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Sediment exchange between the upper beach and the foredune: a post-storm recovery case study

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The extent to which beach-dune systems recover after storm events can be measured using geomorphological methods of sediment budget analysis and topographic profile comparison. These types of analyses can quantify 'cut and fill' processes on a seasonal scale. To local communities, however, this return of sediment quantity to the beach-dune system is often not considered as recovery: relatively gently sloping, vegetated surfaces being replaced with sharp relief and bare sand. For management decisions, improving our understanding of the upper beach/primary foredune zone is a priority.

Recent advances in areas such as secondary airflow, jet flow, blowout dynamics, synchronicity and storm sequencing may enhance our ability to conceptualise this dynamic zone. This paper reports on qualitative and quantitative evidence gathered from a two-year field monitoring project (Maharees, Co. Kerry, Ireland). Post storm recovery of the upper beach led to episodic delivery of sediment to the dune through gaps in the dune line and over the top of a scarped dune face. The upper beach remained unvegetated during the monitoring period except for a section where rock armour was present. The work discusses how recent advances may be used to revisit models of beach-dune interaction with a focus on sediment transport pathways.