NORTHWEST Climate Adaptation Science Center

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8TH INTERNATIONAL WILDLAND FIRE CONFERENCE

GOVERNANCE PRINCIPLES: Towards an International Framework

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Exposure to fire-regime change will transform western US conifer forests but ecosystem feedbacks may support persistence

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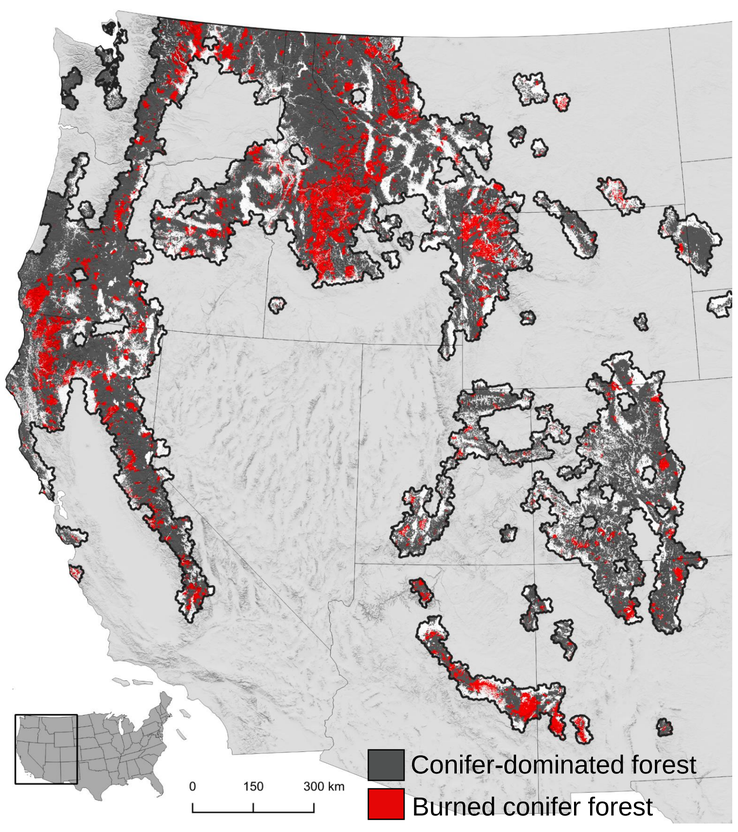
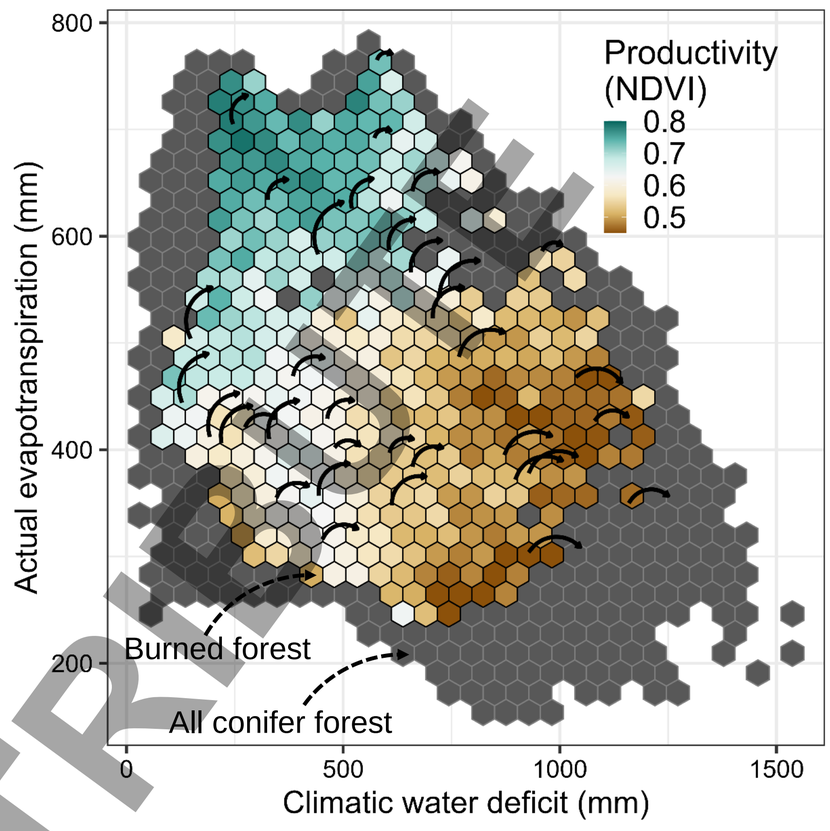
1. Conifer forests are vulnerable to climate and fire-regime change

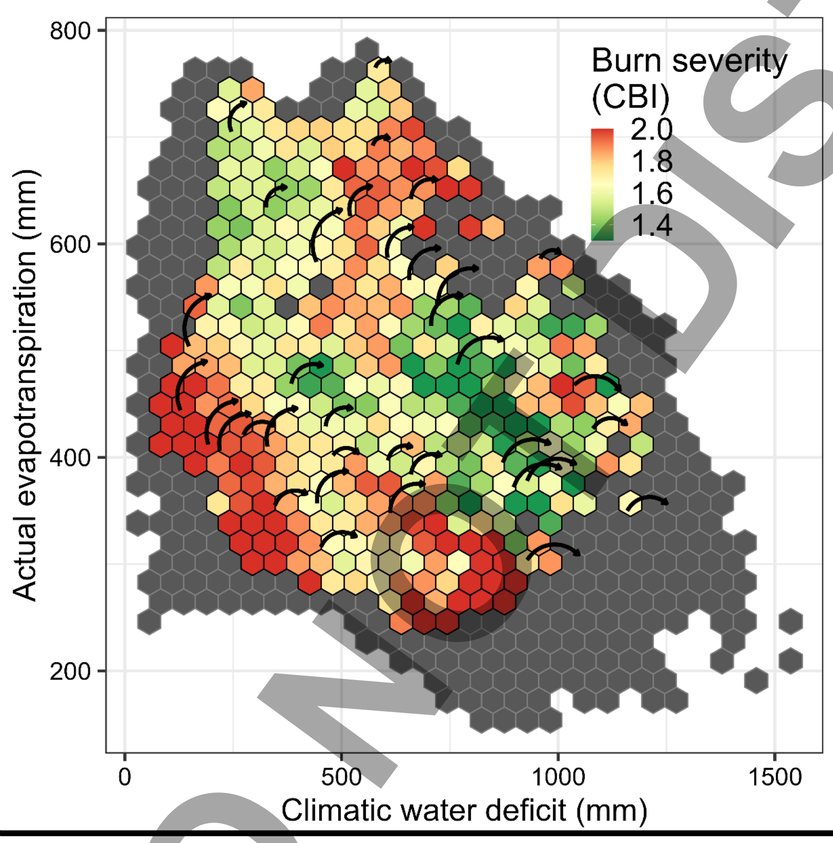
- Conifer-dominated forests (grey) are vulnerable to fire-catalyzed transformations resulting from increased aridity and land management legacies.
- Satellite data from areas that burned 1984-2019 (red) were used to project fire-regime change under a +2° C warming scenario.

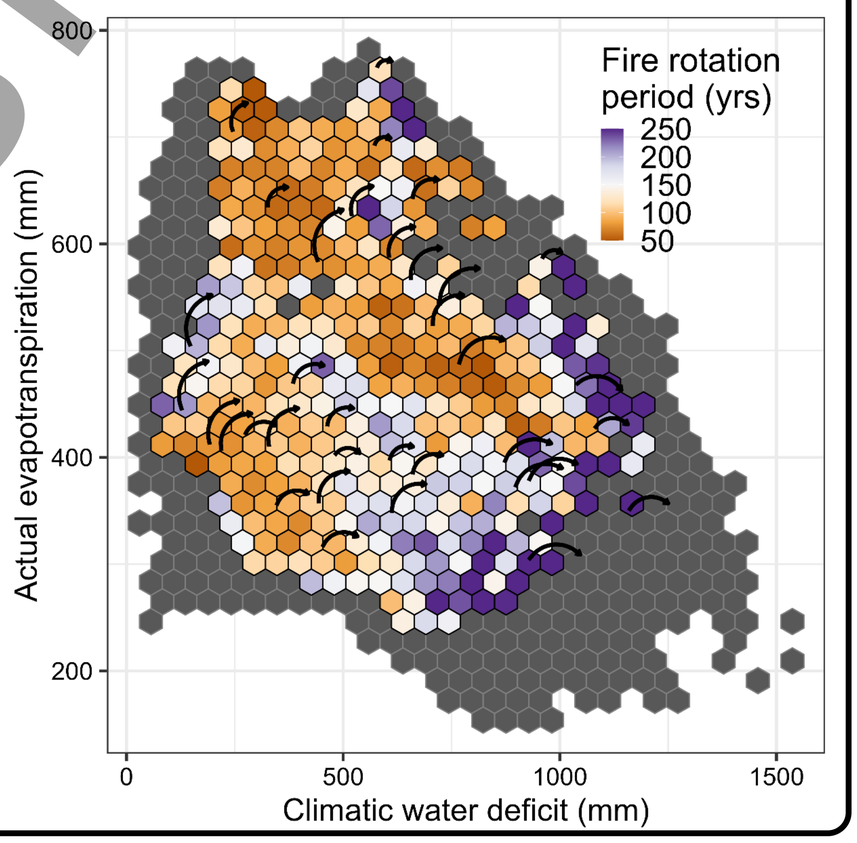


2. Fire regimes were characterized using vegetation productivity, fire frequency, and burn severity

- Western US conifer forests were analyzed in a climate space defined by modeled 30-yr mean water deficit and evapotranspiration. Satellite data from burned forests was grouped (hexagons) into areas with similar climates.
- Each figured is colored by the mean value of three key fire-regime attributes: vegetation productivity (NDVI), fire rotation period (yrs), and burn severity (CBI).
- Arrows show examples of projected shift in the mean climate between the reference (1960-1990) and future (+2° C) periods. Data between all pairs of contemporary and future fire regimes were compared.

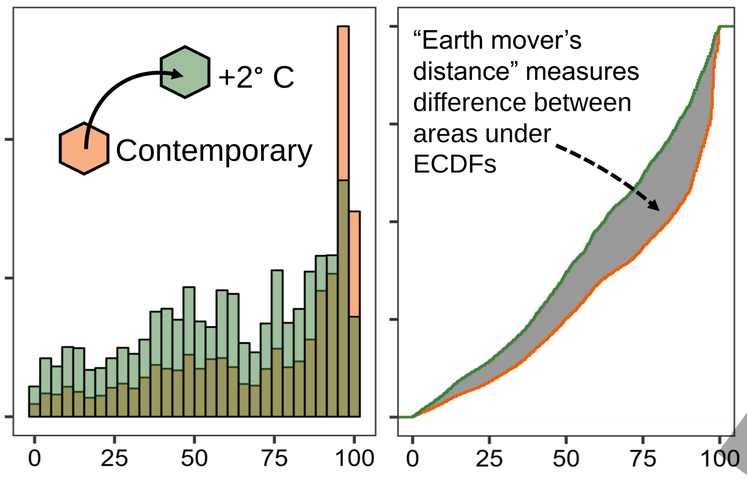






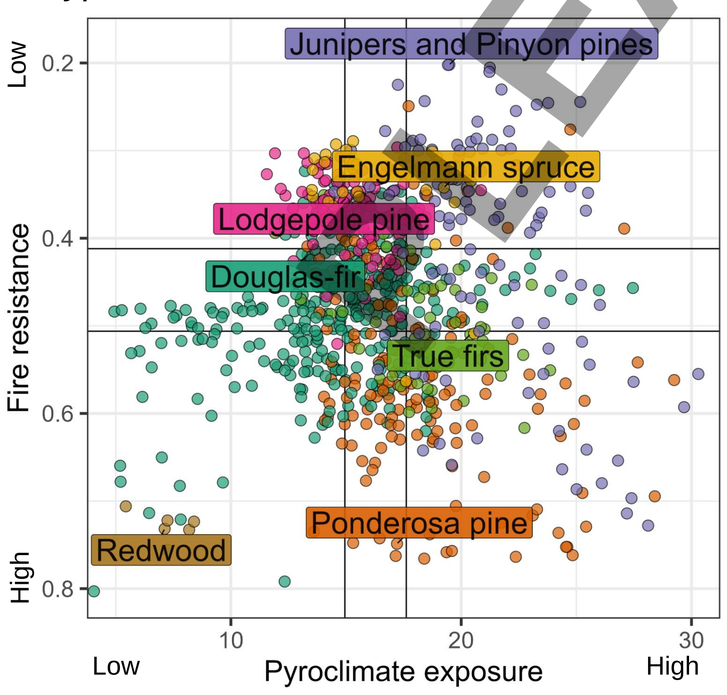
3. Distributions of fire-regime attributes shift under +2° C climate

- Distributions describe variability in fire-regime attributes within a similar climate



4. Vulnerability is widespread

- Paired with forest inventory data, results show that low- and high-elevation forest types are vulnerable.



5. Vulnerability is a function of exposure and adaptive capacity

- Conifer forest vulnerability to fire-driven transformation was measured by the intersection of pyroclimate exposure and species-level fire-resistance traits.
- US Forest Service "firesheds" are mapped and colored based on their combination of pyroclimate exposure and fire resistance traits, which underpin adaptive capacity.
- Persistence of fire-resistance forest types is possible.