessions** (lecture + hands on exercise)	**Lecture 19**: Modelling and data analysis with ARTMO [JV] continued	Presentation of the results by working groups [each WG]
12:30-13:30	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
13:30-15:00	Free for course participants	**Lecture 10:** Introduction to the Calibration Home Base (CHB) of DLR [AB] Visit to Calibration Home Base [AB]	**Lecture 14:** Data fusion Hyperspectral and LiDAR [RK]	Visit to EUFAR aircraft show	**Lecture 20:** Specific case study with ARTMO [LH]	Wrap-up and discussion [Scientific Committee] Departure to Munich Airport
15:00-15:30		Coffee break	Coffee break		Coffee break	
15:30-18:00		**Lecture 11:** **Specific case studies**, 'Tree species classification' lecture + hands on exercise) [NP]	**Lecture 15:** LiDAR and vegetation properties [NC]		WG specific case studies: Preparation of final presentation	
19:00-20:00	Dinner (hotel)	Dinner (hotel)	Dinner (hotel)	ICARE Social dinner	Dinner (hotel)	

Lectures (+ hands on exercises)
Field-Practical sessions
Activities lead by students/Working groups

Confirmed Trainers

AS - Andrew Skidmore, ITC-UT, Netherlands, a.k.skidmore@utwente.nl	EUFAR trainer #1
RD - Roshanak Darvishzadeh, ITC-UT, Netherlands, r.darvish@utwente.nl	EUFAR trainer #2
TW - Tiejun Wang, ITC-UT, Netherlands, t.wang@utwente.nl	EUFAR trainer #3
EN - Elnaz Neinavaz, ITC-UT, Netherlands, e.neinavaz@utwente.nl	EUFAR trainer #4
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NP - Nicole Pinnel, DLR, Germany, Nicole.Pinnel@dlr.de	EUFAR trainer # 7
MB - Martin Bachmann, DLR, Germany, martin.bachmann@dlr.de	EUFAR trainer # 8
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MS - Martin Stary, Sumava, Czech Republic, martin.stary@npsumava.cz	Sumava, Czech Republic
HL - Hooman Latifi, University of Wurzburg, Germany, hooman.latifi@uni-wuerzburg.de	EUFAR trainer #9
GL - Gary Llewellyn, United Kingdom, gaew@nerc.ac.uk	NERC
RK - Ruben van de Kerchove, VITO, ruben.vandekerchove@vito.be	EUFAR trainer #10
JV - Jochem Verrelst, Uni Valencia, Spain, jochem.verrelst@uv.es	EUFAR trainer #11
AB - Andreas Baumgartner, DLR, andreas.baumgartner@dlr.de	DLR
ST - Tobias Storch, DLR, Tobias.Storch@dlr.de	DLR
CA - Clement Atzberger, BOKU, Austria, clement.atzberger@boku.ac.at	EUFAR trainer #12
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