Global Flood Analysis Using IMERG—2017 Hurricane Case Examples

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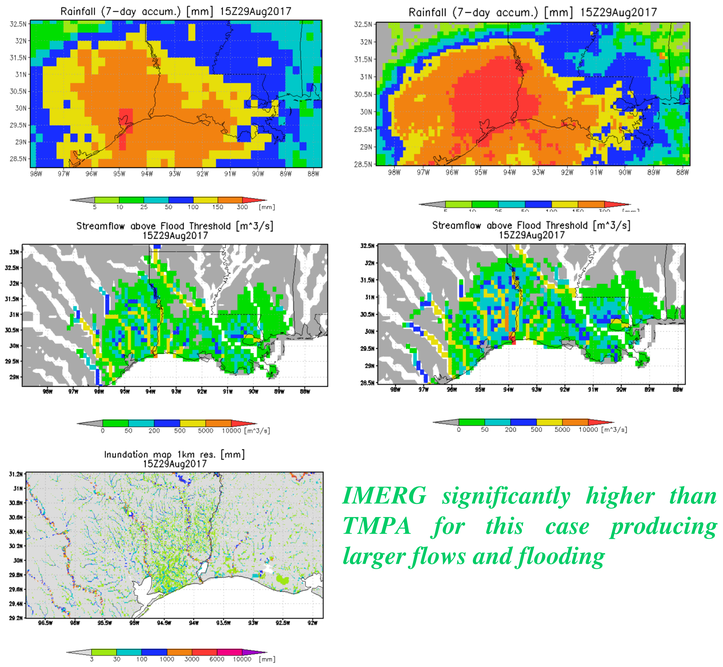
Objective

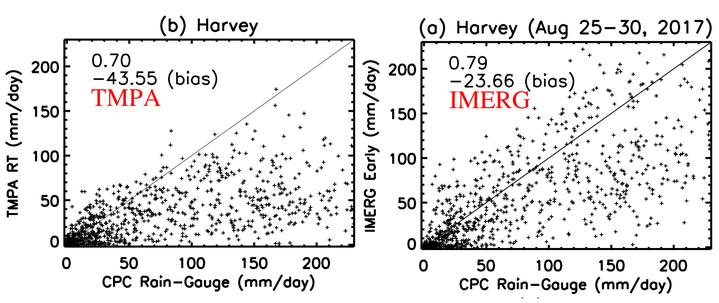
- *Evaluate IMERG in comparison with TMPA in relation to flood results from Global Flood Monitoring System (GFMS) using the three 2017 hurricane cases (Harvey, Irma, Maria) hitting the U.S.*

Hurricane Harvey (Texas)

TMPA IMERG



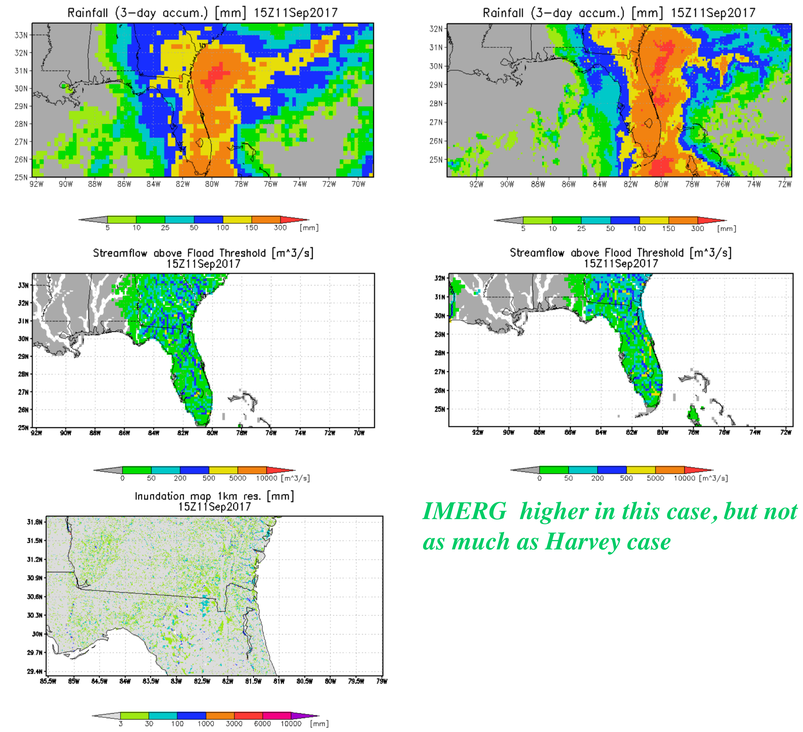
IMERG significantly higher than TMPA for this case producing larger flows and flooding



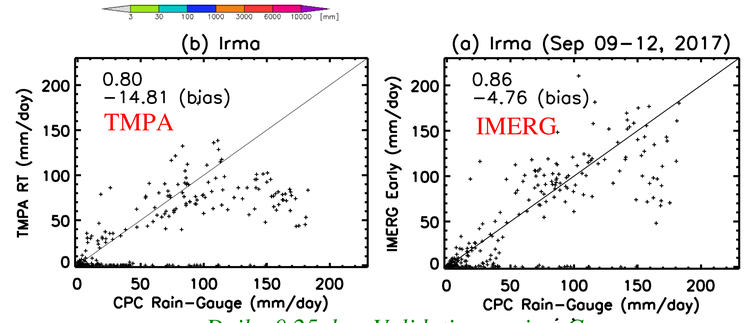
Daily, 0.25 deg. Validation against Gauges

Hurricane Irma (Florida)

TMPA IMERG



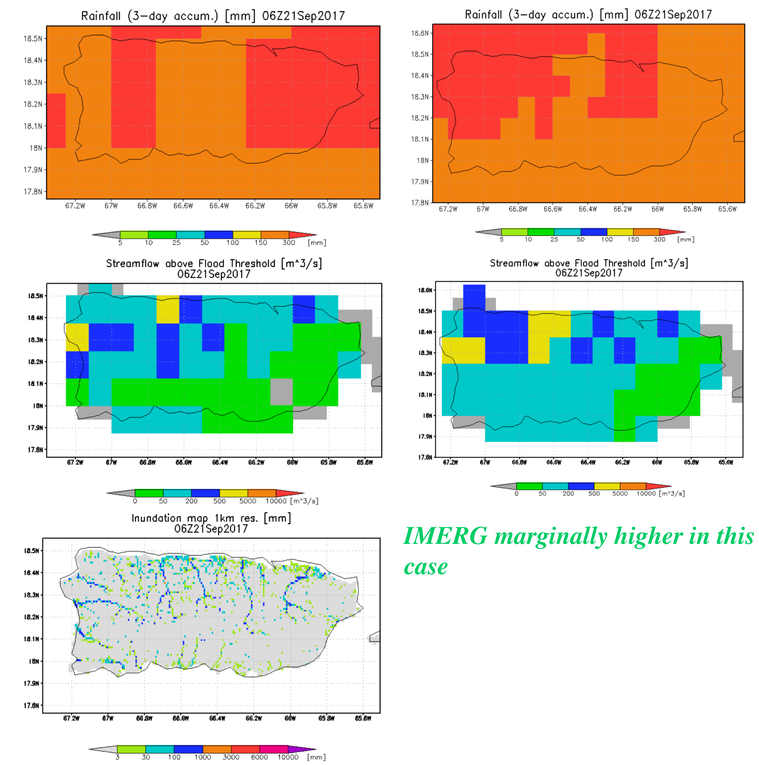
IMERG higher in this case, but not as much as Harvey case



Daily, 0.25 deg. Validation against Gauges

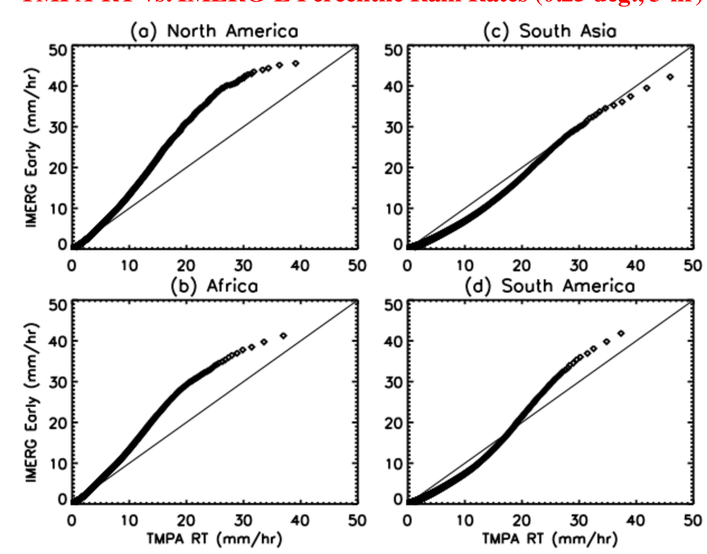
Hurricane Maria (Puerto Rico)

TMPA IMERG



IMERG marginally higher in this case

TMPA-RT vs. IMERG-E Percentile Rain Rates (0.25 deg., 3-hr)



Percentile match-ups differ between regions, with IMERG larger at high end (at 95th or 99th percentile).

Summary

- **IMERG is typically higher than TMPA, but difference highly variable.**
- **IMERG provided better flood results for Harvey, but still did not approach actual event at Houston.**
- **Smaller biases for Irma and good flood results.**
- **For Maria in PR flood results similar, but rain information.**
- **Percentile IMERG/TMPA comparisons indicate differences in different regions; provide basis to adjust IMERG to TMPA to match derived long-term flood thresholds**