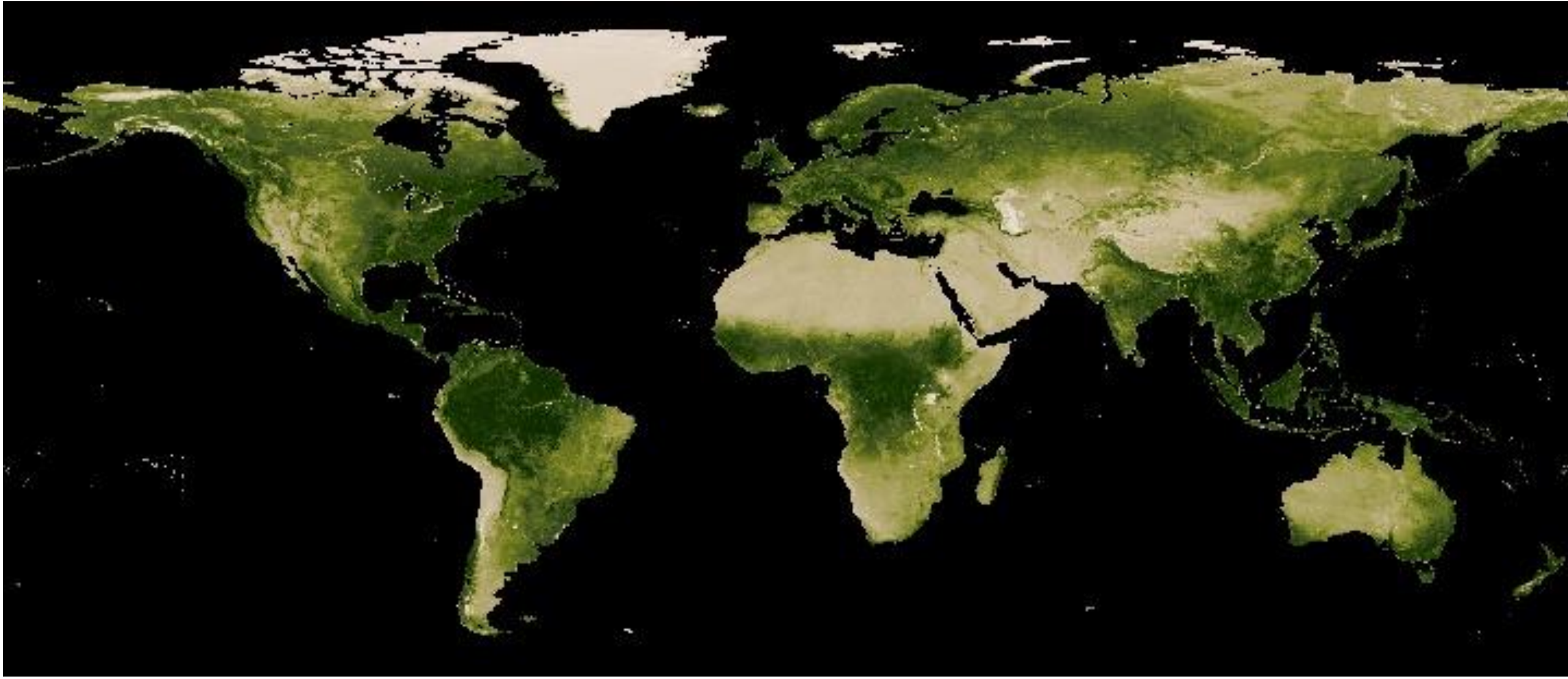
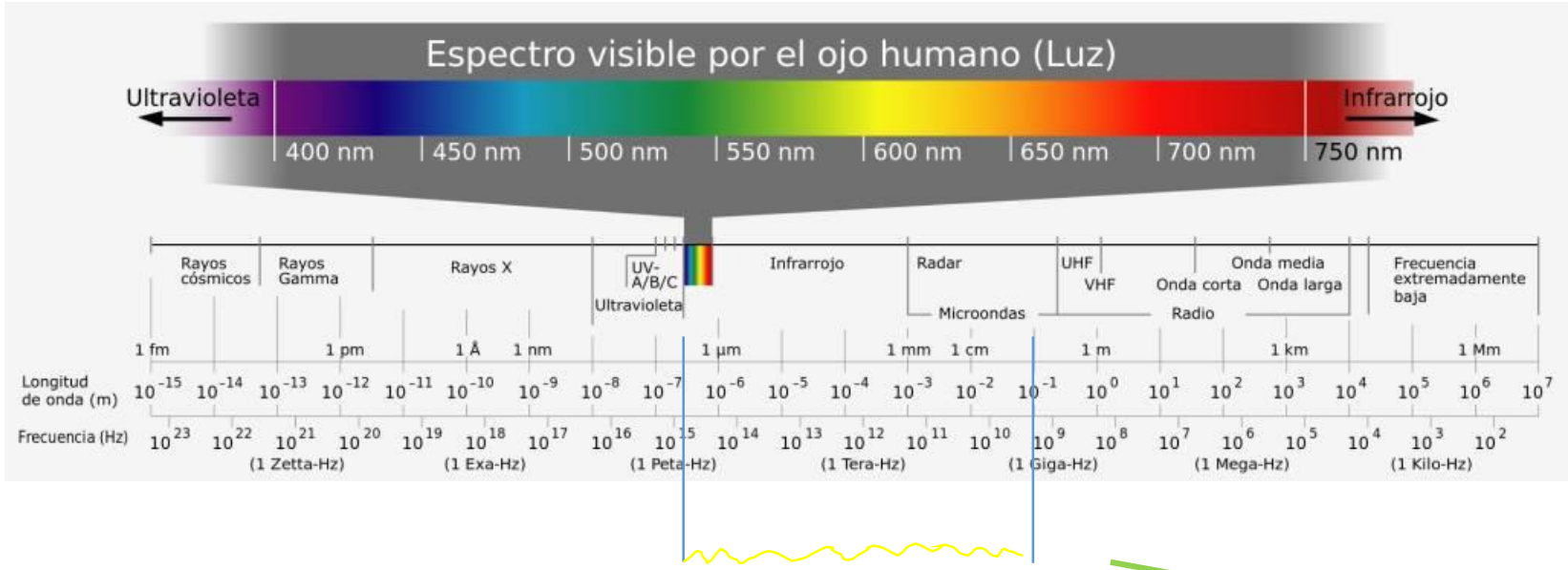


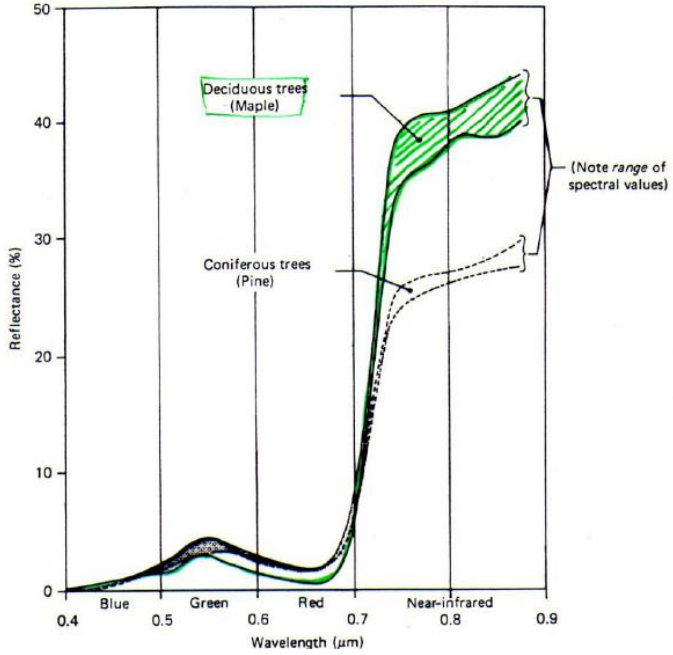
Exploring the NDVI as a remote sensing tool for monitoring in the tropics forest.

What is the Normalized Difference Vegetation Index and how it works ??



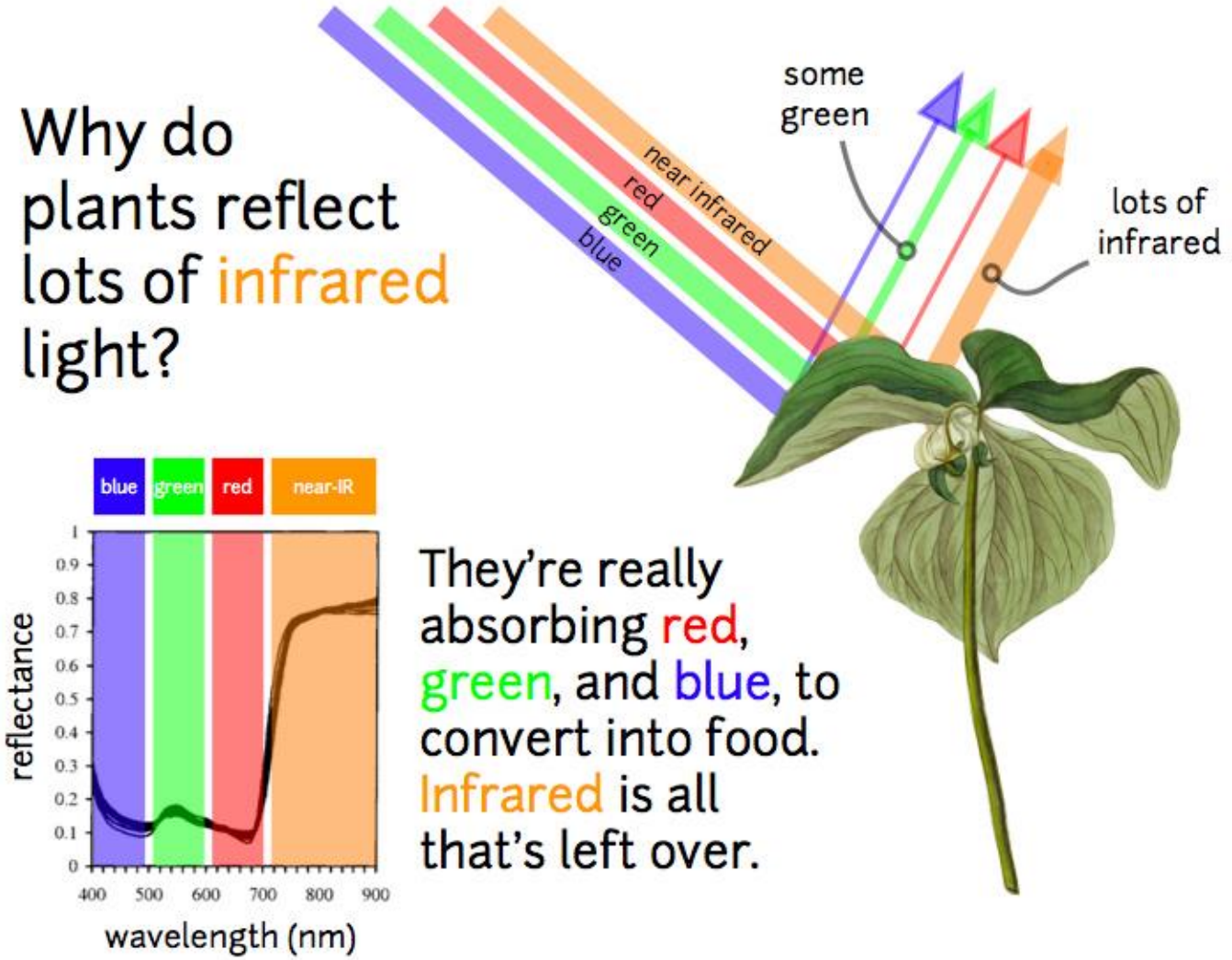
$$NDVI = \frac{NIR - VR}{NIR + VR}$$

0,7µ - 0.1µ



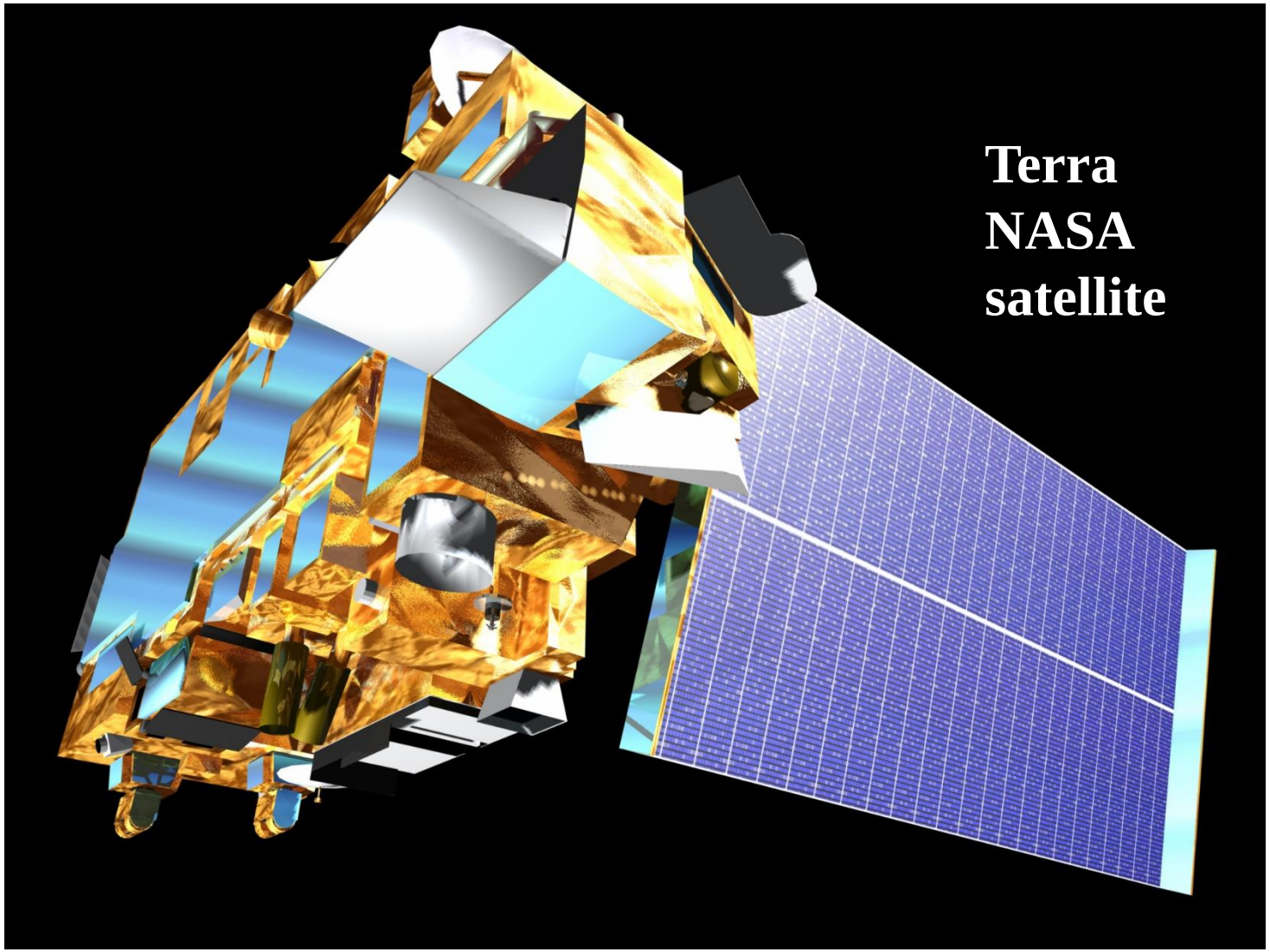
Visible Spectrum by the human eye (light).

Plants reflectance



MODIS

MODERATE RESOLUTION IMAGING SPECTRORADIOMETER



Aqua and Terra.
Resolutions of 250m
Reflectance in 36 different bands.

Compositing is done by examining pixel by pixel of each observation with the maximum NDVI.

Complete earth coverage between 1 to 2 days.
It has a 16 day composite interval.

Values are normally recorded in the range of -1 to 1.

They are recording data since 1999.

Analyses of **trends**, looking for **anomalies.**

$$NDVI = \frac{NIR - VR}{NIR + VR}$$

0,1
0.6
-0,8
-0,2
-0,7
-0,7
0.6
0.3

mean

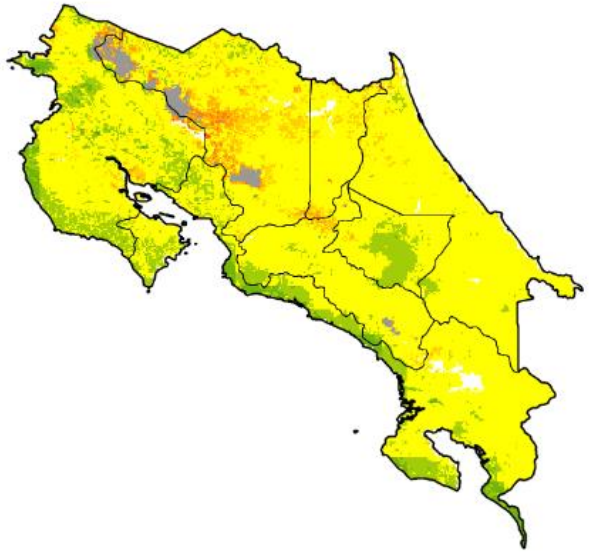
-0,46

mode

-0,7

median

-0,7



February

AGRISCIENTIA, 2015, VOL. 32 (2): 83-93

Tendencia del NDVI en el período 2000-2014 como indicador de la degradación de tierras en Argentina: ventajas y limitaciones

Gaitán, J.J.; D.E. Donaldo Bran y C. Azcona

Year: 2011

Analysis of monotonic greening and browning trends from global NDVI time-series

de Jong, Rogier; de Bruin, S; de Wit, A; Schaepman, M E; Dent, D L

Article

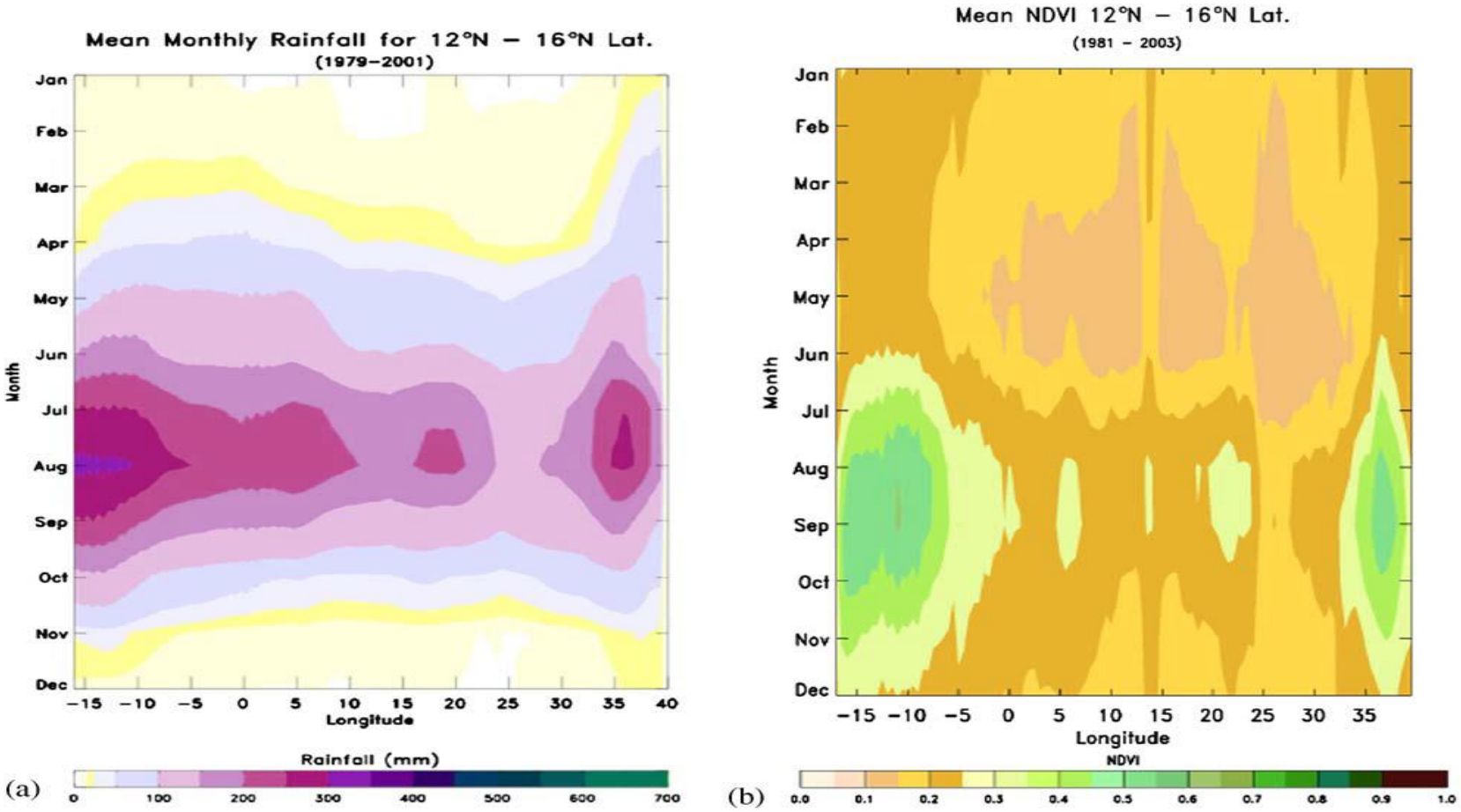
Spatial and Temporal Patterns of Global NDVI Trends: Correlations with Climate and Human Factors

Ya Liu [1,2], Yan Li [1,2], Shuangcheng Li [1,2,*] and Safa Motesharrei [3,4,5]

Trend changes in global greening and browning: contribution of short-term trends to longer-term change

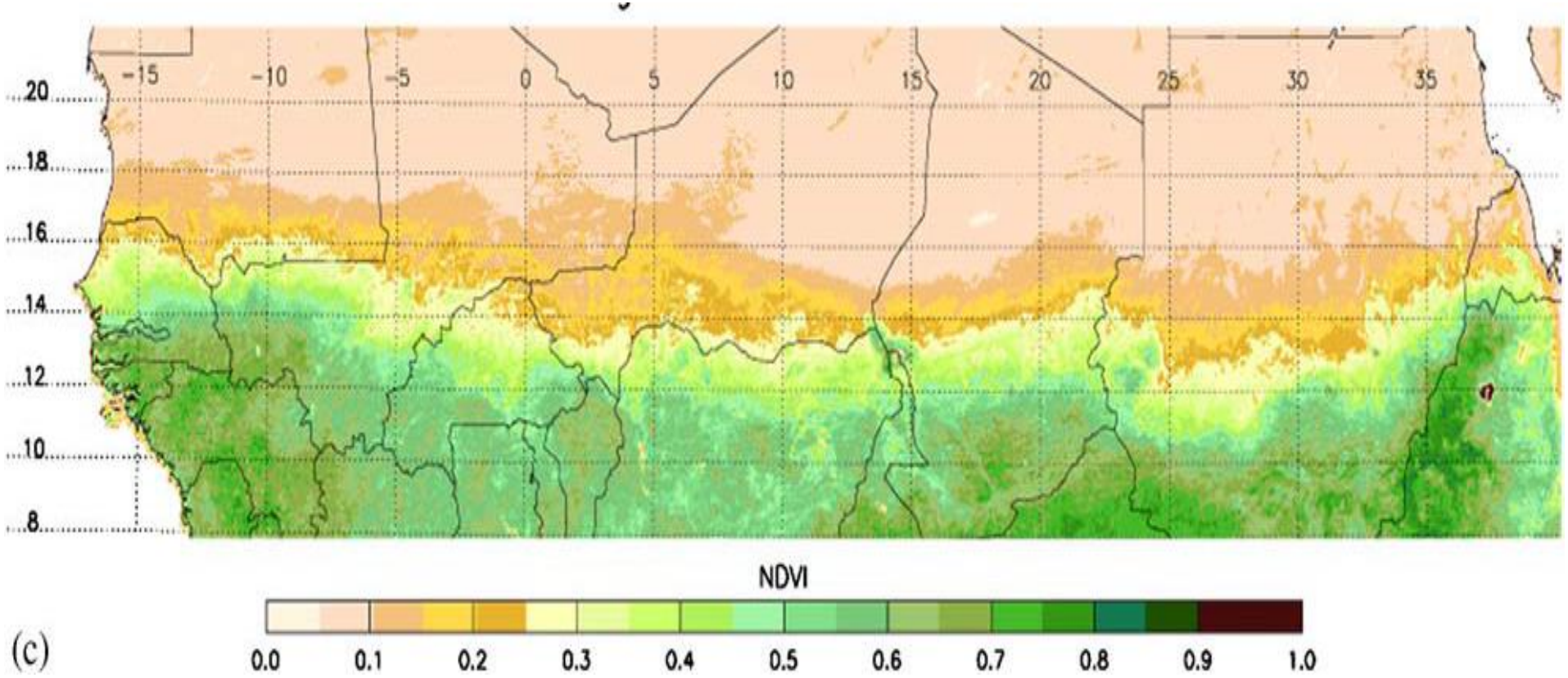
Applications of NDVI

Relationship between rainfall and NDVI in Sahel

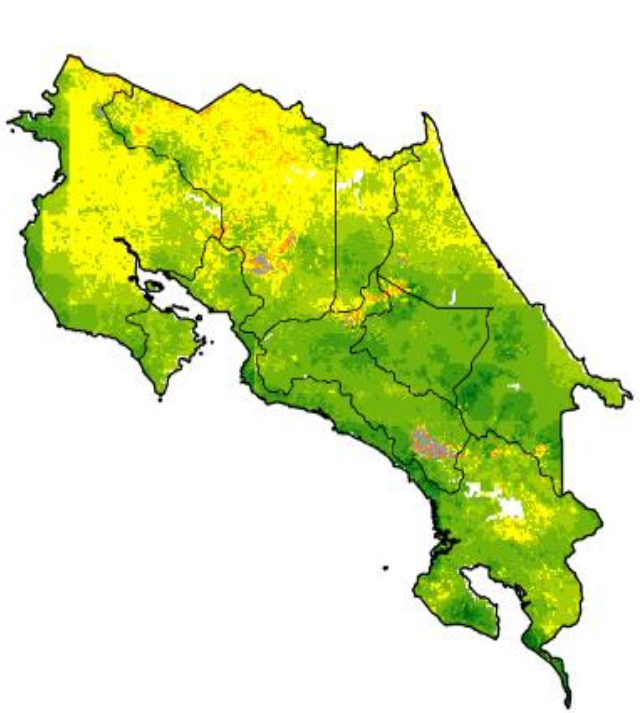


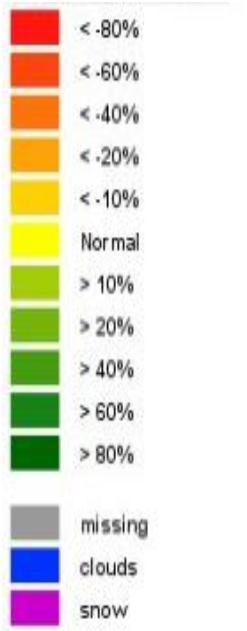
Mean drought conditions of Sahel using NDVI

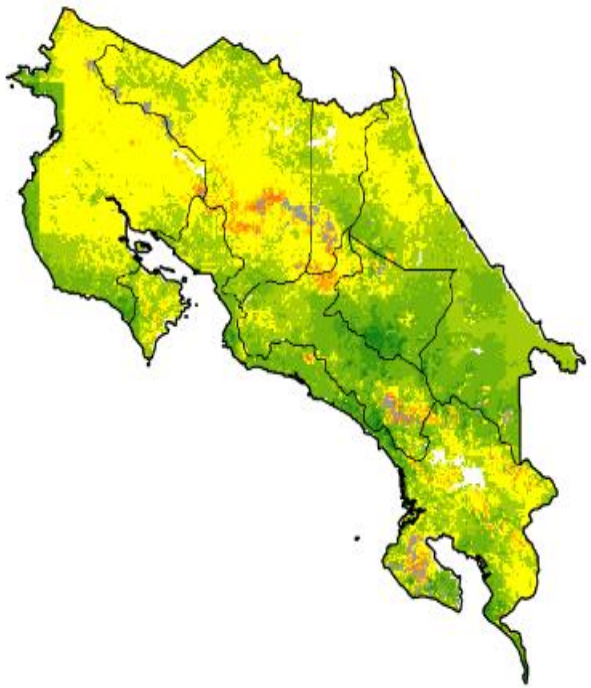
DV= $Y(_{s,t})$ – [NDVI]
Where $[Y_{s,t}]$ is the NDVI value for site “s” at time “t”; and
$[Y_{s,t}]$ is the mean NDVI value over the time frame.



Land use changes



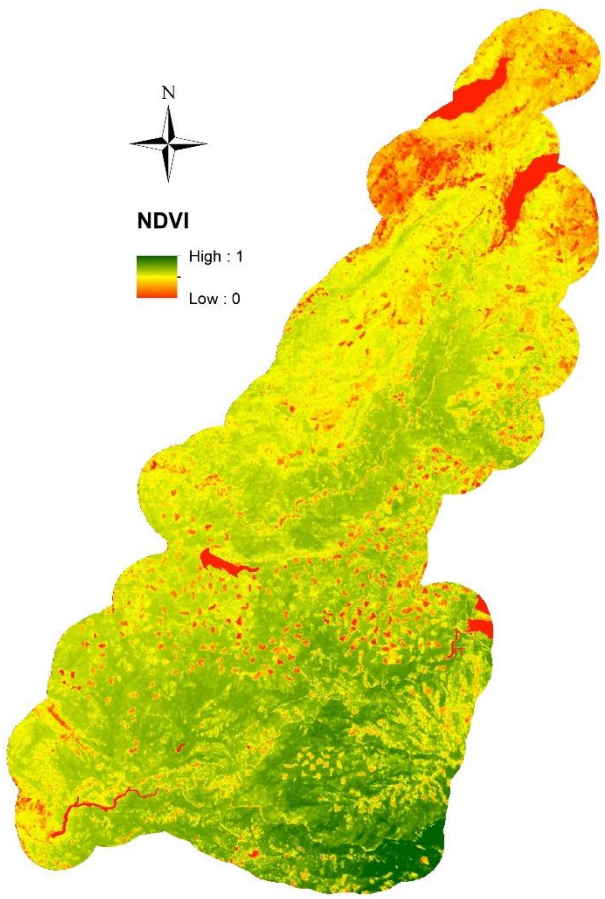




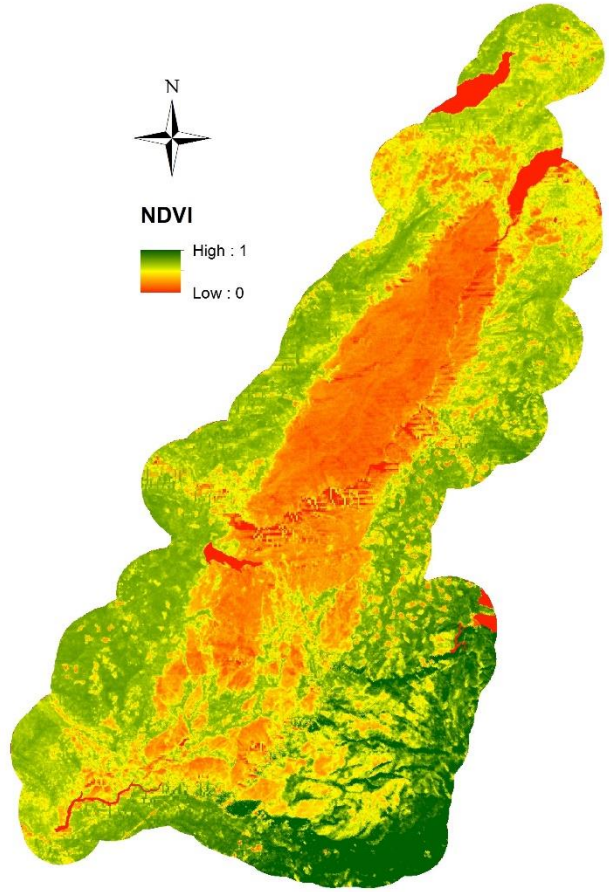
Forest cover before deforestation

Forest cover after deforestation

Forest fires (Rim and King forest fires in Nevada)



Before fire incident



After fire incident

Limitations of NDVI

- **Temporal resolution**: affected by viewing angle and time of day. Therefore maximum composite NDVI have longer duration (>10 days) and thus NDVI is not appropriate for short studies.
- **Pixel Numeration**: Each pixel represents averaging of surface conditions at the spatial resolution of the sensor. This gives discrete impression of a rather continuum surface conditions.
- **Reflectance contaminants**: visible infra red is susceptible to cloud scattering ad thus leads to biasness in detected spectrum. Similar situations occur for vegetation on sparse reflective soils.
- **Sensor degradation**: on-board sensors degrade with time and sometimes there challenges with on-board recalibration.

Conclusion

- NDVI has several applications in the ecological environment.
- Though NDVI lacks field measurement but it makes up for the large area cover at relative considerable effort and time.
- NDVI only present time series of data or information after an event has happened and therefore cannot forecast events before it happens. The main function is a comparison of pre-event and post event time series.
- Cross validation is necessary for NDVI generated images due to potential biasness.

Thank you