European Commission

Science for Environment Policy

European flooding costs could increase almost five-fold by 2050

Extreme and catastrophic floods in Europe, such as those seen in 2013, currently occur approximately once every 16 years, but this may increase to once every 10 years by 2050, according to new research. The study also suggests that annual average economic losses caused by extreme floods could reach almost five times higher than 2013 values.

Heavy rainfall, expected to worsen as climate change progresses, swells rivers and leads to extreme flooding events, such as those experienced in 2008 and 2013 throughout Europe. Such events have resulted in loss of life and damaging economic impacts; the floods of June 2013 led to an estimated €12 billion in economic losses across nine EU Member States. These costs stress the resources of both insurers and governments.

Understanding the financial risks due to both climate change and socio-economic activities is important to informing both climate adaptation strategies and risk-management activities.

In this study, conducted under the EU ENHANCE project[1], researchers used a combination of flooding and climate change computer models to examine trends in flood risk and economic damage under future climate change and socio-economic development up to the year 2050.

They examined river discharge patterns across over 1 000 river sub-basins across Europe. Historically, most large-scale flood risk estimates have tended to treat river basins as independent of each other. However, rainfall patterns and river flows are actually closely linked, being driven by large-scale atmospheric processes across large regions of Europe. Importantly, the current study accounted for this, to give more accurate estimates of the risk and damage caused by large flood events.

The results showed that extreme floods, like those in 2013, were expected to increase in frequency from once every 16 years to once every 10 years by 2050. The average annual economic losses due to flooding were expected to be in the region of €23.5 billion by 2050, over five times the amount for the period 2000 to 2012 (€4.6 billion).

The results indicated that around two thirds of increases in economic damages were attributed to socio-economic growth, with the remaining third due to climate change. Socio-economic growth can affect the costs of floods, as, for example, more buildings in general mean more that can be affected by flooding.

The researchers explored possible ways to limit the current and future economic losses from flooding. They suggest that a larger share of the financial losses can be shared by increasing the levels of flood insurance among households likely to be affected by flooding, or through increasing the value of the EU Solidarity Fund[2]. The Fund aids Member States in the event of major natural disasters.

However, they feel that the most effective option for loss reduction would be investment in flood defences. An investment now of around €1.75 billion could reduce estimated annual flood losses by around €7 billion, an almost 30% reduction, by 2050.

Because of the uncertainty in climate and social models and the costs of building and maintaining flood protection measures, the authors suggest that investments should aim for acceptable, rather than optimal, levels of protection.

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1. ENHANCE (Enhancing risk management partnerships for catastrophic natural disasters in Europe) is supported by the European Commission under the Seventh Framework Programme. See: www.enhanceproject.eu

2. http://europa.eu/legislation_summaries/regional_policy/provisions_and_instruments/g24217_en.htm