

DUE GlobBiomass

Vol. 01

Minutes of the Internal Project Meeting PM5 /
23. – 24.05.2017 CESBIO, Toulouse, France


Prepared for European Space Agency (ESA-ESRIN)

In response to ESRIN/Contract No. 4000113100/14/I_NB



Prepared by

Friedrich-Schiller-University Jena, Department for Earth Observation, Germany

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Revision History


Milestone	Minutes of the PM5 - Internal Project Meeting
Authors	Evelin Matejka
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Minutes - Internal Project Meeting - PM5

Project Name	GlobBiomass			
Project Number	ESRIN/Contract No. 4000113100/14/I-NB			
Purpose	Internal Project Meeting – PM5			
Date and time	23.-24.05.2017			
Location	CESBIO, Toulouse, France			
Author	Evelin Matejka, Carsten Pathe			
Institution	Participant Name	Acronym	Function	WP
ESA	Frank Martin Seifert	FMS	ESA Project Coordinator	
FSU Jena	Christiane Schmuilius	CS	Project Manager	9000
	Evelin Matejka	EM	Administrative Project Management	10000
	Carsten Pathe	CP	Technical Expert	2000, 8000
Uni Leicester (UoL)	Pedro Rodriguez Veiga	PRV	Technical Expert	5000
Uni Sheffield (UoS)	Joao Carreiras	JC	Technical Expert	3000
WUR	Martin Herold	MH	Work Package Manager	1000,
	Danae Rozendaal	DR	Technical Expert	7000
SLU	Johan Fransson	JF	Technical Expert	5000
RSS GmbH	Sandra Lohberger	SL	Work Package Management, Technical Expert	5000
IGIK	Agata Hoscilo	AH	Technical Expert	5000
CESBIO	Thuy Le Toan	TLT	Technical Expert	5000
	Stéphane Mermoz	SM	Technical Expert	
	Alexandre Bouvet	AB	Technical Expert	
GAMMA	Maurizio Santoro	MS	Technical Expert	2000, 3000, 4000, 6000
	Oliver Cartus	OC	Technical Expert	
MPI	Nuno Carvalhais	NC	Technical Expert	6000, 7000


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Agenda Internal Project Meeting – PM5


Tuesday, 23 May	PM5 meeting, Day 1: Overall Project Context, Global Activities & Validation, Regional Biomass Estimation I
08:45 – 09:10	Registration
09:10 – 09:30	Opening and Welcome
Thuy Le Toan	Welcome to CESBIO (<i>5 min talk</i>)
Frank Martin Seifert	Welcome from ESA (<i>5 min talk</i>)
Chris Schnullius	Welcome from Uni Jena & Current Status of the DUE-project GlobBiomass (<i>10 min talk</i>)
09:30 – 11:00	Task 1: WP 3000/6000 - Product Specifications and Algorithm Design – Global Algorithms
Maurizio Santoro/Oliver Cartus (<i>30 min</i>)	Global Algorithm Development and Implementation 1
Nuno Carvalhais (<i>30 min</i>) (<i>per video</i>)	Global Algorithm Development and Implementation 2
Thuy Le Toan / Stéphane Mermoz /Alexandre Bouvet (<i>15 min</i>)	Global Algorithm Development and Implementation 3
Joao Carreiras (<i>15 min</i>)	Comments to the Global Algorithm Development (D6: ATBD - / including D7: DJF – Design Justification File)
11:00 – 12:00	General Discussion on Global Algorithm Development
12:00 – 13:00	Lunch Break / Catering
13:00 – 13:40	Task 2: WP 6000 / 7000 – Global Biomass Estimation & Validation of Global Map
Maurizio Santoro/Oliver Cartus (<i>20 min</i>)	Demonstration of Global Maps & first validation results (D16 Reference Global Biomass Map 2010 & Validation)
Danae Rozendaal (<i>20 min</i>)	Validation of Global Biomass Mapping – first results and plans

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13:40 – 14:30	General Discussion on Global Mapping and Validation
14:30 – 15:30	Task 3: WP 5000 Regional Biomass Estimation I - BIAS
Pedro Rodriguez Veiga / all Regional Partners <i>(30 min)</i>	Overview to Task 5 Bias Correction
Joao Carreiras <i>(30 min)</i>	Regional Mapping Bias Correction - comments and discussion -
15:30 – 16:00	30 min Coffee Break
16:00 – 16:30	Task 4: WP 8000 Data Dissemination
Carsten Pathe	Live Presentation of new Web GIS functions <i>(15 min talk, 15 min discussion)</i>
16:30 – 17:00	Task 5: WP 5000 - Regional Biomass Estimation II – Phase 3 Development – Sweden (preferred from day 2)
Johan Fransson / Maurizio Santoro	SWEDEN Case Study - Phase 3 <i>(15 min talk, 15 min discussion)</i>
17:00 – 17:30	Day 1 Wrap-up
Chris Schnullius <i>(15 min)</i>	Conclusions and Action Items from Day 1, Outlook on Day 2
Frank Martin Seifert <i>(15 min)</i>	Conclusions and Action Items from Day 1
17:30	Closure of GlobBiomass Project Meeting, Day 1
17:30 – 18:30	Transfer to Social Event (by public transport)
18:30 – 22:00	Social Event / Dinner at Brasserie Le Beaux Arts 1 quai de la Daurade, Toulouse http://www.brasserielesbeauxarts.com/en/
22:00	Short walk to Hôtel Le Père Léon


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Wednesday, 24 May		PM5 meeting, Day 2: Regional Activities Phase 3, Outreach and Project Management
8:30 – 11:00	Task 6: WP 5000 Regional Biomass Estimation II – Phase 3 development	
Pedro Rodriguez Veiga	MEXICO Case Study – Phase 3 <i>(15 min talk, 15 min discussion)</i>	
Thuy Le Toan / Stéphane Mermoz / Alexandre Bouvet	SOUTH AFRICA Case Study – Phase 3 <i>(15 min talk, 15 min discussion)</i>	
Sandra Lohberger	KALIMANTAN Case Study – Phase 3 <i>(15 min talk, 15 min discussion)</i>	
10:00 – 10:30 30 min Coffee Break		
Agata Hoscilo	POLAND Case Study - Phase 3 <i>(15 min talk, 15 min discussion)</i>	
11:00 – 12:00	General Discussion on Regional Development (including Validation and Change mapping)	
12:00 – 12:30	Task 7: WP 9000 and 10000 Outreach Activities & Project Management	
Chris Schmallius (10 min)	Report on Outreach Activities	
Evelin Matejka (10 min) <i>(10 min)</i>	Managerial Items of 3 rd Phase Discussion with all partners	
12:30 – 13:00	Conclusions and Closure of PM5 Meeting	
Chris Schmallius	Conclusions and Action Items from PM5	
Frank Martin Seifert	Closure of GlobBiomass Project Meeting	
Catering / Lunch to go (sandwiches, snacks and drinks)		

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1. Opening and Welcome

Issues & Discussion	<p>1.1. Thuy Le Toan – Welcome to CESBIO</p> <ul style="list-style-type: none"> ▪ Welcome and some organizational issues ▪ Short intro to CESBIO <p>1.2. Frank Martin Seifert – Welcome from ESA</p> <ul style="list-style-type: none"> ▪ Intro and looking forward what has been finally achieved with respect to the global approach and the recovery activities on the regional approaches. ▪ Within ESA the Climate Change Initiative Program is extended and will implement an ECV Biomass. ▪ An ECV is characterised by long and consistent time series, hence the Global approach and the efforts on regional changes are fundamental steps towards an ECV Biomass. <p>1.3. Christiane Schmullius – Welcome from Uni Jena & Current Status of the DUE-GlobBiomass project</p> <ul style="list-style-type: none"> ▪ Introduction ▪ Major project tasks (improve above ground biomass maps – stock and changes, platform for data sharing and validation, better stratification of landscape, standardization of maps) ▪ Project overview ▪ 8 presentations relating GlobBiomass at the ISRSE / promotional activities ▪ milestones / deliverables / teleconferences / regional video conference relating bias ▪ short introduction in guiding note relating bias, delivered in May from the Shaun Quegan 		
Conclusion			
Action	Responsibility	Deadline	Changes to Deliverables / Timeline

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2. Task 1: WP 3000/6000 - Product Specifications and Algorithm Design – Global Algorithms

Issues & Discussion	<p>2.1. Maurizio Santoro - Global Algorithm Development and Implementation 1</p> <ul style="list-style-type: none"> ▪ Presentation of biomass retrieval algorithm ▪ Product: 25 m resolution and aggregated versions ▪ BIOMASAR-C – 1 km ▪ Upscaling 1 km to 25 m with cubist – for high biomass ranges cubist not really useful error due to no correlation between BIOMASAR-C GSV, PALSAR and Landsat, ▪ ALOS PALSAR L-band GSV 25m ▪ to combine both with physically based rules ▪ approach developed for merging BIOMASAR-L and Cubist GSV but can be extended ▪ merging based on relationship between biomass and percent tree cover for different ecological zones (GSV to canopy cover) ▪ presentation of merging concept (see presentation) ▪ <u>Weaknesses:</u> (see presentation) <ul style="list-style-type: none"> - assuming that Landsat tree cover = f (BIOMASAR-L) to be the “best” model - possibly attributing the wrong weight at the local Scale - impact of ecological zone, as well as definition of forest area (CCI_LC) on weights - Interpolation to obtain a truly global dataset of weights might introduce artefacts ▪ <u>Conclusion:</u> preferring L-Band in high biomass regions, cubist in low biomass regions ▪ Occasionally Cubist more important but likely to be wrong (Europe, Far East Russia), need to revisit and improve ▪ BCEF as a function of GSV – presented (Biomass conversion and expansion factor) ▪ BCEF based on: merged GSV, FAO GEZ and CCI Land COVER ▪ To avoid sudden offsets due to GEZ categories, BCEF was derived at 0.5° resolution / associating wrong BCEF locally ▪ AGB and GSV map shown ▪ <u>Critical point</u> – GSV to AGB conversion ▪ One L-band (HV) mosaic gives the entire range of biomass, but with significant errors and biases ▪ C-band hyper temporal data is the most accurate estimation but not in very high biomass ▪ Cubist introduces spatial variability in the 1 km C-band estimates – not satisfied with the extrapolation in high biomass / isolated areas ▪ Merging makes sense, but need more predictors and increase complexity of approach
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**Issues &
Discussion**

2.2. Nuno Carvalhais - Conversion of GSV to AGB using IPCC compliant factors

- See presentation
- Presented different models – need to train them, quality depending of input data quality
- Train 50% of whole data, predict/evaluate 25% + 25%
- Train 75%, predict/evaluate 25%
- Method: Thurner et al 2014 (see presentation)
- 2 different aspects – Training on Wood density – Training on Biomass Compartment
- Using of different global/regional databases /
- Wood density without gap – filled by source (BAAD2016, TRY Original, Schepaschenko2017, Phillips2003)
- Species information is important – Species + climate not so important (the same)
- Wood density synthesis: best models predict ~46% of variability
- Variables: soils, cloud cover, temperature, precipitation
- Further steps:
- Exploring finer resolution covariates (250m/30m?)
- exploring TRY upscaling approaches and possibly DL
- GFBI instead of GFIB?

Discussion:


- DR : massive variation in AGB in Europe (small plots) – big source of variation
- NC: measurement of artefacts at the map – mismatch between the plot information and the different indices – try to improve
- NC: have covariance at the Land Cover –
- CS : need a land use / land management map
- NC: look to wood density at most;
- JC : assuming if you want to get a 100 m biomass map – what`s the best model for conversion –
- NC : depending from plot size
- NC: covariance will change depending from topography, seasonality, temperature
- TLT: at the end you don`t need the remote sensing – need the land cover, slope, rainfall... whether you can use remote sensing for this
- NC: have very good models – if the map have the same scale they are unlimited;
- CS: what are you comparing to what? Variability? – What is needed for the modellers?
- CS: real world vs. model? What`s the best? What`s the real worlds error against the model error? What is the further strategy?
- NC: don`t developing models for a region... the up scaled products are interesting – maybe national level would be interesting
- NC: have one for Africa – use it for tests

**Issues &
Discussion****2.3. Thuy Le Toan – Algorithm Design and Development for Global Mapping**


- See presentation
- Define methods leading to an improved global map of AGB (spatial resolution < 500 m and an error expected of max 30%)
- Focus on woody savannas
- Presentation CESBIO approach
- SAR + Forest + Environment: input in MIPERS model (simulated SAR backscatter)
- Simulations at L-band 35°HV (PALSAR)
- Map presented AGB from 0-80 t/ha / 25 m resolution
- Comparison in S. America / Africa
- Summary – tools to generate global estimates are in place
- Woodlands and savanna lower than 100t mapped
- Dense forest need further development
- In situ AGB needed for validation
- Good agreement in comparison with national carbon stocks from FAO

2.4. Joao Carreiras – Products Specification and Algorithm Design

- See presentation
- Purpose of the ATBD
- ATBD v3: Due End of September 2017
- Final global algorithm, regional algorithms and validation results should be within
- Regarding Global Biomass Map:
- What's the situation in the humid tropics?
- Have we improved on existing pan-tropical biomass maps?
- Reason for not using ICESat GLAS data?
- JC - Can't comment much without any validation results from WUR
- Discussion:
- TLT: Seasonality of rainfall is very important
- MS: it's not only remote sensing, a lot of additional information are important
- MS: ICESat GLAS are too raw – the distance between the points are too large and nothing is in the middle
- JC: would it be useful to use this maps (MODIS, ICESat GLAS for validation / comparison?)
- MS: How many of this LIDAR footprint match on the ground? – Not much
- MS: I would not compare it with Saatchi and Baccini within a paper
- FMS: step by step – first the biomass map itself and afterwards maybe comparison.
- FMS: but comparison from somebody else would be better.
- CS: what would you send to the registered users?

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Conclusion	<p><u>Regarding global map</u></p> <ul style="list-style-type: none"> ▪ FMS: before October an information about the conversion factor should be possible ▪ FMS: prime one is the global map 2010, should be supported by regional partners <p><u>Regarding ATBD</u></p> <ul style="list-style-type: none"> ▪ JC: methods from MPI (conversion from GSV to AGB) should be part of the ATBD ▪ FMS: needs to be in the ATBD final version ▪ FMS: ATBD is the key document – should include all relevant methods which has been developed in the project ▪ FMS: send a final prior- ATBD-version 2 weeks before the 3rd user meeting to the registered users, to get the feedback from users and team; ▪ FMS: 16.10.2017 final version within the feedback from the 3rd user meeting 		
	Action	Responsibility	Deadline
<ul style="list-style-type: none"> ▪ Prior-final version of ATBD/DFJ to the registered users of the 3rd User Workshop 	UoS: SQ / JC Uni Jena: EM	28.08.2017	
<ul style="list-style-type: none"> ▪ Final ATBD version including feedback from the 3rd User Workshop 	UoS: SQ / JC Uni Jena: EM	16.10.2017	


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3. Task 2: WP 6000 / 7000 – Global Biomass Estimation & Validation of Global Map

Issues & Discussion	<p>3.1. Maurizio Santoro – Demonstration of Global Maps & first validation results</p> <ul style="list-style-type: none"> ▪ See presentation ▪ Have delivered end of April AGB / GSV map end of April 2017 ▪ Users: IIASA, UNSW, JRC ▪ FAO would like to be involved – okay? – If you agree with that ▪ FMS, yes <p><u>Assessment of estimates</u></p> <ul style="list-style-type: none"> ▪ Comparison from Regional Partners ▪ Comparison with inventory-based estimates at provincial and national scale ▪ Comparison with global statistics by FAO ▪ Looking for systematic errors; <p><u>Validation with INFyS plots – Mexico</u></p> <ul style="list-style-type: none"> ▪ By Pedro Rodriguez Veiga ▪ CONAFOR forest inventory in-situ AGB vs. Global maps ▪ Issue on working on the merging and the conversion factors ▪ Comparing with maps by de Jong (CONAFOR) – better / different allometries between the maps <p><u>Validation with Kalimantan</u></p> <ul style="list-style-type: none"> ▪ Kalimantan is based on Cubist which tended to associate the average to the extremes ▪ Conversion factor too high; <p><u>Comparison</u></p> <ul style="list-style-type: none"> ▪ Europe: Cubist weights significantly more than BIOMASAR-L, low biomass range well, but high biomass not good ported ▪ India: over- or underestimated ▪ China: Chinese maps do not reproduce very high biomass values <p><u>Global GSV statistics</u></p> <ul style="list-style-type: none"> ▪ Comparison with FAO FRA 2010 ▪ Mean value: not much different, ext. ▪ Error bars for the time being omitted; sufficient confidence in the final estimates <p><u>Global carbon stocks statistics</u></p> <ul style="list-style-type: none"> ▪ Comparison with mean C stocks are not good, much different ▪ Conversion factors are not correct
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	<p><u>Discussion:</u></p> <ul style="list-style-type: none"> ▪ CS: Look to the topography and the inventory data ▪ CS: higher topography resolution can be helpful ▪ FMS: would it be helpful to bring in contact with the JAXA people regarding the processing? ▪ MS: ALOS quick-looks with 100m resolution would be helpful ▪ FMS: trying to use interagency channels to find out ▪ FMS: when you getting new BCF data – how long do you need? ▪ MS: 2-3 hours and checking afterwards 		
	<p>3.2. Danae Rozendaal – Validation on Global Map – first initial results</p> <ul style="list-style-type: none"> ▪ See presentation ▪ > 115.000 data plots world wide ▪ Presenting the AGB reference database ▪ Independent validation of initial Global Map ▪ 50% for calibration (MPI), 50% for validation ▪ showed comparisons for different continents ▪ pixel size vs. plot size: 100x100m map pixels vs. 0.01 to > 1 ha ▪ variation in forest cover, around forest plot ▪ guidelines for low variation in forest cover but high/low biomass compared to surroundings ▪ FMS: have you tried to look at the low variation? ▪ DR: Valerio has tried, was positive feedback ▪ Two rounds of validation: 25% / 25% reference data ▪ 1st Random selection for independent assessment of bias and accuracy, per biomass class, per region ▪ 2nd round: input for validation report ▪ Next steps: data acquisition, cleaning, validation (2 rounds), validation report (12/17) ▪ FMS: how should a plot for Biomass estimation look like – can we stimulate a standard? ▪ DR: would be much better ▪ FMS: cooperation with different groups in Europe would be interesting / will speak with Klaus Scipal 		
Conclusion	<ul style="list-style-type: none"> ▪ 		
Action	Responsibility	Deadline	Changes to Deliverables / Timeline
<ul style="list-style-type: none"> ▪ Contact Klaus Scipal regarding cooperation with different groups for validation in Europe 	FMS	asap	


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4. Task 3: WP 5000 Regional Biomass Estimation I - BIAS

Issues & Discussion	<p>4.1. Pedro Rodriguez Veiga – Regional Biomass Estimation – Bias correction</p> <ul style="list-style-type: none"> ▪ See presentation ▪ Overview to progress task 5 ▪ Bias correction overview ▪ Bias Analysis: ▪ Mexico: Modify weights or n parameter optimization / Linear & Non-linear models – not really useful ▪ Poland: non-linear model / non-linear model + residuals ▪ Kalimantan: non-linear model - useless ▪ Eastern South Africa: single model vs. two models / bias in data / inversion procedure ▪ Sweden: is not finalized yet, working on that ▪ Observed vs. predicted / predicted vs. observed ▪ Methods that are able to reduce AGB-range specific biases led to a significant increase on overall bias and RMSE ▪ It is not a problem of the model, it is a problem of the predictors which cannot explain/predict the high AGB classes ▪ Different teams tried different methods ▪ Conclusion: aim to reduce the overall bias from OP perspective, while trying to keep the RMSE at acceptable levels ▪ Each region should make the case for bias correction based in their analysis and report to WP 3000 ▪ ATBD will be updated accordingly ▪ JC: Shaun`s description/guideline is to improve the representation of the bias ▪ PRV: it is only about reporting, not about correcting of bias ▪ PRV: globally / regionally mapping – bias problem is the same <p>4.2. Joao Carreiras – Regional Mapping Bias Correction</p> <ul style="list-style-type: none"> ▪ See presentation ▪ Poland: overestimation at lower, underestimation at higher biomass values ▪ Sweden: same ▪ Indonesia: overall bias not bad, but in biomass ranges ▪ Mexico, South Africa the same ▪ Bias is the crucial issue for Poland, Sweden , Kalimantan, Mexico ▪ Random error is the crucial issue for South Africa ▪ In all regions the random error is almost the same for all regions; it is an absolute error, not an relative error; ▪ Can we reduce bias? – Are the training data and reference data representative? ▪ Where does the random error come from and can we reduce it? Is the reference dataset accurate? Are there environmental changes in the datasets?
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	<ul style="list-style-type: none"> ▪ Overview about current status of bias correction ▪ Shaun`s note: Bias vs Random Error in Biomass Estimation: ▪ “Bias is not a problem if it is constant, you can then just subtract it” ▪ If biomass is small, the algorithms tend to overestimate it, if it is large, they tend to underestimation ▪ “Bias can`t be sensibly defined from predicted value ranges” ▪ Bias correction can`t be done as “posteriori” – Shaun Quegan ▪ <u>Conclusion:</u> need to report the accuracy and appear (into the ATBD)- have two choices: ▪ 1st option: the validation results as they are or ▪ 2nd option: define confidence intervals around each biomass estimate (see Shaun`s bias note) ▪ PRV: not sure about the time to go the 2nd way ▪ PRV: uncertainty will be reported in September for each epoch ▪ JF: interest for validation on stand level ▪ PRV: in tropical countries more plot level, not stand level ▪ AH: in Poland the user like to know the biomass at the stand level ▪ JF: the same in Sweden ▪ CS: at the end the description of the Bias error will be better, but not the results; ▪ CS: could be a nice publication at the end ▪ FMS: the exercise has served the purpose of bringing regional teams together and to discuss the different approaches. Further work on bias correction is needed, but goes beyond the scope of GlobBiomass. 		
Conclusion	<ul style="list-style-type: none"> ▪ regional partners need to report the accuracy and appear (into the ATBD) - have two choices: ▪ 1st option: the validation results as they are or ▪ 2nd option: define confidence intervals around each biomass estimate (see Shaun`s bias note) ▪ FMS: the 1st approach is acceptable within the set-up of the GlobBiomass project, but everybody is invited to think about the 2nd option 		
Action	Responsibility	Deadline	Changes to Deliverables / Timeline
<ul style="list-style-type: none"> ▪ Reporting of validation results and implementation in the ATBD using the 1st option (results as they are) or ▪ Reporting of validation results and implementation in the ATBD using the 2nd option (confidence intervals) 	Regional partners / UoS	asap - until final ATBD/DJF version	

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5. Task 4: WP 8000 Data Dissemination

Issues & Discussion	<p>5.1. Carsten Pathe – Live Presentation of new WebGIS functions</p> <ul style="list-style-type: none"> ▪ Live presentation ▪ Example Poland ▪ Showed some changes ▪ Map selection possible <p><u>Limitation:</u></p> <ul style="list-style-type: none"> ▪ Software has wide limitations for displaying global mapping products ▪ global product too large for our WebGIS-Server, Continents are also to big <p><u>Possible solutions:</u></p> <ul style="list-style-type: none"> ▪ Go back to geoWiki ▪ Show global product at locations of regional products ▪ Implement global products with reduced spatial resolution ▪ Go about a download link 		
Conclusion	<ul style="list-style-type: none"> ▪ FMS: will check ESA internally to host the GlobBiomass products: DUE website or the CCI Open Data Portal (as precursor data) would be an option ▪ PRV: Ecometrica software could be an option (https://ecometrica.com/) for the time being as University of Leicester has a license. It could be set to only visualization and analysis (for downloading we can re-direct to other website preferred by ESA) ▪ CP: will check it 		
Action	Responsibility	Deadline	Changes to Deliverables / Timeline
<ul style="list-style-type: none"> ▪ Checkout of ESA internally possibilities / also related to CCI / CCI Open Data Portal 	FMS	asap	<i>DUE website (24.05.2017)</i>

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6. Task 5: WP 5000 - Regional Biomass Estimation II – Phase 3 Development – Sweden

Issues & Discussion	<p>6.1. Johan Fransson – Sweden Case Study – Phase 3</p> <ul style="list-style-type: none"> ▪ see presentation <p><u>Overview of activities:</u></p> <ul style="list-style-type: none"> ▪ 2015 PALSAR-2 maps of Sweden + Sentinel-1 + kNN – Sentinel-2 maps of the test site of Remningstorp with surrounding areas ▪ Or 2015 PALSAR-2 – Sentinel-2 merged maps of the test site of Remningstorp with surrounding areas ▪ Merged biomass maps: using Landsat tree cover or linear combination of input biomass estimates ▪ Change biomass maps: differences in backscatter / difference in biomass <p><u>Training and validation data:</u></p> <ul style="list-style-type: none"> ▪ Sweden – NFI field plots + Laser based biomass / GSV map of Sweden ▪ Remningstorp: 48 field plots (40m radius) ▪ Krycklan <p><u>Content of presentation:</u></p> <ul style="list-style-type: none"> ▪ Test area: Remningstorp ▪ Sentinel 2 data – not any cloud free data for Sweden 2015! ▪ Field data from Swedish NFI ▪ Method: Sentinel-2 + field plots in kNN box (NN) – AGB map ▪ Need first results to compare with other maps ▪ Stem volumes less than 25-300m³ / ha are underestimated ▪ <u>Investigation of an alternative way of combining biomass estimates from the PALSAR and kNN dates – same concept than in global part</u> ▪ Modelling tree cover as a function of GSV ▪ Combined the merged kNN + laser data ▪ Presented the Sentinel-1 map of the test area (goes more on the average) ▪ Laser map of GSV ▪ JF: There was not a large improvement between the kNN and the use of the BIOMASAR-L algorithm 		
Conclusion			
Action	Responsibility	Deadline	Changes to Deliverables / Timeline

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7. Day 1 Wrap-up

Issues & Discussion	<p>7.1. Conclusions and Action Items</p> <ul style="list-style-type: none"> ▪ FMS: thanks a lot for the global approach, it looks very good and shows potential for further epochs. ▪ FMS: Congratulations to the whole team working on the bias exercise in the regional approaches. It is a very interesting exercise, which deserves follow up activities. Within the project resources it is unfortunately not feasible, but if you have resources fell free to follow up. ▪ FMS: Again congratulations to the regional teams, that engaged heavily in the bi-lateral cross comparison regarding the regional approaches. ▪ FMS: The additional effort is noted and therefore I would like to have a realistic date, when the 3rd epoch will be produced 		
Conclusion	<ul style="list-style-type: none"> ▪ CS: week 50 for the final meeting as suggestion – will setup a doodle 		
Action	Responsibility	Deadline	Changes to Deliverables / Timeline
<ul style="list-style-type: none"> ▪ Setup a doodle for the Final Meeting – planned for week 50/17 	EM	asap	

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8. Task 6: WP 5000 Regional Biomass Estimation II – Phase 3 development

Issues & Discussion	<p>8.1. Pedro Rodriguez Veiga – Mexico Case Study</p> <ul style="list-style-type: none"> ▪ See presentation ▪ Will probably have the 1st version of the 2015 map next week ▪ Is reprocessing the epochs 2005 / 2010 ▪ Will replace the Landsat Tree Cover Continuous Fields (Sexton et al. 2013) by Landsat Percent Tree Cover from Hansen et al. 2013 ▪ Will use the global surface water dataset (Pekel et al. 2016) ▪ Change methods: magnitude of change (AGB Loss: Minimum threshold (e.g. 40-80%) / AGB Gain: Minimum threshold (e.g. 30t / ha or 60t / ha) or uncertainty characterization layer (work in process) ▪ Showed the AGB loss 2005 – 2010 / AGB Gain 2005 – 2010 for Yucatan ▪ Discussed validation aspects ▪ PRV will contact some partners in Mexico for validation of maps ▪ Showed comparison between regional and global map / also for validation ▪ SL: question about merging of Sentinel – 1 ▪ PRV: has done a composite of data using percentiles in google earth engine ▪ SL: multi-temporal speckle filtering? ▪ PRV: tried to do it with google earth engine, but it is not easy to implement ▪ For 2015 is using ALOS-2-PALSAR-2, Landsat PTC, Landsat 8 OLI SR, SRTM, Sentinel-1 Dual Polarisation IW Mode ▪ PRV: will try to implement Sentinel-2 for the RR light area ▪ CS: Mikhail Urbazaev is using Sentinel-2 data for Mexico at the Sentinel -4 RED project ▪ FMS: Are people from CONABIO on the invitation list for the final user meeting? ▪ CS: yes, are on the list
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Issues & Discussion

8.2. Thuy Le Toan – South Africa Case Study


- See presentation
- Working on epoch 1 – 2007 and epoch 3 2015
- Presenting the methodology for AGB estimation
- 2007 mapping – epoch 1 reprocessing to reduce the bias
- Change detection – 2007/2010 – methods see presentation
- Epoch 3 – 2015 – analysis of plot data using ALOS2 / test of sentinel-1 time series
- Have some test areas from Savanna with field data – 56 plots / 1 ha size
- Sentinel-1 data analysis for 2015 – 14 images + LiDAR
- CS: all sites are in the communal woodland – not much change there
- TLT: but the ground plot analysis have a large variability
- Using the Water cloud model
- TLT: will have a Sentinel-1 map for South Africa in for 2015 in September
- TLT: either we process quickly or we look for a longer time and reprocess.
- FMS: it is an opportunity to try and demonstrate S-1 utility in savannah and woodland.
- CS: York Timber (900 km² over plantations) validation data are there – Mikhail Urbazaev could contact TLT to organize the validation

8.3. Sandra Lohberger – Kalimantan Case Study


- See presentation
- Presenting forest inventory
- PALSAR-2 mosaic the main issue – stripes between dry and wet season - difficult to use for 2015
- PALSAR-2 mosaic for 2016 is also a mix, but better
- Showed a burned area change map and Kalimantan in 2015 where a large burned area was into
- 2015 / 2016 double bounce in fresh burnt areas – might have negatively influence for biomass estimation
- 2015/2016 lot of land cover changes with deforestation
- Sentinel-1 2015: 2-3 covers before the fire catastrophe / dry conditions / not date consistency within the orbits - problem
- Sentinel-1 2016: 8-10 coverages with dry conditions
- Now evaluation of best option
- Will do the same procedure for PALAR and Sentinel-1
- Change approach: will calculate the RMSE for each biomass interval, take the minimum and maximum AGB for each epoch – will use the biomass range for the change / calculation of change / no change / large change area
- JF: how you will calculate the change / no change –
- SL: have not developed an exact approach until now

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Issues & Discussion	<p>8.4. Agata Hoscilo – Poland Case Study</p> <ul style="list-style-type: none"> ▪ See presentation ▪ AGB 2015 – reference data – national inventory data 2015-16, 0,05 ha plot size ▪ From GSV to AGB conversion – will do it with the same methods which was done for 2005 and 2010 ▪ 3 approaches: ALOS 2 + S2 / S1 + S2 / ALOS 2 + S1 + S2 – will see, what's the best ▪ Validation will be done at the pixel level / forest stand level ▪ Bias correction reduce the overall bias but increase RMSE and scattering effect, comparison of the RF and RF correction at the stand level ▪ Global product comparison – global product has very high AGB amounts ▪ AH: the total AGB was calculated for each forest stand from RF and RF corrected products: one AGB value per stand and scatter plot was presented ▪ The RF product performed better at the stand level – next step will be to make a comparison for the larger number of stands ▪ JF: how do you estimates the biomass? ▪ AH: forest inventory is done in the field at the plot level and then aggregated and extrapolated for stands - only information at stand level is accessible (no information at the plot level and error) ▪ AH: inventory – calculate the GSV afterwards /in the same way as was done for AGB2005 and 2010 ▪ OC: important is the size of the stands ▪ AH: that's why not interested in pixels, only in stands ▪ Biomass changes: not much progress until now, but will go the same approach than UoL and RSS ▪ AH: will find out the clearcuts by looking at the changes in backscatter and changes in the biomass values <p><u>Discussion relating all Regional Case Studies</u></p> <ul style="list-style-type: none"> ▪ FMS: related to the global biomass map – look in difficult areas and try to get best out of full resolution ALOS time series in comparison to the annual mosaic. ▪ FMS: who has access to ALOS-2 data – all have access ▪ FMS: would like to give feedback to JAXA regarding resolution / products (e.g. need for a 100 m quicklook) ▪ CS: please try to communicate your users to invite them to the user meeting ▪ FMS: please ask you users if some of their data are possible to made available in an open source database for biomass estimation ▪ FMS: comments to light Round Robin ▪ FMS: Poland – if high resolution data available (Sentinel-2) – AH will do more analysis ▪ FMS: if you have both – please compare the approaches (European High resolution forestry layer and own classification based on Sentinel-2) ▪ PRV: uncertainty layer – need to produce until September – what about Sweden and Poland? ▪ AH: will use the RMSE per class and assign ▪ SL: we have not decided now / need to think about ▪ JF: have routine to produce and will do that ▪ JF: what about the change detection – how to report the change from the error –
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Issues & Discussion	<ul style="list-style-type: none"> ▪ FMS: need to wait for finalisation of our global map (GSV to AGB conversion), and then a comparison between global and regional results (2010) will follow. ▪ JF: what kind of change map needed: 2005/2010 – 2010/2015 – 2005/2015? ▪ FMS: all change maps are necessary 			
	<p>Summary from FMS</p> <ul style="list-style-type: none"> ▪ FMS: thanks for all Regional Partners, specifically for the use of Sentinel data and the integration of Sentinel-1 / 2 ▪ FMS: please provide your input regarding the algorithms to UoS until August 17 			
Conclusion				
Action		Responsibility	Deadline	Changes to Deliverables / Timeline
<ul style="list-style-type: none"> ▪ Epoch 3 map: final deadline for delivery to ESA (1 week before to UoL) 		Regional Partners	15.08.2017	
<ul style="list-style-type: none"> ▪ Regional algorithms (mapping, change mapping, validation) – information to UoS for implementation in the ATBD 		Regional Partners	08/17	

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9. Task 7: WP 9000 and 10000 Outreach Activities & Project Management

Issues & Discussion	9.1. WP 9000 <ul style="list-style-type: none"> ▪ 8 GlobBiomass presentations at the ISRSE / South Africa in May ▪ 3 publications until now for 2016, published at the website <p><u>Discussion relating ATBD publishing</u></p> <ul style="list-style-type: none"> ▪ Thinking about a Springer book for algorithm development, publishing together with Claus Scipal ▪ CS: would find it nicer, if the ATBD is published in relevant literature ▪ FMS: within ESA the ATBD will be used for future calls as reference ▪ CS: in the literature a book has more visibility ▪ CS: would be very nice, if the regions think on ways how they doing the transition until now <p><u>Discussion relating Map publishing</u></p> <ul style="list-style-type: none"> ▪ FMS: Global map will be hosted on the DUE website, will check also the Forestry TEP or the CCI website within CCI biomass ▪ CS: nice animation flying around the world with zoom into the interesting areas would be nice for the FAO meeting / 3rd User Workshop ▪ CS: professional ESA film / animation would be nicer ▪ FMS: who has some films on the regional site? Sweden, Kalimantan, South Africa would be possible ▪ FMS: do not see it from ESA side – will check and give feedback 			
	Conclusion			
Action		Responsibility	Deadline	Changes to Deliverables / Timeline
<ul style="list-style-type: none"> ▪ Check for ESA-film / animation 		FMS	asap	

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10. Outlook and Closure of PM5 Meeting

Outlook	<ul style="list-style-type: none"> ▪ FMS: a lot of data for Europe exists, but not all data always accessible ▪ CS: nobody is working within Europa for larger areas with new data (i.e. Sentinels) – should bring it into the September meeting ▪ FMS: GlobBiomass has two European cases – Sweden and Poland. JRC - Valerio Avitabile is interested in Europe – JRC is responsible for Copernicus Global Land. ▪ FMS: EEA through Copernicus Land Monitoring Service could possibly be interested in the European biomass map ▪ FMS: please invite colleagues from JRC to the 3rd User Workshop and discuss there ▪ FMS: in Europe we have a huge tradition in forest inventory ▪ AH: relating Copernicus data uptake: there is a big delay in release of the Copernicus High Resolution Layers - HRLs (inc. Forest Type and Forest Density), still the HRLs 2015 are not available and have not been validated at the national level, yet. There were a few cases of using the HRLs 2012 layers in Poland but not much. ▪ FMS: please invite people from EC and EEA to the FAO meeting 		
	<p><u>New ESA announcements</u></p> <ul style="list-style-type: none"> ▪ FMS: announcement of the BRIX experiment – inter comparison exercise based on P-band airborne data (https://earth.esa.int/web/sppa/meetings-workshops/hosted-and-co-sponsored-meetings/brix) ▪ FMS: announcement of CCI +, extension to the climate change initiative; nine new ECVs will be implemented, amongst these also ECV Biomass. ECV projects are based on GCOS requirements and serve primarily the climate modelling community. ECV biomass will look also for a global map, not only once, but in several epochs. The CCI SoW foresees a wider Round Robin for global approaches – algorithms usable globally, but also algorithms suitable for larger areas (e.g. tropics, boreal zone). On 6 July 2017 CCI+ information date at ESRIN, end of August / begin of September the call will come out. ▪ FMS: Other opportunities are the newly designed “Open Call from September onwards: – submission of small innovative proposals possible any time in the year (timeframe up to 1 year, up to 150.000 Euro) – e.g. chance for follow up of PhD studies towards user uptake; Every 3 month evaluation of proposals for fast implementation. Awards of ca 20 project during a whole year are possible, but the bandwidth is big (science, user driven, market, IT infrastructure/platforms, sustainable development). ▪ FMS: open for specific questions until release of CCI ITT 		
Conclusion	The progress meeting was successful and concluded phase 2 of DUE GlobBiomass.		
Action	Responsibility	Deadline	Changes to Deliverables / Timeline
<ul style="list-style-type: none"> ▪ CCI+ - information date at ESRIN at 6 July 17 	All interested	06.07.17	

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Evelin Matyja

(GlobBiomass Project Management)