



Committee on Earth Observation Satellites

Working Group on Calibration and Validation

# Land Product Validation (LPV) Subgroup Report

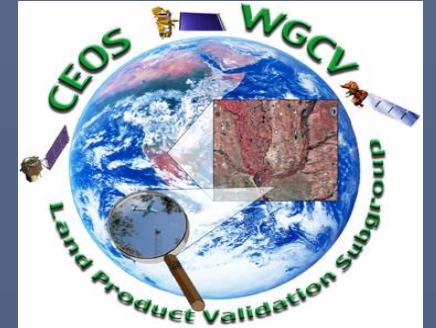
WGCV-48 – Virtual 28/10/2020

Chair: Fernando Camacho (EOLAB / U. Valencia)

Vice-Chair: Michael Cosh (USDA)

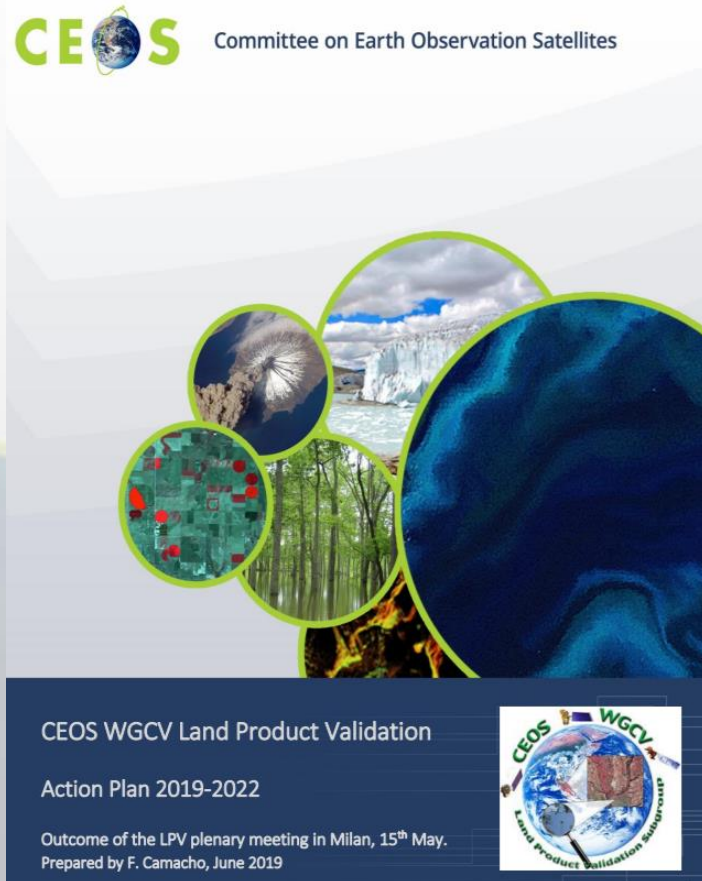
Secretariat: Jaime Nickeson (SSAI/NASA Goddard)

& Focus Area leads





**LPV Strategy agreed in Milan 2019 :** [https://lpvs.gsfc.nasa.gov/LPV\\_Meetings/LPV\\_plenary2019.html](https://lpvs.gsfc.nasa.gov/LPV_Meetings/LPV_plenary2019.html)



Continuous Development of Good Practices

Improving ground references: data, sites, uncertainties

Promoting validation and intercomparison exercises

Improving LPV communication



## CV- 19: Biomass validation protocol

WGCV LPV has decided to extend the time **period for review until 15 December 2020**, and to present it for potential endorsement at the CEOS SIT-36 meeting in spring 2021.

Previously should be endorsed by WGCV.



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Land Product Validation Subgroup

Aboveground Woody Biomass Product Validation

Good Practices Protocol

Version 1.0 – 2020

Editors: Laura Duncanson, Mat Disney, John Armston, David Minor, Fernando Camacho, Jaime Nickeson

Citation: Duncanson, L., Armston, J., Disney, M., Avitabile, V., Barbier, N., Calders, K., Carter, S., Chave, J., Herold, M., MacBean, N., McRoberts, R., Minor, D., Paul, K., Réjou-Méchain, M., Roxburgh, S., Williams, M., Albinet, C., Baker, T., Bartholomeus, H., Bastin, J.F., Coomes, D., Crowther, T., Davies, S., de Bruin, S., De Kauwe, M., Domke, G., Falkowski, M., Fatoyinbo, L., Goetz, S., Jantz, P., Jonckheere, I., Jucker, T., Kay, H., Kellner, J., Labriere, N., Lucas, R., Morsdorf, F., Phillips, O.L., Quegan, S., Saatchi, S., Schaaf, C., Schepaschenko, D., Scipal, K., Stovall, A., Thiel, C., Wulder, M.A., Camacho, F., Nickeson, J., Roman, M., Margolis, H. (2020). *Global Aboveground Biomass Product Validation Best Practices Protocol. Version 1.0*. In L. Duncanson, M. Disney, J. Armston, D. Minor, F. Camacho, and J. Nickeson (Eds.), *Best Practice Protocol for Satellite Derived Land Product Validation*, (p. 222): Land Product Validation Subgroup (WGCV/CEOS), doi:10.5067/doc/ceoswgcv/lpv/agb.001

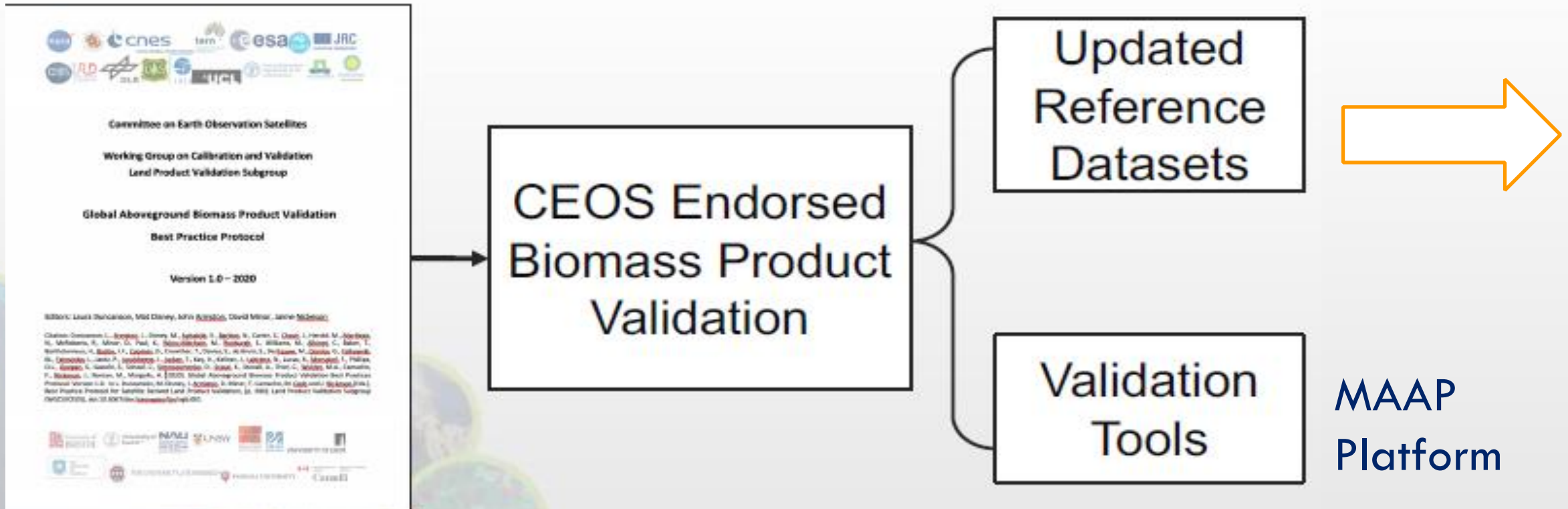
Final draft version for public review:

[https://docs.google.com/document/d/17Yy3-y\\_78gzTHkKRITW733ld7rTqLKy4ovF7RiHnOLc/edit?usp=sharing](https://docs.google.com/document/d/17Yy3-y_78gzTHkKRITW733ld7rTqLKy4ovF7RiHnOLc/edit?usp=sharing)





## Protocol Implementation considerations





## CEOS Forest Biomass Reference System – business case

The greatest value for the enormous EO investment will be gained if products are trusted

We propose the creation of a **CEOS Forest Biomass Reference System** as an equitable and sustainably-funded system of recurrent site-based measurements that will serve as a lasting interface between the Earth Observation agencies and ground-based tree-by-tree measurement initiatives.

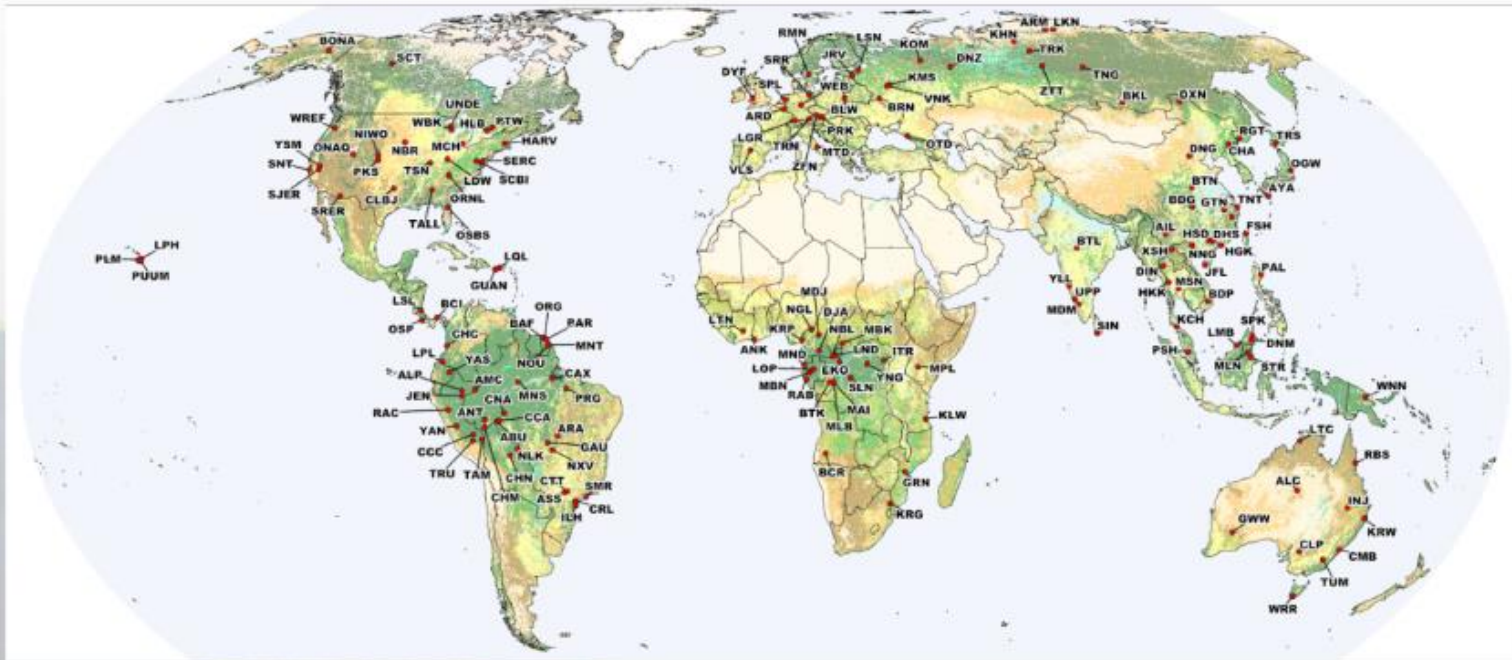
No single EO mission or agency would alone support the costs of this implementation; this infrastructure is designed to become a **common good for the entire EO community**. With this project, CEOS has the opportunity to coordinate this effort, and liaise with the ground research and forestry community.





## CEOS Forest Biomass Reference System – business case

*We propose the creation of a CEOS Forest Biomass Reference System, a network of **100 Biomass Reference Measurement (BRM) sites**, plus **210 additional distributed sites (distributedBRM)**. Such an infrastructure is needed to provide confidence in the outputs of biomass EO missions. Its estimated cost is 33.75 M€ over a 5-year period.*



No Space Agency alone can fund the required work to establish a global network of biomass reference sites but **each Agency can make a contribution by e.g. funding national supersites** or by adopting reference sites

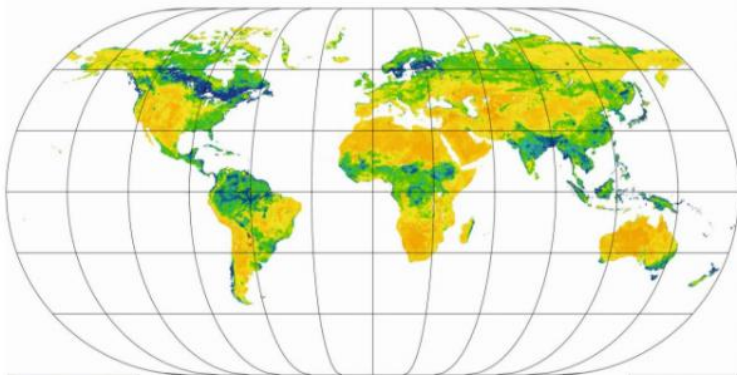
Space Agencies are encouraged to **collaborate with established networks** (e.g. ForestGEO, Rainfor, NEON, TERN, ICOS...etc) **and their local collaborators.**

If most agencies **each sponsor ~5-10 sites** we can meet this goal. Cost estimates will vary by region, and can be reduced through leveraging existing cal/val investments

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### Soil Moisture Product Validation Good Practice Protocol

Version 1.0 – September 2020



**Editors:** Carsten Montzka, Michael Cosh, Jaime Nickeson, Fernando Camacho

**Authors:** Carsten Montzka, Michael Cosh, Bagher Bayat, Ahmad Al Bitar, Aaron Berg, Rajat Bindlish, Heye Reemt Bogena, John D. Bolten, Francois Cabot, Todd Caldwell, Steven Chan, Andreas Colliander, Wade Crow, Narendra Das, Gabrielle De Lannoy, Wouter Dorigo, Steven R. Evett, Alexander Gruber, Sebastian Hahn, Thomas Jagdhuber, Scott Jones, Yann Kerr,

- Soil Moisture Product Validation Good Practices completed the review period by international community.
- Final document in publication process (DOI).
- We will send you a digital copy for endorsement at WGCV-49.

4 main validation components identified:

- (1) low level data validation;
- (2) ground-based validation of soil moisture;
- (3) satellite product intercomparison; and
- (4) time series comparisons.

**Full validation capacity of Soil Moisture Products**, with community-agree-upon protocols, references (ISMN) and online validation tools (QA4SM)





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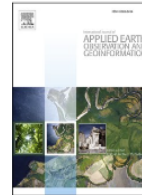


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Contents lists available at ScienceDirect

## International Journal of Applied Earth Observations and Geoinformation

journal homepage: [www.elsevier.com/locate/jag](http://www.elsevier.com/locate/jag)



### Toward operational validation systems for global satellite-based terrestrial essential climate variables

Bagher Bayat<sup>a,\*</sup>, Fernando Camacho<sup>b</sup>, Jaime Nickeson<sup>c,e</sup>, Michael Cosh<sup>d</sup>, John Bolten<sup>e</sup>, Harry Vereecken<sup>a</sup>, Carsten Montzka<sup>a</sup>

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<sup>b</sup> Earth Observation Laboratory (EOLAB), Parc Científic University of Valencia, C/ Catedratic Agustín Escardino, 9, 46980, Paterna, Valencia, Spain

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#### ARTICLE INFO

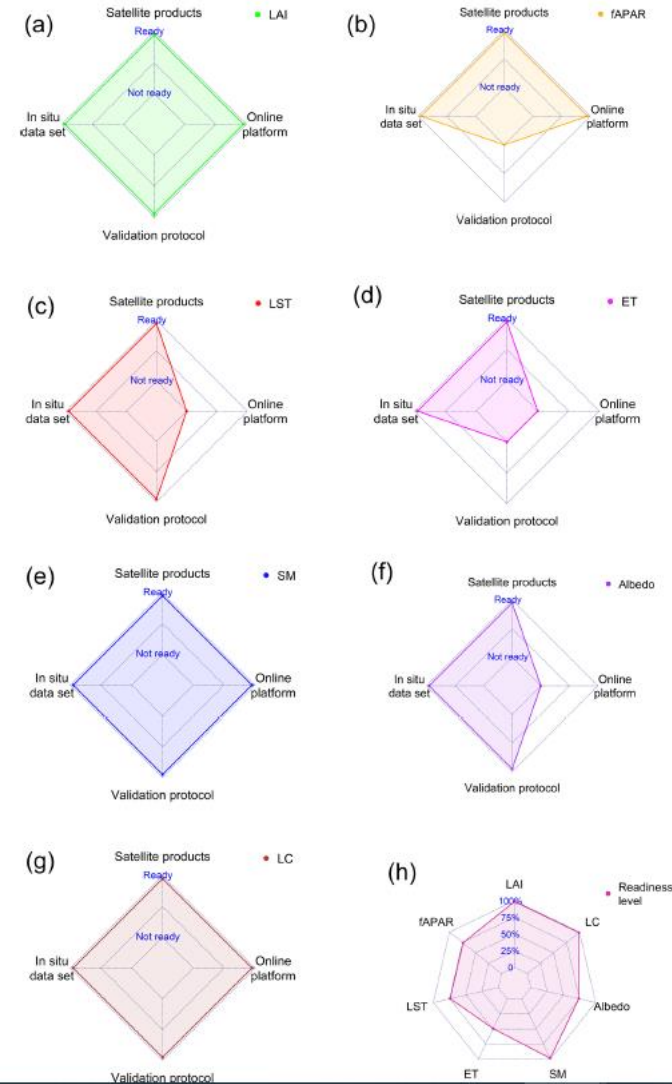
#### ABSTRACT

Keywords:

Terrestrial Essential Climate Variables, known as terrestrial ECVs, are key sources of information for both

[https://authors.elsevier.com/sd/article/S0303-2434\(20\)30883-7](https://authors.elsevier.com/sd/article/S0303-2434(20)30883-7)

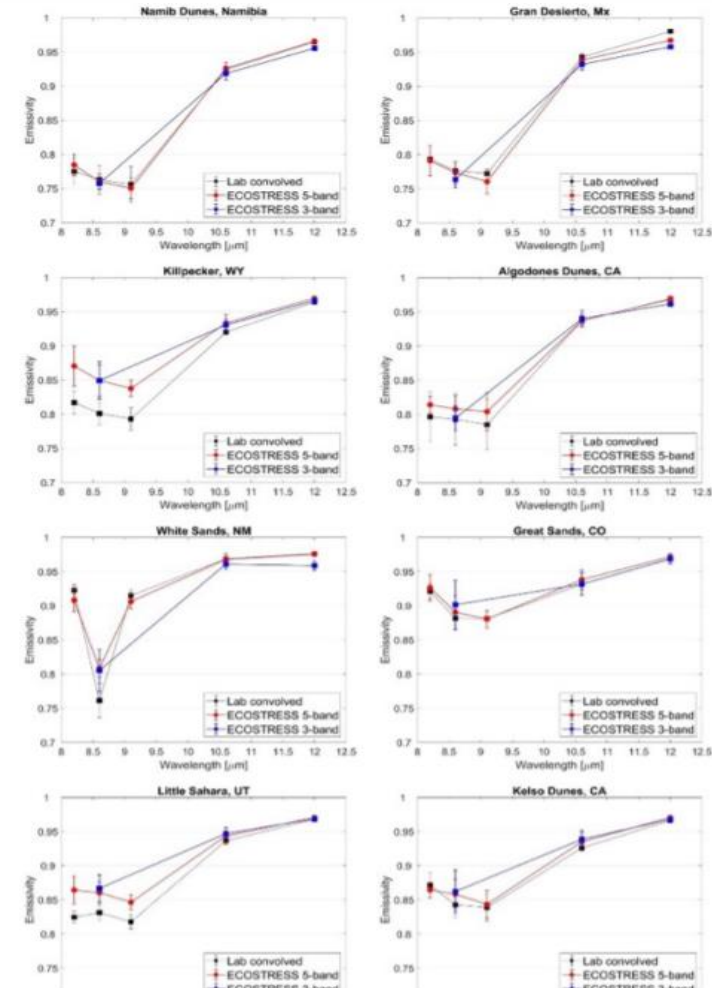
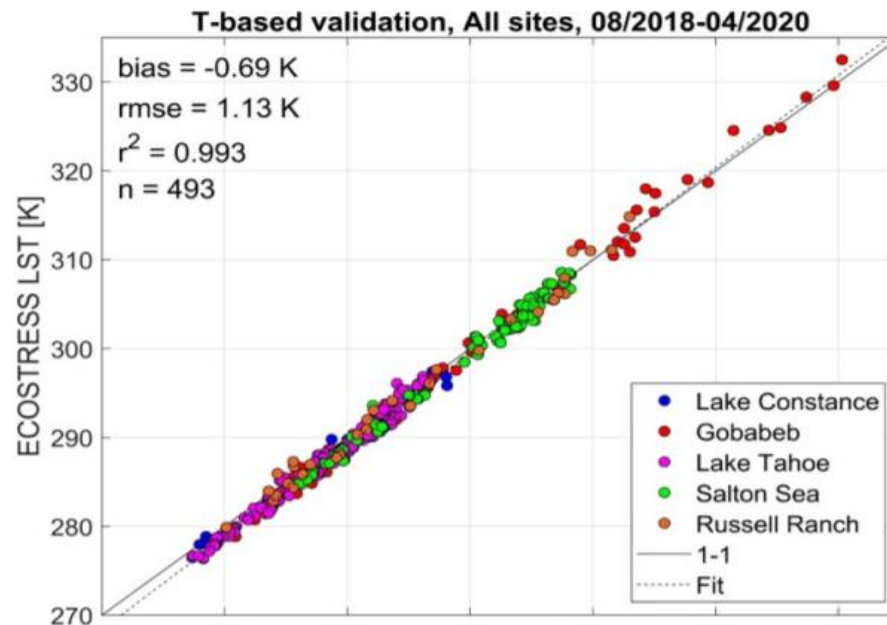
et al.





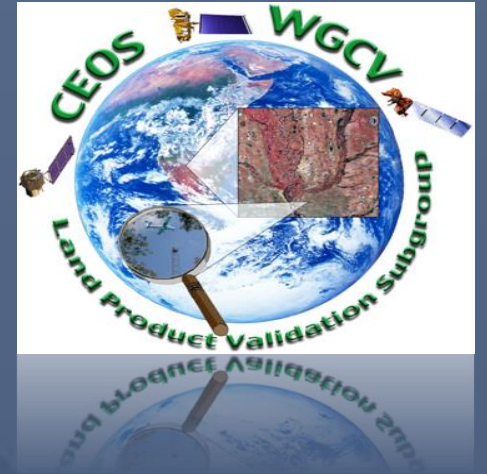


- Stage-1 validation of Level-2 LST&E products complete. Paper in submission to RSE
- LST accuracy: 1.07 K
- Emissivity accuracy: 2.14%





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Thank you for your attention !

<https://lpvs.gsfc.nasa.gov/>

