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## Bushfire in Fiherenana and Onilahy Watersheds (SW Madagascar)

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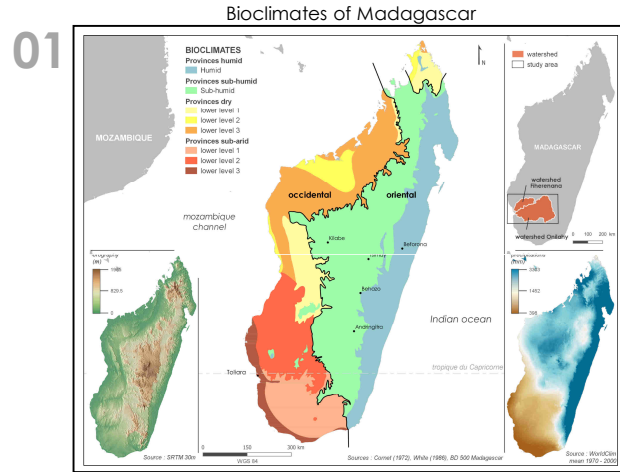
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# BUSHFIRE

Fiherenana and Onilahy Watersheds (SW Madagascar)

Fires detected at earth scale, are mainly located in the intertropical zone (Cochrane, 2009). Madagascar is an interesting study area to analyse this phenomenon, offering large diversity of bioclimates (A).



In Madagascar, fire practice is legally prohibited, since considered as the aim agent of vegetation degradation (Kull, 2002). However, there are controversial issues about their causes (natural or anthropic) and consequences (factor of degradation or not).

## OBJECTIVES and METHODOLOGY

### How is it burning

- Heatmaps with MODIS data (active fires and burned areas (2001-2016))
- Different geographical scales of analysis

### When is it burning

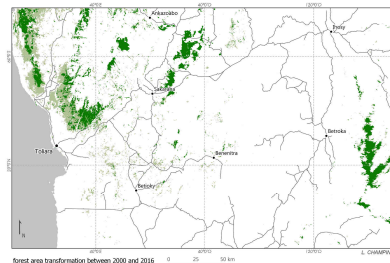
- Calculation of fire return rate (2001-2016)

### What is burning

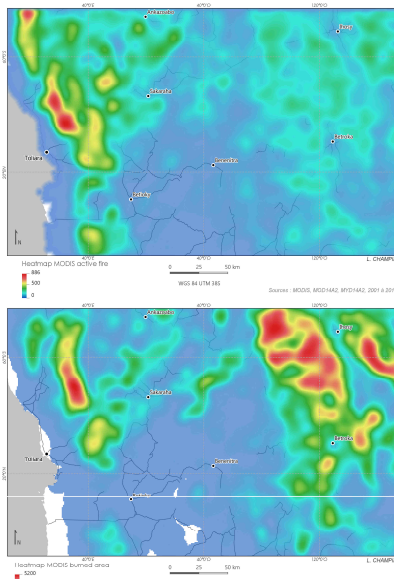
- Intact Forest Landscapes (IFL) method from Laestadius (2012) using MODIS VCF (Vegetation Continuous Fields)
- Typology of plant formations (Forest or savanna, open or closed)

### Why is it burning

- Land cover and land use
- Population uses and practices

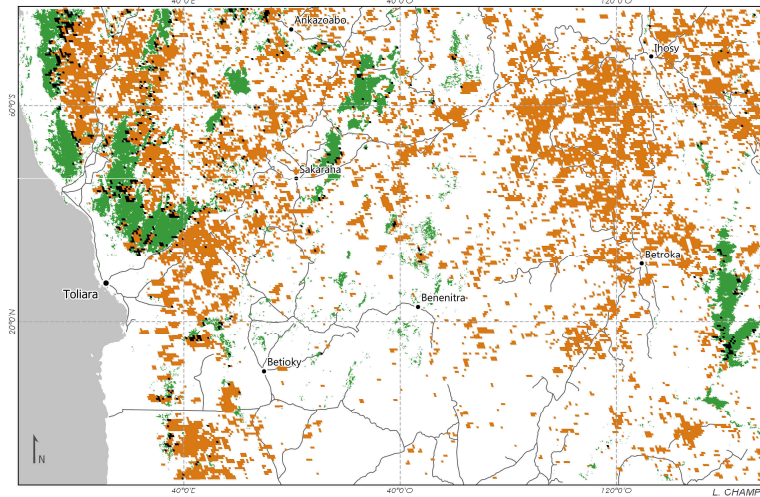


Forest transformation, IFL methode



## Identification of three FIRE patterns

- Type 1, few active fires for large areas burned
- Type 2, a lot of active fires detected but few or no burned areas
- Type 3, when both criteria are met, fires regularly started and burn like a patchwork.



04 WGS 84 UTM 38S Sources : MODIS, MCD14DL, MOD14A2, MYD14A2, VCF, 2004

## LIMITS

Confusions between closed vegetation formations (Deciduous dry forest, xerophytic thicket vegetation, "Tapia" forest) with different fire behaviour

Confusions due to spatial resolution, reducing the forest areas. Complex land uses are not identified in savannas

Need of temporal, frequencies and interannual variability analysis to specify fire trajectories

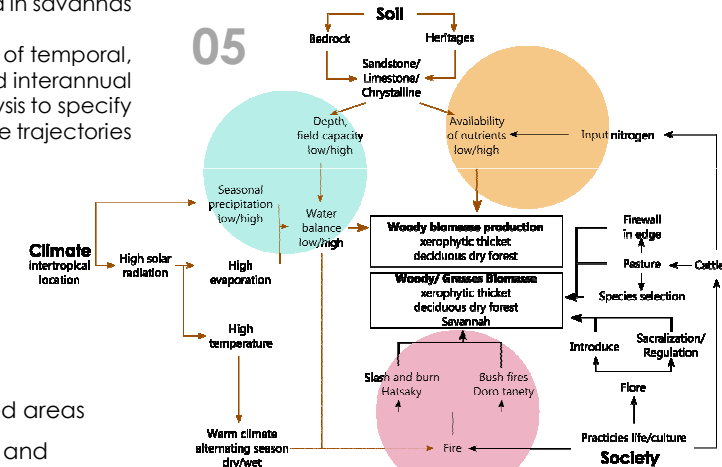
## PERSPECTIVES

**Precise definition of vegetation formations** concerned by fires and how they are affected

**Remote Sensing** by spectral approach with Landsat images

**Spatial evolution analysis** of burned areas, size and number of patches (Fragstat), with VIIRS images

Interannual frequencies of fire returns analysis to develop **fire patterns**, using **modelling tools** (SAGA)



Drivers of fire predispositions and occurrence



"Forest precede fire, not move back due to fires"