

## Abstract

The Dripsey CO<sub>2</sub> flux site in Cork, Ireland is a perennial ryegrass (C3 category) pasture and is grazed for approximately 8 to 10 months of the year. Local farmers own and operate the farms, which are fertilised with approximately 200kg/ha/year of nitrogen. The flux tower monitoring CO<sub>2</sub>, water vapour and energy was established in June 2001. The Cork site also includes streamflow hydrology and stream water chemistry. A second CO<sub>2</sub> flux site was established in a managed grassland pasture of the Irish Agricultural Research station in the South East of Ireland in Wexford (180 km east of Cork) in October 2002. Management and fertilisation practices are well documented. A third CO<sub>2</sub> flux site was established in a pristine blanket peatland (depth approximately 3m of peat) in the South West of Ireland in Kerry (140km west of Cork) in July 2002. The three sites use the eddy covariance flux system with a LICOR 7500 open path CO<sub>2</sub>/water vapour analyser in conjunction with an RMYoung 3D sonic anemometer. We present the results and analysis for the three sites to date. For eight months of the year in the Cork pasture, the grass/soil ecosystem has a net uptake of CO<sub>2</sub> (varying from 50 to 360 g/m<sup>2</sup> per month). For four months (October, November, December and January), the ecosystem is a net source of CO<sub>2</sub> (varying from 0 to -110g/m<sup>2</sup> per month). The cumulative one-year carbon uptake is 3.9t/ha. The estimated carbon required for grass and silage growth is 3.6t/ha. For the one year being reported, this suggests that these pastures are a carbon sink of size approximately 0.3t carbon/ha. The Wexford site is drier (approximately 1200mm/annum) and warmer with very slightly greater fluxes of CO<sub>2</sub>. The CO<sub>2</sub> fluxes in the blanket peatland are approximately one third those of the grassland sites. This work is part of a five-year (2002-2006) research project funded by the Irish Environmental Protection Agency.