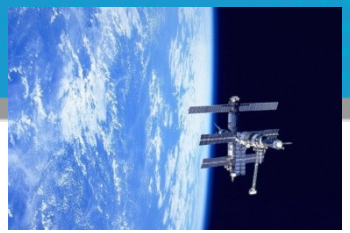
Yenda Activities

John Hornbuckle

CSIRO

Overview of IrriSATSMS



Satellite Measurements

Satellite images used to determine plant performance of an irrigators crop

Incorporates management/soil/water/salinity constraints

Determination of a crop coefficient (Kc) from satellite image

Representing Individual Paddocks

Crop water use determined and irrigation requirement

On Ground

ETo from Weather Stations

Potential Evaporation based on Atmospheric Demand

ETc = ETo X Kc

Daily irrigation scheduling information delivered to irrigators through SMS

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Kc maps available online across Australia

http://www.irrigateway.net/kcmap/

irriGATEWAY

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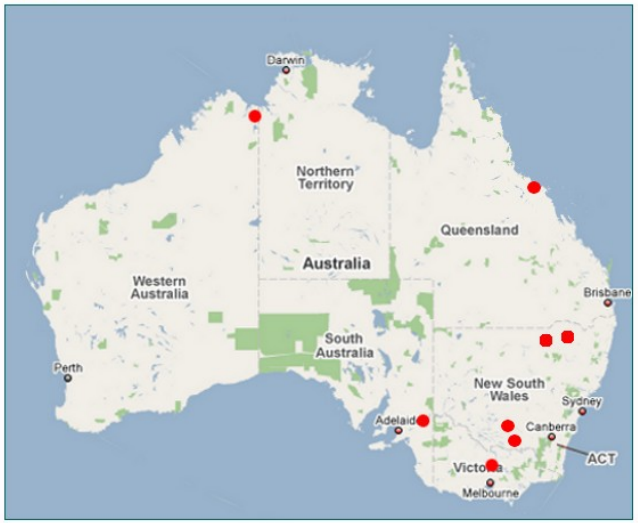
K_c Maps Home | Methodologies and FAQ

K_c Maps for irrigation districts *(prototype)*

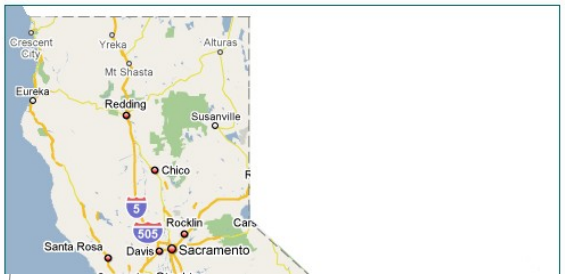
Choose from the locations marked on the maps below.

Australia



- Burdekin
- Coleambally
- Goulburn-Murray Water:
  - Central Goulburn
  - Murray Valley
  - Rochester-Campaspe
  - Shepparton
- Gwydir
- Murrumbidgee
- Namoi
- Ord
- SA Lower Murray

California



- San Joaquin, California:
  - Alta Irrigation
  - Consolidated Irrigation
  - Kaweah Delta
  - Tulare Lake Basin
  - Broadview
  - Firebaugh Canal
  - Panoche

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Ord Irrigation Area *(prototype)*

Choose a map by date: 2009 08 05 Load

Legend: 1.1 0.3

You are viewing the K_c map for 05/08/2009.

Australia:

- Burdekin
- Coleambally
- Murrumbidgee
- Ord
- Goulburn-Murray Water:
  - Central Goulburn
  - Murray Valley
  - Rochester-Campaspe
  - Shepparton

California:

- Alta Irrigation
- Consolidated Irrigation
- Kaweah Delta
- Tulare Lake Basin
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- Panoche

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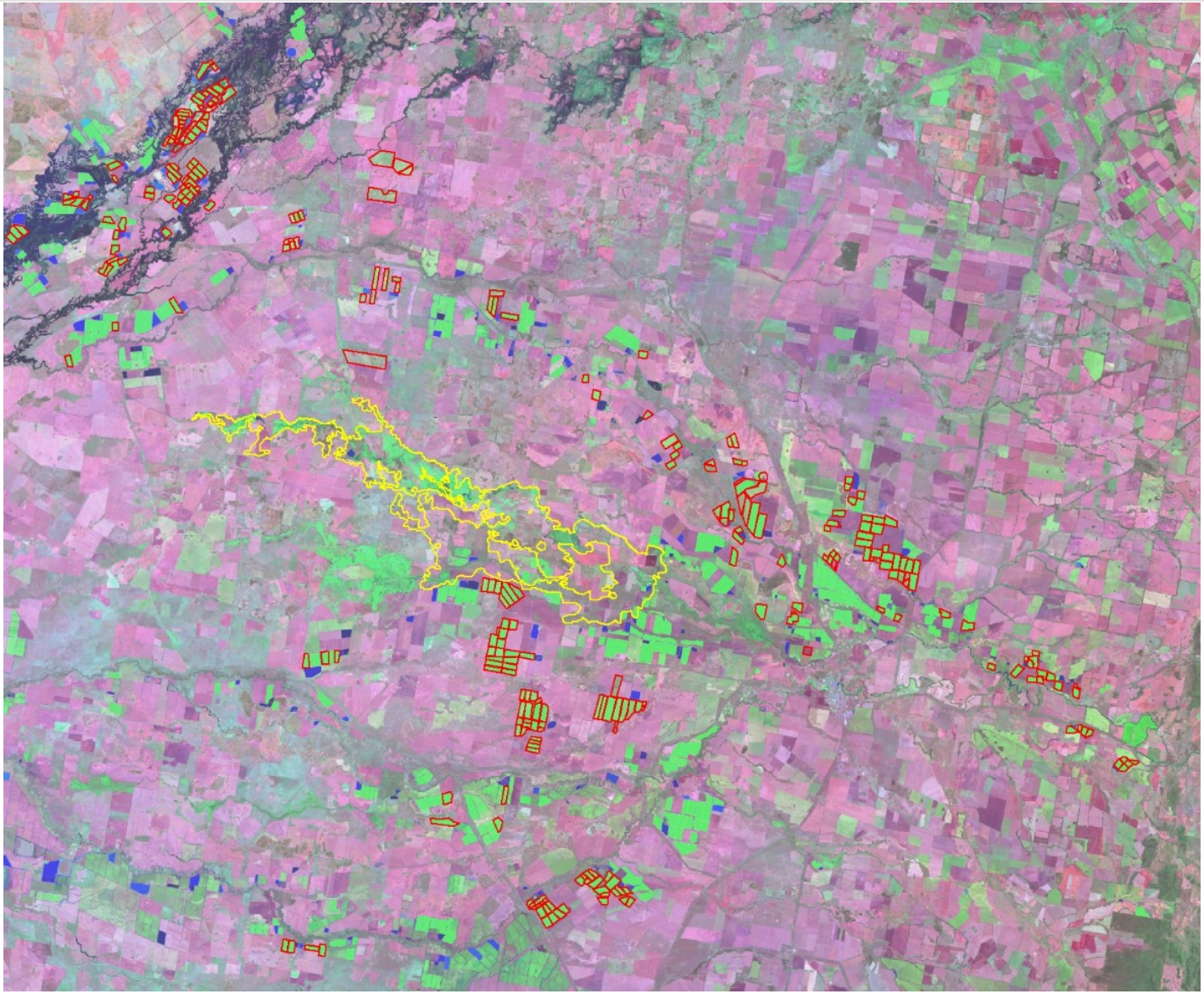
Gwydir - Cotton

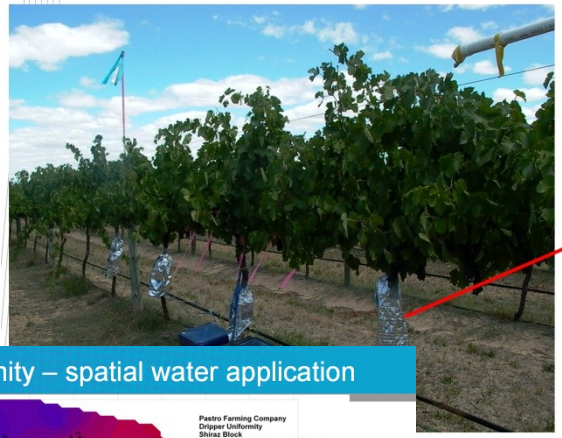


Issues

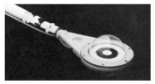
- Forecast ETo data
  - Developed own 7 day forecast –see www.irrigateway.net
- Water-Carbon-Energy nexus
- Rainfall – Runoff
  - Move from Californian summers (little rain) to more wet summers where rainfall begins to significantly contribute to irrigated plant water use

Yenda monitoring

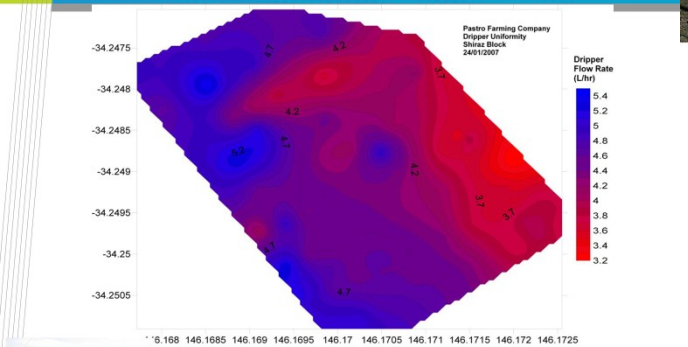
Sapflow sensors



Energy Balance Instrumentation



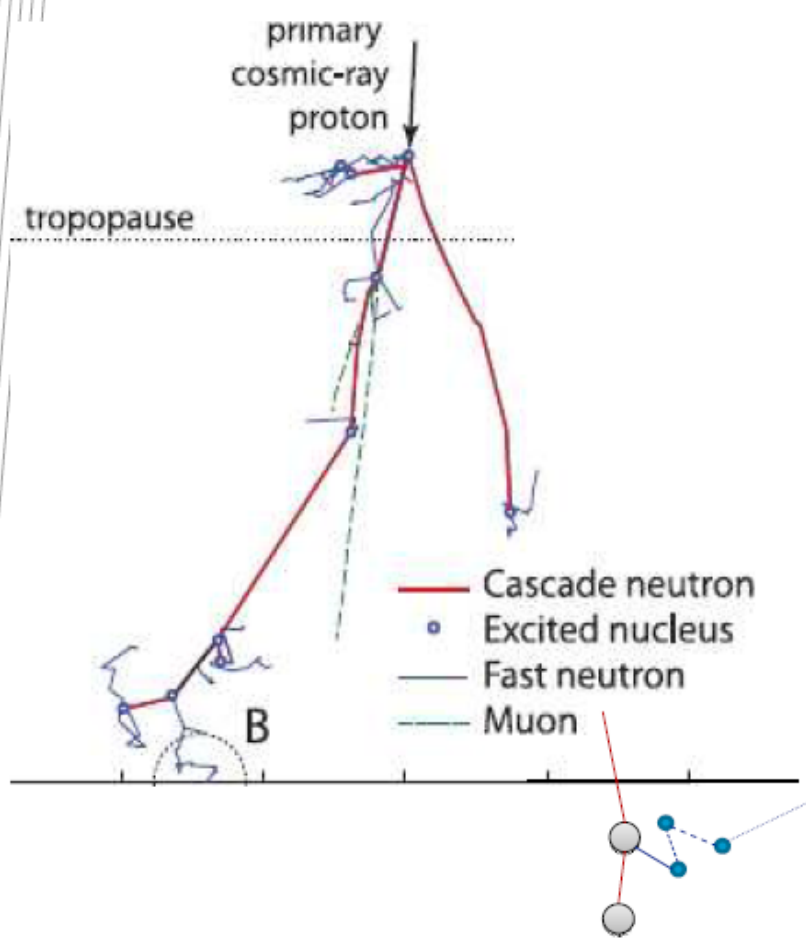
Dripper Uniformity – spatial water application



Electromagnetic Soil Surveys – EM38

COSMOS Soil Moisture Probe – van dijk

Measurement principle



Proportional counter
(^{3}B or ^{10}He)
turns neutron into pulse count

Moderator
(polyethylene)
keeps slow neutrons in

Producer
(Cadmium)
uses fast neutrons to produce slow neutrons

Reflector
(polyethylene)
keeps out slow neutrons

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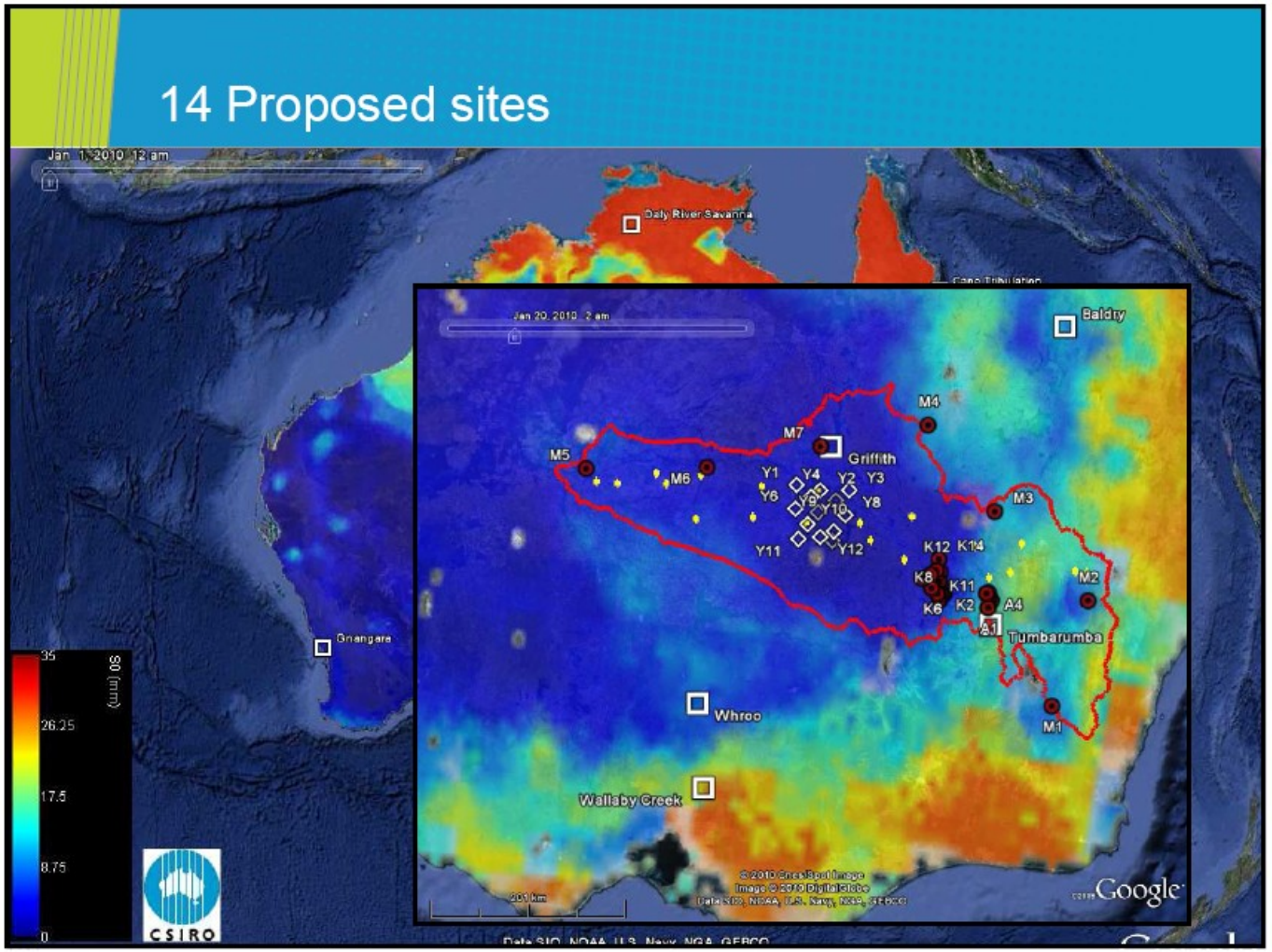
COSMOS – van dijk



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COSMOS – van dijk

Advantages and Disadvantages

Advantages

- Large radius of integrated measurement (~700 m)
- Non-contact, no moving parts = rugged
- Salt, ice, rocks no problem
- Integrates over several dm depth

Disadvantages

- Still early days for this application
- Corrections for variations in cosmic radiation dose (solar activity, pressure, humidity) proposed but need more verification
- Source depth varies with water content (10 to 70 cm)
- Price (~$20k)

COSMOS – Yenda site

- Probe will be installed within the next few weeks
- Ability to control irrigation water will be used to test the use, accuracy and sensitivity of the probe
- Issues
  - Sensitivity at the wet end (problem for irrigation soils)
  - Response time at the wet end

Future

- Moving irriSAT to commercial footing for field/farmer scale
- Newer Australian projects are focused on irrigation water demand/ordering at the irrigation area scale – possibly more use/potential application of NAFE/SMOS data
- New projects in Cambodia and Iraq on irrigation water management – interested in any RS data anyone here maybe using/generating for these regions
- Ensuring Landsat remains operational

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