

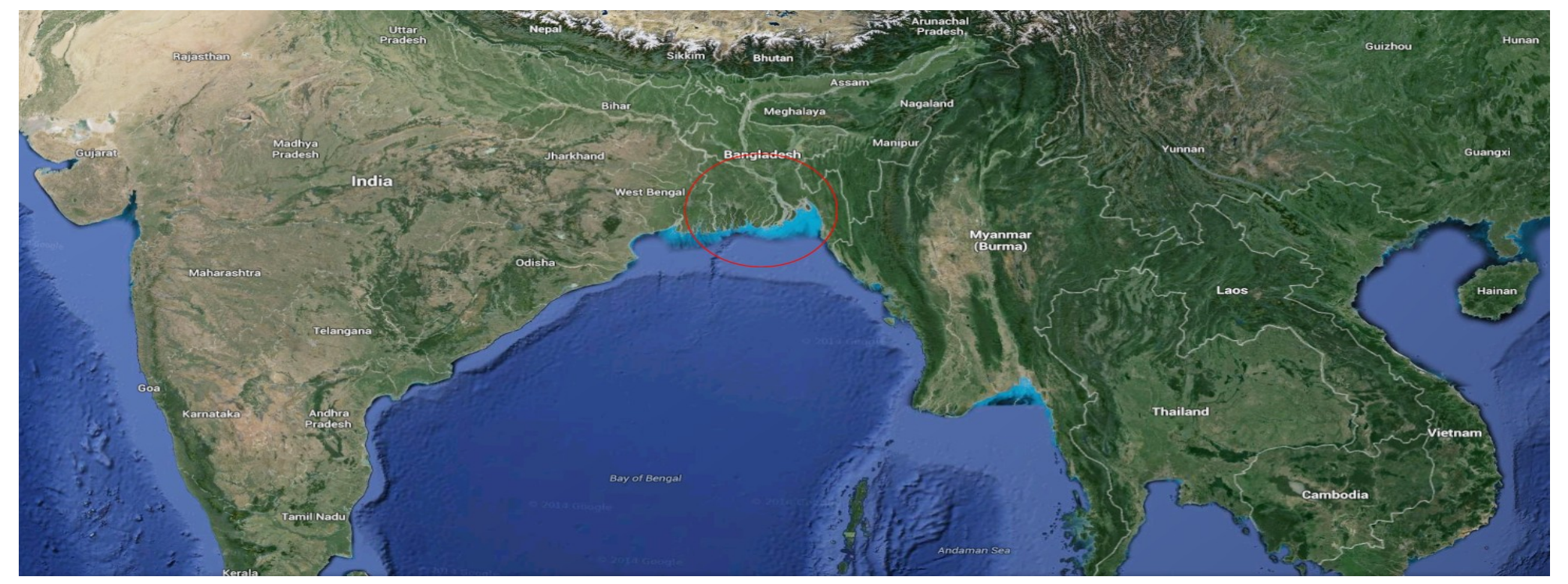
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Abstract

By using satellites to collect high-resolution images of specific areas, it is possible to calculate the correlation between precipitation and inundation in the Ganges River. By using several methods including, simple averaging, Gaussian smoothing and EWMA, we were able to determine correlations between these data. By using more advanced methods we showed that there is a strong relationship between precipitation and inundation.

River Delta Location

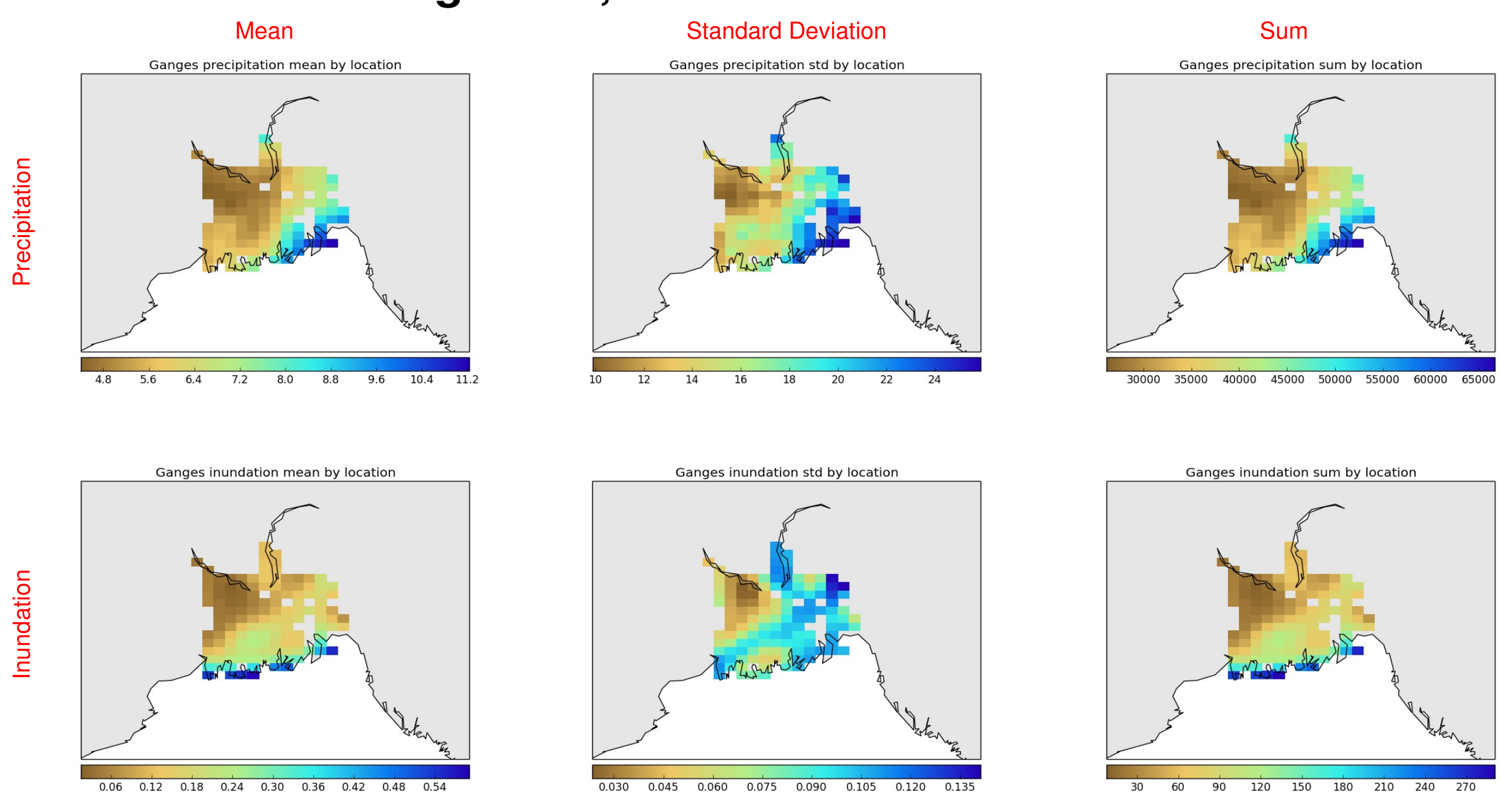


Alternative Method for Data Optimization

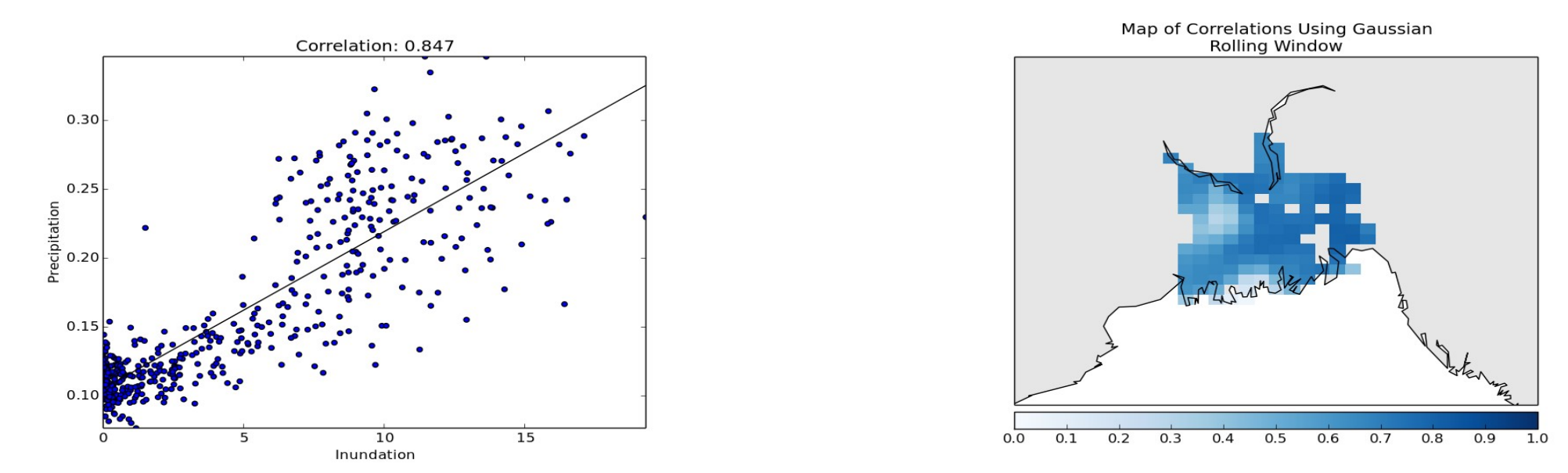
Instead of present days of precipitation, we thought that precipitation from certain days would be an actual cause of inundation. We smoothed the data using a Gaussian kernel function and a moving average to find how many days were affecting the inundation.

Statistical methods for Precipitation

The graphs below depict the rate of precipitation and inundation in the Ganges River Delta for each location using mean, standard deviation and sum.

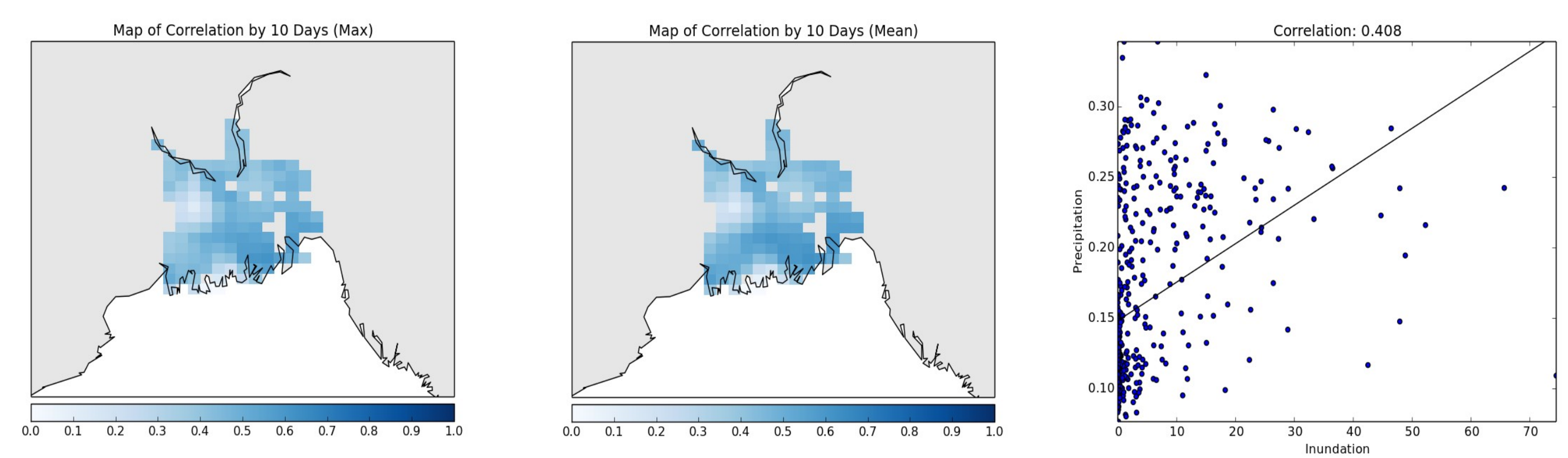


The graph below shows the correlation for each location going by every ten-days using the optimal smoothing.



We found out that using Gaussian smoothing gives us a better correlation of inundation and precipitation by location than using the 10 day mean or max.

Correlation Between Inundation & Precipitation



The graphs above provided us with a correlation between inundation and precipitation. The left graph takes the maximum values of precipitation and find the right graph takes the average vales of precipitation and then finds correlation. However, according to this data, inundation and precipitation are weakly correlated.

Conclusion

The results show that by weighting previous days over most recent days we evaluate twice as much accuracy and more dependency between precipitation and inundation in the Ganges river.

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