

Soil viral community dynamics over seven years of heat disturbance: spatial variation exceeds temporal in annually sampled soils

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Supplemental Tables and Figures

| SiteID | Fire Classification | Temp. 2015 (°C) | Temp. 2016 (°C) | Temp. 2017 (°C) | Temp. 2018 (°C) | Temp. 2019 (°C) | Temp. 2020 (°C) | Temp. 2021 (°C) | Latitude and Longitude |
|---------|---------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------------|
| Site 08 | Reference | 12.7 | 11.1 | 13.3 | 16.1 | 16.3 | 11.6 | 15.8 | 40.8014N 76.3461W |
| Site 11 | FireAffected | 27.4 | 25.1 | 23.2 | 21.8 | 19.3 | 19.5 | 20.0 | 40.8013N 76.3431W |
| Site 14 | FireAffected | 28.9 | 29.4 | 28.5 | 30.0 | 26.9 | 25.4 | 22.1 | 40.8007N 76.3412W |
| Site 15 | FireAffected | 35.3 | 31.8 | 27.2 | 28.6 | 25.0 | 22.3 | 21.8 | 40.8008N 76.3415W |
| Site 16 | FireAffected | 22.4 | 20.9 | 18.9 | 22.2 | 17.1 | 14.4 | 19.5 | 40.8008N 76.3414W |
| Site 17 | Reference | 14.4 | 13.2 | 13.8 | 18.0 | 15.1 | 12.5 | 16.8 | 40.8N 76.3403W |
| Site 19 | FireAffected | 31.0 | 46.3 | 41.3 | 27.3 | 23.7 | 15.9 | 20.1 | 40.8008N 76.3415W |
| Site 21 | FireAffected | 33.8 | 37.3 | 31.5 | 31.7 | 30.0 | 24.5 | 23.5 | 40.8007N 76.3414W |
| Site 22 | FireAffected | 37.4 | 36.6 | 32.3 | 33.9 | 30.8 | 32.5 | 26.4 | 40.8011N 76.3431W |
| Site 23 | Reference | 13.9 | 13.1 | 12.5 | 16.7 | 15.0 | 12.1 | 16.0 | 40.8013N 76.3466W |

Table S1: Geographical information on all 10 sites used in this study including fire classification, soil temperatures (Temp.) during each year, and site coordinates.

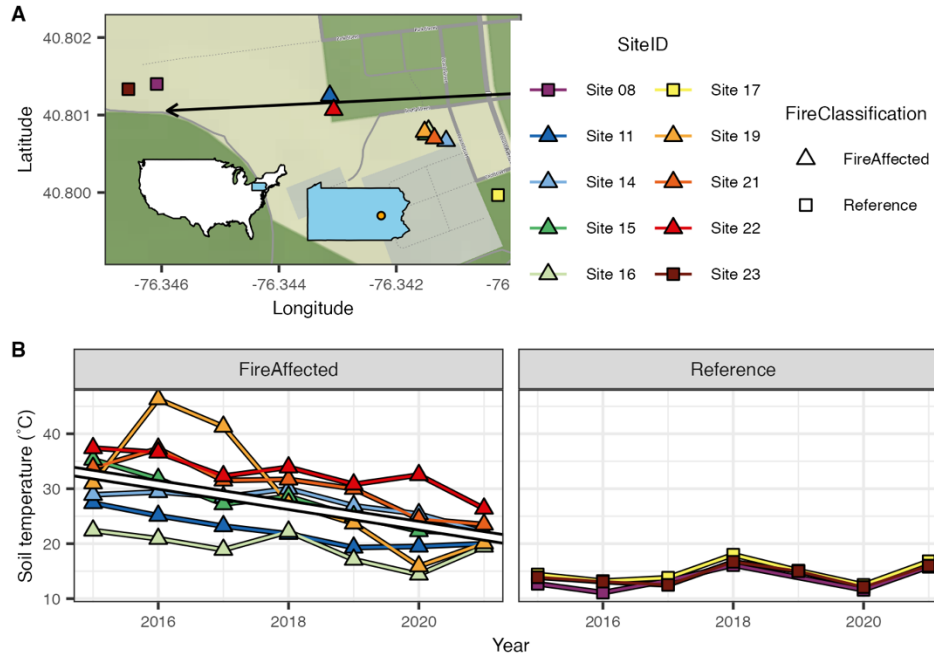


Figure S1: The seven fire-affected and three reference sites in Centralia, Pennsylvania were sampled annually over seven years. A) The map of all 10 sites sampled in Centralia. The location of Centralia (orange dot) within Pennsylvania (blue) along with the location of the state within the contiguous USA are indicated as inset maps. The black arrow indicates the path of one of the active fire fronts. B) The soil temperature within the fire-affected sites decreased over the sampling years but there was no significant change in reference sites. The line indicates the statistically significant LME regression (fire-affected slope = -1.859, p-value < 0.001; reference p-value = 0.160).

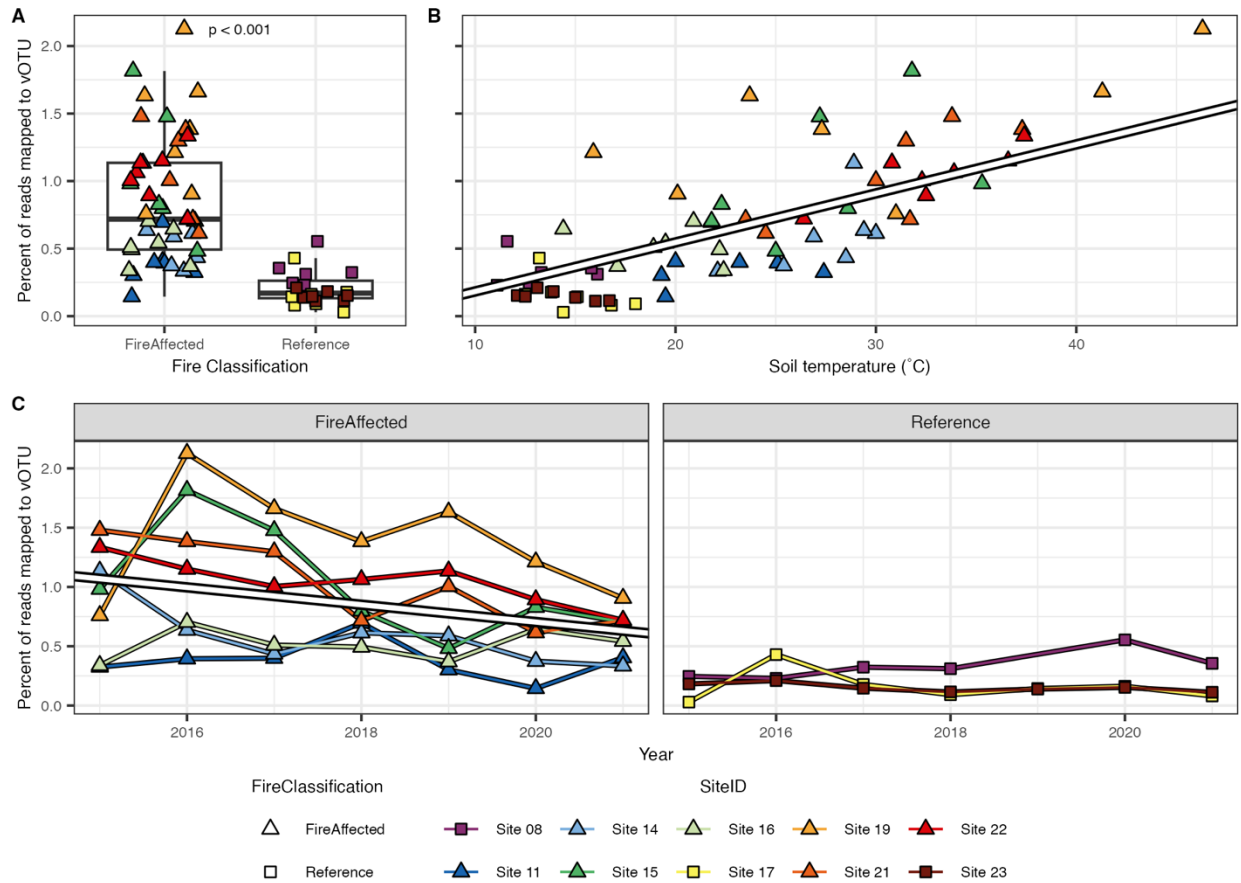


Figure S2: The percent of total reads mapping to vOTU was higher in fire-affected soils than reference and decreased as these fire-affected soils cool. A) vOTU read mapping compared across fire classification with p-value of the Wilcoxon rank sum test indicated. B) vOTU read mapping compared across soil temperature ($^{\circ}\text{C}$) regardless of fire classification with line indicating LME regression (slope = $3.63\text{E-}2$, p -value < 0.001). C) vOTU read mapping compared across sampling years within fire classification with line indicating statistically significant LME regression (fire-affected slope = $-7.31\text{E-}2$, p -value < 0.001 ; reference p -value = 0.818).

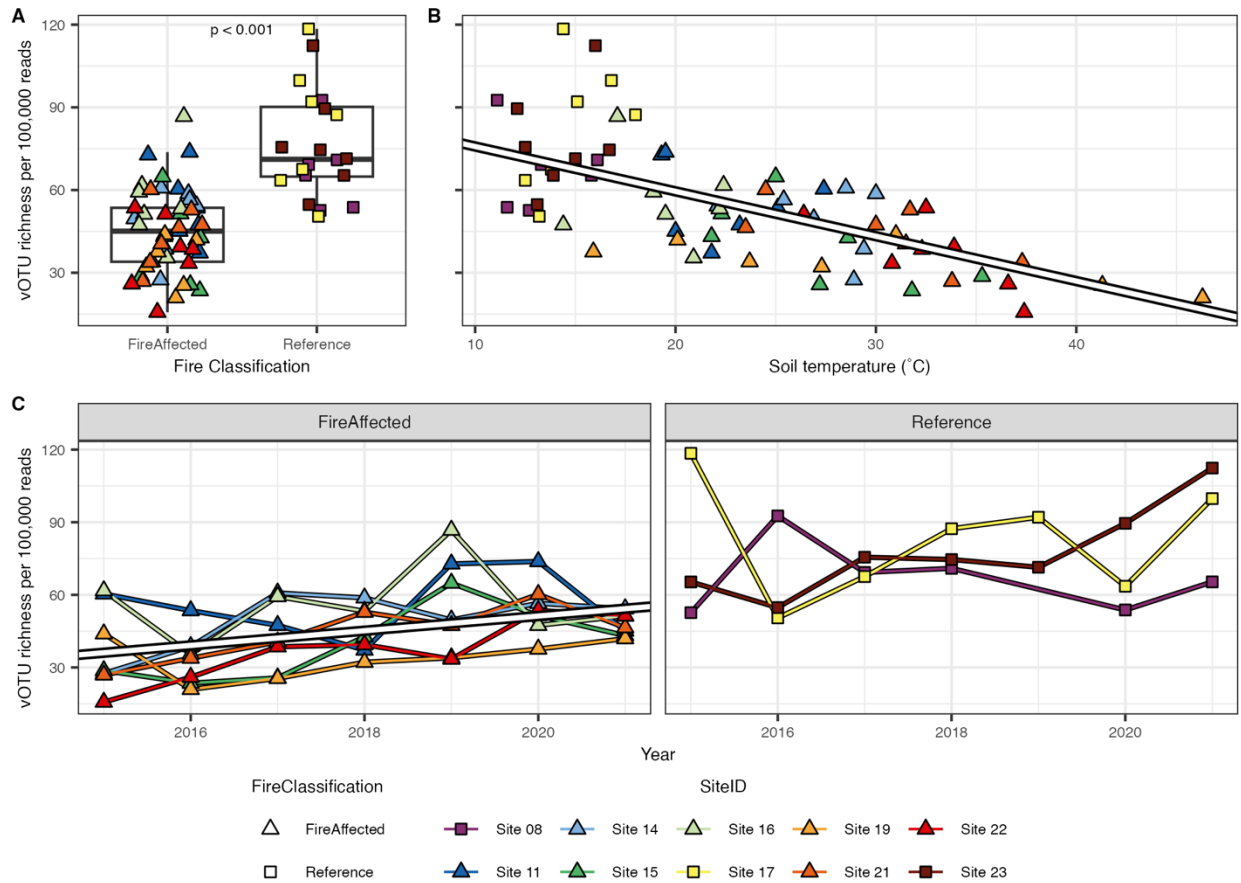


Figure S3: The vOTU richness was higher in reference soils compared to fire-affected and increases as the fire-affected soils cool. The vOTU richness was measured as the number of vOTU observed per 100,000 reads mapped to all vOTU in the sample. A) vOTU richness compared across fire classification with p-value of the Wilcoxon rank sum test indicated. B) vOTU richness compared across soil temperature ($^{\circ}\text{C}$) regardless of fire classification with the line indicating LME regression (slope = -1.627, p-value < 0.001). C) vOTU richness compared across sampling years within fire classification with the line indicating statistically significant LME regressions (fire-affected slope = 3.032, p-value < 0.001; reference p-value = 0.358).

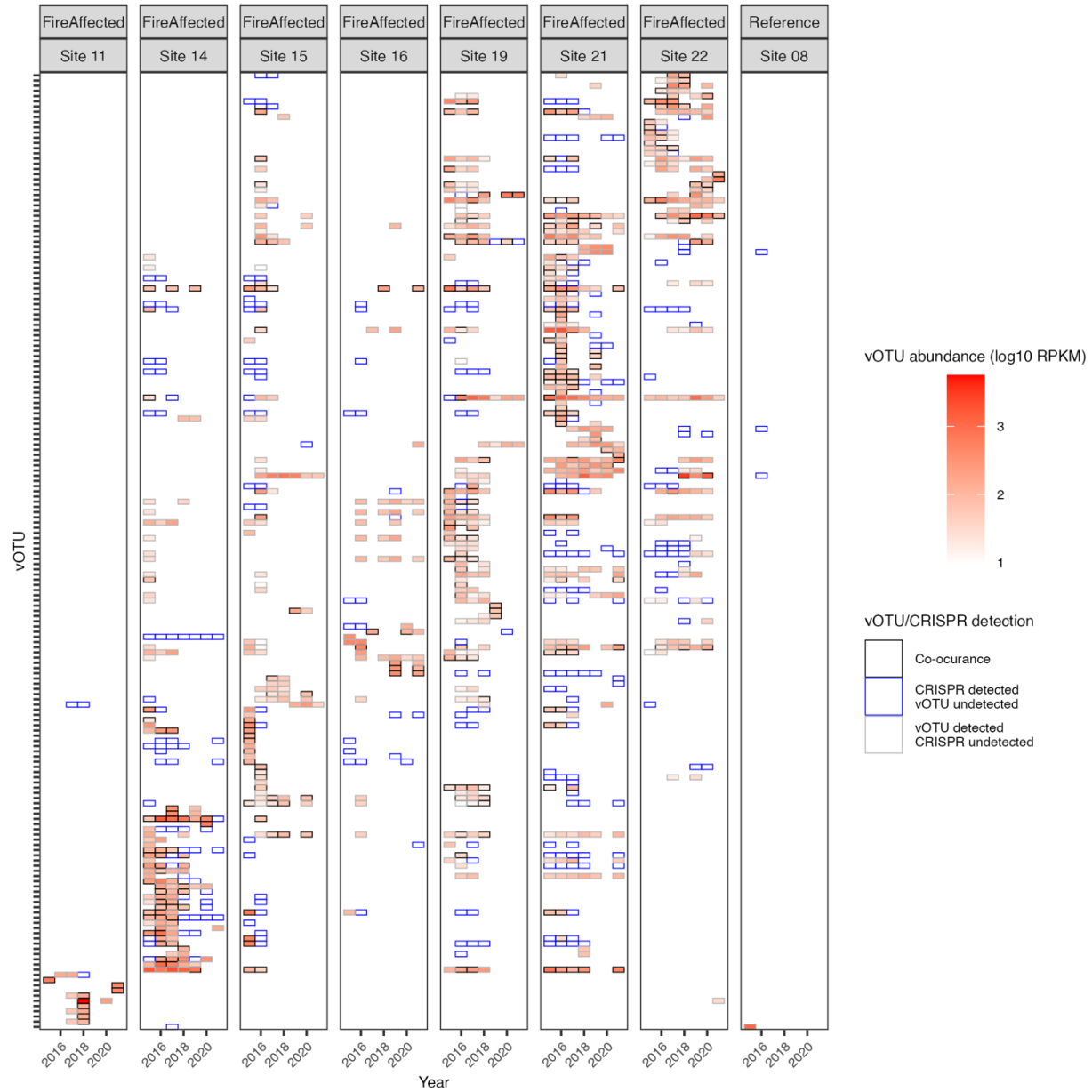


Figure S4: The heatmap of occupancy and abundance of vOTU matching CRISPR spacers across samples, including only vOTU that align with a CRISPR spacer. The rows represent individual vOTU while the columns represent samples with site ID indicated at the top and timepoint indicated at the bottom. The tile borders represent vOTU and matching CRISPR array detection in each sample. Grey bordered tiles represent where a vOTU was detected. Blue bordered tiles represent where an aligned CRISPR spacer was detected but the vOTU was not detected. Black bordered tiles represent where both were detected (*i.e.*, co-occurrence). The red fill in tiles where vOTU were detected (*i.e.*, grey and black bordered tiles) indicates the vOTU abundance in that sample (\log_{10} RPKM). Only one reference site is included as no matching vOTU or CRISPRs were detected in the other two references (Site 17 and Site 23).

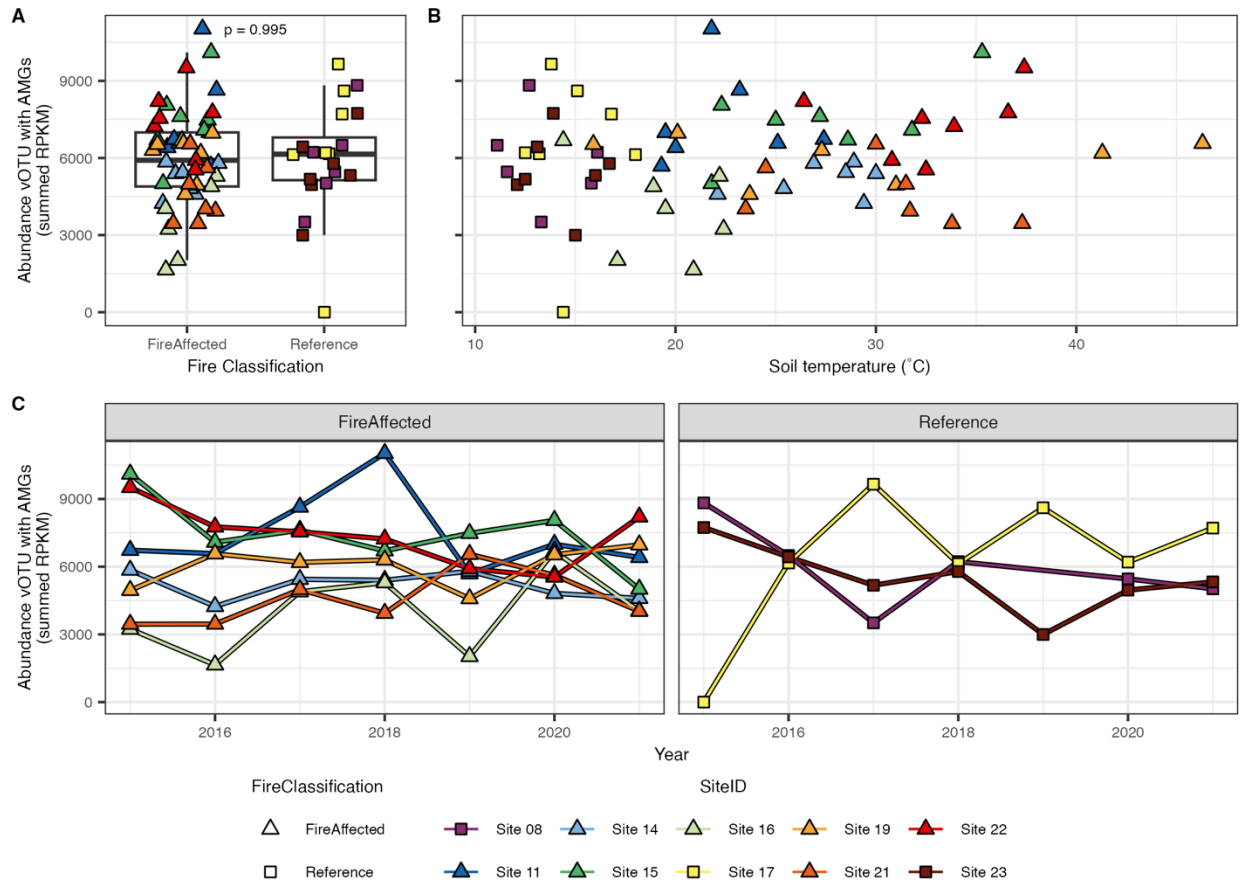


Figure S5: The abundance of vOTU encoding an annotated AMG did not significantly vary across fire classification, temperature or time. A) vOTU abundance compared across fire classification with the p-value of the Wilcoxon rank sum test indicated. B) vOTU abundance compared across soil temperature ($^{\circ}\text{C}$) regardless of fire classification (LME: p-value = 0.581). C) vOTU compared across sampling years within fire classification (LME: fire-affected p-value = 0.713; reference p-value = 0.951).