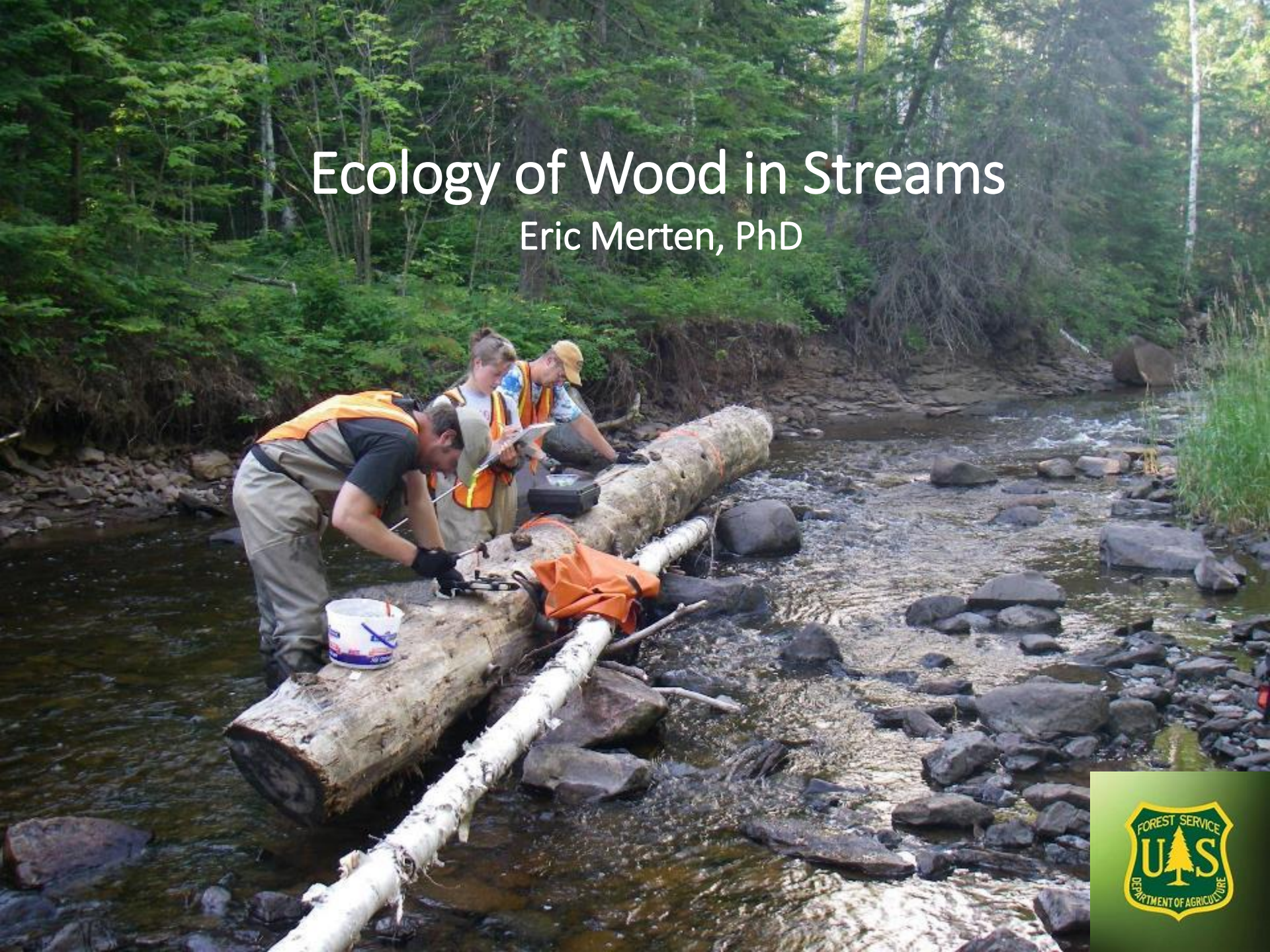
Ecology of Wood in Streams

Eric Merten, PhD



Recruitment

- **Riparian management**
- **Instream restoration**
- **Fire**

Ecology

- **Geomorphology and hydrology**
- **Fish**
- **Organic material**
- **“Bugs”**

Monitoring

Recruitment

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Monitoring

Mid-Columbia
FISHERIES
ENHANCEMENT
GROUP

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Monitoring

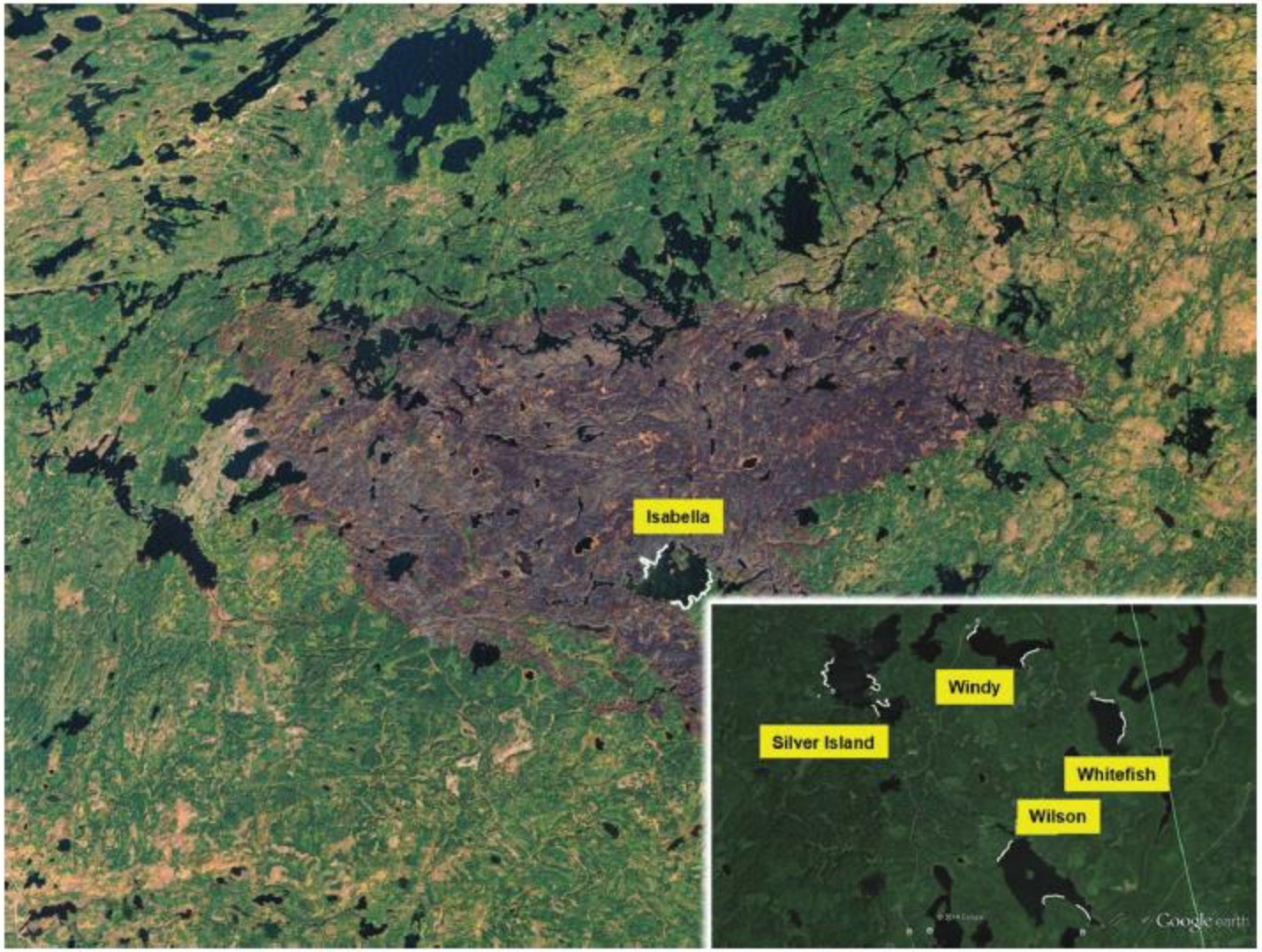
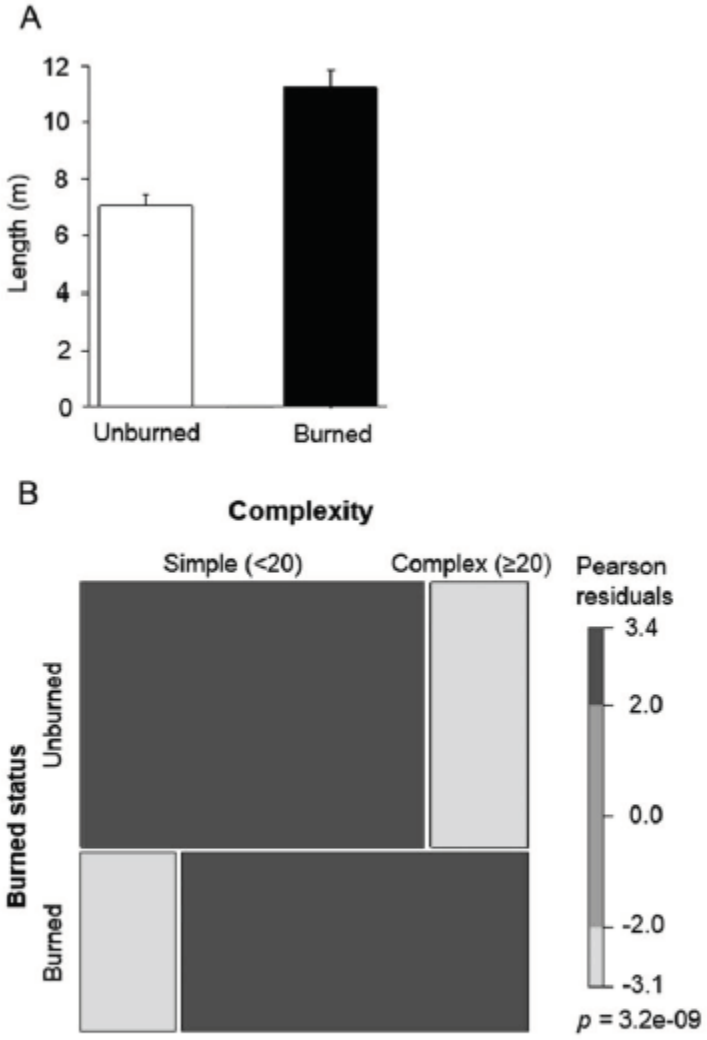


Figure 2. Area burned by the Pagami Creek fire. Inset: lakes in unburned area. Sampled shorelines are highlighted in white. The northwestern shoreline of Lake Isabella was burned, whereas the southeastern shoreline was not. The 4 lakes in the unburned area are southeast of the burned area. (http://upload.wikimedia.org/wikipedia/commons/6/63/Pagami_creek_nasa_landsat-5.jpg)



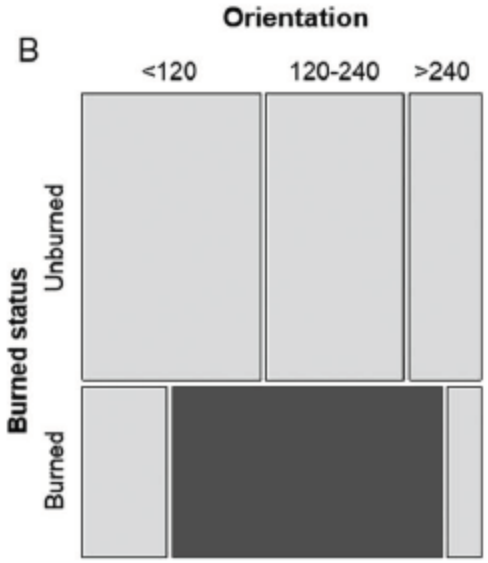
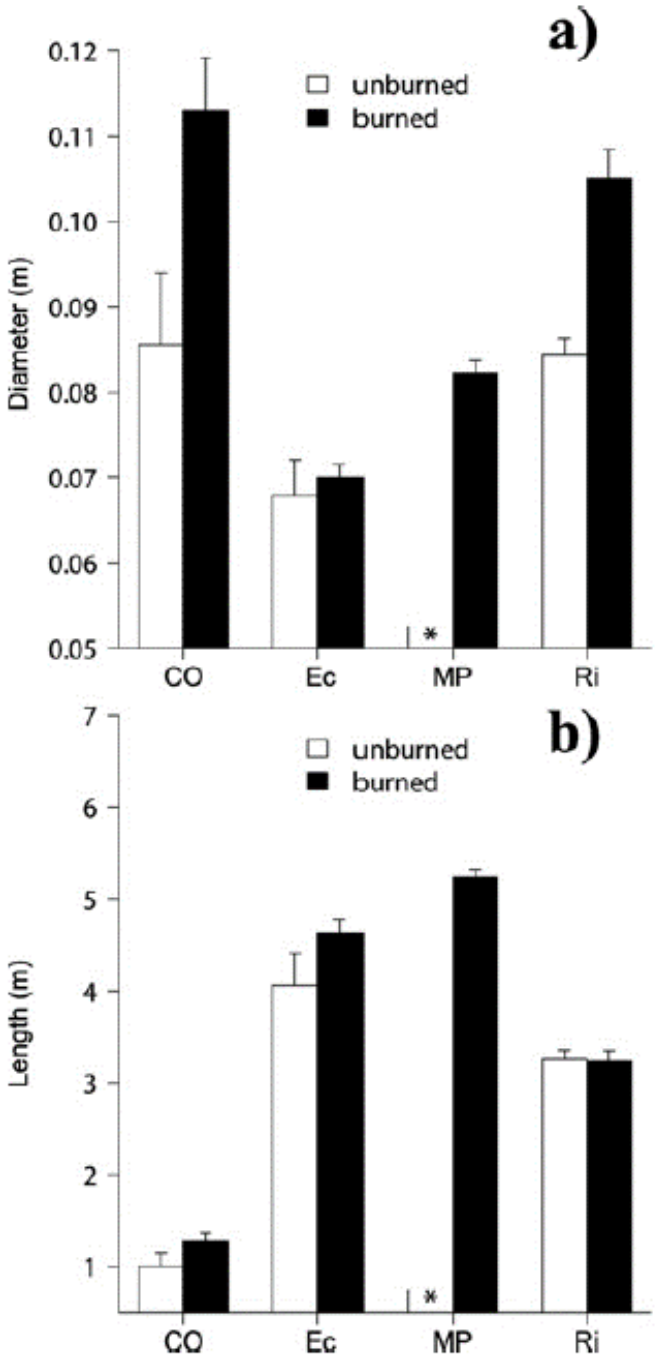


Figure 3. Relationships between burn status and lake wood characteristics. A.—Bar plot of mean (95% confidence interval) lengths of unburned and burned wood pieces along lake shorelines. B.—Mosaic plots associating burn status of the wood pieces in the lake shorelines with branch complexity. Rectangles are proportional to observed frequencies, and shading reflects the magnitude and significance of residuals from contingency table tests.


a)
unburned
burned
Diameter (m)
0.12
0.11
0.10
0.09
0.08
0.07
0.06
0.05
*
CO
Ec
MP
Ri
b)
unburned
burned
Length (m)
7
6
5
4
3
2
1
*
CO
Ec
MP
Ri

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Monitoring

A

KITTITAS
CONSERVATION
TRUST

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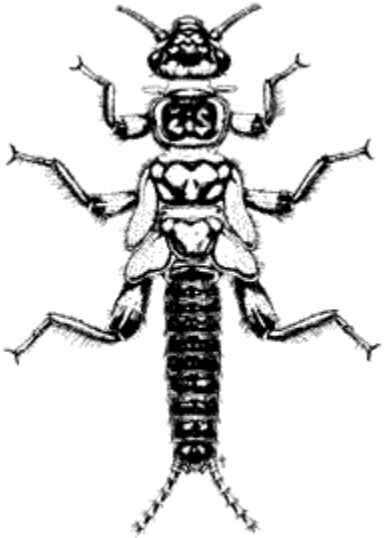
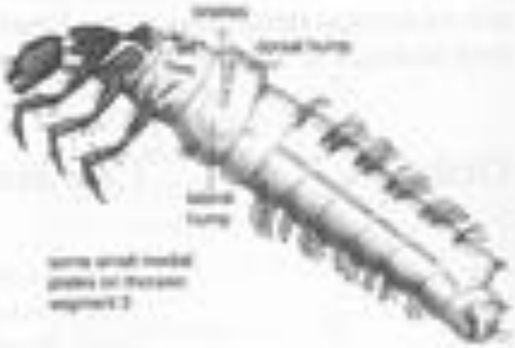


Caddisflies (Order Trichoptera)



Northern Case Makers
Family Limnephilidae
Scraper (if case mineral)
Shredder (if case organic)
up to 1-1/4"

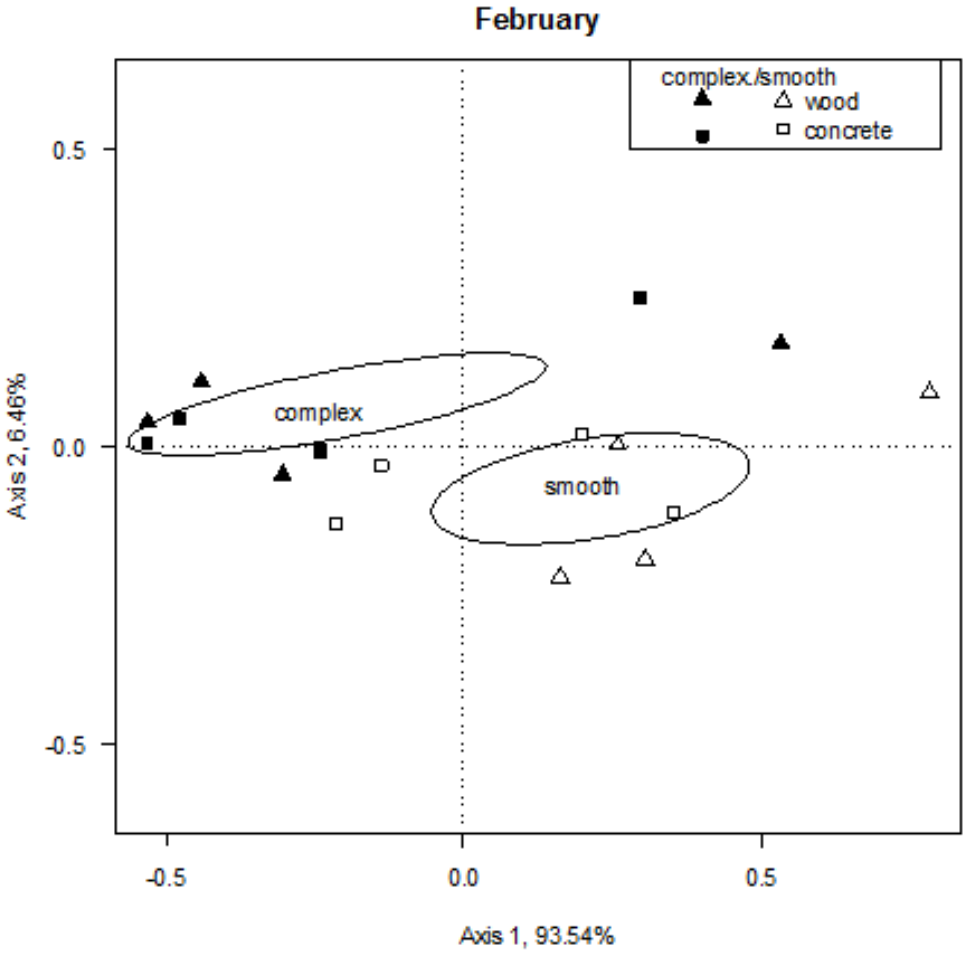


Fig. 3. Db-RDA ordination plot on the February dataset (after two months of colonization). The first two axes explain the noted percent variances. Substrates (wood and concrete) are plotted and ellipses indicate where 95% of the units of the same complexity (smooth, complex) are expected to occur.

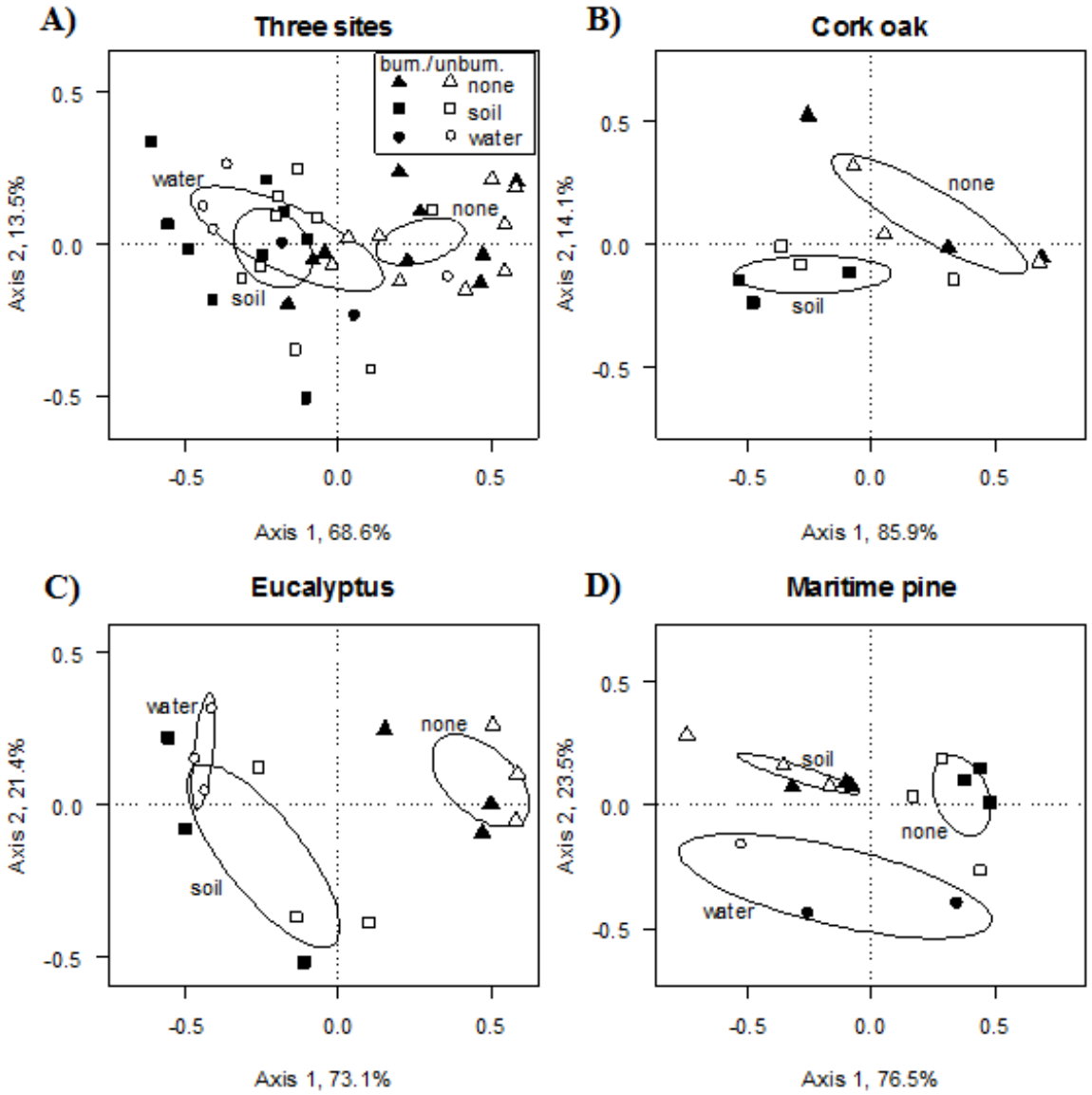


Figure 3.

Figure 3. Db-RDA ordination plots on the entire data set (A; sites combined) and for the sites separately (B-D). The first two axes explain the noted percent variances. Burned and unburned wood bags are plotted and ellipses indicate where 95% of sampling units of the same wood preconditioning are expected to occur. Wood preconditioning included unconditioned wood (none), soil preconditioning, and water preconditioning. Water-conditioning data points were absent for the cork oak site and had reduced sample size for eucalyptus and maritime pine.

Fig. 1 Emergence traps used to sample aquatic insects emerging as adults. Each frame is 1 m × 0.5 m

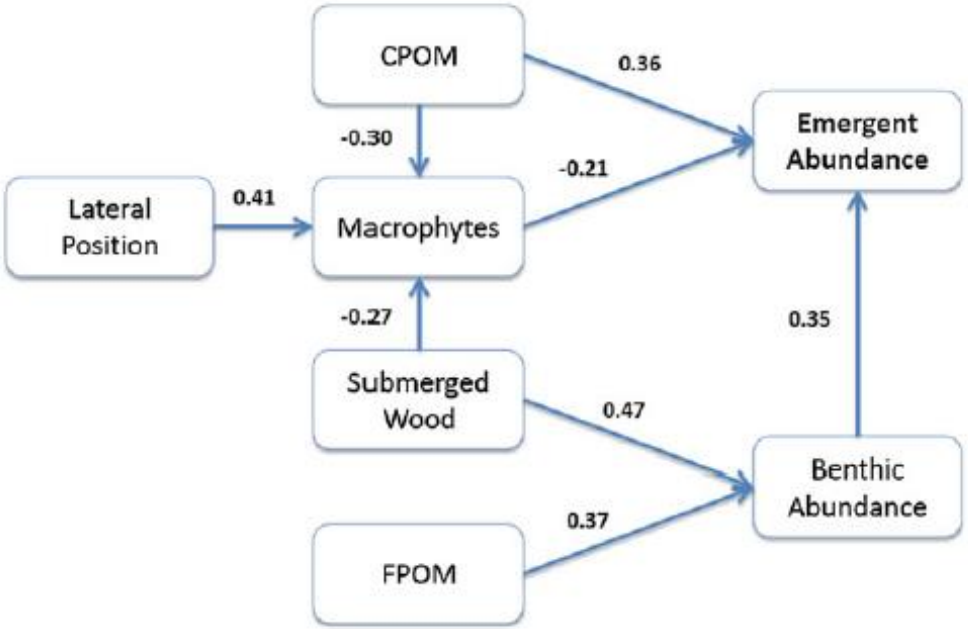


Fig. 2 Structural equation model for biomass of emerging insects during the first sampling period. Numbers shown are standardized correlations, which range from −1 to 1 and indicate the direction and strength of the relationship

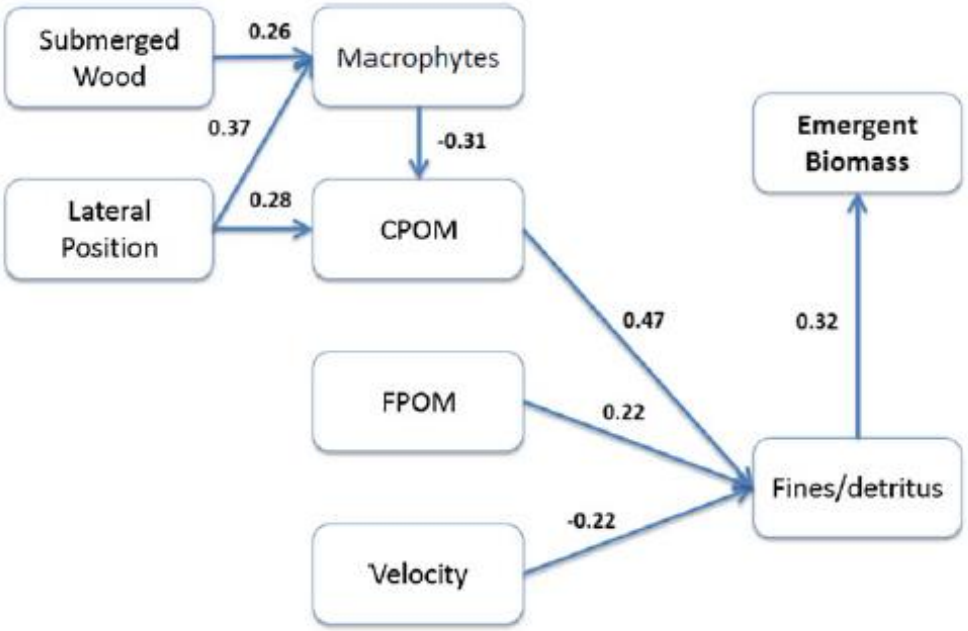


Fig. 3 Structural equation model for abundance of emerging insects during the first sampling period. Numbers shown are standardized correlations, which range from −1 to 1 and indicate the direction and strength of the relationship

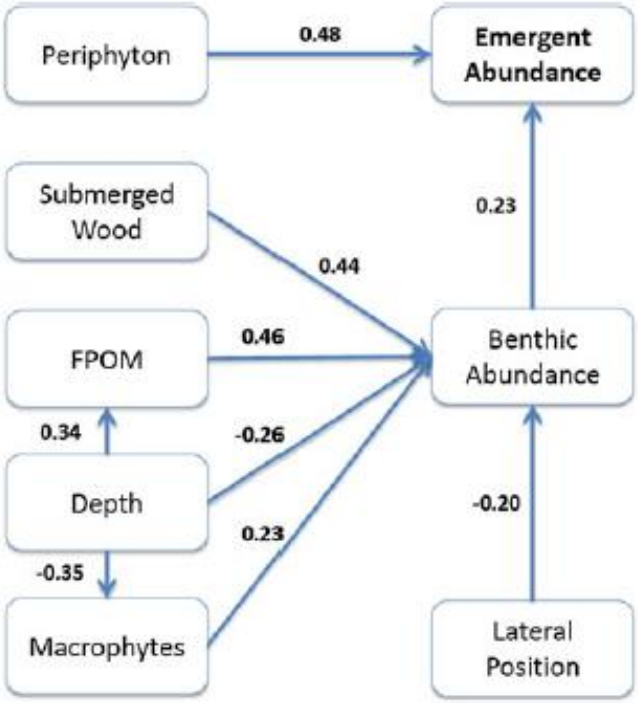


Fig. 4 Structural equation model for biomass of emerging insects during the second sampling period. Numbers shown are standardized correlations, which range from −1 to 1 and indicate the direction and strength of the relationship

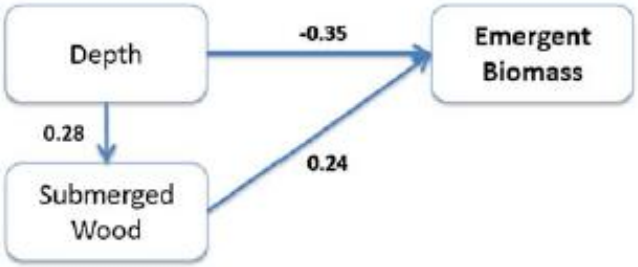


Fig. 5 Structural equation model for abundance of emerging insects during the second sampling period. Numbers shown are standardized correlations, which range from −1 to 1 and indicate the direction and strength of the relationship

Figure 3A

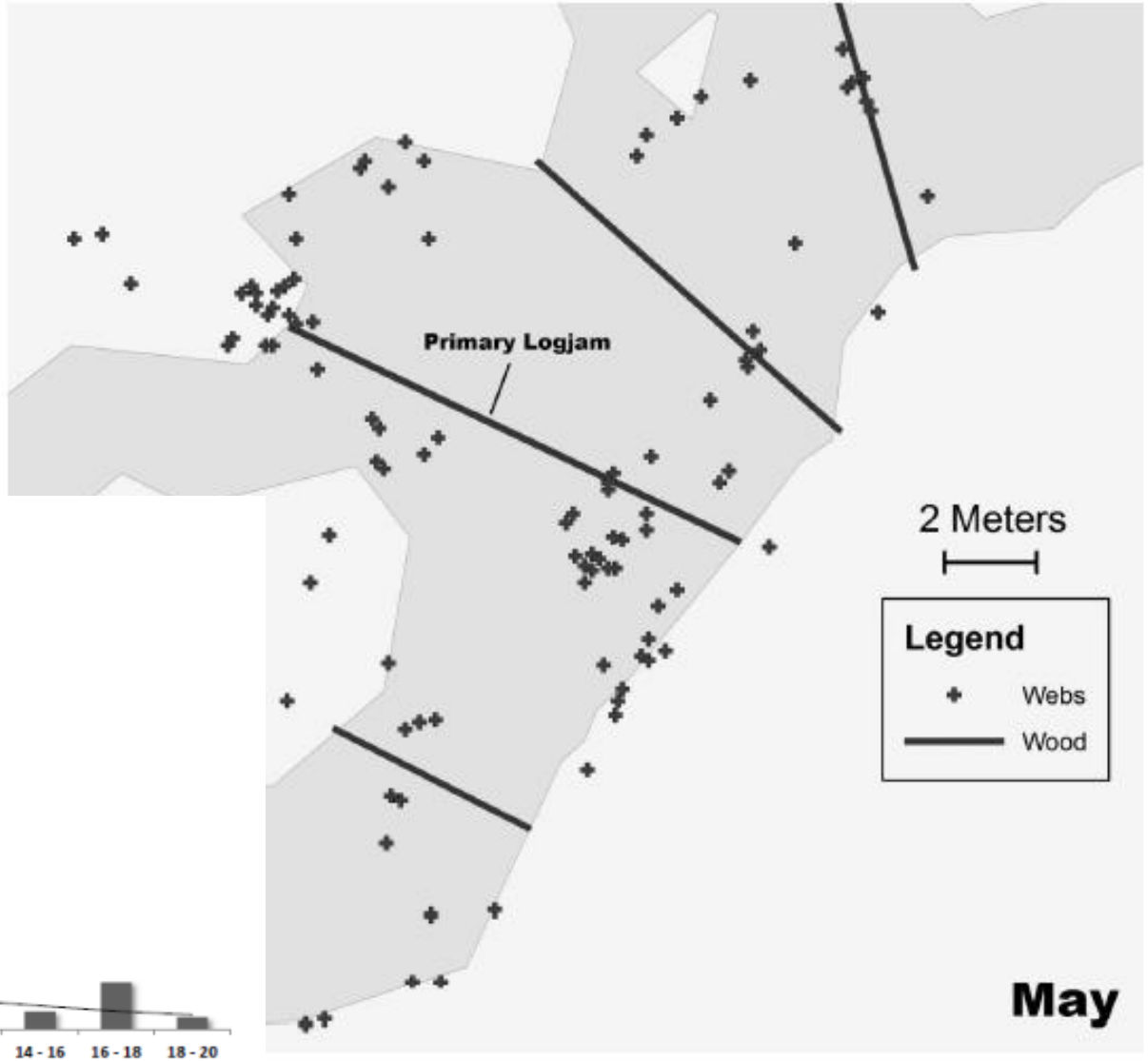
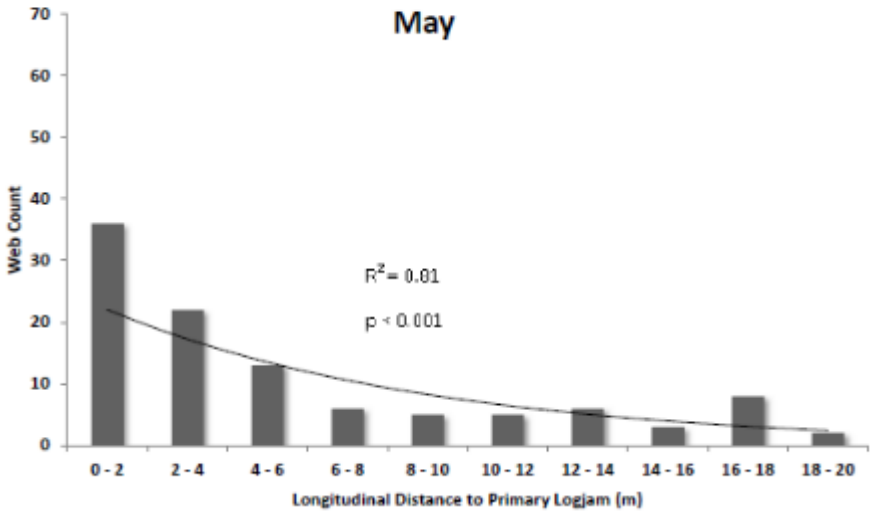


Figure 1A



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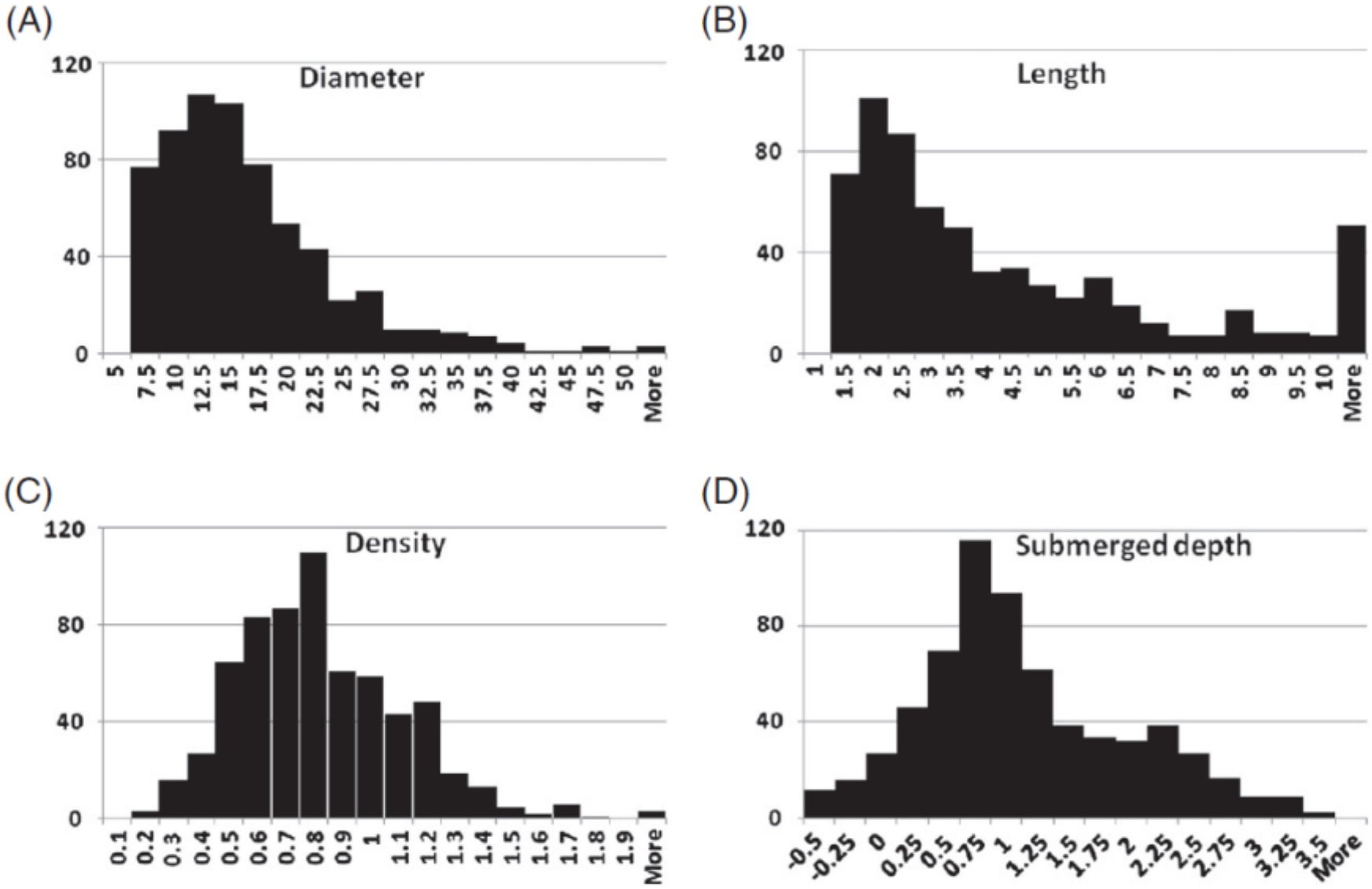
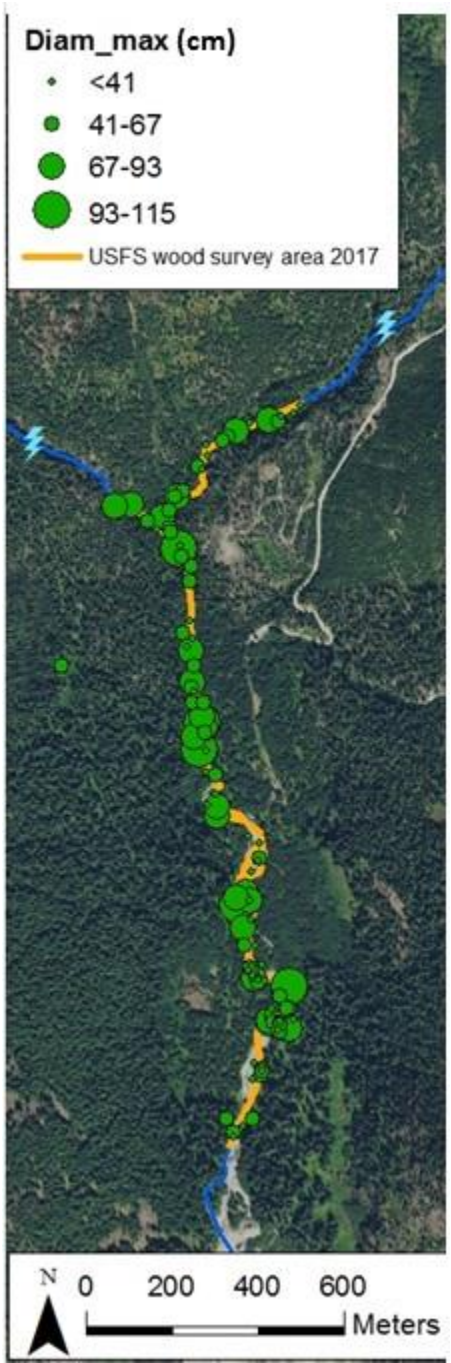
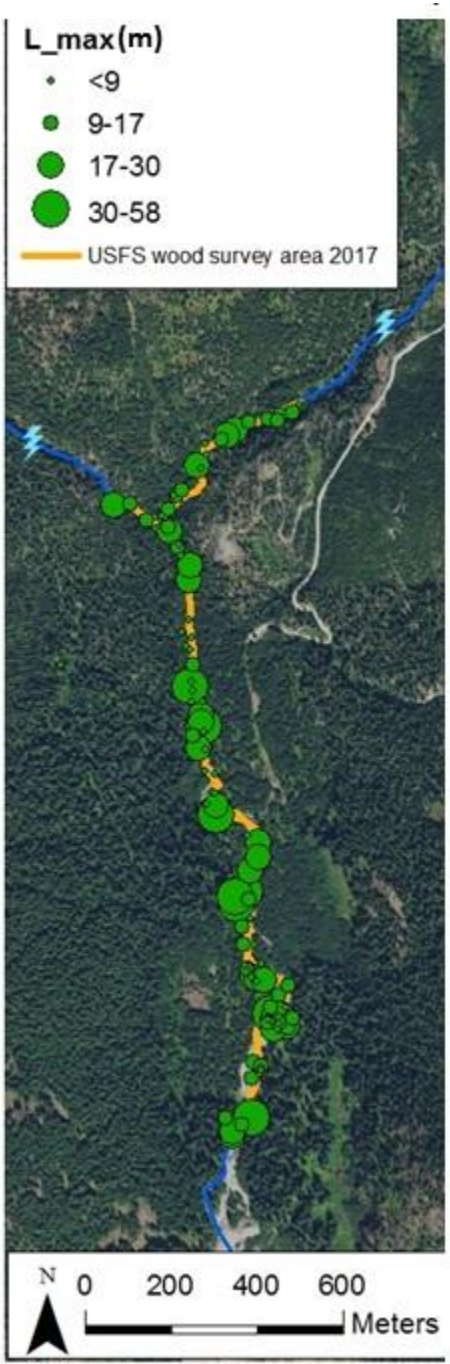
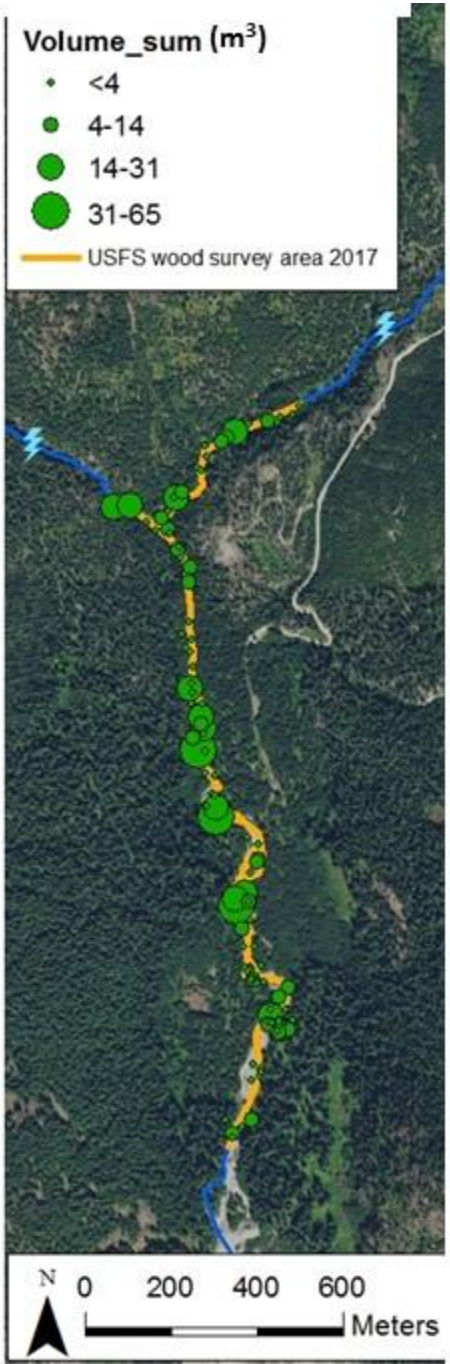


Fig. 1. Distributions of (A) diameters (cm), (B) lengths (m), (C) densities (g/cm^3), and (D) submerged depths (m) for wood pieces in 2007.


Diam_max (cm)
<41
41-67
67-93
93-115
USFS wood survey area 2017
N
0 200 400 600
Meters


L_max(m)
<9
9-17
17-30
30-58
USFS wood survey area 2017
N
0 200 400 600
Meters


Volume_sum (m3)
<4
4-14
14-31
31-65
USFS wood survey area 2017
N
0 200 400 600
Meters

Number of pieces of wood
<4
4-16
16-37
37-105
USFS wood survey area 2017
N
0 200 400 600
Meters

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