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Visualizing uncertainties with the North Wyke Farm Platform Data Sets

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The North Wyke Farm Platform (NWFP) is a systems-based, farm-scale experiment with the aim of addressing agricultural productivity and ecosystem responses to different management practices. The 63 ha site captures the spatial and/or temporal data necessary to develop a better understanding of the dynamic processes and underlying mechanisms that can be used to model how agricultural grassland systems respond to different management inputs. Via cattle beef and sheep production, the underlying principle is to manage each of three farmlets (each consisting of five hydrologically-isolated sub-catchments) in three contrasting ways: (i) improvement of permanent pasture through use of mineral fertilizers; (ii) improvement through use of legumes; and (iii) improvement through innovation. The connectivity between the timing and intensity of the different management operations, together with the transport of nutrients and potential pollutants from the NWFP is evaluated using numerous inter-linked data collection exercises. In this paper, we introduce some of the visualization opportunities that are possible with this rich data resource, and methods of analysis that might be applied to it, in particular with respect to data and model uncertainty operating across both temporal and spatial dimensions. An important component of the NWFP experiment is the representation of trade-offs with respect to: (a) economic profits, (b) environmental concerns, and (c) societal benefits, under the umbrella of sustainable intensification. Various visualizations exist to display such trade-offs and here we demonstrate ways to tailor them to relay key uncertainties and assessments of risk; and also consider how these visualizations can be honed to suit different audiences.