

Selected research highlights

River floods add to plastic pollution



Riverine plastic pollution is of global concern due to its negative impact on ecosystem health and human livelihood. Flood events aggravate the problem of plastic pollution in rivers significantly. A team of researchers, including IVM's Dirk Eilander, combined data on mismanaged plastic waste and river flood extents with increasing return periods to estimate flood-driven plastic mobilisation, from local to global

scale. They show that floods occurring once in 10 years already tenfold the global plastic mobilisation potential compared to non-flood conditions. In the worst affected regions, plastic mobilisation increases up to five orders of magnitude. Flood defences reduce plastic mobilisation substantially, but regions vulnerable to flooding often coincide with high plastic mobilisation potential during floods. The results of the study are published in a [paper in Environmental Research Letters](#).

Energy implications of the 21st century agrarian transition

The ongoing agrarian transition from small-holder farming to large-scale commercial agriculture is reshaping systems of production and human well-being in many regions. A fundamental part of this global transition is manifested in large-scale land acquisitions (LSLAs) by agribusinesses. Its energy implications, however, remain poorly understood. In a recent [paper in Nature Communications](#) IVM's



Jampel Dell'Angelo and co-authors assess the multi-dimensional changes in fossil-fuel-based energy demand resulting from this agrarian transition. They focus on LSLAs by comparing two scenarios of low-input and high-input agricultural practices, exemplifying systems of production in place before and after the agrarian transition. A shift to high-input crop production requires industrial fertilizer application, mechanisation of farming practices and irrigation, which increases by 5 times fossil-fuel-based energy consumption compared to low-input agriculture. Given the high energy and carbon footprints of LSLAs and concerns over local energy access, the analysis highlights the need for an approach that prioritises local resource access and incorporates energy-intensity analyses in land use governance.

Concern about climate change is strongly related to economic factors

Economic indicators are strongly related to concern about climate change in Europe: people in countries with higher GDP and lower unemployment levels tend to be more concerned. The strength of right-wing populist parties has a much weaker link with climate change concern. Sem Duijndam and Pieter van Beukering have statistically analysed these linkages, using a database of over 155,000 survey respondents from 28 European countries over the period 2008–2017. They have looked both at differences between countries (cross-sectional) and over time (longitudinal). Their results are published in a [paper in Climate Policy](#).

FEATURED RECENT PUBLICATIONS

Dissertations:

Niels Debonne (5 February 2021): [New actors and scales of agriculture: A land system science perspective](#).

Lukas Hermwille (15 March 2021): [Guiding the Transformation: The Role of Global Climate Governance as a Facilitator of the Transition of Unsustainable Socio-technical Systems](#)

Selected journal articles:

Bloemendaal, N., de Moel, H., Mol, J.M., Bosma, P.R.M., Polen, A.N. & Collins, J.M. (2021). Adequately reflecting the severity of tropical cyclones using the new Tropical Cyclone Severity Scale. *Environmental Research Letters*, 16, 1–12. [014048]. <https://doi.org/10.1088/1748-9326/abd131>

de Boer, J. & Aiking, H. (2021). Favoring plant instead of animal protein sources: Legitimation by authority, morality, rationality and story logic. *Food Quality and Preference*, 88, [104098]. <https://doi.org/10.1016/j.foodqual.2020.104098>

Debonne, N., van Vliet, J., Metternicht, G. & Verburg, P. (2021). Agency shifts in agricultural land governance and their implications for land degradation neutrality. *Global Environmental Change*, 66, 1–13. [102221]. <https://doi.org/10.1016/j.gloenvcha.2020.102221>

Dell'Angelo, J., Navas, G., Wittenman, M., D'Alisa, G., Scheidel, A. & Temper, L. (2021). Commons grabbing and agribusiness: Violence, resistance and social mobilization. *Ecological Economics*, 184, 1–13. [107004]. <https://doi.org/10.1016/j.ecolecon.2021.107004>

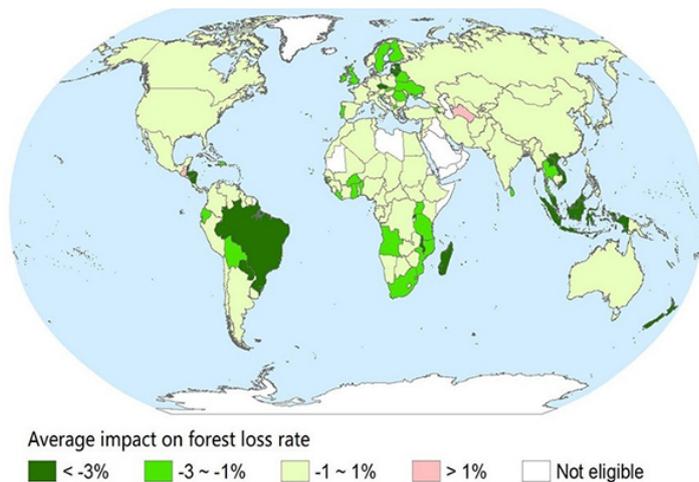
de Ruyter, M., de Bruijn, J., Englhardt, J., Daniell, J. E., de Moel, H. & Ward, P. (2021). The Asynergies of Structural Disaster Risk Reduction Measures: Comparing Floods and Earthquakes. *Earth's Future*, 9(1), 1–21. [e2020EF001531]. <https://doi.org/10.1029/2020EF001531>

Hickmann, T., Widerberg, O. E., Lederer, M. & Pattberg, P. H. (2021). The United Nations Framework Convention on Climate Change Secretariat as an orchestrator in global climate policymaking. *International Review of Administrative Sciences*, 87(1), 1–18. <https://doi.org/10.1177/0020852319840425>

Holtrop, T., Huisman, J., Stomp, M., Biersteker, L., Aerts, J., Grébert, T., Partensky, F., Garczarek, L. & van der Woerd, H.J. (2021). Vibrational modes of water predict spectral niches for photosynthesis in lakes and oceans. *Nature Ecology and Evolution*, 5(1), 55–66. <https://doi.org/10.1038/s41559-020-01330-x>

Protected areas contribute to the reduction of global forest loss

Globally, the number and extent of terrestrial protected areas (PAs) are expanding rapidly. Nonetheless, their impacts on preventing forest loss and the factors influencing the impacts are not well understood. IVM's Yue Dou and co-researchers quantified the impacts of 54,792 PAs worldwide on preventing forest loss from 2000 to 2015, and assessed important landscape and management factors affecting the impacts of PAs. Although the majority (71.4%) of the PAs contributed to preventing forest loss, only 30.5% of forest loss in the PAs have been prevented. PAs with higher rates of forest loss in their surrounding regions, located at lower elevations, within a few hours of travel from the nearest city, with higher agricultural productivity, and permission for fewer human uses were better able to prevent forest loss. Impacts on preventing forest loss were similar regardless of whether the PAs were privately or publicly owned. The findings, published in the journal [Science of the Total Environment](#), highlight the potential benefits of strict protections, involving private entities in the establishment of PAs, and situating PAs in areas exposed to high risks of forest loss to enhance the capacity to combat global forest loss.



Education news

Online graduation ceremony for ERM students

On 8 April some 60 ERM master students from the 2019-2020 course received their diploma in an online session that was also attended by teachers, family and friends. Due to covid-19 restrictions it was not possible to organise a meeting on the campus, but most graduates attending appreciated the virtual setup, which made it also possible for students living abroad and their relatives to participate.

Staff and organisational news

In memoriam

We are saddened by the passing away of three of IVM's former staff members in March and April 2021: [Leon Braat](#), [Jan Willem Wegener](#) and [Xander Olsthoorn](#). Each of them has contributed significantly to IVM's scientific work, its organisation and its culture.

IVM turns 50

IVM was established in 1971. At the occasion of our 50th anniversary, a short film has been made that can be viewed on our [renewed website](#). An online publication with highlights from IVM's history will follow later this year.

Appointments

Jeroen Aerts was appointed as a new member of the [Royal Holland Society of Sciences and Humanities \(KHMW\)](#). The KHMW is the oldest 'learned society' in the Netherlands (established in 1752) and aims at establishing bridges between science and society.

Jampel Dell'Angelo was appointed editor-in-chief of the journal [World Development](#).

Kate Negacz was elected as vice-chair of the International Network of Salt-Affected Soils (INSAS).

Koehler, J., Thomson, P., Goodall, S., Katuva, J. & Hope, R. (2021). Institutional pluralism and water user behavior in rural Africa. *World Development*, 140, [105231]. <https://doi.org/10.1016/j.worlddev.2020.105231>

Moerkerken, A., Duijndam, S., Blasch, J., van Beukering, P. & Smit, A. (2021). Determinants of energy efficiency in the Dutch dairy sector: dilemmas for sustainability. *Journal of Cleaner Production*, 293, 1–10. [126095]. <https://doi.org/10.1016/j.jclepro.2021.126095>

Petrovics, D. & Giezen, M. (2021). Planning for sustainable urban food systems: An analysis of the up-scaling potential of vertical farming. *Journal of Environmental Planning and Management*. <https://doi.org/10.1080/09640568.2021.1903404>

Robinson, P.J., Botzen, W.J.W., Kunreuther, H. & Chaudhry, S.J. (2021). Default options and insurance demand. *Journal of Economic Behavior and Organization*, 183, 39–56. <https://doi.org/10.1016/j.jebo.2020.12.017>

Tierolf, L., de Moel, H. & van Vliet, J. (2021). Modeling urban development and its exposure to river flood risk in Southeast Asia. *Computers, Environment and Urban Systems*, 87, 1–11. [101620]. <https://doi.org/10.1016/j.compenvurbsys.2021.101620>

Tremlett, C., Peh, K.S.-H., Zamora-Gutierrez, V. & Schaafsma, M. (2021). Value and benefit distribution of pollination services provided by bats in the production of cactus fruits in central Mexico. *Ecosystem Services*, 47, [101197]. <https://doi.org/10.1016/j.ecoser.2020.101197>

Wang, Y., van Vliet, J., Debonne, N., Pu, L. & Verburg, P.H. (2021). Settlement changes after peak population: Land system projections for China until 2050. *Landscape and Urban Planning*, 209, 1–12. [104045]. <https://doi.org/10.1016/j.landurbplan.2021.104045>

Zagaria, C., Schulp, C.J.E., Zavalloni, M., Viaggi, D. & Verburg, P.H. (2021). Modelling transformational adaptation to climate change among crop farming systems in Romagna, Italy. *Agricultural Systems*, 188, 1–15. [103024]. <https://doi.org/10.1016/j.agsy.2020.103024>

Other publication highlights:

Marleen de Ruiter contributed to a new book: ['Geosciences and the Sustainable Development Goals'](#). Marleen is co-author of the chapter on 'Peace, Justice, and Strong Institutions'.

STAFF AND ORGANISATIONAL NEWS

Hello and goodbye

[Matilda Petersson](#) joined the EPA staff as a postdoc to work on the [BioStar project](#).

[Neele van den Bongardt](#) is the new coordinator of the [Amsterdam Sustainability Institute \(ASI\)](#). She will be a member of IVM's Environmental Policy Analysis (EPA) section.

[Lena Reimann](#) started as a postdoc at the Water & Climate Risk (WCR) section. She will primarily be working on the [COASTMOVE project](#).

[Suzanne van Osch](#) is a new member of the Environmental Economics (EE) section. Her research will focus on food sustainability, especially within the framework of the [CITIES2030 project](#)

Prizes, awards and grants

Perrine Laroche has won the [2020 Alpro Foundation Award](#) for best publication with her research on the global impact of dietary shifts in the Western world.

Jeroen Aerts has been granted a € 60,000 Research Award from the Alexander von Humboldt Stiftung. He will use the money to work with Prof. Bruno Merz from GFZ Potsdam on approaches that include human behaviour and adaptation measures in flood risk assessments.



> [Read more](#)

IVM in the spotlight

IVM well represented on 'hotlist' of influential climate scientists

No less than five IVM staff members are on the global list of 1,000 most influential climate scientists as compiled by Reuters: Richard Tol, Wouter Botzen, Jeroen Aerts, Peter Verburg and Philip Ward. See <https://www.reuters.com/investigates/special-report/climate-change-scientists-list/>.

Upcoming events

Wednesday 8 September 2021, 15.45h, online: [PhD defence Giorgia Di Capua](#).

Thesis title: *The Indian Monsoon and its interaction with the mid-latitude circulation*

Friday 10 September 2021, 13.45h, Aula VU Amsterdam: [PhD defence Jantsje Mol](#).

Thesis title: *Improving flood preparedness using insights from economic experiments*

Thursday 4 November 2021, 13.45h, Aula VU Amsterdam: [PhD defence Lars de](#)

[Ruig](#). Thesis title: *Improving flood preparedness using insights from economic experiments*

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.ivm.vu.nl or contact us through info.ivm@vu.nl

[Jan Brusselaers](#) started as an Assistant Professor also within EE.

Sofia Frantzi returned to IVM as a postdoc for EE.

[Pierre Chopin](#) started as an Assistant Professor for the Environmental Geography (EG) Group.

Sippora Zoutewelle left IVM to work for Rabobank.

Verena Seufert received a grant from the Robert Bosch Foundation and moved from IVM to the University of Hohenheim in Germany.

APPS, TOOLS, MODELS AND DATA

Within the framework of a study for the European Commission's DG CLIMA IVM and others have prepared a [comprehensive desk review of climate adaptation models and tools](#).

On the IVM website, three departments now have a dedicated page presenting models and data related to our research: [EE](#), [EG](#) and [WCR](#)