

WCRP-JNU Training School on Monsoon Variability in Changing Climate

16-20 January 2016

Monsoon Rainfall and Unusual monsoon tornado over the riverine region of Bangladesh



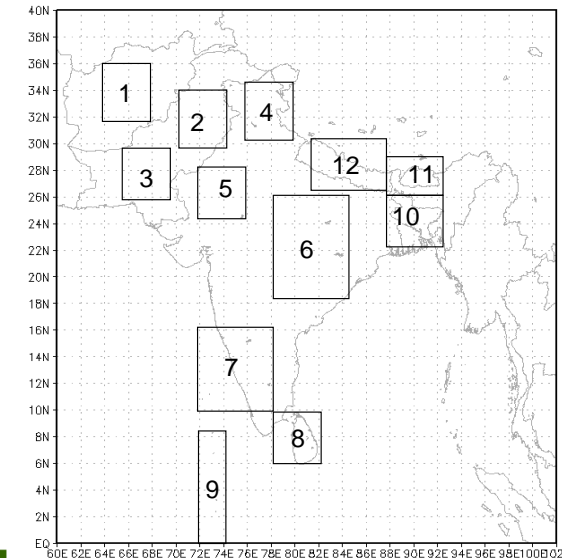
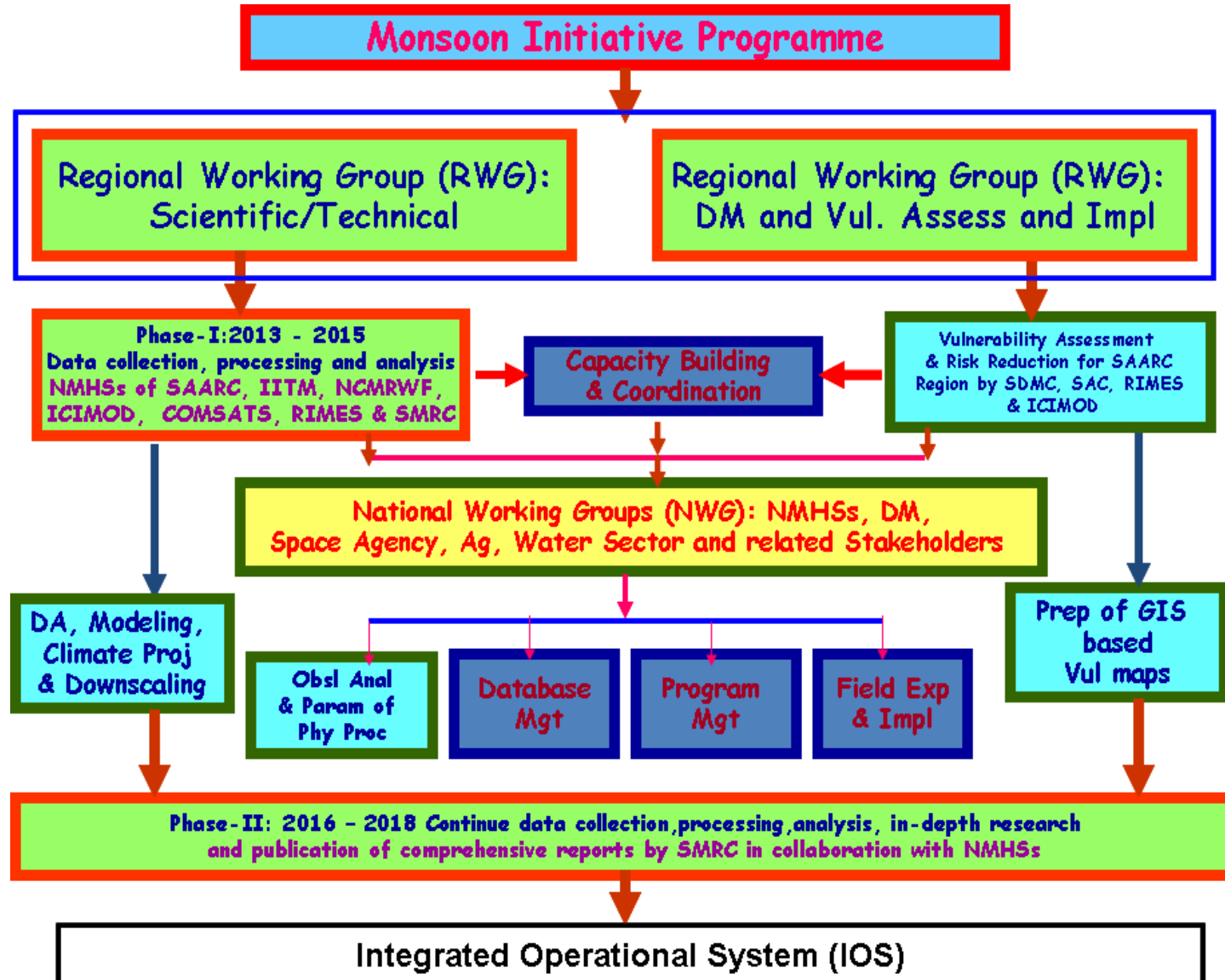
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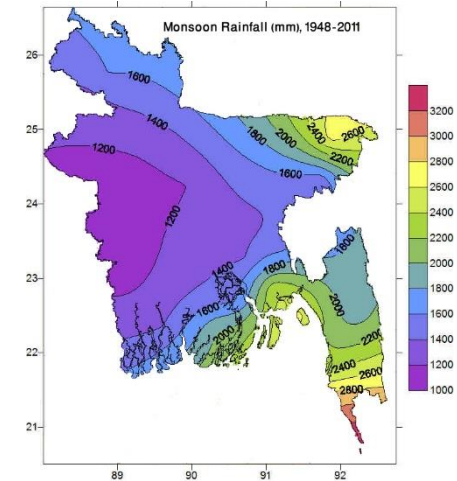
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Monsoon rain is of enormous importance to give shape to agriculture, economy and rhythms of life of the South Asian region. The seasonal forecast of the monsoon is very crucial for policy makers in planning economy of the country.

The Road Map of South Asian Monsoon Initiative Programme



The domain of study over the South Asian region



Monsoon precipitation

Table 1: Number of low pressure systems and depressions formed over the Bay of Bengal during monsoon season for the year 2006-2010.

Year	Over the Bay of Bengal	
	WRF Model	Observations
	No. of low pressure formation / Depressions	No. of low pressure formation / Depressions
2006	37	16
2007	28	11
2008	26	8
2009	15	7

Table 2: Actual rainfall and percentage departure from the normal in Bangladesh

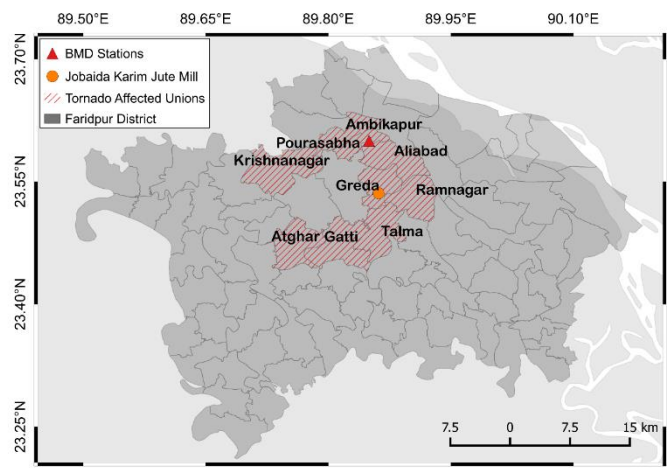
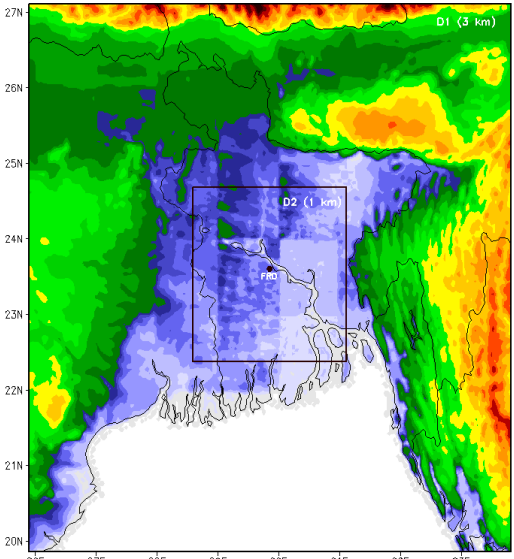
Long period average (LPA) rainfall of SW monsoon over Bangladesh is 1721 mm.

2006		2007		2008		2009		2010	
Actl.	% Dep	Actl.	% Dep	Actl.	% Dep	Actl.	% Dep	Actl.	% Dep
1616	-6 %	1960	14 %	1805	5 %	1660	- 4 %	1399	-19 %

Present Research Problems and Further Attempt

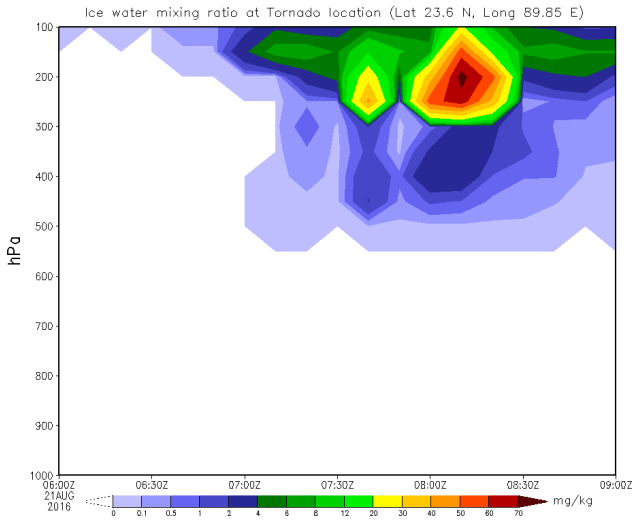
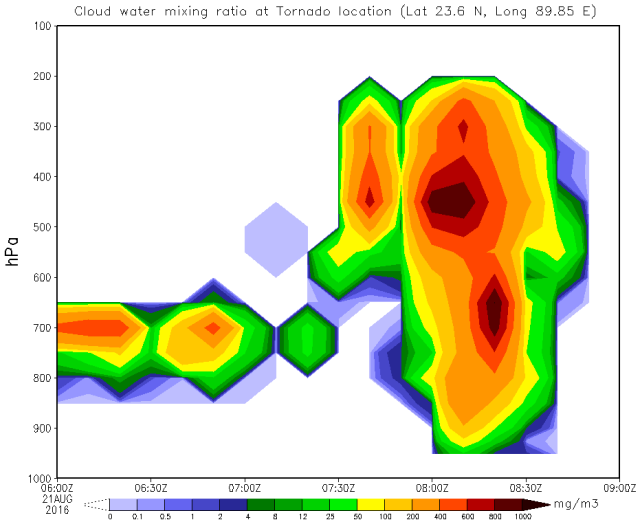
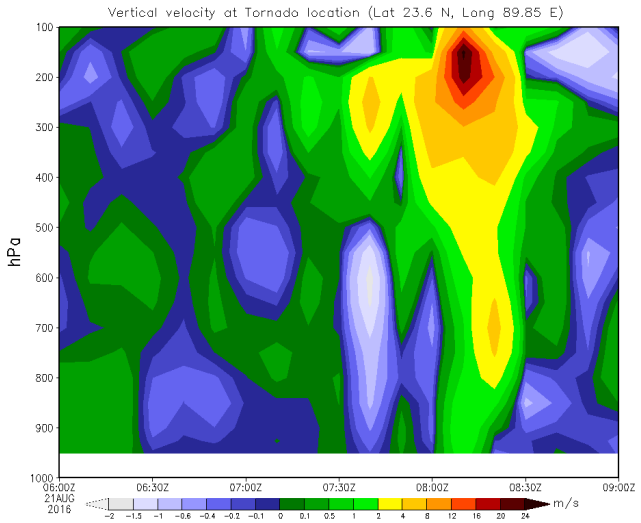
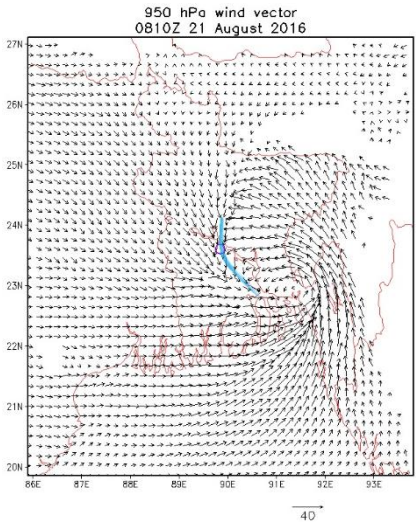
- ◆ There are many limitations in this study and the work can be further expanded subject to availability of computing facilities. In such studies, it is important to predict the anomalies of the rainfall at monthly and seasonal time scales. The anomalies can be computed by making climatology of both model and observed rainfall based on at least 25-30 years.
- ◆ Another important point is that in the seasonal time scale, the Sea Surface Temperature (SST) plays an important role influencing air-sea interaction and large-scale circulation. Thus, the SST has to be incorporated during the model integrations.
- ◆ The 3rd point is to project the model rainfall on the same grid as the observed rainfall for calculations of objective skill scores.
- ◆ More research is required using various parameterization schemes for calibration and producing better forecasts of the seasonal monsoon rainfall. The present work can be extended in future to cover all these aspects.

Unusual monsoon tornado over the riverine region of Bangladesh



Tornado affected unions of Faridpur districts of Bangladesh (left panel.) on **21 Aug. 2016**. The most destruction path of Tornado around Jobaida Karim Jute Mills Ltd., Bakhunda, Greda union of Faridpur, Bangladesh.

Bangladesh and neighbourhood.



(a) 950 hPa wind, (b) vertical velocity, (c) cloud water mixing ratio and, (d) ice water mixing ratio

Thank You 😊