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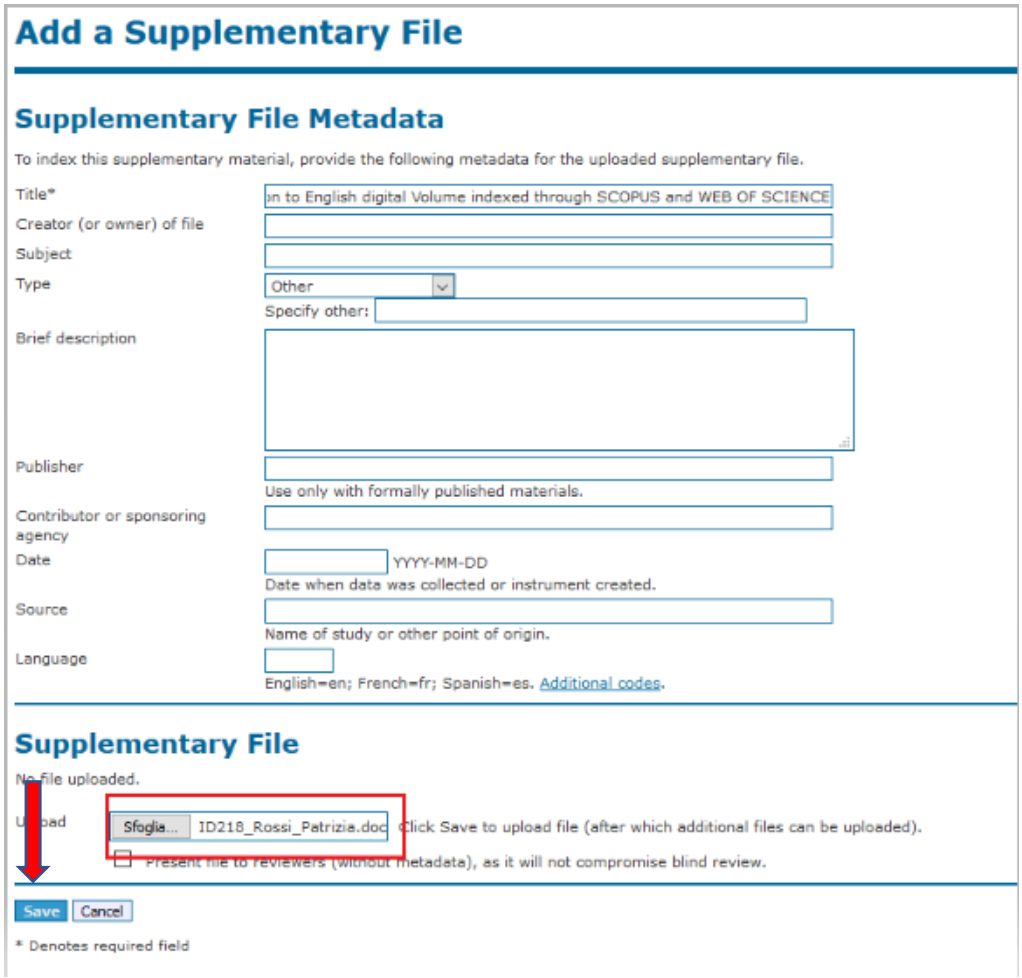

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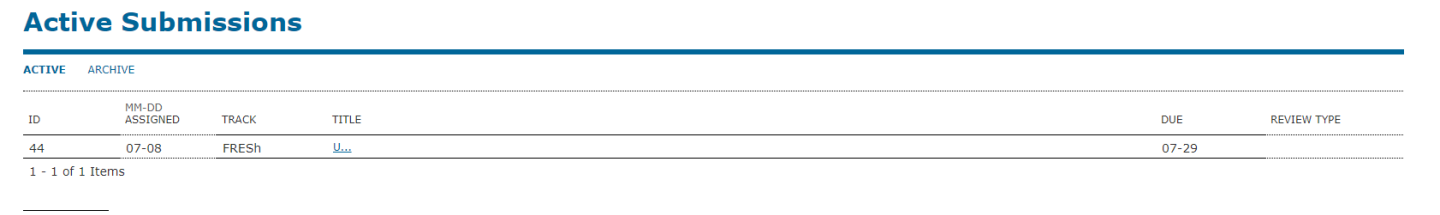

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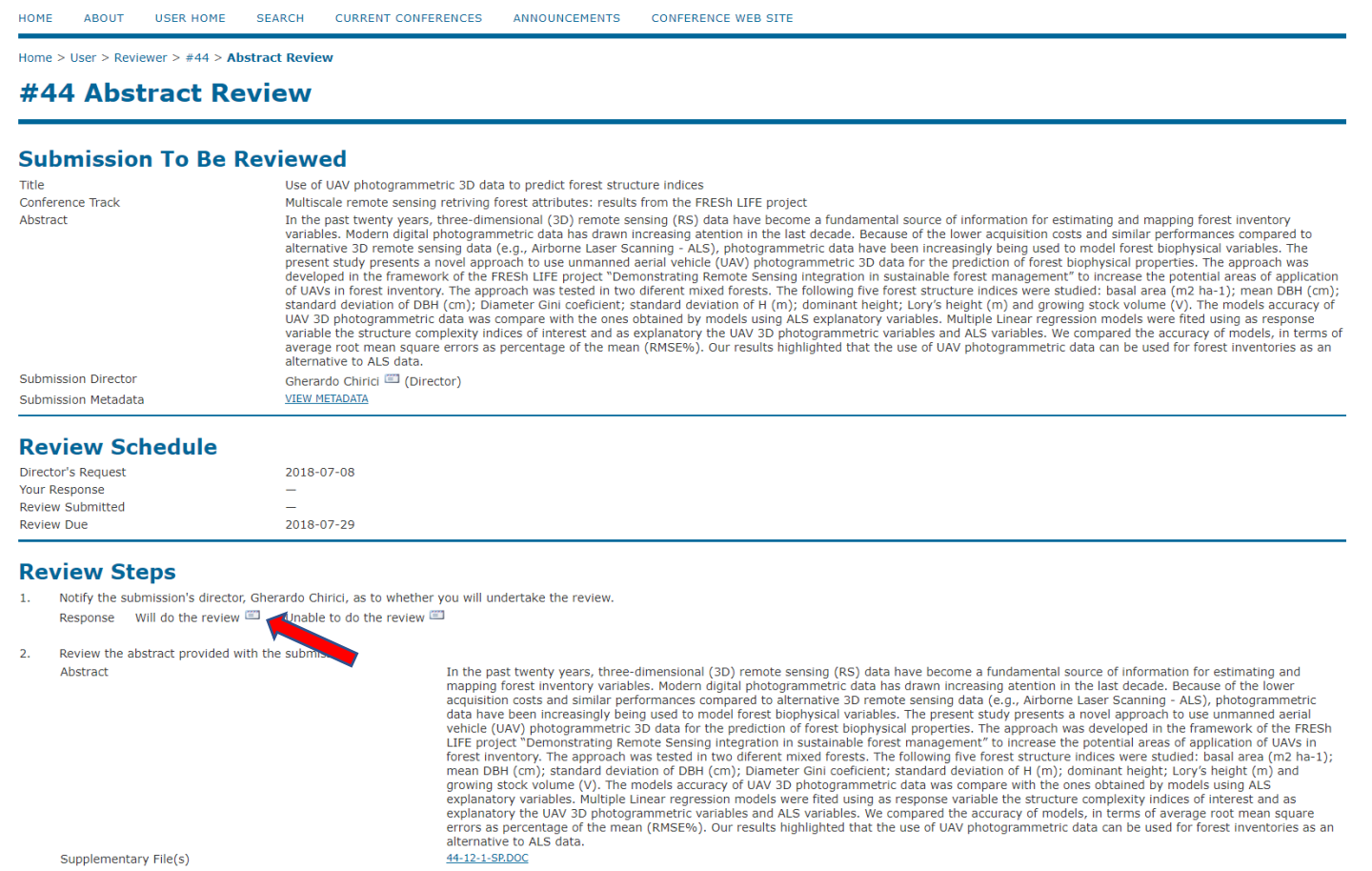

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Submission To Be Reviewed

Title	Use of UAV photogrammetric 3D data to predict forest structure indices
Conference Track	Multiscale remote sensing retriving forest attributes: results from the FRESh LIFE project
Abstract	In the past twenty years, three-dimensional (3D) remote sensing (RS) data have become a fundamental source of information for estimating and mapping forest inventory variables. Modern digital photogrammetric data has drawn increasing atention in the last decade. Because of the lower acquisition costs and similar performances compared to alternative 3D remote sensing data (e.g., Airborne Laser Scanning - ALS), photogrammetric data have been increasingly being used to model forest biophysical variables. The present study presents a novel approach to use unmanned aerial vehicle (UAV) photogrammetric 3D data for the prediction of forest biophysical properties. The approach was developed in the framework of the FRESh LIFE project "Demonstrating Remote Sensing integration in sustainable forest management" to increase the potential areas of application of UAVs in forest inventory. The approach was tested in two diferent mixed forests. The following five forest structure indices were studied: basal area (m2 ha-1); mean DBH (cm); standard deviation of DBH (cm); Diameter Gini coeficient; standard deviation of H (m); dominant height; Lory's height (m) and growing stock volume (V). The models accuracy of UAV 3D photogrammetric data was compare with the ones obtained by models using ALS explanatory variables. Multiple Linear regression models were fited using as response variable the structure complexity indices of interest and as explanatory the UAV 3D photogrammetric variables and ALS variables. We compared the accuracy of models, in terms of average root mean square errors as percentage of the mean (RMSE%). Our results highlighted that the use of UAV photogrammetric data can be used for forest inventories as an alternative to ALS data.
Submission Director	Gherardo Chirici (Director)
Submission Metadata	VIEW METADATA

Review Schedule

Director's Request	2018-07-08
Your Response	2018-07-08
Review Submitted	—
Review Due	2018-07-29

Review Steps

1. Notify the submission's director, Gherardo Chirici, as to whether you will undertake the review.
   Response Accepted

2. Review the abstract provided with the submission.
   Abstract

   In the past twenty years, three-dimensional (3D) remote sensing (RS) data have become a fundamental source of information for estimating and mapping forest inventory variables. Modern digital photogrammetric data has drawn increasing atention in the last decade. Because of the lower acquisition costs and similar performances compared to alternative 3D remote sensing data (e.g., Airborne Laser Scanning - ALS), photogrammetric data have been increasingly being used to model forest biophysical variables. The present study presents a novel approach to use unmanned aerial vehicle (UAV) photogrammetric 3D data for the prediction of forest biophysical properties. The approach was developed in the framework of the FRESh LIFE project "Demonstrating Remote Sensing integration in sustainable forest management" to increase the potential areas of application of UAVs in forest inventory. The approach was tested in two diferent mixed forests. The following five forest structure indices were studied: basal area (m2 ha-1); mean DBH (cm); standard deviation of DBH (cm); Diameter Gini coeficient; standard deviation of H (m); dominant height; Lory's height (m) and growing stock volume (V). The models accuracy of UAV 3D photogrammetric data was compare with the ones obtained by models using ALS explanatory variables. Multiple Linear regression models were fited using as response variable the structure complexity indices of interest and as explanatory the UAV 3D photogrammetric variables and ALS variables. We compared the accuracy of models, in terms of average root mean square errors as percentage of the mean (RMSE%). Our results highlighted that the use of UAV photogrammetric data can be used for forest inventories as an alternative to ALS data.

   Supplementary File(s) 44-12-1-SP.DOC

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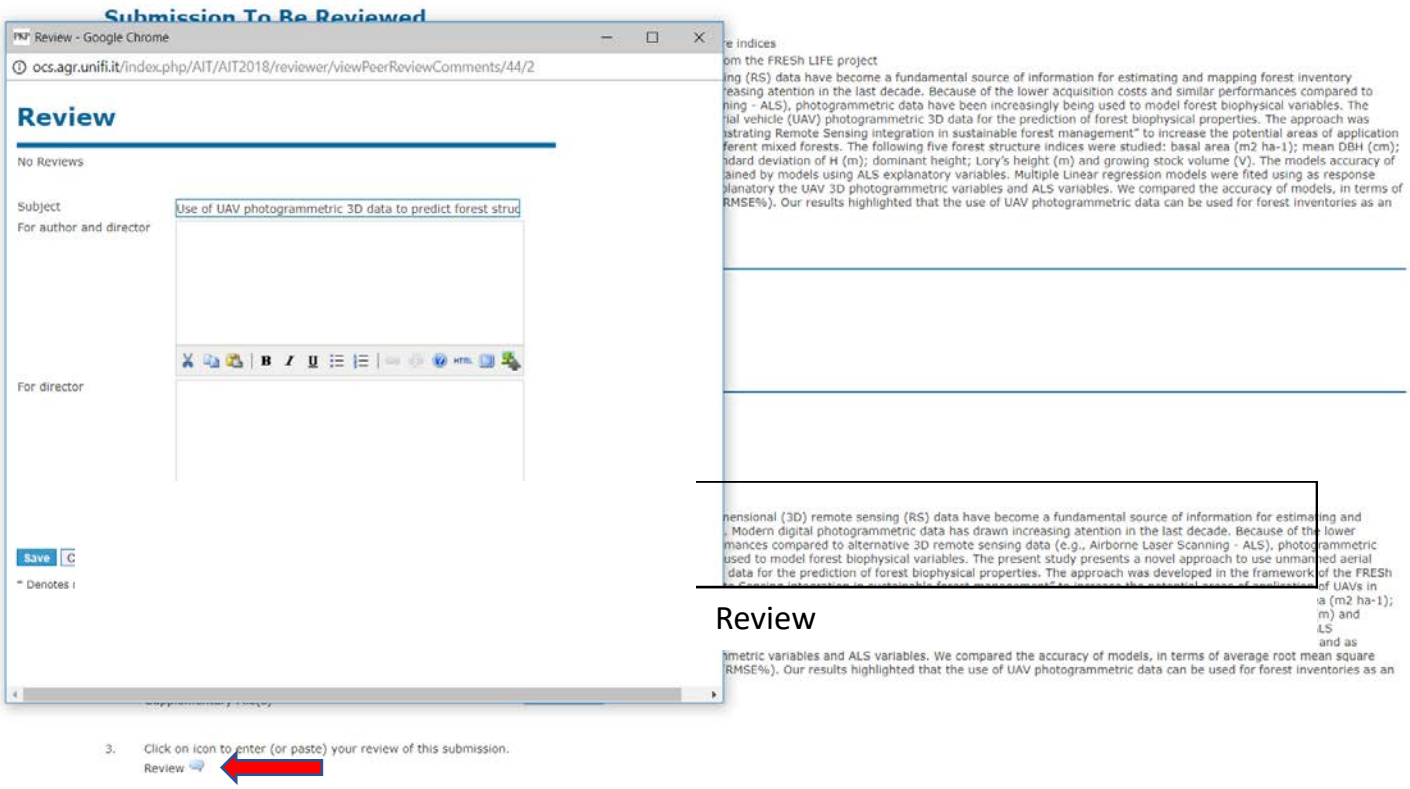
5. Select a recommendation and submit the review to complete the process. You must enter a review or upload a file before selecting a recommendation.
   Recommendation Choose One Submit Review To Director

Submit your review by clicking at step 3 : «Click on icon to enter (or paste) your review of this submission.”



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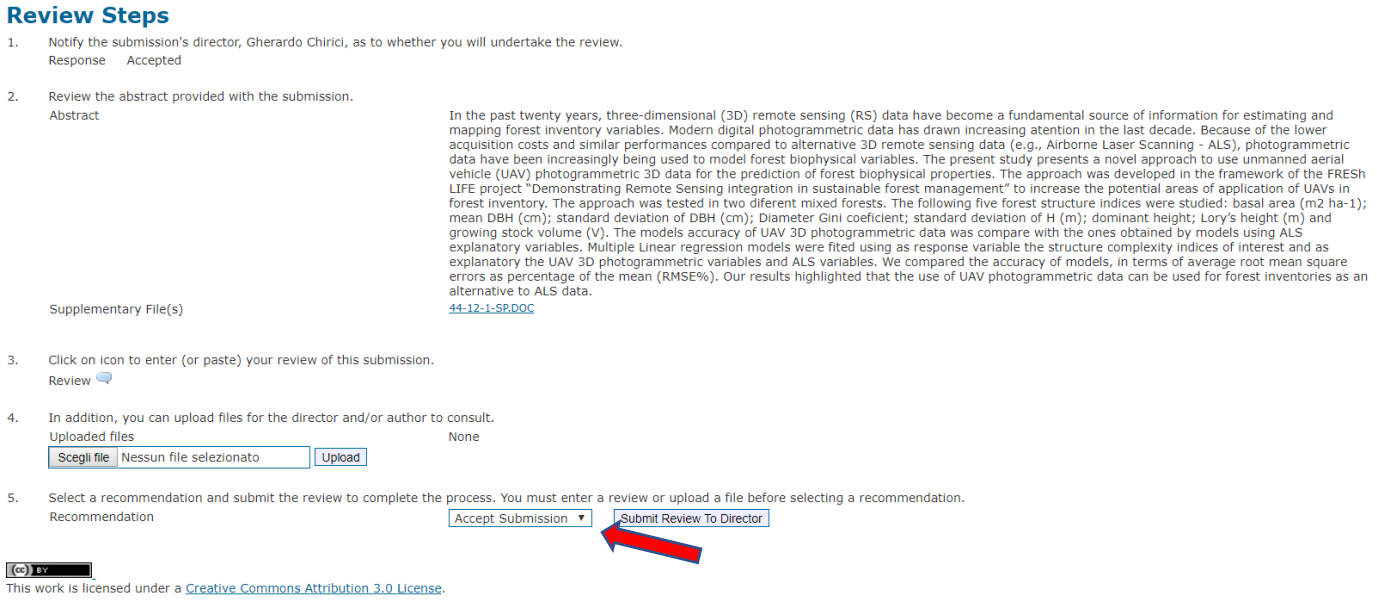

Review Steps

1. Notify the submission's director, Gherardo Chirici, as to whether you will undertake the review.
   Response Accepted

2. Review the abstract provided with the submission.
   Abstract

   In the past twenty years, three-dimensional (3D) remote sensing (RS) data have become a fundamental source of information for estimating and mapping forest inventory variables. Modern digital photogrammetric data has drawn increasing atention in the last decade. Because of the lower acquisition costs and similar performances compared to alternative 3D remote sensing data (e.g., Airborne Laser Scanning - ALS), photogrammetric data have been increasingly being used to model forest biophysical variables. The present study presents a novel approach to use unmanned aerial vehicle (UAV) photogrammetric 3D data for the prediction of forest biophysical properties. The approach was developed in the framework of the FRESh LIFE project "Demonstrating Remote Sensing integration in sustainable forest management" to increase the potential areas of application of UAVs in forest inventory. The approach was tested in two diferent mixed forests. The following five forest structure indices were studied: basal area (m2 ha-1); mean DBH (cm); standard deviation of DBH (cm); Diameter Gini coeficient; standard deviation of H (m); dominant height; Lory's height (m) and growing stock volume (V). The models accuracy of UAV 3D photogrammetric data was compare with the ones obtained by models using ALS explanatory variables. Multiple Linear regression models were fited using as response variable the structure complexity indices of interest and as explanatory the UAV 3D photogrammetric variables and ALS variables. We compared the accuracy of models, in terms of average root mean square errors as percentage of the mean (RMSE%). Our results highlighted that the use of UAV photogrammetric data can be used for forest inventories as an alternative to ALS data.

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3. Click on icon to enter (or paste) your review of this submission.
   Review

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See comments: you are referring to the comments you have provided in the previous step.