Composite Characteristics of Nor'westers Over Bangladesh and Neighborhood During Storm Pilot Experiment in 2009

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Nor'westers or severe thunderstorms are common natural phenomena in Bangladesh and adjoining region of northeastern parts of India, Nepal and Bhutan especially during pre-monsoon seasons. These systems develop mainly due to merging of midtropospheric cold dry northwesterly winds and low-level southerly warm moist winds from the Bay of Bengal. These are embedded within squall lines and accompanied by lightning, thunder, tornadoes, hailstorms and heavy rains. Generally, squall line has spatial extent of about few hundred kilometers and travel several hundred kilometers causing large number of loss of life and severe damages to properties within few hours. Advanced Research WRF (ARW) model, developed by the National Centre for Atmospheric Research (NCAR) of USA is utilized to simulate Nor'wester events, which occurred in pre-monsoon season of 2009 over Bangladesh and neighborhood. Data collected under the pilot experiment of STORM project of SMRC was utilized to identify and categorize the events into light, moderate and severe. National Centre for Environment Prediction (NCEP) FNL data is utilized as initial and lateral boundary conditions (LBCs) at six hourly intervals. Domain is selected to cover the whole Bangladesh at 9 km horizontal resolution with 27 vertical levels. In previous studies^{1,2}, composite characteristics of Nor'westers over Bangladesh and adjoining regions were calculated in considering light, moderate and severe events during pre-monsoon season of 2008. In addition, dynamical characteristics, such as updraft and downdraft wind, of Nor'westers over the West Bengal region were also investigated³ in employing numerical models.

There were about 86 Nor'wester events developed over Bangladesh and the West Bengal region during pre-monsoon season (March/April/May) of 2009, out of which 52 were in very light, 33 were in light and 1 was in moderate strength. During the coordinated pilot experiment of STORM project from 1-31 May 2009, there were about 22 Nor'wester days reported from Bhutan, Nepal, West Bengal and Bangladesh. All the common and some selected Nor'wester events were simulated for calculating composite characteristics for very light, light and moderate cases. Dynamical characteristics associated with Nor'westers were also calculated and compared with the previous studies over the region.

References

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