



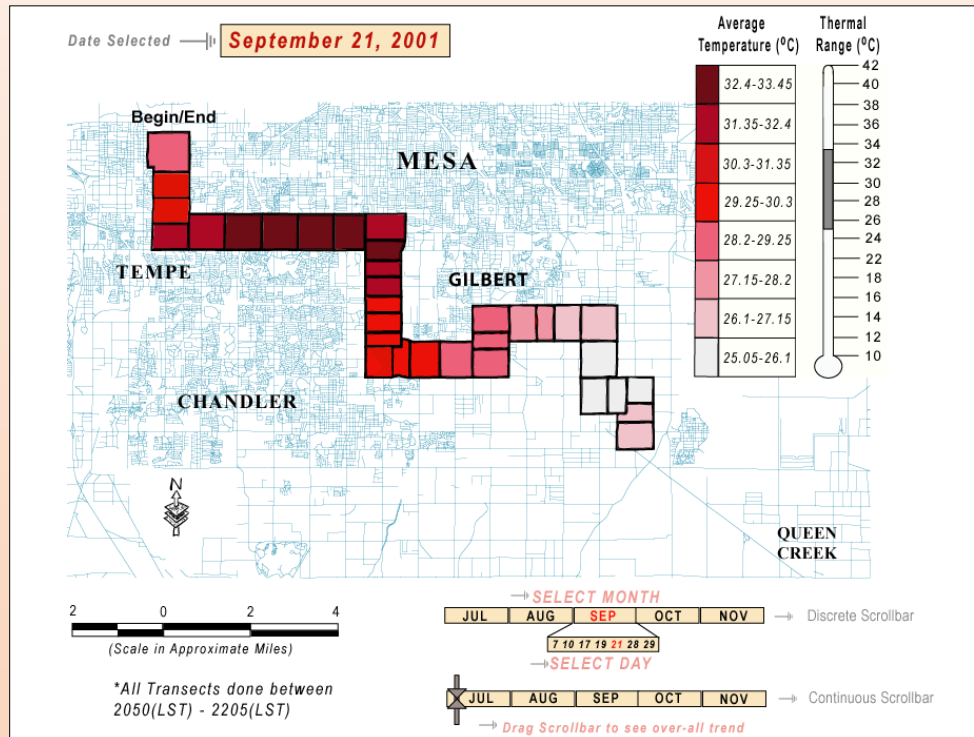
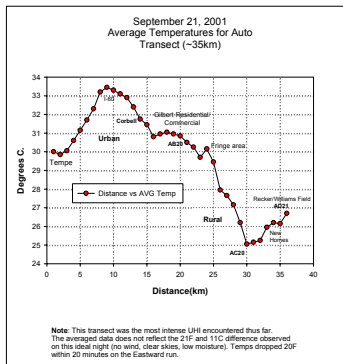
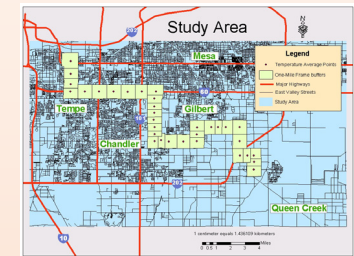
Using GIS and Visualization Tools to Interpret Microclimatic Climate along the Phoenix East Valley Urban Fringe.

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ABSTRACT

The objective of this study is to observe gradients of temperature and moisture at the time of maximum urban heat island development in the southeast valley of Phoenix, and to conduct research on the spatial and temporal variance of these gradients and their relation to the built residential, urban, and rural (agricultural and desert) environments. Data has been collected during a five-month period through the use of various field methods. This includes a series of automobile transects (27), collecting one-minute temperature, humidity, and dew-point information, and with the use of six long-term automated weather stations (HOBOS), collecting five-minute weather data at locations corresponding to CAPLTER 200 point survey points along the urban fringe. Results collected thus far indicate a thermal gradient as great as 11°C between urban to rural areas along the transect route. A proposed interactive, web-based interface is presented, which allows the user to visualize, spatially and temporally, seasonal heat island differences along the urban fringe of Chandler and Gilbert.



Expected Outcome

1. A dynamic, hyperlinked web environment that allows both advanced and novice users to explore, in an interactive environment, a climate phenomenon which occurs in urban areas.
2. A better understanding of seasonal variation in heat island magnitude and climate processes in general.
3. This exploratory environment will spark interest in scientific research and geographic phenomena in students.

Future Research

1. The addition of other variables to the exploration, such as Dew Point, wind speed, etc.(Multivariate exploration).
2. The development of dynamic representation for other urban microclimate research, such as Urban canyons, boundary layer studies, etc.

Project Design

Data

1. Automobile Transect (27) climatic data
2. Base map layers

Dynamic Elements

1. Temporal scrollbars (continuous and discrete)
2. Temperature value & range bar change
3. Color gradient change in transect polygons
4. Transect date change

Tools

1. ArcView 3.2 and ArcGIS (Base map layers of data)
2. Adobe Illustrator and Macromedia Freehand (Static Map)
3. Macromedia Flash 5 and customization via ActionScript (Web-based Interactive Environment)