

# Risky business—calculating climate change losses in major European coastal cities

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A new study that assesses potential future climate damage to major European coastal cities has found that, if, as currently, global carbon emissions continue to track the Intergovernmental Panel on Climate Change's worst emission scenario (RCP8.5), overall annual economic losses may range from 1.2 billion USD in 2030 to more than 40 billion by 2100.

The paper, 'Climate Risk Assessment under Uncertainty: An Application to Main European Coastal Cities' published in the journal *Frontiers in Marine Science*, focused on 19 major European coastal cities including Istanbul, Rotterdam, Barcelona, Hamburg, London, Dublin, Marseille, St Petersburg and Copenhagen.

For the first time, the report's authors adapted into their modelling methods for dealing with uncertainty well known in other fields of economics, such as financial economics. They successfully applied them to so called 'tail events' and their possible impacts in the chosen cities. The study's results show that despite their low probability of occurrence the huge scale of damage that tail events may cause means that they should be carefully considered in coastal vulnerability analysis.

In 2030, just 13 years away, under a worst case emission scenario, Rotterdam tops the economic impact table with expected annual losses of almost 240-million USD, closely followed by Istanbul, St Petersburg and Lisbon. By 2100 the expected annual losses in Istanbul could reach almost 10-billion USD, Odessa in the Ukraine could lose 6.5-billion

USD annually and Rotterdam 5.5-billion. Glasgow and Dublin could both suffer economic losses of around 1.5-billion USD in annual [economic losses](#) by 2100.

About two thirds of our planet's mega-cities—cities with populations of more than 5 million people—are located in low-lying coastal areas so protecting these areas from rising sea levels is critical to saving lives and property. Being so vulnerable to the impacts of [climate change](#), [coastal cities](#) also have a major role in adapting to them.

The report urges local, regional, and national policy-makers not to settle for traditional approaches to calculating climate impacts but instead seek to introduce risk assessments under uncertainty into their decision-making processes. The author's say that in line with the level of risk in each coastal city and the risk aversion of decision-makers, adaptation measures will need to be implemented in the near future in order to avoid critical damage and major losses.

**More information:** Luis M. Abadie et al, Climate Risk Assessment under Uncertainty: An Application to Main European Coastal Cities, *Frontiers in Marine Science* (2016). [DOI: 10.3389/fmars.2016.00265](https://doi.org/10.3389/fmars.2016.00265)

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