



USFS – NASA Joint Applications Workshop: “Earth Observations in Support of Forest and Rangeland Response to Changing Environmental Conditions”



Virtual Pitch Fest Agenda: June 2ND & 3RD, 2020

Introduction

The USFS-NASA Pitch Fest provides a platform to share ideas on how to close the gaps in the integration of NASA products and tools to support priority land management action areas. Representatives from NASA and the USFS will highlight key opportunity areas for increased NASA-Forest Service coordination and collaboration to support sustainable natural resource management. Participants will share and vote for ideas on working together to pilot NASA technology on priority land management scenarios.

Top ideas will be selected based on participant votes with the goal of coordinating support in the form of expertise, tools, and knowledge. Pitch Fest finalists will have the chance to work with NASA mission scientists during the 2020 USFS-NASA Joint Applications Workshop (1-3 September, 2020 / location: Salt Lake City, Utah) to refine their needs for ingesting NASA data and to establish connections and sustained support for developing the tools and methods needed to operationalize the data.

Overall, the Pitch Fest aims to enhance connections and strengthen partnerships between NASA and the USDA Forest Service and the broader resource management community in order to solve research and operational resource management challenges through careful integration of NASA Earth Observation (EO) data sets.

Pitch Fest Agenda – Day 1

Tuesday June 2, 2020

All Times Shown – Eastern Time Zone

11:00 AM Setting the Stage

Goals: Provide a background on USFS-NASA collaboration. Review goals and desired outcomes for the Pitch Fest. Introduce organizing committee and speakers.

- Welcome to the Pitch Fest – Everett Hinkley (Forest Service) – 5 minutes
- 2019 Workshop, Objectives & Goals - Erik Johnson (Forest Service) – 10 minutes
- Team and Speaker Introductions Sabrina Delgado Arias (Science Systems and Applications, Inc.-NASA GSFC) and

11:20 AM Building a bridge between NASA technology & Natural Resource Management Decision Makers

Goals: Provide perspectives from NASA and USFS on developing a strategic framework for collaboration and coordination. Review USDA Forest Service management goals and information needs. Highlight work by NASA's Western Water Applications Office (WWAO) and NASA Land Atmosphere Near Real-time Capability (LANCE)/Fire Information for Resource Management System (FIRMS)

- NASA Perspective: **Lawrence Friedl**, Director, Applied Sciences Program at NASA (10 minutes)
- Forest Service Perspective: **Cynthia West**, Executive Director Office of Sustainability and Climate/USDA Forest Service (10 minutes)
- Connecting NASA Capabilities and Water Resources Needs in the Western U. S. **Stephanie Granger**, Western Water Applications Office (10 minutes)
- Leveraging NASA LANCE/FIRMS web-based active fire mapping and data dissemination activities to optimize USFS upstream data processing framework for active fire mapping. **Diane Davies**, Brad Quayle - NASA GSFC – USFS GTAC (10 min)

12:00 PM Panel 1: Insights on Key Opportunity Areas for NASA-Forest Service Collaboration

Panel Goals: Provide perspective from NASA mission scientists and 'science-to-tools' translators on key opportunity areas for utilizing NASA technology to support the management of fire, smoke, and carbon.

Fire, Emissions & Carbon Panel // Moderated by Birgit Peterson (USGS)

Panelists

- **Andy Hudak** – USDA Forest Service
- **Grant Domke** – USDA Forest Service
- **George Hurtt**, Science Team Leader, U. of Maryland, Carbon Monitoring System (CMS)
- **Brad Quayle** – USDA Forest Service
- **Cara Farr** – USDA Forest Service
- **Sassan Saatchi** – NASA JPL (TBC)

1:00 PM BREAK (30 minutes)

Pitch Fest Begins – Session I

Goals: Participants who submitted a form during the spring Call for Ideas, pitch their ideas on how to advance the use of satellite remote sensing data to support land management decision support needs. All Pitch Fest attendees vote via live polls to prioritize key actions and low-hanging fruit opportunities.

Disturbance Resilience, Resistance, & Recovery			
Time	Idea Title	Team Members	Organization
1:35 PM	Using dynamic remote sensing for early detection of forest stress in the Sierra Nevada Mountains. (1)	Ben Soderquist, Ph.D. Troy Magney, Ph.D. Nick Parazoo, Ph.D.	U.S. Forest Service Office of Sustainability and Climate
1:35 PM	Withdrawn (33)		
1:40 PM	Operational Tool for Producing Near Real-Time Land Surface Phenology Product at 10-30m Pixels by Fusing Landsat, Sentinel-2, and VIIRS Observations for Land Management (3)	Xiaoyang Zhang	South Dakota State University
1:45 PM	Tree Structure Damage Impact Predictive (TreeS-DIP) Model/Product (4)	Renee Jacokes, Brad Quayle, Dr. Andrew Molthan, Dr. Christopher Hain, Bonnie Stine, Bill Burkman	US Forest Service, NASA MSFC
1:50 PM	Landscape conditions for adaptive management and adaptation in a rapidly changing landscape (5)	Jason Sibold, Clay Speas, Carlyn Perovich, Michael Battaglia, Jake Ivan	Colorado State University, USFS GMUG and Rocky Mountain Research Stations, Colorado Parks and Wildlife
1:55 PM	Andy Hudak leads Discussion and Q&A (10 minutes)		

Fire & Fuels			
Time	Idea Title	Team Members	Organization
2:05 PM	Remote sensing of black carbon (BC) inputs from wildland fires: refining estimates of BC production and improving landscape C simulation models (6)	Mac A. Callaham, Joseph J. O'Brien, E. Louise Loudermilk, Dexter J. Strother, Steve Flanagan, J. Kevin Hiers	USFS Southern Research Station, Tall Timbers Research Station
2:10 PM	Remote sensing for more accurate estimates of area burned in sub-canopy prescribed fires using char related spectral signatures (7)	Mac A. Callaham, Joseph J. O'Brien, E. Louise Loudermilk, Dexter J. Strother, Steve Flanagan, and J. Kevin Hiers	USFS Southern Research Station

Fire & Fuels			
Time	Idea Title	Team Members	Organization
2:15 PM	Strategic SMAP soil moisture products downscaling for integration with current USFS wildfire and prescribed burning prediction models, systems, and tools (8)	Grant Snitker, Joseph O'Brien, Mac Callaham, Matt Levi	University of Georgia, USFS Southern Research Station
2:20 PM	Coarse-scale 3D fuel mapping for operational use in next-generation fire-atmosphere fire behavior models (9)	E. Louise Loudermilk, Andrew Hudak, Steve Flanagan, Scott Goodrick, Joseph O'Brien, Kevin J. Hiers	USFS, Southern and Rocky Mountain Research Stations, Tall Timbers Research Station
2:25 PM	Microwave and optical remote sensing for fire detection (10)	Sujay Kumar, John Bolten	NASA GSFC
2:30 PM	Birgit Peterson leads Discussion and Q&A (10 minutes)		
2:40 PM	Break – Video Session (20 minutes)		
3:00 PM	Quantifying canopy bulk density and downed coarse woody fuels via optical and SAR satellite sensor data to enable wildfire modeling and risk management (11)	Peter Wolter, Brian Sturtevant, Jeffrey Kroll, Patty Johnson	Iowa State University, US Forest Service, Rhinelander, Kawishiwi Ranger District and Superior National Forest
3:05 PM	Scalable surface fuels mapping using three-dimensional remote sensing (12)	Jonathan Greenberg, Leland Tarnay, Matthew Dickinson, Eric Rowell, and Carlos Ramirez	University of Nevada, Reno, USFS, Tall Timbers Res. Station & Pacific SW Region
3:10 PM	Introducing Spatially Distributed Fire Danger from Earth Observations (FDEO) using Satellite-based Data in the Contiguous United States (13)	Alireza Farahmand; Natasha Stavros; JT Reager	NASA JPL; Raytheon
3:15 PM	Evaluating Performance of Icesat-2 ATL08 Product for Vegetation Structure Characterization in Various Vegetation Environments In the USA (14)	Lonesome Malambo, Sorin Popescu	Texas A&M University
3:20 PM	Flash and burn: Connecting ignition sources to wildland fires in time and space. (15)	Joseph O'Brien(1), Louise Loudermilk (1), Steve Flanagan (2), J. Kevin Hiers (2), Dan Jimenez (3), Andy Hudak (3), Cynthia Fowler (4) Grant Snitker (5)	USFS Southern and Rocky Mountain Research Stations, Tall Timbers Research Station, Wofford College, University of Georgia
3:25 PM	Everett Hinkley leads Discussion and Q&A (10 minutes)		

Fire & Fuels			
Time	Idea Title	Team Members	Organization
3:35 PM	Enhancing Fire Management with Earth Observations (16)	Mary Ellen Miller, Dr. Nancy French, Matt Dickinson, Sam Batzli	Michigan Tech Research Institute UW - Madison
3:40 PM	NIROPS imagery for calibration and validation of satellite fire products (17)	Luigi Boschetti, Andrew Hudak, Vince Ambrosia	University of Idaho, USFS, NASA-AMES

Land Cover Mapping & Monitoring			
Time	Idea Title	Team Members	Organization
3:45 PM	National Canopy Height Layer (1m) and Dataset of Individual Tree Objects (18)	Jim Ellenwood	US Forest Service R&D IMAR/MRS&GAR
3:50 PM	Seeing the Buildings, Forests, and Trees: Mapping WUI Environments and Losses After Wildfire Events (19)	Miranda H. Mockrin, Volker C. Radeloff, Todd Hawbaker, Sebastian Martinuzzi	Northern Research Station, U. of Wisconsin, USGS
3:55 PM	Disturbance/Recovery Forecasting (20)	Nathan Pugh, Claire Simpson, Rob Vaughan	USFS-GTAC
4:00 PM	Erik Johnson leads Discussion and Q&A (10 minutes)		
4:10 PM	Break – Video Session (20 minutes)		
4:30 PM	Using ICESat-2 and Landsat to Map Forest Aboveground Biomass in the Southern US (21)	Lana L. Narine, Sorin C. Popescu, Lonesome Malambo, and Meng Liu	Auburn University and Texas A&M University
4:35 PM	Subpixel analysis of flaming versus smoldering combustion (22)	Chris Elvidge	Colorado School of Mines

4:40 p.m. Everett Hinkley leads Discussion, Next Steps, & Closing (20 minutes)

5:00 PM End of Day 1

Pitch Fest Agenda – Day 2

Wednesday June 3, 2020

All Times Shown – Eastern Time Zone

11:00 AM Setting the Stage – Day 2

Goals: Review Pitch Fest goals and objectives for Day 2.

- Welcome – Sabrina Delgado Arias (Science Systems and Applications, Inc.-NASA GSFC) and Everett Hinkley (Forest Service) – 5 minutes
- Objectives, Goals - Erik Johnson (Forest Service) – 10 minutes

11:15 AM – 12:00 PM Panel 2: Insights on Key Opportunity Areas for NASA-Forest Service Collaboration

Goals: Provide perspective from NASA mission scientists and ‘science-to-tools’ translators on key opportunity areas for utilizing NASA technology to support land management activities and decisions, specifically for vegetation and water.

Water & Vegetation Panel // Raha Hakimdavar (USFS)

Panelists

- **Simon Yueh** - Project Scientist, Soil Moisture Active Passive (SMAP), NASA JPL
- **Thomas Neumann** - Project Scientist; Ice, Cloud and land Elevation Satellite-2, NASA GSFC
- **Kevin Megown** – Resource, Mapping, Inventory and Monitoring Program Lead, USFS Geospatial Technology and Applications Center
- **Linda Spencer** - National Rangelands Vegetation Ecologist, USFS WO
- **Tim Stroope** - Hydrogeologist, USFS Washington Office

12:00 PM BREAK (30 minutes)

Pitch Fest Begins – Session II

Goals: Participants who submitted a form during the spring Call for Ideas, pitch their ideas for how to advance the use of satellite remote sensing data to support USFS management decision support needs. All Pitch Fest attendees vote via live polls to prioritize key actions and low-hanging fruit opportunities.

Inventory & Analysis of Forest and Forested Wetlands

Time	Idea Title	Team Members	Organization
12:30 PM	Facilitating the use of Remote Sensing for Rapid Detection of Deforestation and Fire and Monitoring Carbon Sequestration (23)	Matthew Dickinson, Carlos Alberto Silva, Andy Hudak	US Forest Service NRS
12:35 PM	Integrating NASA and USFS datasets for a high-resolution	Alex Rudee, George Hurtt	World Resources Institute

Inventory & Analysis of Forest and Forested Wetlands			
Time	Idea Title	Team Members	Organization
	annual forest carbon monitoring system (24)		
12:40 PM	Mapping tree crown areas & height of forests the 50 cm scale using machine learning (25)	Compton Tucker	NASA GSFC
12:45 PM	A deep learning approach for modeling forest structure and classifying disturbance across ecotypes and time (26)	Tony Chang, Ty Barry Wilson, Karen Schleeeweiss	Conservation Science Partners, USFS – RMRS FIA
12:50 PM	Predicting forest mortality by integrating genetics and remote sensing (27)	Benjamin Blonder, Suzanne Marchetti	NASA JPL, R2 Forest Health Protection
12:55 PM	Edil Sepulveda Carlo leads Discussion and Q&A (10 minutes)		
1:05 PM	Break – Video Session (20 minutes)		
1:25 PM	Testing ICESAT2 data for Supporting Tree Canopy Cover Data (28)	Kevin Megown, Stacie Bender, Karen Schleeeweiss, Mark Finco, Bonnie Rufenacht	USFS GTAC, USFS – RMRS FIA
1:30 PM	Improving forest structure monitoring with GEDI (29)	Ray Davis, Sean Healey, David Bell, Zhiqiang Yang	USFS - National Forest System, Pacific Northwest Region
1:35 PM	Landsat-era LAI data for studying declining water resources in Oregon’s Harney Basin (30)	Margaret Matter and Bailing Li	Oregon Department of Agriculture, NASA GSFC, University of Maryland
1:40 PM	Developing an improved biomass inventory system for U.S. mangrove forests using remote sensing and LiDAR-based field sampling techniques (31)	Todd Schroeder, Carl Trettin, Mark Brown, Temilola Fatoyinbo, Mark Simard	USFS - Southern Research Station NASA GSFC & JPL

Forest Hydrology: Processes, Management and Assessment			
Time	Idea Title	Team Members	Organization
1:45 PM	Developing improved forest soil moisture estimates from in situ, satellite and land-surface models (32)	Steven Quiring, Trent Ford	The Ohio State University, University of Illinois Urbana-Champaign
1:50 PM	Edil Sepulveda Carlo leads Discussion and Q&A (10 minutes)		
2:00 PM	Withdrawn (33)		
2:05 PM	Use of remote sensing to monitor the condition and biogeochemical processes in managed forests (34)	Andrew Chris Oishi, Devendra Amatya	USFS - Southern Research Station

Forest Hydrology: Processes, Management and Assessment			
Time	Idea Title	Team Members	Organization
2:10 PM	Delineation of Terrestrial - Blue Carbon Boundary in Coastal Waters of the U.S. (35)	Carl Trettin, Temilola Fatoyinbo, Mark Simard	USFS - Southern Research Station, NASA GSFC & JPL
2:15 PM	Identifying and leveraging synergies with the remote sensing community to improve the next generation of the SNOTEL ground observation network and NRCS water supply forecasting system for the US West (36)	Sean Fleming, Brian Domonkos, Jolyne Lea, Chris Brown, Karl Wetlaufer, Gus Goodbody	USDA - NRCS
2:20 PM	Detection and attribution of a recent, unexpected hydrologic change (37)	Mark Green, Scott Bailey, and John Campbell	Case Western Reserve U. and USFS Northern Research Station
2:25 PM	Mahesh Pun leads Discussion and Q&A (10 minutes)		
2:35 PM	Break – Video Session (20 minutes)		
2:55 PM	Riparian areas vegetation classification (38)	Sinan Abood, Linda Spencer, Nathaniel Gillespie	USFS
3:00 PM	Using thermal imagery acquired with the UAVSAR platform to identify and delineate groundwater dependent ecosystems (GDEs) (39)	Tim Stroope, Donna Shorrock, Karri Cary	USFS
3:05 PM	Designation and recovery tracking of an emergency priority watershed using EO (40)	Raha Hakimdavar (other names to come)	USFS
3:10 PM	Estimation of Rangeland Yield from Soil Moisture Active Passive (SMAP) Data Products (41)	Mahesh Pun, Matt Reeves	NASA GSPF, USFS
3:10 PM	Mahesh Pun leads Discussion and Q&A (15 minutes)		

Knowledge Discovery Tools/Platforms			
Time	Idea Title	Team Members	Organization
3:25 PM	Real Time remote viewing technical assistance (42)	Robert Gubernick	USFS
3:30 PM	Post Harvest Recovery Prediction (43)	Nathan Pugh, Claire Simpson, Rob Vaughan	USFS-GTAC
3:35 PM	A FIESTA Bridge: Spanning the gap between NASA products and forest inventory data (44)	Gretchen Moisen, Tracey Frescino, Kelly McConville	USFS Rocky Mountain Research Station, FIA
3:40 PM	NASA GLOBE Observer Trees Tool for Mobile Tree Height, ICESat-2, and Open Altimetry (45)	Brian Campbell, Peder Nelson	NASA Wallops Flight Facility and GST, Inc., Oregon State Univ.
3:45 PM	Building Capacity to use NASA data For Forestry Management (46)	Ana I. Prados	NASA GSFC

Knowledge Discovery Tools/Platforms			
Time	Idea Title	Team Members	Organization
3:50 PM	Kim Locke leads Discussion and Q&A (10 minutes)		
4:00 PM	Break – Video Session (20 minutes)		
4:20 PM	Satellite data based Virtual Nature (Forest) (47)	Rainer Ressler, Florian Hruby	CONABIO
4:25 PM	Withdrawn (48)		
4:25 PM	The potential for near-term iterative forecasting to advance USFS land-management and decision support (49)	Michael Dietze, Quinn Thomas, Shawn Serbin, Melissa A Kenney, Eric V. Lonsdorf	Boston University, Virginia Tech, Brookhaven National Lab, University of Minnesota, Ecological Forecasting Initiative
4:30 PM	Wildfire mitigation and emergency response: Connecting NASA data, models, and tools to USFS decisions using concept maps and machine-assisted discovery (50)	Bill Teng, Brian Wee, Arif Albayrak	NASA GES DISC, Massive Connections, LLC
4:35 PM	NASA Operational Data Extractor Service (NODES) (51)	Andrew Lister	USFS Northern Research Station
4:40 PM	Kim Locke leads Discussion and Q&A (10 minutes)		

Soil Mapping & Inventory			
Time	Idea Title	Team Members	Organization
4:50 PM	Soil salinization detection, projection, mitigation adaptation for agriculture and forest lands (52)	Steven McNulty	USDA Climate Hubs
4:55 PM	Semi-Automated National Forest Landslide Mapping via LiDAR (53)	Noel Ludwig	USFS Rocky Mountain Region
5:00 PM	Bare-ground trend forecasting (54)	Nathan Pugh, Claire Simpson, Rob Vaughan	USFS-GTAC
5:05 PM	Predictive Erosion Potential (55)	Nathan Pugh, Claire Simpson, Rob Vaughan	USFS-GTAC

5:10 PM Sabrina Delgado Arias leads Discussion, Next Steps, & Closing (20 minutes)

5:30 PM End of Day 2