Rural Research and Development for Profit Programme

# *Smarter Irrigation for Profit*

TASMANIAN INSTITUTE OF AGRICULTURE

Rural Research and Development for Profit
Keeping Australian farmers at the cutting edge

Australian Government
Department of Agriculture and Water Resources

Dairy Australia

UNIVERSITY OF SOUTHERN QUEENSLAND

NCEA
National Centre for Engineering in Agriculture

UTAS

TIA is a joint venture of the University of Tasmania and the Tasmanian Government

Tasmania
Explore the possibilities

# Project target

The Project is expected to result in:

- (a) 10-20 per cent improvement in water productivity, efficiency and farmer profitability;
- (b) adoption of new irrigation technologies and science application by farmers and irrigation professionals to improve farm profits; and
- (c) improved cross-sector industry research collaboration with public and private sectors in four major irrigation industries providing a legacy platform for other sectors to also benefit.

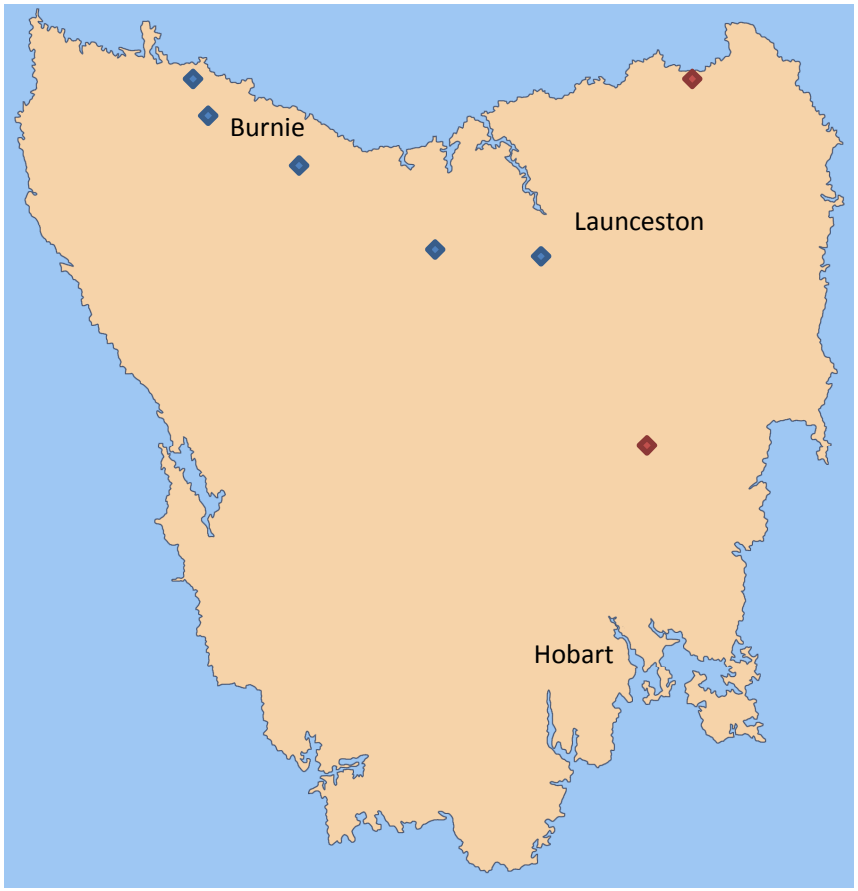
# Smart Automated irrigation

- Increasing farm profit through efficient use of irrigation input to dairy pastures
  - Five Farmer sites
  - Monitoring and Benchmarking
  - Automation (VARIwise)

# Trial sites

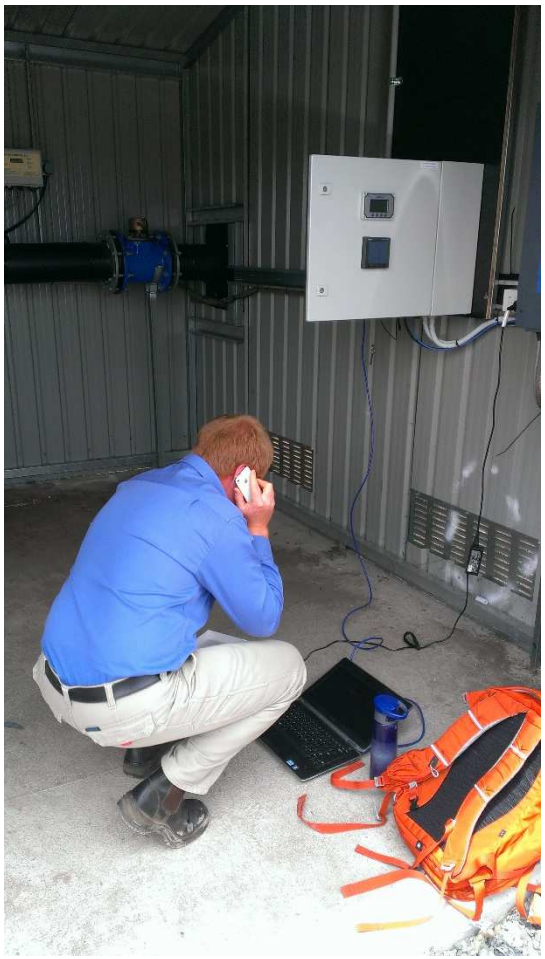
- Cressy (Cressy Clay loam)
- Montana (Alluvial river flat)
- South Riana (Ferrosol)
- Sisters Creek (Ferrosol)
- Rocky Cape (Sandy loam)

Elliott (TIA Dairy Research Facility)



# Monitoring equipment installed

- Power meters
- Flow meters
- Soil moisture probes
- Weather stations
- Data loggers
- Cameras



# Soil moisture

Hydrological services –
SD1-12 with Radio unit

# Water

- Aquatrans AT600 Ultrasonic flow metre
- Easy to use
- Easy to install with no modification required to pipe work
- Accurate

# Power


- PM810RDMG Power Metre
- Web interface
- Alarms on critical conditions
- Power quality
- Ethernet interface
- Compatible with power management expert
- Reputable Schneider brand

# Weather data

- Davis vantage pro 2 plus

# Pasture sensors

# Data


WEATHER STATION

IRRIGATOR

PUMP

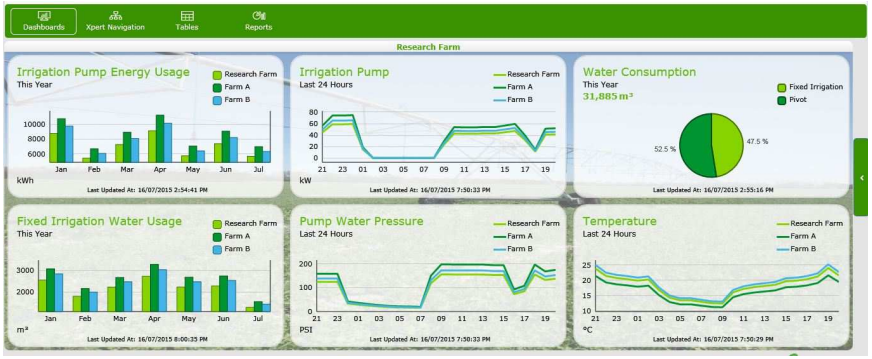
WATER

POWER

PRESSURE

TEMP

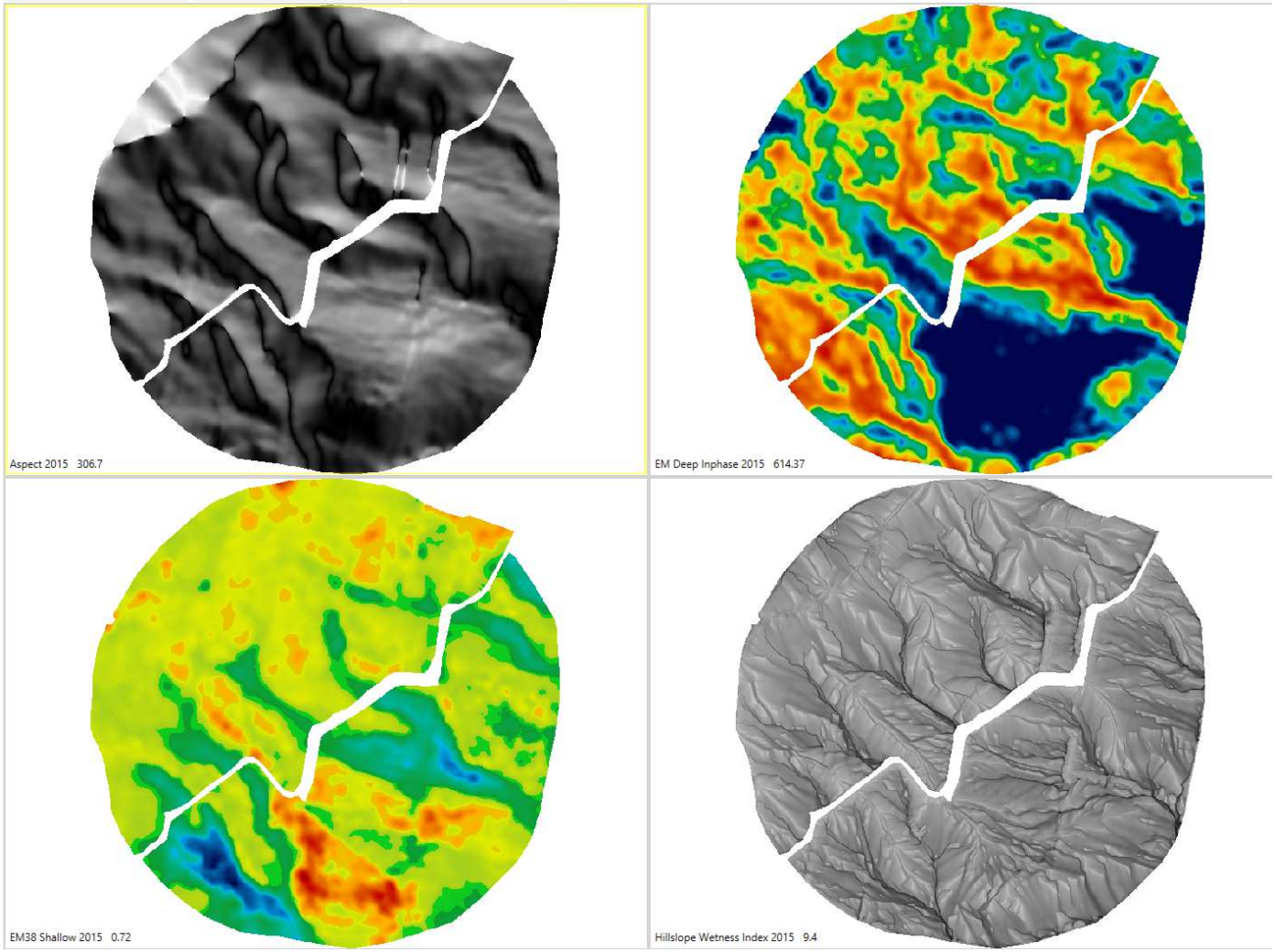
# PME and DEX interface




# Site characterisation

- Site characterisation
  - Detailed mapping
    - (EM38, elevation etc)
  - Soil description
  - Soil cores
  - Soil chemistry

# Variability maps



# Soil cores

# Pasture walks

# Key activities

- Human interface
  - 4 sites
  - Benchmarking to inform potential modifications – 15/16
  - Consultative process with stakeholders leading to agreed practice change
  - Changes evaluated in 16/17
  - Re-evaluated, refined and reassessed in 17/18

- Machine interface
  - 1 site
  - VARIwise
  - Model development and parameterisation in first year
  - Evaluated during 16/17
  - Enhanced development towards autonomous control and testing 17/18

# Key learnings for 2015/16

- Measures of variability (EM38 etc)
- Energy use
- System capacity
- Pasture productivity
- Automation

- Irrigation startup