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## ***Interactive comment on “Mapping Congo Basin forest types from 300 m and 1 km multi-sensor time series for carbon stocks and forest areas estimation” by A. Verhegghen et al.***

### **Anonymous Referee #2**

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This paper presents a methodology for contributing to deliver a detailed forest types map with an improved spatial discrimination and spatially coherent for the whole Congo Basin region. The methodology is based on the knowledge available in the literature, exploring the spatial (MERIS) and temporal (SPOT VGT) resolution data. The remote sensing data and the methodology used support the objective this work. The title is according to the text. The content of the manuscript is clearly organized. However I think the link this work with REDD is not adequate. I think the paper could be concentrated in its objective and title.

Then, P.2 – L.17, The impact of two forest definitions was then assessed in the frame-

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work of the reducing emissions from deforestation and degradation (REDD) initiative and carbon stocks were evaluated. — Could be deleted. P.3 – L.22 These enable comparing the consequences of two different scenarios of forest definitions in the framework of the REDD initiative and the evaluation of the carbon stock of the Basin. — Could be deleted. P.5 – L.24 - The important role in the global carbon cycle provided by the Congo Basin forests appear prominently through the REDD (Reducing Emissions by Deforestation and Forest Degradation) initiative of the United Nations Framework Convention on Climate Change (UNFCCC). — Could be deleted or could be moved for the Discussion section. P.6, L.3 - Developing countries are requested to produce robust estimates of forest carbon stocks to implement REDD mechanisms (Saatchi et al., 2011). — Could be deleted. our map. P.14, L.8 - 3.2.4 REDD forest definition This map is also a key asset for the definition of reference forest area in international convention. In the context of REDD mechanisms, UNFCCC requires that parties select a single value for the minimum forest area (0.05 to 1 ha), potential to reach a minimum height at maturity in situ (2 to 5 m) and minimum tree crown cover (10 to 30 %). As the map is based on 300m image satellites, the minimum forest area has to be higher than 1 ha. Height at maturity does not seem determinative in this region as 5m is probably reached in every vegetation type, except in some specific areas of shrubland. The main question is the minimum tree cover (10 to 30 %). The 10% and 30% scenario have been compared in term of area covered by forest. The accounting of a land cover class area into one scenario was determined according to the canopy cover mentioned in the definition of the forest types classes. — Could be deleted. P.14, L.21 - The REDD mechanisms require to know how much C is stored in different standing vegetation types (especially forests) and soils and released through agriculture, forestry and other land use activities (Nasi et al., 2009). — Could be deleted.

P.22, L.1 - 4.4 REDD forest definition Two minimum tree cover definitions (10% or 30 %) are illustrated spatially thanks to the use of LCCS classifiers. The variation of the forest area according to the selected definition is also reported in Table 6. 5 Six vegetation types are considered as forest for both definitions: class 1 – dense

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moist forest, class 2 – submontane forest, class 3 – mountain forest, class 4 – edaphic forest, class 5 – mangrove, class 8 – closed to open deciduous woodland. Class 6 – forest/savanna mosaic contains vegetation formations including forest and must therefore be considered in the forest classes, or at least a part of the area of this class. Half of the area of the class is here included in the total. Class 9 – savanna woodland-tree savanna and class 10 – shrubland classes were considered as forest classes for the 10% threshold for the canopy cover. When the threshold is set to 10 %, 3 306 100 km<sup>2</sup> are therefore considered as forests, representing the majority (81 %) of the region. For the 30% threshold, only class 1, 2, 3, 4, 5, 8 and half 6 are considered as forests. With 30%, 2 266 000 km<sup>2</sup> are considered as forest, representing 55% of the territory. Figure 12 illustrates well that a threshold of 30% results in a more realistic forest cover representation in Central Africa than the 10% threshold. The choice of the threshold is found therefore crucial as the forest area varies largely from one definition to another. — Could be deleted.

P.25, L.20 - While waiting for better estimations with methods using radar, LIDAR data, ... the estimation made here may therefore provide materials in the context of the REDD and other climatic negotiations. Concerning the REDD forest definition, it illustrates that a threshold of 30% results in a more realistic forest cover representation in Central Africa than the 10% threshold. While bringing relevant information to support the countries decisions in the REDD process, these estimations do not present a lot of flexibility. A possible improvement would be to present additional scenario than the 10% and the 30 %. — Could be deleted.

P.26, L.25 - REDD scenarios for different tree cover threshold had been illustrated based on the forest types map showing that a 30% threshold is more realistic in the context of Central Africa. — Could be deleted. P.54 – Fig.12 - in the framework of the REDD. — Could be deleted.

Some corrections and suggestions: P.5 – L.15 - with a limited land cover — with a limited land cover P.7, L.10 - coastal region of Cameroun — coastal region of Cameroon

P.32, (Modis collection 5500 m) — (Modis collection 5 - 500 m)

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**BGD**

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