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Monitoring Spatial accuracy of oil palm cultivation mapping in southern Cameroon from Landsat series images

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1 INTRODUCTION

▪ **Oil palm in Cameroon**

*Great economic importance, with an industrialisation dating from colonial period.
*Incomes generated by its cultivation have generated agroindustries such as the Cameroonian Society of Palm grove (SOCAPALM).
*This activity is behind of socio-environmental damages (deforestation, loss of biodiversity and pollution).

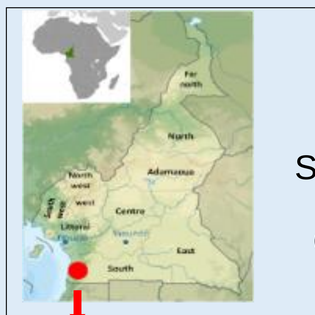
▪ **Context**

*Long-term management of oil palm ressources in Congo basin.
*Studying and mapping palm grove evolution to understand the impact related to its cultivation.

▪ **Objectives**

*Map SOCAPALM industrial palm grove using Landsat series images.
* Measure produced maps accuracy.

2 STUDY AREA



West of Africa
↓
Soutern Cameroon
↓
Ocean County
↓
SOCAPALM industrial Palm grove

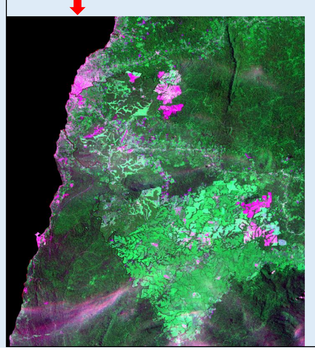


Figure 1. location of study area

▪ **Data**

* Landsat ETM+ (2001)
* Landsat OLI-TIRS (2015)

Table 1. Data specification

Sensor	Acquisition date	Mode	Resolution	Cloud cover
ETM+	26/04/2001	MS/PAN	30m/15m	30%
OLI-TIRS	25/04/2015	MS/PAN	30m/15m	30%

3 METHOD

▪ **Palm grove mapping**

*Per-pixel classification (maximum likelihood algorithm)

▪ **Accuracy assessment**

*Confusion matrix method

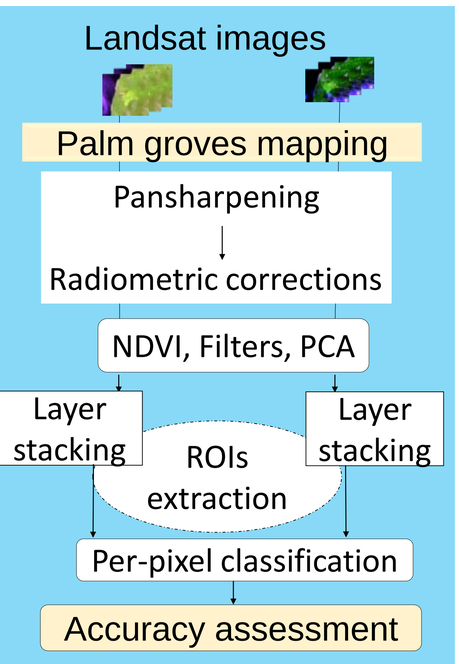


Figure 2. Flowchart of methodology.

4 RESULTS

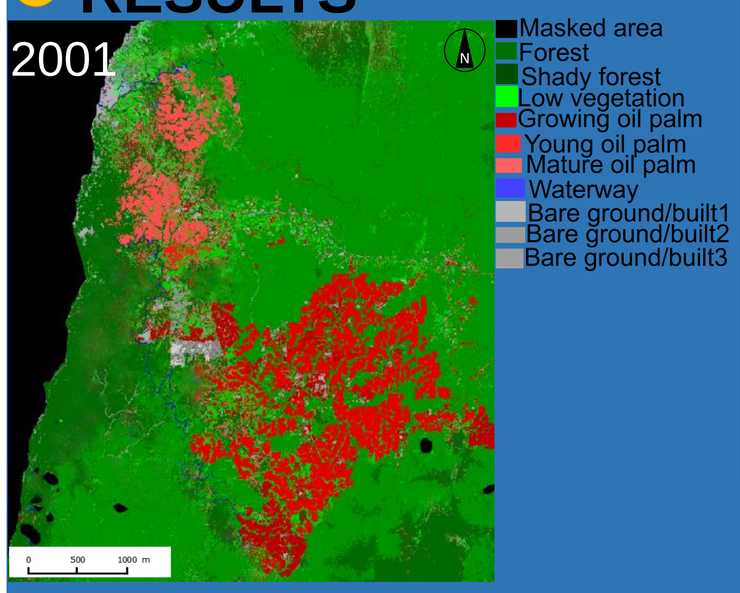


Figure 3. Land cover mapping (2001) ,from Landsat 7 ETM+

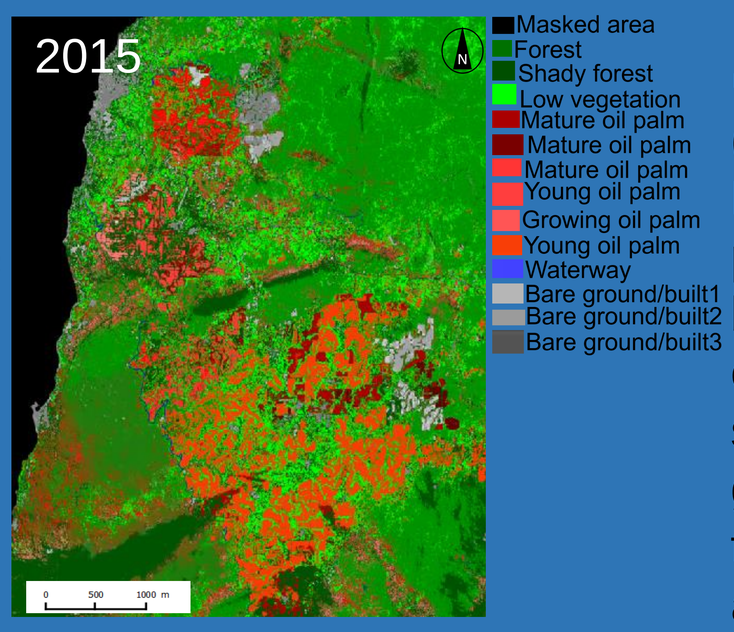


Figure 4. Land cover mapping (2015) ,from Landsat 8 OLI-TIRS

- Overall accuracy of 92% (Kappa=0,92) in 2001 and 80% (kappa=0,89) in 2015.
- An improvement of palm grove surfaces of 18% (from 2001 to 2015)

5 CONCLUSION

- High correlated maps were obtained (Kappa =0,92 in 2001 Vs 0,89 in 2015). However, because of the presence of mixed pixels, some confusions were observed between vegetation and oil palm classes.These confusions resulting from the spatial and spectral characteristics of palm groves, the method used to map and validate the map, and the uncertainty related to data, afect maps accuracy.
- To incrase the accuracy we suggest, (1) use another mapping method such as super-resolution; (2) develop a classification system of cartografic products.

Aknowlegment
CNRS ESPACE UMR 7300