

International Workshop on High-Resolution Thermal EO

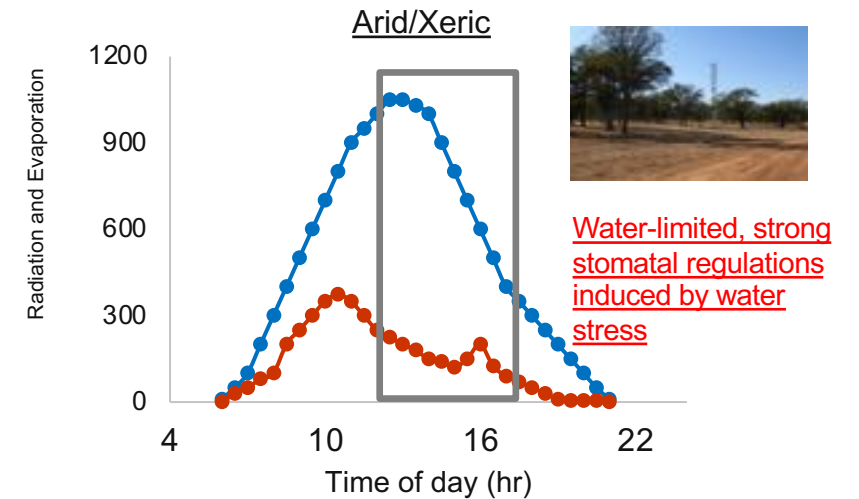
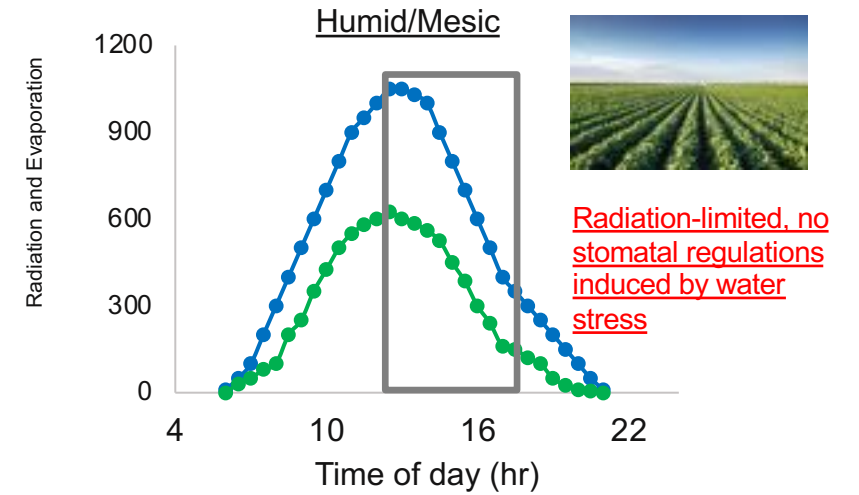
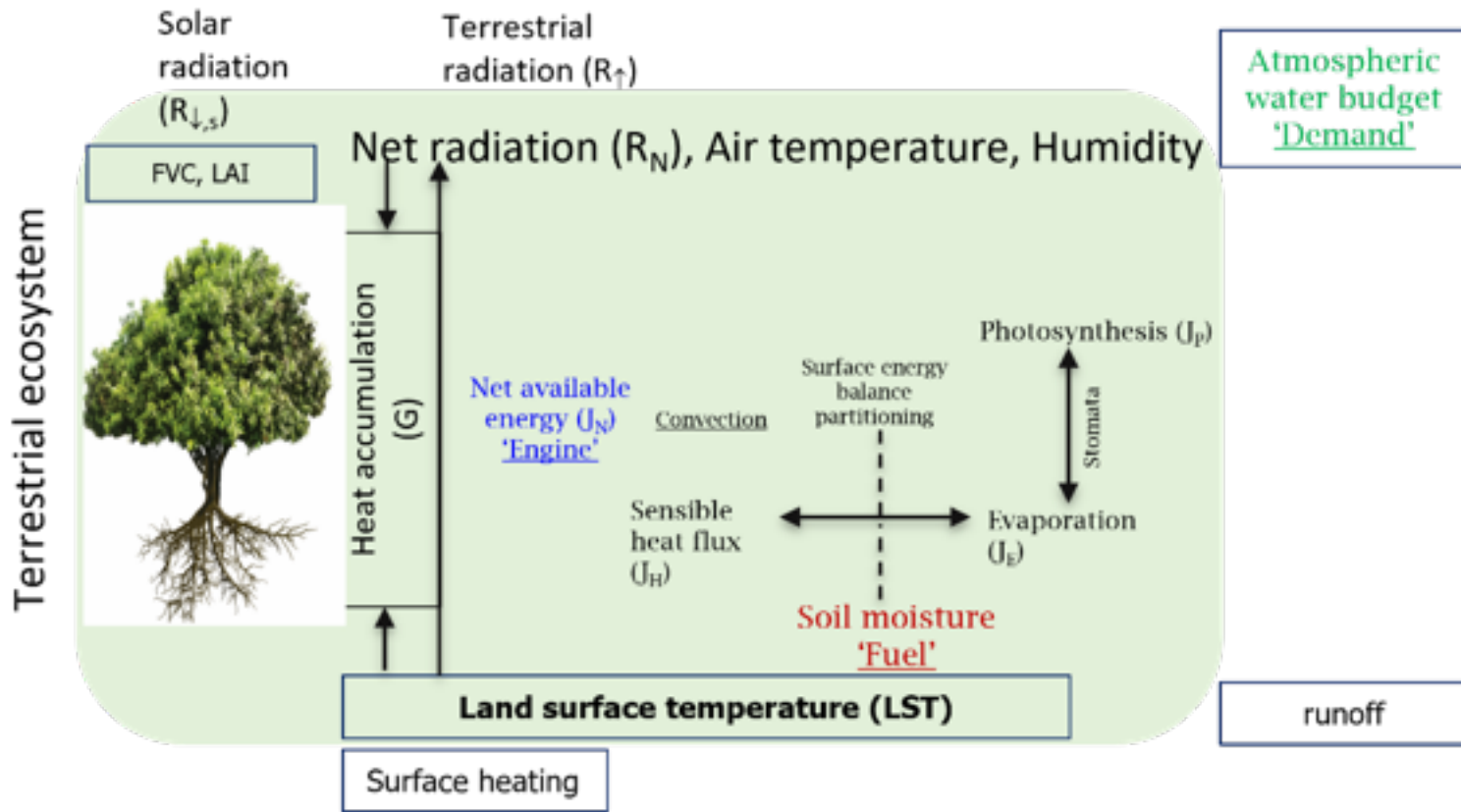
EURopeAN ECOSTRESS hUb phaSe 2 (EURANUS)

—Thermal Infrared Remote Sensing of Terrestrial Ecosystem Processes

11th May 2023

Tian Hu, Kanishka Mallick, Albert Olioso, Patrik Hitzelberger, Yoanne Didry, Zoltan Szantoi et al.

Background



Insights Into the Aerodynamic Versus Radiometric Surface Temperature Debate in Thermal-Based Evaporation Modeling, K. Mallick et al., 2022, GRL

EEH Phase 1 (2020/08 – 2022/07)

Focus 1: Implementation and comparison between SW and TES

Focus-1,1: Implementation of Split Window (SW) and Temperature and Emissivity Separation (TES) algorithms for ECOSTRESS

Focus-1,2: Inter-comparison between SW and TES across different biomes and comparison with the current high-resolution Landsat and ASTER LST estimates



Focus 2: Implementation and Comparison among SEB models with contrasting structures

Focus-2,1: Implementation of one-source STIC, SEBS, and two-source TSEB models for ECOSTRESS

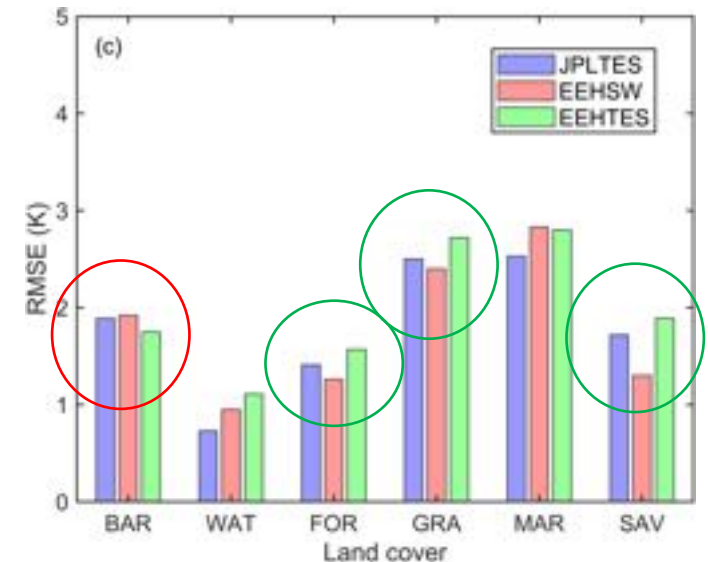
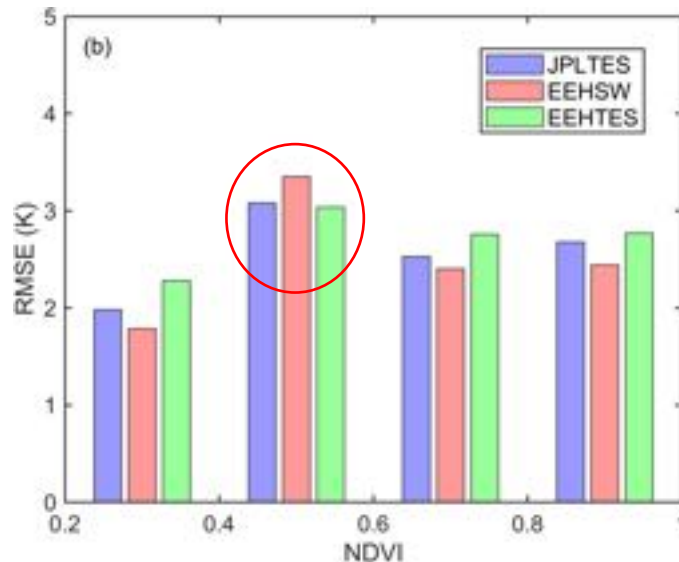
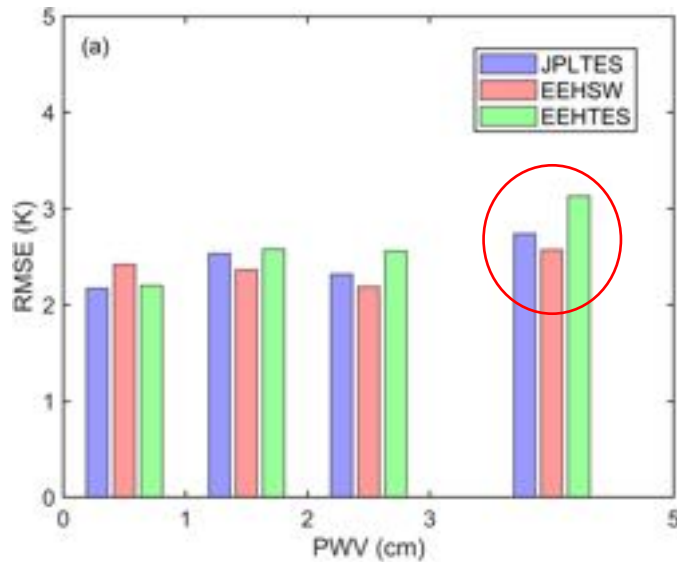
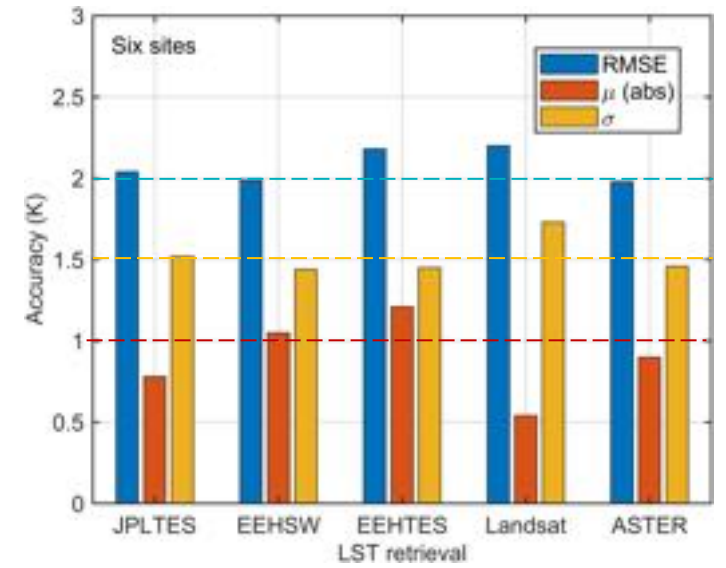
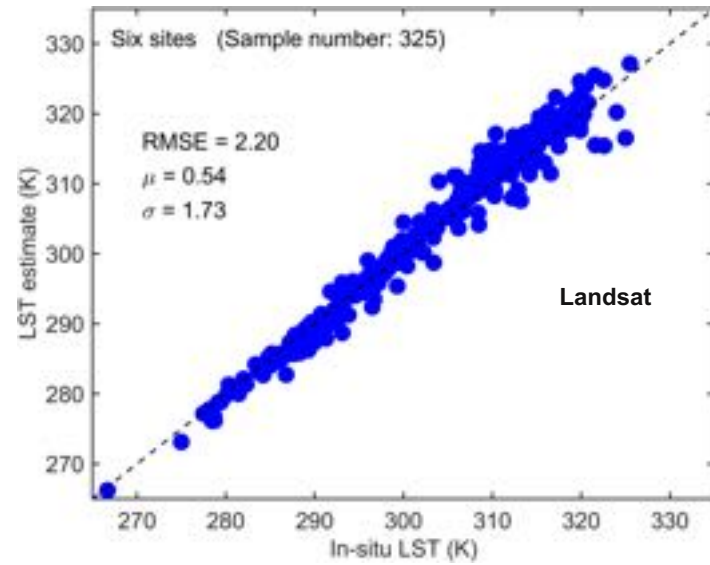
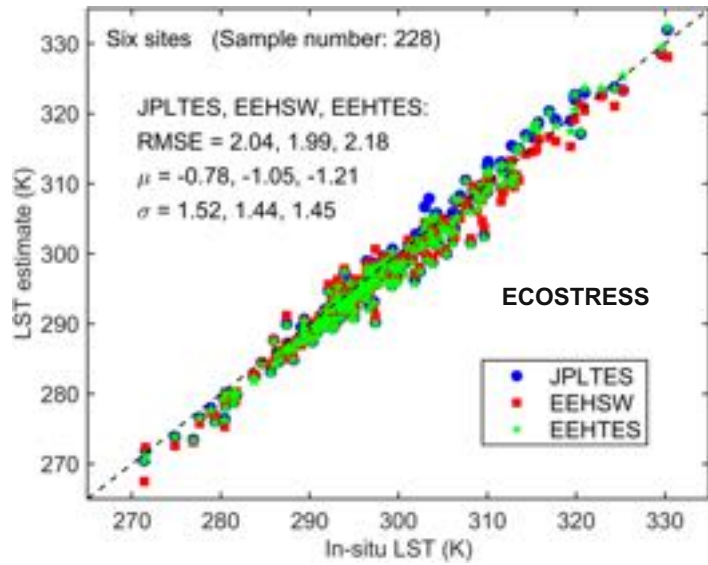
Focus-2,2: Evaluation of different SEB models at eddy covariance sites across different biomes and varying aridity conditions



Focus 3: Operational LST and ET product generation

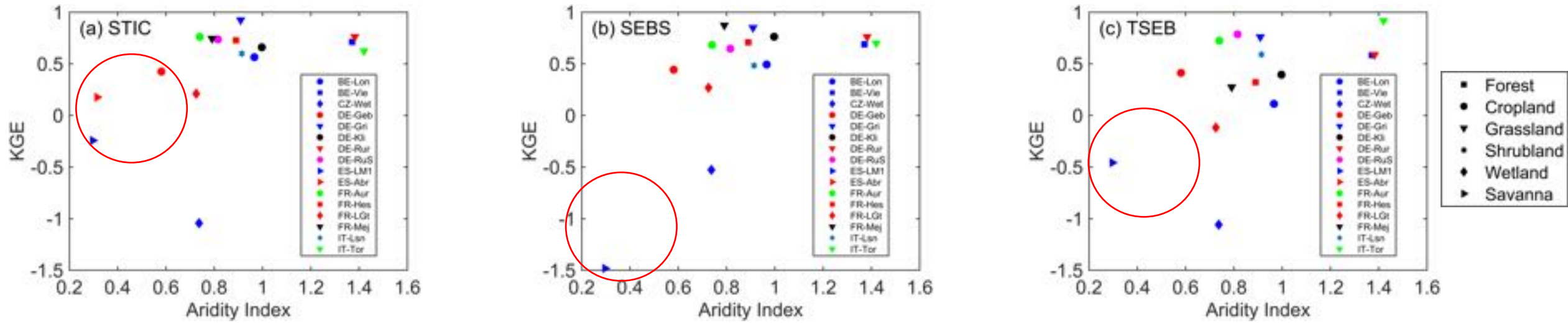
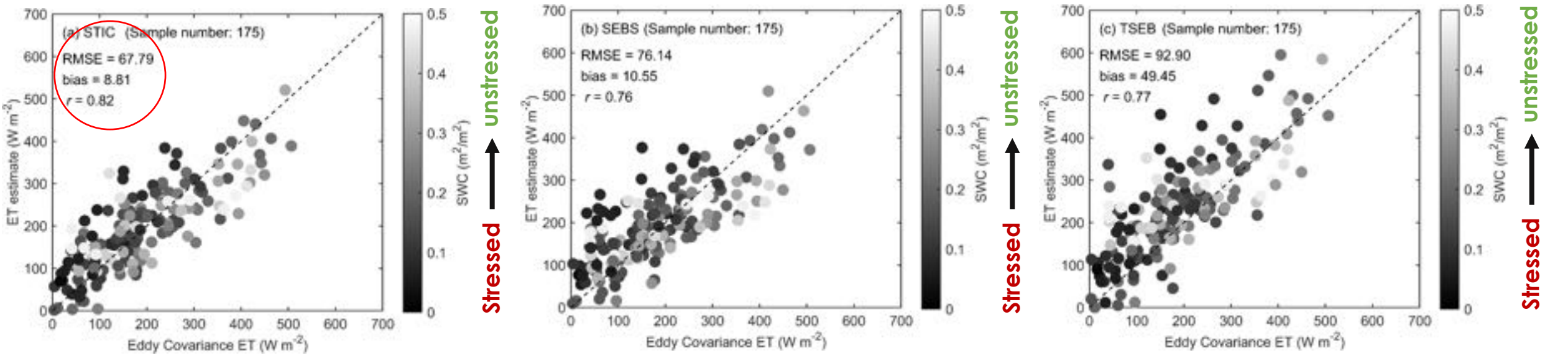
Focus-3,1: Operational generation of LST swath data (Aug. 2018 to Dec. 2021)

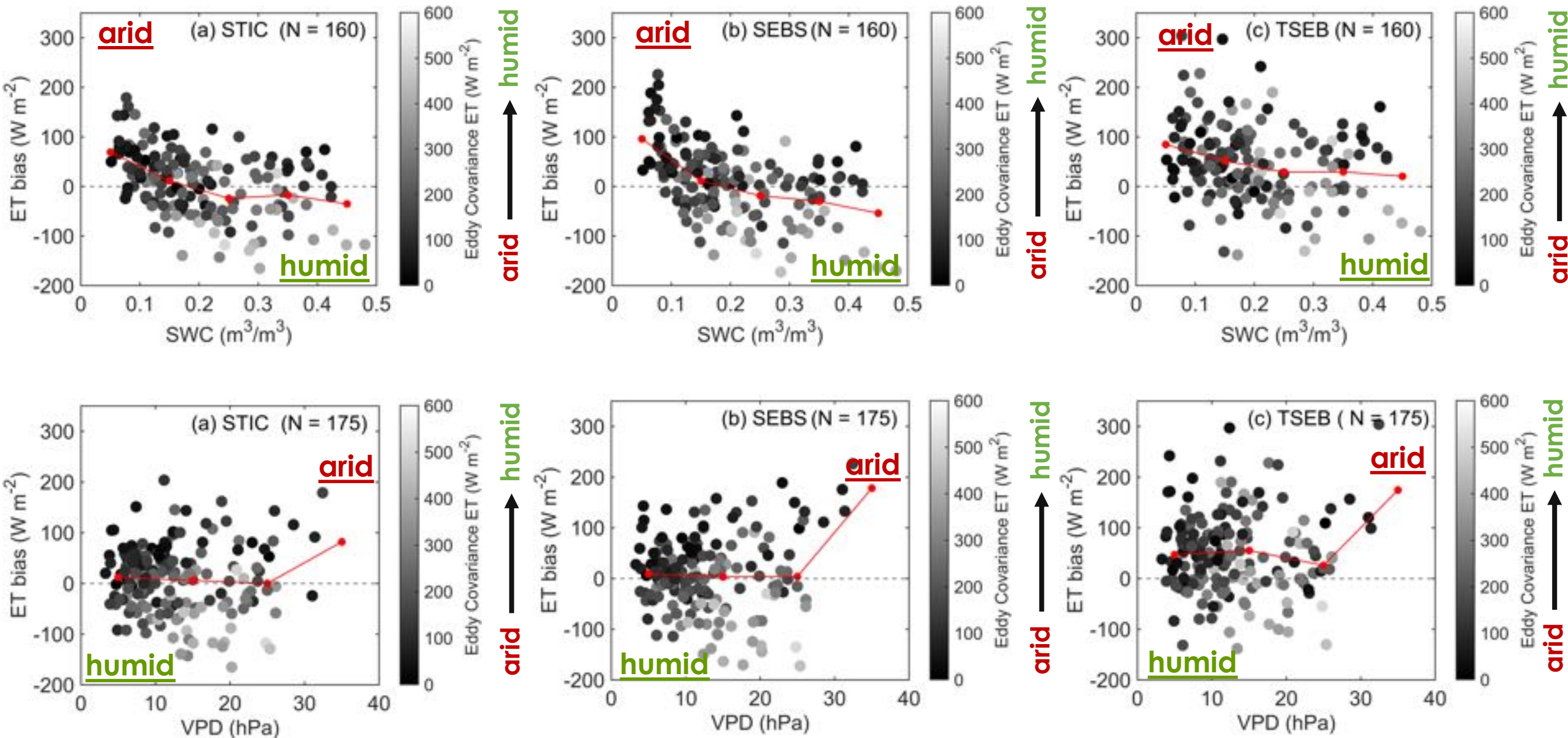
Focus-3,2: Operational generation of ET swath data at the instantaneous scale (Aug. 2018 to Dec. 2021)

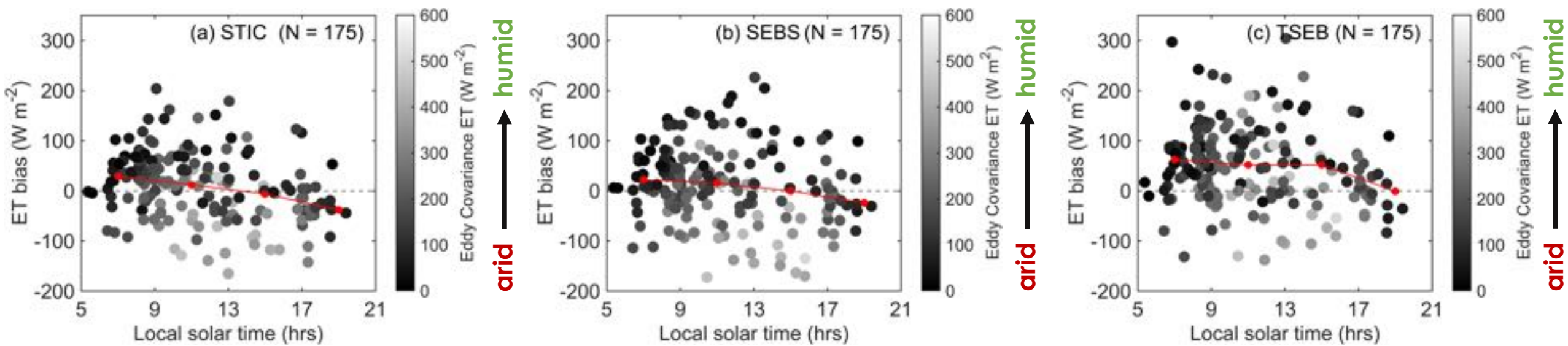
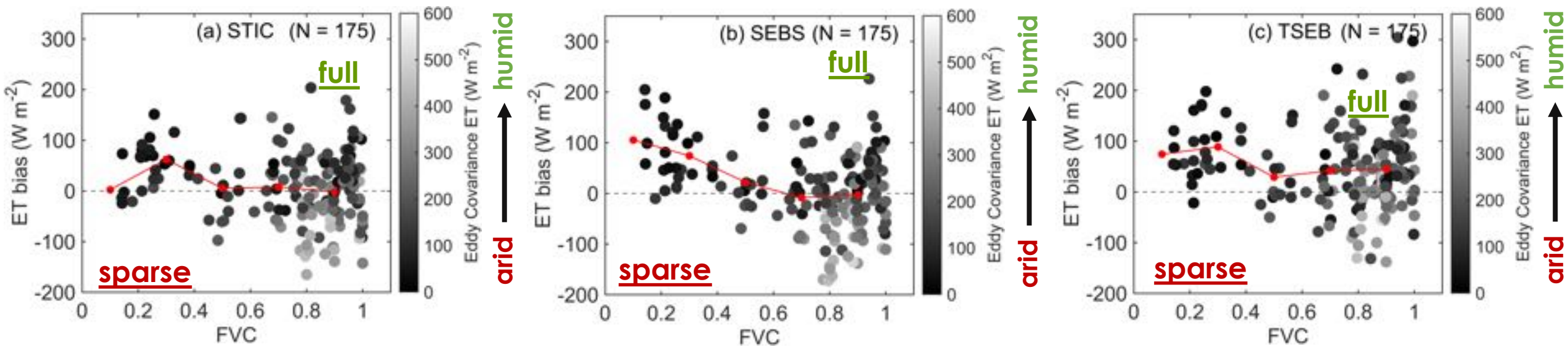


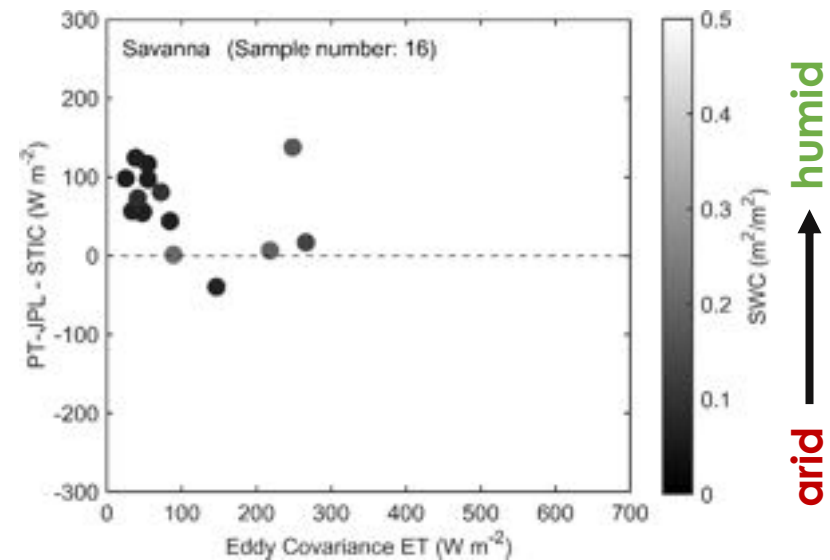
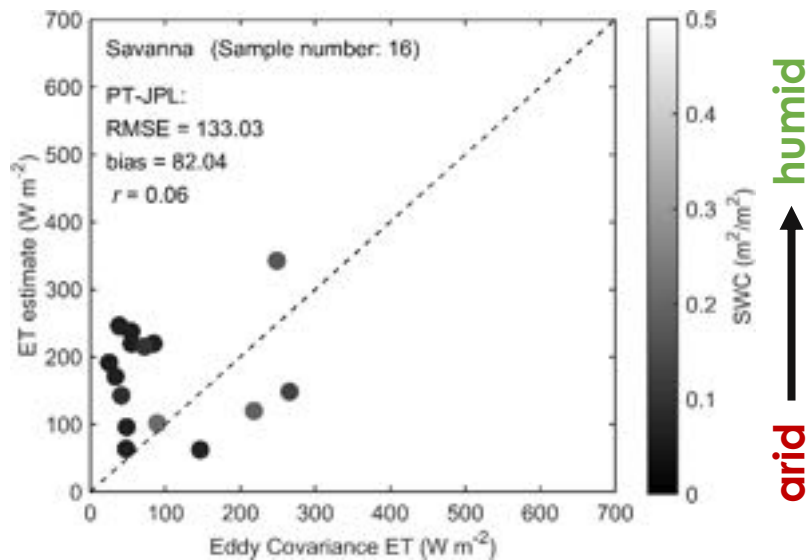
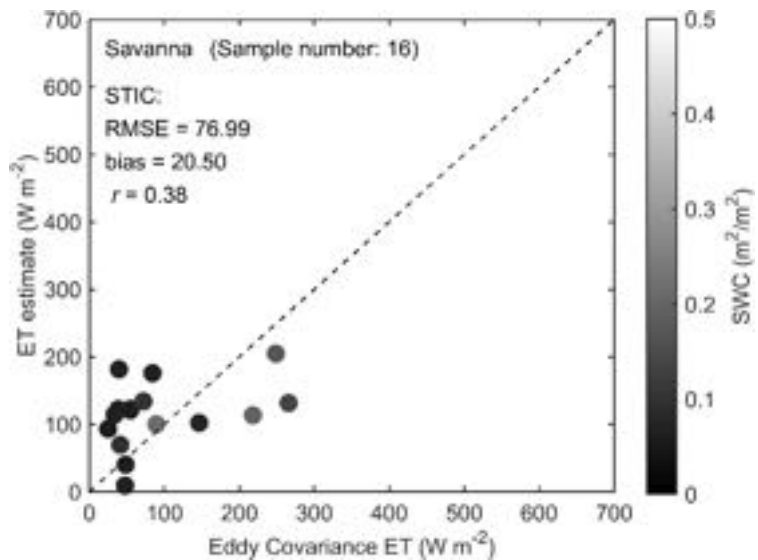
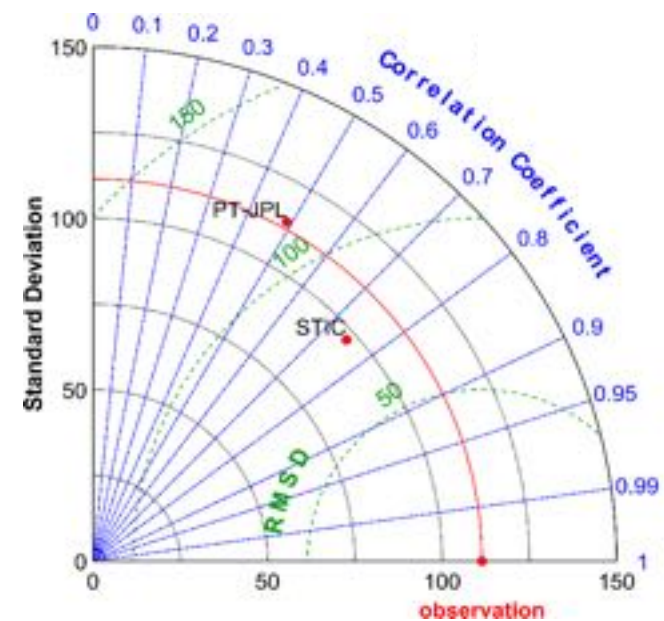
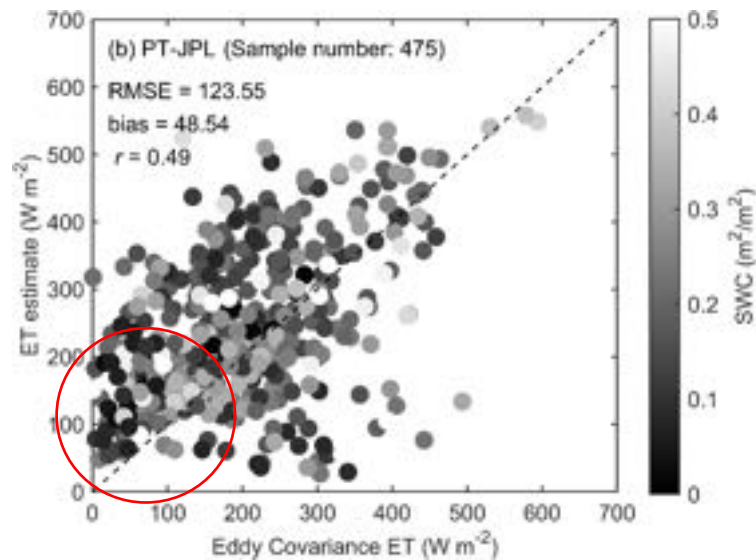
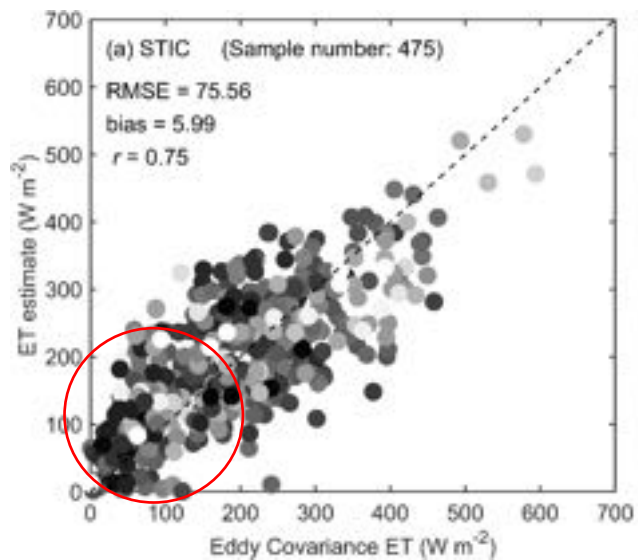
STIC: LST-VPD control, non-parametric

SEBS, TSEB: Only LST control, parametric

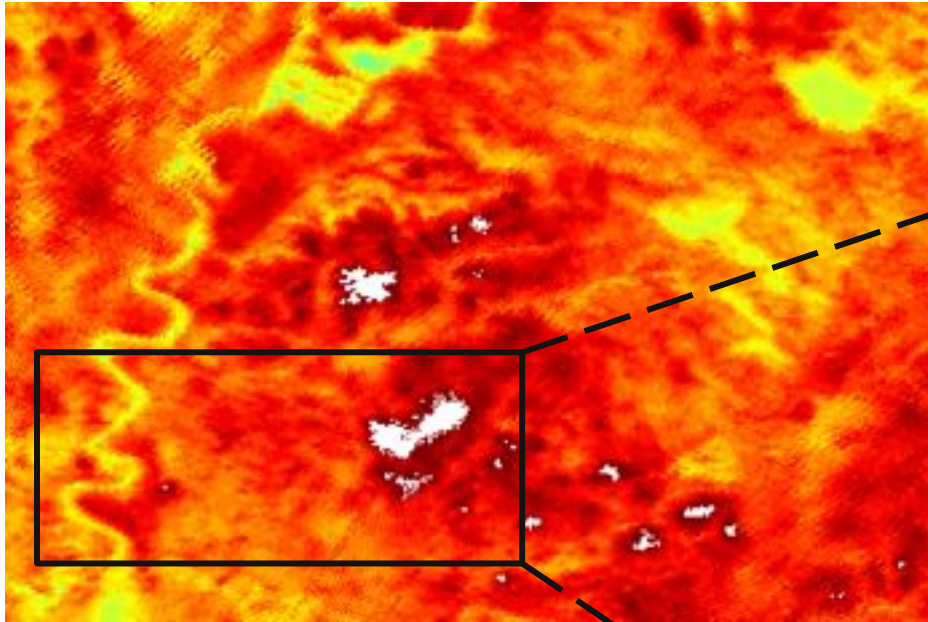




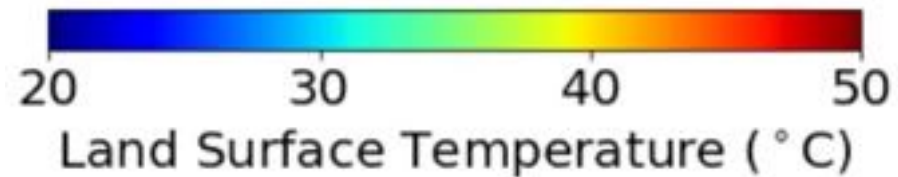
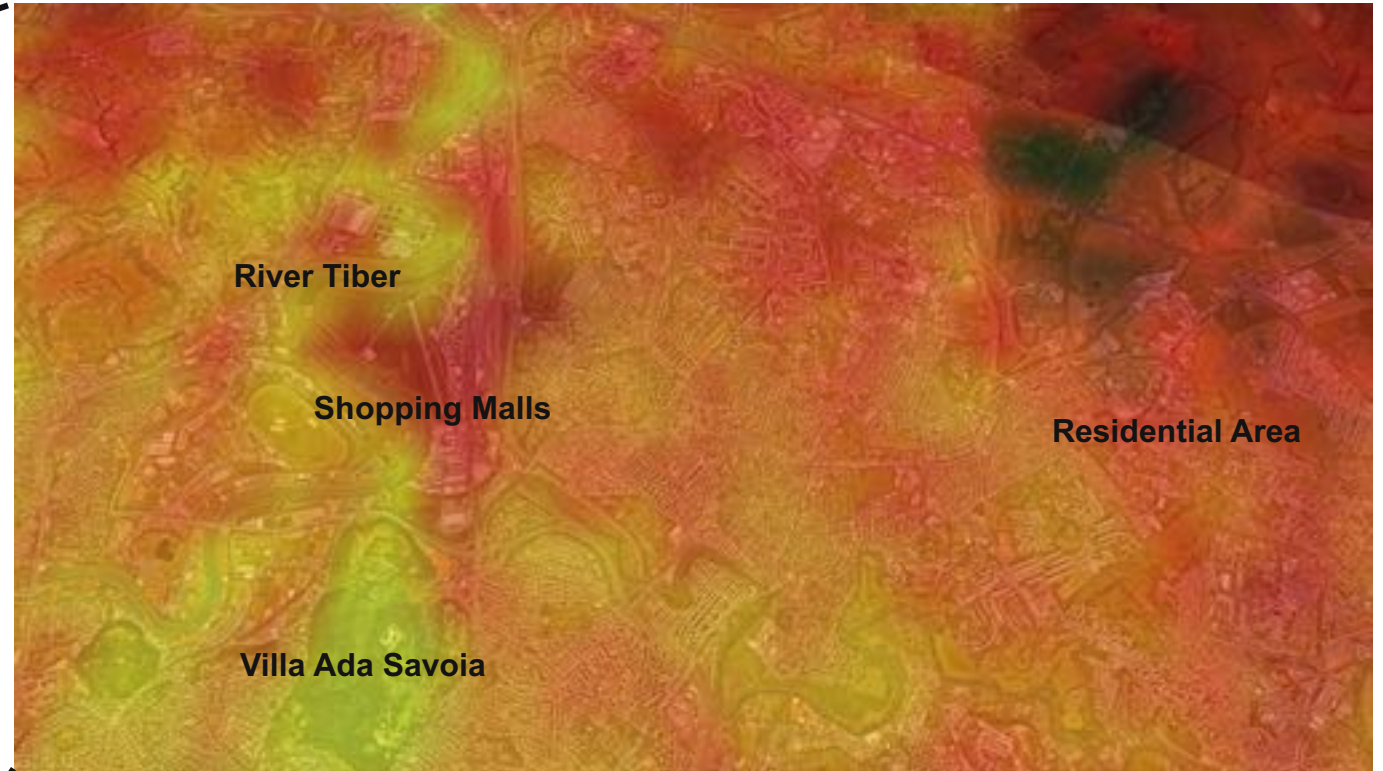




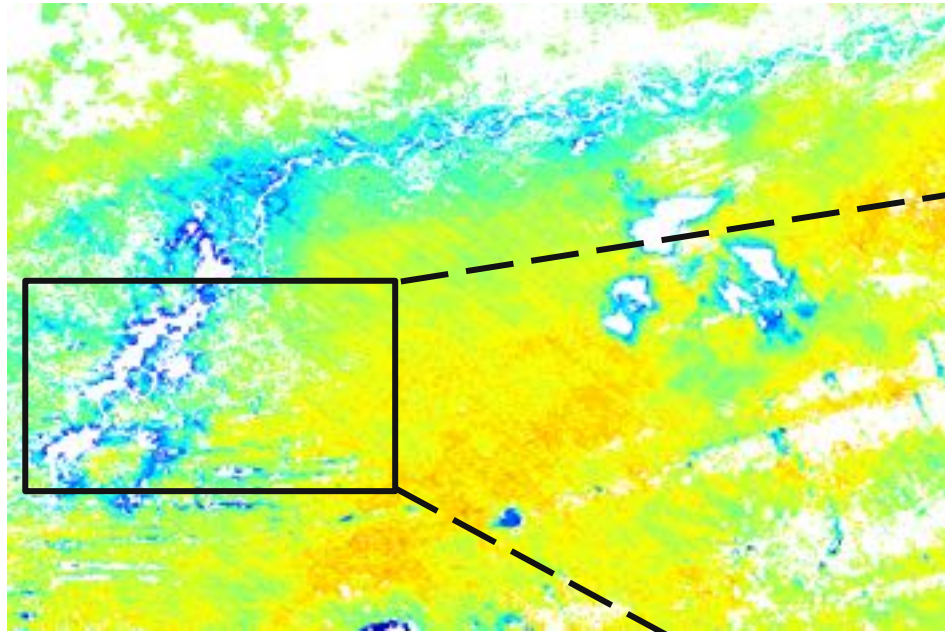
EEH TES LST for urban heat island monitoring



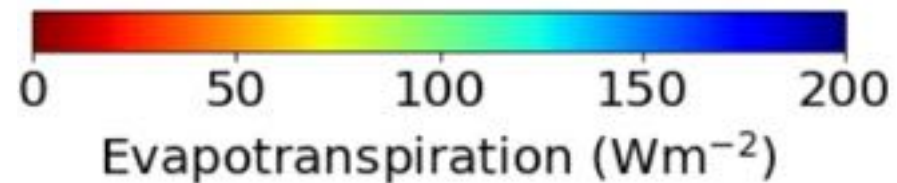
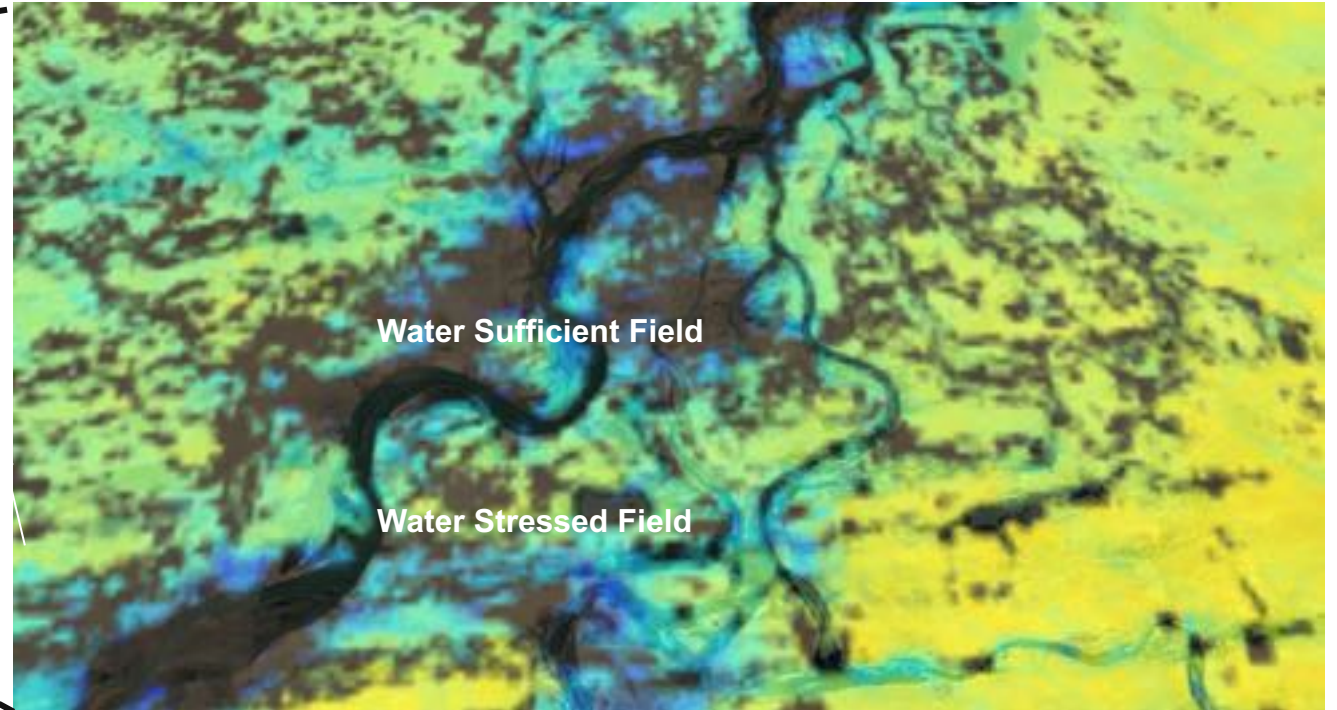
Rome, 13 August 2021, 2:17 pm



EEH STIC ET for agricultural water stress monitoring



Sub-Saharan region, 20 July 2021, 4:55 pm



EEH Phase 2 (2023/02 – 2026/01)

Focus 1: Updating EEH TES and analyzing LST impacts on ET and its biophysical controls

Focus-1,1: Refinement of the TES algorithm by considering canopy cavity effect and evaluation

Focus-1,2: Analyzing the impacts of LST (TES and SW) on ET estimates and the associated conductances across different biomes



Focus 2: Upscaling instantaneous ECOSTRESS ET to daily evaporation

Focus-2,1: Developing a hybrid LUT approach for integrating ETt acquired at any time of the day to ETd

Focus-2,2: Evaluation of the upscaling approach based on ECOSTRESS STIC ET estimates



Focus 3: Development of high spatial resolution GPP and WUE products at the continental scale

Focus-3,1: Development and evaluation of a coupled ET-GPP model applicable to various biomes

Focus-3,2: Estimating and evaluating WUE over different biomes in Europe and Africa



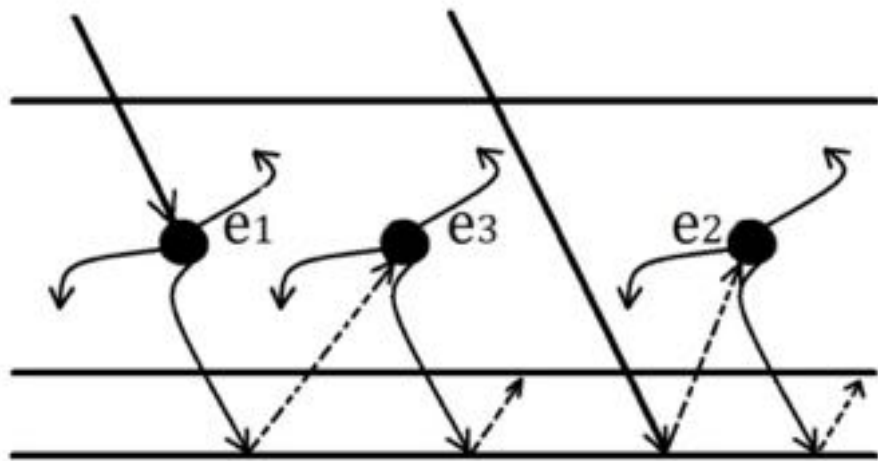
Focus 4: Development of re-gridded high-resolution LST, ET, conductances, GPP, and WUE products at the continental scale based on ECOSTRESS Collection 2 data

Focus-4,1: Generation and re-gridding of the products (2018-2025)

Focus-4,2: Evaluation and release of the ECOSTRESS ecosystem datasets

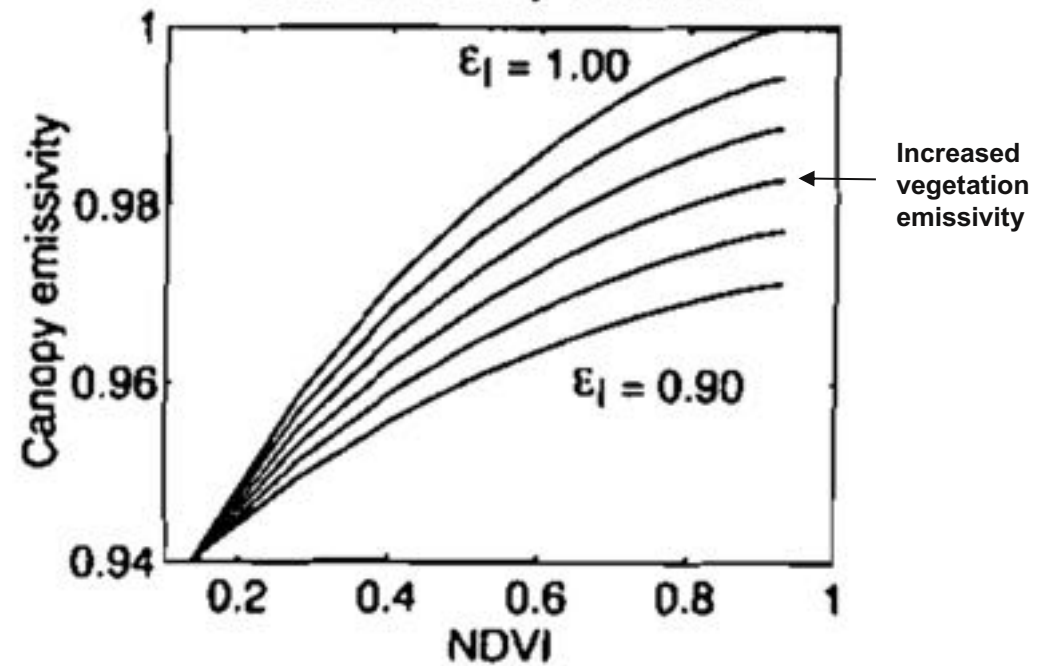


Multiple scattering within canopy

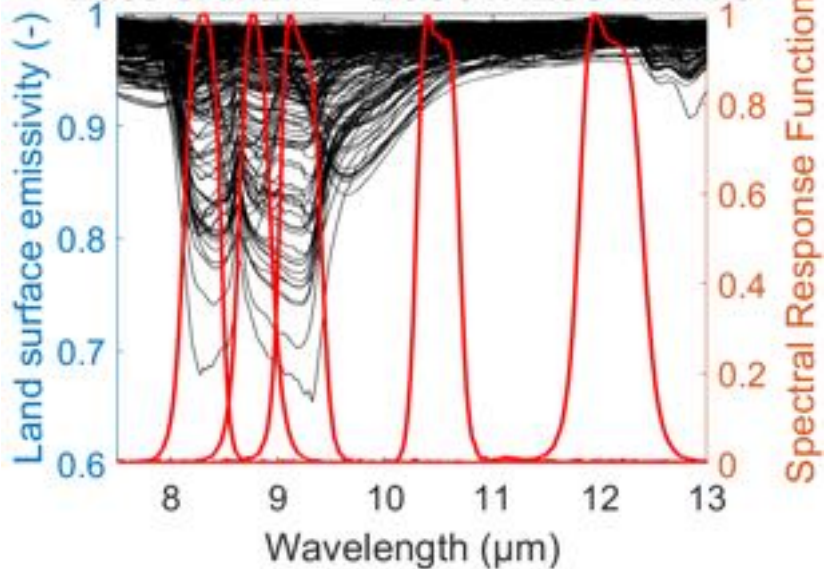


SAIL-Thermique
 (Oliosio, A. 1995)

Leaf emissivity variations

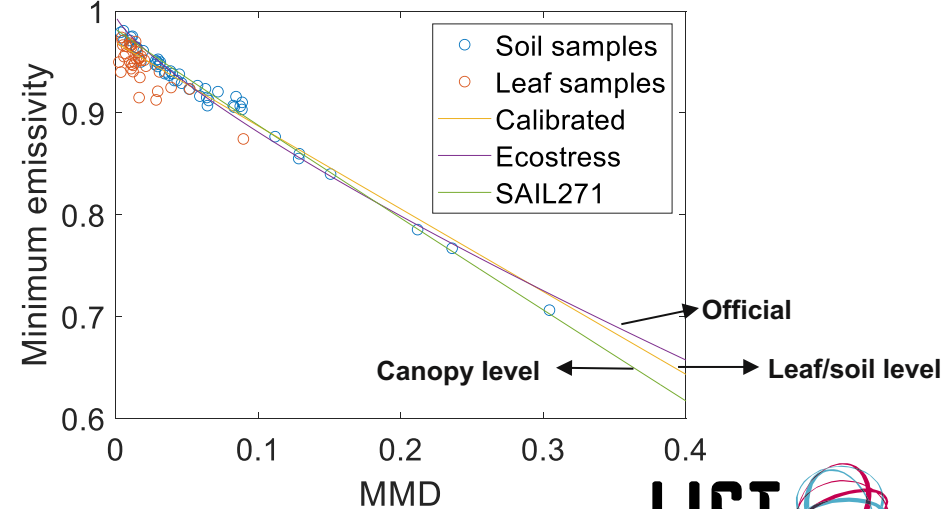


Base SAIL271 + ECOSTRESS BANDS

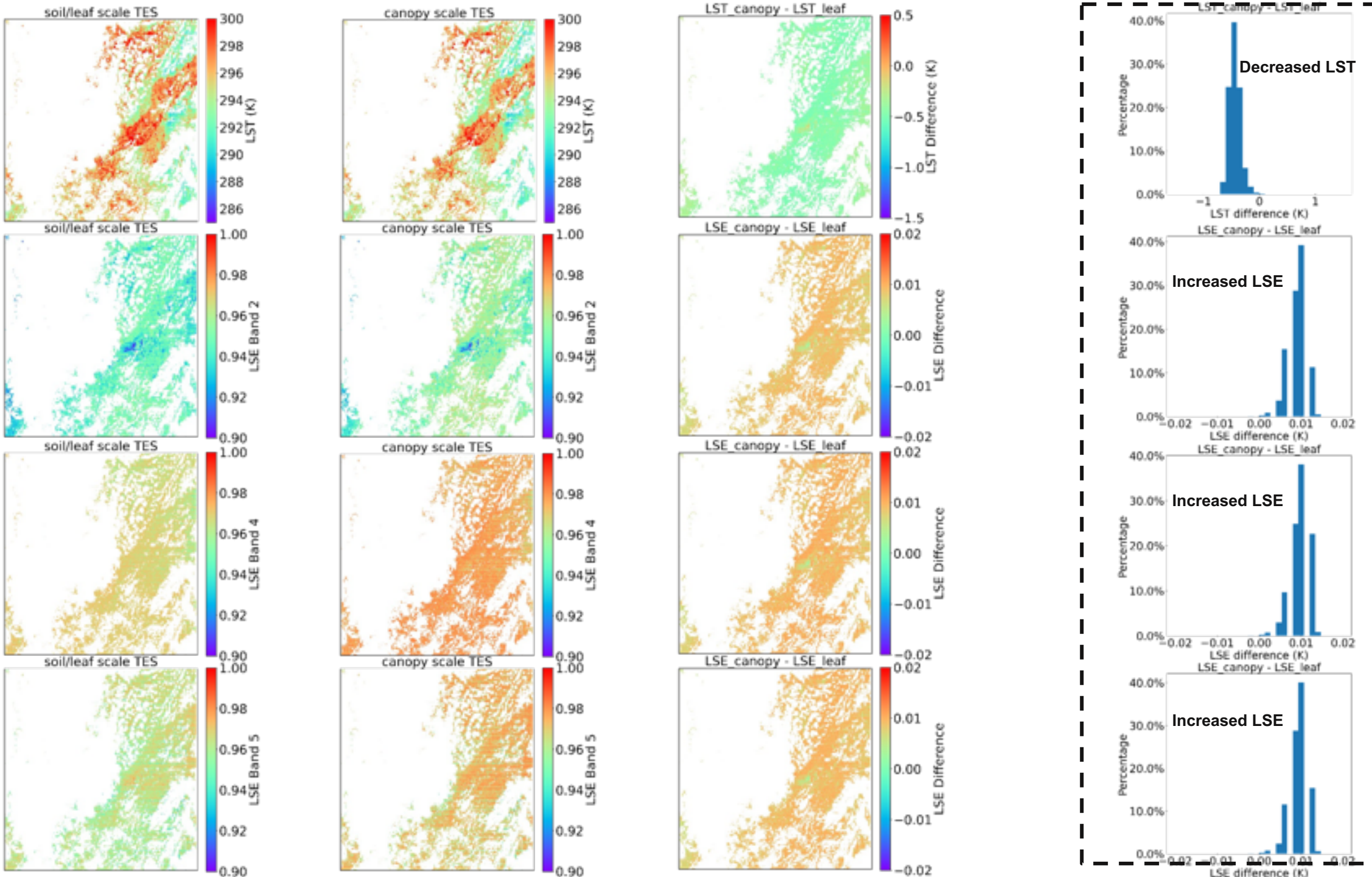


MMD- ϵ_{min} Calibration in TES

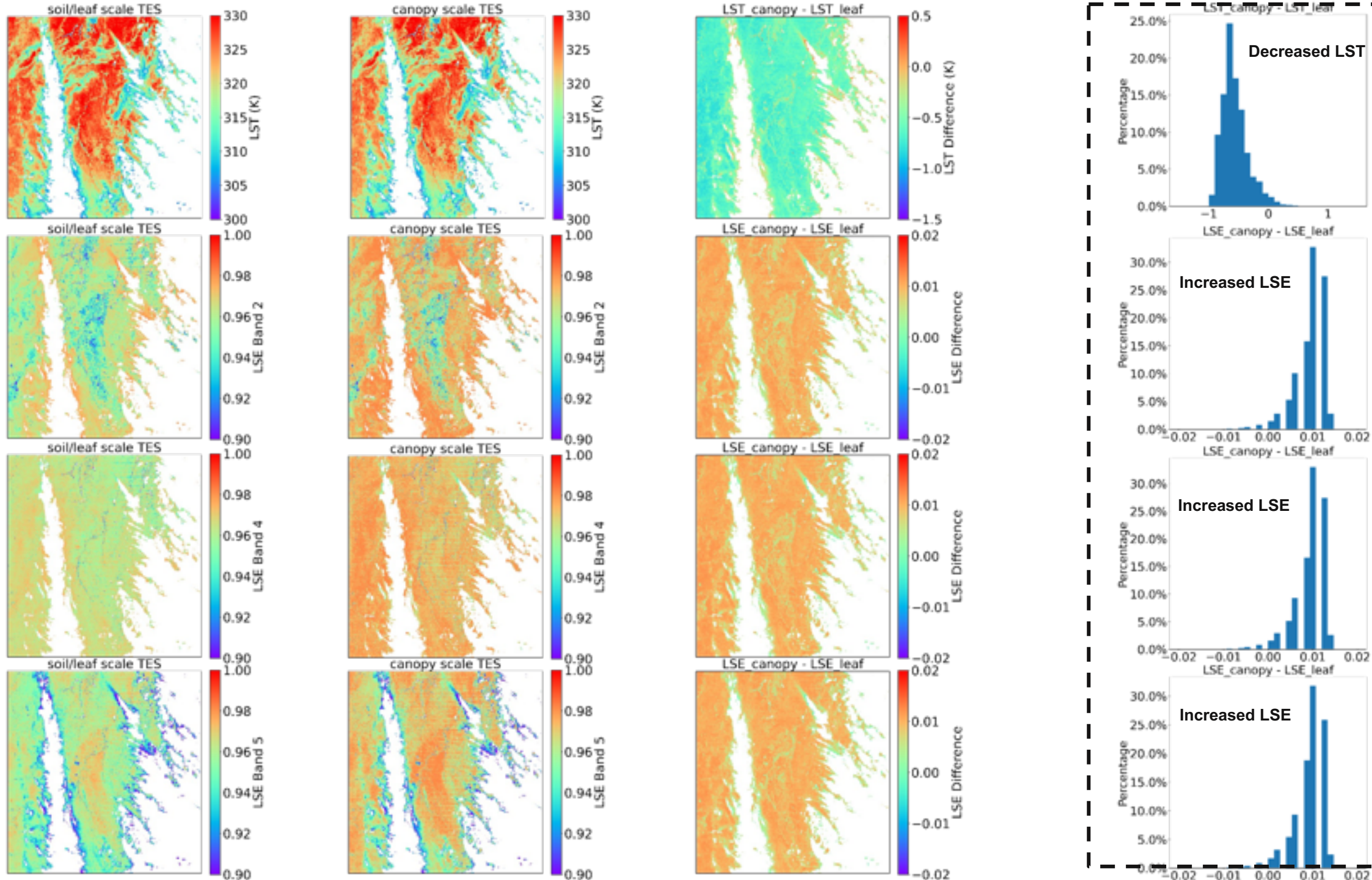
Base SAIL271 TES - 3 bands



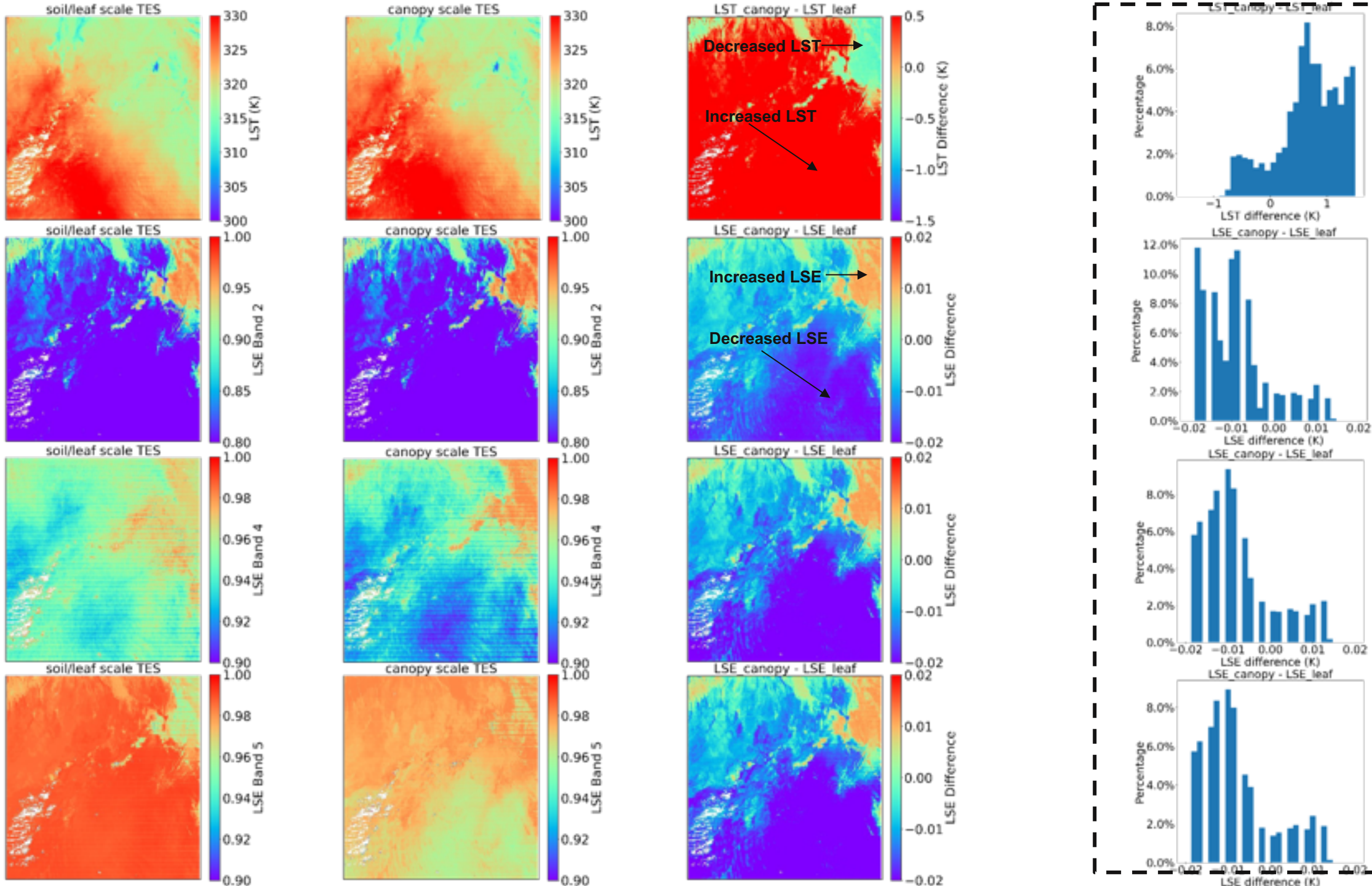
Densely
Vegetated
(Germany)



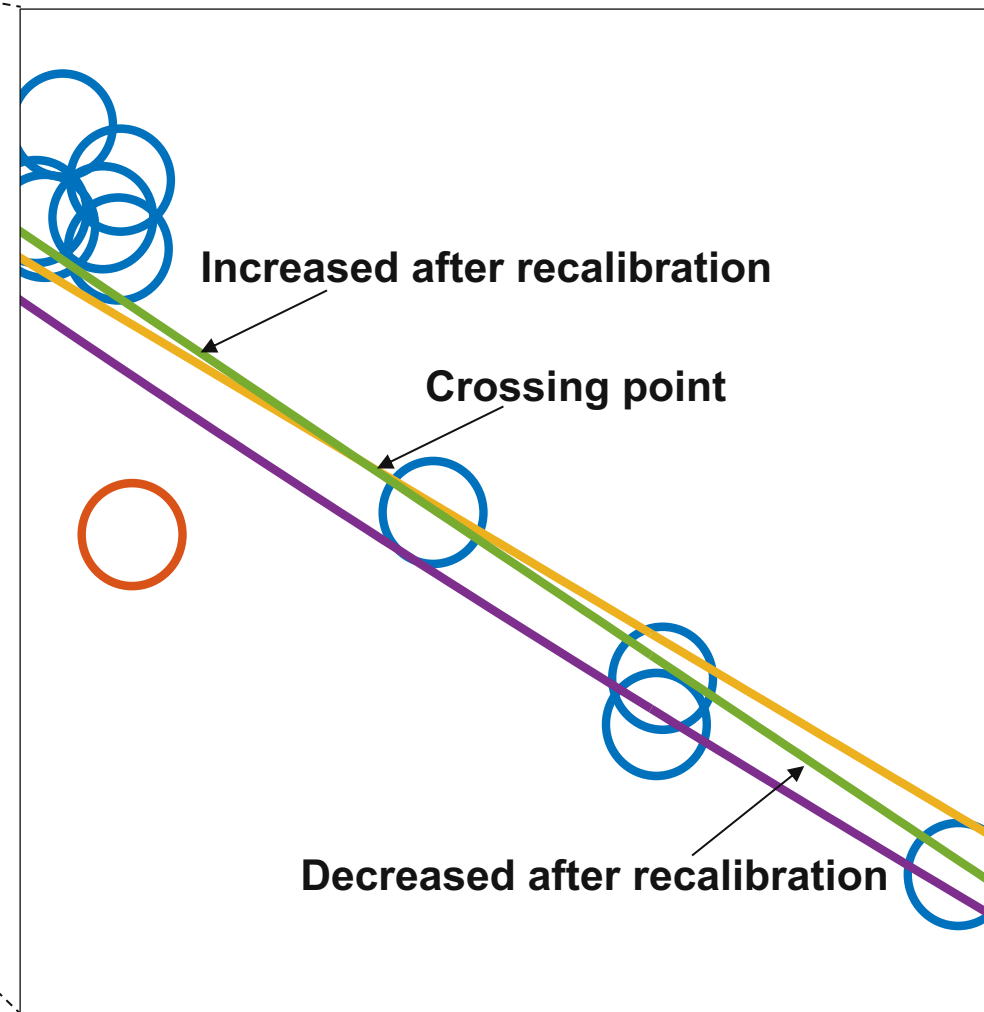
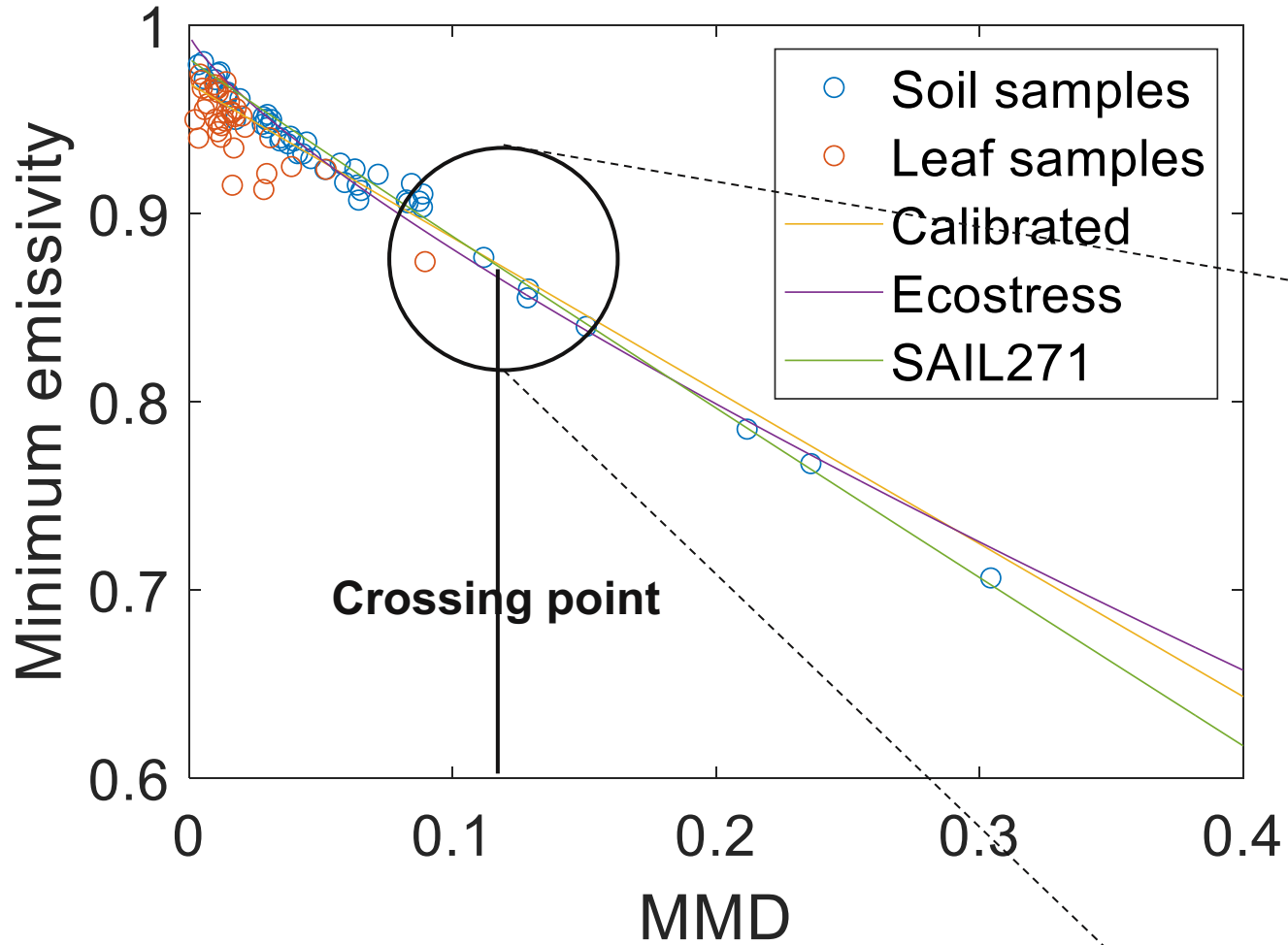
**Sparsely
Vegetated
(Spain)**



Desert
(Algeria)



Base SAIL271 TES - 3 bands



Get ECOSTRESS data on WASDI



The screenshot displays the WASDI web application interface. The top navigation bar includes links for App Store, Workspaces, Plan, Search, Edit, Documentation, Feedback, Admin, and a user profile icon. A search bar and a button to 'Add Selected to Workspace' are also present. The left sidebar contains a 'Filters' panel with a 'Cron Tab' button and a 'Providers' dropdown menu. Below these are date selection fields for 'From' (2019/05/01) and 'To' (2019/05/22), a 'Product Name' search field, and a 'Select missions' section with a grid of mission names: S1, S2, S3, S3P, PROBAV, ENVISAT, L3, Vis, ERAS, CAMS, PLANET, DEM, WorldCover, THEMATICS, MERG, and CM. The 'ECOSTRESS' filter is selected, showing sub-filters for 'Dataset' (EEHCM), 'Orbit Range' (from 1 to 10000), 'Parameter', and 'DayNightFlag'. The main map area shows a satellite view of the Mediterranean region with two orange bounding boxes overlaid on the landmasses. The bottom status bar indicates 'Waiting' and 'Running' states.

Register for free on
<https://www.wasdi.net/>

