

Sub-task Number: DI-09-03b

Sub-task Title: Implementation of a Wildland Fire Warning System at Global Level

Overarching Task: Warning Systems for Disasters

Area: DISASTERS

Related Community of Practice: Geohazards, Forest

Relevant Committee: TBD

Related Targets: (to be included in 2009)

Sub-task Definition (as given in the 2009-2011 Work Plan):

Develop a globally-coordinated warning system for wildland (vegetation) fires, including improved prediction capabilities, analysis tools and response support through sensors, information products and risk assessment models. Related activities will include: (i) Review of existing warning systems; (ii) Assessment to enhance current fire early warning systems; (iii) Development of mechanisms for the implementation of an operational global early warning system. Activities will be coordinated with the UNISDR “Global Wildland Fire Network” and the Global Fire Monitoring Center (GFMC). They will also build upon the European Forest Fire Information System (EFFIS) – providing fire danger forecasts and analyses of forest fire damages for the pan-European area and GMES projects in the area of emergency response.

Leads (GEO Member or PO, Entity carrying out the work, Contact: e-mail):

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Motivation/Background

Extreme wildland fire disasters are increasingly frequent events around the globe. The increasing severity of fire disasters are a consequence of increased vulnerability of the natural environment and societies. The social, economic and environmental costs of these fires are very high, often leaving many thousands of people homeless and displaced, without income due to loss of local livelihood by the fire, and in many cases millions of people affected by negative long-term health impacts caused by fire emissions. The early warning science and technology that currently exists will be implemented to mitigate or prevent wildfire disasters.

Outputs

Planned:

- A. 2008-2009 Definition document (technical, operational) for a global early warning system for wildland fire
- B. 2009-2010 Periodical update of the GMFC website and its linkage with GEO Web/clearinghouse
- C. 2010-2011 Regional and global prototypes of the System pre-operational, including its link to GEO Web/clearinghouse
- D. 2011-2012 Continue progressive implementation and operations

The system will operate as a coordinated network of regional systems using existing remotely-sensed and ground-based data networks, and new forecasting and fire danger risk models to provide improved prediction capabilities, analysis tools, and response support. The system will operate at global to local levels, with rapid information dissemination via dedicated networks. Technology transfer and capacity building programs in system operation and use will be conducted at global, regional, and local levels. Interface coordination will

be put in place to ensure that activities of other Social Benefit Areas will benefit from data and products generated within this Task. Activities will be coordinated with the UN-ISDR "Global Wildland Fire Network" coordinated by the Global Fire Monitoring Center (GFMC).

The work will include:

1. Continue and complete the review of existing warning systems for fire including technical/operational capabilities and status (demonstration project, pre-operational...), product adequacy...etc, identify gaps and weaknesses, periodically update the GMFC web-based fire early warning portal, by including relevant links. Explicit request for information on this matter will be sent to all GEO members.
2. Define, with the involvement of the user communities, the scientific community, the producers of the products, here included space agencies, the basic features of an operational global early warning system and associated possible options and mechanisms for its progressive implementation. The expected result is an improvement and an update of the above mentioned project "Global Early Warning System for Wildland Fire".
3. Perform a review of the information products, of evident crosscutting nature or generated for specific use in other societal benefit areas, that, if realized with a suitable frequency, may serve as a key intermediate step to ensure the operation of the early warning system.
4. Progressively enlarge the partnership for the execution of the task, clearly identify new partners involvement and contributions
5. Advocate and actively foster financial support for the implementation;
6. Start the implementation of the global system, involving relevant final users and starting from regions where the identified gaps are highest.

In parallel to the above described activities, that constitute the core of this task, two other activities will also be conducted:

- Continuous assessment of ways to enhance current fire early warning systems (new products and associated modelling requirements, improved product accuracy and delivery time, development of standards, protocols ...etc) taking into account capabilities of new/forthcoming generation of Earth observation satellites (both geostationary and polar orbiters) and advanced product dissemination systems
- Link with specialized organizations (UN and others) and forestry associations to identify options and interfaces in order to take benefit from data and products generated within this Task.

Progress on task execution will be presented at workshops and conferences in order to gather broader consensus by an enlarged community.

Produced (current status): ...

The task is being co-led by the GFMC and GTOS/GOFC-GOLD. Point of contact - is W.J. (Bill) de Groot (GOFC-GOLD Fire IT, and Canadian Forest Service); co-leader is Johann G. Goldammer (GFMC, and GOFC-GOLD Fire IT). A proposal for a Global Early Warning System for Wildland Fire was prepared and presented to the UN-ISDR at the 3rd Early Warning Conference (March 2006, Bonn). Numerous presentations on the proposed system have been made at international fora, and several papers on the system have been published in international proceedings. The consortium of international agencies proposing this system are focusing efforts on the search for funding opportunities.

Activities (operations or work processes through which resources are mobilized to produce specific outputs; outlined in the form of milestones including timelines)

Planned:

- A. 2008-2009 Definition document (technical, operational) for a global early warning system for wildland fire

- Develop the “Implementation Plan for a Global Early Warning System for Wildland Fire”, including a summary of three potential prototype regional systems in areas of high fire risk and/or threat to social, economic, and environmental values (Africa, South America, and Southeast Asia)
- Initiate an outreach program to disseminate information on, and gain support for, the Implementation Plan by the wildland fire user community through presentations at international for a.
- Secure funding to support full development of at least one prototype regional system (3-year period minimum)

B. 2009-2010 Periodical update of the GMFC website and its linkage with GEO Web/clearinghouse

- Assess and acquire regional infrastructure (hardware, software, communication networks) and human resource needs
- Detailed design of regional prototype model, including integration of data collection networks, data processing (active fire monitoring, fire danger modeling, and fire weather forecasting), and early warning information dissemination
- First-year trial run of system operation by Wildland Fire EWS consortium
- Conduct information sessions and training workshops on system operation with regional remote sensing, weather, and wildland fire networks

C. 2010-2011 Regional and global prototypes of the System pre-operational, including its link to GEO Web/clearinghouse

- Conduct capacity building workshops on system use at regional to local levels; this includes calibration of early warning system to local and regional fire regimes, and design of fire prevention, detection, and suppression preparedness programs in response to early warning system information
- Initiate transfer of operational system tasks from the Wildland Fire EWS consortium to regional agencies
- Presentation of results at GEO Plenary and Ministerial Meeting (2010)

D. 2011-2012 Continue progressive implementation and operations

- Complete transfer of daily operational system tasks to regional agencies
- Provide consultation and training as necessary on use of early warning system information in fire management decision-making and implementation of fire programs
- Design detailed model structure to integrate early warning system information from multiple regional systems into a coordinated global system for use in international wildland fire disaster programs
- Provide ongoing calibration and validation of regional systems, as required

Progress (current status):

July 2009

GEO Concept Proposal (Type III) on “A sub-Saharan Africa Early Warning System for Wildland Fire Threat and Air Quality Hazard” submitted to GEO User Interface Committee and Capacity Building Committee. Other funding proposals in preparation.

Development of a **Global Early Warning System for Wildland Fire** information website (including definition document) initiated by Lead Agencies of this Task; expected completion by Nov 2009.

June 2009

Presentation of the Global Early Warning System for Wildland Fire in the frame of a Special Event at the Second Global Platform for Disaster Risk Reduction (UNISDR).

August 2008

Presentations on the Global Early Warning System for Wildland Fire were made at:

- i. UN Wildland Fire Advisory Group/Global Wildland Fire Network meeting, 4-6 July 2008, Freiburg, Germany (<http://www.fire.uni-freiburg.de/GlobalNetworks/Rationale-and-Introduction-1.html>)
- ii. GOFC-GOLD Int'l Workshop on Advances in Operational Weather Systems for Fire Danger Rating, Edmonton, Canada, 14-16 July 2008

December 2007

Presentations of the Global Wildland Fire Early Warning System at UNOOSA COPUOS STSC 44th Session - 16 February 2007, the 4th International Wildland Fire Conference, Seville, Spain, May 2007 and the GEO Capacity Building Workshop in Sevilla, 10-11 September.

Regional consultations in Syria (Expert Consultation Meeting on Wildfire Early Warning and Detection Systems, Lattakia, Syria, 15 – 17 July 2007) and Ukraine (International consultation on “Reducing Risk of Disaster from Catastrophic Wildfires in the Chernobyl Irradiated Forests, 26-27 July 2007, Kiev-Chernobyl, Ukraine).

GEO supported GOFC-GOLD Workshop on the Requirements for a Fire Early Warning System for Africa, in conjunction with the West Africa Regional Network Meeting on Earth Observation and Environmental Change, 12-16 November 2007, University of Ghana (Legon), Accra, Ghana

Task team made contributions to the publication “The Full Picture” and to the Early Achievements Annex 100 First Steps to GEOSS, both presented at the GEO Ministerial Summit of Cape Town 30 November 2007)

December 2006

Revision of title and content of the Task, as a result of the approval of the 2007-2009 Workplan.

The task is being co-led by the GFMC and GTOS/GOFC-GOLD. The point of contact is Johann G. Goldammer (GFMC).

The status of December 2006 is reflected by the preparation of the project “Global Early Warning System for Wildland Fire” presented at EWC-III (March 2006). Updates of existing wildland fire early warning systems including scientific, technical and political developments are provided regularly on the GFMC Wildland Fire Early Warning Portal (<http://www.fire.uni-freiburg.de/fwf/fwf.htm>) and the Global Wildland Fire Monitoring Portal (<http://www.fire.uni-freiburg.de/current/globalfire.htm>). The envisaged design of the system has been presented to the WMO Commission on Agrometeorology (New Delhi, India, October 2006) and to the 5th International Conference on Forest Fire Research (Figueira da Foz, Portugal, November 2006).

Resources (indication of resources – e.g. financial, human – contributed by GEO Members or Participating Organizations to produce outputs)

Canadian Forest Service, Global Fire Monitoring Center, Australian Centre for Climate and Weather Research, University of Maryland, and NAA/NESDIS: all agencies providing staff to work part-time on the project; providing travel funds to make presentations and seek project funding.

Architecture and Data Component

1) Please briefly describe any task-related Earth observation resources (data set, system, website/portal) and any related Web Service interfaces that are contributed to GEOSS. State whether these items are or will be registered with the GEOSS Component and Service Registry for access via the GEO Web Portals, and whether any associated standards or other interoperability arrangements will be registered in the Standards and Interoperability Registry.

Details to follow:

2) Please also describe what data and information your activity/system needs that you would request to be accessible through the GEOSS Common Infrastructure.

Details to follow:

Capacity Building Component

Infrastructure and technology transfer – this is essentially in place at a global level, with mixed capacity at regional, national, and sub-national (local) levels (it is country specific); capacity building of this component will be on a country by country basis and dependent on funding.

Individuals – good capacity at global and regional levels; education and training to operationally run the system at a national level will be required for many countries, and can be facilitated by regional experts (GOFC-GOLD regions, Global Wildland Fire Network); it is an important component of this Task.

Institutions – much work needs to be done at the global level in development of international policies and programs to utilize the early warning system; a number of nations are well-established in this area, and will be relied upon to guide policy and program development at all levels; this is another important component of the overall technology transfer of this Task.

2) Have any additional CB needs for this Task been identified? Please provide a short description.

A major component of this task is local capacity building in the final end user – fire management agencies. Specifically, this involves technology transfer and training in the practical application of early warning information in daily fire management decision-making. This is something that would happen at all system levels. For instance, at the global level, early warning information can be used for international resource-sharing decisions that are made before disaster fires occur; at the local level, early warning can be used for the most basic decisions involving fire prevention, detection, and suppression activities in advance of critical burning conditions.

User Engagement Component

(please briefly describe to what extent end users are engaged in this Task and influence the nature of the outputs produced)

End users (sub-national, national, global fire and remote sensing regional networks, UN-ISDR, UNEP, FAO, WHO) are engaged throughout the system development and establishment process. They are included during system design and implementation to ensure data protocols and information transfer are operational and efficient. They are also closely involved in the technology transfer and capacity building activities to ensure the system is self-sustaining and functional at a local level.

Science and Technology (S&T) Component

1) Please briefly describe the elements of scientific research or technological development contained in this Task.

2) In relation to the S&T component(s) of this task, please describe gaps, priorities, continuity needs, barriers, scientific expertise and additional resource needs (this information will be used for developing a gaps and needs assessment in Task ST-09-01)

Members and POs' Contributions to Outputs and Activities above:

(Input is optional. This section gives the chance to Members and POs to provide more details (3-5 lines) on their individual activities, making a clear connection with the Outputs and Activities outlined above).

Japan

AFFRIT: Producing Automatic Forest Fire Information Reporting system(AFFIRE) using hotspot obtained from NOAA, Terra and Acqua satellite data in Japan. This warning system will take part in developing regional forest fire warning system and network in Asia.

JAXA: To provide the service of Sentinel Asia hot-spot monitoring and also consider the possibility to provide the information on the early warning by using the soil moisture products

Spain

Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA): Development of pioneer fire risk index from satellite images in Spain. Could be developed too in Latinamerica, together with INPE.

USA

NOAA's atmospheric research Office - OAR (Oceanic and Atmospheric Research), has been involved with fire weather operations through Heath and Eli's fire weather unit in the NWS. We have also been involved in fire weather research planning and some initial fire scale modeling efforts.

CEOS

NOAA: Develop global fire warning system (geostationary and polar orbiting satellites). Operational implementation of geostationary fire monitoring for GOES, MSG and MTSAT.

Participation (Table to be filled in 2009):

Type	Member or PO	Representing	Contact Name	EmailAddress
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