



# The Netherlands flooded by flames: a rapid-response analysis of the Apr/May 2026 simultaneous wildfire events

Cathelijne R. Stoof<sup>1</sup>, Brian Verhoeven<sup>2</sup>, Harm Bartholomeus<sup>3</sup>, Marc Castellnou Ribau<sup>4,5</sup>, Jelmer Dam<sup>6</sup>, Edwin Kok<sup>2</sup>, Lone Mokkenstorm<sup>7</sup>, Janette Bessembinder<sup>7</sup>, Sjoukje Philip<sup>7</sup>, Nora Schreuder<sup>5</sup>, Adriana Solovei<sup>1</sup>

<sup>1</sup> Department of Environmental Sciences, Wageningen University, PO box 47, 6700 AA Wageningen, The Netherlands

<sup>2</sup> Netherlands Instituut Publieke Veiligheid, PO box 7010, 6801 HA Arnhem, The Netherlands

<sup>3</sup> Laboratory for Geo-Information Science and Remote Sensing, Wageningen University, PO box 47, 6700 AA Wageningen

<sup>4</sup> Catalan Fire Service, Bombers GRAF, Parc de Bombers de Cerdanyola del Vallès, Av. De Serragalliners, 08193, Cerdanyola del Vallès, Spain

<sup>5</sup> Meteorology and Air Quality Group, Wageningen University, PO Box 47, 6700 AA Wageningen, The Netherlands

<sup>6</sup> Brandweer Nederland, PO box 7010, 6801 HA Arnhem, The Netherlands

<sup>7</sup> Royal Netherlands Meteorological Institute, Utrechtseweg 297, 3731 GA De Bilt, The Netherlands

*Correspondence to:* Cathelijne R. Stoof ([Cathelijne.Stoof@wur.nl](mailto:Cathelijne.Stoof@wur.nl))

## Abstract.

In The Netherlands in April/May 2026, the country world famous for its floods and water management saw itself overwhelmed by wildfires. Here, we present a multi- and transdisciplinary rapid response analysis focusing on the phenological, meteorological and climatological conditions in which these fires occurred, assess their characteristics, and describe the response of the emergency services, government, and media. Within five days of high-alert, 111 wildfires were reported; only three were large enough for their burned area to be detected in EFFIS – all on military terrain. Despite major public outcry against the Department of Defence, we could only trace 6 out of 111 fire reports to military sites, 5.4%. The wildfire outbreak triggered considerable smoke concerns, evacuations and closures as well as a media storm, and caused the country to request EU assistance for the first time. The simultaneity of these fires was not new, we argue that the challenge was caused by a small number of large fires and a large number of smaller fires, to which large numbers of resources were deployed because of the continuing drought combined with low day- and nighttime relative humidity, incomplete vegetation green-up and strong winds, in a densely populated country with a lack of defensible space. We explain the major impacts not by the number of fires, their size, or behavior, but by the millions of people unfamiliar with wildfires that were exposed to smoke, emergency alerts, or the subsequent media attention. Based on this, we formulated five rapid lessons to prevent collapse of the emergency response system: 1) reduce ignitions in critical weather, 2) create a warning tool for atmospheric fire coupling, 3) make landscapes fire resilient, 4) increase initial attack capacity of military and land managers, and 5) engage proactively when crises occur. Structural recommendations to develop a fire culture and facilitate implementation of



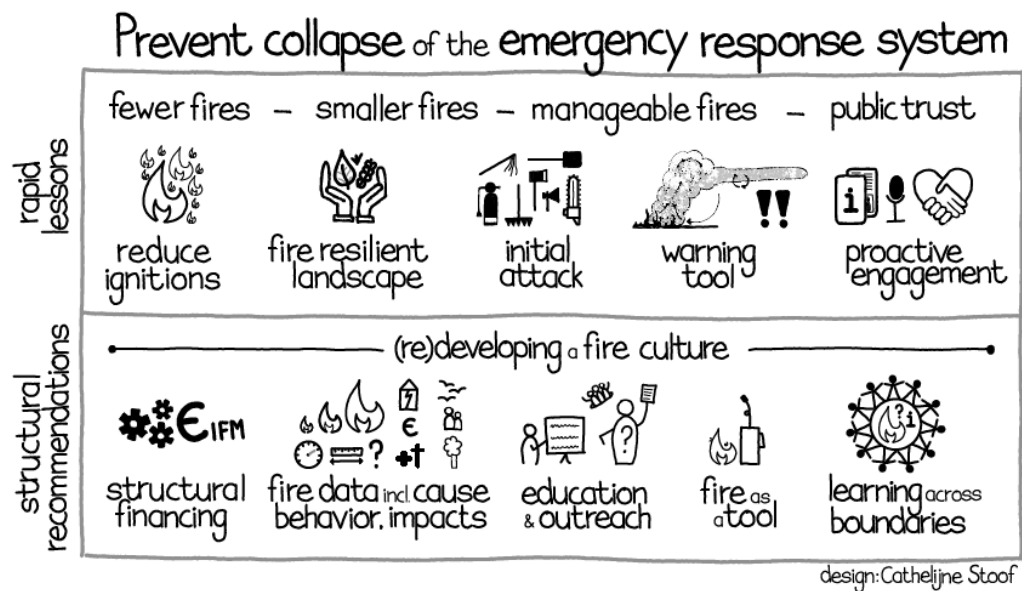
35 these lessons are: 1) structurally finance integrated fire management, 2) systematically collect data, 3) invest in education and outreach, 4) facilitate the use of fire as a tool, and 5) support cross-boundary learning.

**Short summary**

This Spring, The Netherlands was overwhelmed by wildfires and asked EU support. We studied what happened and why, to  
40 learn from this. 111 wildfires were reported within five days, with three larger fires occurring on military terrain. We explain the major impacts not by the number, size or speed of the fires, but by the millions of people unfamiliar with wildfires that smelled or saw smoke and received emergency alerts, and the media attention. We suggest ten steps to reduce future impacts.

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**Graphical abstract and key figure**



**1 Introduction**

“The last time the future turned out not to be the future, but harsh reality, was when COVID-19 hit. Now there are the days  
50 with fire danger” wrote columnist Sheila Sitalsing in a leading Dutch newspaper early May 2026 (Sitalsing, 2026), during a wave of simultaneous wildfires that shook The Netherlands. Even though wildfires are already in temperate Europe and have always been there (Jeffers, 2021; Stoof et al., 2024), they are often considered a phenomenon that happens elsewhere, or in the future. As a result, fire management, prevention and preparedness is expanding but still not commonplace. It is therefore



imperative that when an emerging fire country like The Netherlands experiences episodes of severe and simultaneous  
55 wildfires such as in April/May 2026, lessons are rapidly learned, shared and implemented.

Wildfire in temperate Europe is a non-predominant hazard: a hazard that is often overlooked, forgotten, or neglected (Jeffers, 2021). While the region has a long fire history and fire is a 6000-yr old tool in its heathlands (Davies et al., 2022; Vandvik et al., 2014), this region is better known for its coastal floods, river floods and storms. As such, fire awareness and  
60 preparedness are low, and wildfires are typically managed from an urban firefighting perspective. Meanwhile fire is changing in frequency, timing and intensity, impacting regions historically less affected (EASAC, 2025), sometimes faster than plans and capacities can cope with (COP30, 2025). The reason for this is also because the change from surface-driven fire regimes to atmospherically coupled fire regimes is not necessarily gradual but can very well be stepwise, as was illustrated by the Summer 2022 extreme wildfire season in southern France (Lanet et al., 2024) and the 2025 South Korea  
65 wildfires (Sung et al., 2025). Such fire events overwhelm even the best prepared countries and fire services (Castellnou et al., 2019). Europe therefore has a choice: to continue to invest in fire suppression or address the root causes of the fire challenge (EASAC, 2025), and revalue rural areas, create fire resilient landscapes and communities, and foster good, safe and traditional use of fire (Stoof et al., 2025). In line with this, world leaders at COP30 called for a paradigm shift that promotes “a global transition from reactive fire suppression toward proactive, prevention-driven, inclusive and ecological fire  
70 management strategies” (COP30, 2025). It is amidst this context changing fire regimes and calls for paradigm shifts that The Netherlands found itself overwhelmed by simultaneous wildfires in April 2026, and requested support from the EU for the first time in known history.

Landscape fires in temperate Europe are strongly driven by phenology (Nikonovas et al., 2024; Quiñones et al., 2025), given that winter senescence of plants means that vegetation in Spring is still yellow and dry and therefore susceptible for burning.  
75 The temperate European fire regime is characterised by typical Spring fires, with Summer fires mainly occurring during years with intense drought (Iverson et al., 2025; Stoof et al., 2024). Because mean fire size tends to be very small (San-Miguel-Ayanz et al., 2019; Stoof et al., 2024), these fires are largely undetected by satellites. Yet size does not equal impact, and in a region with high population density, low awareness and preparedness, Stoof et al. (2024) reported how small fires in The Netherlands have already caused major challenges. Further zooming in on The Netherlands, these authors reported that  
80 knowledge of the Dutch fire regime is still in development, after dedicated wildfire statistics ended in 1994 and only recommenced in 2017. Fire management in the country is in its infancy but rapidly evolving: in 2024 the ministry of Ministry of Agriculture, Fisheries, Food Security and Nature (LVVN) officially took ownership of the topic, which meant that for the first time in recent history the national government took responsibility for the topic of wildfires. In 2024, the government announced a 5-year total financial investment of 70 M€ dedicated to wildfires to support the development of risk  
85 management, crisis management, and knowledge and innovation, taking shape in a new law and regulations, a national crisis plan (NCTV, 2025), and a national center for integrated fire management. The Dutch governments’ vision is clear and embracing the role of fire in the landscape like the country lives with water, and focused on living with fire and integrated



fire management (Rummenie, 2024, 2025). Yet this innovative vision remains to be implemented more broadly, as illustrated by the fact that the use of fire as a tool has been removed from the regulated toolbox available to land managers (Stoof et al., 2026a; VBNE, 2025), and that wildfires are absent in the *Nota Ruimte*, the long term spatial planning vision of the Dutch government that makes spatial choices for 2030 and 2050 (VRO, 2025). And while key stakeholders recognize that integrated fire management requires sustained commitment, its structural financing remains to be arranged (Van Essen, 2026).

Here, we provide a rapid response analysis focused on the case of The Netherlands being impacted by simultaneous fast-spreading and large wildfires in Spring 2026, followed by a day of severe thunderstorms that brought significant atmospheric instability with a high possibility of (still) active fires interacting with the chaotic winds surrounding thunderstorms, as well as being able to rapidly produce pyroconvection. We analyzed the phenological and climatological conditions in which these fires occurred, assess their characteristics, and describe the response of the emergency services, government, and media. We pay specific attention to the blame game that erupted in the media towards the Department of Defence, after three major fires started during military exercises on military terrain. Altogether, we discuss how the simultaneity of these fires and the challenges brought forth were not unexpected and had been warned for, and draw key lessons for the implementation of integrated fire management in The Netherlands, that are likely valuable for other countries where wildfires are an emerging challenge.

## 2 Methods

With a multi-disciplinary author team representing science and practice, we here focus on the wildfire events that occurred in The Netherlands in Spring 2026 with a focus on the high alert period from 28 April to 2 May 2026. We aimed to rapidly identify and share lessons that are available based on an exploratory analysis of the wildfire events from a range of perspectives and scientific disciplines, based on available data: satellite and weather data, internal fire service records, and news articles, complemented with information requested from government officials. We thereby intentionally chose quality over quantity, multi-disciplinarity over mono-disciplinarity, correctness over completeness, and speed over a long-term study. This scientific analysis was initiated and coordinated by the first author; it was not commissioned. Most analyses were done within 2-4 weeks of the fire events. This rapid response analysis is therefore not an in-depth investigation of the course of events, which will be the subject of official evaluations. Rather, by summarizing the events, placing them in a wider context and highlighting lessons that can already be drawn, we aim to support science, policy and practice in The Netherlands and internationally, because addressing and implementing these lessons cannot wait.



## 2.1 Environmental context: phenology and weather

### 2.1.1 Phenology

Normalized Difference Vegetation Index (NDVI) time-series analysis was conducted to evaluate whether vegetation conditions differed between years prior to the recent fires. Median NDVI values were derived from Sentinel-2 imagery for the period 2021–2026 using all available scenes with less than 10% cloud cover within a 200-m buffer surrounding the plot location. The use of median compositing reduced the influence of residual cloud contamination and outliers, providing a robust representation of seasonal vegetation conditions. NDVI is widely used as an indicator of vegetation greenness, biomass, pre-fire vegetation status and post-fire recovery dynamics because it reflects changes in photosynthetic activity and canopy structure (Tucker, 1979; Van Wagtenonk & Root, 2003). Previous studies have demonstrated the effectiveness of Sentinel-2 NDVI time series for detecting vegetation change and monitoring post-fire regeneration in fire-affected ecosystems (Lasaponara et al., 2022). By comparing interannual NDVI patterns, we aimed to assess whether vegetation productivity and cover in the study area deviated from previous years.

### 2.1.2 Weather conditions before and during the fire events, and their long-term likelihood

Meteorological conditions prior to and during the wildfires were assessed using data from the Dutch meteorological institute KNMI. To place the events in April/May 2026 in context, the national average precipitation sum and precipitation deficit (from 1 Apr – 30 Sept) were calculated from precipitation data at KNMI's P13 reference manual gauge stations, and global radiation and average temperature data at Automatic Weather Stations (AWS's) nearby these P13 stations in order to calculate potential evapotranspiration (Hooghart & Lablans, 1988). These values were compared to long-term averages (1991–2020; KNMI, 2022, 2026). The Standardized Precipitation Index calculated over a one-month accumulation period (SPI-1) was obtained from <https://spi-monitor.pub.knmi.cloud/>. Weather analysis for the period 24 Apr – 3 May was subsequently based on daily measurements for De Bilt, the reference station for The Netherlands, to describe wind and wind gusts, temperature, precipitation and relative humidity. These data were also used to calculate the Fire Weather Index (FWI) and two of its sub-indices that are more frequently used in The Netherlands: the Fine Fuel Moisture Code (FFMC, as a measure of the moisture content of litter and other dry fuels on the ground surface) and the Initial Spread Index (ISI, describing the expected rate of fire spread). Analyses were done following (Van Wagner & Pickett, 1985) and (Van Wagner, 1987), with daily data used instead of data at local noon (Table A1). The longer-term likelihood of FFMC, FWI, and ISI was assessed by analysing their return period, as well as any trends in magnitude of this type of event. We considered both the persistence of the fire weather during the high alert period (5-day mean, 28 Apr–2 May) and daily extremes in April 2026. A Generalized Extreme Value (GEV) fit was applied to the maximum 1-day and 5-day average FFMC and ISI data occurring in the month of April between 1961 and 2026 following the attribution protocol of Philip et al. (2020) using the Climate Explorer (KNMI, 2022). As a forward-running mean was used for the return period calculation of the values occurring



during the 5-day high alert period, the first days of May were also included in the analysis. The GEV-fit was assumed to shift with global mean surface temperature (GMST) and the shape was constrained to  $\pm 0.4$ . Visual inspection of the GEV fits to FFMC and ISI indicates a reasonable fit: all data points reflecting the transformed observations were well within the 95% confidence bounds, providing reasonable estimates for further analysis.

### 2.1.3 Fire danger forecast and pyroconvection analysis

Since 2024, the Dutch fire service has a dedicated 7-person team of fire behaviour analysts (FBAN-NL) that conducts national operational wildfire danger assessments during the fire season in The Netherlands. These assessments are shared with wildfire specialists in the fire service and in the national crisis management system LCMS, an information and coordination platform used by emergency services and governmental authorities that facilitates multi-agency and real-time information sharing and coordination during emergencies and large-scale incidents. In addition to their sub-weekly fire danger assessments, the FBAN-NL team creates spot forecasts for larger wildfires, translating forecasted meteorological and fuel conditions into potential implications for fire behaviour. Meteorological institute KNMI supports these analyses by providing relevant meteorological information (forecasts and measurements). Starting in early April 2026 and throughout the rest of the month, the FBAN-NL team shared two operational fire danger assessments per week (and daily during the high-alert period), for four days ahead each, combining information of meteorological conditions (fire weather) and the perceived state of different fuel types into a forecast of fire danger conditions. The analysts base their methodology on the international standard practices as described by Castellnou Ribau et al. (2021). The meteorological analysis forecast was mainly based on weather models of the Dutch and German meteorological institutes (Harmonie Cy43, KNMI; ICON-D2, DWD; and ICON-EU, DWD), focusing on surface weather parameters as well as vertical atmospheric conditions. Any bias between observed (current or recent) and modelled conditions were corrected, which was particularly needed for the average wind, as modelled values underestimated observed wind speeds the days before the wildfire outbreak. As such, wind speed was forecasted to be 2-3 m s<sup>-1</sup> above model outputs. The fuels assessment focused on both dead and live fuels following (Carlson et al., 2007). Dead fuels were separated into four time-lag classes (1h, 10h, 100h, 1000h) based on their diameter, and their availability to burn was determined by analysis of the total period of drought and day- and nighttime relative humidity (based on meteorological data), as well as their consumption during prior wildfires (field measurements, photos, and anecdotal evidence). The status of live fuels was assessed based on visual signs of vegetation stress (e.g. discoloration in leaves or needles, or a delayed green-up of heather vegetation) that would indicate an increased flammability.

Pyroconvection potential was assessed by modelling vertical profiles of the atmosphere through Skew-T log-P diagrams and following the mixed layer parcel method (Lareau & Clements, 2016; Tory et al., 2018). First, we assessed the degree of complexity for fire suppression based on an operational framework developed and used by the Catalan Fire and Rescue Service (CFRS), based on historical data of fire spread as well as meteorological data and thresholds (Appendix A2), and then translated into a simple metric for operational use. These complexity maps are different from risk maps; they serve as



an awareness tool that highlight when and where the factors that contribute to the rapid and intense spread of fires accumulate: e.g., a combination between a wind driven fire, over extremely dry fuels, without recovery of nighttime relative humidity, and with pyroconvection. In the case of The Netherlands, with a fire regime mainly driven by dead fine fuels, the complexity for fire suppression increases with increasing duration of the burning window, wind speed, and moist  
185 pyroconvection (overshooting PyroCu, resilient pyroCu and pyroCb prototypes).

For fires with a complexity level  $\geq 2$ , the fire's energy output is considered sufficient to generate pyroconvection in case the atmosphere is conducive to this. Therefore, where complexity exceeded Level 2, the maximum potential pyroconvection prototype possible given the atmospheric conditions was assessed following Castellnou et al. (2022): convective plumes, overshooting PyroCu, resilient PyroCu, or PyroCb. The result is visualized spatially in pyroconvection prototype maps,  
190 produced by the Meteorology and Air Quality Group at Wageningen University (The Netherlands).

## 2.2 Fire occurrences and characteristics

To place the wildfire events in April/May 2026 in context of the fire regime in The Netherlands, we created an overview of Dutch wildfire reports since the dedicated data collection restarted in 2017. For this, we used data collected by Stoof et al.  
195 (2024; 2017-2022 period) complemented with data collected by the Netherlands Institute for Public Safety (NIPV; 2023-2026). To allow for comparison of the long-term record, and because we were interested in requests from emergency services, we here focus on the reports of fire occurrences (*'natuurbrandmeldingen'*). Wildfire records on the ASK and ISK military sites were requested from their respective fire services. For methodological details, please refer to Appendix A3. Hourly distribution of fire reports was determined from data extracted from raw non-public dispatch data (GMS system)  
200 obtained from NIPV, filtered to remove duplicates and aborted requests (Appendix A3). These data were also used to map the approximate location of the fires based on the GMS coordinates. We then analyzed the number of wildfires on military terrain during the high-alert period by these GMS coordinates with the shapefiles of military land and property extracted from OpenStreetMap using the Overpass API (Appendix A3). To assess the degree to which the European Forest Fire Information System EFFIS captured the fire occurrences, we counted the total number of fires and area burned detected with  
205 the MODIS/SENTINEL2, fire severity, and VIIRS data products for the five high-alert days from 28 April to 2 May.

Finally, we zoom in on eight significant wildfires that occurred during the five days of high alert, selected based on their size, impact, fire behavior and suppression response. These fires include the three fires large enough for their burned area to be detected in EFFIS, the incidents where NL-Alerts were triggered, a handcrew or Chinook helicopter was deployed, as  
210 well as incidents where fire behavior was very rapidly developing. The largest fire occurred near the village of 't Harde at the Artillery Shooting Range (Box 1) for which high resolution Planet images were downloaded for visual comparison. Incident starting times were obtained from the emergency service dispatch information GMS, fire duration from media reports, and fire size, fire severity (dNBR, Appendix A3) and vegetation type based on satellite analysis using images of



215 dates before, during and after the fires. Fire behavior characterization was based on internal fire service knowledge, and  
suppression response on public P2000 incident reports. An overview of all emergency alerts sent out by the Dutch  
government via cellphone towers was obtained from NL-Alert (<https://actueel.nl-alert.nl/alerts/>) on 9 May 2026: NL-Alerts  
are sent out by the national government to warn and inform people of emergency situations (e.g. a disaster, major incident, or  
crisis). A rough estimate of the effect of the large smoke cloud from ‘t Harde on air quality across The Netherlands was  
obtained from PM2.5 data (Bult et al., 2026) collected through a citizen science initiative from the Dutch National Institute  
220 for Public Health and the Environment (de Ruiter et al., 2025; Wesseling et al., 2019). The number of people exposed to the  
smoke cloud from ‘t Harde and reached by the large NL-Alert across Noord-Brabant was subsequently estimated (see  
Appendix A3). Further information including regarding fire impacts was based on internal fire service knowledge as well as  
media reports.

#### **Box 1. The large fire at ‘t Harde of 29 Apr 2026**

**Background and site description.** The Artillery Shooting Range (ASK) is a 5400-ha military shooting range in the center of the country, that is closed to the public and classified as Natura2000. Located near the village of ‘t Harde, the ASK is situated on sandy soils, and its vegetation is comprised of heathland and Scots pine forest (*Pinus sylvestris*). The Doornspijksche Heide also harbors valuable juniper woodland (*Juniperus communis*), a rare and threatened species that is protected in The Netherlands (Hommel et al., 2007; van der Meijden et al., 2000). Newman Thacker et al. (2023) highlighted the ASK military site as a fire resilient landscape, because of the acceptance and use of fire, active land management, close collaboration between fire service and land management, its presence of a well-trained fire service focused on loss avoidance, and active focus on post-fire recovery including learning. Fire is regularly used as a tool at the northern part of the ASK site, the Oldebroeksche Heide, and because of the calculated presence and regular occurrence of fire at this site, its in-house fire service is the most experienced wildfire crew in The Netherlands. The landscape is designed based on preventive measures such as access routes, tree-less zones, firebreaks, green fire breaks and water access ponds (Van Weel & Boswijk, 2026). The mosaic landscape is interspaced and surrounded by wide sandy firebreaks, installed after lessons learned from a major fire on 18 Jun 1970.

The Netherlands has two military shooting ranges, the Artillery Shooting Range (ASK) and the Infantry Shooting Range (ISK). In addition, the Department of Defence also owns a large number of Exercise and Training Locations, which are areas used for military training exercises while being open to the public for recreation. In contrast to the shooting ranges, Exercise and Training locations do not have a dedicated military fire service; Van Weel and Boswijk (2026) report that risk measures aim to prevent fire spread and allow effective response of emergency services.

**The fire of 29 Apr 2026.** The fire ignited around 11.30h during a planned exercise in which explosives were detonated (Marechaussee, 2026), with the in-house fire service arriving on site within ~10 min. Due to the rapid development of a large fire plume, civilian fire crews were initially alarmed for (supposedly) two major wildfires in neighbouring towns, but



rerouted to the ASK when the correct location emerged. Estimates of relative humidity (RH) were 30-35% and wind speed 6-7 m s<sup>-1</sup> at the time of ignition (Fig. B2); wind speed and wind gusts progressively increased while RH decreased into the afternoon. RH did not recover well during the night (RH<sub>max</sub> of 50%), indicating that fine fuel moisture did not recover. Weather conditions on 30 Apr were broadly similar (Fig. B2), and precipitation was not recorded.

**Fire behavior.** The observed fire behavior fit a wind-driven spread pattern under the influence of the strong easterly winds. Based on initial estimates, rate of spread was ~2.5-3 km h<sup>-1</sup> with a maximum spotting distance of up to 200-300 m. Soon after ignition, headfire flame lengths in heather and purple moor-grass (*Molinia caerulea*) quickly reached 2-4 m. As such, it directly rapidly triggered torching and crown fire when reaching pine trees and small coniferous forest patches, respectively, with flame lengths estimated at ~10-20 m. In patches of pine forest with more broadleaf undergrowth such as blueberry (*Vaccinium myrtillus*), also located at the western edge of the terrain, the fire slowed down and decreased in intensity. Despite green-up, fire spread continued also in broadleaf vegetation, although milder fire behavior in these fuels did allow suppression opportunities at the head of the fire.

**Impacts.** Satellite imagery shows the fire was contained within the military site itself: 10-20-m wide sandy firebreaks provided fire crews a safer space to stop the fire spreading off-site. On-site immediate impacts on flora and fauna, and off-site impacts caused by smoke are detailed in Table 1. Post-fire recovery was immediately initiated, to combat grass proliferation, provide shelter for reptiles and insects by leaving tree trunks, and to provide nesting locations for grey shrike (*Lanius collurio*) by installing slash piles of Scots pine (*Pinus sylvestris*) (Tweede Kamer, 2026).

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### 2.3 Response to the fire events: fire service, government and media

We analyzed the official response to the fire events based on government letters that informed Dutch Parliament, internal fire service knowledge, news releases as well as media reports. Within a month of the fires, Dutch Parliament was informed twice about fire management in 6-9 page letters written jointly by the Ministers and Secretary of State of three governmental departments (Safety and Justice; Defence; Agriculture, Fisheries, Food Security and Nature, LNVN) about the simultaneous wildfire events (11 May 2026; Van Weel & Boswijk, 2026) and integrated fire management in general (22 May 2026; Van Essen, 2026). Based on these letters, we describe the governmental approach to the fires. This information was complemented with internal fire service knowledge to further describe the operational preparedness and response. Finally, for the public communication of the Department of Defence we analyzed media reports (e.g. newspapers, online articles) as well as relevant news releases from the Department of Defence (<https://www.defensie.nl/actueel/nieuws>) and its military police the Koninklijke Marechaussee (<https://www.marechaussee.nl/actueel/nieuws>). This analysis was done on 20 May 2026 and focused on the period 28 Apr - 19 May 2026. Public communication by the ministry LNVN (<https://www.rijksoverheid.nl/ministeries/ministerie-van-landbouw-visserij-voedselzekerheid-en-natuur/nieuws>) was done on 1 Jun 2026.

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### 240 2.3.1 Media coverage analysis

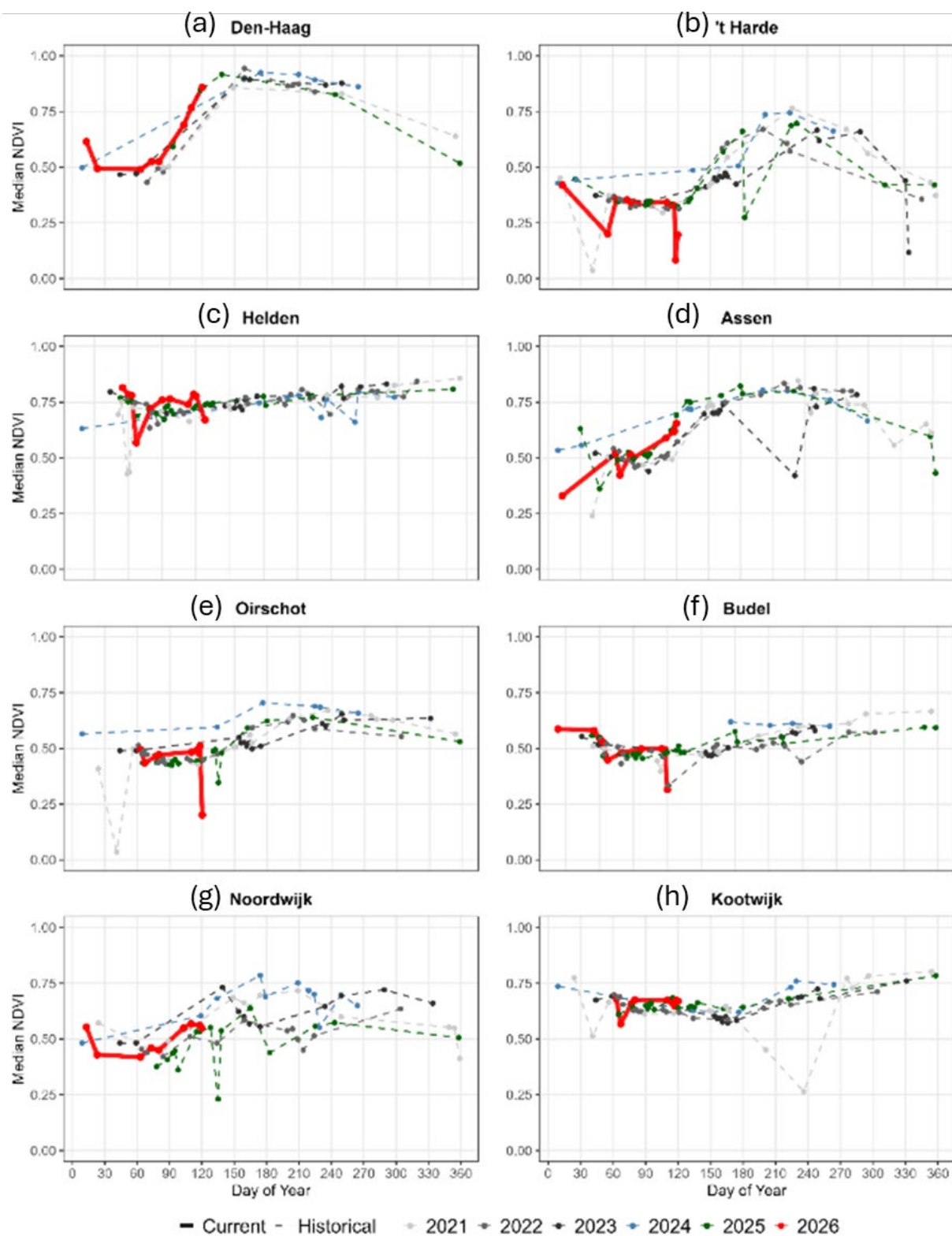
We analysed Dutch news media coverage of the wildfire events, by quantifying media attention from 2 April to 4 May, and by analyzing the framing of wildfire events during the high alert period from 28 Apr to 2 May. For this, we downloaded articles from LexisNexis Academic, using the search string *natuurbrand OR bosbrand OR heidebrand OR duinbrand* (nature fire OR forest fire OR heathland fire OR dune fire), with results filtered to The Netherlands. Total daily article counts were  
 245 calculated by deduplicating on title, outlet, and publication date; unique story counts were calculated by deduplicating on title and date alone, with the difference between total and unique counts reflecting identical or near-identical articles distributed to multiple publishers. The full dataset spanned from 2 Apr to 4 May 2026 and included a total of 1,209 publications, reduced to 556 unique stories after deduplication across 54 editorial organisations. The framing analysis focused on unique stories published during the high alert period (28 Apr – 2 May), and was done through automated content  
 250 analysis (Boumans & Trilling, 2018). Articles were categorized automatically based on whether their headlines and text contained keywords associated with six pre-selected frames: Emergency Response, Public Safety & Impact, Climate & Structural Risk, Military Responsibility, Human Interest, and Nature & Ecology (see Table A2). The frame preselection was informed by generic news-framing and wildfire media coverage literature (Nilsson & Enander, 2020; Paveglio et al., 2011; Semetko & Valkenburg, 2000). Frame presence was coded as a binary indicator per article; the primary frame was  
 255 determined by the frame with the highest total keyword hit count per article; multiple frames could be present per article. A random subsample (10%) was coded manually by one researcher (AS), yielding acceptable reliability for all frames (Cohen's Kappa > 0.6). Data analysis was conducted in R and Excel.

## 3 Results

### 3.1 Environmental context

#### 260 3.1.1 Phenology

Analysis of six years of NDVI data for the locations of eight significant wildfires during the high alert period in 2026 shows that while some sites were still in the green-up phase (e.g. 't Harde, Assen, Oirschot), others had already reached their peak of greenness when the fires occurred (e.g. Den Haag). In four cases, a distinct drop in NDVI is present around DOY =120, due to the large impact of the fire on the vegetation. This drop is apparent in the larger fires ('t Harde, Helden, Oirschot,  
 265 Budel) but not in the other, smaller ones. Comparison of the NDVI development in 2026 with previous years indicates that this year was not markedly different from the period 2021-2025 (Figure 1).





270 **Figure 1: Annual development of median NDVI (2021-2026) for the location of eight significant wildfires that occurred during the five-day period of high alert, showing that NDVI in April/May 2026 was not markedly different from other years.**

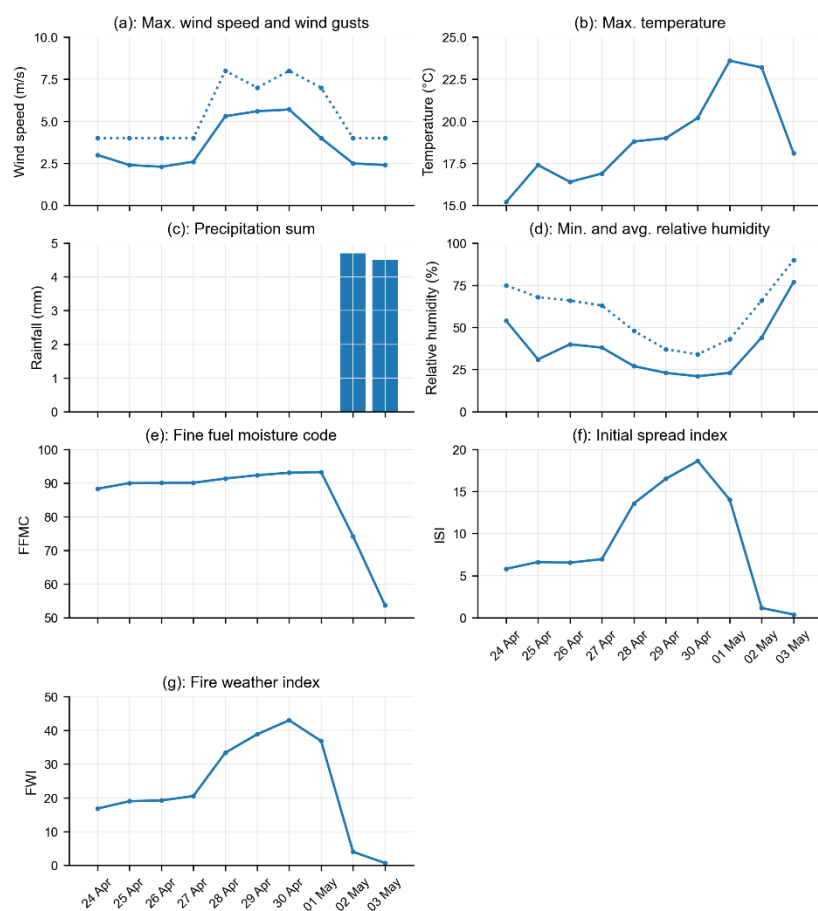
### 3.1.2 Weather conditions before and during the fire events, and their long-term likelihood

In terms of weather conditions, the fires in April/May 2026 occurred in a context of drought. Because of below-average precipitation and above-average solar radiation, the preceding year (2025) marked a year with a significant precipitation deficit reaching a maximum of 268 mm country-wide, 107 mm above the 1991-2020 average, although there were strong regional differences. Winter 2025-26 was relatively dry, followed by a slightly drier than average March, and a very dry April 2026, that saw only 8 mm of precipitation (20% of the long-term average; Table B1). This resulted in a strong precipitation deficit by 30 April 2026 (77 mm) along with very low Standardized Precipitation Index (SPI-1) that crossed the threshold for ‘extremely dry conditions’ (-2.0) on 28 Apr and reached -4.0 on 1 May (Figure B1).

280 On 27 Apr 2026, the large-scale circulation veered easterly, due to a blocking area of high-pressure area over northwestern Europe, causing dry and relatively warm air masses to reach The Netherlands. The temperature gradually increased until 1 May (Fig. 2b), while sunshine duration from 29 Apr - 1 May reached > 90% of the maximum potential value; no precipitation was recorded in this period. Minimum relative humidity between 28 Apr – 1 May was 21-27% in De Bilt, and nighttime relative humidity did not exceed 52% on 29-30 Apr, reducing fine fuel moisture recovery. As a result, FFMC

285 gradually increased to 93.2 on 1 May. Simultaneously, wind speeds increased, causing peaks in ISI (18.6) and FWI (43.0) on 30 April (Fig. 2a). As such, most of the high-alert period can be classified as a ‘fire danger day’ following (Lambrechts et al., 2024). Overall, a peak in fire weather was observed between 28 Apr and 1 May, characterized by exceptionally high FFMC (i.e. low fuel moisture) and exceptionally high potential rate of spread (ISI). The observations indicate a trend in both FFMC and ISI towards more frequent fire-prone weather: analysis of return periods reveals that the fire weather observed

290 during the high alert period in Apr/May 2026 are far more likely in the current climate than in a pre-industrial climate that was globally 1.3°C cooler than now (Table B2). In the current climate, the average FFMC, ISI and FWI during the high-alert period had a return period of 1.5, 9.6, and 16.0 yr, respectively (Table B2). In a pre-industrial climate, return periods would have been 1.5 to 2-fold higher for all three indices. Also, the daily maximum indices occurring in April 2026 were considerably more likely in the current climate than before (Table B2).



**Figure 2: Daily meteorological measurements (between 0:00 Coordinated Universal Time (UTC) and 23:59 UTC) and derived Fire Weather Indices at KNMI Automatic Weather Station De Bilt between 24 April and 3 May 2026.**

## Box 2. Forecast of fire danger and pyroconvection potential

**Fire weather.** The operational fire danger assessment on 27 Apr 2026 highlighted a high potential for large and difficult-to-control wildfires in The Netherlands. With April being very dry without significant rain (Section 3.1.2), the weeks before were relatively sunny with low daytime relative humidity, enhancing evapotranspiration. Forecast conditions for 28 Apr to 1 May included very low relative humidity (minimum of 15-20 % for 3 days), along with poor recovery of relative humidity at night (max. 50-60%). Winds were forecasted to be easterly, bringing dry air, and increasing in strength (mean wind speeds up to 7-9 m s<sup>-1</sup>, gusts up to 14 m s<sup>-1</sup>).

**Fuels.** Particularly fine dead fuels (1-10 h fuels), including heather and grass (e.g. *Molinia caerulea*), were considered highly available for ignition and rapid fire spread, while greening-up of live vegetation in forested areas was expected to partially limit fire intensity and spread. Yet, due to prolonged drought increasingly affecting deeper organic layers, also

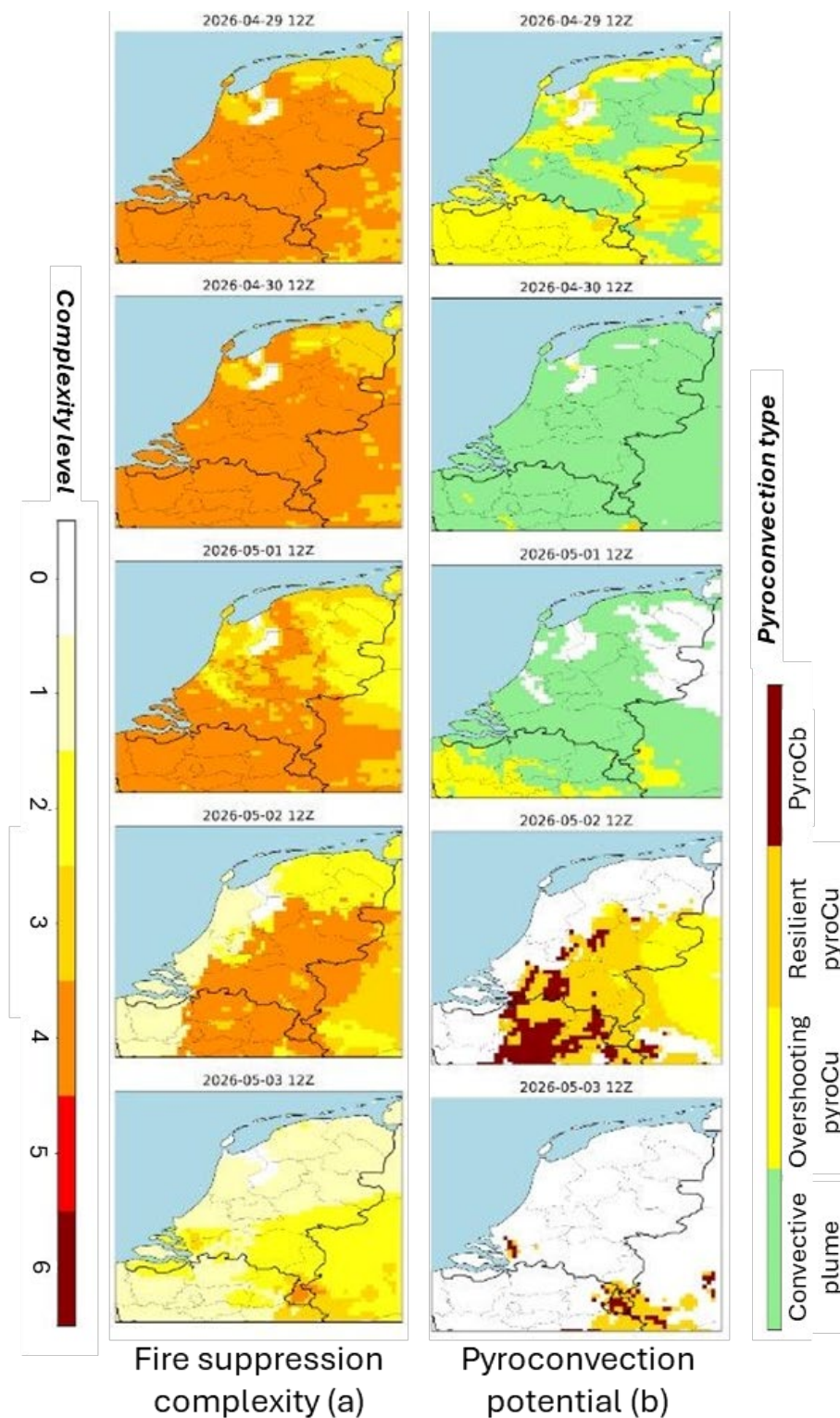


100h fuels were expected to become available to burn under the conditions forecasted later in the week, contributing to higher potential fire intensity, increased probability of persistent hotspots due to smouldering combustion in dry organic layers.

**Fire behavior.** Based on the above, the operational fire danger assessment forecasted predominantly wind-driven fire behaviour, with expected fire behaviour considered to be particularly critical in open terrain, where rapid rates of spread, high fire intensity and spotting potential were anticipated. In forested areas, lower spread rates were forecasted, with the possibility of increased fire intensity in areas with abundant dead (fine) fuels and organic material accumulation. In addition, the combination of strong winds and poor overnight recovery of relative humidity was forecasted to allow active fire spread and new ignitions to continue throughout the evening and night.

**Pyroconvection.** From 29 April to 1 May the fire suppression complexity levels were high (Level 4 out of 6) for the majority of The Netherlands, while pyroconvection potential was limited due to strong inversion at the top of the Atmospheric Boundary Layer. This changed on 2 May, when the afternoon arrival of a low pressure area with thunderstorms brought instability in the atmospheric boundary layer and free troposphere. Because of this instability, and the accumulated dryness of the fuels, pyroconvection potential was such that resilient pyrocumulus (pyroCu) and pyrocumulonimbus (pyroCb) prototypes were possible in case of a well-developed fire front (Fig. 3). Based on the WUR/CFRS plume model (Wildfire Data Portal, 2026), a heathland fire with an actively burning surface area of ~4 ha could have the capacity to produce a pyroconvective plume > 8000 m. Following Castellnou et al. (2022), this would have resulted in moist convection: a pyroconvective wildfire with a pyroCb, where the fire can accelerate, flanks have an increased capacity to widen, and extreme surface winds can occur in case of collapse of the fire's plume.

**Forecast issued.** Based on the above, the operational fire danger level was elevated to the highest category (Purple) from Wed 29 Apr to Friday 1 May, and Red for Tue 28 Apr (as the preceding night had good nocturnal RH recovery) and Sat 2 May, when wind speed slightly decreased and relative humidity increased, but fuel availability was considered to be high because of the dry April. The forecast for 2 May explicitly mentioned atmospheric instability (with expected thunderstorms) and related risk for extreme (pyroconvective) fire behaviour, in case wildfires would burn overnight or new ignitions would occur. It also highlighted the possibility of erratic in- and outflow winds of thunderstorms near active fires, and therefore sudden changes in fire spread and direction. Finally, the three days of highest alert were warned to see fire behaviour similar to previous severe wildfires in The Netherlands, including the 2014 Nationaal Park the Hoge Veluwe fire and more specifically the 2020 Deurnese Peel (Stoof et al., 2020) and Meinweg wildfires.





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**Fig. 3 Fire suppression complexity (a) and pyroconvection potential (b) for the period 29 Apr to 3 May at noon; see Fig. B3-B4 for further details for these days.** When complexity maps indicate complexity level  $\geq 3$  and pyroconvection maps indicate the possibility of pyroconvection, a large and active fire can likely become pyroconvective.

### 305 3.2 Reports of fire occurrences and fire characteristics

In terms of daily occurrences, the number of wildfires that were reported in the study period steadily increased from early April onwards, and markedly peaked during the high alert period from 28 Apr to 2 May (Fig. 4b). Zooming in on these five days of high alert, a total of 111 wildfires were reported, with 86 fire reports within three consecutive days (29 Apr - 1 May, Fig. 4b). Wednesday 29 Apr and Friday 1 May saw the most fires reported: 31 and 30 fire reports, respectively. During the  
 310 five high-alert days, wildfires were reported predominantly during daytime (7:00–19:00 h,  $n=77$ , 71% of all fires), and particularly in the afternoon ( $n=62$ , 57% of all fires), though interestingly 10 fires (9%) reportedly started in the late evening and during the night (22 h to 3 h).

Spatially, the wildfires were reported across the country (Fig. 5). Analysis of dispatch data and military locations suggest that 6 out of the total of 111 wildfires reported between 28 Apr and 2 May burned on military terrain (5.4%): three on a  
 315 shooting range ('t Harde, Harskamp  $n=2$ ) and three on military training sites (Assen, Oirschot, Budel; Appendix B3). The three largest wildfires were 't Harde (425 ha), Budel (132 ha) and Oirschot (26 ha), all on military terrain. Combination of the satellite-based fire perimeters of these fires (Fig. 5) and the perimeters of these military terrains suggests that the main burn scars located within the military terrains, with only the Budel fire burning a few meters into the green grass of the adjacent airfield. This analysis does not allow for identification of the location of spot fires, but the fact that no other burn  
 320 scars are visible outside the terrains indicates that any spot fires that may have occurred beyond the main fire scars were very small and rapidly contained.

Given the small size of all other wildfires in this period, only the larger fires in 't Harde, Budel and Oirschot (2.7% of all occurrences) were visible in the European Forest Fire Information System (EFFIS, Table B3). Fire severity was predominantly low to moderate (smaller fires, Budel, part of Oirschot and 't Harde), with moderate-high severity in much of  
 325 the 't Harde and Oirschot burn scars and high severity in smaller patches, particularly in 't Harde and Budel (Fig. 5).

Table 1 highlights eight fires that occurred during the five days of high alert, and characterize these fires in terms of their location, size, fire behavior, fire suppression and impacts. Aside from the three large fires (26–425 ha), several of these significant fires remained smaller than 1 ha (e.g. The Hague, Noordwijk, Kootwijk). While data on fire behavior is limited,  
 330 observations indicate that most fires were wind driven. The largest wildfires occurred in heathlands, where the wind had a dominant effect on the fire spread due to the open terrain, resulting in estimated rates of spread up to  $3 \text{ km h}^{-1}$  (based on current knowledge). In cases of torching or crowning in pine trees, spotting distances up to 300–600 meters was observed in



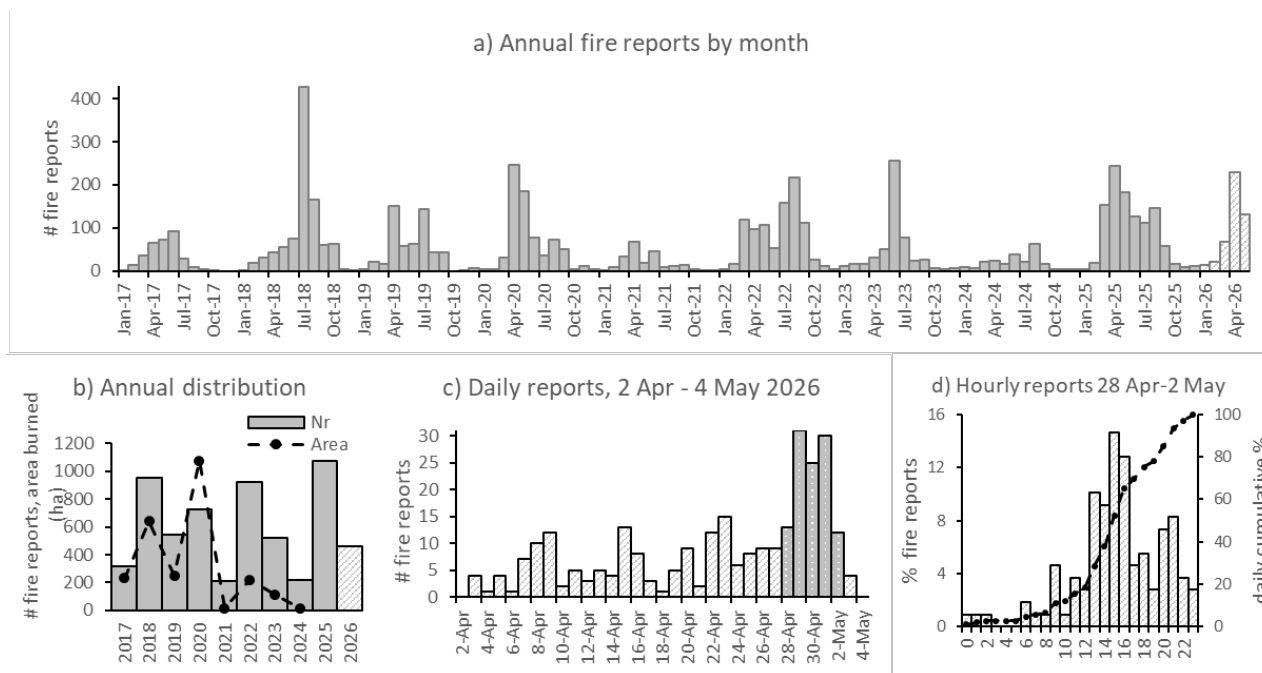
multiple fires. Spot fires were observed in grass-encroached heathland, as well as in wooded areas with an understory of dead fine fuels, grass or shrubs. Field observations and photo/video material indicate that 1-h, 10-h and 100-h dead fuels were available for burning and often fully consumed. In typical heathland fuels, head fires were beyond suppression capacity; suppression was possible where fire intensity and rate of spread diminished because of a change in fuel continuity, load or structure. This was for instance illustrated near Budel, where the head fire lost most of its intensity and spread once it impacted the adjacent airfield, where mostly green grass was present. Finally, a large number of deep and long-lasting hotspots were observed in dry litter and duff inside the fire perimeters and along their edges. Some caused minor reignitions up to 2-3 weeks after the spread of a fire was suppressed, despite tens of millimeters of rainfall since the evening of 2 May.

Overall, the fire suppression response was strong, with large numbers of fire engines deployed (e.g. 52 fire engines to the 0.3-ha fire in The Hague). Impacts furthermore included road and railway closures, and evacuations of 1500 refugees and a commercial airport. A total of 17 NL-Alerts were sent out to warn for smoke, across both rural and major urban areas (Table B4, Fig. B5): one alert for instance covered much of the province of Noord-Brabant, alarming an estimated 0.6 million people. Another was triggered around midnight, awakening people from their sleep. Two other NL-Alerts were issued covering the Hilversum Mediapark, where > 100 media companies are based, including the Dutch national public broadcaster. All NL-Alerts were released in both Dutch and English, except for the Budel fire (Table B4).

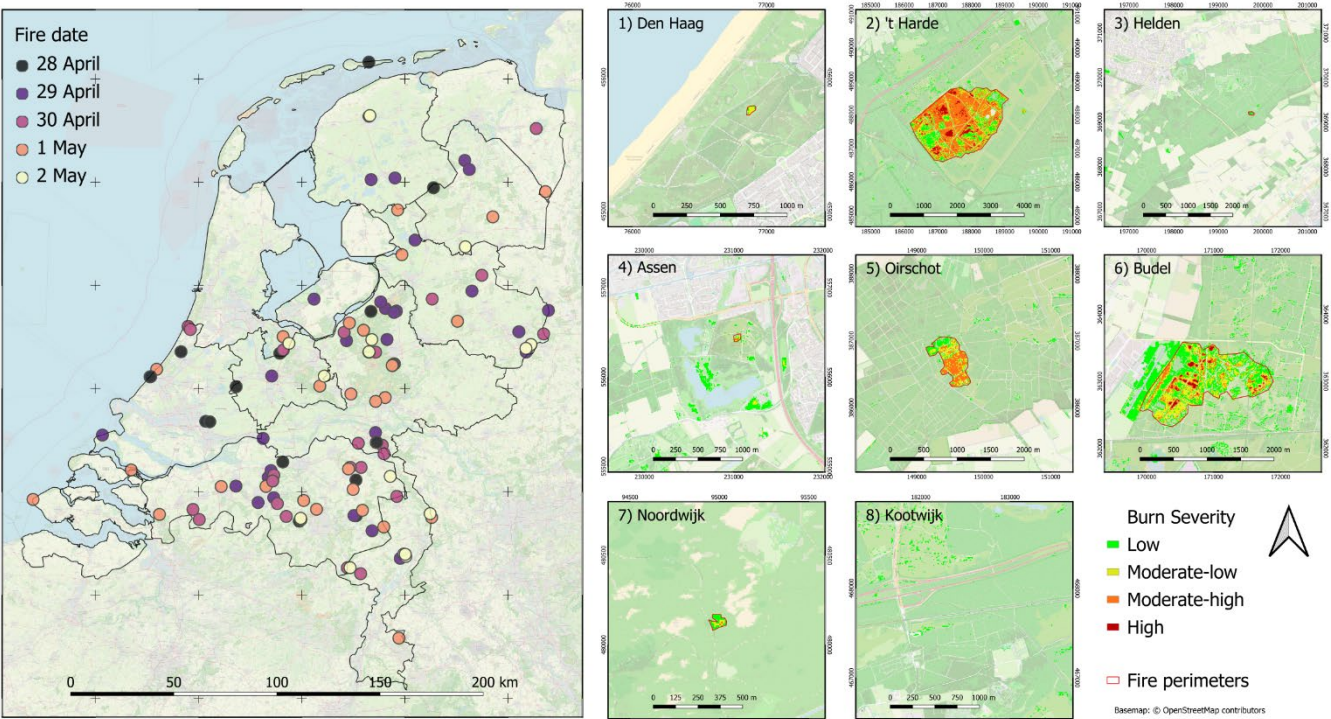
Imagery of the largest fire, the 425-ha fire near 't Harde (Fig. 6a), shows that in the flat landscape of The Netherlands, large smoke plumes are easily visible from a distance (Fig. 6b). This smoke considerably increased PM<sub>2.5</sub> concentrations and thereby reduced air quality across a large and densely populated area (Fig. 6c-e; see Bult et al. (2026) for an animated video), exposing an estimated 2.3 million people. This included the cities of Amsterdam (the Dutch capital, and home to several leading media houses) and The Hague (where Dutch Parliament is based). Reports indicated that the smoke even spread across the Channel to England<sup>1</sup>. Aerial photos (Fig. 6f-g) demonstrate that the fire was finally contained within the military terrain itself, aided by large sandy firebreaks that were in place. Pre-, during and post-fire aerial images are provided in Fig. 6h-j.

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<sup>1</sup> <https://nos.nl/liveblog/2612410-deel-brand-onder-controle-rookwolk-nu-boven-engeland>



**Figure 4: Temporal characteristics and other metrics of wildfires reported in The Netherlands: 2017-2026 number of fires reported by month (a) and annual distribution (b), daily fires reported for 2 Apr – 4 May (c), and hourly distribution of fires reported during the five days of high alert (28 Apr – 2 May; d). Data represented represent all reports of wildfire occurrences regardless of terrain ownership (n=5953 in plot a-b, n=273 in plot c, and n=109 in plot d); burned area data in plot is for 2017-2024 only, n=1611.**



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**Figure 5: Spatial distribution of the wildfire reported during the high-alert period from 28 April to 2 May 2026, with all fire reports based on dispatch data (GMS system; main panel), and dNBR based burn severity maps of eight selected fires (subpanels). For Kootwijk the dNBR could not be calculated, since no cloud-free post fires satellite images were available at the time of analysis.**

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**Table 1: Characteristics of several significant wildfires that occurred during the high-alert period from 28 April to 2 May. For details on sources, please refer to Appendix A3 and Fig. B6. Note that the resources listed are an example, and therefore likely an underestimation of what has been deployed.**

| Where |                       | When |                        | Size and land cover                                | Example of resources                 | Fire behavior                                                                                      | Further information, incl. impacts                                                                                                                                                                                                             |
|-------|-----------------------|------|------------------------|----------------------------------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.    | The Hague             | 28   | Apr,                   | 0.3 ha <sup>c</sup> , dune vegetation <sup>d</sup> | 52 fire engines                      | Low to moderate intensity, mostly against the wind; slight orography due to the presence of dunes. | 3-h wildfire in the coastal dunes in The Hague, a 570 thousand-person city where the Dutch Parliament is seated. Although the wind direction was favourable for the city, two NL-Alerts were triggered to warn for smoke nearby the fire site. |
| 2.    | 't Harde <sup>a</sup> | 29   | April (11.31h) - 2 May | 425 ha <sup>c</sup> , pine forest, heathland,      | The first day, 44 engines, handcrew, | High intensity wind-driven fire with high rate of spread (2.5–3                                    | 4-day wildfire at the Doornspijkse Heide, the southern part of the Artillery Shooting Range of the Department of Defence. Significant smoke was                                                                                                |



|                             |                                            |                                                    |                                                |                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------|--------------------------------------------|----------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             |                                            |                                                    | grass-<br>encroached<br>heathland <sup>c</sup> | Chinooks and a<br>Cougar helicopter<br>were deployed.<br>Because of the<br>presence of<br>unexploded<br>ordnance, only<br>the pantsared<br>military fire<br>trucks can drive<br>into the field –<br>civilian fire<br>trucks suppress<br>the fire from the<br>paths. | km h <sup>-1</sup> ), long-range<br>spotting up to 200-300<br>m. 1-, 10- and 100-h<br>fuels available for<br>burning. Many<br>hotspots, causing<br>reignitions up to 2-3<br>weeks post-fire.                                                                                                                                    | noticeable across a large area including Amsterdam,<br>The Hague and even across the Channel to England.<br>Nine NL-Alerts were sent to warn for poor air<br>quality from this fire (Table B4), highway A28,<br>N309 and N795 were closed, and Amersfoort-<br>Zwolle train traffic restricted because of the smoke.<br>News media reported evacuations of a campground<br>and closure of a restaurant and swimming pool, two<br>cases of mental health impacts because of the fire<br>(fear, anxiety), and physical and mental health<br>impacts due to the effects of smoke on lung patients<br>(Appendix A3). In terms of impact on flora and<br>fauna, a Parliamentary letter reported many<br>observations of butterflies, insects and red wood<br>ants a few days post-fire, and also indicated that<br>large fauna were reported to have left the area<br>during the fire; no remains of large fauna were<br>found post-fire. While the surroundings of an osprey<br>( <i>Pandion haliaetus</i> ) nest were burned, immediately<br>post-fire the couple was observed on the nest and<br>showing natural breeding behavior (Tweede Kamer,<br>2026). |
| 3. Helden                   | 29 Apr<br>(22.22h) -<br>30 Apr<br>(16.33h) | 0.8 ha <sup>c</sup> ,<br>mixed forest <sup>d</sup> | Fire engines,<br>handcrew,<br>Chinook          | Difficult to reach and<br>dense forested area<br>with mixed fuels.<br>Wind-driven fire in<br>difficult to reach and<br>dense forest terrain.<br>Low-moderate fire<br>intensity and rate of<br>spread. Persistent<br>hotspots in organic<br>layers.                  | One of three wildfires in the vicinity between 29<br>Apr and 2 May, this overnight wildfire broke out<br>in the forest between Helden and Kessel. Because of<br>the drought, ample resources were deployed. Smoke<br>caused issues at a nearby campground with 2400<br>people, during school holidays, causing 200 to<br>leave. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 4. Assen <sup>b</sup>       | 29 Apr,<br>23.03h to<br>midnight           | 0.5 ha <sup>c</sup> ,<br>heathland <sup>d</sup>    | Fire engines                                   | Low intensity                                                                                                                                                                                                                                                       | 1-h wildfire at night on a military exercise and<br>training location, ‘likely not caused by the<br>Department of Defence’ <sup>c</sup> . NL-Alert triggered<br>because of smoke concerns.                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 5.<br>Oirschot <sup>b</sup> | 30 Apr,<br>12.40h                          | 26 ha <sup>c</sup> , pine<br>forest,               | Fire engines, and<br>a drone team, and         | High intensity wind-<br>driven fire; limited                                                                                                                                                                                                                        | Wildfire at a military exercise and training location,<br>started during a military exercise with the cause                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |



|                       |                 |                                                                                                          |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                          |
|-----------------------|-----------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       |                 |                                                                                                          | heathland, grass-encroached heathland <sup>c</sup>                                                                                               | a farmer with tractor with water                                                                                                                                                                                                                                                                                                                                                                                                                                | information available                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | being under investigation. This was one of eight wildfires in the area (also daily from 23-28 April, and 2 May), triggering police investigations for potential arson. Three NL-Alerts were triggered to warn for smoke. |
| 6. Budel <sup>b</sup> | 30 Apr, 13.16h  | 132 ha <sup>c</sup> , pine forest, severely grass-encroached heathland, open shifting sands <sup>c</sup> | Fire engines, a handcrew, a Kodiak military tank, and two Chinook helicopters, with cross-border assistance was provided by Belgian firefighters | a High intensity wind-driven fire; long-range spotting up to 500-600 m, and Horizontal Rolling Vortices in the plume observed along the flanks. Persistent hotspots caused reignitions for 2-3 weeks post-fire. On 2 May, the fire reacted to outflow winds from a thunderstorm, flaring up hotspots that ignited unburned fuels within the perimeter, that were quickly extinguished by firefighters, with rain from newly formed thunderstorms shortly after. | Wildfire at a military exercise and training location. The fire started at 13.20h during a military exercise; the cause is under investigation. Smoke caused issues in Budel and adjacent Hamont-Achel (Belgium), three NL-Alerts were sent, and evacuations took place of Kempen airport (used for commercial and business flights) as well as all 1500 people and staff at the second largest refugee center of the country that was preventively evacuated. Initial concerns over kerosine storage tanks at Kempen airport were quenched when it became clear these were underground. |                                                                                                                                                                                                                          |
| 7. Noordwijk          | 30 Apr, 13.49h  | 0.5 ha <sup>c</sup> , grass/ open woodland <sup>d</sup>                                                  | Fire in inaccessible terrain, managed with fire beaters and with a terrain-proof wildfire vehicle from a neighboring safety region               | Low to moderate wind-driven spread in surface fuels in the dunes, ≤ 2 m flame length at the head. Limited information available.                                                                                                                                                                                                                                                                                                                                | 4-h wildfire in the Amsterdam Water Supply Dunes, which was detected by a visitor (the site is open to the public on foot or bicycle). In terms of impacts, a bicycle path was closed; the smoke was blowing towards the sea and caused no issues. The site owner reported that no drinking water production occurred at the specific location, hence water supply was not threatened; and indicated animals including deer were able to leave the area and no animals seem to have been hurt.                                                                                           |                                                                                                                                                                                                                          |
| 8. Kootwijk           | 1 May 14.59-16h | 1 ha <sup>d</sup> , forest <sup>d</sup>                                                                  | 20 engines                                                                                                                                       | Moderate - high intensity wind-driven                                                                                                                                                                                                                                                                                                                                                                                                                           | 1-h wildfire in forest, with rapidly developing fire behavior, adjacent to main highway and railway.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                          |



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fire that crowned in Motorway A1 was closed for traffic; trains were not  
young pine trees interrupted  
within 10 min after  
ignition, with flame  
lengths of ~10-15 m.  
Fire intensity  
decreased due to fuel  
discontinuity,  
allowing rapid  
suppression.

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<sup>a</sup> Wildfire on military shooting range; <sup>b</sup> Wildfire on military Exercise and Training location; <sup>c</sup> based on satellite analysis; <sup>d</sup> based on photo and video material, internal fire service knowledge or media reports, <sup>e</sup> [Korte heidebrand bij Baggelhuizerplas bij Assen, NL-alert verstuurd - RTV Drenthe](#)

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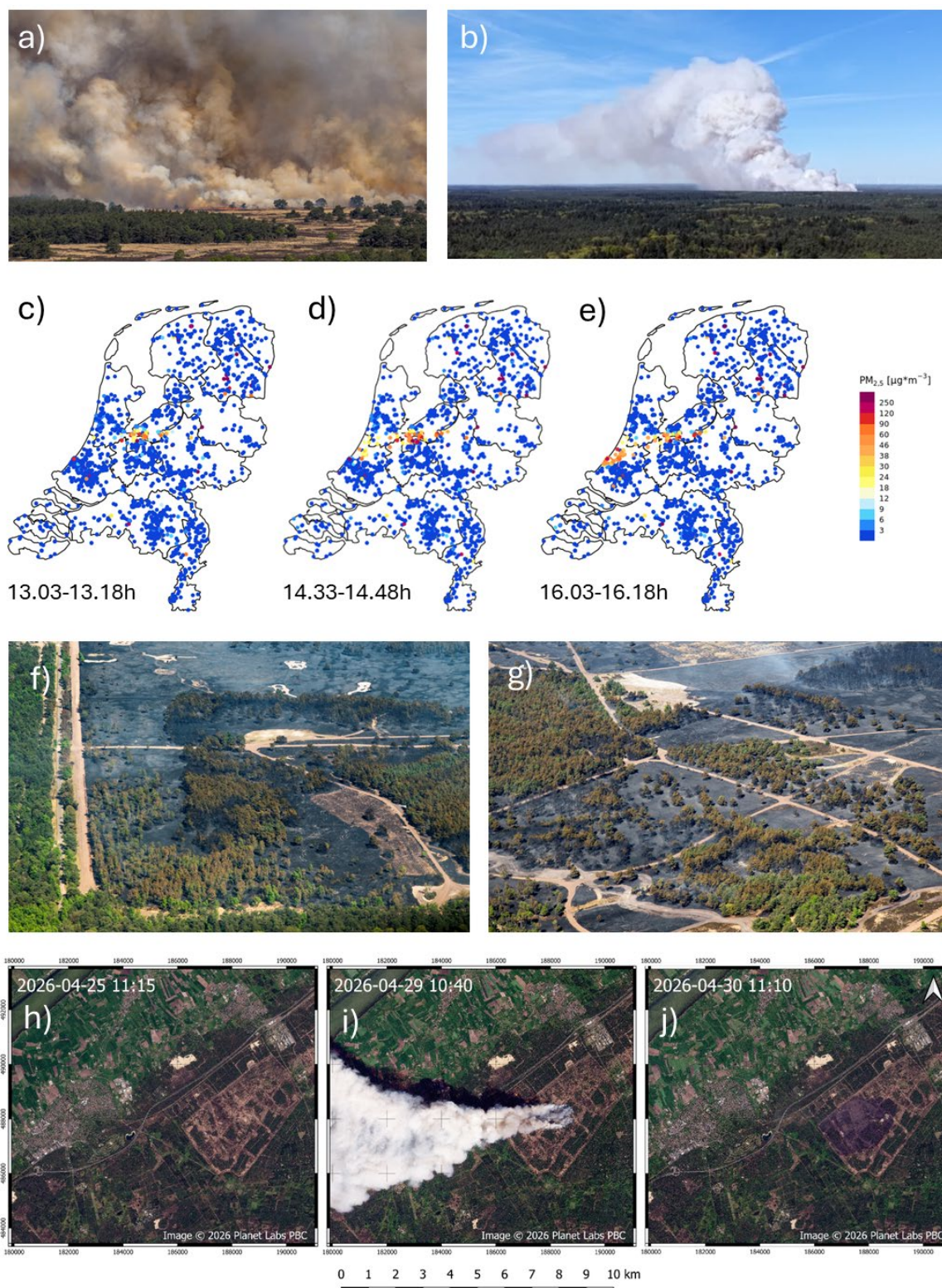




Figure 6: Multi-day wildfire at the ASK military site near ‘t Harde: a) the fire in close-up (29 Apr 2026, 12:04h); b) the plume seen from a distance; c-e) estimated PM<sub>2.5</sub> concentration on 29 Apr, 15-min averages based on raw uncalibrated data; f-g) aerial photos taken 1 day post-fire; h-i-j) satellite imagery on 25 Apr 2026 (pre-fire, h), 29 Apr (during fire, i) and 30 Apr (1 day post-fire, j). Source and any imagery copyrights: a) © HollandLuchtfoto; b) © SPS Media; c-e) Bult et al. (2026); f-g) © ANP, Bram van de Biezen; h-i-j) © 2026 Planet Labs PBC. The images in panels a, b, f and g are not included in the Creative Commons license applying to this article. Copyright remains with the rights holder. Any reuse, reproduction, distribution, or other use of this image beyond applicable statutory exceptions requires permission from the copyright holder. Times given in subpanels f-g-h are indicative, given that the shown images are composites of images with a few minutes time difference.

### 3.3 Response to the fire events: operational, administrative, outreach and media

#### 3.3.1 Operational and administrative preparation, coordination and communication

Because of the drought and the weather conditions, the alert phase for wildfires ([www.natuurbrandrisico.nl](http://www.natuurbrandrisico.nl)) late April 2026 was at the highest level (Level 2) across The Netherlands. The Minister of Justice and Safety and the Secretary of State of Defence Van Weel and Boswijk (2026) reported that “landowners, land managers and emergency responders were specifically alert”, and that “residents and visitors of natural areas were explicitly requested to be careful with fire-hazardous activities”. Ministry contacts indicated that this public communication was coordinated by the LVVN ministry; although analysis of LVVN news releases did not reveal any items about wildfires in the period of interest, the ministry’s social media accounts (including those of the Minister of LVVN) did include calls to prevent wildfires, with 7 posts during the high alert period (28 April-2 May) focusing on public alertness, wildfire prevention, and behavioural guidance during the wildfire season. These posts published on three social media channels: X, Instagram and LinkedIn. On 30 April, the Dutch prime minister also tweeted to stay alert and prevent further wildfires (Table B5). Weather institute KNMI, that is in charge of weather warnings in The Netherlands, does not issue public warnings for high fire danger.

Throughout the Dutch fire season, the National Action Center Wildfires (*Landelijk Actiecentrum Natuurbranden*) meets weekly (online) to discuss and establish a fire danger and risk forecast; it was in early warning before the wildfire outbreak, coordinated an extra briefing on 27 Apr 2026 (a national holiday), and went to high alert on 28 Apr when it also briefed all regional fire chiefs about the forecast in a videoconference. The afternoon of 29 Apr, during the fire near ‘t Harde, the National Action Center was physically installed, facilitating national coordination between the 25 safety regions (that are independent bodies), governmental ministries and other crisis partners. Van Weel and Boswijk (2026) write that “along with multiple smaller wildfires, the three large-scale wildfires required strong fire service response which necessitated national coordination”. The National Action Center was responsible for operational coordination as well as administrative coordination because of scarcity concerns. The fire analysts of the FBAN-NL team were based in this National Action Center, where they were tasked with keeping an overview of all wildfires across The Netherlands, monitoring fire danger and potentially advising on prioritization of scarce resources based on expected fire behaviour and potential impact of the fires. To ensure rapid information exchange, the LVVN ministry liaised with land management organizations and Provinces.



Meanwhile, the fire service was very open about the strain put on their operational capacity. The Dutch public broadcaster  
420 NOS joined the National Action Center on 30 April, recording the live discussions between the fire analysts about the  
challenging conditions and the limits of the fire service (NOS, 2026). At night, and also the evening before, fire service  
officials were transparent about the challenges and the limits of the fire service (Table B6), reporting being “under major  
pressure” and “practically not having vehicles available that can be deployed for any new wildfires”, with regions that  
“cannot provide mutual assistance anymore because of the high risk, or the fires in their own region”; “our abilities are  
425 finite”. Given that the wildfire outbreak occurred during school holidays, volunteer fire brigades had much fewer staff  
available. The long duration of wildfires and the mop up that is required put additional strain on the system, resulting for  
instance in no fire crew bosses being available anymore on 1 May, because they all had been deployed and needed a legally-  
mandated 24-h rest period (*Arbeidstijdenwet*) before they could be deployed again. This meant that some fires that day had  
fewer personnel in place than protocols dictate. An interregional policy team (IRBT) was formed on 29 April to facilitate  
430 interregional administrative coordination. This team met on 29 and 30 April and 1 May, and adopted a “commanders intent”  
to limit the number of resources sent to existing fires, to ensure sufficient regional resources remained available to allow  
rapid suppression of any new fires and thereby prevent new ignitions from becoming large-scale wildfires. Van Weel and  
Boswijk (2026) report that the simultaneity and scale of the fires put a major strain on the fire suppression capacity, which  
compromised the ability to provide interregional assistance. As such, the National Action Center advised to request EU  
435 support through the Union Civil Protection Mechanism. On 30 Apr, the ministry of Safety and Justice activated UCPM  
around 18h, asking for fire fighters and specialized wildfire equipment. France and Germany responded positively within 2  
h, sending a total of 108 people and 31 vehicles that were deployed the next morning, for a total of 2 days (1-2 May). The  
week after the fires, the minister of LNVN and the Secretary of State of Safety and Justice conducted working visits across  
the country (Table B6).

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### 3.3.2 Communication about the fires on military terrain

News releases by the Ministry of Defence during and after the wildfire events focused on the helicopter team being standby  
(3 items between 29 Apr and 13 May), a short announcement of the fire near ‘t Harde (29 Apr) and an announcement that  
ministry will review military training protocols during drought (30 Apr, Table B7). Three news releases by the military  
445 police Marechaussee focused on the cause investigations for ‘t Harde (30 Apr) as well as three other fires (1 May), and the ‘t  
Harde investigation being completed (7 May, Table B7).

As questions around the cause of the ‘t Harde fire were already mounting on 29 Apr and two other major wildfires broke out  
on military terrain the day after (Oirschot, Budel), the highest military officer Onno Eichelsheim gave a press conference in  
the afternoon of 30 Apr. Even though he also announced review of training protocols, which was picked up by some media  
450 (Omroep Gelderland, NOS, NRC; Table B7), what made the headlines was that the wildfires after military exercises were  
very “unpleasant” (*vervelend*) but that the “trainings need to continue” and that stopping these exercises was “not necessary”

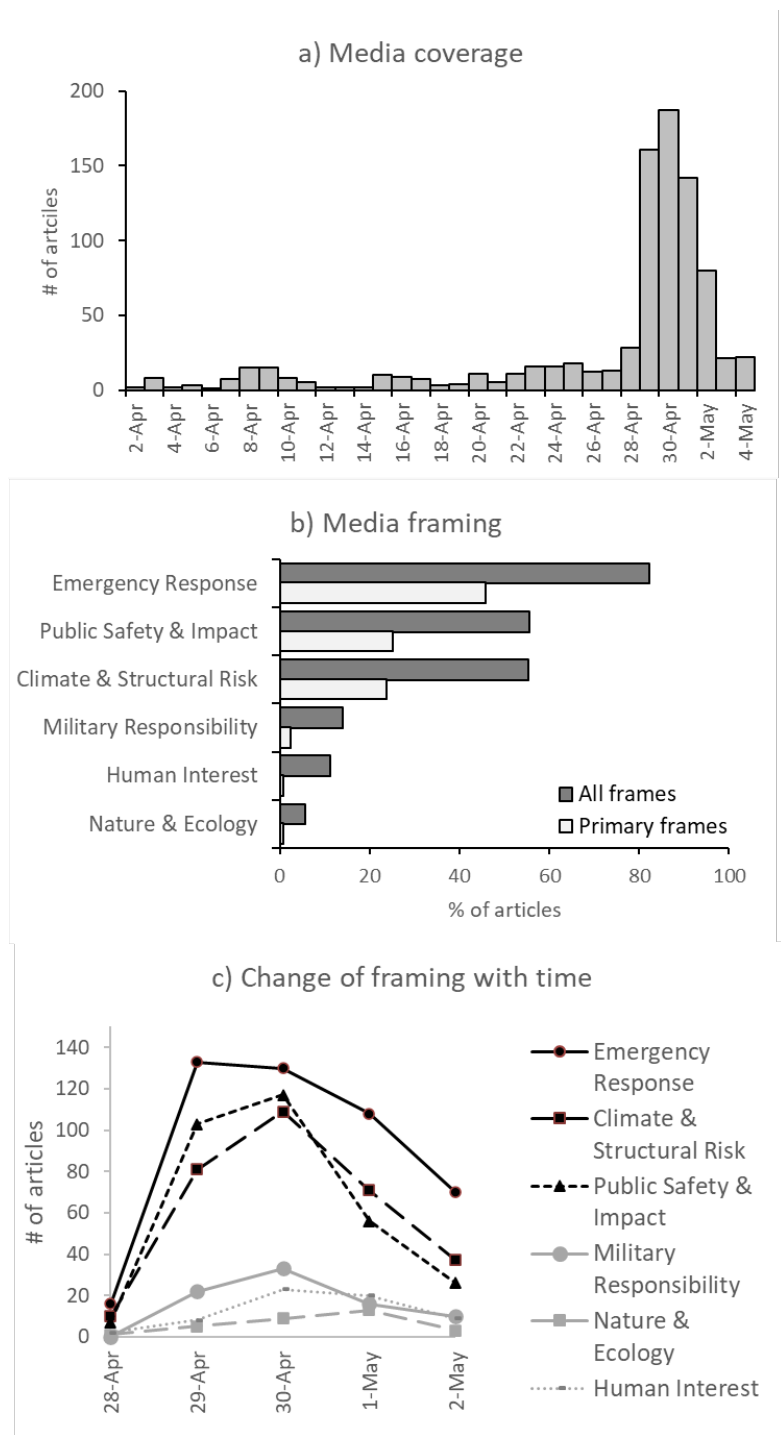


(Table B7). This was met with astonishment, for instance amongst mayors (Table B7), who in The Netherlands are officially responsible for safety within their municipality. The global geopolitical situation was stressed across a range of articles, explaining for instance that “Defence needs to grow and keep training because of the Russian threat” (NRC, 30 Apr). This was also stressed in the Parliamentary letter by Van Weel and Boswijk (2026) on 11 May: “the safety and security situation globally requires a strong and well-trained military force. Realistic trainings are essential for that”.

### 3.3.3 Media coverage

Considering the media coverage of the wildfires, wildfire news coverage in The Netherlands in April 2026 was moderate, with up to 30-50 publications per day, abruptly increasing six-fold on the first day of the fire at 't Harde (29 Apr) and peaking on 30 Apr (n = 297 publications; 174 unique stories; Fig. 7a). The coverage decreased to pre-event levels on 3 May. The presence of multiple multi-day liveblogs published by major national and local media organizations (Table B8) further indicates the widespread media attention and salience of the event.

In terms of the framing of these wildfire events by Dutch media, *Emergency response* was the dominant frame, present in 457 articles (82%) and being the main focus in 254 articles (primary frame, 46%; Figure 7b). *Public safety & impact* and *Climate & structural risk* were the next most prevalent (56% and 55%, respectively), and were each detected as the primary frame in about a quarter of the articles (25% and 24%), indicating they were used mainly for context. *Military responsibility* was present in 81 articles (14%) and the main focus of 12 articles (2%). It should be mentioned that the large majority of articles focused on fires occurring on military terrain and explicitly noted the link with military exercises and the Department of Defence. We only classified these articles under the *Military responsibility* frame in cases where accountability or blame was attributed to the Department of Defence. *Human interest* (total n=62, 11%; primary n=4, 0.7%), and *Nature & ecology* (total n=31, 6%, primary n=4, 0.7%) were also contextual topics rather than dominant frames in the published articles (Fig. 7b). Figure 7c illustrates the temporal changes in the framing of the wildfires in the Dutch media: *Emergency response* dominated throughout the events, while the presence of other frames changed in time: *Public safety & impact* and *Climate & structural risk* received early focus (29-30 Apr), the *Military responsibility* frame increased on 30 Apr.



**Figure 7: Media coverage of wildfires in The Netherlands (a), along with the framing of these events (b) and the temporal evolution of the presence of media frames (c). Panels a-b focus on unique stories, rather than on the totality of published articles which includes duplicates across publishers.**



## 4 Discussion

### 4.1 The Netherlands overwhelmed by simultaneous wildfires

In The Netherlands in April/May 2026, the country world famous for its floods and water management saw itself overwhelmed by wildfires. 111 wildfires reported within the five days of high alert triggered a total of 17 NL-Alerts (Table B4), smoke concerns across highly urbanized areas, evacuations of 1500 asylum seekers and a commercial airport (Table 1), as well as an intense media storm, and caused the country to request EU assistance for the first time in known history. While the impact of these fires was considerable, it is important to note that there were no reports of loss of life or property. On-site impacts therefore currently seem to be limited to ecological effects and fire suppression costs, while off-site societal impacts also include the tangible and intangible physical and mental health impacts of smoke (Reid et al., 2016; Richardson et al., 2012) and any economic, cultural and public trust impacts (Stoof et al., 2026b). Using MODIS/Sentinel2, only three of the total of 111 reported fires were large enough for their burn scar to be visible in EFFIS (Table B3), highlighting how a large number of simultaneous wildfires can pose major challenges in an emerging fire region like The Netherlands, no matter how small they are. These events also stress that fire in temperate Europe is not something of the future, “it is already there” as Stoof et al. (2024) reported previously.

Analysis of monthly fire occurrences between Jan 2017 and Apr 2026 shows that the number of wildfire reports in Spring 2026 was high but within the range of recent years: April 2026 saw  $n=229$  fire reports, fewer than in April 2025 ( $n=245$ ) and April 2020 ( $n=246$ ; Fig. 4a). The total number of wildfires reported in 2026 also falls within the typical range of previous years (Fig. 4b). In terms of the daily number of fire reports, 29 April and 1 May stood out with 31 and 30 fire reports, respectively, and 86 within 3 days (Fig. 4c), which was high but not higher than during the widespread European drought ( $n=31$  on 1 July 2018), and when 94 fires were reported within 5 days in 2020, including the multi-day transboundary fires at Deurnese Peel and Meinweg (Stoof et al., 2024). The question therefore arises: if 2018 had similar numbers of simultaneous wildfire reports, why was the wildfire outbreak in April/May 2026 so challenging? It is clear that environmental conditions preceding and during the recent wildfire outbreak were highly conducive to fire ignition and spread. Although vegetation greenness 2026 was not markedly different than other years, it was still recovering after winter senescence (Fig. 1), as is typical for springtime conditions in temperate Europe (Nikonovas et al., 2024; Quiñones et al., 2025). Vegetation was therefore more susceptible to burning than after green-up would be completed. Meteorological conditions on the other hand did stand out, as the combination of drought and strong winds created a high potential for large and difficult-to-control wildfires in The Netherlands, which was accurately and timely forecasted by the FBAN-NL team. We therefore argue that it was not just the number of fire reports that was challenging, but the combination of a small number of large fires and a large number of small fires, to which large numbers of resources were deployed because of the continuing drought combined with low day- and nighttime relative humidity, incomplete vegetation green-up and strong winds. Although atmospheric coupling of wildfires was not observed during this wildfire outbreak, the conditions were close. The potential development of a



pyrocumulonimbus (pyroCb) demands special operational precautions, as these extreme events are notorious for their highly erratic and unpredictable behavior. A pyroconvective wildfire coupled with a deep pyroCu or pyroCb introduces severe thunderstorm-related hazards, particularly the risk of powerful downdrafts that generate extreme surface winds. These dynamics can cause sudden, chaotic escalation in fire spread and intensity across multiple directions. Consequently, such rapid and unrelenting expansions can easily overwhelm suppression efforts, posing severe risks of firefighter entrapments and catastrophic impacts on the inhabited Wildland-Urban-Interface (WUI) zones in The Netherlands. With extreme wildfire events increasing (WFEC, 2014), it is imperative to be aware and prepared for this, and mitigate potential impacts by investing in home hardening and defensible space (WFEC, 2014).

But even without a pyroconvective wildfire, the outbreak in April/May 2026 was highly challenging for The Netherlands, nearly overwhelming the emergency response system. To be fair, 111 fire reports in five days, with only two fires > 100 ha and the largest being < 500 ha is not something that will stand out internationally - these numbers would represent ordinary Summer days in Mediterranean regions. Yet in emerging fire regions like The Netherlands, fire is new and not known. The Netherlands was not overwhelmed by fire, but by the uncertainty created by the new simultaneous fire events in an abnormally hot and dry Spring. Because The Netherlands is a very flat country, the smoke was highly visible and affected large numbers of people. While a very rough estimate, the 2.9 million people exposed to the largest smoke plume and the largest NL-Alert is likely an underestimation of the total number of people ‘touched’ by the fire events, as this would also include those who saw the smoke, received other NL-Alerts, or saw the high level of reporting in newspapers and on TV. Albeit small and internationally few, this wildfire outbreak touched millions, in a country where awareness and preparedness is low, smart suppression is still in development, defensible space and home hardening are not commonplace, and fire is absent in education and public engagement. Speaking informally, these fires were not ‘megafires’ (Stoof et al., 2023) but a ‘mega civil protection event’.

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## 4.2 Mitigating impacts of simultaneous fire events

While for urban or industrial fires it is uncommon for incidents to be concurrent, for wildfires simultaneity is systemic: the conditions at which wildfires can easily occur are such that simultaneity is a given - when vegetation is dry and winds are strong this is often the case across larger areas. Particularly when ignitions are not limited under high fire danger conditions, simultaneous wildfires can pose major challenges for emergency services. In Portugal for instance, >500 wildfire events in a single day turned into a national disaster on when hurricane Ophelia swung past the Iberian Peninsula on 15 Oct 2017 (Ramos et al., 2023). Further north, a large number of mostly small wildfires across England damaged 37 buildings and overwhelmed emergency services in July 2022, when an intense heatwave resulted in a “firewave” that caused the London Fire Brigade to have its busiest day since World War II (John & Rein, 2025). Given this known challenge of simultaneous wildfires, it is therefore imperative to review the assumption by the Dutch fire service that major incidents cannot happen

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concurrently (Brandweer Nederland, 2018). This was previously highlighted (Stoof et al., 2024; Verhoeven et al., 2023), and also stressed by fire officials in the media (30 Apr, Table B6). At the same time, research shows that ignition reduction during critical fire weather cannot only lead to fewer fires in general but particularly to fewer high intensity fires (DaCamara et al., 2024). To prevent similar disasters like Portugal experienced in 2017, the Portuguese National Action Program developed after these disasters aims to modify behavior and reduce intentional and negligent ignitions by 80% on high fire risk days. Given the paucity of public warnings to prevent ignitions during the April/May wildfire outbreak (Section 3.3.1) and the fact that warnings do not necessarily lead to behavioral change (Edgeley et al., 2025; Grant et al., 2017), clearly more work is needed to reduce the number of wildfires during critical days, and prevent system collapse of emergency response (Castellnou et al., 2019).

Effective ignition reduction campaigns require accurate information about wildfire causes. Unfortunately, the cause of nearly all wildfires during the recent outbreak is unknown: although the Netherlands has a dedicated national team of fire fighters and police officers who jointly conduct wildfire origin and cause investigation (NBO teams; NIPV, 2026), this team was not deployed to the best of our knowledge, although there are reports of fires being investigated by regional TBO teams. Systematic analysis of fire origin and cause is an essential basis to ensure lessons can be drawn to prevent these fires. This is valuable for all fires but can be considered particularly important for locations where wildfire reports were clearly clustered (e.g. Helden  $n=3$  in 4 days, Kootwijk,  $n=3$  in 2 days) or where fires were reported late at night (e.g. Assen, 23.03, Uddel 00:36, Kerkenveld 02.14h), to ensure foul play can be ruled out. For this, it is essential that fire crews arriving on site preserve the site of origin of the fire, also during mop up operations, to preserve tracks and traces to allow establishment of the point of origin and potential cause. This is not always easy when fires are small and it is standard practice to mop-up wildfires by driving heavy engines across the burn scar and apply large amounts of water, usually under high pressure: in Helden for instance, the burn scar was so disturbed by fire suppression activities that any traces needed for cause and origin investigation had been removed/ mixed up (personal communication Aniek Henken).

### 4.3 Media coverage

The media coverage findings revealed a sharp increase in coverage around the 't Harde wildfire, indicating a short-term but substantial rise in the media visibility of wildfires in the Netherlands. This is particularly relevant in a context where wildfire risk is increasingly emerging as a societal challenge. From an agenda-setting perspective, increased media attention may contribute to making this emerging issue more salient in public and policy debate. However, beyond the question of *how much* an issue is reported, it is also important to consider *how* it is reported: which perspectives and frames are used to represent the issue. Our framing analysis (Fig. 7b-c) shows that this media visibility was largely centered around an *Emergency response* frame, indicating that wildfires were primarily presented as incidents requiring suppression and crisis management. Frames such as *Climate & structural risk* and *Public safety & impact* were also present, but mostly functioned as contextual elements rather than as central narratives. Furthermore, the *Military responsibility* frame also became salient in



580 the public debate, particularly regarding the role of Defence and the ignitions resulting from military exercises. Discussing  
accountability is important during a crisis event, however, in the context of wildfires, a strong emphasis on this frame may  
move attention towards blame for a specific event rather than towards the broader socio-environmental circumstances under  
which wildfires become a risk. From a public communication perspective, this is relevant because media framing plays an  
important role in shaping public perceptions of risk (Entman, 1993). Wildfire coverage that predominantly focuses on  
585 suppression and accountability may reinforce a perception that wildfires are incidents, rather than structural risks than need  
systematic prevention. As such, more nuanced wildfire narratives can connect crisis reporting to underlying risk factors and  
preventive action.

Our rapid analysis of Defence's public communication during the April – May 2026 wildfire events showed that  
communication mainly focused on operational updates, helicopter standby capacity and the review of training protocols  
590 during drought (Table B7). The Marechaussee communicated separately about cause investigations. While these messages  
provided relevant information, they offered little explanation of the high level of prevention, preparedness, response and  
recovery at the ASK site, or the societal impact of the fires, public safety concerns, and environmental effects. This became  
relevant because questions about the cause of the 't Harde fire were already growing when two new large wildfires started on  
military terrain the day after (Oirschot, Budel). As such, while Defence's communication emphasized operational necessity,  
595 public and media attention started focusing more on responsibility and preventability of the crises. From the perspective of  
situational crisis communication theory (Coombs, 2007), a more balanced communication frame could have helped connect  
operational explanations with public concerns. This case also illustrates the importance of anticipating how messages may  
become fragmented in media coverage: although Defence stated in interviews and press briefings that protocols for training  
during fire-danger weather would be reviewed, several prominent media foregrounded in their headlines the word  
600 "*vervelend*" ("unpleasant"), which was used by the highest military officer during an interview to describe the impact of the  
fires on surrounding communities and landscapes. The term became a media hook, as it appeared to contrast with the  
seriousness of the wildfire situation and could be (mis)interpreted as downplaying public concerns.

For potential future fire events, Defence could acknowledge more promptly the off-site impacts of smoke and the on-site  
impacts on flora and fauna, while also explaining that the operational aim is to keep fires within the boundaries of military  
605 terrain and prevent additional impacts on surrounding communities. It would also be useful to communicate more clearly and  
timely about the difference between shooting ranges and other military training locations, and that fire on a shooting range is  
a known operational risk for which these sites are managed and prepared. As such, the ASK site is classified as a fire  
resilient landscape (Newman Thacker et al., 2023), with a well-trained in-house fire service, drought protocols (Van Weel &  
Boswijk, 2026), agreements with civil fire services and regular joint exercises. Such open communication can demonstrate  
610 preparedness and concern, helping to maintain public trust during emergencies while reducing uncertainty. Had this line of  
communication been taken, it would possibly not have been needed to halt shooting practice (Defensie, 2026) at the shooting  
ranges when a new dry period started on 26 May 2026.



#### 4.4 Rapid lessons and structural recommendations to prevent collapse of the emergency response system during simultaneous wildfires

615 In several ways, these simultaneous events were not a surprise: they had been warned for. Because of the warnings of the FBAN-NL team, the wildfire outbreak in The Netherlands in Apr/May 2026 was not a surprise but could be prepared for. This young team has clearly proven their value, yet it is not yet officially embedded nor structurally financed, which should be a priority to solve. The challenges were also warned for in a broader sense - since 2023, the Dutch fire service has been highly transparent about their limits, indicating that they are not sufficiently prepared for wildfires (de Gelderlander, 2023).

620 And as one fire official stated: “for years we have warned that simultaneous wildfires are a major problem, requiring decisions for where aerial support and other resources are deployed, ensuring availability of resources also for the next day” (Table B6). The challenge of simultaneity has thereby been stressed in a range of government reports (Algemene Rekenkamer, 2021; ANV, 2022), fire service reports (Brandweer Nederland, 2024; Kok et al., 2023; Verhoeven et al., 2023) and other work (Stoof et al., 2024; Stoof et al., 2026b). But the fact that potential disasters have been warned for does not

625 mean that sufficient or timely action is taken to prevent them, as illustrated by for instance the wildfire disaster in Lahaina, Hawaii (County of Maui, 2021; Marris, 2023), or closer to The Netherlands the 1953 storm surge that killed 1800 people in The Netherlands, Belgium and UK (Gerritsen, 2005; van der Ham, 2006). In the case of wildfires in The Netherlands, we have regularly experienced that our warnings were not taken seriously or even ridiculed, and/or heard that investment in water access points will save us, as for instance illustrated by (Geelen, 2024). Given that science is clear that (repeated)

630 disasters are needed to get or keep a topic on the agenda (Birkland & Warnement, 2014; de Guttery & Ratter, 2022; O'Donovan, 2017), it is quite impressive that fire management in The Netherlands has progressed so rapidly in recent years. While a lot is still needed to prevent disasters, simultaneous wildfires had been prepared for in the National Crisis Plan Wildfires (NCTV, 2025). This plan was barely a year old during the wildfire outbreak, yet provided the foundation for a joint approach of the diverse crisis partners involved at national, regional and local, including a set of key decisions

635 (templates) regarding for instance the sharing of scarce resources. At the same time, the events illustrate that further efforts are necessary to prevent collapse of the emergency response system during simultaneous wildfires: on 30 April, there were practically no engines left for any new wildfires (Table B6). This vulnerability can be explained by the fact wildfire suppression is approached with predominantly urban firefighting approaches, which has its limits. Smart suppression can help tailor firefighting to the dynamic and environmental conditions typical for wildfires, and thereby require fewer

640 resources, decreasing the probability that emergency response systems become overwhelmed. Given that high fire danger across Europe increasingly occurs across distinct parts of Europe *and* the world at the same time, more conservative deployment of resources can additionally make emerging fire countries more resilient, reducing the need to ask for international assistance when other countries may also be in need.

645 Based on our exploratory analysis of the wildfire events, we formulated rapid lessons and structural recommendations for emerging fire regions in general and The Netherlands in specific, to prevent collapse of the emergency response system



during simultaneous wildfires. The rapid lessons are aimed at having fewer, smaller and more manageable fires, and maintaining public trust (see Graphical Abstract):

1. **Reduce ignitions**, particularly during critical fire weather, by informing and educating public and professionals and by patrolling to prevent ignitions in areas where repeated ignitions occur and arson may be expected;
2. Make landscapes **fire resilient** (Newman Thacker et al., 2023) by managing fuels to ensure that when ignitions occur the fire spread is slowed down, facilitating fire suppression. This is particularly relevant in areas where ignitions can be expected because of the presence of people and transport (e.g. along roads and railways, in recreation areas) or because of fire hazardous activities (e.g. certain types of shooting practice on military terrain). Defensible space and home hardening (WFEC, 2014) are two other key ingredients of fire resilient landscapes.
3. Increase **initial attack** capacity of people who are likely nearby ignitions (military staff, land managers), including the use of simple handtools to prevent ignitions from developing into large-scale fires, while also increasing its effectiveness by tailoring fire suppression to wildfires. In the case of the military, understanding of fire behavior and suppression can not only mitigate unwanted fires at home but also provide valuable knowledge and skills to stay safe during deployment, given that wildfire is an active threat during war and armed conflict (Sydorenko et al., in press).
4. Create a **warning tool** for atmospheric fire coupling, translating the fundamental scientific work of (Castellnou et al., 2022; Castellnou Ribau et al., 2025) into an accessible nowcasting tool (for instance through Copernicus) that would allow fire services across Europe and ideally around the world to anticipate extreme fire behavior.
5. **Engage proactively** by informing and engaging the public, media, and local authorities early about what happened, prevention and preparedness measures in place, and activities to contain the fire spread and mitigate societal impacts. Research shows that ensuring timely, accurate, empathetic, and action-oriented communication during crises can be effective (Reynolds & Seeger, 2005) and thereby prevent communication gaps that can result in blame (justified or unjustified) and erode public trust (Coombs, 2007).

Implementation of these rapid lessons requires structural change improvements in fire management, to create a fire-literate and fire-adapted society (EASAC, 2025), not only in The Netherlands but also in other emerging fire countries in the region. This includes but is not limited to:

1. **Structural financing of integrated fire management**, providing national guidance and frameworks for bottom up implementation, tailored to local landscapes and communities by bringing diverse actors together to decide together what is an acceptable risk (NCTV, 2025) and what does that mean for the landscape and its people. Fire does not go away. Investing in prevention is not only the smartest approach but also the most economical solution (Snider et al., 2006).
2. **Systematic data collection** on why, what, when, where, and how it burns, and its diverse impacts. Dedicated investigation of fire causes is imperative to establish a knowledge base for developing fact-based prevention



campaigns. Actively monitoring fire behavior during incidents (e.g. isochrones, flame lengths, spotting, pyroconvection) supports operational decisionmaking as well as post-fire learning (Cruz et al., 2025; Filkov et al., 2018). And tracking the impacts of wildfire suffering (environmental, social, physical, mental, cultural and resource suffering; Newman Thacker et al., 2025) can help support the urgency of proactive solutions.

3. Invest in **education and outreach** to educate children and adults, students and professionals, by including the topic of wildfire and living with fire in educational curricula across all school systems, and developing awareness campaigns; to ensure people know that wildfires exist in their country, how to avoid accidentally starting a wildfire, what do to in case a wildfire happens, and how to mitigate risks in the home ignition zone. Efforts should also build public capacity to recognize, avoid amplifying, and counter misinformation about wildfire risk, prevention, preparedness, and response, given its growing relevance as a challenge in fire management (Maui Police Department, 2025).
4. Facilitate the use of **fire as a tool**, to keep this age-old cultural practice alive, manage the landscape, provide training opportunities for people to learn to read fire and work with it safely, and bring people from various backgrounds together. The use of fire as a tool is therefore a key part of integrated fire management, to increase the benefits of fire while limiting its negative impacts (Rego et al., 2021).
5. Support **cross-boundary learning** and knowledge exchange, to prevent reinvention of the wheel but ensure learning from best practice across disciplines, sectors, and geographies (Stoof & Kettridge, 2022), while also learning from a country's own past in fire management.

## 5 Conclusions and further research

With a multi-disciplinary author team representing science and practice, we presented an exploratory analysis of the wildfire events that occurred in The Netherlands in April/May 2026, based on available data: satellite and weather data, internal fire service knowledge, governmental information and news articles. Placing our analysis of the status of the vegetation, fire weather and the fire occurrences in the context of previous events in The Netherlands, we posit that a combination of drought, low day- and nighttime relative humidity, incomplete vegetation green-up and strong winds resulted in a large number of resources being deployed, causing the simultaneity of the wildfires to nearly cause a collapse of the emergency response system. Worse outcomes had been possible on 2 May, when wildfires had the potential to produce pyroconvection and exhibit extreme fire behavior. Internationally speaking, this wildfire outbreak was not concerning in size or volume. We therefore explain its major impacts by the millions of people unfamiliar with wildfires, that were affected by seeing smoke in the flat landscape, smelling it, receiving piercing NL-Alert messages or witnessing the ensuing media attention. The wildfire outbreak received substantial media coverage centered on emergency response and public safety; we argue that more timely institutional communication addressing the public concerns about high-risk activities during increased fire danger can help prevent conditions in which responsibility attribution and criticism could intensify. Finally, we discussed how the



simultaneity of these fires and the challenges brought forth were not unexpected and had been warned for, and formulated rapid lessons and structural recommendations to urgently prevent collapse of the emergency system in the future. The rapid  
 715 lessons of the April/May 2026 events are: 1) reduce ignitions in critical weather, 2) create a warning tool for atmospheric fire coupling, 3) make landscapes fire resilient, 4) increase initial attack capacity of military and land managers, and 5) proactive communication when crises occur. Structural recommendations to facilitate implementation of these lessons are: 1) structurally finance integrated fire management, 2) systematically collect data on fire cause, location, behavior, and impacts, 3) education and outreach to inform children and adults, students and professionals, 4) facilitate the use of fire as a tool, and  
 720 5) support cross-boundary learning. Given that fire regimes are changing (EASAC, 2025), implementation of these lessons cannot wait.

We would like to stress again the rapid response nature of this analysis. A range of official evaluations and investigations have been initiated and will be upcoming, which may reveal new facts and new or different conclusions, particularly in terms  
 725 of how the events unfolded on the ground, the response of the emergency services and the government, and the impacts and societal costs (including economic losses and health impacts; Richardson et al., 2012; Sangha et al., 2020) of these fires. Given that the challenge of the wildfire outbreak was not necessarily at the level of individual fires but at their joint occurrence, we strongly urge evaluations not just to focus on incident level but also at the system as a whole.

The rapid response nature of this analysis also means that there are items that would warrant further research. First, since  
 730 long-term observations suggest a trend in FFMCI, ISI and FWI towards more frequent fire-prone weather (Table B2), we advise analysis of the role that climate change has played and is expected to play in the occurrence of severe fire weather. Second, to draw lessons for prevention, preparedness, response and recovery, we recommend further analysis to elucidate why some ignitions turned into big fires (Moreira et al., 2010), and possibly more importantly, why the large number of  
 735 other fires was able to stay small. Third, further analyses of risk communication strategies and (social) media coverage that go beyond a descriptive scope can inform effective communication strategies that convey wildfires as a structural and growing risk. This includes assessment of how different communication formats and messages reach diverse public audiences, including populations that are underserved by mainstream information sources, and how exposure to different messages influences public risk perception and policy salience before, during and after wildfire events. Communication  
 740 engagement should also extend beyond one-way information flows (Ottolini et al., 2023) by using interactive and engaging formats, such as community-based activities, serious games, participatory workshops, and dialogue-oriented public engagement. Fourth, given the concerns around the fire impacts on flora and fauna (Tweede Kamer, 2026), we recommend analysis of ecological impacts and the pathway to potential recovery or a new state, focusing on positive as well as negative impacts, at site-level and at landscape level, including potential management measures that can be taken. We furthermore  
 745 advise proactive planning to ensure time, capacity and resources are available to implement rapid response measures to support post-fire recovery, not only for flora and fauna, but also for any communities or vital infrastructure that may be

affected. Finally, we additionally recommend continuation of the excellent initiative by Dutch mycologists to study rare and threatened post-fire fungi (Morsink, 2025; Veerkamp, 1998), of which some were possibly observed overtop a thick layer of reddish-white ash four weeks post-fire at ASK ‘t Harde.

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## Appendix A - Additional methods

### A1. Phenology

No additional methods

### A2. Weather

755 **Table A1. Variables used to calculate fire weather indices (FWI, FFMC and ISI) for De Bilt, The Netherlands. In the analysis, validated daily (00:00 to 23:59 UTC) KNMI measurements at De Bilt were used as a proxy for measurements taken at local noon.**

| Variable in formula by (Van Wagner & Pickett, 1985; Van Wagner, 1987) |  | Used proxy in this study            |
|-----------------------------------------------------------------------|--|-------------------------------------|
| P: cumulative precipitation at local noon over the last 24 hours      |  | RH: 24-hour precipitation sum       |
| T <sub>12</sub> : temperature at local noon                           |  | TX: daily maximum temperature       |
| H <sub>12</sub> : relative humidity at local noon                     |  | UN: daily minimum relative humidity |
| U <sub>12</sub> : wind speed at local noon                            |  | FG: 24-hour average wind speed      |

### *Pyroconvection analysis – complexity maps*

760 The operational framework developed and used by the Catalan Fire and Rescue Services assesses the level of complexity for fire suppression based on five key factors. CFRS initially developed this Developed for Catalonia and tailored for NL and other countries.

1. Low relative humidity, to allow fine dead fuels (1-h fuels) to carry the flames of a headfire effectively;
2. Extended periods without a recovery of the relative humidity at night, making 10-h fuels and litter available for  
765 burning, causing fire to be more persistent and increasing radiation level, complicating direct attack efforts by firefighters;
3. Low dew point (~0°C), further exacerbating drying of fuels and adding to the intensity of fires;
4. Simulated fire spread > 1 km during the first hour (simulated in standard conditions of no slope and constant fuel), hindering decision-making for initial attack by firefighters;



- 770      5. Pyroconvection prototype (pyroCu/Cb), enhancing fire spread, flame length and intensity, making firefighting more challenging.



### A3. Fire characteristics

#### 775 *Analysis of wildfire reports*

For the period 2017-2022, Stoof et al. (2024) described and released the Dutch wildfire statistics that was done jointly between Edwin Kok (Brandweer Nederland) and Cathelijne Stoof (Wageningen University). In 2023, Brandweer Nederland handed over the data collection to NIPV, which implemented methodological changes which requires additional attention and care when comparing the data. These methodological changes furthermore include additional verification of the incident type, for instance based on media reports, which means that there are now two types of records: reports of wildfire occurrences ('natuurbrandmeldingen', 2017-2022, also available  $\geq 2023$ ), and verified wildfire occurrences ( $\geq 2023$ ). These verified wildfire occurrences for instance exclude pile burns and fire reports where resources were dispatched but upon arrival concluded that assistance was not or no longer needed.

780 NIPV maintains a dashboard with wildfire data at <https://kerncijfers.nipv.nl/mosaic/kerncijfers-veiligheidsregio-s/kerncijfers-natuurbranden>. Since the monthly reports of fire occurrences are not available on this website for the entire period of interest (2023-2025), we did not download these data but requested them from NIPV. Preliminary daily data of reported wildfires for 2026 was directly downloaded from the dashboard.

Wildfire records of the ASK and ISK military sites are kept separately and are integrated into this NIPV database after the end of each year. We therefore requested these records from the ASK and ISK fire services and added them manually to the 790 2026 dataset. Additional verification and discussion learned that the ISK data were erroneously missing from the NIPV dataset since 1 May 2024, because of a change in reporting procedures. We therefore additionally requested the ISK data for 1 May 2024 through to 31 Dec 2025. These ASK and ISK records were screened to select wildfire incidents on their own terrain, excluding mop-up activities as well as any management fires, before the totals were added to our dataset.

#### 795 *Screening and filtering of GMS dispatch data*

Dispatch data was screened based on the following procedures.

Selection of the focus dataset

- The full dataset contained  $n=285$  records, containing data from 4 to 7 April 2026 and from 18 April to 2 May 2026
- we verified that data were ordered by date and time
- 800 - Given that our data focus is 28 Apr to 2 May, we removed all records before this period ( $n=104$ )
- The resulting focus dataset contained  $n=181$  records before quality checks

Quality checks were subsequently performed as follows:

- We removed all aborted records ('afgebroken alarmering, afgebroken inzet'),  $n=5$
- Subsequently, we removed duplicates highlighted in the dataset ('IsDubbelIncident'),  $n=46$
- 805 - Subsequently, we removed records without any location information (location is NULL),  $n=1$
- The remaining dataset without aborted records, without incidents labeled as duplicates by the dispatch center, and without empty records contained  $n=129$  records



Finally, we manually checked these records for any remaining duplicates that were not automatically flagged, by cross-checking addresses, dates and times. Three reports were additionally verified with the safety region. This manual check highlighted another n=20 for removal, because of duplicates, mop-up activities or reinforcements sent.

### *Analysis of fires on military terrain*

Military and Defence areas across the Netherlands were extracted from OpenStreetMap via the Overpass API. The query was scoped to the national boundary and applied a broad definition of military property, selecting all ways and relations tagged "landuse = military" or carrying any "military=\*" tag, with full geometry returned for spatial analysis. These polygons and GMS dataset of reported fire occurrences were reprojected to RD New (EPSG:28992) to enable metric distance calculations. Two spatial relationships were then assessed: the number of fires reported exactly within a military polygon, and the number of fire reports falling within 50 m buffer of any military polygon, to accommodate for small errors in the GMS locations.

### *Fire severity analysis*

Fire severity was assessed using the Differenced Normalized Burn Ratio (dNBR) processed on the Google Earth Engine (GEE) platform. Analysis was based on Level-2A surface reflectance data from the Sentinel-2 MultiSpectral Instrument (MSI) (Drusch et al., 2012). Two observation windows were established relative to the 2026 fire events: a pre-fire period (1 Jan - 28 Apr 2026) and a post-fire period (30 Apr – 11 May 2026). Cloud and cirrus contamination were filtered out using the scene quality assessment band (QA60), and representative pre- and post-fire geometries were generated via pixel-by-pixel median image composition. For fires occurring on or after 1 May, cloud free images were not always available, so the burn severity could not be assessed. This was the case for the fire in Kootwijk.

The Normalized Burn Ratio (NBR) was computed for both periods using the Near-Infrared (NIR; Band 8) and Shortwave Infrared (SWIR; Band 12) bands (Escuin et al., 2008):

$$NBR = \frac{B8 - B12}{B8 + B12}$$

To quantify the magnitude of fire-induced change, the post-fire NBR was subtracted from the pre-fire NBR. The resulting delta NBR (dNBR) was scaled by a factor of 1000 to align with standard USGS and Monitoring Trends in Burn Severity (MTBS) data protocols (Eidenshink et al., 2007; Key & Benson, 2006):

$$dNBR = (NBR_{pre-fire} - NBR_{post-fire}) * 1000$$

The continuous, scaled dNBR raster was stratified into four discrete burn severity classes. The applied thresholds delineate categories ranging from unburned (dNBR<99), low-severity (100-269), moderate-low severity (270-439), moderate-high severity (440-659) and to high-severity burn areas (dNBR>660). Final data layers were projected to the Amersfoort / RD New coordinate system (EPSG:28992).



### *Estimation of number of people exposed to smoke cloud, reached by large NL-Alert*

The number of people exposed to the smoke cloud from ‘t Harde was estimated by drawing a perimeter around the elevated PM2.5 concentrations (Fig. 6c-d-e) and calculating the number of residents within this perimeter using the CBS 100-m population statistics dataset for 2024 (Centraal Bureau voor de Statistiek, 2025). The result should be treated as a rough estimate, because of the exact placement of the perimeter within a densely urbanized region as well as the quality of citizen science data on which the PM2.5 concentrations are based.

The number of people reached by the large NL-Alert across Noord-Brabant (Fig. B5a) was estimated by manually drawing the perimeter of the NL-Alert, calculating the number of residents within this perimeter using the CBS 100-m population statistics dataset (N), and multiplying this with the average reach of NL-Alert messages (92% of recipients  $\geq 12$  year old, (IPSOS I&O, 2025)) and the percentage of residents  $\geq 12$  year old obtained from CBS (<https://www.cbs.nl/nl-nl/visualisaties/dashboard-bevolking/leeftijd/jongeren>; data for 2025):

|   |                                               |            |
|---|-----------------------------------------------|------------|
| - | Total inhabitants in The Netherlands:         | 18,044,027 |
| - | Number of inhabitants 0-12 year old:          | 2,121,379  |
| - | Number of inhabitants $\geq 12$ year old:     | 15,922,648 |
| - | Percentage of inhabitants $\geq 12$ year old: | 88.2%      |

### *Sources for Table 1*

- **Incident start times:** dispatch center data (GMS) obtained from NIPV
- **Fire size and vegetation type burned:** satellite analysis, GPS measurement in the field, and media reports/imagery.
- **Fire behavior:** internal fire service knowledge, media reports/imagery
- **Further information, incl. impacts, and fire size/ vegetation type where not assessed by satellite analysis**
  - <https://awd.waternet.nl/nieuws/2026/brand-in-de-amsterdamse-waterleidingduinen/>
  - <https://awd.waternet.nl/nieuws/2026/de-dag-na-de-natuurbrand/>
  - <https://haaglandenveilig.nl/incidenten/zeer-grote-duinbrand-den-haag>
  - <https://hollandsmiddenveilig.nl/duinbrand-de-zilk-0>
  - <https://nos.nl/artikel/2612473-grote-natuurbrand-uitgebroken-tussen-helden-en-kessel>
  - <https://nos.nl/artikel/2612657-brand-in-bos-bij-kootwijk-onder-controle-a1-ter-hoogte-van-stroe-weer-open>
  - <https://nos.nl/liveblog/2612527-branden-bij-weert-en-oirschot-onder-controle-nederland-vraagt-europese-hulp-bij-brandbestrijding>
  - <https://www.gelderlander.nl/binnenland/als-videobeelden-opduiken-is-het-direct-duidelijk-dit-is-geen-gewone-natuurbrand~a3241340/>
  - <https://www.gld.nl/nieuws/8469804/bosbranden-bij-kootwijk-en-harderwijk-brandweer-bezig-met-nablussen>



- 875     ○ <https://www.11nieuws.nl/nieuws/3154219/opnieuw-natuurbrand-tussen-kessel-en-helden-brandstichting-niet-uitgesloten>
- <https://www.limburger.nl/regio/peel-en-maas/kessel/blushelikopter-in-actie-bij-grote-natuurbrand-tussen-helden-en-kessel-noodverordening-van-kracht/150434223.html>
- <https://www.limburger.nl/regio/weert/grote-brand-op-defensierrein-weerterheide-breidt-zich-niet-meer-uit-1500-asielzoekers-uit-azc-budel-tijdelijk-geevacueerd/150466104.html>
- 880     ○ <https://www.omroepbrabant.nl/nieuws/6007757/reeks-natuurbranden-op-defensierrein-marechaussee-schaalt-op>
- <https://www.omroepbrabant.nl/nieuws/6007883/zeer-grote-brand-op-oirschotse-heide-brak-uit-op-oefenterrein-van-defensie>
- <https://www.omroepbrabant.nl/nieuws/6008149/defensie-zet-zwaarste-voertuig-in-bij-bestrijding-natuurbrand-budel>
- <https://www.omroepwest.nl/112/5095438/veel-rook-bij-duinbrand-tientallen-brandweerwagens-opgeroepen>
- 885     ○ <https://www.rtvdrenthe.nl/nieuws/18421044/korte-heidebrand-bij-baggelhuizerplas-bij-assen-nl-alert-verstuurd>
- <https://www.rtvnunspeet.nl/grote-brand-in-natuurgebied-bij-epe-meerdere-korpsen-ter-plaatse>
- <https://www.vnog.nl/incidenten/natuurbrand-ask-t-harde>



## 890 A4 Response

**Table A2. Frame definitions and keywords**

| Frame                                | Definition                                                                                                                                                                                                                    | Keywords (Dutch)                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Emergency response</b>            | Coverage centred on the active management of the fires: deployment of firefighting crews, escalation of emergency response levels (GRIP), containment updates, and declarations of fire control (sein brand meester).         | Blussen, geblust, brandweer, blusvoertuig, bluswagen, tankautospuut, opschalen, opgeschaald, bijstand, versterking, peloton, extra inzet, helikopter, chinook, blushelikopter, luchtmacht, cougar, brandweerlieden, brandweerman, brandweervrouw, vrijwilliger, blusploeg, onder controle, brand meester, nablussen, stoplijn, hotspot, brandhaard, veiligheidsregio, commandant, officier van dienst, meldkamer. |
| <b>Public safety &amp; impact</b>    | Stories centred on the immediate consequences for public safety and health: official warnings, NL-Alerts, emergency ordinances, evacuation orders, smoke exposure, and air quality risks.                                     | nl-alert, waarschuwing, advies.*bevolking ramen sluiten deuren sluiten, evacuati, ontruim, evacueer, verlaten, opvang, rook, rookoverlast, luchtwegen, fijnstof, gezondheidm omwonenden, bewoners, campinggasten, azc, asielzoekers, afgesloten, weg dicht, snelweg, verkeershinder, meting, gevaarlijke stoffen, luchtkwaliteit.                                                                                 |
| <b>Climate &amp; structural risk</b> | Coverage contextualising the fires within broader structural conditions: climate change, prolonged drought, fire risk forecasting, and the systemic drivers of increasing wildfire frequency and severity in the Netherlands. | Droogte, kurkdroog, niet.*geregend, watertekort, verdroging, klimaatverandering, klimaat opwarming, broeikaseffect, nieuwe normaal, vaker, toename, steeds meer, elk jaar, wind, harde wind, lage luchtvochtigheid, hoge temperatuur, brandbaar, kwetsbaar, droge vegetatie, heide, naaldbos, fase 2, hoogste.*niveau, natuurbrandrisico, alarmniveau.                                                            |



|                                |                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Military responsibility</b> | Stories questioning, investigating, or contesting Defence's causal responsibility for fire ignition. This frame does not capture stories mentioning military terrain solely as the incidental location of ignition. | door de oefening; tijdens de oefening; marechaussee; sporenonderzoek; rookgranaat; oefengranaat; munitie; explosief; verantwoordelijkheid; aansprakelijkheid; schuld; verwijtbaar; stoppen + oefening; onverantwoord; oefenterrein + brand; defensierrein + brand; blijven oefenen; militair + oorzaak                                                                          |
| <b>Human interest</b>          | Stories reporting personal experiences and emotional impact of the fires on residents, evacuees, witnesses, and affected communities.                                                                               | Getuige, omstander, voorbijganger, zag het, ontdekte de brand, vertelt, zegt hij, zegt zij, ik zag, we zagen, persoonlijk verhaal, angst, schrik, ontzetting, indrukwekkend, vreselijk,, vrijwilliger.*vertelt, brandweerman.*zegt, brandweervrouw.*zegt, held, helden, omwonende.*vertelt, bewoner.*vertelt, campinggast.*zegt, moest vluchten, huis verlaten, spullen gepakt. |
| <b>Nature &amp; ecology</b>    | Coverage focused on the ecological consequences of the fires: damage to natural habitats, effects on wildlife and rare species, and the long-term recovery of burned landscapes.                                    | flora, fauna, ecosysteem, biodiversiteit, habitat, leefgebied, zandhagedis, lentevuurspin, vogel.*brand, dier.*brand, insect.*brand", natuur.*herstel, bodem.*herstel, vegetatie.*herstel, brandgang, aangetast.*natuur, schade.*natuur, natuur.*schade, hectare.*verbrand, verbrand.*hectare", natuur.*verlies, verlies.*natuur, kwetsbare natuur                              |



Appendix B - Additional results

B1. Phenology

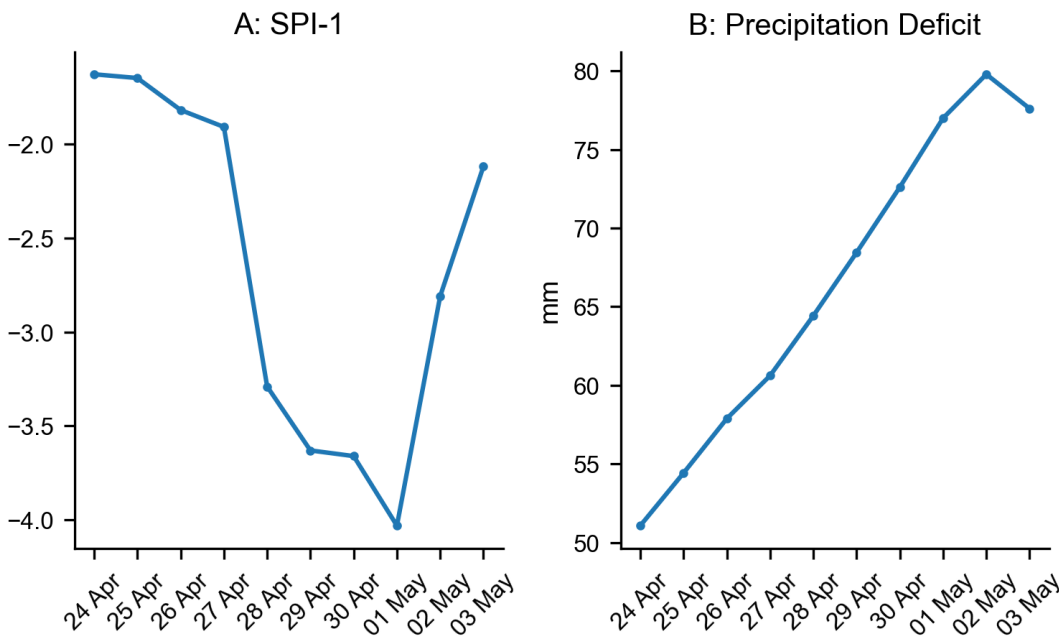
No additional results

B2. Weather

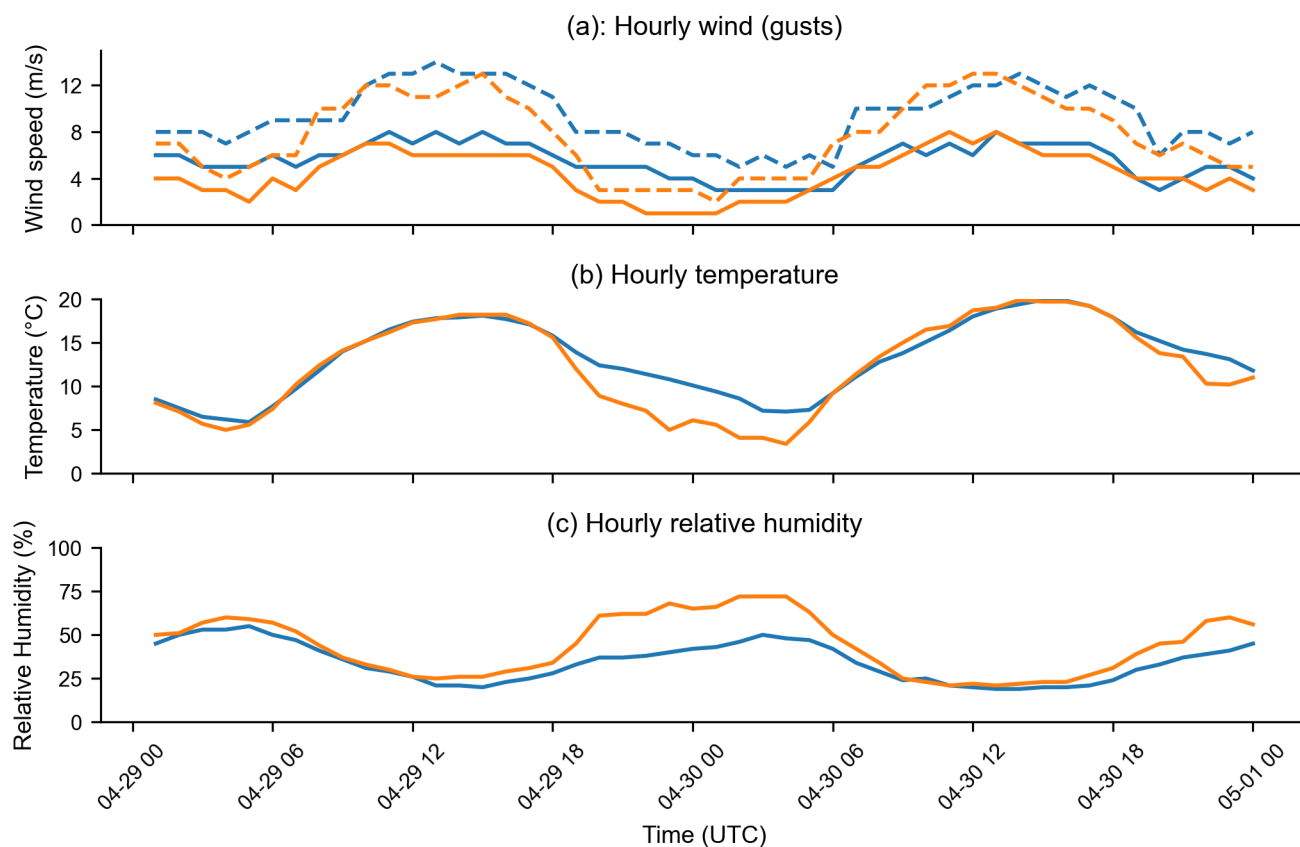
900 **Table B1. Precipitation and precipitation deficit for The Netherlands (country-wide) in the period preceding the fire events. Average precipitation is measured at 13 manual gauge reference stations in the Netherlands (P13-stations). Precipitation deficit in The Netherlands is calculated from 1 Apr – 30 Sept using calculated potential evapotranspiration and manual precipitation measurements (Dullaart & van der Wiel, 2024)**

| Parameter             | Period                          | Amount (mm) | 1991-2020 average (mm) |
|-----------------------|---------------------------------|-------------|------------------------|
| Precipitation deficit | Year 2025 (1 Apr – 30 Sept)     | 268         | 161                    |
| Precipitation deficit | April 2026 (1 – 30 Apr)         | 77          | 25                     |
| Precipitation         | Winter 2025-26 (1 Dec - 28 Feb) | 135         | 204                    |
| Precipitation         | March 2026                      | 47          | 53                     |
| Precipitation         | April 2026                      | 8           | 40                     |

905



**Figure B1. Evolution of the Standardized Precipitation Index-1 (SPI-1) in the Bilt and the national average precipitation deficit for April 24 up to and including May 3<sup>rd</sup>**



910 **Figure B2.** Weather conditions at the two KNMI Automatic Weather Stations that are the closest most similar stations to ‘t Harde: Deelen Airport (blue) and Heino (orange), with dashed lines representing wind gusts. Heino and Deelen have similar soils and vegetation as the ASK military site and are located ~20 km East-northeast and ~40 km South, respectively. We selected these two stations because another station at 20 km distance (Lelystad Airport) was less representative because of soils and vegetation.

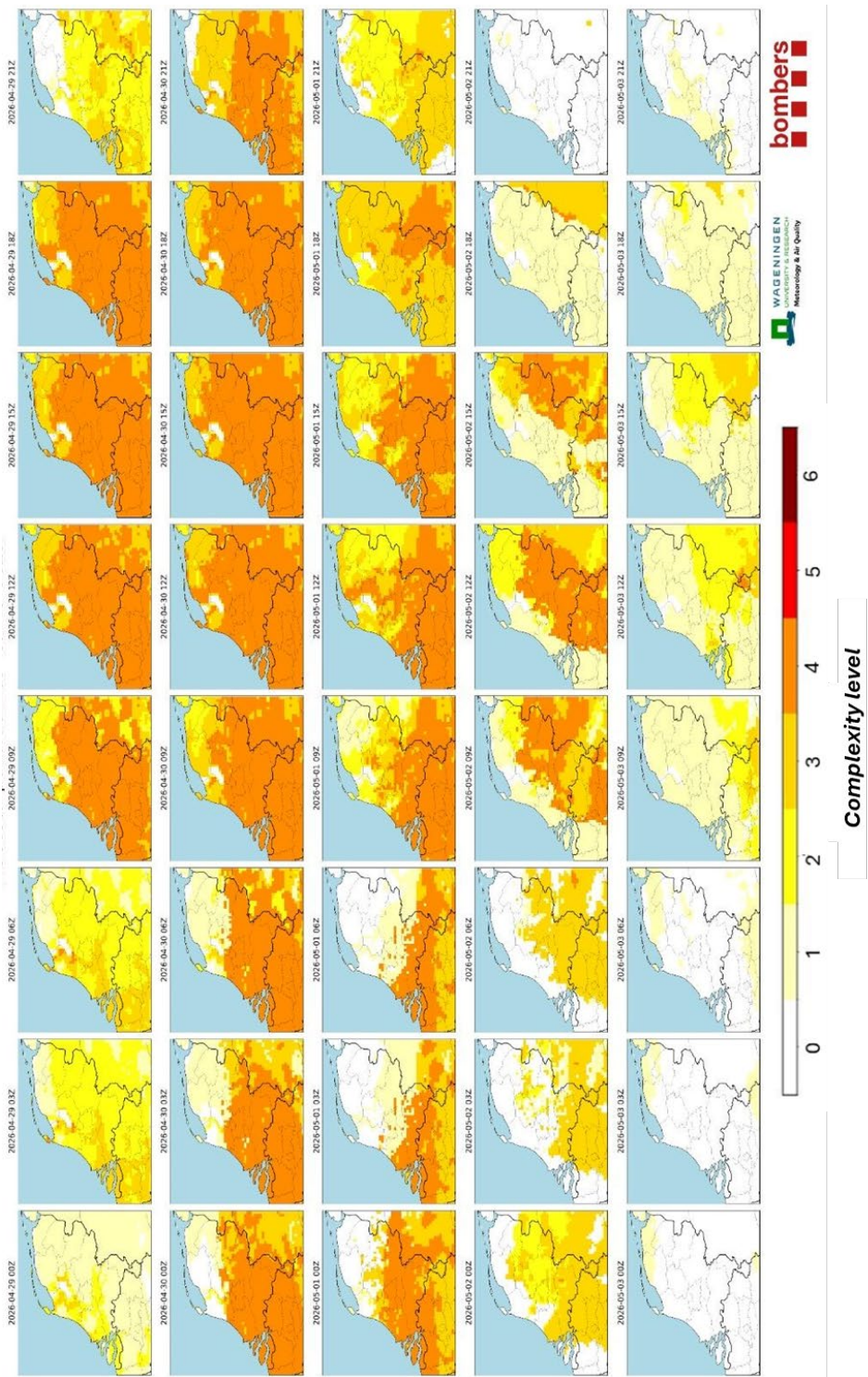
915



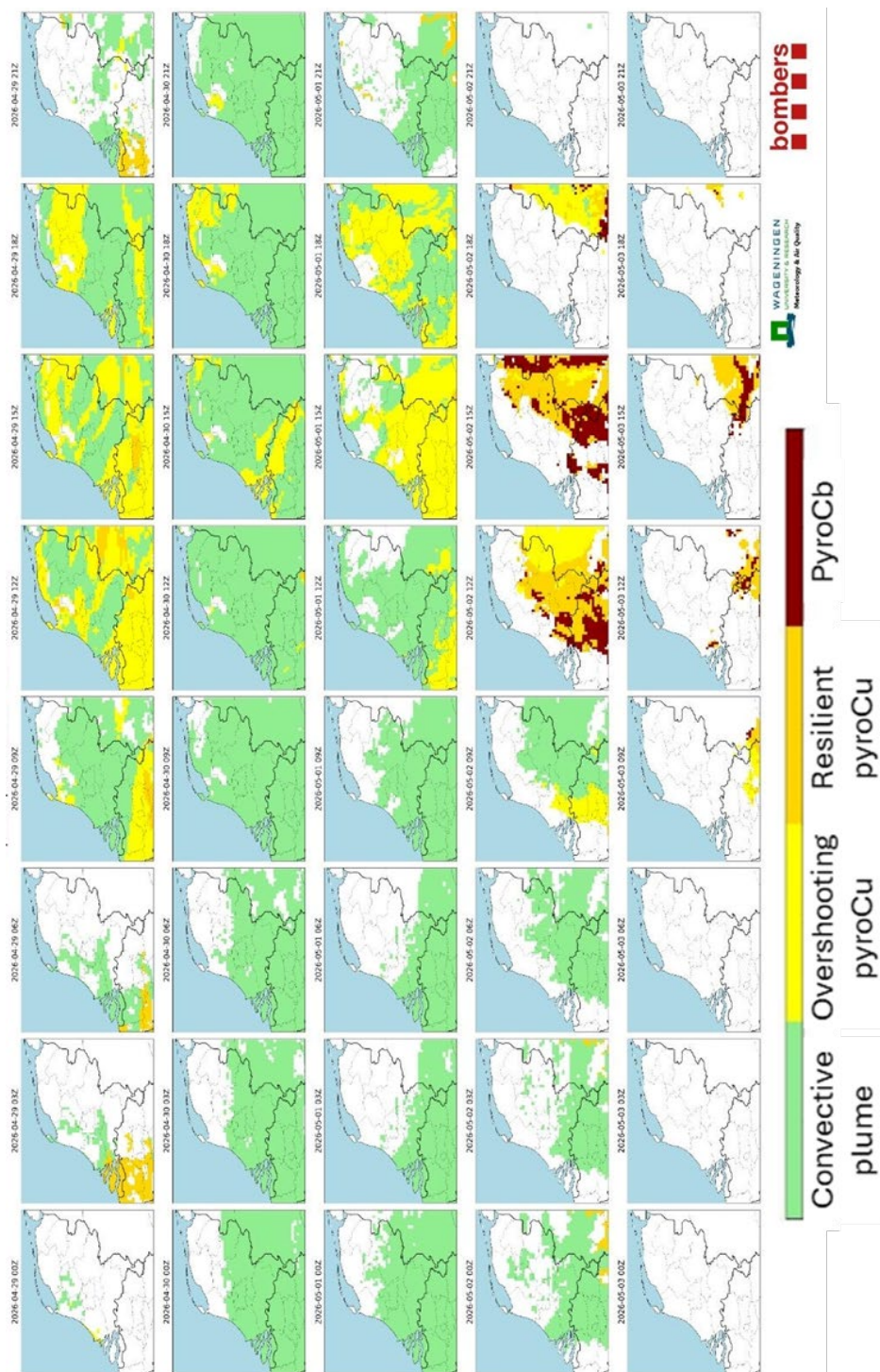
920

**Table B2.** Return periods and changes in magnitude of an event of the same rarity calculated for Fine Fuel Moisture Code (FFMC), Initial Spread Index (ISI) and Fire Weather Index (FWI), including 95% Confidence Intervals (CI). Values occurring during the high-alert period from 28 Apr to 2 May ('5-day') as well as the maximum daily value occurring in April 2026 ('1-day') were analysed and compared with 1961-2026 April maxima from De Bilt. Return periods and changes in magnitude are with respect to events occurring in the month of April. The 5-day forward running mean extends into early May, including events up to and including 4 May 2026.

| Fire<br>Weather<br>Index<br>component<br>(value) | Return period 2026 |            | Return period at -1.3 GMST |             | Change in magnitude<br>(-1.3 GMST to 2026) |           |
|--------------------------------------------------|--------------------|------------|----------------------------|-------------|--------------------------------------------|-----------|
|                                                  | (years)            |            | (years)                    |             |                                            |           |
|                                                  | <i>Mean</i>        | <i>CI</i>  | <i>Mean</i>                | <i>CI</i>   | <i>Mean</i>                                | <i>CI</i> |
| ISI, 5-day (12.8)                                | 9.6                | 3.7-24.9   | 19.3                       | 11.7-73.5   | 1.9                                        | -0.2-5.0  |
| FFMC, 5-day (88.8)                               | 1.5                | 1.2-2.0    | 2.9                        | 2.2-4.8     | 2.6                                        | 0.8-4.6   |
| FWI, 5-day (31.2)                                | 16.0               | 6.5-47.1   | 29.9                       | 16.8-146.5  | 4.9                                        | 0.5-12.7  |
| ISI, 1-day (18.6)                                | 14.7               | 6.3-53.2   | 73.7                       | 31.1-4583.5 | 4.4                                        | 1.9-7.3   |
| FFMC, 1-day (93.2)                               | 4.2                | 2.2-11.5   | 32.9                       | 13.3-196.3  | 2.4                                        | 0.5-4.5   |
| FWI, 1-day (43.0)                                | 32.0               | 13.4-140.7 | 81.4                       | 33.2-1919.2 | 8.0                                        | 2.6-16.8  |



925 Fig. B3 Fire suppression complexity from 29 Apr to 3 May 2026



**Fig. B4** Pyroconvective potential from 29 Apr to 3 May 2026



930 **B3. Fire characteristics**

**Analysis of fires on military terrain**

During the high alert period between 28 Apr and 2 May 2026, our analysis suggests that six wildfires occurred on military terrain. Six fire occurrences were reported within the boundaries of a military site or object: Oirschot (30 Apr and 1 May; two reports for the same fire), Budel (30 Apr), Harskamp (ISK, two fires, on 29 and 30 Apr) and Schijf (Rucphense Heide, 935 30 Apr). An additional three fire occurrences were reported within 50 m of the boundaries of a military site or object: the fires near 't Harde (ASK, 29 Apr), Hilversum (28 Apr), and Assen (29 Apr 2026). The fires near 't Harde, Assen, Harskamp, Oirschot and Budel are confirmed wildfires; the report in Schijf turned out to be smoke from another fire ([https://www.instagram.com/p/DXws9Q0jU91/?img\\_index=2](https://www.instagram.com/p/DXws9Q0jU91/?img_index=2)), and the report in Hilversum was not visible in exploratory dNBR analysis nor in media reports so was either very small or may not have been an actual wildfire. As such, this analysis 940 suggests that during the high alert period between 28 Apr and 2 May 2026, six wildfires occurred on military terrain, namely the fires of 't Harde, Assen, Harskamp (n=2), Oirschot, and Budel.

945 **Table B3 Analysis of fire size using EFFIS Current Situation Viewer (<https://forest-fire.emergency.copernicus.eu/apps/effis.csv>) and dNBR (this manuscript). Note that the MODIS/VIIIRS NRT estimates are much larger than the MODIS/SENTINEL2 and dNBR fire size estimates; based on ground reports the approximate locations are correct but the size estimated by MODIS/VIIIRS NRT is a considerable overestimate.**

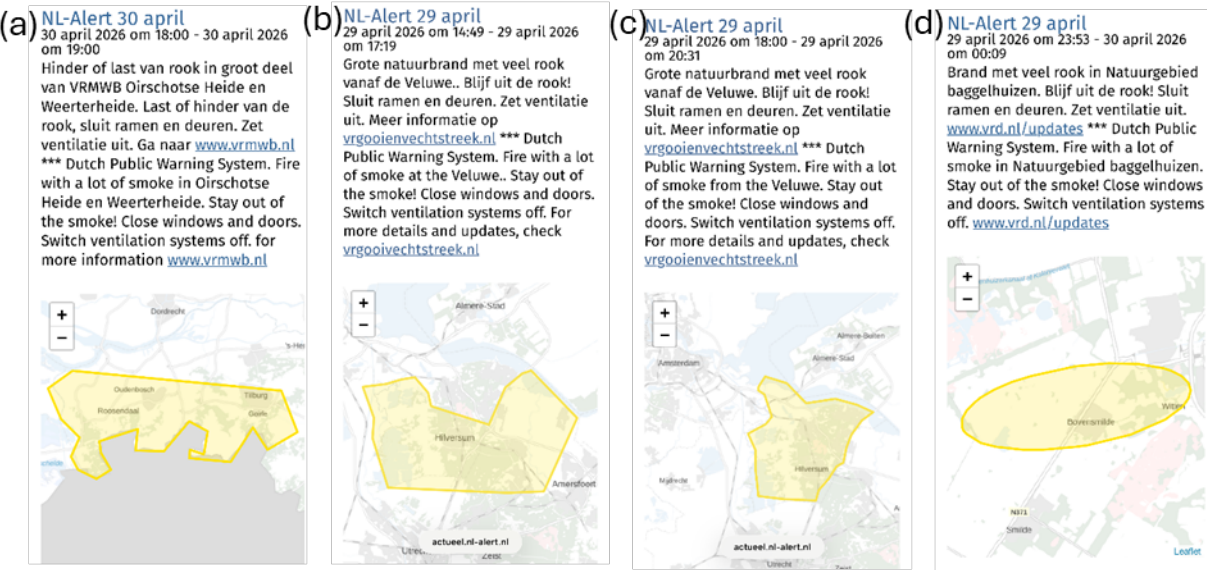
| Location | Start date | Area (ha)                  |                             |      |
|----------|------------|----------------------------|-----------------------------|------|
|          |            | MODIS/SENTINEL2<br>(EFFIS) | MODIS/VIIIRS NRT<br>(EFFIS) | dNBR |
| 't Harde | 29-Apr-26  | 421                        | 890                         | 425  |
| Oirschot | 30-Apr-26  | 7                          | 205                         | 26   |
| Budel    | 30-Apr-26  | 126                        | 397                         | 132  |



950 **Table B4 During the high-alert period from 28 Apr to 2 May, 17 NL-Alerts were sent, all during the first three days of the high-alert period. Source: <https://actueel.nl-alert.nl/alerts/>**

| Date       | Number of NL-Alerts | Location                                                              | Language                                                                                                                  |
|------------|---------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Tue 28 Apr | 2                   | The Hague                                                             | Dutch and English                                                                                                         |
| Wed 29 Apr | 10                  | 9 for 't Harde, 1 for Assen (Baggelhuizen)                            | Dutch and English                                                                                                         |
| Thu 30 Apr | 5                   | 2 for Budel (Weeterheide), 2 for Oirschot, 1 for both fires together. | Dutch and English for the two alerts on the Oirschot fire; Dutch only for the two alerts on the Budel fire (Weeterheide). |
| Fri 1 May  | 0                   | n/a                                                                   | n/a                                                                                                                       |
| Sat 2 May  | 0                   | n/a                                                                   | n/a                                                                                                                       |

955



**Fig. B5 NL-Alerts for much of the Province of Noord-Brabant (a), in the middle of the night (b), and covering the Hilversum Mediapark (c-d).**

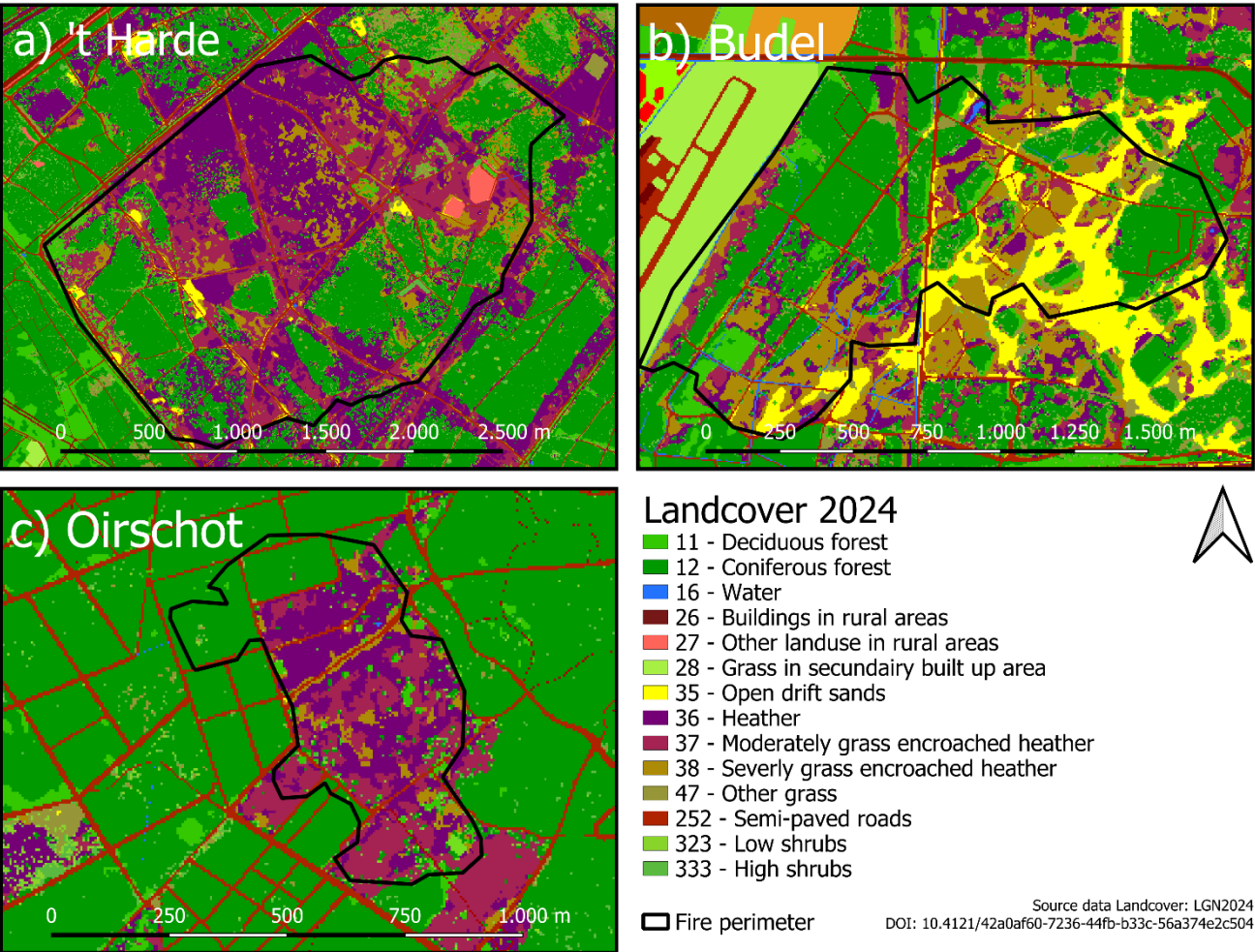


Figure B6. Pre-fire landcover and fire perimeter for the wildfires at a) 't Harde, b) Budel and c) Oirschot. Landcover data are derived from LGN2024 (Hazeu et al., 2026).



## Appendix B4 Response

**Table B5 Social media posts about wildfires by the ministry of LVVN, the minister of LVVN and by the Dutch prime minister.** The overview of LVVN social media accounts was obtained from <https://www.rijksoverheid.nl/ministeries/ministerie-van-landbouw-visserij-voedselzekerheid-en-natuur>

| Date                    | Platform                                                                                                                                       | Message                                                                                                                                                                                                                                                                                                       | Views on 1 June 2026                                | Accessible without login? |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|---------------------------|
| <b>X Prime Minister</b> |                                                                                                                                                |                                                                                                                                                                                                                                                                                                               |                                                     |                           |
| 30 Apr, 20:29h          | X (@MinPres)<br><a href="https://x.com/MinPres/status/2049919202748719182">https://x.com/MinPres/status/2049919202748719182</a>                | Respect for emergency service staff/volunteers, call to stay alert and prevent further wildfires. Link provided to the national DenkVooruit campaign: <a href="https://www.denkvoortuit.nl/risicos/risicos-in-nederland/natuurbrand">https://www.denkvoortuit.nl/risicos/risicos-in-nederland/natuurbrand</a> | 98.6 k; 1100 comments; 157 reposts; 283 reactions.  | Yes                       |
| <b>X Minister LVVN</b>  |                                                                                                                                                |                                                                                                                                                                                                                                                                                                               |                                                     |                           |
| 29 Apr, 17:26h          | X (@ministerLVVN)<br><a href="https://x.com/ministerLVVN/status/2049510726193074354">https://x.com/ministerLVVN/status/2049510726193074354</a> | The post states that ongoing wildfires are having a major impact. It expresses appreciation for firefighters and emergency services working under difficult conditions.                                                                                                                                       | 31.2k views, 127 comments, 20 reposts, 52 reactions | Yes                       |
| 29 Apr, 17:26h          | X (@ministerLVVN)<br><a href="https://x.com/ministerLVVN/status/2049510727879139463">https://x.com/ministerLVVN/status/2049510727879139463</a> | The post warns that persistent drought is increasing the risk of fire. It urges people to stay alert, keep distance from fires, follow local authorities' instructions and expresses hope that the situation will soon be under control.                                                                      | 4.2 k views, 45 comments, 10 reposts, 9 reactions   | Yes                       |
| 30 Apr, 19:10h          | X (@ministerLVVN)<br><a href="https://x.com/ministerLVVN/status/2049899286888931803">https://x.com/ministerLVVN/status/2049899286888931803</a> | The post states that wildfires continue to have impact on people, animals and nature; calling the images of the fires distressing.                                                                                                                                                                            | 12.8 k views, 81 comments; 6 reposts; 20 reactions  | Yes                       |
| 30 Apr, 19:10h          | X (@ministerLVVN)<br><a href="https://x.com/ministerLVVN/status/2049899289590051269">https://x.com/ministerLVVN/status/2049899289590051269</a> | The post emphasizes that nature should be cherished but is particularly vulnerable at this time of year. It calls for collective efforts to protect natural areas.                                                                                                                                            | 13k views, 81 comments, 5 reposts, 8 reactions      | Yes                       |
| 30 Apr, 19:10h          | X (@ministerLVVN)<br><a href="https://x.com/ministerLVVN/status/2049899292173746282">https://x.com/ministerLVVN/status/2049899292173746282</a> | The post thanks the fire department and emergency services for their efforts to limit the damage caused by wildfires. It warns that drought continues to keep the fire risk high and urges people to stay alert and follow official instructions.                                                             | 2.7k views, 13 comments, 1 repost, 7 reactions      | Yes                       |
| 6 May, 14:42h           | X (@ministerLVVN)<br><a href="https://x.com/ministerLVVN/status/2052006144802017352">https://x.com/ministerLVVN/status/2052006144802017352</a> | The post summarizes a visit to the Utrechtse Heuvelrug, where the minister spoke with firefighters, Staatsbosbeheer and local administrators about wildfire prevention and management.                                                                                                                        | 8.3 k views, 87 comments, 9 reposts, 10 reactions   | Yes                       |
| 6 May,                  | X (@ministerLVVN)                                                                                                                              | The post mentions that €70 million is available until                                                                                                                                                                                                                                                         | 1.8 k views, 18                                     | Yes                       |



|                                   |                                                                                                                                                |                                                                                                                                                                                                                                                                                              |                                                 |     |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-----|
| 14:42h                            | <a href="https://x.com/ministerLNVN/status/2052006147993842142">https://x.com/ministerLNVN/status/2052006147993842142</a>                      | 2030 for wildfire management, including knowledge sharing through a national expertise centre and measures to make nature more fire-resilient.                                                                                                                                               | comments, 3 reposts, 6 reactions                |     |
| 22 May, 16:34h                    | X (@ministerLNVN)<br><a href="https://x.com/ministerLNVN/status/2057832493370204228">https://x.com/ministerLNVN/status/2057832493370204228</a> | The post states that the minister informed the House of Representatives about recent developments and next steps in wildfire management and emphasizes the importance of strengthening cooperation to protect nature and public safety.                                                      | 2.6 k views, 19 comments, 1 repost, 1 reaction  | Yes |
| <b>X Ministry of LNVN</b>         |                                                                                                                                                |                                                                                                                                                                                                                                                                                              |                                                 |     |
| 30 Apr, 14:49h                    | X (@minlvvn)<br><a href="https://x.com/minlvvn/status/2049833405513076881">https://x.com/minlvvn/status/2049833405513076881</a>                | The post warns that wildfires can quickly get out of control because fire spreads rapidly, especially during persistent drought. It encourages people to take preventive action and refers them to DenkVooruit.nl for guidance on reducing wildfire risks.                                   | 882 views, 1 comment, 0 shares, 0 reactions     | Yes |
| 6 May, 17:26h                     | X (@minlvvn)<br><a href="https://x.com/minlvvn/status/2052047298968817892">https://x.com/minlvvn/status/2052047298968817892</a>                | The post summarizes Minister LNVN's working visit to the Utrechtse Heuvelrug, where wildfire management with the fire department, Staatsbosbeheer and local governments was discussed. It highlights that persistent drought is making nature more vulnerable and increasing wildfire risks. | 883 views, 1 comment, 0 shares, 0 reactions     | Yes |
| 6 May, 17:26h                     | X (@minlvvn)<br><a href="https://x.com/minlvvn/status/2052047302861132010">https://x.com/minlvvn/status/2052047302861132010</a>                | The post reports a €70 million funding for wildfire management, supporting a national expertise centre for wildfire management and preventive landscape measures.                                                                                                                            | 509 views, 2 comments, 0 shares, 0 reactions    | Yes |
| 26 May                            | X (@minlvvn)<br><a href="https://x.com/minlvvn/status/2059212127731122666">https://x.com/minlvvn/status/2059212127731122666</a>                | The post explains that wildfires are unpredictable and hard to fight, and that people can help prevent them from spreading. It gives practical advice such as calling 112, keeping access roads clear.                                                                                       | 617 views, 3 comments, 2 reposts, 2 reactions   | Yes |
| <b>Youtube Ministry of LNVN</b>   |                                                                                                                                                |                                                                                                                                                                                                                                                                                              |                                                 |     |
| None                              | Youtube                                                                                                                                        | n/a                                                                                                                                                                                                                                                                                          | n/a                                             | n/a |
| <b>Instagram Ministry of LNVN</b> |                                                                                                                                                |                                                                                                                                                                                                                                                                                              |                                                 |     |
| 16 Apr                            | Instagram @ministerielvvn<br><a href="https://www.instagram.com/p/DXMvVazDfDU/">https://www.instagram.com/p/DXMvVazDfDU/</a>                   | Announcing that the wildfire season has started and warning that dry periods plus small incidents can have major consequences. It asks the public to stay alert and directs to DenkVooruit.nl for tips on what to do before, during and after a wildfire.                                    | No view count available; 7 reactions; 0 shares  | No  |
| 30 Apr                            | Instagram @ministerielvvn<br><a href="https://www.instagram.com/p/DXwhxMbivaI/">https://www.instagram.com/p/DXwhxMbivaI/</a>                   | The post explains that wildfires are unpredictable and hard to fight, and that people can help prevent them from spreading. It gives practical advice such as calling 112, keeping access roads clear.                                                                                       | No view count available, 13 reactions, 0 shares | No  |
| 6 May                             | Instagram @ministerielvvn                                                                                                                      | The post shows Minister Jaimi van Essen and other                                                                                                                                                                                                                                            | No view count available,                        | No  |



|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                     |                                                                  |    |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|----|
|                                    | and @ministerlvvn<br><a href="https://www.instagram.com/p/DYAT0sNtfZ7/">https://www.instagram.com/p/DYAT0sNtfZ7/</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | stakeholders speaking about wildfire management after visiting the Utrechtse Heuvelrug.                                                                                                                                                                                                                             | 57 reactions, 0 shares                                           |    |
| 28 May                             | Instagram @ministerielvvn<br><a href="https://www.instagram.com/p/DYzDJM4jXTG/">https://www.instagram.com/p/DYzDJM4jXTG/</a> may                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | The post explains that wildfires are unpredictable and hard to fight, and that people can help prevent them from spreading. It gives practical advice such as calling 112, keeping access roads clear.                                                                                                              | No views count available, 7 likes, 0 reposts                     |    |
| <b>LinkedIn Minister of LVVN</b>   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                     |                                                                  |    |
| ~30 April<br>(No exact date shown) | Linkedin @Minister van Landbouw, Visserij, Voedselzekerheid en Natuur   Jaimi van Essen<br><a href="https://www.linkedin.com/posts/ministerielvvn_een-natuurbrand-kan-zich-snel-en-onvoorspelbaar-activity-7464977836701962240-9_fB?utm_source=share&amp;utm_medium=member_desktop&amp;rcm=ACoAAqJhZQB-cfDIHngJtUbmdp7wU0TbRnwLiQ">https://www.linkedin.com/posts/ministerielvvn_een-natuurbrand-kan-zich-snel-en-onvoorspelbaar-activity-7464977836701962240-9_fB?utm_source=share&amp;utm_medium=member_desktop&amp;rcm=ACoAAqJhZQB-cfDIHngJtUbmdp7wU0TbRnwLiQ</a>                                                                                           | The minister says the ongoing wildfires, including at the military training area 't Harde, are having a major impact and expresses appreciation for firefighters and emergency services working under difficult conditions. He warns that continued drought increases wildfire risk and urges people to stay alert. | No view count available<br>52 reactions, 1 comment; 6 reposts    | No |
| ~ 6 May<br>(No exact date shown)   | Linkedin @Minister van Landbouw, Visserij, Voedselzekerheid en Natuur   Jaimi van Essen<br><a href="https://www.linkedin.com/posts/minister-van-landbouw-visserij-voedselzekerheid-en-natuur_afgelopen-week-waren-de-beelden-van-natuurbranden-activity-7457800796450152448-gcCG?utm_source=share&amp;utm_medium=member_desktop&amp;rcm=ACoAAqJhZQB-cfDIHngJtUbmdp7wU0TbRnwLiQ">https://www.linkedin.com/posts/minister-van-landbouw-visserij-voedselzekerheid-en-natuur_afgelopen-week-waren-de-beelden-van-natuurbranden-activity-7457800796450152448-gcCG?utm_source=share&amp;utm_medium=member_desktop&amp;rcm=ACoAAqJhZQB-cfDIHngJtUbmdp7wU0TbRnwLiQ</a> | The minister reflects on the recent wildfires and the concern they cause for nearby residents and nature. After visiting the Utrechtse Heuvelrug, he highlights €70 million for wildfire management,                                                                                                                | No view count available<br>160 reactions; 2 comments, 10 reposts | No |
| <b>LinkedIn Ministry of LVVN</b>   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                     |                                                                  |    |
| ~30 April                          | Linkedin @ministerielvvn<br><a href="https://www.linkedin.com/p">https://www.linkedin.com/p</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | The same prevention message as the 30 April Instagram post.                                                                                                                                                                                                                                                         | No view count available; 62 reactions; 6                         | No |



|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                         |                                                               |    |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----|
| (No exact date shown)            | <a href="https://www.linkedin.com/posts/ministerielvvn_natuurbranden-kunnen-snel-uit-de-hand-lopen-activity-7455563872515547136-omFd?utm_source=share&amp;utm_medium=member_desktop&amp;rcm=ACoAAAqJhZQB-cfDIHngJtUbmdp7wU0TbRnwLiQ">osts/ministerielvvn_natuurbranden-kunnen-snel-uit-de-hand-lopen-activity-7455563872515547136-omFd?utm_source=share&amp;utm_medium=member_desktop&amp;rcm=ACoAAAqJhZQB-cfDIHngJtUbmdp7wU0TbRnwLiQ</a>                                                            |                                                                                                                                                                                                                                                         | comments; 6 reposts                                           |    |
| ~6 May<br>(No exact date shown)  | Linkedin @ministerielvvn <a href="https://www.linkedin.com/posts/ministerielvvn_tijdseen-werkbezoek-aan-de-utrechtse-heuvelrug-activity-7457807993531719680-Yd4d?utm_source=share&amp;utm_medium=member_desktop&amp;rcm=ACoAAAqJhZQB-cfDIHngJtUbmdp7wU0TbRnwLiQ">https://www.linkedin.com/posts/ministerielvvn_tijdseen-werkbezoek-aan-de-utrechtse-heuvelrug-activity-7457807993531719680-Yd4d?utm_source=share&amp;utm_medium=member_desktop&amp;rcm=ACoAAAqJhZQB-cfDIHngJtUbmdp7wU0TbRnwLiQ</a>   | The post reports on the minister's visit to the Utrechtse Heuvelrug and discusses how government and partners are preparing for increasing wildfire risks. It highlights €70 million in funding for wildfire management.                                | No view count available; 122 reactions; 1 comment; 2 reposts  | No |
| ~26 May<br>(No exact date shown) | Linkedin @ministerielvvn <a href="https://www.linkedin.com/posts/ministerielvvn_een-natuurbrand-kan-zich-snel-en-onvoorspelbaar-activity-7464977836701962240-9_fB?utm_source=share&amp;utm_medium=member_desktop&amp;rcm=ACoAAAqJhZQB-cfDIHngJtUbmdp7wU0TbRnwLiQ">https://www.linkedin.com/posts/ministerielvvn_een-natuurbrand-kan-zich-snel-en-onvoorspelbaar-activity-7464977836701962240-9_fB?utm_source=share&amp;utm_medium=member_desktop&amp;rcm=ACoAAAqJhZQB-cfDIHngJtUbmdp7wU0TbRnwLiQ</a> | The post warns that wildfires can spread quickly and unpredictably, so landowners, nature managers and emergency services are extra alert. It emphasizes that the public can also help prevent wildfires and directs people to more information online. | No view count available; 61 reactions; 0 comments; 17 reposts | No |

970

**Table B6 Fire service officials present in talkshows on television during the high-alert period**

| Date   | Who             | Quotes                                            | Where         |
|--------|-----------------|---------------------------------------------------|---------------|
| 29 Apr | Helga van Leur, | For the fire in 't Harde, we had to deploy almost | Pauw & De Wit |



|                |                                     |                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                |
|----------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| 2026           | Anton Slofstra,<br>Ferd Grapperhaus | all our potential. If those [additional] small fires also become large, we will really have a major problem.<br><br>ASK 't Harde has its own fire service, fire is part of the operational management of that site.                                                                                                                                                                | <a href="https://npo.nl/start/afspelen/pauw-de-wit_136">https://npo.nl/start/afspelen/pauw-de-wit_136</a>                      |
| 30 Apr<br>2026 | Olav Strotmann                      | Fire service under major pressure, we practically had no vehicles available that could be deployed for any new wildfires<br><br>Regions that “cannot provide mutual assistance anymore because of the high risk, or the fires in their own region”.<br><br>For years, we have indicated that we need to revise the fire department's premise that no simultaneous incidents occur. | Eva<br><br><a href="https://npo.nl/start/afspelen/eva_277">https://npo.nl/start/afspelen/eva_277</a>                           |
| 30 Apr<br>2026 | Edwin Kok                           | Situation is very severe. We have been warning for years that the simultaneity of fires is a very big problem.                                                                                                                                                                                                                                                                     | Pauw & De Wit<br><br><a href="https://npo.nl/start/afspelen/pauw-de-wit_137">https://npo.nl/start/afspelen/pauw-de-wit_137</a> |
| 1 May<br>2026  | Jelmer Dam                          | It is not just the fire department's responsibility. Our abilities are finite.                                                                                                                                                                                                                                                                                                     | RTL Tonight<br><br><a href="https://www.youtube.com/watch?v=zA5i0SgGm5c">https://www.youtube.com/watch?v=zA5i0SgGm5c</a>       |

975

**Table B7. Communication about the fires on military terrain**

| Date              | Message                                                                                              | Source   | Address                                                                                                                                                                                                                                                         |
|-------------------|------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   | <i>Ministry of Defence</i>                                                                           |          |                                                                                                                                                                                                                                                                 |
| 29 Apr            | Helicopter team is standby because of 'increased risk of forest fires'                               | Defensie | <a href="https://www.defensie.nl/actueel/nieuws/2026/04/29/weekoverzicht-defensieoperaties">https://www.defensie.nl/actueel/nieuws/2026/04/29/weekoverzicht-defensieoperaties</a>                                                                               |
| 29 Apr,<br>17.24h | Large fire at military terrain 't Harde                                                              | Defensie | <a href="https://www.defensie.nl/actueel/nieuws/2026/04/29/grote-brand-op-defensieterrein-t-harde">https://www.defensie.nl/actueel/nieuws/2026/04/29/grote-brand-op-defensieterrein-t-harde</a>                                                                 |
| 30 Apr,<br>17.21h | Defence will review training protocol during drought                                                 | Defensie | <a href="https://www.defensie.nl/actueel/nieuws/2026/04/30/defensie-kijkt-opnieuw-naar-droogteprotocol-na-grote-brand-bij-t-harde">https://www.defensie.nl/actueel/nieuws/2026/04/30/defensie-kijkt-opnieuw-naar-droogteprotocol-na-grote-brand-bij-t-harde</a> |
| 6 May             | Helicopter team standby until 1 Oct because of heightened risk of forest fires. Until last Friday it | Defensie | <a href="https://www.defensie.nl/actueel/nieuws/2026/05/06/weekoverzicht-defensieoperaties">https://www.defensie.nl/actueel/nieuws/2026/05/06/weekoverzicht-defensieoperaties</a>                                                                               |



|                |                                                                                                                                                           |                   |                                                                                                                                                                                                                                                                                                                                                             |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | was standby with extra people and equipment                                                                                                               |                   |                                                                                                                                                                                                                                                                                                                                                             |
| 13 May         | Helicopter team standby until 1 Oct because of heightened risk of forest fires                                                                            | Defensie          | <a href="https://www.defensie.nl/actueel/nieuws/2026/05/13/weekoverzicht-defensieoperaties">https://www.defensie.nl/actueel/nieuws/2026/05/13/weekoverzicht-defensieoperaties</a>                                                                                                                                                                           |
|                | <i>Marechaussee</i>                                                                                                                                       |                   |                                                                                                                                                                                                                                                                                                                                                             |
| 30 Apr, 10.23h | Marechaussee investigates cause of 't Harde fire                                                                                                          | Marechaussee      | <a href="https://www.marechaussee.nl/actueel/nieuws/2026/04/30/marechaussee-onderzoekt-brand-op-militair-oefenterrein-t-harde">https://www.marechaussee.nl/actueel/nieuws/2026/04/30/marechaussee-onderzoekt-brand-op-militair-oefenterrein-t-harde</a>                                                                                                     |
| 1 May, 10.06h  | Marechaussee investigates cause of several fires on military terrain (Ede, 21 Apr 2026, 't Harde 29 Apr, Oirschot 30 Apr, Budel/Weerterheide 30 Apr 2026) | Marechaussee      | <a href="https://www.marechaussee.nl/actueel/nieuws/2026/05/01/marechaussee-onderzoekt-diverse-branden-op-militaire-terreinen">https://www.marechaussee.nl/actueel/nieuws/2026/05/01/marechaussee-onderzoekt-diverse-branden-op-militaire-terreinen</a>                                                                                                     |
| 7 May, 15.00h  | Investigation 't Harde fire completed                                                                                                                     | Marechaussee      | <a href="https://www.marechaussee.nl/actueel/nieuws/2026/05/07/feitenonderzoek-naar-brand-t-harde-afgerond">https://www.marechaussee.nl/actueel/nieuws/2026/05/07/feitenonderzoek-naar-brand-t-harde-afgerond</a>                                                                                                                                           |
|                | <i>News media – selection of items after the Defence press conference of 30 April</i>                                                                     |                   |                                                                                                                                                                                                                                                                                                                                                             |
| 30 Apr, 17.02h | Stopping military exercises after wildfires 'not necessary', but extra measures                                                                           | Omroep Gelderland | <a href="https://www.gld.nl/nieuws/8469028/teruglezen-tweede-dag-natuurbrand-t-harde-geen-uitbreiding-verwacht-hulp-uit-duitsland-en-frankrijk">https://www.gld.nl/nieuws/8469028/teruglezen-tweede-dag-natuurbrand-t-harde-geen-uitbreiding-verwacht-hulp-uit-duitsland-en-frankrijk</a>                                                                   |
| 30 Apr, 17.04h | 'Wildfires no reason for Defence to stop with exercises'                                                                                                  | Omroep Brabant    | <a href="https://www.omroepbrabant.nl/nieuws/6007939/natuurbranden-geen-reden-voor-defensie-om-te-stoppen-met-oefenen">https://www.omroepbrabant.nl/nieuws/6007939/natuurbranden-geen-reden-voor-defensie-om-te-stoppen-met-oefenen</a>                                                                                                                     |
| 30 Apr, 17.06h | "Highest military officer after wildfires: unpleasant (vervelend), but exercises need to continue"                                                        | Nu.nl             | <a href="https://www.nu.nl/binnenland/6394290/hogste-militair-na-natuurbranden-vervelend-maar-moeten-blijven-oefenen.html">https://www.nu.nl/binnenland/6394290/hogste-militair-na-natuurbranden-vervelend-maar-moeten-blijven-oefenen.html</a>                                                                                                             |
| 30 Apr 18.38h  | Defence considers changes to exercises                                                                                                                    | NOS               | <a href="https://nos.nl/artikel/2612547-niet-de-eerste-brand-bij-militaire-oefeningen-defensie-overweegt-aanpassingen">https://nos.nl/artikel/2612547-niet-de-eerste-brand-bij-militaire-oefeningen-defensie-overweegt-aanpassingen</a>                                                                                                                     |
| 30 Apr, 21.08h | "Defence continues with exercises despite wildfires on military terrains: 'tensions between national safety and nature'"                                  | BNR               | <a href="https://www.bnr.nl/nieuws/nieuws-politiek/10599971/defensie-blijft-oefenen-ondanks-natuurbranden-op-militaire-terreinen-spanning-tussen-nationale-veiligheid-en-natuur">https://www.bnr.nl/nieuws/nieuws-politiek/10599971/defensie-blijft-oefenen-ondanks-natuurbranden-op-militaire-terreinen-spanning-tussen-nationale-veiligheid-en-natuur</a> |
| 30 Apr, 19.15h | "Military training protocols are tightened but, Defence: we need to keep training"                                                                        | NRC               | <a href="https://www.nrc.nl/nieuws/2026/04/30/de-protocollen-rond-militaire-oefeningen-woorden-aangescherpt-maar-zegt-defensie-we-moeten-blijven-oefenen-a4926716">https://www.nrc.nl/nieuws/2026/04/30/de-protocollen-rond-militaire-oefeningen-woorden-aangescherpt-maar-zegt-defensie-we-moeten-blijven-oefenen-a4926716</a>                             |



|               |                                                                                                                                                                                                                                                                                                            |            |                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | “Defence needs to grow and keep training because of the Russian threat”                                                                                                                                                                                                                                    |            |                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1 May, 19.06h | Secretary of State Boswijk: no military exercises with open fire until investigation results are ready                                                                                                                                                                                                     | NOS        | <a href="https://nos.nl/artikel/2612678-brand-t-harde-nog-niet-onder-controle-bluswerkzaamheden-gaan-door">https://nos.nl/artikel/2612678-brand-t-harde-nog-niet-onder-controle-bluswerkzaamheden-gaan-door</a>                                                                                                                                                                                             |
| 1 May, 11.14h | <ul style="list-style-type: none"> <li>- Defence Secretary of State Boswijk: Defence investigates drought protocols, no exercises with open fire until investigations completed</li> <li>- Mayors concerned</li> <li>- Two military unions comment on Eichelsheim, agreement as well as concern</li> </ul> | NOS        | <a href="https://nos.nl/artikel/2612624-defensie-onderzoekt-protocollen-voor-droogte-schietverbod-op-terreinen-in-belgie">https://nos.nl/artikel/2612624-defensie-onderzoekt-protocollen-voor-droogte-schietverbod-op-terreinen-in-belgie</a>                                                                                                                                                               |
| 1 May, 11.49h | Learning to live with the ‘fire culture’: wildfire expert calls for a radical shift in thinking                                                                                                                                                                                                            | Volkskrant | <a href="https://www.volkskrant.nl/wetenschap/leren-leven-met-de-vuurcultuur-natuurbrandexpert-pleit-voor-radical-omslag-in-het-denken~b44ff8ec/?referrer=https%3A%2F%2Fwww.google.com%2F">https://www.volkskrant.nl/wetenschap/leren-leven-met-de-vuurcultuur-natuurbrandexpert-pleit-voor-radical-omslag-in-het-denken~b44ff8ec/?referrer=https%3A%2F%2Fwww.google.com%2F</a>                             |
| 1 May, 16.38h | Mayor of Weert responds to Defence after wildfire on military site: “astonished”                                                                                                                                                                                                                           | L1         | <a href="https://www.l1nieuws.nl/nieuws/3155274/burgemeester-weert-reageert-op-defensie-na-natuurbrand-militair-terrein-verbaasd">https://www.l1nieuws.nl/nieuws/3155274/burgemeester-weert-reageert-op-defensie-na-natuurbrand-militair-terrein-verbaasd</a>                                                                                                                                               |
| 6 May         | Minister Van Essen (Agriculture, Fisheries, Food Security and Nature) visits the Leersummerheide heathland. “According to the fire department, the forest ranger, and regional politicians, more money and equipment are needed to prevent or stop wildfires in the future.”                               | NRC        | <a href="https://www.nrc.nl/nieuws/2026/05/06/een-veelvoud-van-3-500-liter-water-is-niet-genoege-tegen-een-natuurbrand-ziet-ook-de-minister-op-de-heide-op-een-gegeven-moment-zijn-we-kansloos-a4927118">https://www.nrc.nl/nieuws/2026/05/06/een-veelvoud-van-3-500-liter-water-is-niet-genoege-tegen-een-natuurbrand-ziet-ook-de-minister-op-de-heide-op-een-gegeven-moment-zijn-we-kansloos-a4927118</a> |
| 6 May 2026    | Minister Van Weel (Justice and Safety) visits fire fighters to thank them                                                                                                                                                                                                                                  | DTVnieuws  | <a href="https://dtnieuws.nl/nieuws/artikel/minister-bedankt-brandweerlieden-na-inzet-bij-vele-bosbranden">https://dtnieuws.nl/nieuws/artikel/minister-bedankt-brandweerlieden-na-inzet-bij-vele-bosbranden</a>                                                                                                                                                                                             |
| 16 May 2026   | “The Ministry of Defence must better arm itself against wildfires                                                                                                                                                                                                                                          | Trouw      | <a href="https://www.trouw.nl/binnenland/van-bosbrand-tot-overstroming-generaal-waarschuwt-leger-voor-nieuwe-klimaatrisico-s~bd9a3e17">https://www.trouw.nl/binnenland/van-bosbrand-tot-overstroming-generaal-waarschuwt-leger-voor-nieuwe-klimaatrisico-s~bd9a3e17</a>                                                                                                                                     |



|  |                                                                                                                        |  |  |
|--|------------------------------------------------------------------------------------------------------------------------|--|--|
|  | and floods, warns ‘climate general’ Tom Middendorp [retired]. ‘Hopefully, the recent wildfires increase the urgency.’” |  |  |
|--|------------------------------------------------------------------------------------------------------------------------|--|--|



**Table B8 Selection of liveblogs active in newspapers and other news outlets**

| Medium                                                                                                               | Scale    | Period                                     | Source                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------|----------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NOS                                                                                                                  | National | 29 Apr - 30 Apr<br>(separate liveblogs)    | <a href="https://nos.nl/liveblog/2612410-deel-brand-onder-controle-rookwolk-nu-boven-engeland">https://nos.nl/liveblog/2612410-deel-brand-onder-controle-rookwolk-nu-boven-engeland</a><br><a href="https://nos.nl/liveblog/2612527-branden-bij-weert-en-oirschot-onder-controle-nederland-vraagt-europese-hulp-bij-brandbestrijding">https://nos.nl/liveblog/2612527-branden-bij-weert-en-oirschot-onder-controle-nederland-vraagt-europese-hulp-bij-brandbestrijding</a> |
| AD (the same content also shown in the regional newspapers BN De Stem, Eindhovens Dagblad, Brabants Dagblad and PZC) | National | 29 Apr – 2 May                             | <a href="https://www.ad.nl/binnenland/live-brand-veluwe-brandweer-ziet-gunstige-ontwikkeling-bij-natuurbrand-t-harde-en-focust-zich-op-hotspots~a474434b/">https://www.ad.nl/binnenland/live-brand-veluwe-brandweer-ziet-gunstige-ontwikkeling-bij-natuurbrand-t-harde-en-focust-zich-op-hotspots~a474434b/</a>                                                                                                                                                            |
| NRC                                                                                                                  | National | 30 Apr – 2 May, plus an update on 7 May    | <a href="https://www.nrc.nl/nieuws/2026/04/29/liveblognatuurbrand29april-a4926634">https://www.nrc.nl/nieuws/2026/04/29/liveblognatuurbrand29april-a4926634</a>                                                                                                                                                                                                                                                                                                            |
| Nu.nl                                                                                                                | National | 30 Apr                                     | <a href="https://www.nu.nl/binnenland/6394278/live-natuurbranden-helikopters-helpen-in-t-harde-blussen-duurt-nog-hele-dag.html">https://www.nu.nl/binnenland/6394278/live-natuurbranden-helikopters-helpen-in-t-harde-blussen-duurt-nog-hele-dag.html</a>                                                                                                                                                                                                                  |
| Telegraaf                                                                                                            | National | 29 Apr – 30 Apr                            | <a href="https://www.telegraaf.nl/binnenland/live-brandweer-zwaar-onder-druk-duitse-en-franse-hulp-onderweg-geen-voertuigen-meer-vrij-voor-nieuwe-bosbranden/150238091.html">https://www.telegraaf.nl/binnenland/live-brandweer-zwaar-onder-druk-duitse-en-franse-hulp-onderweg-geen-voertuigen-meer-vrij-voor-nieuwe-bosbranden/150238091.html</a>                                                                                                                        |
| Trouw                                                                                                                | National | 29 Apr – 2 May, updates on 2 May and 7 May | <a href="https://www.trouw.nl/binnenland/live-natuurbranden-koninklijke-marechaussee-brand-t-harde-door-springstof-oefening~be80739e/">https://www.trouw.nl/binnenland/live-natuurbranden-koninklijke-marechaussee-brand-t-harde-door-springstof-oefening~be80739e/</a>                                                                                                                                                                                                    |
| de Volkskrant                                                                                                        | National | 29 Apr – 2 May                             | <a href="https://www.volkskrant.nl/binnenland/grote-natuurbranden-onder-controle-inzet-franse-duitse-en-belgische-brandweer-niet-meer-nodig~b11710d4/">https://www.volkskrant.nl/binnenland/grote-natuurbranden-onder-controle-inzet-franse-duitse-en-belgische-brandweer-niet-meer-nodig~b11710d4/</a>                                                                                                                                                                    |
| de Gelderlander                                                                                                      | Regional | 29 Apr – 2 May                             | <a href="https://www.gelderlander.nl/binnenland/live-brandweer-geeft-sein-brand-meester-voor-grote-natuurbrand-op-veluwe~a474434b/?slug_rd=1">https://www.gelderlander.nl/binnenland/live-brandweer-geeft-sein-brand-meester-voor-grote-natuurbrand-op-veluwe~a474434b/?slug_rd=1</a>                                                                                                                                                                                      |
| L1                                                                                                                   | Regional | 30 Apr                                     | <a href="https://www.l1nieuws.nl/nieuws/3154275/teruglezen-ook-brand-bij-weert-onder-controle-80-hectare-getroffen">https://www.l1nieuws.nl/nieuws/3154275/teruglezen-ook-brand-bij-weert-onder-controle-80-hectare-getroffen</a>                                                                                                                                                                                                                                          |
| Omroep Brabant                                                                                                       | Regional | 30 Apr                                     | <a href="https://www.omroepbrabant.nl/nieuws/6007902/live-brabant-geteisterd-door-natuurbranden-brandweer-krijgt-europese-hulp">https://www.omroepbrabant.nl/nieuws/6007902/live-brabant-geteisterd-door-natuurbranden-brandweer-krijgt-europese-hulp</a>                                                                                                                                                                                                                  |
| Omroep Gelderland                                                                                                    | Regional | 29 Apr- 2 May<br>(separate liveblogs)      | <a href="https://www.gld.nl/nieuws/8468680/teruglezen-liveblog-natuurbrand-geen-uitbreiding-verwacht-burgemeesters-prijzen-inzet">https://www.gld.nl/nieuws/8468680/teruglezen-liveblog-natuurbrand-geen-uitbreiding-verwacht-burgemeesters-prijzen-inzet</a>                                                                                                                                                                                                              |



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|          |       |                |                                                                                                                                                                                                                         |
|----------|-------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |       |                | <a href="https://www.gld.nl/nieuws/8469028/live-brandweer-nog-op-volle-kracht-aanwezig-in-t-harde-acht-vragen">https://www.gld.nl/nieuws/8469028/live-brandweer-nog-op-volle-kracht-aanwezig-in-t-harde-acht-vragen</a> |
|          |       |                | <a href="https://www.gld.nl/nieuws/8469491/live-natuurbrand-t-harde-afgeschaald-naar-grip-0">https://www.gld.nl/nieuws/8469491/live-natuurbrand-t-harde-afgeschaald-naar-grip-0</a>                                     |
|          |       |                | <a href="https://www.gld.nl/nieuws/8469917/live-brand-t-harde-nog-niet-uit-grootste-gevaar-geweken">https://www.gld.nl/nieuws/8469917/live-brand-t-harde-nog-niet-uit-grootste-gevaar-geweken</a>                       |
| Nunspeet | Local | 29 Apr – 1 May | <a href="https://www.rtvnunspeet.nl/grote-brand-in-natuurgebied-bij-epe-meerdere-korpsen-ter-plaatse">https://www.rtvnunspeet.nl/grote-brand-in-natuurgebied-bij-epe-meerdere-korpsen-ter-plaatse</a>                   |

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## 7 Code and data availability

SPI-1 data and daily and hourly AWS-data for De Bilt, Heino and Deelen by KNMI are publicly available through the KNMI Data Platform through <https://dataplatfom.knmi.nl/>. Precipitation deficit data can be accessed through the KNMI Climate Explorer through <https://climexp.knmi.nl/>. The code used to calculate fire weather (sub)indices is available through <https://github.com/lcmok/FWI-code>. The Planet data underlying the RGB satellite data in Figure 6 are obtained under the Wageningen University contract with Planet, and therefore not publicly available. Likewise, the photos in Figure 6 a, b, f and g are not included in the Creative Commons license applying to this article. Copyright remains with the rights holder. Any reuse, reproduction, distribution, or other use of this image beyond applicable statutory exceptions requires permission from the copyright holder.

## 8 Author contributions

CRS conceived the idea for this study including the various subthemes, and coordinated the author team. The analysis and draft writing of the subthemes were done by HB (satellite analyses), LM, SP and JB (weather analyses), BV and MC (fire danger analysis including pyroconvective potential), CRS, BV and NS (fire events), BV, JD and EK (fire service response), AS and CRS (media response), with input from CRS. CRS analysed the government response, and prepared the manuscript with contribution from all co-authors.

## 9 Competing interests

The authors have declared that there are no competing interests

## 10 Disclaimer

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