

TransParcNet Meeting 2023  
German-Dutch Nature Park Maas-Schwalm-Nette  
20-23 June 2023

**Fire Management and Wildfire Risk Reduction  
in Cross-boundary Protected Areas**

Johann Georg Goldammer



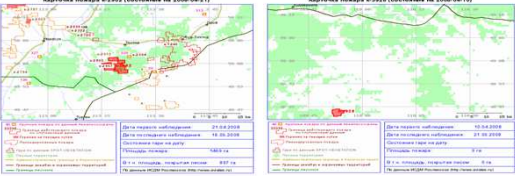
The Global Fire Monitoring Center (GFMC)

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**Overview**

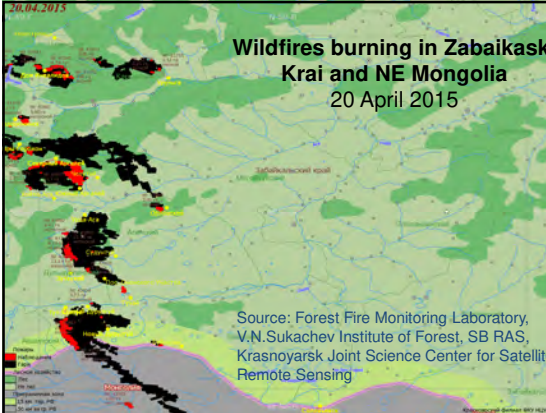
- Cross-boundary fires and smoke transport
- Cross-boundary fire management in protected areas / national parks
- Historic views of fire use and implications on contemporary land and fire management
- Conflicting issues: Conservation goals vs. wildfire risk reduction

**Cross-boundary fires – a phenomenon in all continents....**



Местонахождение очагов возгорания	Общая площадь возгораний, га	Общая протяженность возгораний, км
Восточная Сибирь	10 000 000	100 000
Южная Сибирь	5 000 000	50 000
Центральная Сибирь	2 000 000	20 000
Западная Сибирь	1 000 000	10 000
Северная Сибирь	500 000	5 000

**Wildfires burning in Zabaikaski Krai and NE Mongolia**  
20 April 2015



Source: Forest Fire Monitoring Laboratory, V.N. Sukachev Institute of Forest, SB RAS, Krasnoyarsk Joint Science Center for Satellite Remote Sensing

**Wildfires burning in Southeast Siberia and Northeast Mongolia**  
14 April 2015



Smoke

Burn scar

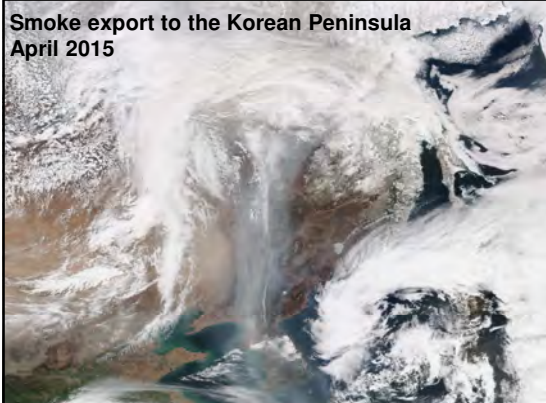
Russia

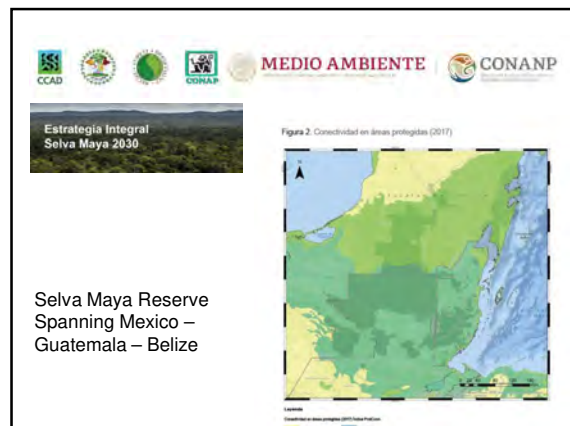
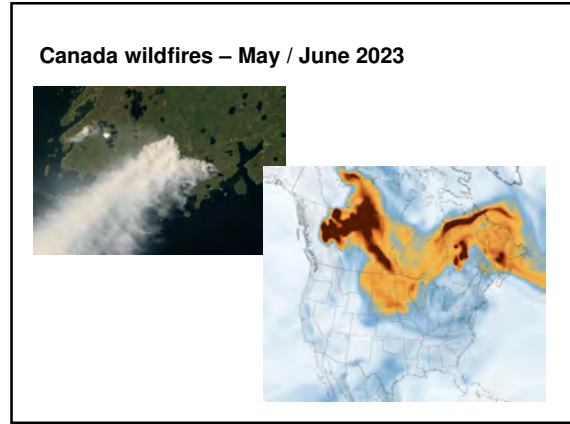
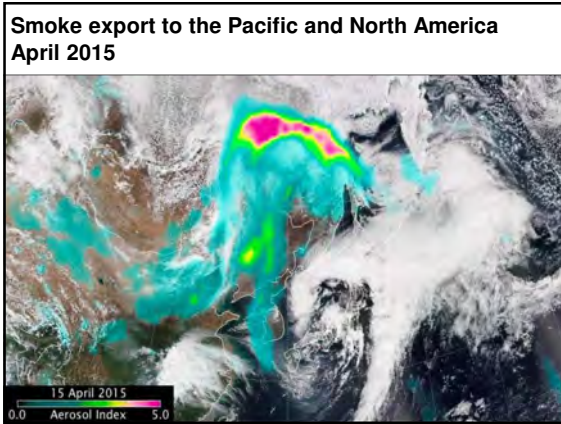
Mongolia

China



50 km

**Smoke export to the Korean Peninsula**  
April 2015







Consequences of surface fire (low intensity) in beech forest  
 National Park Shar Planina, North Macedonia

**Workshop “Climate Change and Security in the Shar/Sara Mountains and Korab Massif Area:**  
 Developing a joint co-operation/adaptation strategy and an implementation plan”, 2-3 November 2022, Mavrovo (NM)



<https://www.osce.org/secretariat/530446>

**European Cultural Fire History:  
 16<sup>th</sup> – 18<sup>th</sup> Century**


**Land clearing and land-use systems involving fire, e.g.**

- Slash-and-burn agriculture
- Moor burning
- Pasture / heathland burning



**Central Europe – Example:**

Atlantic and continental open heathland ecosystems are a result of centuries of intensive land use – including the use of fire

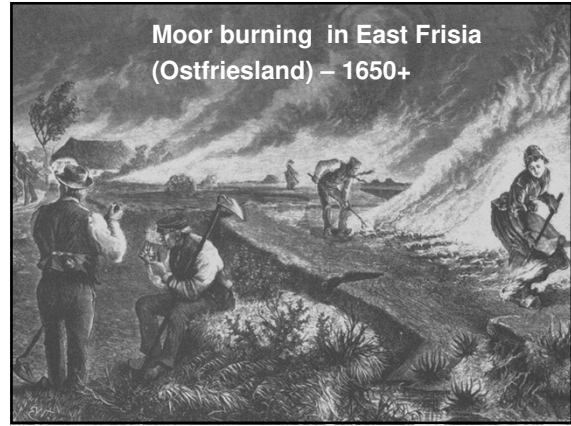


*Calluna vulgaris*  
*Erica tetralix*





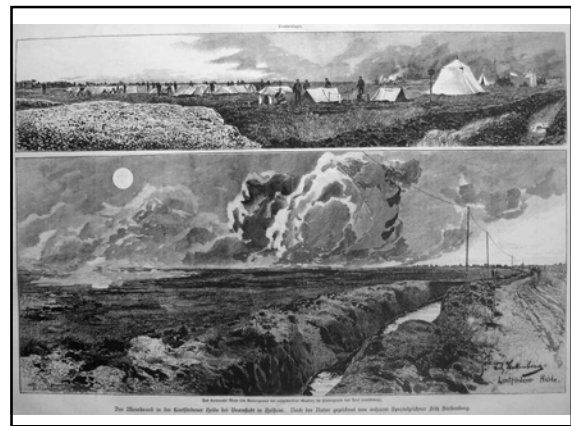
Eero Järnefelt 1873  
"Forest burning"  
Ateneum, Helsinki



Moor burning in East Frisia  
(Ostfriesland) – 1650+



Moor  
wildfire  
in North  
Frisia 1893



What about today?

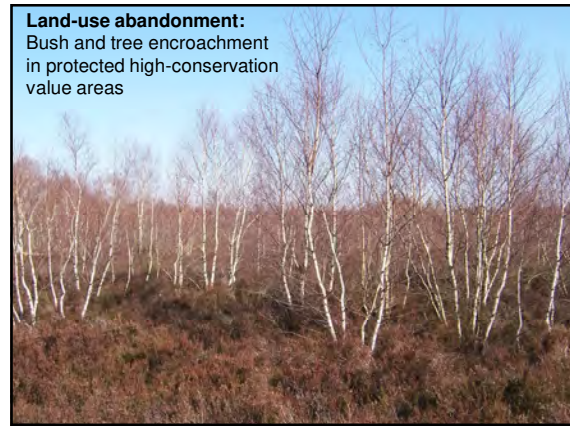
Photo: J. Prüter



Landscape fire ecology in Central Europe  
The Lunenburg Heath

Photo: J. Prüter








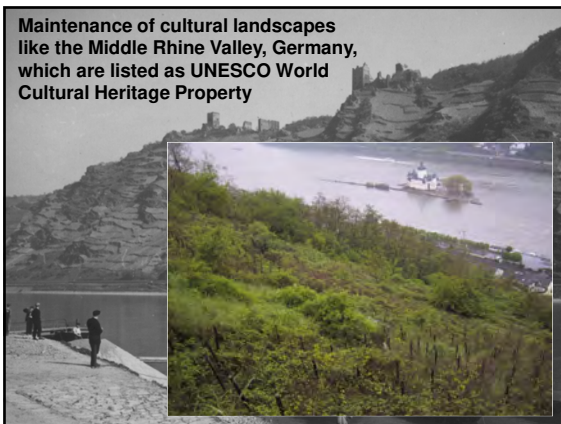
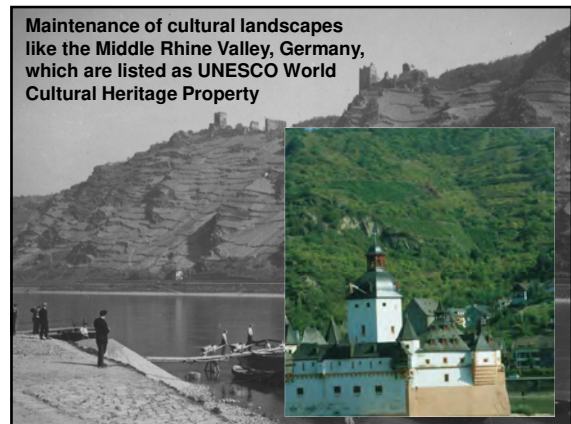
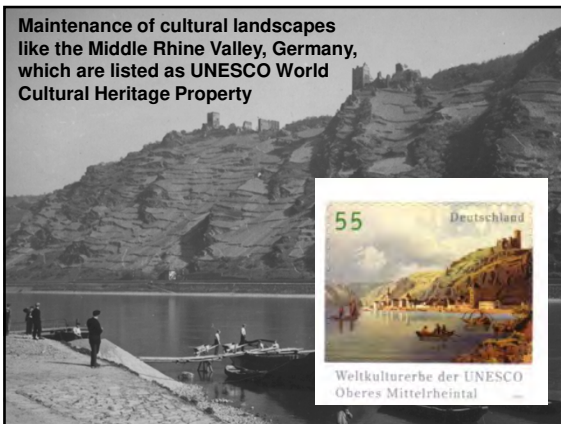
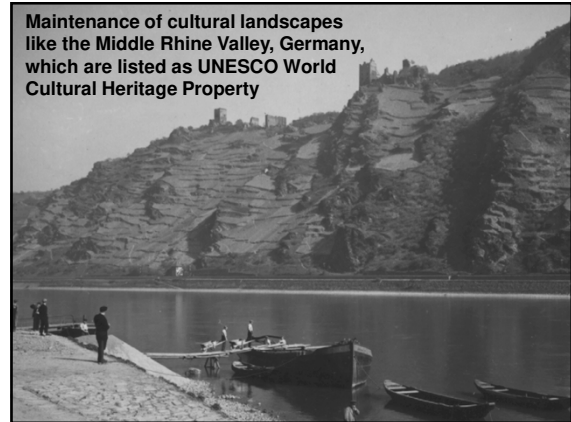


**Germany: Upper Middle Rhine Valley**

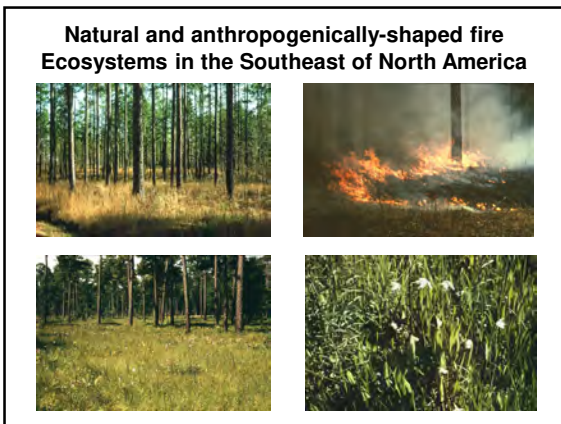
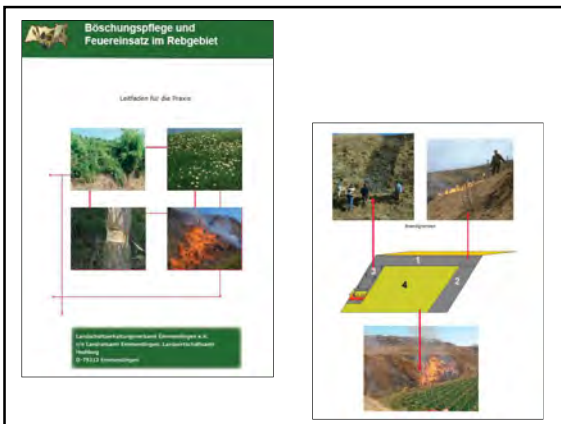


Historic vineyard terraces which are characteristic for the Middle Rhine Valley (left) :

- > Now increasingly overgrown by bush and tree encroachments as a consequence of land-use change (abandonment of steep vineyard terraces)
- > Prescribed fire has been used together with prescribed grazing and mechanical treatment, to maintain the openness and characteristic features of this WHS











### The Dilemma

Example Government of Germany – Promoting an idealized scheme of multiple functions of forests

- Ecosystem Services of forests – contribution to biodiversity, carbon sequestration, recreation etc.
- Implications of climate change and wildfire threat not considered

### Ökosystemleistungen des Waldes

Dargestellt sind die Leistungen, die der Wald in Deutschland aufweist. In der Abbildung ist ein Drittel Deutschlands (17,4 Mio. Hektar) bewaldet.

- Regulationsleistungen:**
  - Luftreife
  - Wasserrückhalt
  - Wasserrückhalt
  - Wasserrückhalt
  - Wasserrückhalt
- Belebensleistungen:**
  - Photosynthese
  - Sauerstoffproduktion
  - Artenvielfalt
  - Wasserrückhalt
  - Wasserrückhalt
- Versorgungsleistungen:**
  - Ernährung
  - Wasser
  - Wasser
  - Wasser
  - Wasser
- Kulturelle Leistungen:**
  - Recreation
  - Wasser
  - Wasser
  - Wasser
  - Wasser

### Forest Fire Statistics Germany

- 2017-2018: Rapid increase of **Share of hardwood / deciduous species** in the statistics.

Share of **deciduous stand areas affected by fire** of the total burned area (all forest ownership exempt Federal Forest – mainly active or abandoned military lands):

2017:	84%
2018:	50%
2019:	43%

### Climate Crisis in Germany – Droughts and Forest Dieback – Example Harz Mountains

2020: 60% of forests in Germany affected by drought  
 2021 / 2022 : 80% of tree crowns in forests are damaged

Source: Various Online Media – not released for further publication



**Revisit of traditional management and use of forests**  
 Functions of :

- Open "light" forests
  - less number of trees / ha
  - Less competition for (limited) water
  - Individual trees having "solitary" character
  - Higher resilience against extreme winds
- Combined agro-silvo-pastoral forest use
- Controlled (prescribed) grazing and burning

**Revisit of traditional management and use of forests**

**Alternative mechanical treatment of forests**  
 Wildfire hazard reduction by mechanical means:

- Fuel reduction – leaving behind compact biomass for soil protection
- Use of woody biomass as resource for renewable energy
- Strategic positioning of fuel break corridors

**Alternative mechanical treatment of forests**

- Strategic positioning of fuel break corridors





**Bad Siegburg – Germany (2018)**  
 First experience of wildfire entering residential areas

**Altenreuth – 16 June 2023**  
 Small grass fire .....

**Outreach through Regional Fire Management Resource Centers in Europe: Development of Guidelines (2012-2013)**

**Defence of Villages, Farms and Other Rural Assets against Wildfires: Guidelines for Rural Populations, Local Communities and Municipality Leaders in the Balkan Region**

English and Greek versions finalized (October 2013) –  
 meanwhile available in other languages

**Defence of Villages, Farms and Other Rural Assets against Wildfires: Guidelines**

Preparation of local people to become aware of wildfire threats and to prepare their home for defense against wildfires

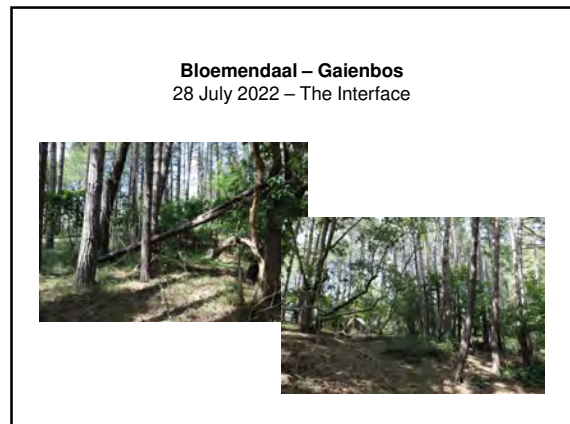
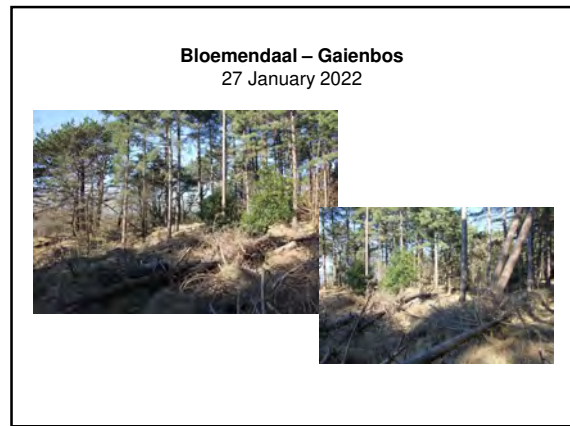
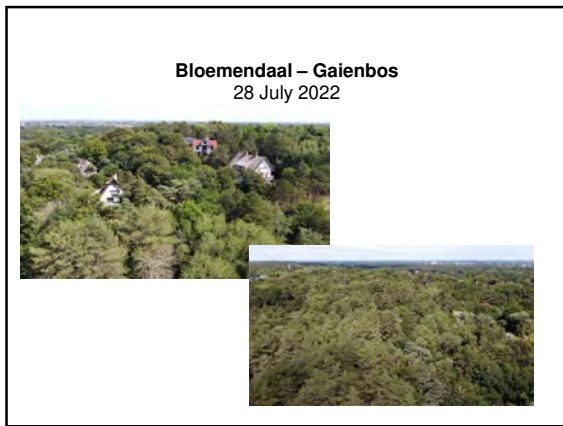
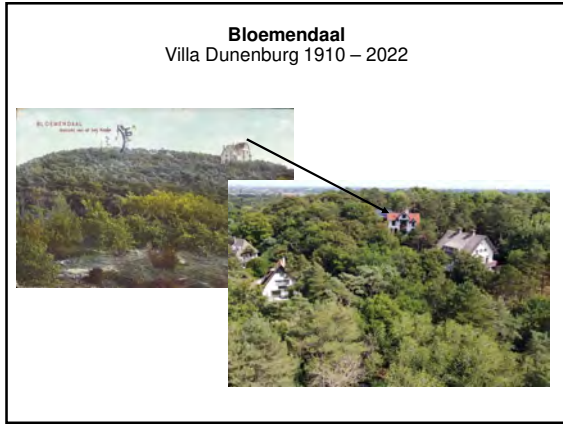
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Preparation of local people to become aware of wildfire threats and to prepare their home for defense against wildfires

**Bloemendaal**  
 Development of Forest – Hoge Duin en Daalsweg 1907 – 2013






**Bloemendaal – Gaienbos – The Netherlands**  
 Round Table initiated by Residents – 28 January 2022

Development of the "Living Lab" (ongoing 2023+)

**Bloemendaal – Gaienbos – The Netherlands**  
 Round Table initiated by Residents – 28 January 2022




**First results:**  
 Residents take initiative and offer investments for silviculture / fuel reduction along the borders of forest / private lands (ongoing 2023+)

**Bloemendaal – Gaienbos – The Netherlands**  
 28 July 2022



**Bloemendaal – Gaienbos**  
 Forest landscape aesthetics and wildfire safety



**United States of America – California in the 1980s**  
 Establishment of wildfire protection corridors by mechanical treatment



**Silvopastoral / Agroforestry Management**  
 A practice receiving increasing attention between Spain and Germany




Natural open, climate-stress resilient pine forests in Eurasia and North America: Shaped by natural and prescribed fires




**Securing the interface to residential areas**

- The Beelitz Model – Brandenburg State, Germany




**Germany – The Freiburg Model (I)**

- 2012: City administration concerned about increasing wildfire risk – agreement with GFMC to capacitate local agencies of improved preparedness and governance of wildfire incident management
- 2013: Development of the first forest fire map
- 2014: Purchase of equipment for hand crews
- 2015: Formation of the **Task Force Landscape Fire** and first theoretical and field training




**Germany – The Freiburg Model (II)**

- 2019: Continuation of theoretical and field



**Germany – The Freiburg Model (III)**

- Annual Refresher
- Emphasis: Hand tools, suppression firing ....



**Germany – The Freiburg Model (IV)**

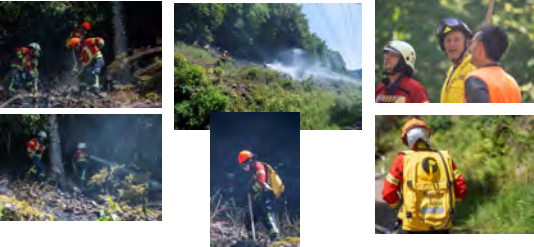
- 2020:
  - Formal establishment of the Task Force Landscape Fire
  - Inclusion of the Forest Office of Freiburg City
- 2020: Competent response to forest fires
  - July 2020 and April / July 2023





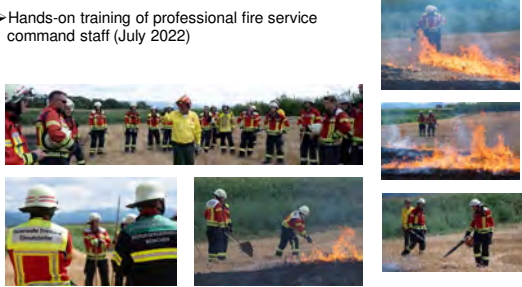
**Germany – The Freiburg Model (V)**

➤ Example 2022: Team of firefighters and foresters offroad



**Germany – The Freiburg Model (VI)**

➤ Hands-on training of professional fire service command staff (July 2022)



**Germany – The Freiburg Model (VII)**

➤ Development of a multi-purpose unit for firefighting – also to be used for watering plants and high-pressure cleaning – The Welte „Backpack“ for agricultural and forestry tractors



**Germany – The Freiburg Model (VIII)**

➤ Demonstration – July 2022



**Some considerations to think about**

- Development of training materials in Dutch and German
- Based on EuroFire Competency Standards



**Some considerations to think about**

- Development of training materials in additional languages of countries hosting protected areas
- Based on EuroFire Competency Standards



**International competency standards for training of firefighters**



**January 2023:**

**Available in 22 languages for the use in 60+ countries**



<https://gfmc.online/eurofire/index-11.html>

**EuroFire** Стандарти і навчальні матеріали EuroFire

Training of forest firefighters in Ukraine



Рисунок EF 6.15. Ступінчасте запалювання фронтального вогню командою

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Transparcnet  
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**Thanks for Your Attention**



The Global Fire Monitoring Center (GFMC)