



## **Human thermal sensation over a mountainous area. The case of Ainos Mt., Kefalonia Island, Greece**

StelioS ManiatiS (1), Panagiotis Nastos (2), Kostas Moustris (), and Athanasios Kamoutsis (1)

(1) Agricultural University of Athens, Faculty of Crop Science, Laboratory General & Agricultural Meteorology, Greece (steman78@hotmail.com), (2) 2Laboratory of Climatology and Atmospheric Environment, National and Kapodistrian University of Athens, , (3) 3Department of Mechanical Engineering, University of West Attica

Mt Ainos in Kefalonia Island hosts a large variety of plant species, some of them endemic to the region. Because of its rich biodiversity, a large portion of the mountain area is designated as national park and is protected from human activities such as hunting or logging. Therefore, the area presents a lot of opportunities for ecotourist activities, such as trekking, birdwatching and mountain climbing.

In order to estimate its tourist activities potential, it is essential to assess the mountain's bioclimatic conditions. To achieve that, the human thermal index PET (Physiologically Equivalent Temperature) was used, which is based on a human energy balance model. However, it is difficult to get the specific meteorological data over mountainous areas (air temperature, humidity, wind speed and global solar radiation), appropriate as input variables for PET modeling. In order, to overcome this limitation, artificial neural networks (ANNs) were developed for the estimation of PET index, taking into account only hourly meteorological data of air temperature and humidity, as input variables for model training and validation. These datasets were acquired from the reference high altitude Eudoxos meteorological station, (38° 10' 11" N, 20° 34' 8" E), in an area, near the entrance of Ainos national park at an altitude of 1100 m, during the years 2011-2013. Thereafter, the PET index was calculated in ten sites within the Ainos national park, five at the northwest side and five at the southeast side at the respected altitudes, by applying the developed ANNs. Data loggers installed at the aforementioned sites have recorded air temperature and relative humidity every 10 minutes during the years 2011-2013.

In the process, the spatiotemporal distributions of the PET index were illustrated on seasonal and annual basis, taking into consideration the sites' observations and the outputs from the developed ANNs. The findings of the performed analysis shed light that Mt Ainos offers the greatest tourist opportunities from May to September, when thermal comfort conditions appear. The study also proves that the highest percentage of thermal comfort appear within the aforementioned time period over the highest altitudes, while on the contrary, slightly warm class appear as the altitude decreases on both sides of the mountain.