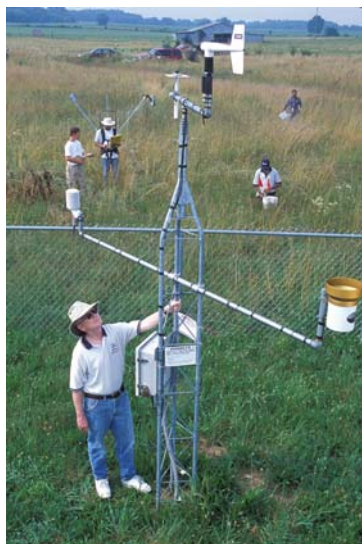


Cloud Land Surface Interaction Campaign (CLASIC) Land Hydrology

Fundamental to the Cloud Land Surface Interaction Campaign (CLASIC) is understanding the interactions between the atmosphere and the land surface. Land-atmosphere feedback mechanisms and their resulting impacts on clouds and weather have been hypothesized. Through the CLASIC observations and modeling we hope to explain and validate these hypotheses. Knowledge gained from this study will lead to better prediction tools that will benefit a broad spectrum of applications in agriculture ranging from more accurate weather forecasting to improved water management decisions and crop yield estimation.



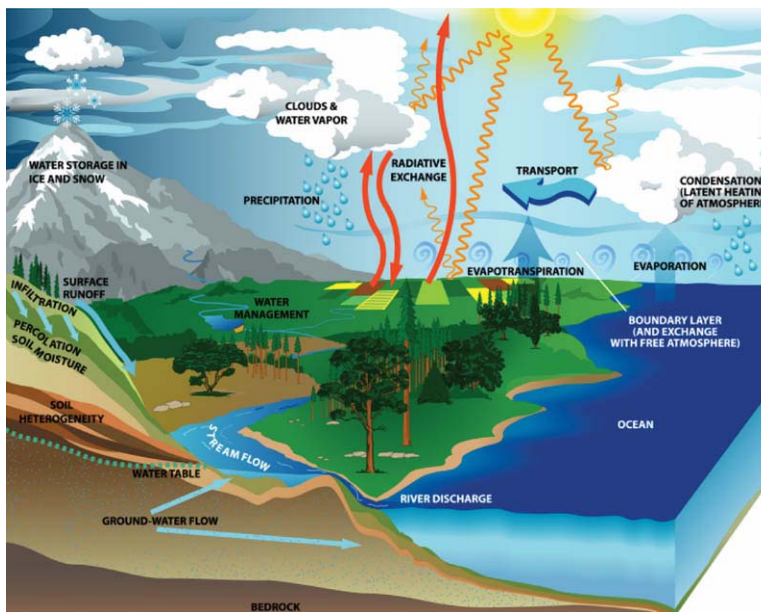
USDA, in cooperation with the National Aeronautics and Space Administration (NASA), U.S. Department of Energy (DOE), and several universities, will focus on characterizing two of the three most important hydrologic components in land-atmosphere interactions: soil moisture (the storage reservoir) and evapotranspiration (the moisture supply to the atmosphere). Precipitation (the moisture supply to the ground) is the third and is readily available.



A team of scientists and students will make highly accurate ground-based observations from two carefully selected locations west of Chickasha, Oklahoma: the Little Washita and Fort Cobb. Each of these watersheds is monitored by USDA. Several aircraft with new instruments that can remotely monitor these same ground variables will be used to transfer the point information to the entire 20,000 square mile CLASIC study area.

Science Objectives

- Soil moisture and evapotranspiration rates derived using the ground and aircraft observations and models will be used to develop and validate satellite based approaches.
- The benefit of this effort would be that the results of CLASIC field experiment could be applied over larger areas (continents and the globe), allowing us to possibly identify interactions that extend beyond the CLASIC space and time domains.



A schematic of the hydrologic cycle (Courtesy of NASA)

- Of particular interest to USDA will be the development and testing of a new aircraft based instrument for soil moisture remote sensing. This instrument is called the Passive and Active L-Band System (PALS), developed by NASA, and will fly on a Twin Otter aircraft based out of Oklahoma City. This is a prototype for a future satellite that was recently identified as one of the highest priorities for NASA by the National Research Council. It is anticipated that this approach would offer improved accuracy and an order of magnitude improvement in spatial resolution beyond current satellite options.

Partners

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 NOAA Oak Ridge
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