

Characteristics of the Explosively Developed Cyclone during the winter season of 2005/06

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Cyclones frequently went through and developed over the eastern offshore of Hokkaido and the Sea of Okhotsk during the winter of 2005/06. Rapidly development and stagnancy of cyclones affect the surrounding snowfall distribution and vapor transportation. As the cyclone develops due to the upper level cold vortex advection, it tends to strengthen the cold air outbreak over the Japan Islands and a heavy snowfall may occur along the coastal region facing of the Sea of Japan. In this paper, characteristics of the explosively developed cyclones during the winter season of 2005/06 comparing with 6 winter seasons between 1999/00 and 2004/05. The cyclone's deepening rates were calculated by central sea level pressure deepening between 12 hours normalized to 60°N in latitude (Yoshida and Asuma, 2004). The explosive cyclones were defined as the cyclones having their maximum deepening rates exceeded over 1.0 Bergeron among the cyclones which continued over 24 hours.

282 cases were found in total in 7 winter seasons (from December to March) between 1999/00 and 2005/06. Totally 37 explosive cyclones are occurred in 2005/06 winter. The total occurrence number is the almost the same as that of other 6 winter seasons and the deepening rate in 2005/06 winter has a tendency of stronger. And further these tendencies can be found among the 3 explosively deepening cyclone types following to Yoshida and Asuma (2004). Although the cyclone's deepening positions were distributed continuously over the north-western Pacific region during 6 referenced winter seasons, stronger explosively cyclones occurred near the Japan Islands over the Pacific Ocean as well as over the Sea of Japan. Monthly characteristics were also investigated during the winter of 2005/06. A number of stronger explosively cyclones occurred in December, the explosively cyclones were less in January, stronger but small number of explosive cyclones developed in February and weaker but a large number of explosive cyclones occurred in March. As the explosively cyclones develop by the upper level forcing and lower level moisture supply, these tendencies are reflected by the PV, temperature and moisture advection around Japan Islands.