

**EGU25 Press Release: How will 13 million farmers fight back against sea level rise? New global model simulates adaptation, migration, and survival in the face of climate crises**

**UNDER EMBARGO UNTIL 02 MAY 2025 FEBRUARY 09:03 CET**

Researchers from the Institute for Environmental Sciences (IVM) at Vrije Universiteit Amsterdam have unveiled DYNAMO-M, a groundbreaking global agent-based model that projects how farmers across the world's coasts may respond to the growing threat of coastal flooding and salt intrusion due to sea level rise (SLR). The model, which will be presented at the EGU General Assembly 2025 in Vienna, offers new insights into the challenges faced by 13 million farming households globally.

Using decision-making logic rooted in discounted expected utility (DEU) theory, DYNAMO-M doesn't just forecast physical impacts — it simulates real human choices: stay and absorb losses, adapt with salt-tolerant crops and elevated homes, or migrate inland. These decisions play out year by year, crop by crop, from 2020 through 2080, covering 23 major food crops in flood-prone areas worldwide. "Rising seas are forcing a decision: stay, adapt, or migrate," says lead researcher Kushagra Pandey.

The stakes are enormous. Rising salinity and floodwaters are already slashing crop yields and farming income. DYNAMO-M identifies hotspots of future migration, with vulnerable coastal regions in Florida, New York, Oregon, Japan, China, the Philippines, and Italy likely to see major shifts in population and land use. Notably, the model also highlights areas within 1 in 100 year floodplains, which are at particular risk.

But it's not all doom and displacement. The team also tested insurance schemes and government support policies in the model, revealing that smart interventions could

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significantly reduce the pressure to migrate and help communities stay and thrive despite the rising tides.

“Small subsidies can significantly enhance adaptive capacity and reduce migration driven by sea-level rise,” continues Kushagra Pandey.

The findings push the frontier of climate risk modelling and offer actionable insights for governments, insurers, and global development agencies grappling with how to support frontline farming communities in a warming world. DYNAMO-M could be the missing link in understanding one of the most urgent and complex questions of our time: what happens when our farmlands flood — and the farmers have to choose what to do next.

For further information or inquiries, please contact Kushagra Pandey at [kushagrapandey.bsky.social](https://kushagrapandey.bsky.social). The project website is [www.coastmove.org](http://www.coastmove.org)

### **Note to the media**

When reporting on this story, please mention the EGU General Assembly 2025, which is taking place from 27 April – 02 May 2025. This paper will be presented in full [Session HS5.2.3] at EGU25 on Friday, 02 May, 09:03–09:05 (CEST) PICO spot 4, PICO4.10If reporting online, please include a link to the abstract:  
<https://meetingorganizer.copernicus.org/EGU25/EGU25-10487.html>

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**More information:**

The European Geosciences Union (EGU) is Europe's premier geosciences union, dedicated to the pursuit of excellence in Earth, planetary, and space sciences for the benefit of humanity. It is a non-profit interdisciplinary learned association of scientists founded in 2002 with headquarters in Munich, Germany. The EGU publishes a number of diverse scientific journals, organizes several topical meetings, and runs education and outreach activities. Its annual General Assembly is the largest and most prominent European geosciences event, attracting over 18,000 scientists worldwide. The EGU General Assembly 2025 is taking place in Vienna, Austria and online from 27 April – 02 May 2025. For more information and press registration, please visit [EGU25 website](#).

**About the EGU**

The European Geosciences Union (EGU) is the leading organisation for Earth, planetary and space science research in Europe. With our partner organisations worldwide, we foster fundamental geoscience research, alongside applied research that addresses key societal and environmental challenges. Our vision is to realise a sustainable and just future for humanity and for the planet. The annual EGU General Assembly is the largest and most prominent European geosciences event, attracting over 19,000 scientists from all over the world. The meeting's sessions cover a wide range of topics, including volcanology, planetary exploration, the Earth's internal structure and atmosphere, climate, as well as energy and resources. For more information about the meeting please check [media.egu.eu](http://media.egu.eu) or follow EGU on [social media](#).

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