How does burning influence forest carbon storage?

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Research objectives

1. Measure the immediate post-burn impact of fuel reduction burning (FRB) on carbon balance across a range of forests (fuel loads) and burn conditions

2. Develop a better knowledge base to enable end-user agencies to model the immediate consequences of FRB on both carbon and greenhouse gas emissions (GHGs)

3. Model recovery of carbon stocks over a range of timescales

4. Identify burn techniques likely to minimize emission of GHGs whilst achieving appropriate fuel- and risk-reduction outcomes
Study sites – QLD, NSW, VIC, TAS
Where are we at?

- 6 18 months in developing adopted methods AND
- still taking measurements = still learning a lot!
What they look like: east coast Tasmania sites
<table>
<thead>
<tr>
<th>Location</th>
<th>No. plots completed or planned</th>
<th>Burnt</th>
<th>Pre &amp; post burn measures completed</th>
<th>Agency</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Otways, Victoria</td>
<td>9 plots 2011</td>
<td>9 plots 2011</td>
<td>Yes</td>
<td>DSE</td>
<td>Results are available</td>
</tr>
<tr>
<td>Gippsland, Victoria</td>
<td>9 plots 2012</td>
<td>0 plots</td>
<td>No</td>
<td>DSE</td>
<td>More burns in spring</td>
</tr>
<tr>
<td>NE Tasmania</td>
<td>9 plots 2012</td>
<td>3 plots</td>
<td>Next week</td>
<td>Tas Parks &amp; Wildlife</td>
<td>More burns in spring</td>
</tr>
<tr>
<td>Eden, NSW</td>
<td>9 plots planned</td>
<td>Not yet</td>
<td></td>
<td>Forests NSW</td>
<td>August 2012 burns</td>
</tr>
<tr>
<td>Gympie, Queensland</td>
<td>12 plots planned</td>
<td>Not yet</td>
<td></td>
<td>Qld Parks and Wildlife</td>
<td>July 2012 burns</td>
</tr>
</tbody>
</table>
Otways
*E. obliqua* forest

Before fire

Immediately after fire

12 months after fire
Fine fuel recovery, Otways sites

Ongoing study

N=18 ±s.e.

Fine fuels (litter, bark, twigs) tonnes per hectare

Time relative to fire
What do we hope to achieve?

• Which forest carbon pools most important to measure?
  – Standing litter
  – Bark
  – Understorey, surface vegetation and elevated fine fuels
  – Soil surface including humus layer

• More confident in carbon loss estimates
  – Indicative values for range of forests and conditions
  – Correlate with standard fuel hazard assessments

• A conversation with end-users to help in better understanding emissions risks from burning
  – Repeated fuel reduction burns
  – Wildfire at longer intervals
Queensland, Gympie

Proposed design:
6 plots in to be burnt forests;
3 plots in controlled unburnt forest;
3 plots in 5 year after burn forest

Purpose:
Compare rates of carbon changes and recovery between:
- immediately after burn,
- 5 years after burn and
- long unburnt forest