# Journal Supporting Information

**Article Title:** *Repeat short-interval fires put carbon storage at risk in Interior Alaska**via cumulative combustion of soil carbon*

**Authors:** Katherine Hayes, Melissa Lucash, Kristin Olson, Brian Buma

## S1. Allometric equations

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Table S1. Allometric equations used to calculate aboveground biomass, reported by species. Y represents aboveground dry biomass in grams. DBH stands for diameter at breast height (measured and reported in centimeters), MSE stands for mean square error, SE stands for standard error. | | | | | | | |
| Species | Source | Equation | | R2 | Published DBH range | Our DBH range | Error |
| *Populus tremuloides* | Bond-Lamberty et al. 2002 | Log10Y = 2.614 + 0.852\*(log10DBH) | | 0.99 | 0.3-23.7 | 0.1–6.5 | MSE 0.016 |
| *Populus balsamifera* | Byrd 2013 | Y = 0.261e0.0591\*DBH | | 0.86 | AV 2.77 | 1.3–2.3 |  |
| *Betula neoalaskana* | Bond-Lamberty et al. 2002 | Log10Y = 2.462 + 1.095\*(log10DBH) | | 0.66 | 0.3-0.7 | 0.1–23.5 | MSE 0.012 |
| *Picea Mariana* | Bond-Lamberty et al. 2002 | Log10Y = 3.011 + 1.202\*(log10DBH) + -.01(AGE) + 0.972(Log10DBH\*AGE) | | 0.97 | 0.5-17 | 0.1-20 | MSE 0.021 |
| *Salix* | Bond-Lamberty et al. 2002 | Log10Y = 2.481 + 1.19(log10DBH) | | 0.54 | 0.3-1 | 0.1–8.1 | MSE 0.043 |
| *Alnus* | Binkley et al. 1984 | Leaves | LogeY = 1.82 + 2.38(LogeDBH) | 0.88 | 2-7 | 0.2–4.5 | SE 0.276 |
| Stem | LogeY = 4.5 + 2.3(LogeDBH) | 0.88 | 2-7 | 0.2-4.5 | SE 0.127 |

## S2. Tree ring core results

We took tree-ring cores at each plot to estimate the age of mature (unburned) stands and to provide additional estimates of the age of reburned stands. Not all reburned stands contained individuals large enough to take a tree core (marked “No sample” in the table below).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Table S2.** Results of tree-ring cores taken at each plot. Age is represented in years – we report the oldest date obtained from dating tree cores, as well as the median date. We present both next to the confirmed age of the stand based on fire history obtained from aerial photographs and remote sensing. | | | | | | |
| Site | Burn History | Plot | n | Max Age | Median Age | Confirmed age |
| *Upland* | Mature | 10\_0 | 11 | 78 | 86 |  |
| 11\_0 | 10 | 78 | 87 |
| 44\_0 | 11 | 79 | 83 |
| 58\_0 | 19 | 75 | 87 |
| 1 fire | 42\_1 | 1 | 16 | 16 | 16 |
| 12\_1 | 7 | 7 | 11 | 14 |
| 41\_1 | 3 | 15 | 27 |
| 48\_1 | 4 | 9 | 10 |
| 50\_1 |  | No sample |  |
| 52\_1 | 2 | 11 | 11 |
| 64\_1 |  | No sample |  |
| 65\_1 |  | No sample |  |
| 2 fires | 40\_2 | 3 | 16 | 18 | 16 |
| 32\_2 | 6 | 13 | 16 |
| 39\_2 | 6 | 11.5 | 14 | 14 |
| 16\_2 | 4 | 10 | 12 |
| 47\_2 |  | No sample |  |
| 56\_2 | 4 | 7.5 | 10 |
| 57\_2 | 6 | 9 | 14 |
| 8\_2 | 6 | 9 | 13 |
| 3 fires | 14\_3 | 3 | 7 | 11 | 14 |
| 15\_3 | 2 | 11 | 14 |
| 37\_3 | 4 | 8 | 15 |
| 54\_3 | 4 | 9 | 10 |
| 55\_3 | 1 | 52 | 52 |
| 7\_3 | 4 | 67 | 9 |
| *Lowland* | Unburned | 1\_0 | 4 | 81 | 93 |  |
| 31\_0 | 3 | 61 | 106 |
| 6\_0 | 7 | 80 | 84 |
| 9\_0 | 6 | 83 | 88 |
| 1 fire | 18\_1 | 1 | 15 | 15 | 15 |
| 33\_1 | 1 | 15 | 15 |
| 28\_1 | 1 | 15 | 15 |
| 29\_1 | 2 | 8 | 10 |
| 20\_1 | 1 | 13 | 13 | 13 |
| 36\_1 | 1 | 13 | 13 |
| 5\_1 | 1 | 15 | 15 |
| Two fires | 19\_2 | 1 | 66 | 66 | 15 |
| 26\_2 | 2 | 9 | 9 |
| 27\_2 | 1 | 66 | 66 |
| 3\_2 | 4 | 10 | 12 |
| 34\_2 | 1 | 62 | 62 |
| 4\_2 |  | No sample |  |
| Three fires | 17\_3 | 1 | 62 | 62 | 15 |
| 2\_3 | 3 | 8 | 9 |
| 22\_3 | 1 | 62 | 62 |
| 23\_3 | 4 | 9 | 11 |
| 24\_3 | 3 | 12 | 15 |
| 25\_3 | 3 | 12 | 13 |
| 35\_3 | 2 | 12.5 | 14 |