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Water seekers awarded \$1 Million

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More than \$1 million has been awarded for a project to develop new techniques which will help farmers make use of water trapped in soil and could relieve pressure on Australia's key water catchments.

Dr Jeffrey Walker, from the University of Melbourne's Department of Civil and Environmental Engineering, says Australia's main river basins are under mounting pressure to satisfy a wide range of competing needs for water and that farmers are feeling the strain of limited access to this crucial resource.

"A better understating of soil moisture distribution on farmland will make a huge difference to farmers because it will enable them to develop better techniques for using water in soil and to make better use of their limited allocation for irrigation," he says.

The research is not only of value to farmers. For example, soil moisture and its impact on water and energy fluxes can influence weather and climate predictions.

"It has been shown that soil moisture is more important than surface sea temperatures (indicator of El Nino/La Nina) in making precipitation forecasts over land at mid latitudes."

"So, more accurate soil moisture estimates should lead to better weather and climate predictions," Dr Walker says.

"To date, there are no high-resolution soil moisture products available, and in fact there is not even an operational low resolution product available. So far, we are the only group to have developed an airborne system for making such high resolution soil moisture measurements together with such a wide range of supplementary data to be used for collecting the most detailed land surface information."

The Australian Research Council (ARC) recently awarded Dr Walker and colleagues from the University of Newcastle, Flinders University and NASA \$667,000 for a three year project to undertake high-resolution mapping of surface and root-zone soil moisture in key areas of Australia. This will involve several large airborne campaigns utilising some new ARC-funded equipment.

\$657,000 (ARC-LIEF grant) was awarded 12 months ago for a thermal imager and polarimetric I-band microwave radiometer (plmr), which measures naturally emitted electromagnetic energy from the earth's surface at microwave wavelengths that can be related back to soil moisture.

Manufacture of this instrument has just been completed and is currently being installed on

an aircraft from the Airborne Research Australia National Research Facility at Flinders University for test flying in April.

A further \$338,000 (ARC-LIEF grant) was recently awarded to enable the purchase of an airborne laser scanner (LIDAR) for creating high precision, high resolution digital models of the terrain.

“This terrain information together with the thermal and other data will enable the development of techniques for increasing the current resolution of satellite observations. Additionally, these instruments are being used for satellite validation and algorithm development,” Dr Walker says.

To ensure that Australian scientists are able to take maximum advantage of the extensive airborne data to be collected over the next two years, a National Airborne Campaign is being organised and was recently kick-started with a workshop held at the University of Melbourne in February.

Dr Walker says the workshop has initiated a huge collaborative effort across a range of disciplines.

“During the campaigns there will be some 40 people on the ground making detailed soil moisture and related measurements, including visitors from NASA, the European Space Agency, CSIRO and national and international universities.”

“A lot of these people will also be collecting data for a range of other related activities including bushfires, forestry mapping, carbon mapping and so on.”

The researchers are currently preparing for their first major airborne campaign which will take place over the Goulburn River in November this year. The second campaign will take place over the Murrumbidgee River a year later.

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