

Determination of Sediment Sources Following a Major Wildfire and Evaluation of the Use of Color Properties and Polycyclic Aromatic Hydrocarbons (PAHs) as tracers

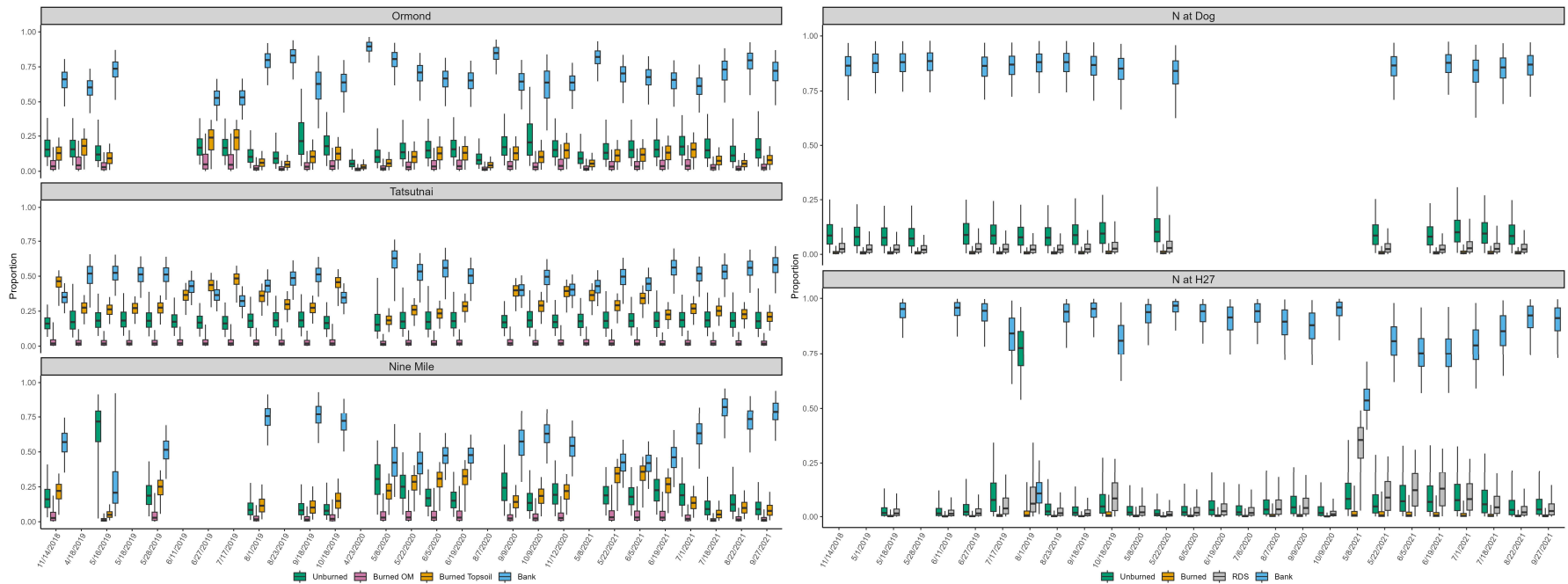
IWRG

Theme 2 – Phase 2



K. A. Kieta, P. N. Owens and E. L. Petticrew (2023) - <https://doi.org/10.1007/s11368-023-03565-0>

Results from unmixing modeling in the tributaries (left) and Nechako River (right). The tributaries showed burned topsoil to be an important contributor of sediment while banks were the primary source in the mainstem Nechako River.



Research Purpose: Assess sediment sources after the 2018 Shovel Lake wildfire, using PAHs and colour.

Methodology: Collected sediment samples (2018-2021) from tributaries and mainstem Nechako River, analyzing for color properties and 16 PAHs. Employed MixSIAR unmixing model for source assessment.

Key Findings: In tributaries, burned topsoil was a significant sediment contributor (up to 50%), while the mainstem Nechako River showed less influence (up to 89% contribution from banks). Color tracers provided more realistic results compared to PAHs.

Conclusion: Wildfires had a noticeable impact on sediment sources in smaller watersheds, with color tracers being cost-effective and reliable. Although PAHs were less effective in this study, there should be further research on their behavior and degradation for future studies that aim to use them for sediment fingerprinting.

Future Implications: With wildfire size and severity predicted to increase in the future, understanding sediment contributions remains challenging. This study recommends the widespread use of color tracers and encourages ongoing research on PAHs to enhance their potential as tracers in wildfire-related studies.