

## A Land Information Sensor Web (LISW) study in support of land surface STUDIES

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**Abstract:** To meet future earth system science challenges, NASA will develop constellations of smart satellites in sensor web configurations which provide timely on-demand data and analysis to users, and can be reconfigured based on the changing needs of science and available technology. A sensor web is more than a collection of satellite sensors. According to a most recent definition by NASA/AIST 2007 Sensor Web investigator meeting, “A Sensor Web is a coherent set of heterogeneous, loosely-coupled, distributed nodes, interconnected by a communications fabric that can collectively behave as a single dynamically adaptive and reconfigurable observing system”. That means, a sensor web is a system composed of multiple platforms interconnected by a communication network for the purpose of performing specific observations and processing data required to support specific science goals. Sensor webs can eclipse the value of disparate sensor components by reducing response time and increasing scientific value, especially when integrated with science analysis, data assimilation, prediction modeling and decision support tools. The study of a prototype Land Information Sensor Web (LISW) is sponsored by NASA, trying to integrate the Land Information System (LIS) in a sensor web framework which allows for optimal 2-way information flow that enhances land surface modeling using sensor web observations, and in turn allows sensor web reconfiguration to minimize overall system uncertainty. This prototype is based on a simulated interactive sensor web, which is then used to exercise and optimize the sensor web - modeling interfaces. These synthetic experiments provide a controlled environment in which to examine the end-to-end performance of the prototype, the impact of various design sensor web design trade-offs and the eventual value of sensor webs for particular prediction or decision support. The Study of virtual Land Information Sensor Web (LISW) is expected to provide some necessary priori knowledge for designing and deploying the next generation Global Earth Observing System of systems (GEOSS). In this paper, the design, implementation and synthetic experiments, which were achieved from the LISW study, will be presented.

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