FLUXNET Community Council Newsletter

November 2024
FCC Issue No. 4

Contents:

Community Council Letter……2
FLUXNET Data system initiative……3
FLUXNET 2025 meeting in Australia……4
Flux sciences from around the world……5
Regional network updates……6
Working group updates……12
FLUXNET Early career researcher network……18
The Great Thermal Bake-off……19
FLUXNET-CH4 v2.0 Processing Workshop……20
Secondment Adventures……21
Final Details……22

FLUXNET Community Council Welcome Letter

FCC Issue No. 4,
November 2024

Dear FLUXNET Community,

We are excited to announce that the next FLUXNET meeting will be held at the University of Queensland's St Lucia campus in Brisbane, Australia, from July 8-11, 2025. More information will follow in the coming months, but please mark your calendars.

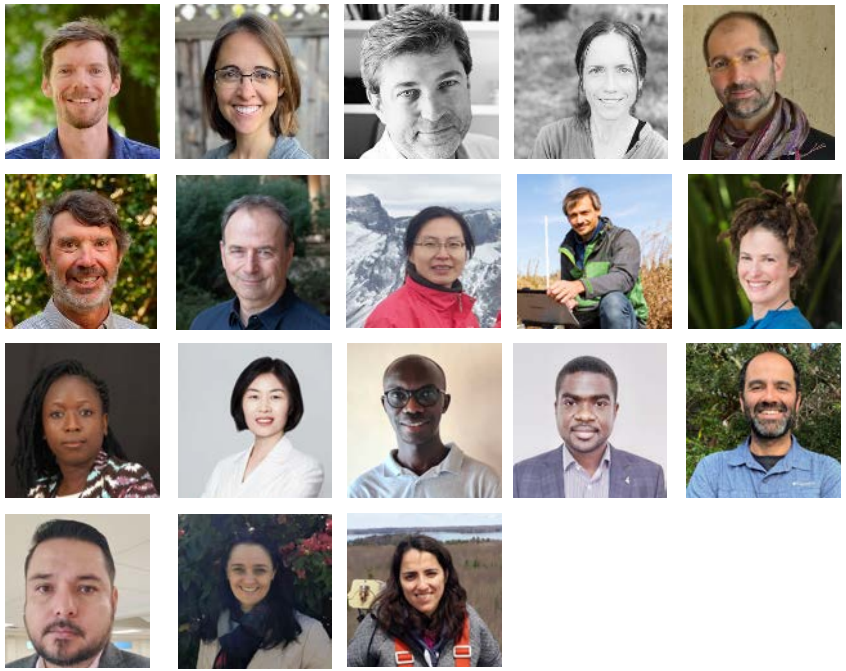
Another important development is the FLUXNET Data System Initiative, which aims to build a globally accessible, continually updated FLUXNET dataset. This initiative, supported by regional networks and the FLUXNET Coordination Project, represents a significant expansion of flux tower data availability and spatial coverage, advancing our understanding of ecosystem-climate interactions. We invite site teams to consider contributing data and engaging with this transformative effort.

As we close out another productive year, we would like to recognize our outgoing Council members and thank them for their dedication and service to FLUXNET during their terms. We also warmly welcome the incoming representatives and thank them for their commitment to the FLUXNET community.

We look forward to a productive year, and to seeing many of you in Brisbane in 2025!

Warm regards,
The FLUXNET Community Council

FLUXNET Community Council Members

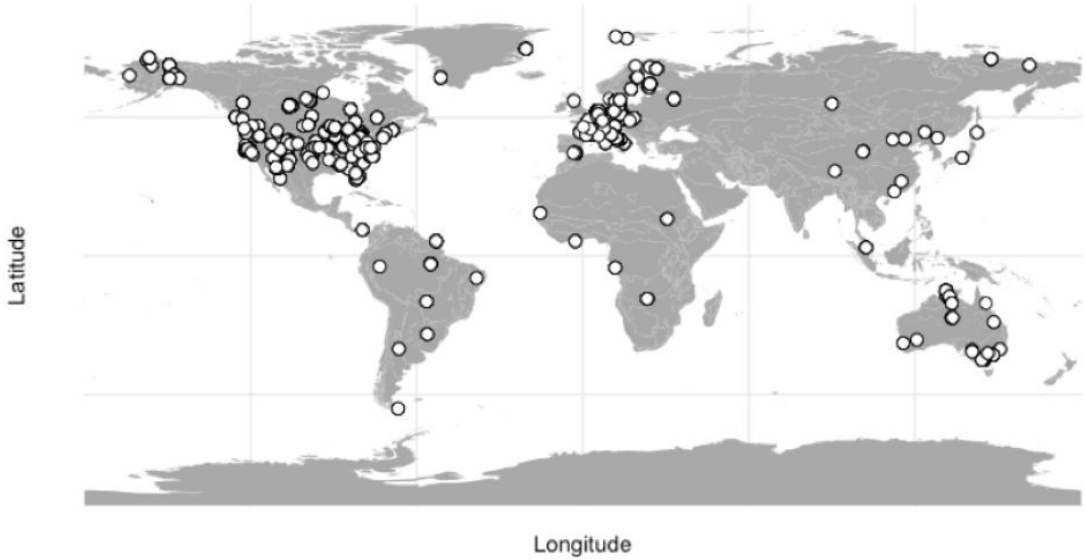


(from top left: Trevor Keenan, Kyle Delwiche, David Moore, Kim Novick, Dario Papale, Dennis Baldocchi, Stefan Arndt, Zhi Chen, Alexander Graf, Samantha Grover, Ossenatou Mamadou, Shuli Niu, Vincent Odongo, Frederick Otu-Larbi, Jorge Pérez-Quezada, Eli Perez-Ruiz, Débora Regina Roberti,Theresia Yazbeck. FCC members not pictured: Chandra Deshmukh, Chris Florian, Kathleen Smart)

FLUXNET Data System Initiative

The FLUXNET Data System marks the next generation of global, open-access flux data. Planned to be fully operational by December 2025, this resource will build on the FLUXNET2015 dataset and be continually updated by a coalition of regional and global flux tower networks. **Currently, data from over 400 sites are included, and more site teams are invited to contribute** to expanding the dataset's depth and geographical coverage.

The initiative will feature an annual synthesis article on key land-atmosphere flux dynamics, with co-authorship opportunities for contributing tower teams. New tools and mentoring networks are also being developed to support data preparation and submission. The success of this initiative depends on contributions from the entire flux community, with opportunities for data sharing, mentorship, working group participation, and engagement in workshops. Additional information is available in the evolving FAQ and online.



Sites with data currently available in FLUXNET format. More sites will be added through the Data System development.

FLUXNET 2025 Meeting in Brisbane, Australia

Dear FLUXNET Community,

We are excited to announce that next year's FLUXNET meeting will be held in Brisbane, Australia, July 8-10, 2025 (plus a field site visit July 11th), organized by the FLUXNET Coordination Project in collaboration with OzFlux and Australia's Terrestrial Ecosystem Research Network (TERN). The meeting will be hosted by the University of Queensland St Lucia campus, near Brisbane city center.

The meeting will include talks, posters, and breakout discussions, along with plenty of time for informal discussion with colleagues. There will also be a field trip to a nearby field site.

Further details will be provided later, but for now please mark your calendar and plan to join us in Brisbane next July.

Thank you,
Kyle Delwiche (Deputy Director of FLUXNET Coordination Project)
Trevor Keenan (Director of FLUXNET Coordination Project)
Stefan Arndt (Director of OzFlux)
Beryl Morris (Director of TERN)

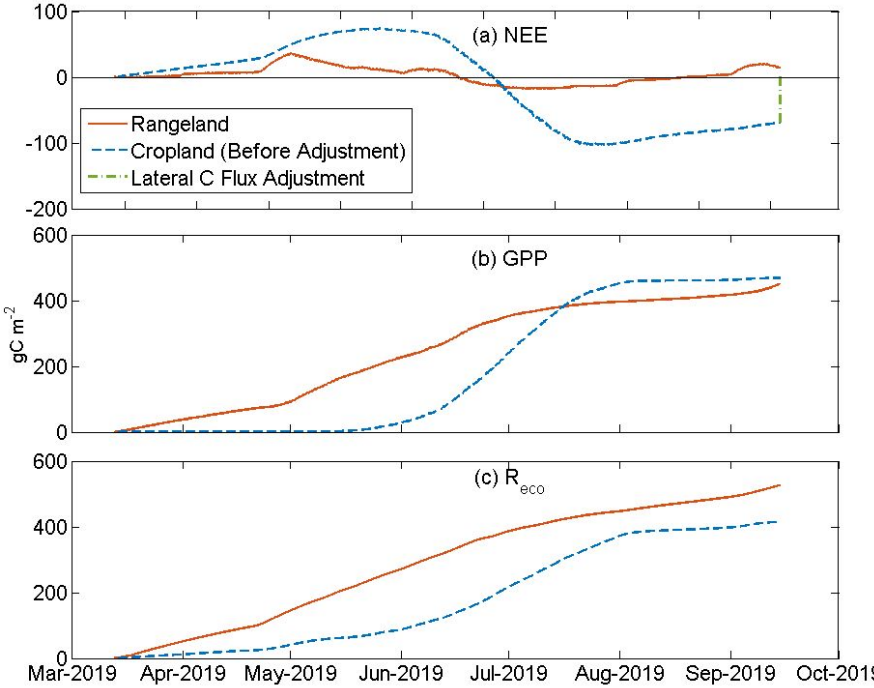
Flux science from around the world

Contrasting carbon and water dynamics in Semi-Arid Kenyan Ecosystems

A recent study led by Vincent Odongo, v.odongo@cgiar.org, (under peer-review) conducted in the semi-arid savannas of Kenya provides insights into the distinct carbon and water dynamics of two adjacent ecosystems: a rangeland and a dryland agricultural system. Despite both ecosystems exhibiting near carbon neutrality, researchers observed notable differences in their seasonal carbon and water fluxes.

The cropland demonstrated consistently higher carbon use efficiency, indicating more effective carbon sequestration. This efficiency is attributed to agricultural practices such as fertilizer application and minimum tillage, which enhance nutrient availability and promote efficient carbon use for plant growth. These practices help overcome nutrient limitations that often constrain carbon fluxes in such environments.

The study highlighted how water and carbon processes are closely linked in these ecosystems. Rangelands used water more efficiently throughout the entire season as a water conservation strategy, which results in a stable but lower carbon use efficiency. In contrast, croplands showed substantial water and carbon use efficiency during peak growing seasons likely due to agricultural interventions like fertilization and the selection of drought-resistant crops, which optimize water usage and growth conditions.



Most importantly, the study emphasizes the need to account for lateral carbon fluxes, such as crop harvest and biomass removal in carbon balance assessments. Neglecting these fluxes can lead to overestimations of an agricultural system carbon sequestration potential.

Regional Network Updates

OzFlux

- In November 2024, OzFlux hosted a data workshop and conference at the University of Western Australia (UWA) in Perth, Western Australia.
- The 5-day data workshop covered lectures on the theory and practice of eddy covariance, demonstrations of instrumentation, and hands-on processing of flux data from raw to gap filled and partitioned data using PyFluxPro.
- The 3-day conference included talks across the themes of 1. agroecosystem measurement and modelling, 2. ecological applications of flux science, 3. advances in flux science and integration of novel measurement techniques, and 4. scaling flux science with remote sensing and modelling. The third day comprised a field trip to two local flux tower sites - the Boyagin wandoo woodland and the UWA Farm Ridgefield.

Left: Conference participants at UWA Perth Campus
Middle: participants enjoying the UWA Ridgefield farm flux and CZO site despite the rain
Right: field trip participants at the TERN Boyagin Flux site
Image credits: Liena Fordham, UWA

Regional Network Updates

AmeriFlux

- A successful Annual Meeting was held in Berkeley, CA, Sept 6-8, with over 100 attendees and 3 days of intense science. See here for more details.
- 240 sites now gap-filled and partitioned to FLUXNET standard through ONEflux - you can download them all here.
- Come check out the AmeriFlux Town Hall at AGU this December 10th (@ 12:30 pm - 1:30 pm EST)!

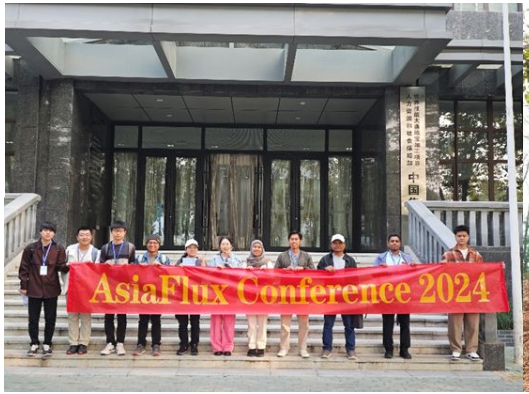
MexFlux

- We had a Special Session in the 2024 Annual Meeting of the Mexican Geophysical Union from Oct. 27th to Nov. 1st
- Members of the MexFlux community participated in several national scientific meetings in Mexico, including: the 48th Mexican Congress of Soil Science from Oct. 14th-18th, the IX Mexican Congress of Ecology from Oct. 6th-11th, and the XV International Symposium of Carbon in Mexico from Oct. 16th-18th.
- The MexFlux community participated in the 2024 AmeriFlux Annual Meeting and in the 2024 AmeriFlux Regional Workshop during Aug. 20th-21st, in Las Cruces, NM.
- This month, we start with MexFlux Newsletter with all the highlights of our community. Follow our social networks (**X**, **FB**, **IG**), join the MexFlux mail-list and visit our website.

Regional Network Updates

AsiaFlux

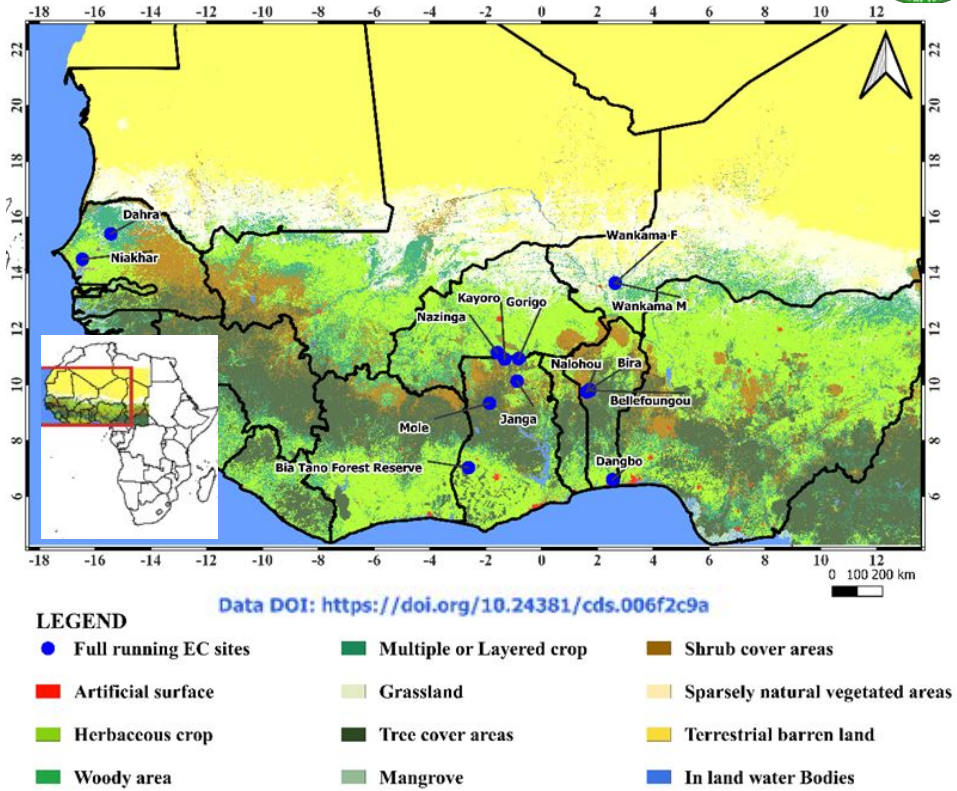
- AsiaFlux Conference 2024 was held from Oct. 28 to Nov. 2, 2024, in Wuhan, China, hosted by China University of Geosciences (Wuhan). Approximately 140 participants from 10 countries and regions attended.
- The theme is “Biosphere-Atmosphere Interactions and Carbon Dynamics in Asian Ecosystems.” We had Flux Training Session, Plenary Session, four Sessions, and Poster Session. Please refer to conference website.
- We especially collaborated with the A3 Foresight program. Through this conference, we aim to build world-class research hubs within the Asian region by fostering outstanding new generations.
- Next AsiaFlux Conference 2025 will be held in Riau, Indonesia. We look forward to your participation!
- Members of the AsiaFlux Scientific Steering Committee have completed their three-year terms and have been renewed. Details will be updated on AsiaFlux website.



Regional Network Updates: WAF-Net

WAF-Net : the West Africa Flux Network is a collaborative initiative addressing climate change in a region recognized as a global 'hotspot' due to intensified hydrological patterns since the 1990s. This shift toward fewer, more intense rainfall events poses challenges for agriculture and ecosystems. Led by Ossénatou Mamadou, Associate Professor at Université d'Abomey-Calavi (Bénin), WAF-Net includes 31 scientists across six West African countries and operates 14 eddy covariance sites, some nearly two decades old. These sites span the ecoclimatic gradient from the arid Sahel (Sénégal, Niger) to the humid tropics (Ghana, Bénin), covering diverse ecosystems such as semi-deciduous forest, savanna, and woodland.

Flux tower sites include **(6) in natural ecosystems** (moist semi-deciduous forest, clear forest, bushy savannah, pristine savanna forest, guinea savanna woodland forest and ferlho savanna), (**7) in agricultural ecosystems** (rice, millet, oil palm, mixed crop, Faidherbia albida, degraded crop areas, and grassland savanna), and **(1) in a fallow ecosystem (Site details provided on next page).**



The network aims to generate innovative solutions for West African societal challenges through flux science, fostering collaboration among researchers, securing funding opportunities, influencing policy, promoting scientific cooperation, addressing the regional shortage of in-situ observations and nurturing the next generation of scientists.

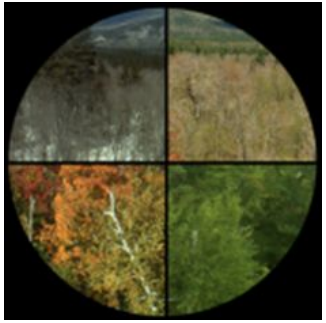
Regional Network Updates: WAF-Net

Table: WAF-Net site location list

Lat (°N)	Lon (°E)	Names	Country	Ecosystem types	Operational since	PI (s)	Contacts
14.495799	-16.453515	Niakhar	Senegal	Faidherbia Agro-Forestry	03/2018	O. Roupsard F. Do D. M. Diongue S.M. Diene	olivier.roupsard@cirad.fr frederic.do@ird.fr djimmouhamadou.diongue@ucad.edu.sn serignemansour.diene@univ-thies.sn
15.403155	-15.432863	Dahra	Senegal	Ferlho Savannah	2010	T. Tagesson	torbern.tagesson@ign.ku.dk
13.647488	2.63374	Wankama M	Niger	Millet Field	2005	J.Demarty, I.Mainassara	jerome.demarty@umontpellier.fr mainassara.ibrahim@gmail.com
13.64251	2.631118	Wankama F	Niger	Fallow	2005		
9.74484	1.60457	Nalohou	Benin	Mixed crop	09/2007	J.Cohard, O.Mamadou	jean-martial.cohard@univ-grenoble-alpes.fr ossenatou.mamadou@imsp-uac.org
9.79115	1.718	Bellefoungou	Benin	Clear Forest	06/2008		
9.82777	1.71573	Bira	Benin	Bushy savannah	04/2022		
6.607338	2.543043	Dangbo	Benin	Oil Palm plantation	04/2022	O.Mamadou	ossenatou.mamadou@imsp-uac.org
7.03325	-2.62253	Bia Tano Forest Reserve	Ghana	Moist semi-deciduous forest	03/2023	C. Mensah F. Otu-Larbi	caleb.mensah@uenr.edu.gh f.otu-larbi@lancaster.ac.uk
10.918	-1.321	Kayoro	Ghana	Crop and grassland Savanna	10/2012	A.A.Belko, H. Kunstmann E. Quansah S. Guug	diallo.b@wascal.org harald.kunstmann@kit.edu emm.quansah@gmail.com guug.s@wascal.org
10.93567	-0.82412	Gorigo	Ghana	Degraded Crop and grassland Savanna	06/2017		
11.1516	-1.5857	Nazinga	Burkina-Faso	Pristine Savanna Forest (Protected)	01/2013		
10.1299	-0.8837	Janga	Ghana	Rice field (Savanna)	07/2022		
9.3386	-1.8689	Mole	Ghana	Guinea Savanna woodland forest (Protected)	06/2023		

Regional Network Updates: ICOS

New ERC project LEAFPACE started in July 2024: 12 thermal cameras (FLIR A655sc) will be installed at different ICOS sites in 2025. The aim is to identify links between microclimate and phenology and support leaf temperature modelling. Sites should have an associated phenocam and ideally sapflow sensors. Data will be available to the community after a minimum embargo and cameras can likely stay at sites after the project. More information: https://ecofun.ispa.bordeaux.inrae.fr/index.php/projects/ (Marc Peaucelle marc.peaucelle@inrae.fr)



This project will perfectly align with the efforts already ongoing in ICOS through the NUBICOS European project and the ITINERIS Italian project that are also investing in the thermal measurements of the canopy. The aim is to add these measurements in ICOS.

Cite and acknowledge campaign: In times of sites spending more and more effort to produce free, fast, high-quality data for the global community, it is important to ensure that this effort is acknowledged. ICOS therefore started a campaign to advertise fair use of their data and describe best practice in citing and acknowledging: https://www.icos-cp.eu/how-to-cite. The website might also inspire users and other regional networks of FLUXNET to implement and apply similar best practices.

ICOS and Europe toward FLUXNET2025: In preparation for the new FLUXNET distribution model that is planned for release end of 2025, the European Database with the support of the ICOS ETC started to add the new sites in the ICOS Carbon Portal for their automatic findability and access. More info in the ICOS Carbon Portal or by writing to info@europe-fluxdata.eu.

Lowering the bar for flux education

The Education working group has continued efforts to disseminate flux education materials in multiple languages. Building on the initial release from December 2023, the team is finishing translation of additional presentations which will be made available on the Fluxnet website by the end of the year. More Spanish presentations will be available soon, along with our first release of materials translated to French! Official rollout of new materials is aimed to coincide with AGU 2024, so check back on the Fluxnet Education Page in December.

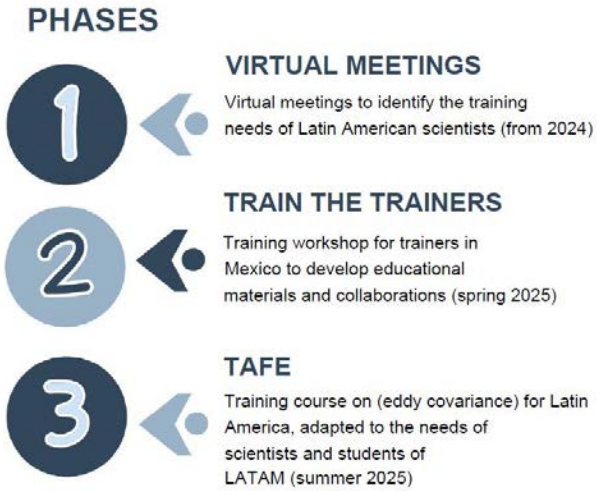
Do you have materials that are useful in training the next generation of flux scientists? Are you bilingual and interested in helping translate education materials? The education working group is always looking for more members to help in our efforts of making it easier to learn about Eddy Covariance and flux related methods. Reach out to one of us if you are interested in participating.

TAFE: Taller de Aprendizaje de Flujos Ecosistémicos

Planning is underway for the first ever Spanish language workshop on eddy covariance methodology! This workshop stems from an effort to expand flux networks globally and to increase the number of flux tower sites in latin america and other spanish speaking areas. The course will provide introductory training on instrumentation, theory, data processing, and data analysis of the eddy covariance method.

Details are still being refined but the workshop is planned to take place in Mexico in mid to late 2025. If you are interested in learning more about TAFE, or participating in some capacity, please fill out this survey.

More information on TAFE, including Spanish language information, available here: https://fluxnet.org/tafe/



Outreach is Merging Art & Science

Fostering creative spaces for art and science to interact is of particular importance, because it generates conditions for novel ideas and meaningful impact beyond each discipline. In August 2024, we launched an NSF-funded pilot, the FLUXNET Artists in Residence program, to engage the public through art that highlights scientific themes at and across flux tower sites.

In September 2024, artists in residence participated in the Ameriflux Annual Meeting to promote creative dialogue with the greater fluxnet community. Each artist presented on creative projects, including: flux tower data sonification (Sara Bouchard); visualizing seasonal patterns of gas exchange using indigenous symbolism (Mallery Quetawki); using Phenocam imagery to ingest thousands of unique spatial and temporal moments (Julia Oldham); meditative simulations of breathing ecosystems (David Glowacki).

Over the next year, artists will create projects in dialogue with their FLUXNET hosts that synthesize and share knowledge to challenge how we relate to our environment and our science. In Jan 2026, we will host an exhibit and performance at Patricia Valian Reser Center for the Creative Arts (PRAx) in Corvallis OR.

Visit the FLUXNET Artist Residency website and read our news story "Art Meets Science" to learn about the artists in residence and check out flux art in progress.

Left to right: Maoya Bassiouni, Robert Shortt, Sara Bouchard, Emma Reich, Julia Oldham, Marcy Litvak at Eden Landing Ecological Reserve, Site US-EDN

FLUXNET Working Groups: Outreach

Outreach is Recording a Podcast!

Meet the Fluxers is a podcast bridging the gap between eddy covariance flux scientists & society.

Our audience and participants are researchers and stake-holders interested in applying flux science for societal benefits.

We aim to collaborate on telling stories and insights of all Fluxers in and outside academia and hope to explore the full breadth, depth and diversity of flux science around the globe.

We are approaching our podcast as a co-learning experience for hosts, participants and all listeners.

Reach out to pitch a story and/or be a guest:
https://meetthefluxers.github.io/contact

From left to right: Emma Reich, Jason Kelley, Robert Shortt, Maoya Bassiouni, and Jessica Richardson from the Outreach Working Group.
New members always welcome in our regular meetings to help develop projects that advance and communicate flux science to broader audiences.

FLUXNET Working Groups: Open Source Code

Updates and activities:

- We held our first webinar in May about Git/Github. This webinar was aimed at getting beginners up and running with the basics of version control, with no prior knowledge required. If you missed it, you can go through the tutorial on our website!
- We held a “Put your code on GitHub” working session at the AmeriFlux annual meeting, where we helped participants put their code in a GitHub repository.
- In January, we plan to hold a repeat of our Git/GitHub webinar, followed by an intermediate GitHub/collaborative coding webinar. Stay tuned for details!

The Open Source Code Working Group welcomes new members! If you would like to get involved, please fill out this form or email missik.2@osu.edu.

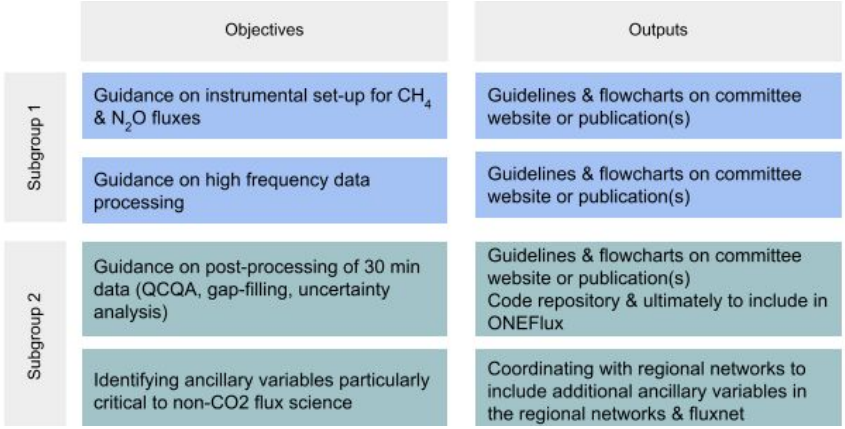
Check out our website!

The Open Source Code Working Group maintains a website, where we have been working tutorials and a resources guide about coding best practices and open-source code development. Our website is open-source and we welcome contributions from the community!

FLUXNET Working Groups: CH_4 and N_2O

FCC Issue No. 4,
November 2024

This committee brings together FLUXNET community scientists interested in collecting, analyzing, and sharing non-CO_2 eddy covariance flux data for the potent non-CO_2 greenhouse gasses such as methane (CH_4) and nitrous oxide (N_2O). Our goal is to develop guidelines for instrumental set-up and data processing that are accessible to new scientific investigators, will facilitate the inclusive growth of the FLUXNET CH_4/N_2O community, and lead to improved standardization of community data products. We have two subgroups, and the objectives are summarized in the figure to the right.



Subgroup-1 has been focusing on developing a protocol to process high-frequency (10 Hz) CH4/N2O data from closed-path gas analyzers, including Aerodyne TILDAS and LGR-ICOS.

The topics include critical considerations for field deployment, evaluating choices for software/platforms (EddyPro, Edire, RFlux, and eddy4R), timing synchronization issues, and incorporating signals from CO2 flux to rigorously analyze N2O flux from the same analyzer. The group has also been working on using the time series cross-correlation function (CCF) to detect time delay for 10Hz raw data and wavelet filtering for 10Hz data. Anyone interested in this topic can contact Xiangmin (Sam) at xsun25@unl.edu.

Subgroup-2 has been focusing on post-processing of EC CH4/N2O fluxes. Areas we have explored and continue to work on include spike removal and filtering, USTAR filtering for CH4 and N2O fluxes, gap-filling and uncertainty quantification. Anyone interested in this topic can contact Sara Knox at sara.knox@mcgill.ca. We have also started discussions around identifying ancillary variables of particular important to non-CO2 fluxes. Anyone interested in discussing this topic further can contact Shannon Brown at brown366@llnl.gov.

Early Career Researcher Network

1. New Committee Formation

FLUXNET-ECN has established a new committee to drive its core initiatives, which include outreach engagement (such as social media and email list management), research collaboration, and organizing workshops and events. The selection process identified individuals who bring relevant expertise and a collaborative spirit to the network. Click this link to meet our new committee members!

2. Seminars and Workshops

To support knowledge exchange and professional development, FLUXNET-ECN's new committee has organized seminars and workshops on AI and Machine Learning for eddy covariance applications:

- **Upcoming: Knowledge-Guided Machine Learning for Estimating Carbon Fluxes using Eddy Covariance Data**
  Date/Time: Wednesday, November 20, 9 AM PDT/ 11 AM US Central/ 5 PM Central Europe.
  Registration link: **https://lbnl.zoom.us/meeting/register/tJAldOugqj4uHNTMDM0L0HIl4E0fRVaEZrJQ**
  This seminar will explore methods to open the 'black box' of machine learning by integrating scientific knowledge from mechanism-based models into advanced machine learning frameworks. Our invited speaker is **Dr. Licheng Liu** from the University of Minnesota.

- **Completed: AI/Machine Learning for Eddy Covariance Data**
  This workshop focused on AI and Machine Learning Applications for Eddy Covariance Data, featuring speakers **Dr. Pamela Weisenhorn** from Argonne National Laboratory and **Dr. Benjamin Stocke**r from the University of Bern. Link to Dr. Stocker's machine learning for eddy covariance tutorial: https://geco-bern.github.io/ml4ec_workshop/

FCC Workshops: The Great Thermal Bake-Off

In August 2024, Northern Arizona University's Historic Hat Ranch hosted a workshop gathering 40 scientists from over 10 countries to discuss the advancement and standardization of near-surface Thermal Infrared (TIR) remote sensing in ecosystem research. This diverse group, including many early-career researchers, aimed to foster cross-disciplinary collaboration and promote standardized practices in TIR data use, addressing accuracy and accessibility challenges that have limited broader adoption. The workshop was supported by the FLUXNET Coordination Project, Ameriflux, and NAU, and was organized by Jen Diehl, Ben Wiebe, and Mostafa Javadian. Key activities included:

- **Thermal Camera Calibration and Field Testing:** Participants calibrated cameras in lab settings, followed by a 24-hour field testing campaign to assess camera performance under various environmental conditions.
- **Best Practices Paper:** Work began on a standardized protocol for thermal camera calibration, data processing, and field setup to make TIR technology more accessible and reliable.
- **Network Strengthening:** The workshop fostered collaboration within the TIR research community, connecting scientists across career stages and disciplines.

More information available here: https://fluxnet.org/fluxnet-workshop-the-great-thermal-bake-off/

FCC Workshops:FLUXNET-CH4 v2.0 Data Processing

This hybrid workshop, held on Oct 21-23, 2024**,** focused on data processing to facilitate the inclusion of new sites into FLUXNET-CH4 V2.0 and the new **FLUXNET Data System Initiative**.

Specific objectives of the workshop included:

1. Providing an overview of FLUXNET-CH4 V2.0 and the FLUXNET 2025 data release
2. Providing **tutorials** and open-source code to facilitate the inclusion of new or existing sites into FLUXNET-CH4 V2.0 and the FLUXNET 2025 data release. Additional guidance was provided on gap-filling, and uncertainty quantification for flux tower measurements, with an emphasis on CH4 fluxes.
3. Facilitating the inclusion of CH4 fluxes in the ONEFlux pipeline and thereby inform the next generation of the FLUXNET database
4. Fostering existing and new international community collaborations by bringing together students/postdocs and PIs from across the globe.

We had 25 participants in person, and up to 90 participants online. The workshop presentations are available on the **EcoFlux Lab youtube channel**.

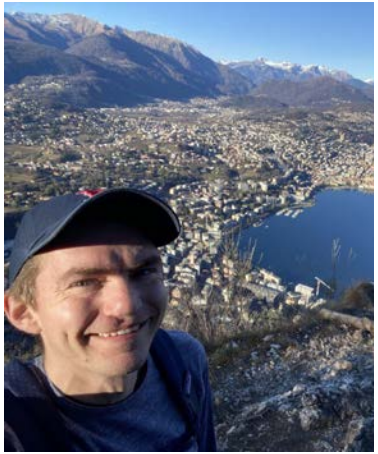
If you have questions related to the **data tutorial**, you can contact us at ecofluxlab (at) gmail (dot) com

Also, if you are interested in contributing to FLUXNET-CH4 V2 and haven't contacted us already, please let us know by **filling out this form**. If you are unable to access the form, you can email Fa Li (fali2@stanford.edu).

FCC Secondment Adventures

The FLUXNET Secondment program launched in 2022, continues to send U.S. based early-career scientists abroad to study at host institutions. The Secondment program is designed to increase international connections between scientists using eddy covariance data and to therefore strengthen the FLUXNET network, while also supporting early-career scientists. Full write ups from all secondees can be found here: https://fluxnet.org/fluxnet-secondment-recipients/, with some highlights below.

Cheristy Jones worked with Dr. Efrén López-Blanco at Aarhus University and the Greenland Institute of Natural Resources to study lateral carbon flux at the Kobbefjord catchment in Greenland.



David Miller was hosted by Drs. Sebastian Wolf and James Kirchner in Zurich, Switzerland, where he worked on explaining how plant water use efficiency changes in drought conditions.

Angela Che Ing Tang traveled to Cairns, Australia to work with Dr. Michael Liddell to study CO2 fluxes from tropical lowland rainforests.

Ifekristi Ogunwobi worked with Dr. Korenat Utrech University in the Netherlands to predict nitrous oxide fluxes using machine learning.

Final Details

Want to learn more or get involved?

Sign up for the mailing list (https://fluxnet.org/community/join/), and/or email fluxnet.cc@gmail.com

Join one of our active committees by emailing the committee lead (see here)

Key upcoming events

The FLUXNET2025 Meeting will be held in Brisbane, Australia July 8-11. More details to come.

TAFE, the first Spanish language Fluxcourse, will be held in Mexico in mid to late 2025.

Funding Acknowledgements

We would like to acknowledge and thank the National Science Foundation's Accelerating Research through International Network-to-Network Collaborations (NSF AccelNet) program for their funding support.

About the Editor

Kyle Delwiche studies methane emissions from natural ecosystems using eddy covariance, modeling, data synthesis, and other field measurement techniques. (https://kyledelwiche.weebly.com/). She is also the Deputy Director of the FLUXNET Community Council.