



Urban Heat Island or Urban Heat Bubble?

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A project based on “citizen science” approach is currently carrying out a campaign of measurements to describe the heat island effect over the town of Udine (100 000 inhabitants, positioned in the middle of Friuli Venezia Giulia plane, North east of Italy).

The project is based on a group of volunteers that use portable data loggers (i-buttons ©) to record temperature every 15' in twenty fixed points of measurement, positioned on sites that describe the texture of the Udine town, from city center (densely inhabited) up to suburban areas that fade in the almost constant density of the Friulian plane. Positions were chosen following a protocol to ensure homogeneity according to buildings, roads and trees distance from data logger site.

Data loggers are positioned at a fixed height within a solar and rain shield specifically designed for the project, called “the nest”. The monitoring started in august 2014 and is planned to continue for at least one year. The aim of this project is that to determine the thermal pattern of Udine town for urban planning purposes and to determine potential effects of the urban texture over a centuries-old temperature time series collected since 1888 up to now in Udine downtown.

Preliminary results show different characteristics for minimum and maximum temperatures. In particular, there is not a clear “heat island” effect on maximum temperatures, because they can occur with the same intensity almost wherever over the town, even if at different days. This behavior is consistent with the conceptual model of a “heat bubble” produced by the town that, because of its relatively small dimensions, it is easily moved and warped by synoptic and mesoscale winds.

Under the point of view of minimum temperatures, the heat island effect is more clear, with higher minima in downtown.

Taking into account local features, a clear Northeast-Southwest gradient of temperatures is revealed. This gradient is explained thanks to the last part of the mountain breezes that blow in that direction over the Udine area. Moreover, in the eastern part of Udine a riverbed (Torre river) collects cold air that often impacts the town.

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