

Change detection in RS

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Change Detection

- Change detection involves the direct comparison of two or more images to identify how areas change over time
- Change detection is the process of identifying differences in the state of an object or phenomenon by observing it at different times.

- Remotely sensed data have become the major data source for different change detection applications during the past decades.

Applications of Remote Sensing Change Detection

- Land-use/land-cover changes
- Forest or vegetation change
- Forest mortality and damage assessment
- Deforestation and regeneration
- Wetland change
- Forest fire
- Landscape change
- Urban change
- Environmental change

- Lambin and Strahler (1994) listed five categories of causes that influenced land-cover change:
 - long-term natural changes in climate conditions
 - geomorphological and ecological processes such as soil erosion and vegetation succession
 - human-induced alterations of vegetation cover and landscapes such as deforestation and land degradation
 - inter-annual climate variability
 - the greenhouse effect caused by human activities.

- When selecting remote sensing data for change detection applications, it is important to use the same sensor, same radiometric and spatial resolution data with anniversary or very near anniversary acquisition dates in order to eliminate the effects of external sources such as sun angle, seasonal and phenological differences.

Major Methods of Change Detection

- Post-classification methods
- Image-differencing methods

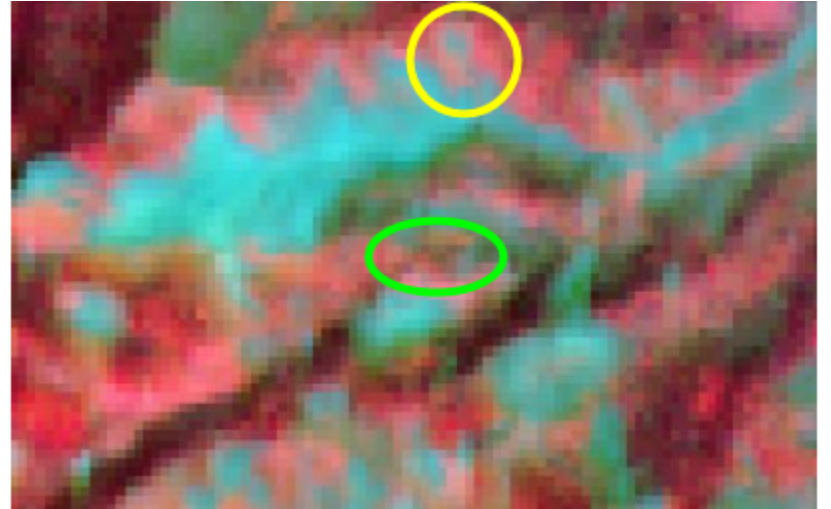
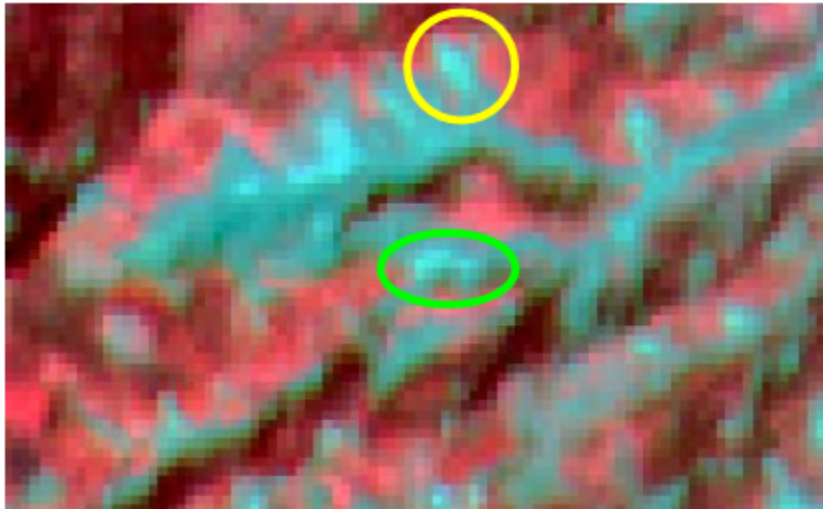
Change detection methods

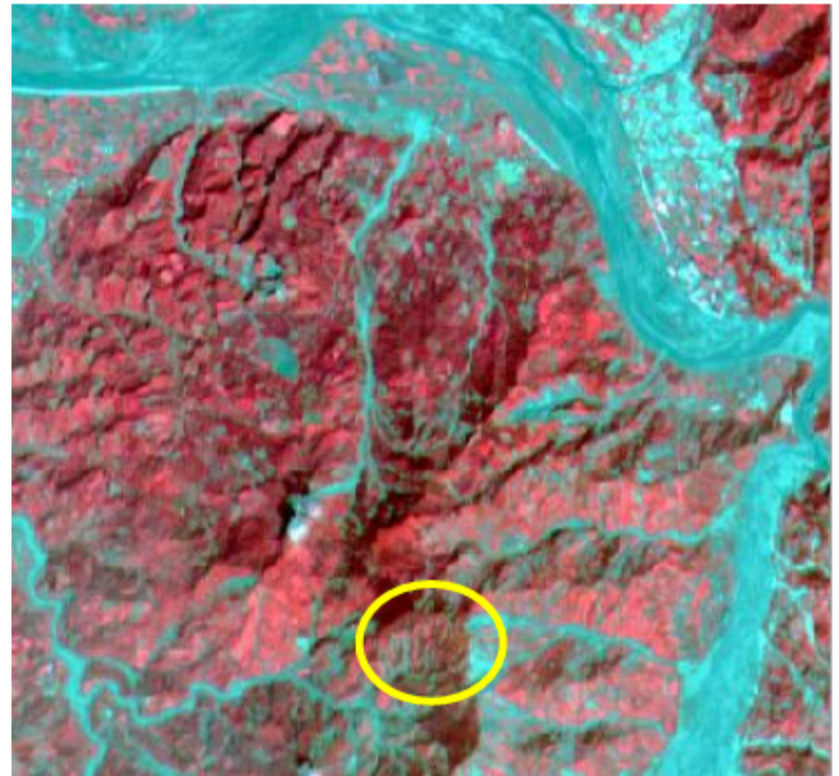
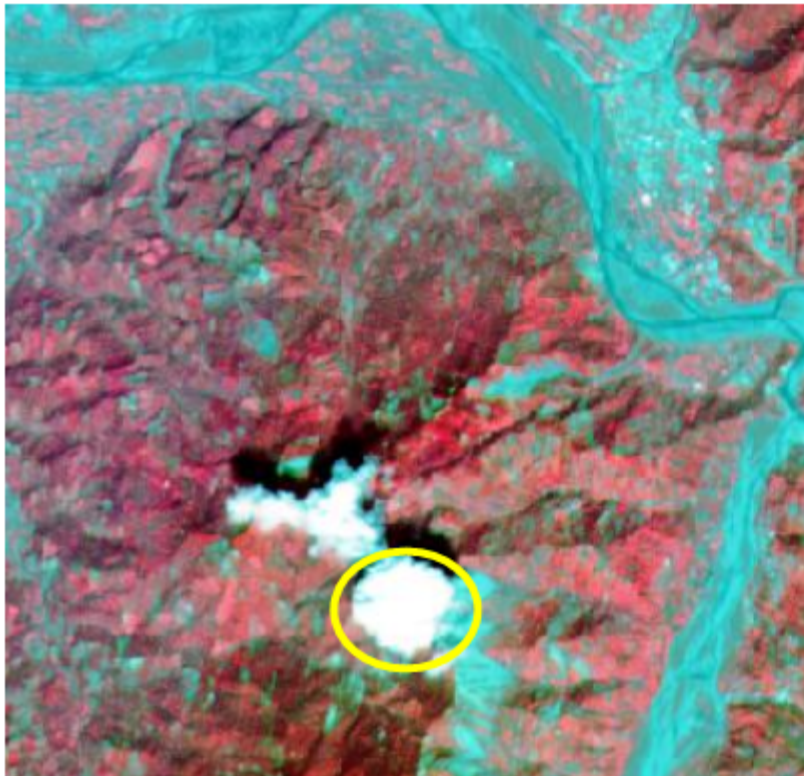
❖ Image differencing

- Image differencing or image subtraction simply involves the subtraction of one image from another
- No change = zero, change = +ve or -ve values

❖ Post-classification comparison

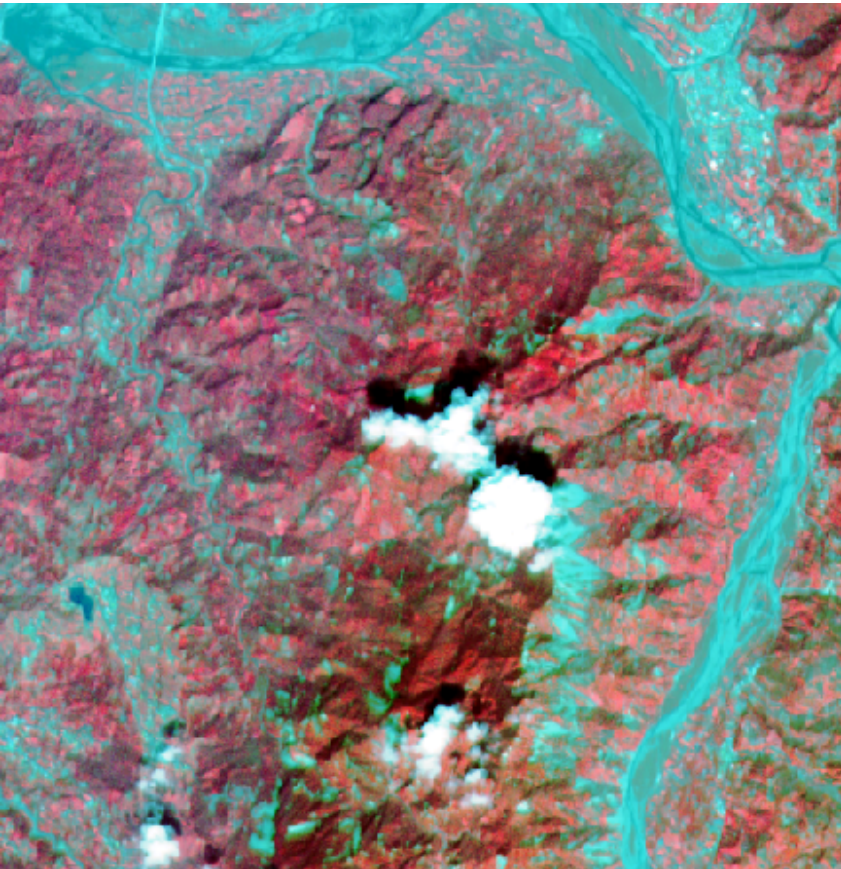
- Each image is classified independently
- Resulting classifications are compared to identify change



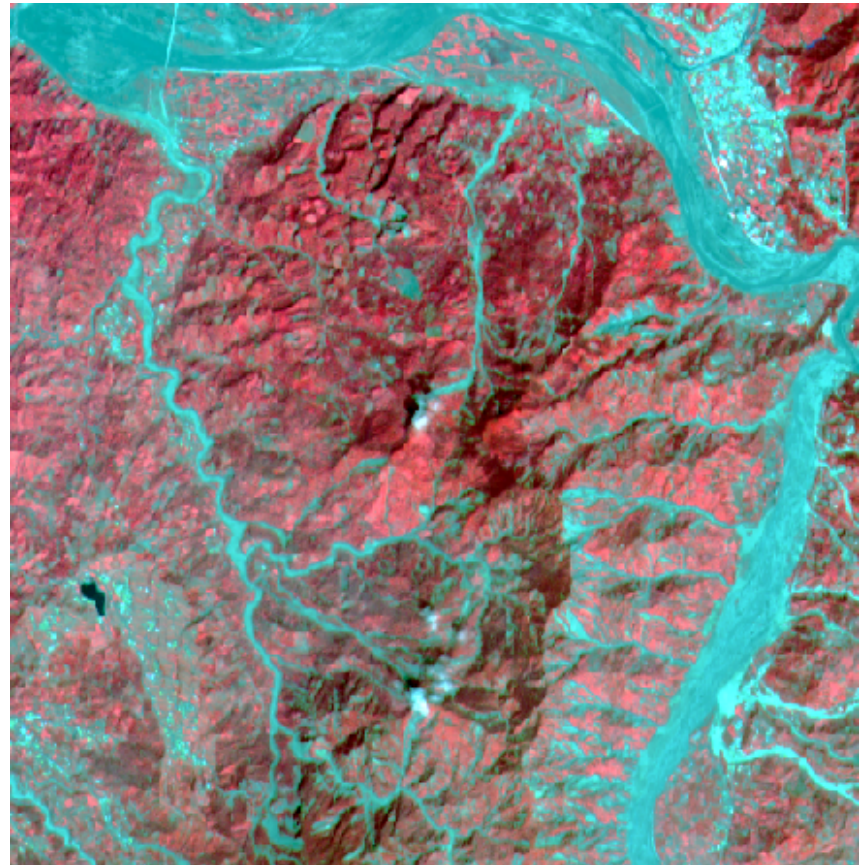


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SPOT Image of the Study Area



Oct. 1, 1999



Sept. 21, 2001

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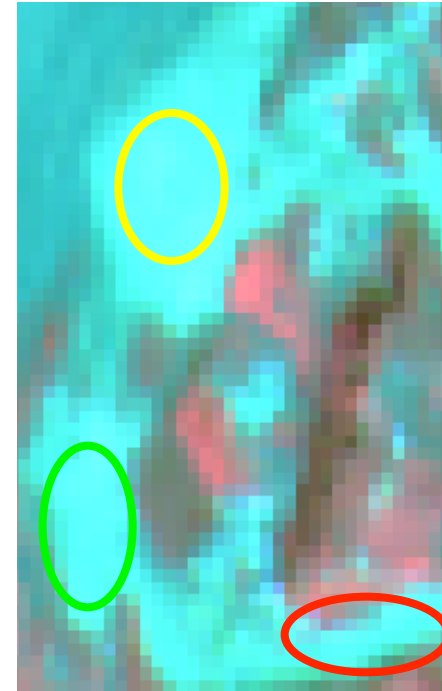
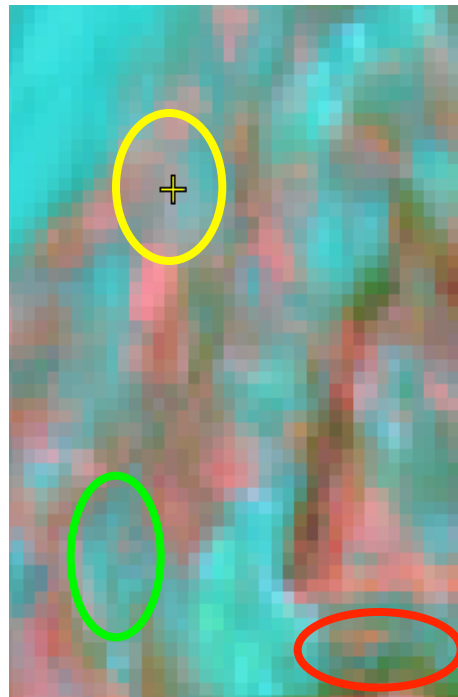
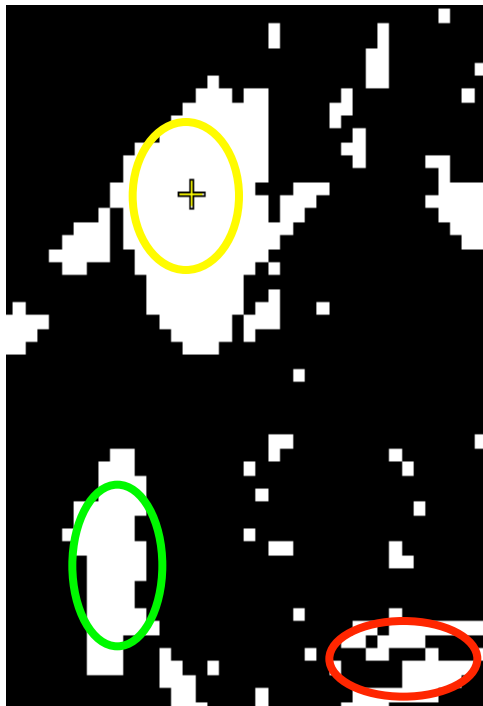
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Examples of Detected Changes

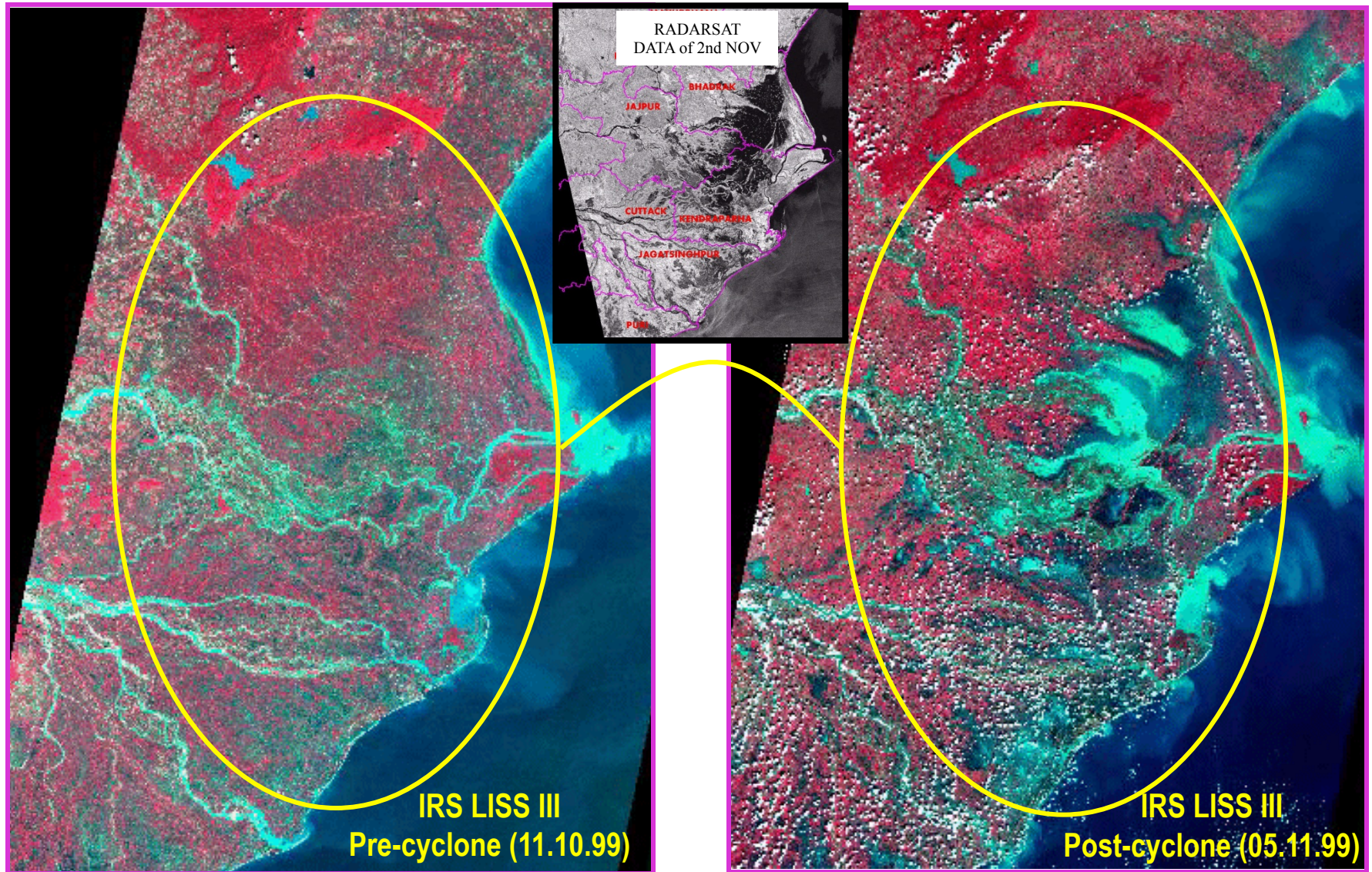
Changed sites

01/10/1999

21/09/2001



Flood due to cyclone (29th October 1999) off Orissa coast



Data

- Time series of NDVI imagery of Africa from the NOAA AVHRR sensor

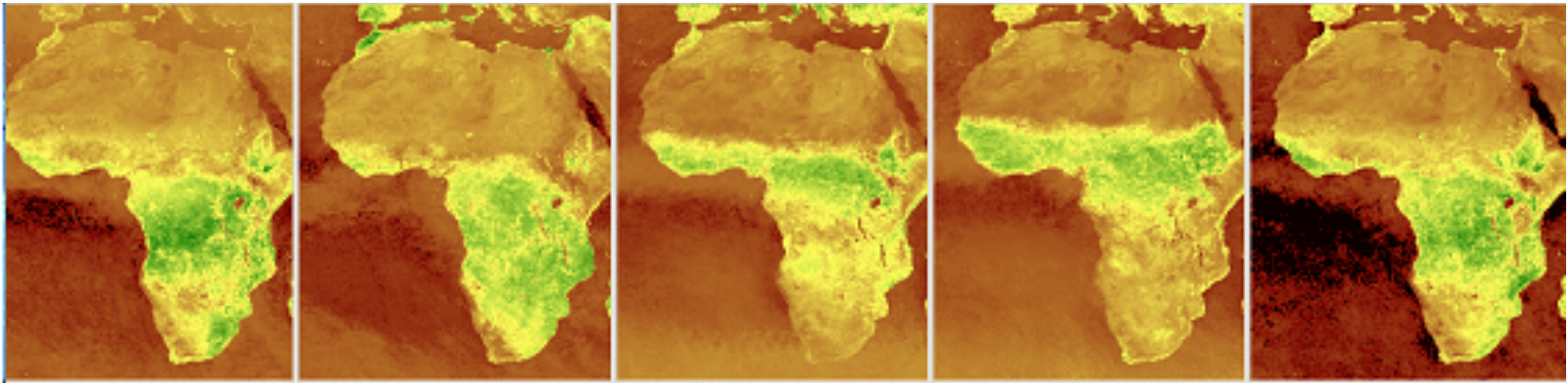
Dec 87

Mar 88

Jun 88

Sep 88

Dec 88



Thanks for Attention