



The Global Wildfire Information System (GWIS)

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Wildfires: a global issue

- Humans have co-existed with wildfire since ancient times
- Wildfires are intrinsic to ecosystem dynamics and a tool in agricultural practices

However:

- Fires burn approximately 400 Million ha of land every year
- Fires emissions contribute, globally, to about 20% of greenhouse gas emissions
- The natural dynamics of wildfires has been changed by fire exclusion policies
- Wildfires are the cause of environmental degradation, leading to desertification in some regions of the world
- Wildfires are the cause of increasing losses of human lives and economic damages

Climate change is identified as the cause of recent critical fires such as:

Alaska & Indonesia (2015),

Canada, California (2016),

Chile, Canada, Australia, South Africa, California, Europe (2017),

California & Europe (2018),

Amazon, Central Africa, Arctic circle (2019),

Australia, California, west coast (USA), Amazon, Arctic Circle (2020)

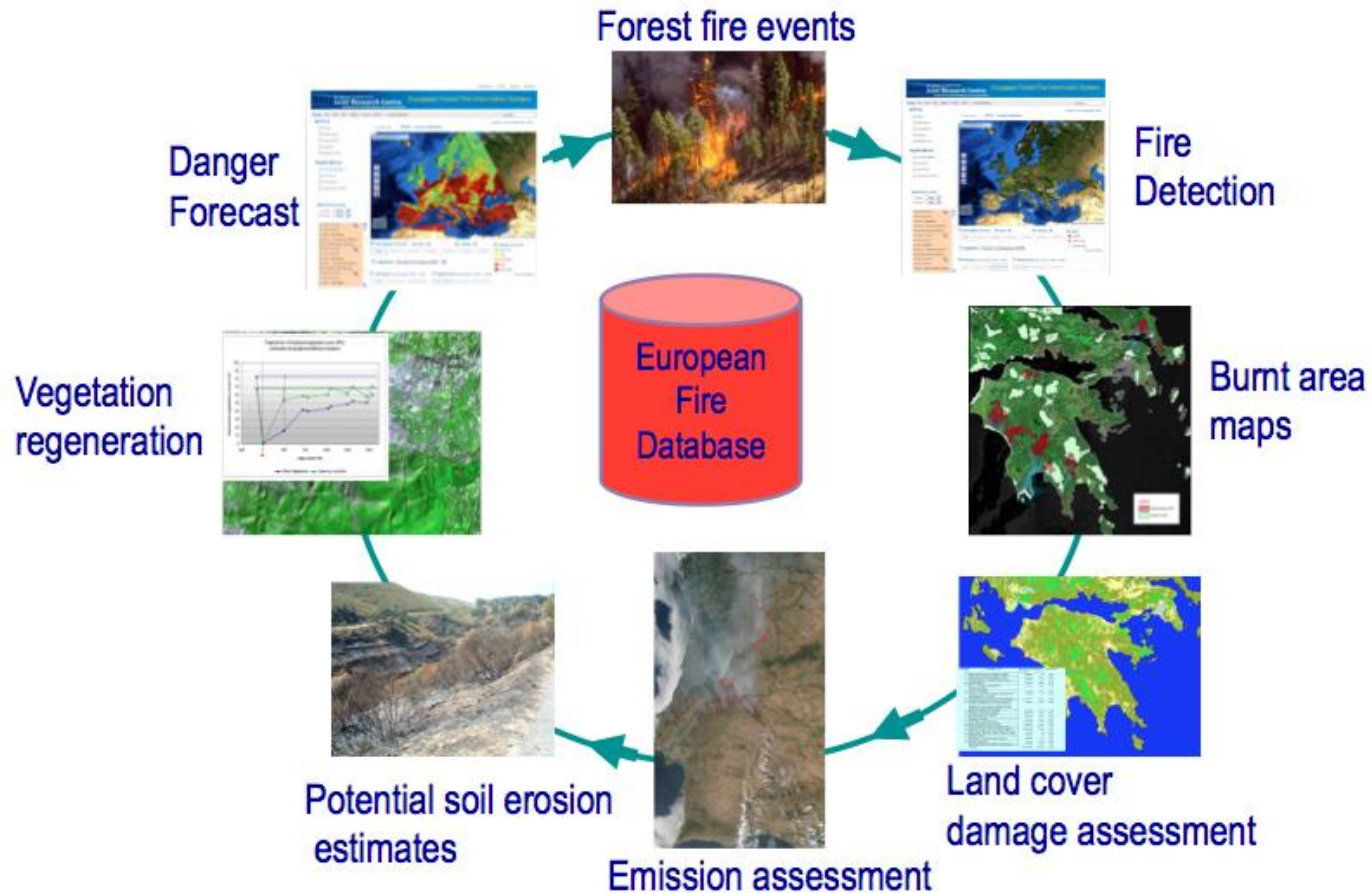
California (USA), Siberia (Russia) (2021)

All the above were unprecedented events!

The intensity and impact of critical wildfires is increasing in Europe, and globally

A regional/global strategy is needed to minimize the impact of wildfires!

European Forest Fire Information System (EFFIS)





COPERNICUS

Emergency Management Service



European Commission > JRC EU Science Hub > DRM > Copernicus EMS > European Forest Fire Information System (EFFIS)

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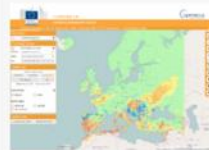
Welcome to EFFIS

The European Forest Fire Information System (EFFIS) supports the services in charge of the protection of forests against fires in the EU countries and provides the European Commission services and the European Parliament with updated and reliable information on wildland fires in Europe.

A number of specific applications are available through EFFIS:

Since 1998, EFFIS is supported by a network of experts from the countries in what is called the **Expert Group on Forest Fires**, which is registered under the Secretariat General of the European Commission. Currently, this group consists on experts from 40 countries in European, Middle East and North African countries. In 2015, EFFIS became one of the components of the Emergency Management Services in the EU Copernicus program.

The link to some of the most widely used applications is provided below. Additional applications such as the extension of EFFIS to the global level into a Global Wildfire Information System (GWIS) are available through the side "Applications" box.



Current Situation

The most up to date information on the current fire season in Europe and in the Mediterranean area. This includes today meteorological fire danger maps and forecast up to 6 days, daily updated maps of hot spots and fire perimeters.



Fire News

A selection of news from the press on wildland fires in Europe updated daily by the EFFIS team. News can be browsed for specific countries selected by the user from the news map.

New feature

Make your specific requests of data by the new Data Request Form

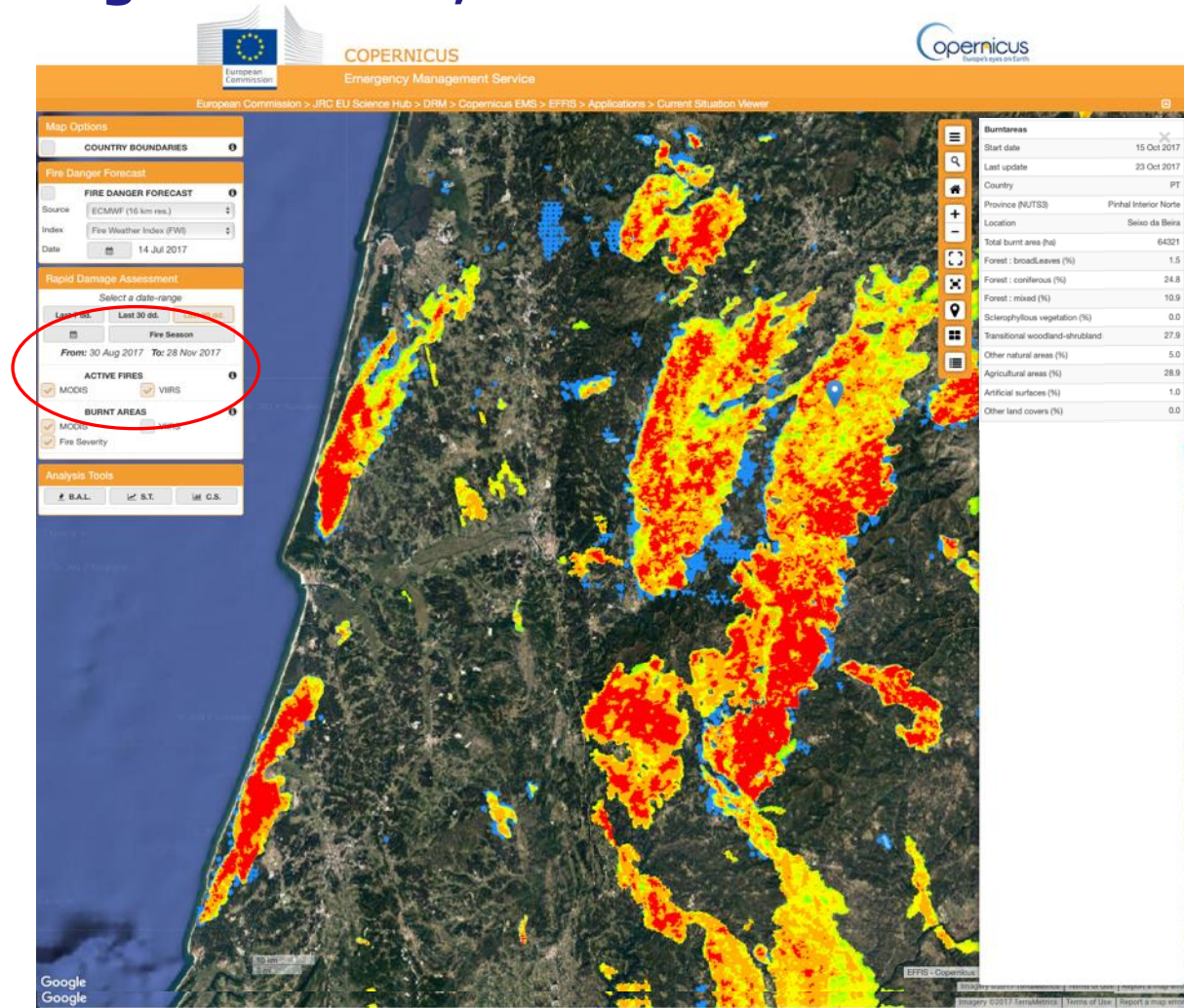
Visit the brand-new Global Wildfire Information System Viewer

EFFIS Damage Assessment

EFFIS Burned Area (ha)
Total EU28 Countries
 Mapped: 193741 (19.2 % Forest)
 Estimated: 258321.33

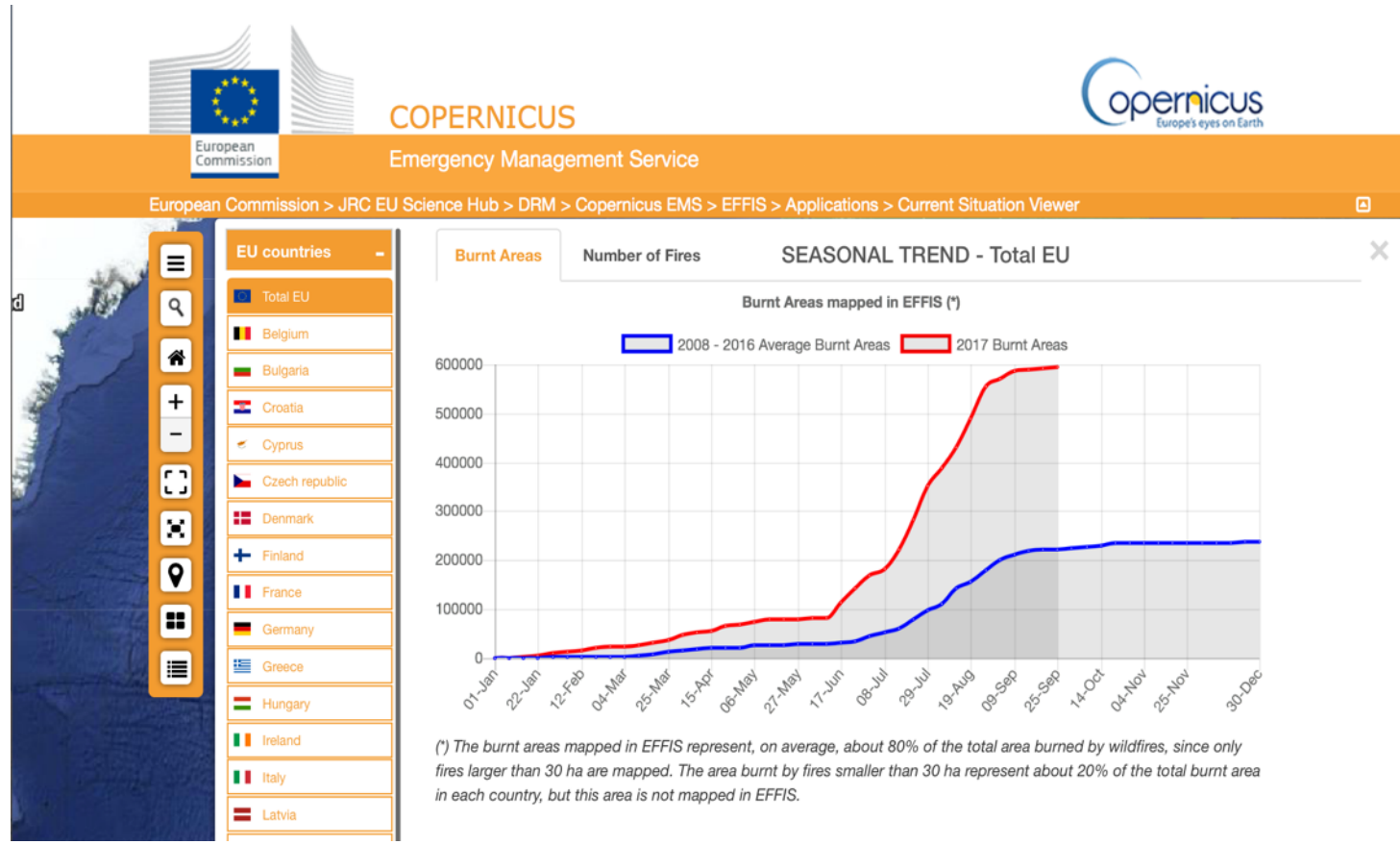
Total EFFIS Coverage
 Mapped: 264051
 Estimated: 352068
 (Updated daily)

Fire danger forecast, active fire and burnt area mapping





EFFIS wildfire monitoring



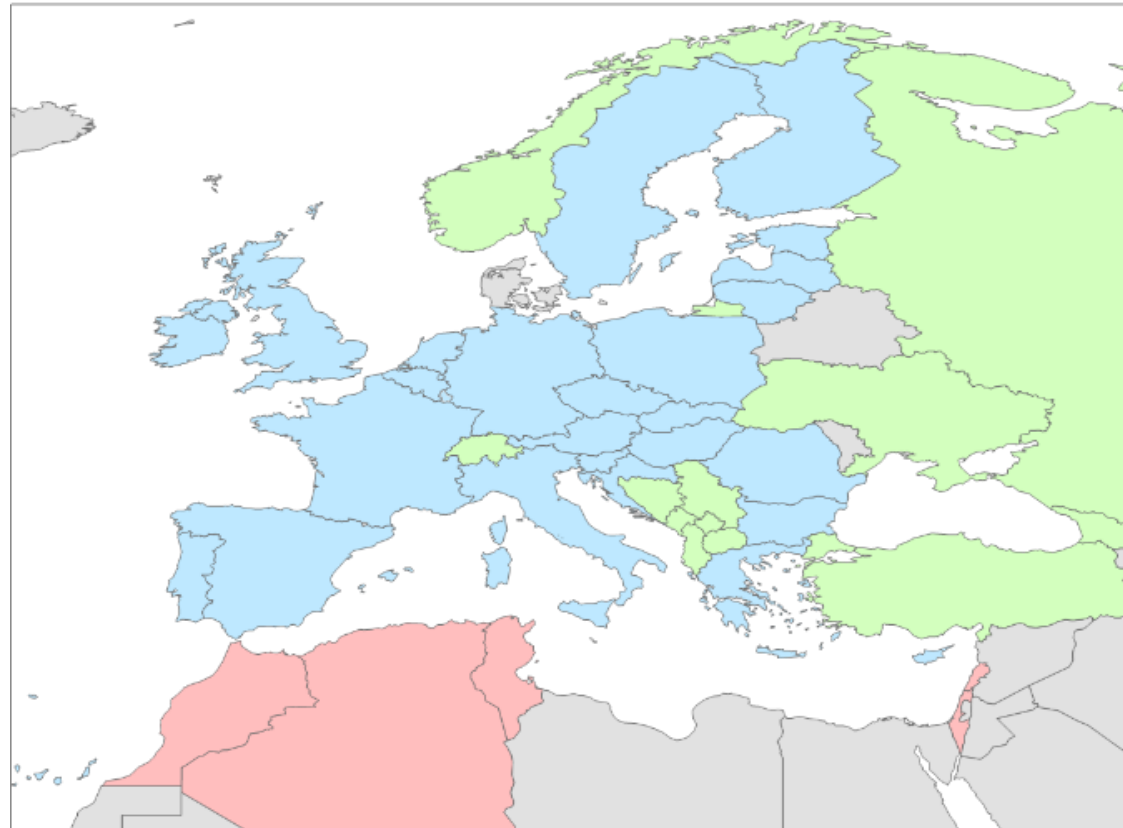


Current EFFIS Network of 43 Countries

EFFIS Network

Extension to MENA countries in collaboration with FAO

-  EU Countries
-  European non-EU countries
-  North Africa & Middle East



https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1995

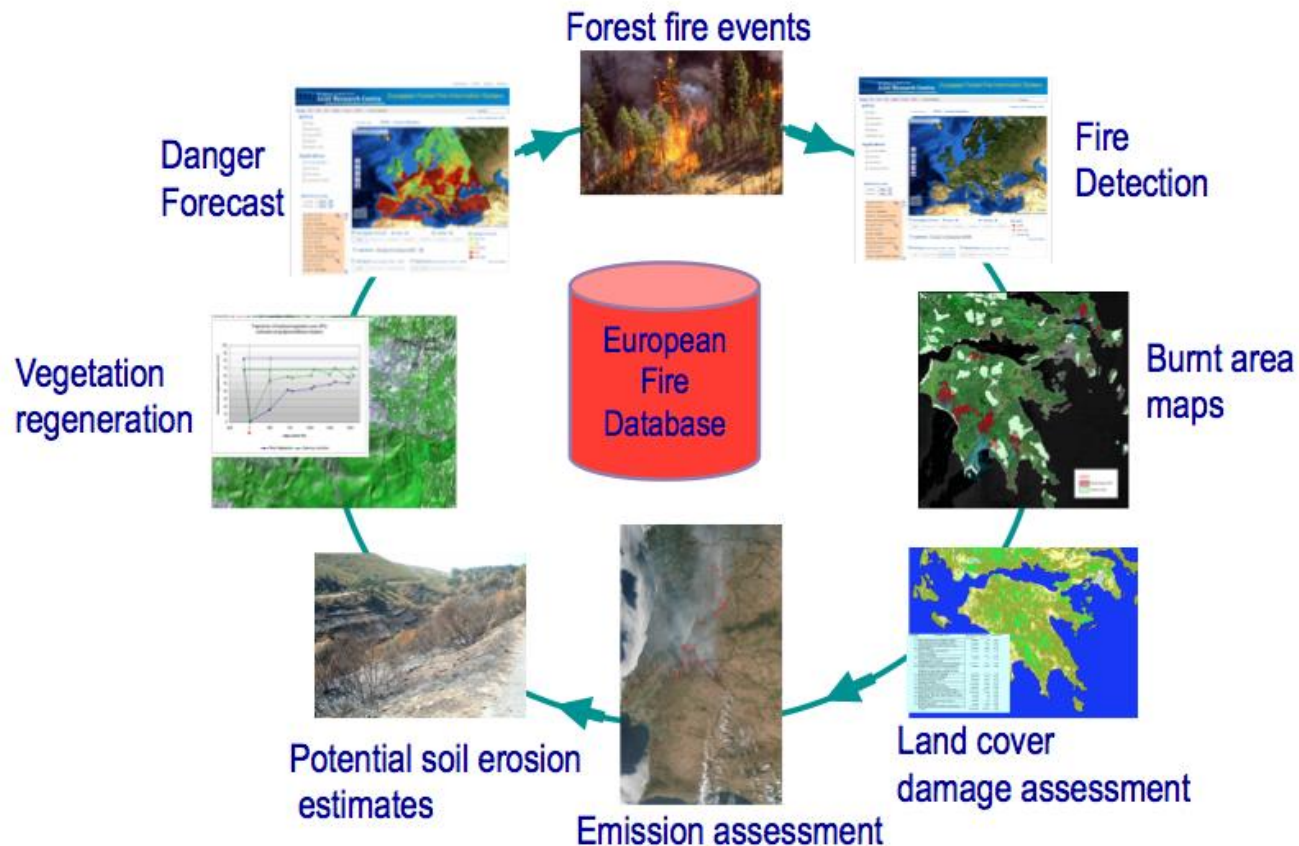


Global Wildfire Information System (GWIS)



GWIS concept:

follows the EFFIS (European Forest Fire Information System) fire cycle:





European Commission



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Global Wildfire Information System (GWIS)



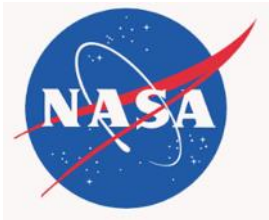
The Global Wildfire Information System is a joint initiative of the GEO and the Copernicus Work Programs. The Global Wildfire Information System (GWIS) aims at bringing together existing information sources at regional and national level in order to provide a comprehensive view and evaluation of fire regimes and fire effects at global level.

GWIS builds on the ongoing activities of the European Forest Fire Information System (EFFIS), the Global Terrestrial Observing System (GTOS) Global Observation of Forest Cover- Global Observation of Land Dynamics (GOFC-GOLD) Fire Implementation Team (GOFC Fire IT), and the associated Regional Networks, complementing existing activities that are on-going around the world with respect to wildfire information gathering. The development of GWIS is supported by the partner organizations and space agencies. Support to GWIS was just launched by NASA through its ROSES program

Access to worldwide information on wildfires is available through the GWIS viewer at http://gwis.jrc.ec.europa.eu/static/gwis_current_situation/public/index.html

Applications

- Current Situation Viewer
- Data and services





GWIS applications – fire danger forecast





European Commission

GWIS applications – active fire and burnt area mapping



GWIS
Global Wildfire Information System



European Commission > JRC EU Science Hub > DRM > GWIS > Applications > Current Situation Viewer

Map Options

- Country Boundaries Layer
- Human Settlement Layer
- Protected Areas Layer
- CCI Landcover

Forecasts

FIRE DANGER FORECAST

Source: ECMWF (8 km res.)

Index: Fire Weather Index (FWI)

LIGHTNING FORECAST

Date: 15 Nov 2021

Rapid Damage Assessment

Select a date-range

Last 1 Day | Last 7 Days | Last 30 Days

Fire Season

From: 01 Jan 2021 To: 15 Nov 2021

ACTIVE FIRES

MODIS VIIRS

BURNT AREAS

MODIS (Last update: 2021-05-31)

MODIS & VIIRS NRT

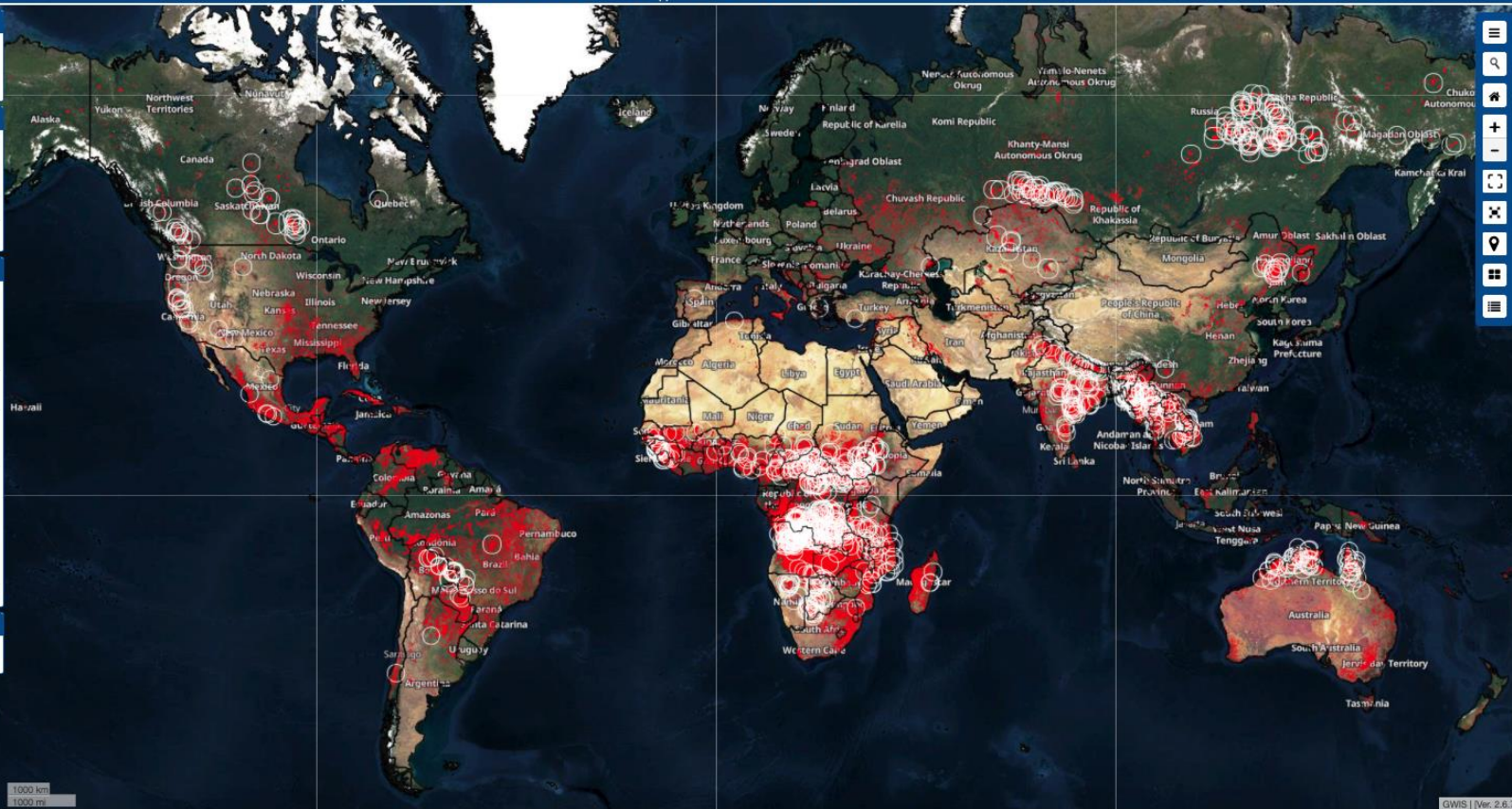
FIRE EMISSIONS

- Black Carbon
- Carbon Dioxide
- Sulfur Dioxide
- Organic Carbon
- Non-Methane Hydro-Carbon
- Total Carbon in Aerosols
- Methane
- Carbon Monoxide
- Nitrogen Oxides
- Particulate Matter

FUELS

Analysis Tools

GWIS Estimates per Country



MODIS & VIIRS NRT

NRT Burnt Areas (ha.)

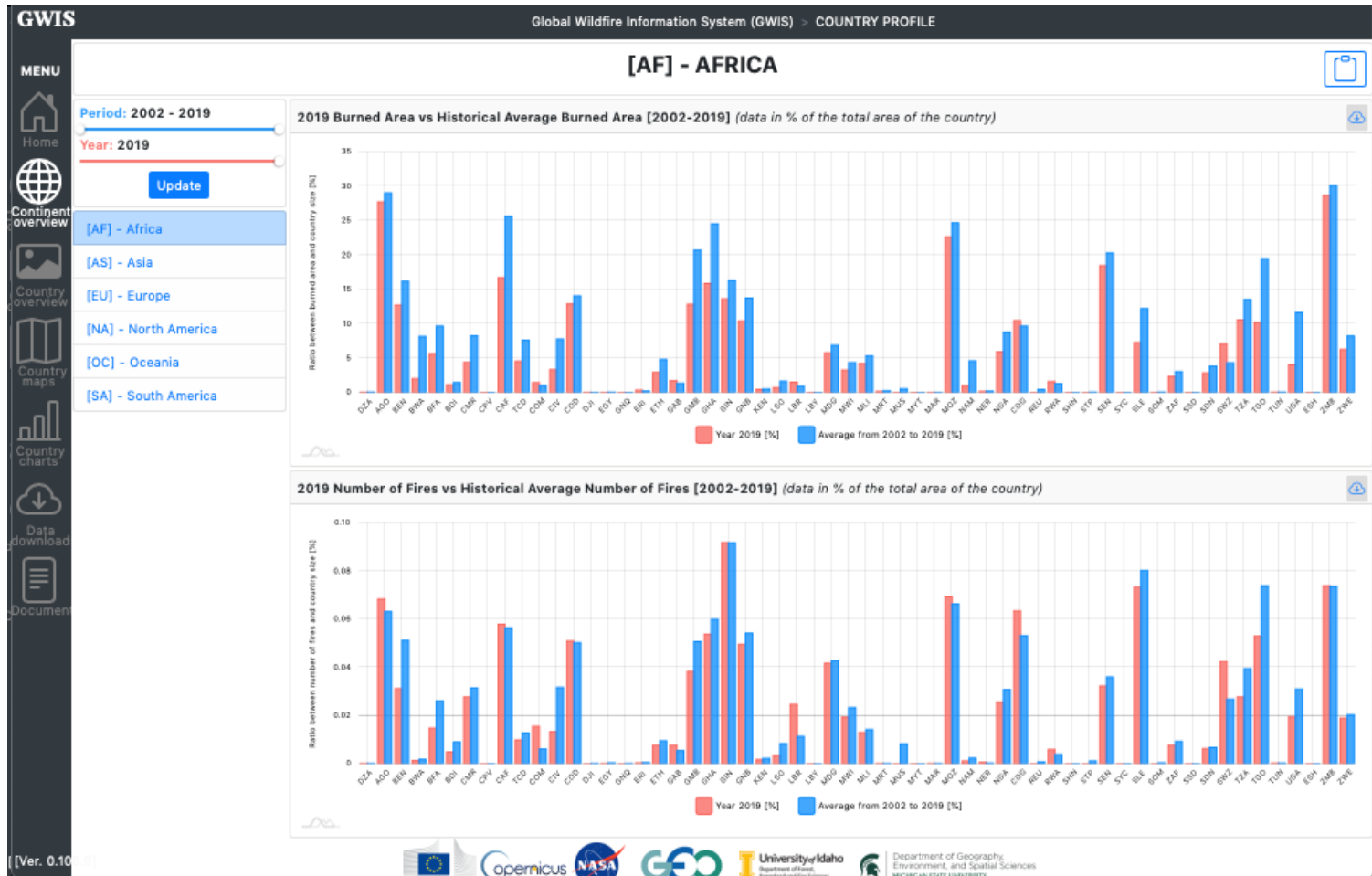
Map navigation controls: Home, Zoom In (+), Zoom Out (-), Full Screen, Location, Layers, and a menu icon.



GWIS Country Profiles (launched March 2021)

GWIS – Country Profiles:

- Burnt area extent
- Fire frequency
- Seasonality
- Landcover damage
- Damage to protected areas
- Etc...





GWIS Country Profiles (launched in 2021)

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Global Wildfire Information System (GWIS) > COUNTRY PROFILE

[COD] - DEMOCRATIC REPUBLIC OF THE CONGO

| Population, total | Cropland area (km ²) | Forest area (km ²) | Grass/shrubland area (km ²) | Other (km ²) | Surface area (km ²) |
|-------------------|----------------------------------|--------------------------------|---|--------------------------|---------------------------------|
| 86,790,567 | 273,031 | 1,885,773 | 83,091 | 97,442 | 2,339,339 |

Landcover Overview

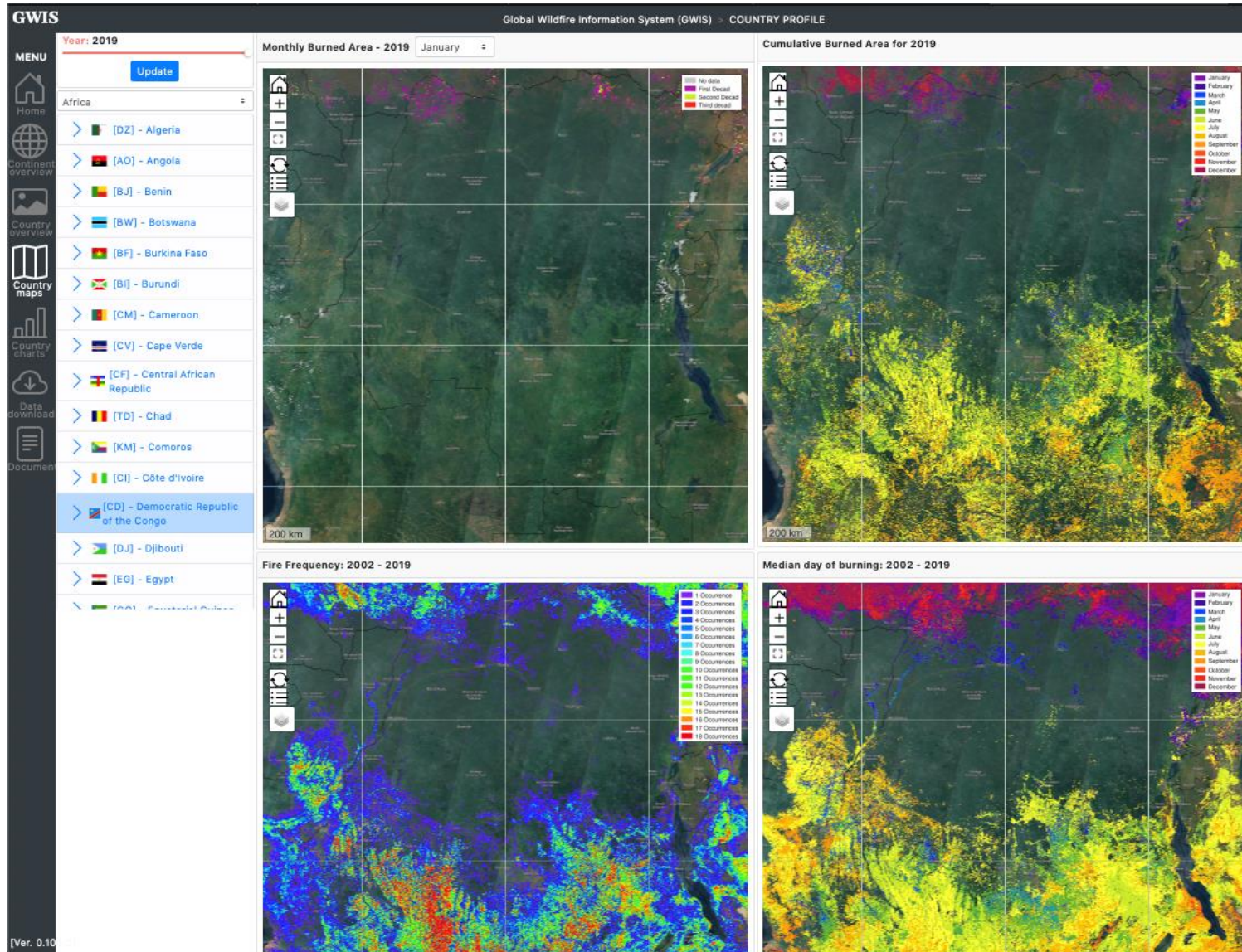
CCI Landcover

Ver. 0.10

Logos: European Union, Copernicus, NASA, GEO, University of Idaho, Department of Geography, Environment, and Spatial Sciences, MICHIGAN STATE UNIVERSITY



GWIS Country Profiles (launched in 2021): Maps of burnt areas



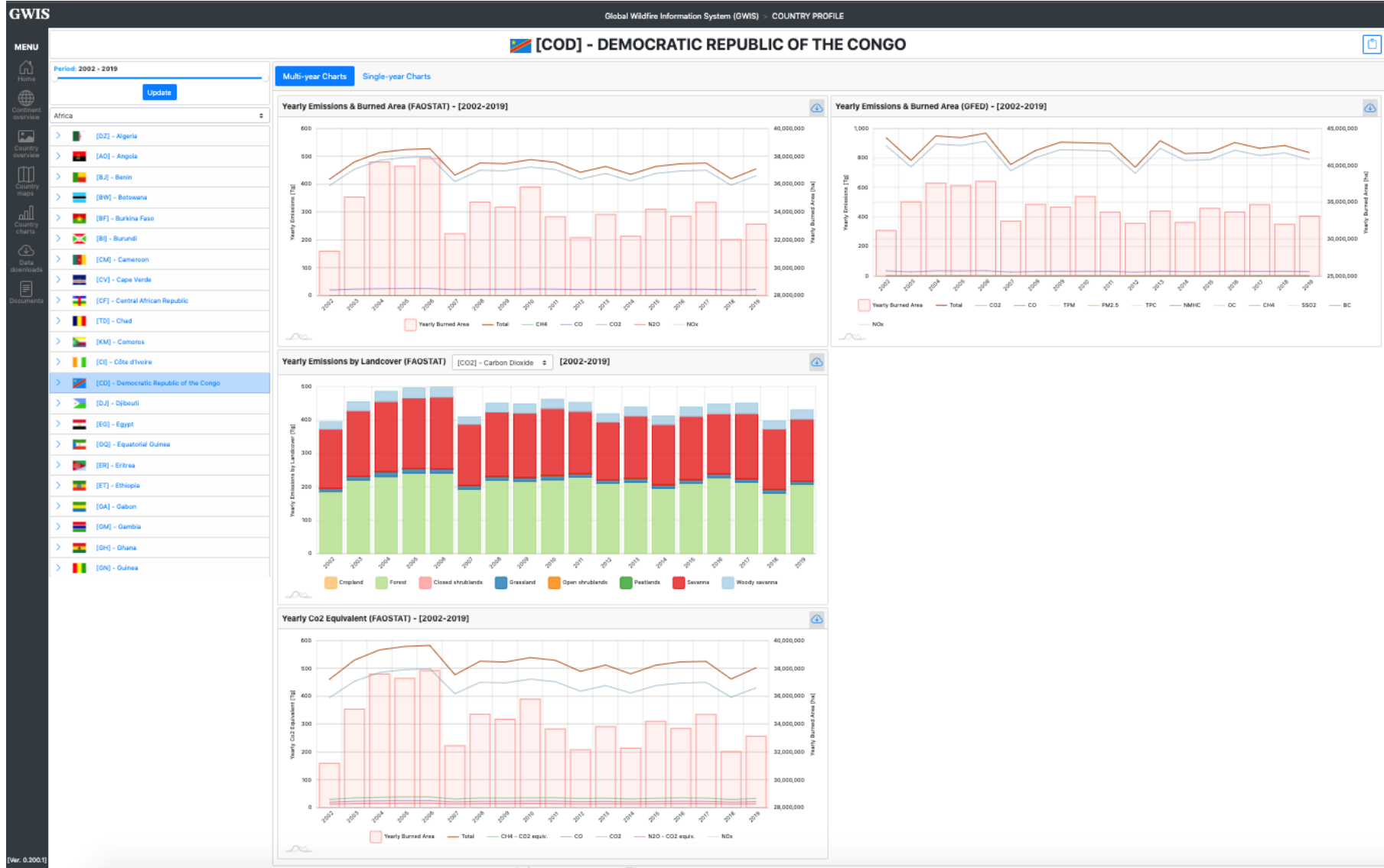


GWIS Country Profiles (launched in 2021): Burnt area, number of fires, fire size





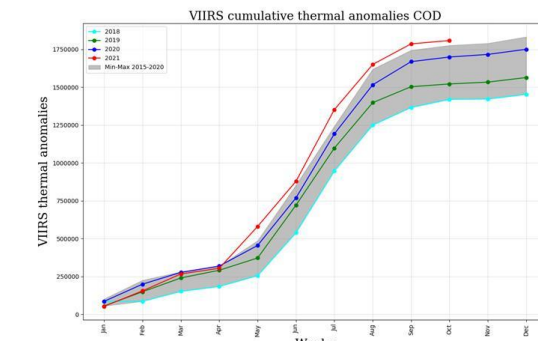
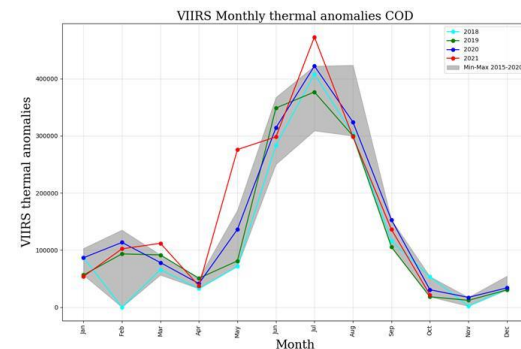
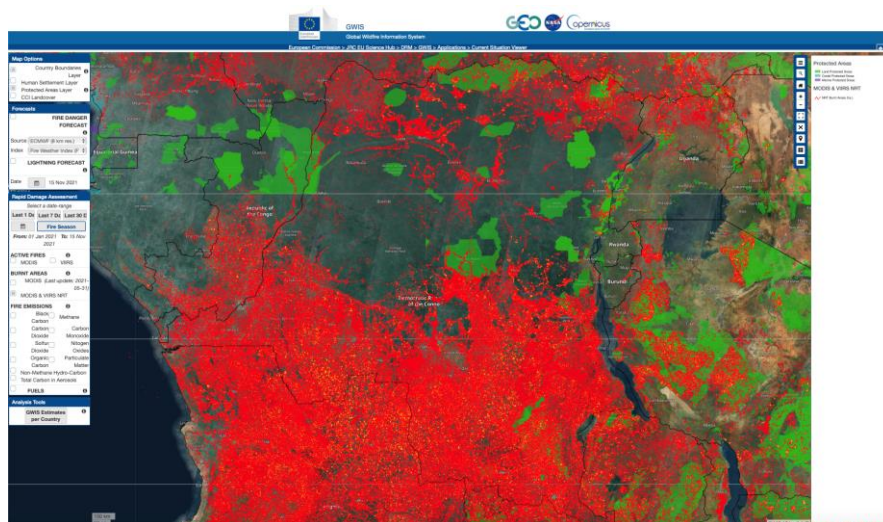
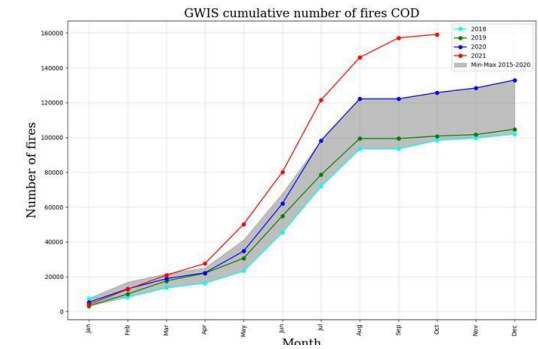
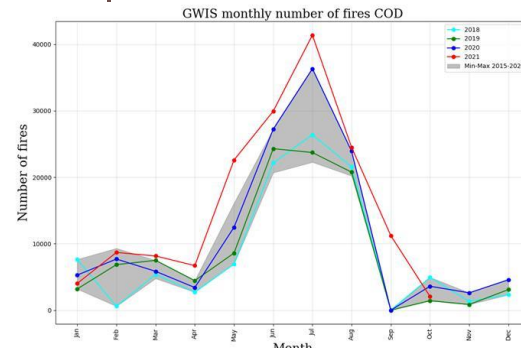
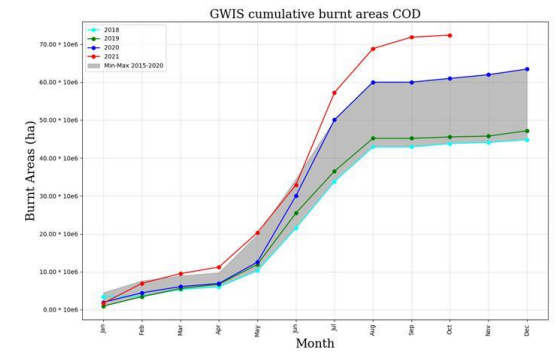
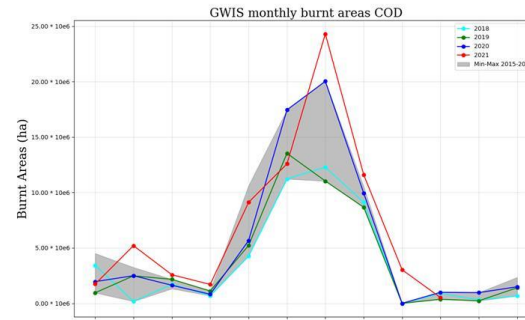
GWIS Country Profiles (launched in 2021): Biomass Emissions





Seasonal Trends (under development, e.g. Democratic Republic of Congo):

Weekly evolution of: damage to protected areas, burnt areas, active fires, land cover damage, fire danger, fire emissions

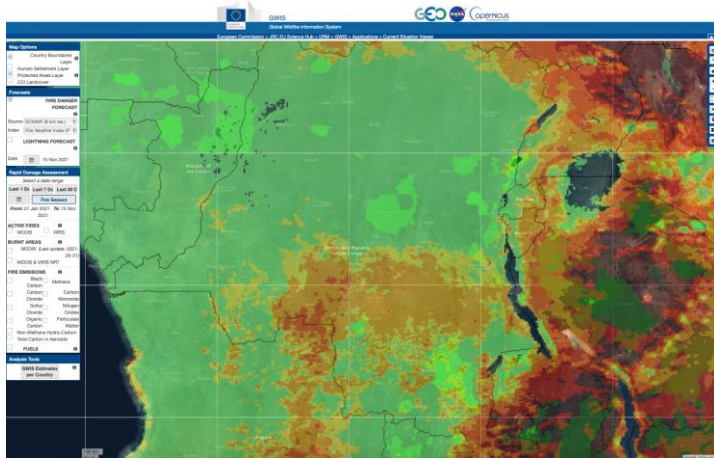




European Commission

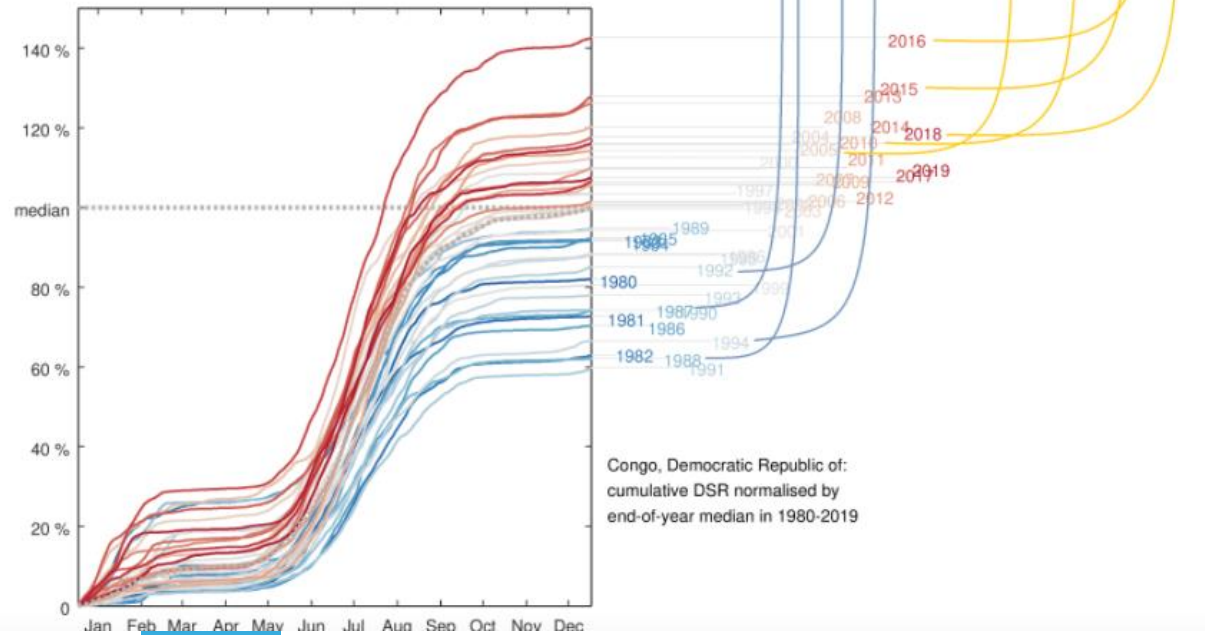
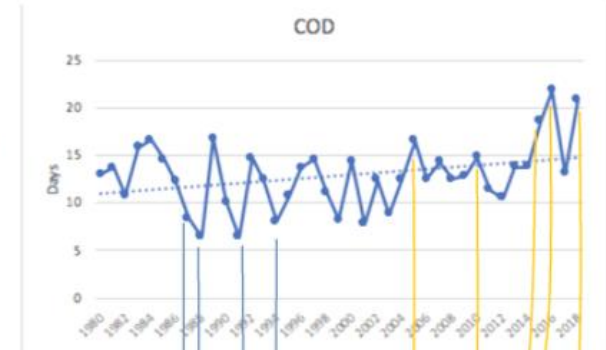
Fire danger forecast and fire danger trends

Fire Weather Index



Congo (Democratic Republic of): mean values for the number of max of consecutive days above the 90th percentile in the period 1980-2018

Daily Severity Rating



Congo, Democratic Republic of: cumulative DSR normalised by end-of-year median in 1980-2019

What can GWIS provide for wildfire monitoring at global scale?

- Analysis of fire regimes and changes in different regions of the world
- Harmonized and up to date comparable data across the globe to assess wildfire effects
 - wildfire regime profiles, fire seasonality, impact, trends
- Methods for reliable analysis of fire damages and economic impacts, including near real time information on critical events
- Implementation of information systems reachable at national/regional/global scale
- Web information services reaching citizens (education/awareness)
- Development of tools supporting fire prevention/preparedness
- Repository for relevant global datasets for users
- Training and capacity building...

Wildfire science is at a loss for comprehensive data

An international monitoring initiative is crucial for understanding wildfires and reducing their damage

Nature (Bowman, July 2018)

<https://gwis.jrc.ec.europa.eu>

<https://effis.jrc.ec.europa.eu>

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