Earth observation derived crop mapping to help produce agriculture statistics

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Using satellite derived crop mapping to create agriculture statistics – sugarcane case study

- Australian Sugar Milling Council - Regional production totals from Sugar Mills
- Levy Payers Register - Unit record production data with addresses
- Government Satellite Mapping of Sugarcane
Satellite derived sugarcane crop map
Sugar Cane Levy Payers Register
Business locations and tonnes of sugarcane harvested

1. Records in Urban Areas - untrusted
2. Records where there is no sugarcane - untrusted
Determining trusted sugarcane business locations – business counts by statistical area level 2 (SA2)
Automated, iterative process to aggregate & apportion levy payer data to statistical areas level 2

1. Divide levy record locations into trusted/untrusted
   - Trusted
     - Aggregate to SA2
       - Ensure SA2 confidentiality is met
       - Benchmark to Sugar Region production totals
       - Any big yields?
         - No
           - Create SA2 totals
         - Yes
           - Set largest record in big-yield SA2s as untrusted
   - Untrusted
     - Divide into 3 untrusted groups
     - Aggregate levy totals in each group
     - Apportion aggregates based on SA2 crop area

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# Measures of re-allocation of levy payer data

<table>
<thead>
<tr>
<th>Quality of Levy Payer Location Information</th>
<th>Number of businesses (%)</th>
<th>Production amount (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trusted – Location not changed</td>
<td>91.8</td>
<td>87.3</td>
</tr>
<tr>
<td>Trusted – Re-allocated due to size within Sugar Region</td>
<td>2.3</td>
<td>7.0</td>
</tr>
<tr>
<td>Untrusted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Re-allocated to all SA2s within Sugar Region</td>
<td>4.3</td>
<td>3.0</td>
</tr>
<tr>
<td>- Re-allocated to all SA2s within State</td>
<td>1.3</td>
<td>2.5</td>
</tr>
<tr>
<td>- Re-allocated to all SA2s within Australia</td>
<td>0.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

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Timely, regional statistics without survey questions

Sugarcane: experimental regional estimates 2019-2020

This interactive map examines the geographic distribution of sugarcane production in 2019-2020 using Statistical Area Level 2 (SA2) regions. These experimental statistics have been produced using new, administrative and satellite data sources, that help to reduce reporting burden on farmers, improve the timeliness of statistics and produce more detailed regional data.

Source: Sugarcane, experimental regional estimates using new data sources and methods, 2019-2020 (Cat. no. 7128.0).

In the SA2 of Burdekin, there were 701,900 tonnes of sugarcane harvested during 2019-2020.
Next steps

- Apply this method to other Agricultural Commodities
- Explore other applications
Partnerships with government and industry to use satellite data for crop mapping

ABS agriculture data on crop type linked to land parcels

Digital Earth Australia satellite data store

Crop mapping products

Other field information on crop type with detailed location to inform algorithms

Machine learning & algorithm development by Industry, Academia and Government

Link for more information
Proposed Recommendations *in brief* *(last slide)*

- FAO provide countries with technical assistance to use earth observations data in the production of agricultural statistics
Thank you!

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