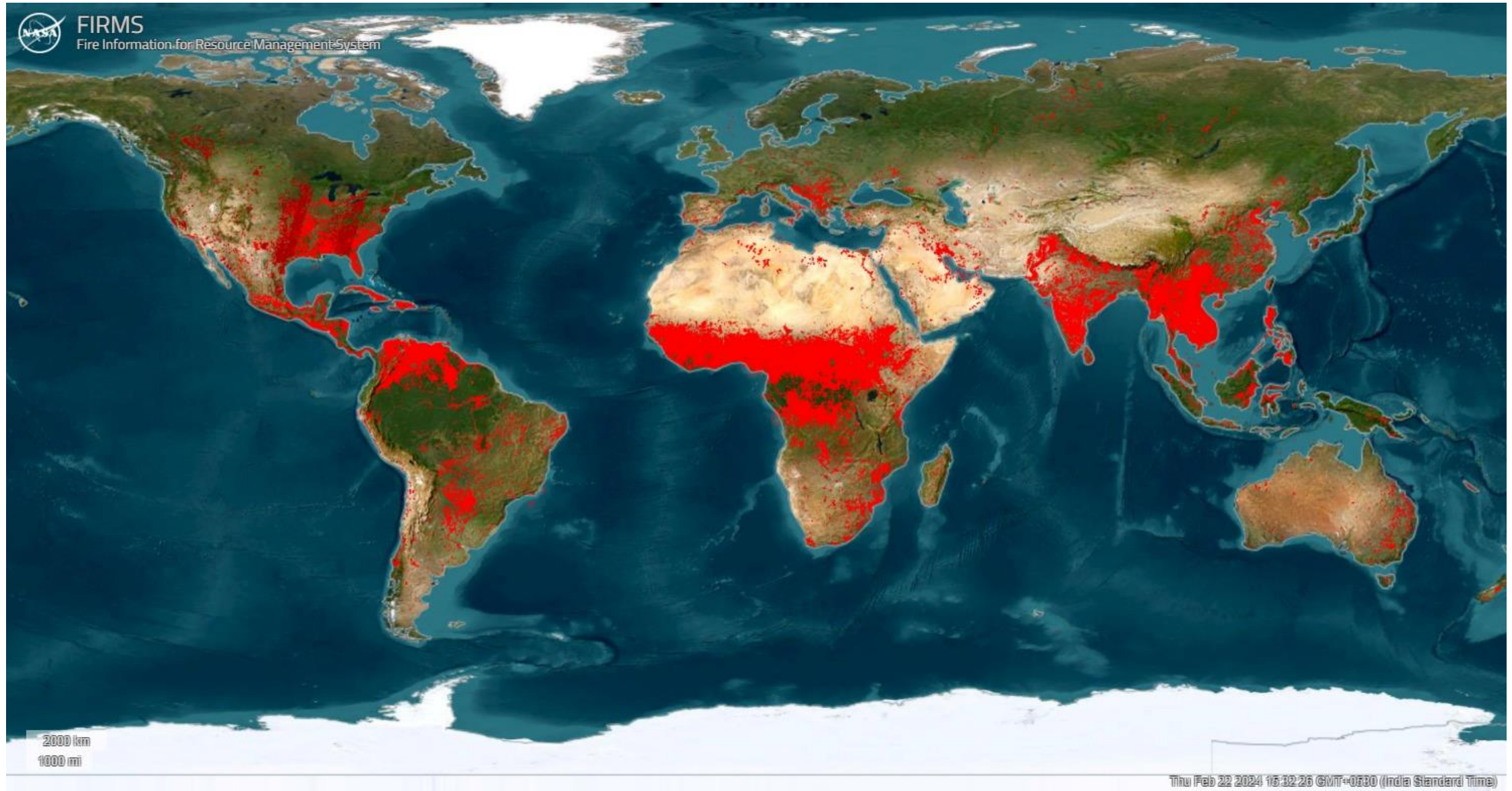


Remote Sensing of Fires

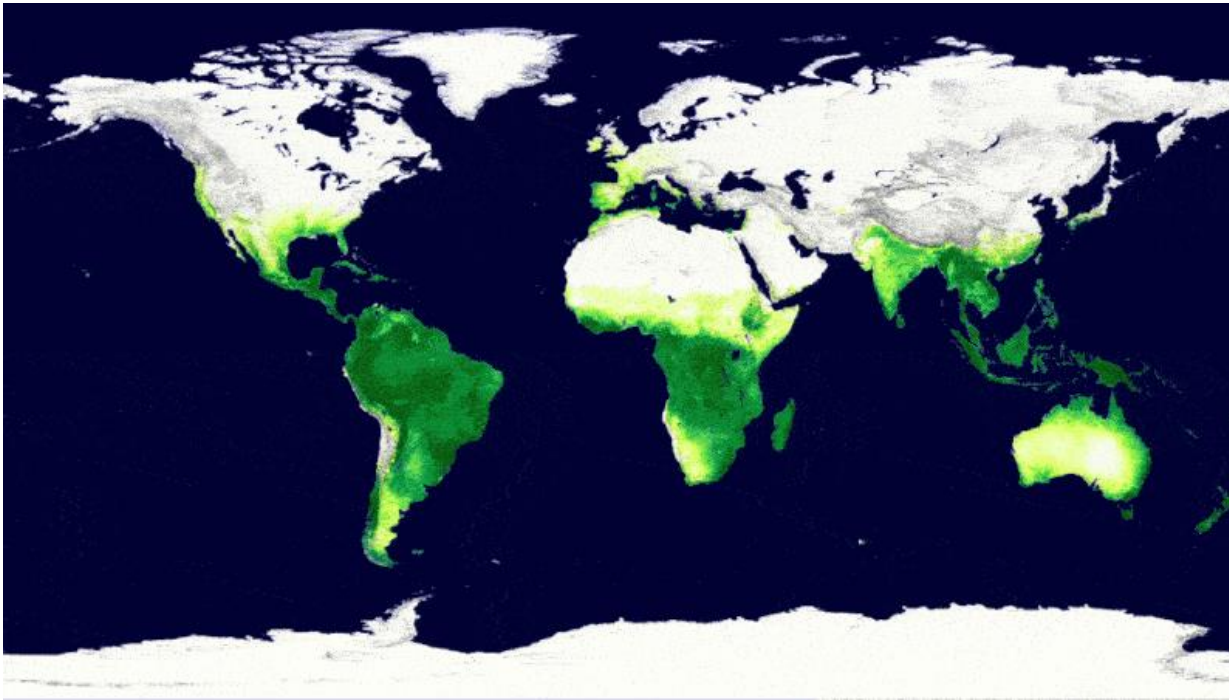


Active Fires – 3rd Week, February 2024 - <https://firms.modaps.eosdis.nasa.gov/>

Earth Observation from Space

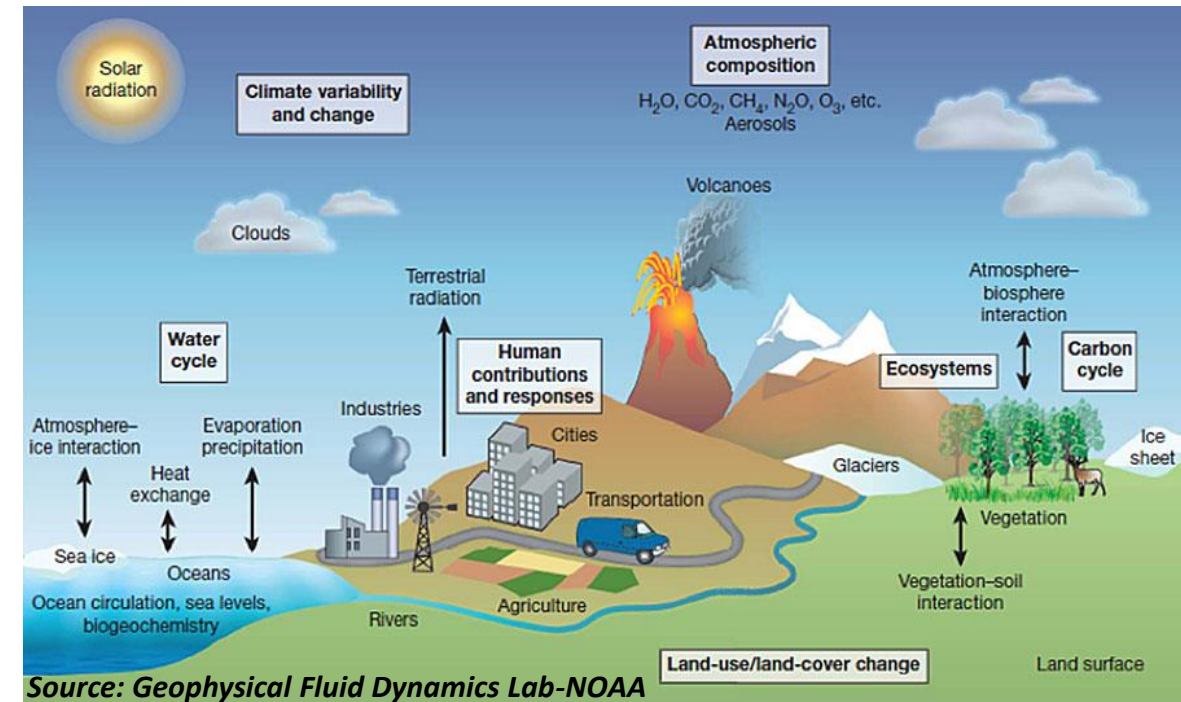
Earth System Science & Modelling

- Geosphere-Biosphere Interactions
- Climate Variability & Change

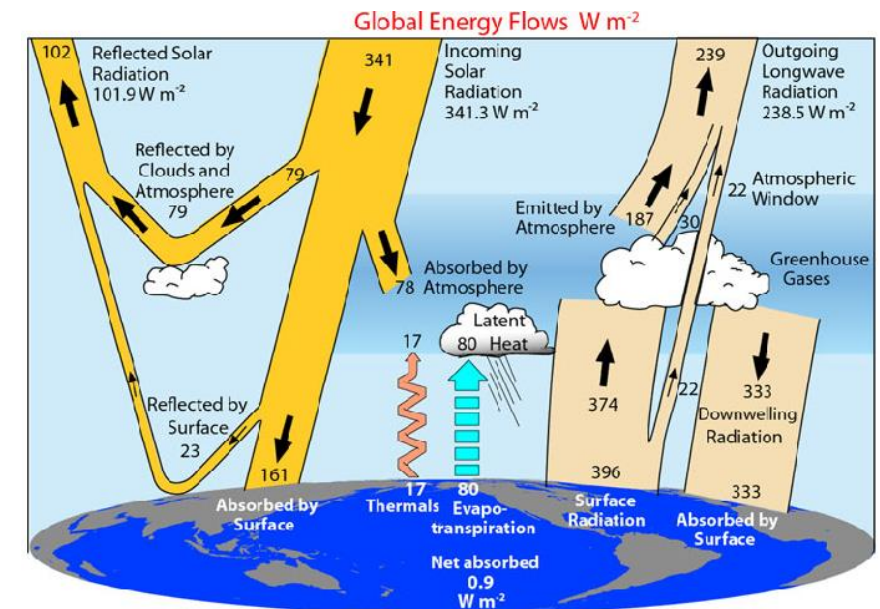


Global Vegetation Cycle

Credit: NASA Goddard's Scientific Visualization Studio



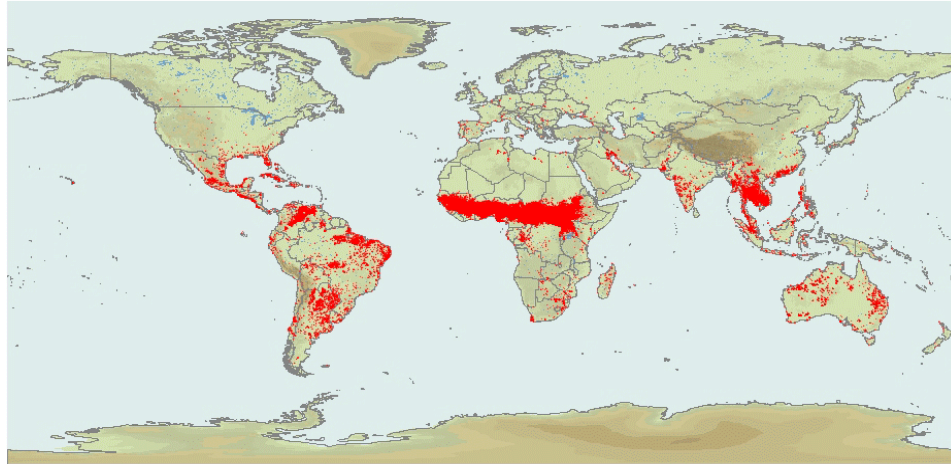
Source: Geophysical Fluid Dynamics Lab-NOAA



DOI:10.1007/s10712-011-9150-2

Retrieving spatio-temporal patterns from earth observation

MODIS Rapid Response Fire Detections for 2005



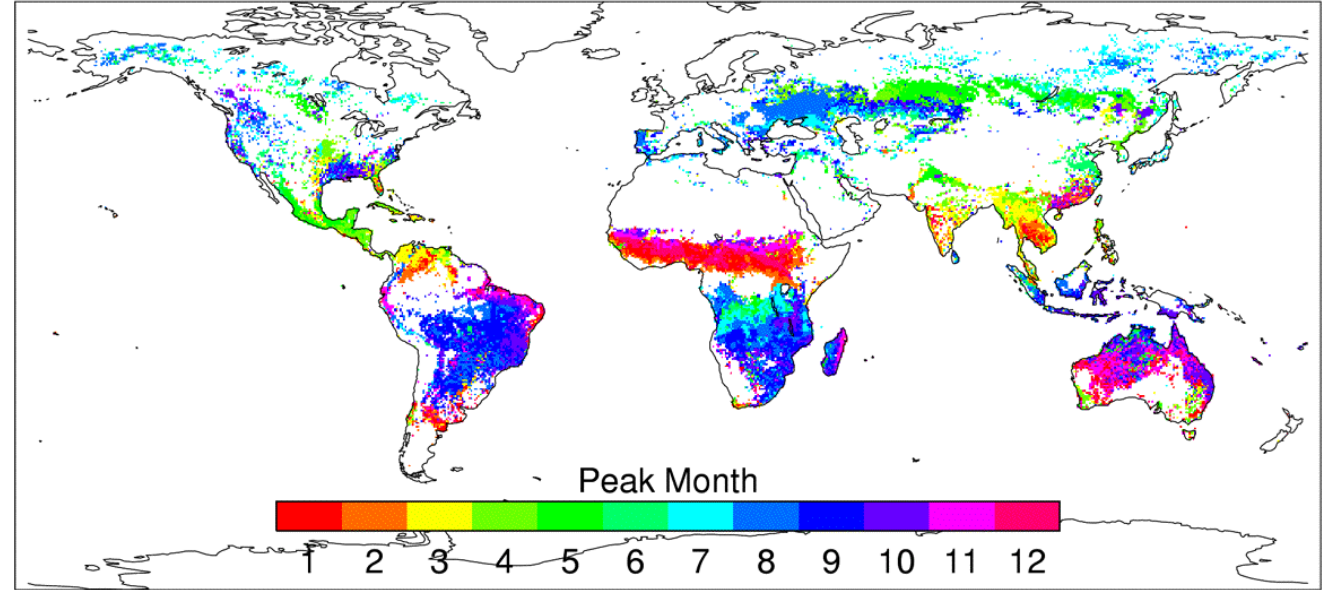
JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER



• MODIS Active Fire Detections
□ World Countries

Active fires are detected using MODIS data from the Terra satellite.
Source: MODIS Rapid Response <http://rapidfire.sci.gsfc.nasa.gov>
Web Fire Mapper: <http://maps.geog.umd.edu>

Fire Climatology, 2005



Mean Peak Fire Month (2000-2005)
Giglio et al. (2006)

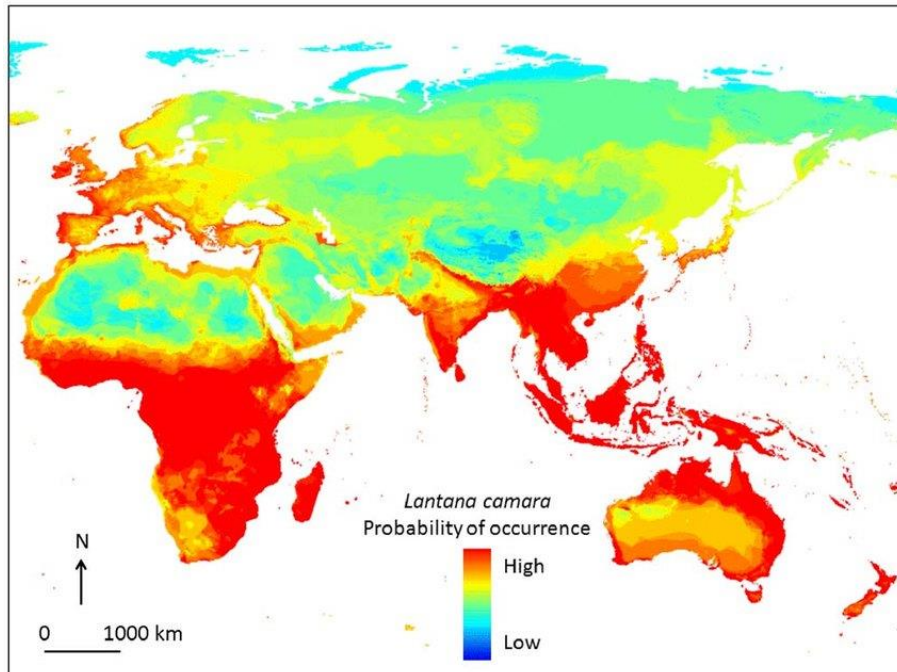
Fires are a Global Phenomenon

- ❖ Often termed as wildland fire or wildfire.
- ❖ Depending on the place of occurrence they are also termed as bush fires, peat fires, grass fires, hill fires and brush fires
- ❖ **Peak fire season in India is during March-May every year**

Why study fires?

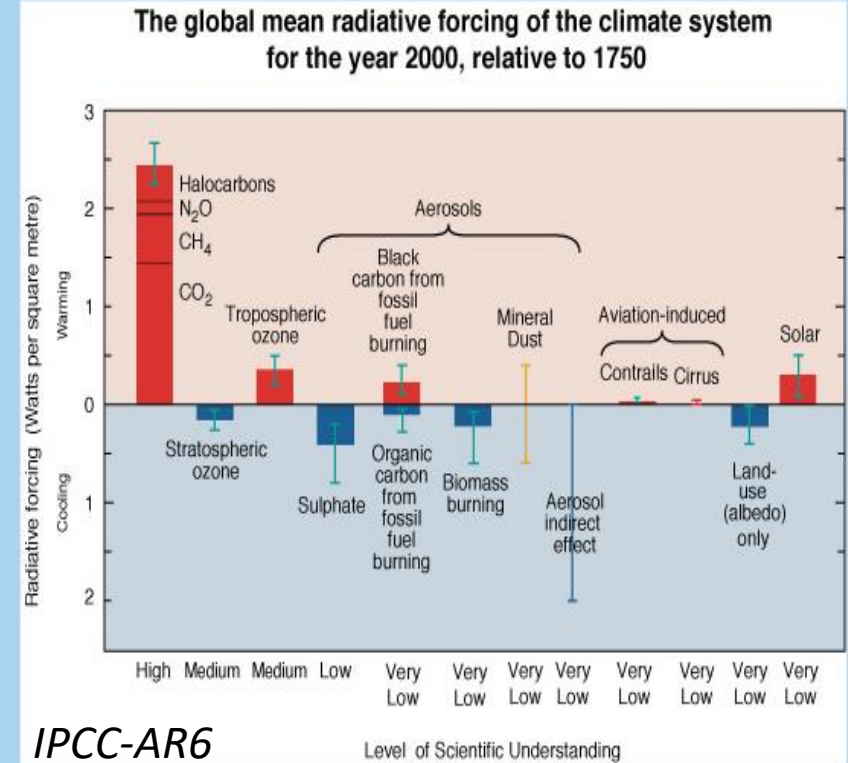


Socio-economics



Ecological effects

Radiative Forcing of natural and anthropogenic Sources



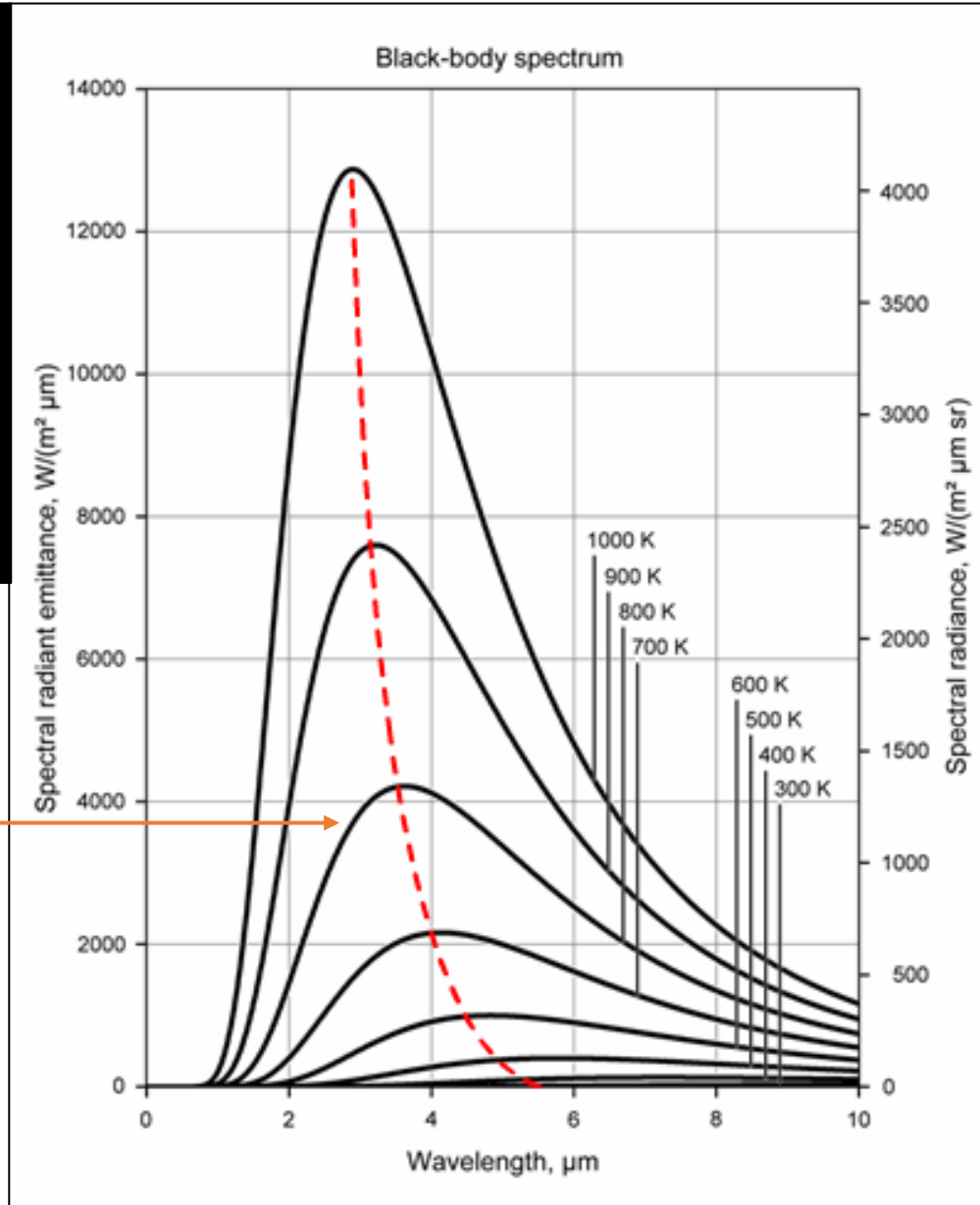
Atmospheric effects – Radiative Forcing

- Loss to human life and property
- Loss to biodiversity
- Soil erosion and runoff
- Invasion of fire resistant species
- Radiative forcing and climate change

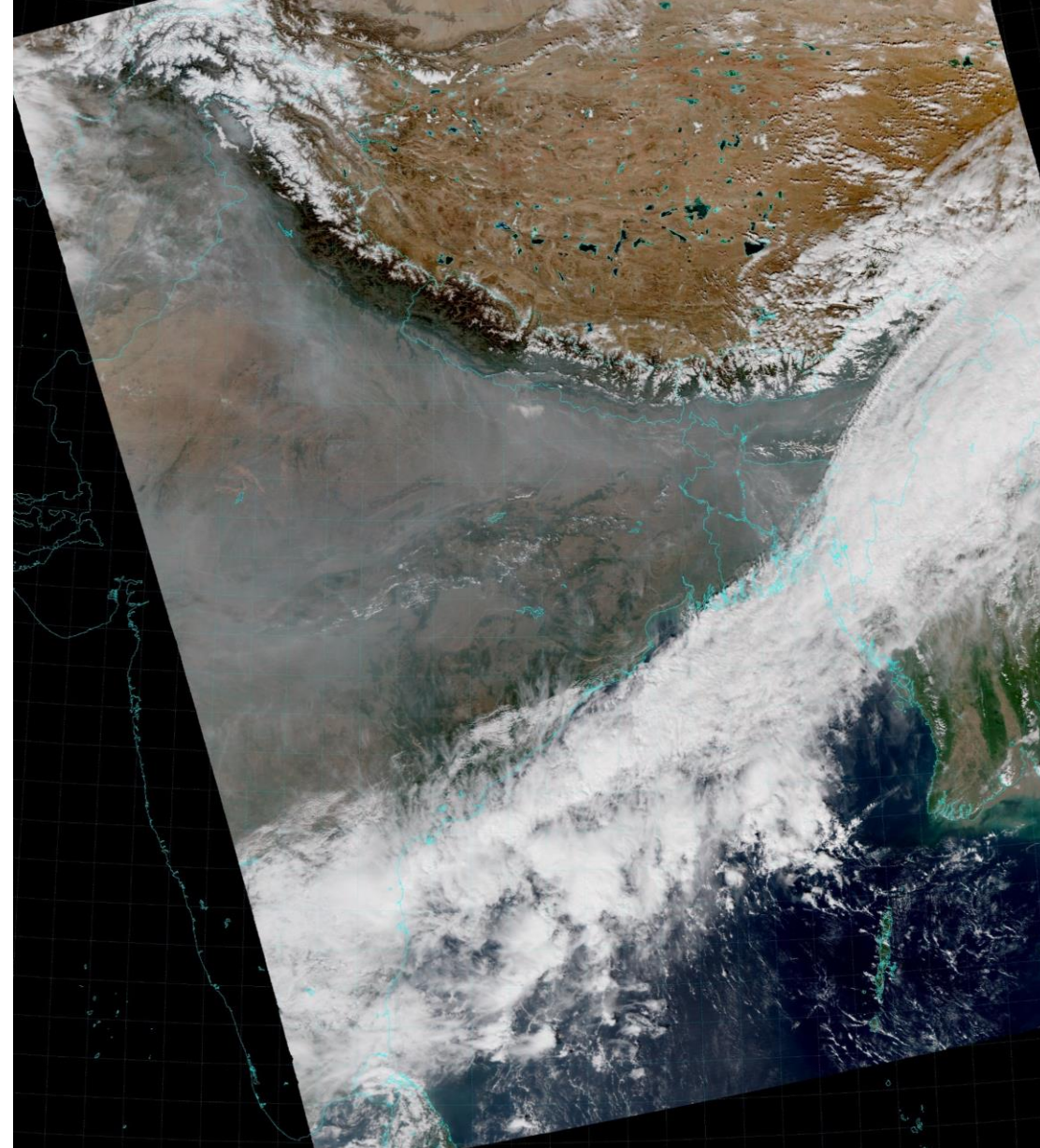
Physical Basis



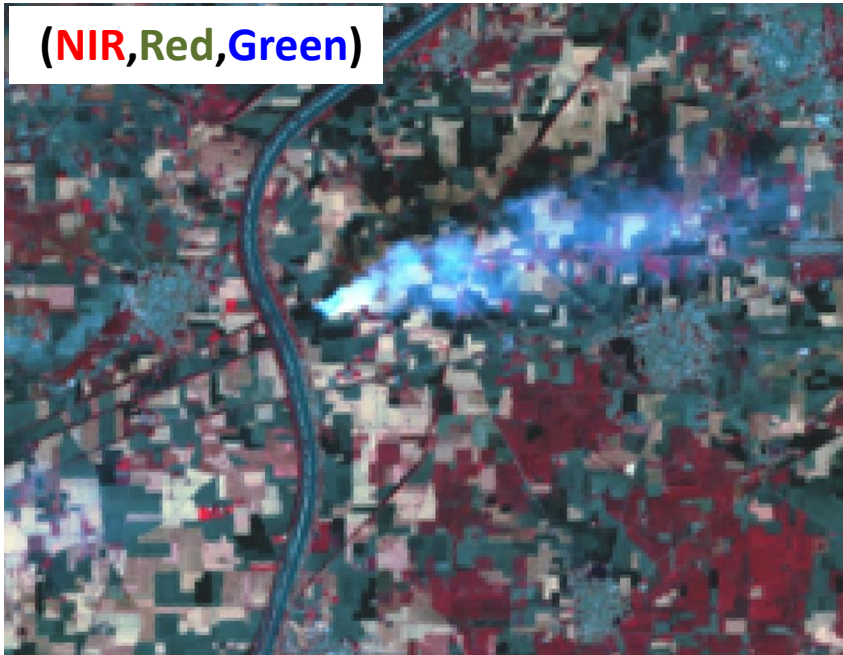
~ 4 μ m band
is sensitive
to
vegetation
fires



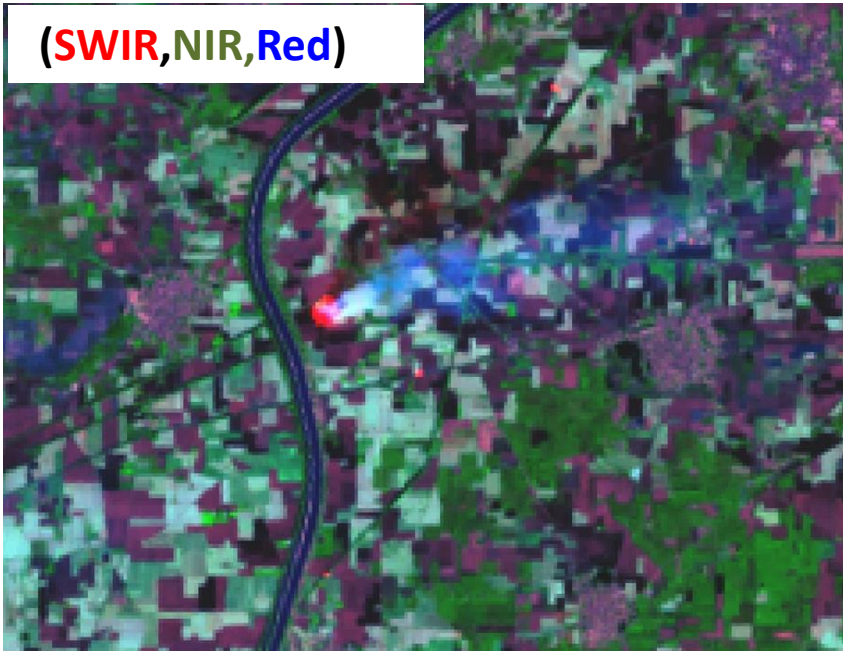
Wien's Displacement Law



(NIR,Red,Green)

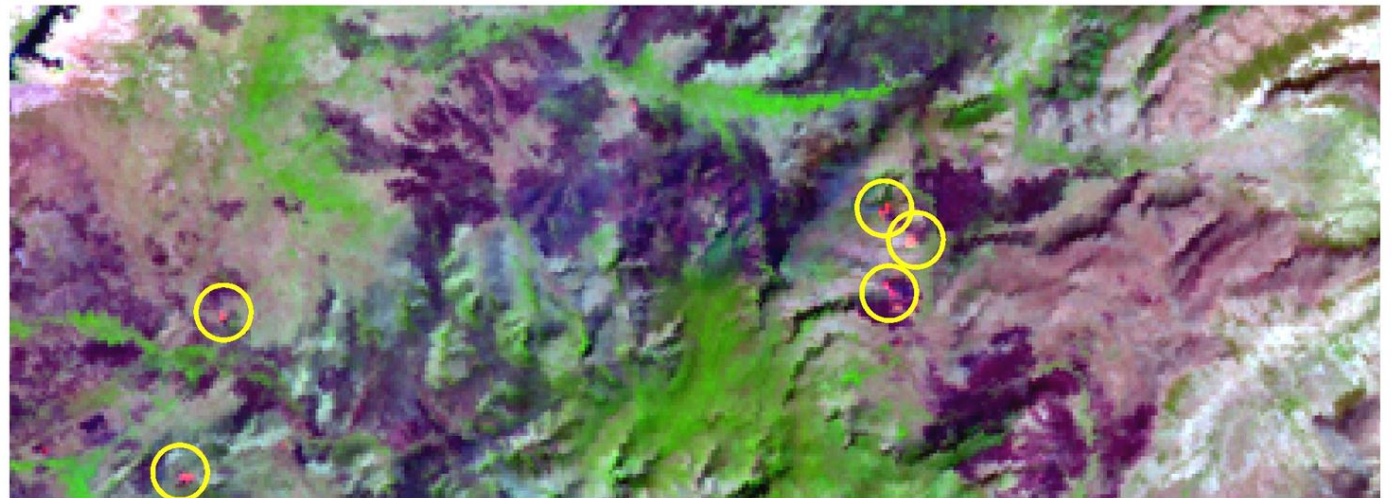
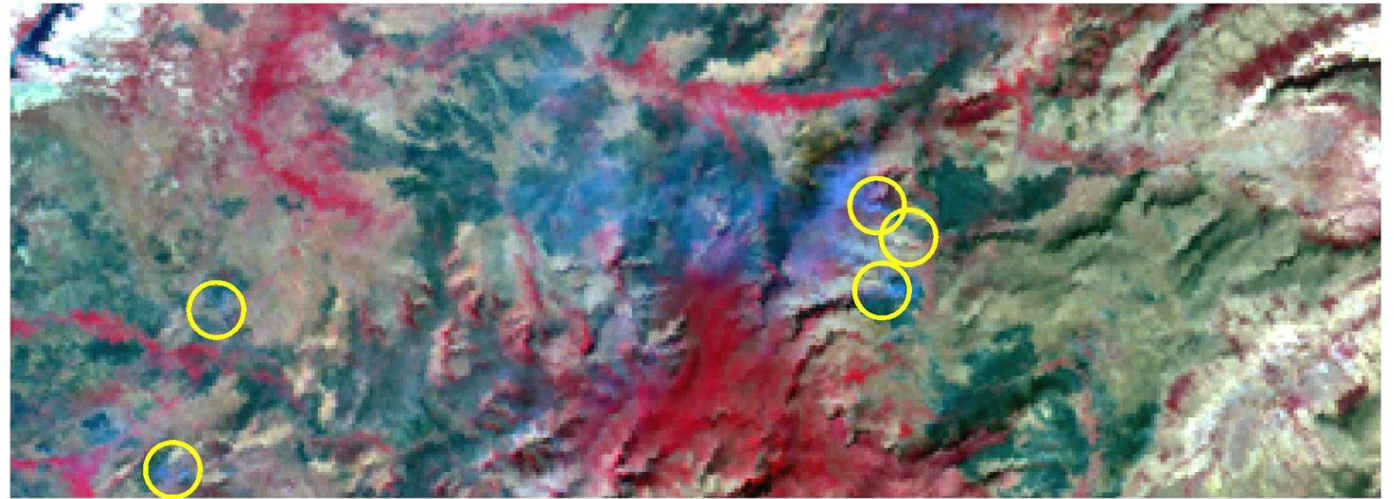


(SWIR,NIR,Red)

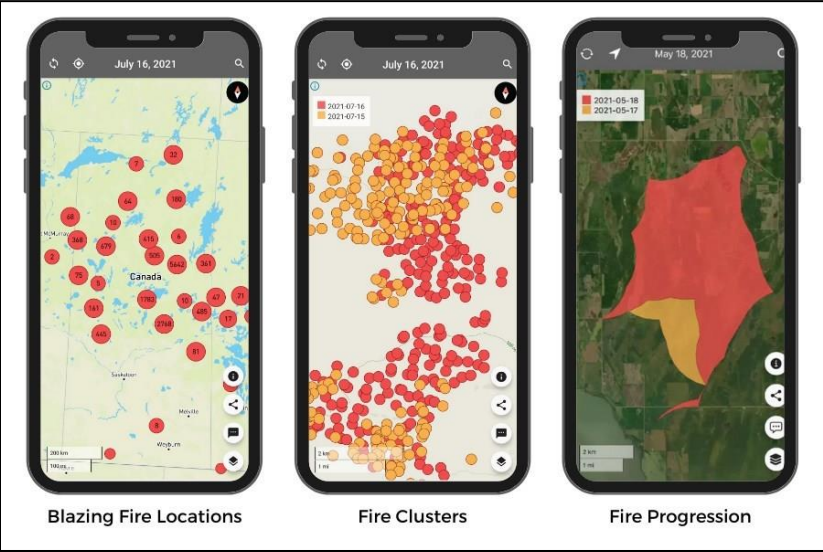


How fires are seen in optical wavelength

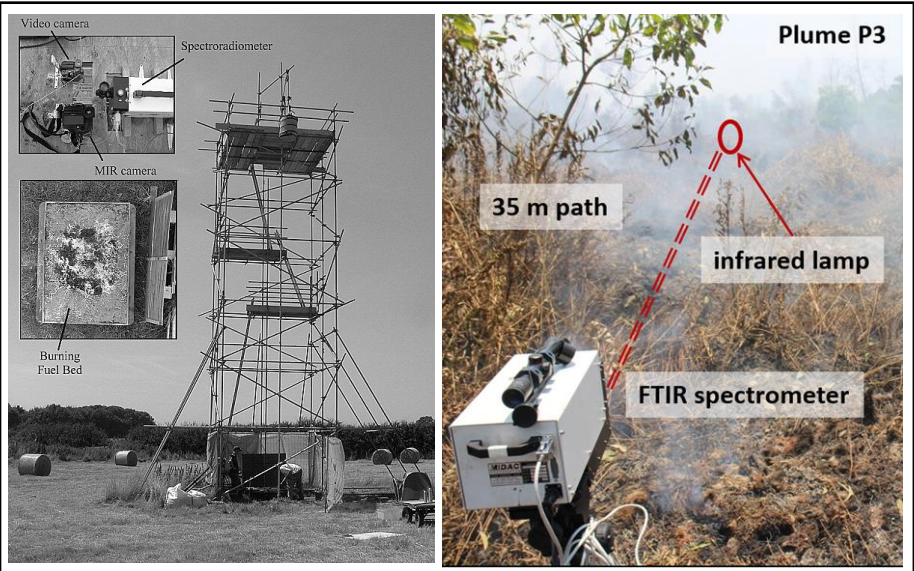
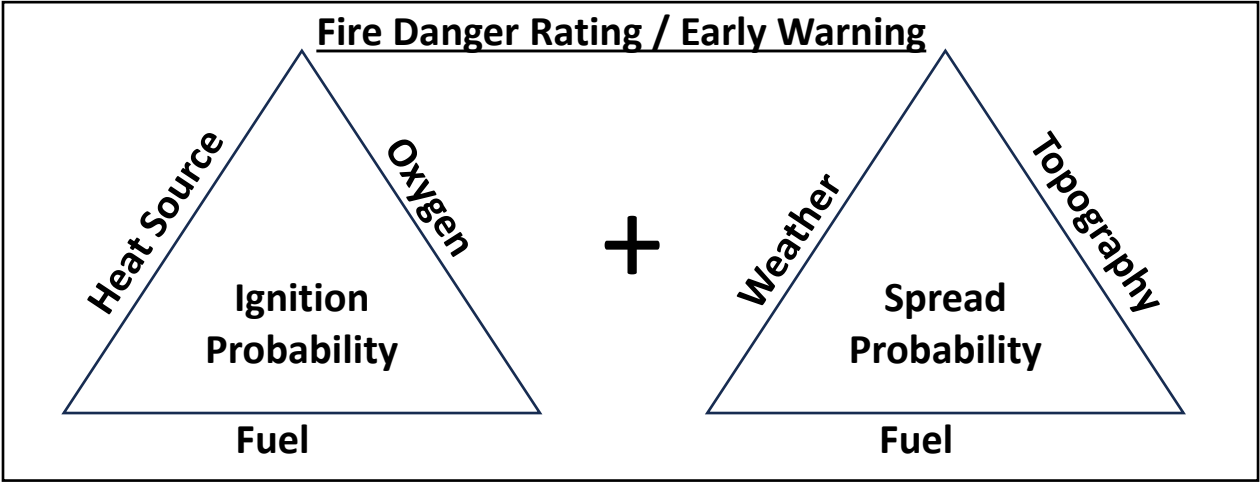
IRS-P6 AWiFS DATA OF 24th February 2004



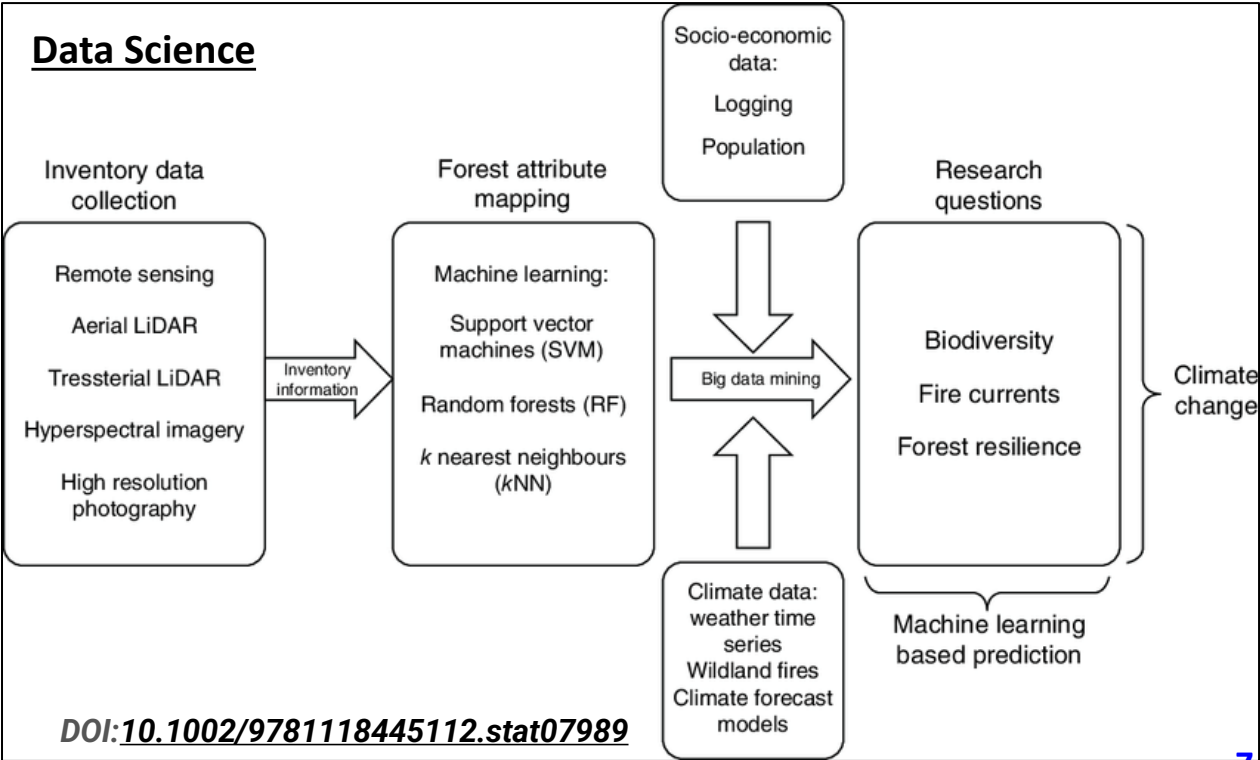
Application areas and scope for R & D



Mobile App – Fire Response Management Group, CA



Field experiments GHG inventory



Camp fire, 8-9th November 2018, California destroyed 70000 acres of forests
<https://earthobservatory.nasa.gov/images/>

Thank You

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