

Michael Allison

Carbon Management

Title:

"Calculating the carbon impacts associated with the damage, repair and recovery of residential buildings after a major flood event within the City of Leeds"

A comprehensive investigation into the current justification of flood defence schemes, what damages they protect residential properties from and the carbon related impact of the necessary repairs that take place when damages do occur. An estimation for the carbon emissions associated with the repair of a 3-bedroom property affected by floodwater at a depth of 0.5 m has been calculated through the development of a model based upon the research conducted. The model resulted in the estimated carbon impact of 10.45 tonnes of CO₂e per house restored. The replacement of structural material was discovered to be the most carbon intensive process at an estimated 61.5% of all carbon emissions associated with the reinstatement of the property. Other processes considered were those involved in the decontamination, drying and replacement of damaged contents phases. These processes accounted for 7.68%, 6.74% and 24.08% respectively although the impact of the drying process may increase or decrease depending on the time of year as the required heating load will be affected. When compared to the carbon emissions associated with the construction of the Leeds Flood Alleviation Scheme, it was found that a net benefit in carbon savings could be achieved after providing protection to over 4669 residential properties.