Monitoring of Active Fire, Smoke and Haze in Southeast Asia using MODIS products (MOD14, MOD04)

A case study of Thailand

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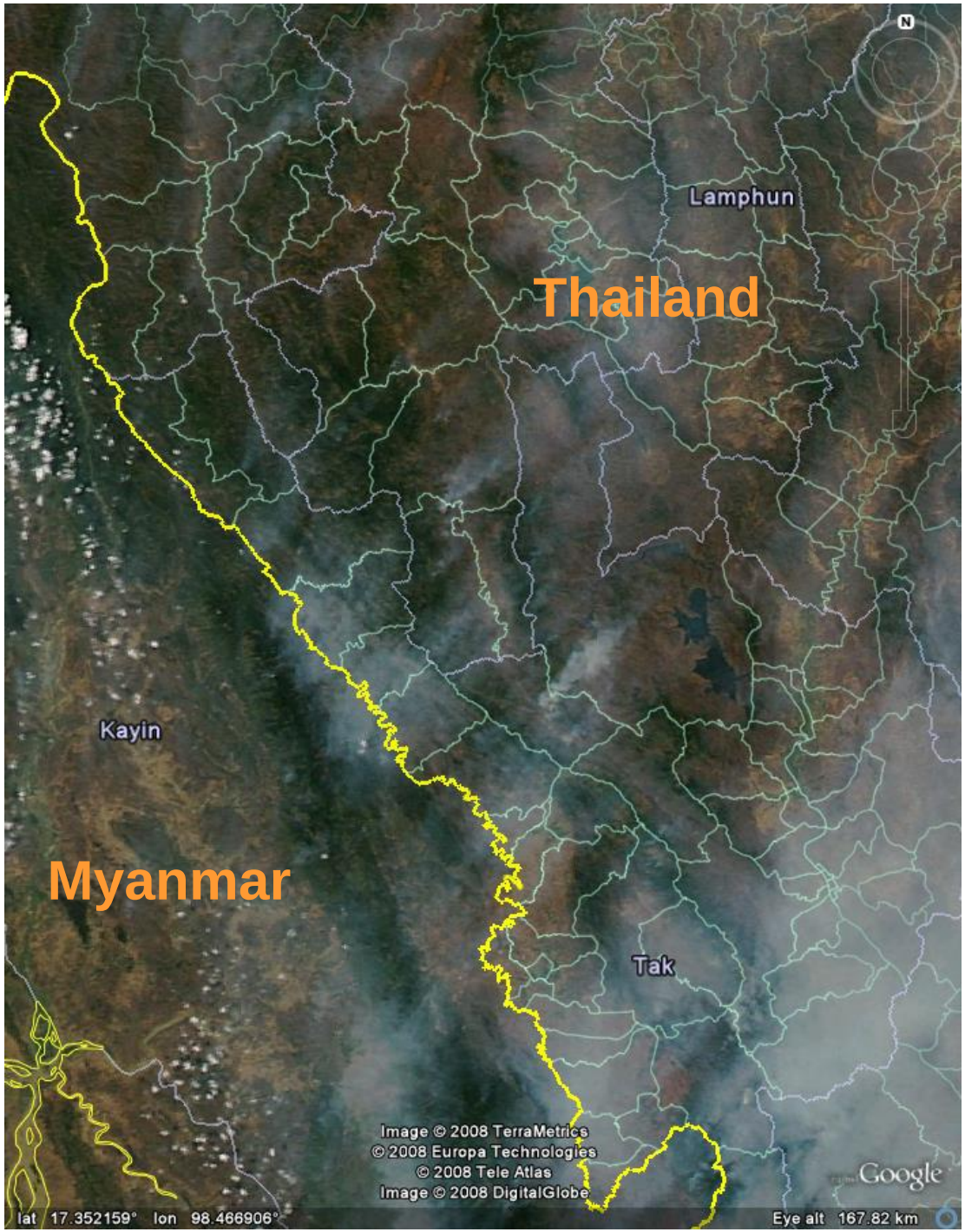
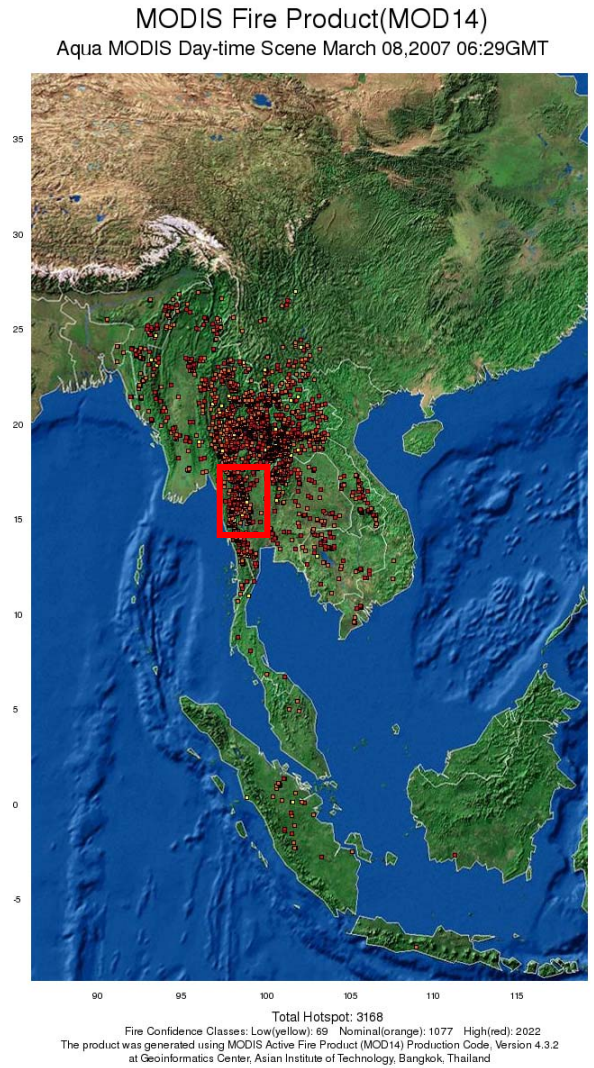
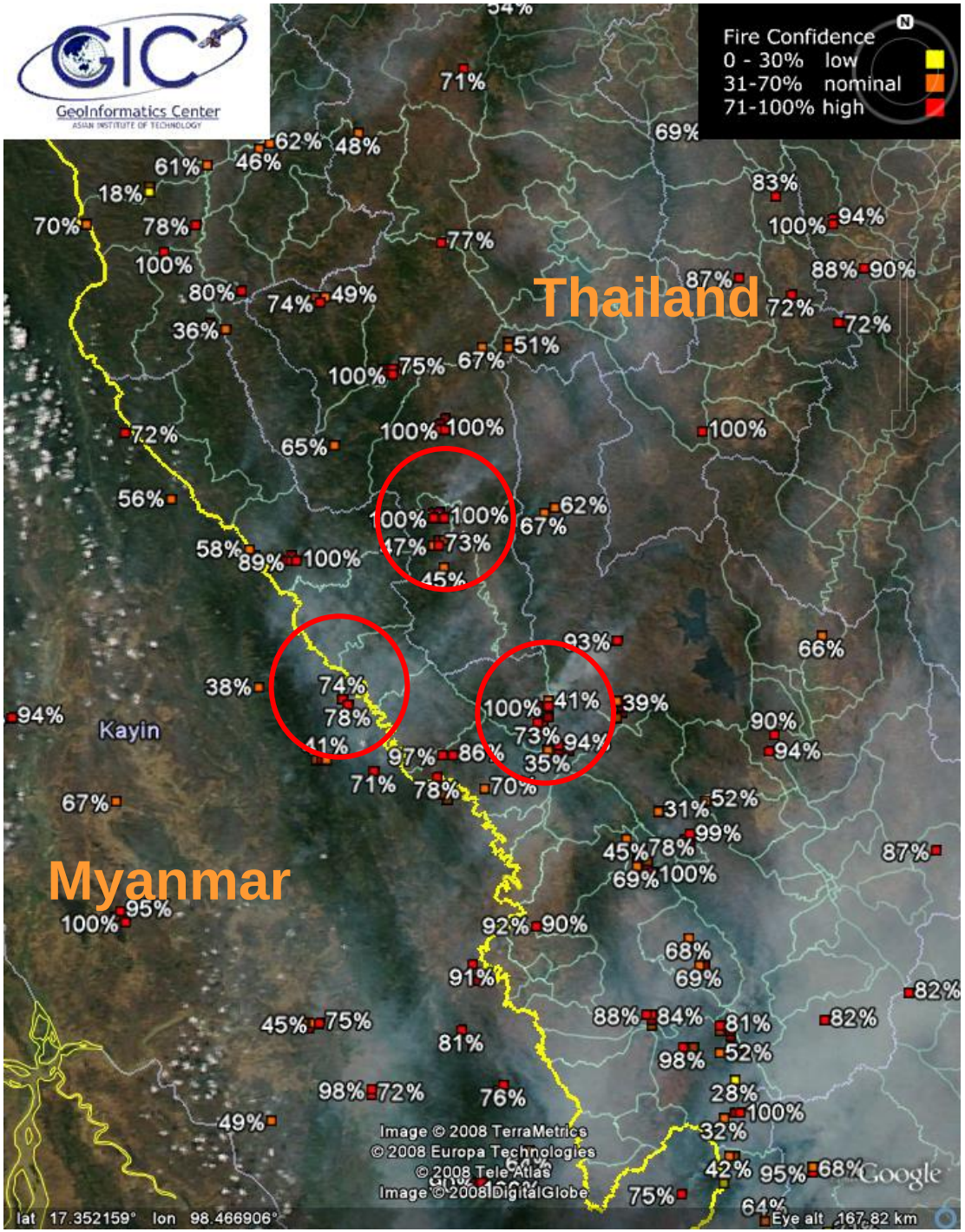
Available MODIS products for monitoring

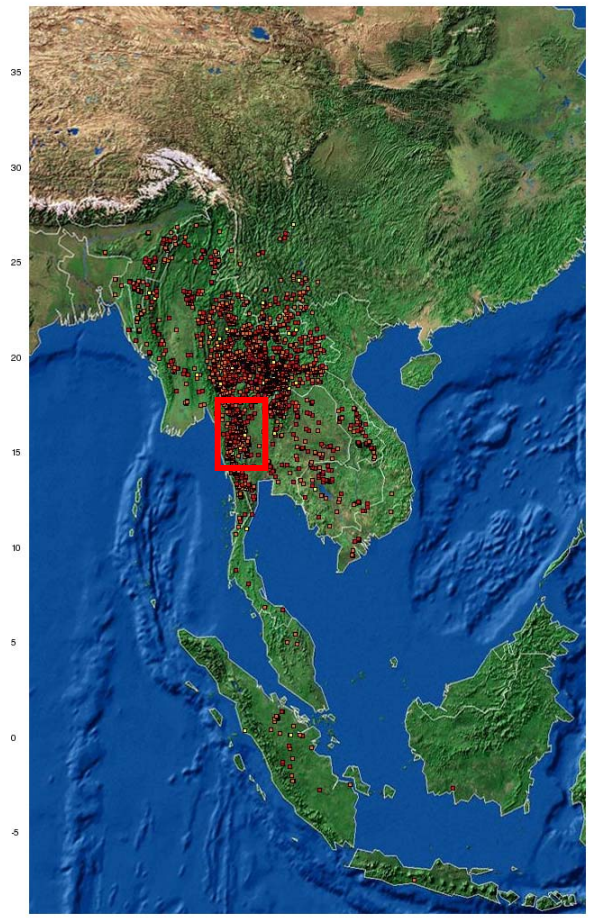
- In this case study, in order to monitor the smoke, haze and the area covering by smoke as well, we use the MODIS products which are:
  1. Active Fire (MOD14)
  2. Aerosol Optical Depth (MOD04)
  3. MODIS True Color 250m resolution
- It would be better if we can have the meteorological data like wind direction, etc. in order to understand the behavior of the smoke direction and coverage.
- Using MOD04 we can understand the level of air quality in the study area, as the concentration of the AOT can tell us the air quality conditions in the area.



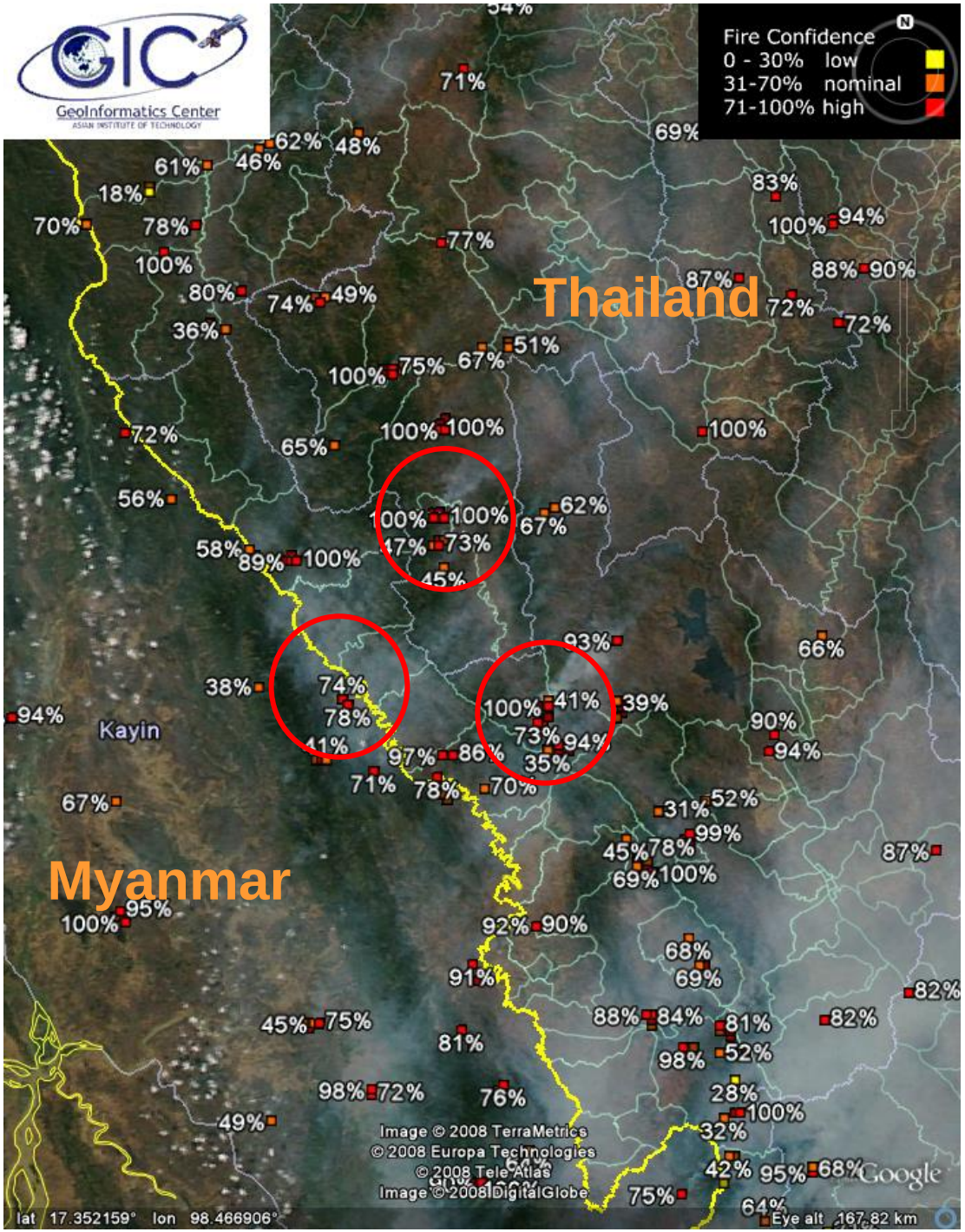


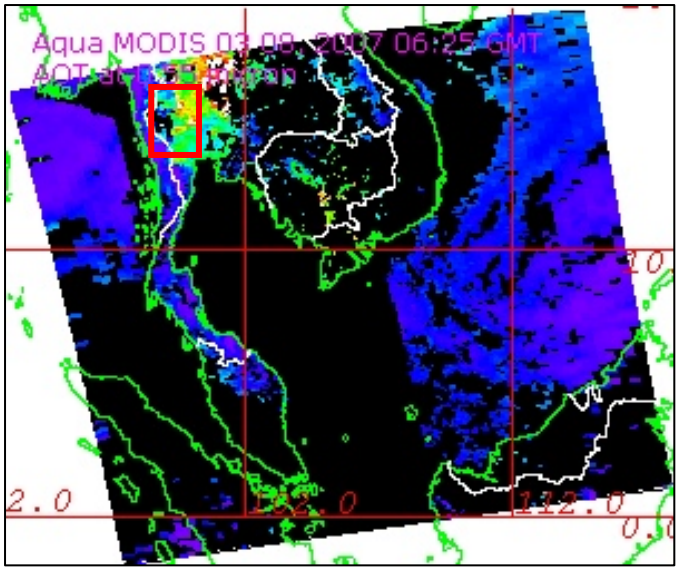
Monitoring of active fire can be conducted by using MODIS fire product image (active fire or hotspot in red color) to overlay with true color MODIS image of 250m resolution.



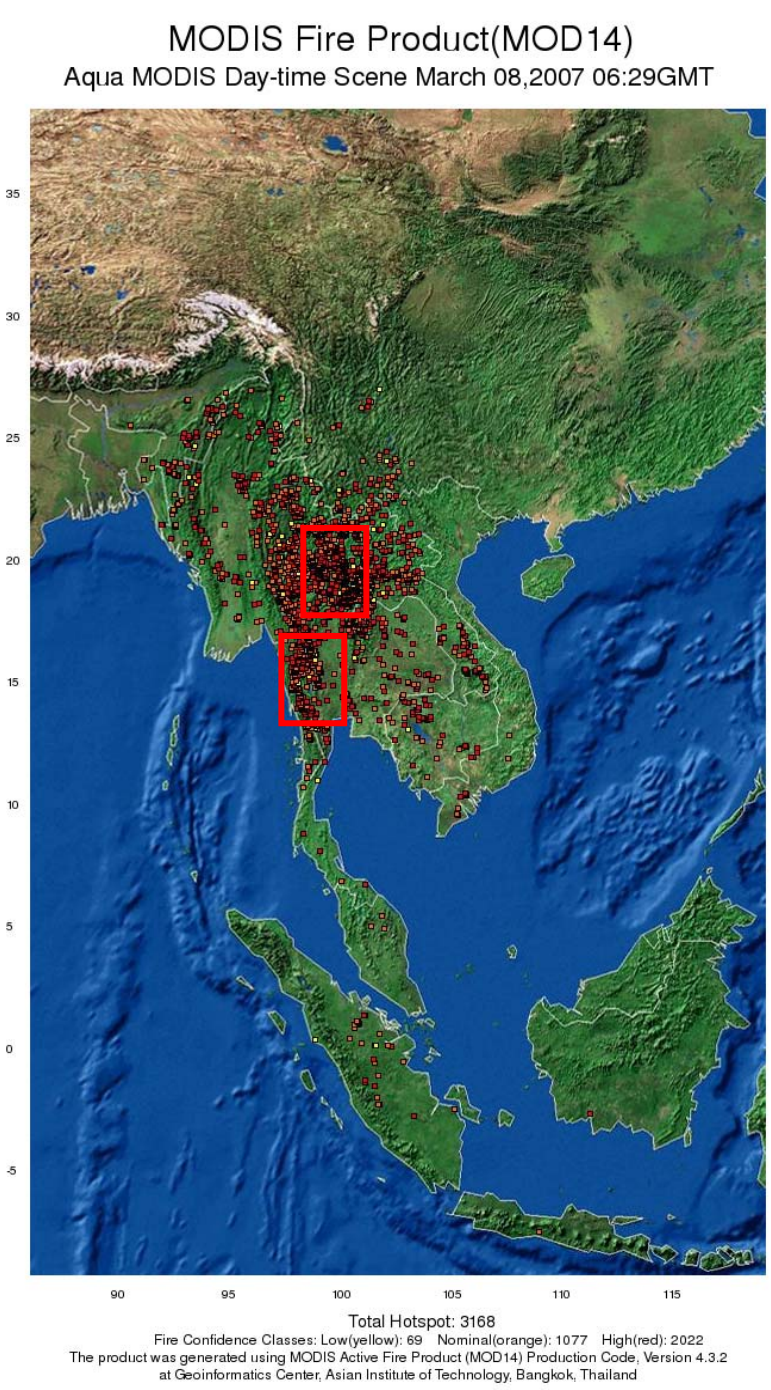


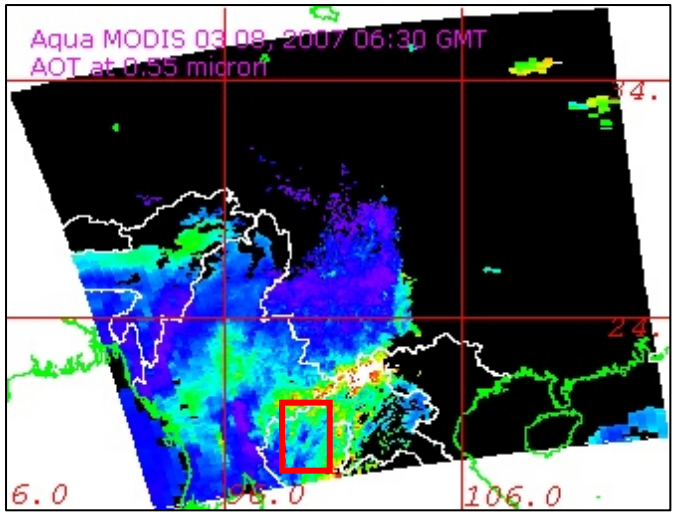
The red circles show the source of the fire which have strong smoke. These features can be seen by overlaying the active fire points on the Google Earth.

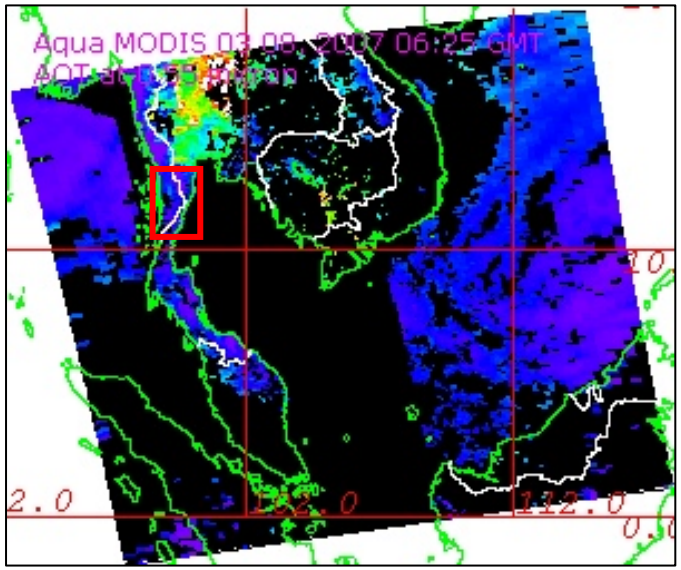




In the smoky area on the true color image (left), the high concentration of aerosol optical depth (AOD) or thickness (AOT) can be observed using the Aerosol MODIS product (MOD04). It is obviously that the high concentration of AOT are located at the area of active fire (red and yellow area)

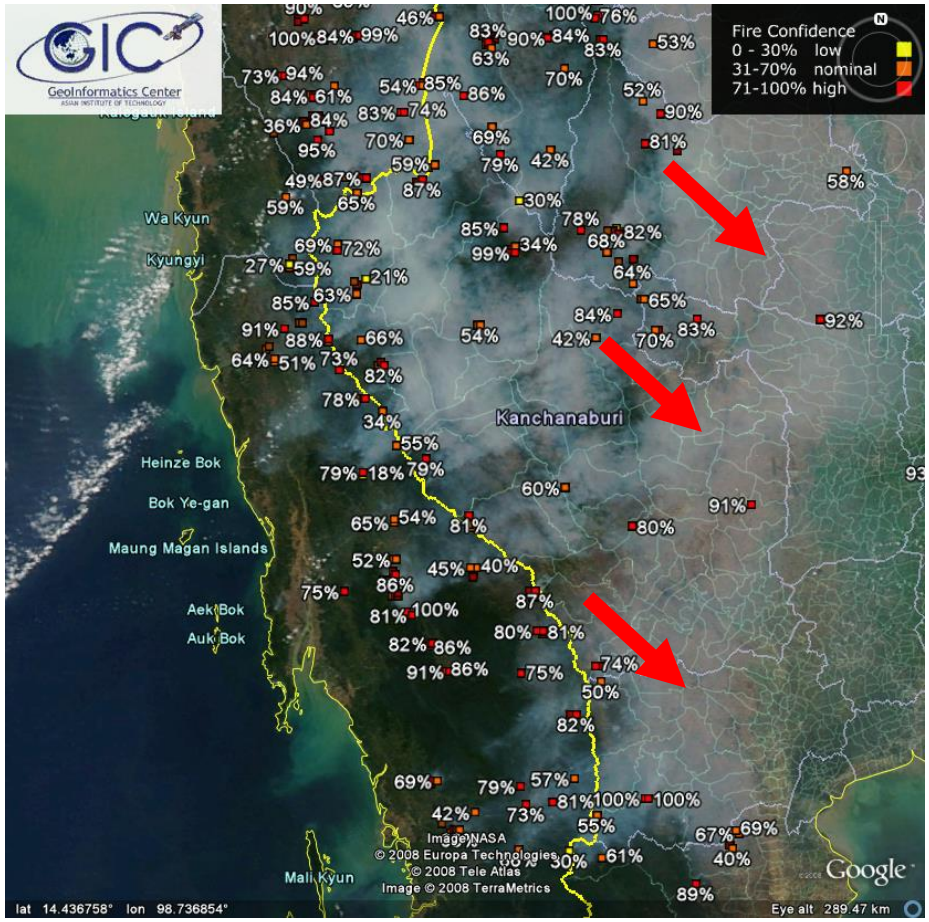


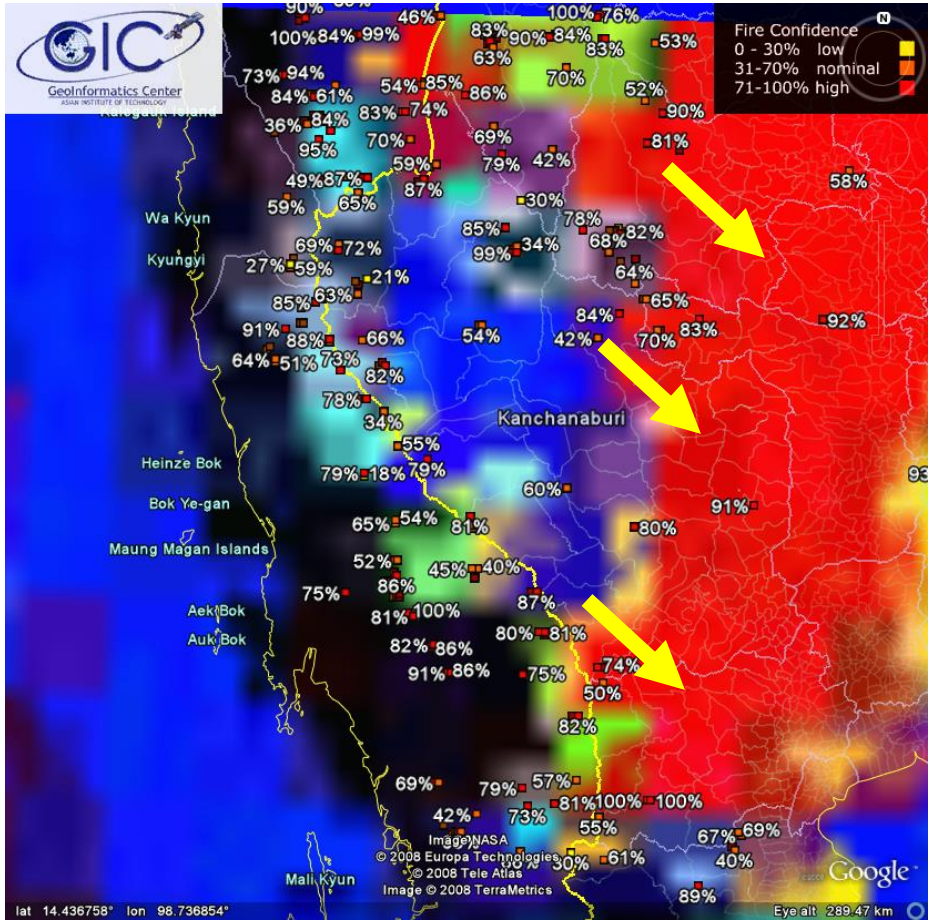




The left image shows the location of the big group of active fire pixels (in red blocks), which have high concentration of aerosol optical thickness (right images)

Smoke and haze during forest fire in
Thailand and Myanmar on March 08, 2008 06:29 GMT
monitoring by MODIS product MOD14 and MOD04





Active fire with smoke and haze over
Myanmar and western part of Thailand

In MODIS true color (left image), the smoke and haze is clearly visible. The area covering by haze with high concentration of AOT is shown by red area (right image) which are indicated by red arrows (left) and yellow arrows (right)

Aerosol optical thickness (AOT) over
Myanmar and western part of Thailand

(Aerosol Optical Thickness = Digital number / 1000)