Post-wildfire Contamination of Soils and Sediments by Polycyclic Aromatic Hydrocarbons in North-central British Columbia, Canada

IWRG
Theme 2 – Phase 2
UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

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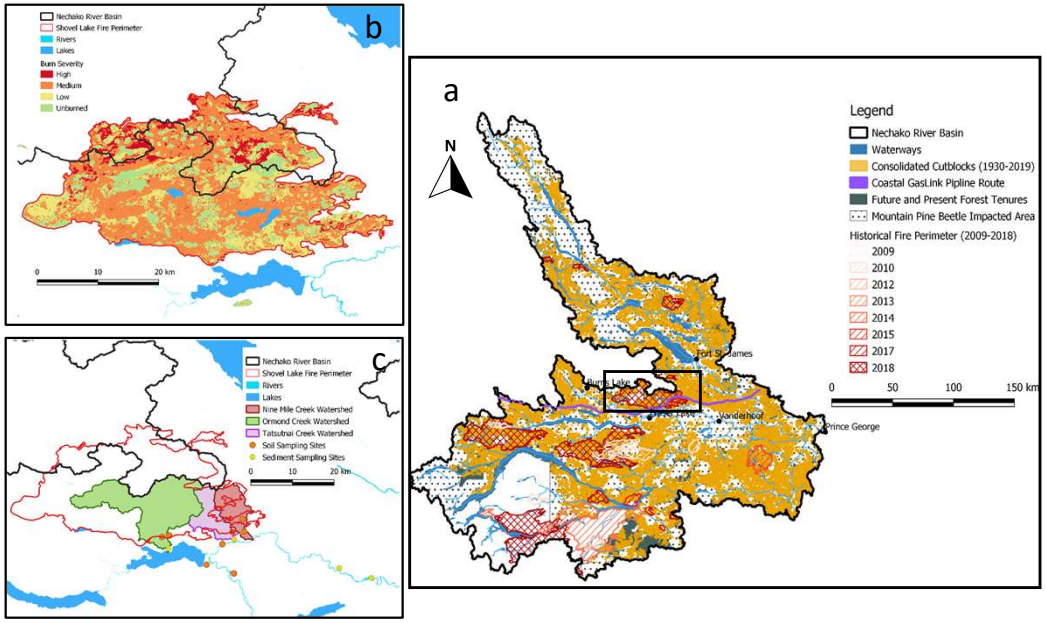

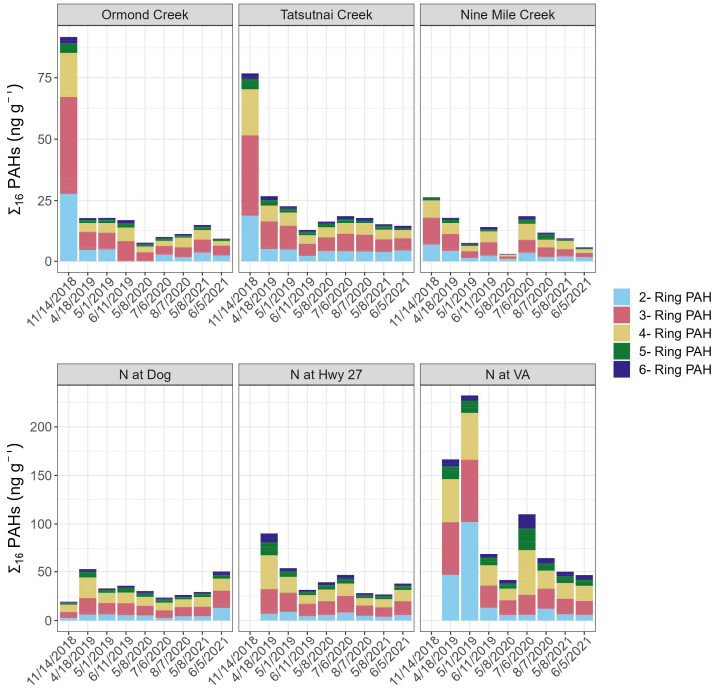

Figure 1. (a) Map of landscape disturbances within the Nechako River Basin and research study area. (b) Fire severity map of the 2018 Shovel Lake fire. (c) Map of the studied tributaries, soil and sediment sampling sites. (d) Total PAH concentrations in the studied tributaries (top) and mainstem Nechako River (bottom) sites, categorized by PAH ring number

Research Objective: Measure post-wildfire PAH contamination in soils and river sediments, pinpointing main sources of PAHs.

Methods: Collected soil samples from burned and unburned areas in 2018, and from burned sites in 2020 and 2021. Analyzed sediment samples from three tributaries and three main Nechako River locations for parent PAHs spanning 2018-2021.

Key Results: Soil PAH levels dropped from 2018 to 2021 but remained higher than in unburned areas. Initial elevated PAH levels in tributary sediments post-fire reversed in subsequent years. Wildfires are the primary source of persistent PAHs, in the tributaries with mixed origins downstream in the Nechako River.

Conclusion: Wildfires significantly amplify PAH pollution in both land and water. Sources of PAHs in the Nechako River and its tributaries were suprising and provide insights for future studies in wildfire-affected watersheds.

Future Implications: The increasing frequency of severe wildfires globally poses environmental threats, particularly with respect to PAH contamination. Urgent research is crucial to understand the prolonged presence of PAHs from wildfires and their potential adverse impact on aquatic life, considering cumulative post-wildfire effects.