

Selected research highlights

Machine-Learning improves extended weather forecasting for critical climate planning decisions



Important planning decisions pertaining to energy, water, and agriculture pivot on the reliability of extended weather forecasts. Current physical models occasionally fall short in their reliability, overlooking significant climate interactions. In recent research, a team of scientists from the WCR group (see [Straaten et al., 2023a; 2023b](#)) developed a Machine-Learning algorithm capable of identifying and restoring missed predictive signals, unveiling the West-Pacific's sporadic influence on European summer weather – an erstwhile dismissed correlation. This innovative hybrid combination of Machine Learning and physical models not only improves forecast accuracy but also allows for in-depth data investigation. The scientific team is currently engaged in advancing this research on the Pacific-to-Europe connection.

New evidence on the socio-economic implications of climate change on Bonaire calls for safeguarding vulnerable communities

A group of scientists and students from the Institute for Environmental Studies (IVM) have shed light on the key socioeconomic implications of climate change on Bonaire, a Dutch Caribbean island. The results from this interdisciplinary result are clear: Bonaire's public health, cultural heritage, built environment, and economy are all critically vulnerable to the effects of climate change, including coral reef degradation, sea level rise, and rising temperatures. Even if global warming is limited to 1.5 degrees Celsius, as agreed in the Paris Climate Agreement, the consequences will still be significant, though considerably smaller than at 2.7 or 4.4 degrees Celsius. It is therefore urgent that adaptation measures be taken. The study has had significant policy impact due to a successful communication strategy, including widespread coverage in national and international media, the adoption of three motions in the Dutch parliament calling for immediate policy responses, and the nomination of former environmental minister Ed Nijpels as a special advisor to co-design a climate action plan for Bonaire. As the world continues to grapple with the consequences of climate change, this study by IVM serves as a reminder of the importance of taking proactive measures to safeguard vulnerable communities and ecosystems.



> [Read more](#)

Conflicting interests between local governments and the European target of no net land take



The European Commission aims to stop the loss of agricultural and natural land due to urban expansion by 2050. At the same time, we see urban expansion across Europe, which indicates that we are not on track to reach this aim soon. In this study, we analyse changes in urban growth boundaries in all 319 cities in Romania. Urban growth boundaries indicate the area within which it is allowed to build new buildings.

We found that the vast majority of the cities increased their urban growth boundaries

FEATURED RECENT PUBLICATIONS

Dissertations:

Dirk Eilander (22 November 2022): [Towards global scale compound flood risk modeling](#)

Kees van Ginkel (8 December 2022): [Exploring climate change induced socio-economic tipping points to support decision making](#)

Cecilia Zagaria (12 December 2022): [Mapping and modelling adaptation in Mediterranean agricultural landscapes](#)

Mengmeng Li (15 March 2023): [Advancing large-scale analysis of human settlements and their dynamics](#)

Perrine Laroche (27 March 2023): [Impacts of Western lifestyles in a telecoupled world: Mapping and specifying current and future demand for ecosystem services](#)

Anaïs Couason (30 March 2023): [The role of \(in\)dependence in flood risk assessments](#)

Andreas Coester (5 April 2023): [Economics of sustainable electricity supply: The German electricity market](#)

Sem Vijverberg (26 May 2023): [Hidden amongst Chaos: Dynamics and predictability of weather on subseasonal-to-seasonal timescales](#)

Hanna Dijkstra (8 September 2023): [Ripples to waves: How business models and entrepreneurs are propelling the transition towards a sustainable plastic system](#)

Catherine Fayet (9 October 2023): [From challenges to opportunities in abandoned farmlands: Assessing benefits and trade-offs of alternative farmland abandonment trajectories](#)

Books and reports:

Koetse, M.J. & Bouma, J.A. (2023). Farmer heterogeneity and the greening of agriculture: the role of behavioural & financial-economic factors in explaining farming practices. In Bucciol, A., Tavoni, A. & Veronesi, M. (eds), Behavioural economics and the environment: a research companion (pp. 31-49). UK: Routledge.,

Selected journal articles:

Buyle, M., Audenaert, A., **Brusselaers, J.** & Passel, S.V. (2023). Rebound effects following technological advancement? The case of a global shock in ferrochrome supply. *Journal of Cleaner Production*, 391, 136264. <https://doi.org/10.1016/j.jclepro.2023.136264>

Chintalapati, P., Nyaga, C., Walters, J., **Koehler, J.**, Javernick-Will, A., Hope, R. & Linden, K. (2022). Improving the Reliability of Water Service Delivery in Rural Kenya through Professionalized Maintenance: A System Dynamics Perspective. *Environmental Science and Technology*, 56(23),

between 2006 and 2019, thus allowing for further expansion. Yet, we could not explain these changes based on recent urban growth, shortage of land, or population dynamics. Instead, a survey among the people involved in spatial planning in these municipalities suggest that urban growth boundaries do not necessarily change because there is a need to do so. Instead, they hoped to attract more private investments, increase land prices and more generally the local budget. This result indicates that there is a conflicting interest between European policy makers that aim to preserve agricultural and natural areas, and local policy makers that are more concerned with the financial situation in their own city. As urban planning is the domain of local administrations in most countries, this finding will make it increasingly difficult to reach European policy targets..

> [Link to paper](#)

New dataset unlocks synergies by mapping Multi-Stakeholder Partnerships to Sustainable Development Goals

The 2030 Agenda for Sustainable Development endorses multi-stakeholder partnerships (MSPs) to implement the Sustainable Development Goals (SDGs). MSPs are cooperation mechanisms that bring together actors from the public, private and civil society sectors. Perhaps more importantly, MSPs display potential to create synergies between issue areas, which could break down silos in governance, and bring about transformative change. In response to the need for a better understanding of which MSPs that connect SDGs and how they govern synergies, colleagues at EPA have built a dataset capturing characteristics of MSPs that address two or more SDGs. The work is carried out under the 'Transformative Partnerships 2030' research project, a collaboration between researchers at IVM, Stockholm University and Lund University. The dataset, summarised in [a technical report](#), shows that MSPs who connect multiple SDGs tend to engage in functions such as knowledge sharing rather than financing, and that environmental issue areas such as climate change (SDG13) and biodiversity (SDG15) are more connected relative to issue of sustainable consumption and consumption patterns (SDG12).



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<https://doi.org/10.1021/acs.est.2c00939>

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Duijndam, S., Botzen, W., Hagedoorn, L., Bubeck, P., Haer, T., Pham, M. & Aerts, J. (2023). Drivers of migration intentions in coastal Vietnam in response to increased flood risk from sea-level rise. *Climatic Change*, 176(2), 12. <https://doi.org/10.1007/s10584-022-03479-9>

Filyushkina, A., Komossa, F., Metzger, M.J. & Verburg, P.H. (2022). Multifunctionality of a peri-urban landscape: exploring the diversity of residents' perceptions and preferences. *Ecosystems and People*, 18(1), 583–597. <https://doi.org/10.1080/26395916.2022.2131911>

Galli, N., Dell'Angelo, J., Epifani, I., Chiarelli, D.D. & Rulli, M. C. (2022). Socio-hydrological features of armed conflicts in the Lake Chad Basin. *Nature Sustainability*, 5(10), 843–852. <https://doi.org/10.1038/s41893-022-00936-2>

Grammatikopoulou, I., Badura, T., Johnston, R.J., Barton, D.N., Ferrini, S., Schaafsma, M. & La Notte, A. (2023). Value transfer in ecosystem accounting applications. *Journal of Environmental Management*, 326, Part B, 116784. <https://doi.org/10.1016/j.jenvman.2022.116784>

Koks, E., Le Bars, D., Essenfelder, A., Nirandjan, S. & Sayers, P. (2023). The impacts of coastal flooding and sea level rise on critical infrastructure: a novel storyline approach. *Sustainable and Resilient Infrastructure*, 8(sup1), 237–261. <https://doi.org/10.1080/23789689.2022.2142741>

Laroche, P.C.S.J., Schulp, C.J.E., Kastner, T. & Verburg, P.H. (2023). The role of holiday styles in shaping the carbon footprint of leisure travel within the European Union. *Tourism Management*, 94, 104630. <https://doi.org/10.1016/j.tourman.2022.104630>

Morseletto, P. (2023). Sometimes linear, sometimes circular: States of the economy and transitions to the future. *Journal of Cleaner Production*, 390, 136138. <https://doi.org/10.1016/j.jclepro.2023.136138>

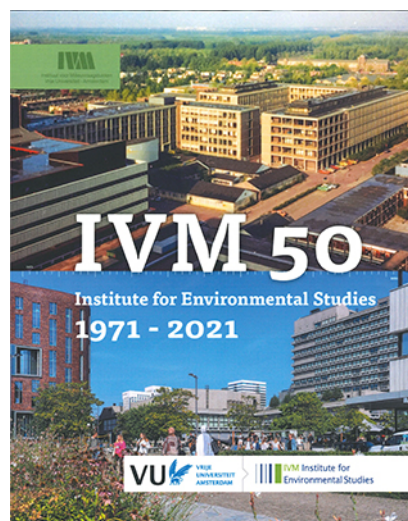
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West, T.A.P., Rausch, L., Munger, J. & Gibbs, H.K. (2022). Protected areas still used to produce Brazil's cattle. *Conservation Letters*, 15(6), e12916. <https://doi.org/10.1111/conl.12916>

IVM's 50th anniversary



In 2021 IVM turned 50 years old. This landmark was celebrated on 14 April this year. During the afternoon IVM held an anniversary conference consisting of presentations and discussion by former landmark IVM'ers who looked back at the foundation of the institute and current key researchers who examined the state of the institute and field in the present and into the future. The conference focus not only centred around the institute's academics and its research in both the past, present, and future, but also on the individuals who made IVM what it is today. For this occasion a book was published. This anniversary book gives a brief glimpse into what the efforts of half a century of productive work can and has produced.

There are some spare copies of the book available. If you are interested obtaining a copy, you can click [here](#) and send the resulting mail as it is with your postal address. It will be on a first-come-first-served basis.

Prizes, awards and grants

Environmental scientist Toon Haer has been awarded a Vidi grant by the Netherlands Organization for Scientific Research (NWO) for his research 'Towards a fair distribution of coastal climate risk'.

> [Read more.](#)



Climate scientist Marleen de Ruyter is using the Veni funding granted to her to investigate the likelihood of an outbreak following a series of natural hazards anywhere in the world as well as to map vulnerable regions.



> [Read more](#)

IVM in the spotlight

Thijs Endendijk appeared on the [Dutch Radio 1](#) to talk about the impacts of a default nudge in waste management in Amsterdam. He also appeared in several Dutch newspapers on the same topic, such as: [Het Parool](#), [Nederlands Dagblad](#) and [AD](#)

Yes, as the Dutch royal family visited the Dutch Caribbean islands last January, our research (**Lotte van Oosterhout** and others) on the socioeconomic impacts of climate change on Bonaire garnered renewed media attention. Here are a few examples in [de Correspondent](#)., [NRC](#), [AD](#).

Thales West's article in Science about carbon offsets received a lot of exposure.

- *Showcase project by the world's biggest carbon trader actually resulted in more carbon emissions.* Follow the Money. Netherlands, 27 Jan. 2023.
- *Revealed: more than 90% of rainforest carbon offsets by biggest provider are worthless, analysis shows.* The Guardian. UK, 18 Jan. 2023.
- *The Carbon Con.* SourceMaterial. 18 Jan. 2023.
- *CO₂-Zertifikate: Grün getarnt. Zeit.* Germany, 18 Jan. 2023.
- *Afkopen van CO₂-uitstoot is gouden handel en een grote mislukking.* Follow the Money. 4 Nov. 2022.

ED&I

On 14 September IVM hosted a successful ED&I event named 'Diversity and Inclusion as Means to Belong in Academia'. During this event the ED&I working group that was established by the IVM management team and supported by staff about a year ago shared various tips and tricks under the topics of: (1) Gender and LGBTQIA+, (2) Minoritized groups/topics, and (3) Race and ethnicity. Within each theme they developed practical outcomes on how to be more diverse and inclusive in terms of teaching, research and workplace/management. The sharing of these outcomes with various representatives of the Faculty of Science, the VU more broadly, and external stakeholders resulting in an inspiring afternoon, and a fruitful exchange of ideas.

Upcoming events

Monday 9 October 2023, 11:45h, Auditorium VU Amsterdam: PhD defence Catherine Fayet. Thesis title: *From challenges to opportunities in abandoned farmlands. Assessing benefits and trade-offs of alternative farmland abandonment trajectories*

Friday 27 October 2023, 13:45h, Aula VU Amsterdam: PhD defence Predrag Ignjačević. Thesis title: *Local-scale climate change impacts using an integrated assessment model*

Wednesday 8 November 2023, 09:45h, Aula VU Amsterdam: PhD defence Tadzio Holtrop. Thesis title: *An Ocean of Colors*

Monday 20 November 2023, 09.45h, Auditorium VU Amsterdam: PhD defence Chiem van Straaten. Thesis title: *Machine Learning to improve and understand sub-seasonal forecasts of European temperature*

Friday 8 December 2023, 13:45h, Aula VU Amsterdam: PhD defence Katharina Schulze. Thesis title: *Mapping 'Life on Land': Methodological improvements for assessing land use implications from achieving SDG 15*

Wednesday 24 January 2024, 15.45h, Auditorium VU Amsterdam: PhD defence Job Dullaart. Thesis title: *Facing the storm: Assessing global storm tide hazards in a changing climate*

IVM (Institute for Environmental Studies), Vrije Universiteit Amsterdam produces two newsletters per year to promote and communicate its research activities. They present a series of articles of our researchers on their newest findings in the fields of Environmental Geography, Economics, Policy and Governance, and Water and Climate Risk. You are receiving this newsletter because you have been in contact with us recently or in the past. Should you not wish to receive our information in the future please unsubscribe by [clicking here](#) (send the resulting e-mail as it is). If you receive our newsletter indirectly you can subscribe by [clicking here](#) (send the resulting e-mail as it is). For more information please visit our website www.vu.nl/ivm or contact us through info.ivm@vu.nl

Zagaria, C., **Schulp**, C.J.E., Malek, Ž. & **Verburg**, P.H. (2023). Potential for land and water management adaptations in Mediterranean croplands under climate change. *Agricultural Systems*, 205, 103586. <https://doi.org/10.1016/j.agsy.2022.103586>

STAFF AND ORGANISATIONAL NEWS

Appointments

Pieter van Beukering will be the new vice-dean and education portfolio holder of the Faculty of Science. In conversation with the Bèta-zine, he talks about his view of the faculty and the remarkable start of his academic career: "I had conscientious objections to military service, so I had to find a place where I could contribute to social benefit in a non-profit organisation. Pieter van Beukering took his first steps in academia as an intern at the Institute for Environmental Issues (IVM). He would eventually rise to director there before handing over this role to Wouter Botzen late last year. [Read more](#).

Wouter Botzen has been appointed by the Faculty Board as the new director of IVM and started in January in this position. Wouter came to IVM as a PhD student, and he feels honoured to now serve as director of IVM. His aim is to further strengthen IVM's position as one of the world's leading institutes in sustainability science.

Marije Schaafsma became the new Head of dept of Environmental Economics as of January this year.

Marleen de Ruyter has become the Associate editor of Earth's Future as of Feb 2023 for 4 years

Hello and goodbye

Over the past months, IVM has welcomed several new staff members:

- In the section Water and Climate Risk (WCR) Wiebke Jäger and Melinda Galfi started as Assistant Professors. Joshua Kiesel started as a Postdoc. Tarun Sadana and Emma Schultz as Junior Researchers. Ayoola Apolola, Maria Colmenares Escallon, Maurice Kalthof, Benedetta Sestito, and Surender Raj Vanniya Perumal are new PhD Candidates
- In the section Environmental Policy Analysis (EPA) Mathieu Blondeel took up a position of Assistant Professor.
- The section Environmental Economics welcomed Veronica Lupi and Miguel Poblete Cazenave as Assistant Professors; Kiri van den Wall Bake as a Junior Researcher and Michiel Ingels and Veerle Siegerink as PhD Candidates.
- In the section Environmental Geography Esther Boere, Federico Riva and Mario Torralba Viorreta arrived as Assistant Professors. Diana Ramírez Mejía and Juan Antonio Hernández-Agüero started as postdocs. Niek Scherpenhuijzen and Ilse Nijenstein are the new PhD Candidates.

We said goodbye to Marlies Barendrecht, Julia Grosinger, Gabriela Guimarães Nobre, Roos Haasnoot, Johanna Koehler, Christian Levers, Žiga Malek, Stan van Manen, Iris Manola, Antonia Matthes, Saskia Oostdijk, Roos van Rosmalen, Marjolijn van Schendel, Marta Talevi, Ciska Ulug and Cecilia Zagaria.