This presentation premiered at WaterSmart Innovations

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Urban Water Management

Is it a Water Supply Crisis or a Water Management Crisis

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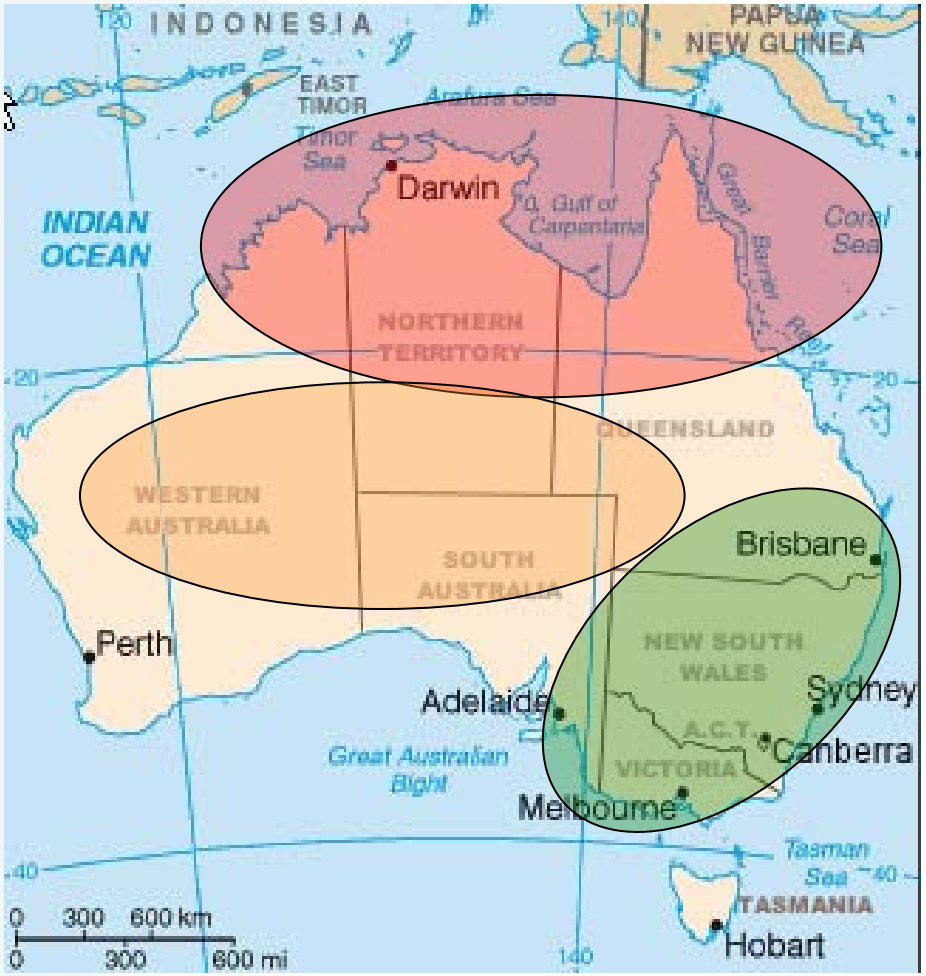
Urban Water Management

- Three Major Topics
  - Australian Drought
  - Case Studies
  - Whole of Community Irrigation Management (WOCIM)

Australia (compared with USA)

- Land Size 83%
- Population 7%
- Arable Land 28%
- GDP – 85% (per capita)
  - Higher than Western Europe



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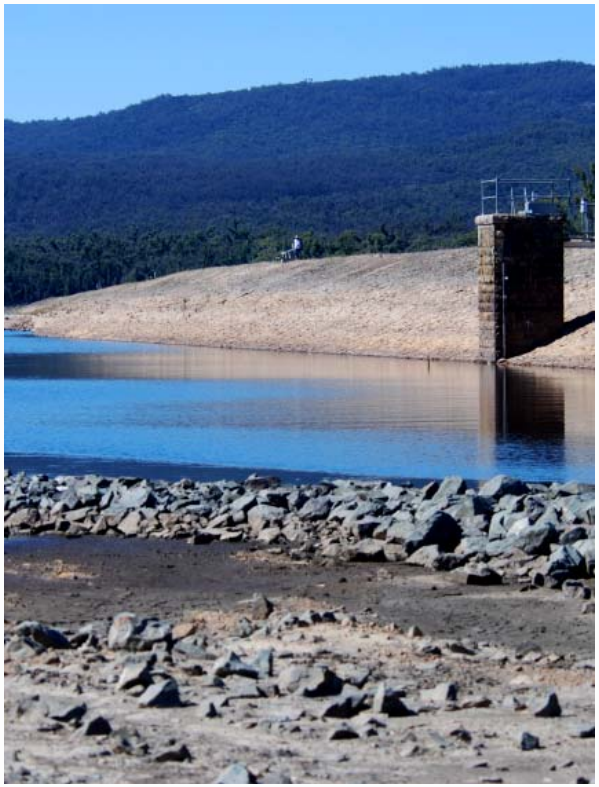
The Australian Drought

- A drought has affected much of the country's south-east.
- For around 10 years below average rainfall has been the outcome of persistent Il Nino affecting Australia.
- The worst-hit areas over the long term were SE Queensland, southern Victoria and SW Western Australia, as well as the Murray-Darling river basin, the country's agricultural heartland.
- Cotton production along the Murray Darling River was reduced to 25% of normal.
- Dams and reservoirs levels dropped to critical levels in many areas affecting urban populations through very strict water restrictions

Government Response …

- Australia's federal government committed more than $3Bn to drought relief since 2001.
- A further $10Bn was also allocated in 2006
- The drought cut 10 percent off the value of Australia's agricultural production in 2006-07, taking total output down to $34.2Bn.
- $2Bn has been allocated to modernise the irrigation channels in Northern Victoria. The objective is to re-direct 30% of water from the Goulburn-Murray Water District to Melbourne for domestic supplies.
- Most cities are under strict water restrictions to level 4 and 5. This has resulted in parks and gardens being allowed to dry out. Trees have died and some playing surfaces are no longer ‘playable’.



Water is now an economic resource

- Newspaper Articles
- Are water shortages a sign of climate change?
  - Public Reactions
  - Government Reactions
- Water shortages are world-wide
- World food shortages partly caused by water and by an increase in bio-fuel production.
- Rice production in Australia has dropped by 61% in the last 5 years

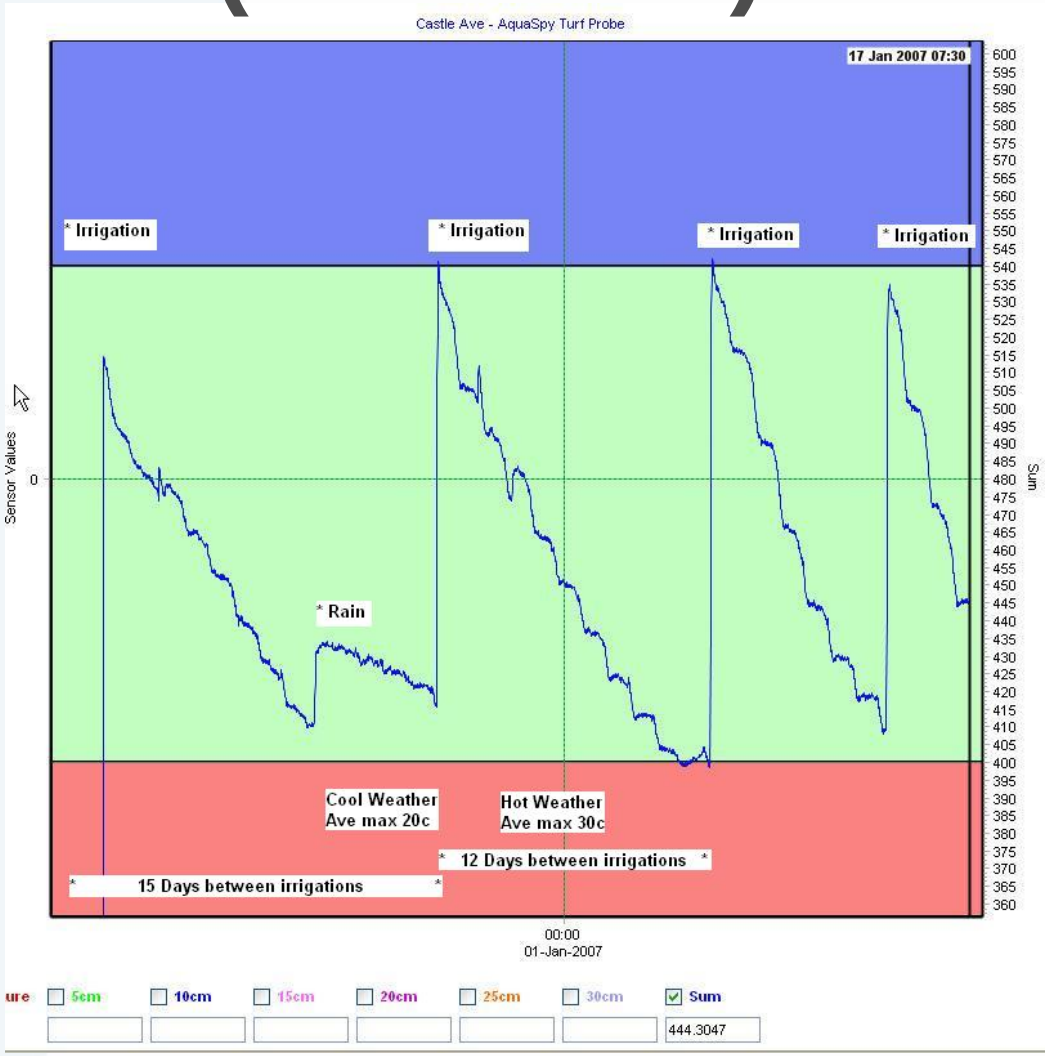
Water Use Efficiency

- Doing more with less – Efficiency is the key!
- Manage the resource
- Be efficient with water to:-
  - Maximise crop yield
  - Maximise quality of product
  - Minimise wasted water
  - Reduce pollution by sending nutrients into the Aquifer or River systems
- By-products of being more efficient:
  - Reduce green house gases
  - Help Save the Planet

Water is Heavy…

Water Restrictions (Domestic)

- On the right is a soil moisture profile before and after restrictions. In reality watering was needed initially after 15 days.
- However with higher temperatures, watering was needed more often (probably 9-10 days). Water restrictions however forced him to irrigate every 7 days.



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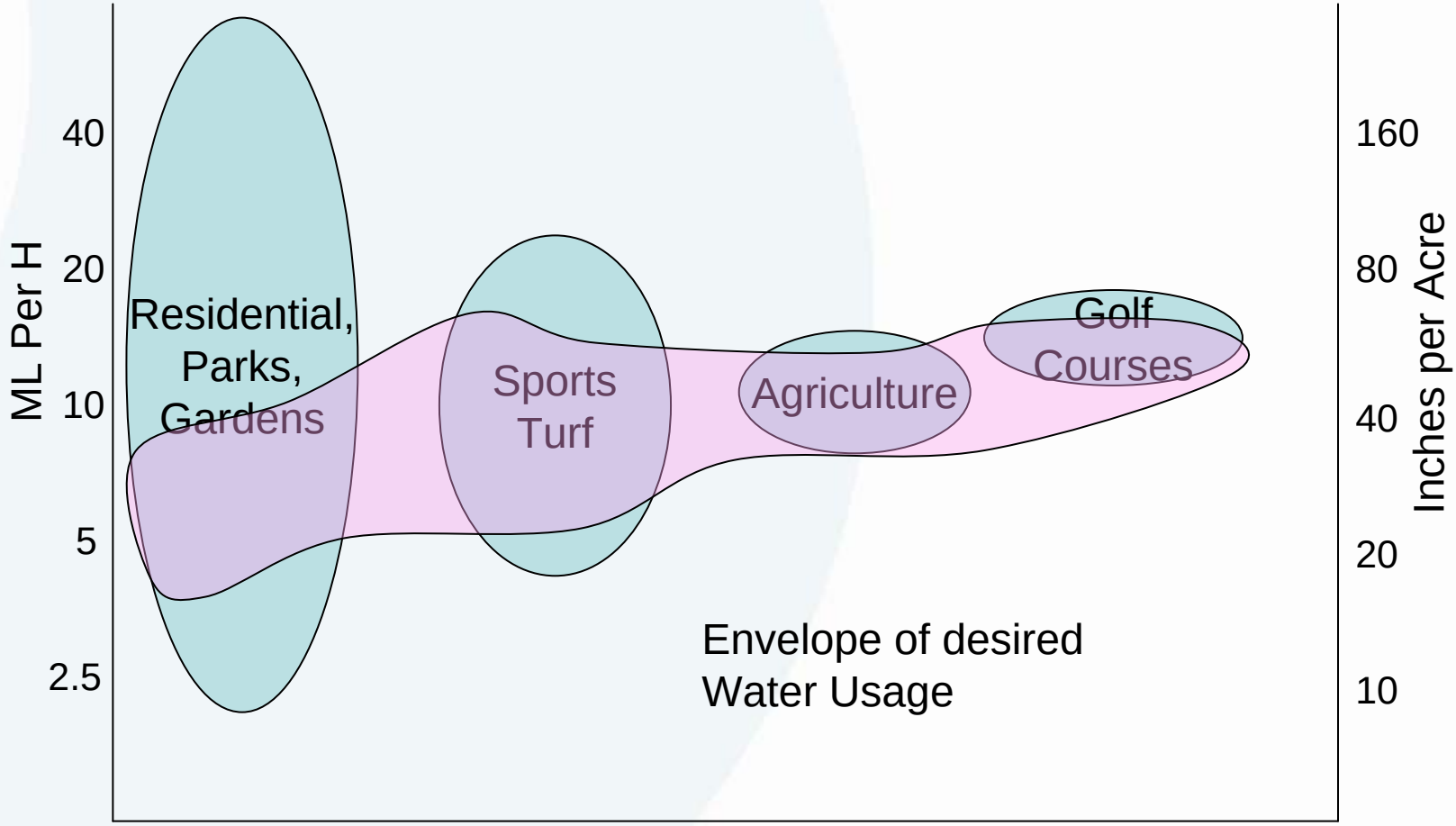
Typical Water Usage



* Vertical scale is exaggerated

Automatic Watering Systems

- Time
  - Standard approach used in domestic timers
- Volume
  - Measure water flow and therefore volume
  - Applied as mm or inches of water
  - Can be used directly with ET data for control
- Demand
  - Ask the plant what it needs
  - Direct feedback from the source to determine requirements.

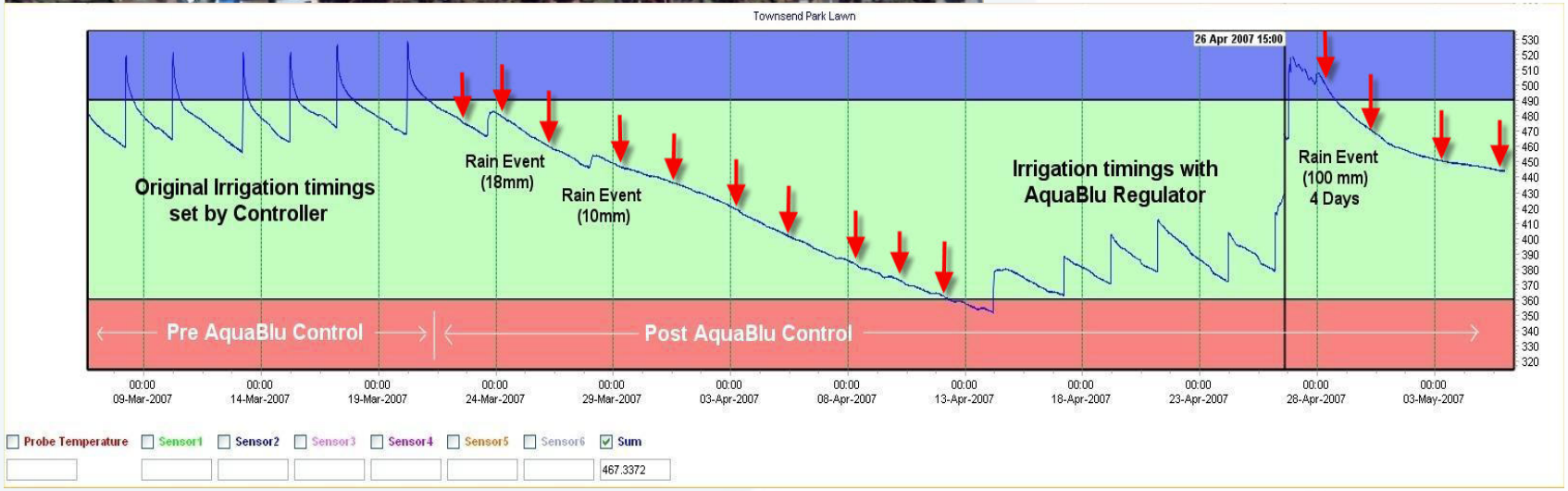
Sensing and Control Products

AquaSpy 12 inch Turf Probe
(6 soil moisture sensors every 2 inches plus temperature)

AquaBlu – Single Soil Moisture sensor with a regulator

Residential and Retirement Site

AquaBlu Soil Moisture Controllers were fitted to automatic watering systems using underground drip. This demonstrated that the organisation had been substantially over watering by as much as 73%. The AquaBlu curtailed this over watering.



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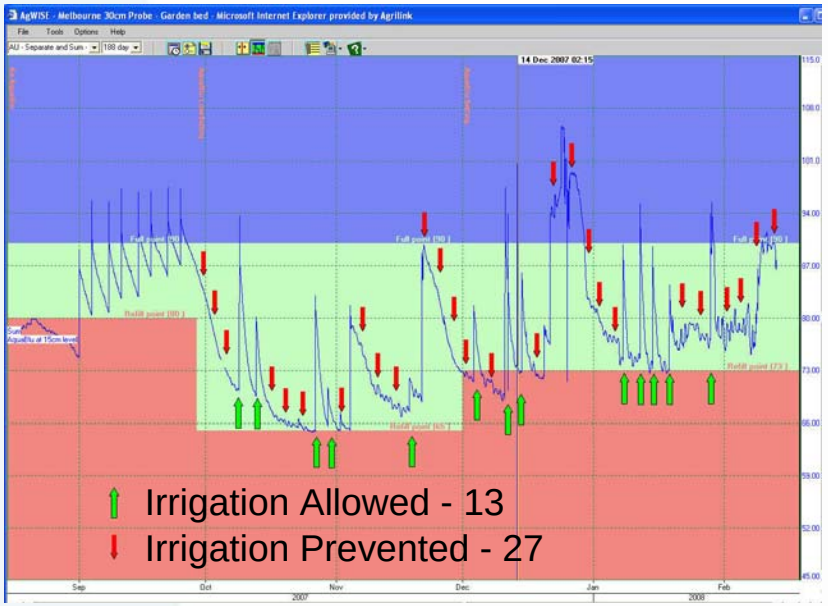
Urban Landscape

- Over a 5 month period, 40 irrigations programmed by irrigation timer:-
  - 13 irrigations were allowed
  - 27 irrigations were prevented
  - About 60% water was saved



- An **AquaBlu** was installed in a landscaped garden bed at a warehouse situated in an industrial park in Melbourne,
- The garden bed was installed with drippers in August 2007 to comply with the water restrictions in place at the time and programmed to irrigate 2 times a week.
- An **AquaSpy Turf probe** was installed in the same garden bed to monitor the **AquaBlu**.

WOCIM – Whole Of Community Water Management

A ‘community’ can be any cluster – farms, houses, parks, golf courses, cities or even countries!

Tiered model for Demand based irrigation

Tier 1 – Sensor layer

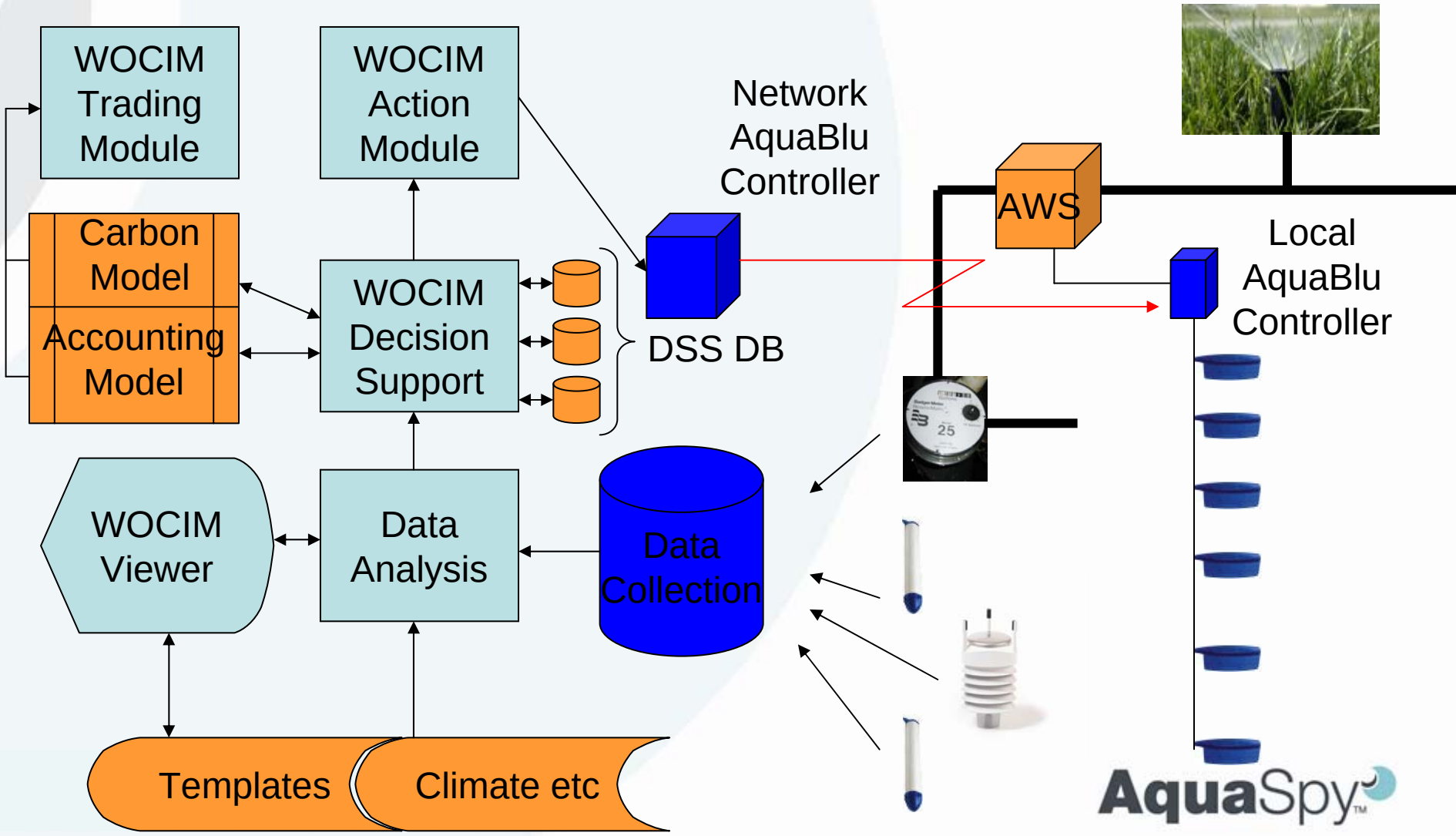
Tier 2 – Analysis Layer

Tier 3 – Control Layer

Tier 4 – Accounting Layer

Tier 5 – Carbon and Water Trading Layer

WOCIM Model


WOCIM Trading Module
WOCIM Action Module
Network AquaBlu Controller
AWS
Local AquaBlu Controller
Carbon Model
Accounting Model
WOCIM Decision Support
DSS DB
WOCIM Viewer
Data Analysis
Data Collection
Templates
Climate etc
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Summary Benefits

- Minimise water use
- Minimise power (pump) use
- Minimises cost of fertilizer
- Optimises quality (and yields in agricultural output)
- Reduces run-off and pollution
- Takes the pressure off Supply of Water and onto DEMAND Management and Water Use Efficiency.

“We shouldn’t have a Water Supply Crisis if we managed correctly”

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Thankyou and Questions