Characterizing GPROF Regional Bias Using Radar-Derived Hydrometeor Information

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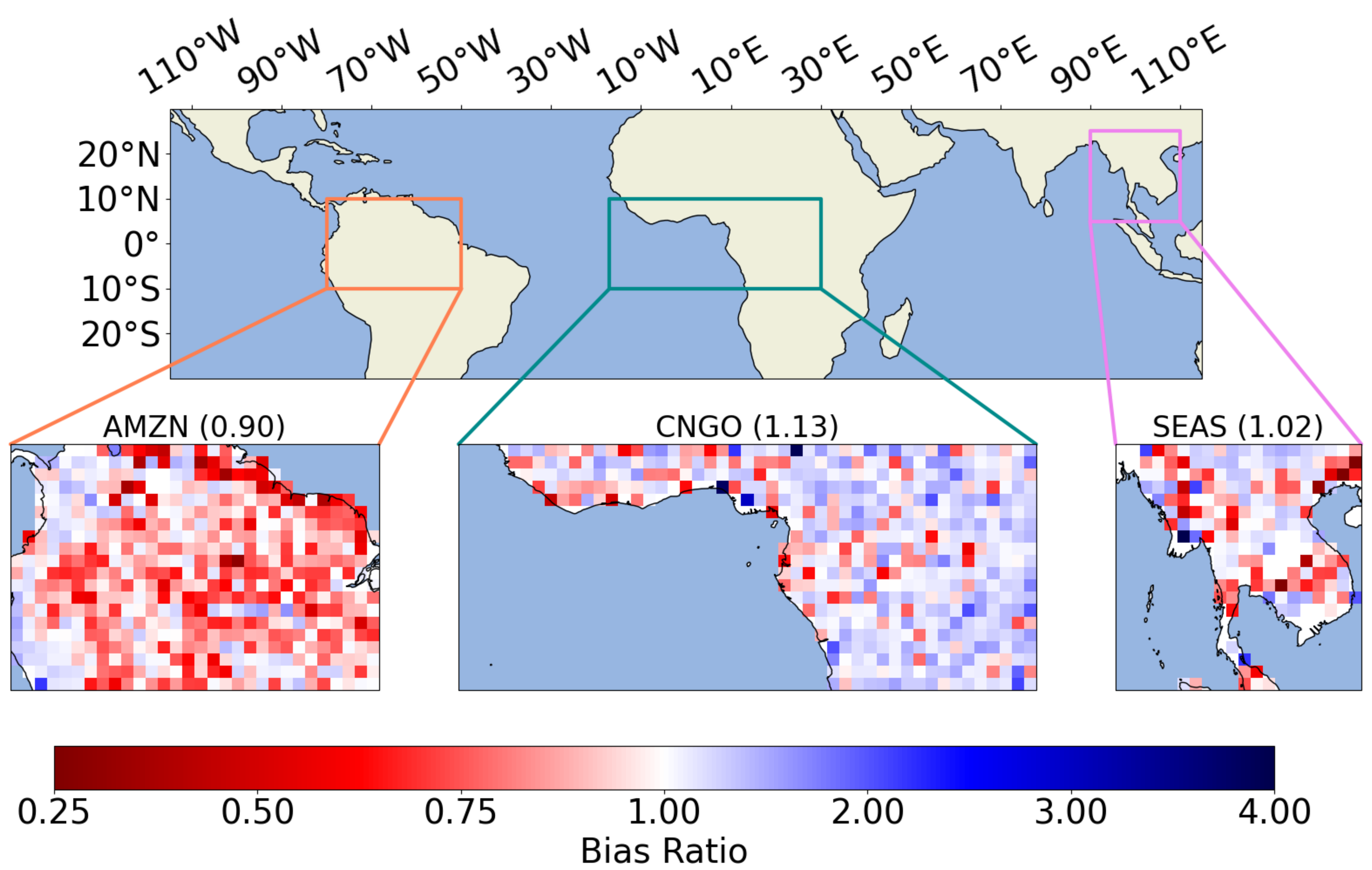
Satellite precipitation exhibits global and region-dependent uncertainties



Regions which should have similar precipitation characteristics see different GPROF uncertainties

Experiment

1. **Identify regional bias characteristics in three tropical regions of interest.**
2. **Identify ancillary information which can describe GPROF biases.**
3. **Determine the impacts of this information on regional biases.**

Datasets

GPROF V7 retrieval against its own database

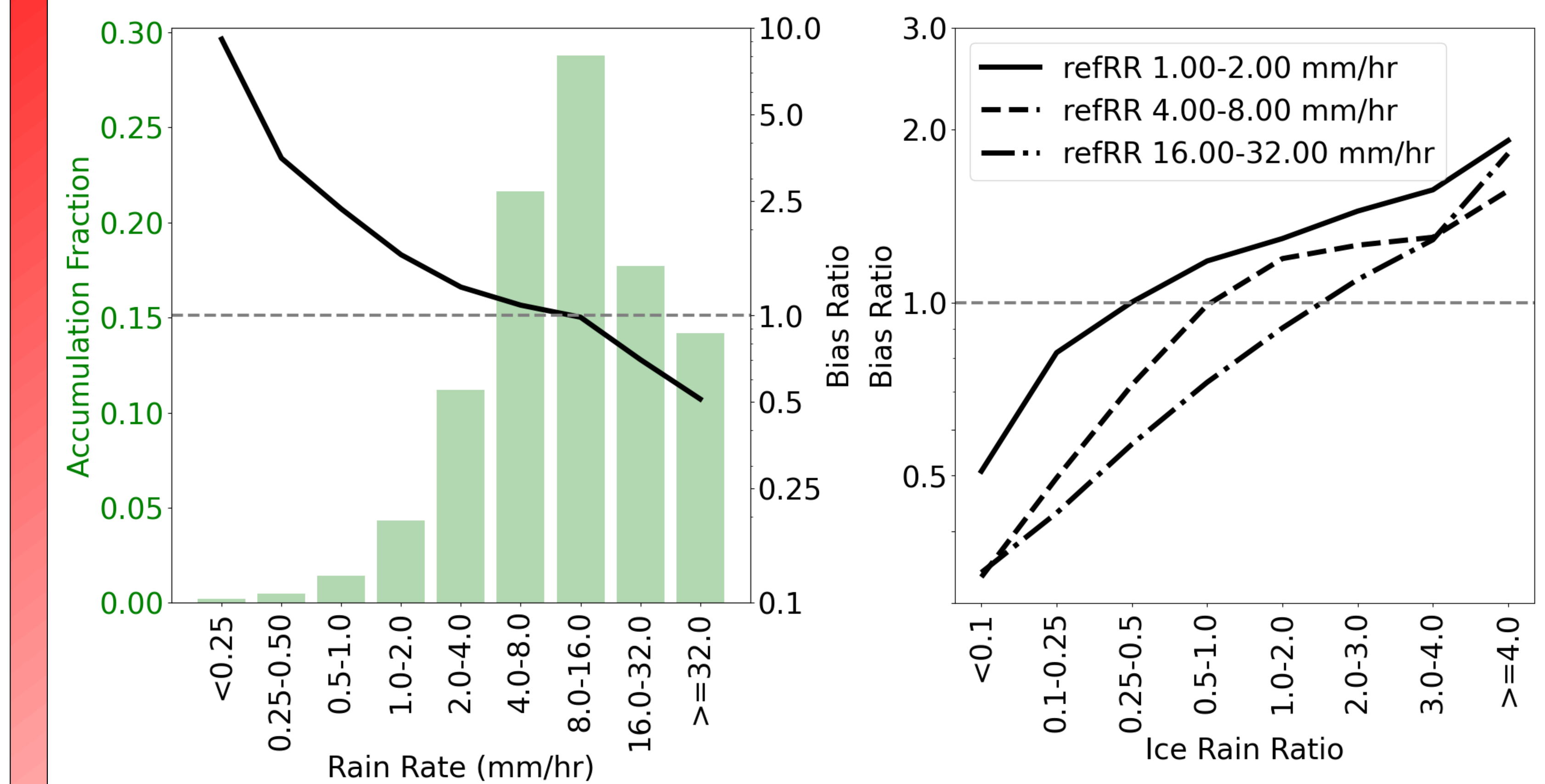
- Only for the three highlighted regions and data with GPROF surface class 3 (max vegetation) or 17 (mountain rain)

GPM Combined rain and ice water profiles

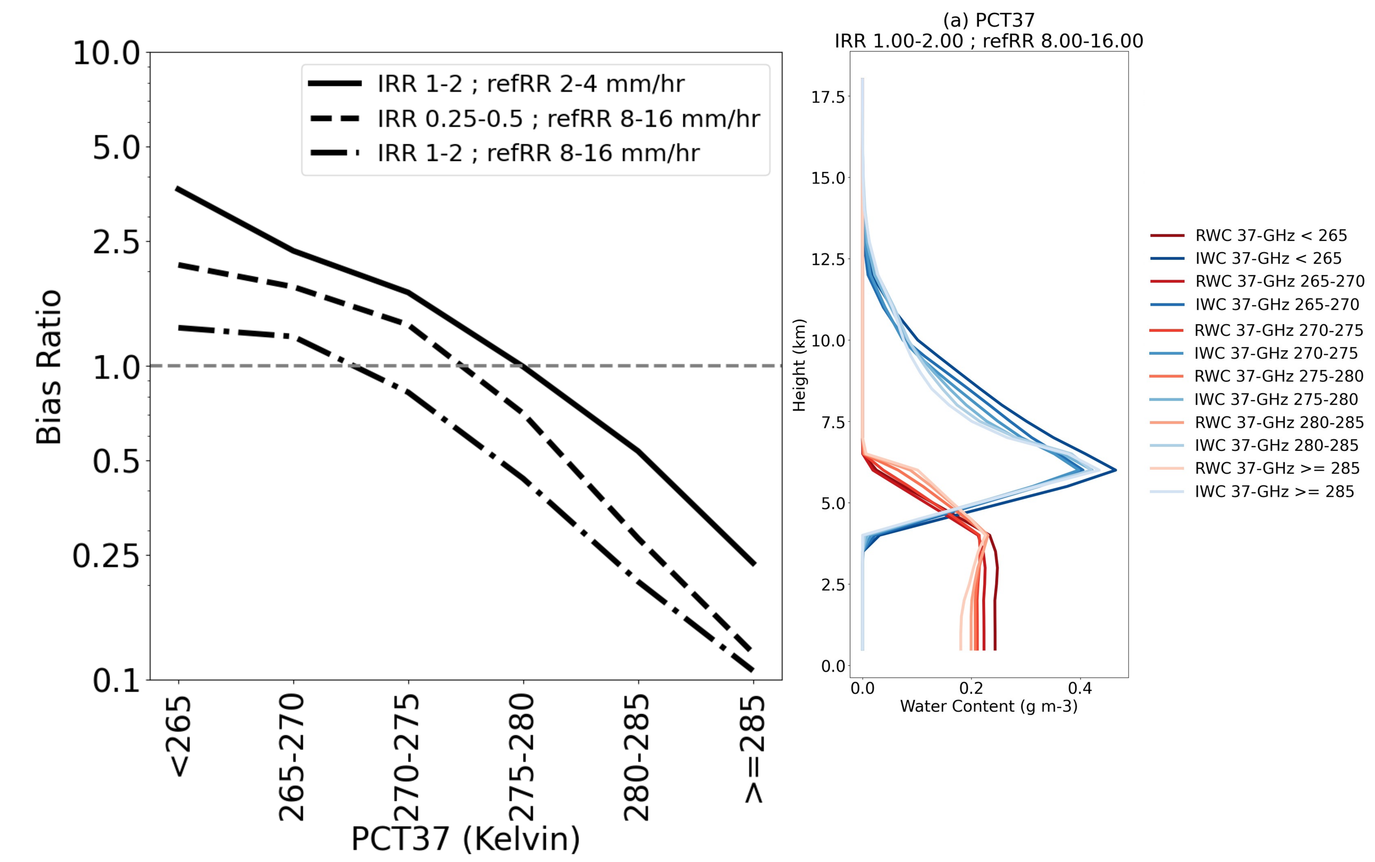
- Taken from the V7 retrieval database and adjusted for scan geometry mismatch and bright banding

GMI brightness temperatures

Rain Rate (refRR), Ice-Rain Ratio (IRR) and 37-GHz TBs (PCT37) can describe biases



GPROF over(under)estimates at light(heavy) refRR due to its averaging tendency and at high(low) IRR due to its reliance on ice scattering properties



PCT37 adds context to the refRR and IRR biases by accounting for more subtle differences in the underlying hydrometeor structure

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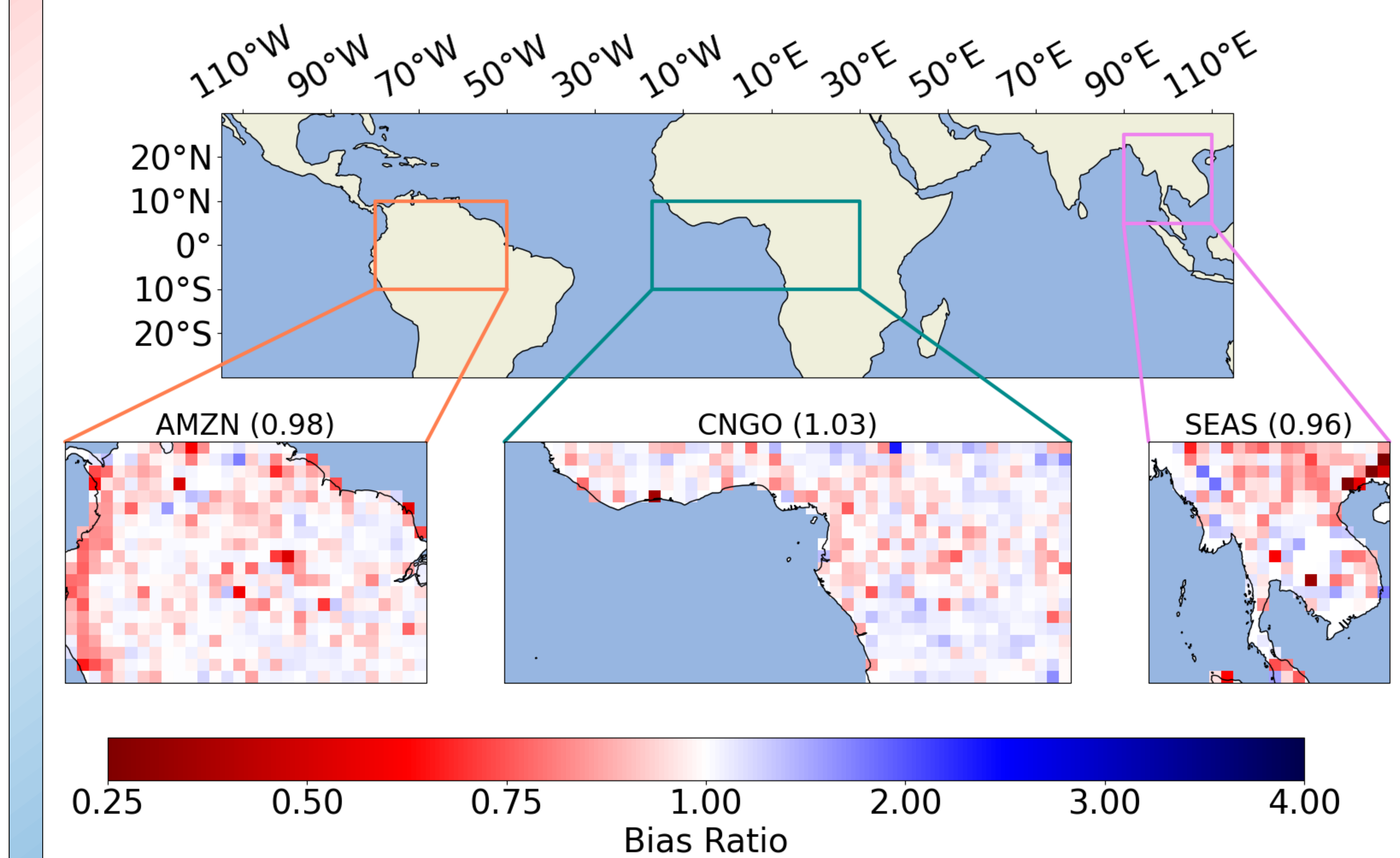
Accounting for these sources greatly increases GPROF regional bias similarity



Removing the bias contributions of refRR, IRR, and PCT37 results in regional biases which are overall more comparable and representative of random error

Future Work

1. Identify large-scale atmospheric drivers of these variables
2. Expand to other regions/precipitation regimes
3. Test with other truth datasets (i.e., MRMS)

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