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Supplement of

Drought-influenced mortality of tree species with different predawn leaf water dynamics in a decade-long study of a central US forest
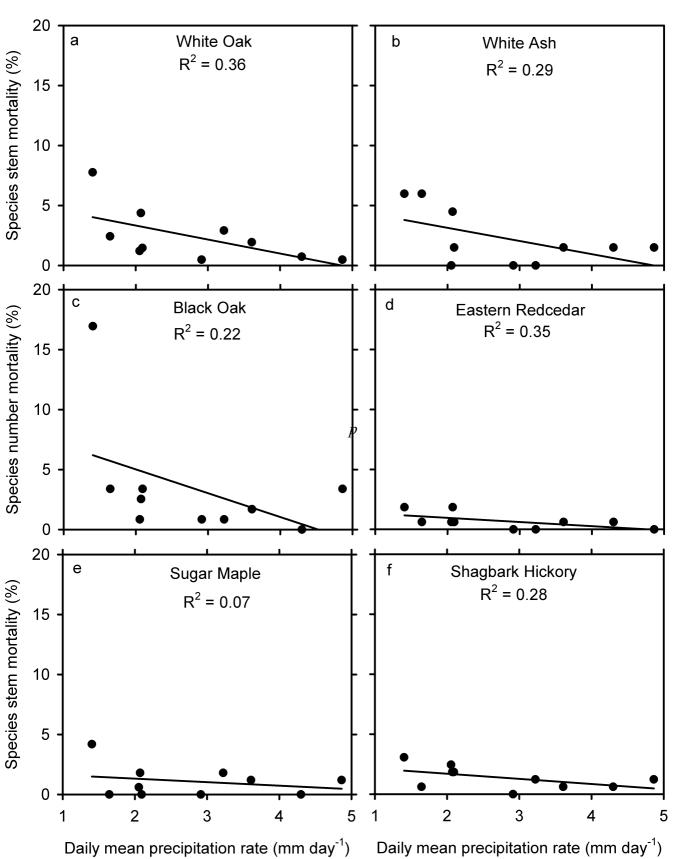
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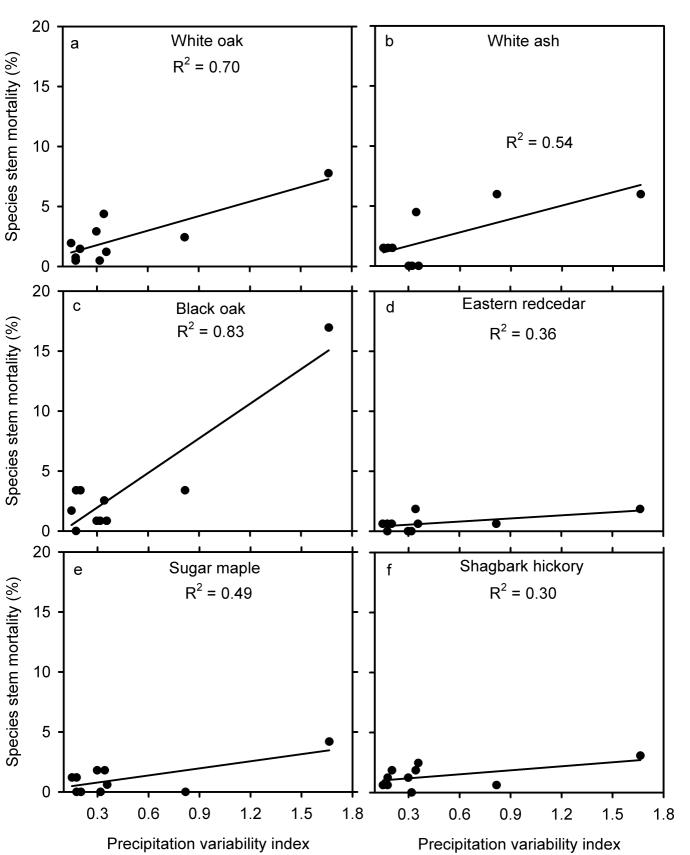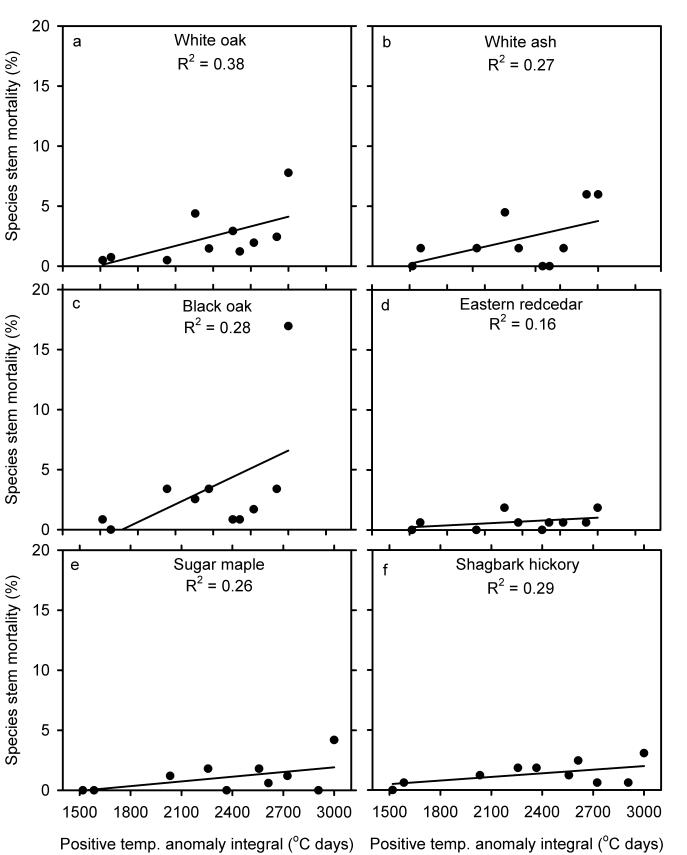*Correspondence to:* L. Gu (lianhong-gu@ornl.gov)

Figure S1. The species mortality expressed relative to the stem number density of 2005 as a function of daily mean precipitation rate in the previous year. Fittings are linear.

Figure S2. The species mortality expressed relative to the stem number density of 2005 as a function of precipitation variability index in the previous year. Fittings are linear.

Figure S3. The species mortality expressed relative to the stem number density of 2005 as a function of positive temperature anomaly integral in the previous year. Fittings are linear.

Figure S4. The species mortality expressed relative to the stem number density of 2005 as a function of vapor pressure deficit integral in the previous year. Fittings are linear.

Figure S5. The mortality of the plant community as a whole expressed relative to the stem number density of 2005 as a function of the composite mean effective precipitation interval with a threshold daily precipitation rate of 5 mm day^{-1} (MEPI5). The composite MEPI5 is the previous year's MEPI5 plus the halved MEPI5 two years earlier. The two-parameter fitting equation is also shown.

Figure S6. The mortality of the plant community as a whole expressed relative to the stem number density of 2005 as a function of the previous year's daily mean precipitation rate (a), predawn leaf water potential integral (PLWPI) at the community level (b), precipitation variability index (c), mean effective precipitation interval with a threshold daily precipitation rate of 5 mm day^{-1} (d), positive temperature anomaly integral (e), and vapor pressure deficit integral (f). Mortality data of 2013 and 2014 are removed. This figure shows that even when the impact of the extreme drought of 2012 is not included,

1   these predictors still explain a significant amount of variance in interannual variations of

2   tree mortality. Fittings are linear.

3

Figure showing six scatter plots (a–f) of species stem mortality (%) versus daily mean precipitation rate (mm day^{-1}).

- a: White Oak, $R^2 = 0.36$
- b: White Ash, $R^2 = 0.29$
- c: Black Oak, $R^2 = 0.22$
- d: Eastern Redcedar, $R^2 = 0.35$
- e: Sugar Maple, $R^2 = 0.07$
- f: Shagbark Hickory, $R^2 = 0.28$

Y-axis labels: Species stem mortality (%) for panels a, e; Species number mortality (%) for panel c.

X-axis label: Daily mean precipitation rate (mm day^{-1})

Figure. Species stem mortality (%) versus Precipitation variability index for six tree species: (a) White oak, $R^2 = 0.70$; (b) White ash, $R^2 = 0.54$; (c) Black oak, $R^2 = 0.83$; (d) Eastern redcedar, $R^2 = 0.36$; (e) Sugar maple, $R^2 = 0.49$; (f) Shagbark hickory, $R^2 = 0.30$.

Figure: Six-panel scatter plots of Species stem mortality (%) versus Positive temp. anomaly integral (°C days).

(a) White oak, $R^2 = 0.38$
(b) White ash, $R^2 = 0.27$
(c) Black oak, $R^2 = 0.28$
(d) Eastern redcedar, $R^2 = 0.16$
(e) Sugar maple, $R^2 = 0.26$
(f) Shagbark hickory, $R^2 = 0.29$

Figure with six panels (a–f) plotting Species stem mortality (%) against Vapor pressure deficit integral (kPa days):

- a. White oak, $R^2 = 0.55$
- b. White ash, $R^2 = 0.28$
- c. Black oak, $R^2 = 0.54$
- d. Eastern redcedar, $R^2 = 0.17$
- e. Sugar maple, $R^2 = 0.30$
- f. Shagbark hickory, $R^2 = 0.33$