

Earth Observations for Disaster Risk Assessment and Resilience

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6-15 August 2019



Training Summary



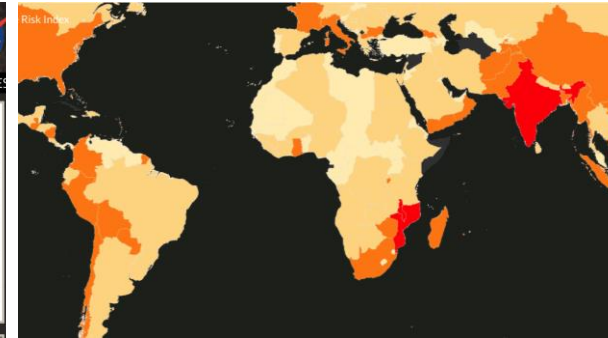
Aug 6, 2019

- NASA Remote Sensing Data
- Socioeconomic Data for Disaster Risk Assessment: SEDAC



Aug 8, 2019

- Assessing Risk of Floods & Cyclones Using NASA Data



Aug 13, 2019

- Disaster Risk Assessment Case Studies
- NYS Dept of Health
- World Resources Institute



Aug 15, 2019

- Operational Application of Remote Sensing for Disaster Management
- Pacific Disaster Center

Terminology

- Disaster Risk Assessment (DRA)
 - Hazard
 - Exposure
 - Vulnerability
 - Disaster
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- Disaster Risk
 - Resilience
 - Disaster Risk Reduction (DRR)
 - Disaster Risk Management (DRM)



DRA Using Remote Sensing Observations: Limitations

- Low and different spatial and temporal resolutions of various earth observations:
 - IMERG Precipitation (~10 km, half-hour)
 - MERRA-2 and GEOS-5 Winds, Sea Level Pressure (~25-60 km, hour)
 - MODIS (500 m, ~2200 km swath, day) and NLDAS (12 km) Land Surface Temperatures
 - Socioeconomic, Terrain, Impervious Surface Data (30 m to ~ several km, static to multi-year)
- Quantitative data analysis, in situ observations are required for accurate DRA

DRA for Flooding: Limitations

- DRA for flood in this webinar was inferred from area-integrated heavy/extreme rain, flooding within urban area may be difficult to resolve
- Flood monitoring tools based on optical data (MODIS – 250 m, ~2000 km swath, 1-2 day; and Landsat – 30 m, 185 km swath, 16 day) can not see flooded surface through clouds
- Flood monitoring with microwave data (e.g. Synthetic Aperture Radar – 5 m, 250 km swath, 12 day) have limited temporal coverage
- Flood models require high-resolution weather data and routing scheme
- DRA for flooding based on remote sensing would require combined analysis of in situ data, multi-sensor data, and flood modeling data

For More Information

- Monitoring Urban Floods Using Remote Sensing:
 - <https://arset.gsfc.nasa.gov/disasters/webinars/urban-flooding-18>
- Advanced Webinar: Radar Remote Sensing for Land, Water, & Disaster Applications; Capacitación en Línea Avanzada: La Teledetección por Radar y sus Aplicaciones para la Tierra, el Agua y Desastres:
 - <https://arset.gsfc.nasa.gov/disasters/webinars/advanced-SAR-18>
- Monitoring Tropical Storms for Emergency Preparedness
 - <https://arset.gsfc.nasa.gov/disasters/webinars/18-tropical-storms>

DRA Using Remote Sensing Observations: Advantages

- Provide data where no in situ data are available
- Spatially uniform data compared to in situ data
- Data are open source, data access and download available via web-tools
- Availability of near-global, past, present, and forecast hazard data together with exposure & vulnerability data allow for improved DRA
- Regionally, combination of Earth observations, Earth system model outputs, and socioeconomic data, with in situ data would lead to better DRA augmenting improved DRM strategies

Homework & Certificate

- Homework:
 - 2 homework assignments
 - Answers to homework must be submitted via Google Forms
- Certificate of Completion:
 - Attend all webinars
 - Complete 2 homework assignments by 30 August
- You will receive certificates approximately two months after the completion of the course from: marines.martins@ssaihq.com

Sign up for the ARSET Listserv

<https://lists.nasa.gov/mailman/listinfo/arset>



As the weather warms in the Northern Hemisphere, many will notice an increase in algal blooms like [this one](#) which occurred in Washington last year. [Learn the basics of aquatic remote sensing, including how to access satellite-derived chlorophyll data.](#)

UN Sustainable Development Goals

In the 2030 Agenda for Sustainable Development, the United Nations established a series of goals for protecting the planet and ending global poverty. In a recent ARSET webinar, nearly 400 participants learned to use satellite observations of air quality in support of the goals. The training was featured on the [SDG Knowledge Hub](#), and materials from the training are now available on the [ARSET website](#). This June, the program is offering a three day webinar on remote sensing of land indicators for Sustainable Development Goal 15.

[Register Here](#)

NASA EOSDIS recently announced that Reverb data search would be replaced with Earthdata Search by the end of the year. The new system will be faster and easier to use. [Read the full announcement here»](#)

Remote Sensing of
Aquatic Environments



Introduction to Synthetic Aperture Radar Introducción al Radar de Apertura Síntica

June 28, 29 and July 5, 6
English: 21:00-22:00 EDT (UTC-4)

SAR can observe the Earth's surface day and night, through most weather conditions, and the signal can penetrate the vegetation canopy. There are a number of existing SAR datasets from current and past airborne and satellite missions, as well as exciting upcoming missions. This online webinar will focus on building the skills needed to acquire and understand SAR data, including polarimetric and interferometric SAR (PolSAR and InSAR), as well as potential applications.

[Register](#)

28, 29 de junio y 5, 6 de julio
Español: 12:00-13:00 EDT (UTC-4)

SAR puede observar la superficie terrestre de día y de noche y a través de la mayoría de las condiciones meteorológicas. Además, la señal puede penetrar la cubierta vegetal y proporcionar información relacionada al estado de inundación de la vegetación. Existen datos de SAR del presente y del pasado obtenidos desde satélites y aviones y habrá más con futuras misiones. Esta capacitación en línea se enfocará en desarrollar los conocimientos necesarios para adquirir y entender datos de SAR incluyendo polarimetría e interferometría y sus potenciales aplicaciones.



The MODIS image above (Credit: [NASA Earth Observatory](#)) shows a wildfire burning in Greenland. Many areas around the world are experiencing above average wildfire activity this year. [Learn to forecast, monitor, and manage wildfires using satellite observations.](#)

SAR Success

We just wrapped up our first training focused on Synthetic Aperture Radar. Unlike optical sensors, SAR can penetrate through cloud cover and vegetation and is useful for nighttime observations. This four-session webinar, offered in both English and Spanish, was ARSET's largest training to date. Missed the live webinar? You can watch it on demand.

[Watch Now](#)

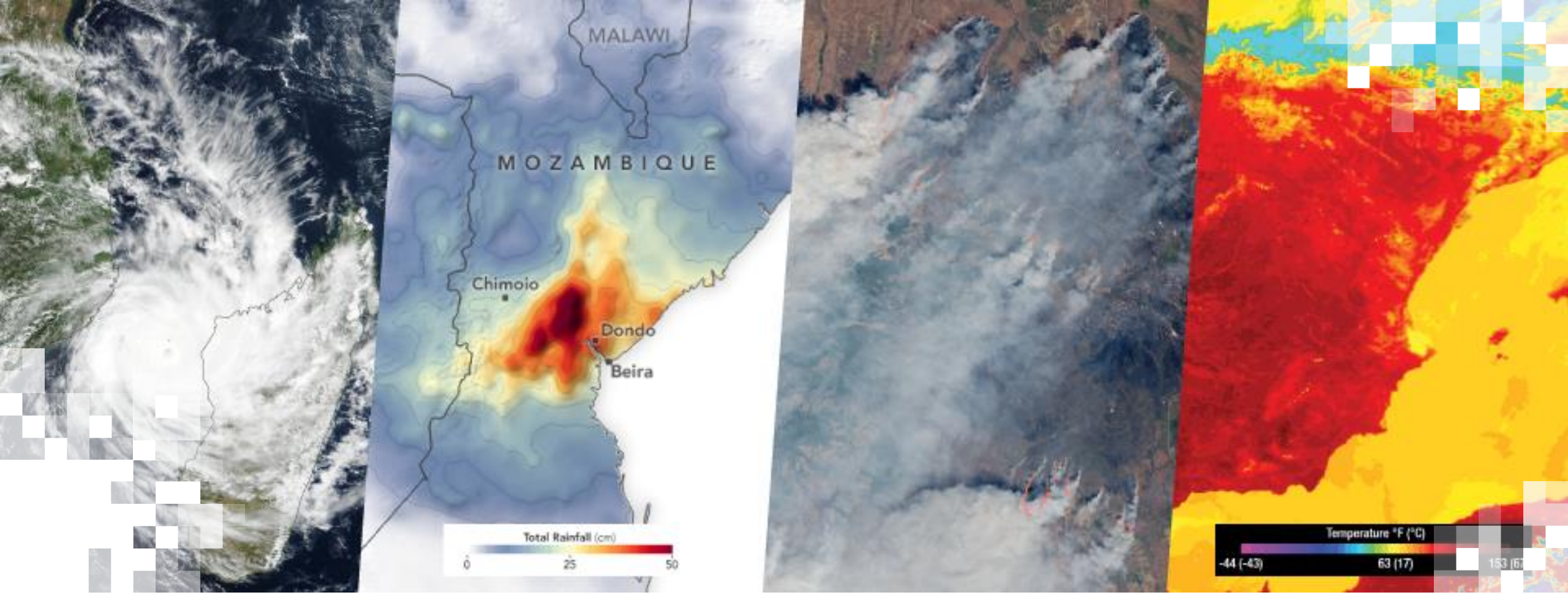
Have You Heard of AppEEARS?

Application for Extracting and Exploring Analysis Ready Samples, or AppEEARS, is a useful tool for downloading remote sensing data. Download just the data you need by subsetting spatially (by point or area), temporally, and spectrally. The application also allows you to visualize the results before downloading them.

[Learn More](#)

Thank you to our guest presenters!

- SEDAC:
 - Susana B. Adamo, Ph.D., CIESIN
- NYS Department of Health
 - Tabassum Insaf, Ph.D.
- PDC
 - Michael Chatman
 - Joseph Green, Ph.D.
- WRI
 - Corey Filiault
 - Liz Saccoccia
 - Amelia Snyder
 - Samantha Kuzma
 - Leah Schleifer
 - Emily Nilson



Thank You!