How California Counts Carbon in Forests and Other Lands

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Change in California GDP, Population and GHG Emissions since 2000

- GDP
- Population
- GHG Emissions
- GHG Emissions per Capita
- GHG Emissions per GDP

2013 Total CA Emissions: 459.3 MMTCO2e

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CH₄ 9% N₂O 3% HGW 4%
CO₂ 84%

2013 Total CA Emissions: 459.3 MMTCO2e

Electricity Generation (In State) 11%
Industrial 23%
Transportation 37%
Residential 7%
Commercial 5%
Not Specified <1%
Agriculture 8%

2013 Total CA Emissions: 459.3 MMTCO2e
California is an ecologically diverse region.
Coast redwood
Highest carbon density in the world
Maximum 2900 Mg ha$^{-1}$

Busing and Fujimori 2005 Plant Ecology
Coastal Sagebrush scrub
AGL: 36 Mg ha\(^{-1}\)
Coastal Prairie
AGL: 3.8 Mg ha$^{-1}$
Distribution of Forests and Working Lands (Landfire)

136 types in natural/working lands (82% of the state) match NatureServ Ecological Classification scheme

<table>
<thead>
<tr>
<th>Vegetation Order</th>
<th>Area (10^3 km^2)</th>
<th>Area (%)</th>
<th>AGL (Tg)</th>
<th>AGL (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trees</td>
<td>122</td>
<td>37</td>
<td>780</td>
<td>91</td>
</tr>
<tr>
<td>Shrubs</td>
<td>131</td>
<td>39</td>
<td>66</td>
<td>8</td>
</tr>
<tr>
<td>Herb</td>
<td>41</td>
<td>12</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Sparse Vegetation</td>
<td>20</td>
<td>6</td>
<td>1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>No Vegetation</td>
<td>20</td>
<td>6</td>
<td>1</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

Top five ecosystems by area

Desert scrub               16.3%
Mixed conifer forest       11.5%
Barren                     6.0%
Annual grassland           5.5%
Oak woodland               5.0%
Carbon pools (FCAF, IPCC)

Live tree biomass (above and belowground)

Understory vegetation

Standing dead

Downed dead wood

Litter

Soil

Harvested wood products (IPCC, not currently in FCAF)
Standing dead trees

Typical:
11% of trees
7% of C

Some sites:
29+% of trees

June Mountain Inyo NF CA (USFS/MacKenzie photo)
Van Mantgem and Stephenson 2007; FIA DB 2009
Downed dead wood

Domke et al. 2013
Woodall et al. 2015

Litter and soil

Pie chart showing biomass distribution:
- Live Tree: 16,248 Tg C
- Standing Dead: 1,014 Tg C
- Understory: 735 Tg C
- Down Wood: 1,737 Tg C
- Litter: 6,156 Tg C
- Soil Organic Carbon: 64,876 Tg C
THE DATA: Databases, literature, and remotely sensed products