
WP23_25: Global Wildfire Information System

1260,222

Basic Information

Full title of the Initiative

Global Wildfire Information System

Short Title or Acronym

GWIS

Current category in the 2020-2022 GWP

GEO Initiative

Proposed category in the 2023-2025 GWP

GEO Initiative

Points of Contact

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Purpose

Objective

Monitor and assess the effects of wildfires globally

Please provide a short description of the Initiative

GWIS aims at providing a continuous and standardized information on wildfires at different scales, from national to global. At the global scale, where information on wildfires is scattered and not harmonized, GWIS has become a unique source of information for global initiatives and policies, while supporting the analysis of wildfire regimes at this scale. Near-real time and historical wildfire information is disseminated through web services that provide a quick and easy access to georeferenced and statistical data on wildfires at country and sub-country level, globally. The calibration of the system and the validation of the different modules is an ongoing process that requires the close collaboration with regional and national partners. In countries that currently do not have a wildfire information system, GWIS will fill this gap and help countries engage in international collaboration. For countries and regions where wildfire information systems exist, GWIS will provide a complementary and independent source of harmonized information adding to the national/regional information sources. GWIS builds on the experience, achievements and networks established connection with the European Forest Fire Information System (EFFIS) and the Global Observation of Forest Cover Global Observation of Land Dynamics (GOFC GOLD) Fire Implementation Team and Fire Regional Networks . Engagement with wildfire managers at national and local scale is channeled through the EFFIS network in Europe, Middle East and North Africa, through the EU project on support to wildfire management in the LAC and through the GOFC Fire IT networks in

other areas of the world.

Why is this Initiative needed?

Comprehensive and accurate ground-based inventories on wildfires at the global level do not exist, nor exists a comprehensive global system that is able to provide in a synthesized way information on the evolution of fire regimes and fire impacts at national, regional and global levels. Efforts to collect information at local or national level have shown that this endeavor is very difficult, making it nearly impossible to collect such datasets at the global level. The existence of different definitions of forests or wildfires, different methods in the collection of information and different systems at the national or sub-national level, makes it impossible to gather global information through the aggregation of ground collected information. This information is essential to understand fire management from the local to national to regional and at a global scale, and the use of Earth Observation provides alternative ways to collect wildfire information. that provides comprehensive information on different phases of fire management at the global scale, prior, during and after the events.

What evidence is there to support this need?

The call for an international initiative to gather information on wildfires has been in the press, journals and the political agenda for many years. The initiative provides key information on wildfires that support international initiatives on disaster risk reduction such as the Sendai Framework, provides data to monitor progress towards the UN Sustainable Development Goals and supports wildfire management actions at national level on a global scale. The initiative is supported by organizations such as the FAO, UNEP, WMO, ACTO at regional to global scales.

Is this Initiative open to participation by representatives of any GEO Member, Participating Organization, and GEO Associate?

Yes

Are you aware of other projects or initiatives at a global or regional scale (both in GEO and externally) that provide similar products or services?

Yes

Please describe.

GWIS is built based on the experience on the development of the European Forest Fire Information System (EFFIS) in the pan-European territory.

How is this Initiative unique?

GWIS is the only system that provides near-real time and historical information and data at country and sub-country level for all the countries in the world. The information is provided through web services and access to data download. GWIS is unique, as it synthesizes in a single system information on the different phases of wildfire management. Prior to the events, it provides fire danger forecast up to 10 ahead of a given date. For ongoing fires, it provides near-real time information on active fires, burnt areas, thermal anomalies and the assessment of wildfire impact on land cover, protected areas and wildfire emissions. The system provides the near-trends of active fires, burnt areas, thermal anomalies at country and sub-country level, globally. Furthermore, GWIS provides historical information derived from EO since 2002 until the ongoing year in the form of datasets, maps and statistical graphs. The information provided by GWIS supports policies for mitigating damages caused by wildfires in critical regions of the world such as the Brazilian Legal Amazon, the Arctic Monitoring and Assessment Program (AMAP) region, Africa, Asia, etc.

Please identify the most important actual and/or intended outputs (products, services, etc.) produced by the Initiative, along with their intended and/or actual users. This list does not need to be comprehensive but should identify the outputs which are most used and are expected to have the greatest potential impact.

Output	Status	Users	Additional info
Fire danger forecast	Regularly updated	Over 47000 users from 160 countries in 2021	https://gwis.jrc.ec.europa.eu/apps/gwis_current_situation/index.html
Thermal anomalies	Regularly updated	Over 47000 users from 160 countries in 2021	https://gwis.jrc.ec.europa.eu/apps/gwis_current_situation/index.html
country profiles	Regularly updated	Over 47000 users from 160 countries in 2021	https://gwis.jrc.ec.europa.eu/apps/country.profile/
monthly and seasonal temperature and precipitation anomalies	Regularly updated	Over 47000 users from 160 countries in 2021	https://gwis.jrc.ec.europa.eu/apps/gwis.longterm.forecasts/
weekly reports on wildfire activity	Regularly updated	Countries in South America	https://gwis.jrc.ec.europa.eu/reports-and-publications/2021-amazon-and-south-america-weekly-reports
near-real time statistical trends on wildfires	Regularly updated	Just published March 2022	https://gwis.jrc.ec.europa.eu/apps/gwis.statistics/seasonaltrend

If needed, please provide additional comments or explanation to accompany the outputs table

Annual meetings of GWIS are organized with the participation of all the partners in the initiative.

What kinds of decisions are the outputs of this Initiative primarily intended to support?

Wildfire management, environmental and climate adaptation/mitigation decisions at country, regional and international level

How will these decisions benefit from the outputs of this Initiative?

GWIS provides the basis to assess trends in wildfire impact in the different countries and regions of the world.

What kinds of impacts (for example, reduced loss of life, monetary savings, conservation of biodiversity, etc.) are anticipated as a result of the use of the outputs of this Initiative?

Reduced losses in lives and environmental damages caused by wildfires, enhanced biodiversity conservation, science-based policy decisions towards mitigation and adaptation to climate change, better understanding of wildfire regimes and impacts globally, enhanced wildfire management for many countries that do not have system to monitor wildfires, etc.

Has this Initiative been asked to provide specific information (for example, reports, data, services) on an ongoing basis to an international convention, organization, or other multilateral body?

Yes

Please identify the requesting organization.

FAO, UNEP, UNSPIDER, European Commission - European Civil Protection and Humanitarian Aid Operations (ECHO)

Describe the nature of the request.

Wildfire statistics at country level supporting the Global Forest Resources Assessment, UN report on environment in the LAC region, near-real time information on wildfire impacts in e.g. the Amazon region, the Arctic Circle

Please provide supporting documentation of the request.

- no supporting documents provided -

Technical Synopsis

Please provide a brief description of the methods used by the Initiative to produce its (actual or planned) outputs.

Fire danger assessment is based on the processing of numerical weather predictions (forecast of weather variables) that are used for the computation of several fire danger rating indices. Monthly and seasonal weather forecasts are based on predictions by the monthly and seasonal models of the European Center for Medium Range Weather Forecasts. Active fire detection is based on MODIS and VIIRS thermal anomalies, which are filtered to eliminate false positives for wildfires. Near-Real Time burnt areas are based on spatio-temporal algorithms that derive fire perimeters on the basis of MODIS and VIIRS thermal anomalies. Burnt areas and number of fires are based on the computation of fire perimeters, which are used to calculate the number of fires, using the GlobFire methodology, based on MODIS MCD64 A1 as base product. Additional details for each product are available as "info" buttons in the GWIS web pages.

If you would like to provide further details on the technical methods, you may upload one or more documents here.

- no supporting documents provided -

Are there any significant scientific or technical challenges that need to be resolved by the Initiative during the 2023-2025 period?

Yes

Please describe these challenges and the steps being taken to solve them.

There is a need to, as far as possible, increase the spatial resolution for the mapping of fire events and burnt area, which is a challenge at the global scale.

Does the Initiative expect to complete any key new outputs, improvements to existing outputs, or improvements to the methods of producing outputs, in the 2023-2025 period?

Yes

Please describe these new outputs or improvements.

There is a large uncertainty in the computation of fire emissions, as there is no agreement among the different sources at global scale. In GWIS, we are adopting a methodology that follows that of FAO, which is compatible with IPCC guidelines.

Please identify the key tasks that must be implemented to ensure delivery of these changes, with target dates for completion.

Task	Task description	Expected completion (month/year)
Computation of emission and inter-comparison among emission sources	Computation of emission and intercomparison among emission sources	2022/23

Resources

Have all resources required to implement the Initiative's planned work in the 2023-2025 period been secured?

Please list all financial and non-financial contributions to the Initiative (other than in-kind, voluntary participation by individual contributors) having a value of more than USD 50,000.

Contributing Organization	GEO Status	Type of Resource	Value	Currency
EU Copernicus Program	European Commission	Financial		
European Civil Protection and Humanitarian Aid Operations	European Commission	Financial		
EU Team Europe Initiative on Amazon	European Commission	Financial		

Lessons from the 2020-2022 Period

Were all planned activities for the 2020-2022 period implemented as expected?

No

Please describe which activities were delayed or not implemented and how has this affected plans for 2023-2025.

Collaboration with countries and regional organizations is ongoing and will continue in the period 2023-2025.

Were there any key challenges faced by the Initiative in the 2020-2022 period?

No

Were there any impacts or changes to operations due to COVID-19?

Yes

Please describe.

Systems and operations are currently performed in cloud services instead of in Institutional servers.

Please describe the key changes proposed for the 2023-2025 period, for example, new projects, new areas of focus, or adjustments to the activity governance.

New project on the Team Europe Initiative on Amazon will start in mid-2022 and will continue until 2027
Collaboration with SERVIR USAID NASA Hubs has recently started and will continue in the next period.

Does the Initiative have outputs (products, services, etc.) available to users now, even if only on a pilot or testing basis?

Yes

Please provide any available information describing this usage (for example, user statistics, results of user testing) and/or feedback from users (for example, user comments, evaluations).

GWIS was used by over 47000 users from 160 countries in 2021, with a very positive feedback from users. The use of GWIS is now institutionalized as a service for many organizations in Europe and globally, especially in South America due to the recent focus of the EU-LAC Project on support to wildfire management in the region.

Please provide supporting documentation if available.

- no supporting documents provided -

Do you have evidence of any impacts that have occurred in part as a result of using the outputs of the Initiative (for example, policy decisions taken, behaviour changes by users, risks mitigated)?

Yes

Please provide examples, with evidence where available.

Recent support to Argentina by the Emergency Response Coordinating Centre of the European Civil Protection and Humanitarian Aid Operations service, supported by the map of the situation in Argentina in February 2022. Support to activities of the Arctic Council on the basis of evidence of increase number of fires and burnt areas in the last years produced by GWIS. Inclusion of activities of GWIS in the EU initiative in support to the cooperation with Amazon countries on wildfire management for the period 2022-2027.

Please provide supporting documentation if available.

- no supporting documents provided -

Have there been any internal or external reviews or evaluations of the Initiative since 2019?

Yes

Please provide a copy of the report, if available.

- no supporting documents provided -

Please indicate any GEO Work Programme activities with which you have ongoing collaboration.

- AMERIGEO - Americas Group on Earth Observations
- CAMS - Copernicus Atmosphere Monitoring Service
- C3S - Copernicus Climate Change Service
- HUMAN-PLANET - GEO Human Planet
- GEO Secretariat Operations - GEO Secretariat Operations

Please indicate any additional GEO Work Programme activities with which you would like to establish new collaborations.

- AFRIGEO - African Group on Earth Observations
- AOGEO - Asia-Oceania Group on Earth Observations
- GEO-DARMA - Data Access for Risk Management
- EO4SENDAI-MONITORING - Earth Observation and Copernicus in support of Sendai Monitoring
- EUROGEO - European Group on Earth Observations
- GEOSS Data, Information and Knowledge Resources - GEOSS Data, Information and Knowledge Resources
- GFOI - Global Forest Observation Initiative

Stakeholder Engagement and Capacity Building

Are there specific countries or organizations that your Initiative would like to engage?

Yes

Please list these countries, regions or organizations.

Countries in Latin America and the Caribbe

Organizations: Food and Agriculture Organization (FAO), United Nations Environment Program (UNEP), Amazon Cooperation Treaty Organization (ACTO), USA National Aeronautics and Space Administration (NASA)

What are your plans to engage them?

GWIS is already collaborating with these organizations and they will be involved in the implementation of actions in the GWIS program for the period 2023-2025.

Does your Initiative engage users in the work of the Initiative (for example, consultation, testing, co-design)?

Yes

Please briefly describe the Initiative's approach to engaging users.

Countries in South America and involved through the cooperation with the EU Delegations; collaboration with NASA is ongoing and will be extended through cooperation with e.g. SERVIR

Does the Initiative have a user engagement strategy or similar kind of document?

Yes

Please upload it.

- no supporting documents provided -

Are there categories of users that are not represented at this time, but you would like to engage?

No

Does the Initiative have a documented capacity development strategy?

No

Please describe the approach to capacity development that is being implemented by the Initiative?

The initiative benefits from the use of the Team Europe Initiative in the Amazon (TEI Amazon) for the engagement of wildfire management authorities in the countries of Latin America and the Caribbean.

Are there any commercial sector organizations participating in this Initiative?

No

Are there opportunities for commercial sector uptake of the outputs of the Initiative?

Yes

Please describe these opportunities.

Outputs of GWIS are readily available for further development of geospatial services for wildfire management, which are already in use by different private entities and organizations.

Is there already commercial uptake occurring?

Yes

Please describe the nature of this uptake and the relevant commercial sector organizations.

Use of data available in GWIS for the development of geospatial applications

Are there opportunities for further commercial sector participation in the Initiative?

No

Does the Initiative have a plan for commercial sector engagement?

No

Governance

Please describe the roles of each of the key leadership positions, as well as any team structures involved in day-to-day management.

GWIS is lead by the Joint Research Center of the European Commission, although there is a close involvement of the Global Observation of Forest Cover Fire Implementation Team (GOFC Fire IT) and NASA through its support to the development of GWIS through the NASA GEO Program, as part of the Applied Science Program. Training and dissemination activities are coordinated with NASA ARSET.

Is there a steering committee or other governance bodies that advise the Initiative but are not involved in day-to-day management?

Yes

Please describe the roles of each body. If there are multiple governance bodies, please describe the relationships among them (such as through a governance structure diagram).

There is an advisory board made of members of GOFC Fire IT, from which guidance is received for the further development of GWIS. Specifically, FAO advises on the needs of countries to support wildfire management plans in the country administrations. Attached is the AB in the period 2020-2022.

- no supporting documents provided -

What methods does the Initiative use to communicate with its participants?

- Email / e-newsletters
- Website
- Regular events

Please describe the key risks that could delay or obstruct the completion of the planned activities and outputs of the Initiative, along with any actions taken to mitigate these risks.

Description of the hazard	Description of the possible impacts	Scale of impact	Likelihood of occurrence	Mitigation measures
Disruptions on data sources	Disruption of GWIS applications	Moderate	Not very likely	changes in data sources, flexible applications based on the use of available data
Changes of GWIS related staff	Disruption of GWIS work program	Moderate	Not very likely	recruitment of new staff

What methods are used by the Initiative to monitor its effectiveness?

- Informal discussions with users / beneficiaries
- Website statistics
- Consultations or events

Would the Initiative be interested in assistance from the GEO Secretariat for developing an impact plan?

No

How are the results of the monitoring and evaluation activities shared with participants and the wider GEO community?

Through the outputs of the different activities, minutes, meeting reports, web statistics, etc.

Are any monitoring or evaluation activities required by funders/contributors?

No

Participants

Please list the active individual participants in the Initiative

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Other information

Please provide any other comments or information that was not included in the previous sections, but you would like to appear in the Implementation Plan.

- no answer given -

- no supporting documents provided -

Co-Editor Management

List of co-editors for this initiative

- no answer given -