Digital Soil Assessment: Guiding Irrigation Expansion in Tasmania, Australia

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Operational Digital Soil Assessment to Determine Enterprise Suitability - Tasmania

The Wealth from Water Pilot Program is a two-year, $2.15 million undertaking that commenced in November 2010, primarily to support Tasmanian State Government Irrigated Agricultural Expansion Policy through Land Suitability Assessment. Provides farmers and agribusiness with information needed to confidently invest in Tasmanian Irrigated Agriculture, and planning to address current State expansion in irrigated agriculture ($400 million public-private schemes).

Wealth from Water is a partnership between the:
- Department of Primary Industries, Parks, Water and Environment, Tasmania
- Department of Economic Development, Tourism and the Arts, Tasmania
- Tasmanian Institute of Agriculture (University of Tasmania)
- University of Sydney, Faculty of Agriculture and Environment (ARC Linkage)
-ACLEP (Australian Collaborative Land Evaluation Program)
WEALTH FROM WATER AIMS:

1. Generate soil (DSM), climate, crop and enterprise suitability data

2. Classify Land (within Tasmanian Irrigation Schemes) according to its suitability for various agricultural enterprises (Approximately 70,000ha as a pilot (Dec 2012), 20 Enterprises) - potentially 340,000ha

3. Aid existing or potential farmers/ investors to move or diversify into high-valued enterprises, and/ or increase existing production.

4. Stimulate up-take of new irrigation scheme water-allocation licenses
WEALTH FROM WATER:

Legend

- Temperature Loggers
- Training/Validation Soil Samples

cLHC and Fuzzy k-means Sample Designs
### Suitability Requirements

#### Crop Suitability Rules: Blueberries

<table>
<thead>
<tr>
<th>Crop</th>
<th>Soil Depth</th>
<th>Depth to Sodic Layer</th>
<th>pH of top 15cm (H2O)</th>
<th>EC</th>
<th>Texture (top 15cm - % clay)</th>
<th>Drainage</th>
<th>Stoniness (top 15cm)</th>
<th>slope</th>
<th>Frost (To be revisited when more is known about format of outputs)</th>
<th>Mean Max. Monthly Temp.</th>
<th>Rainfall (frequency and intensity and season to be determined)</th>
<th>Growing Season (GDD)</th>
<th>Chill Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>&gt;100cm</td>
<td>5.5-7</td>
<td></td>
<td></td>
<td></td>
<td>Wall, Med</td>
<td>&lt;20%</td>
<td>&lt;12%</td>
<td>Min air temp &gt;0°C Aug and Sept</td>
<td>20-26°C</td>
<td>low</td>
<td>800-1200</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>75-100cm</td>
<td>4.5-5.5</td>
<td>5.7-6.7</td>
<td></td>
<td></td>
<td>Imperfect</td>
<td>20-35</td>
<td>12-20%</td>
<td>26-30°C</td>
<td></td>
<td></td>
<td>700-800</td>
<td></td>
</tr>
<tr>
<td>MS</td>
<td>50&gt;75cm</td>
<td>6.7-7.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>35-50</td>
<td></td>
<td>Min air temp &lt;=-6°C August &lt;=-4°C September &lt;0°C October-March</td>
<td>&gt;30°C</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>&lt;10cm</td>
<td>&gt;50cm</td>
<td>&lt;4.5 5.5</td>
<td></td>
<td></td>
<td>Poor, v. poor</td>
<td>&gt;50%</td>
<td>&gt;20%</td>
<td></td>
<td></td>
<td></td>
<td>&lt;700 &gt;1200</td>
<td></td>
</tr>
</tbody>
</table>

* Rules derived by TIAR from a combination of research, literature, industry workshops and expert opinion
- Example of Government Investment in an Operational Digital Soil Assessment
- Build Tasmanian Government DSM Capacity, through Australian Research Council Linkage Project with University of Sydney