Life Cycle of Precipitation Events over Orographic Regions
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### Mentor: Malarvizhi Arulraj

Motivation

- Precipitation over mountain regions are highly varying in space and time.

- Understanding the life cycle of precipitation systems is critical - to study precipitation systems, better forecasts and monitoring capabilities.

Objectives

- Leverage high-resolution ground and satellite observations to study precipitation lifecycle.

- Investigate if there is any causal relationship between satellite observations with a lag and intense precipitation events.

Data

- Continuous **rain observations from tipping-bucket gauges** in the Smoky Mountain Region
- Brightness Temperature from **Advanced Baseline Imager** onboard GOES-16.
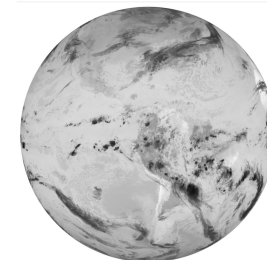
Study region - **Smoky Mountains**

Methods

- Identified **continuous rainfall events** from gauge data - noted the start-time, duration, peak rain
- Each of these events are **matched with ABI Data** - from 6-h before the start time to end time.
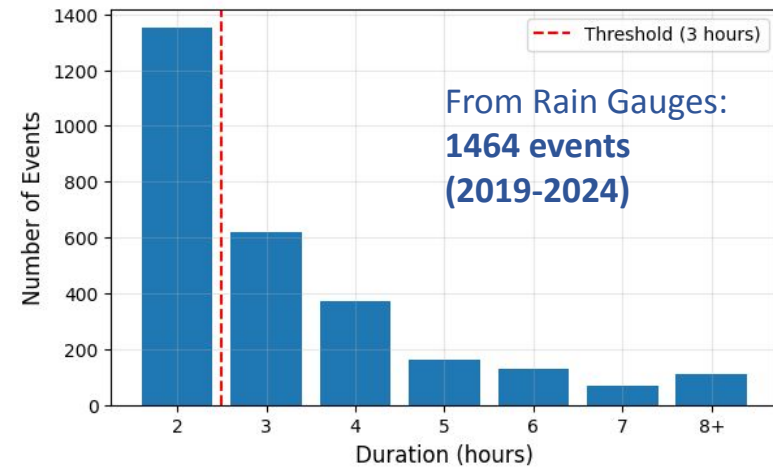
Life Cycle of Precipitation Events over Orographic Regions
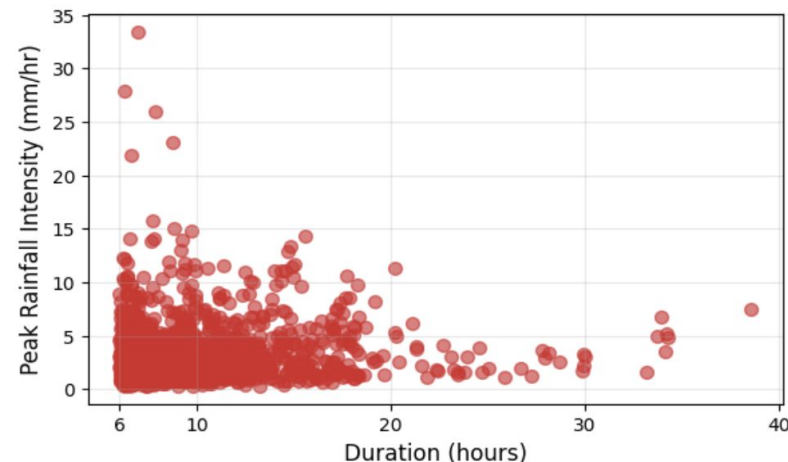## Saisidharth Seyyadri
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CISESS
Cooperative Institute for Satellite Earth System Studies

Continuous Rain Event Identification

From Rain Gauges:
**1464 events
(2019-2024)**
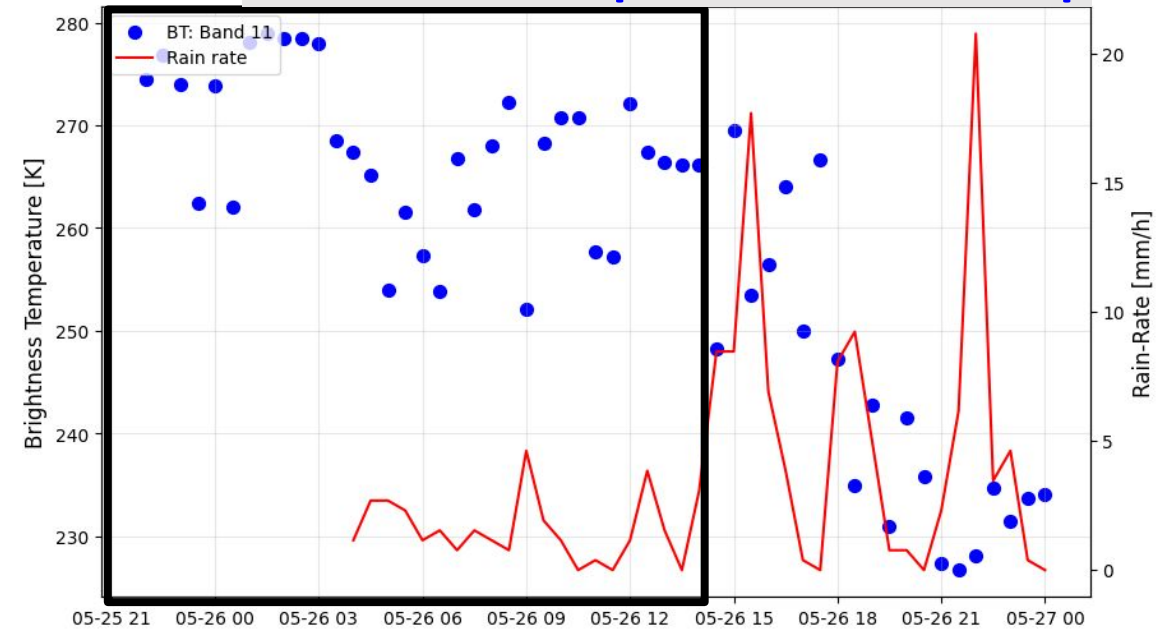
Match Cloud Top Properties from satellite with rain gauge observations

Warm Cloud Top → Cold Cloud Top

Results

- Found artifacts in the rain gauge data for events less than 2 hours [communicated to the developers].
- Identified different types of precipitation events from ABI - **warm/shallow** events, **cold/deep events** and **transition** events

Future Work

- Use non-linear methods to identify relationship between cloud top properties and rain-rates.