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Making Space for Water: A review of SUstainable Drainage systems (SUDs) in a rural/urban area of Newcastle upon Tyne, UK.

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Expansion of the city of Newcastle included a new development of over 3000 houses and an associated commercial area on agricultural land. The development firmly signed up to the notion that the new estate should adhere to full SUDs design and implementation. In essence there should be no loss of floodplain capacity, the total runoff from the new housing should not increase flood risk downstream and benefits to ecology, recreation and amenity should be fully maximised. Credit must be given to Newcastle City Council, the Environment Agency, the local water company and the developers themselves as a full set of large scale SUDs now exist and they are clearly an asset to the city. However, such a large scale landscape engineering endeavour has not been without direct and indirect problems. This paper reviews some of the experiences, problems and lessons learnt from SUDs implementation, the function of SUDs during flood events and the perception of SUDs by the public. During the life of the project several older estates close to the new development suffered from two major flood events; including foul water inundation, the drowning out of sewer overflows and intense flash flooding. These floods at first gave rise to the public perception that the new development had caused the flooding. During a research project entitled 'making space for water', the instrumentation of the river in the area and the SUDs took place. The hydrological data this produced has given rise to a mixture of positive and negative aspects of SUDs implementation. The cause of one flood was due to the drowning out of key sewer overflows by locally generated by urban flood flow arising from an upstream estate. The second flood was caused by a 48 hour storm event giving rise to high runoff from the rural area again drowning out key sewer overflows. The SUDs were found to perform well during storm events and do not increase runoff from the new estates. The main fundamental complaint is that despite such a large investment in the Newcastle area, the older estates continue to be flooded. There is at this time no capability to think about holistic solutions to flooding in a catchment and the 'development' in the town gives rise to local solution only. A proposal to use the new SUDs and the floodplain to help lower flood risk for the older estates has met with a wall regulatory objections. The ability to manage runoff sources arising from rural areas could be addressed by investing in SUDs on agricultural land. Equally, putting SUDs into older estates could be very beneficial to the whole of the city. Holistic options and catchment management has to be at the heart of future planning considerations. The whole experience is great example of hydrology, engineering, planning and politics in action. The role of solid hydrological evidence in the debate has been significant. The most reassuring aspect of the work is that all the partners are endeavouring to learn and improve the flood management in the area and holistic thinking is now occurring.