

Satellite Monitoring for Forest Management (SMFM) Project

Project Reference no: 1231131
Monthly progress summary: May 2019
Project month no: 30
Submitted by: LTS international
Date: 25.06.2019

Main progress:

1 Project planning and analysis

Following a decision taken in April 2019 to select Namibia as the 3rd project partner country, a kick-off mission to Namibia was prepared and carried out between May 20 and 24, 2019. During this mission, talks were held with the Namibia Department of Forestry, a meeting with other stakeholders organised and a short training on the use of SMFM tool 1 and 2 was delivered.

During the mission, the initial Namibia country work plan was finalised with deliverables and timelines defined by the Namibia team. A major debriefing to the wider project team was organised via video conference after the mission.

Following the SMFM side event at the GFOI plenary in Maputo in April, all presentations of the side event, including the presentation by partner country Mozambique, were made available to the GFOI organisers for distribution.

Technical update:

2.1 Design new or enhanced satellite EO methods to address requirements and gaps

SMFM Tool 1a / b:

Preceding the production of a “release” version of Tools 1a and 1b, further updates to the Sen2mosaic code have been applied to improve pre-processing steps towards SMFM Tool 3.

SMFM Tool 2:

With SMFM Tool 2 finalised, there was no major development or improvement work during May 2019.

SMFM Tool 3:

Main focus of the development work was on SMFM Tool 3 and on updating the dense time series procedure. The tool now has a new command line interface, which simplifies the use of the Linux command line and the use of the tool on the F-TEP platform. Testing of the improvements is expected to continue into June, with documentation and worked examples to follow.

As the Bayesian change detection methods used in this SMFM Tool 3 are difficult to understand for a new user, the development team has reproduced the change detection



method in Excel so that the algorithm can be interactively investigated (see Fig. 1). This approach will also be used in upcoming training events on SFM Tools 3 and 4.

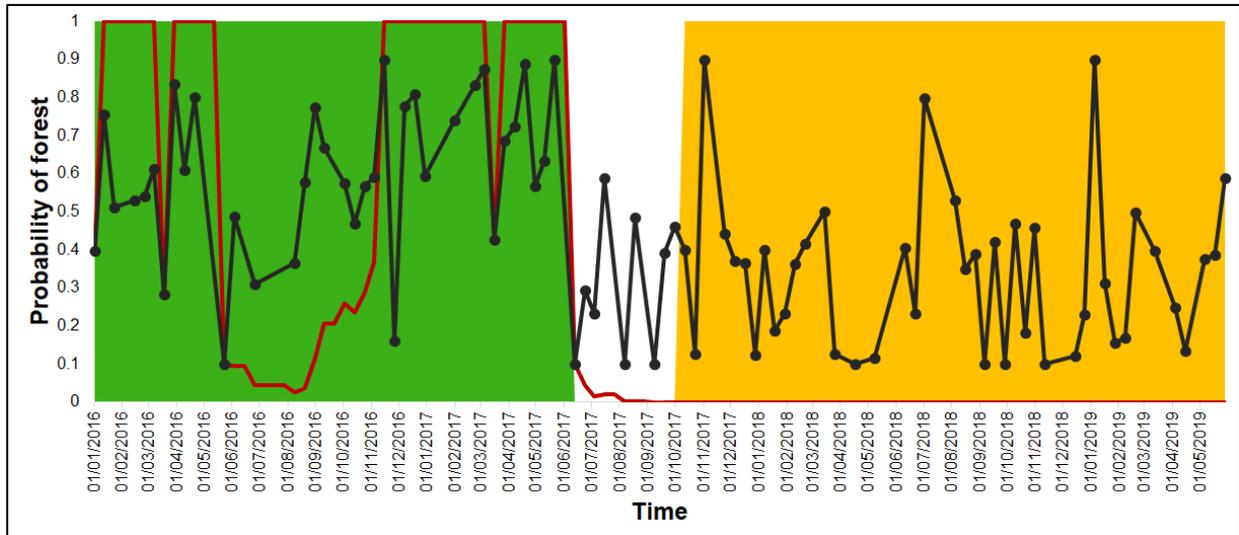


Fig. 1 Change detection given a noisy time series (black) of forest (green) that undergoes deforestation (white) that is detected by the algorithm (yellow), given a Bayesian combination of probabilities (red)

SMFM Tool 4:

Development of SMFM Tool 4 benefited from testing the implementation of a Random Forest machine learning algorithm. Using a training sample of 800 sites, predictive accuracy was under 70% and therefore insufficient to be considered as a reliable model when applied to new data. The construction of the training sample proved labour intensive and may therefore not be a suitable solution for countries outside the original 2 partner countries, for which the training sample has originally been prepared. As an upside, the testing revealed that adding additional data sources and classification criteria do not significantly contribute to classification success and that identifying types of deforestation should be possible from image parameters alone (intensity, shape, size, etc.).

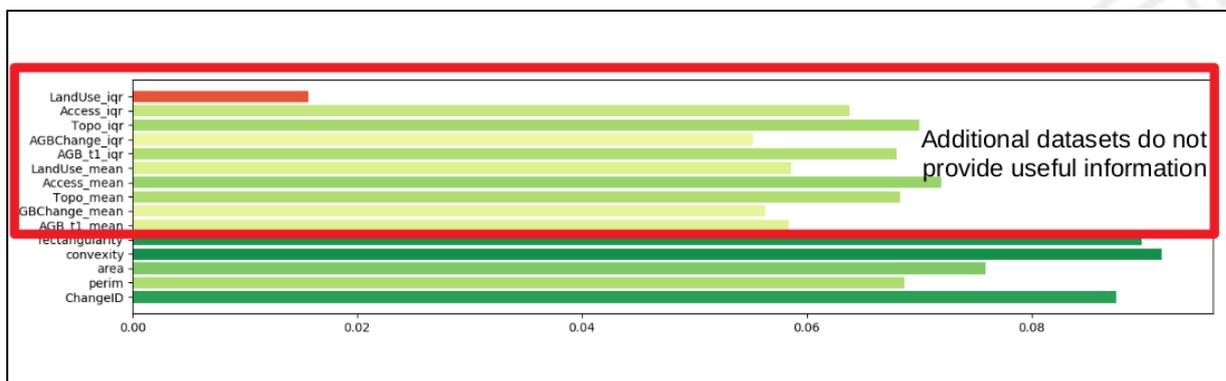


Fig. 2 Testing of additional parameters and datasets; shorter bars indicate less relevant parameters

Whilst it is not likely that the tool will be capable of reliably producing predictive outputs, work will continue on the unsupervised clustering algorithm to improve the quality of classes. Expected outcome of this development work is a method of grouping change types into classes with similar attributes, which can later be labelled by an operator using field data and high-resolution imagery.

4 Global knowledge products for tropical dry forest monitoring and forest degradation assessment

Following the project side event at the GFOI plenary in Maputo, Mozambique in April 2019, the team provided all presentations given at the side event to the GFOI organisers. The presentations material will be accessible to all GFOI plenary participants¹. This represents an additional benefit from the participation in the plenary as project and tool information is shared with interested participants who can freely download the materials.

On May 29-30, 2019, team member of the Consultant consortium² was invited to the World Bank offices in Washington D.C., USA to present the current status of the SMFM tools and their potential application in other Bank supported projects and sectors. The presentation was followed by direct talks with Bank staff (project managers, task team leaders) and the World Bank remote sensing unit.

A member of the SMFM consultant consortium³ attended the ESA Living Planet Symposium in Milan, Italy. On the side-lines of the event talks were held with VTT (F-TEP team) and Hatfield Consultants on possible costing of F-TEP platform services for end-users and on potential long-term support of the SMFM tools in the post-project period.

4.3 Implement at least two training events; including SSKE

In direct discussions with the SMFM partner country focal points, it has been agreed to organise the next regional training on SMFM Tools 3 and 4 at the RCMRD in Kenya after the 10th of August 2019. A training programme and agenda is under preparation to allow preparation.

A 2-day basic training was delivered to the Namibia country team that focussed on the introduction to Tools 1 and 2. In the course of the training, the Linux command line, the GDAL library, the principles of biomass mapping with radar, and a live demonstration of the F-TEP platform were covered.

¹ <https://drive.google.com/drive/folders/1hVogcj2kKH1ec5U1fCk9ciiUv8HPyvd1> (under day 4 / side event)

² Samuel Bowers of the University of Edinburgh

³ Mr. Simone Vaccari. LTS interlational

LTS International Limited (UK), Pentlands Science Park, Bush Loan, Penicuik, Nr. Edinburgh EH26 0PL, Scotland

☎ (+44) 131 440 5500 📠 (+44) 131 440 5501 @ mail@ltsi.co.uk 🐦 @LTS_Int

www.ltsi.co.uk





Fig. 3: Training of the Namibia country team in Windhoek

Although the 3rd partner country, as per the project document, is expected to test the applicability of the SMFM tools without major technical assistance and training inputs, it has been agreed to continue remote assistance sessions following a regular schedule, during which further support and concrete exercises are organised.

Issues and potential bottlenecks:

Issues surrounding F-TEP platform limitations (lack of temporary storage) as well as service disruptions from ongoing platform development and maintenance remain valid.