

When increased complexity does not help. Both FWI and NFDRS fail to accurately predict forest fire risk in Fennoscandia.

Supplementary table – Specifications of the 7 Fennoscandian fire event datasets

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Table 1: Specifications of each fire damage dataset. Sources: 1. (Skogbrand, n.d.-a), 2. (Skogbrand, 2019), 3. (Viken, 2021), 4. Correspondence with contact person at DSB, 5. (DSB, n.d.), 6. (Chuvieco et al., 2018), 7. (Chuvieco et al., 2019), 8. (Bakke et al., 2023), 9. (Lizundia-Loiola et al., 2020), 10. (Copernicus, n.d.), 11. (European Forest Fire Information System, n.d.), 12. (Giglio et al., 2021), 13. (Earth Science Data Systems, 2025), 14. (Copernicus Atmosphere Monitoring Service, 2022), 15. (ECMWF, 2026)

Dataset	Resolutions and time period coverage	Specifications	Basis of inclusion of fire events in dataset	Availability
Skogbrand Forest Insurance: Burned area	<u>Spatial resolution:</u> Municipal <u>Temporal resolution:</u> Daily <u>Time period coverage:</u> 2007-2023	<ul style="list-style-type: none"> Municipal scale. Burned area and related costs for confirmed fires in insured productive forests [1, 2] 	Burned area of productive forest of at least 2 000 m2 in size [1]	Not freely available
Norsk Insitutt for Bioøkonomi (NIBIO) Landskogstakseringen (National Forest Inventory Norway): Burned area	<u>Spatial resolution:</u> Plot coordinates, spaced unevenly <u>Temporal resolution:</u> Five yearly <u>Time period coverage:</u> 1996-2023	<ul style="list-style-type: none"> Species, management and percentage burned forest of each monitoring plot [3] 	Percentage of the 1 000 m2 monitoring plot that shows burn scars with a minimum 5% of plot burned [3]	Not freely available

<p>Direktoratet for Samfunnssikkerhet og Beredskaps (DSB) Brannstatistikk: Burned area</p>	<p><u>Spatial resolution:</u> Firefighting meetup coordinates, spaced unevenly <u>Temporal resolution:</u> Daily <u>Time period coverage:</u> 2001-2018, data before 2016 incomplete [4]</p>	<ul style="list-style-type: none"> • Complete overview of confirmed (forest) fires in Norway. • Provides information on: <ul style="list-style-type: none"> ◦ Cause of fire, ◦ Fire spread, ◦ Conditions that increased the fire hazard, ◦ Meetup location, ◦ Dates the fires burned ◦ Reported fire extent ◦ Type of forest affected (productive vs unproductive) [5] • Fire extent can be inaccurate [4] 	<p>Firefighting personnel called out to fight the fire [5]</p>	<p>Not freely available</p>
<p>MODIS FireCCI51: Burned area</p>	<p><u>Spatial resolution:</u> 250m for pixel product [6], 0.25 degrees for grid product [7] <u>Temporal resolution:</u> Monthly <u>Time period coverage:</u> 2001-2022</p>	<ul style="list-style-type: none"> • Misses many Norwegian fires [8]. • Inaccuracy in both date and number of fires in boreal areas due to cloudiness and confidence/size threshold [8]. <ul style="list-style-type: none"> ◦ Presence of clouds prevents accurate dating [9]. ◦ Coarse resolution sensors miss fires below 100 ha in size [9]. • Substantial commission and omission errors (respectively 67.1% and 54.4% on average) [9]. 	<p>Near-infrared band burn scars following a thermal active fire detection [6]</p>	<p>[6,7]</p>

<p>European Forest Fire Information System (EFFIS): Burned area</p>	<p><u>Spatial resolution:</u> 250m [10] <u>Temporal resolution:</u> Daily <u>Time period coverage:</u> 2008-2026, data before 2018 incomplete due to manual identification method and lower detection boundary of 30ha [10]</p>	<ul style="list-style-type: none"> • Includes information on ratio of vegetation types in the affected gridcell based on CORINE landcover dataset. • Data before 2018 incomplete due to detection limit of 30 ha before 2018 combined with a more manual identification approach. • No distinction between wildland fires, environmental burnings or prescribed fires. • Dates do not always correspond to burn dates of actual fire [10] 	<p>Visually verified burn scars from MODIS and Sentinel-2 imagery identified after MODIS active fire detection [10]</p>	<p>[11]</p>
<p>MODIS Active Fires: Radiative Power</p>	<p><u>Spatial resolution:</u> 1km [12] <u>Temporal resolution:</u> Daily <u>Time period coverage:</u> 2007-2023</p>	<ul style="list-style-type: none"> • Includes confidence level, brightness, radiative power and whether the observation was made during day or night. • Recorded date based on first near-cloudless day with detection: small delay possible in cloudy periods [12]. 	<p>Radiative power recorded when gridcell is significantly hotter than its neighbours on a near-cloudless day [12]</p>	<p>[13]</p>
<p>Global Fire Assimilation System (GFAS): Radiative Power</p>	<p><u>Spatial resolution:</u> 0.1 degrees <u>Temporal resolution:</u> Daily <u>Time period coverage:</u> 2003-present [14, 15]</p>	<ul style="list-style-type: none"> • Includes information on smoke plumes, gas fluxes, combustion rates and radiative power related to wildfires. • Near-real-time information on location, relative intensity and estimated emissions from biomass burning and vegetation fires [14, 15]. 	<p>Radiative power and fire emissions recorded after active fire detection registered in the NASA Terra MODIS and Aqua MODIS active fire products [15]</p>	<p>[14]</p>