PIK Alumni Newsletter 12/2025

Dear PIK Alumni,

Welcome to the winter newsletter 2025. The past half year has seen some prominent examples of PIK's policy advice with some ups and downs. Most recently at COP 30 in Belém, PIK scientists were active at 27 Side Events and PIK co-hosted the Planetary Science Pavillion, chaired by Johan Rockström together with prominent Brazilian scientist Carlos Nobre. Yet the outcome of the COP was disappointing: you can read an assessment by PIK's directors here.

Scientific expertise from PIK flows into an event like the COP through manifold channels. The IPCC's Assessment Reports bring together thousands of scientists worldwide to reach consensus on current climate science, and in the upcoming 7th Assessment Cycle nine PIK researchers have been named as lead authors, contributing to all three Working Groups. The Planetary Health Check by PIK's Planetary Boundaries Science Lab (about which more below) assesses annually the nine critical Earth system boundaries – of which 7 have already been breached, including for the first time this year the boundary for ocean acidification. A new report by the EAT-Lancet Commission, with the participation PIK, shows that global food production is the main driver behind the exceeding of five planetary boundaries (defined as critical limits of the Earth system) and accounts for around 30 percent of global greenhouse gas emissions. At the same time, billions of people lack access to healthy food. Fair and sustainable food systems are crucial for improving health, reducing inequalities, and staying within planetary boundaries. In the run-up to the COP, Directors Johan Rockström and Ottmar Edenhofer together with Elmar Krielger and Gunnar Luderer from PIK published a statement assessing where global climate action stands and outlining science-based pathways to return global warming to safe limits. In September PIK Director Johan Rockstrom even addressed Heads of state at the United Nations General Assembly (pictured above), as part of a High-Level Event on Climate Action organized by UN Secretary-General António Guterres in the run-up to COP30. A transcript and video of his speech are available here.

On the good news side, PIK research continues to point to solutions. A paper lead-authored by Ottmar Edenhofer showed that sustainable climate policy and solid state finances are compatible. Measures to combat global warming justify additional government debt, since they prevent CO_2 emissions and, as a result, climate damage. The 'Green-gold rules for climate policy' aim to reconcile sustainable, future-proof policies with sound public finances and to prevent the misuse of funds. For Germany, provided that the targets set are strictly adhered to, a total of €161 billion in new debt for climate protection by 2030 appears to be justifiable and economically sensible (Edenhofer et al. Perspectives on Economic Policy, 2025).

In the summer PIK was invited to comment on the Climate Protection Act to the Federal Constitutional Court. You can read PIK's statement here

Publication Highlights

Here are a few more recent publication highlights:

60 Percent of the World's Land Area Is in a Precarious State
A new study led by researchers from PIK and BOKU University Vienna, published in *One Earth*, maps for the first time the transgression of the planetary boundary of "functional biosphere integrity." Using advanced biosphere modelling, it shows that 60% of global land areas are already outside the safe operating space, with 38% in a high-risk zone. Functional biosphere integrity refers to the plant world's ability to co-regulate Earth's carbon, water and nitrogen flows, supporting ecosystems and their many networked processes. "There is an enormous need for

civilisation to utilise the biosphere – for food, raw materials and, in future, also for climate protection," says Fabian Stenzel, lead author and PIK researcher in the Terrestrial Safe Operating Space group. The study uses two indicators to measure biosphere strain: human appropriation of biomass and risk of ecosystem destabilisation. "This first world map showing the overshoot of the boundary for functional integrity of the biosphere […] is a breakthrough from a scientific perspective," adds PIK Director and co-author Johan Rockström. The findings underline the urgent need for integrated climate and biosphere protection. Read more…

New Study Reveals Critical Intervention Points for European Adaptation to Cascading Climate Impacts

A new study in *Nature Climate Change*, led by PIK scientists Cornelia Auer and Christopher Reyer, maps how climate impacts originating outside the EU can cascade into the region via trade, finance, conflict, and mobility. Using stakeholder co-produced impact chains and network modelling, the study identifies key adaptation leverage points. By analysing data from 108 non-EU countries, the researchers highlight water, agriculture, livelihoods, and violent conflict as recurring critical nodes. These intervention points are essential for designing coherent and strategic EU adaptation policies that respond to interconnected, cross-border risks. Read more…

Unveiling Hidden Risks: Flood-Induced Transport Disruptions Threaten Germany's Healthcare Access

A study in *Communications Earth & Environment*, led by PIK doctoral researcher Jonas Wassmer, reveals how flood-related transportation disruptions pose serious risks to Germany's healthcare system. Even robust infrastructure can fail during extreme weather events, delaying emergency services and cutting off rural communities. The research, conducted within Potsdam University's *NatRiskChange* graduate school, highlights the growing need for cross-sector collaboration and infrastructure resilience to protect healthcare access amid intensifying climate impacts. Read more…

Four Major Earth System Components Are Losing Stability

A major study in *Nature Geoscience* shows that four key components of the Earth's climate system (the Greenland ice sheet, the Atlantic meridional overturning circulation (AMOC), the Amazon rainforest, and the South American monsoon) are all showing signs of destabilisation. "We now have convincing observational evidence that multiple Earth system components are destabilising," says lead author Niklas Boers of research department 'Complexity Science' and TU Munich. These tipping elements are interconnected and may be nearing critical thresholds, increasing the risk of abrupt and irreversible changes. The authors call for rapid emission reductions and improved global monitoring to detect early warning signals. Read more…

Introducing ….

the Planetary Boundaries Science Lab at PIK

At the end of 2023, PIK and its partners launched a major scientific effort to improve both our ability to monitor how the Earth system evolves under the pressure of human activity, as well as our ability to measure the state of the Earth system on a regular basis. This became the Planetary Boundaries Science Lab (PBScience) at PIK and the lab will soon be celebrating its second birthday in 2025.

The lab is co-led by Boris Sakschewski and Levke Caesar, whose mission is to bring together specialist scientists for the Planetary Boundaries and produce up to date assessments of the state of the health of the planet. The team, which now numbers over a dozen people, has the skills to link current Earth observation data and ground level datasets with cutting edge modelling, artificial intelligence assisted literature and data analysis. In doing so the lab will be able to provide the most up to date visualisation tools, backed by as recent data as possible, to bring us back onto sustainable pathways and offer the most comprehensive analysis of the health of our planet.

It is a daunting task but the lab has grown over the last two years and now includes an international team with the addition of a science communicator to make sure the public is aware of the work of the lab and the risks we face. Science communication is a key part of any research lab because as the saying goes "what is the point of the research, if no one knows about it". You can find a taste of the science communication we do at our new YouTube channel here: https://www.youtube.com/@PlanetaryBoundariesScience. It mixes scientist interviews, with experiments that anyone can try, and even an "astronaut" to make Planetary Boundaries Science more engaging and relevant to the general public. The lab also recently supported the research for a Swedish National TV programme on the Planetary Boundaries Science Lab and had its work featured at the COP30 Blue zone science pavilion in Brazil.

In the near future the lab aims to give scientists at PIK basic training in improving science communication and in addition to this, the lab will explain basic concepts and misinconceptions via its content to push back against the rise of mis- and disinformation online. In addition to this, in just the last six months the lab has run two expert workshops on the Oceans with Sylvia Earle, and an Earth Energy Imbalance workshop to bring together a consensus on key metrics and collate the newest research. Among the many attendees were NASA GISS's Gavin Schmidt, who was able to join online, and Piers Forster, Director of the Priestley Centre for Climate Futures, in person.

To make the global assessments as current and automated as possible the lab is already constructing a "Planetary Boundary Analyzer" which will automatically merge together global datasets with high temporal resolution. The next steps are to work with our global partners to produce near real time assessments of planetary boundary transgression, accessible to all on a local level to help communities find the right solution for them. This will culminate in the "Planetary Boundary Initiative", which will essentially be Earth's "health monitoring system". It's designed to track the planet's vital signs, warn us when we're crossing dangerous thresholds, and guide humanity back into a safe operating space. Watch this space for more in the near future!

For more information: The Planetary Boundaries Science Lab has a newsletter and brand-new updated website (you can subscribe from the website if you scroll to the bottom of the homepage): https://www.planetaryhealthcheck.org/

More news

PIK is coordinating a major new EU project: NEWPATHWAYS - New pathways for equitable climate action in line with the Paris Agreement and sustainable development

As humankind has still not managed to bend the global GHG emissions curve, it is clear that warming will likely overshoot 1.5°C in the next two decades, even if most ambitious action is taken now. Countries must rapidly and collectively strengthen climate action to limit temporary overshoot, stay well below 2°C and retain credible options to limit warming below 1.5°C by the end of the century.

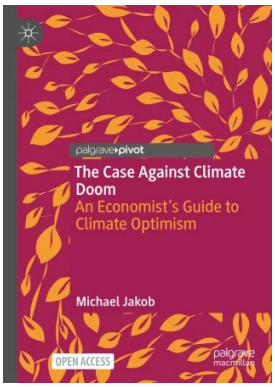
The NEWPATHWAYS project seeks to inform transparency and consistency of GHG emission reduction commitments, identify opportunities to leverage equity and finance to strengthen collective climate action, and establish new national and global transformation pathways that limit temporary overshoot, rely on deep sectoral transformations, combine climate and nature protection, and are aligned with sustainable development and just transition objectives.

The project brings together 24 international partners across Americas, Asia, Africa, and Europe with expertise in pathway modelling, social sciences, economics, and climate policy analysis. NEWPATHWAYS is funded by the European Union and coordinated by the Potsdam Institute for Climate Impact Research. It runs from January 2025 to June 2028.

For more information: Visit the website | Follow on LinkedIn | Subscribe to the newsletter.

Book recommendation

"The Case Against Climate Doom" is a recently published open-access book by PIK Alumnus Michael Jacob. By highlighting the social, political and technological progress already made, the book presents an optimistic outlook for a transition to a climate-neutral world and successful adaptation to climate change. With a focus on economics and policy, it covers a wide range of cases where climate action is heading in the right direction. As Michael points out in the preface, from an economic perspective, the prospects for successful climate policy seem brighter today than most people might assume.



Data set of atmospheric rivers

A group from department 'Complexity Science' have developed the PIKART Catalog, a regularly updated, pioneering high-resolution global dataset tracking atmospheric rivers from 1940 to 2023. This advanced tool improves detection accuracy, especially in challenging polar

and tropical regions, and for the first time uncovers hotspots of inland penetration. By differentiating atmospheric rivers from other weather systems and considering the additional moisture caused by global warming, PIKART enables scientists, meteorologists, and policymakers to enhance forecasting, water resource management, and climate adaptation efforts globally. Read more…

Congratulations to …

……. two PIK scientists newly appointed to professorships:

Falko Ueckerdt from RD3 'Transformation Pathways' will become Founding Professor for Energy Transition and Climate Futures at the the newly established Interdisciplinary Transformation University (IT:U) in Linz, Austria. Distinctive featues of this new university are its interdisciplinariy and its focus on computational approaches – which as Falko said, fit very well to himself and to PIK. He is looking forward to his new function as a 'founding professor' with the chance to shape structures at IT:U, and will continue to collaborate closely with PIK colleagues.

Jan Steckel, working group leader in department 'Climate Economics and Policy – MCC Berlin', has been appointed Professor of Political Economy of Climate Policy at the Technical University of Munich, in a joint appointment with PIK. Jan had up until now a professorship at BTU Cottbus-Senftenberg.

No less than 16 scientists from PIK were among in the top one percent of the "Highly Cited Researchers" in this year's prestigious ranking by Clarivate Analytics. They are (in alphabetical order) Benjamin Bodirsky, Felix Creutzig, Jonathan Donges, Katja Frieler, Dieter Gerten, Florian Humpenöder, Elmar Kriegler, Jürgen Kurths, Gunnar Luderer, Jan Minx, Christoph Müller, Robert Pietzcker, Alexander Popp, Stefan Rahmstorf, Director Johan Rockström, and Ricarda Winkelmann. Congratulations!

Upcoming events

If you are reading this before 15th December 2025 (and happen to be in Berlin):
Come along to the **PIK-MAS party at Badehaus**, Revaler Straße 99 in Berlin-Friedrichshein. Starting at 7:00 pm there will be live bands, DJs, bar, and a lot of PIK colleagues all in party mood. Alumni are invited to join. Code word at the door: **Telegrafenberg**. You are welcome to chip in a contribution to costs at the door.

REMIND-MAgPIE workshop
A REMIND-MAgPIE workshop is being planned for 15th – 19th June 2026. It will be a hybrid event (PIK and online) and may be fee-based. If interested, get in touch with Lavinia Baumstark or Jan Philipp Dietrich.

EGU Sessions 2026
Several members of PIK (and some former ones) are (co-) convening sessions at the EGU General Assembly in May 2026. In most cases, abstracts for the sessions can still be submitted until 15th January 2026. For details please follow the respective links:

Cross-disciplinary session on Earth resilience in the Anthropocene: From tipping points to human-Earth system interactions (CL0.12) (Conveners: Jonathan Donges, Nico Wunderling, Lan Wang-Erlandsson, David Armstrong McKay, Ricarda Winkelmann)
https://www.egu26.eu/session/57723

Temperature overshoot: impacts, (ir)reversibility and negative emission pathways (Conveners: Carl-Friedrich Schleussner, Torben Koenigk, Leon Merfort, Biquing Zhu)
https://www.egu26.eu/session/57126

Attributing climate change, extreme events, and their impacts: quantifying contributions from external forcing, internal climate variability, and/or other drivers (Conveners: Paula Romanovska from RD2, among others)
https://www.egu26.eu/session/56365

Space-time dynamics of flood risk: processes, controls and attribution (HS2.4.6) (Convener: Dominik Paprotny with co-conveners)
https://www.egu26.eu/session/55915

Manchmal braucht es nur kleine Eiskristalle auf einem gefrorenen Teich, um uns daran zu erinnern, wie schön und zugleich fragil unsere Welt ist. Aufgenommen in Potsdam, lenkt das Foto den Blick auf ein kleines Detail. Am Potsdam-Institut für Klimafolgenforschung erforschen wir die großen Klimafragen – und staunen zugleich über die kleinen Wunder vor unseren Füßen.

Sometimes it only takes a few ice crystals on a frozen pond to remind us how beautiful and fragile our world is. Taken in Potsdam, the photo draws attention to a small detail. At the Potsdam Institute for Climate Impact Research, we study the big climate questions – and still marvel at the small wonders right at our feet.

PIK's Alumni programme

Please keep us up to date: Send an update to alumni@pik-potsdam.de if you have changed your job or want to update your details in our Alumni database. We'd also welcome news about ***your recent publications, personal achievements, or research activities***.
Best wishes to all! **Alison Schlums**, Alumni Officer.

KEEPING IN TOUCH
Keep up to date on PIK's social media channels:
https://www.pik-potsdam.de/en/institute/about/communications-office/piks-social-media-channels

IMPRESSUM
Potsdam Institute for Climate Impact Research (PIK) e. V.
Telegraphenberg A 31 14473 Potsdam Germany
https://www.pik-potsdam.de/en/impressum

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KEEP US UPDATED
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