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WMO RA-II (Asia) Workshop on Quality Management in Surface, Climate and Upper-air Observations

The Importance of Data Quality Control in Disaster Prevention and Mitigation

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- 1. Meteorological characteristics and natural disasters of Japan
- 2. Information for severe weather preparedness
- 3. Rainfall data for forecasting operations
- 4. The importance of quality control for rainfall data

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Natural disasters in Japan



Inundation

Snow damage



Sediment-related disaster



High waves



Flood

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Natural disasters in Japan

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The Number of Deaths and Missing by Type of Disaster



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Information delivered by JMA



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- NHK : Japan Broadcasting Corporation
- JCG : Japan Coast Guard

WMO RAII QM-OBS 2010.7.27 Natural disasters in Japan Heavy rain warning/advisory ming/advisory Inundation Examples... Sediment-related disaster Snow damage Flood Hig warning/advisor warning/advisory **High waves** Flood Japan Meteorological Agency





Criteria for heavy rain warnings/advisories and flood warnings/advisories

Visual outlines of the soil water index Rainfall

Visual outlines of the runoff index



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WMO RAII QM-OBS 2010.7.27 Precipitation observation equipment Radar **Raingauges** The f R/A 解抗雨量 AIMIMIMIMIMIM Radar Raingauges Can observe large areas with higher spatial resolution than the raingauge Can measure actual amounts of **Advantages** precipitation. network. May produce readings different from precipitation observed on the ground, as it measures the amount of rain overhead. Dis-Can observe precipitation at single advantages points only.

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Precipitation observation equipment



Radar/raingauge-analyzed precipitation



Precipitation amounts observed by radar generally does not agree with those observed by raingauges, and radar data are therefore calibrated with raingauge data.



The calibrated radar data are then made into a single composite data set.



Radar/Raingauge-Analyzed Precipitation(R/A)

Radar/Raingauge-Analyzed Precipitation data depicts precipitation with high dimensional accuracy, and is issued every thirty minutes with a spatial resolution of 1 km.



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WMO RAII QM-OBS 2010.7.27 The importance of quality control for rainfall data Forecasters expect rainfall to meet the trigger criteria. Issue appropriate Correct warning/advisory values The general public trust warning/advisory Forecasters may be obstructed Anomalous Issue inappropriate values warning/advisory The general public do not trust warning/advisory Japan Meteorological Agency

Examples of Anomalous values

- Inappropriate performance of raingauge inspections.
- Influences related to the raingauge installation site.
- Raingauge blockages.
- >Upper data limit
- >Wrong metadata

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≥ 0.08

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Inappropriate performance of raingauge inspections



Radar/raingauge-analyzed precipitation is made automatically

Example of the Inappropriate performance of raingauge inspections

.50km

If inspections are carried out correctly, such anomalous values will not arise.

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Influences related to the raingauge installation site



lower than the true values.

higher than the true values.

Raingauges in such locations should be moved to a suitable place or not used.



Example of the Influences related to the raingauge installation site JMA Meteorological Agency





WMO RAII QM-OBS 2010.7.27 Wrong metadata R/A解析雨量 R/A解析雨量 2008年08月28日22時00分(JST) 2008年08月28日 22時00分/JST 12.0 20.0 4.0 **3**.0 [■] 51.0 **3**.0 IInit mm > 0.0< 1.0 10≦ < 3.0 1.0 30≦ < 5.0 3.0 50≦ < 10.0 100 ≦ < 20.0 < 10.0 200 ≤ < 40.0 < 20.040.0 ≦ < 60.0 < 40.0 < 80.0 600 ≤ < 60.0 80.0 ≦ < 100.0 < 80.0 100.0 ≦ 80.0 ≦ 🛛 🗖 < 100.0100.0 ≦ 7.0 10km 10km if the location of a raingauge is wrong, even if it observes heavy rain correctly, forecasters will misidentify the location of the precipitation. JMA Japan Meteorological Agency

Conclusion

- Quality control for observed data is important for smooth forecast operation.
 - Follow an observation procedure and inspection procedure.
 - Select the appropriate raingauge installation site.
- Decide the upper data limit carefully
- Make a correct metadata

It should also be noted that the importance of quality control for manual observation is the same as that for automatic observation.

Forecasters require accurate, prompt observation data. It is important to obtain correct measurements at fixed times and report them quickly.

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Thank you for your attention

End