NASA Outlook

Vince Ambrosia & Amber Soja

NASA Applied Science Program:

9 May 2018

TFRSAC Meeting

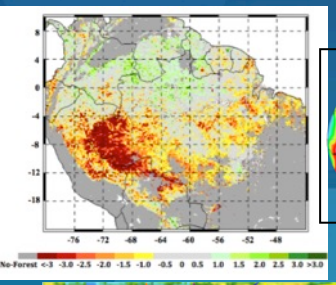
NASA Ames Conference Center (NACC)

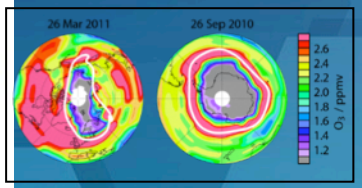
NASA Ames Research Park

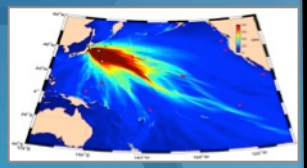
Moffett Field, CA

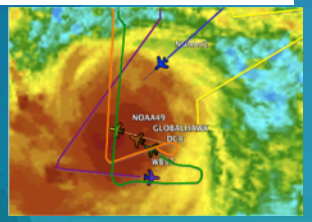
NASA's Earth Science Division

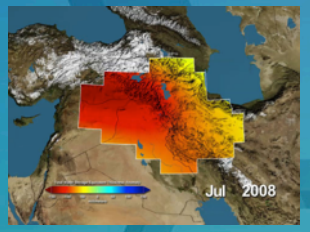
Research

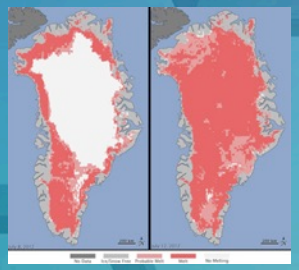






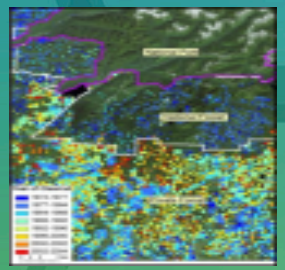


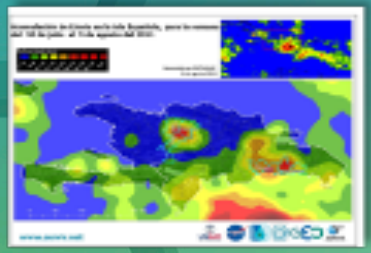


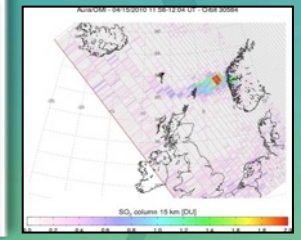


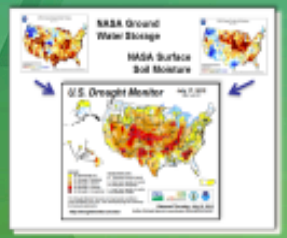
Flight

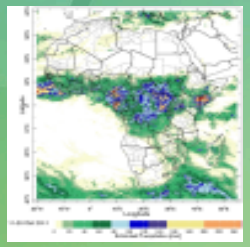
Applied Sciences



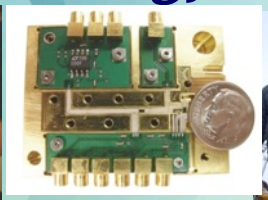


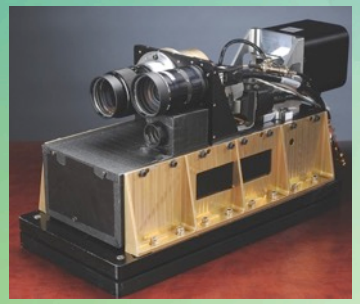


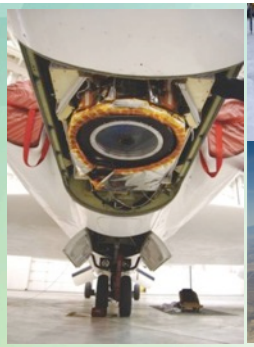




Technology







Applications Themes & Societal Benefit Areas

Emphasis in 4 Applications Areas

Health & Air Quality

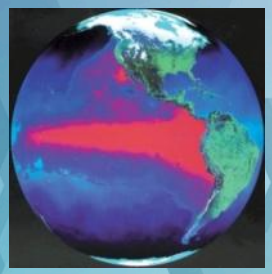
Water Resources

Disasters

Ecological Forecasting

Support opportunities in 5 additional areas

Agriculture



Climate

Weather

Energy

Oceans

Crosscutting theme: Wildland Fires

NASA ASP Wildfire Management Team

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 H… …mplex Terrain;

Sher Schranz / NOAA:
Wildland Fire Behavior and Risk Prediction;

James Vogelmann / USGS EROS Center
Improving National Shrub and Grass Fuel Maps Usi… …l Modeling to Support Fire Risk Assessments;

Birgit Peterson / USGS EROS Center:
Enhanced Wildland Fire Manag…

Karyn Tabor / Conservation In…
An Integrated Fore…
Management…

Wilfrid…
…Active Fire Data Sets in … Support of …
…to Map Fires in the US;

Ma… …earch Institute (MTRI):
… Process-Based Hydrological Models to Increase Understanding of …atersheds and Improve Post-Fire Remediation Efforts;

Keith W… …State University
RE… …: Rehabilitation Capability Convergence for Ecosystem Recovery;

- Projects Closed out September 2017 at end of 4th year of applications development;
- Most projects continuing through FY18 (till Sept 2018) via a NCE to complete their work and any SE activities they may have in augmentation.
- Applications development efforts will be highlighted at the AFE & IAWF Wildfire Continuum Conference (Special Session & Open Workshop), Missoula, MT, May 21-24, 2018.

EO Socioeconomic Impacts for Wildfire Support

Solicitation: NASA's objectives are to exercise analytic techniques and methodologies, articulate the impacts of Earth observations applications in social and/or economic terms, contribute to the body of literature, and advance cross-disciplinary connections and collaborations.

- ***Quantifying potential economic benefits of incorporating gridded fuel moisture and weather data into wildland fire decision support in the Northern Rocky Mountains.***

Zachary Holden

- ***Socioeconomic impact analysis of linking remote sensing and process-based hydrological models to improve post-fire remediation efforts.***

Mary Ellen Miller

- ***Using Earth Observations to Assess the Socioeconomic Impact of Human Decision Making during the Suppression of a Wildland Fire***

Sher Schranz

- ***Evaluating the Socioeconomic Impacts of Rapid Assembly and Deployment of Geospatial Data in Wildfire Emergency Response Planning: A Case Study using the NASA RECOVER Decision Support System (DSS)***

Keith Weber

Group on Earth Observations (GEO)

GEO GROUP ON EARTH OBSERVATIONS

Global Wildfire Information System (GWIS)

NASA ROSES-16 GEO Solicitation

ROSES 2016 A.50 GEO Work Programme Solicitation

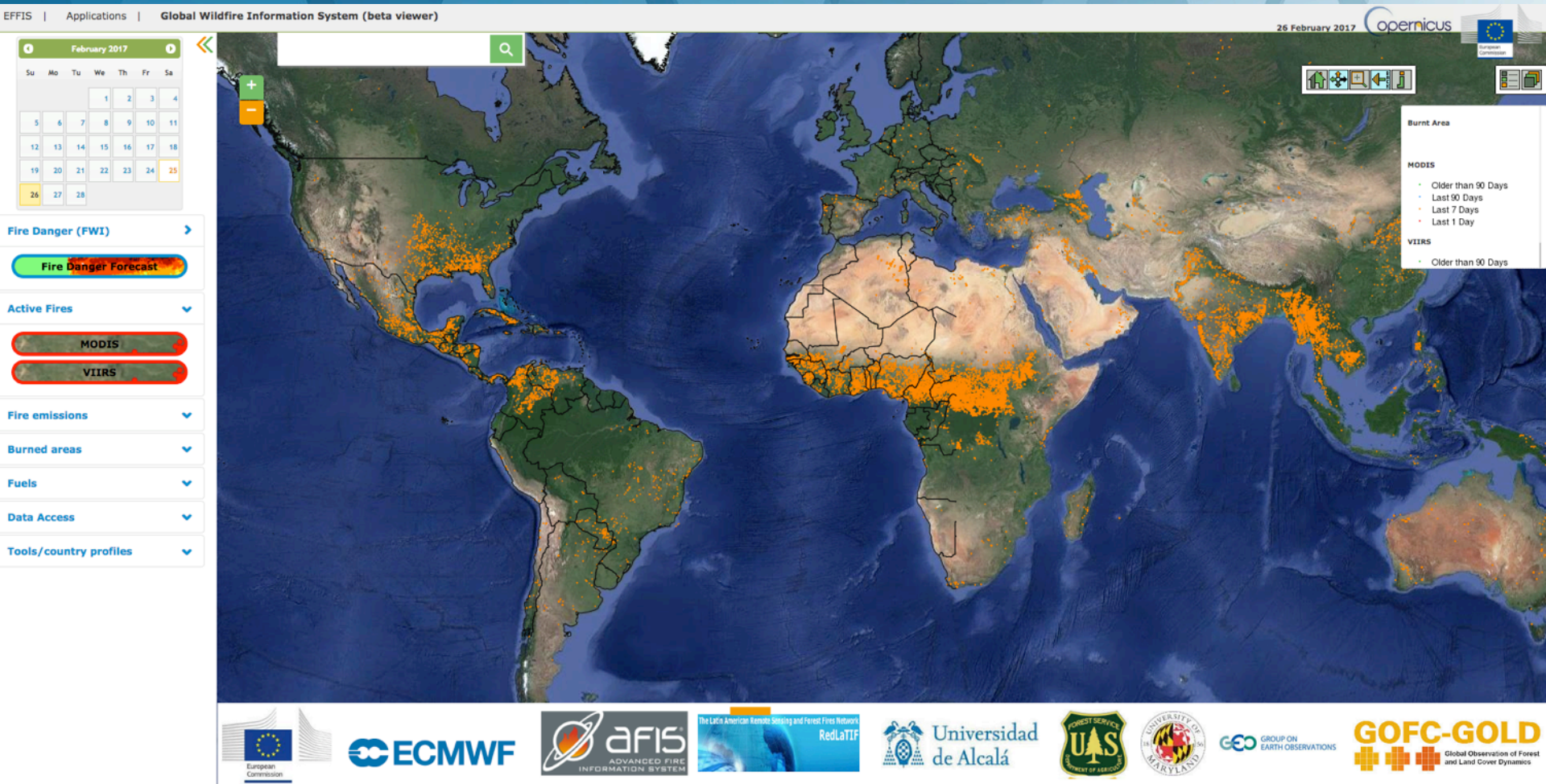
- **Funding Opportunity Number:** NNH16ZDA001N-GEO
- **Number of New Awards:** ~32
- **Max Duration of Awards:** 36 months
- **Total Amount of NASA Funding (FY17-20):** >$8M
- **Expected Level of Awards:** $30K - $200K per year
- **Main POC:** Lawrence Friedl
  - **GEO GWIS POC:** Vince Ambrosia

NASA GEO Support Solicitation

- 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;

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 History

- **Oct 2011:** GWIS developed under the GOFC (Global Observation of Forest Cover) element at the GOFC Fire Implementation Team meeting in Stresa, Italy;
- **April 2013:** 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);
- **March 2014:** Adopted by GEO and added under the DISASTERS component (Informing Risk Management & Disaster Reduction, Component C4 (DI-01-C4));
- **2016:** GWIS continued in the GEO Transitional Work Programme in 2016 (GI-04), and then adopted as a continuing component of the GEO Work Programme for 2017-2019;

GWIS Leads

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

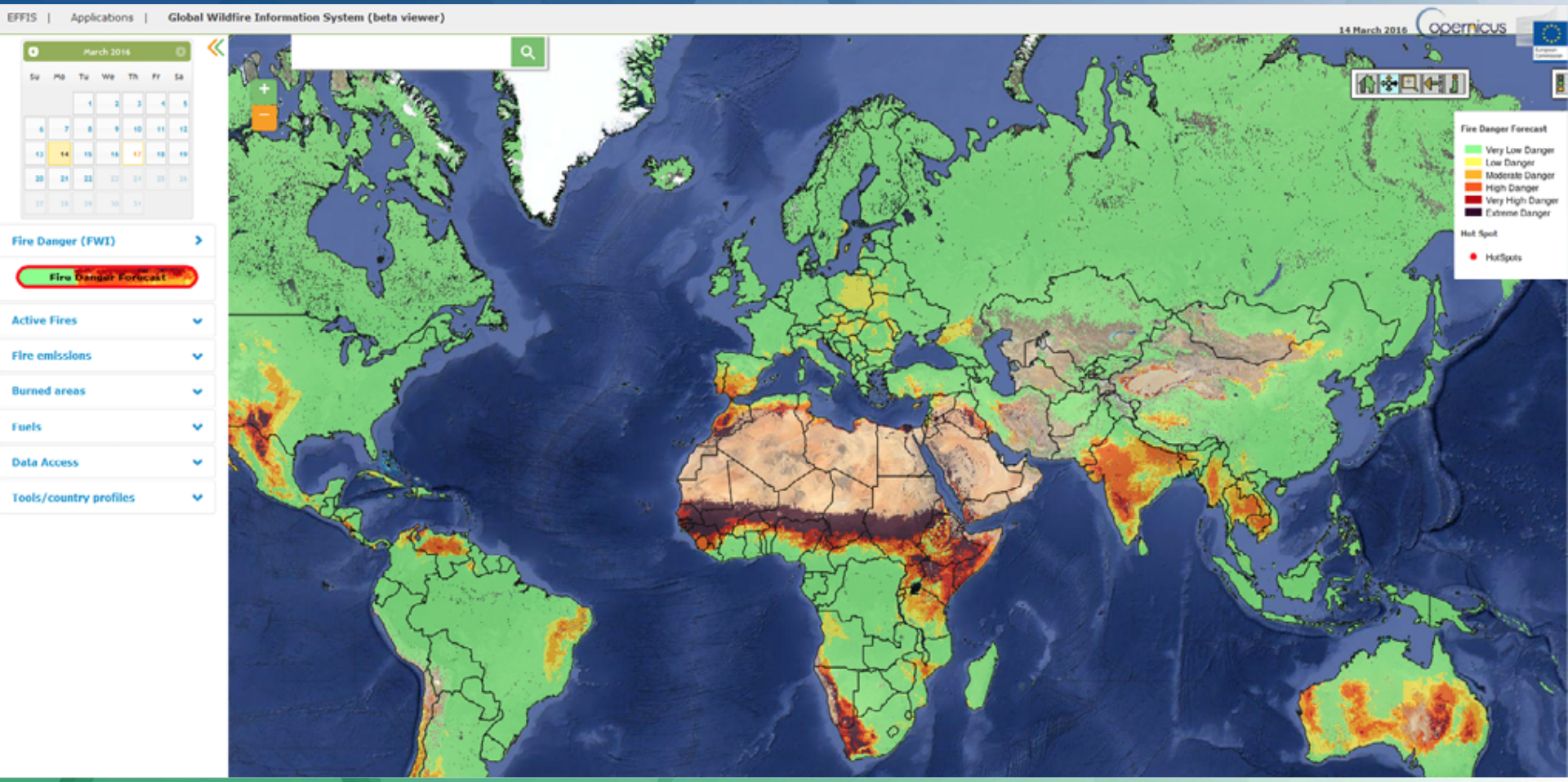
Component Leads & Contributors

- ***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 Goals in GEO WP 2017-2019

- *Provide harmonized fire information (e.g. fire danger)*
- *Promote networking* of fire information providers *through annual workshops;*
- *Establish operational links with other wildfire communities;*
- *Integrate / harmonize regional wildfire information data sources;*
- *Develop, implement and promote interoperability and communication*
- *Coordinate / promote capacity building and training activities*

GWIS WMS Beta Site



Fire danger forecast

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

Hotspot

Selected NASA GEO-GWIS Projects

A.50 GEO Work Programme

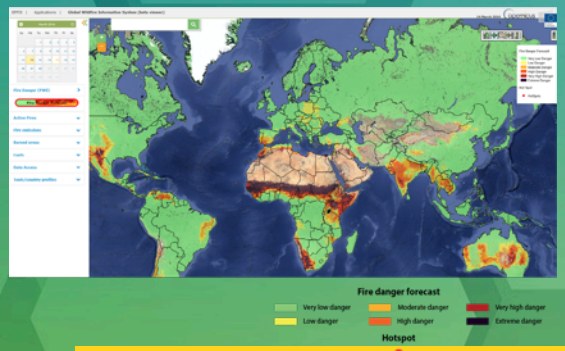
3.8 Global Wildfire Information System (GWIS)

- **Robert Field (Columbia University)**
  - *"Enhancements to the Global Wildfire Fire Information System: Fire Danger Rating and Applications in Indonesia"*
- ***Wilfrid Schroeder, et al (University of Maryland / NOAA)***
  - *"Development of a Harmonized Multi-Sensor Global Active Fire Data Set"*
- ***Luigi Boschetti / David Roy (U. of Idaho & So. Dakota State Univ.)***
  - *"Using the NASA polar orbiting fire product record to enhance and expand the Global Wildfire Information System (GWIS)"*

ARSET 2018 Wildfire Applications Webinars

GEO-GWIS

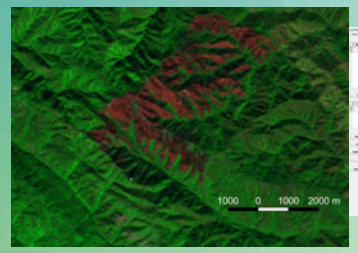
- **Objectives:** Provide an overview of relevant uses of GWIS and navigation through the GEO-GWIS tools and map services
- **Dates:** TBD (in 2018)
- **Agenda / Schedule:** Usually one, 1-hour session per week for 5-week. Materials can be accessed on own time following the completion of the webinar
- **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.

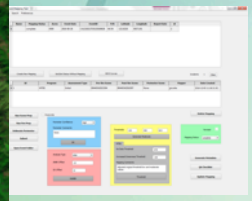


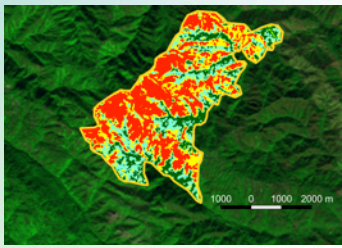
Burned Area Detections

- **Objectives:** Utilize an open source tool (QGIS; J. Picotte, USGS-EROS) 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.







https://arset.gsfc.nasa.gov

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

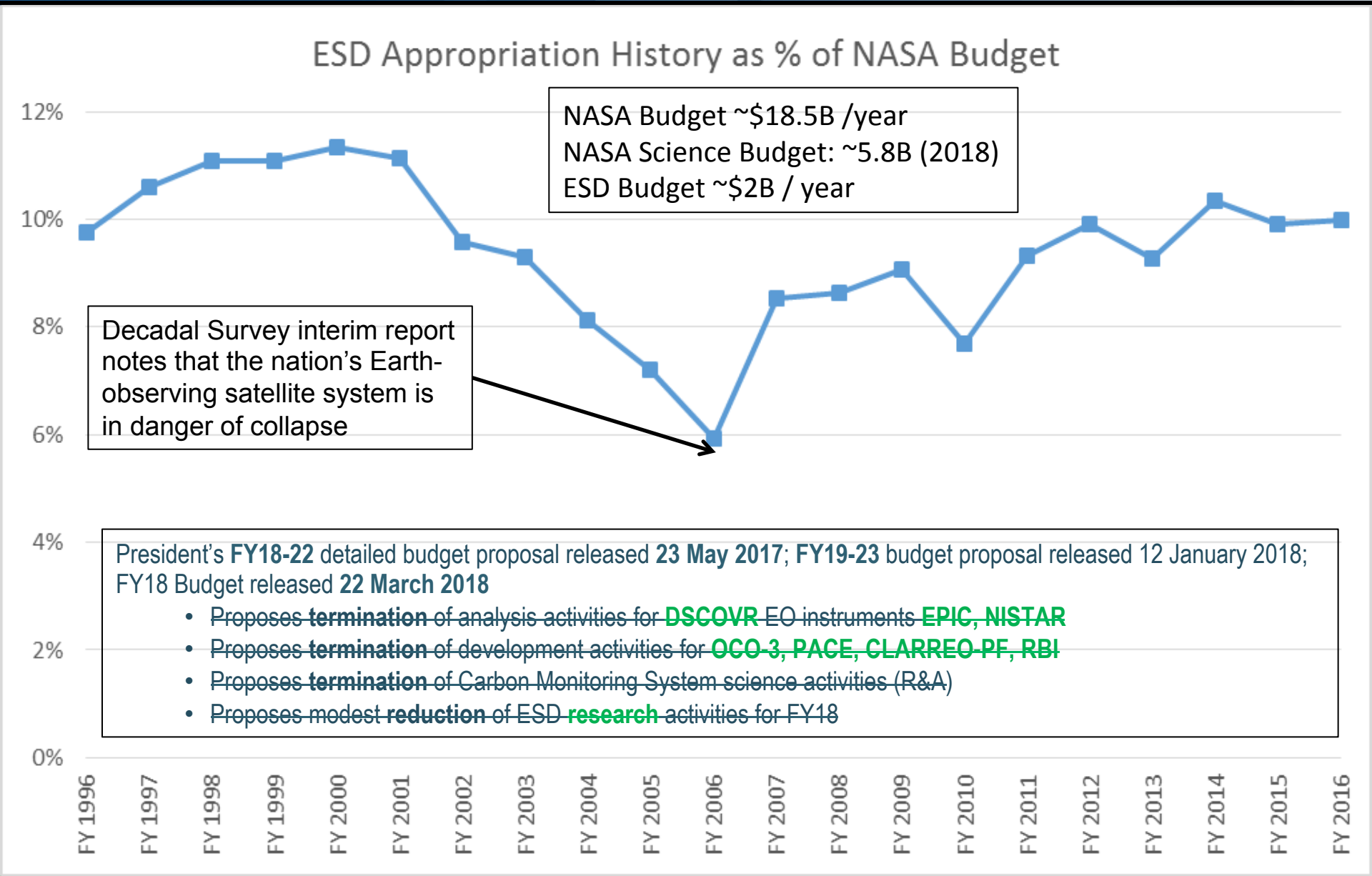
The 2017-2027 Decadal Survey for Earth Science and Applications from Space (ESAS 2017) will help shape science priorities and guide agency investments into the next decade. The survey, sponsored by NASA, NOAA, and the USGS, is driven by input from the scientific community and policy experts.

https://science.nasa.gov/earth-science/decadal-surveys

Recent & Upcoming Activities

- **Earth Observations Summit** 2017: Montreal Canada; T. Lynham organized workshop on: *The Role of Remote Sensing in Wildfire Management and Research* (20-22 June 2017); Report at:
- **AFE 7th International Fire Ecology & Management Congress**, Orlando, FL, Nov 27-Dec 1, 2017; NASA Exhibit, papers and panel session involvement by PIs and Mgt Team;
- **NASA-ARC / USFS-RSAC submitted new SAA:** Provides collaboration mechanism for 2017-2022.
- **NASA ASP ROSES-18 Solicitation Open (released 2-14-18):** "Fire" mentioned 5 times in the solicitation; Solicitation at: https://nspires.nasaprs.com/external/solicitations/summary!init.do?solId=%7bE2CB9318-72CB-C51A-6962-013E762AE713%7d&path=open
- **AFE / IAWF Fire Continuum Conference**, Missoula, MT May 21-24, 2018; NASA is a major sponsor / supporter of meeting; Special session (2), EO for Wildland Fire Workshop, & Exhibit organized by NASA; Info at: http://firecontinuumconference.org

ESD Funding Appropriations Time Series



NASA SMD Funding 2018

An 8 percent increase for NASA's Science Mission Directorates *hides considerable variation between divisions. The Planetary Science Division is receiving almost $400 million in new funding, a 21 percent increase, with much of the increase dedicated to the Europa Clipper and Lander missions, which Congress also supported in fiscal year 2017.*

The Earth Science Division budget remains flat but funding for the five missions that the administration targeted for cancellation is explicitly protected.

NASA's two next-generation astrophysics space telescopes, the James Webb Space Telescope and Wide Field Infrared Survey Telescope, are both funded at levels that will allow their development to continue.

Points of Contact

NASA Applied Science Program - Wildfire

http://appliedsciences.nasa.gov/

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