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A Capacity Building Initiative to Support the Uptake of Earth Observations for a More Resilient Energy Sector

AGU 2021

SA34A- Accessing Broader User Communities for Earth Observations of Terrestrial Systems

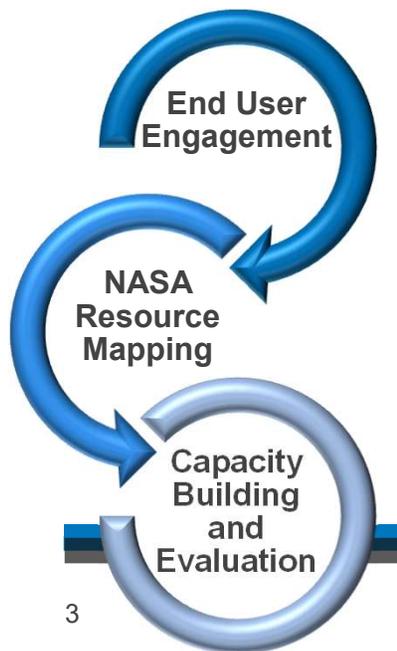
Energy Sector Challenges

- Shifts in extreme weather and climate impact electrical infrastructure and resource availability
- Utilities need data to plan, monitor, respond, and improve resiliency
- NASA has Earth Observations (EOs) relevant to electric utility applications
 - Are these actionable? What does “actionable” mean?
 - Do NASA EOs meet decision-making needs?
 - What are priorities for U.S. electric utilities?
 - What is their capacity for using EOs?



Capacity Building Approach

- Needs assessment & mapping NASA EO's to needs
- Developing tools, trainings, handouts, webinars, papers
 - StoryMap®: <https://tinyurl.com/NASAEnergyStoryMap>
 - ARSET Training: <https://tinyurl.com/ARSET-Energy-Management>
- Outreach & dissemination



NASA Earth Observations for Electric Utility Applications

Home Case Studies Datasets Definitions Tutorials

Energy Infrastructure & Assets Elevation Evapotranspiration Fire & Burn Products Groundwater & Soil Moisture Land Cover/Land Use Change Land Surface & Reanalysis Models Landslide Products Nighttime Lights Precipitation Sea Level Change

1 Overview

2 Snow Cover Products (MODIS & VIIRS)

MODIS snow products from the National Snow & Ice Data Center (NSIDC) provide gridded data on percentage of snow covered land and snow cover extent. Snow cover is identified using the Normalized Difference Snow Index (NDSI) and a series of screens designed to alleviate errors and flag uncertain snow cover detections. Although MODIS resolution is coarser than other EO's, MODIS offers a global collection of imagery on a daily basis, which is made available in near real-time. MODIS snow extent and snow cover layers can be visualized in Worldview (right). To learn more about the real world use of MODIS snow products, see the article [Looking For Freshwater In All the Snowy Places](#).

TUTORIALS

Let It Snow: Accessing and Analyzing VIIRS & MODIS Snow Data at the NSIDC DAAC (Source: NASA NSIDC)

DATA SETS

MODIS Snow Cover Products are available from the NSIDC.

- Format: HDF-EOS, Geotiff
- Temporal Resolution: daily, 8-day, monthly
- Temporal Coverage: 2000-present
- Spatial Resolution: 500 m, 0.05 deg LxW
- Spatial Coverage: Global

Separately, the VIIRS instrument on the joint NASA/NOAA Suomi NPP satellite offers similar products. VIIRS data are direct heritage from MODIS. MODIS algorithm refinements will be integrated into the VIIRS algorithm, as VIIRS is intended to replace MODIS when MODIS is retired.

DATA SETS

3 Snow Water Equivalent (AMSR-E/AMSR2)

NASA WORLDVIEW

OVERLAYS

- Snow Extent (L3, 8-Day) Aqua / MODIS
- Snow
- Snow Extent (L3, 8-Day) Terra / MODIS
- Snow
- Snow Cover (Normalized Difference Snow Index) Aqua / MODIS
- Snow Cover (Normalized Difference Snow Index, L3, Daily) Terra / MODIS
- Snow Cover (Normalized Difference Snow Index, L3, Daily) Terra / MODIS

Group Similar Layers

Add Layers Start Comparison

2020 FEB 10 1 DAY N 2020

NASA ARSET: Introduction to Earth Ob... Watch later Share

NASA EARTH OBSERVATIONS FOR ENERGY MANAGEMENT

Watch on YouTube

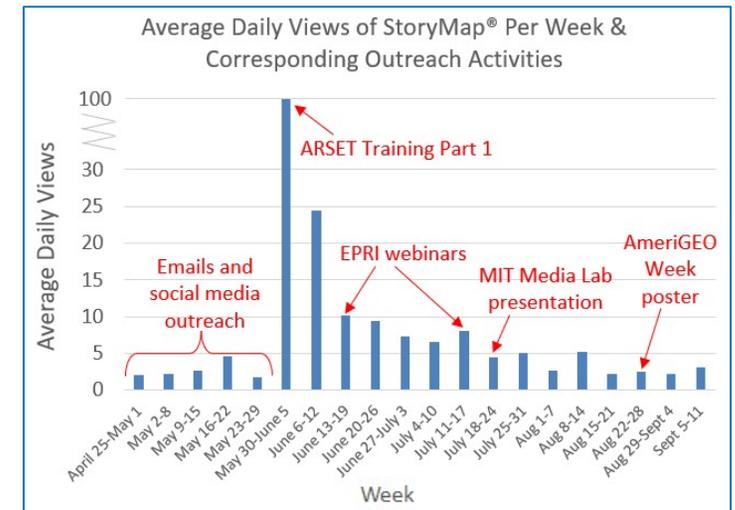
Evaluation

• Successes

- User-friendly, relevant, and accessible tools that effectively bridge gap between scientists and end users
- Broad, global reach through ARSET training (but was it the right audience?)

• Challenges

- Engaging U.S. electric utilities (very busy!)
- Overcoming utility bias about the usefulness of EOs
- Measuring impact over a short period
- Sustaining communication and interest after project end



Countries Represented by ARSET Training Participants



Represented Sectors Among Participants of ARSET Training

