

## ARS Mission Statement

As the principal in-house research arm of the U.S. Department of Agriculture, the Agricultural Research Service has a mission to:

Conduct research to develop and transfer solutions to agricultural problems of high national priority and provide information access and dissemination to: ensure high-quality, safe food, and other agricultural products, assess the nutritional needs of Americans, sustain a competitive agricultural economy, enhance the natural resource base and the environment, and provide economic opportunities for rural citizens, communities, and society as a whole.

### Hydrology and Remote Sensing Laboratory

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United States Department of Agriculture

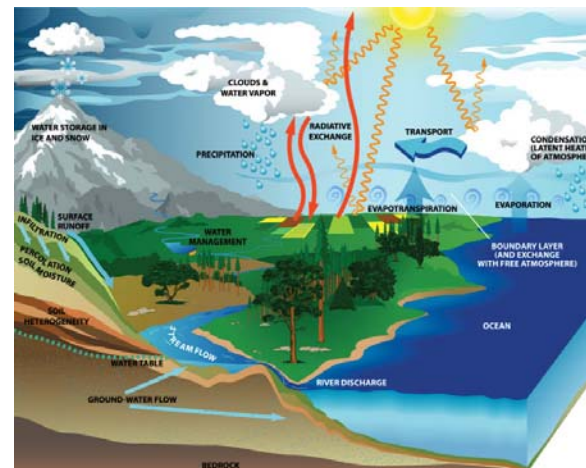
Agricultural Research Service

## Hydrology and Remote Sensing Laboratory



## HRSL MISSION

The mission of the Hydrology and Remote Sensing Laboratory is to conduct nationally orientated basic and applied research on water resources and remote sensing concerns related to the production of food and fiber and the conservation of natural resources.



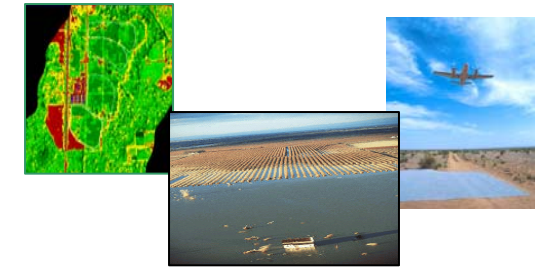
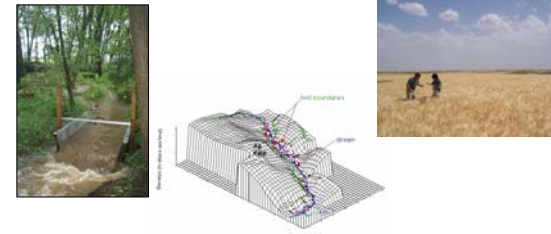
Courtesy: NASA

## RESEARCH OBJECTIVES

The Hydrology and Remote Sensing Lab consists of 12 research scientist and 5 support scientist who are involved in one or more of the following major research projects.

- Develop remote sensing methods for quantifying nutrients and constructing nutrient budgets for crops at the leaf, field, watershed, and regional scales.
- Develop methods for measuring crop residue cover and soil organic carbon at the field, watershed, and regional scales.
- Develop remote sensing-based methods for quantifying and mapping zones for site-specific crop and soil management

- Develop techniques for deriving local, regional, and global soil moisture, surface temperature, vegetation cover, crop yields and surface roughness distributions by integrating in situ measurements, remote sensing observations and land surface modeling products.
- Investigate the utility of remote sensing data and water-energy-carbon flux models in evaluating the effects of spatial variability and scale on surface states and fluxes from field and farm to watershed and regional scales.
- Develop a method for integrating remote sensing data with land surface-atmosphere models to understand the effects of landscape heterogeneity on local and regional energy fluxes.
- Integrate micrometeorological measurements of carbon exchange into regional models of ecosystem processes, which are driven by remotely sensed vegetation indices, for rangelands and evaluate soil carbon sequestration models in crop lands.
- Develop improved methods for evaluating subsurface water movement and chemical transport.
- Develop methods to delineate plant available water zones within watershed.
- Develop and evaluate protocols to identify water and chemical source areas of watershed.
- Develop and evaluate innovative management strategies and recommendations to reduce soil and agricultural chemical export to neighboring ecosystems.



## ADMINISTRATION

### Beltsville Area

Director: Joseph Spence  
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## SCIENTISTS

### Joe Alfieri *Physical Scientist*

Research interests: Surface energy and flux modeling, scaling, and landscape heterogeneity.

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### Martha Anderson *Physical Scientist*

Research interests: Water, energy and flux mapping, drought modeling, remote sensing, landscape heterogeneity.

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### Michael Cosh *Hydrologist*

Research interests: Soil moisture networks, remote sensing, satellite validation, spatial geostatistics, and scaling

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### Greg McCarty *Soil Scientist*

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### Ali Sadeghi *Soil Scientist*

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