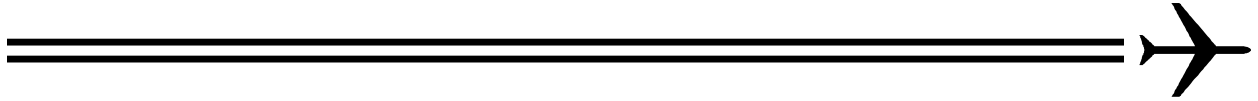


NCAR/RAP Seminar

Research Applications Program



Diurnal boundary-layer circulations in the Great Basin Desert

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Wednesday, October 31, 2001
Foothills Lab, Building 2
Room 1001, 3:00 – 4:00 pm

Results from an observation- and model-based study of the Great Basin Desert boundary layer are presented to illustrate the variety of locally forced circulations that can affect such an area during a diurnal cycle. The area of the Great Basin Desert that was studied is located to the southwest of Salt Lake City, Utah. It is characteristic of the arid "Basin and Range" province of North America in that it contains complex terrain, varied vegetation and substrates, and high water tables associated with salt-encrusted basin flats (playas). The study area is especially well instrumented with surface meteorological stations operated by the Army's West Desert Test Center and a collection of cooperating mesonets in northeastern Utah. The study period was chosen based on the availability of special radiosonde data in this area.

One of the processes that is documented here that is unique to desert environments is the salt breeze that forms around the edge of playas as a result of differential heating. The data and model solution depict the diurnal cycle of the salt breeze, wherein there is on playa flow at night and off-playa flow during daylight. There is also a multiplicity of drainage flows that influence the study area at different times of the night, from both local and distant terrain. Lastly, the lake-breeze front from the Great Salt Lake and Utah Lake progresses through the complex terrain during the day, to interact with early mountain drainage flow near sunset.