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Biological invasions as costly as natural disasters

- For the last 40 years, the financial losses caused by biological invasions have been equivalent to those caused by storms or floods.
- The costs of biological invasions rose faster than those of natural disasters over this period.
- Investments in prevention and management of biological invasions are ten times lower than the financial losses caused by this phenomenon.

Over the past 40 years, the financial losses caused by biological invasions have been equivalent to those caused by various types of natural disasters, such as earthquakes, floods or storms; however, according to scientists from the CNRS and Université Paris-Saclay they are now increasing at a faster pace. These results, obtained with the support of the AXA Research Fund, are published in the April-May 2023 issue of *Perspectives in Ecology and Conservation*.

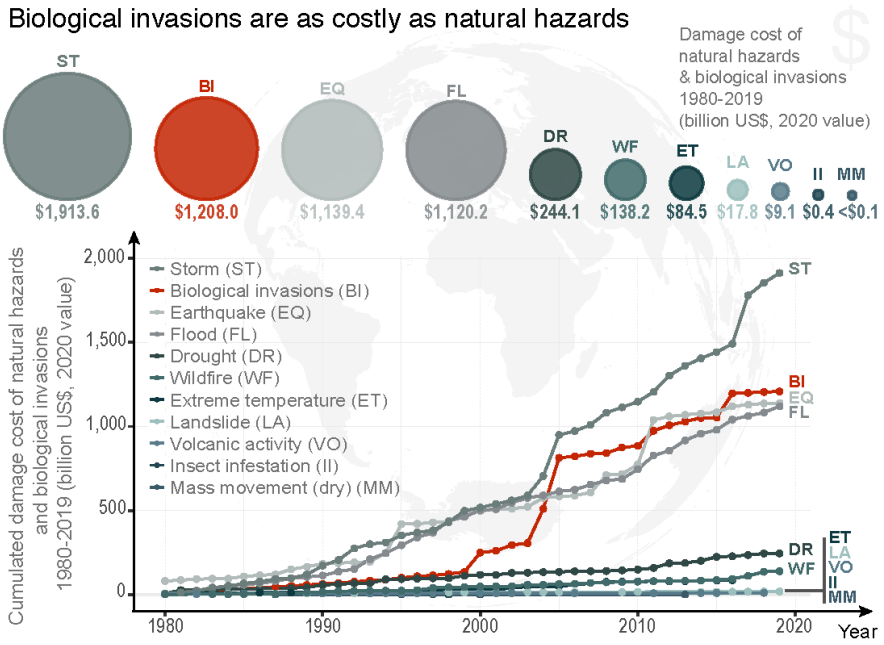
By invading new environments, some alien species have caused disastrous consequences for local species and ecosystems, as well as for human activities – damage to infrastructure, crops, forest plantations, fishing yields, health and tourism. The areas affected are multiple and the damage is costly.

In a new study, an international research team led by scientists from the Écologie, systématique et évolution Laboratory (CNRS/Université Paris-Saclay/AgroParisTech) reveals an explicit order of magnitude: the global economic impact of these biological invasions is equivalent to that of natural catastrophes. From 1980 to 2019, financial losses due to invasive alien species amounted to $1,208 billion (US), compared to nearly $1,914 billion in losses caused by storms, $1,139 billion attributed to earthquakes and $1,120 billion due to floods.

Scientists have also found that the costs of biological invasions increased more rapidly than those of natural disasters over a given period. Invasive alien species have a long-lasting and cumulative effect: for example, the zebra mussel is capable of attaching itself to a wide variety of substrates, wreaking havoc on everything from ship hulls to nuclear power plant pipes. Its spread is particularly problematic in North America.

To date, investments in preventing and managing biological invasions are ten times lower than the financial losses caused by them. For this research team, these results call for the deployment of action plans and international agreements on limiting the advance of invasive alien species, similar to those implemented in the context of natural disasters.

These results were obtained using the InvaCost database, which currently lists over 13,500 costs due to biological invasions worldwide. The costs of natural disasters at the global level were compiled using the International Disaster Database and data from the US National Oceanic and Atmospheric Administration (NOAA).



Economic costs of damage caused by natural disasters (grey) and biological invasions (red), in billions of dollars (2020 value). Circles show the total costs between 1980 and 2020, which are of the same order of magnitude for the first four categories. The curves show the annual increase in these costs over this period. Both representations illustrate that biological invasions are as costly as natural disasters.

Bibliography

Biological invasions are as costly as natural hazards. Anna J. Turbelin, Ross N. Cuthbert, Franz Essl, Phillip J. Haubrock, Anthony Ricciardi and Franck Courchamp. *Perspectives in Ecology and Conservation*, April-May 2023. DOI : https://doi.org/10.1016/j.pecon.2023.03.002

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