

#### The Effecting of the Natural Ventilation Method to be applied at Urban Scale on Bioclimatic Comfort in the Hot and Humid Climate Regions: A case study of Hatay/Iskenderun Dr. Fatih ADIGÜZEL Associate Professor Dr. Mehmet ÇETİN

#### 1. Introduction

As a result of intensive construction with increasing urbanization and consumption understanding; The proliferation of vertically extending plasmas, the development of natural areas, the uncontrolled energy consumption in the buildings, the increase in population and the increase in people's automobile use, and the increase in carbon monoxide gases in parallel with these, the coating of evaporation surfaces with materials such as concrete and asphalt cause temperature changes.





Figure 1: The Study area of location map

#### 2. Material and Method

Temperature, wind and humidity measurements were made in certain periods in June, July and August. ENVI MET software was used to construct the working method and to obtain the data to be used in climatic simulation modeling. Then import the analysis result data and use SuperMap iDesktop for 3D scene modeling and display.









#### Bioclimatic comfort areas in Hatay





Figure 2: Three-dimensional view of the study area

### Kestrel 5500



Floor heights are very effective on air temperatures, especially in terms of changing wind directions and storage temperatures due to surface features and spatial size of the city, causing cities to warm up (Öke, 2004). From this point of view, the distribution and proportions of the building floors in our study area are different. The number of floors varies between 1 and 19 (Figure 3). There are green areas and a small amount of empty space in the exterior structures. Although building heights have a negative effect on urban temperature, this effect can vary depending on factors such as street-to-street width and various urban forms.



Figure 3: The Building of floor numbers



Figure 4: Study area of the temperature map



Figure 5: Study area of the relative humidity maps

SSI (New Summer Index) formula (SSI Formula = 1.98 [Ta- (055-0.0055Ur) (Ta-58)] - 56.83) Temperature values are calculated in °F in this formula. The temperature map in °C was converted to °F with the ArcGIS Raster Calculator for the formula application. The temperature and relative humidity of the study area were obtained with the SSI formula. When this map is examined, the perceived temperatures vary between 31.88-38 °C in the morning, 38.92-43 °C in the morning and 34.72-43.65 °C in the evening (Figure 6). This means that bioclimatic comfort zones cannot be determined by looking at temperature maps alone.



Figure 6: Temperature maps made with the SSI formula



Figure 7: Study area of the classification of new summer index (SSI)

## 4. Conclusions

This study deals with the borders of Iskenderun district of Hatay province. It has been observed that problems such as increasing greenhouse gases with climate change, increase in population density, uncontrolled construction due to the increase in the number of building floors, increase in impermeable surfaces that prevent evaporation, and decrease in energy resources parallel to all these, bring along imbalances in temperature values.

# Thank you for listening...