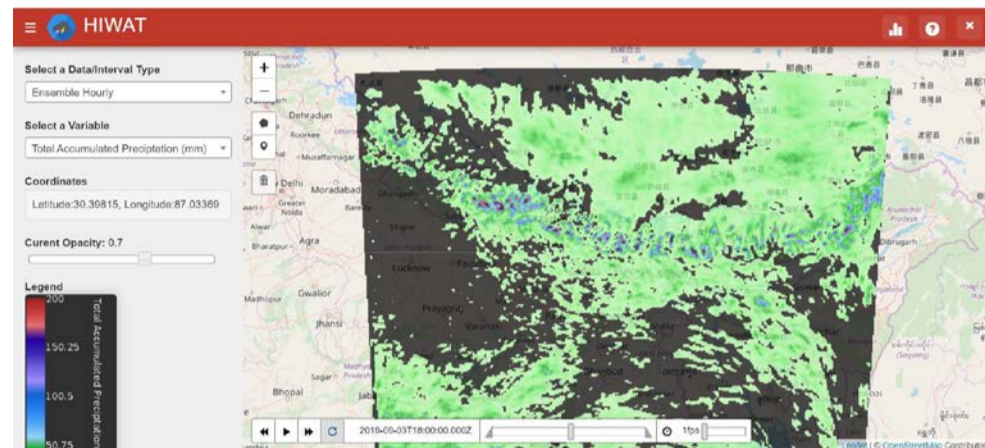


Helen Baldwin<sup>1,2</sup>, Dr. Robert Griffin<sup>1</sup>, Dr. Lee Ellenburg<sup>1,2</sup>  
 (1) UAH Earth System Science, (2) NASA SERVIR



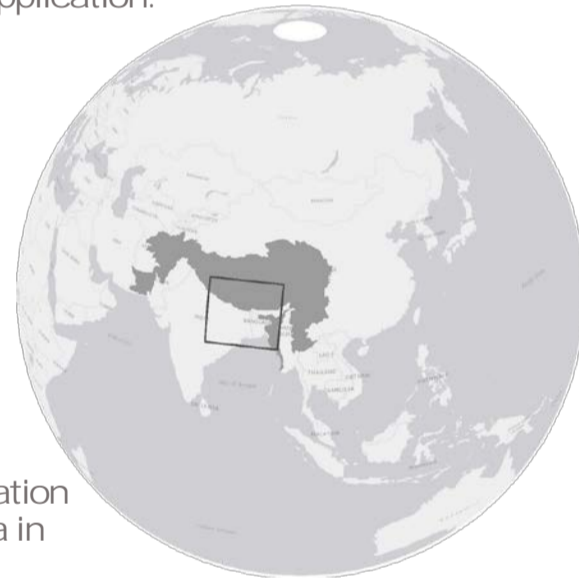
NASA SERVIR's HIWAT Viewer

## Background

NASA SERVIR developed the High Impact Weather Assessment Toolkit (HIWAT) to reduce damage and loss in the data sparse Hindu Kush Himalaya region. Key stakeholders, including the Department of Hydrology and Meteorology in Nepal and the Bangladesh Meteorological Department, can view the probability of extreme weather events such as high rainfall rates, high impact wind, and more through this online application.

## Objectives

- ▶ Compare CHIRP and CHIRPS with station data in Bangladesh to establish a baseline using Pearson's correlation coefficient, RMSE, and a confusion matrix
- ▶ Validate HIWAT precipitation forecast with station data in Bangladesh
- ▶ Compare entire HIWAT extent with CHIRP using a pixel-to-pixel analysis



HIWAT Extent in Hindu Kush Himalaya Region

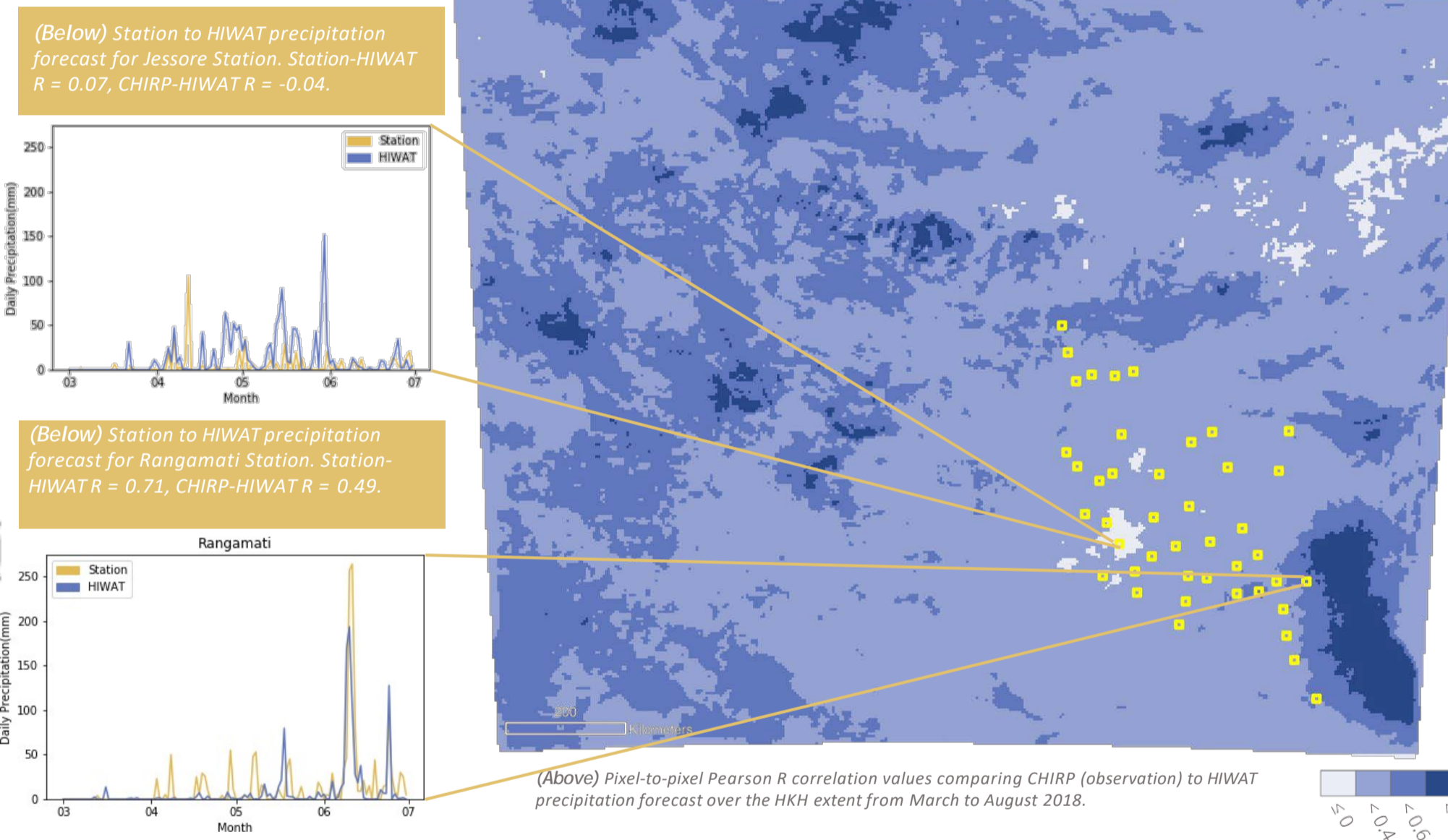
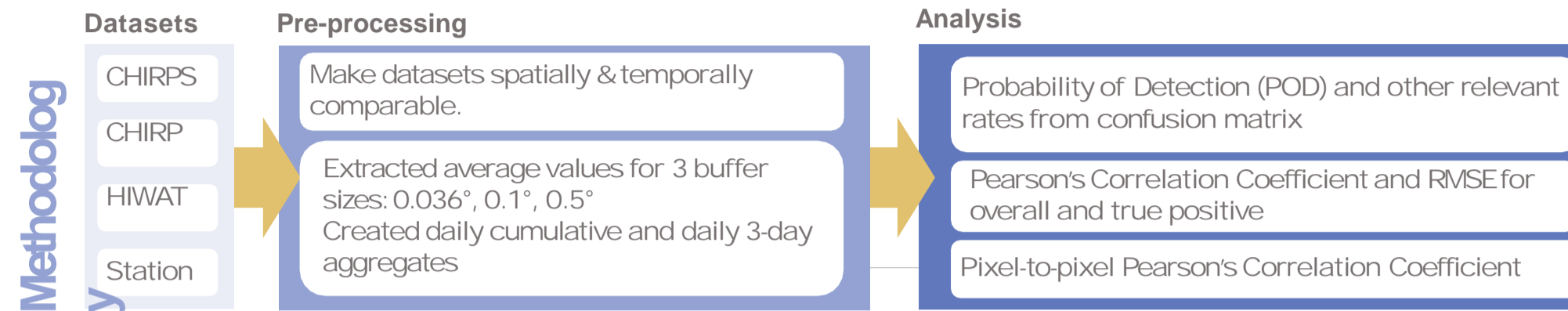
## Datasets Used

Parameter	Resolution	Time Period	Area
HIWAT (PMM*)	Hourly, 0.036°	March - August, 2018	HKH Extent
CHIRPS/CHIRP	Precipitation, Daily, 0.05°		
Station	Daily, N/A	March - June, 2018	Bangladesh

\*Probability Matched Mean, created from 12 ensemble members

## Acknowledgements

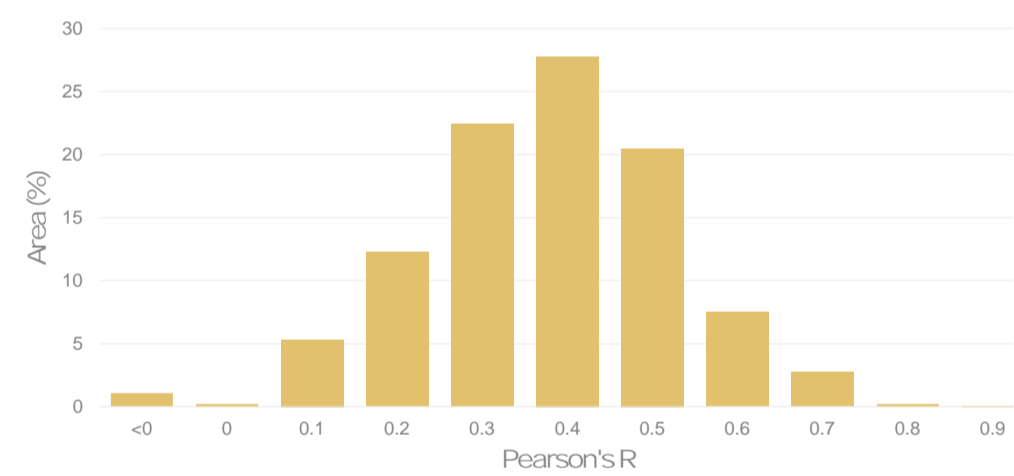
NASA SERVIR Science Coordination Office and Applied Science Team including Patrick Gatlin and Jonathan Case | Bangladesh Meteorological Department  
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**Conclusion: CHIRP, a Climate Hazards Group satellite-based precipitation product, shows SERVIR-HKH's HIWAT precipitation forecast is good for decision-making.**

## Results

- CHIRP, CHIRPS, HIWAT to STATION:**
- ▶ Isolating True Positives did not increase R or RMSE
  - ▶ Increasing precipitation presence threshold above 0.1 mm did not increase R or RMSE
  - ▶ CHIRPS to HIWAT, the POD was 75.1%
- HIWAT to STATION:**
- ▶ Moderate, positive correlation for daily, daily cumulative, and 3-day rolling aggregate
  - ▶ Lowest correlation with station of products → expected since forecast
  - ▶ 0.5° buffer consistently performed best (R and RMSE)
  - ▶ for station to HIWAT, the POD was 93.8%
- CHIRP/CHIRPS to STATION:**
- ▶ Moderate to high positive correlation, highest for daily cumulative precipitation
  - ▶ Buffer size same result except daily comparison, where CHIRPS 0.5° and CHIRP 0.036°
- Pixel-to-Pixel HIWAT to CHIRP:**
- ▶ 31% of the HIWAT Extent had R of 0.5 or higher



## Conclusions/Discussion

- IDENTIFICATION of PRECIPITATION:**
- ▶ Relatively high for all comparisons
    - can use CHIRP in place of station data to assess HIWAT forecasts of precipitation
    - Lowest for HIWAT to Station (anticipated, since HIWAT is forecasted)
- INTENSITY of PRECIPITATION:**
- ▶ Moderate to high positive correlations for all comparisons
  - ▶ Reject null hypothesis for all comparison

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