Fire IT Program Status

Chris Justice (Fire IT Co-chair)
Krishna Vadrevu (Fire IT Exec Officer)
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**

**GOFC – GOLD Executive Committee**

**Fire Implementation Team**

*Co-Chairs:* Chris Justice, UMd and Johann Goldammer, GFMC  
*Fire IT Officer:* Krishna Prasad Vadrevu, UMd  
*Fire IT Members:* Anja Hoffmann, K.V.S. Badarinath, Bill de Groot, Alessandro Brivio, David Roy, Eckehard Lorenz, Emilio Chuvieco, Guido van der Werf, Ivan Csizsar, Jesus San-Miguel-Ayanz, Kevin Tansey, Louis Giglio, Luigi Boschetti, Martin Wooster, Michael Schmidt, Olivier Arino, Tim Lynham

**Regional Networks (w. Fire Emphasis)**

*Coordinator:* Anja Hoffman  
*Regional Network Leads:* Carlos Souza, Olga Krankina, Magsar Erduntaya, Landing Mane, Alberto Setzer, Philip Frost, Pang Yong,
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
  – *Operational* 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

Fire-IT Meeting Summary
Earth Observer, 2012


Summary

The Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD) Fire Implementation Team (IT) workshop was held in Trento, Italy from October 18–19, 2012. The workshop reviewed the current program, recent developments, and future prospects for fire observations, fire science, and applications. Satellite fire data continue to be widely used for fire research and applications community. The workshop provided opportunities for the team members to share their experiences, review the latest developments, and discuss raising international issues. The workshop participants highlighted the need for:

- strengthening the Global Fire Monitoring System (GFMS) to include observations from other national and international programs;
- improving the integration of the GOFC-GOLD Fire Implementation Team activities with the GFMS network;
- improving the participation of non-regional partners in specific areas of interest; and
- increasing the amount of fire-related data available for research and applications.

The article describes the workshop's findings, important steps in satellite fire research.

Introduction

GOFC-GOLD is an international organization with an ambitious, multi-disciplinary strategy that integrates space-based and in situ observations for sustainable management of natural resources. GOFC-GOLD is a product of the Global Forest Observing System (GFOS), with the overall objective of improving the availability and utility of Earth observations for forest, land cover, and fire at global and regional scales for a variety of users.

The main themes of the GOFC-GOLD program are fire monitoring and land-cover characterization and change. In addition to these themes, new thematic 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 focus offices supported by NASA and the European Space Agency (ESA). Over the past year, GOFC-GOLD has facilitated the development of several regional networks that act as a forum for the exchange of information, data, and methods within and between regions.

The GOFC-GOLD Fire Implementation Team (IT) aims to coordinate the international observation requirements and encourage the best possible use of fire products from existing and future forest monitoring systems for management, policy decision-making, and global-change research. The primary goals of the Fire IT are shown in Figure 1.

GOFC-GOLD Fire IT Goals

- Monitoring and mapping of forest, land cover, and land use changes;
- Developing and upgrading spatial datasets, products, and information;
- Enhancing the utility of products and data for decision-makers and stakeholders;
- Developing and implementing global fire regimes models;
- Enhancing the participation of non-regional partners in specific areas of interest.

The purpose of this workshop was to review current programs, recent developments, and future prospects for fire science and applications and the associated GOFC-GOLD Fire IT activities. The workshop took place in collaboration with an ESA Fire-Climate Change Initiative (CCCI) technical workshop that focused on developing global burn-area algorithms for coarse-resolution.
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 users 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 Global 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*  
  – Global Fire Assessment – *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
9.30-10.00: 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

<table>
<thead>
<tr>
<th>Time</th>
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<th>Presenter/Group</th>
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<tr>
<td>1.30-1.50</td>
<td>Burned area and validation- next steps</td>
<td>Boschetti</td>
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<td>1.50-2.10</td>
<td>Fire-CCI project updates</td>
<td>Itziar (Chuvieco team)</td>
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<td>2.10-2.30</td>
<td>Terrestrial Observation Panel for Climate (TOPC)-Fire ECV update including CEOS LPV</td>
<td>Tansey</td>
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<td>2.30-2.50</td>
<td>Discussion on burned area validation</td>
<td>Lead: Roy</td>
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<td>2.50-3.30</td>
<td><strong>Break</strong></td>
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<td>3.30-3.50</td>
<td>User needs perspective – fire management</td>
<td>Goldammer, GFMC</td>
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<td>3.50-4.10</td>
<td>User needs - institutional cooperation at regional level</td>
<td>Gitas/Zalidis, Balkan Env. Center</td>
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<td>4.10-4.30</td>
<td>User needs panel discussion – International Biomass burning initiative (IBBI) – IGAC project - Atmospheric science perspective-Kaiser</td>
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<td>4.30-5.10</td>
<td>User needs panel discussion</td>
<td>All</td>
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<td>5.10</td>
<td><strong>Closing of the session</strong></td>
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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 - Wooster
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 ?