**NASA Land Cover Land Use Change Scientist Program Support**

Final Report

PI: Christopher Justice

CoI: Krishna Vadrevu

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**Introduction**

The Land-Cover and Land-Use Change (LCLUC) program is an interdisciplinary scientific theme within NASA’s Science Mission Directorate and seeks to understand how the patterns of land use and land cover have changed and how they will change in the future and the implications of these changes; for example on biogeochemical and hydrological cycles, human livelihoods and resource management. The LCLUC program is currently contributing to the ESE Carbon and Water Cycle, Climate Variability Focus Areas. The LCLUC program also has potentially strong connections with the ESE Applied Sciences Program. The LCLUC Program is a major user of moderate resolution remotely sensed data and through the Program Manager has close connections to the Landsat Program. The new Multi-Source Land Imaging (MUSLI) initiative falls under LCLUC. The NASA LCLUC program is a contributor to the USGCRP, with a focus on Land Use and Societal Benefit. The LCLUC Program also contributes to the International GOFC-GOLD Program and two GEOSS tasks (i.e. Land Cover and GEOGLAM), various international partner and regional programs concerned with land cover related research and applications e.g. EARSeL Special Interest on Land Cover, the Global Land Project, MAIRS, NEESPI/NEFI, USAID CARPE. The program is paying attention to emerging new international initiatives such as Southeast Asia Research Initiative (SARI), Future Earth and its various regional initiatives.

The activities included two important components a). NASA Project Scientist support and b). GOFC-GOLD Fire Program support.

**I). NASA Project Scientist Support: As a part of the same, four different Tasks have been implemented:**

***Task-1: Organizing LCLUC PI Spring science team meetings (in the US): The following meetings have been organized in the US:***

04/20/2010: 04/22/2010: NASA Land-Cover and Land-Use Change Science Team Meeting, Bethesda North Marriott, Bethesda, MD: The meeting involved 120 attendees, providing an opportunity for investiga­tors to present their research results in the form of re­view talks and posters, and discuss the enhancement of the NASA Landsat Global Land Survey (GLS) projects. The presentations, posters, and breakout group reports from the meeting can be downloaded from: *ftp://ftp.iluci.org/LCLUC/LCLUCMeetings/2010\_APR/*.

03/28/2011: 03/30/2011: NASA Land-Cover and Land-Use Change Science Team Meeting, Adelphi, Maryland: The meeting celebrated the 15th anniversary of the NASA LCLUC program and focused on historical, current, and emerging science in the field of LCLUC. One hundred thirty-five people attended the meeting, including the currently funded Science Team and a number of members from the first Science Team that was formed in 1996. In the meeting, emphasis to synthesize and integrate past case study results has been stressed. Essential components of synthesis and integration of LCLUC research include: summarizing the state-of-the-art knowledge; compiling available relevant data-sets and research studies; advancing our understanding of the processes, drivers and impacts of LCLUC; and developing new understandings and conceptual frameworks. Detailed meeting report has been published in the Earth Observer and can be accessed from: http://lcluc.umd.edu/Documents/ScienceTeamMtg/2011\_03/2011\_3\_EO\_UMD.pdf

10/03/2011: 10/07/2011: NASA Carbon Cycle and Ecosystems Joint Science Workshop,

Alexandria, Virginia: This workshop was the 3rd NASA Carbon Cycle and Ecosystems Joint Science Workshop. On October 6, individual discipline NASA programs within this Focus Area had their own science team meetings. The focus for the one-day LCLUC ST Meeting was on Land-Use Observations with an emphasis on agriculture. The meeting included presentations by LCLUC Science Team members and invited scientists, a breakout session organized for discussion of the future program focus and direction, and a poster session. From this meeting,

number of priorities for land-use science were identified, including climate impacts, vulnerability and adaptation to rapidly changing conditions, and the increasing stresses on agricultural production and water, while working towards sustainable resource use. The group recognized that the relevance of land-use science is increasing, and that NASA should consider increasing the LCLUC budget to enable additional or broader annual research solicitations to fulfill the needs of the growing LCLUC and modeling communities in the context of adaptation science. Full meeting report can be accessed from: http://lcluc.umd.edu/Documents/ScienceTeamMtg/2011\_10/JointMeeting\_Virginia.pdf

04/03/2012: 04/05/2012: NASA Land-Cover and Land-Use Change Science Team Meeting, Rockville, Maryland: The meeting focused on *urban land dynamics*. More than 100 scientists and graduate students from the LCLUC community attended the meeting, which, in addition

to offering presentations on urban land use, included a review of the final results from the project’s third year of activities, posters and discussion sessions on improving the social science component of LCLUC, and the role of collaborative synthesis research. Representing international partners at the meeting were Giovana Espindola [Global Land Project (GLP)—

*Executive Officer*], Lei Wang [Chinese Academy of Sciences, Institute of Remote Sensing], and Oganes Targulyan [ScanEx1—Russia]. Representing regional partnerships were Pavel Groisman [Northern Eurasian Earth Science Partnership Initiative (NEESPI)—*Project Scientist*] and Hassan Virji [Global Change SysTem for Analysis Research and Training (START)—*Director*]. In the meeting, the importance of enhancing linkages with international programs, such as the Global Observations for Forest and Land Cover Dynamics (GOFC–GOLD) and Group on Earth Observations (GEO), and regional programs like NEESPI and Monsoon Asia Integrated Regional Study (MAIRS), in which regional networks, supported by START, became clear. The presentations, posters, and other details from the meeting can be downloaded from *lcluc.umd.edu/meetings.php?mid=37.* Full meeting report can be accessed from: http://lcluc.umd.edu/Documents/ScienceTeamMtg/2012\_June/springStm2012\_report.pdf

04/02/2013 : 04/04/2013, 2013 Spring Science Team Meeting, Rockville, Maryland: A record number of 150 participants—including scientists and graduate students from across the U.S. and several international participants—attended the meeting indicative of continued growth in interest about the science program. From the discussions, it was recognized for the LCLUC program to continue international efforts facilitating continued collaborations with ESA, INPE and GLP. In the meeting, Dr. Gutman emphasized that that social science remains an integral part of LCLUC studies and that the program will continue to balance activities thematically and geographically; foster generation of global land-use products for models; promote LCLUC products internally and externally through the program’s web site, the Facebook page, and LCLUC brochures; keep LCLUC proposal calls on a regular annual basis; and continue the twice-a-year Science Team meeting structure. Full meeting report can be accessed from: http://lcluc.umd.edu/Documents/ScienceTeamMtg/2013APR/EO\_July\_Aug\_2013\_508\_color.pdf

04/23/2014: 04/25/2014, LCLUC Spring Science Team Meeting 2014- Focus on Urban

LCLUC, Rockville, MD: The 2014 LCLUC Annual Spring Science Team meeting focused on Urban Land Use and Land Cover Change. Presentations at the meeting included project status updates, including methods being adopted for Urban LCLUC studies and analysis. The meeting also included discussions and updates on LCLUC international initiatives that include; NASA-NEESPI, NASA-MAIRS, and GOFC-GOLD networks (SCERIN and CARIN). In the meeting, scientists and researchers were asked to raise important questions to mitigate climate change specific to the urban systems and emissions. During the meeting, participants expressed high interest in participating and kick-starting LCLUC webinars as a means to expand the community and to increase program visibility. The feedback received on the webinars has been implemented in the subsequent months and currently on-going. During the meeting the importance of international collaborations was also realized, especially in the framework of Committee on Earth Observation Satellites (CEOS) on the land-surface imaging constellation, forming a Land

Imaging Science Team, and developing preparatory studies using Sentinel-2 and Landsat-8 data in concert. Full meeting report can be accessed from: <http://lcluc.umd.edu/Documents/ScienceTeamMtg/2014APR/EO\_JulyAug\_2014\_STM\_APR\_2014\_Report.pdf>

***Task-II. Organizing regional joint science team meetings (in different countries)***

08/25/2010: 08/28/2010, Monitoring land cover and land use in boreal and temperate natural biomes, Tartu, Estonia: The Land-Cover/Land-Use Change (LCLUC) Science Team meeting was held jointly with the GOFC-GOLD Northern Eurasia Regional Information Network (NERIN) and the Northern Eurasia Earth Science Partnership Initiative (NEESPI) in Tartu, Estonia. The focus of this meeting was on monitoring processes related to land-cover and land-use change in boreal and temperate regions of central, eastern and northern Europe. Forests and other biomes in boreal and temperate zones comprise about a half of the world vegetation cover. To study processes in the boreal and temperate ecosystems as related to climate, the workshop is was organized around 4 themes: 1.Changes in ecosystems, their composition and structure; 2.Carbon Cycle; 3.Water Cycle; 4.Human dimensions of land-cover and land-use change.

Hosted by the Tartu Observatory, with contributions from the Global Change System for Analysis, Research and Training Program (START), ScanEx Research and Development Center, and NASA, more than 80 participants repre­senting 14 nations in and around the Baltic region at­tended. The meeting provided an opportunity for scien­tists to present and discuss their research on monitoring processes related to land-cover and land-use change in boreal and temperate regions of Central, Eastern, and Northern Europe. Directly preceding the meeting (Au­gust 21-23), a training session on *Quantitative Research Methods in Human Dimensions of Environmental Change within Eastern Europe* took place that Vidzeme Univer­sity in Valmiera, Latvia hosted. Detailed information on the meeting and training session, including presenta­tions and posters is available on the LCLUC website: *lcluc.umd.edu/meetings.php?mid=15*.

11/05/2011 : 11/11/2011, Workshop on Land Cover Land Use Change, Southeast Asia, Hanoi, Vietnam: The Land-Cover/Land-Use Change (LCLUC) Science Team meeting was hosted by the Hanoi University of Agriculture in Vietnam. The focus of the science meeting was on aspects of land-cover and land-use change of relevance to the S.E. Asia region and the global change research community. The Center for Research and Ecological Studies of Hanoi University of Agriculture hosted the meeting, with contributions from the START program; Vietnam Forestry University (VFU); University of Maryland, College Park (UMCP); Michigan State University (MSU); the East-West Center (EWC); and NASA. More than 100 participants representing eight countries attended the meeting. The goals of the meeting were to review LCLUC research conducted throughout Southeast Asia (SEA) by regional and international scientists, and to discuss the availability of satellite datasets and new research methodologies relevant to regional analysis. Research was presented around four major themes: a) regional trends in land-cover and land-use change (forests, agriculture, urban) and remote sensing methods, b) the patterns and process of peri-urban development; c) carbon monitoring, reporting and d) verification and land-atmosphere interactions. More details about the meeting outputs can be found on the LCLUC webpage: [*http://lcluc.umd.edu/meetings.php?mid=21*](http://lcluc.umd.edu/meetings.php?mid=21)*.* After the meeting, from November 9-11, 2011, two concurrent workshops were organized in collaboration with local universities to train participants in LCLUC analysis, with emphasis on combining remote sensing, ground, and census data to describe afforestation, deforestation, and urban sprawl—all of which are major land-cover changes occurring in the region. The first workshop, cohosted by the VFU and the Vietnamese Ministry of Agriculture and Rural Development (MARD), addressed remote-sensing and field-based estimation of C-stocks in tropical forests. More than twenty scientists from Vietnam, Indonesia, China, Thailand, Laos, Russia, and the U.S. participated in the training. This two-day gathering included both training in field-based data collection and computer laboratory work on remote sensing analytical techniques to quantify carbon in forest and agroforestry systems. Full meeting report can be accessed from: http://lcluc.umd.edu/Documents/ScienceTeamMtg/2011\_11/meetingreport\_viet.pdf

01/07/2013 : 01/08/2013, A Special Focus Meeting on “LCLUC and water resources in coastal zones and Western Ghats” CWRDM, Calicut, Kerala State, India and 01/10/2013 : 01/13/2013, International LCLUC Regional Science Meeting in South Asia, Coimbatore, Tamil Nadu, India: The 2013 NASA Land Cover/Land Use Change (LCLUC) Regional Science Meeting was held in South India and had three components: a) a focused workshop on water resources at the Centre for Water Resources Development and Management (CWRDM), held in Kozhikode, Kerala in India, from January 7-8, and a Land Use (LU) Transect Study from Kozhikode, Kerala, to Coimbatore, Tamil Nadu, in India 1 on January 9; b. a NASA international regional meeting, held January 10-13, at Karunya University in Coimbatore, Tamil Nadu; and c) a training workshop titled Remote Sensing and Geospatial Technologies for Land Cover and Land Use Change Studies and Applications, held January 14 at Karunya University. The goal of the meeting was to discuss LCLUC issues and impacts in the South Asia region. The meeting was organized around eight technical sessions: 1) Agricultural land-use change; 2). LCLUC-related Earth observations (missions, data, and products); 3) Atmosphere/land-use interactions (aerosols, greenhouse gases); 4). LCLUC and the carbon cycle; 5) Forests and LCLUC in mountainous areas; 6) Coastal zones and water resources; 7) Urban LCLUC; and 8) working towards a Regional Global Observation for Forest and Land Cover Dynamics (GOFC–GOLD) South Asia Regional Information Network (SARIN) (including prospects, opportunities, and challenges). More than 100 participants attended the meeting. The meeting was highly successful as it led to the formation of new initiative entitled “South Asia Research Initiative (SARI)”. As meeting outputs, a special issue of papers has been published in the Journal of Environmental Management. The training workshop took place on January 14th at the Karunya University. Nearly 130 participants attended the training. The following topics were discussed: Fundamentals of emote sensing and geospatial technology; advanced tools, methods, and data products for land use and land cover, air pollution and applications; environmental modeling and land-use and land-cover change and its impact on biogeochemistry (carbon and nitrogen) and biogeophysics (water and thermal energy) in Asia; and data, methods, and tools for Earth observation for studies pertaining to global croplands, cropland water use, and food security. The meeting presentations can be downloaded from:

<http://lcluc.umd.edu/meetings.php?mid=40>. In addition to the report that is published in the NASA Earth Observer, a special issue of papers were also published in the Journal of Environmental Management. The citations of the same are given at the end of the report.

11/07/2013: 11/15/2013, Joint NASA LCLUC Science Team Meeting with GOFC-GOLD CARIN, NEESPI and MAIRS on Land Use and Water Resources in Central Asia: Tashkent, Uzbekistan. Sustainable land and water resource management under a changing climate is one of the greatest challenges in Center Asia. The nations in the Central Asia region are heavily dependent on fragile drylands and limited arable lands and water resources that are changing as a result of extensive agricultural exploitation. Changes in land use and land cover have direct implications for water use, food production, and lifestyles of rural communities in the region. This creates challenges for food and water sustainability of all nations within the region. Strategies to ensure food and water sustainability, therefore, must consider all societal, environmental and economic factors. A number of regional and international efforts have been made to understand the causes, extent, rate and societal implications of land use changes in the region, but these efforts have not been synthesized or framed effectively to address emerging issues. This LCLUC Science Team meeting served as a forum to address the above issues and also on implementing NASA LCLUC programmatic objectives for developing informational scientific synthesis, as related to policy needs concerning food and water resources in the region. Presentations can be downloaded from: <http://lcluc.umd.edu/meetings.php?mid=48>. After the meeting, the TIIM Eco-GIS center organized a two-day training event for students and young investigators. It featured eight international experts from several countries, who served as trainers for the 45 participants. The training topics included: a) Introduction to remote sensing data and products; b) hydrological cycle changes over the extra-tropical land areas; c) the contemporary hydro-physical state of the Aral Sea and its impact on the coastal zones of Kazakhstan and Uzbekistan; d) geospatial analytical methods and critical data/methodological issues specific to Central Asia; e) Geo-informatics applications in Central Asia; and f) remote sensing techniques for monitoring land-use and land-cover change, including irrigation and salinity issues in Uzbekistan.

*10/16/2014: 10/22/2014: International LCLUC Regional Science Meeting in Central Europe, Sopron, Hungary:* The purpose of this International LCLUC Regional Science Meeting was to provide a multidisciplinary, inter-sectoral and international forum, to bring scientists and agencies together to discuss the land-cover and land-use change (LCLUC), its driving forces and impacts with a regional focus on Central Europe. Overview presentations included recent research accomplishments and the state of the art on these topics in Central Europe, applications development needs and future research directions for the region. The workshop is organized around 5 themes focused on theuse of earth observation data: i).Land cover and water management interactions; ii).Forest dynamics, water and climate change; iii) Land cover and land use change; iv).Land use in mountainous regions; v).The role of institutions in land cover change. The meeting helped in bringing together scientists from the Central-Eastern European region, USA and Europe involved in remote sensing, agriculture, forestry, hydrology, biodiversity, as well as researchers involved in building decision support systems for natural resource management. The presentations and brainstorming discussions focused on integrating top-down and bottom-up methodologies for LCLUC research and associated climate, social and economic impacts. In addition, the University of West Hungary, Faculty of Forestry organized the training involving students and early career researchers. Nearly 30 participants attended the training which included topics on: a) remote sensing applications; b) fire research and applications; c) Sentinel data processing; d) MODIS and Landsat Time series data processing; and e) Tools and techniques for processing high-resolution satellite imagery. The training helped in capacity building with respect to LCLUC science in the Central-Eastern Europe.

The meeting outputs are posted at

<http://lcluc.umd.edu/meetings.php?mid=57>.

***Task-III. Providing science guidance and aiding in the development of the new LCLUC proposal calls and reviewing proposals:*** As a part of this task, PI assisted in the development of LCLUC- -2013 Early Career Scientists’ call, ROSES-2014 LCLUC and ROSES-2015 NESSF proposals. The details of these documents can be found at: http://lcluc.umd.edu/index.php

***Task-IV. Outreach component (LCLUC website, Program brochures, international liaison, etc.):*** The NASA LCLUC website (<http://lcluc.umd.edu/index.php>) is being updated in a timely manner with reference to the latest LCLUC news, ROSES solicitations, LCLUC related calls from the other international programs, opportunities for the early career scientists, new satellite launch information relating to LCLUC, etc. in 2013 we developed a Brochure which can be found at:

<http://lcluc.umd.edu/program_information.php?tab=6>.

Under this task the a Webinar Series was developed and implemented. Details can be found at <http://lcluc.umd.edu/static/lcluc_webinar_2014.php> and http://lcluc.umd.edu/static/lcluc\_webinar\_2015.php

**II). Support for the Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD): Fire mapping and monitoring program office:** As a part of this activity, the following tasks have been implemented:

A). GOFC-Fire IT website updates: The UMd GOFC fire website (www.gofc-fire.umd.edu) is continuously updated with the user feedback to include latest meetings, regional network information, and several resources (satellite resources, data provider resources, documents and publications and other international programs).

B). Inputs to the United Nations Economic Commission for Europe (UNECE)- Food and Agriculture Organization (FAO) – Forestry and Timber Section on Fire related matters: GOFC GOLD Fire IT is a part of UNECE-FAO- Forestry and Timber Section and provides inputs for fire related matters. As a part of part of strategic review of their program, UNECE/FAO sent out a questionnaire requesting feedback on programmatic matters. GOFC-Fire IT although not fully involved all aspects of the program, provided specific inputs on fire related matters. The inputs will be used for technical aid to countries in disaster management.

C). GOFC-GOLD Fire-Implementation Team (IT) project office activities: Some of the Fire-IT activities that are pursued during the project period include: a). Global burnt area validation protocols and implementation: continue helping validation of burnt area products, especially GCOS T37 protocol and accuracy assessment; b). Global fire danger including early warning and risk: encourage the international teams (Europe and Canada) to continue develop fire EWS products through engaging in scientific workshops, symposia; c). Regional network issues including capacity building and data accessibility: through international workshops and training; d). Long-term data record (LTDR) generation: pursue this activity and CEOS T-35 action plan documents; e). Global Fire validation teams: through field verification and experiments; f). User outreach and feedback: through updates on the GOFC REDD sourcebook and promoting involvement of GOFC regional networks in the process; g). Data requirements for ECV's: complete GCOS templates for different fire action items. Update information on ECV T13 document; h). New fire related missions and products: continue to provide technical guidance to the Space Agencies on new fire related missions such as VIIRS, SENTINELS, TET-1, BIROS, etc. In addition to the above, GOFC-Fire IT office is working with the Space Agencies to continue to provide validated fire products; strengthening the Global Geostationary Fire Network through operational production of fire products from Geostationary Operational Environmental Satellites (GOES), Multifunctional Transport Satellites (MTSat), Meteosat Second Generation (MSG), and inclusion of data from other international geostationary systems; refinement of fire emissions products by integrating top-down and bottom up approaches; expanding the fire component of the GOFC-GOLD REDD Sourcebook; providing Space Agencies with requirements for and technical input on new fire related missions; funding for strengthening the programs regional fire network activities, including organizing training programs, regional data validation activities and improved data access.

During the project period, the following international workshops have been organized

involving regional networks and Fire researchers from different parts of the world.

**1). The GOFC-GOLD-Fire Mapping and Monitoring Implementation Team Meeting, College Park, MD, 29 – 31 July 2014:** The GOFC-Fire-IT meeting was held for 2.5days, during July 29-31, 2014. The meeting was hosted by NOAA in the Conference Center at the NOAA Center for Weather and Climate Prediction (NCWCP) in College Park, MD. The meeting was co-sponsored by START (SysTem for Analysis, Research and Training) and the University of Maryland-College Park. The overall goal of the meeting was to promote collaboration among the US and international researchers focusing on satellite remote sensing of fires. The purpose was to review the current progress, recent developments and future prospects of satellite based fire monitoring and science for forest/natural resource management and other applications. Specifically, the meeting focused on reviewing the current progress of new satellite fire sensing systems, e.g. Suomi NPP VIIRS, ESA Sentinels and TET data processing /products. Also, several GOFC-Fire-IT thematic issues were reviewed including: a). Active fires and burnt area characterization from polar and geostationary satellite data; b). Calibration and validation of satellite fire products; c). Global geostationary network and fire products; d).Fire observations from new satellite instruments – algorithms and refinements; e).Fire radiative energy products from polar and geostationary data; g).Global fire early warning system; h).Fire management with focus on reducing emissions from deforestation and forest degradation activities and i).Satellite fire data outreach, dissemination and activities –requirements and challenges. GOFC-Fire IT meeting was highly successful in bringing the researchers together to review the current progress and latest developments in satellite fire sensing systems e.g. Suomi NPP VIIRS, ESA Sentinels and TET data including calibration and validation of satellite fire products. GOFC-Fire-IT will continue to a).promote open data policies and free sharing of earth observations data for scientific research; b). promote generation of higher order fire products from different satellites; c). support the regional fire networks and develop capacity building programs on the use of satellite fire data; d). coordinate with international agencies to develop best practices and protocols of fire observations in support of the essential climate variables, UN REDD and international Conventions; e). facilitate satellite fire data outreach, and dissemination activities. The presentations can be downloaded from <http://gofc-fire.umd.edu/meeting/static/GOFC_Fire_IT_2014/index.php>. *More details can be accessed from the* Earth Observer report (Vadrevu et al., 2015).

**2). GOFC-Fire IT meeting during the 3rd GOFC-GOLD Land Monitoring Symposium, 15 – 19 April 2013, Wageningen, The Netherlands:** Through oral / poster presentations, and working sessions, the Symposium reviewed the recent research accomplishments in the global land cover and forest monitoring in the arenas of research, implementation, support of international assessments, and capacity development in developing countries. The symposium was co-hosted by CIFOR, Wageningen University, CEOS Cal/Val working group, GCOS, GEO and START. The main objectives of the event included presentations, discussions and synthesis of achievements of the on-going GOFC-GOLD (Implementation Teams (IT), Working Groups (WG), Regional Networks (RN)) and partners activities. The Fire-IT meeting was organized as a part of the GOFC-GOLD Symposium that included other meetings that focused on land cover, biomass, the United Nations Collaborative Program on Reducing Emissions from Deforestation and Forest Degradation (REDD), and the GOFC-GOLD regional networks. Participants in the Fire-IT meeting reviewed current progress, recent developments, and future prospects for Earth observations for fire science and applications. In summary, discussions among the workshop participants highlighted the need for: International space agencies to provide validated fire products of known accuracy; strengthening the Global Geostationary Fire Network through operational production of global fire products; refining fire-emissions products by validation and by integrating/reconciling top-down and bottom-up emission estimation approaches; expanding the fire component of the GOFC-GOLD REDD Sourcebook; providing space agencies with requirements for and technical input on new fire-related missions; and funding for strengthening regional fire network activities, including organizing training programs, developing regional data validation activities, improving satellite data access, and establishing and developing cooperation with other regional networks. The meeting was successful in bringing experts together to discuss the latest topics in satellite fire research. Presentations can be accessed at [*gofc-fire.umd.edu/meeting/static/Netherlands\_2013/index.php*](http://gofc-fire.umd.edu/meeting/static/Netherlands_2013/index.php)*. More details can be accessed from the* Earth Observer report (Vadrevu et al., 2014).

**3). GOFC-Fire Implementation Team Meeting held in conjunction with the Fire-Climate Change Initiative (Fire-CCI) Workshop, Stresa, Italy, 17-19 October, 2011:** The workshop reviewed the current progress, recent developments and future prospects of fire science/applications and the associated GOFC-GOLD Fire implementation team (IT) related activities. 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 a). The participating space agencies to continue to provide validated fire products; b).strengthening the Global Geostationary Fire Network through operational production of fir 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; c).refining fire emissions products by integrating top-down and bottom-up approaches; d).expanding the fire component of the GOFC–GOLD Reducing Emissions from Deforestation and Forest Degradation (REDD) Sourcebook; e).providing the participating space agencies with requirements for and technical input on new fire-related missions; and f).funding to strengthen the program’s regional fire-network activities, including organizing training programs, regional data validation activities, and improved data access. The presentations and meeting outputs can be accessed from http://gofc-fire.umd.edu/meeting/static/Stresa\_meeting\_Oct\_2011/index.php.

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**Grant related publications**

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* Krishna Prasad Vadrevu, Csiszar, I., Roy, D., Giglio, L., Gutman, G., and Justice, C. Summary of the 2014. GOFC GOLD Fire Implementation Team Meeting. The Earth Observer. 27(1)29-33.
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