Land Product Validation (LPV) Sub-group Meeting

Fernando Camacho – (EOLab/U. Valencia) – Chair
Vice Chair – Michael Cosh (USDA)

Subgroup meeting
1 Sept 2020

NEXT LPV TELECON 03 Nov 2020

Attendance

Participants

Michael Cosh
Jaime Nickeson
Zhuosen Wang
Laura Duncanson
Gareth Roberts
John Bolten
Sylvain Leblanc
Carsten Montzka
Tomoaki Miura
Hongliang Fang
Louis Giglio
Pontus Olofsson
Sophie Bontemps

Not attending

Frank Göttsche
John Armston
Glynn Hulley
Mat Disney
Chris Crawford
Else Swinnen
Victor Rodríguez-Galiano
Joshua Gray
Fernando Camacho
Dominique Carrer
Thomas Nagler
Marie Weiss

Proposed agenda items

- Welcome
- Newsletter 2020
- Web Status
- Focus Area review and update status
- Focus Area Reporting

Newsletter 2020

- As we do every fall, we will be distributing an LPV newsletter to all of LPV sometime this month.
- As mentioned in the distribution of minutes, a new page has been added to the web site where our telecon minutes now reside. This has been reported to the SIT and will be in our newsletter.
- If you have input (meetings/special issues) you want distributed to all of LPV, let me know.
- We will announce the status of the two protocols that are nearly complete, which is great news, and the updates to our Working Group.
- This leads into our next perpetual slide…

Focus Area Review/Update Status

Status of updates by focus area.

Some only need a review, changes are not required, just assure all is current!

Action needed!!

Focus Area	Letter sent to leads	Home Page Review / Update	Products Reviewed/ Updated	Collaboration Review/ Update	References Updated	Listserv review/ update	Letters to community
Landcover	Apr 2019	Sept 2020	Sept 2020	Sept 2020	Sept 2020	Oct 2019	
Biophysical LAI/Fapar	Apr 2019	July 2019	July 2019	July 2019	July 2019	Oct 2019	Sep 2019
Surface Rad/Albedo	Apr 2019	Dec 2019	Oct 2019	Dec 2019	Dec 2019	Dec 2019	
LST/Emissivity	Apr 2019	Apr 2019	Apr 2019	Apr 2019	Apr 2019	Apr 2019	
Fire/Burn	Apr 2019		Mar 2020		Mar 2020		
Soil Moisture	Apr 2019		Feb 2019		Sep 2019	Sep 2019	
Phenology	Apr 2019		May 2020	Apr 2020			
Snow Cover	Apr 2019					Oct 2019	
Vegetation Index	Apr 2019	Sep 2019	May 2019	Sep 2019	May 2019	May 2019	
Biomass	Apr 2019	Apr 2019	Mar 2020	Apr 2019	Apr 2019	Oct 2019	

Focus Area Reports

- Surface radiation
- Soil Moisture
- Vegetation Indices
- Snow
- Biomass
- Land Cover
- Biophysical (LAI/FAPAR)
- Fire/Burn Area
- Phenology
- LST&E

Surface Radiation

Downward radiance validation best practices protocol

- Outline distributed to co-authors

New Products

- EUMETSAT released a new collection of the Geostationary Surface Albedo covering both first and second generation of Meteosat from 1981-2017.

Projects

- Negotiation for the next EUMETSAT/LSA-SAF phase (CDOP4) – one objective of the phase (2022-2027) is the development of surface albedo for EPS-SG/VII and EPS-SG/3MI.
- Continuation of the development of the COPERNICUS/C3S Albedo Collection 2 (1981-today) - will be released in 2021.
- Discussion for the development of future NDVI products based on spectral albedos (Eumetsat Federate activity – EOLAB is responsible – Fernando may complete)

Articles

- Sánchez-Zapero, J., Camacho F., Martínez-Sánchez E., Lacaze R., Carrer D., Pinault F. Benhadj I, Munos-Sabater J., Quality Assessment of PROBA-V Surface Albedo V1 for the Continuity of the Copernicus Climate Change Service, Remote Sens. 2020, 12(16), 2596; https://doi.org/10.3390/rs12162596

Soil Moisture (1/2)

News:

- Best Practices Protocol: Final internal revision before submission to community
- Virtual National Soil Moisture Workshop 2020 - A vision for the next decade of soil moisture monitoring (August 12-13, 2020)
- Montzka, C., H. R. Bogena, M. Herbst, M. H. Cosh, T. Jagdhuber, and H. Vereecken (2020): *Estimating the number of reference sites necessary for the validation of global soil moisture products*. IEEE Geoscience and Remote Sensing Letters. DOI:10.1109/LGRS.2020.3005730
- Bagher Bayat, Fernando Camacho, Jaime Nickeson, Michael Cosh, John Bolten, Harry Vereecken, Carsten Montzka (under review): *Towards Operational Validation Systems for Global Satellite-Derived Terrestrial Essential Climate Variables*. International Journal of Applied Earth Observation and Geoinformation
- NISAR has moved launch to a January 2023
- New SMAP Science Team was selected to start in October 2020

Soil Moisture (2/2)

Workshops:

- National Soil Moisture Workshop (U.S.) August 12-13, 2020, Beltsville, MD. Virtual Meeting!
- 6th Satellite Soil Moisture Validation and Application Workshop, postponed to Autumn 2021, Perugia, Italy
- SMOS for Climate symposium, postponed to 9-11th March 2021 at the Eden project, UK
- 7th Satellite Soil Moisture Validation and Application Workshop, Fall 2022, New Orleans, LA, USA

Vegetation Indices

No input at this time.

Discussed protocol development strategies.

Snow

Above Ground Biomass

CEOS Biomass Protocol finalizing this week (!!) for NASA approval and 3 weeks public review

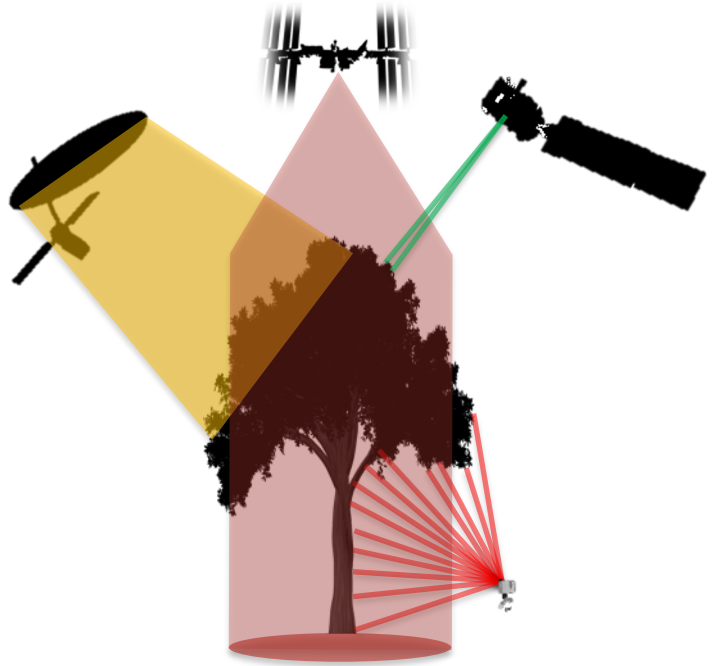
- Huge effort by ~60 authors with 40 different affiliations
- ~200 pages but includes a 7 page executive summary for those interested

- 30 minute presentation at SIT Technical Workshop on protocol and associated business case

- **Business case is asking for coordinated support from CEOS agencies for new field and airborne acquisitions**

Other activities

- Multi mission cal/val group still active
- BRIX2 still hopefully having launch meeting in Toulouse in Jan
- Early GEDI biomass products forthcoming this fall
- Working on ICESat-2 boreal-wide biomass product for 2021
- **Working with AFOLU group in CEOS to try to get biomass products into UNFCCC 2023 Global Stock take** (post Paris agreement); will be discussed at SIT and plenary
- SAOCOM 1B launched successfully on Sunday Aug 30!



Land Cover (1/3)

- 2019 global LC map generated within by the EU Copernicus Climate Change (C3S) service
  - Internal delivery to be validated
  - Validation starting now (qualitative & quantitative, with the update of the reference DB for 2019)

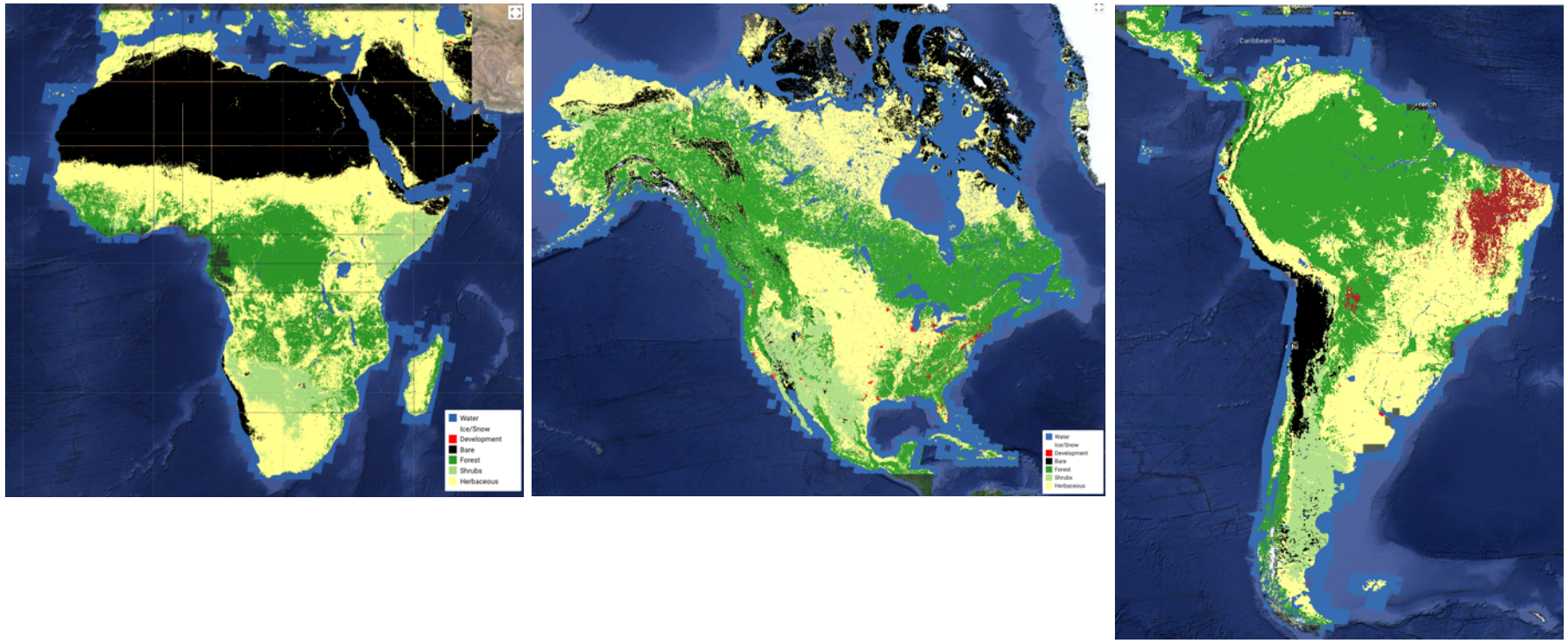
- GEOGLAM Essential Agriculture Variables (EAV's)
  Sprint in June-July to define all variables – work nearing completion

- Website has been reviewed

- Land Cover newsletter drafted

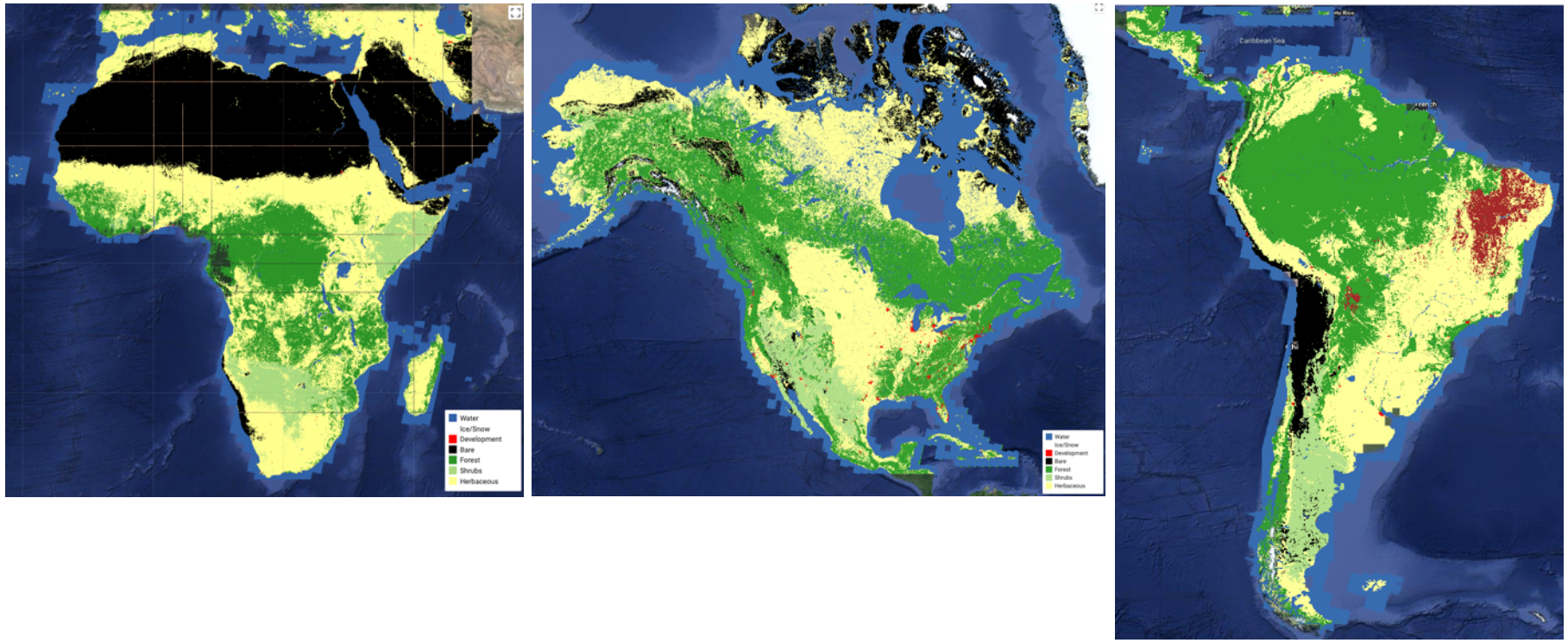
Land Cover (2/3)

- GLanCE: Global Land Cover mapping and Estimation – a NASA MEaSURES project at Boston University (PI Mark Friedl).
- Aim to map 21st century global land cover, land use and land cover change at 30m resolution.
- Version 1 of NA, SA, Africa complete

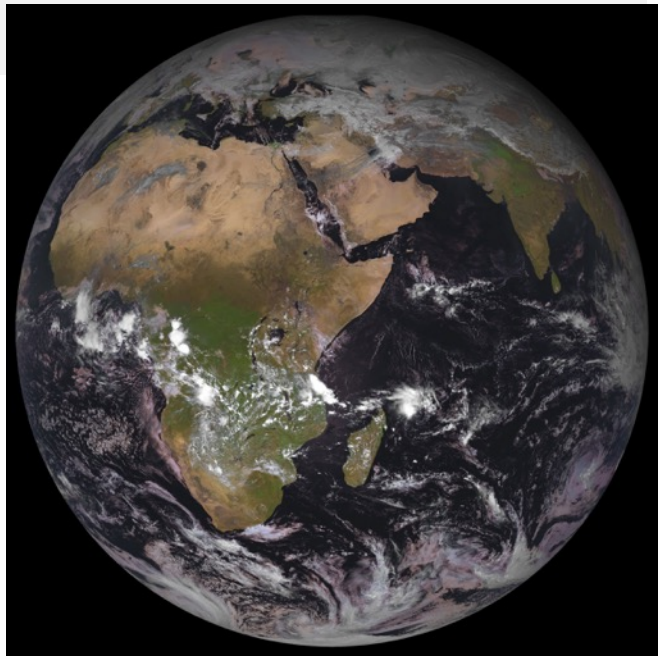


Land Cover (3/3)

- Sample data selected under simple random sampling for estimation of map accuracy are being collected
- Tools for creating local stratifications, sampling design and reference data collection provided with tutorials for users



Fire/Burned Area (1/2)



MSG-SEVIRI : IODC FRP product

- FRP-Pixel and FRP-Grid products available from the LSASAF (https://landsaf.ipma.pt/)
  - Provides FRP retrievals over the Africa, Middle-East and India every 15min
  - Data available from 2017-07-26 – present

- FRP-Pixel algorithm is applied to GOES-16, MSG, MSG-IODC and Himawari
  - Near global dataset
    - Only MSG and MSG-IODC currently publicly available
  - Will be assimilated into Copernicus Atmospheric Monitoring System (CAMS) for emissions estimation

Fire/Burned Area (2/2)

Publications

Active fire :

Li, F., Zhang, X., Kondragunta, S., Schmidt, C.C. and Holmes, C.D., 2020. A preliminary evaluation of GOES-16 active fire product using Landsat-8 and VIIRS active fire data, and ground-based prescribed fire records. *Remote Sensing of Environment*, *237*, p.111600.

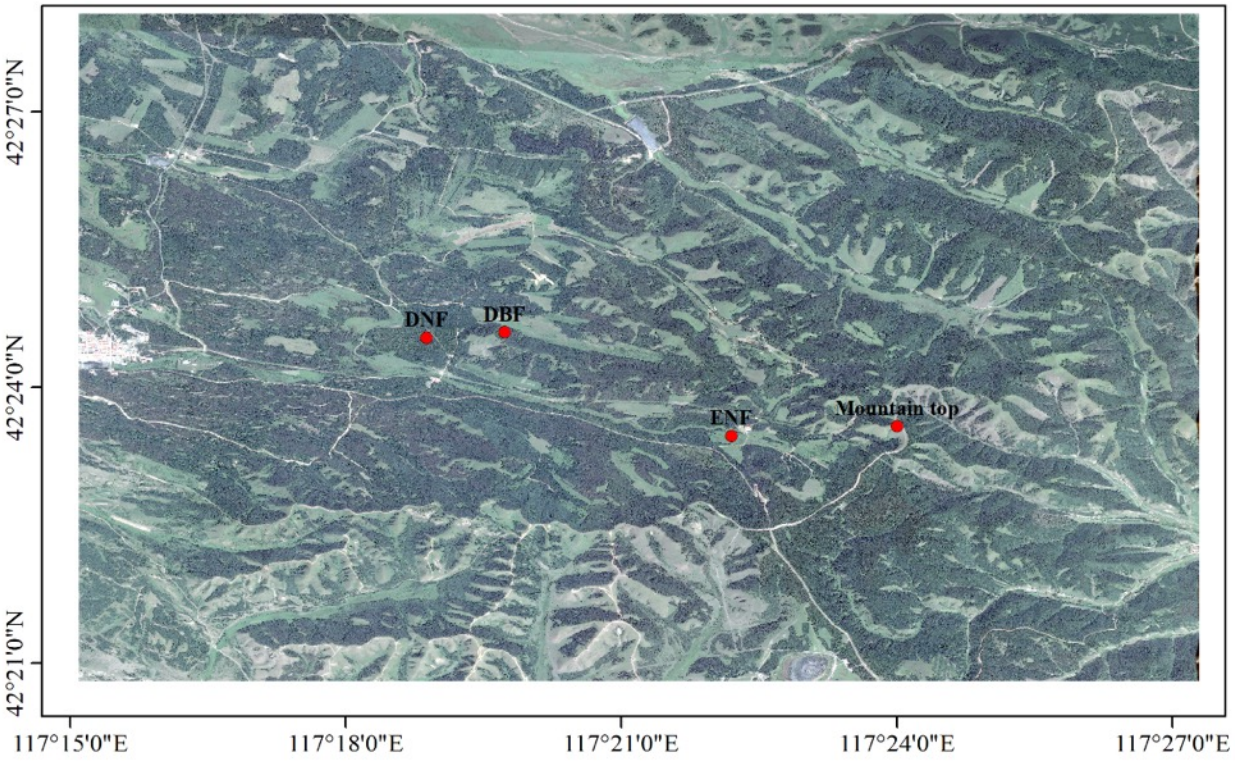
Xu, W., Wooster, M.J., He, J. and Zhang, T., 2020. First study of Sentinel-3 SLSTR active fire detection and FRP retrieval: Night-time algorithm enhancements and global intercomparison to MODIS and VIIRS AF products. *Remote Sensing of Environment*, *248*, p.111947.

Burned Area :

Giglio, L. and Roy, D.P., 2020. On the outstanding need for a long-term, multi-decadal, validated and quality assessed record of global burned area: caution in the use of Advanced Very High Resolution Radiometer data. *Science of Remote Sensing*, p.100007.

Biophysical (1/3)

- New towers erected in Saihanba, China (40 m)
  POC: Dr. Xihan Mu (muxihan@bnu.edu.cn)
  - DNF 42°24'32.63"N 117°18'52.62"E
  - DBF 42°24'35.15"N 117°19'43.79"E
  - ENF 42°23'28.36"N 117°22'12.88"E
- Field and air measurements

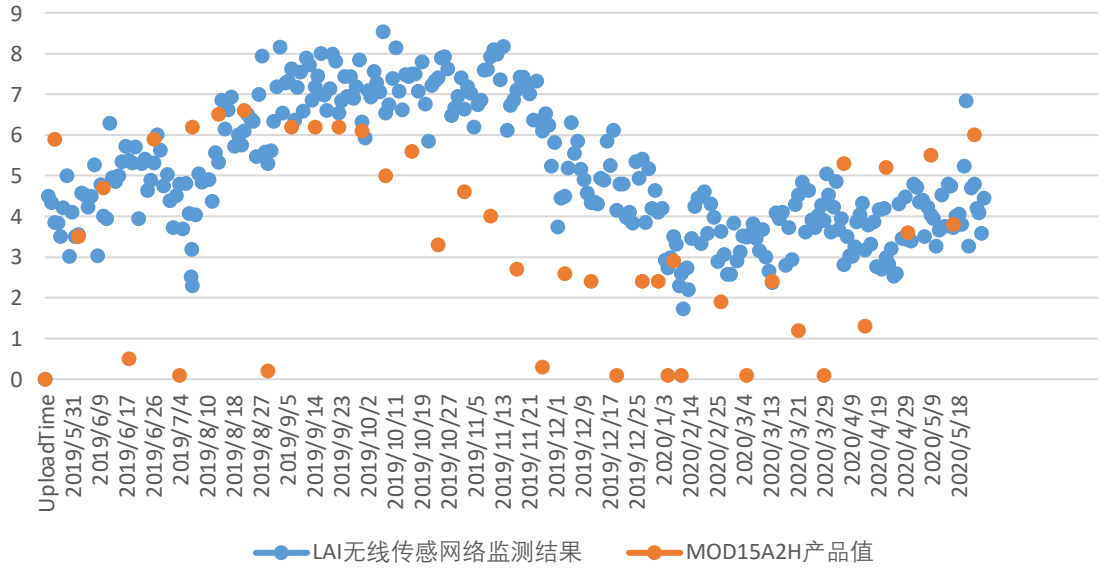


Biophysical (2/3)

- Wireless automated measurement network, China
- PI: Prof. Xingfa <guxingfa@radi.ac.cn>

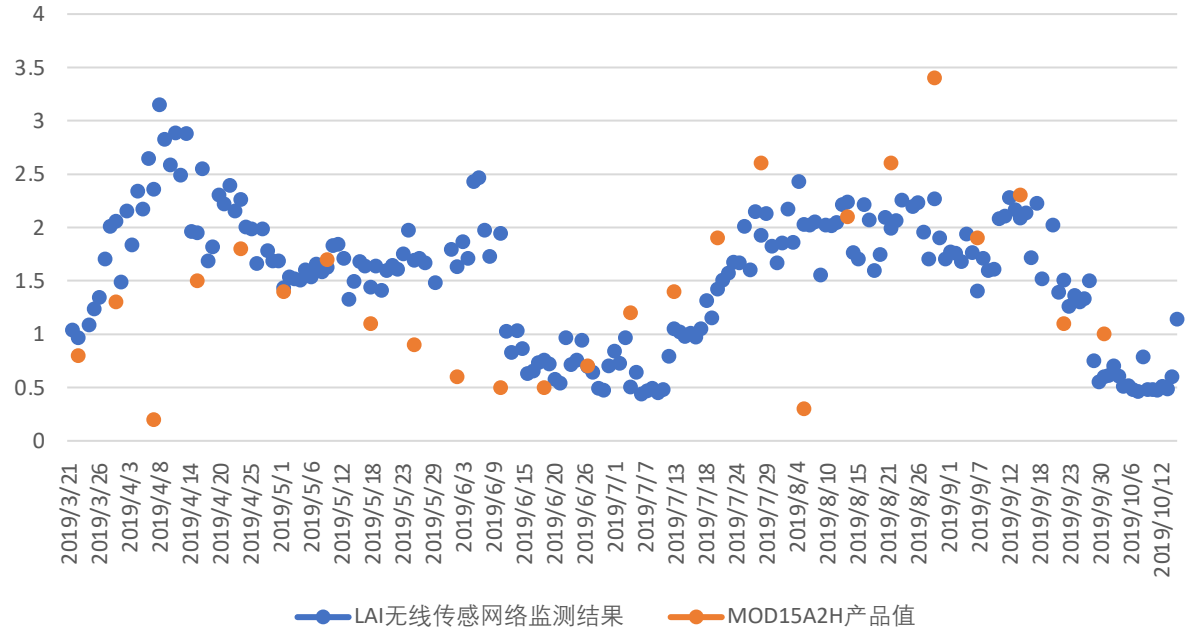
Biophysical (3/3)

- Comparison of field and MODIS LAI



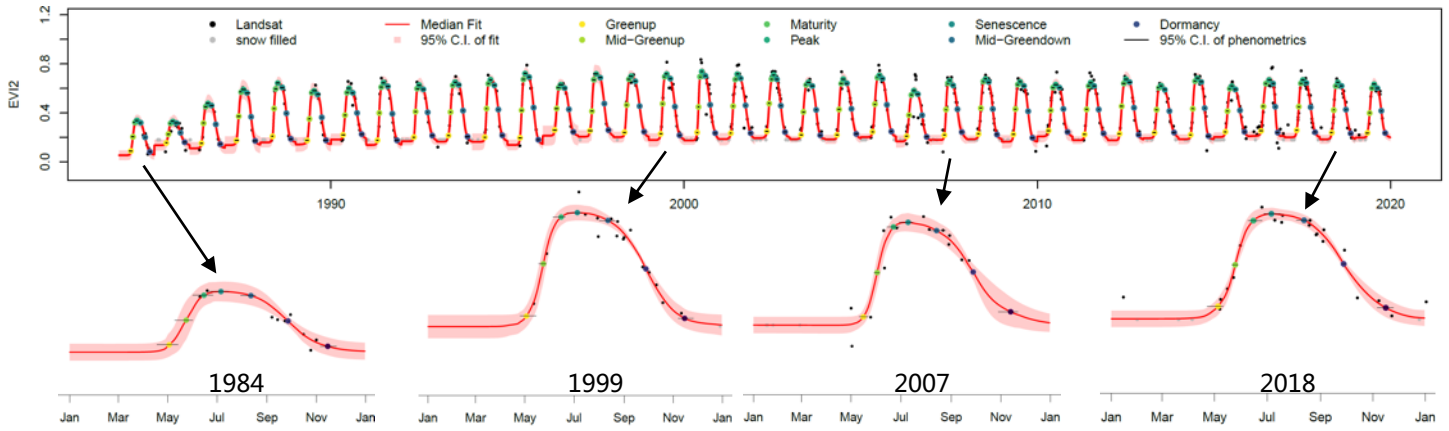
Evergreen needleleaf forest
Qianyanzhou, Jianxi, China

Cropland
Yucheng, Shangdong, China



Land Surface Phenology

- Using Hubbard Brook (A. Bailey) and Harvard Forest (J. O'Keefe) long-term ground phenology observations to evaluate moderate res LSP from new Bayesian method
  - Evaluating best practices for handling ground obs: Melaas et al and Richardson et al methods
  - Need other long-term datasets
  - Compared to Melaas et al method, new approach recovers >3x as much data
- Refining EC-derived fluxmetric and MCD12Q2 C6 comparison
- MCD12Q2 C6 paper close to submission
  - Intercomparison w/ C5, VIIRS, and HLS products
  - Assessment w/ PhenoCam and USNPN independent data



Remote Sensing of Environment 132 (2013) 176–185

Contents lists available at SciVerse ScienceDirect

Remote Sensing of Environment

journal homepage: www.elsevier.com/locate/rse

Detecting interannual variation in deciduous broadleaf forest phenology using Landsat TM/ETM + data

Eli K. Melaas *, Mark A. Friedl, Zhe Zhu

Department of Earth and Environment, Boston University, 675 Commonwealth Avenue, Boston, MA 02215, United States

Global Change Biology (2006) **12,** 1174–1188, doi: 10.1111/j.1365-2486.2006.01164.x

Phenology of a northern hardwood forest canopy

ANDREW D. RICHARDSON*, AMEY SCHENCK BAILEY†, ELLEN G. DENNY‡, C. WAYNE MARTIN† and JOHN O'KEEFE§

**Complex Systems Research Center, University of New Hampshire, Durham NH, USA, †USDA Forest Service, Hubbard Brook Experimental Forest, Campton NH, USA, ‡School of Forestry and Environmental Studies, Yale University, New Haven CT, USA, §Harvard University, Harvard Forest, Petersham, MA, USA*

LST & Emissivity

COVID-19 and conferences

- AGU Fall meeting**, 7-11 Dec 2020: Format TBD**
  - **Temperature Session: Taking the Temperature of the Earth**

- 6th Sentinel-3 Val Team meeting: **moved to 14-17 Dec 2020**

- EUMETSAT Conference 2020: **cancelled**
  (next: Bucharest, 20-24 Sep 2021)

- 6th Recent Advances on Quantitative Remote Sensing (RAQRS) Conference: **postponed** (Sep 2021)

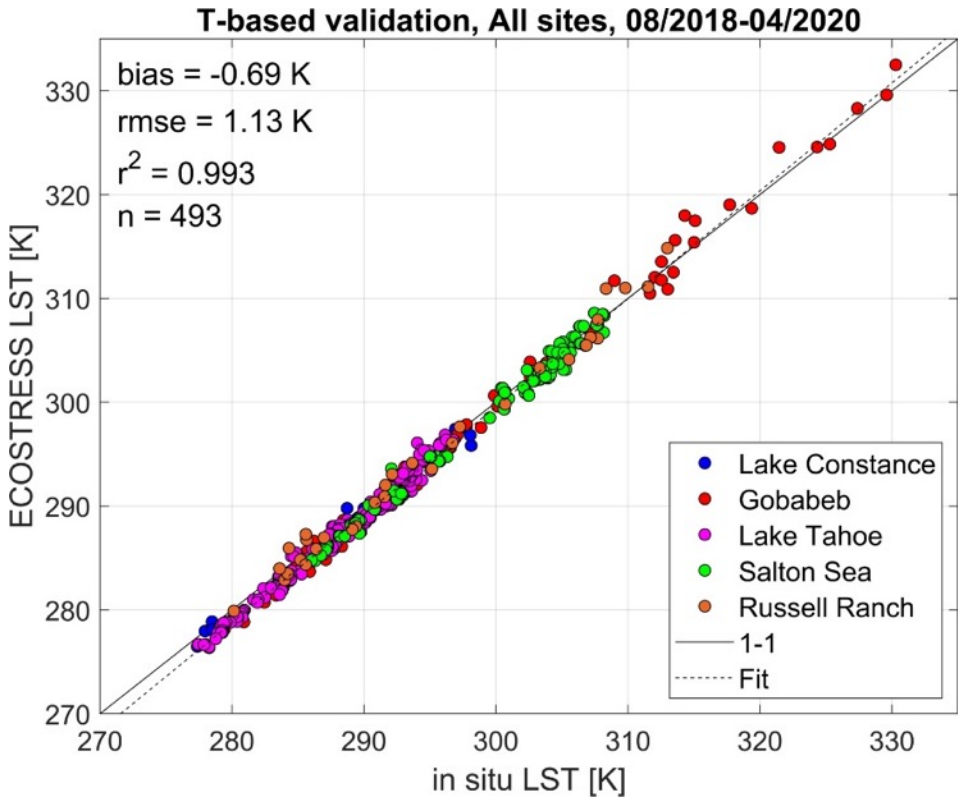
LST in-situ validation activities

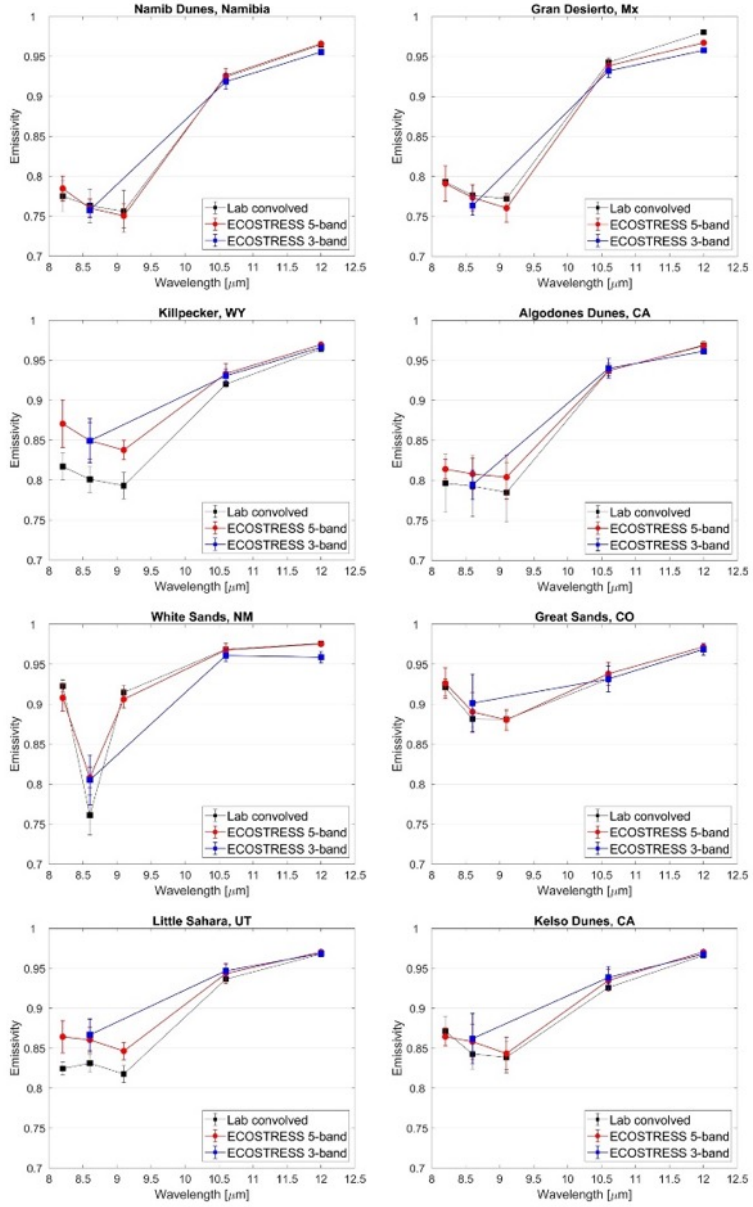
- **Copernicus LAW project**: deployed first validation instrument package (mixed forest around KIT's 200 high meteorological tower; operation started in Aug 2020).
  - Four more instrument packages; deployment depends on Covid-19
  - Project web-site: law.acri-st.fr/app/home

- **EUMETSAT study:** 'Thermal Infra-red Product Inter-comparison and Validation with FRM Radiometers'
  www.eumetsat.int/website/home/Data/ScienceActivities/ScienceStudies/ThermalInfraredProductIntercomparisonandValidationwithFRMRadiometers/index.html
  - Acquire Lake Water Surface Temperature (LWST) from two FRM radiometers operating in parallel: inter-comparison campaign on Lake Constance, 1–23 Sep 2020. (KIT instruments vs ISAR; www.isar.org.uk)
  - Compare infra-red satellite ST products, in particular Sentinel-3

ECOSTRESS activities

- Stage-1 validation of Level-2 LST&E products complete. Paper in submission to RSE
- LST accuracy: 1.07 K
- Emissivity accuracy: 2.14%





Urban validation activities

- Validate temperatures of urban surfaces in cities (e.g. LA) for ‘sharpened’ LST products at 30m resolution, e.g. ECOSTRESS, MuSLI urban LST