

## The direction of science and technology supporting DPR responses at the Japan Meteorological Agency

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The JMA performs work, on the basis of science and technology, to monitor and forecast typhoons, localized heavy rainstorms, earthquakes, tsunamis, volcanic activity, climate change and so forth. To monitor and forecast these natural phenomena, we constantly strive to incorporate the products of the most up-to-date science and technology and to improve our disaster risk reduction (DRR) and weather information.

In recent years we have seen the worst series of disasters, such as the Great East Japan Earthquake of 2011, the torrential rain dropped on the Kii Peninsula by severe tropical storm Talas in 2011, and the eruption of Ontakesan in 2014. These terrible natural disasters have shown what we need to improve in order to protect human life from disasters: the accuracy of our monitoring and forecasts, suitable mechanisms for communication to utilize information relating to evacuation, and also attitudes, awareness and information literacy so that individual citizens can take appropriate actions for DRR. Accordingly, we are working to improve our technology development and the resulting information, and to collaborate with various institutions on efforts for public awareness and education about the uses of DRR information.

For effective DRR responses to protect life, it is important to concentrate on and promote improvements in information that contributes to the DRR responses being put into practice by the staff of disaster response bodies and by citizens. In regard to the science and technology that supports this, as well as natural science?refining our monitoring and forecasting technology?we must consider social science aspects such as, with forecasts featured by uncertainty, how the information is actually put to use by society.

This presentation will introduce the JMA's latest efforts towards effective mechanisms for DRR taking account of society's wishes, and will explain the significance of the technology development and fundamental research required to support these efforts on the technological side. The discussion will explore several urgent issues for the JMA, in particular the current and future directions of the following topics for improving our technology development:

- 1) Developing technology to monitor and forecast the localized heavy rain and tornadoes associated with cumulonimbus clouds that suddenly appear and grow
- 2) Accurately predicting line-shaped precipitation and nighttime localized rainstorms caused by backbuilding; upgrading and improving the precision of quantitative forecasting technology
- 3) Improving forecasts of tropical cyclonetrack and intensity up to five days ahead
- 4) Developing technology for the accurate warnings of tsunamis from major ocean trench type earthquakes, such as the Nankai Trough megathrust earthquake that is expected to occur in the future
- 5) Improving the prompt issue of level 2 and 3 volcanic warnings after the early detection of phreatic eruption and the accurate issue of level 4 and 5 volcanic warnings when transitions to magma eruptions are identified

The major medium-term issue for this technology development is research supporting the work of the JMA, which is being conducted mainly at weather research institutions in collaboration with universities and related bodies. In this session, discussion will be encouraged about the direction of research in relation to a renewed shared understanding of the significance of JMA's role in society and to further strengthen collaboration with researchers and experts in different scientific associations to resolve technical issues.

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