Deconstruction of a science paper's data-evidence basis

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My Paper

- Title, Citation
  - Flood Extent Analysis Over the Major River Basins in the Indian Subcontinent Using Satellite Microwave Radiometric Data
  - Antony, T., Suresh Raju, C., Mathew, N., & Krishna Moorthy, K.
- Size of evidence set:
  - 8 Figures, 0 tables, 0 magic-number (in-text) results

Figure 1

- This figure provides **background Info**
  - Shows **relationship** between incidence angle and emissivity in the 19 GHz range for varying types of wet and dry soil
  - This is meant to demonstrate how different types of soil can be mistaken for another

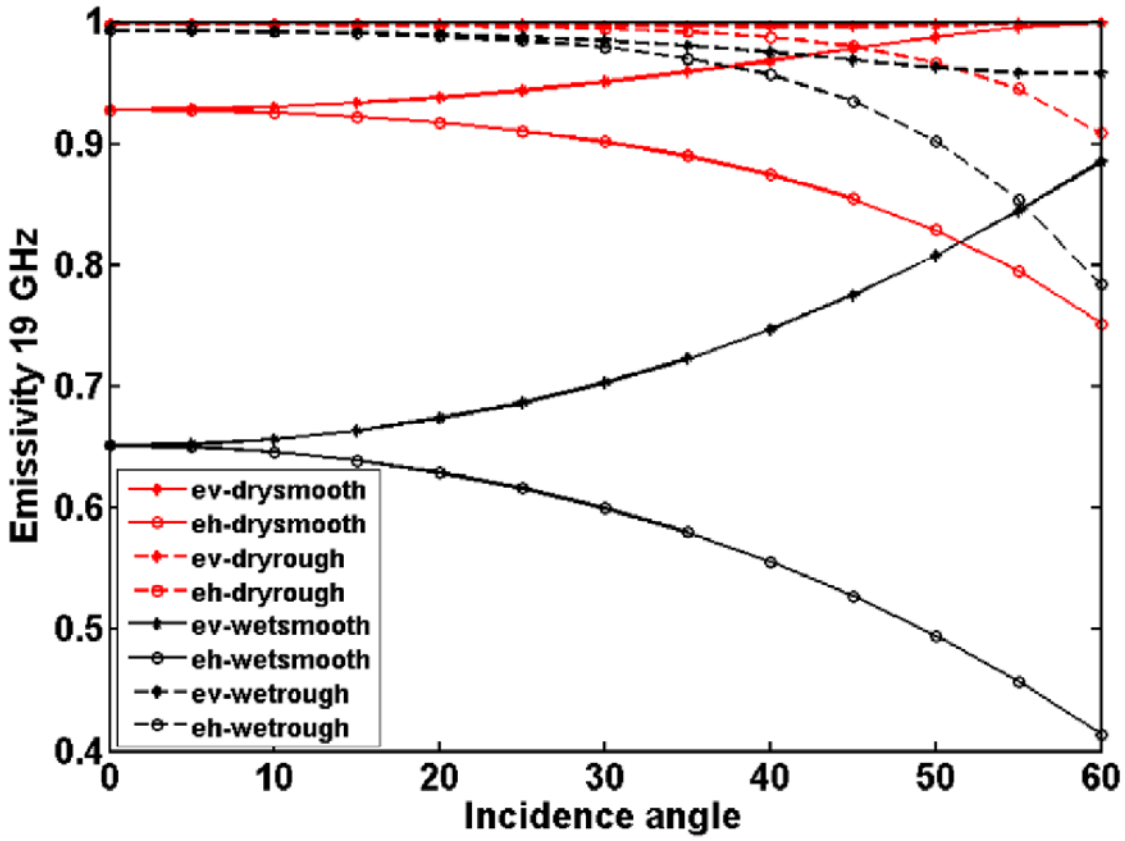


Figure 2

- These figures provide display of “raw” data
  - The raw data is given as measurements of T_B, or brightness temperature, and the emissivity values are retrieved from those values. The figures show emissivity values for different months.

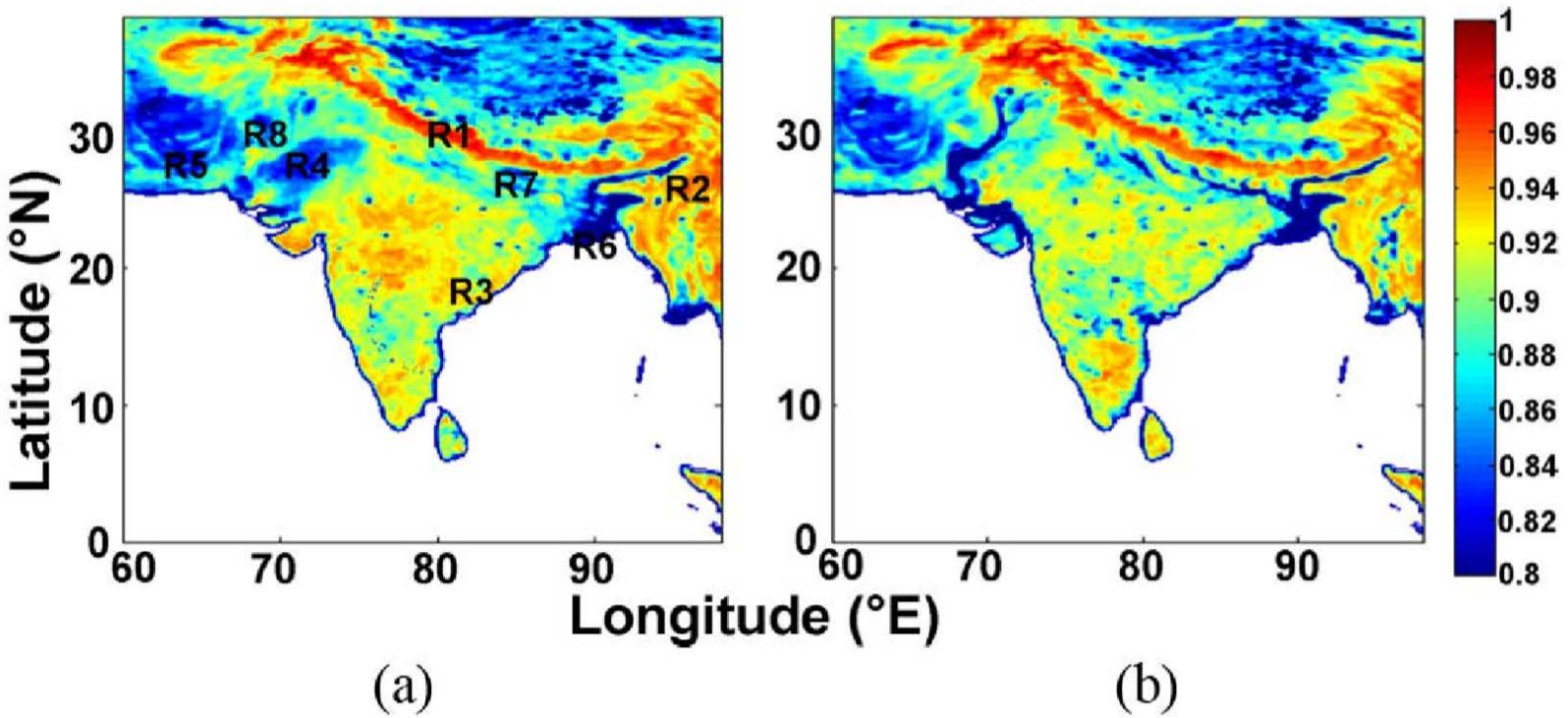


Figure 3

- This figure provides a summary of raw data and claims relationships
  - Summary of rainfall data and river height data taken from satellites and Emissive Polarization Index calculations taken from the study
  - Shows claim of causality: Rainfall causes increased river height and increases EPI

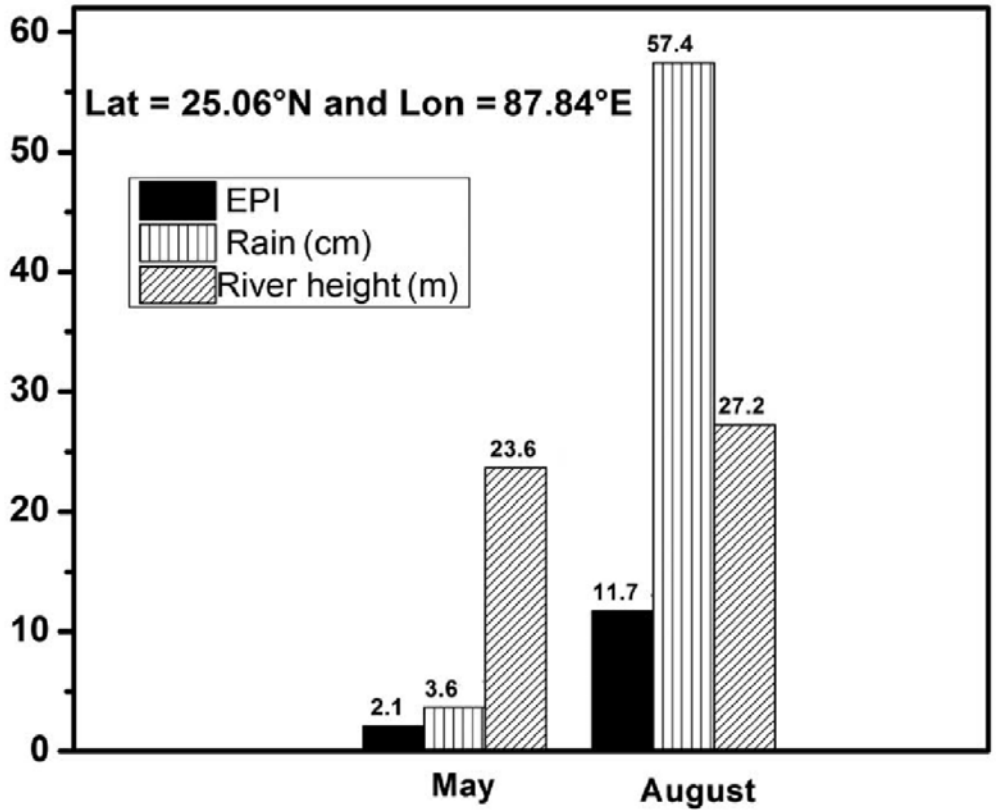


Figure 4

- This figure displays background information
  - Compares individual pixels of images from two different methods of measurement. Shows why an EPI threshold of 7 was chosen for their method of measurement: highest number of pixels agree and least number disagree

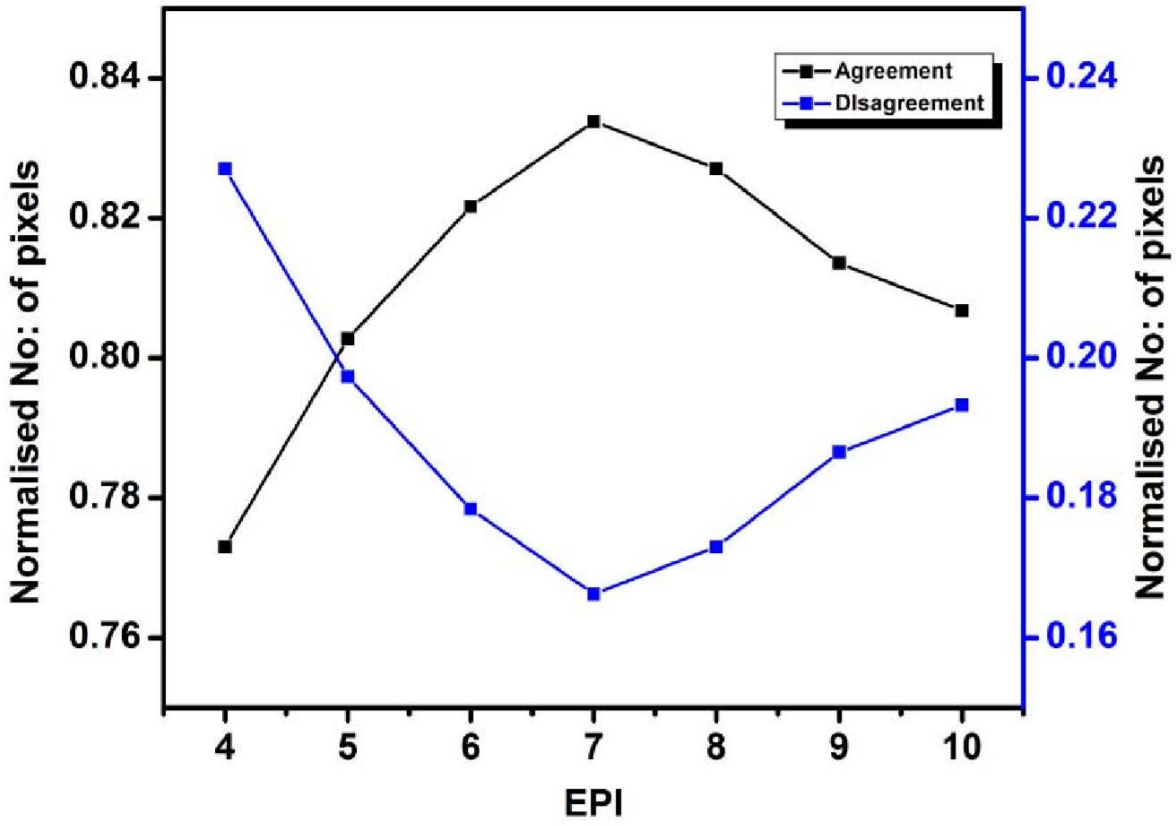


Figure 5

- This figure displays “raw” data and claims a relationship
  - Data is not actually raw. It is EPI values calculated from emissivity values, which are calculated from brightness temperature data. Inset shows relationship with pixels from MODIS image.

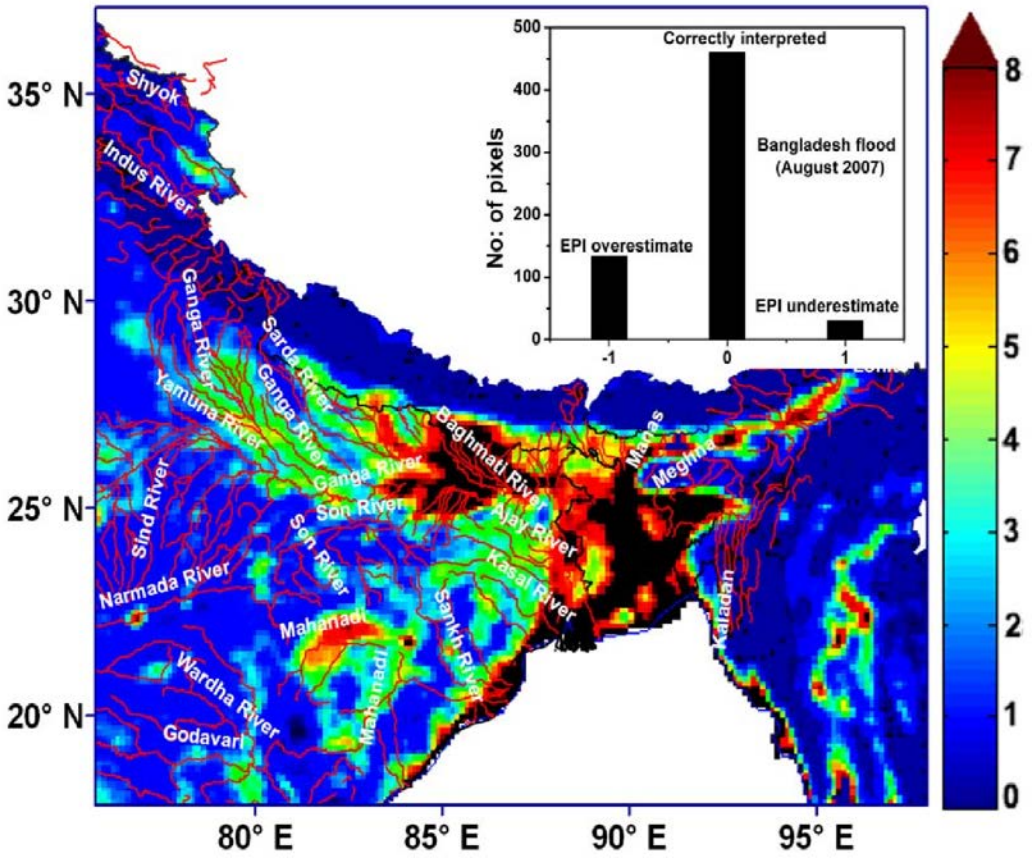


Figure 6

- This figure displays “raw” data
  - Similar to figure 5 but for different year

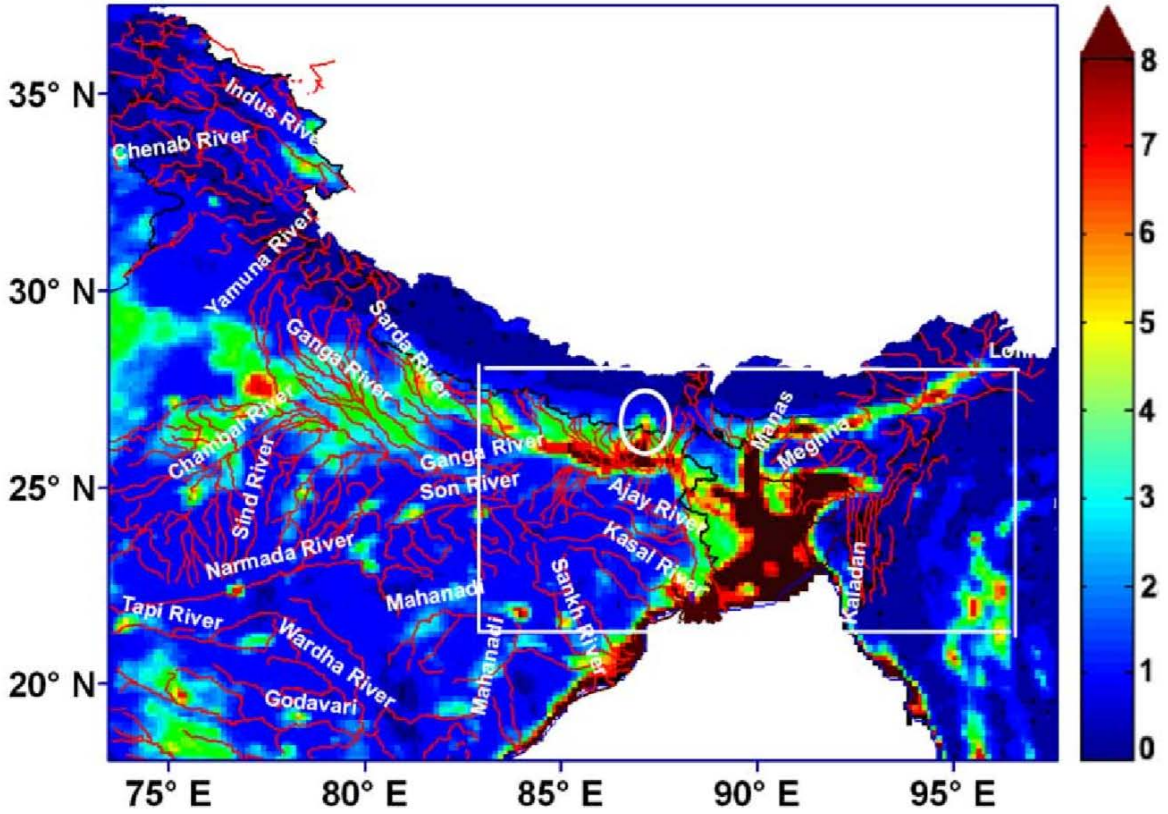


Figure 7

- This figure displays background information
  - Shows inter-annual variation of flooding

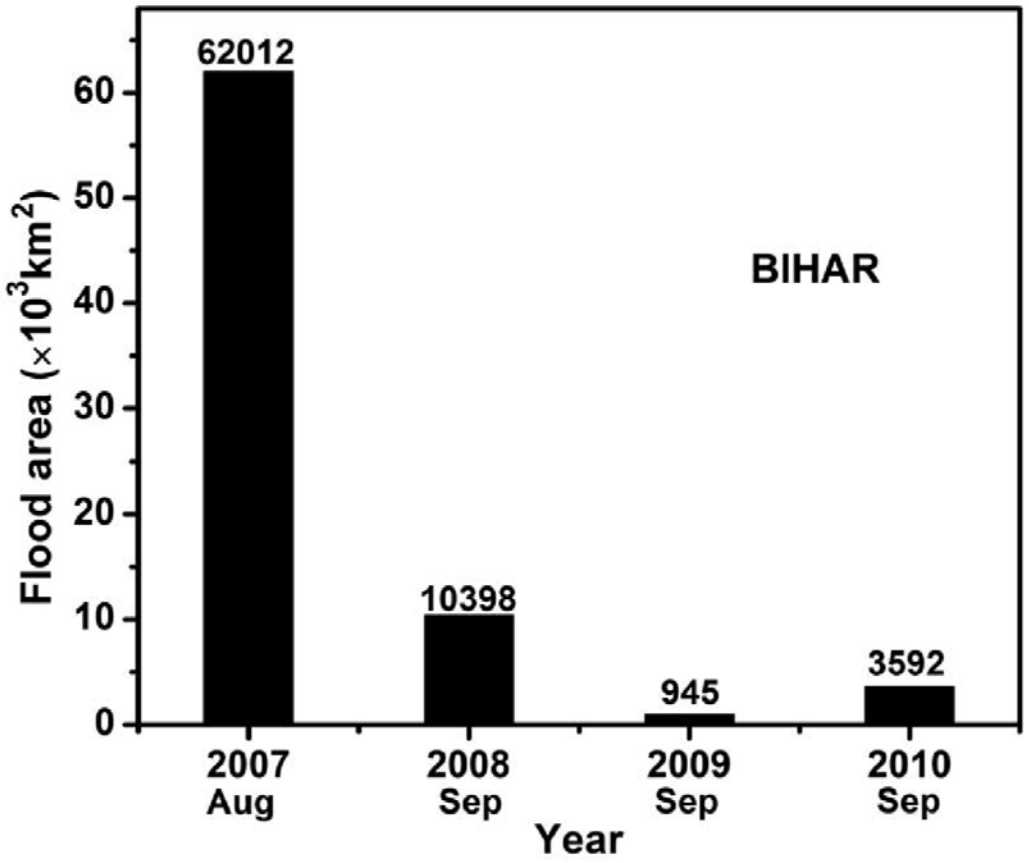
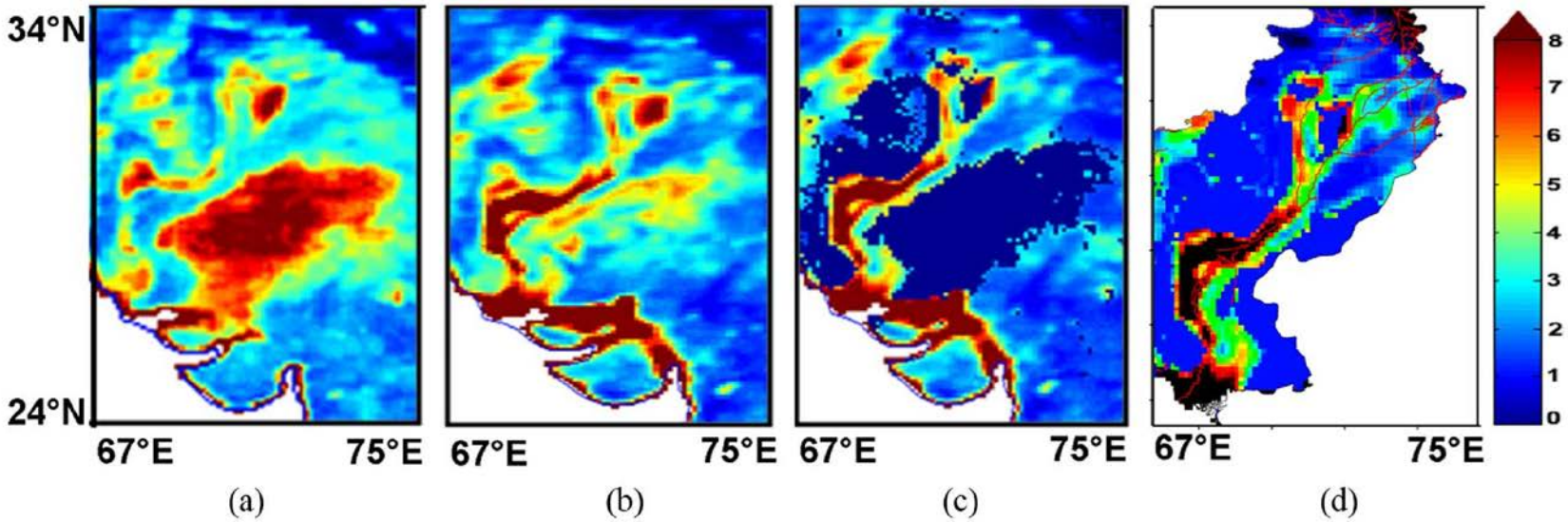
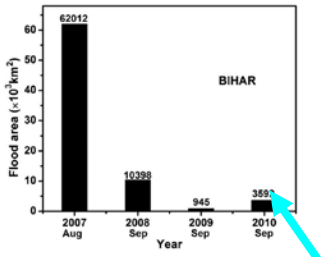


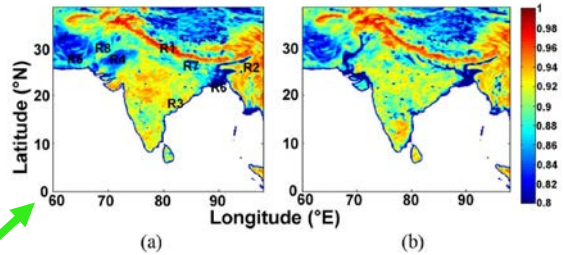
Figure 8

- This figure displays “raw” data
  - Similar to figures 5 & 6 but in a different area for different months



The Abstract: How figures support its claims





Every year South Asia suffers from widespread floods along its major river basins, especially during the southwest monsoon season calling for planning, mitigation, and hazard management strategies. This study demonstrates **the application of land surface microwave emissivity data** in identifying and quantifying flooded areas. It employs an indigenously developed scheme based on microwave radiative transfer to **retrieve emissivities at 19 GHz from satellite microwave radiometers and to estimate emissivity polarization index (EPI) from it**. By assigning **thresholds to the EPI** for delineating inundated areas, this study examines the inter-annual variability of floods over the Indo Gangetic plains for the period 2007–2010 and the cataclysmic flood of 2010 in Pakistan.