Canopies at Risk: re-evaluating air quality in the Pacific Northwest

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Degradation of the canopy has direct impacts on forest health

- nutrient cycling
- forest food webs
- climate regulation
- nesting
- forage
- habitat
Shifts in epiphyte communities reflect air quality - but what does this mean for ecosystem function?

Air Score
- **Best**—All Sensitive Species Present; 75% Quantile for All Sensitive Species (-1.4 - -0.11)
- **Good**—All Sensitive Species Present; 90% Quantile for All Sensitive Species (-0.11 - 0.02)
- **Fair**—Some of the Sensitive Species Absent; 97.5% Quantile for All Sensitive Species (0.02 - 0.21)
- **Degraded**—Most of the Sensitive Species Absent (0.21 - 0.35)
- **Poor**—Weedy Nitrophilous Species Enhanced (0.35 - 0.49)
- **Worst**—All Sensitive Species Absent (0.49 - 2)

USFS FIA National Program & Air Resource Management Program
Urban

- upper canopy
- low canopy
- ground level

Mid

- upper canopy
- low canopy
- ground level

Remote

- upper canopy
- low canopy
- ground level
Shift in epiphytic community composition across sites

![Graph showing relative frequency (%)](image)

- **Urban** at 0 km
- **Mid** at 74 km
- **Remote** at 109 km

Pollution Sensitivity:
- Tolerant
- Moderate
- Sensitive

*Statistical significance: *p < 0.05, **p < 0.01, ***p < 0.001
next steps...
Solutions

Regional canopy data are needed

Recalculation of current critical loads

Development of Regional Air Resources Board