



Remote Sensing and the Detection of Change in the Global Water Cycle

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The continued improvement of climate models has led to growing confidence in their projections of change for the global water cycle associated with increasing concentrations of atmospheric greenhouse gases. In particular, some elements of the water cycle with implications for water resources such as cloud cover, precipitation, soil moisture and runoff are expected to be affected. Other anthropogenic factors including land use change, aerosols, and water management may also be affecting these variables. Some changes in the water cycle have now been confirmed regionally by observations of changes in the size of mountain glaciers and in the seasonality of runoff. These observations suggest that significant changes are underway in all parts of the water cycle that must be accounted for in water resources planning.

This presentation reviews the evidence for changes in the global water cycle and potential contributions of remote sensing in measuring their rate and extent as well as variations in forcing factors such as aerosols and land use. Processes that involve changes of phase between ice and water represent some of the most visible changes. For example, changes observed in the ice cover regimes of high latitude lakes and rivers and snow melt are occurring because of warming temperatures. Other factors that need to be monitored include the water holding capacity of the atmosphere, precipitation regimes and their variability, and the frequency and intensity of extreme events. Opportunities for remote sensing applications in each of these areas will be discussed.