



Welcome to the:

***Twenty-Eighth Tactical Fire Remote Sensing
Advisory Committee (TFRSAC) Meeting***

Hosted By:

USDA-Forest Service: Everett Hinkley

NASA Applied Science Program: Vince Ambrosia

14 December 2017

NIFC

Boise, ID

Introductions: All



Name:

Organization Affiliation:

**Role at Meeting: (PI Presenter, Cheerleader,
etc.)**

What Are You Looking Forward to This Week?

Objective / Goals of TFRSAC Meeting



OBJECTIVES

- Inform on the various earth observations of wildfire by community partners; both from airborne and orbital assets; Help to increase awareness of use of data / info.
- Inform on partner affiliated programs (NASA, USFS, JFSP, DOI, Universities, Private orgs., etc.);
- Encourage Collaborations!

GOALS

- Build new relationships / knowledge;
- Be exposed to new ideas / concepts; Learn something new today!
- Walk away from the meeting with a sense of accomplishment and excitement for the coming year!
- **Be relaxed and have fun while learning!**



TFRSAC Schedule: 14 December (AM)

8:30 AM

Meeting start

Morning Session (20 Minutes Each)

Welcome and Introductions / Logistics
View from NIFC / National IR Program
CALFIRE Update
NASA Outlook

Ambrosia / Hinkley
Tom Mellin
Jana Luis
Vince Ambrosia

10:00 AM

Break (15 min)

10:15 AM

Resume Morning Session (20-25 minutes each)

Forest Service Update
AMS Update
Forest Service UAS Activities
Dept. of Interior UAS Update
Update: Thermal Working Group Activities

E. Hinkley / L. Elenz
Quayle, Smith, Kaz, Buechel
Quayle / Riley
DOI Representative
Hawkeye Team

12:00 PM - 1:15 PM

Lunch

TFRSAC Schedule: 14 December (PM)



1:15 PM Afternoon Session #1 (20-25 minutes each)

UMd / NASA UAS Fire Imaging Test
Android Tactical Awareness Kit (Colorado CoE)
Wildland Fire Data Logistics Network ((Wildfire DLN)
SBIR Tech: GeoCollaborate (Live Demo)

Rob Sohlberg
Brad Schmidt
J. Aden / E. Kissel
Dave Jones

3:10 PM Break (10 minutes)

3:20 PM Afternoon Session #2 (20-25 minutes each)

Fire Detection Development Efforts
NASA DEVELOP Fire Analysis Efforts
Wildfire Remote Sensing Requirements
Pyro-convection from Geostationary Satellites (25)
Machine-Learning Mediated Smoke Detection (25)

Rob Sohlberg / Predator B
L. Fifer / T. Ball
Jenna Williams
ALL
Dr. David Peterson
Dr. C. Pennypacker

5:00 PM Adjourn for Day

Additional Topics on Deck (Time Permitting):

Sonoma Co. Fires: Up Close and Personal
FireMAP Research

V. Ambrosia
D. Hamilton

Meeting Logistics



Please sign-in / check your name on the attendance sheet being passed around;

Presentations will be made available to all participants (author permitting) after the meetings. We will provide a link to the access point.

POCs:

Vince Ambrosia cell: 408.666.7609

Everett Hinkley cell: 801.455.8764

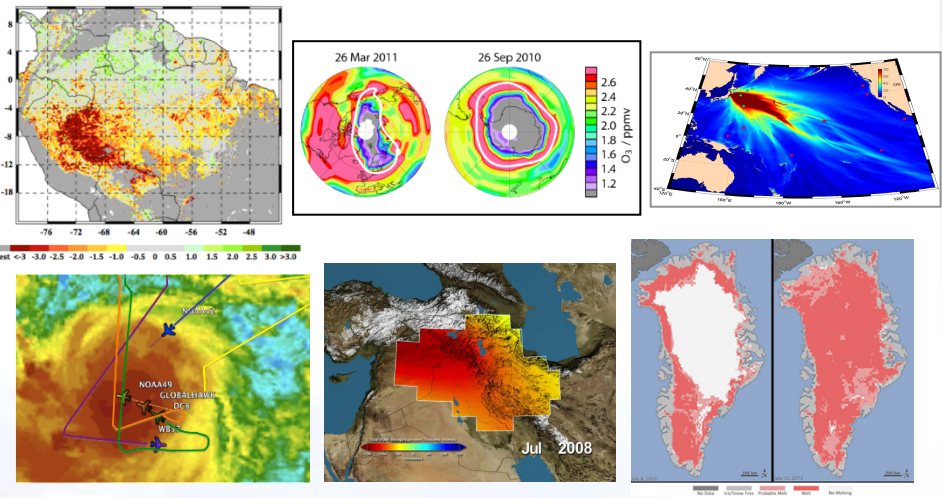


NASA Overview

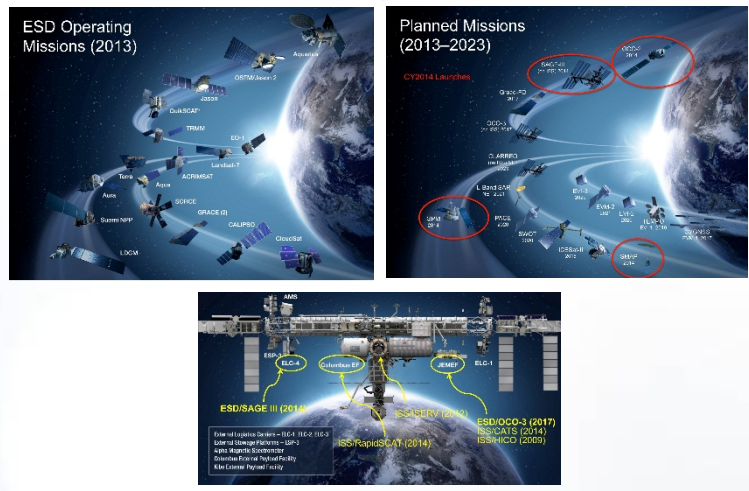
NASA's Earth Science Division



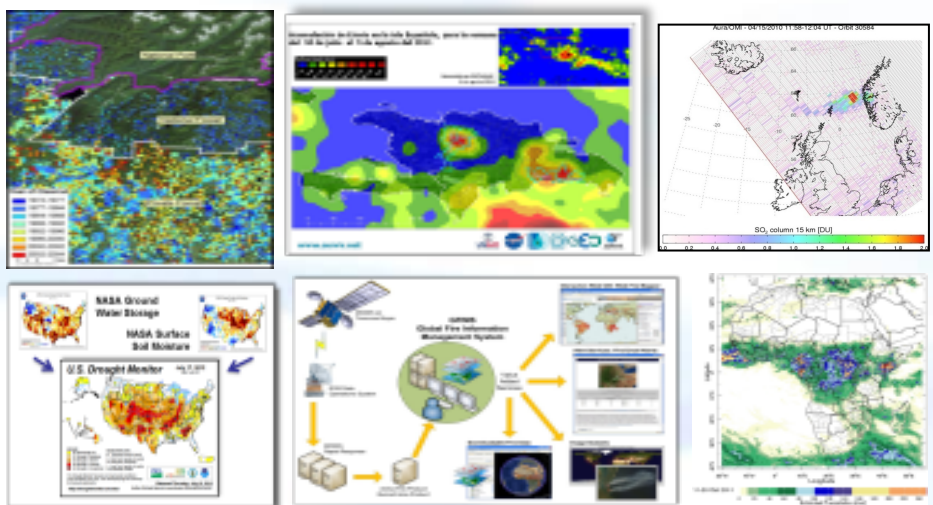
Research



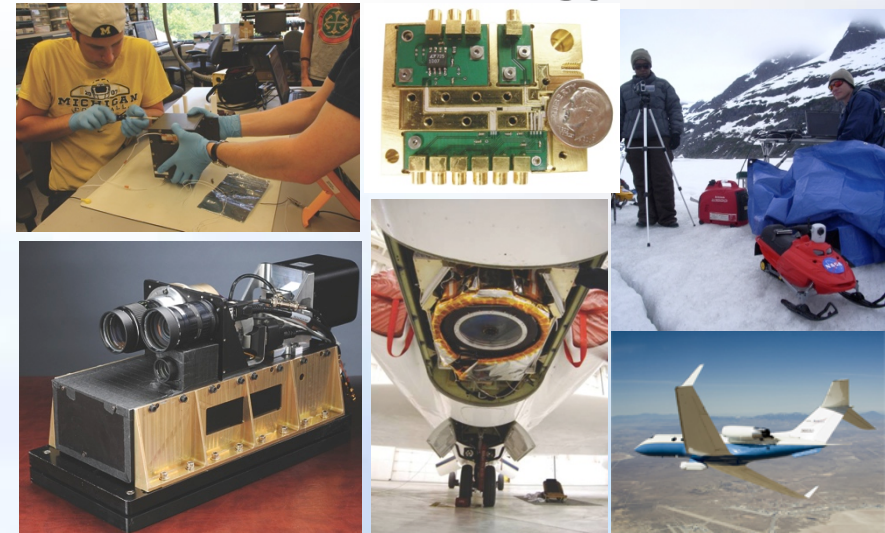
Flight



Applied Sciences



Technology



Applications Themes & Societal Benefit Areas

Emphasis in 4 Applications Areas



Health & Air Quality



Water Resources



Disasters

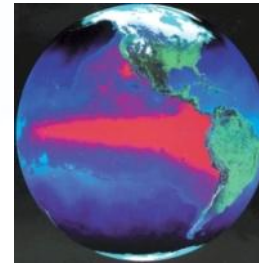


Ecological Forecasting

Support opportunities in 5 additional areas



Agriculture



Climate



Weather



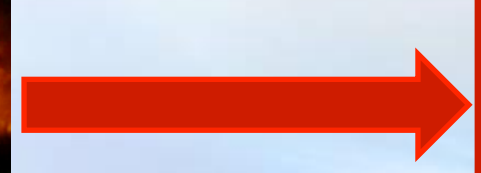
Energy



Oceans



Crosscutting theme:
Wildland Fires





Lawrence Friedl:

**NASA Applied Sciences Program Director /
Wildfire Program Manager**

Vince Ambrosia:

Associate Wildfire Program Manager

Amber Soja:

Associate Wildfire Program Manager

ROSES-2011 A.35 Phase II Projects



Zachary Holden / USDA Forest Service:

A Prototype System for Predicting Insect and Climate-Induced Impacts on Fire Hazard in Complex Terrain;

Sher Schranz / NOAA:

Wildland Fire Behavior and Risk Prediction;

James Vogelmann / USGS EROS Center

Improving National Shrub and Grass Fuel Maps Using Remotely Sensed Data and Biogeochemical Modeling to Support Fire Risk Assessments;

Birgit Peterson / USGS EROS Center:

Enhanced Wildland Fire Management Decision Support Using Lidar-Infused LANDFIRE Data;

Karyn Tabor / Conservation International Foundation

An Integrated Forest and Fire Monitoring and Forecasting System for Improved Forest Management in the Tropics;

Wilfrid Schroeder / University of Maryland

Development and Application of Spatially Refined Remote Sensing Active Fire Data Sets in Support of Fire Monitoring, Management and Planning;

Stephen Howard / USGS EROS Center:

Utilization of Multi-Sensor Active Fire Detections to Map Fires in the US;

Mary Ellen Miller / Michigan Tech Research Institute (MTRI):

Linking Remote Sensing and Process-Based Hydrological Models to Increase Understanding of Wildfire Effects on Watersheds and Improve Post-Fire Remediation Efforts;

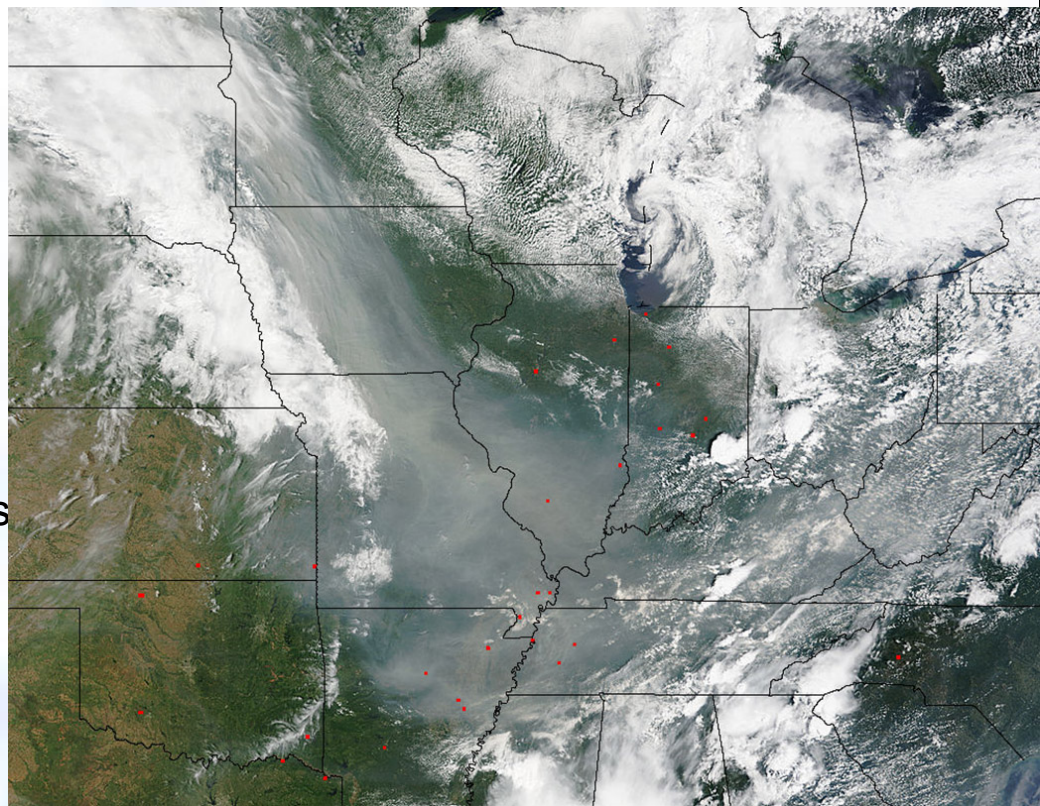
Keith Weber / Idaho State University

RECOVER: Rehabilitation Capability Convergence for Ecosystem Recovery;

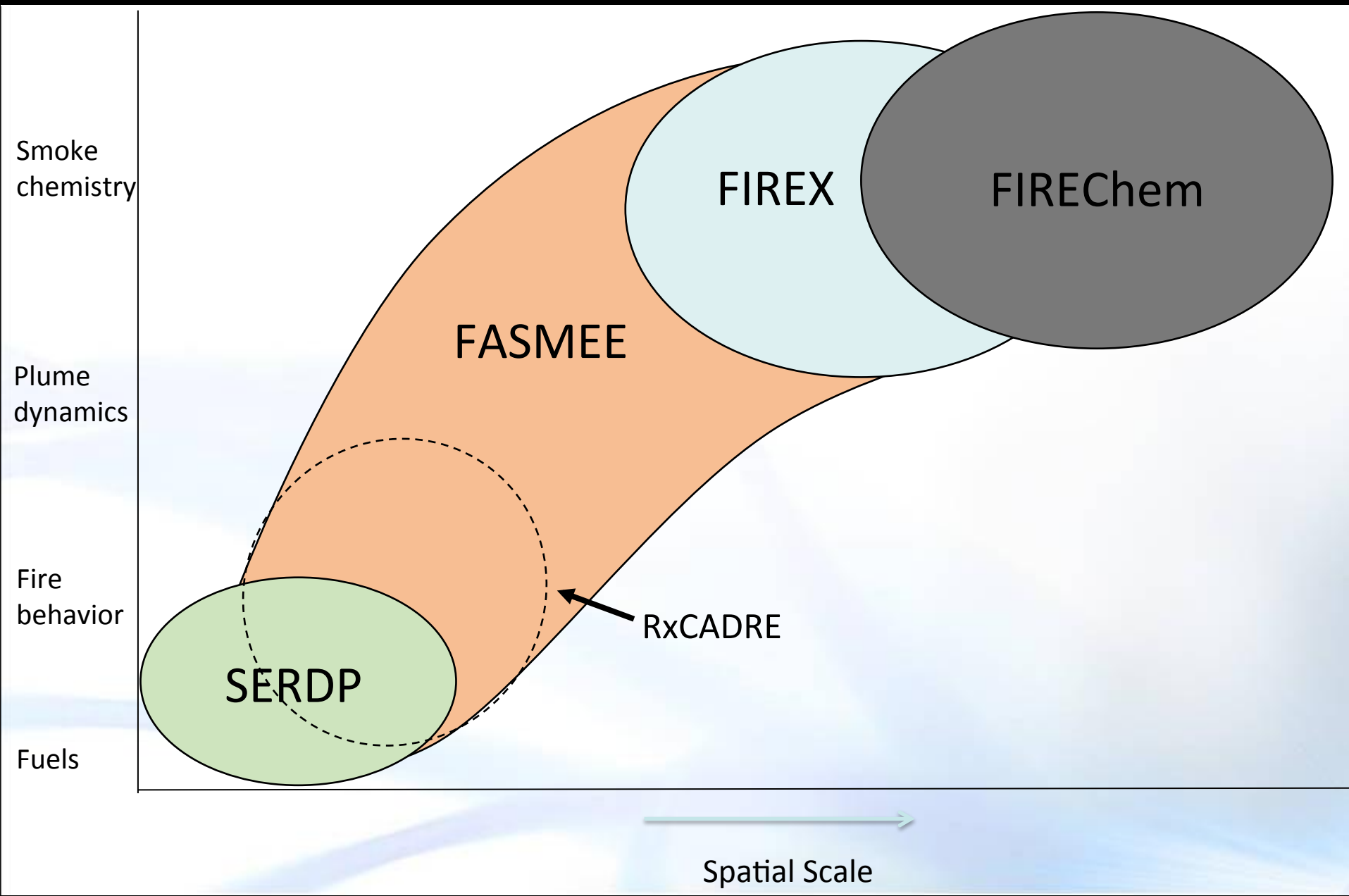
FIREChem: A Cooperative Wildfire Air Quality Field Study

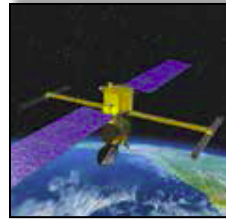


- A NASA sponsored field study (July 23rd to September 15th, 2018) to focus on the links between satellite and ground-based measurements of both fresh and aged biomass burning plumes in the continental United States.
- Coordinated sampling with the NOAA FIREX and Joint Fire Science Program FASMEE field campaigns. Coordinated aircraft flights with NOAA P-3. NASA DC-8 will be ready to sample FASMEE burn in Fishlake National Forest, Richfield, UT during first 2 weeks of Sept. 2018.
- Actively working with NSF and EPA to leverage opportunities for additional aircraft and ground-based measurements.
- FIREChem will include NASA DC-8 & B200 aircraft for *in situ* sampling and remote sensing to measure upwind and downwind of natural and agricultural fires.
- Goals: (1) improve our understanding of the transport of and chemical transformations in biomass burning plumes and their impact on air quality, and (2) improve the ability to incorporate wildfires into air quality forecast models using satellite products.



FIREChem Interaction With Other Campaigns

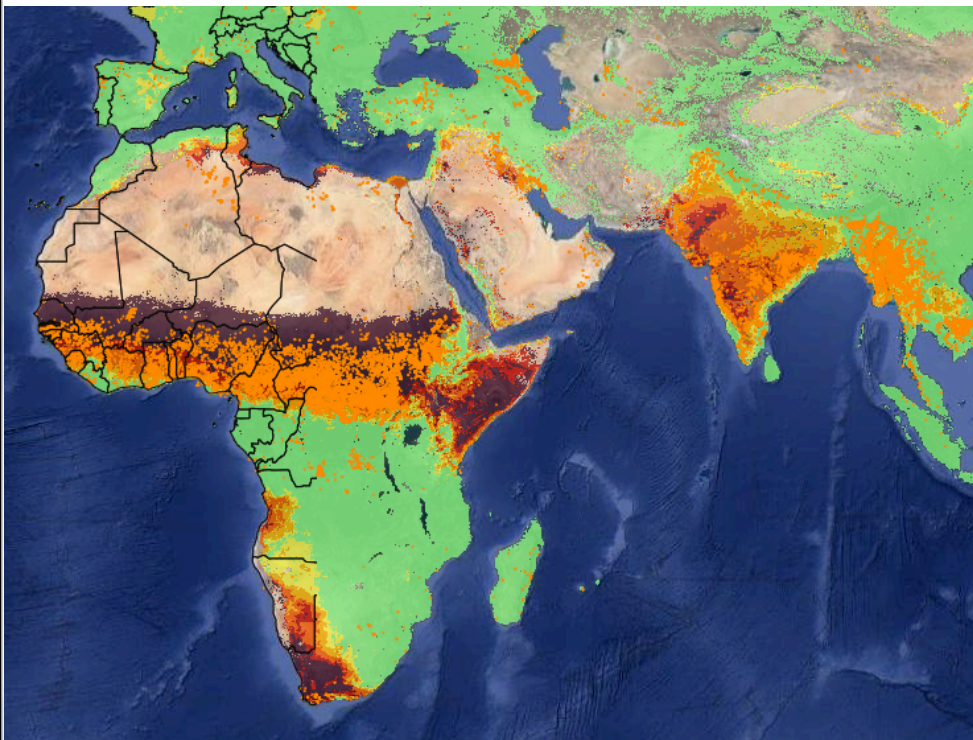




Group on Earth Observations (GEO)

GEO GROUP ON
EARTH OBSERVATIONS

Global Wildfire Information System (GWIS)



GWIS History



- The Global Wildfire Information System was developed as a proposal in October 2011 under the GOFC (Global Observation of Forest Cover) element at the GOFC Fire Implementation Team meeting in Stresa, Italy;
- In April 2013, the GWIS was conceived as a beta system under the European Forest Fire Information System (EFFIS) operated by the European Commission (EC);
- November 2013: GWIS proposed under GEO for the Work Programme 2012-2015 (by C. Justice, San Miguel Ayanz, and Gaetani);
- Adopted by the GEO WP in March 2014 and added under the DISASTERS component, Informing Risk Management & Disaster Reduction, Component C4 (DI-01-C4); GEO GWIS was
- The GWIS was continued as a GEO Initiative in the Transitional Work Programme in 2016 (GI-04), and then adopted as a continuing component of the GEO Work Programme for 2017-2019;

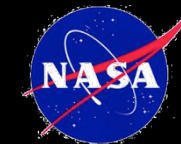


Canada (CFS), EC (JRC), South Africa (CSIR), and GTOS (GOFC-GOLD), and U.S. (NASA)

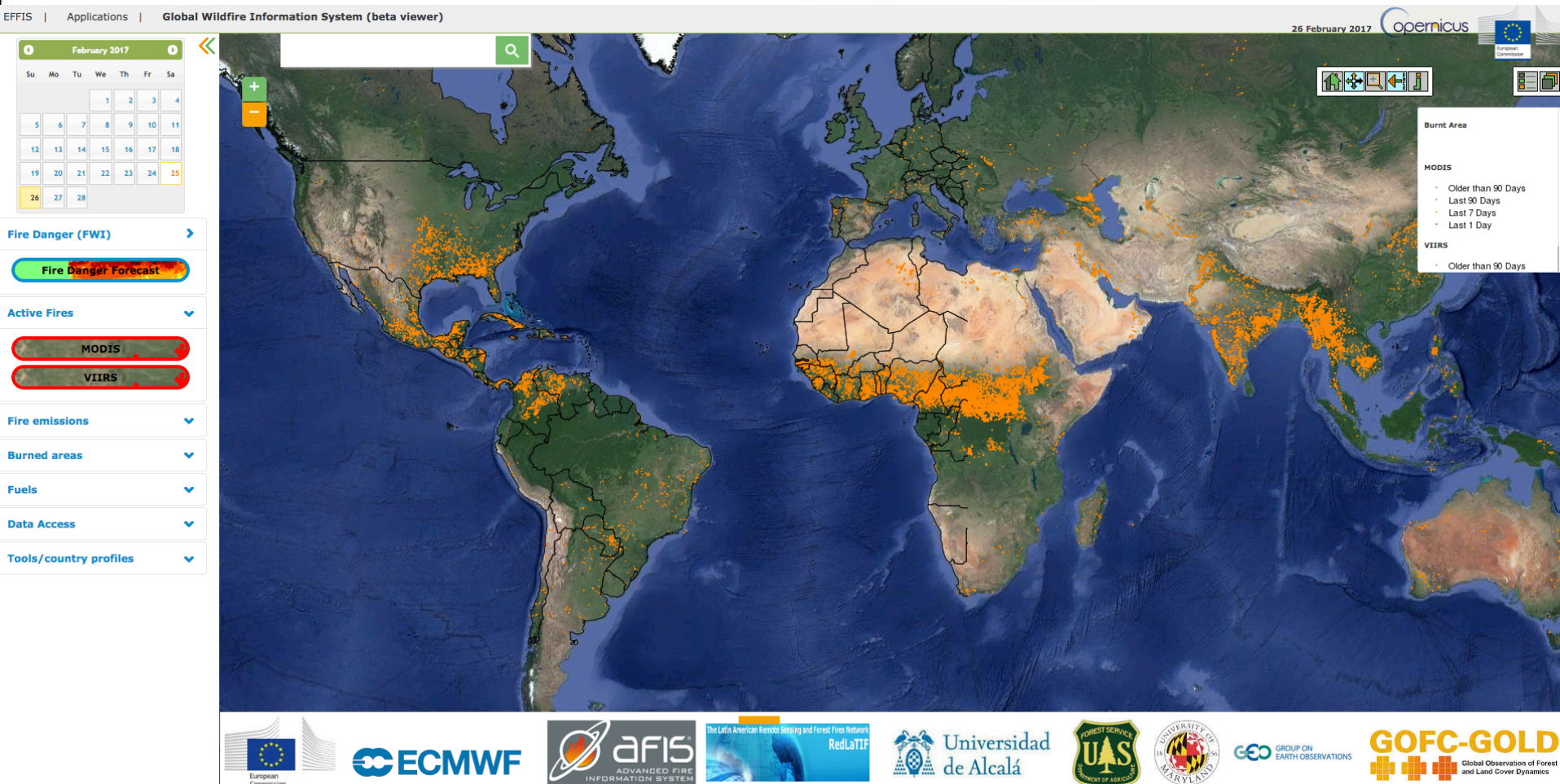
Component Leads & Contributors

- **Jesus San-Miguel-Ayanz (EC-JRC, GOFC-GOLD Fire IT), Chair**
- Krishna Prasad Vadrevu (GOFC-GOLD Fire IT)
- Antonio Martucci (FAO, NRL)
- Bill de Groot (CFS, Canada)
- Fang Chen (Institute of Remote Sensing and Digital Earth –RADI-CAS, China)
- Paolo Fiorucci (CIMA Research Foundation, Italy)
- Vince Ambrosia (NASA Applied Science Program, USA)

GWIS Prototype



GWIS prototype provides a beta web map service (WMS) viewer that includes real-time fire information sets such as Fire Danger, Active Fires, Fire Emissions, Burned Areas, Fuels, and other layers, on a global scale.



GWIS Goals in GEO WP 2017-2019



- **Provide harmonized fire information (e.g. fire danger)** – building on initial activities of the EC in the EFFIS and the GOFC-GOLD Fire Implementation Team (GOFC-GOLD Fire IT);
- **Promote networking of fire information providers through annual workshop** through key international organizations and initiatives and national and regional providers;
- **Establish operational links with other wildfire communities** dealing with global wildfire aspects (e.g. burnt area assessment, emission estimation);
- **Integrate / harmonize regional wildfire information data sources;**
- **Develop, implement and promote interoperability and communication** among national, regional and global wildfire information systems following OGC standards and the GEOSS Data Sharing Principles;
- **Coordinate / promote capacity building and training activities** in close cooperation with the GOFC-GOLF Fire IT regional networks and the EFFIS network.



A.50 Group on Earth Observations Work Programme

- Solicitation offered by NASA Earth Science and Applied Science Program
- To demonstrate a strong ability to support and advance GEO, to further U.S. and NASA interests, and to demonstrate U.S. and NASA commitments to GEO ;
- To foster broader domestic involvement in a U.S. national approach to GEO and the Work Programme;
- Advance the use of Earth observations to inform decisions and actions and broaden the organizations routinely using them;
- Increase international collaboration and partnering across GEO and broaden the GEO community;



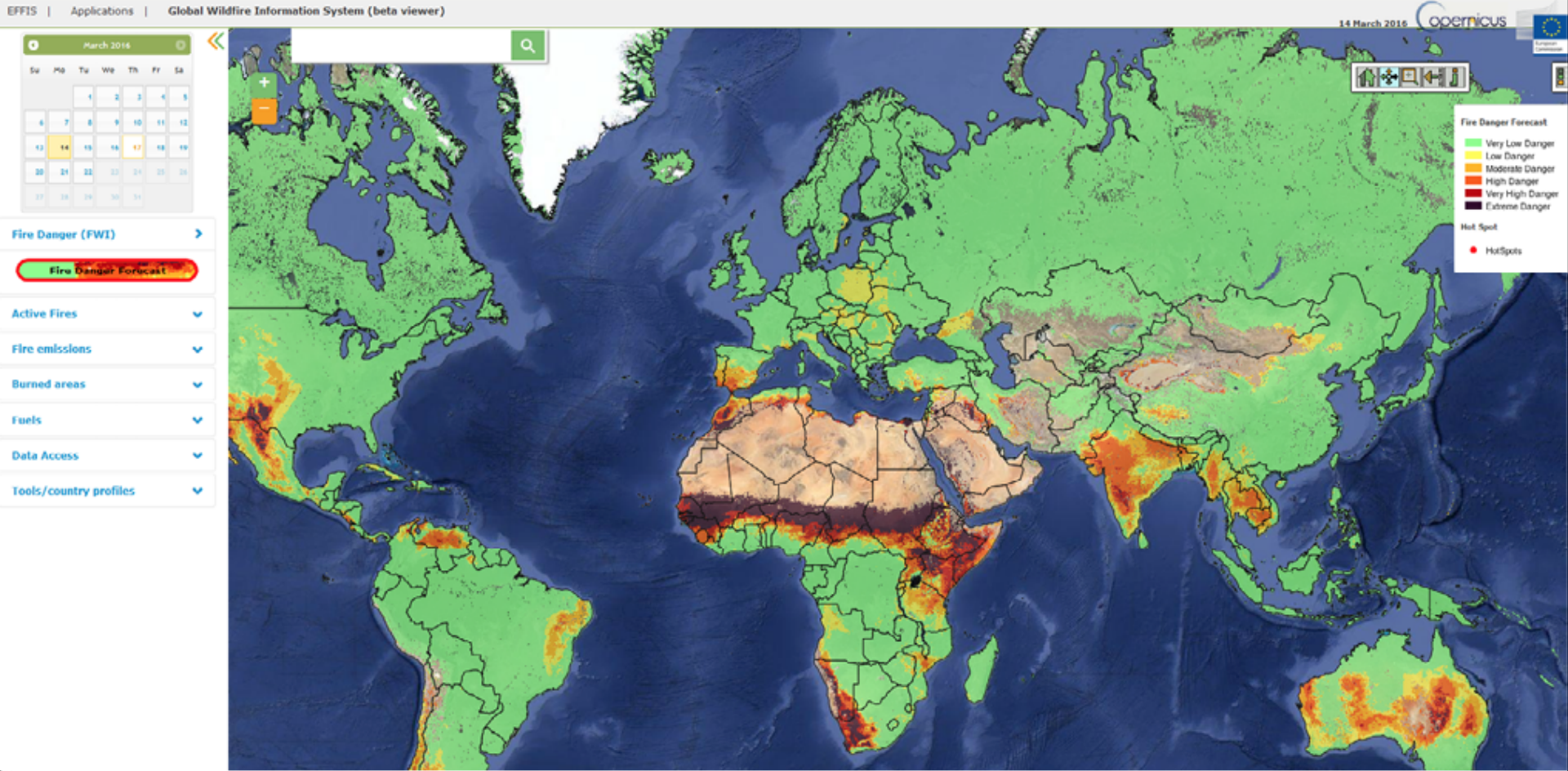
A.50 GEO Work Programme Solicitation

- **Funding Opportunity Number:** NNH16ZDA001N-GEO
- **Number of New Awards:** ~20-25
- **Max Duration of Awards:** 36 months
- **Total Amount of NASA Funding (FY17-20):** \$8M
- **Expected Level of Awards:** \$30K - \$200K per year
- **Proposal Due Date:** March 10, 2017
- **Expected Project Start Date:** 6 months after proposal due date
- **Main POC:** Lawrence Friedl
 - **GEO GWIS POC:** Vince Ambrosia









A.50 GEO Work Programme--GWIS

- **NASA requests proposals on one or more of the two items:**
 - ***Data Compilation and Analysis.*** NASA requests proposals for GWIS enhancements and tools for on-demand statistics, tabular information, and graphical information at various spatial scales (sub-national to continental) and temporal domains. Information on indices and fire variables would be derived from EO and other sources.
 - ***Workshops and Trainings.*** NASA requests proposals for webinars, workshops, and in-person trainings to increase awareness, familiarity, and use of GWIS, as well as to characterize users and identify needs. Such proposals should target NGO, indigenous, government, or commercial organizations. Proposals for onsite trainings and workshops should articulate approaches to leverage in-region resources, such as for training facilities and participant travel. NASA particularly encourages proposals focused on AfriGEOSS, AOGEOSS, and AmeriGEOSS member countries.



Fire danger forecast

- | | | |
|--|---|--|
|  Very low danger |  Moderate danger |  Very high danger |
|  Low danger |  High danger |  Extreme danger |

Hotspot



Recent & Upcoming Activities



- **NASA ASP-Wildfire Program Review Mtg**; Boulder, CO (28 Feb – 2 Mar 2017)
- **Workshop**: “*Opportunities to Apply Remote Sensing in Boreal / Arctic Wildfire Management & Science*”; Fairbanks, AK (4-7 April 2017);
- **Special Sessions at ISRSE-37**, Tshwane, South Africa (8-12 May 2017):
 - *Improving Wildfire Knowledge Through Earth Observations: From Local to Global Perspectives*;
 - *Paradigm Shift: Autonomous Aerial Vehicles Supporting Earth Observations*;
- **Earth Observations Summit 2017**: Montreal Canada; Combines the CSRS and Quebec Association of Teledetection (AQT); CA colleagues (T. Lynham) organized a Remote Sensing Workshop on: *The Role of Remote Sensing in Wildfire Management and Research* (20-22 June 2017);
- **NASA ASP GEO Solicitation (GWIS) review of submitted proposals**; Boulder, CO (30 May – June 2 2017);
- **NASA-ARC / USFS-RSAC submitted new SAA**: Provides collaboration mechanism for 2017-2022.

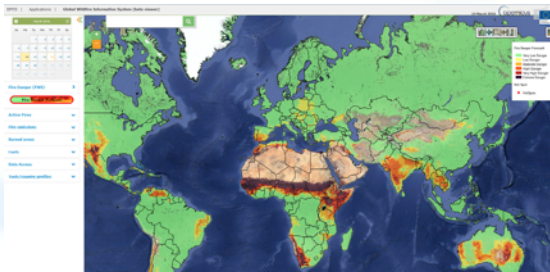
Recent & Upcoming Activities (continued)



- AFE 7th International Fire Ecology & Management Congress, Orlando, FL, Nov 27-Dec 1, 2017; NASA Exhibit and session discussion on NASA Role in the Federal Fire Science “Sandbox”
- AFE / IAWF Fire Continuum Conference, Missoula, MT May 21-24, 2018;
- Wildfire element will likely be subsumed within various programs of NASA Applied Science Program (Disasters and / or Ecological Forecasting); No wildfire-specific solicitation currently expected in 2017 or 2018.

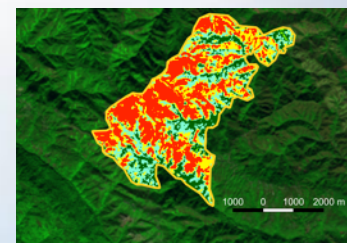
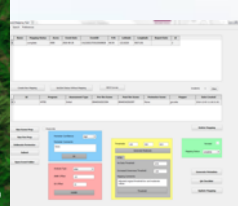
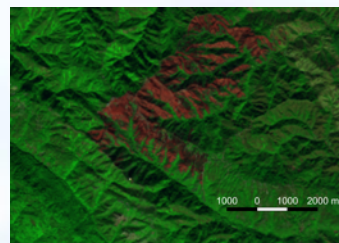
GEO-GWIS

- **Objectives:** Provide an overview of relevant uses of GWIS and navigation through the GEO-GWIS tools and map services
- **Dates:** TBD (in 2018)
- **Agenda / Schedule:** Usually one, 1-hour session per week for 5-week. Materials can be accessed on own time following the completion of the webinar
- **Audience:** National and international entities involved in wildfire management or responsible for providing fire statistics on regional or national wildfire events. Professionals interested in implementing satellite capabilities for wildfire management activities.



Burned Area Detections

- **Objectives:** Utilize an open source tool (QGIS) to download Landsat imagery to identify suitable imagers for fire mapping, and subsequently create an automatically-derived, MTBS-like threshold burn severity products. Provides a much needed tool to allow worldwide users to track and map fires.
- **Dates:** TBD (in 2018)
- **Agenda / Schedule:** TBD; Workshop in conjunction with Josh Picotte (USGS-EROS)
- **Audience:** National and international entities involved in burn severity assessment or providing fire statistics on regional or national wildfire events.





DECADAL SURVEY FOR EARTH SCIENCE AND APPLICATIONS FROM SPACE (ESAS 2017)

The 2017-2027 Decadal Survey for Earth Science and Applications from Space (ESAS 2017) will help shape science priorities and guide agency investments into the next decade. The survey, sponsored by NASA, NOAA, and the USGS, is driven by input from the scientific community and policy experts.

Research and Management

What key questions and advancements does the **Wildfires** science and applications community need to address in the next 10-15 years?

What key questions – if addressed well or answered – would make major advances in our knowledge *and* its use in decisions and actions?

What are key questions and challenges that address both scientific needs and societal decisions?

In addition to research questions and reasons for measurements, input from **Wildfires** users/managers on needs for advancement and what that impact can mean on the ground, can provide language to the Decadal Survey panels to:

- a) help with influence within panel discussions, and
- b) write more cogent, compelling rationales.

Decadal Survey Wildfire Submissions



- The Wildfire Science and Applications community submitted five (5) documents that refer to the importance of wildland fire science and applications for the next NAS Decadal Survey:
 - “Burning Questions: Critical Needs for Remote Sensing of Fire Impacts on Ecosystems” (P. Dennison, et al);
 - “Prudent Observations Necessary to Address Wildland Fire Science and Applications Grand Challenges: Critical Feedbacks with the Climate System” (A. Soja, et al);
 - “Input to NRC Decadal Survey from a Broad Audience of Remote Sensing Scientists – Air Quality-Fire Themes” (Amy Thomas, et al);
 - “Views of the Fire, Fuels, Smoke, and Air Quality Community for the 2017 NRC Decadal Survey in Earth Science and Applications from Space” (D. Sullivan, et al)
 - “The Role of Fire in the Earth System” (Stavros, et al.)



NASA Applied Science Program - Wildfire

<http://appliedsciences.nasa.gov/>

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