

## Selected research highlights

### The role of illicit transactions in land-change dynamics



Illegal activities and corruption have a major impact on land use changes and the related sustainability debate. Due to the hidden nature and the dangers of explicitly investigating this, too little attention is paid to this.

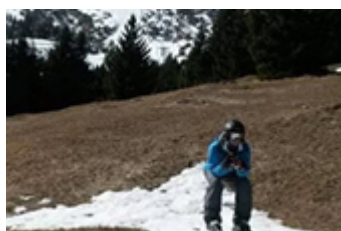
IVM's Peter Verburg, together with colleagues from Arizona State University and the University of

Alabama, sketches on the basis of a new conceptual model how data on this phenomenon can be collected and included in international models for quantifying the consequences for climate change and biodiversity. The research was published on 13 January in [Nature Sustainability](#).

The researchers indicate in the publication how important it is to map the role of illegal and corrupt practices on land use change by combining data from satellite images and land use activities in innovative ways. Illegal activities range from deforestation for narco drugs in Costa Rica to the illegal mining of sand by Mafia groups in India and illegal transactions between property developers and politicians in the US. Everywhere in the world there are examples of illegal activities that have a major impact on land use. Scientists estimate that 40% of global deforestation is illegal and that in some countries, such as Indonesia and Brazil, this can go up to 80%. Failure to include these activities can have major consequences for quantifying the impact of land use on climate and biodiversity and shaping effective policies. The research is a call to the scientific community to take this topic seriously by using the new model.

### 'Tipping points' in society and economy due to climate change

European scientists, including Kees van Ginkel (IVM/Deltares) and Wouter Botzen (IVM), recently completed a study of sudden changes in Europe's economy and social fabric caused by climate change. They looked at 'tipping points'. At the local level, socio-economic tipping points can be very painful but a new economic balance emerges on a broader scale. The results of the study were published in [Environmental Research Letters](#).



Sometimes the climate can change suddenly. This is called a 'tipping-point'. Until now, there has been no research looking at whether climate change could also cause major, sudden changes in the socio-economic system. These 'tipping points' are also seen in, for example, ecosystems: a gradual increase in water temperature or nutrients can result in a sudden explosion in algae growth. The article in *Environmental Research Letters* looks at three socio-economic tipping points: in winter tourism, agriculture and 'strategic retreat' in response to sea level rise.

### Featured recent publications

#### Dissertations:

Gabriela Guimarães Nobre (15 November 2019): [Floods, droughts and climate variability: From early warning to early action.](#)

Franziska Komossa (18 June 2020): [Outdoor Recreationists and Where To Find Them: Quantifying Outdoor Recreation Preferences In European Landscapes.](#)

Peter Robinson (26 June 2020): [Behavioural Economic Studies of Flood Insurance Demand.](#)

Konstantinos Bischiniotis (6 July 2020): [Before the Flood: Using Forecasting to Improve Risk Management.](#)

#### Selected journal articles:

Bloemendaal, N., Haigh, I.D., de Moel, H., Muis, S., Haarsma, R.J. & Aerts, J.C.J.H. (2020). [Generation of a global synthetic tropical cyclone hazard dataset using STORM.](#) *Scientific Data*, 7, 40.

Bockarjova, M., Botzen, W.J.W. & Koetse, M.J. (2020). [Economic valuation of green and blue nature in cities: A meta-analysis.](#) *Ecological Economics*, 169, 106480.

Brander, L.M., van Beukering, P., et al. (2020). [The global costs and benefits of expanding Marine Protected Areas.](#) *Marine Policy*, 116, 103953.

Davis, K.F., [...], Dell'Angelo, J., et al. (2020). [Tropical forest loss enhanced by large-scale land acquisitions.](#) *Nature Geoscience*, 13, 482–488.

de Boer, J., Schösler, H. & Aiking, H. (2020). [Fish as an alternative protein – A consumer-oriented perspective on its role in a transition towards more healthy and sustainable diets.](#) *Appetite*, 152, 104721.

de Ruijter, M.C., Couasnon, A., van den Homberg, M.J.C., Daniell, J.E., Gill, J.C. & Ward, P.J. (2020). [Why we can no longer ignore consecutive disasters.](#) *Earth's Future*, 8(3), e2019EF001425.

Dijkstra, H., van Beukering, P. & Brouwer, R. (2020). [Business models and sustainable plastic management: A systematic review of the literature.](#) *Journal of Cleaner Production*, 258, 120967.

## Economic motivation for raising coastal flood defences in Europe



Extreme sea levels in Europe could rise by as much as one metre or more by the end of this century due to climate change. This poses significant challenges to safeguard coastal communities. In a recent [article in Nature Communications](#) IVM's Philip Ward and co-authors present a comprehensive analysis of economically efficient protection scenarios along Europe's coastlines during the present century.

They find that at least 83% of flood damages in Europe could be avoided by elevating dykes in an economically efficient way along 23.7%-32.1% of Europe's coastline, specifically where high value conurbations exist. The European mean benefit to cost ratio of the investments varies from 8.3 to 14.9 while at country level this ranges between 1.6 and 34.3, with higher efficiencies for a scenario with high-end greenhouse gas emissions and strong socio-economic growth.

## Innovation in water governance: the NEWAVE project

IVM is managing and coordinating the recently started [NEWAVE](#) project. NEWAVE is rooted in the conviction that the rising threats of future water crises and hydro-social challenges, present an urgent need to enhance the global capacity to reflect critically on the current water governance trajectory. In that light NEWAVE aims to:



- Bring together an excellent trans-national and transdisciplinary network of water governance organisations;
- Develop and implement a cutting-edge actionable research agenda on the key water governance priorities and insights for future directions;
- Train a new generation of water governance early stage researchers and ensure that they have the trans- and interdisciplinary skills to make significant contributions to both the academic and extra-academic water governance world.

NEWAVE is a Marie Skłodowska-Curie Innovative Training Network, funded by the EU's Horizon 2020 programme.

## Education news

The Covid-19 pandemic has its impact on all IVM activities, including our courses. The switch to 100% online teaching has been made quite smoothly and the start of the academic year 2020-21 will also be characterized by distance learning. We are making sure that nonetheless there is ample room for interaction and cooperation between teachers and students as well as among students. With new options (such as the ERM specialization Global Food Challenges and the new master [Climate Econometrics](#)) as well as a record number of new students we are looking forward to a dynamic and vibrant new course year.

## Prizes, awards and grants

**Sem Duijndam** won the Vrije Universiteit 2019 master thesis award for his ERM research on the economic assessment of the Simson Bay Lagoon in Sint Maarten. His work is currently being used to determine Sint Maarten's environmental policy.



Sem Duijndam (right), winner of the VU master thesis award 2019

Hsu, A., Brandt, J., Widerberg, O., Chan, S. & Weinfurter, A. (2020). [Exploring links between national climate strategies and non-state and subnational climate action in nationally determined contributions \(NDCs\)](#). *Climate Policy*, 20(4), 443–457.

Koks, E.E. & Haer, T. (2020). [A high-resolution wind damage model for Europe](#). *Scientific Reports*, 10, 6866.

Komossa, F., Wartmann, F.M., Kienast, F. & Verburg, P.H. (2020). [Comparing outdoor recreation preferences in peri-urban landscapes using different data gathering methods](#). *Landscape and Urban Planning*, 199, 103796.

Kornhuber, K., Coumou, D., Vogel, E., Lesk, C., Donges, J. F., Lehmann, J. & Horton, R. M. (2020). [Amplified Rossby waves enhance risk of concurrent heatwaves in major breadbasket regions](#). *Nature Climate Chang*, 10(1), 48–53.

Leijten, F., Sim, S., King, H. & Verburg, P.H. (2020). [Which forests could be protected by corporate zero deforestation commitments? A spatial assessment](#). *Environmental Research Letters*, 15, 6.

Morseletto, P. (2020). [Restorative and regenerative: Exploring the concepts in the circular economy](#). *Journal of Industrial Ecology*, 24(4), 763–773.

Prestele, R. & Verburg, P.H. (2020). [The overlooked spatial dimension of climate-smart agriculture](#). *Global Change Biology*, 26(3), 1045–1054.

Schaafsma, M. & Brouwer, R. (2020). [Substitution Effects in Spatial Discrete Choice Experiments](#). *Environmental and Resource Economics*, 75, 323–349.

Schoderer, M., Dell'Angelo, J. & Huitema, D. (2020). [Water policy and mining: Mainstreaming in international guidelines and certification schemes](#). *Environmental Science & Policy*, 111, 42–54.

Shaw, B.J., van Vliet, J. & Verburg, P.H. (2020). [The peri-urbanization of Europe: A systematic review of a multifaceted process](#). *Landscape and Urban Planning*, 196, 10373.

Vousdoukas, M.I., Mentaschi, L., Hinkel, J., Ward, P.J., Mongelli, I., Ciscar, J. C. & Feyen, L. (2020). [Economic motivation for raising coastal flood defenses in Europe](#). *Nature Communications*, 11, 2119.

## Other publication highlights:

IVM's Luke Brander contributed to a new report '[Protecting 30% of the planet for nature: costs, benefits and economic implications](#)'. The 30% protected area goal is expected to be approved by the Convention on Biological Diversity's 196 parties next year in Kunming, China.

Oscar Widerberg is one of the editors of the recently published book '[Governing the Climate-Energy Nexus](#), Institutional Complexity and Its Challenges to Effectiveness and Legitimacy'. Lisa Sanderink and Philipp Pattberg also contributed to the book.

An international team of researchers and organisations, including IVM's **Jeroen Aerts**, **Anne van Loon**, **Dim Coumou** and **Toon Haer**, has been awarded over €6.7m from EU Horizon 2020 to help tackle food and water insecurity in the Horn of Africa Drylands (HAD). The DOWN2EARTH project aims to help rural East African communities adapt to climate change using state-of-the-art predictions of water scarcity and food insecurity.

> [Read more](#)

**Jeroen Aerts** has also been awarded a European Research Council (ERC) Advanced Grant, the largest individual research grant in Europe. With the grant of 2.5 million euros, he will run COASTMOVE, an international and collaborative research initiative. In the COASTMOVE project, Jeroen Aerts will investigate the effects of rising sea levels on migration in coastal areas worldwide. His aim is to develop a simulation model to answer the question "Will people in coastal areas defend their communities and settlements or will they move away?" The ultimate aim of the model is to produce a simulation for all of the world's coastal areas.



## Upcoming events

Wednesday 2 September 2020, 11.45h: [PhD defence Dennis Wagenaar](#). Thesis title: *'Capturing Complexity: Transferable flood impact models with Machine Learning'*.

Thursday 17 September 2020, 11.45h: [PhD defence Marleen de Ruiter](#). Thesis title: *'Dynamics of Vulnerability: From single to multi-hazard risk across spatial scales'*.

Tuesday 29 September 2020, 11.45h: [PhD defence Jens de Bruijn](#). Thesis title: *'Natural Hazards in a Digital World: Algorithms for using social media in disaster management'*.

Friday 9 October 2020, 9.45h: [PhD defence Lisa Sanderink](#). Thesis title: *'Energising a renewable future: Institutional interactions in the climate-energy nexus and their implications for structure, coherence and effectiveness'*.

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IVM (Institute for Environmental Studies), Vrije Universiteit Amsterdam produces three 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 Economics, Geography, 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](http://www.ivm.vu.nl) or contact us through [info.ivm@vu.nl](mailto:info.ivm@vu.nl)

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## Apps and tools

On 23 April, [Aqueduct Floods](#) was launched, a webtool that aims to empower disaster risk analysts with quantitative information on flood risks and adaptation strategy costs, including the ability to assess costs and benefits of adapting to current and future flood risk.

## Staff and organisational news

Last January, IVM moved to its **new premises**: the spacious and sustainable [NU building](#). Due to the lockdown we have been able to enjoy it for just two months, but since June we are allowed to enter it again (with limited numbers). We hope to be able soon to receive our guests here as well.

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

[Eric Mortensen](#), [Tim Busker](#) and [Tristian Stolte](#) started as PhD candidates within the Water and Climate Risk (WCR) group;

[Anne van Loon](#) is the new Associate Professor in Drought Risk within WCR. Her research deals with hydrological processes and their interaction with human activities, especially in relation to drought management and changes in water use and vulnerability;

[Raisa Cole](#) is a new PhD researcher in the Environmental Policy Analysis team. She will be working on issues of climate change adaptation governance in African cities;

[Dániel Petrovics](#) joined the Environmental Policy Analysis section as a new junior researcher.

[Caterina Marinetti](#) started as the project manager of the Newave project where she monitors and coordinates the project.

[Job Rosier](#) joined the Environmental Geography group as a PhD candidate. His research focuses on classifying differences within human settlements using remote sensed data and machine learning;

[Sean Goodwin](#) is the new junior researcher within the Environmental Geography group.

[Roos Haasnoot](#) started as a junior lecturer and will assist with different courses of IVM's bachelor and master programmes.