ICOS
Integrated Carbon Observation System

ICOS SCIENCE CONFERENCE 2024

10-12.9.24
VERSAILLES, FRANCE & ONLINE

Programme

Welcome to Versailles!

In a time when climate change continues to accelerate, yet climate action is deprioritised in many countries, science must remind societies that climate change is not going away and the time to act is now. The sixth ICOS Science Conference is a crucial gathering for scientists to convene and discuss the latest knowledge on greenhouse gases and climate-carbon feedbacks.

This year's ICOS Science Conference is being held in Versailles, Paris, and online from September 10th to 12th, 2024. We are proud and excited to be here for many reasons. In Versailles, we will feel the touch of history while answering the call to offer the best available science for the Paris Agreement. We really look forward to meeting our friends and colleagues in this beautiful place. ICOS Science Conference has always sparked new conversations and helped form new research initiatives. We are proud to provide a space for these types of interactions.

This year, the conference attracted a record number of over 460 abstracts. The session themes reflect the broad scientific spectrum of ICOS as well as the research projects we are currently coordinating. The conference is an excellent opportunity to enhance your knowledge of climate science and get familiar with the latest results and developments.

This includes technical innovation. The programme features an exciting group of instrument manufacturers who will present their latest case studies and technical solutions, as well as discuss future industry trends at the vendor exhibition in the Mazarin room.

A personal note to conclude: this will be my last ICOS Science Conference as Director General of ICOS. After more than ten years, I will be handing over my duties to new hands. The ICOS Science Conferences have always been the absolute highlights of my tenure. I am deeply grateful to you, the participants, and the ICOS community for making these conferences such an incredible success. I also want to extend my heartfelt thanks to the coordination teams that have worked tirelessly to bring all six conferences to life.

On behalf of the entire team: we hope you enjoy ICOS Science Conference 2024!

Werner Kutsch
Director General, ICOS ERIC

ICOS SCIENCE CONFERENCE 2024
10-12.9.24 VERSAILLES, FRANCE & ONLINE

icos-ri.eu/sc2024
#ICOS2024SC

MON09 Sept

Badge pick-up

Lobby

15:00 – 19:00 Attendees can come collect their badge from the conference venue early from 15:00 CEST.

Ice-breaker event

Mazarin

15:00 – 19:00 Come catch up with colleagues, make new connections and get acquainted with the venue during our ice-breaker event! Complimentary drinks are included.

Please note that the programme is subject to change. For the latest updates, visit **icos-ri.eu/sc24**

TUE10 Sept

Plenary sessions

Sessions 1-4: Climate science for Cities, Continent and Oceans

Richelieu

09:00 Opening words
Werner Kutsch, ICOS ERIC and invited speakers

09:50 **Plenary 1.**
Philippe Ciais

10:15 – 10:45 **COFFEE BREAK**
Mazarin

10:45 – 12:00

Plenary 2. An Improved Downscaling Method for City-Scale European GHG Inventories: Insights Learned from Comparisons With Munich, Zurich and Paris Local Inventories
Emma Schoenmakers

Plenary 3. The African Greenhouse Gas Budget (2010-2019): A Synthesis of the Most Recent Data and Models
Yolandi Ernst

Plenary 4. Land-Ocean Continuum as Ideal Spots to Study Ocean Alkalinity Enhancement – the Case of the Southern Baltic Sea
Karol Kulinski

12:00 – 13:00 **LUNCH BREAK**
Mazarin

13:00– 14:00 **POSTER SESSIONS 1-4**
Le Nôtre Gallery, Lulli and Bar Salon

See pg. 6 for presentation titles and the online programme for exact poster session locations.

14:00 – 15:30 Parallel Sessions 1 – 4

Parallel Session 1

Theme 9. Combining data and models to improve estimates of regional to global GHG budgets and trends

Richelieu

The Variability of Terrestrial CO2 Fluxes in Semi-Arid Regions of the Southern Hemisphere as Seen by GOSAT
Sanam Vardag

Long-term trend of anthropogenic emissions measured with eddy covariance in Firenze
Tommaso Giordano

Addressing Challenges in Representing Inter-Annual Variability of Gross Primary Productivity Fluxes Using Robust Empirical and Theory-Based Models
Shanning Ranit De

An Effective Machine Learning Approach for Improving the Global Estimate of the Land Carbon Sink
Félicien Meunier

Historic Debt and Future Mitigation Potential: How Much of the Greenhouse Gas Emissions from Global Palm Oil Production Can We Cut By 2050?
Ana Meijide

Parallel Session 2

Theme 11. Quantification of urban greenhouse gas emissions - from novel monitoring to source identification

Lulli

Estimation Of The Fossil-Fuel Fraction Of Co2measured In Paris Based On Radiocarbon, And Co-Emitted Species (Nox, Co, Bc)
Ingrid Chanca

Fossil Fuel Co2 Gradients And Emissions In London Observed Using Radiocarbon (14c) Measurements.
Fang Liu

Complex Spatial And Temporal Patterns Of Greenhouse Gas Emissions Central London, Uk: Hotspots And Long-Term Trends
Carole Helfter

Flux Ratios Of Co2, Co, And Nox: An Inter-City Comparison Between Paris And Zurich Using Urban Tall-Tower Eddy Covariance
Rainer Hilland

Urban Atmospheric Monitoring Network Requirements To Track Co2 Emissions Until Climate Neutrality
Ivonne Albarus

Parallel Session 3

Theme 17. Best Practices in the landscape of Research Infrastructures: Cooperation, Co-location and other lessons learned

Foyer Condé

Impact Pathways – Towards Demonstrating the Socio-economic Impact of RIs
Evi-Carita Riikonen and Werner Kutsch

Co-Location of Measurement Sites – What Does it Mean and What is the Added Value it Provides?
Niku Kivekäs, Elena Saltikoff and Jaana Bäck

Expanded Freshwater and Terrestrial Environmental Observation Network: A Landscape Scale Environmental Research Infrastructure in South Africa
Gregor Feig

A Web-Based Tool for the Validation of Sentinel-2 and Sentinel-3 Derived Bio-Geophysical Products Against ICOS Terrestrial Ecosystems Measurements
Noelle Cremer

The Application of Non-Linearity Calculations to Greenhouse Gas Measurements Made by Cavity Ring Down Spectroscopy
Ruby Aklotsoe

Parallel Session 4

Theme 7. Carbon Cycling along the Land Ocean Aquatic Continuum

Colbert

Exploring the Impacts of Glacial Meltwater on Marine CO2 Uptake Potential: Insights from Young Sound, NE Greenland
Henry Henson

Hot Spots and Hot Moments in Greenhouse Gas (CO2, CH4 and N2O) Fluxes in a Diverse Coastal Ecosystem
Märta Brunberg

Recent Inorganic Carbon Increase in a Temperate Estuary Driven by Water Quality Improvement and Enhanced by Droughts
Louise Rewrie

Carbon Sinks in Prodeltaic Sediments : A Double-Trigger Environment
Eva Ferreira

Influence of Karstic Rivers and Southern Adriatic Waters on the CO2 System of the Gulf of Trieste (Mediterranean Sea)
Michele Giani

15:30 – 16:00 COFFEE BREAK

Mazarin

16:00 – 17:30 Parallel Sessions 5 – 8

Parallel Session 5

Theme 9. Combining data and models to improve estimates of regional to global GHG budgets and trends

Richelieu

Higher Global Gross Primary Productivity Under Future Climate With More Advanced Representations Of Photosynthesis
Matthias Cuntz

Strong integral carbon cycle constraints from global airborne surveys
Britton Stephens

Measurements of CO2 fluxes over the Baltic Sea from land and ship using EC method and different gas transfer velocity parameterizations
Iwona Niedzwiecka

An assessment of CO2 storage and sea-air fluxes for the Atlantic Ocean and Mediterranean Sea between 1985 and 2018
Meike Becker

Celebrating the Surface Ocean CO2 Atlas (SOCAT), a community-led synthesis, with WMO G3W on the horizon
Tobias Steinhoff

Parallel Session 6

Theme 11. Quantification of urban greenhouse gas emissions - from novel monitoring to source identification

Lulli

Demonstrating atmospheric O2/N2 measurements as a proxy for fossil fuel CO2 in the city of Heidelberg, Germany
Penelope Pickers

Eddy covariance measurements of Carbonyl sulfide (COS) to partition the urban carbon flux
Jesse Soininen

Biogenic CO2 fluxes in different urban vegetation types in Helsinki, Finland
Liisa Kulmala

Evaluation of source and sink contributions to urban flux tower measurements using flux footprint modelling
Betty Molinier

Emission inventory for human respiration: case study in Munich utilizing statistical and mobile network data methods
Julian Hinderer

Parallel Session 7

Theme 2. Exchange of reactive gases and aerosols between the land surface and the atmosphere in natural and managed ecosystems

Foyer Condé

A dynamic soil, plant, animal and atmosphere modelling system for NH3 exchange in grazed grasslands.
Mubaraq Olarewaju Abdulwahab

Temporal trends in high-resolution flux of Nitrogen-Dioxide (NO2) from a grazed African Savanna
Tamryn Hamilton

From forest to atmosphere: towards a more comprehensive assessment of BVOC exchanges in a mixed temperate forest
Clément Dumont

VOC fluxes and concentrations at a boreal forest site before, during and after clear-cutting
Janne Rinne

Ammonia deposition evaluation at the ICOS Loobos site
Arjan Hensen

Parallel Session 8

Theme 6. Greenhouse gas fluxes at high latitudes and climate/human induced feedbacks

Colbert

Temporal and vertical variation of in-situ methane turnover from stable isotope studies at a boreal peatland
Xuefei Li, Janne Rinne and Timo Vesala

Winter-time methane fluxes in boreal and arctic peatlands
Elodie Salmon

High emissions of CO2 and CH4 due to active-layer warming in Arctic tundra
Margaret Torn

Eddy covariance GHG fluxes from grasslands on mineral and drained organic soils in eastern Finland
Narasinha Shurpali

Sustainable use of peatlands for agriculture in the Arctic
Junbin Zhao

17:30 – 19:00 POSTER SESSIONS 5 - 8

Le Nôtre Gallery, Lulli and Bar Salon

See pg. 10 for presentation titles and the online programme for exact poster session locations.

TUE 10 Sept

13:00 – 14:00 Poster sessions 1 – 4

Poster session 1

Theme 9. Combining data and models to improve estimates of regional to global GHG budgets and trends

467 The Norunda Clear-Cut – Towards a Carbon Budget of a Full Forest Rotation Cycle
Natascha Kljun

129 How reliable are process-based radon flux maps? Results from a radon inversion in Europe
Fabian Maier

462 Reviewing the latest Artificial Intelligence and Eddy Covariance technologies for Comprehensive Flux Monitoring
Arianna Lucarini

398 Cross-border influence: assessing the impact of additional CO2 monitoring sites in European nations on constraining carbon fluxes in neighboring countries
Yohanna Villalobos

258 Mapping CO2 fluxes of drained fen meadows in the Netherlands with machine learning
Laura van der Poel

153 Terrestrial flux products from an extended data-driven scaling framework, FLUXCOM-X
Sophia Walther

87 European methane flux estimates for 2022 based on the Radon Tracer Method, regional atmospheric inversions and inventories
Camille Yver-Kwok

315 Simple annual CO2 flux indicator from Sentinel-2 and ERA5 data
Ludovic Arnaud

156 Estimating European CH4 fluxes using the CarboScope Regional atmospheric inversion system
Frank-Thomas Koch

340 Comparison of CO2 Balances in Finnish Terrestrial Biosphere: Bottom-up vs. Top-down
Kielo Isomäki

104 Combining NDVI data and flux measurements to estimate CO2 GPP rate and annual photosynthesis
Jón Guðmundsson

58 Refining the Global Picture: the Impact of Increased Resolution on CO Atmospheric Inversions using OCO-2 XCO retrievals
Zoé Lloret

348 From science to services: towards the Copernicus greenhouse gas emission monitoring service
Richard Engelen

172 Verification of an earth system model CCAM using the ground-based measurements across South Africa
Nolusindiso Ndara

390 The Copernicus Atmosphere Monitoring Service (CAMS) global greenhouse gases forecasts and near-real-time analysis
N'Dri Ernest Koffi

302 Assessing atmospheric fossil fuel emissions using 14CO2 measurements and global atmospheric simulations with the CIF-LMDZ transport and inverse modeling system
Hannah Allen

114 Enhancing Constraints on Atmospheric Nuclear 14CO2 Contributions in Europe to Improve Continental 14CO2-based Fossil Fuel Estimates
Timo Knaack

Poster session 2

Theme 11. Quantification of urban greenhouse gas emissions - from novel monitoring to source identification

396 Detection and quantification of urban methane emissions in Heidelberg (Germany) using mobile and isotope measurements
Martina Schmidt

152 14CO2-based Fossil Fuel CO2 Flux Estimation in Zurich Using Relaxed Eddy
Ann-Kristin Kunz

387 Mixing layer heights in ICOS Pilot Cities
Christopher Claus Holst

35 Design, operation, and insights from Zürich city's mid- and low-cost ICOS Cities CO2 sensor network
Stuart Grange

380 MAGIC 2022-2023, a multi-measurement constraint on urban emissions
Charbel Abdallah

230 Quantification of Hotspot Emissions Using Ground-Based Spectral Imaging of Methane and Carbon Dioxide
Lennart Resch

275 Locating the signal: mapping the carbon landscape of European cities to inform urban emission monitoring strategies
Ida Storm

292 Quantifying biogenic CO2 fluxes in urban areas using field observations
Stavros Stagakis

86 Analysis of urban CO2 and heat fluxes and evaluation of the SUEWS model using eddy covariance observations from two towers in Heraklion, Greece
Konstantinos Politakos

382 CO2 source identification of two nearby flux towers in the city centre of Basel, Switzerland
Stavros Stagagis

270 Quantification of carbon dioxide and methane emissions from a Chinese city based on eddy covariance measurements
Kai Wang

32 URBFLUX project: Monitoring urban and peri-urban CO2 and energy fluxes in the city of Valencia
Arnaud Carrara

470 Toward a standardized processing of eddy covariance multi-gas flux measurements in urban environments
Giacomo Nicolini

448 Investigating Vienna's CO2 and CH4 emissions with tall tower eddy covariance flux measurements
Fasano Enrichetta

224 In-situ NOx observations using the German ICOS tall tower setup
Tobias Kneuer

187 Urban Emission Assessment based on High-Resolution Dispersion Simulations and Bayesian Inversion
Junwei Li

413 Land-Atmosphere Exchanges in Complex Urban Landscapes: From Process Diagnosis to Climate Impacts
Sebastien Biraud

195 Eddy Covariance measurements of CO2 fluxes at short and tall towers in the Paris area
Laura Bignotti

99 Spatial modelling of biogenic CO2 and heat fluxes in the city of Zürich
Anni Karvonen

Poster session 3

Theme 17. Best Practices in the landscape of Research Infrastructures: Cooperation, Co-location and other lessons learned

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Jan Pisek

395 Integrating Data into Urban Climate Governance: Interdisciplinary Approaches Through Collaborative Strategies
Barbara Dias Carneiro

471 An unintentional large-scale land use change and restoration experiment promoting a holistic approach: the new Castelporziano research cluster
Dario Papale

136 GEORGE roadmap towards marine data interoperability of 3 ERICs (EMSO – Euro-Argo – ICOS)
Thanos Gkritzalis

454 Advance Marine Research Infrastructure Together. A federated services project for ocean observing and data products
Mortier Laurent

379 Lessons learned from the labelling phase of ICOS ecosystem stations
Simone Sabbatini

338 How AERIS atmosphere Data Centre contributes to disseminate and promote greenhouse gases data
Payan Sébastien

155 The ICOS Ocean Thematic Centre: How we can support you in providing data to estimate the Ocean Carbon Sink
Richard Sanders

49 The AmeriFlux Management Project: Overview and the Year of Remote Sensing
Sebastien Biraud

Theme 2. Exchange of reactive gases and aerosols between the land surface and the atmosphere in natural and managed ecosystems

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Stanislav Juran

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Ralf Aben

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Roberto Corsanici

120 Volatile organic compounds emission and secondary organic aerosol formation from agricultural recycling of organic waste products
Raluca Ciuraru

177 Carbon dioxide, methane and carbon monoxide were observed over one-year at the tall tower of El Arenosillo station in Southwestern Europe
Jose Adame

105 BVOCs fluxes characterization from a Sorghum plantation in a Mediterranean ICOS site: exploring phenology, stresses, source and sink ripartition of the net ecosystem exchange
Antonio Manco

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Theme 7. Carbon Cycling along the Land Ocean Aquatic Continuum

381 Exploring acidification dynamics in the Southern Adriatic: Insights from high frequency pCO2 and pH data at the E2M3A observatory
Carlotta Dentico

394 Inorganic carbon transported into the Gulf of Trieste by rivers draining karstic areas
Vincenzo Alessandro Laudicella

455 Interannual and seasonal variability of the air—sea CO2 exchange at Utö in the Baltic Sea
Martti Honkanen

17 Linking coastal biodiversity, carbon cycling, and climate feedback: hotspots and hot moments
Nicolas-Xavier Geilfus

83 Variability of surface seawater fCO2 in the coastal region off Brazil sampled by the France-Brazil ICOS Station
Nathalie Lefevre

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154 Carbon Fluxes along the GB Land Ocean continuum
Richard Sanders

466 Quantifying Carbon Sequestration in Tidal Wetlands using Eddy Covariance
Marilyn Roland

431 Analysis of the concentration of methane and carbon dioxide in an area of environmental preservation between the cities of Cananéia - Iguape, southern coast of the State of São Paulo
Elaine Araujo

399 The seasonal succession of diatoms in the coastal Baltic Sea: insights for their use as a micropaleontological proxy for past environmental change
Sohvi Railo

388 Carbon fluxes in marginal ice zone
Erik J. Schaffernicht

Theme 6. Greenhouse gas fluxes at high latitudes and climate/human induced feedbacks

39 Advances and challenges of Solar-Induced chlorophyll Fluorescence (SIF) in understanding Arctic-Boreal carbon uptake across spatial-temporal scales: A review
Rui Cheng

44 Flux measurements of carbon monoxide by eddy covariance over two pristine wetlands in high latitudes
Asta Laasonen

54 Optimizing spatial resolution in landcover classification for accurate methane emissions estimates in Arctic and Boreal regions
Joshua Hashemi

160 Sustainable use of peatlands for agriculture in the Arctic
Junbin Zhao

178 Improving Estimates of Arctic Ocean CO2 Uptake with a new Machine Learning derived p(CO□) product for the Arctic Ocean
Victoria Dutch

202 Tussock Tundra CH4 Fluxes are Heterogeneous and Sensitive to Spring Conditions: An NGEE-Arctic Study at Council, Alaska
Sigrid Dengel

17:30 – 19:00 Poster sessions 5 – 8

Poster session 5

Theme 9. Combining data and models to improve estimates of regional to global GHG budgets and trends

344 The Potential of night-time observation applications in atmospheric inversions based on CarboScope-Regional system
Yang XU

301 Estimating air-sea CO2 fluxes from an oceanographic tower in the Northern Adriatic Sea using ΔpCO2 and wind/wave measurements
Silvio Davison

74 Using optical and radar inputs data in a machine learning model to predict net ecosystem exchange of cropland
Sarah Dussot

67 European Obspack: compilation of all CO2, CH4 and N2O measurements in Europe
Clément Narbaud

149 Modelling carbon recovery time after clear-cutting or fire in boreal forests under changing climate
Md. Rafikul Islam

325 Discrepancies between ICOS measurements and modelled greenhouse gas concentrations characterizing the parametrization error for greenhouse gas emission verification
Diego Jiménez-de-la-Cuesta

122 Estimation of Terrestrial Vegetation Gross Primary Productivity (GPP) using the Quantum Yield Model and Sentinel-3 Data: The QY GPP Product
Booker Ogutu

185 A Review of Open Fire GHG Emissions in the Mediterranean Region Across Major Inventories
Rabia Ali Hundal

289 Influence of deep stratosphere-to-troposphere transport to atmospheric carbon dioxide and methane at the Mt. Cimone WMO/GAW Global Station (2165 m a.s.l., Italy) over 2015 – 2022
Paolo Cristofanelli

336 The ICOS background station at Plateau Rosa and the assessment of high-resolution CH4 simulations in complex terrain
Giulia Zazzeri

441 Estimation of daily CO2 fluxes using a statistical approach based on multi-satellite optical images and meteorological data
Tiphaine Tallec

47 Evaluation of atmospheric CO2 transport across scales from cities to continents
Anna Agustí-Panareda

335 Continuous ΔCO-based ΔffCO2 record of the ICOS network: signal strength and uncertainties
Maksym Gachkivskyi

256 Bottom-up evaluation of greenhouse gases (CO2, CH4, N2O) at regional scale
Akihiko Ito

360 GHG budget estimates from polyisotopic carbon dioxide (CO2) at Weybourne Atmospheric Observatory (WAO), north Norfolk, United Kingdom
Jan Kaiser

196 Comparative Analysis of Prediction Models for CO2 Forecasting Across Diverse Ecosystems Using the ICOS Network
David Rodríguez García

372 Evaluating greenhouse gas (GHG) emissions estimate robustness: Utilizing radon for atmospheric transport model uncertainty analysis
Dafina Kikaj

293 Evidence of ongoing SF6 emissions in Germany
Katharina Meixner

297 A Vegetation Photosynthesis and Respiration Model (VPRM) for the post-MODIS era
Theo Glauch

474 Consistency between the spatial representativity of space-borne observations and of ground-based eddy covariance measurements
Giacomo Nicolini

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Theme 11. Quantification of urban greenhouse gas emissions - from novel monitoring to source identification

73 Nocturnal fluxes of CO2 and CH4 from Barcelona Metropolitan Area obtained with the Radon Tracer Method
Claudia Grossi

436 Quantifying CO2 Emissions from Large Point Sources in the Indian Region: A Data-Driven Approach using Satellite Measurements
Jithin Sukumaran

456 Inverse transport and dispersion modelling for the Oslo area for urban greenhouse gas emissions assessment
Ignacio Pisso

429 Assessing CO2 emission sources from a top-down approach based on tracers and carbon isotopes in the Aix-Marseille metropolis area to assess independently the local emissions inventory
Irène Xueref-Remy

10 Atmospheric GHG Monitoring Network of the metropolitan area of Barcelona
Roger Curcoll

330 Mapping of Greenhouse gases within the Greater Athens Area using mobile measurements
Aikaterini Bougiatioti

339 Net Zero Carbon Berlin: Developing a Systems Framework
Christopher Ryan

263 Assessing the variations of Atmospheric Methane concentration across the state of Gujarat, India during 2020-22 using satellite data
Anurag Kandya

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294 Anthropogenic emissions measured with eddy covariance in two “climate-neutral by 2030” nearby italian cities
Simone Putzolu

420 Urban CO2 and CH4 atmospheric measurements in the Milan city area (northern Italy)
Paolo Cristofanelli

194 Paris mid-cost CO2 sensor network : performance assessment and suitability for city co2 emission retrieval
Olivier Laurent

159 Comparison of intra-urban energy exchange in vegetated vs metropolitan Mediterranean areas: the case study of the city of Naples
Teresa Bertolini

346 Micrometeorological measurements of methane and carbon dioxide emissions at landfills
Maiju Linkosalmi

354 Assessing methane emissions for megacity Mumbai, India using satellite data
Shruti Uphale

409 Urban Greenhouse Gas Emissions in Uganda: Unveiling Hidden Sources for Sustainable Development
Turyamureeba Amon

23 Clumped isotope signatures of atmospheric CO2 sources
Richmal B. Paxton

400 Influence of Evaporation Gradient and Hydrologic Connectivity on Water-Carbon Dynamics in a Rewetted Peatland
Aram Kalhori

Poster session 7

Theme 12. Translating Scientific CO2 Emission Research into City Services

445 Dijon Metropole journey towards carbon neutrality
Denis Hameau

158 Integrating scenario planning and real-time monitoring for urban GHG emissions management
Angelica Centanaro

Poster session 8

Theme 6. Greenhouse gas fluxes at high latitudes and climate/human induced feedbacks

217 Comparing the Environmental Response of Carbon Dioxide and Methane Flux Dynamics in a Boreal Bog and Fen
Eyrún Gyða Gunnlaugsdóttir

219 Spatially comprehensive modelling of methane emissions in northern latitude peatlands
Koffi Dodji Noumonvi

222 Implementing shrub plant functional types to improve the representation of high latitude vegetation in ORCHIDEE
Anna Kirchner

225 Luke GHG flux network on northern managed ecosystems
Janne Rinne

280 Investigating high-latitude carbon cycle response using an EC-Earth framework
Rayanne Vitali

283 Assessing LAKE 2.0 model performance in simulating thermal and greenhouse gases dynamics in a small boreal lake in southern Finland
Marta Fregona

323 Carbon dioxide and methane fluxes over the coastal Baltic Sea
Aki Vähä

341 Understanding the climate impacts of rewetting in a boreal peatland forest
Ellinoora Ekman

355 Freshwater carbon fluxes at high northern latitudes
Judith Vogt

375 Study of greenhouse gas fluxes and earth system feedbacks in the Horizon Europe project GreenFeedBack
Lise Lotte Sørensen

406 CO2, Surface Radiation, and Meteorological Outcomes in the Polar Regions
Kevin Forbes

423 Primary productivity signals in the Kolyma River and tributaries in northeastern Siberia
Karel Castro-Morales

424 CO2 exchange in a nutrient-rich peatland forest after the application of two distinct harvesting techniques
Mika Korkiakoski

450 Impact of CO2 fertilisation on carbon allocation patterns in a sub-arctic rich fen peatland
Sandeep Thayamkottu

31 Summer greenhouse gases spatial variability from Southern Greenland Fjords to subpolar North Atlantic Ocean
Coraline Leseurre

304 Disentangling the role of plant phenology in regulating methane emissions from a northern peatland: results from a 10-year data archive
Gillian Simpson

417 Simulation of carbonyl sulfide and carbon dioxide fluxes in a northern boreal coniferous forest using memory-based deep learning
shuai liu

199 Five-year continuous measurements of CO and CH at the Atlas Mohammed V Atmospheric Research Station in Morocco
Ibrahim Ouchen

103 Anthropogenic CO2, air-sea CO2 fluxes and acidification in the Southern Ocean: results from a time-series analysis at station OISO-KERFIX (51°S-68°E)
Claire Lo Monaco

WED11 Sept

ICOS SCIENCE CONFERENCE 2024

Plenary sessions

Sessions 5-7: From Space to Sea: Innovation in Support of Global Initiatives

Richelieu

09:00 – 10:15

Plenary 5. Global Greenhouse Gas Watch
Gianpaolo Balsamo

Plenary 6. Using satellites in support of methane emission reductions
Ilse Aben

Plenary 7. A new age of autonomous marine carbon system observations: An evaluation of in situ Lab-On-Chip carbonate sensors in recent applications
Emily Hammermeister

10:15 – 10:45 COFFEE BREAK
Mazarin

10:45 – 12:30 **Parallel Sessions 9 – 12**

Parallel Session 9

Theme 3. Cross-domain technological development: autonomous vehicles, sensor miniaturisation, low-cost sensors and labour-intense approaches

Richelieu

UAV based in-situ measurements of CO2 and CH4 emissions
Abdullah Bolek

Blue Boat: a low-cost autonomous surface vehicle for measuring carbonate system parameters in surface waters
Sean Morgan

The ocean gliders capacity to estimate the air-sea CO2 flux: from machine learning tools to innovative sensors
Laurent Coppola

Developing a framework for automated and continuous measurements of FAPAR from distributed wireless sensor network
Somnath Paramanik

Low-cost sensors for spatially distributed CO2 measurements through Arctic snowpacks
Victoria Dutch

Parallel Session 10

Theme 11. Quantification of urban greenhouse gas emissions - from novel monitoring to source identification

Lulli

Building-resolved CO2 simulations to estimate emissions of the city of Zurich
Leonie Bernet

Influence of atmospheric transport in inversions using greenhouse gas column measurements: a study with MUCCnet in Munich.
Haoyue Tang

Urban-scale inversions of methane emissions for Melbourne, Australia
Nasimeh Shahrokhi

A high-resolution atmospheric inversion framework for CO2 observations in Paris using GRAMM/GRAL
Robert Maiwald

Optimizing CO2 emission estimates in Paris through enhanced urban atmospheric monitoring
Ke Che

Parallel Session 11

Theme 15. Science communication and outreach to increase the impact of climate research

Foyer Condé

Scientist's toolkit: how to get media visibility for your research?
Karlina Ozolina

Science communication: opportunities between Vivaldi and the Museum of Knowledge
Alexander Knohl

Participatory hydrological modelling for collective exploration of catchment management: promoting water stewardship across a multi-stakeholder platform
Faith Jumbi

Climate change communication in a time of information abundance
Fran Laurik

Visualizing science: an immersive technology in education and science communication
Dmitrii Krasnov and Steffen Manfred Noe

Parallel Session 12

Theme 6. Greenhouse gas fluxes at high latitudes and climate/human induced feedbacks

Colbert

Northern European forests' carbon balance and management disturbances: the tale of the direct flux measurements
Samuli Launiainen

Towards an increasingly biased view on Arctic change
Efrén López-Blanco

Towards reconciling terrestrial CO2 flux estimates from regional and global data-driven up-scaling approaches
Sophia Walther

Deciphering Arctic Ocean surface ocean carbon fluxes: insights from atmospheric inverse analyses
Jayashree Ghosh

12:30 – 13:30 LUNCH BREAK
Mazarin

13:30 – 14:30 POSTER SESSIONS 9–12
Le Nôtre Gallery, Lulli and Bar Salon

See pg. 18 for presentation titles and the online programme for exact poster session locations.

14:30 – 16:00 Parallel Sessions 13 – 16

Parallel Session 13

Theme 9. Combining data and models to improve estimates of regional to global GHG budgets and trends

Richelieu

Investigation of the Suess Effect in the High Latitude Over the Last Two Decades- a model-data study
Coraline Leseurre

Towards global long-term multi-tracer data assimilation estimates of carbon fluxes
Joram Hooghiem

Long-term monitoring of CO2 emissions over Switzerland using observations and forward simulations of 14CO2
Dylan Geissbühler

Unlocking insights: evaluating simulated CO2 over Europe through aircraft observations and error apportionment
Đanilo Custódio

Identifying the interannual variability (IAV) of terrestrial carbon fluxes and their response to climate change from observational perspectives
Songyan Zhu

Parallel Session 14

Theme 11. Quantification of urban greenhouse gas emissions - from novel monitoring to source identification

Lulli

Inversion of anthropogenic and biospheric CO2 fluxes in the city of Zurich from a network of mid-cost CO2 sensors
Nikolai Ponomarev

Advancing urban greenhouse gas monitoring: development and evaluation of a high-density CO2 sensor network in Munich
Patrick Aigner

SCOUT: Street-Level Carbon Observatory for Urban Terrain
Daniel Kühbacher

Assimilating mid-cost CO2 sensor measurements into WRF-chem eulerian and WRF-STILT Lagrangian Inverse Modeling for Quantifying CO2 emissions in Paris
Jinghui Lian

Local-level CO2 emissions and their spatial variability in two contrasting cities Helsinki and Beijing
Leena Järvi

Parallel Session 15

Theme 10. Remote sensing of greenhouse gases from ground and space: Their application for carbon cycle studies, satellite and model validation and building MVS capacity

Foyer Condé

The Long-Lived greenhouse gas Products Performances (LOLIPOP) CCI+ project
Elisa Castelli

CarbonBridge – Connecting GHG satellite measurements with ground based measurements through vertical profiles
Colm Sweeney

Trainou super site for measuring greenhouse gases in Europe, combining ICOS, TCCON and AIRCORE
Michel Ramonet

Multi-year urban total column network observations – challenges and insights of using MUCCnet for emission estimates
Jia Chen

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Theme 6. Greenhouse gas fluxes at high latitudes and climate/human induced feedbacks

Theme 4: Processes involved in the greenhouse gas cycle in terrestrial ecosystems

Colbert

Long term flux measurements of carbon dioxide and methane over a small boreal lake using eddy covariance technique
Ivan Mammarella

Quantifying Arctic-Boreal methane emissions using atmospheric observations and aglobalinverse model
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Greenhouse gas fluxes and their drivers in large northern boreal Lake Pallasjärvi
Joonatan Ala-Könni

Shoulder season controls on methane emissions from a boreal peatland
Katharina Jentzsch

Understanding and modelling the response of high latitude ecosystems to extreme meteorological events with the ORCHIDEE land surface model
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Theme 9. Combining data and models to improve estimates of regional to global GHG budgets and trends

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To what extent does CO2 diurnal cycle impact carbon flux estimates in CarboScope?
Saqr Munassar

Spring melting season methane emissions in the northern high latitude Wetlands based on inversion modeling
Sara Hyvärinen

Inverse modeling of emissions of CH4, N20 and F-gases in Europe: an intercomparison study of three inverse methods
Daniela Brito Melo

Global CO2 inversions with chemical production from CO
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Characterizing background errors in IFS greenhouse gas emission inversions
Auke Visser

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WMO IG3IS Integrated Global Greenhouse Gas Information System
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Transparent Horizons: IMEO's methane data empowering global action
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GBOV (Copernicus ground-based observation for validation): an overview of the service
Christophe Lerebourg

The CDRatlas: a platform to visualise the potential of CDR
Steffen Swoboda

PARIS, AVENGERS, EYE-CLIMA – Verification and reconciliation of estimates of climate forcers **Rona Thompson**

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Foyer Condé

Recent developments in satellite and airborne remote sensing of methane emissions
Hartmut Boesch

Use of a Langrangian transport model for atmospheric inversions using satellite observations: case study using TROPOMI to estimate CH4 emissions over Europe
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Evaluating GHGs at total column methane measurements using nested WRF LES simulations
Yunsong Liu

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Investigation of CO2 sources, variability and trends in Mexico City
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Theme 3. Cross-domain technological development: autonomous vehicles, sensor miniaturisation, low-cost sensors and labour-intense approaches

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The need to develop ocean-based carbon dioxide removal in a globally fair and equitable manner: Perspectives, principles and recommendations
Christopher Pearce

Lessons for coastal ocean alkalinity enhancement in a fully-coupled Earth system model
Andrew Yool

Assessment of float pH quality control methods from the coupling of two observational infrastructures: a case study in the subpolar northwest Atlantic ocean
Cathy Wimart-Rousseau

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ICOS Integrated Carbon Observation System
SCIENCE CONFERENCE 2024

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Sessions 8–10: Exploring the Carbon Cycle: From Soils to the Atmosphere

Richelieu

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Plenary 8. Radiocarbon Isotopic Disequilibrium Shows Little Incorporation of New Carbon in Mineral Soils of a Boreal Forest Ecosystem
Andrés Tangarife-Escobar

Plenary 9. A Near Real Time Framework for the Detection and Attribution of Carbon Flux Anomalies
Thomas Colligan

Plenary 10. Advancements in Atmospheric Methane Clumped Isotope Measurements and Modelling
Malavika Sivan

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Mazarin

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Parallel Session 21

Theme 1. Isotopes and other tracers for studies of methane sources and sinks

Richelieu

Capabilities of CH4 source apportionment using atmospheric 14CH4 measurements: Switzerland as a case study
Thomas Laemmel

Simulated detection of methane emissions from Arctic permafrost thawing contribution with atmospheric radiocarbon and other tracer measurements
Alina Yang

Inverse modelling of regional methane emissions from multiple sources using high frequency methane isotope observations
Alice Ramsden

Measurements and calibration for high precision continuous monitoring of stable isotope ratios in atmospheric methane
Christopher Rennick

Methane sources in Cluj-Napoca, Romania: insights from isotopic analysis
Jacoline van Es

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Theme 5. Impact of climate extremes on GHG fluxes: understanding driving processes and responses across scales

Lulli

Surface CO2 system dynamics along the western Mediterranean Sea based on high-frequency measurements from a Volunteer Observing Ship
Melchor Gonzalez-Davila

Impact of climate extremes on air-sea CO2 exchanges in the north western Mediterranean Sea: a study based on the MOOSE network
Thibaut Wagener

Impacts of warm autumn on carbon sequestration: insights from mature hemiboreal coniferous forest
Svyatoslav Rogozin

Influence of meteorological conditions on a young beech forest gross primary productivity: insights from 24 year-long measurements using a novel wavelet-based approach
Jonathan Bitton

Parallel Session 23

Theme 18. Manufacturers' session

Foyer Condé

Advancement of an accurate multi-functional pCO2 sensor for measurements at depth and air-sea CO2 surface flux determination
Pro-Oceanus Systems, Mark Barry

Advancing Greenhouse Gas isotopic measurements: evaluating the compatibility and efficiency of Picarro Gas Autosampler with Picarro Isotopic Analyzers
PICARRO, Keren Drori

Advances and applications of tunable infrared laser direct absorption spectroscopy (TILDAS) in atmospheric gas quantification
Aerodyne, Scott Herndon

New advancements in sensor development provided by Aeris Technologies
Hans Helsen, Aeris Technologies

Multi-Path Ultrasonic Anemometer uSonic-3 MP
METEK, Hans-Jürgen Kirtzel

Parallel Session 24

Theme 4. Processes involved in the greenhouse gas cycle in terrestrial ecosystems

Colbert

Forest ecosystem transpiration and carbon sequestration at the footprint level of an ICOS site
Holger Lange

A paired flux tower-dendrometer network to investigate forest carbon from assimilation to allocation to tree growth
Mukund Rao

Addressing forest canopy decoupling in eddy covariance flux measurement networks
Georg Jocher

Evaluation of the behaviour of O2 and CO2 above a canopy of a forest and its application to further constrain the forest carbon balance
Kim Faassen

Bridging the gap between historical and ICOS ecosystem flux data series: methodological choices and their impact on net fluxes
Ariane Faurès

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Mazarin

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Parallel Session 25

Theme 9. Combining data and models to improve estimates of regional to global GHG budgets and trends

Richelieu

Identifying hotspots of greenhouse gas emission from drained patlands in the European Union **Quint van Giersbergen**

Methane emissions over major fossil fuel basins from bottom-up inventories and atmospheric inversions
Kushal Tibrewal

Evaluating optimal release heights from mountain receptors for an improved estimate of methane emissions in Northern Italy
Lilja Dahl

Map-IO: atmospheric and oceanic observation program in the Southern Indian Ocean
Michel Ramonet

Complementing regional scale GHG flux observations with area-specific emission signatures
Konstantinos Kissas

Parallel Session 26

Theme 5. Impact of climate extremes on GHG fluxes: understanding driving processes and responses across scales

Lulli

Snow as an insurance: winter snowpack protects against alpine grassland from early summer drought
Kukka-Maaria Kohonen

Impact of extreme drought events on soil carbon dynamics in mountains: experimental and observational study
Didier Voisin

Soil texture modulates ecosystem water limitation: from local to global importance of soil and atmospheric drought on transpiration and photosynthesis
Fabian Wankmüller

Global and local climate change impacts on CO2 exchange from a Scottish peatland
Karen Yeung

Feedback between climate, land-atmosphere fluxes and structure in a forest ecosystem severely damaged by recent hot-droughts **Andreas Christen**

Parallel Session 27

Theme 14. Leveraging direct flux measurements beyond academia for real-world applications

Foyer Condé

Integrating Ameriflux data in the CarbonSpace platform
Andrey Dara

An innovative use of eddy covariance methodology to assess energy, water and carbon fluxes over utility-scale photovoltaic parks in France
Emma Lopez

Crop gross primary production and yield estimation from Sentinel-2 data using a light use efficiency model
Rahul Raj

The mosaic nature of peatland emission calls for co-learning for science-based mitigation policy and community acceptance
Christian Fritz

Policy-driven mobile eddy covariance and chamber networks to monitor effectiveness of multiple emission mitigation measures in Frisian peat meadows
Bart Kruijt

Parallel Session 28

Theme 4. Processes involved in the greenhouse gas cycle in terrestrial ecosystems

Colbert

Methane exchange in the floodplain forest
Natalia Kowalska

A new wavelet-based-direct-partitioning eddy covariance CO2 fluxes workflow evaluated in ICOS
Pedro Herig-Coimbra

Shoots of mature European beech as important sinks for atmospheric nitrous oxide (N2O) **Katerina Machacova**

Do N2O fluxes and N2O production processes differ under different grassland management (overseeding legumes vs. organic fertilization)?
Iris Feigenwinter

Source attribution of pasture-scale N2O fluxes using a random forest approach
Christof Ammann

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Parallel Session 29

Theme 9. Combining data and models to improve estimates of regional to global GHG budgets and trends

Richelieu

High-resolution regional atmospheric CO2 inversion: integrating data and models for carbon budgets
Carla D'angeli

Exploring the use of forest inventory data in an inverse modelling system for monitoring the European carbon cycle
Marnix van de Sande

Atmospheric monitoring of the CO2 anthropogenic and biogenic fluxes, at European and national scales, based on the assimilation of surface and satellite observations
Elise Potier

Cross-scale convergence in the carbon balance of managed forests in boreal Sweden
Matthias Peichl

High-resolution modeling of CO2 in the Netherlands and the dispersion of emissions from the Randstad using DALES
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Parallel Session 30

Themes 1, 5, 6 and 11

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Continuous high-frequency CO2, CH4 and N2O fluxes year-round from the boreal Siikaneva bog, Finland
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Simultaneous hot and dry extreme-events increase wetland methane emissions: an assessment of compound and discrete extreme-event impacts using Ameriflux and FLUXNET-CH4 site datasets
Tanya Lippmann

Environmental monitoring of coal mining area: lessons learned from ground-based CH4 measurements
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Tracking methane emissions at the site-scale
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From science to service: leveraging urban CO2 monitoring for actionable science-based policymaking – insights from Paris Case Studies
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A data science-based dashboard to promote near-realtime quality control of atmospheric composition measurements
Yuri Brugnara

Tools for easy analysis of ICOS data
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Net ecosystem exchange in a degraded tropical peatland: can restoration of degraded tropical peatlands help Indonesia achieve its carbon neutral goals?
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Towards a pan-African research infrastructure for atmospheric, climate and ecosystem services: three decades of international collaboration in Kenya
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Theme 4. Processes involved in the greenhouse gas cycle in terrestrial ecosystems

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Carbon balance and flux dynamics at the FR-Grignon ICOS Site: a 2005-2023 analysis
Carmen Kalalian

Vineyard floor vegetation defines net CO2 exchange during the crop dormant season
Torben Callesen

Climate-induced changes in carbon flux dynamics of an alpine grassland: insights from transplantation experiment
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Modelling the CO2 transport through secondary circulations
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Liisa Ikonen

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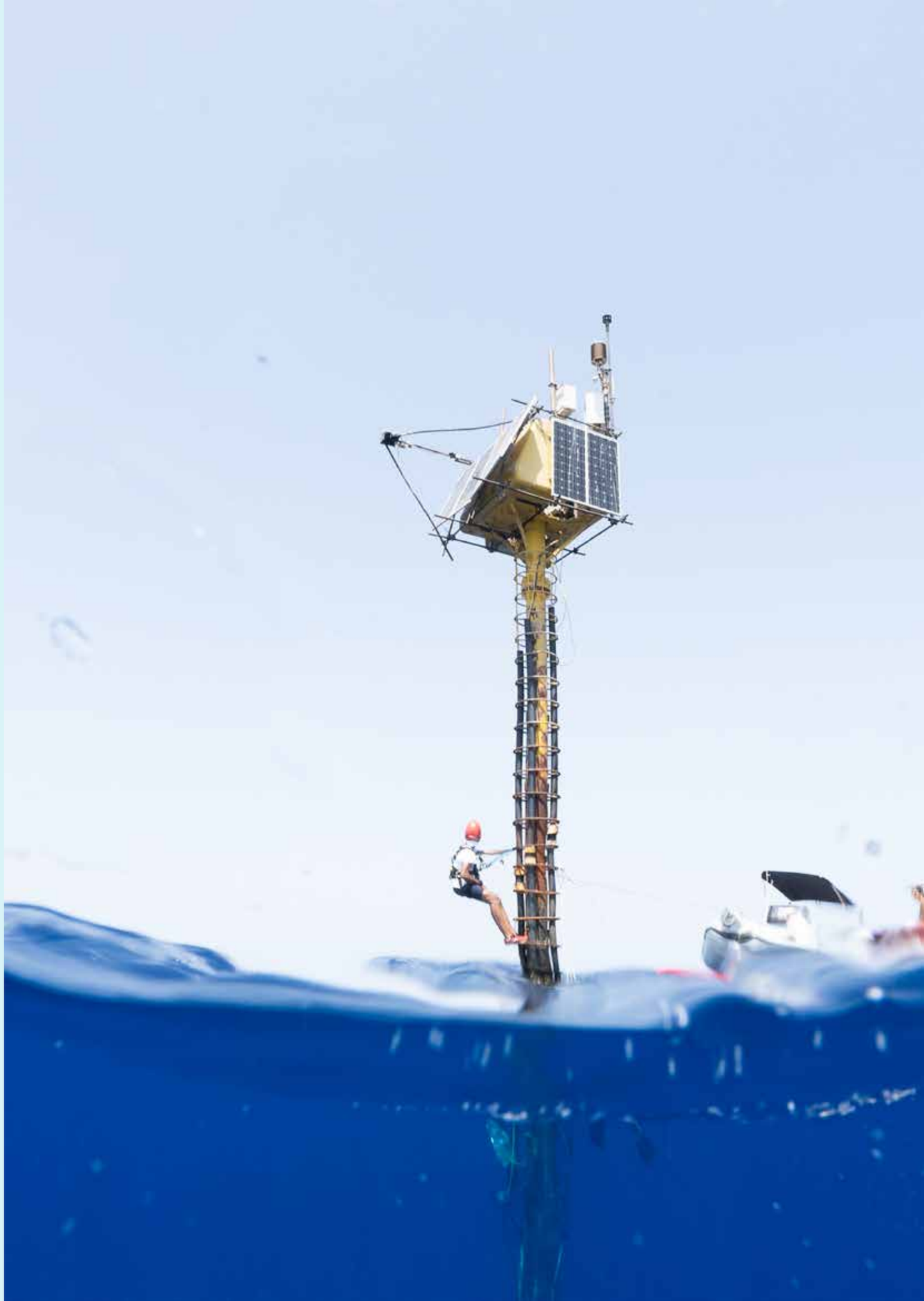


ICOS Integrated Carbon Observation System
SCIENCE CONFERENCE 2024

Venue & access

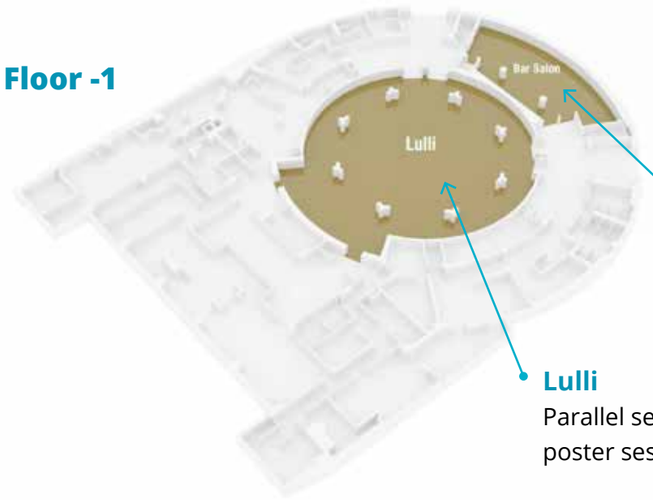
Finding your way

The registration and information desks are located at the entrance. Conference activities will take place throughout the building.

Questions about the programme?

The most up-to-date programme can be found online at **icos-ri.eu/sc24**. You can also scan the QR code on your name tag to access the programme on your phone.

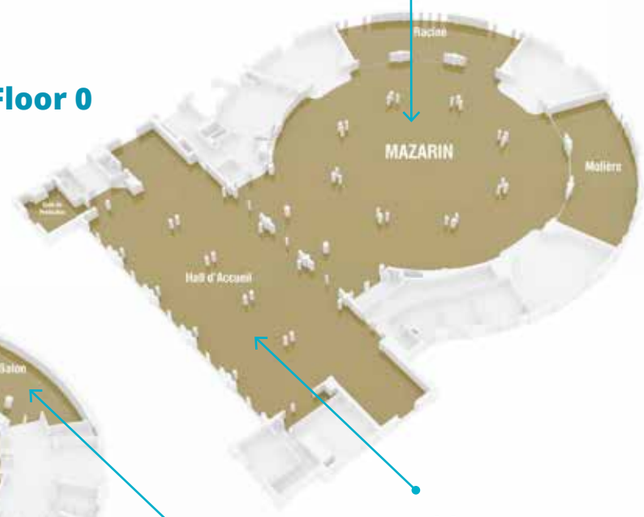
Floor -1



Bar Salon
Poster sessions

Lulli
Parallel sessions & poster sessions

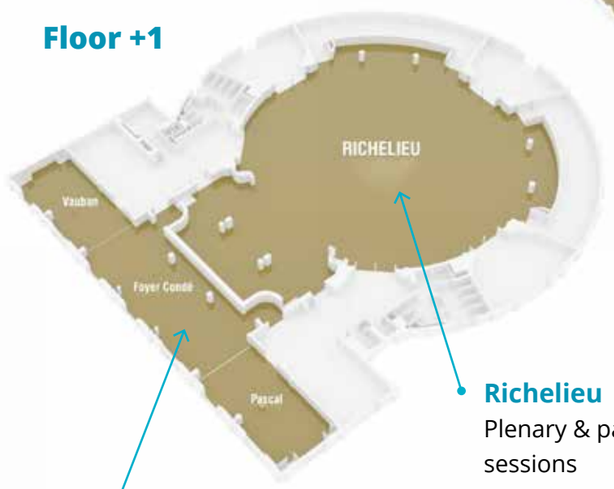
Floor 0



Mazarin
Vendor exhibition & lunch and coffee

Lobby
Registration and info desk

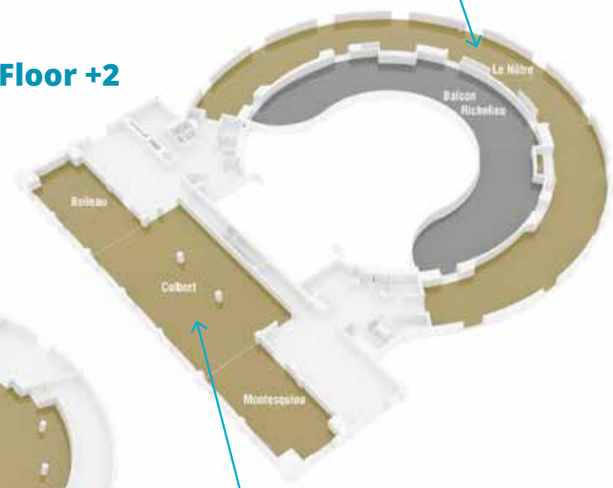
Floor +1



Foyer Condé
Parallel sessions

Richelieu
Plenary & parallel sessions

Floor +2



Le Nôtre Gallery
Poster sessions

Colbert
Parallel sessions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