

# The Global Early Warning System for Wildland Fire: African Developments

Presented at:

Joint GOFC-GOLD – UNISDR Global Wildland Fire Network Meeting  
9 May 2011 Sun City, South Africa

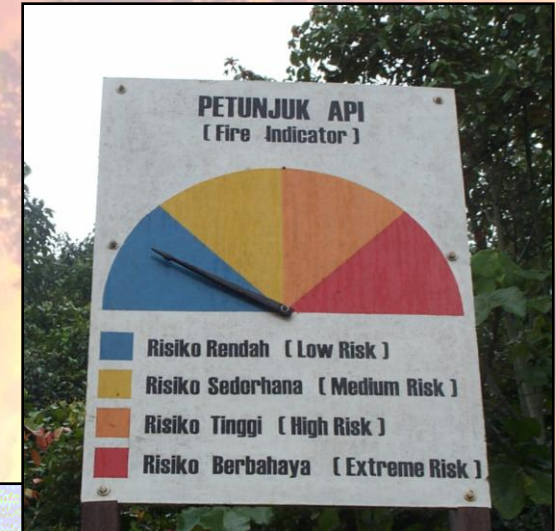
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## What is Fire Danger and Early Warning?

Wildland Fire Danger – a measure of the potential for fire to start, spread, and have significant impact.

Fire danger rating is the systematic assessment of fire danger and is a primary fire management decision-aid tool.





## What is Fire Early Warning?

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Photos: Working on Fire



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Fire early warning provides:

1. Guidance in the planning and appropriate use of prescribed fire
2. Time to implement fire management actions that mitigate or prevent wildland fire disaster



## Fire Suppression Criteria Based on Head Fire Intensity (HFI)

Resource	HFI Limit (kW/m)
Hand tools	0-250
Power pumps	250-1250
Mechanized equipment to build control lines	1250-2500
Aircraft	2500-5000
Indirect attack (burning out)	5000+

## **Fire Intensity**

in savannah and grasslands, classified by thresholds of suppression capability (ie, hand tools, power pumps, aircraft, indirect attack with burnout fire)

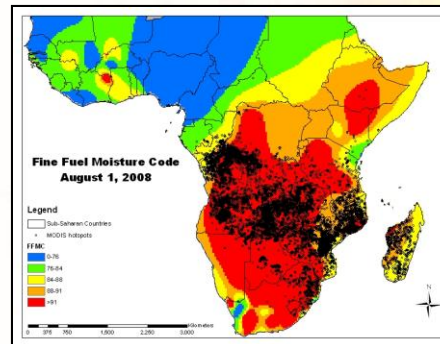
## **Fire suppression criteria**



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## Fire suppression criteria



← Fire Weather

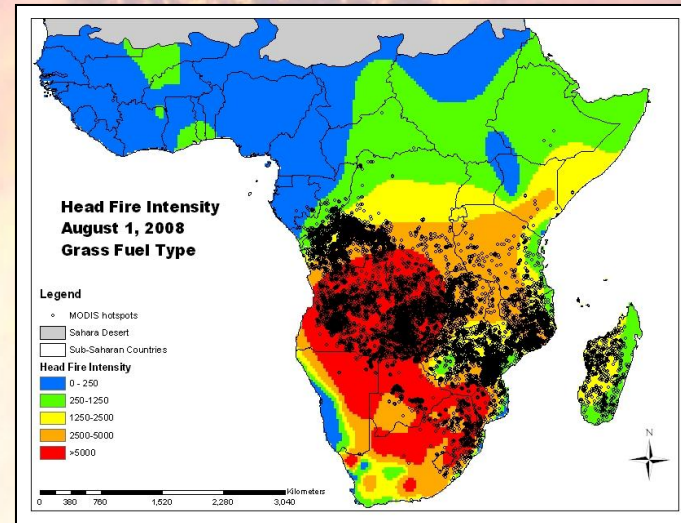
← Hot spots



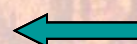
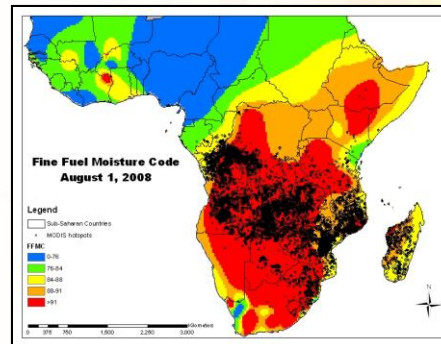
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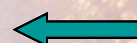
Fire  
suppression  
criteria



Suppression  
Requirements and  
Active Fires

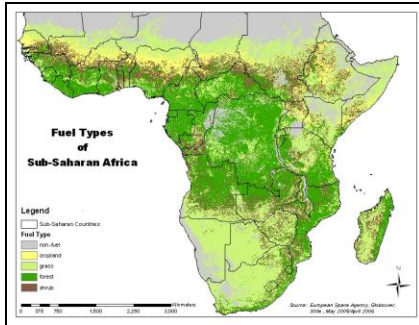


Fire Weather



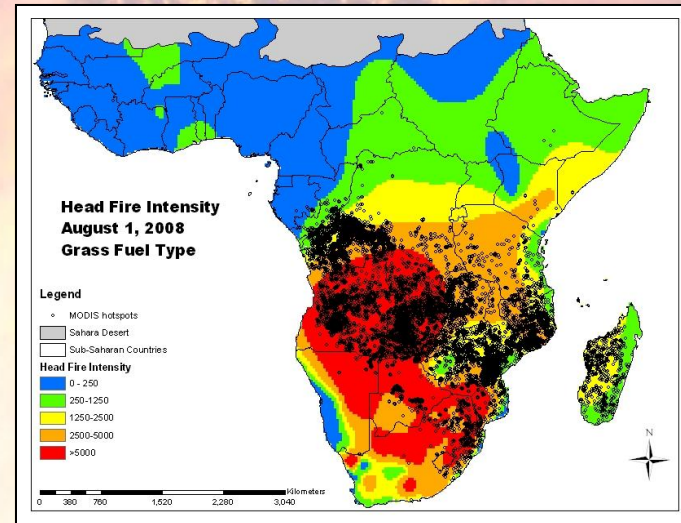
Hot spots

## Vegetation – Fuel Classification

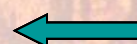
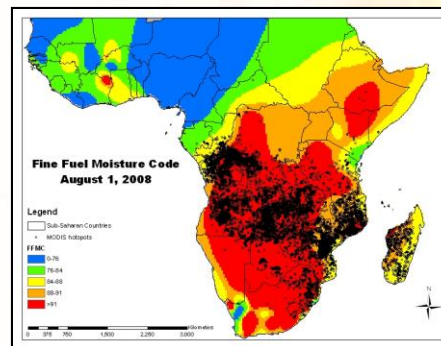


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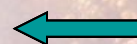
**Fire suppression criteria**



**Suppression Requirements and Active Fires**



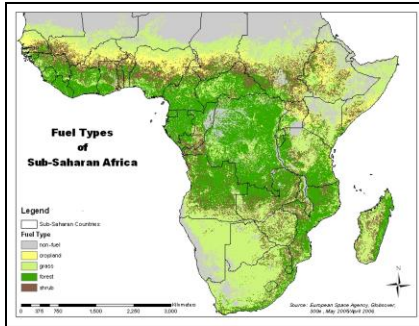
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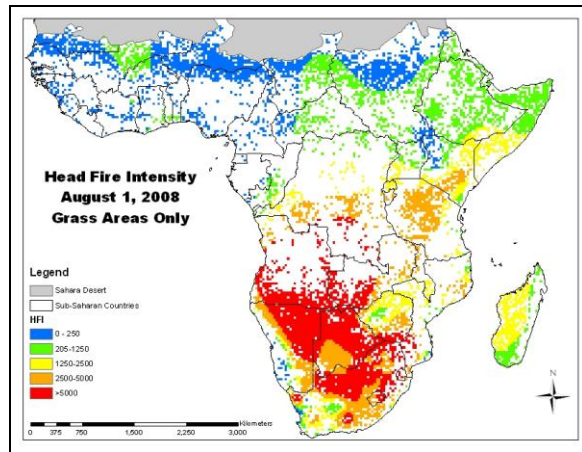
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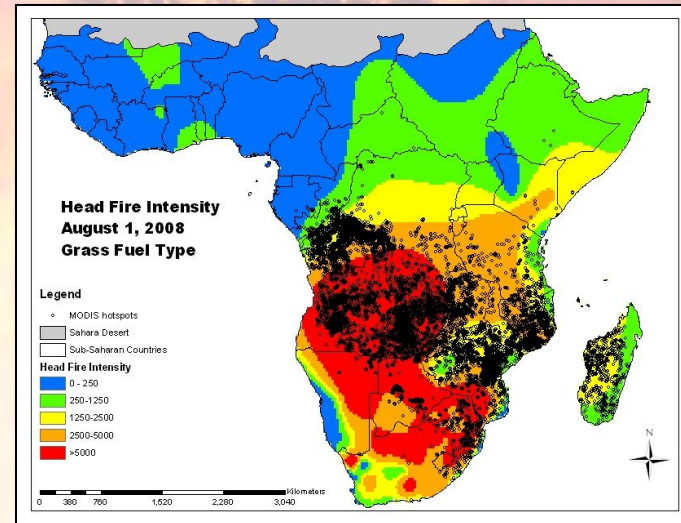
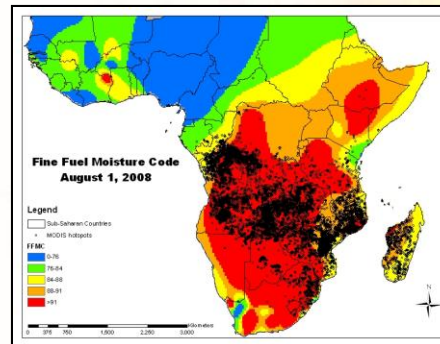


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## Predicted Suppression Requirements

**Fire suppression criteria**







**Suppression Requirements and Active Fires**

**Fire Weather**

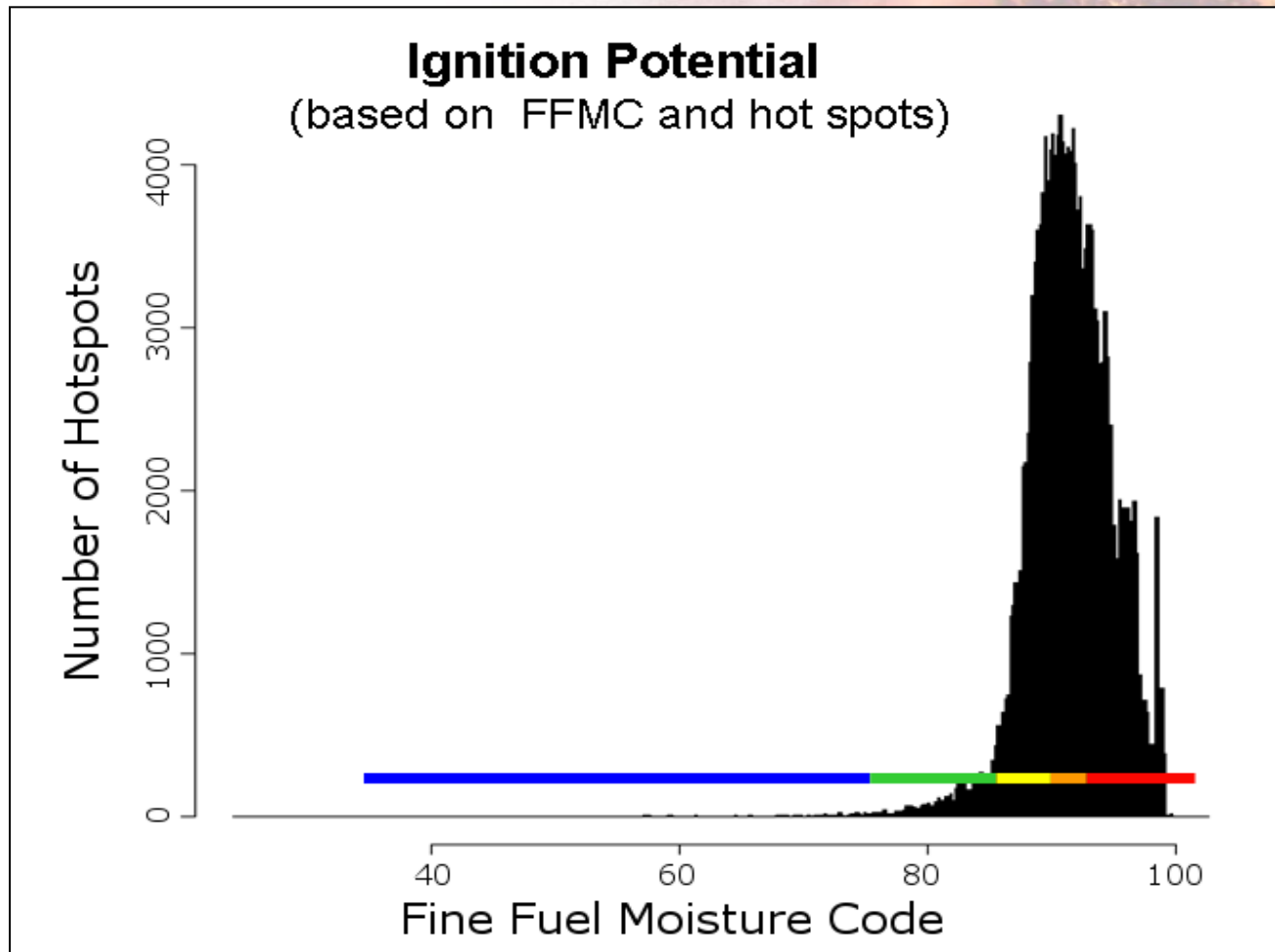
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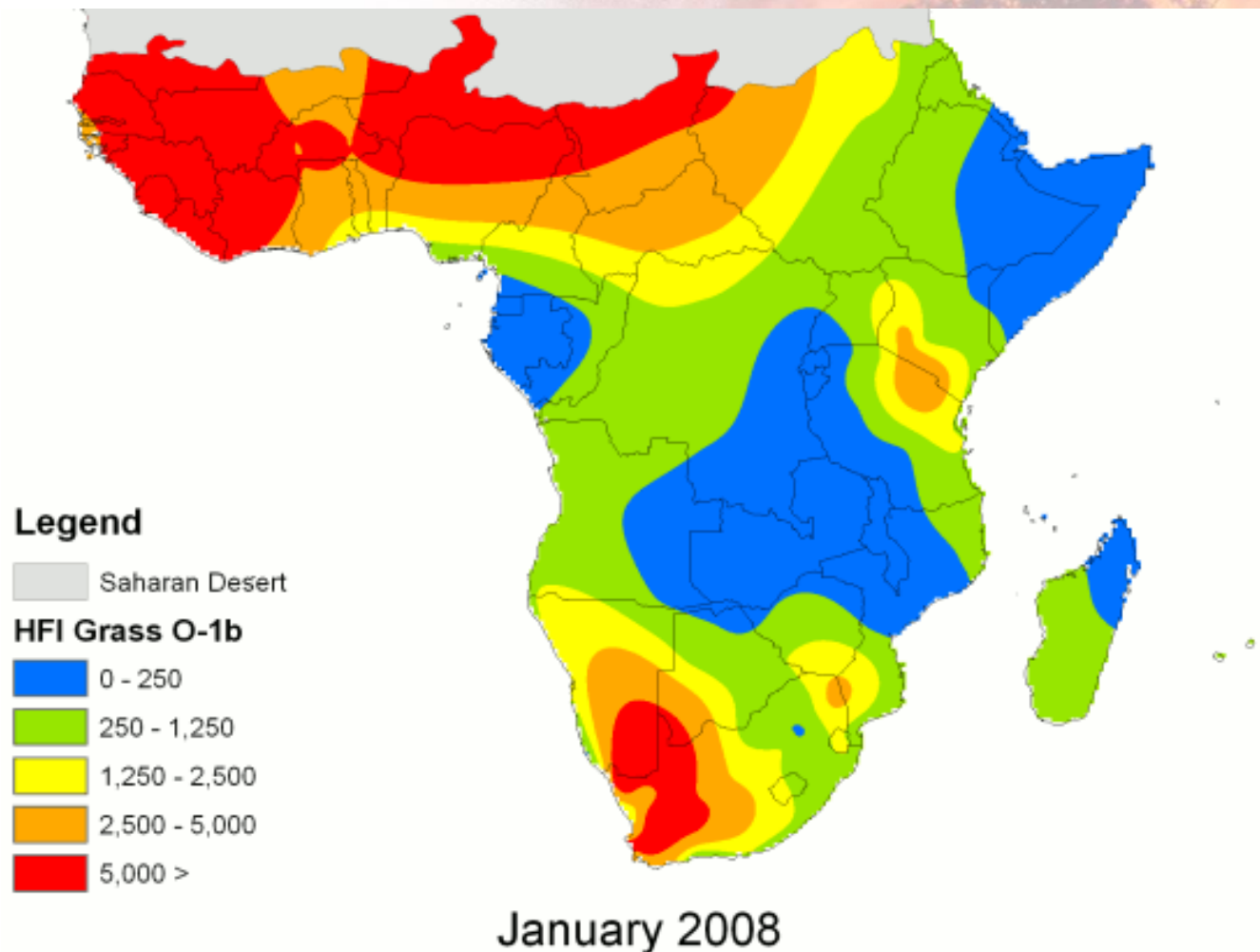
## Pre-Suppression Action

Wildfire Threat Level		Resources on Standby	Alert Period	Dispatch Time
Low		crews, hand tools	mid-day	60-min
Moderate		crews, hand tools	all day	30 min
		pumps, water tanks	mid-day	60 min
High		crews, hand tools	all day	15 min
		pumps, water tanks	all day	30 min
		control line-building equipment	mid-day	60 min
Extreme		crews, hand tools	all day	15 min
		pumps, water tanks	all day	15 min
		control line-building equipment	all day	30 min
		aircraft, burnout equipment	mid-day	60 min

# Calibrating the System

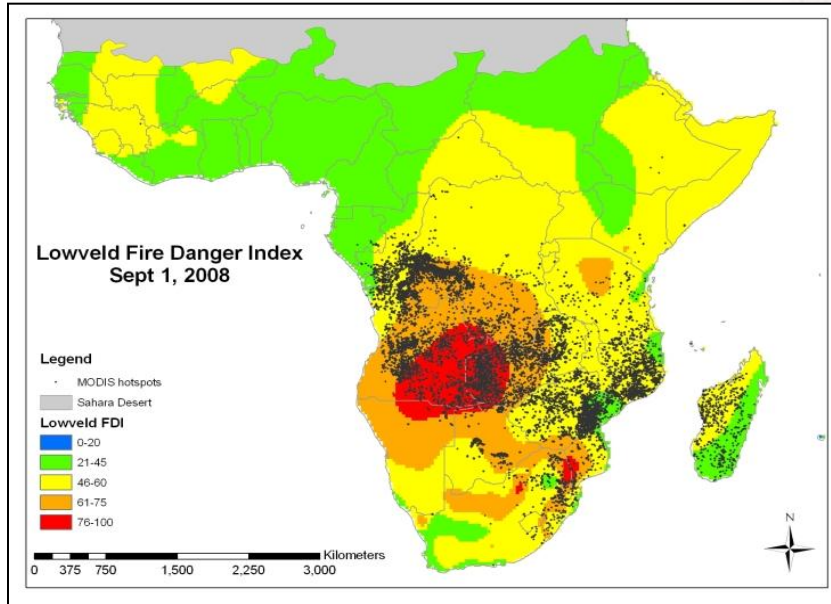


## HFI in Grass Fuel – Monthly Means for 2008

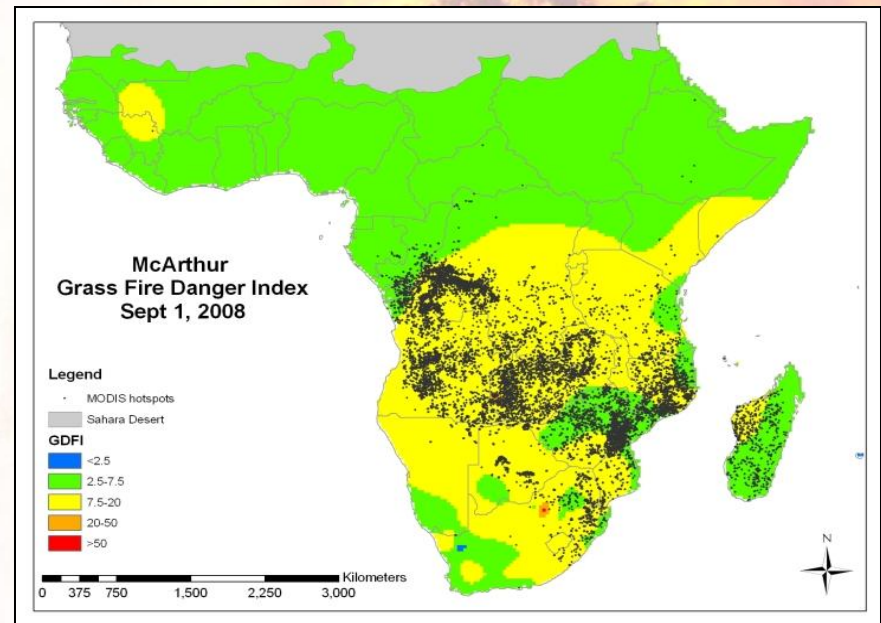




## Lowveld Fire Danger Index



## MacArthur Grassland Fire Danger Index



# Remote Sensing Improvements to Global Fire Danger

Items to include in future that influence fire danger products:

- spatial rainfall (surface temperature, RH?)
- seasonal vegetation greenup and curing
- live vegetation moisture content
- biomass (fuel load), affecting emissions as well as fire behaviour
- fire radiative energy, use FRP for fuel consumption and emission rates
- refined fuel classification
- Incorporate RS biomass to improve fire intensity, fire emissions prediction
- Calibrate predictive ignition models with hot spot data

## GOFC-GOLD Fire EWS Project:

- Global Fire Monitoring Centre
- Canadian Forest Service
- University of Maryland/FIRMS
- NOAA/NESDIS
- Joint Research Centre, European Commission