GEDI
ECOSYSTEM LIDAR

Global Ecosystem Dynamics Investigation

Height and biomass calval Applications

Adrian Pascual

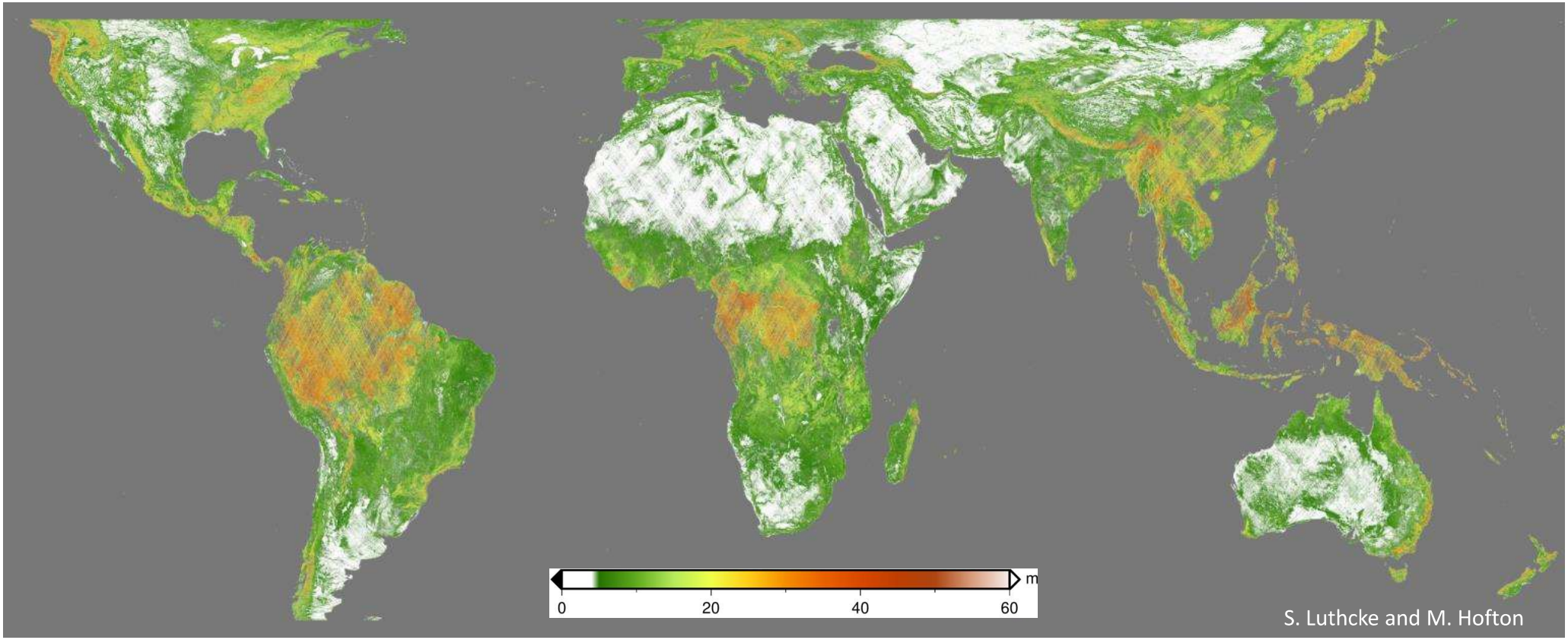
University of Maryland

UNIVERSITY OF MARYLAND 18 56
DEPARTMENT OF GEOGRAPHICAL SCIENCES
GEDI ECOSYSTEM LIDAR NASA

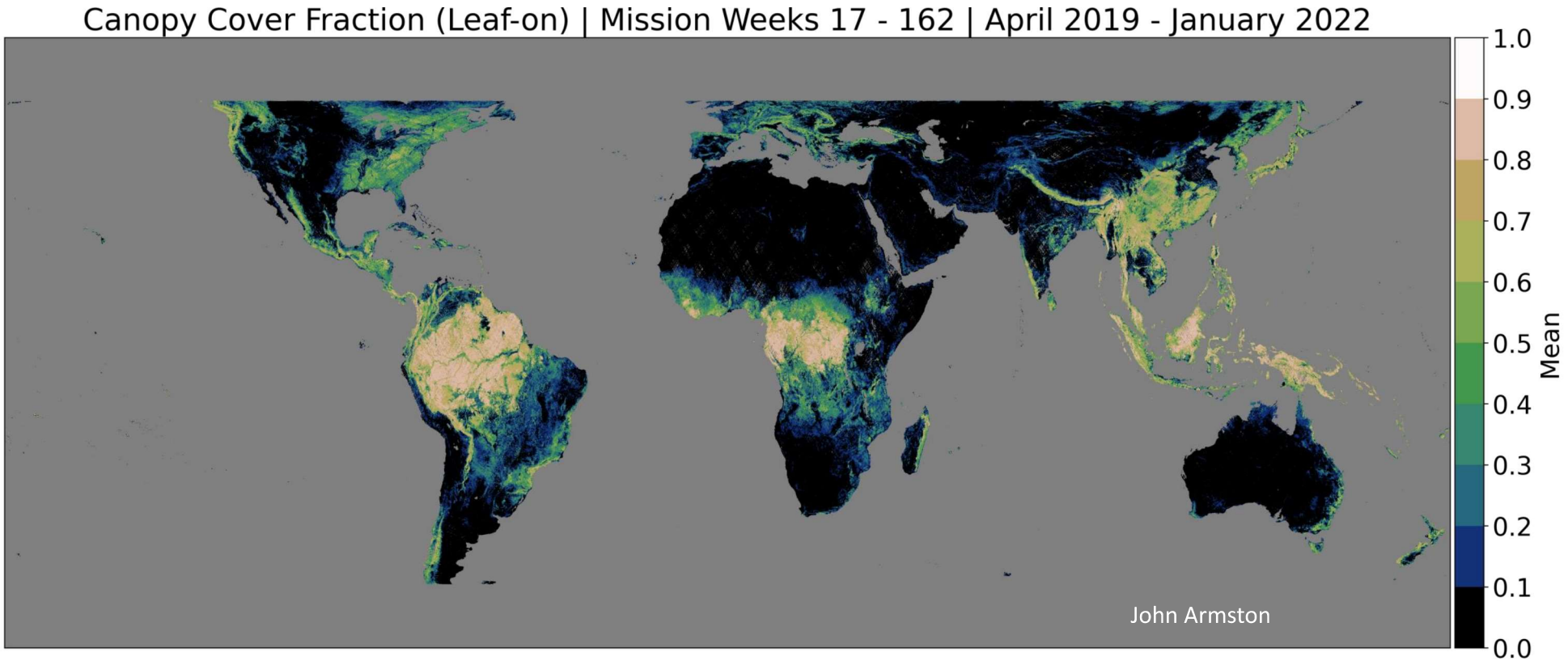
Mission

Product/ Data File	Description	Source	First Data Delivery After IOC	Data Latency	Archive Site
GEDI00_B	Level 0B Instrument Products	MOC	Within 24 hours of receipt at GSFC	Within 24 hours of receipt at GSFC	LPDAAC
GEDI01_A-TX	Level 1A-TX Transmitted Waveform Fitted Parameters	SOC	First 2 months of L1 released at 6 months	4 months in monthly intervals	LPDAAC
GEDI01_A-RX	Level 1A-RX Received Waveform Fitted Parameters	SOC	First 2 months of L1 released at 6 months	4 months in monthly intervals	LPDAAC
GEDI01_B	Level 1B Calibrated and Geolocated Waveforms	SOC	First 2 months of L1 released at 6 months	4 months in monthly intervals	LPDAAC
GEDI02_A	Level 2A Elevation and Height Metrics	SOC	First 2 months of L2 released at 6 months	4 months in monthly intervals	LPDAAC
GEDI02_B	Level 2B Canopy Cover and Vertical Profile Metrics	SOC	First 2 months of L2 released at 6 months	4 months in monthly intervals	LPDAAC
GEDI03	Level 3A Gridded Land Surface Metrics	SOC	Populated with first 2 months of L2 data at 6 months	4 months in monthly intervals	ORNLDAAC
GEDI04_A	Level 4A Footprint Above Ground Biomass	SOC	First 12 months at 17 months (late)	6 months after global sampling required to meet L1 requirement	ORNLDAAC
GEDI04_B	Level 4B Gridded Above Ground Biomass	SOC	First 12 months at 17 months (late)	6 months after global sampling required to meet L1 requirement	ORNLDAAC

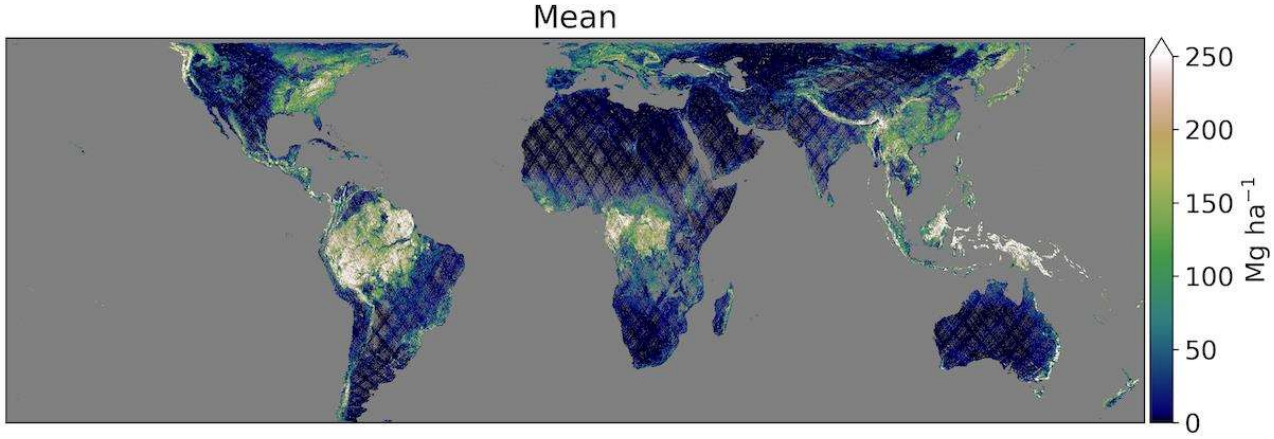
GEDI Canopy Height (2.75 years)

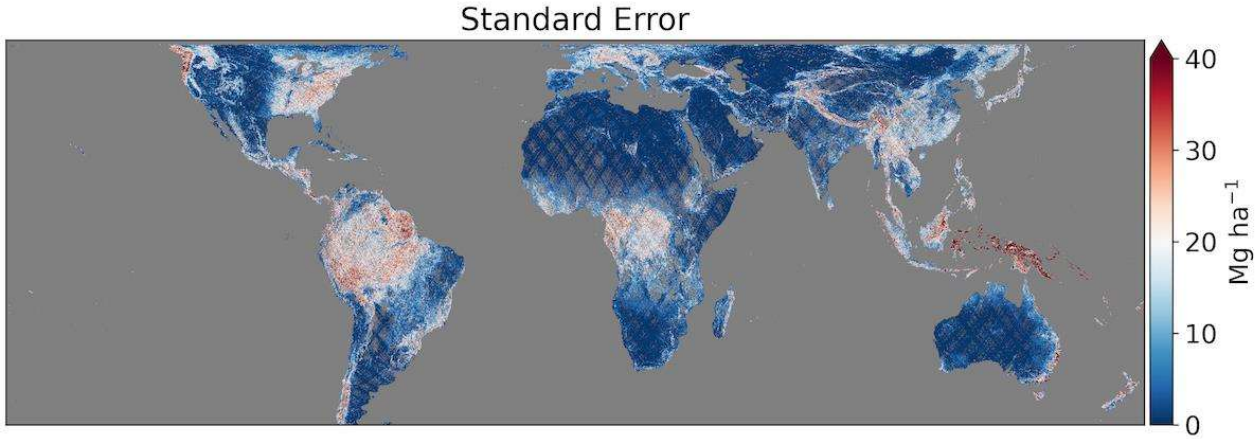


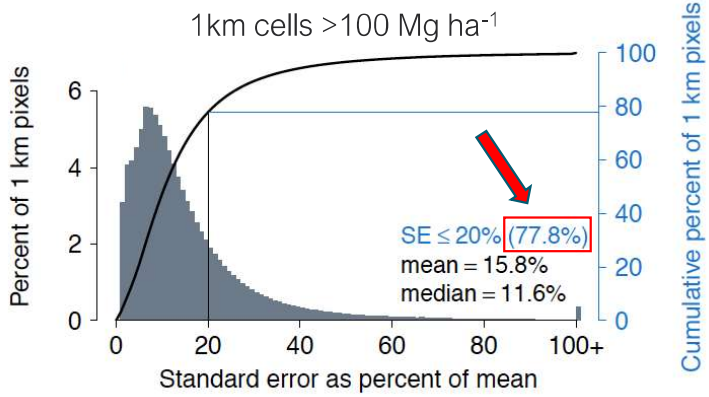
Canopy Cover

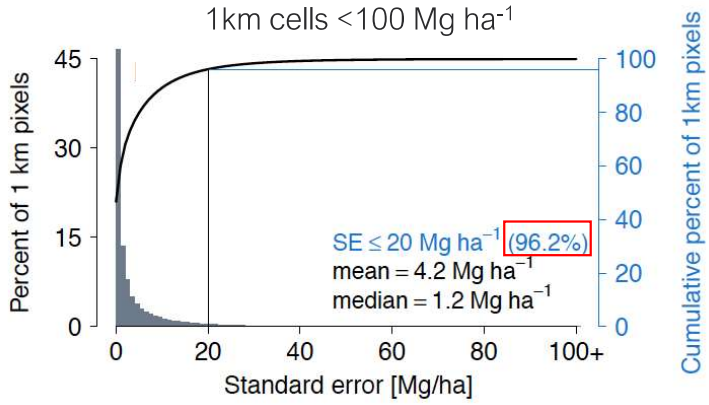


GEDI Gridded Biomass

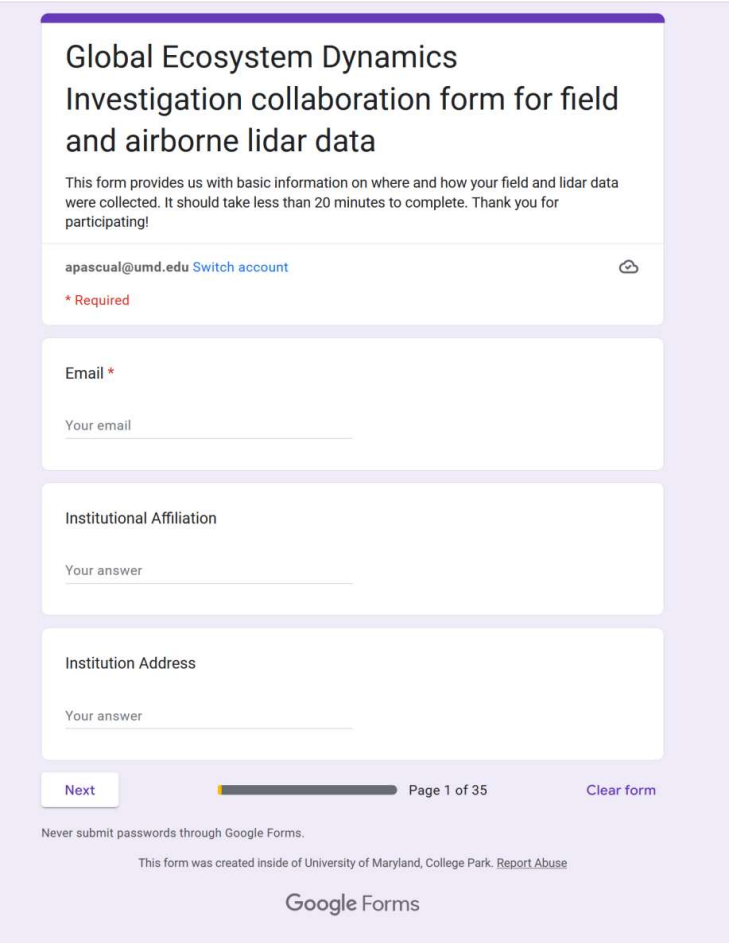








Validation & calibration of GEDI measurements



Global Ecosystem Dynamics Investigation collaboration form for field and airborne lidar data

This form provides us with basic information on where and how your field and lidar data were collected. It should take less than 20 minutes to complete. Thank you for participating!

apascual@umd.edu Switch account

* Required

Email *

Your email

Institutional Affiliation

Your answer

Institution Address

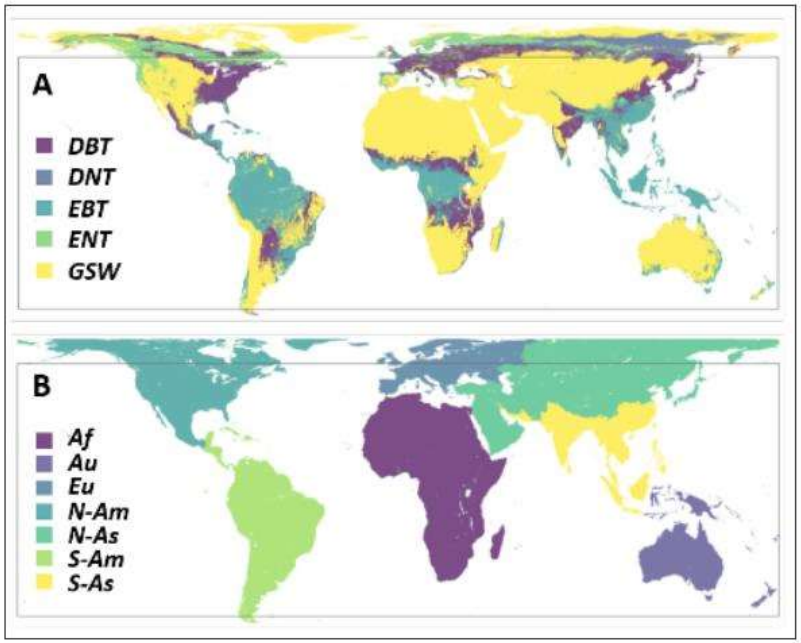
Your answer

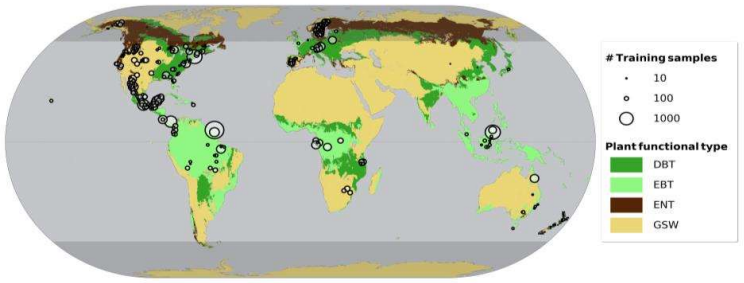
Next Page 1 of 35 Clear form

Never submit passwords through Google Forms.

This form was created inside of University of Maryland, College Park. Report Abuse

Google Forms



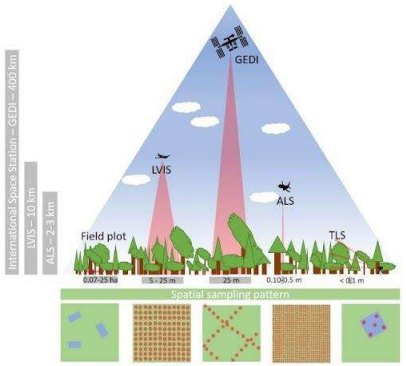


Adrian Pascual
University of Maryland

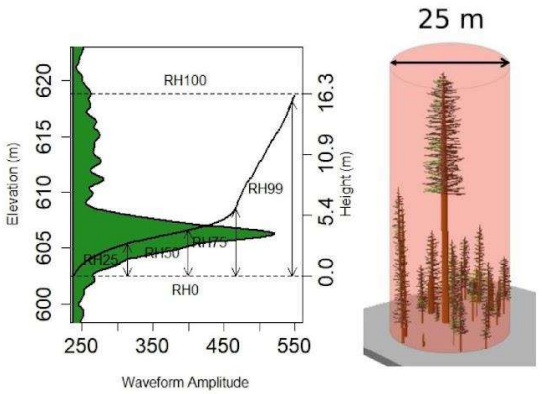
Validation & calibration of GEDI measurements

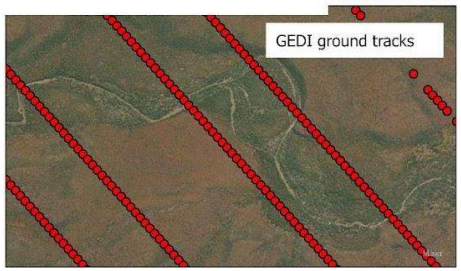
- **Height**
- **Biomass**
- **Factors**

1. Density of ALS data
2. Data colocation
3. Seasonality
4. Plant functional type
5. Geographic regions



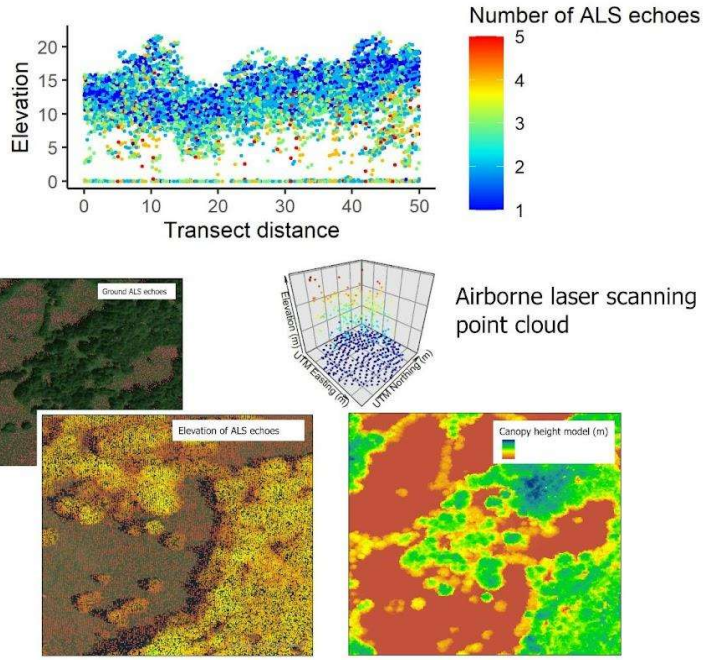
GEDI ECOSYSTEM LIDAR





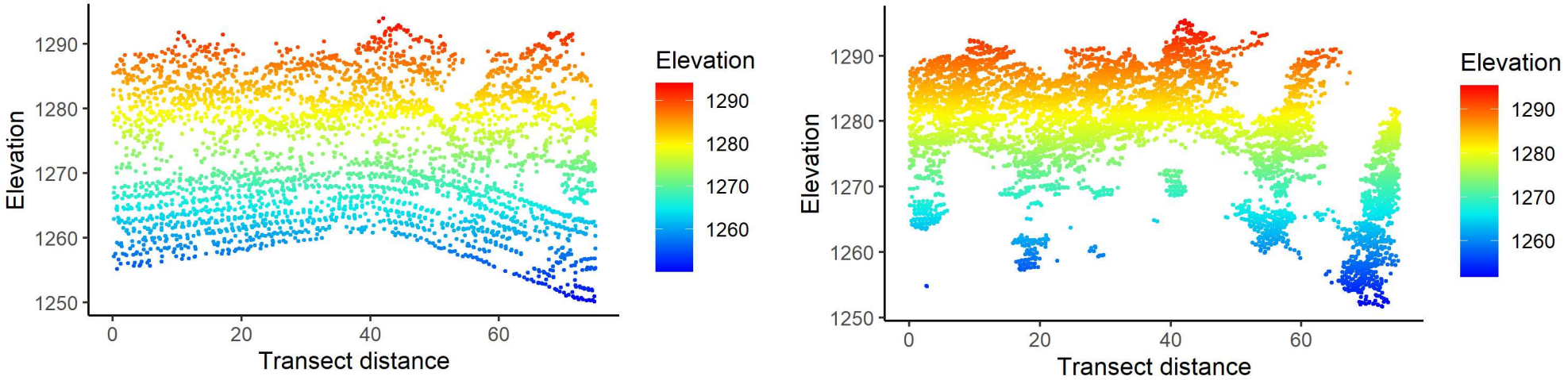
Adrian Pascual
University of Maryland

GEDI Forest Structure and Biomass Database (FSBD)



Validation and calibration of GEDI measurements

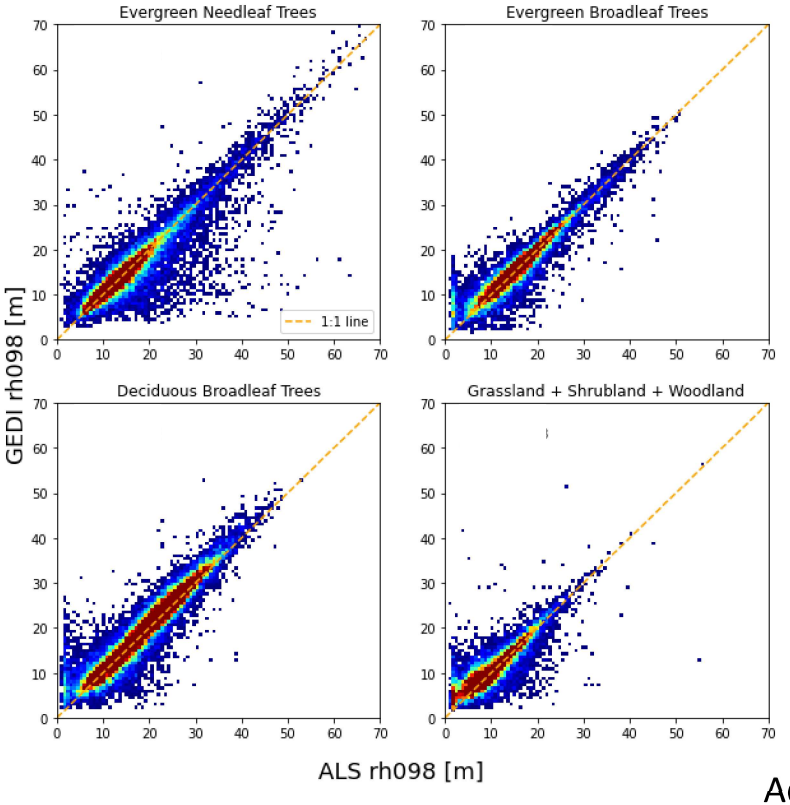
- Leaf-on versus leaf-off

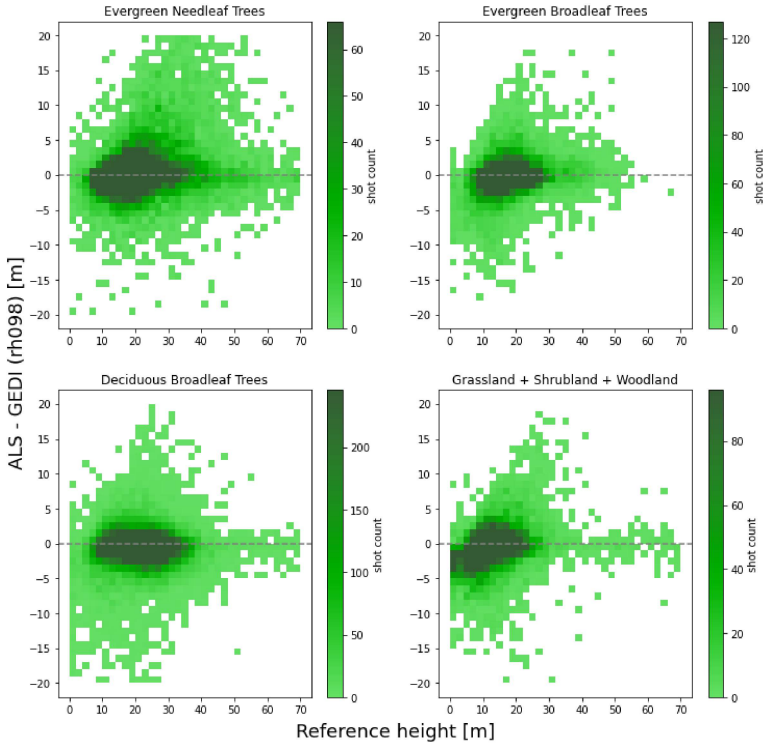


Adrian Pascual
University of Maryland

Validation & calibration of GEDI measurements

- **Height**



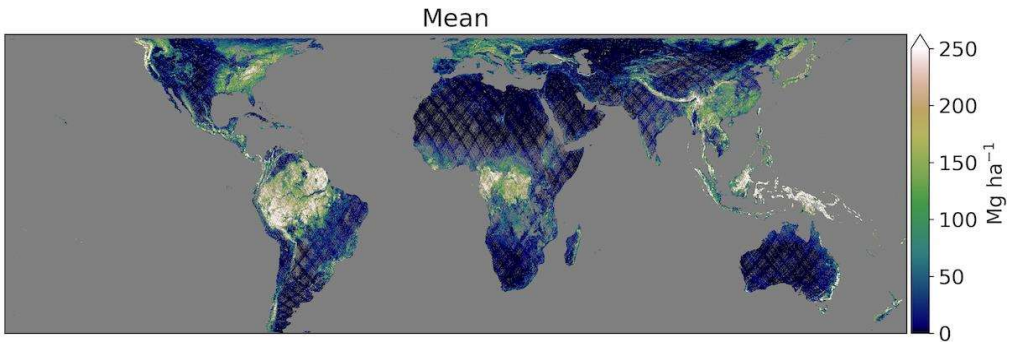


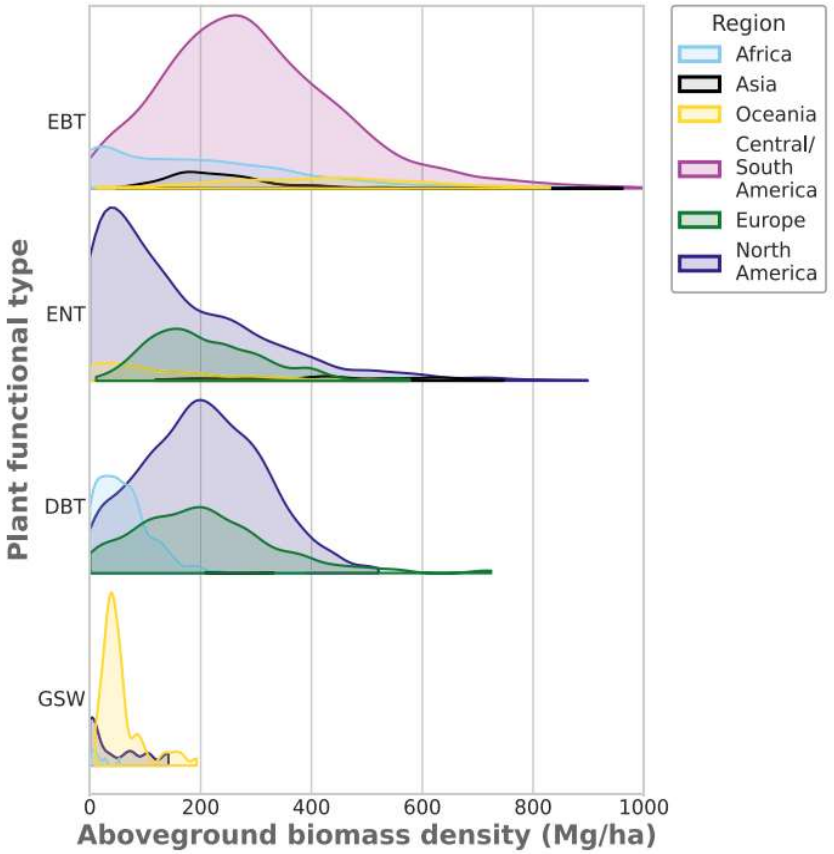
Adrian Pascual
University of Maryland

GEDI Forest Structure and Biomass Database (FSBD)

Table 3. AGBD Linear Models by Prediction Stratum

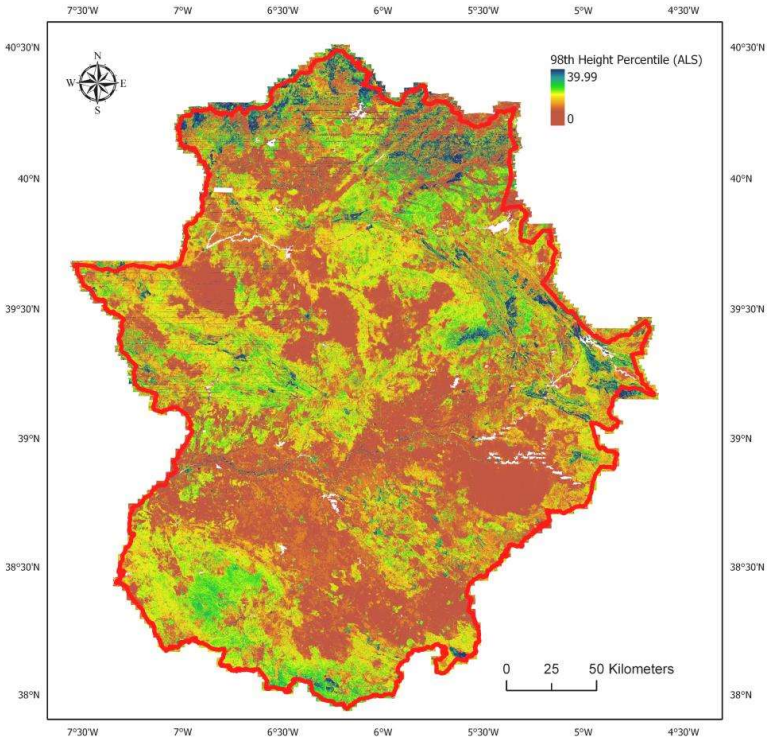
predict_stratum	model_name	fit_stratum	AGBD model
DBT_SAs, EBT_Af, EBT_SAs	EBT_Af, EBT_coarse	EBT	AGBD = -104.9654541015625 + 6.802174091339111 x RH_50 + 3.9553122520446777 x RH_98
DBT_NAs, EBT_NAs	DBT_coarse	DBT	AGBD = -110.05912780761719 + 5.133802890777588 x RH_60 + 6.171630382537842 x RH_98
GSW_Af, GSW_Eu, GSW_NAs, GSW_SA, GSW_SAs, GSW_NAm	GSW_coarse	GSW	AGBD = -124.83228302001953 + 12.426309585571289 x RH_98
DBT_Au, EBT_Au	EBT_Au	EBT_Au	AGBD = -155.41419982910156 + 7.816701889038086 x RH_70 + 7.7095465660095215 x RH_98
GSW_Au	GSW_Au	GSW	AGBD = -151.3834991455078 + 4.490713596343994 x RH_50 + -2.346837282180786 x RH_80 + 12.941423416137695 x RH_98
ENT_Au, DNT_Au	ENT_Au	ENT_Au	AGBD = -101.98419952392578 + 6.396724700927734 x RH_40 + 4.258835315704346 x RH_98
DBT_SA, EBT_SA	EBT_SA	EBT_SA	AGBD = -134.77015686035156 + 6.653591632843018 x RH_50 + 6.687118053436279 x RH_98
DBT_Eu, EBT_Eu, ENT_Eu, DNT_Eu	DBT_Eu, ENT_Eu	Eu	AGBD = -96.53070068359375 + 7.175395488739014 x RH_70 + 2.9214682579040527 x RH_98
DBT_NAm, EBT_NAm	DBT_NAm	NAm	AGBD = -120.77709197998047 + 5.507718563079834 x RH_50 + 6.808018207550049 x RH_98
ENT_NAm, DNT_NAm	ENT_NAm	ENT	AGBD = -114.35456848144531 + 8.400657653808594 x RH_70 + 3.3459579944610596 x RH_98
DBT_Af	DBT_Af	DBT_Af	AGBD = -118.40806579589844 + 1.956794023513794 x RH_50 + 9.96180534362793 x RH_98
ENT_Af, ENT_NAs, ENT_SA, ENT_SAs, DNT_Af, DNT_NAs, DNT_SA, DNT_SAs	ENT_coarse	ENT	AGBD = -118.41133880615234 + 7.776707172393799 x RH_60 + 4.377904415130615 x RH_98

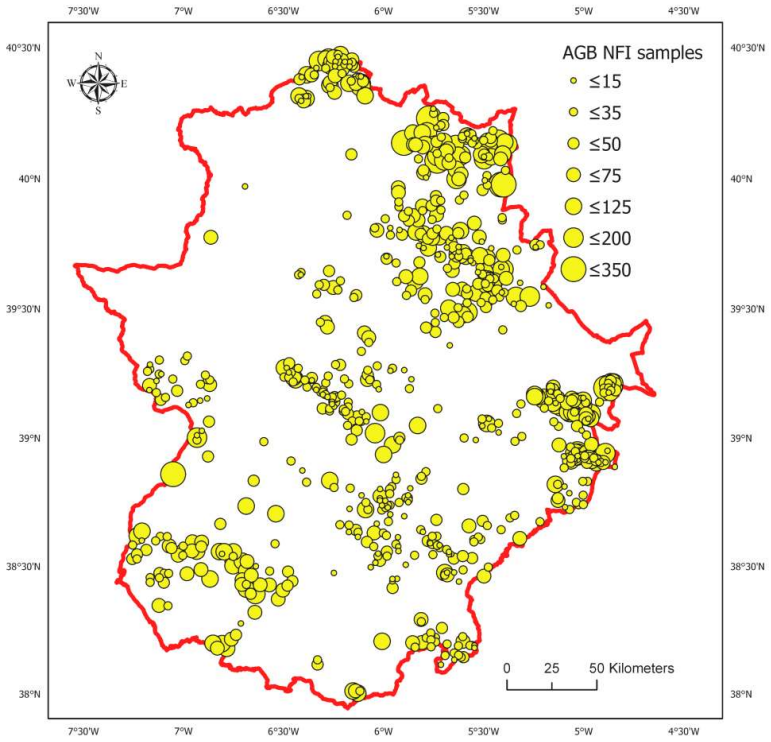


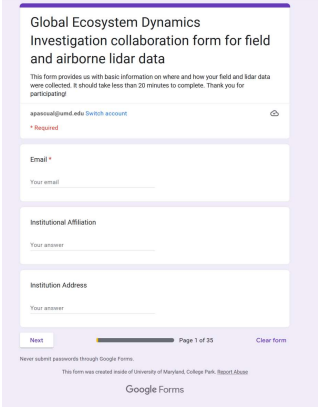


Adrian Pascual
University of Maryland

Validation & calibration of GEDI measurements






Global Ecosystem Dynamics
Investigation collaboration form for field and airborne lidar data

This form provides us with basic information on where and how your field and lidar data were collected. It should take less than 20 minutes to complete. Thank you for participating!

Email *

Institutional Affiliation

Institution Address

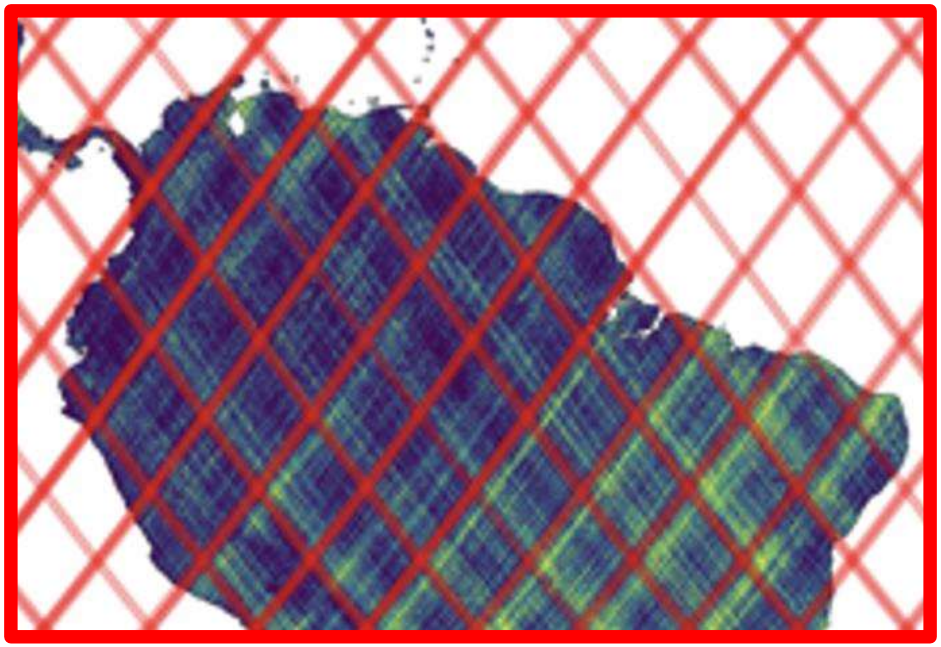
Next

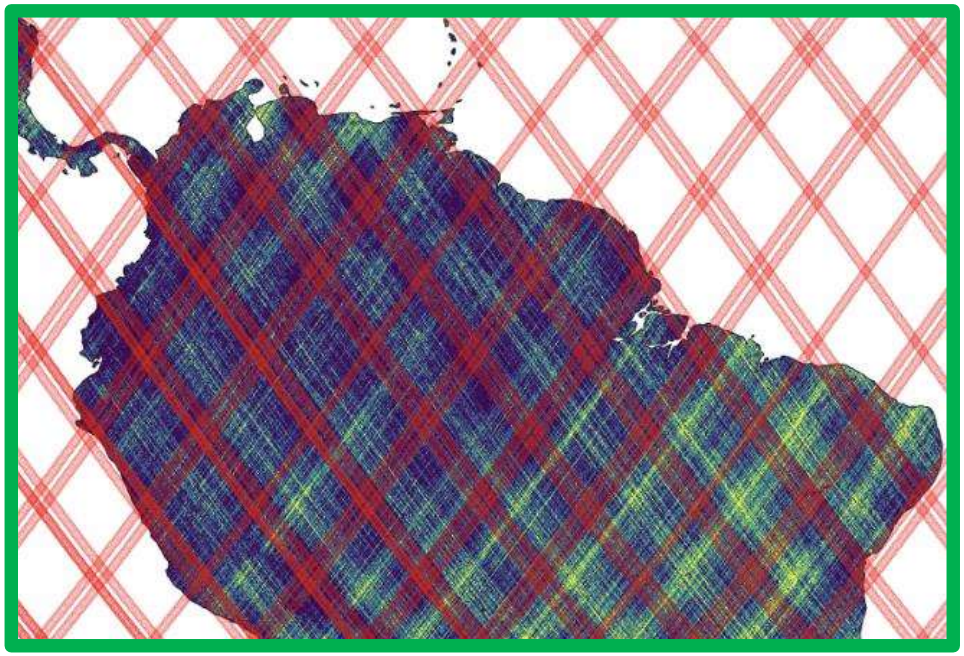
Google Forms

Biomass

Adrian Pascual
University of Maryland

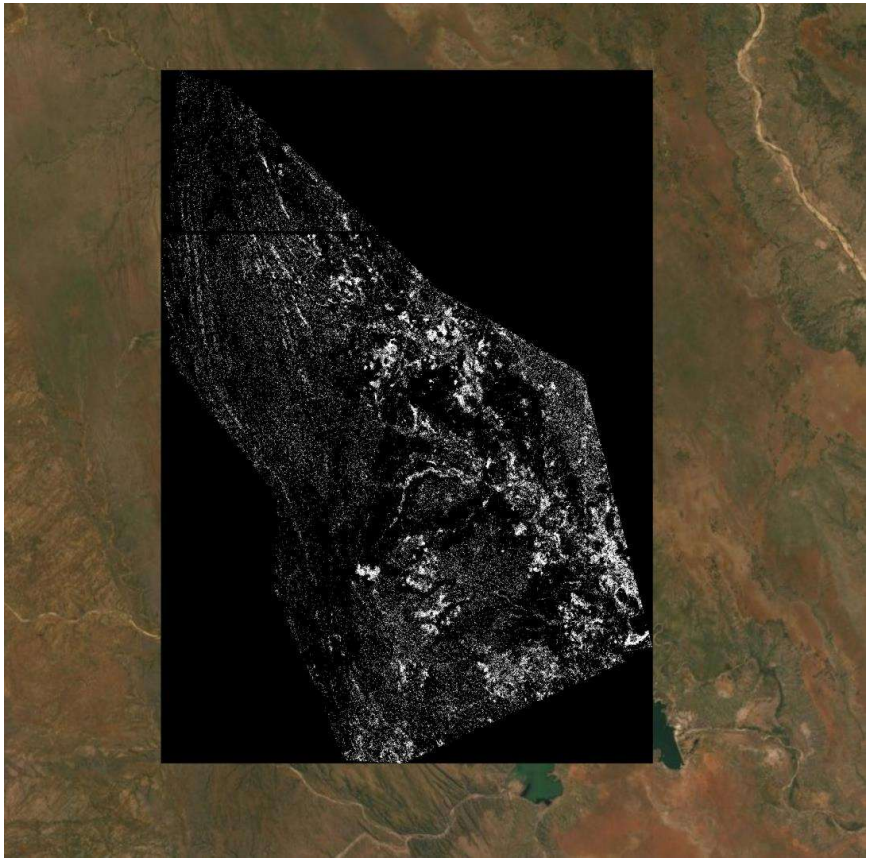
Scenario - Repeated GEDI orbit tracks

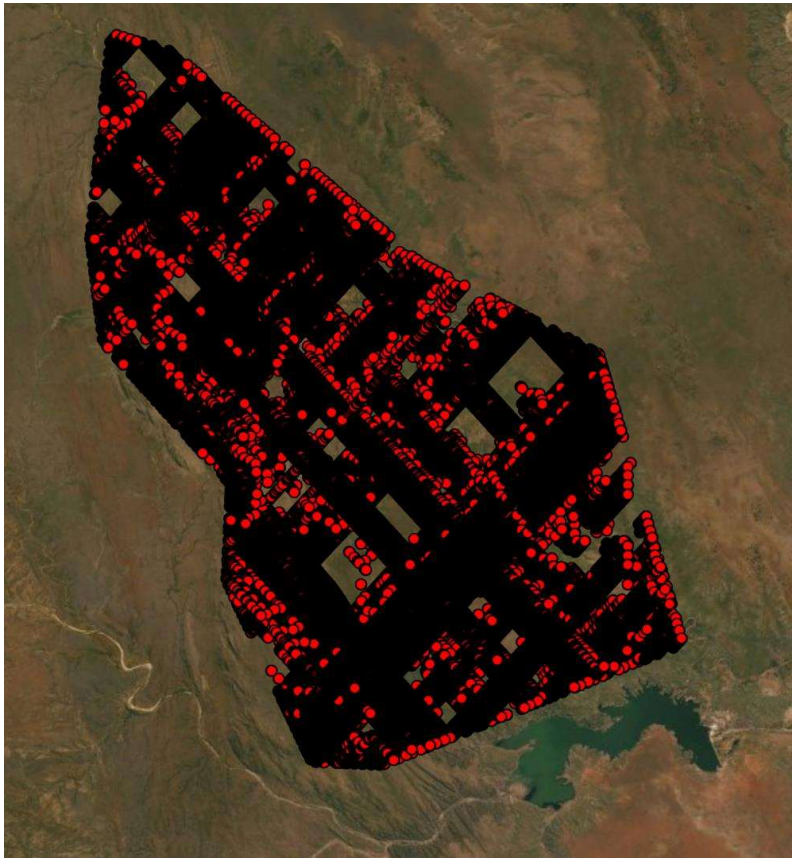




Adrian Pascual
University of Maryland

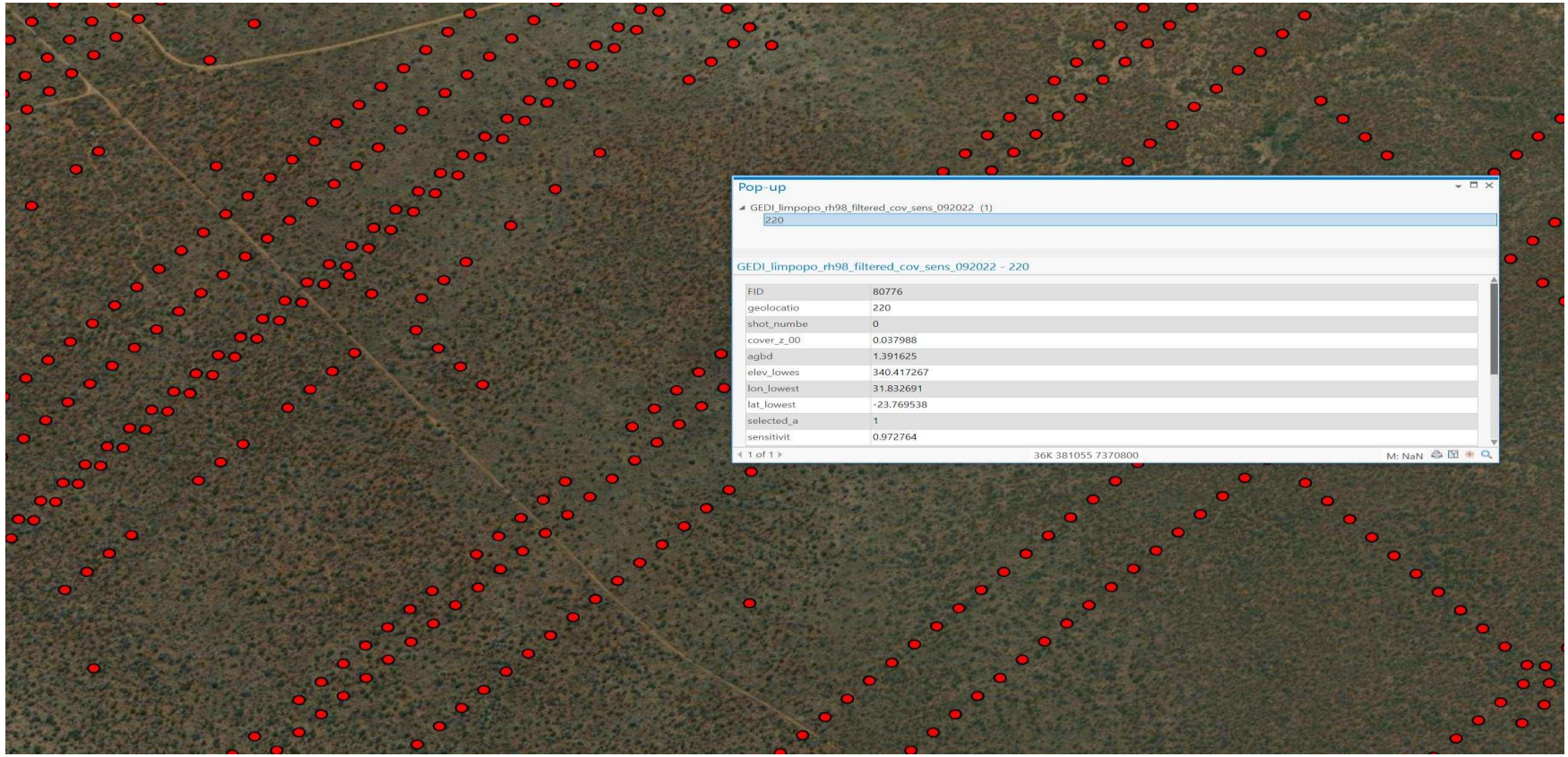
Field sampling design – Limpopo (Mozambique)





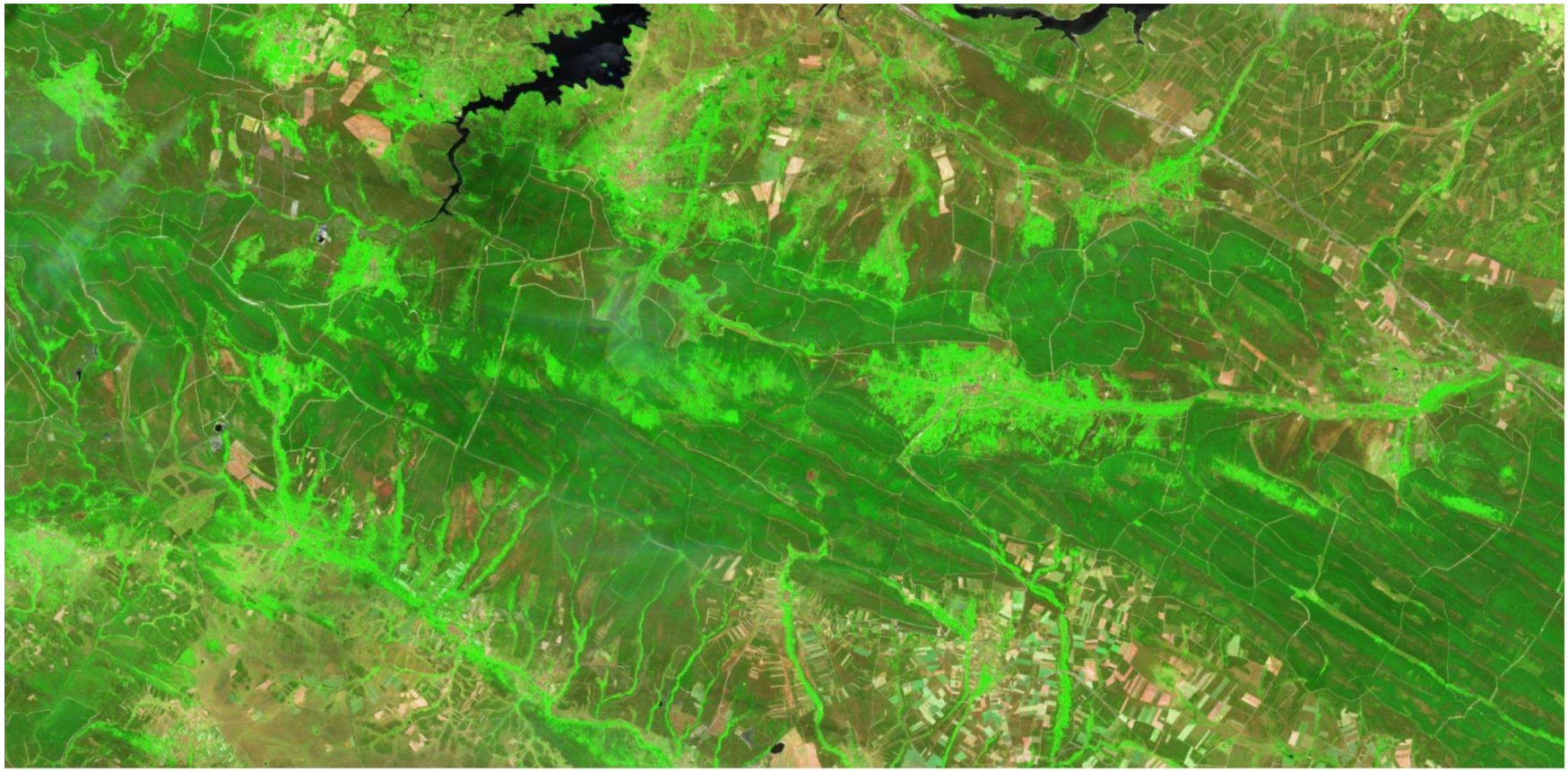
Adrian Pascual
University of Maryland

Field sampling design – Limpopo (Mozambique)



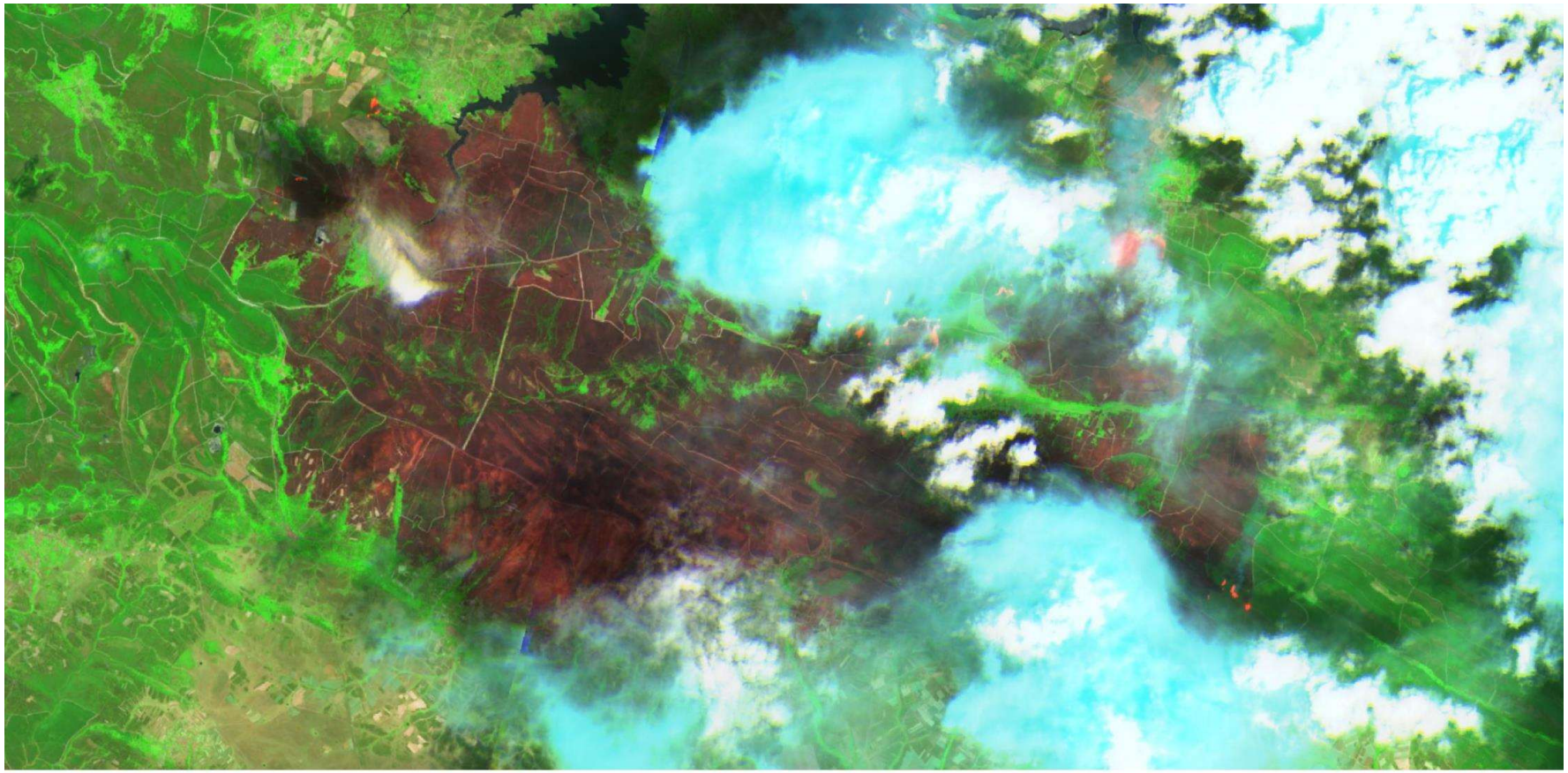
Adrian Pascual
University of Maryland

Science for repeated ISS tracks - Wildfires



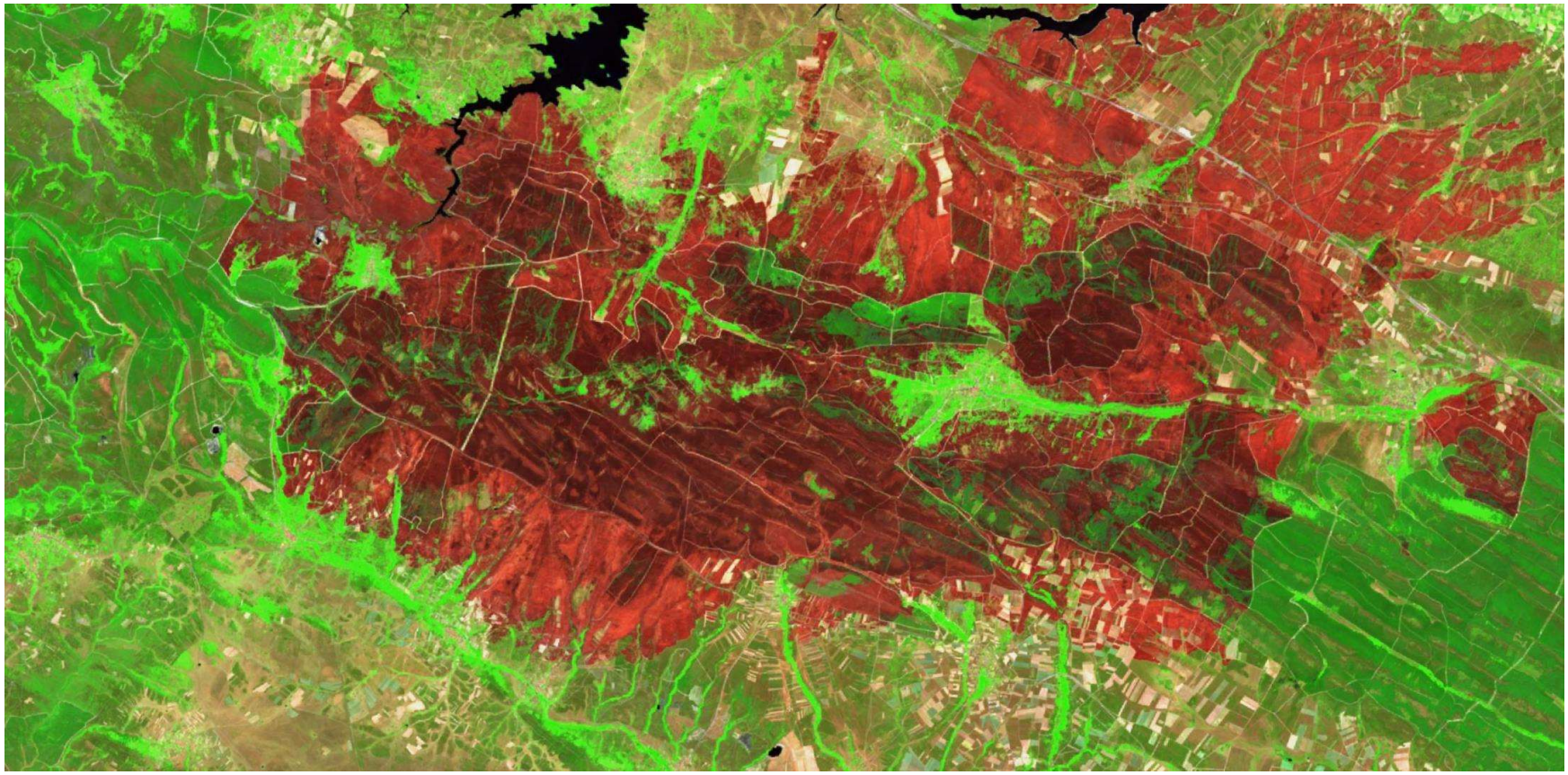
Adrian Pascual
University of Maryland

Science for repeated ISS tracks - Wildfires



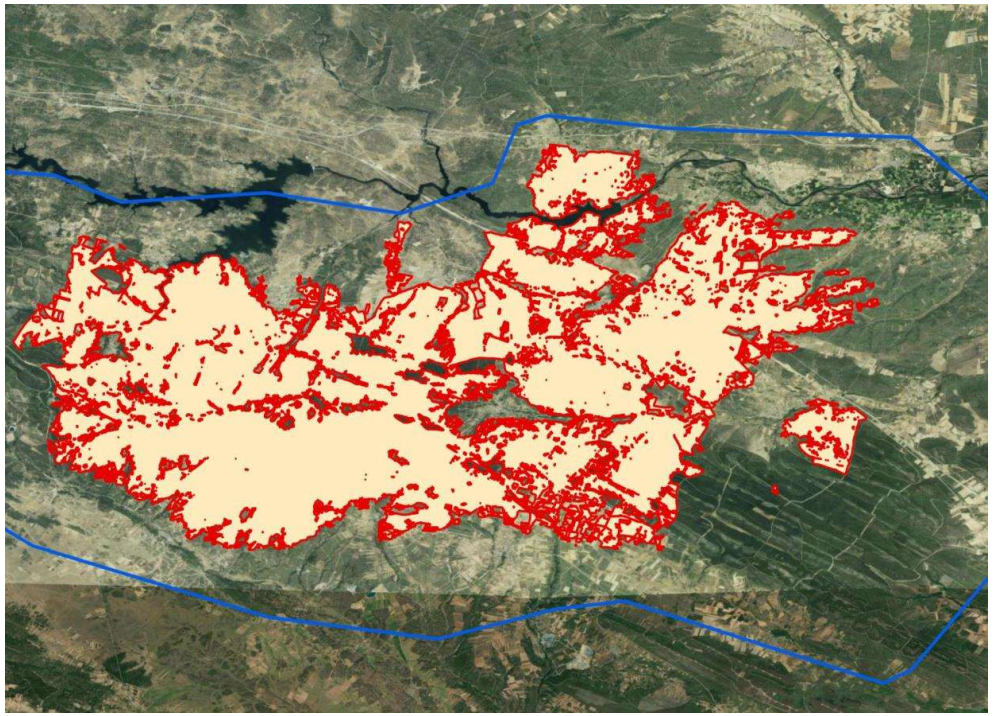
Adrian Pascual
University of Maryland

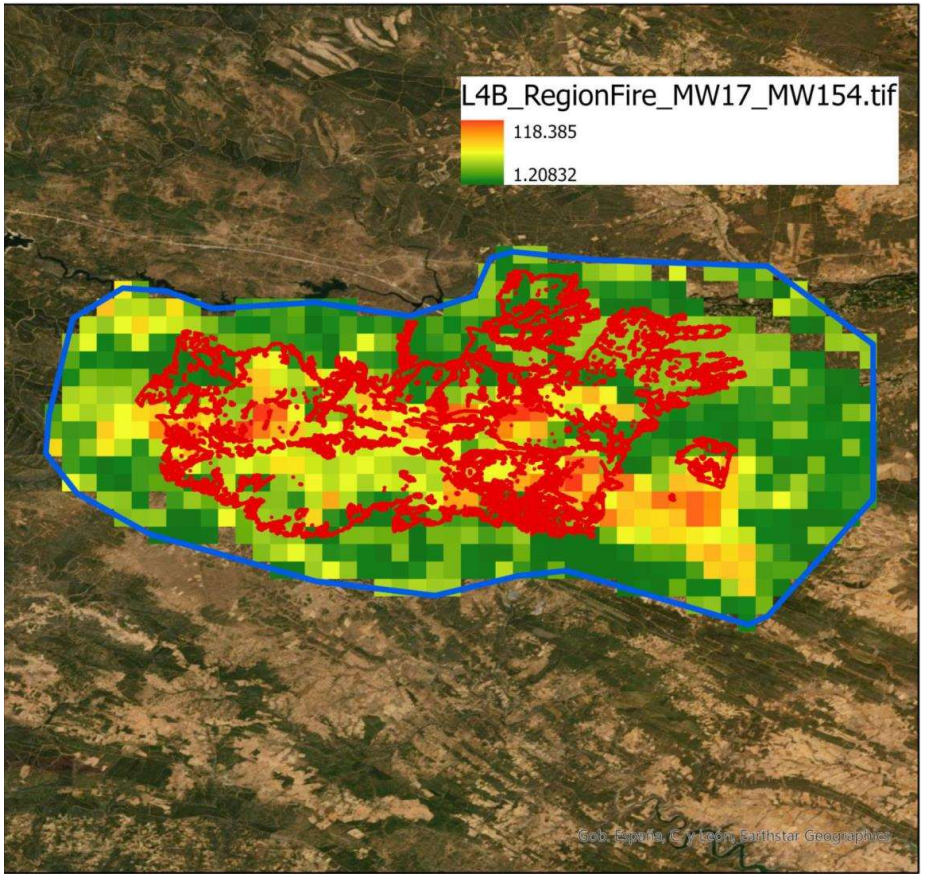
Science for repeated ISS tracks - Wildfires



Adrian Pascual
University of Maryland

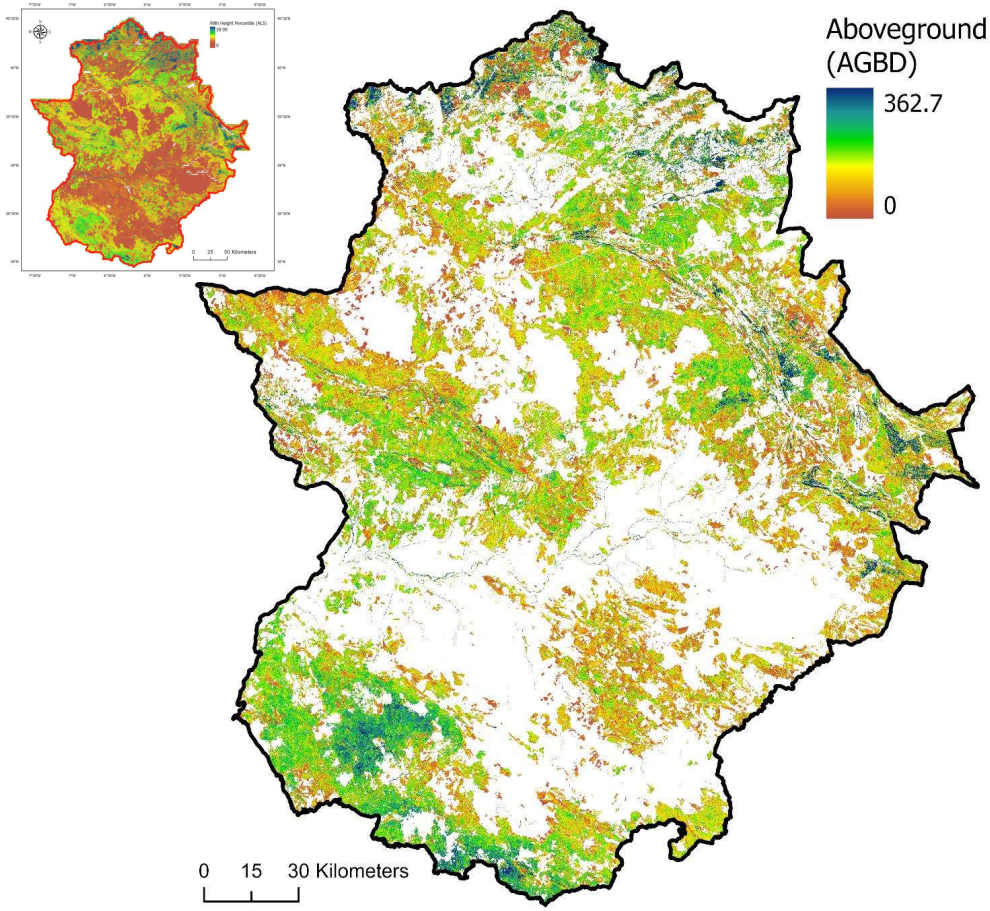
Science for repeated ISS tracks - Wildfires

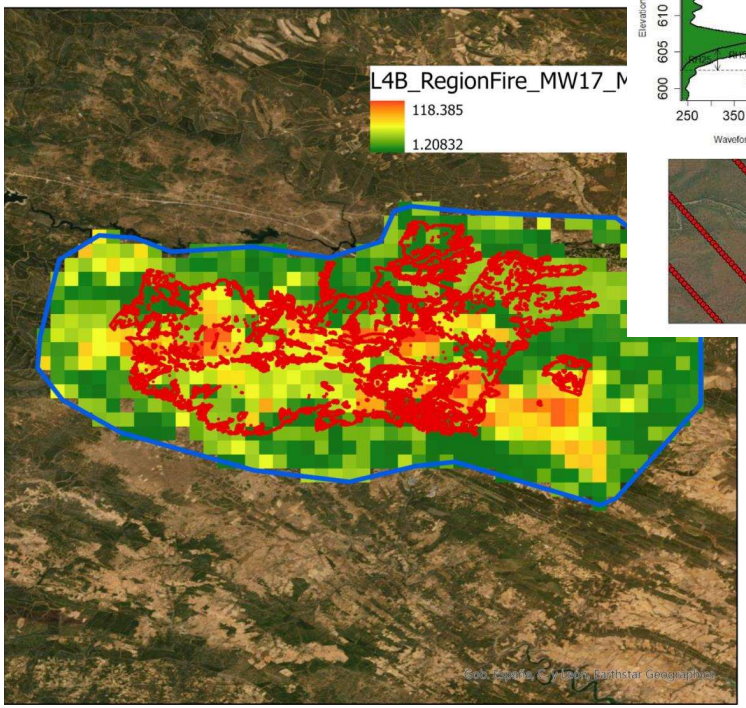


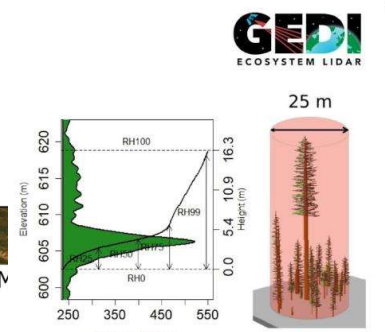


Adrian Pascual
University of Maryland

Science for repeated ISS tracks - Wildfires







Science for repeated ISS tracks - Wildfires

- **Release 3**
- Many more data
- Geolocation error & Optimized algorithm selection
- Homogenous use of filters between height and biomass products

- **Hybrid methods for finer-scale biomass mapping**
- **Applications**

1. Hybrid methods for finer-scale biomass mapping
2. Corridors
3. Restoration – Growth - Disturbances
4. Engagement towards next global missions

NISAR
NASA - ISRO SAR Mission

GEDI
ECOSYSTEM LIDAR

Global Ecosystem Dynamics Investigation

Height and biomass calval Applications

Adrian Pascual

University of Maryland

UNIVERSITY OF MARYLAND 18 56
DEPARTMENT OF GEOGRAPHICAL SCIENCES
GEDI ECOSYSTEM LIDAR NASA