**Motivation**

NASA’s Soil Moisture Active Passive (SMAP) mission will use noisy, high resolution (3km) active microwave observations together with more accurate, low resolution (40km) passive microwave observations to enhance the accuracy and resolution of current global soil moisture products. Airborne and ground field data are needed to develop and test active microwave and joint active/passive microwave retrieval algorithms in preparation of SMAP launch.

**Study Area**

An instrumented semi-arid agricultural area in the Murrumbidgee catchment, NSW, Australia. The area presents 6 experimental farms and a mix of irrigated crops, dryland crops and dryland pasture.

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**The SMAP Airborne Simulator**

A low-cost, low-weight airborne facility including L-band active microwave radar, passive microwave radiometer, and ancillary sensors is available in Australia to simulate SMAP observations for SMAP algorithm development.

**Airborne Field Experiments**

4 field experiments for SMAP algorithm development will be undertaken in 2010 (Table I) to capture seasonal soil moisture variability and crop growth.

**Monitoring Strategy**

Each campaign will provide SMAP-like observations of one SMAP pixel (~36km x 36km) by aggregation of airborne observations with scaled SMAP radar/radiometer resolution ratio. Concurrent ground continuous and spatially distributed (250m) soil moisture measurements of 6 simulated SMAP radar pixels (3km) will be used for algorithm verification.