Sensor Web Dynamic Measurement Techniques & Adaptive Observing Strategies

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Sensor Web observing systems may have the potential to significantly improve our ability to monitor, understand, and predict the evolution of rapidly evolving, transient, or variable environmental features and events. This improvement will come about by integrating novel data collection techniques, new or improved instruments, emerging communications technologies and protocols, sensor mark-up languages, and interoperable planning and scheduling systems. In contrast to today's observing systems, "event-driven" sensor webs will synthesize real- or near-real time measurements and information from other platforms and then react by reconfiguring the platforms and instruments to invoke new measurement modes and adaptive observation strategies. Similarly, "model-driven" sensor webs will utilize environmental prediction models to initiate targeted sensor measurements or to use a new observing strategy. The sensor web concept contrasts with today's data collection techniques and observing system operations concepts where independent measurements are made by remote sensing and *in situ* platforms that do not share, and therefore cannot act upon, potentially useful complementary sensor measurement data and platform state information. This presentation describes NASA's view of event-driven and model-driven Sensor Webs and highlights several research and development activities at the Goddard Space Flight Center.