

Accident in the Japanese NPP Fukushima: Spread of Radioactivity/ weather currently not favourable (Update: 25 March 2011 16:00)

Weather in the crisis region

Currently, a disturbance is crossing the crisis region. There are numerous showers passing by. In Fukushima, we expect some rain and possibly some snow overnight. There is rain also expected for Tokyo. Currently, weak easterly winds predominate, which means that transport of radioactivity is slow. In the course of the night, the winds turn quickly to the west.

Tomorrow and the day after tomorrow, north-westerly winds predominate. Air from Fukushima will thus be transported to the Pacific.

Emission estimates based on CTBTO data

Due to the numerous highly accurate radionuclide data (24-hour air samples) available to us from the world-wide network of the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) in Vienna, we have been able to estimate the source strengths of Iodine-131 and Cesium-137 for the first few days of the accident. These estimates are subject to uncertainties, but they are accurate by the order of magnitude. Based on our current best estimate, we assume a daily emission of Iodine-131 of about 10^{17} Bq, and a daily emission of Cesium-137 between $5 \cdot 10^{15}$ and $5 \cdot 10^{16}$ Bq. Calculated across the full accident scenario, one would assume a similar source term of both isotopes as during the accident in Chernobyl.

Since the volatile gases and particles like Iodine-131 and Cesium-137 do only make up a certain proportion of the total effective dose rates, our estimate does not imply that the effective dose rates around the Fukushima plant are comparable with those measured around Chernobyl. Using only the volatile substances Iodine-131 and Cesium-137 to calculate the effective dose rates, we end up with estimates that do not contradict the measurements provided by the Japanese Authorities and IAEA.

Dispersion Modeling

The results of the dispersion model show that radioactivity is transported a limited distance inland today. Tokyo and surroundings seem to be not affected. Tomorrow and the day after tomorrow, the cloud is transported to the Pacific Ocean, as was the case most of the time during the last two weeks (see figures below).

The colour scale shows a total of 5 colours. The area marked „E“ shows an area with estimated current equivalent dose rate of 10 mSv/h (in a 25×25 km² square). The violet colour on the outer edge of contaminated areas (Area A) represents 0,3 µSv/h, which corresponds to the amount of the natural background radiation dose.

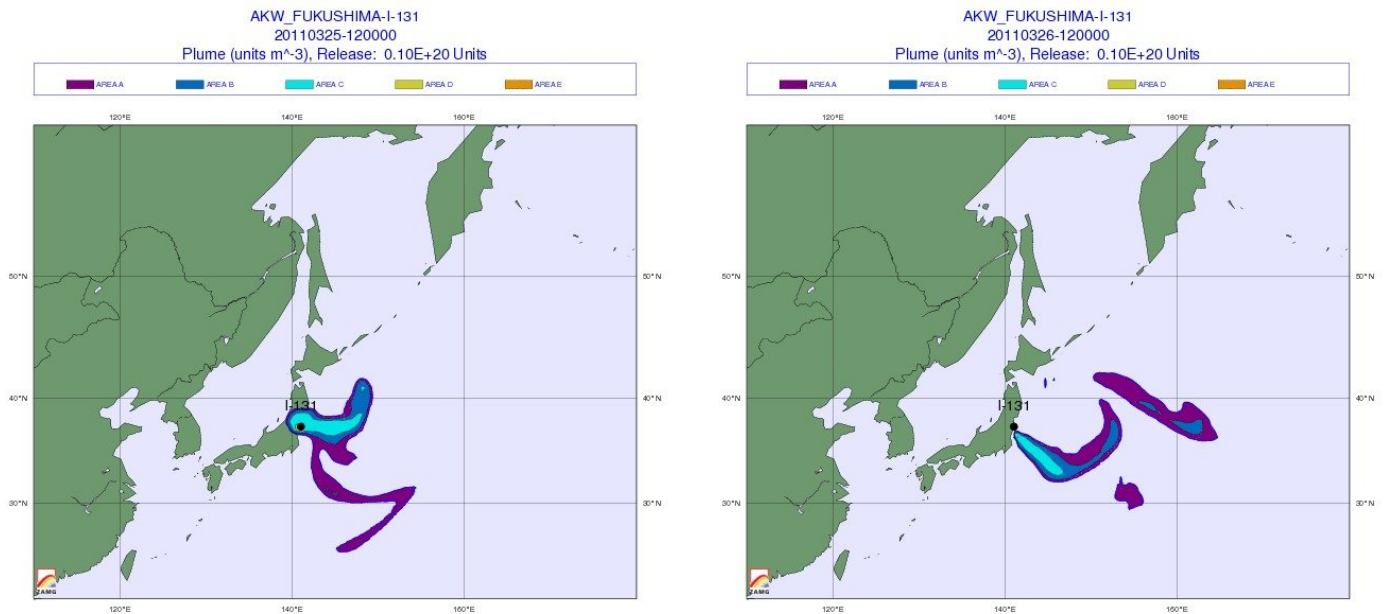


Figure: Spread of Radioactivity over Eastern Asia today and tomorrow 12:00 UTC

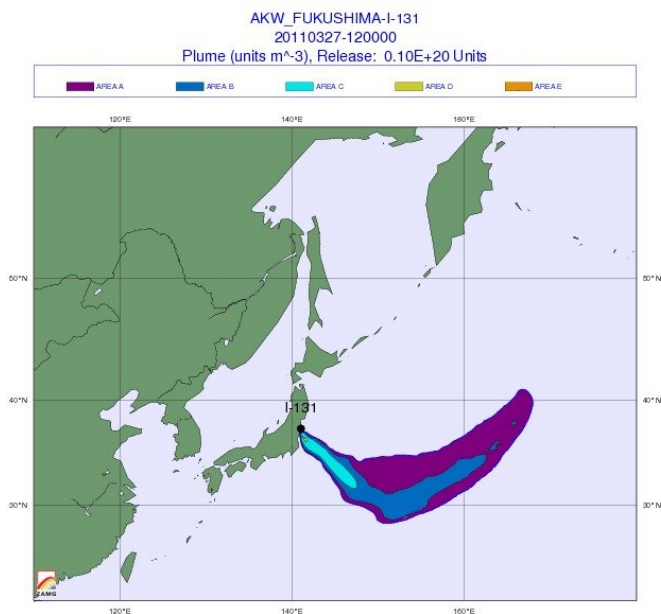


Figure: Spread of Radioactivity over Eastern Asia the day after tomorrow 12:00 UTC

Dr. Gerhard Wotawa

Division for Data, Methods and Modelling

Central Institute for Meteorology and Geodynamics

Hohe Warte 38, 1190 Wien

gerhard.wotawa@zamg.ac.at

ZAMG will not answer any questions related to travel in Japan or in other parts of the world, since this is the responsibility of national radiation protection authorities. Travel advisories and warnings are available from your foreign ministry. In Austria, such advisories are available on www.bmcia.gv.at.

This information is updated daily, and whenever the development of the situation requires it.

Videos:

Plume spread from Fukushima/Permanent Release/Iodine-131