Fire IT Program Status

Chris Justice (Fire IT Co-chair)

Krishna Vadrevu (Fire IT Exec Officer)

GOFC-GOLD Fire

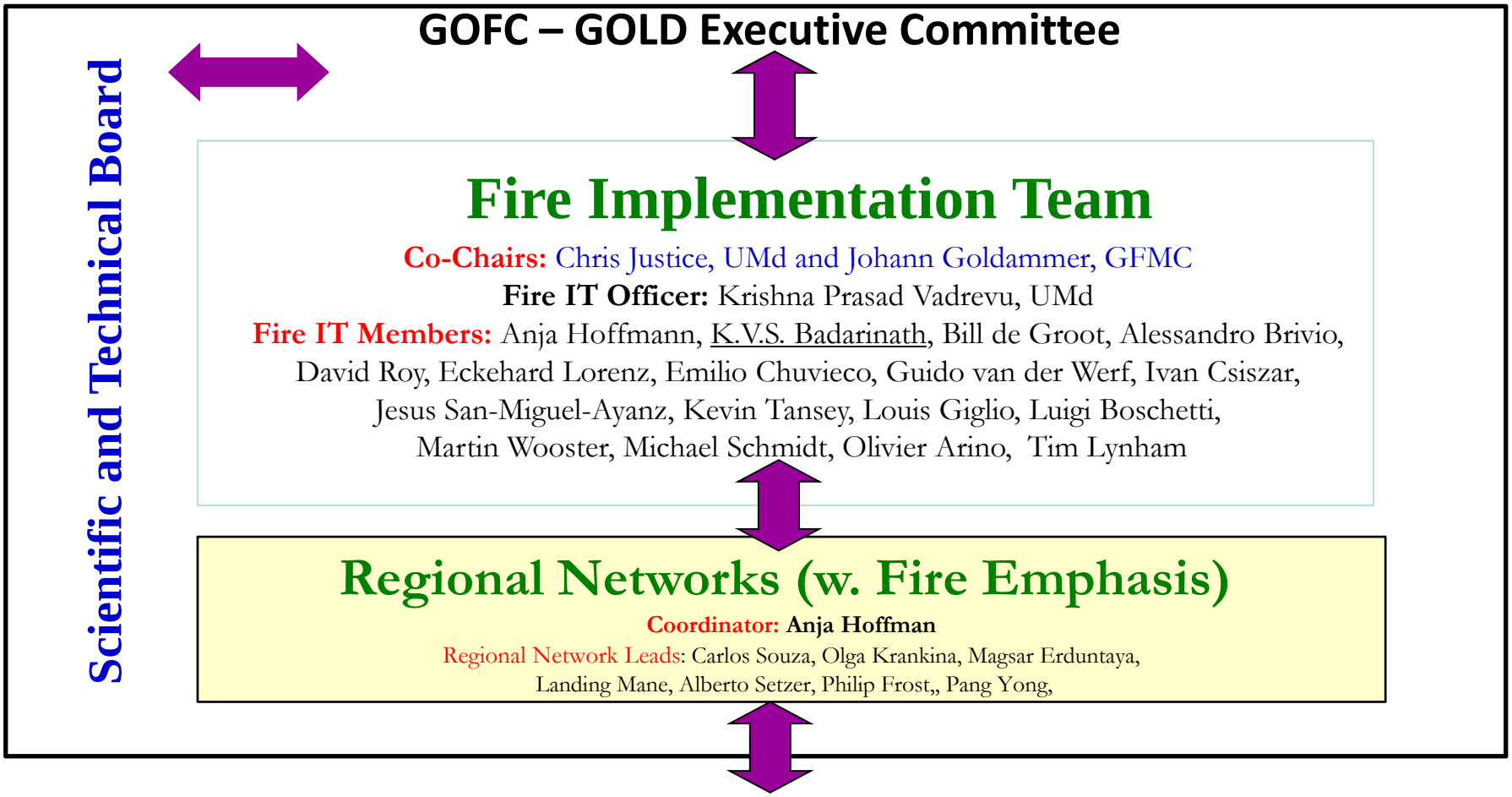
http://gofc-fire.umd.edu/

GOFC- GOLD IT Fire: Structure

GOFC-GOLD-Fire consists of 5 structural elements:

- *GOFC-GOLD Scientific and Technical Board (STB)*
- *GOFC-GOLD Executive committee (Chair: Janetos)*
- Fire Implementation Team (Justice/Goldammer)
- Fire Project Office (Vadrevu, NASA sponsored @UMd)
- Regional Networks (Various, Fire / Landcover)

Organization of GOFC-GOLD Fire



International Strategic Partnerships e.g. START, UN ISDR Wildland Fire Network, CGMS, CEOS and LPV, ILDRCC, GEO, EARSEL SIG-Fire

GOFC/GOLD-Fire IT Broad Goals

Promote :

- Increased user awareness of EO fire and data use

- Data and Service Continuity and Long-Term fire data records
  - Establishment of a geostationary global fire network
  - O*perational* polar orbiters (coarse and moderate) with adequate fire monitoring capability

- Assessment of Fire Product Accuracies and Quality Assessment

- Global Fire Early Warning Systems - operational products

- Use of EO in fire emissions product suites

- Improved data access

- Establish enhanced user products

- Promote experimental fire observation systems and related research

GOFC/GOLD Regional Networks

- The Regional Networks have developed to highlight **regional priorities** and requirements for operational fire observations and establish improved communication between regional fire data users and fire researchers.

- Forum for data producers and **regional users** to interact to assess current data availability and existing data collection systems and proven research

- Mechanism for lateral transfer of technology and applications experience

GOFC/GOLD Regional Networks

- Mechanism for involving regional scientists and users in new activities e.g. regional product accuracy assessment (validation)

- Complement the emerging UN Regional Fire Networks which are focusing on fire management, policy and training

- Forum for satellite data providers, global change and resource managers to improve communication

GOFC Fire IT Meeting 2012

Summary published in The Earth Observer, March- April, Issue, No. 2 Vol. 24. 2012.

Fire-IT Meeting Summary
Earth Observer, 2012

The GOFC–GOLD Fire Implementation Team Workshop – Satellite Remote Sensing of Fires: Current Progress and Future Prospects

Krishna Prasad Vadrevu, University of Maryland/GOFC–GOLD Fire, krishna@hermes.geog.umd.edu
Ivan Csiszar, NOAA/NESDIS Center for Satellite Applications and Research, ivan.csiszar@noaa.gov
David Roy, South Dakota State University, david.roy@sdsu.edu
Luigi Boschetti, University of Maryland, luigi@hermes.geog.umd.edu
Louis Giglio, University of Maryland, giglio@hermes.geog.umd.edu
Chris Justice, University of Maryland/GOFC–GOLD Fire, justice@hermes.geog.umd.edu

Summary

The Global Observation of Forest and Land Cover Dynamics (GOFC–GOLD) Fire Implementation Team (IT) workshop was held in Stresa, Italy from October 18–19, 2011. The workshop reviewed the current progress, recent developments, and future prospects for Earth observations for fire science and applications. Satellite fire data continue to be widely used by the fire research and applications communities. The workshop provided opportunities for the team members to share their experiences, review the latest developments, and discuss crosscutting international issues. The workshop participants highlighted the need for:

- *The participating space agencies to continue to provide validated fire products;*
- *strengthening the Global Geostationary Fire Network through operational production of fire products from the Geostationary Operational Environmental Satellites (GOES), Multifunctional Transport Satellites (MTSat), Meteosat Second Generation (MSG), and inclusion of data from other international geostationary systems;*
- *refining fire emissions products by integrating top-down and bottom-up approaches;*
- *expanding the fire component of the GOFC–GOLD Reducing Emissions from Deforestation and Forest Degradation (REDD) Sourcebook;*
- *providing the participating space agencies with requirements for and technical input on new fire-related missions; and*
- *funding to strengthen the program's regional fire-network activities, including organizing training programs, regional data validation activities, and improved data access.*

The article summarizes the workshop's findings and important aspects of satellite fire research.

Introduction

GOFC–GOLD is an international organization with an ambitious, multifaceted strategy that integrates space-based and *in situ* observations for sustainable management of natural resources. GOFC–GOLD is a panel of the Global Terrestrial Observing System (GTOS), with the overall objective of improving the availability and utility of Earth observations of forests, land cover, and fire at global and regional scales for a variety of user communities. The main themes of the GOFC–GOLD program are fire monitoring and land-cover characterization and change. In addition to these themes, new focus-group activities are being developed focusing on biomass estimation and agricultural land-use change. GOFC–GOLD activities are guided by the executive committee, with the support and coordination of two thematic project offices supported by NASA and the European Space Agency (ESA). Over a period of years, GOFC–GOLD has facilitated the development of several regional networks that act as a forum for exchange of information, data, technology, and methods within and between regions.

The GOFC–GOLD Fire Implementation Team (IT) aims to articulate the international observation requirements and encourage the best possible use of fire products from existing and future satellite observing systems for management, policy decision making, and global-change research. The primary goals of the Fire IT are shown in **Figure 1**, next page. The Fire IT achieves these goals through emphasis on utilizing spaceborne assets for fire research; generating fire data and information products; data distribution; and capacity-building activities. The GOFC–GOLD Fire IT is continuing its strategic partnership with international organizations including the following groups and programs:

- International Geosphere Biosphere Program (IGBP);
- SysTem Analysis and Training (START);
- United Nations International Strategy for Disaster Reduction (UNISDR);

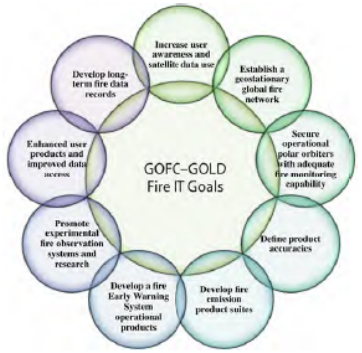


Figure 1. GOFC–GOLD Fire IT goals.

- Global Wildland Fire Network (GWFN);
- European Association of Remote Sensing Laboratories (EARSeL) Special Interest Group on Fires;
- Coordination Group for Meteorological Satellites (CGMS);
- Committee on Earth Observation Satellites-Land Product Validation subgroup (CEOS-LPV);
- International Land Direct Readout Coordination Committee (ILDRCC); and
- Global Earth Observation System of Systems (GEOSS).

The Fire IT reassesses its goals through periodically revisiting and assessing gaps in its activities and overall priorities.

The purpose of this workshop was to review current progress, recent developments, and future prospects for fire science and applications and the associated GOFC–GOLD Fire IT activities. This workshop took place in conjunction with an ESA Fire–Climate Change Initiative (CCI) technical workshop that focused on developing global burnt-area algorithms from coarse-resolution

GOFC–GOLD Fire IT meeting participants, October 2011, Stresa, Italy.

Product Status Reporting

- **System promoted by CEOS WGCV LPV for product status**
  - **Beta** – algorithms run, known problems with the data set
  - **Provisional** – product generated but unvalidated, includes product evaluation and "confidence building" by inter-comparison with other unvalidated data sets or visual inspection
  - **Validated** (using independent data sets of known accuracy, results published in peer reviewed literature)
    - **Stage 1 – at a few locations, targets of opportunity**
    - **Stage 2 – over a representative range of observation conditions**
    - **Stage 3 – systematic, statistically robust sample in space and time**
    - **Stage 4 – updating validation on new versions and over time series**

2012 Strategic Tasks for GOFC/GOLD-Fire

- Implementation of operational Global Fire Early Warning System
- Develop Meteorological Agency support for establishing the Global Geostationary Fire Network
- Ensure operational fire monitoring capabilities on JPSS VIIRS and METOP, Sentinel 3 providing data continuity
  - Ensure Direct Readout access to the data
- International Space Agency coordination of global Landsat Class resolution data processing and availability (Sentinel 2, LDCM, etc)
- Support for running the Regional Fire Networks and developing capacity building programs on the use of satellite fire data
- Providing a coordination mechanism for defining requirements and implementation of fire observations in support of the International Conventions
  - ECV's for UN FCCC , CEOS
  - Defining the role of Fire in UN REDD (i.e. GOFC-GOLD REDD Sourcebook)

What is the future of GOFC-GOLD?

(why we held this meeting now and here)

- GTOS – FAO is stepping down (parent organization) – what was the role of GTOS
- GOFC-GOLD Secretariat - Canada stepped down) – coordination function
- Future directions for our Land Cover and Biomass sister IT's
- Sustained non – US Funding for the Regional Networks

Current Fire IT Issues

In terms of its goals, GOFC-GOLD Fire is a decadal process

- Continuity of satellite observations (for operational useres and global change science)
  - Data continuity and operationalization (MODIS>JPSS, ESA Sentinels
  - Data policy (free and open sharing of data and products)
  - Data delivery systems (ease of access and information)
  - Data Formats (ease of use)
- Some issues are technical – for these GOFC can provide guidance and if needed build a community consensus and provide community representation
  - Which communities are we representing (global change research, data providers, operational users
    - Best practices and scientific quality
    - *User community with respect to data needs and services provided*
- Some issues require cultural change within the various space agencies and data provider agencies and funding agencies

Areas of Recent Progress

- **Spaceborne Assets**
  - **Fire Monitoring with next generation Operational Polar Orbiters > Data Continuity (e.g. VIIRS, Sentinel 3, ProbaV ?) capability exits but fire products need attention**
  - **Moderate Resolution Data Continuity (e.g. Sentinel 2, LDCM, ResourceSat)**
  - Geostationary Global Fire Network (e.g. NOAA CGMS) – *Stalled?*
  - Next Generation Fire Sensor Technologies (e.g. DLR) ?
- **Data and Information Products**
  - **Regional / Global Burned Area Products**
  - **Systematic Global BA product validation (e.g. MODIS CEOS LPV Stage 3)**
  - **Near real-time and regional fire emissions modeling (e.g. GFED +)**
  - **Global Fire Early Warning System in development (e.g. CFS / JRC)**
  - **Multi-source fire information integration (e.g. AFIS)**
  - Long Term Fire Data Records (AVHRR 1km > present)
  - Global Fire Assessment – *Stalled*

Progress being made

- **Data Distribution**
  - **Near Real-Time Global Daily Active Fire Monitoring (e.g. NASA LANCE)**
  - **Web based Fire and Imagery Distribution Systems (e.g. FIRMS, WELD)**
  - GeoNetcast Distribution
  - Increased Coordination between Direct Readout Stations (ILDRCC)
- **Capacity Building for Data Utilization**
  - **Regional Fire Networks – workshops and initiatives (e.g. SAFNET, CARIN, SEARIN planned)**
  - Increased UN Fire Monitoring Capability (GFIMS)

Format for the Workshop

- 2 days (Split between 3) - session 3 after GOFC/GOLD Excom and Agency Plenary)
- Designed to encourage free and open discussion and exchange of ideas (IT Members and 'Observers')
- Need to develop a consensus from the IT as to priorities
- Identify upcoming opportunities to help attain the program goals
- Overview presentations (20min) on selected topics followed by questions and discussion (10 mins)
- Suggest everyone to actively discuss the themes during discussions and to identify action items – who will do what
- Krishna will be taking notes (taping for report writing purposes only) of the discussion – will develop a meeting report – with a possible review article on community priorities for fire observations.

Monday, April 15, 2013

8.30-8.50 : GOFC Fire-IT Status and Updates- *Justice, Goldammer and Vadrevu*

8.50-9.10: Round the table introductions of participants
9.10-9.30: Global Geostationary Network and Fire Products -*Giglio*
9.30-10.00 Fire Observations from New Instruments – *Giglio*

10.00-10.30 Break

10.30-10.50- VIIRS Fire products update- Giglio
10.50-11.10 Discussion on fire related sensors *All*
11.10-11.30 Sentinel products update *Plummer*
11.30-11.50 Discussion *All*
11.50 Lunch

Monday, April 15, 2013 - Afternoon

1.30-1.50 Burned area and validation- next steps *Boschetti*
1.50-2.10 Fire-CCI project updates *Itziar (Chuvieco team)*
2.10-2.30 Terrestrial Observation Panel for Climate (TOPC)-Fire ECV update including CEOS LPV *Tansey*
2.30-2.50 Discussion on burned area validation *Lead: Roy*

2.50-3.30 Break
3.30-3.50 User needs perspective – fire management; *Goldammer, GFMC*
3.50-4.10 User needs - institutional cooperation at regional level *Gitas/Zalidis, Balkan Env. Center*
4.10-4.30 User needs panel discussion – International Biomass burning initiative (IBBI) – IGAC project - Atmospheric science perspective-*Kaiser*
4.30-5.10 User needs panel discussion *All*
5.10 Closing of the session

Tuesday, April 16, 2013 (Morning)

8.30-8.50	Progress and potential roadmap for the global fire EWS and activities- *de Groot*
8.50-9.10	European Forest Fire Early Warning System (EWS) - *San-Miguel-Ayanz*
9.10-9.30	Seasonal forecast model for the Global EWS- *Brown (DRI)*
9.30-9.50	Discussion on Fire EWS; *Lead: Justice*

9.50-10.30 Break

10.30-10.50	UN-REDD Fire-GOFC source book updates and next steps *Boschetti*
10.50-11.10	WALFA project - *Maier*
11.10-11.20	AFIS update - *Frost*
11.20-11.30	Briefing for preparation of Session-10-Collaborative activities with Fire-IT -*Hoffmann*
11.30-11.50	Discussion *All*

11.50 Closing of the session

Thursday April 18, (Morning)

1.30-1.50 Latest updates and research on fire radiative energy products - W*ooster*

1.50-2.10 FRP emissions - *Kaiser*

2.00-2.10 Update on Global Fire Emissions Inventory-*Van der Werf*

2.20-2.30 Evaluation of tropospheric emission products in relation to fires-*Vadrevu*

2.30-2.40 Discussion on fire emission products *Lead: Wooster*

2.40-2.50 As above

2.50-3.30 Break

3.30-3.50 User needs Forestry perspective (Webex/Skype) *Hinkley*

3.50-4.10 Fire regional network update-*Hoffman*

4.10-4.30 Regional Networks and Round table on next steps for GOFC GOLD Fire IT – Discussion-*Justice and Vadrevu*

4.30-4.50 As above

4.50-5.10 Action items and final remarks; -*Justice and Vadrevu*

5.10 Closing of the session

Fire-IT Members – Not Attending

-Elaine Prins (provided slides)
-Ivan Csiszar (provided slides)
-Everett Hinckley (provided slides/call in)
-Catherine Liousse (no input – no participation)
-Arino Olivier (Health issues)
-Emilio Chuvieco (Brazil meeting; sent representative)
-Ivan Csiszar (sent slides)
-Francesco Gaetani (Spain meeting)
-Timothy Lynham (travel issues)

RN representatives; Magsar (Mongolia); Narasira Thongoboonchoo (Thailand) – Japan meeting;

Redlatif representative (conflict due to Brail meeting); OSFAC (Landing Mane – personal reasons);

Current Issues Cont'd

- Coarse Res'n AM / PM observation continuity
  - (Terra / Aqua > METOP, VIIRS, Sentinel 3)
- Data Integration
  - LDCM and Sentinel 2 processing and access
  - MODIS, VIIRS and Sentinel 3 (Active Fire)
- Early Warning System Status
  - User needs and product evaluation

- Fire Behavior and EO ?
- New fire RS technologies ?