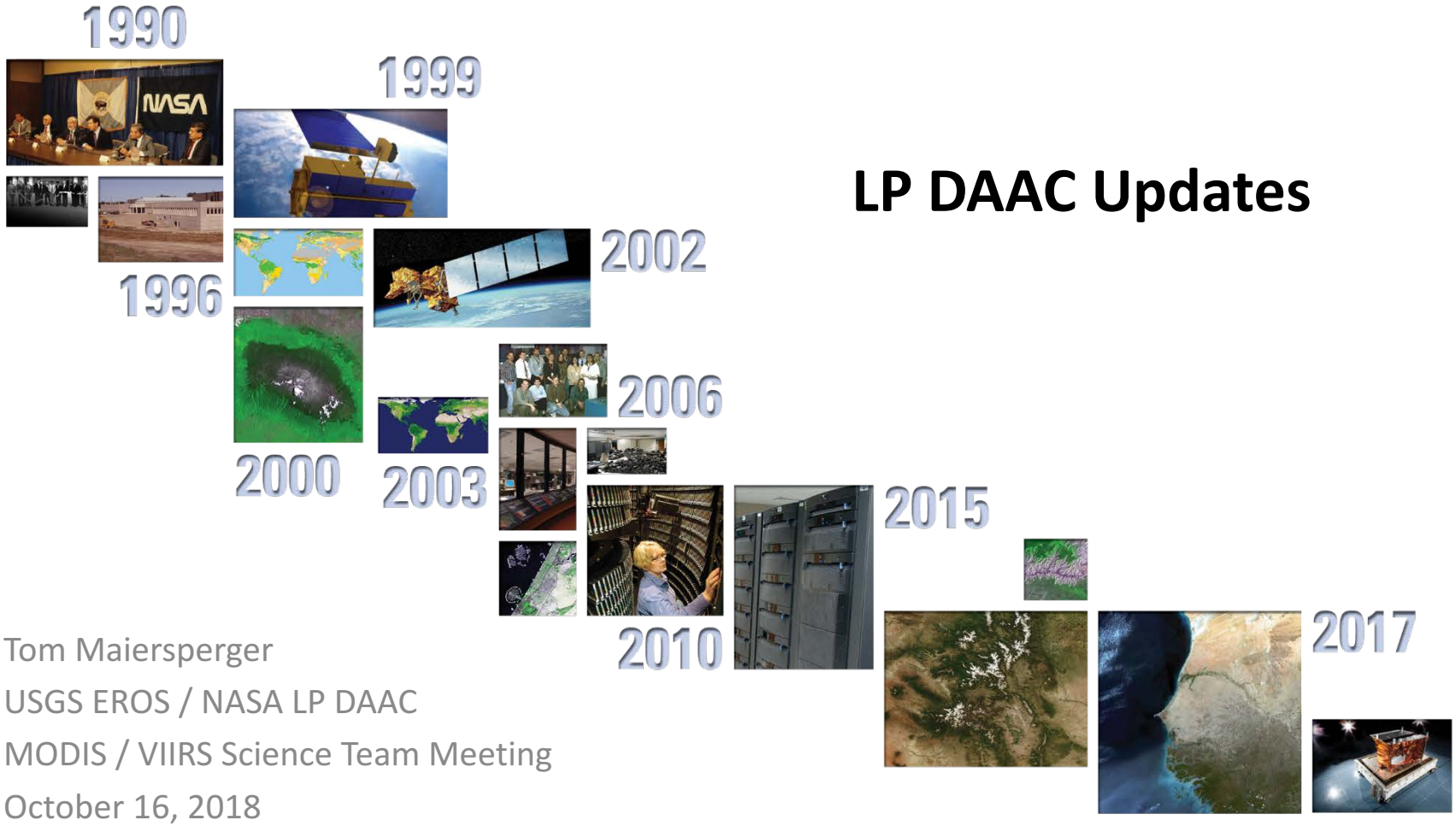
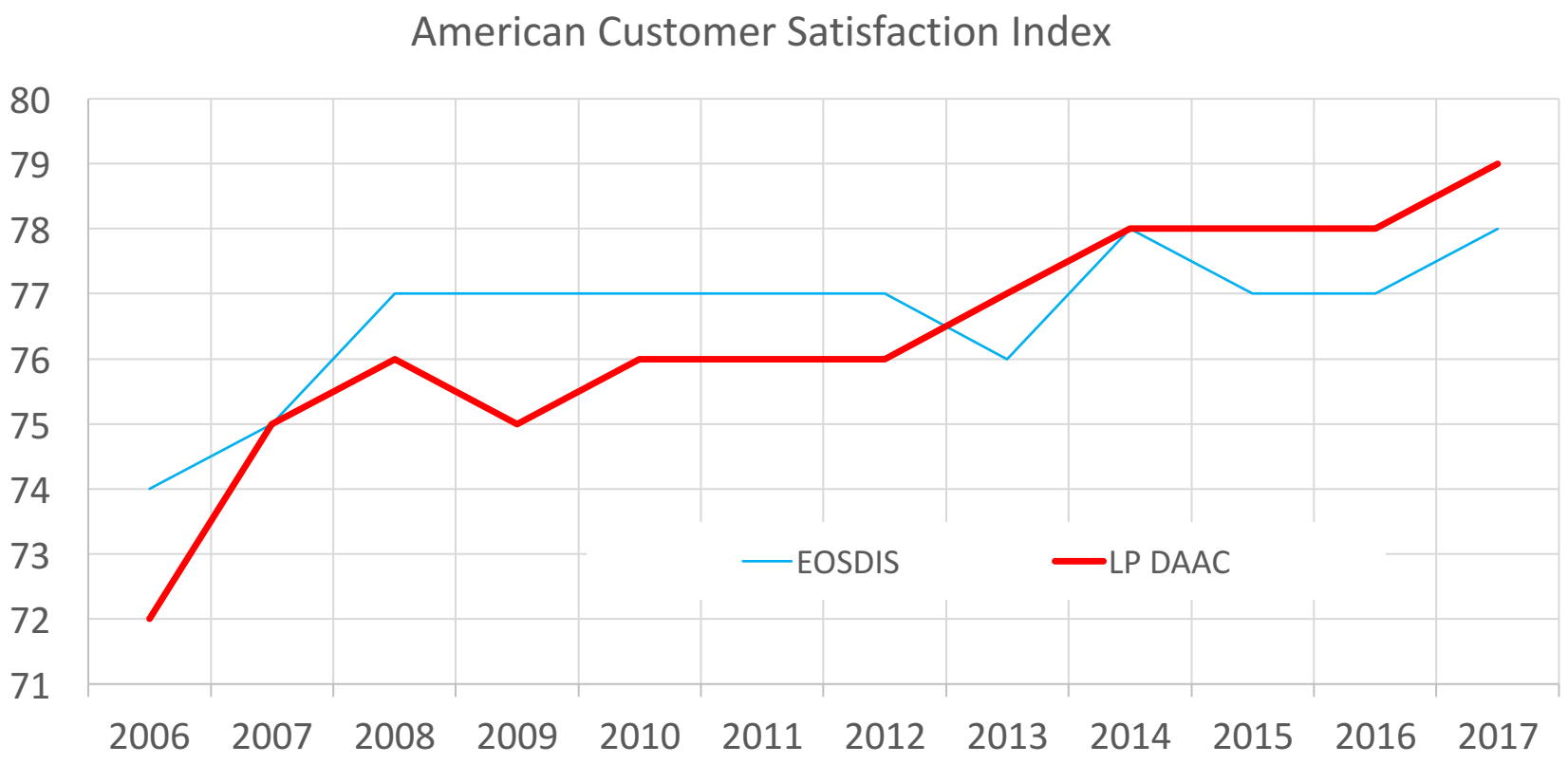


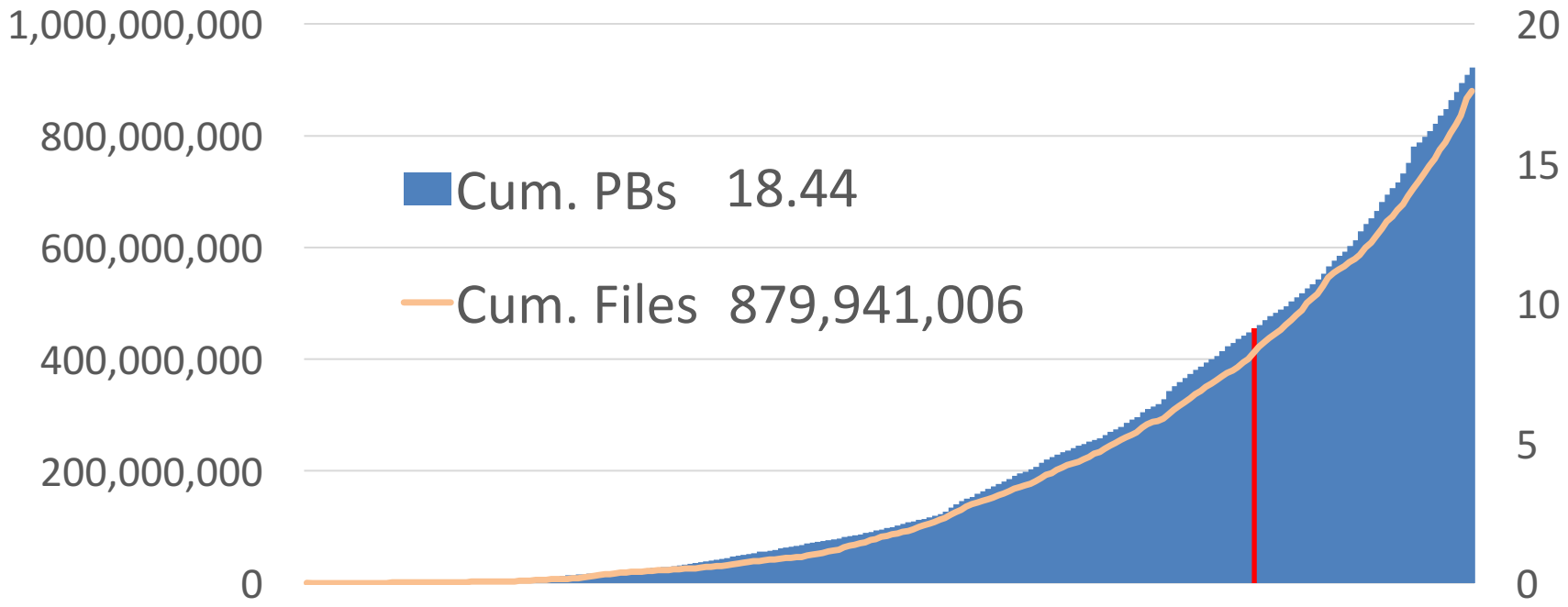
LP DAAC Updates

Tom Maiersperger
USGS EROS / NASA LP DAAC
MODIS / VIIRS Science Team Meeting
October 16, 2018

LP DAAC Overall User Satisfaction Trend



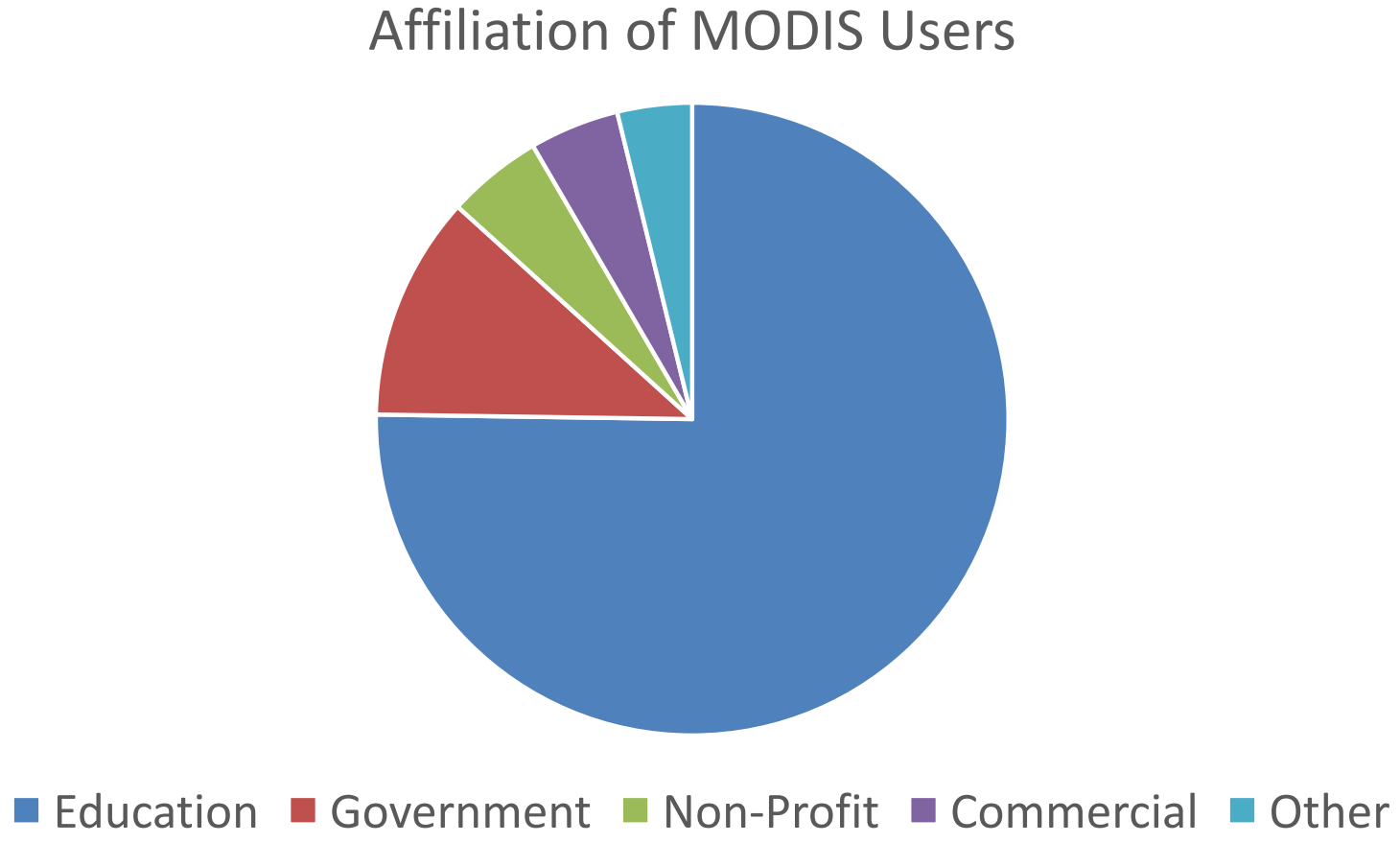
LP DAAC MODIS Land Data Distribution (thru 9/2018)



- Midpoint of volume distributed (9.22 PB) occurred in May 2015
- In the last year, distribution is averaging ~ 300TB and ~16M files/month
- In 2019, cumulative volume distribution will exceed 20 petabytes and cumulative file distribution will exceed one billion

LP DAAC MODIS Land Data Distribution – 1 Year Detail

- For period October 1, 2017 – September 30, 2018
- n = 16,530



LP DAAC MODIS Land Data Distribution – 1 Year Detail

- For period October 1, 2017 – September 30, 2018
  - Eight products had > 1,000 unique users:

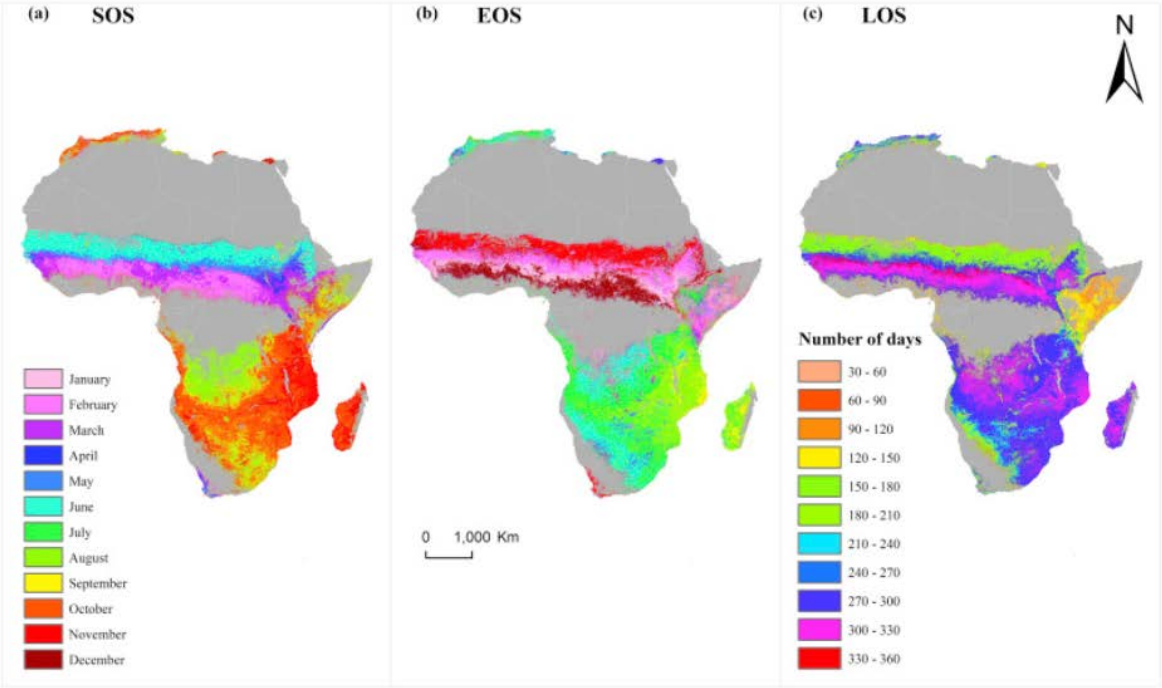
Product	Shortname	Version	Unique Users
MODIS/Terra Vegetation Indices 16-Day L3 Global 250m SIN Grid	MOD13Q1	6	3,547
MODIS/Terra+Aqua Land Cover Type Yearly L3 Global 500m SIN Grid	MCD12Q1	51	1,948
MODIS/Terra Land Surface Temperature/Emissivity Daily L3 Global 1km SIN Grid	MOD11A1	6	1,836
MODIS/Terra Surface Reflectance 8-Day L3 Global 500m SIN Grid	MOD09A1	6	1,716
MODIS/Terra Land Surface Temperature/Emissivity 8-Day L3 Global 1km SIN Grid	MOD11A2	6	1,582
MODIS/Terra Net Evapotranspiration 8-Day L4 Global 500m SIN Grid	MOD16A2	6	1,310
MODIS/Terra Vegetation Indices 16-Day L3 Global 500m SIN Grid	MOD13A1	6	1,085
MODIS/Terra Surface Reflectance Daily L2G Global 250m SIN Grid	MOD09GQ	6	1,034

  - 12 products had 500-999 unique users
  - 57 products had 100-499 unique users
  - 78 products had 10-99 unique users
  - 118 products had 1-9 unique users

USGS

NASA

Adole, T., Dash, J., & Atkinson, P. M. (2018). **Characterising the land surface phenology of Africa using 500 m MODIS EVI**. Applied Geography, 90, 187–199. https://doi.org/10.1016/j.apgeog.2017.12.006

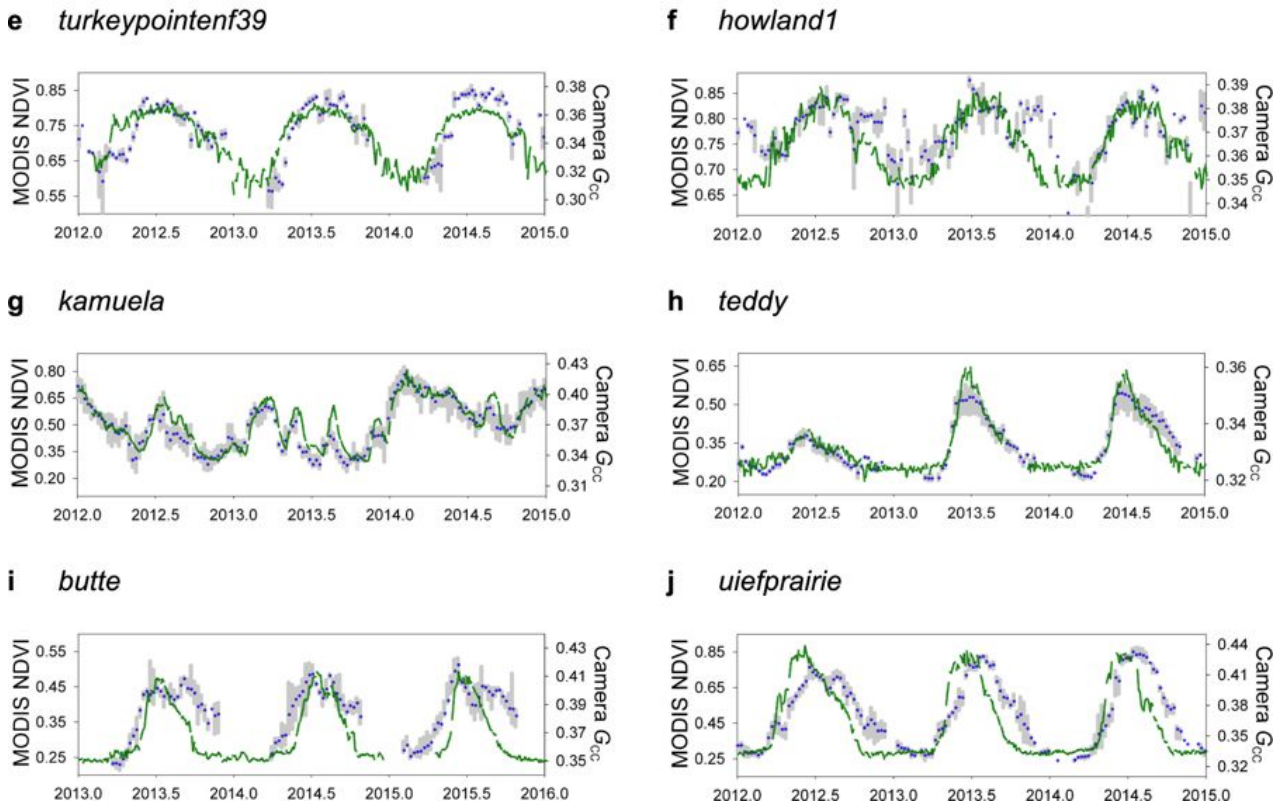


The LSP of the major vegetation types in Africa was described for the first time using...12 years (2001–2012) **MODIS land cover data** (MODIS MCD12Q1) and EVI derived from the **MODIS MOD09A1 product**.

The maps of LSP parameters (SOS, EOS, LOS) produced here represent the **finest spatial resolution and most detailed maps of the phenology of Africa to-date.**

The inter-annual variability of all LSP parameters for all of Africa was reported for the first time.

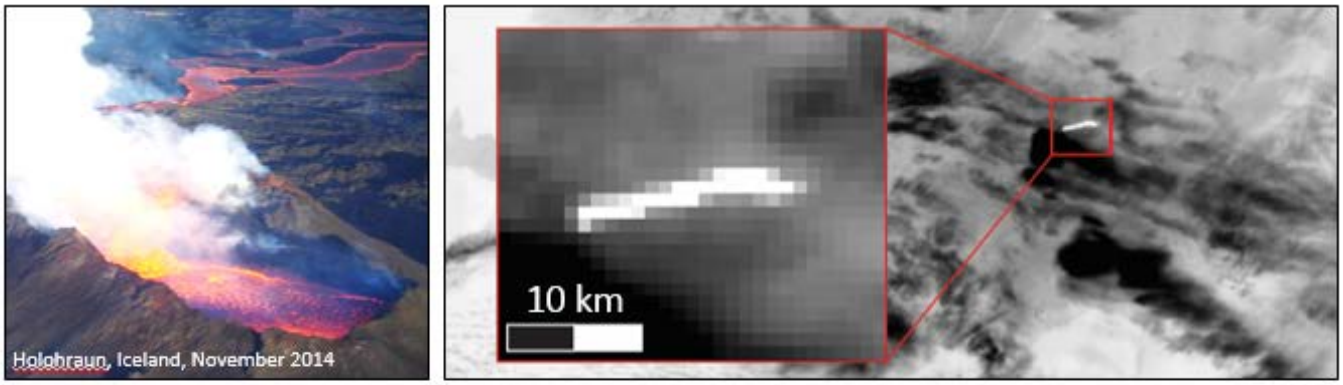
Richardson, A. D., Hufkens, K., Milliman, T., & Frolking, S. (2018). **Intercomparison of phenological transition dates derived from the PhenoCam Dataset V1.0 and MODIS satellite remote sensing**. Scientific Reports, 8(1). https://doi.org/10.1038/s41598-018-23804-6

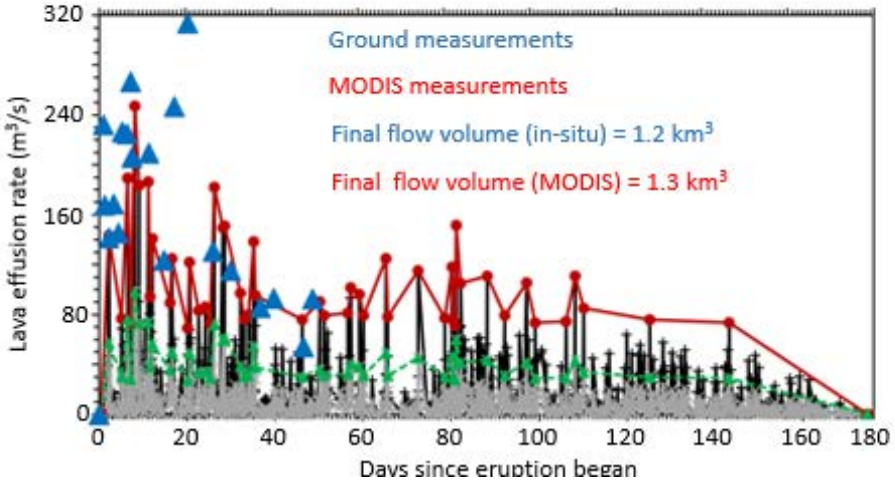


Multi-scale monitoring of vegetation phenology

Time series intercomparison of phenological transition dates, **MODIS vegetation indices**

Bonny, E., Thordarson, T., Wright, R., Höskuldsson, A., & Jónsdóttir, I. (2018). **The Volume of Lava Erupted During the 2014 to 2015 Eruption at Holuhraun, Iceland: A Comparison Between Satellite- and Ground-Based Measurements**. Journal of Geophysical Research: Solid Earth, 123(7), 5412–5426. https://doi.org/10.1029/2017jb015008





Predicting the end of lava flow forming volcanic eruptions - **MODIS allows us to measure the thermal emission from the active lava flow** (below, right), and how this varies with time. This is proportional to the lava effusion rate, and **we often see the predicted waxing-waning effusion rate pattern in MODIS time-series**. The MODIS-derived effusion rates compare well to those estimated on the ground (bottom)

de la Fuente, A., & Meruane, C. (2017). **Spectral model for long-term computation of thermodynamics and potential evaporation in shallow wetlands**. Water Resources Research, 53(9), 7696–7715. https://doi.org/10.1002/2017wr020515

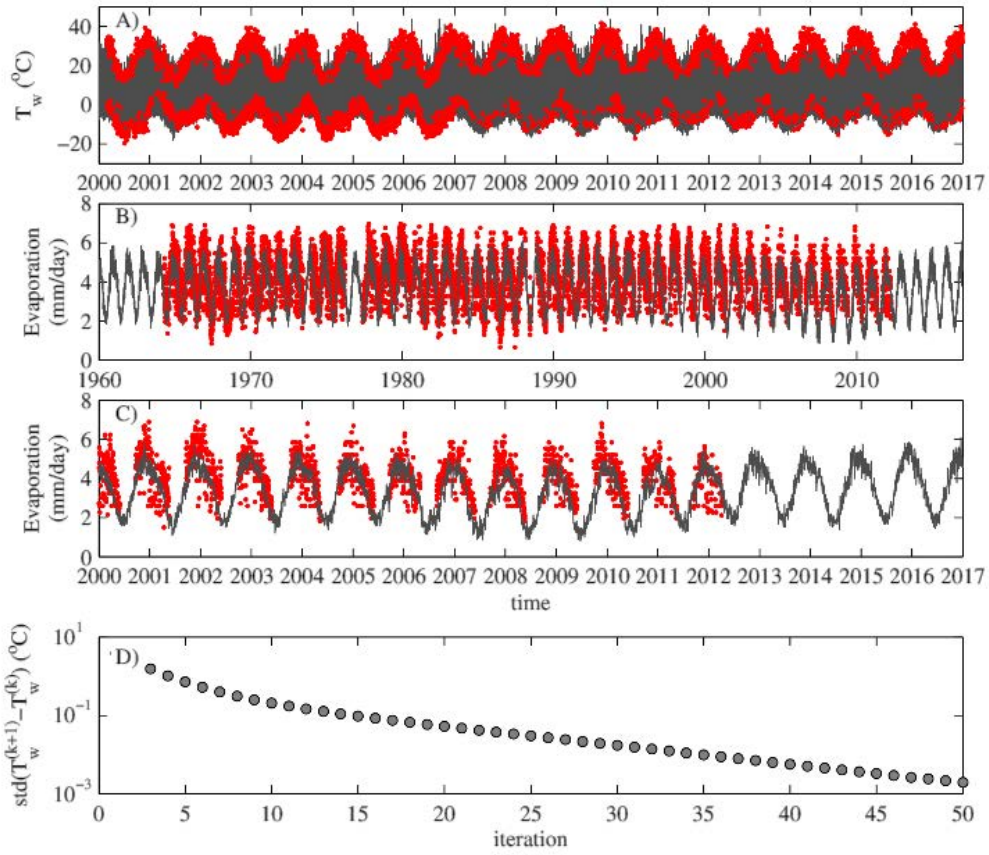
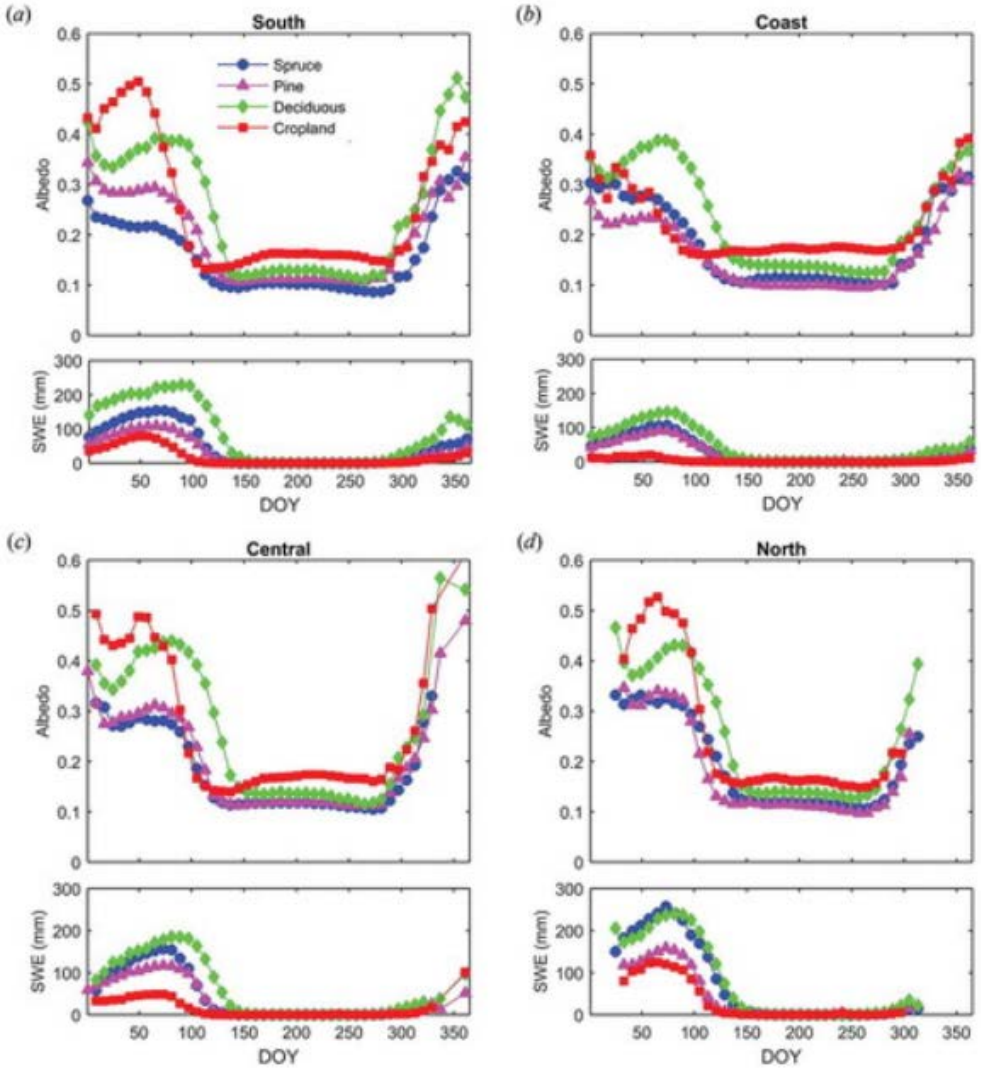


Figure 5. (a) Time series of observed (red dots) and simulated (black line) land surface temperatures of Salar del Huasco for fitted parameters of Table 1. (b) Time series of observed (red dots) and simulated (black line) daily evaporations for the entire period of simulation (1960–2016). (c) Similar to Figure 5b for the calibration period between 2000 and 2016. (d) Evolution of the convergence of the spectral model as a function of the number of iterations for the 67 yearlong simulation.

…model solves for water and sediment temperature, as well as heat, momentum, and mass exchanged with the atmosphere. The **parameters of the model** (water depth, thermal properties of the sediments, and surface albedo) **and the atmospheric downscaling were calibrated using the MODIS** product of the **land surface temperature**

…suitable tool for assessing the global climate change effects on shallow wetlands whose thermodynamics is forced by heat exchanges with the atmosphere and modulated by the heat-reservoir role of the sediments.

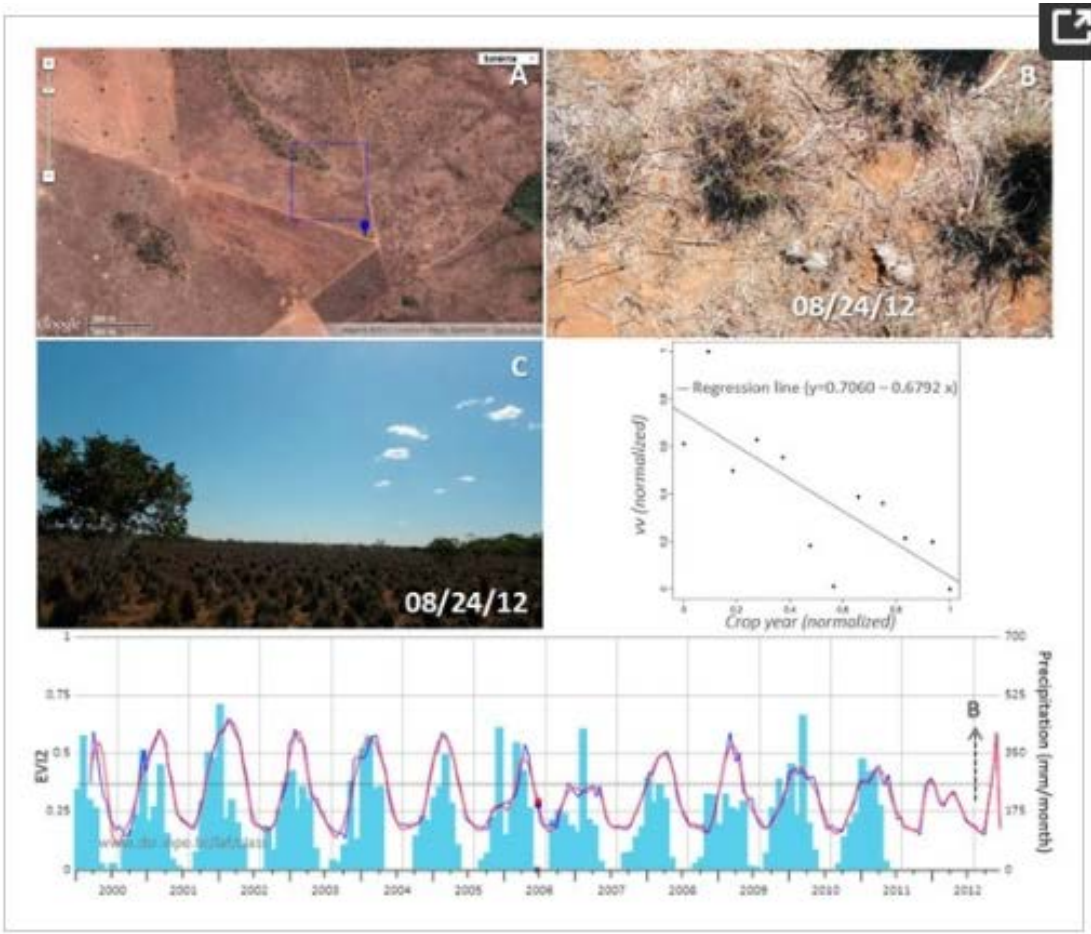
Cherubini, F., Vezhapparambu, S., Bogren, W., Astrup, R., & Strømman, A. H. (2017). **Spatial, seasonal, and topographical patterns of surface albedo in Norwegian forests and cropland.** International Journal of Remote Sensing, 38(16), 4565–4586. https://doi.org/10.1080/01431161.2017.1320442



…use satellite retrievals of Moderate Resolution Imaging Spectroradiometer **(MODIS) surface albedo (MCD43A3),** high-resolution land-cover maps, and meteorological records to characterize climatological albedo variations in Norway across latitude, seasons, land-cover type (deciduous forests, coniferous forests, and cropland), and topography.

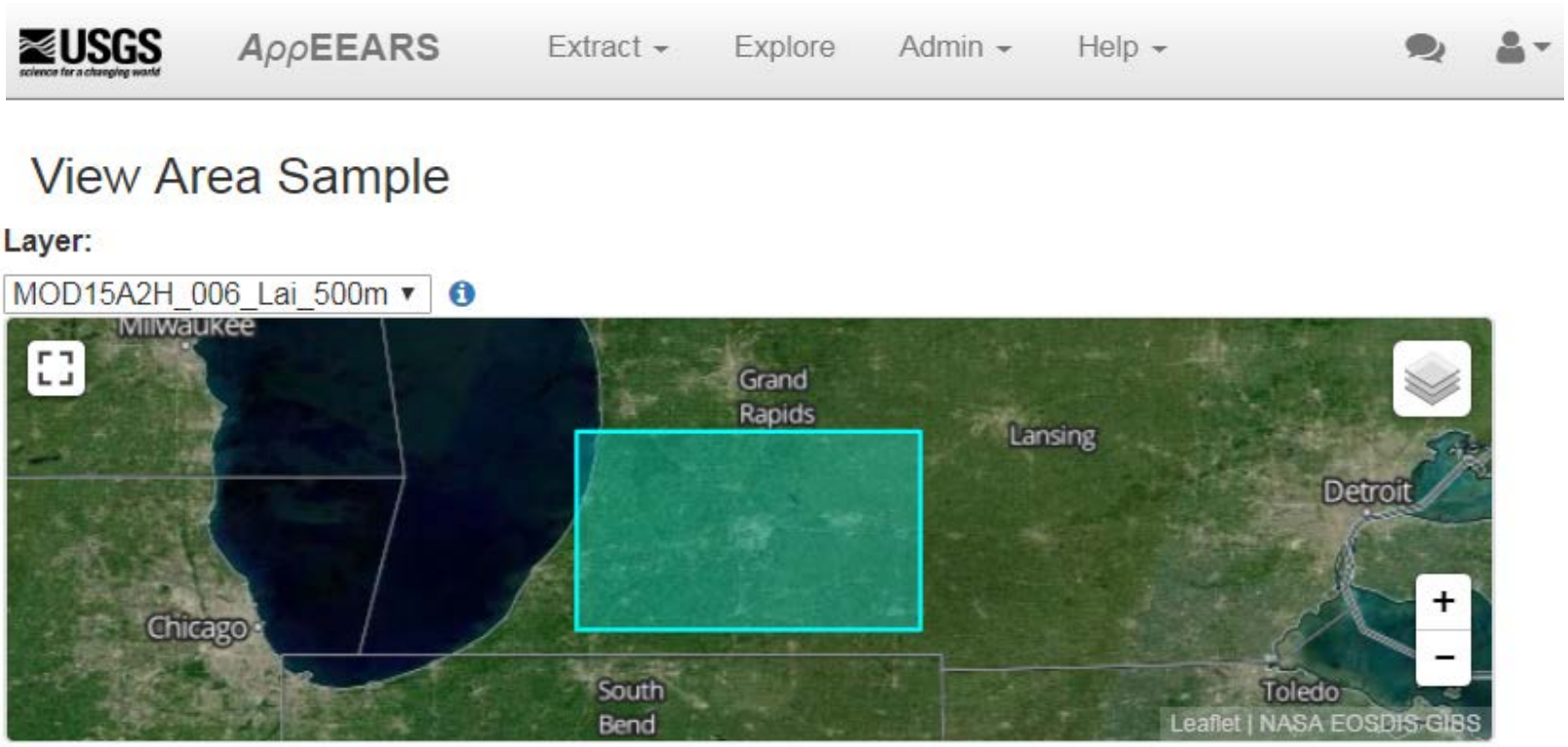
By integrating satellite measurements and high-resolution vegetation maps, our results provide a large semi-empirical basis that can assist future studies to **better predict changes in a fundamental climate-regulating service such as surface albedo**.

Aguiar, D., Mello, M., Nogueira, S., Gonçalves, F., Adami, M., & Rudorff, B. (2017). **MODIS Time Series to Detect Anthropogenic Interventions and Degradation Processes in Tropical Pasture**. Remote Sensing, 9(1), 73. https://doi.org/10.3390/rs9010073

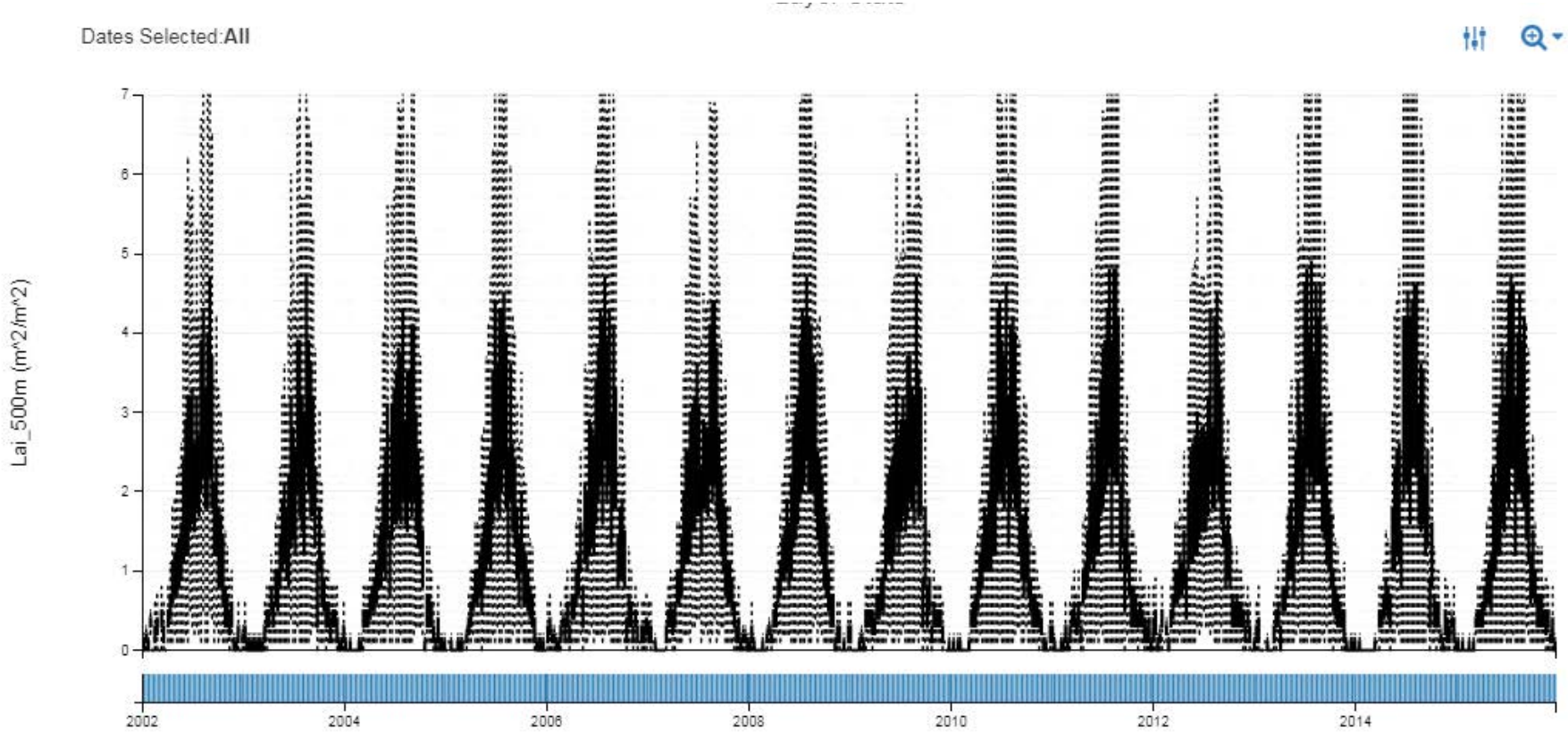


Time series of **MODIS EVI2** data have the potential to be used for **detecting degradation processes in tropical pastures**, as well as anthropogenic interventions (i.e., renewal/recovery and reformation).

Application for Extracting and Exploring Analysis Ready Samples (AppEEARS)



Application for Extracting and Exploring Analysis Ready Samples (AppEEARS)



Application for Extracting and Exploring Analysis Ready Samples (AppEEARS)