

## Multiscale factors causing climatological high temperature in Tajimi, the 'hottest city' in Japan

TAKANE, Yuya<sup>1\*</sup> ; KUSAKA, Hiroyuki<sup>2</sup> ; KONDO, Hiroaki<sup>1</sup> ; OKADA, Maki<sup>3</sup> ; ABE, Shiori<sup>3</sup> ; TAKAKI, Midori<sup>3</sup> ; MIYAMOTO, Kenji<sup>4</sup> ; FUJI, Yukino<sup>4</sup> ; NAGAI, Toru<sup>4</sup>

<sup>1</sup>National Institute of Advanced Industrial Science and Technology, <sup>2</sup>Center for Computational Sciences, University of Tsukuba, <sup>3</sup>Graduate School of Life and Environmental Sciences, University of Tsukuba, <sup>4</sup>Tajimi City Government

In this study, multiscale climatological features of extreme high temperature (EHT) events in Japan's hottest city, Tajimi in Gifu Prefecture were investigated using observational data corrected by Japan Meteorological Agency (JMA) during past 23 years and original data observed by authors during three years. The results showed that the occurrence of a specific pressure pattern of 'WHALE' (tail of a whale) — the synoptic-scale factor — and the urbanisation of Tajimi (meso  $\gamma$  scale) are the background factors that lead to climatologically high temperatures in Tajimi. In addition, the high-temperatures in Tajimi are contributed by the foehn-like westerly airflow coming from the mountains located in the northwest/western side, which cover the inland part of the Nobi Plain (the meso  $\beta$  scale factor), and the location of Tajimi observation station established within the urban section (~about 400 m<sup>2</sup>) of the city where high temperatures tend to be observed (the microscale factor). On the other hand, statistical analysis indicated the possibility that the small-scale basin effects and soil dryness around Tajimi City (the meso  $\gamma$  scale factors), which were proposed as other hypotheses, do not play a climatological role in the occurrence of the EHT events in Tajimi.

Keywords: Extreme high temperature, Pressure pattern, Foehn, AMeDAS, Tajimi