The Regional Eastern Africa Fire Monitoring Resource Center (REA-FMRC)

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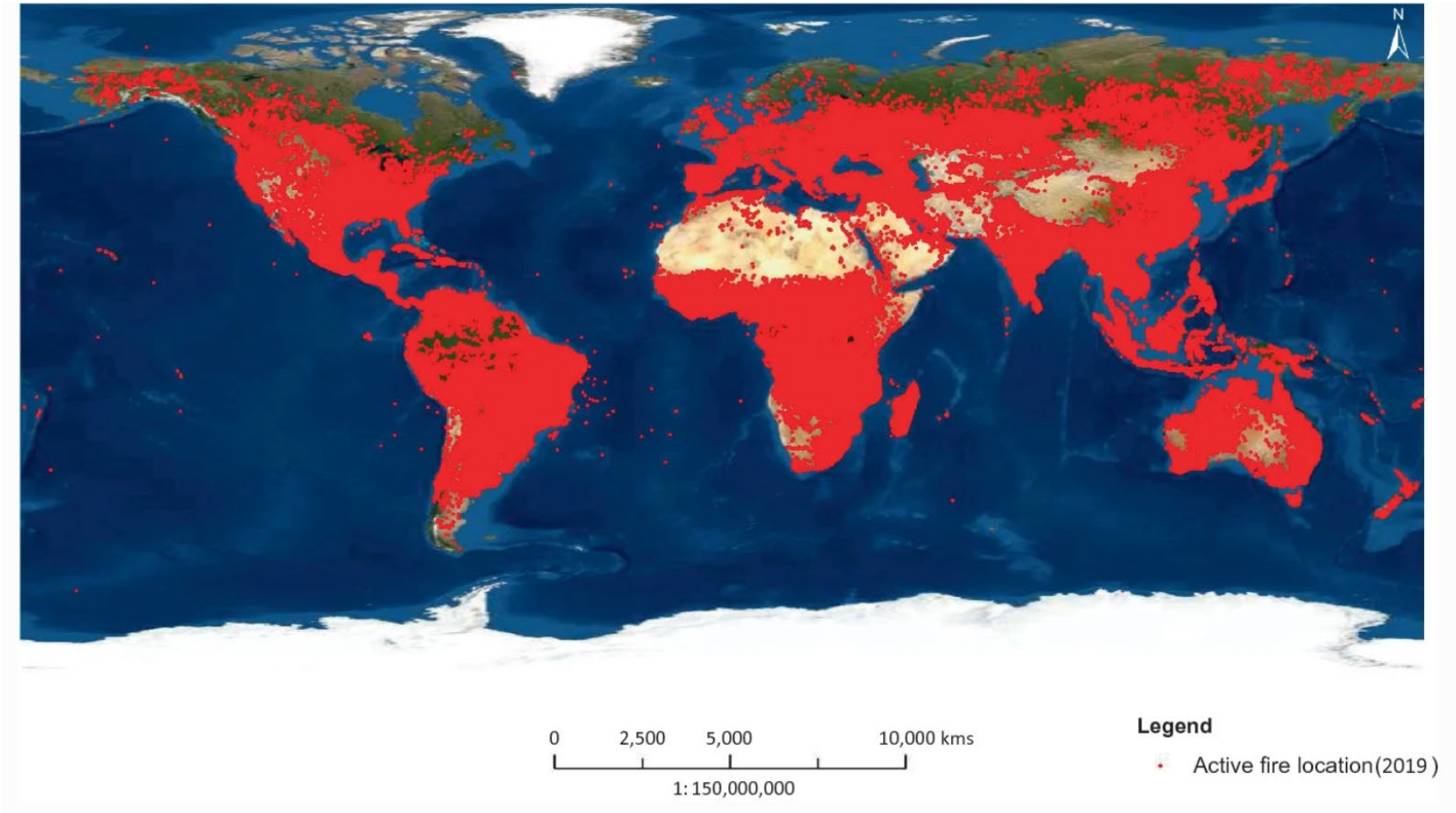
Fires across the world



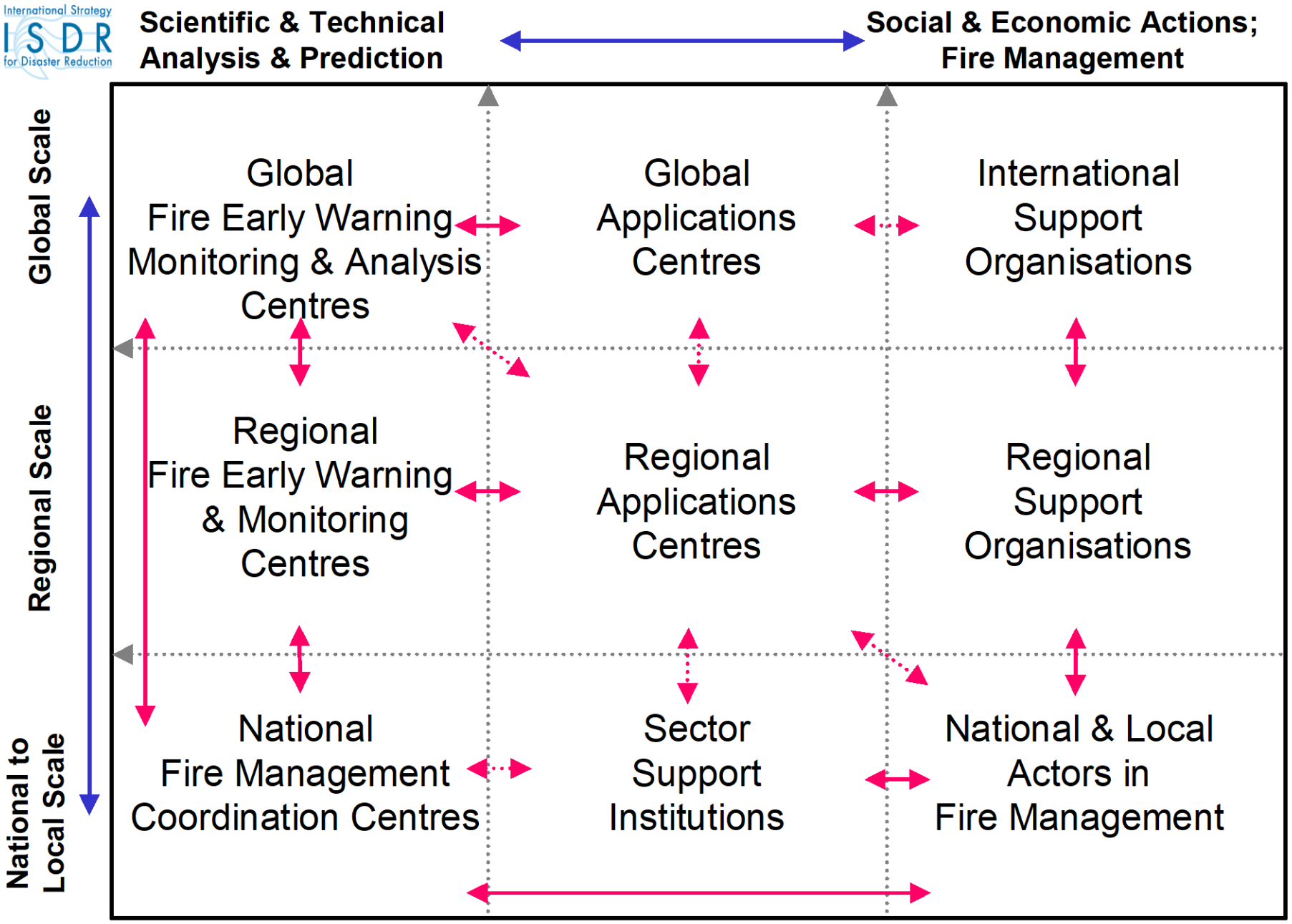
Global distribution of active fires from January to December 2019, as detected by MODIS (Thapa et al., 2021).

Global Fire Monitoring Center (GFMC)

- Given the growing vulnerability of the global environment and societies to the damaging effects of landscape fires, and the recognized need and value of sharing scientific, conceptual and pragmatic fire management solutions and resources → **initial thoughts at the 1996 Global Change Seminar in Russia**
- Specialist team's proposal on fires (UN Economic Commission for Europe (UNECE), the Food and Agriculture Organization of the UN (FAO) and the International Labour Organization (ILO))
- **Creation of the GFMC** through funding from the German Government, via the Ministry of Foreign Affairs in 1998

Global Fire Monitoring Center (GFMC)

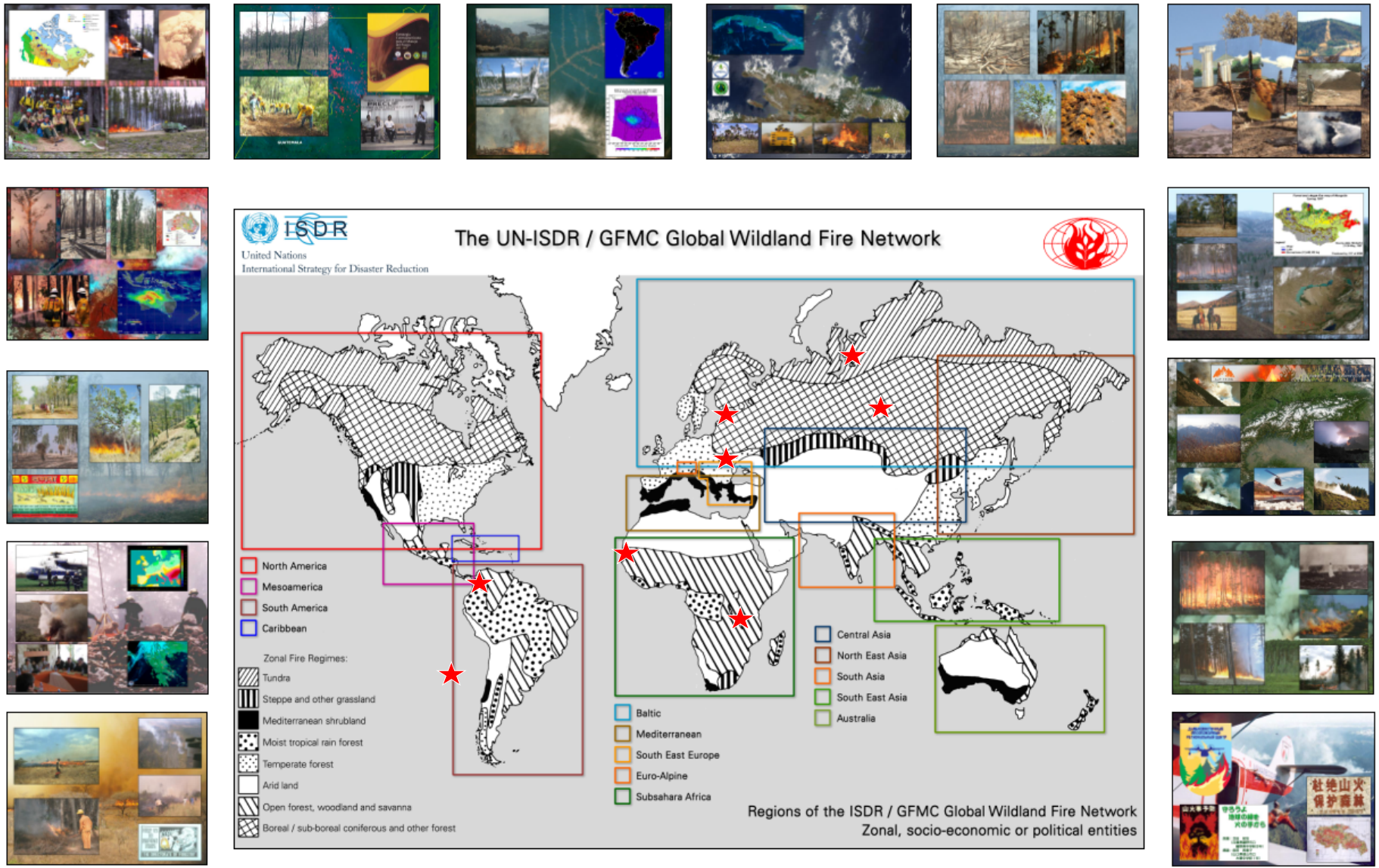
- Hosted by the Fire Ecology Research Group, a subdivision of the Biogeochemistry Department of the Max Planck Institute for Chemistry at Freiburg University (Germany), and Associated Institute of United Nations University (UNU, Japan)
- provides a publicly accessible global portal (https://gfmc.online/) for landscape fire documentation, information and monitoring. Its contents are generated by a worldwide network of cooperating institutions, dealing with **early warning**, **archiving and interpretation of fire information**, support to **develop public policies and implementation strategies and decisions from local to international level**
- **Reduce the negative impacts of landscape fires on the environment and humanity**


International Strategy
ISDR
for Disaster Reduction
Scientific & Technical
Analysis & Prediction
Social & Economic Actions;
Fire Management
Global Scale
Regional Scale
National to
Local Scale
Global
Fire Early Warning
Monitoring & Analysis
Centres
Global
Applications
Centres
International
Support
Organisations
Regional
Fire Early Warning
& Monitoring
Centres
Regional
Applications
Centres
Regional
Support
Organisations
National
Fire Management
Coordination Centres
Sector
Support
Institutions
National & Local
Actors in
Fire Management

Global Wildland Fire Network (GWFN)

- 8 Regional Fire Management Resource Centers (RFMRCs) and Regional Fire Monitoring Centers (RFMCs)
  - Regional Fire Monitoring Center for Southeast Europe / Caucasus (RFMC) 2010
  - Regional Eastern Europe Fire Monitoring Center (REEFMC) 2013
  - Regional Central Asia Fire Management Resource Center (RCAFMRC) 2015
  - Regional Fire Management Resource Center – South East Asia Region (RFMRC-SEA) 2017
  - Regional Eurasia Fire Monitoring Center (REFMC) - 2017
  - Regional Fire Management Resource Center – South America Region (RFMRC-SAR) 2017
  - **Regional Eastern Africa Fire Management Resource Center (REAFMRC) – October 2020**
  - Regional Western Africa Fire Management Resource Center (RWAFMRC) - 2021
- 14 Regional Wildland Fire Networks

Disaster Reduction Focal Points

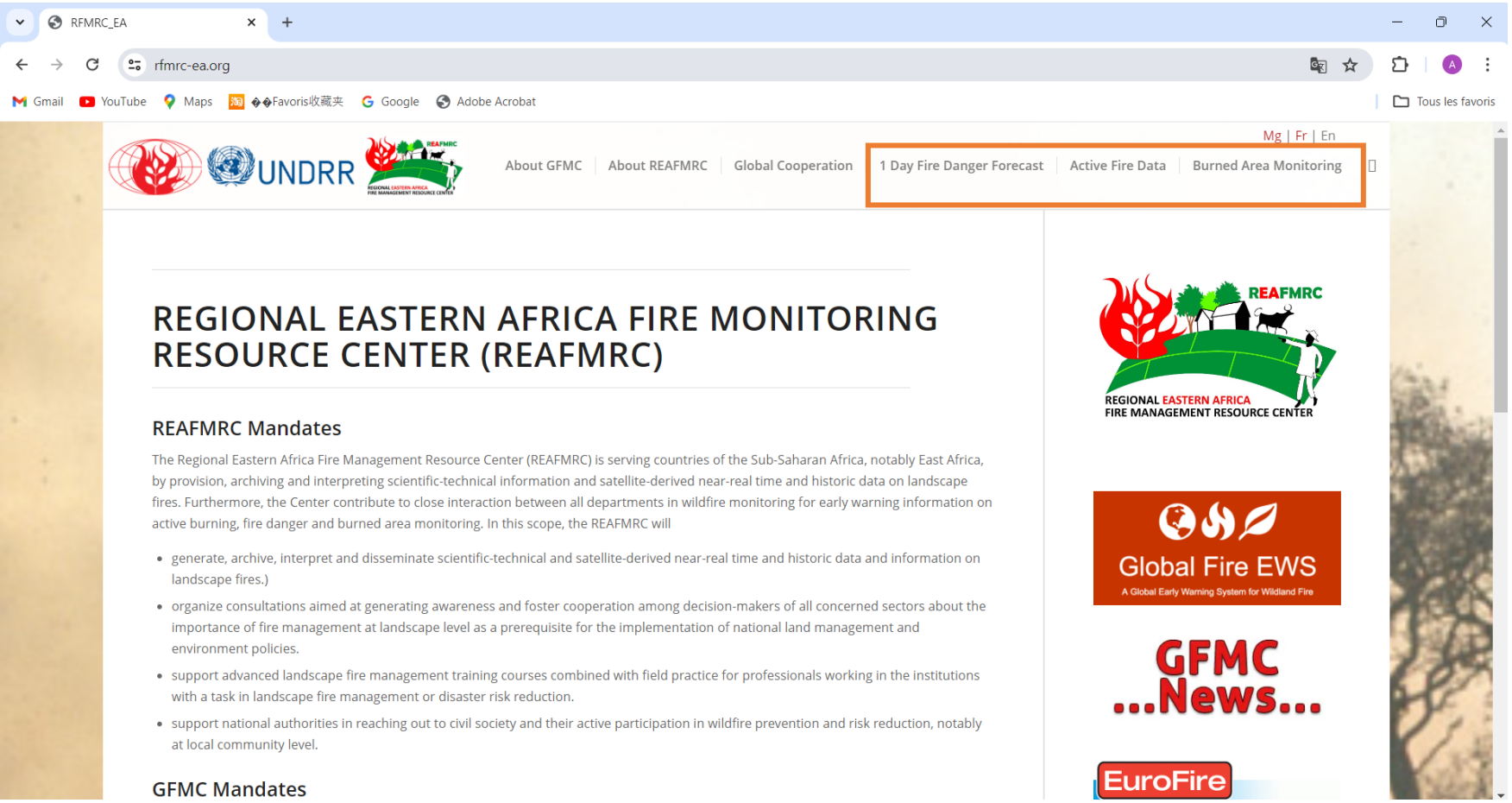


Regional Eastern Africa Fire Monitoring Resource Center (REA-FMRC)

- Hosted by LLandDev (Land, Landscape and Development Research Lab) (www.llanddev.org), Department of Water and Forestry in the School of Agronomy at the University of Antananarivo, Madagascar
- Serving countries of the Sub-Saharan Africa, notably East Africa : provision, archiving and interpreting scientific-technical information and satellite-derived near-real time and historic data on landscape fires
- To decentralize the role of the Global Fire Monitoring Center (GFMC) for an adapted response to the local, national and regional needs of stakeholders in fire management data
- Contribute to close interaction between all departments in wildfire monitoring for early warning information on active burning, fire danger and burned area monitoring
- Specific geoportal www.rfmrc-ea.org for Madagascar and all eastern Africa countries (Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Somalia, Tanzania, Uganda, Zambia, Zimbabwe)

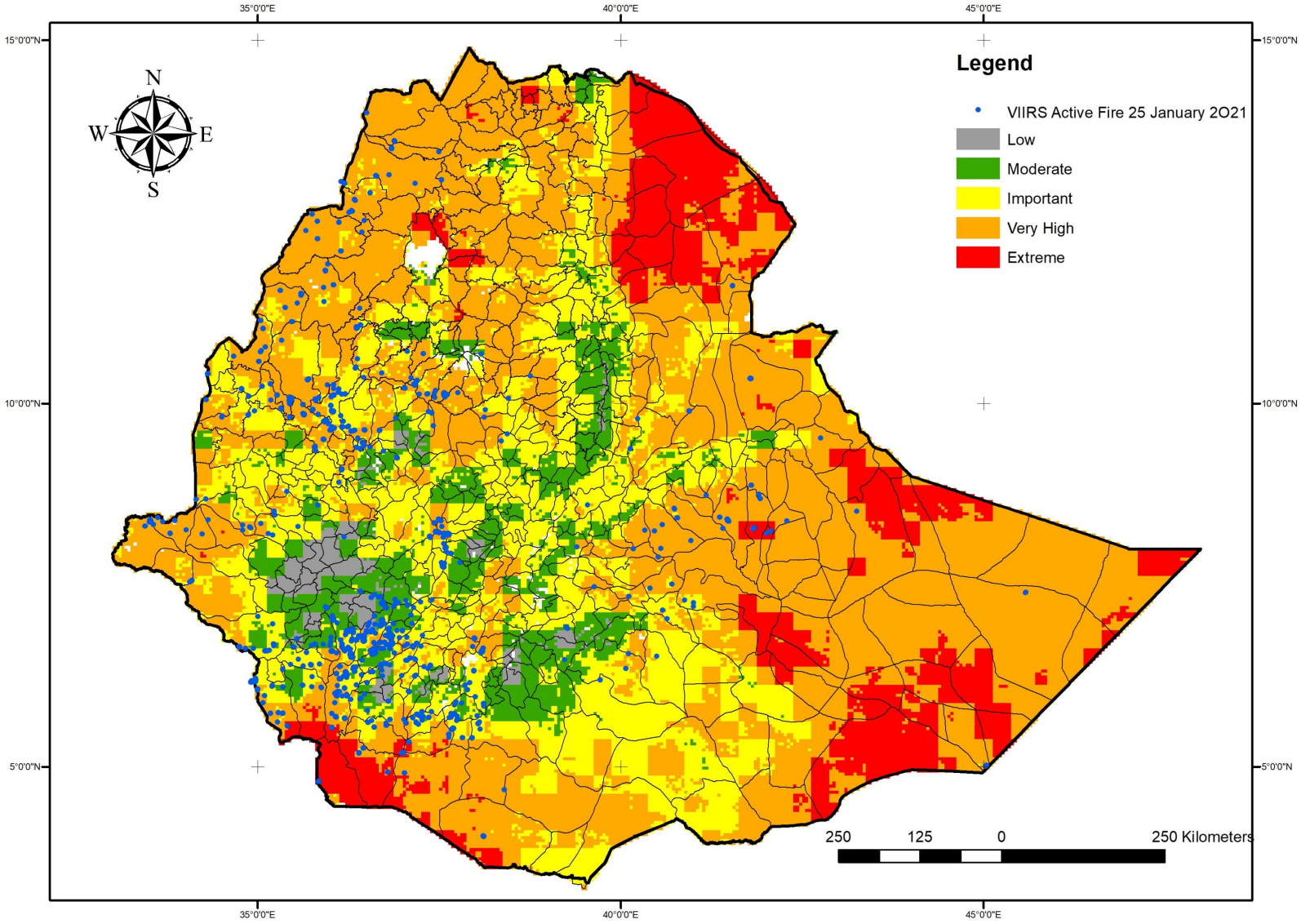
Fire Monitoring in East Africa

www.rfmrc-ea.org



- Daily fire danger forecast based on the Canadian Fire Weather Index (FWI) System by using remote sensing weather data on Google Earth Engine
- Near Real-Time (NRT) active fire data (MODIS and VIIRS) provided by the NASA FIRMS (Fire Information for Resource Management System)
- Monthly and annually burnt area monitoring by using two spectral indexes (Normalized Burn Ratio, NBR and Burned Area Index for Sentinel-2, BAIS2) from Sentinel-2 images.

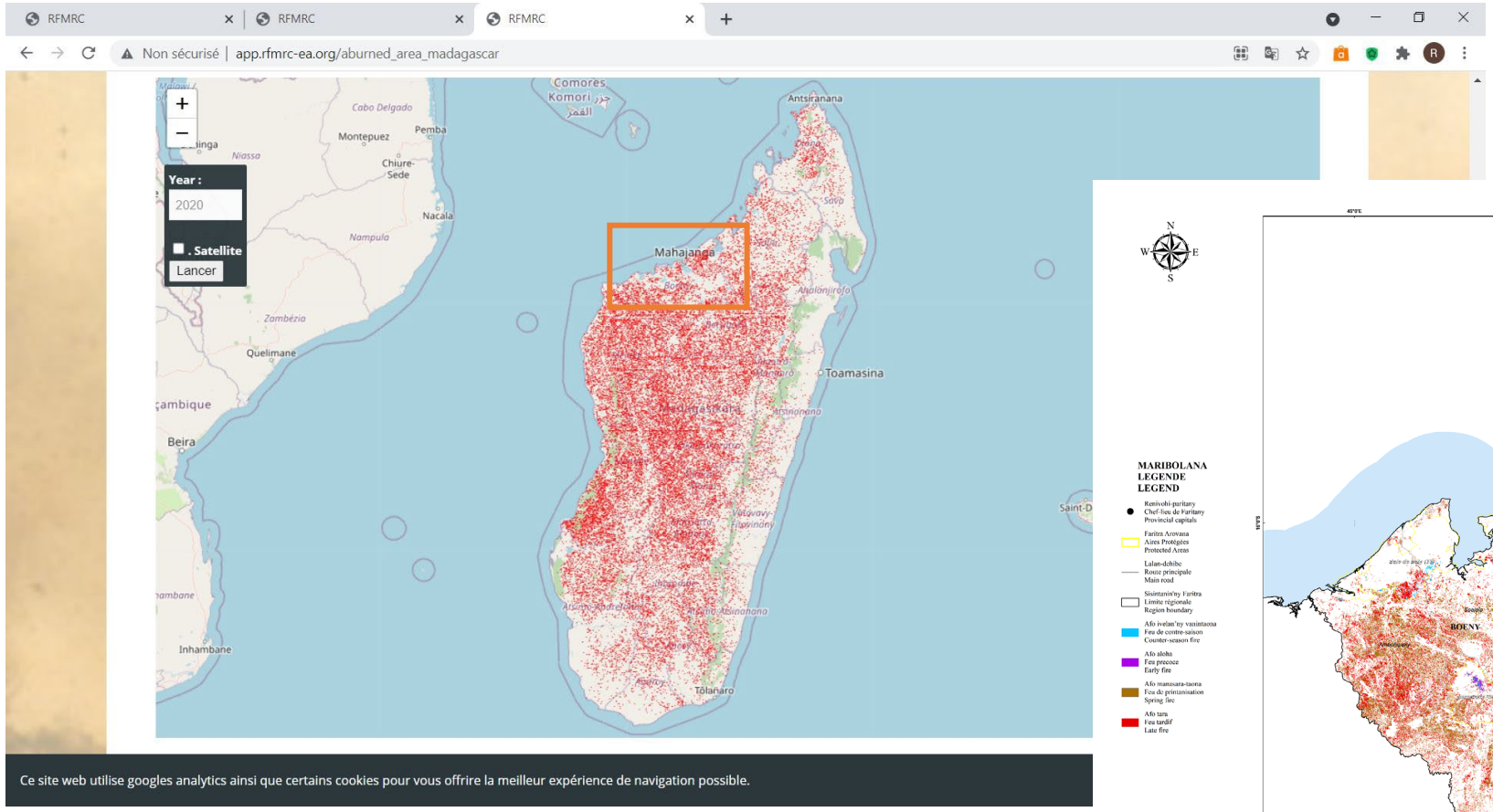
Ethiopia Fire Weather Index (FWI) 25 January 2021

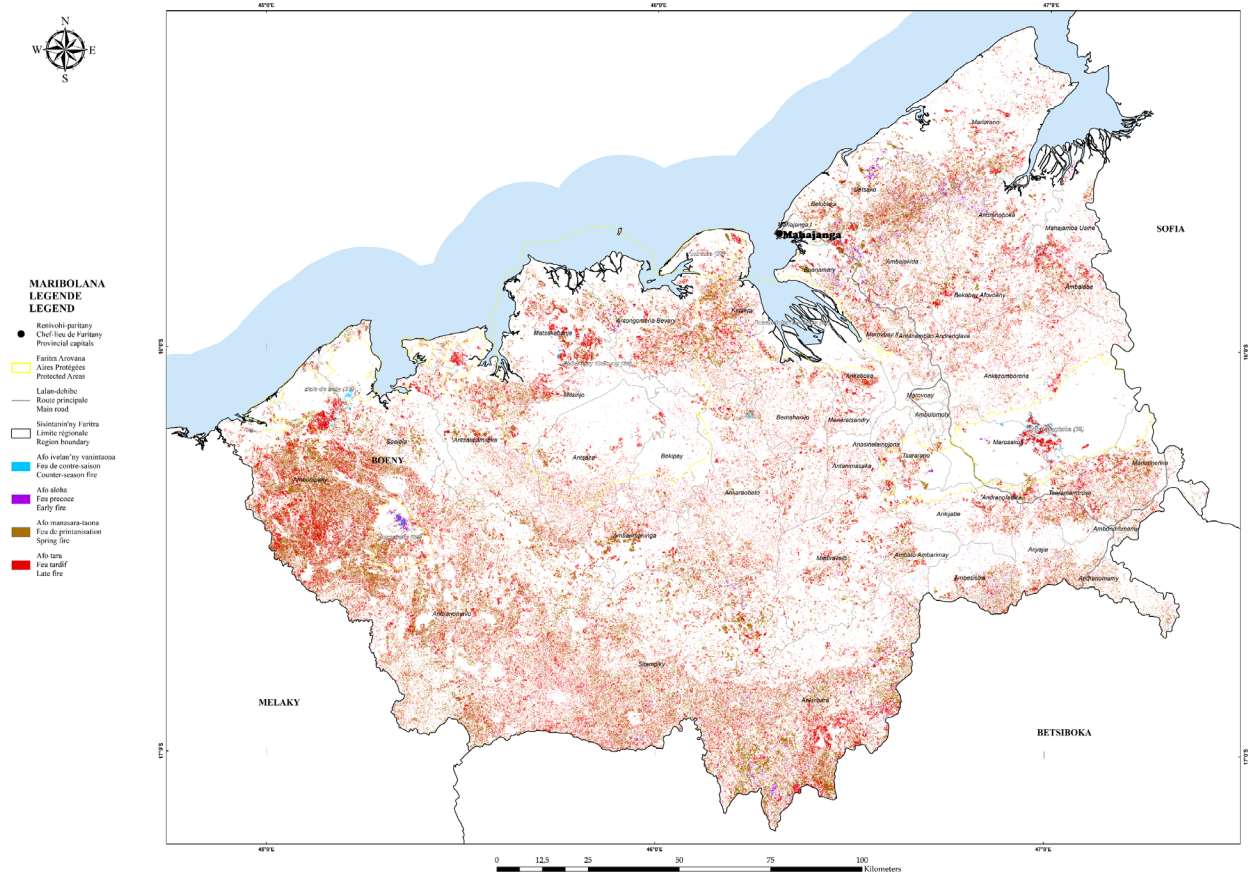


Daily fire danger forecast application

- Early warning has been done operationally for three years in Madagascar : communication to stakeholders and the public via social media, WhatsApp and the geoportal, and to the local community via radio
- Identification of high prone fires areas and implementation of 65 km agricultural fuelbreaks, mainly around Ankarafantsika National Park in northern Madagascar between 2021 and 2022 : established in generally open landscapes dominated by grassy savanna to limit the spread of fires and create an additional 615 ha of farmland for crop production to limit further slash-and-burn activities in the national park and so further reduce the potential for future fire ignitions (Rakoto Ratsimba et al., 2022)
- Data for all Eastern African countries are available from January 2019 to today.

Burned Area mapping





Burned Area mapping

At needed scale

Common understanding of the drivers

Value added from data using

Social learning / developing fire resilient landscape

Challenges, future works, …

- Policy support and international cooperation
- Refinement of remotely-sensed FWI algorithm by determining the suitable empirical parameters
- Integration of some geographical parameters (DEM, land cover, etc.) to improve FWI and model fire spread to enhance our ability to predict and respond to the behavior and dangers of wildfire
- Develop a communication plan so early warning information gets to the local community level
- Scientific research on calibration and use of the FWI system components and climate change effect on FWI value and fire occurrence and behavior

Tahintsoa G.E., Raherinjatovoarison D., Rakotoarinivo H.Z., Ratsimandresy R.N. and Rakoto Ratsimba H., 2022. Using satellite images to monitor burned areas in Madagascar.
https://doi.org/10.55515/FIOP8254
Rakoto Ratsimba H., Andriamiharimanana J.N., Braun M. and Goldammer J.G., 2022. Agricultural fuelbreaks in sustainable fire-resilient landscapes in Madagascar.
https://doi.org/10.55515/PJMX6791

Thanks for your attention

www.rfmrc-ea.org

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FIRE MANAGEMENT RESOURCE CENTER

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