

**REPEATED AND EXTENSIVE FIRE AS THE MAIN DRIVER OF  
LAND COVER CHANGE IN BLOCK C OF  
THE FORMER MEGA RICE PROJECT AREA**

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# Study area

**INDONESIA**

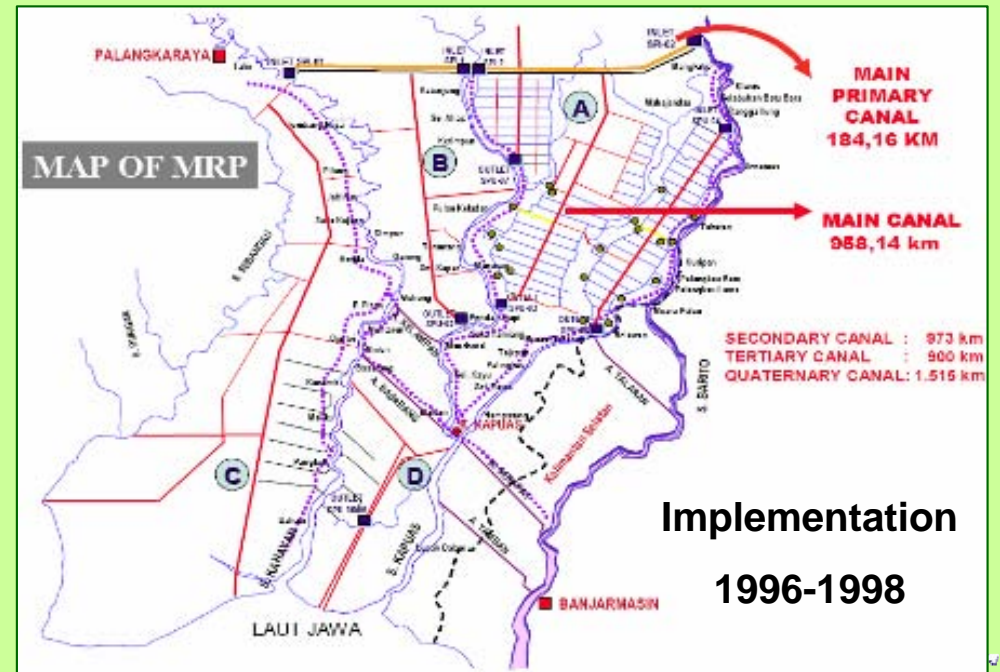
**BORNEO**

**Central Kalimantan**

**Ex-Mega Rice Project**

**Block C: ~ 450 000ha  
88% peatlands**

**~ 40% of the total peatlands  
area within the MRP**

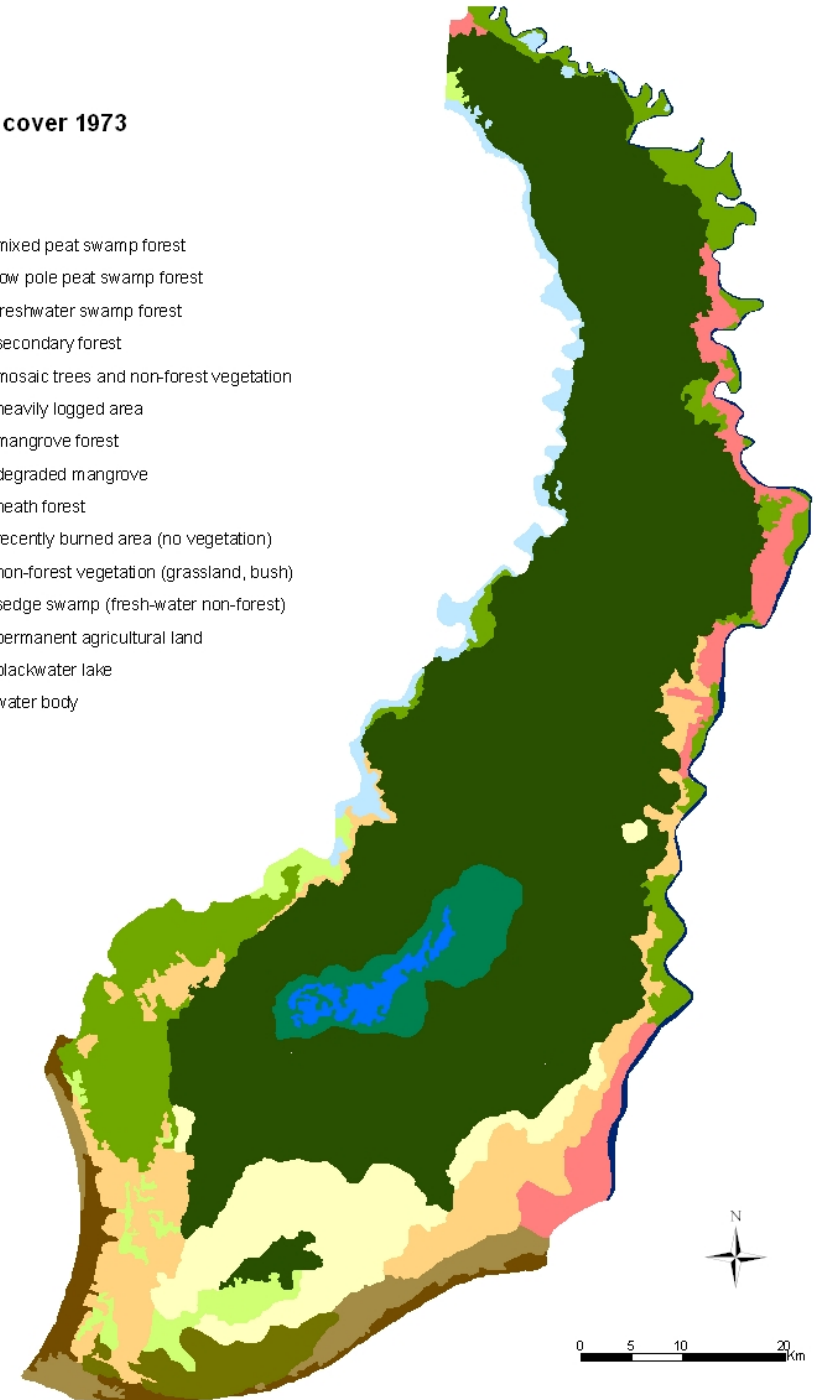


**Year 1973**

**Peat swamp forest  
60% of Block C  
(267,733 ha)**

- **Carbon sink and storage**
- **Regulation of water cycle**
- **Soil protection, erosion control**
- **Food production, livelihood**
- **Biodiversity**

**Land cover 1973**



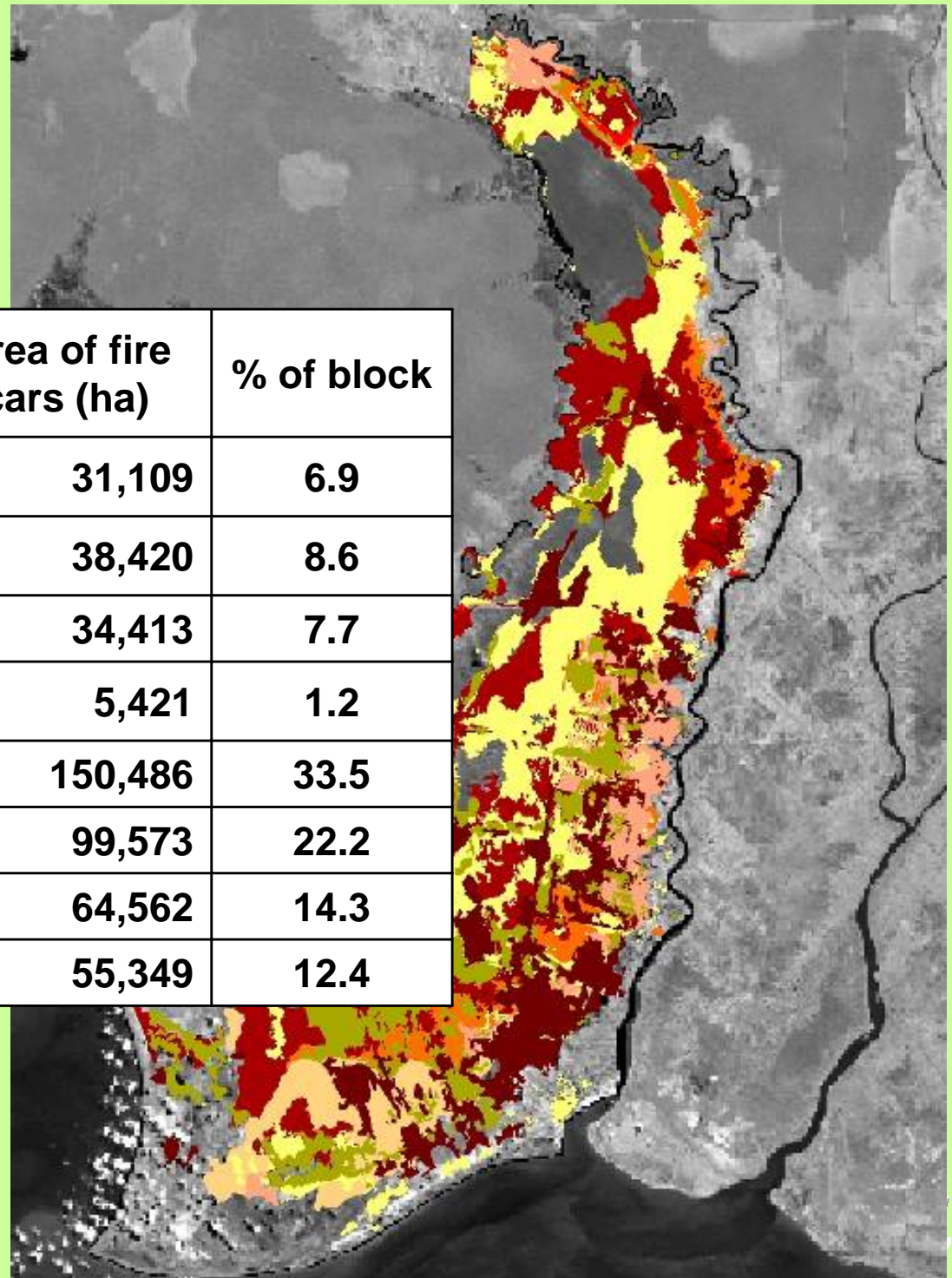
# Fire as a major driver of deforestation & land cover dynamics



# Fire occurrence

Time period	El Niño events	Area of fire scars (ha)	% of block
1973	1972/73	31,109	6.9
1973-1990	1982/83;87	38,420	8.6
1991	1991/92	34,413	7.7
1994-1996		5,421	1.2
1997	1997/98	150,486	33.5
2002	2002/03	99,573	22.2
2004		64,562	14.3
2005		55,349	12.4

Burned area mapped from satellite data

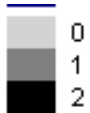


# Fire frequency

## 1973-1997

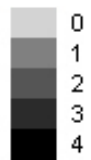
## 1997-2005

Fire frequency  
(1973-1997)



	1973-1997	1997-2005
<b>fire frequency</b>	<b>% of burned area</b>	
1	99,1	35,2
2	0,9	48,6
3		12,9
4		3,3

Fire frequency  
(1997-2005)



# LAND COVER CHANGE 1973-2005

Derived from time-series of  
satellite images:

Landsat MSS

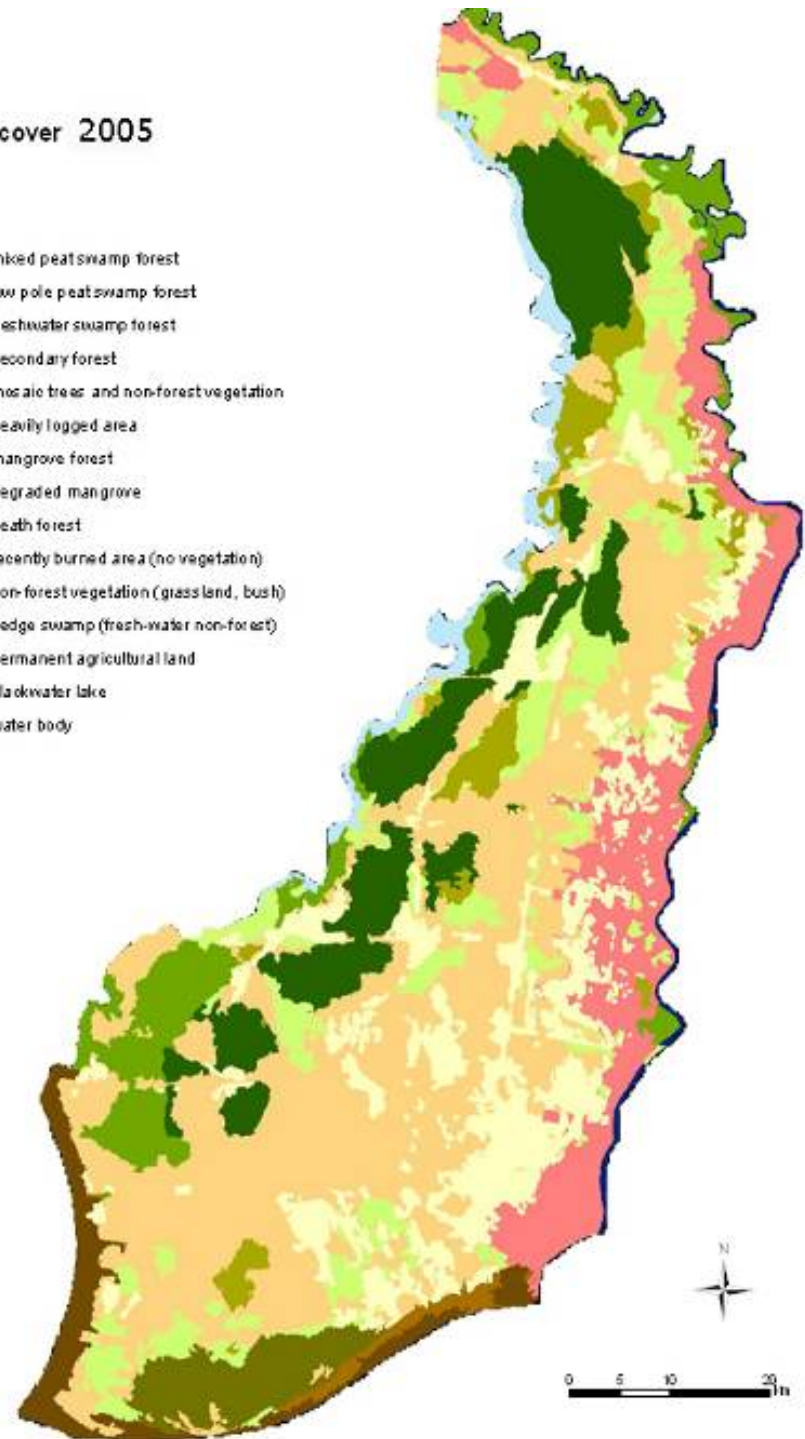
Landsat TM

Landsat ETM

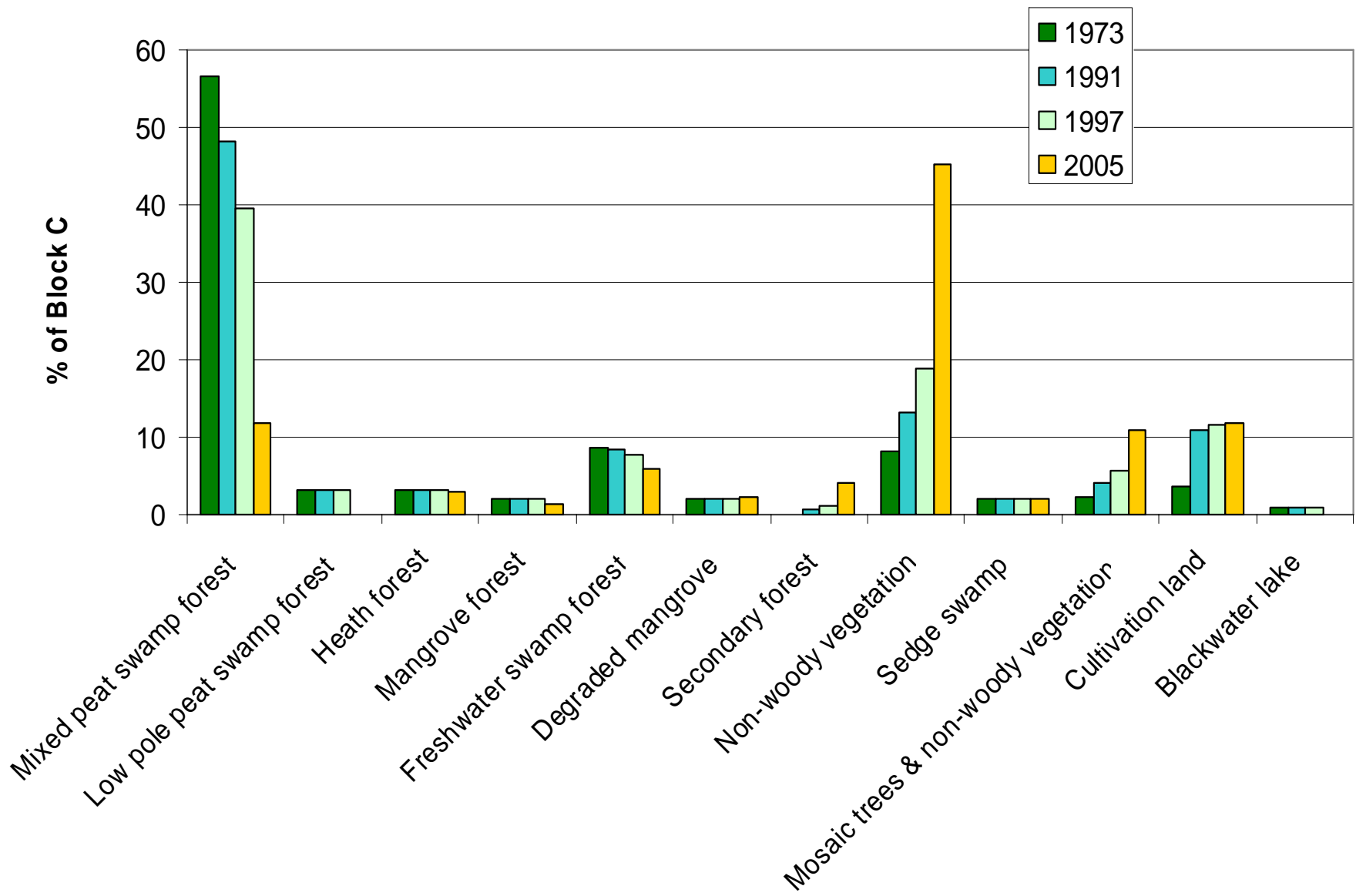
Aster/TERRA

DMC (Disaster Monitoring  
Constellation)

Land cover 2005

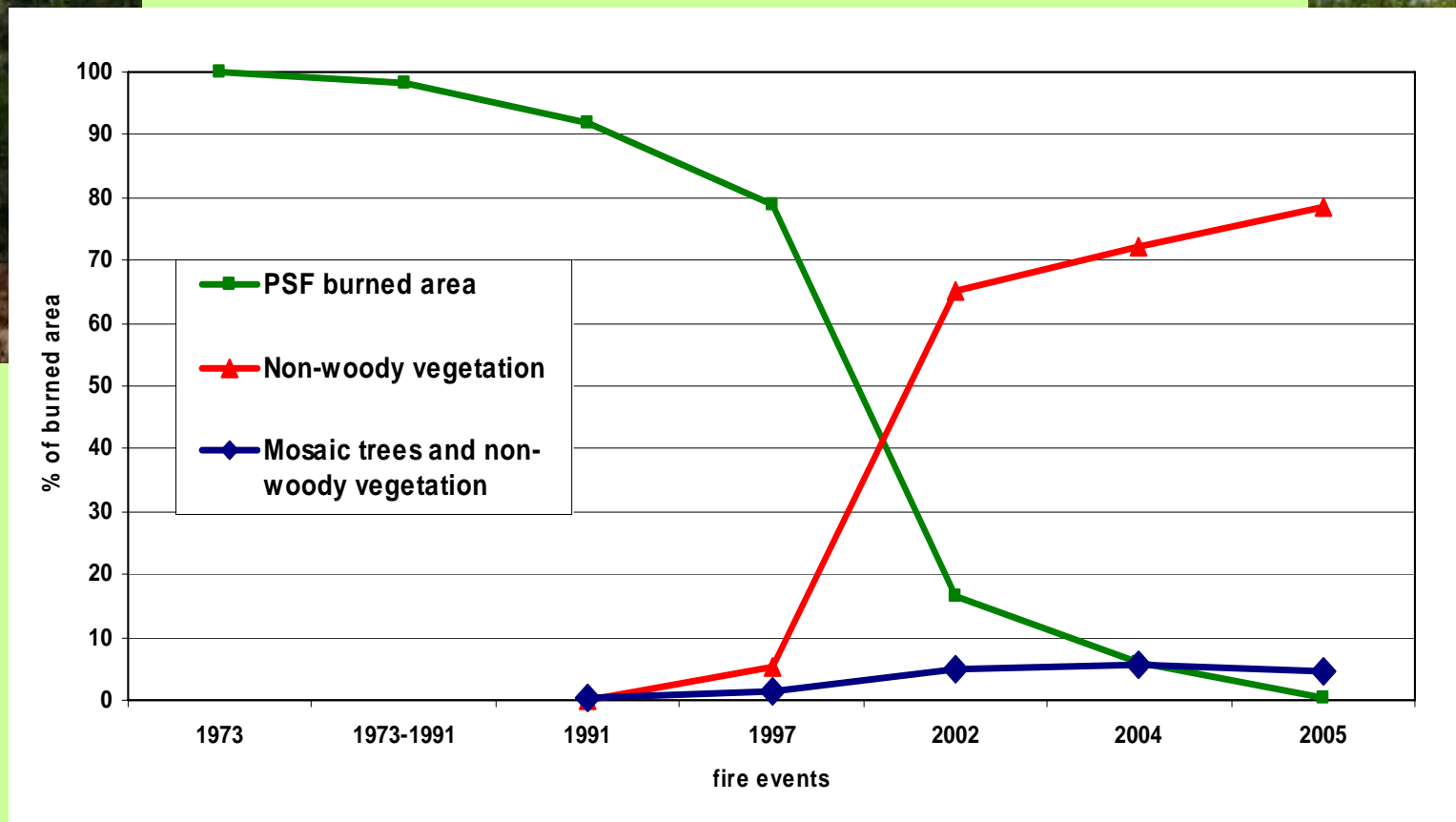
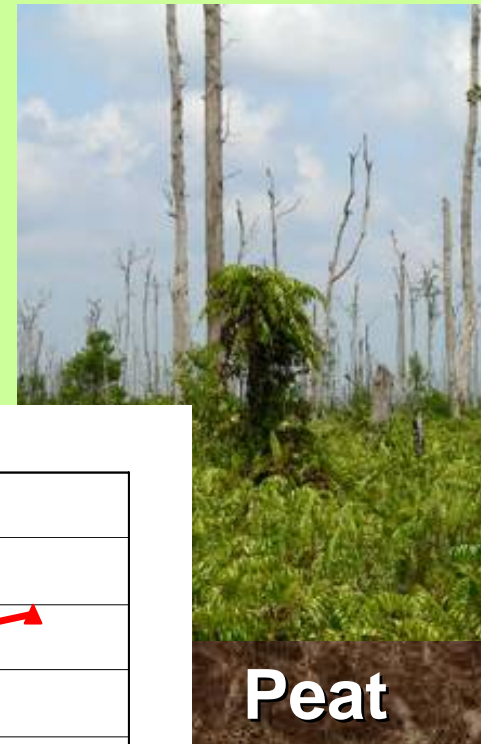
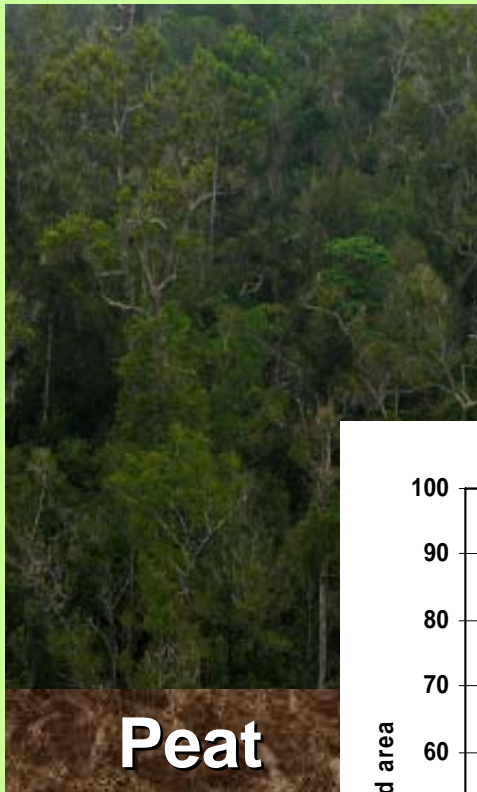


# Land cover & Land cover change

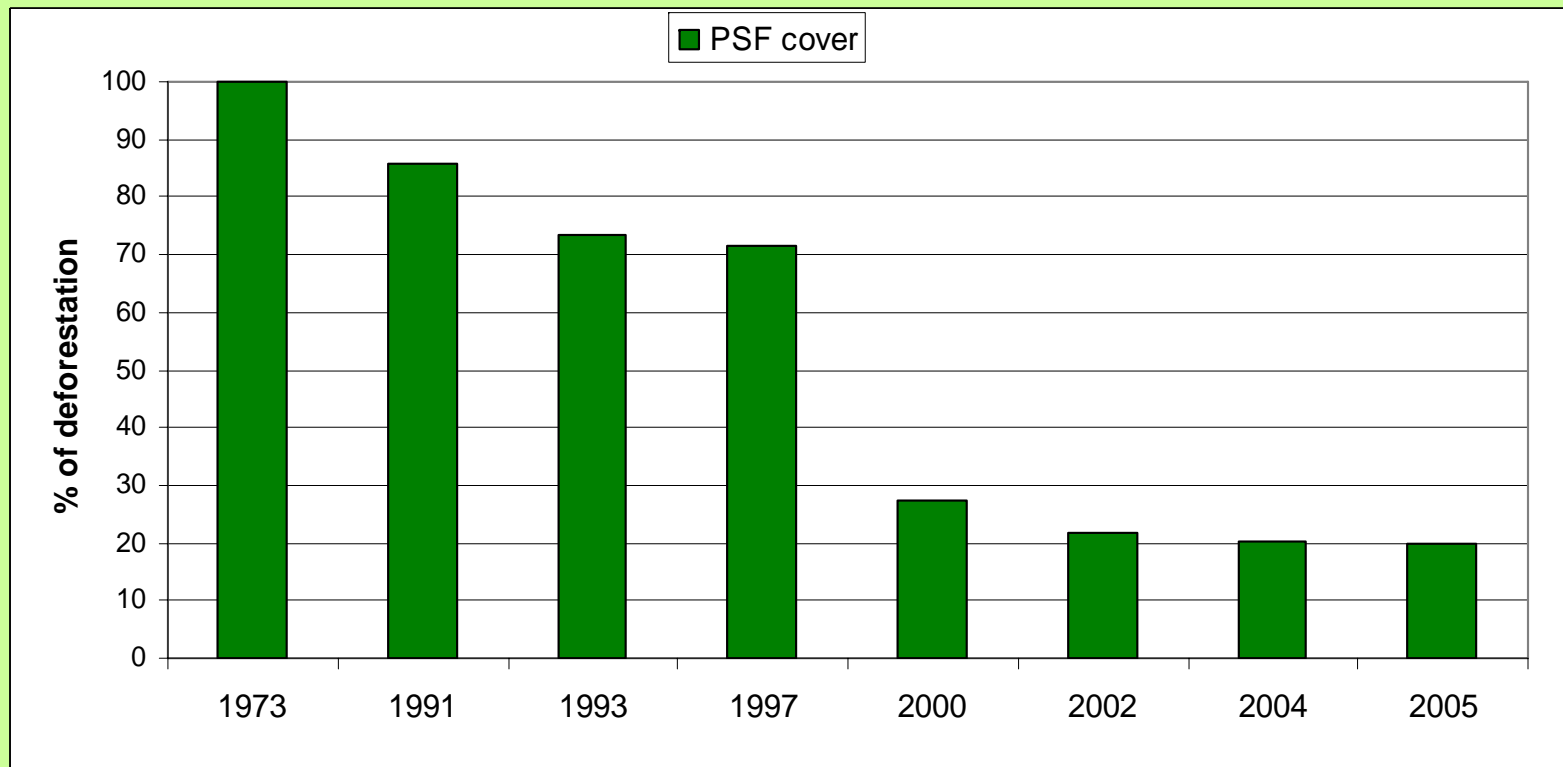


# What is the main fire fuel load?

## What is currently burning?



# Peat swamp forest loss



267,733ha

53,665ha

## Deforestation rate (% / year)

	1973-2005	1991-2005	2000-2005
peat swamp forest	2.5	5.5	5.3
freshwater forest	1.0	2.1	0.2
mangrove	1.1	2.5	7.1

# Conclusion

- *land cover dynamics is strongly driven by widespread fires, that have increased in recent years*
- *fire frequency, occurrence and interval have noticeably increased over the last decade*
- *incidence of fire is becoming decoupled from ENSO, with an increased risk of fire even during 'normal' (i.e. non-ENSO) dry seasons*
- *once burned fragments have become more susceptible to future fires (~50% of total burned area over period 1997-2005 was burnt two times)*
- *the fire fuel load has shifted from mainly peat swamp forest towards non-woody vegetation (in both cases the peat soil is included in burning process )*
- *peat swamp forest has been mainly converted into unused land covered by homogenous, lower growing plant communities dominated by ferns and sedges with very few trees, where the peat is exposed to additional degradation by oxidation*
- *there are still locations with evidence of secondary vegetation regrowth towards forest – but these will be lost with further fires*

# Thank You