

# Using Satellite Imagery to Detect Illegal Logging: GFW's Experience in Cameroon



*Linking forests & people*

*A program of the  
World Resources Institute*

# **GFW Remote Sensing Work on Illegal Logging**

- Cameroon – pilot dataset completed
- Central Africa (proposed)
- Indonesia (partial funding)

# Why use satellite imagery to monitor logging roads?

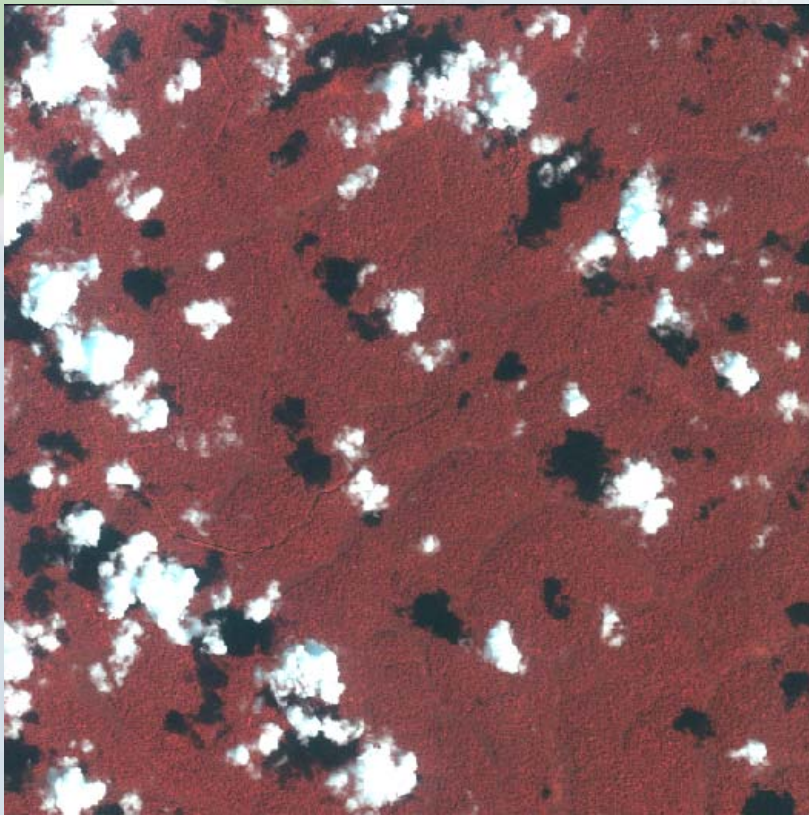
- Imagery provides a national landscape-level view
- Allows detection of logging roads where access is limited
- Provides documentation of infractions
- Input to prioritize field-based activities
- Mechanism for long-term monitoring

# Satellite Imagery

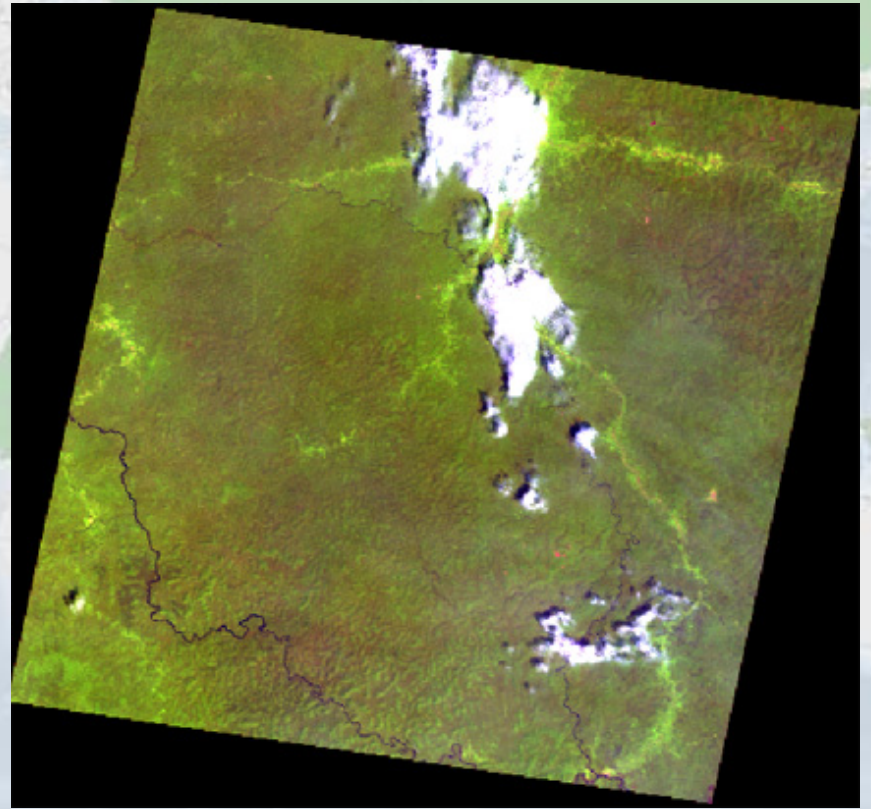


- Cost increases with resolution
- Landsat 7 (launched April 1999)
  - most commonly used by GFW
  - reasonable cost w/ good resolution
  - Available at a discount and may be freely distributed
- IKONOS imagery – expensive, but excellent resolution (use selectively)
- Low-resolution imagery provides too little information

# Satellite Imagery: IKONOS vs. Landsat

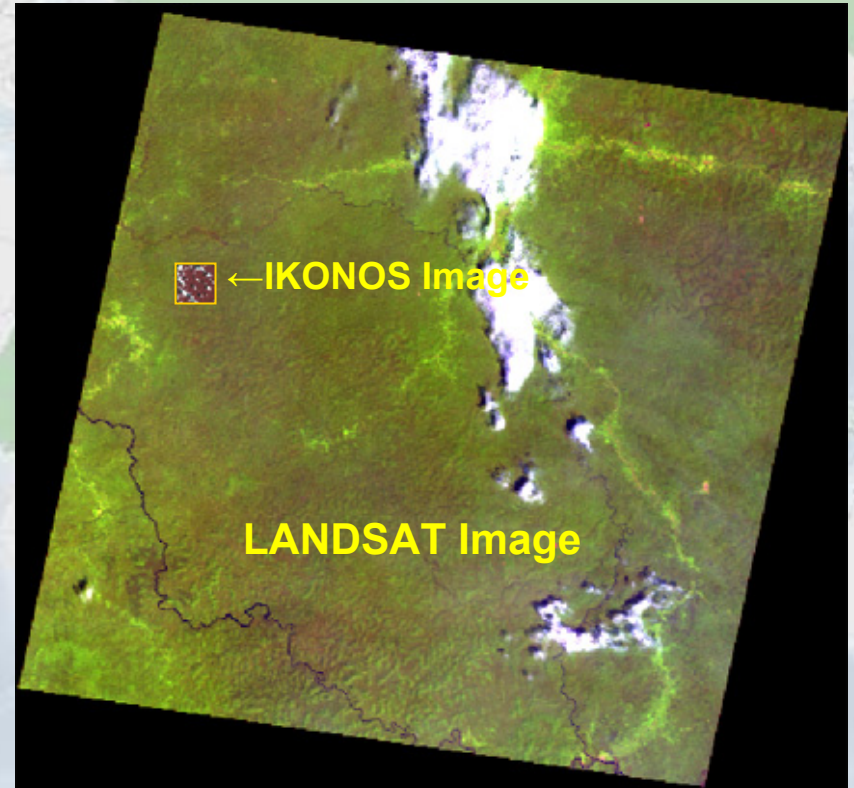
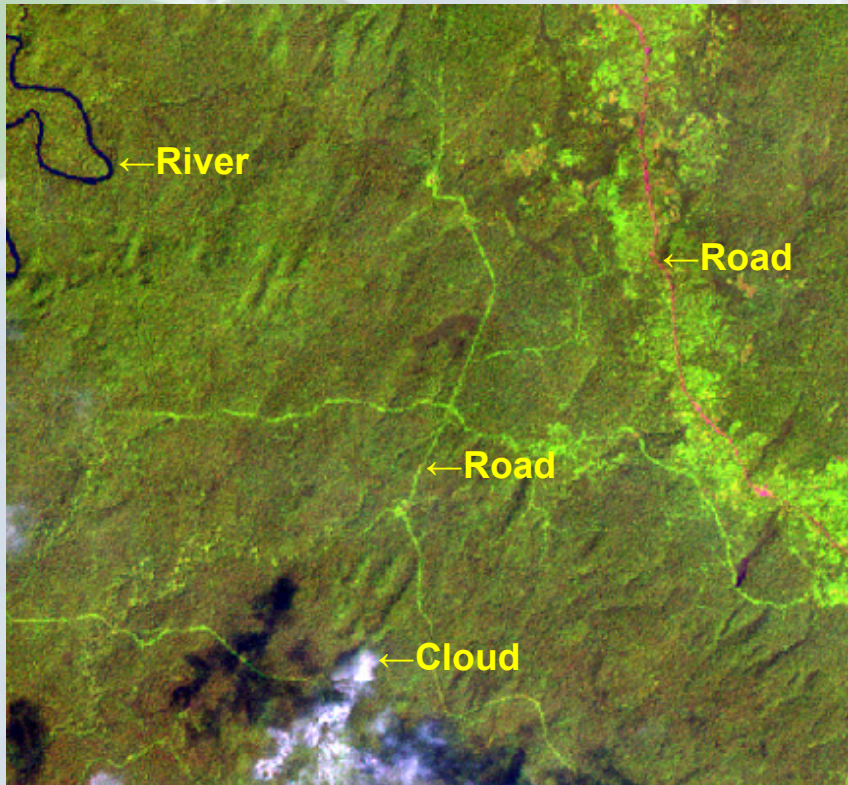


**IKONOS ~\$2,000**



**LANDSAT ~\$400**

# Landsat Imagery



← 10km →

# Satellite Imagery: IKONOS vs. Landsat



←500m→

Pixel  
Size

**IKONOS**  
Very high resolution

←1m→



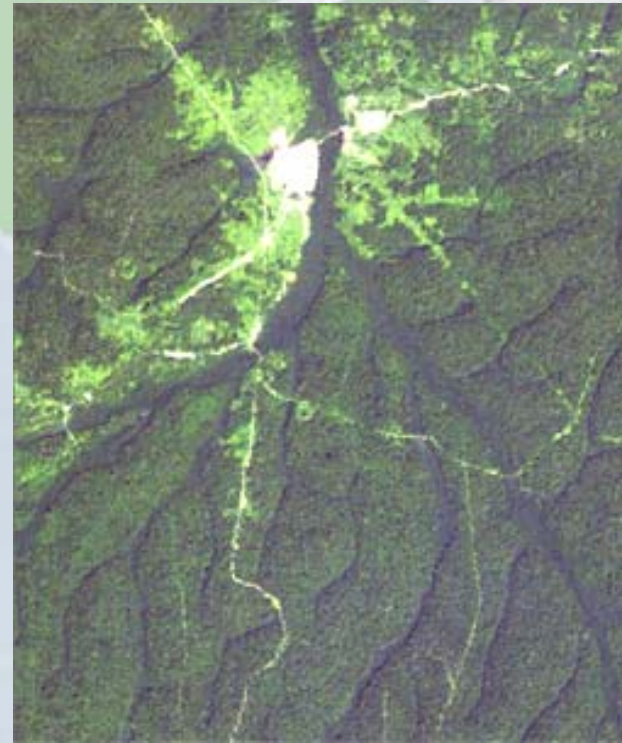
←500m→

Pixel  
Size

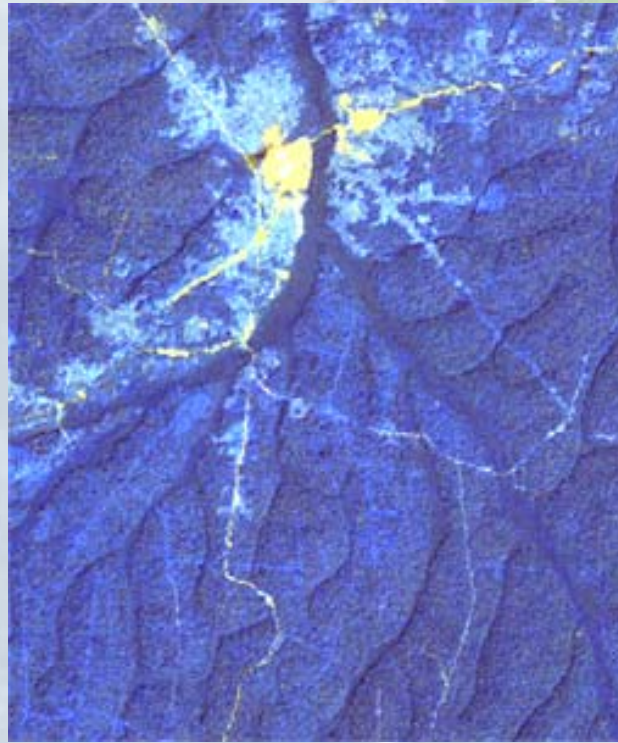
**Landsat 7**  
Med-high resolution

←30m→

# Landsat Band combinations



Bands 6-5-3



Bands 6-5-4



Bands 5-4-3

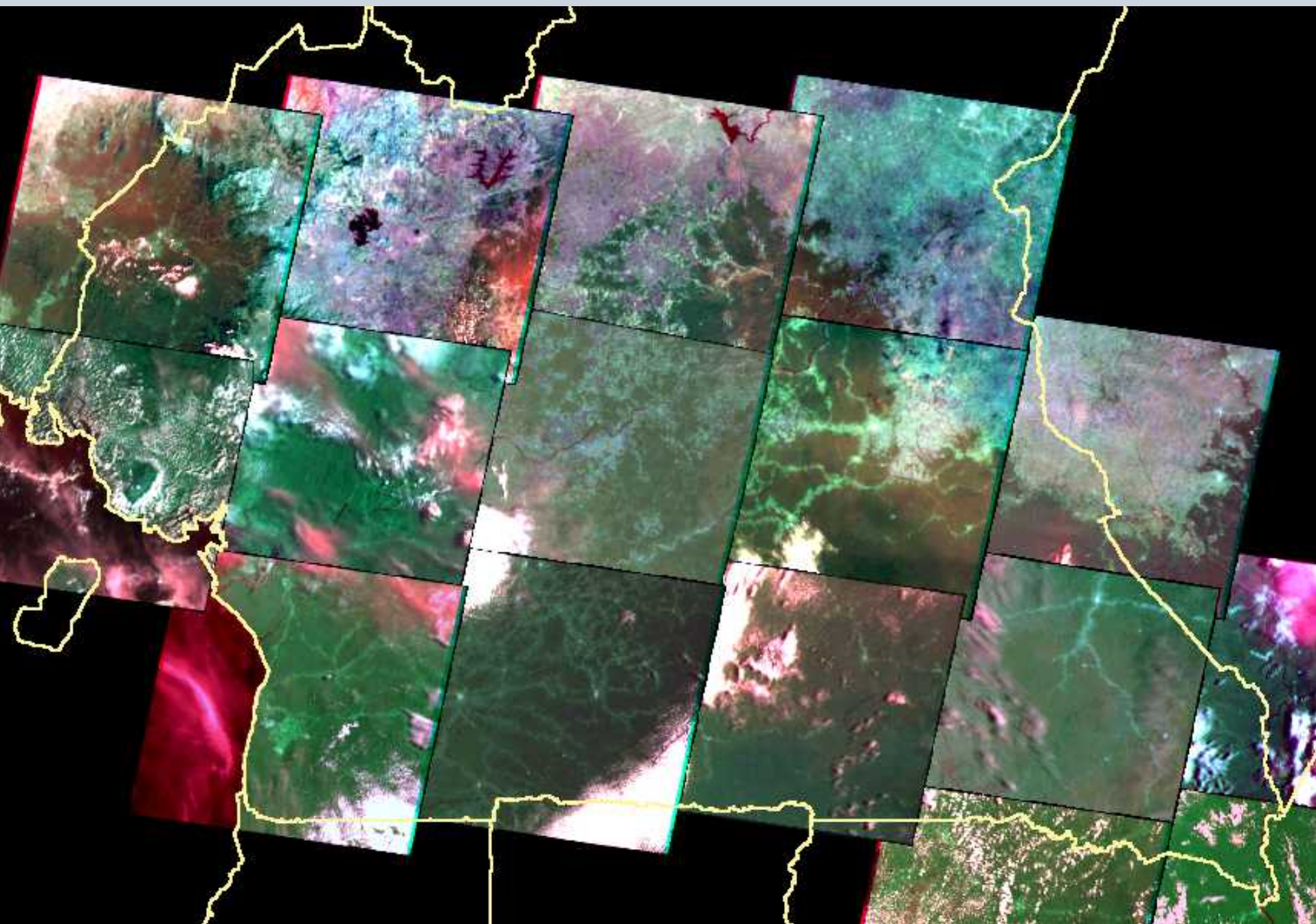


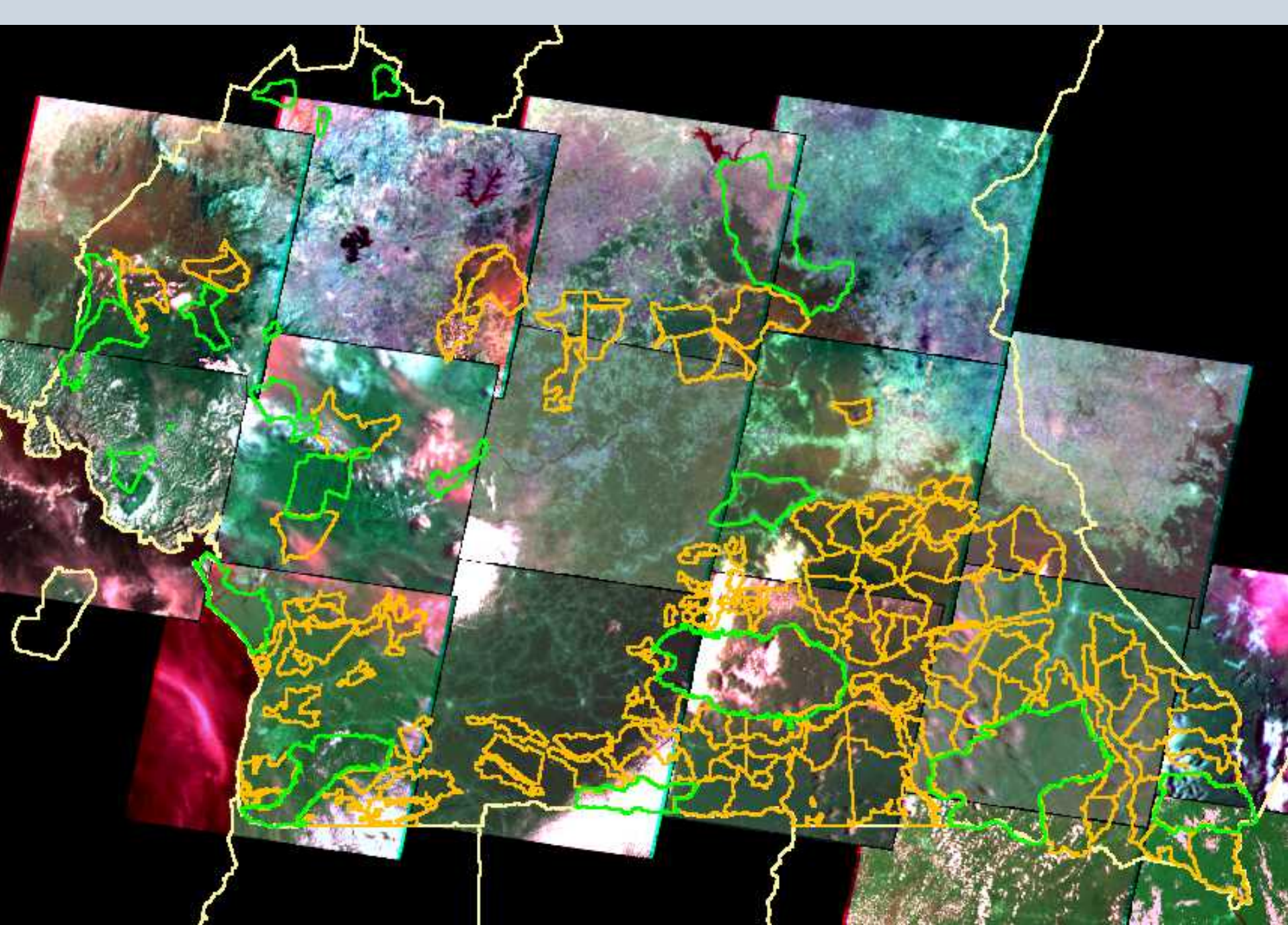
# Remote Sensing Study in Cameroon

A world map with a light blue background and green landmasses, serving as a background for the text.

- Partnership with MINEF Cameroon, European Union, Global Witness, Tropenbos and Nature+
- Project to map logging roads and conduct field audits
- Applications for monitoring legality and extent of logging activity



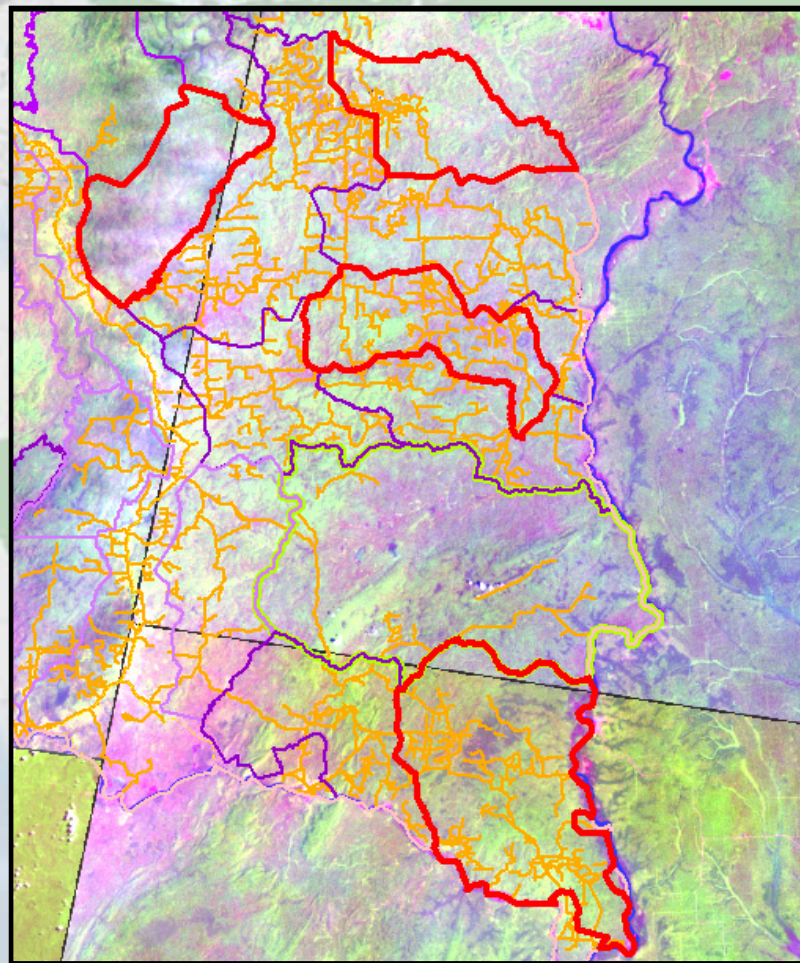




# Remote Sensing Applications for Compliance Monitoring

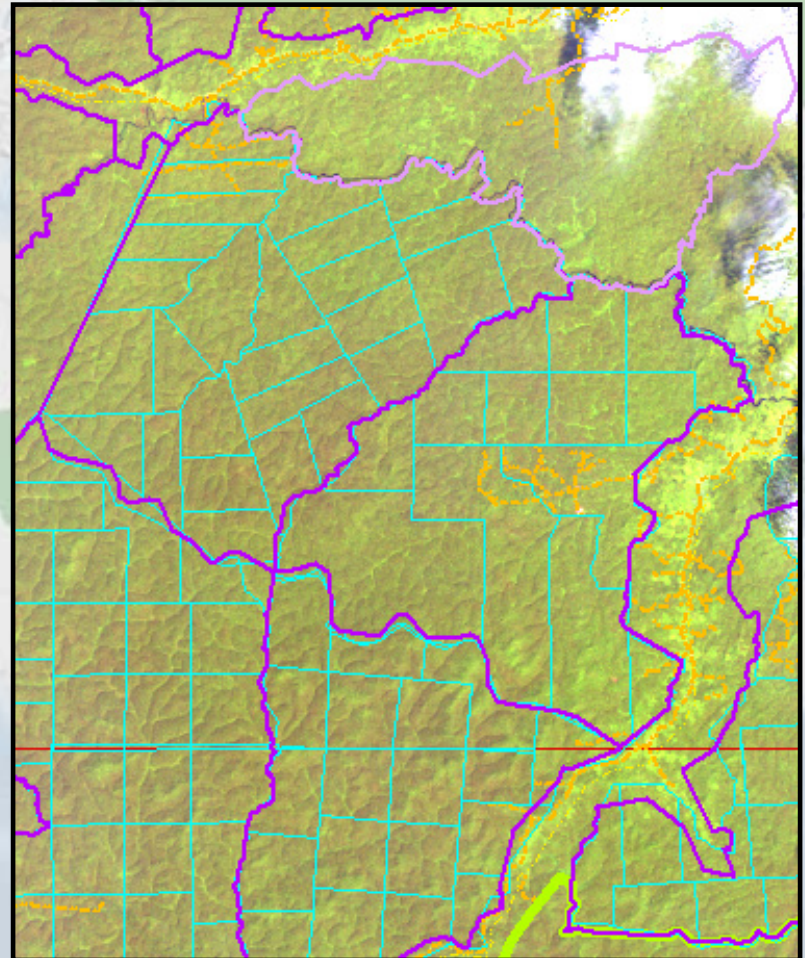
Satellite imagery used to determine:

- Whether logging takes place where/when legally permitted



# Remote Sensing Applications for Compliance Monitoring

- Determine whether management plans are being followed
  - Annual cut areas
  - Sensitive areas, steep slopes
  - Excessive selective logging
  - Deforestation
  - Burned areas



# Limitations and Benefits of Compliance Monitoring by Remote Sensing

## Limitations

- Cost (images, software, computers, training)
- Challenging to learn/ access to training
- Time-consuming
- Computer cost & space
- Cloudiness esp. in tropics
- Field audits to support RS work

## Benefits

- Objective evidence
- Purchased Landsat imagery can be freely shared
- Ability to collect data remotely
- Powerful communication of results
- Development of new needed datasets

# Next Steps

- Long-term monitoring
- Applications outside Central Africa
- Make Landsat Imagery freely available
- Provide new datasets (logging roads)
- Improve public roads data and make available