Researchers have created a simple tool to analyse the risk of river flooding across almost all of Europe, and to estimate the associated economic losses. They found that Eastern Europe, Scandinavia, Austria and the UK are the regions and countries most at threat.

Since 2000, there have been several major floods in Europe, causing significant damage to property and loss of life. As the frequency of such extreme weather events increases under current scenarios for climate change, and growing populations mean that more buildings are erected on floodplains, policymakers need to be able to identify flood risks to help design and implement effective mitigation strategies.

The European Directive on the assessment and management of flood risks requires all EU Member States to identify flood risk along all of their rivers and coastline and create flood risk maps by 2013 and flood risk management plans by 2015. However, there is no current assessment of overall flood risk across all of Europe.

To address this, the researchers, with support from the EU ADAM project, developed a Europe-wide tool to provide an assessment of the direct risk, in economic terms, from river flooding. They combined data on three aspects of risk: exposure - which is the value of assets at a given location threatened by flooding; vulnerability - defined as the lack of resistance to damage; and hazard - describing the magnitude of the flood and the probability of it happening.

Data on exposure came from the CORINE Land Cover map for Europe, and information from previous studies allowed the researchers to estimate the value of the land at each location. To keep the tool relatively simple, the researchers calculated the vulnerability of the assets under threat as a function of the depth of flooding they were exposed to. Hazard information came from a 1km resolution Flood Hazard Map, which combined the Pan-European river network database with a digital terrain model to define five hazard classes.

Combining all three elements resulted in a series of damage maps that included data on flood depth, land cover and land value and damage. The researchers then aggregated these detailed maps to provide regional and national-level results more useful for economic modelling and policy formulation. The results were shown as annual average damage in a region.

The research identified that average annual damage was highest for Eastern Europe, Scandinavia, Austria and the UK, as well as some areas in France and Italy. The researchers note that the tool may overestimate the potential economic losses, although such conservative estimates do serve to draw attention to high risk areas and counterbalance the lack of information on risk from rivers too small to be captured in the scale of the analysis.