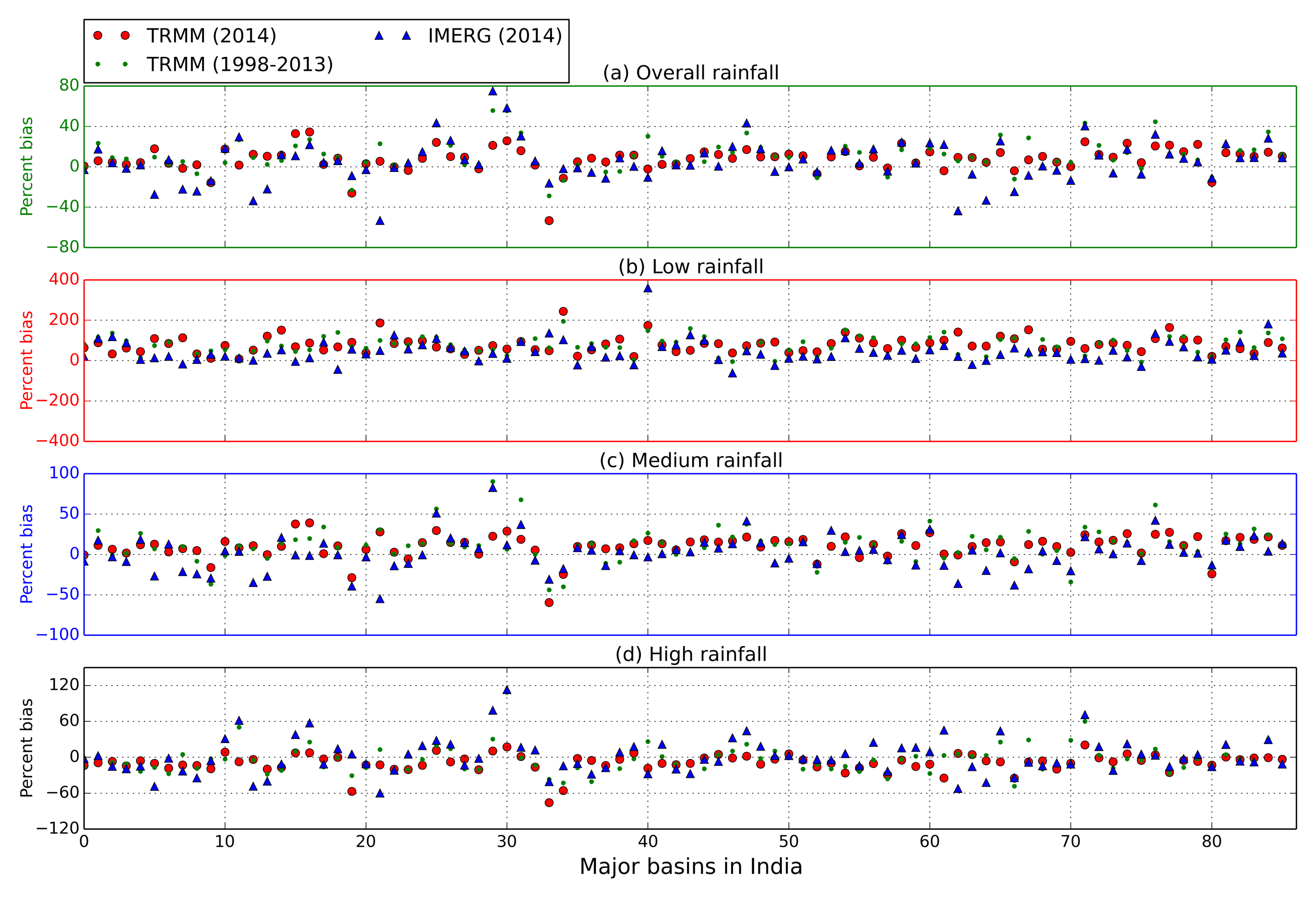
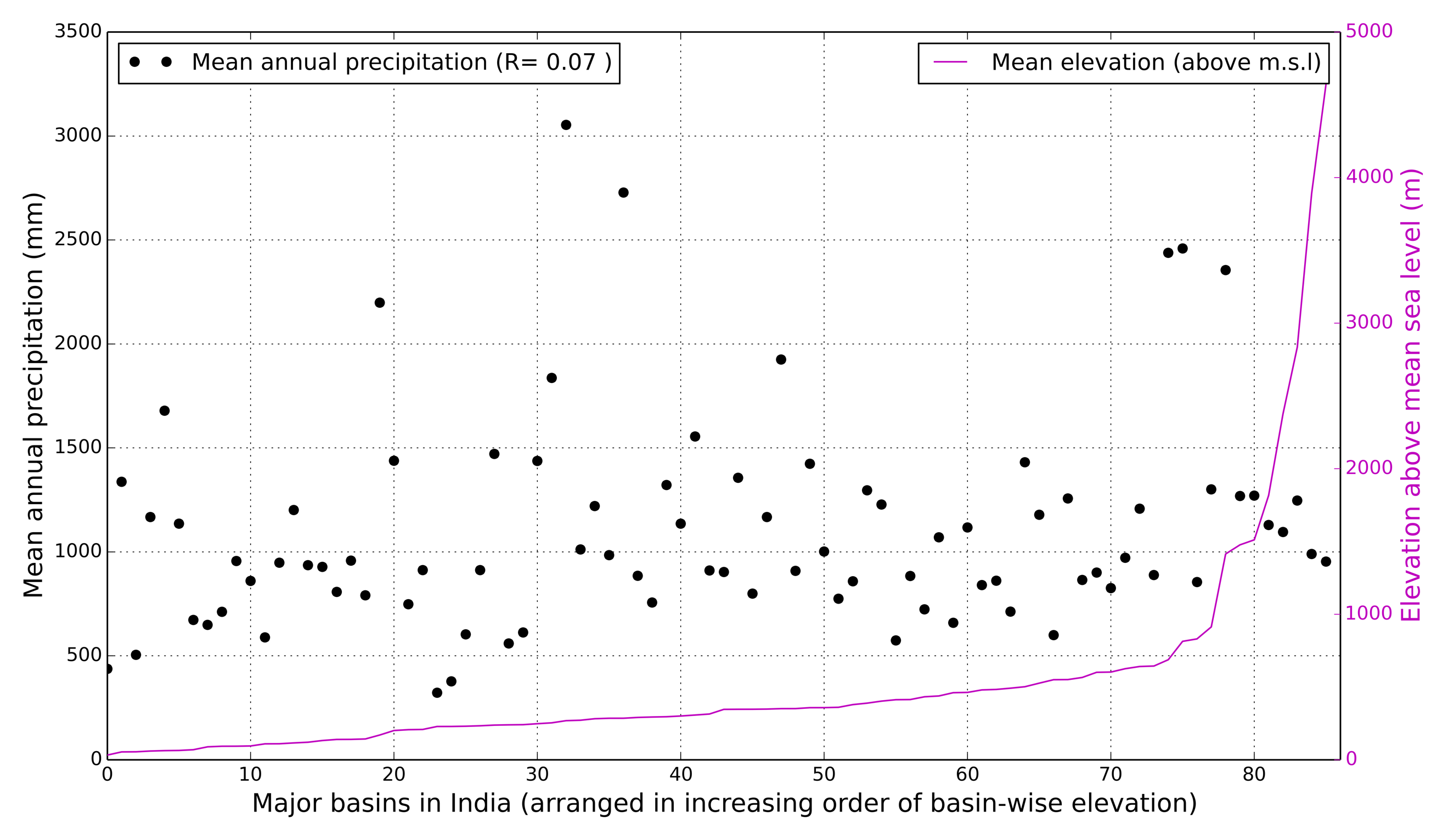
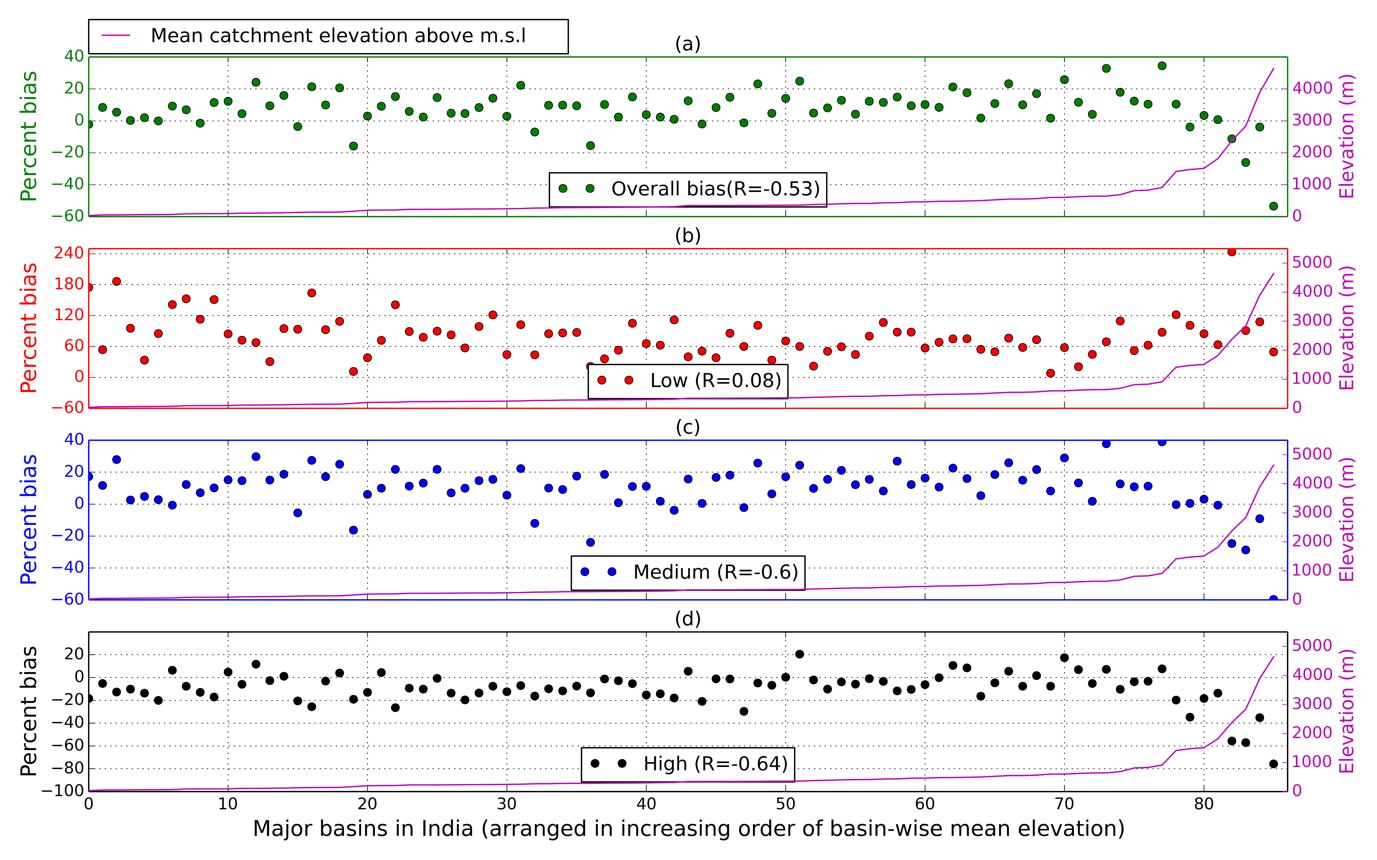


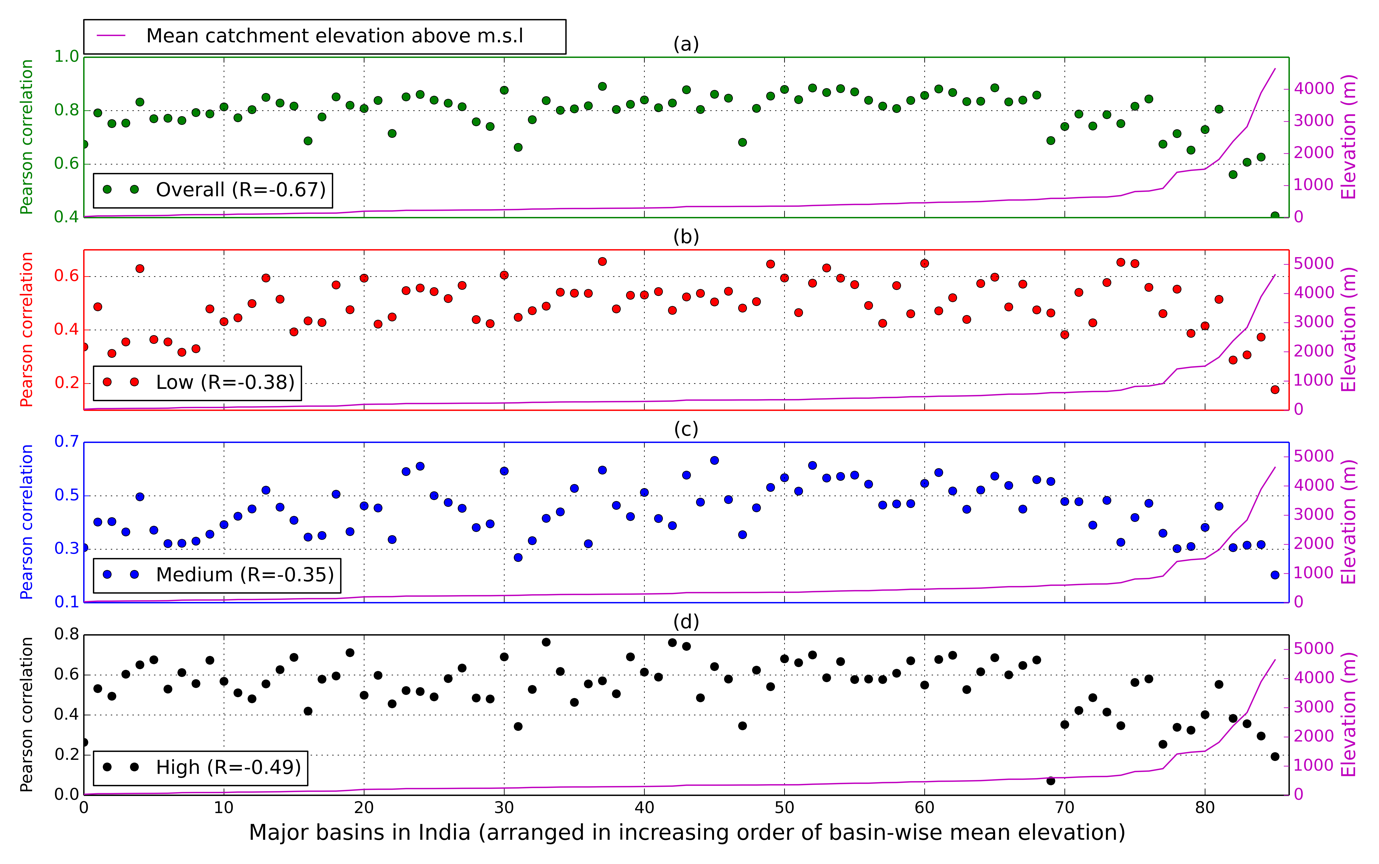
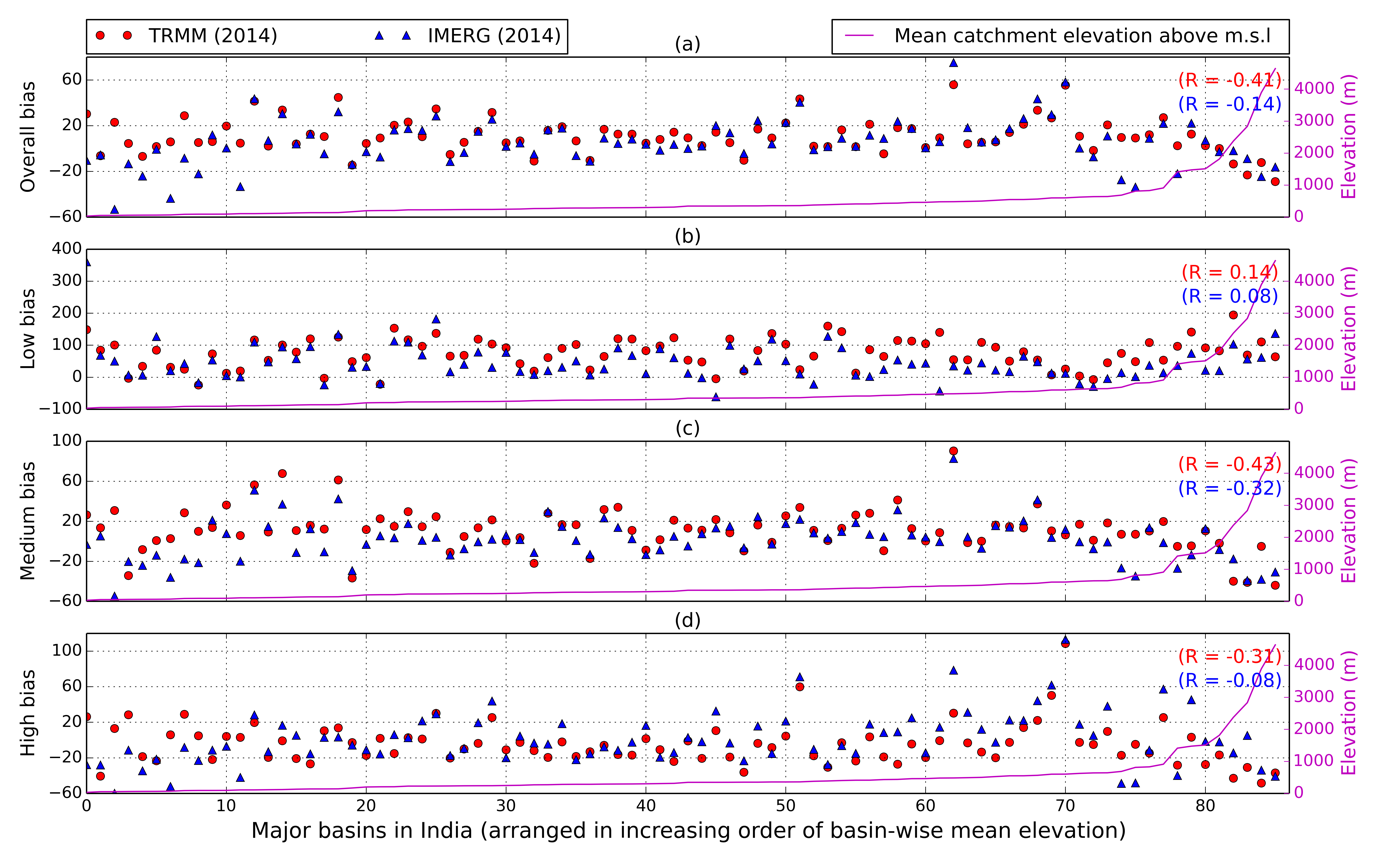
**Figure S1.** Correlation of TRMM (1998-2013), TRMM (2014) and IMERG (2014) over 86 major basins in India for **(a)** overall time series and over **(b)** low, **(c)** medium and **(d)** high rainfall regime.

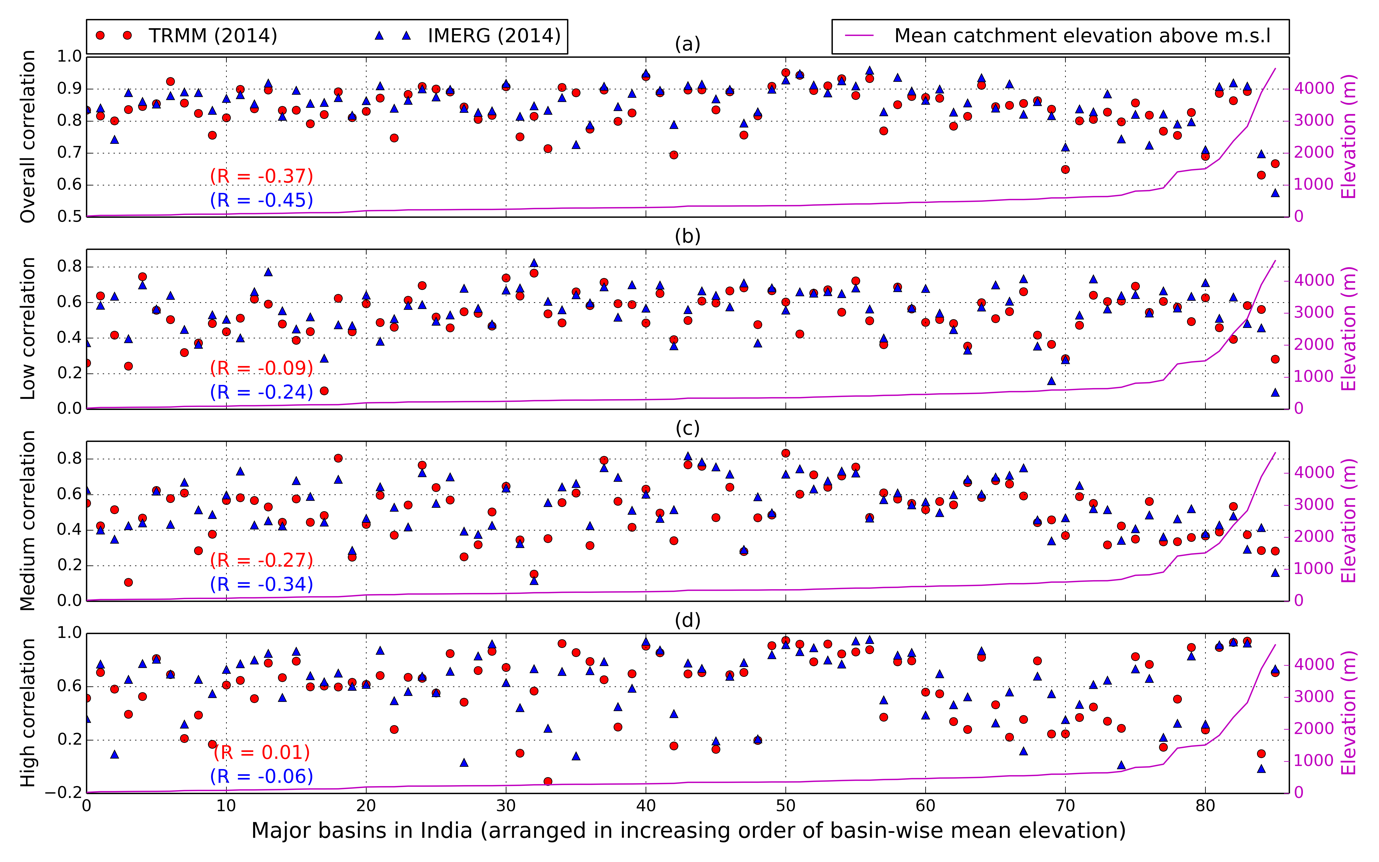
**Figure S2.** Percentage bias of TRMM (1998-2013), TRMM (2014) and IMERG (2014) over 86 major basins in India for **(a)** overall time series and over **(b)** low, **(c)** medium and **(d)** high rainfall regime.

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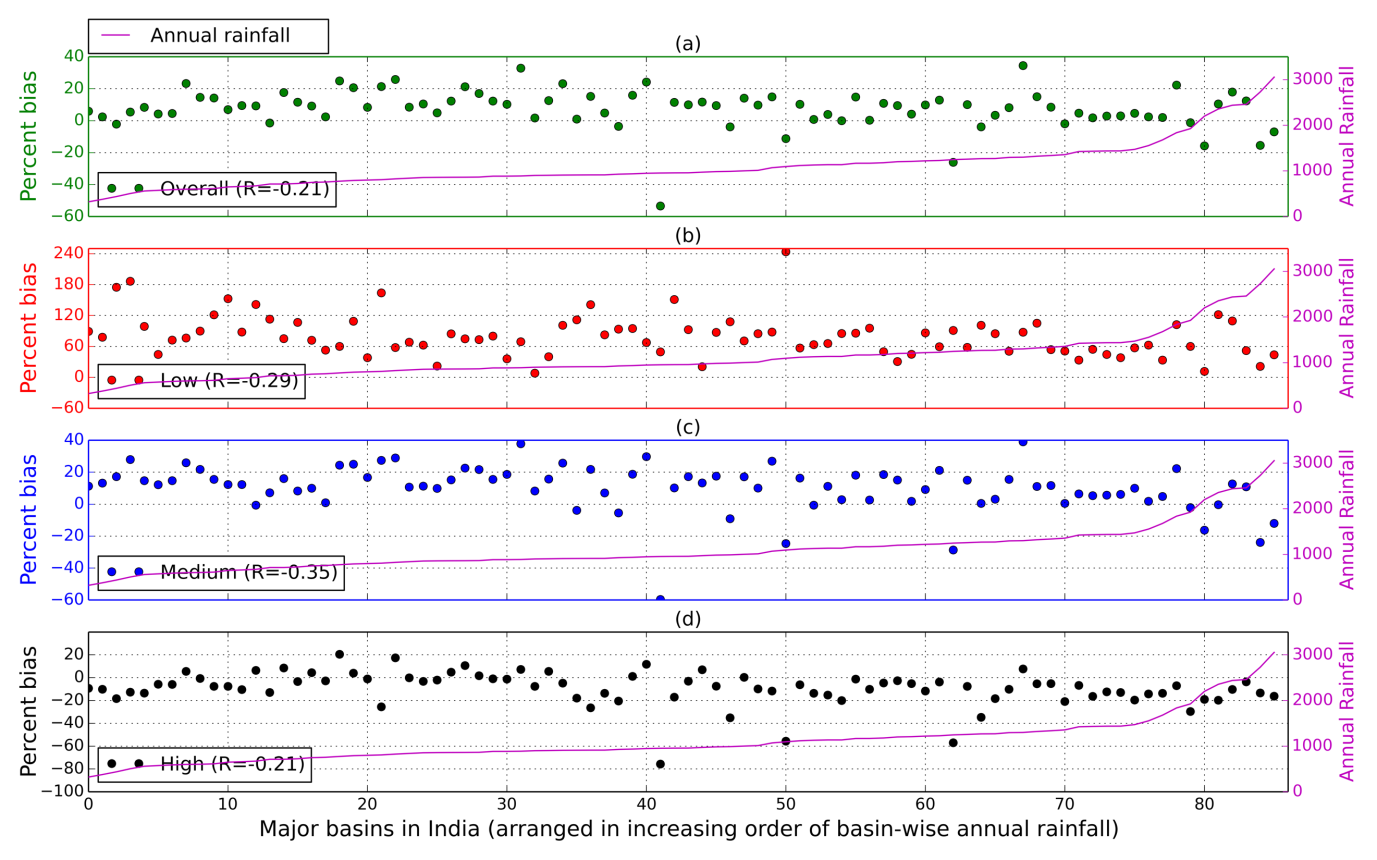
**Figure S3.** Graphical representation of long term average annual rainfall (calculated from IMD gridded rainfall dataset from years 1980-2010) and average elevation above mean sea level for 86 major basins in India (arranged in increasing order of their mean elevation).

**Figure S4.** Graphical representation of percentage bias of TRMM (1998-2013) arranged in the increasing order of basin-wise average elevation over mean sea level for **(a)** overall time series and over **(b)** low, **(c)** medium and **(d)** high rainfall regime for 86 major basins in India.

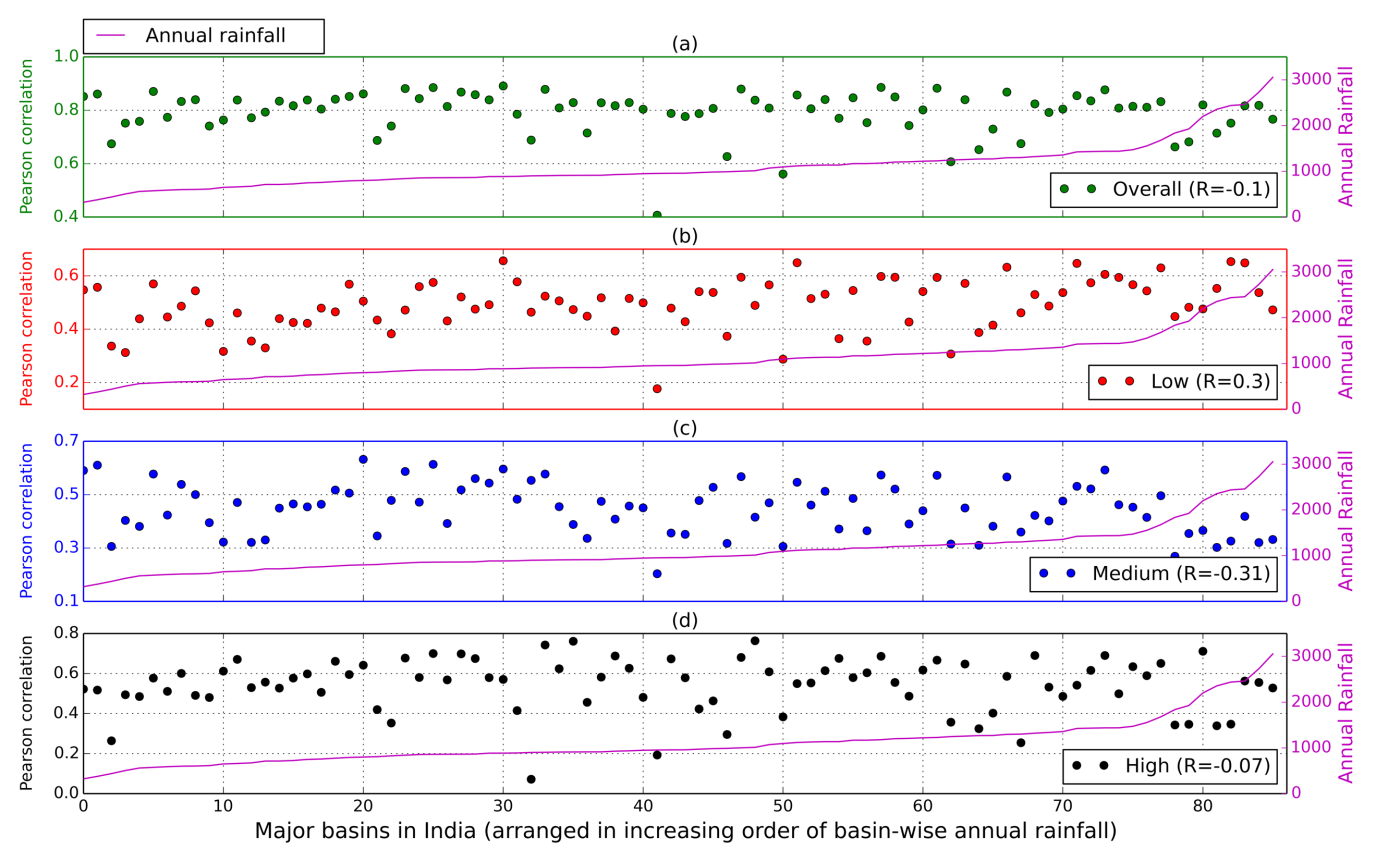
**Figure S5.** Graphical representation of correlation of TRMM (1998-2013) arranged in the increasing order of basin-wise average elevation over mean sea level for **(a)** overall time series and over **(b)** low, **(c)** medium and **(d)** high rainfall regime for 86 major basins in India.**Figure S6.** Graphical representation of percentage bias of IMERG (2014) and TRMM (2014) arranged in the increasing order of basin-wise average elevation over mean sea level for **(a)** overall time series and over **(b)** low, **(c)** medium and **(d)** high rainfall regime for 86 major basins in India.



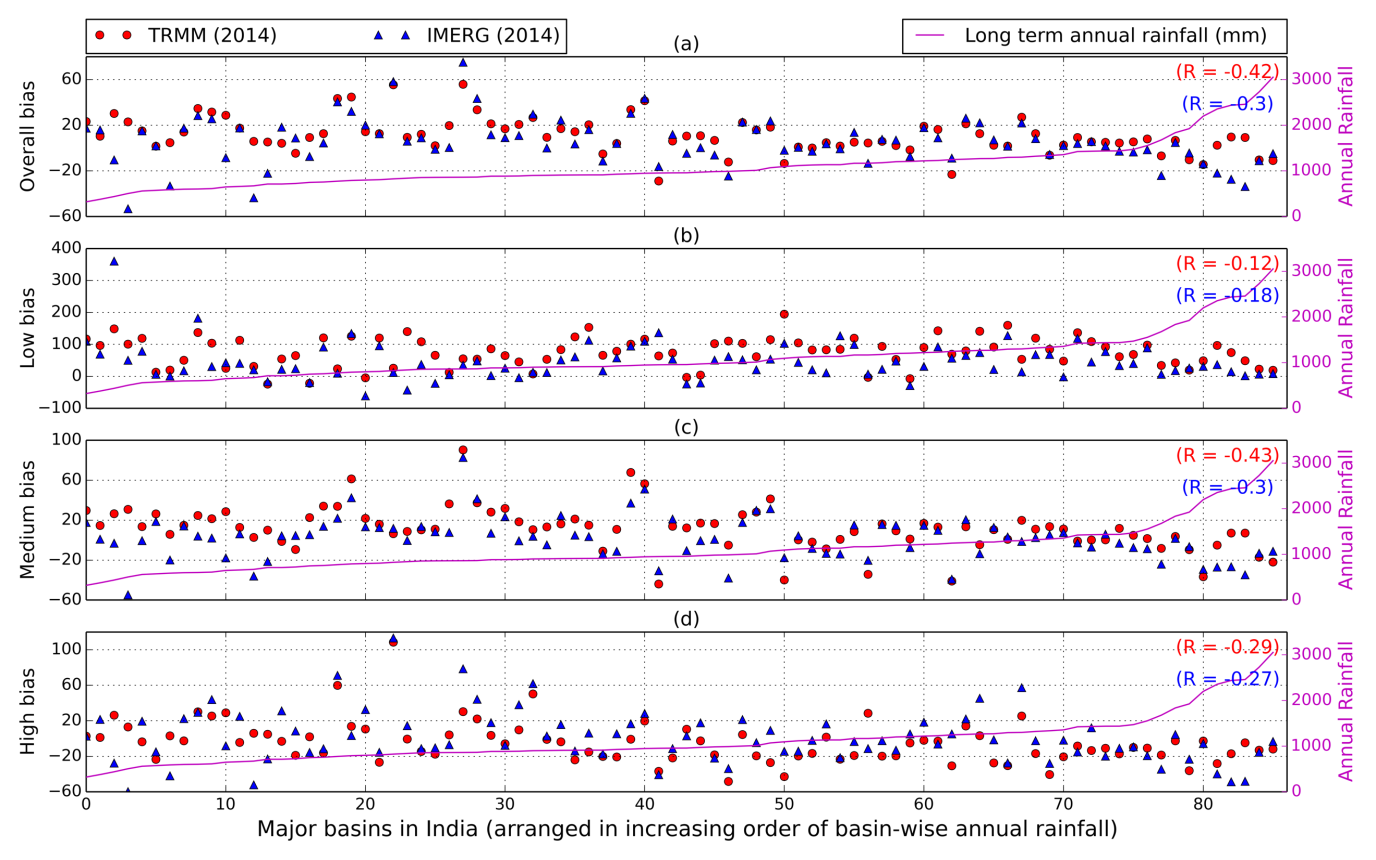
**Figure S7.** Graphical representation of correlation of IMERG (2014) and TRMM (2014) arranged in the increasing order of basin-wise average elevation over mean sea level for **(a)** overall time series and over **(b)** low, **(c)** medium and **(d)** high rainfall regime for 86 major basins in India.



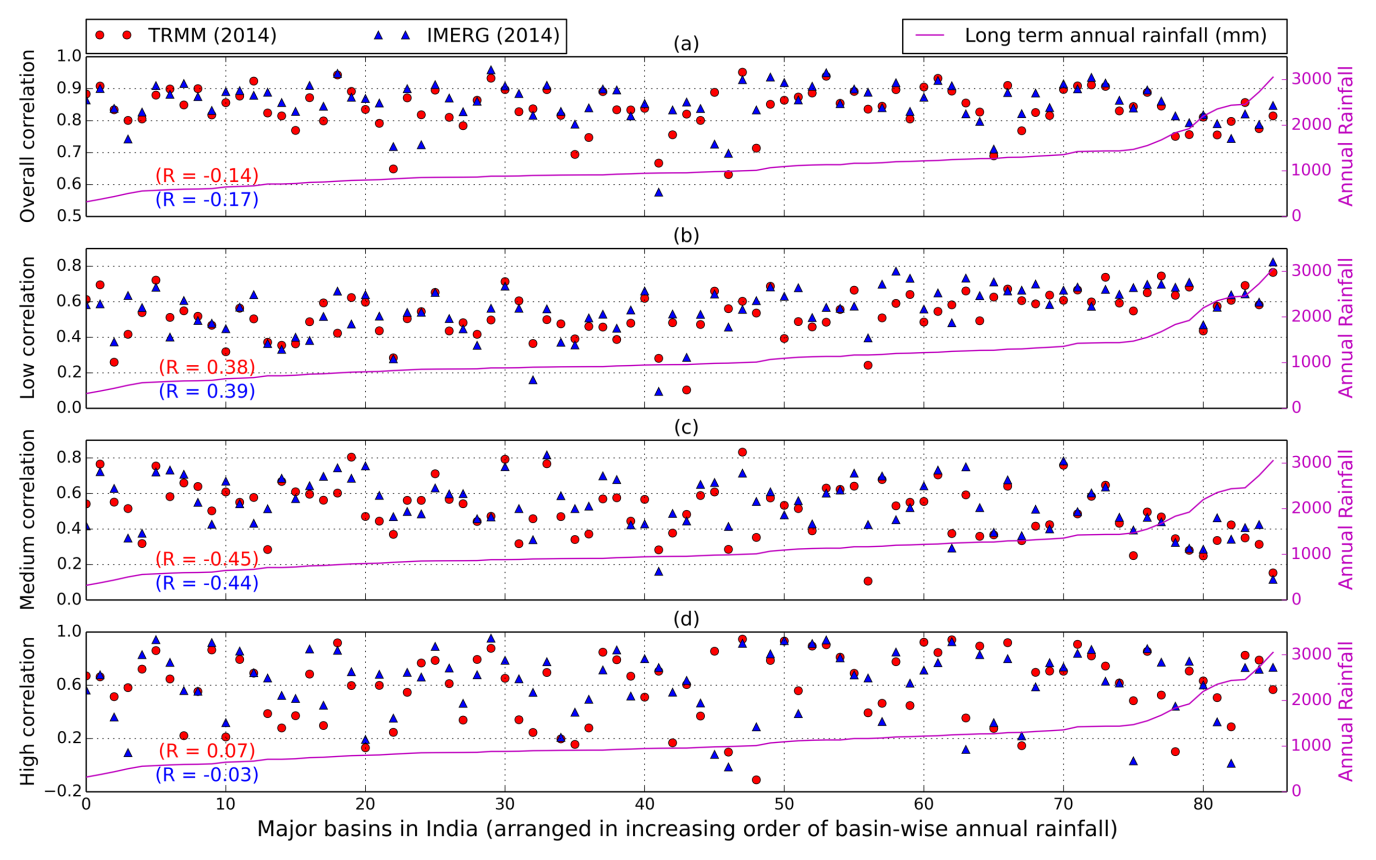
**Figure S8.** Graphical representation of percentage bias of TRMM (1998-2013) arranged in the increasing order of basin-wise average annual rainfall for **(a)** overall time series and over **(b)** low, **(c)** medium and **(d)** high rainfall regime for 86 major basins in India.



**Figure S9.** Graphical representation of correlation of TRMM (1998-2013) arranged in the increasing order of basin-wise average annual rainfall for **(a)** overall time series and over **(b)** low, **(c)** medium and **(d)** high rainfall regime for 86 major basins in India.



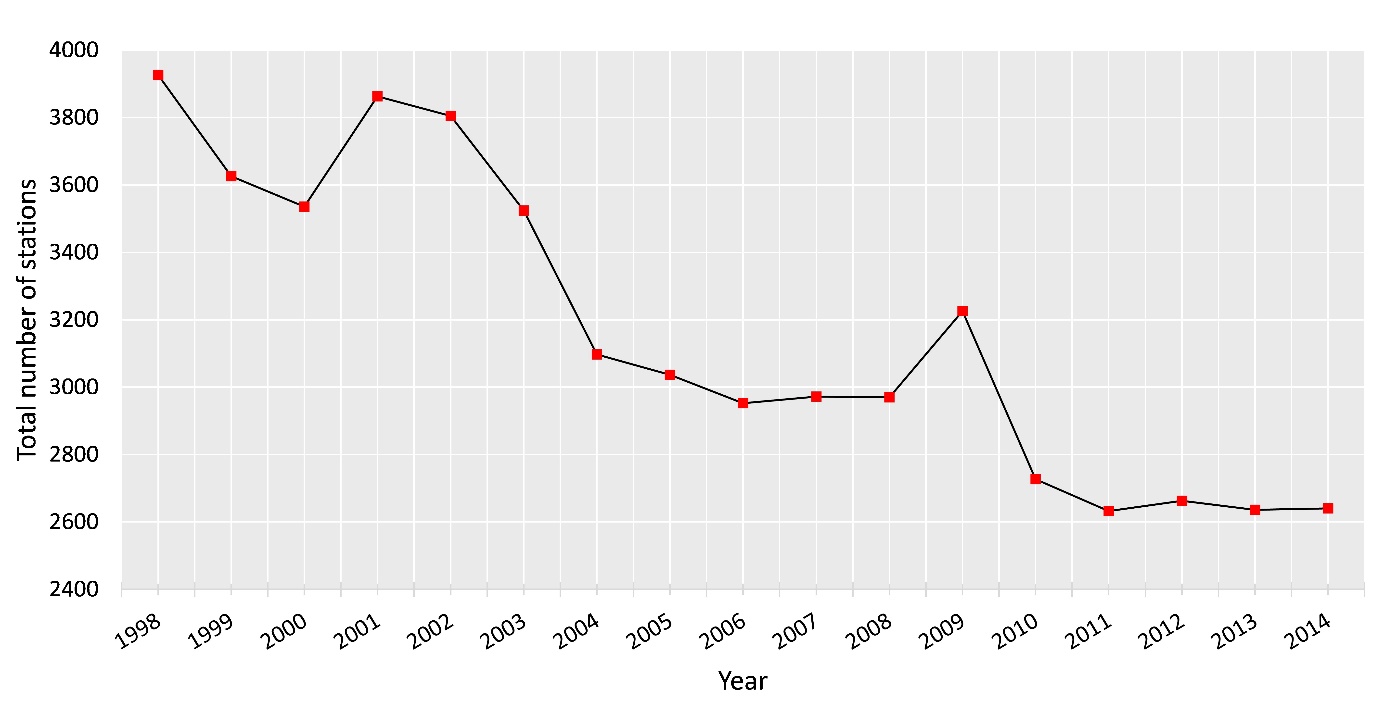
**Figure S10.** Graphical representation of percentage bias of IMERG (2014) and TRMM (2014) arranged in the increasing order of basin-wise average annual rainfall for **(a)** overall time series and over **(b)** low, **(c)** medium and **(d)** high rainfall regime for 86 major basins in India.



**Figure S11.** Graphical representation of correlation of IMERG (2014) and TRMM (2014) arranged in the increasing order of basin-wise average annual rainfall for **(a)** overall time series and over **(b)** low, **(c)** medium and **(d)** high rainfall regime for 86 major basins in India.

**Station related info**

Gridded rainfall product of IMD is prepared from station record of rainfall. However, the total number of stations used varies from year to year, the reasons may be attributed to maintenance, cost of operation, data quality, and man power availability. Figure S8 shows the maximum total number of stations used for preparing the high resolution gridded rainfall product during 1998-2014. Decline in the number of station over the period of time is evident form the fig. S8, nevertheless, the IMD gridded rainfall product has been widely used by the researchers in similar studies as discussed in the manuscript. Spatial distribution of rainfall stations during 1998-2014 at 0.25 degree spatial resolution is shown in the fig. S9, to reduce the number of plots maps are shown at 3 year interval during 1998-2014. Comparatively, a high density of rainfall station network can be seen in southern peninsular India. In some cases, the total number of stations in a single grid can go up to 11.

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**Fig S12.** Total maximum number of active rainfall stations across all the grids during 1998-2014

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**Fig S13.** Spatial distribution of rainfall station during 1998, 2002, 2006, 2010, and 2014