Center for Environmental & Applied Fluid Mechanics

"Modeling flow over terrain: gravity waves and turbulence"

Presented by

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It is well-known that as stably-stratified air passes over obstacles such as mountains, gravity waves can be generated preferentially downstream and may propagate to high altitudes. Associated with the gravity waves at low levels are accelerated flows in the lee of the obstacle (downslope winds) and possibly rotors. These effects combine such that strong near-surface winds and turbulence are a common occurrence in the lee (typically east) of most major mountain ranges in the western half of the U.S., especially in the winter months.

In this talk the atmospheric processes conducive to the formation of gravity waves and turbulence will be reviewed, and climatologies presented. It turns out that these effects can be captured by finer-scale numerical weather prediction models, such as those that run operationally at some of the Army test ranges (e. g., the White Sands Missile Range in New Mexico and the Electronic Proving Ground in Arizona). These operational models will also be discussed and some examples of mountain waves and turbulence over those areas presented.

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11:00 a.m., 110 Maryland Hall