



Summary of the Wildfire Threat

The wildfire threat for communities in the boreal far north is not one thing. It is (a) fires started in backyards that threaten individual homes and neighborhoods. It is (b) dangerously poor air quality produced by persisting smoke from wildfire sieges that last weeks or months. And in its most devastating form, it is (c) wildfires that may rage into communities from the flammable wildlands surrounding them. Under given climate change scenarios, the prospect of all three threats becomes more challenging to prevent, control, and mitigate.



With more than 200 responses to human-caused outdoor fires each year in the Fairbanks study area, established fire response capabilities have prevented the kind of simulated potential posed in image a). The smoke hazard, image b), often comes from remote wildfires, but its impact on public health can be felt broadly over whole communities. And, most destructively, crown fire potential of spruce forests in and around the community, image c) poses the most dramatic wildfire impacts for you to consider. The Community Wildfire Protection Plan of 2006 calls for protection education, fuel hazard reduction projects, planned evacuation, effective suppression response, and fire-safe development.

Uncertainties

The most important uncertainties that must be accounted for are the questions of where, when, and how individual future wildfires will threaten the Fairbanks North Star Borough community.

Human-caused fires will commonly occur each year, threatening at least some nearby values at risk. The many fewer significant lightning ignitions generally need reinforcing driver interactions, such as concentrations of high-hazard fuels, seasonally dangerous fire weather exacerbated by climate change, and periodic drought to produce the extreme events that can bring catastrophic consequences into the Wildfire Urban Interface (WUI). The likelihood that a wildfire will impact a specific location and the values found there will remain extremely low on any given day or season. However, over a decade or over a generation, the cumulative probability rises to a level that wildfire impacts should be anticipated.

Will we see more ignitions, human or lightning, looking into the future? Climate change scenarios suggest that it is possible, especially when considering the boreal interior as a whole. Regardless, smoke impacts to air quality have already exhibited widespread and persistent threats that may increase in frequency and duration. These will be difficult to anticipate or prevent, and a challenge to mitigate.

Wildfire Driver Interactions and Trends

Wildfire risk incorporates wildfire's flammability hazard (most prominent in spruce forests in the Fairbanks area as it varies across the landscape), climate change effects on fire weather due to increasing temperatures, and human habitation in the WUI that brings concentrations of fire-starting behaviors in proximity to values at risk. Boreal fire ecology imposes an extreme, episodic fire regime that, combined with these other factors, makes for increasing area burned focused on areas most exposed to landscape flammability hazard.

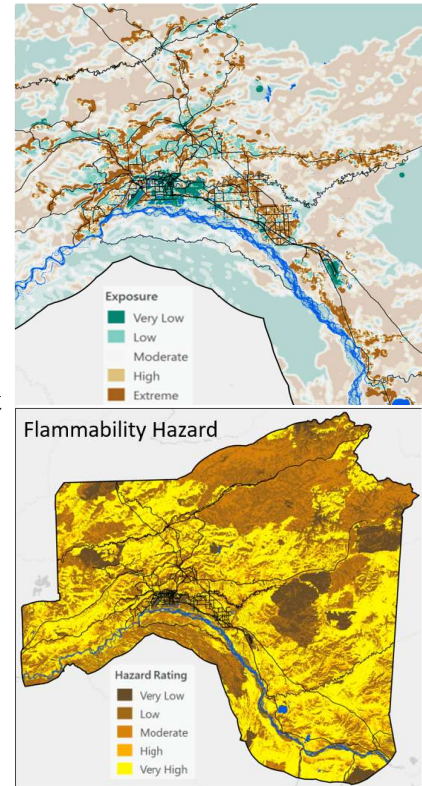
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Where Wildfires Threaten People and Places around Fairbanks

Despite our best efforts, we lack the ability to predict future wildfire events with any specificity. At the same time, we need to know where the threat is most important to help prioritize our actions. In Alaska’s interior, the greatest wildfire threat is from conifer forests, especially from black spruce forests and woodlands. Torching and active crown fire can loft and spread burning embers, commonly up to 0.3 miles. Other forests, shrubs, and grasses represent lower hazards with limited reach, exposing primarily the immediate area (within a few hundred feet).

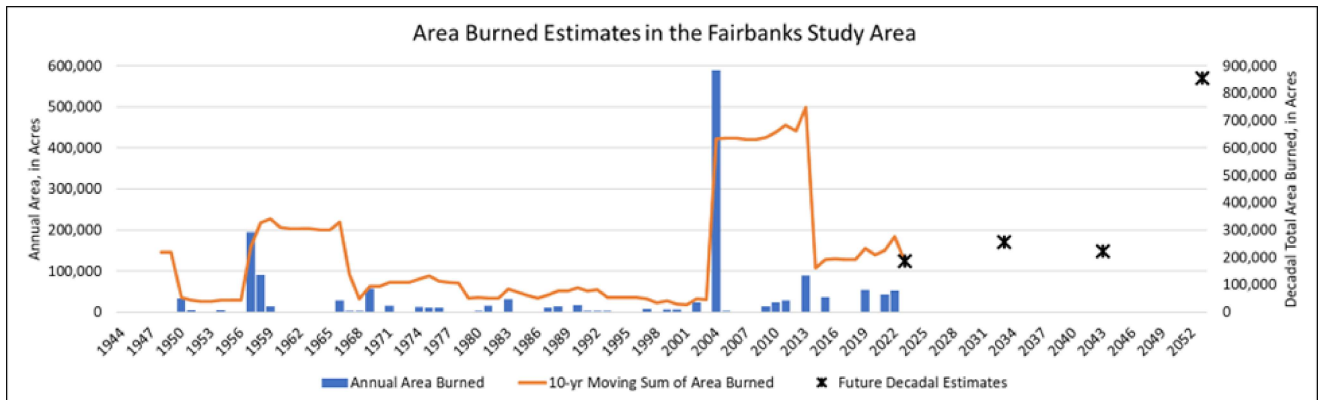
This potential impact, estimated as **Wildfire Exposure** in the image here, is identified as the relative likelihood of wildfire impact at each location due to distribution of the fuel hazard around it. While the likelihood that wildfire will reach any particular location from an individual incident is very low, this exposure depiction suggests that more than half (52%) of the developed area around structures (highlighted) is rated as high or extreme exposure. This means that any of the summarized impacts above are plausible threats to people and their needs over extended planning horizons. .



Drought, Climate Change, and Area Burned

Climate change is already manifest in the area burned history from the recent decades, as shown by the area rated as very low and low flammability in the graphic here. 2004, a drought year, alone impacted nearly 600,000 acres, reducing the hazard in those areas. As a result, it is anticipated that major wildfires will continue to burn large areas, with an uncertain threat each year.

Periodic drought and the surges in the area burned it creates (as shown on the graph below) should manifest again by 2050, approaching one million acres burned in a single decade. In fact, by 2054, we anticipate that restored forests suggested by vegetation growth models in burn scars should return Flammability Hazard to High and Very High levels for most of the areas burned before 2014.



While we cannot anticipate wildfire threats over planning horizons with any spatial or temporal specificity, landscape exposure assessment provides risk assessment tools to inform and prioritize areas of concern for catastrophic community-wide events and local day-to-day threats to life, health, property, community, and environment.

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