

EDII - A European Drought Impact Report Inventory



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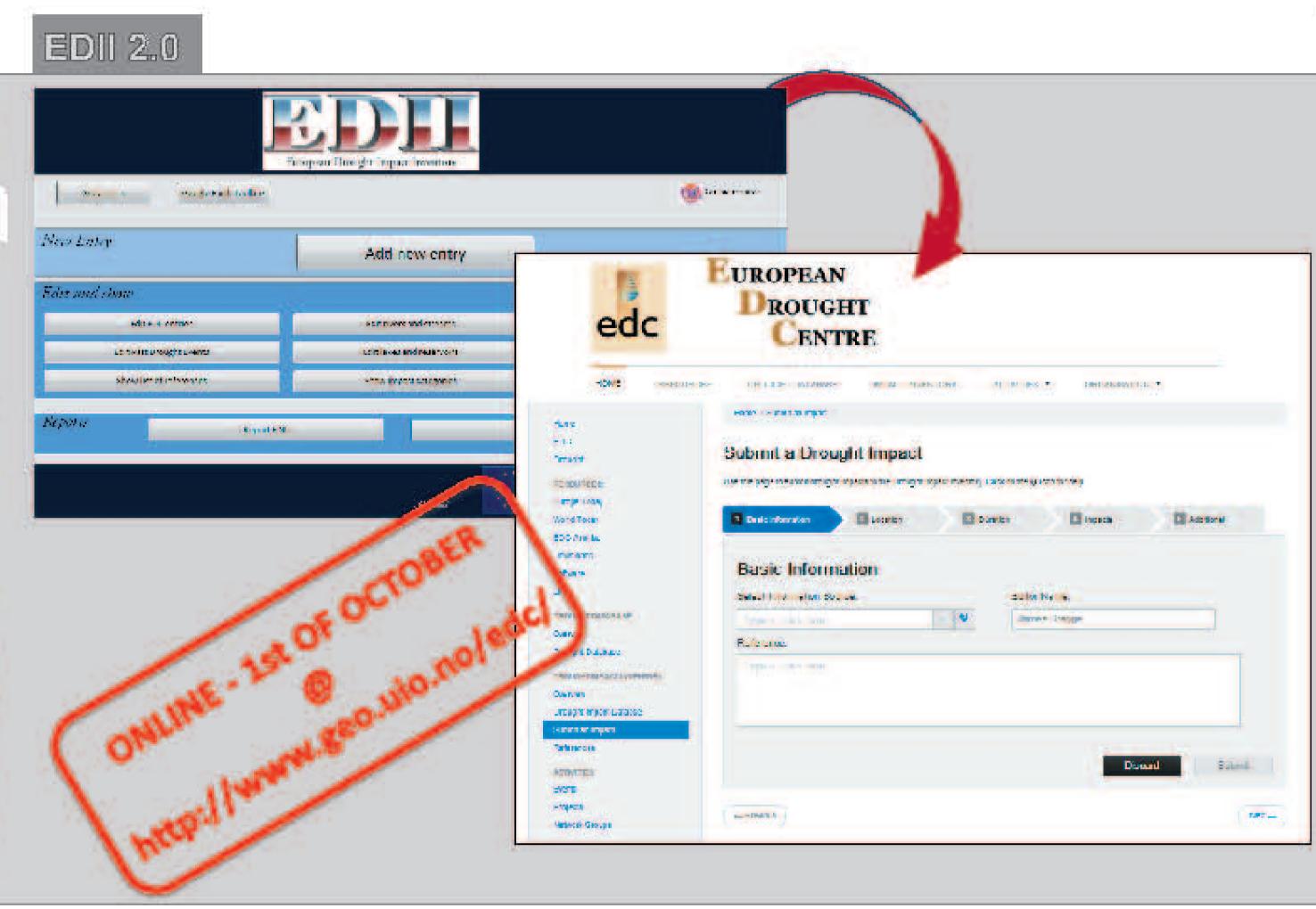
Drought is one of the most disastrous natural hazards in Europe. It cannot be prevented, but its impacts can be reduced by mitigation. In Europe, numerous drought indicators have been proposed, but few studies have tested how commonly used drought indices actually relate to drought impacts and susceptibility. Even fewer studies have linked drought impacts with large-scale meteorological and hydrological drought indicators commonly used to describe events across Europe's different geo-climatic regions. Thus, there is a need for a comprehensive pan-European investigation of historical events and their impacts built on a common data source, against which existing studies can be compared. The European Drought Impact report Inventory (EDII) developed as part of the EU FP7 project Drought R&SPI (Fostering European Drought Research and Science-Policy Interfacing) aims to collect and build a database of past drought impacts in Europe reported by various sources. Impact information is:

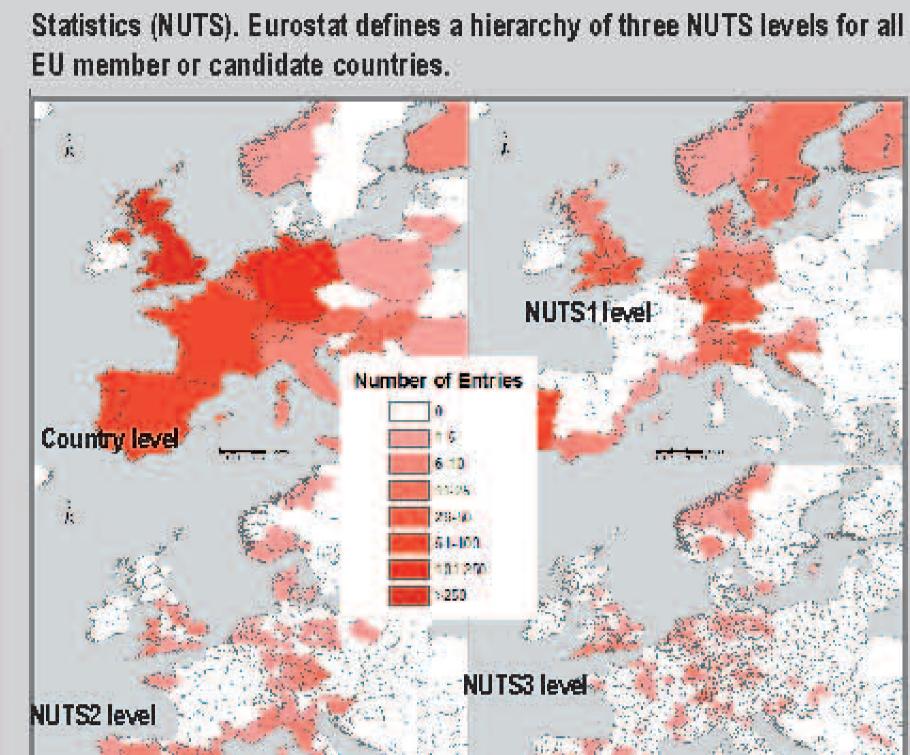
- (a) classified into pre-defined impact categories,
- (b) referenced temporally and spatially, and
- (c) complemented with additional reported impact information including drought response measures where applicable. The initial database is still project-internal, but the aim is to make it publicly accessible as a web-GIS supported online database in the future.

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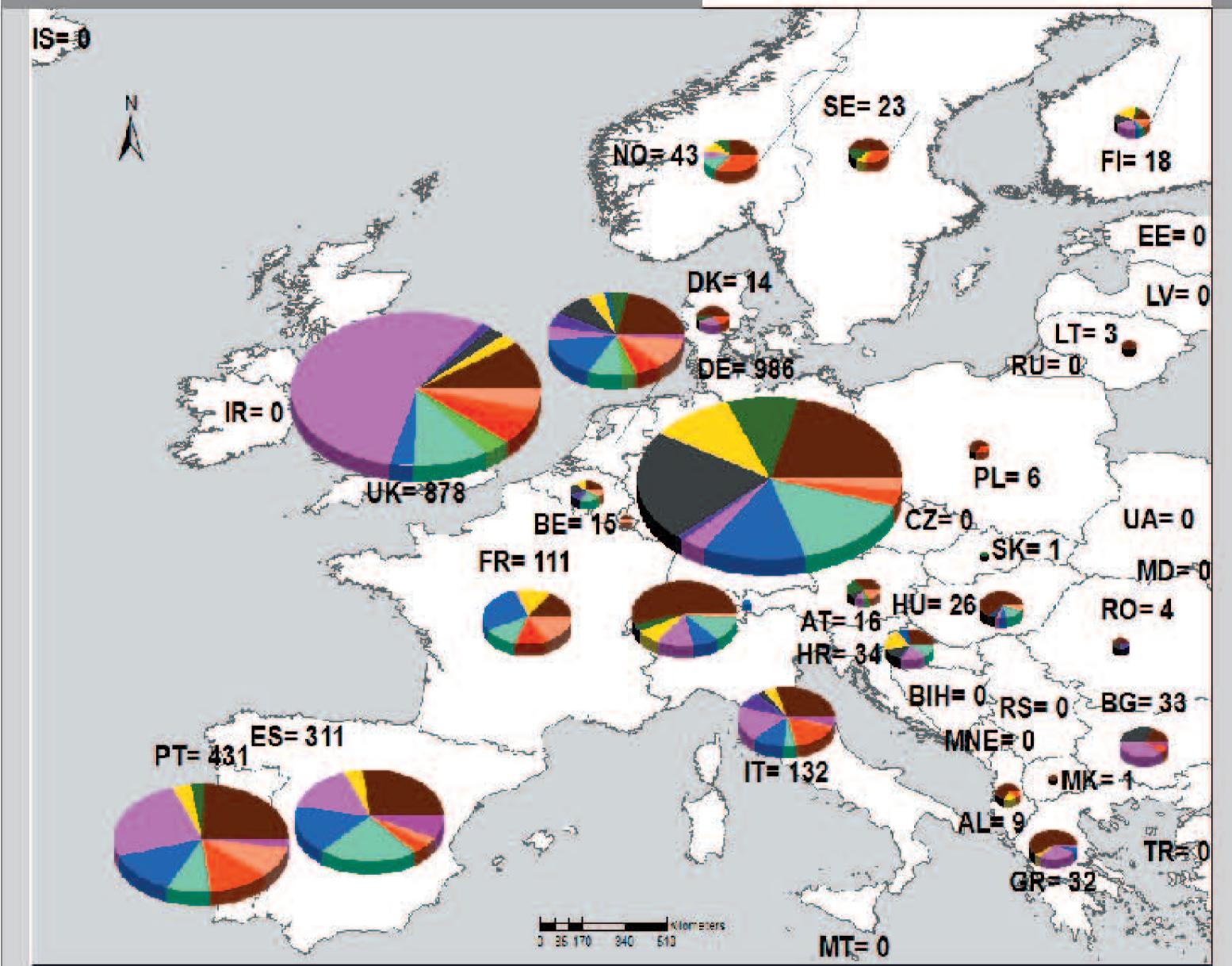
STATE OF THE INVENTORY Agriculture and Livestockfarming Forestry Freshwater Aquaculture and Fisheries Energy and Industry 241 Waterborne transportation Tourism and Recreation Public water supply Water quality Freshwater ecosystems: habitats, plants and wildlife Terrestrial ecosystems: habitats, plants and wildlife 48 Soll system Air quality 134 Human health Conflicts





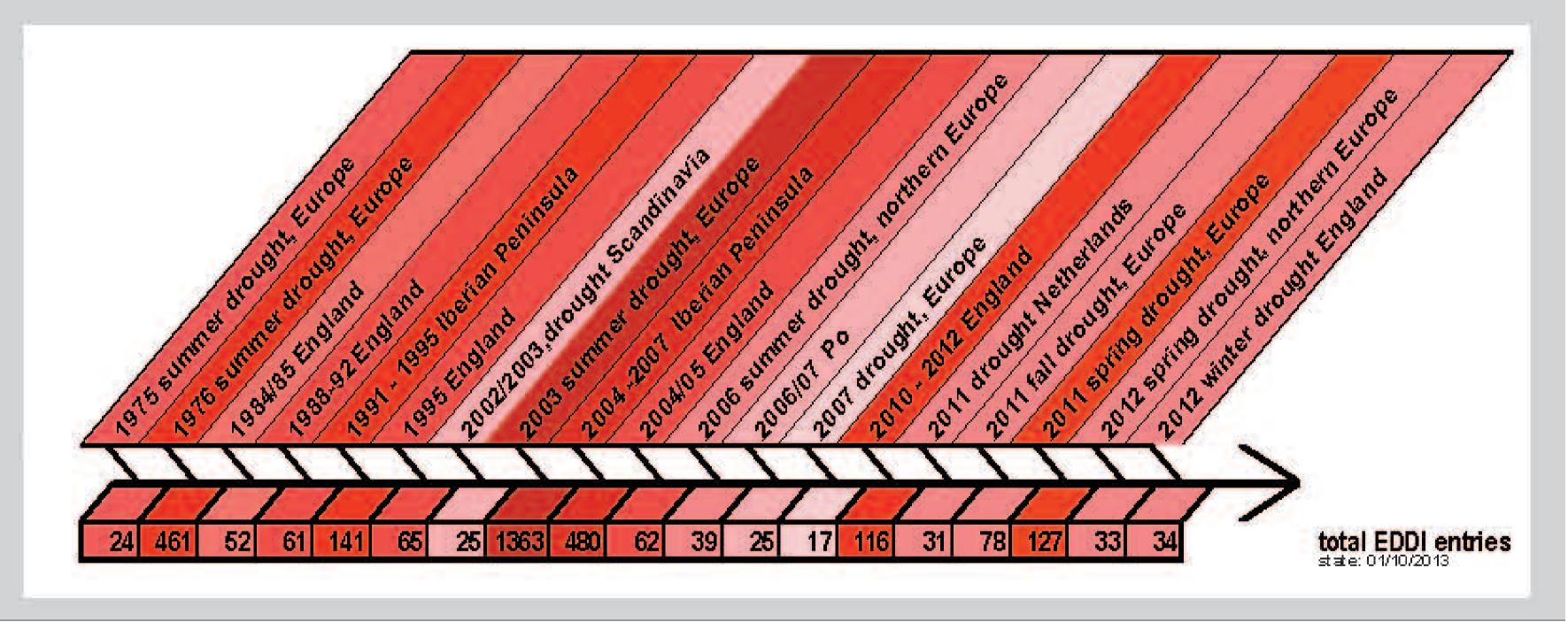
EDII entries are referenced to the Nomenclature of Territorial Units for

STATE OF THE INVENTORY BY COUNTRY



MAJOR DROUGHT EVENTS

Based on geographical reference (left), the distribution of entries across impact categories can be mapped. The preliminary dataset does not yet allow to test which areas are more prone to specific impacts or which impacts are specific to different geo-climatic regions. Nevertheless, some differences already emerge, e.g., a greater proportion of water supply related impacts in Southern Europe, where water is scarce, versus a greater proportion of reported impacts on ecology and river flow in Central and Northern Europe, where perennial rivers are used for fishing, hydropower generation, navigation, etc.. Overall, 90 "drought events" have been described The figure (lower) shows a timeline of those 19, which have more than 15 impact entries in the database. The summer drought of 1975 in Western Europe was the earliest with many reports from France, Germany and the UK. Several events in the 1990s followed with notable droughts in Spain and Portugal. The largest number of impact entries yet is recorded for the summer drought of 2003 that affected large parts of Europe, followed by the multi-year drought event of 2004-2007 on the Iberian Peninsula and the European summer drought in 1976.



THE 1975-76 DROUGHT - REPORT

Already in growing season of 1975, parts of Northwestern Europe were markedly below average rainfall causing hosepipe bans throughout South West England by June, extending to substantial parts of England and Wales by the following months

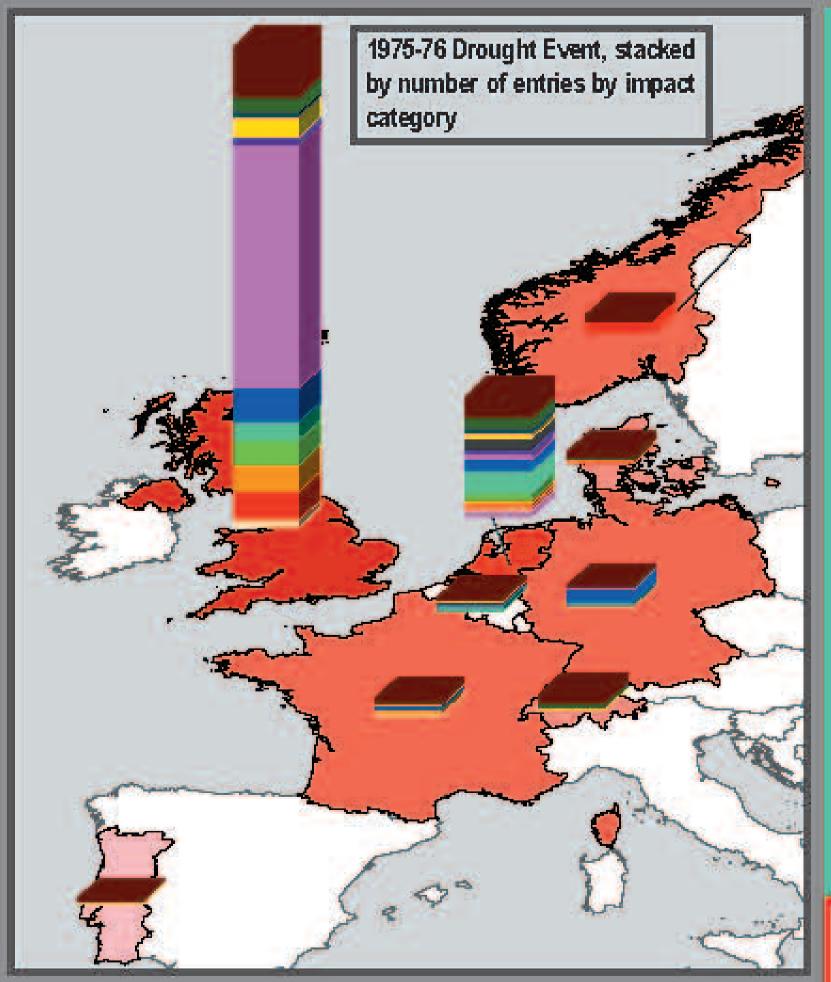
Furthermore, Newspaper articles reported numerous forest -, health- and field fires in Denmark and adjacent Northern Germany.

Eastern Norway reported fodder-shortages leading to early cattle-slaughtering milk import from the West.

Drought conditions in 1976 combined with a heat wave in June/July resulted in widespread socio-economic and environmental impacts throughout Western Europe. Agriculture was extensively affected. Due to insufficient grazing availability, low hay and fodder crop yields; livestock and especially dairy farming severely suffered from feed shortages during the hot weather period. Hence, early livestock-slaughtering at "unprecedented rates". Especially France, Great Britain and Denmark (all facing drought conditions since 1975) reported drastically fallen milk production. In parts of Great Britain and the Netherlands saline intrusions contributed to agricultural damage. Subsequently, households were impacted through sharply increased prices especially for potatoes and fresh vegetables together with the loss of their own garden produce.

The impact on public water supply services varied spatially. In England and Wales, daily shutoffs had to be applied which finally affected over one million consumers. French limitations in water supply affected urban and rural areas, in particular: the East, Brittany and in touristic West-coast -areas. Reductions in demand, as outdoor water use restrictions, was also given in large parts of the Rhine basin. Critical regional water shortages and failures of supply remained limited mainly to rural areas, where in some cases emergency supply had to be realized by trucks and even helicopters.

Low stream flows resulted in i) reduced hydropower production and impaired production of thermal and nuclear power and ii) impaired inland navigation on the Rhine and further important transport routes until into 1977.



According to RIZA, 1976 belongs to the top five years of largest economic loss for the navigation sector in the Netherlands (ranked fifth after the years 1921, 1949, 1949 and 1959). Across much of Southern and Eastern England land subsidence was experienced leading to substantial property damage.

Reported environmental freshwater 1976-drought impacts ecosystems, i.e. the temporary deterioration of water quality (mainly eutrophication algal blooms, extreme water phenomena). temperatures, depletion of dissolved oxygen to critical levels, massive proportions of sewage effluent, saline incursions, fish kill events (sometimes related to excessive withdrawals for agricultural irrigation), drying up of stream sections with effects on aquatic species and especially migratory fish. In Dutch delta areas, an outbreak of avian botulism (over 60 000 cadavers counted) got attributed to prevailing drought conditions. Futhermore, considerable falling of groundwater levels had a particular impacts on oligotrophic wetland habitats in the Netherlands . Drought impacts on nature conservation sites got also noted by Hearn & Gilbert (1977) in Britain.

Devastating wildfires occurred widespread in summer 1976, again Southern England and parts of Northern France were severely affected.

Besides direct fire damage, European woodlands and forests suffered from the prolonged drought stress and increased incidence of diseases such as the Dutch elm disease, in particular increased dieback of beech & birch was observed.







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