Abstract

Tropical cyclones (TCs) have caused severe disasters in Japan for many years. Although great advances have been made in TC forecast skills and disaster preparedness management, the heavy rain, strong winds, and storm surges that typically accompany TCs still have great impacts in Japan. On average, 11.4 TCs approach Japan each year and 2.7 make landfall, according to 30-year statistics kept by the Japan Meteorological Agency. In 2012, 17 TCs approached Japan, two made landfall on the main islands. Particularly, three intense TCs struck Okinawa Island in August and September 2012. In 2013, 14 TCs approached Japan and two made landfall. In September 2013, heavy rainfall brought by Typhoon (TY) Man-Yi (1318) caused severe flooding across broad areas of western Japan, and in October, massive landslides due to the torrential rainfall brought by TY Wipha (1326) caused many casualties on Izu Oshima. Each TC that approaches Japan has unique characteristics, which should be documented by using new data sources, such as microwave sensors onboard polar-orbital satellites, operational ground-based Doppler radars, and reanalysis datasets, and analysis methods, including cyclone phase space analyses. Here, the knowledge gained by many studies in recent decades of the TC life cycle, including TC genesis, rapid intensification, and extratropical transition is applied to better understand these TC cases.

Section 1 of this report is an introduction. In Section 2, TC statistics for 2012 and 2013 are presented, including the frequency with which TCs were generated, and the numbers that approached Japan and made landfall there. The environmental conditions during the TC season of each year are also described, and the relation between TC activity and the environment is discussed. Section 3 describes the life cycles and characteristics of 10 TCs that had a major impact on Japan in 2012 or 2013. A list of abbreviations and a glossary with explanatory notes are included as appendices in this report.