



New Directions in Land Data Assimilation

June 13-15, 2022 · 10:00-13:00 EDT / 4:00 - 7:00 CEST / [Time Zone](#)

*Virtual Workshop: Draft Program
Updated May 3, 2022*

Co-chairs[†]: Natasha MacBean (Indiana University), Jana Kolassa (NASA GSFC), Andy Fox (Joint Center for Satellite Data Assimilation), Tristan Quaife (University of Reading), Hannah Liddy (Columbia University/NASA GISS)

[†]*Organized by the AIMES Land Data Assimilation Working Group*

Day 1, Monday, June 13, 2022

Machine Learning in Land DA

9:50 AM EDT/ 15:50 CEST	Coffee/tea time to join the conversation early and test out your camera and microphone. If you wish to use one, we are encouraging everyone to choose a different field work or earth observation photo each day (e.g. from the NASA or ESA image archives) as your background image on Zoom.
10:00 AM EDT/ 16:00 CEST	Welcome from the Co-Chairs: Introduction to the workshop context and goals
10:10 AM EDT/ 16:10 CEST	Speaker 1: Sujay Kumar (NASA GSFC) - Use of advanced machine learning for improved exploitation of remote sensing information
10:25 AM EDT/ 16:25 CEST	Q&A
10:30 AM EDT/ 16:30 CEST	Speaker 2: Xu Shan (TU Delft) - Assimilating ASCAT dynamic vegetation parameters to constrain the plant water dynamics in land surface model
10:45 AM EDT/ 16:45 CEST	Q&A
10:50 AM EDT/ 16:50 CEST	Speaker 3: Timothée Corchia (CNRM) - Contribution of machine learning for the integration of satellite observations in a global model of the soil-plant system

11:05 AM EDT/ 17:05 CEST	Q&A
11:10 AM EDT/ 17:10 CEST	<i>Break</i>
11:20 AM EDT/ 17:20 CEST	Speaker 4: Feng Tao (Tsinghua University) - PROcess-guided deep learning and DAta-driven modelling (PRODA) to uncover key patterns and mechanisms in global soil carbon dynamics
11:35 AM EDT/ 17:35 CEST	Q&A
11:40 AM EDT/ 17:40 CEST	Speaker 5: Philippe Peylin (CNRS-LSCE) - Comparative evaluation of different data assimilation approaches to optimize the parameters of the ORCHIDEE land surface model
11:55 AM EDT/ 17:55 CEST	Q&A
12:00 PM EDT/ 18:00 CEST	Speaker 6: Daiya Shiojiri (Chiba University) - Optimizing rain gauge locations based on data-driven sparse sensor placement
12:15 PM EDT/ 18:15 CEST	Q&A
12:20 PM EDT/ 18:20 CEST	<i>Break</i>
12:25 PM EDT/ 18:25 CEST	Poster Session and Career Corner
1:00 PM EDT/ 19:00 CEST	END

Day 2: Tuesday, June 14, 2022

Novel Observations and Approaches

9:50 AM EDT/ 15:50 CEST	Coffee/tea time to join the conversation early and test out your camera and microphone. If you wish to use one, we are encouraging everyone to choose a different field work or earth observation photo each day (e.g. from the NASA or ESA image archives) as your background image on Zoom.
10:00 AM EDT/ 16:00 CEST	Welcome from the Co-Chairs: Introduction to Day 2 (5 min)
10:05 AM EDT/ 16:05 CEST	Speaker 1: Cédric Bacour (LSCE) - Assessing the complementarity of multiple datasets in constraining model estimates of net and gross global C budgets within a data assimilation framework

10:20 AM EDT/ 16:20 CEST	Q&A
10:25 AM EDT/ 16:25 CEST	Speaker 2: Yiqi Luo (Northern Arizona University) - Estimating spatially and temporally varying parameters of Earth system models with data assimilation and deep learning
10:40 AM EDT/ 16:40 CEST	Q&A
10:45 AM EDT/ 16:45 CEST	<i>Break</i>
10:55 AM EDT/ 16:55 CEST	Speaker 3: Paul A. Levine (Jet Propulsion Laboratory at Caltech) - Variable response of Amazon watersheds to climate and CO2 trends across environmental gradients
11:10 AM EDT/ 17:10 CEST	Q&A
11:15 AM EDT/ 17:15 CEST	Speaker 4: Shuang Ma (Jet Propulsion Lab at Caltech) - Resolving the carbon-climate feedback potential of high latitude wetland CO2 and CH4 exchanges
11:30 AM EDT/ 17:30 CEST	Q&A
11:35 AM EDT/ 17:35 CEST	Lightning talks: Overview of Land DA Groups
12:05 PM EDT/ 18:05 CEST	<p>Breakout Group Discussions:</p> <p>1. Characterizing human management features with remote sensing and data assimilation <i>Leads: Sujay Kumar and Manuela Girotto</i> This breakout session will focus on exploring data assimilation and modeling efforts to characterize the impact and drivers of anthropogenic processes such as irrigation, groundwater pumping, reservoir management, disturbances such as fires.</p> <p>2. Land forecasting and the NEON Forecasting Challenge <i>Lead: Michael Dietze</i> What can we do, in general, to promote near-term and S2S forecasts of land processes and how can the land DA community get involved with the Ecological Forecasting Initiative's NEON forecasting challenge in particular?</p> <p>3. Non-linear filters for data assimilation <i>Lead: Prashant Kumar</i> This breakout session will consider potential and need of non-linear filters for land data assimilation. The goal of this breakout group is to explore limitations of the present land data assimilation techniques and benefits and challenges of assimilating land observations using non-linear filters.</p>

	<p>4. Co-developing DA education/course materials <i>Lead: Natasha MacBean</i> In this breakout group we will discuss opportunities for co-developing, as a Land DA Community, DA educational materials (or a possible short course) to help train early-stage PhD students in DA methods, and/or to entice senior undergraduate and Masters students to pursue PhDs that would require knowledge and experience in DA.</p> <p>5. Sensitivity / Uncertainty analysis of carbon dynamics in arctic terrestrial ecosystems <i>Lead: H��l��ne Genet</i> This breakout group will discuss methods, data availability and model comparison of sensitivity and uncertainty analysis focused on carbon dynamics in arctic and boreal ecosystems. The goal of this breakout group is to develop a sensitivity analysis that would be conducted by multiple modeling groups to evaluate how model sensitivity (and performance) is affected by model structure.</p>
1:00 PM EDT/ 19:00 CEST	END

Day 3: Wednesday, June 15, 2022

Ensemble DA Methods

9:50 AM EDT/ 15:50 CEST	Coffee/tea time to join the conversation early and test out your camera and microphone. If you wish to use one, we are encouraging everyone to choose a different field work or earth observation photo each day (e.g. from the NASA or ESA image archives) as your background image on Zoom.
10:00 AM EDT/ 16:00 CEST	Welcome from the Co-Chairs: Introduction to Day 3
10:05 AM EDT/ 16:05 CEST	Speaker 1: Shunji Kotsuki (Chiba University) - Development of Portable Ensemble Data Assimilation Algorithm for Land, Atmosphere and, Coupled Data Assimilation
10:20 AM EDT/ 16:20 CEST	Q&A
10:25 AM EDT/ 16:25 CEST	Speaker 2: Yijian Zeng (University of Twente) - Impact of land model physics on estimating soil moisture and temperature with an Ensemble Transform Kalman Filter
10:40 AM EDT/ 16:40 CEST	Q&A
10:45 AM EDT/ 16:45 CEST	<i>Break</i>
10:55 AM EDT/ 16:55 CEST	Speaker 3: Kenneth J. Davis (Pennsylvania State University) - What do atmospheric inversions need from the Land DA community?

11:10 AM EDT/ 17:10 CEST	Q&A
11:15 AM EDT/ 17:15 CEST	Speaker 4: Michael Dietze (Boston University) - Assimilating Discrete Disturbance Events
11:30 AM EDT/ 17:30 CEST	Q&A
11:35 AM EDT/ 17:35 CEST	Speaker 5: Clara Draper (NOAA OAR ESRL PSL) - Generating ensembles for ensemble-based soil moisture data assimilation
11:50 AM EDT/ 17:50 CEST	Q&A
11:55 AM EDT/ 17:55 CEST	<i>Break</i>
12:00 PM EDT/ 18:00 CEST	Breakout Group Report Backs and Plenary Discussion
1:00 PM EDT/ 19:00 CEST	END