Woody Biomass from Logging and Mill Residuals

Todd A. Morgan, CF
The University of Montana - Missoula
Grand Challenge

• Understanding woody biomass in logging & mill residuals
  – Amounts generated annually
  – Geographic distribution
  – Current uses
  – “Suitability” as biojet feedstock
  – “Availability” for biojet conversion
Where are we today?

- Current biomass inventories
  - Forest Inventory & Analysis (FIA)
    - Standing live & dead trees
  - Timber Product Output (TPO)
    - Mill-delivered volumes of timber
    - Logging residue
    - Primary mill residuals
Logging & Mill Residuals

• Goals and deliverables
  – Inventory assessment for NARA region
    • Emphasis on current and near-term residual generation by state
    • Preliminary logging residue estimates for OR & WA
    • Updated logging residue estimates for MT & ID
    • Mill residuals in all four states
Roadmap to success

• Produce a woody biomass inventory
  – Utilize and enhance existing methods & data:
    • Field sampling of logging sites
    • TPO: logging residue, primary mill residue
    • Ongoing primary mill censuses
    • FIA: standing live & dead trees
  – Normalize the data between the “east” and “west”
Roadmap to success

• Necessary cross-team linkages
  – Work with Feedstock Teams to identify & quantify “available” volumes based on cost, distance, etc.
  – Use Conversion Team expertise to refine volume estimates based on “suitability”
  – Coordinate with Outreach Team to identify test communities for more detailed local analyses
Montana feedstock & wood products
Montana’s Timber Resource
Non-reserved Timberlands
2003-2009

Growing stock volume  36,061 MMCF
Standing dead volume  6,421
Annual (gross) growth  853
Annual mortality  492
Annual harvest (2004)  198
average (2003 - 2009)  ~140
(2011)  ~ 90
Montana’s Timber Resource
Non-reserved Timberlands
2003-2009

<table>
<thead>
<tr>
<th>Year</th>
<th>Public</th>
<th>Private</th>
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<tbody>
<tr>
<td>2011</td>
<td>239</td>
<td>122</td>
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</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Public</th>
<th>Private</th>
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<tbody>
<tr>
<td>Net Growth (MMCF/yr)</td>
<td>239</td>
<td>122</td>
</tr>
<tr>
<td>Harvest (MMCF)</td>
<td>~30</td>
<td>~52</td>
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<tr>
<td>Ratio</td>
<td>8 : 1</td>
<td>2 : 1</td>
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</tbody>
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Montana Timber-Processing Facilities by Size Class

- Under 10 MMBF Annual Use
- Over 10 MMBF Annual Use

Year | Under 10 MMBF | Over 10 MMBF |
--- | --- | --- |
1976 | 140 | 38 |
1981 | 193 | 35 |
1988 | 147 | 36 |
1993 | 164 | 33 |
1998 | 194 | 26 |
2004 | 198 | 17 |
2011 | 105 | 11 |
## Montana Logging Utilization Results

Cubic feet of growing stock per MCF delivered to mills

<table>
<thead>
<tr>
<th></th>
<th>1965</th>
<th>1988</th>
<th>2002</th>
<th>2011*</th>
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<tbody>
<tr>
<td>G.S. product</td>
<td>997</td>
<td>999</td>
<td>986</td>
<td>987</td>
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<tr>
<td>G.S. residue</td>
<td>163</td>
<td>122</td>
<td>54</td>
<td>37</td>
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<tr>
<td>G.S. removals</td>
<td>1,160</td>
<td>1,121</td>
<td>1,041</td>
<td>1,024</td>
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</tbody>
</table>

1965 Factors are from Wilson et al. 1970.
2002 Factors are from Morgan et al. 2005.
*2011 Factors are preliminary—7 sites.
Preliminary Montana Results

2011

- 7 sites
- 196 trees
- 7.0 – 22.5” dbh
- 4 more years of measurements
Comments/Questions?

BE KIND TO TREES

They provide shade, food & homes