

National Aeronautics and  
Space Administration



## ARSET

Applied Remote Sensing Training

<http://arset.gsfc.nasa.gov>

 @NASAARSET

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Conservation Campus: #WCC 9634  
From Earth Observations to Earth Action:  
satellite applications for biodiversity conservation

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Welcome to the Campus

CONSERVATION  
INTERNATIONAL



# Campus Information

Sunday, 4 September 2016, 14:30 – 19:00

All accompanying documents, presentations, and exercises can be viewed and downloaded from the IUCN Campus web space

<http://portals.iucn.org/congress/session/9634>

Also available through the ARSET website

[bit.ly/ARSETWCC16](http://bit.ly/ARSETWCC16)

## Agenda

*14:30 -14:45: Who We Are and Why Remote Sensing?*

*14:45 -15:30: Introduction to Remote Sensing*


*15:30 -16:40: Remote Sensing for Conservation and Biodiversity*

*16:45 -18:00: Remote Sensing Tools and Data Exploration Exercises*

*18:00 -19:00: Feedback and Wrap-up*

# This Campus Will Be

- an introduction to the many applications of remote sensing for biodiversity conservation and land management
- applicable to a broad audience that is interested in learning the basic concepts of remote sensing and how to apply them directly to conservation goals
  - *no prior experience is needed*
- an interactive event with hands-on, step-by-step exercises based on readily available web tools
- receptive to your feedback as end-users in order to address your decision support activities
- **Pono**: to be in complete harmony and alignment with our shared custodial relationship with the Earth, a righteous stewardship

An aerial photograph of a mountain range, showing rugged terrain with green vegetation on the higher elevations and brownish, rocky slopes in the lower areas. A semi-transparent white rectangular box is centered over the image, containing text.

# NASA Applied Remote Sensing Training Program (ARSET) Trainers

Cindy Schmidt, [cynthia.l.schmidt@nasa.gov](mailto:cynthia.l.schmidt@nasa.gov)

Brock Blevins, [brockbl1@umbc.edu](mailto:brockbl1@umbc.edu)

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A satellite view of Earth from space, showing a vast expanse of blue oceans and white clouds. A semi-transparent light blue rectangular box is overlaid on the center of the image, containing text. In the bottom right corner, a portion of a landmass with green vegetation and brown terrain is visible.

# Conservation International Trainers

Jenny Hewson, [jhewson@conservation.org](mailto:jhewson@conservation.org)

Karyn Tabor, [ktabor@conservation.org](mailto:ktabor@conservation.org)

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An aerial photograph of a mountain range, showing a mix of green forested peaks and brown, rocky terrain. A semi-transparent white rectangular box is centered over the image, containing text. The text is in a clean, black, sans-serif font. The background image shows a winding river or stream cutting through the mountains, and several small lakes or ponds are visible in the lower part of the frame.

# Special Guest Speakers

Tanya Birch, Google Earth Outreach, [tanyak@google.com](mailto:tanyak@google.com)  
Lilian Pintea, Jane Goodall Institute

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A satellite view of Earth from space, showing a vast expanse of blue oceans and white clouds. A large landmass is visible in the lower right corner, with a prominent mountain range. The image is used as a background for a presentation slide.

# How Practitioners Use Remote Sensing for Conservation

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# Observations to Applications

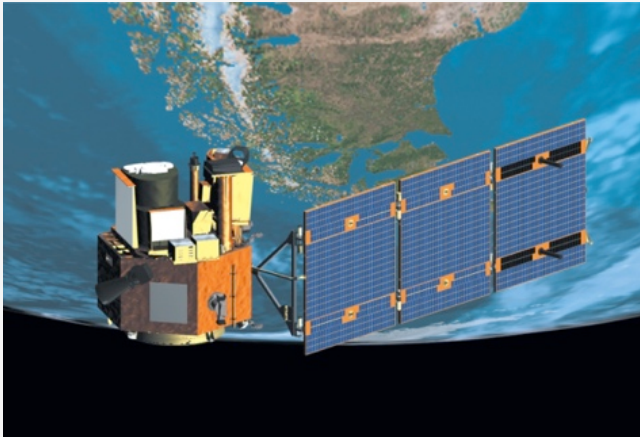
Satellite Measurements



Satellite Products



Environmental Applications



Satellite images, remote sensing and modeling data, along with other sources of data, are used directly or in statistical or physical modeling tools for a variety of applications

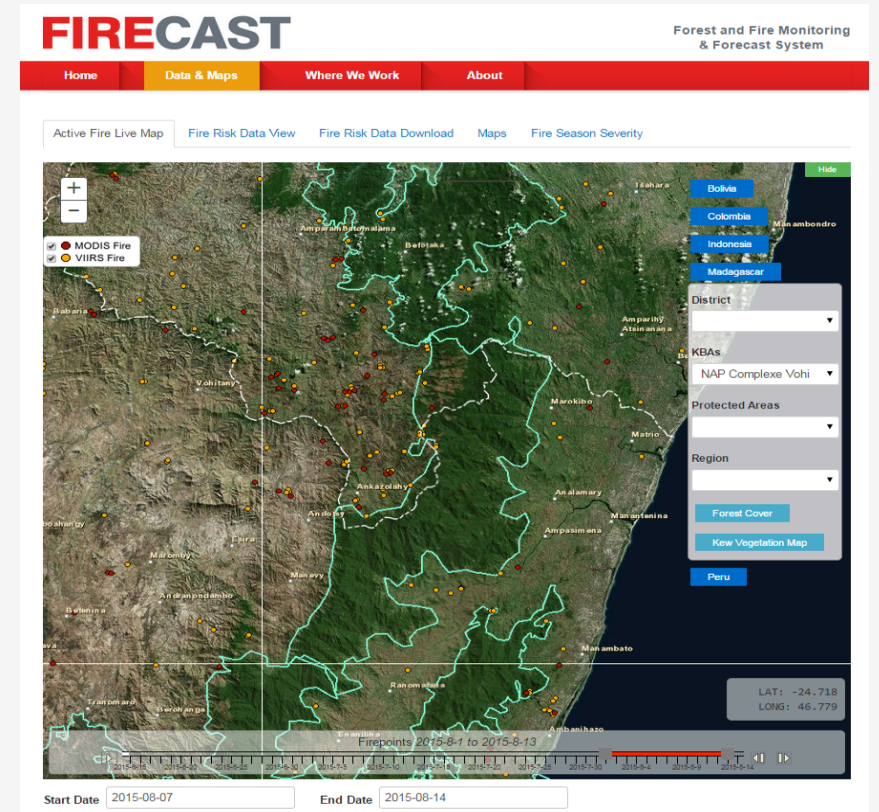
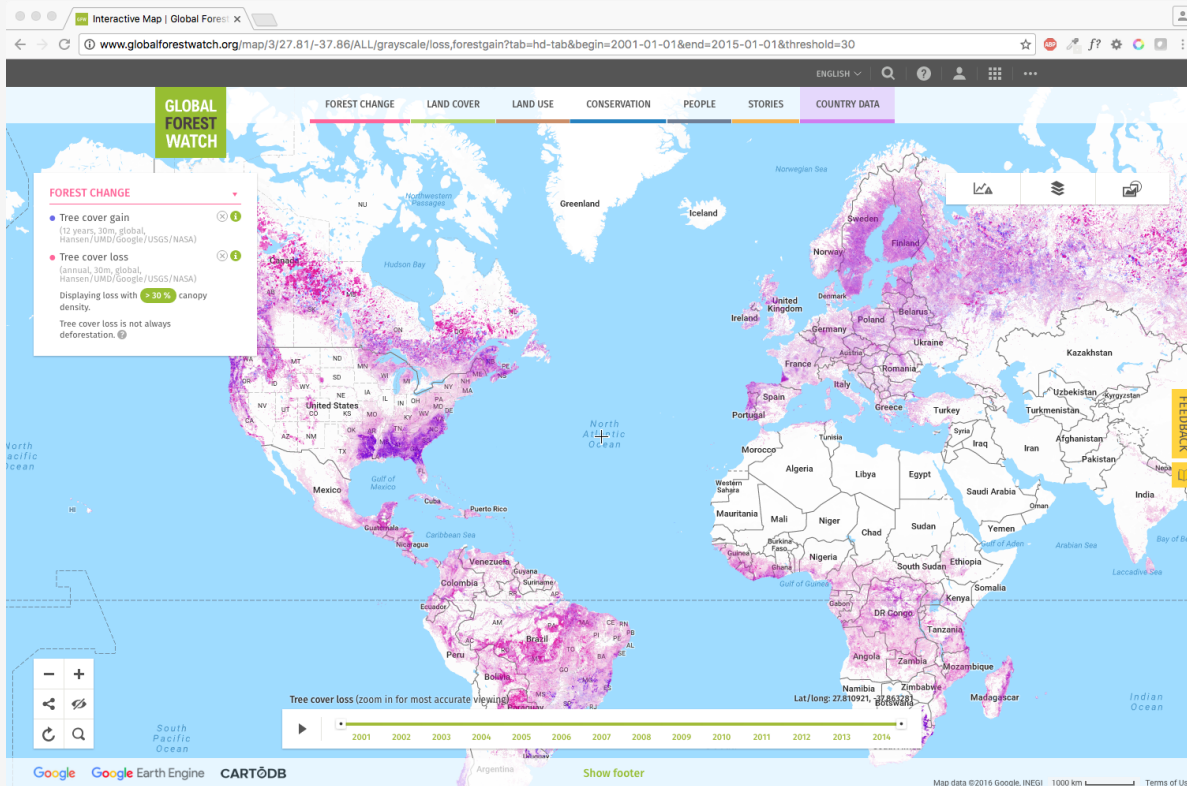


\*Image Credits: Left: NASA; Center: NASA; Right: (top) UNDP/George Ntonya, (bottom) UNDP/Arjan van de Merwe



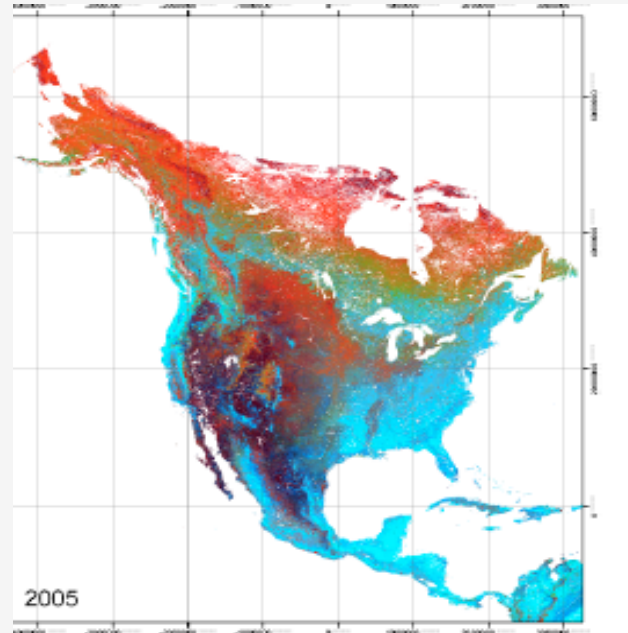
# Examples of Data Applications

## Monitoring deforestation, Reducing Emissions from Deforestation and forest Degradation (REDD+)



# Examples of Data Applications

Natural Capital accounting  
Species distribution modeling  
Climate adaptation  
Climate mitigation  
Land degradation



\* Coops et al., (2009)

## Dynamic Habitat Index

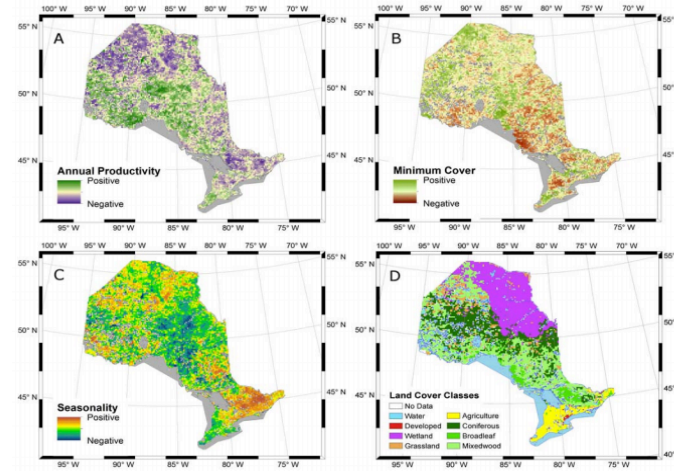
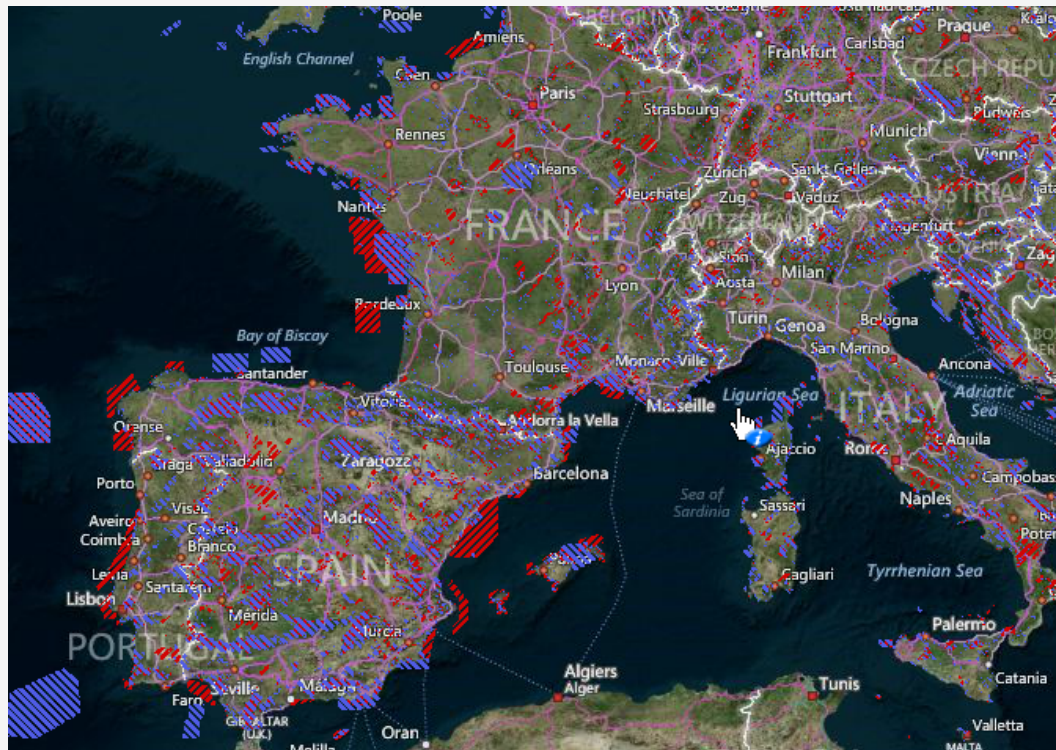


Figure 2. Ontario overall observed Theil-Sen's trend recorded over the 2003-08 period for each of the individual component of the dynamic habitat index (DHI): (A) annual productivity, (B) vegetative cover, (C) seasonality. Also shown is the EOSD land cover classification resampled to a 10 km x 10 km grid (D).

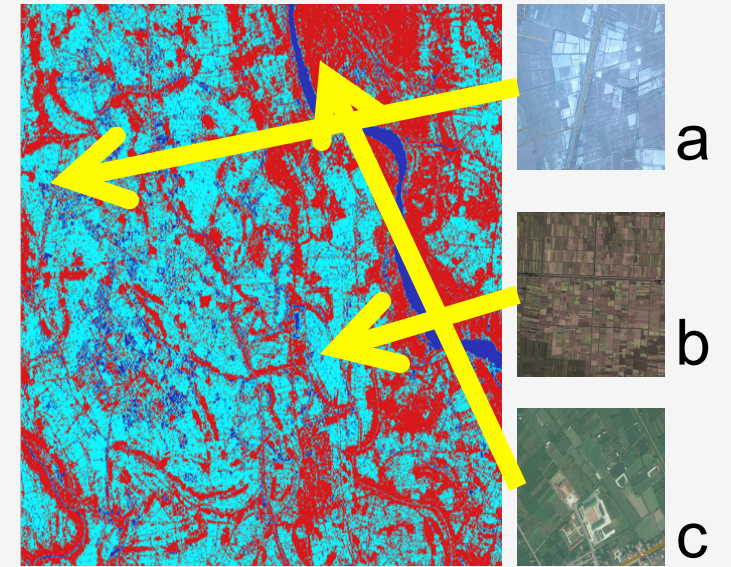
\* Michaud et al, (2012)

# Examples of Data Applications

Ecosystem service assessments  
Forecasting food security  
Land cover/use characterization



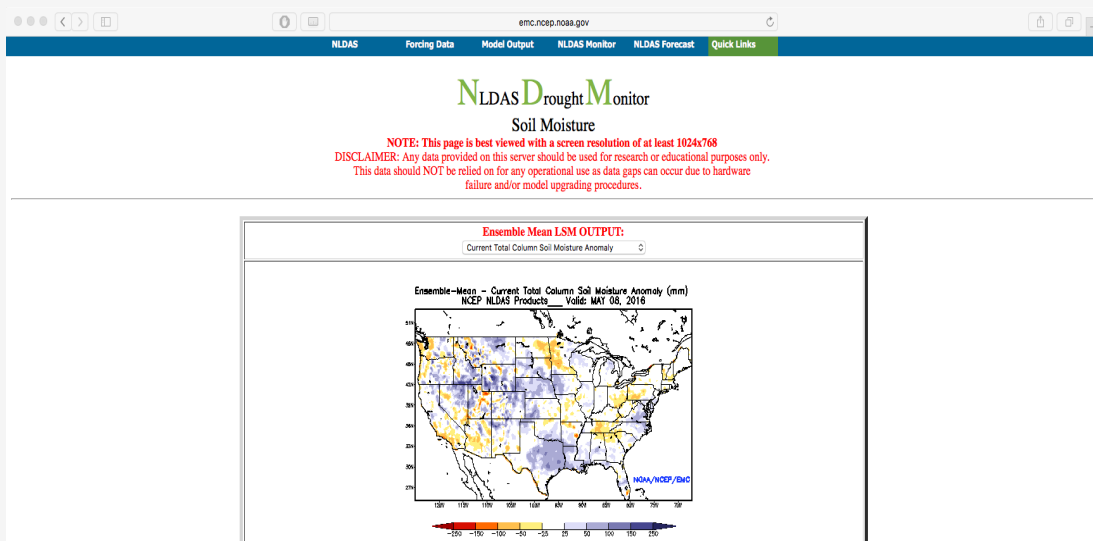
Natura, European Environment Agency (EEA)



- a) Water bodies and flooded rice paddies (5-7 x)
- b) Agriculture (3-4x)
- c) Urban, natural vegetation, and plantations (1-2 x)

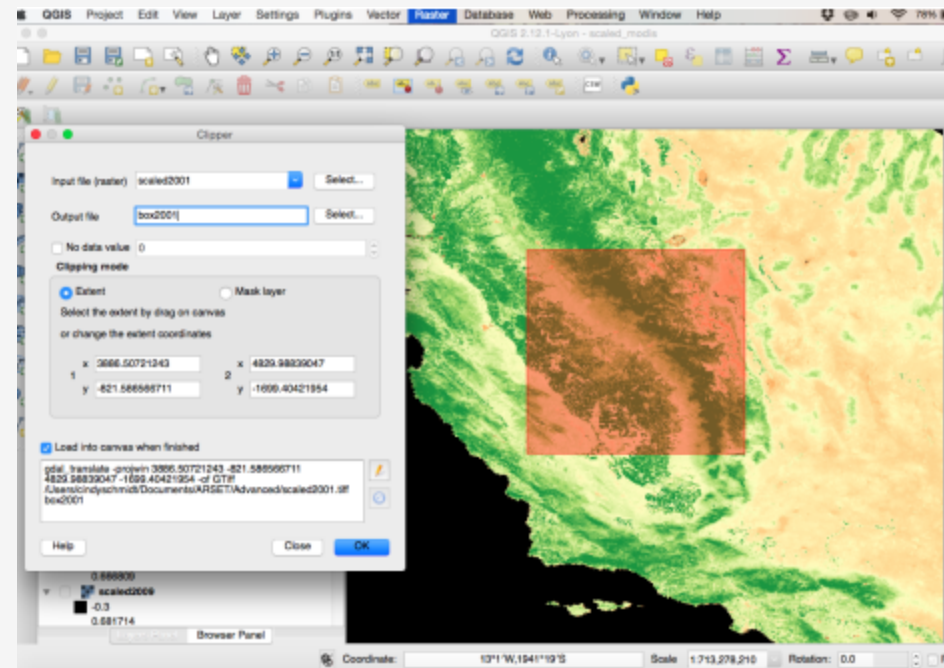
# Examples of Data Applications

## Drought and vegetation health monitoring



The North American Land Data Assimilation System uses satellite observations and model output to create land-surface model datasets

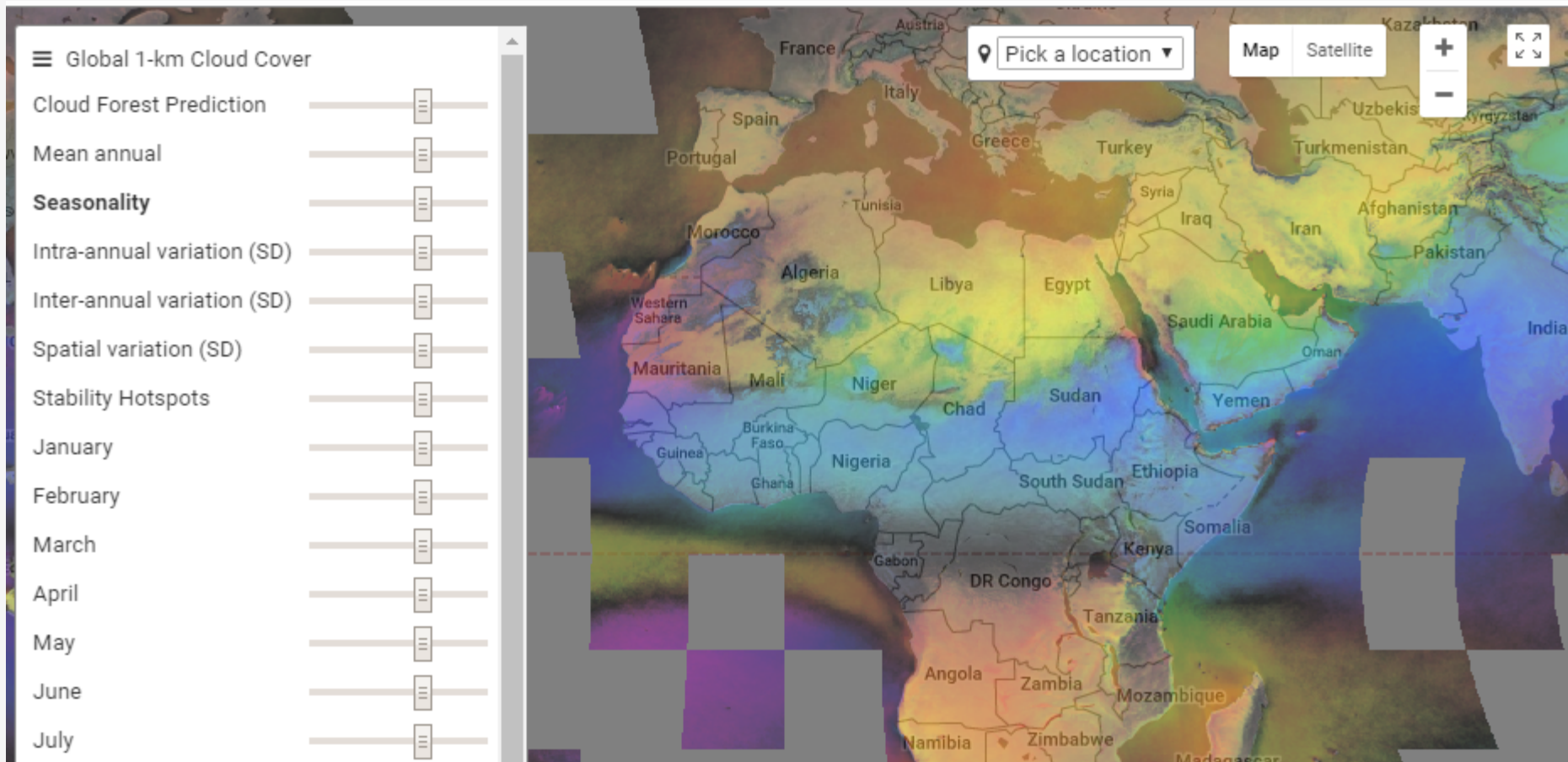
[www.emc.ncep.noaa.gov/mmb/nldas/drought/](http://www.emc.ncep.noaa.gov/mmb/nldas/drought/)



NDVI anomalies as an indicator of drought or declining vegetation health

# Examples of Data Applications

Assessing status and trends in biodiversity, ecosystems, and climate



<http://www.earthenv.org/cloud>

An aerial photograph of a mountain range. The foreground shows rugged, brownish-tan terrain with some small green lakes. The middle ground is dominated by a large, semi-transparent grey rectangular box that contains text. The background shows lush green mountains with winding rivers and some snow-capped peaks.

This Campus is Part of the “Life on Land  
Journey”

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# Life on Land Journey

- This journey will report on different perspectives on land and how they relate
- It will forge partnerships for a more coordinated approach to achieving Land Degradation Neutrality

