



The James Hutton Institute

Using high resolution temporal data and modelling to better target the impact of Nature-Based Solutions on N, P, and sediment.

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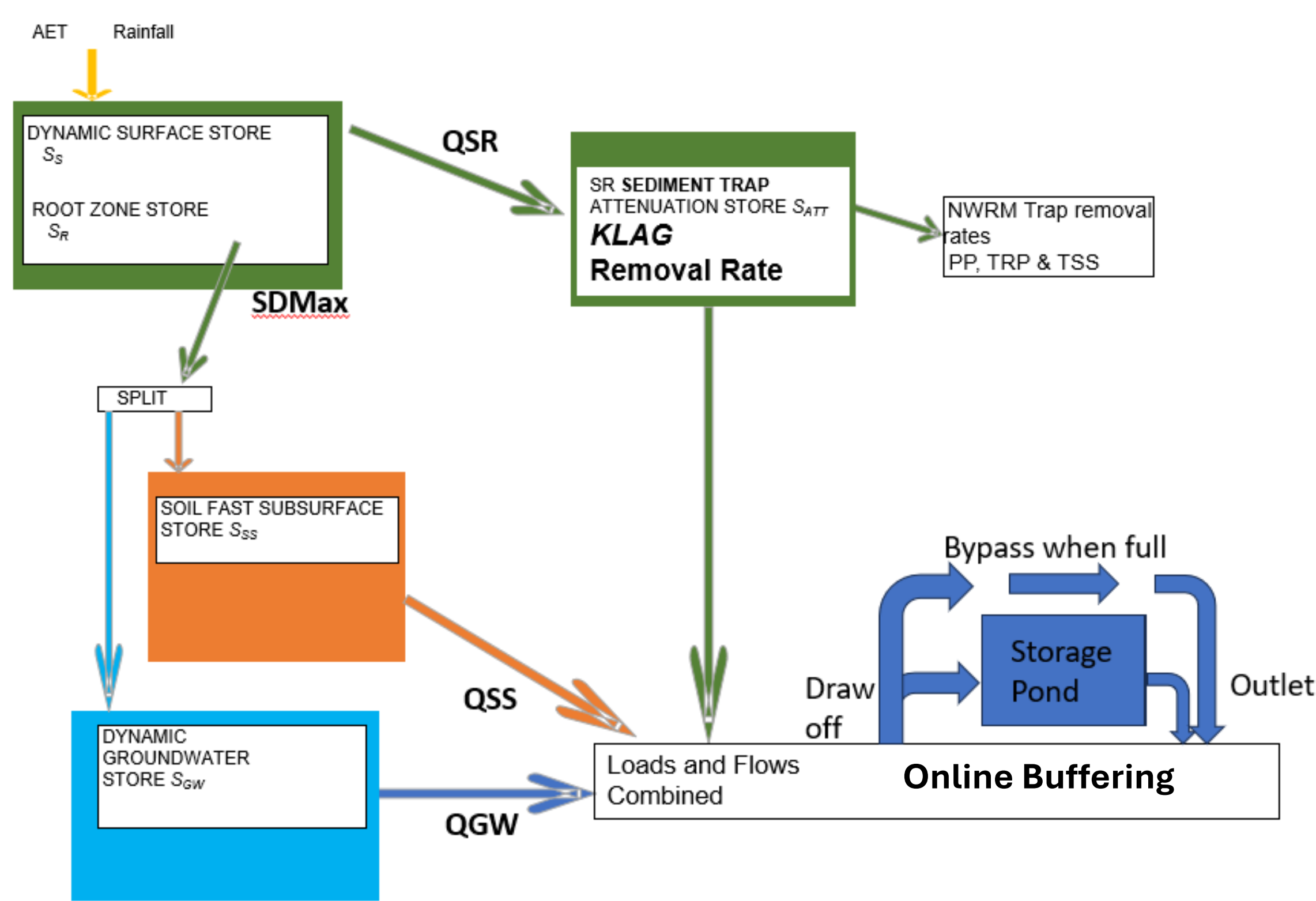


Fig 1. CRAFT (Catchment Runoff Attenuation Flux Tool) is a rainfall runoff model using an hourly timestep

3 Flow pathways are represented : Fast near surface flow (QSR)
Fast subsurface soil flow (Fast SS)
Slow groundwater flow (Slow GW)

- Concentration values for N, PP, SRP are set for each pathway (based on calibration or expertise)
- CRAFT contains a dedicated sediment trap for fast flow, i.e., in fields or in small ditches, and sediment can be removed (along with the associated PP)
- Buffer Zone Efficiency is based on an estimate (assuming a 10m buffer zone can give approximately 20% reduction in TP)
- Using data from The Irish Agricultural Catchments Programme at Ballycanew, Wexford, we can show the ability of the model simulate flow pathways, nutrient concentrations and the likely impact of targeted NBS.

What can we manage?

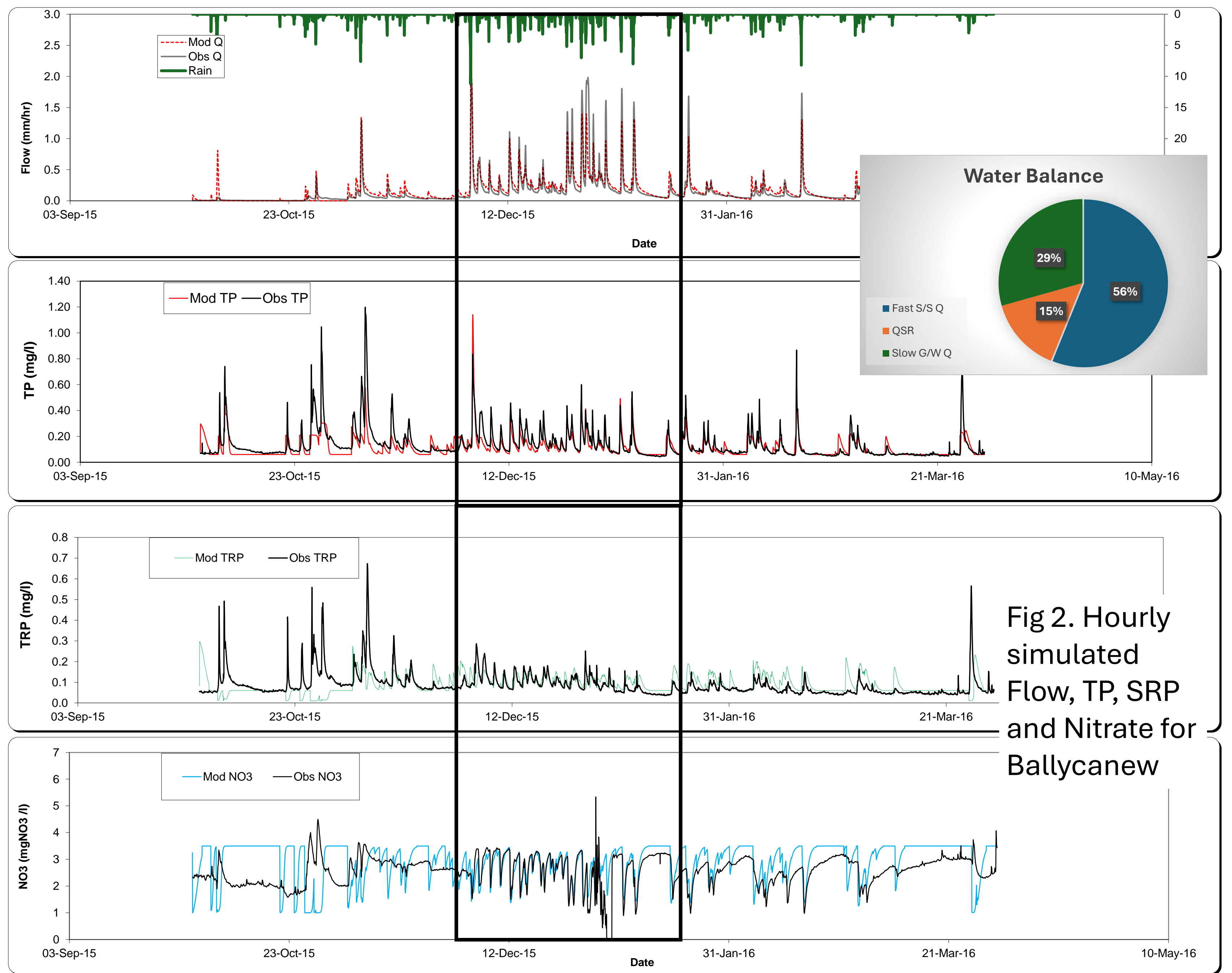


Fig 2. Hourly simulated Flow, TP, SRP and Nitrate for Ballycanew

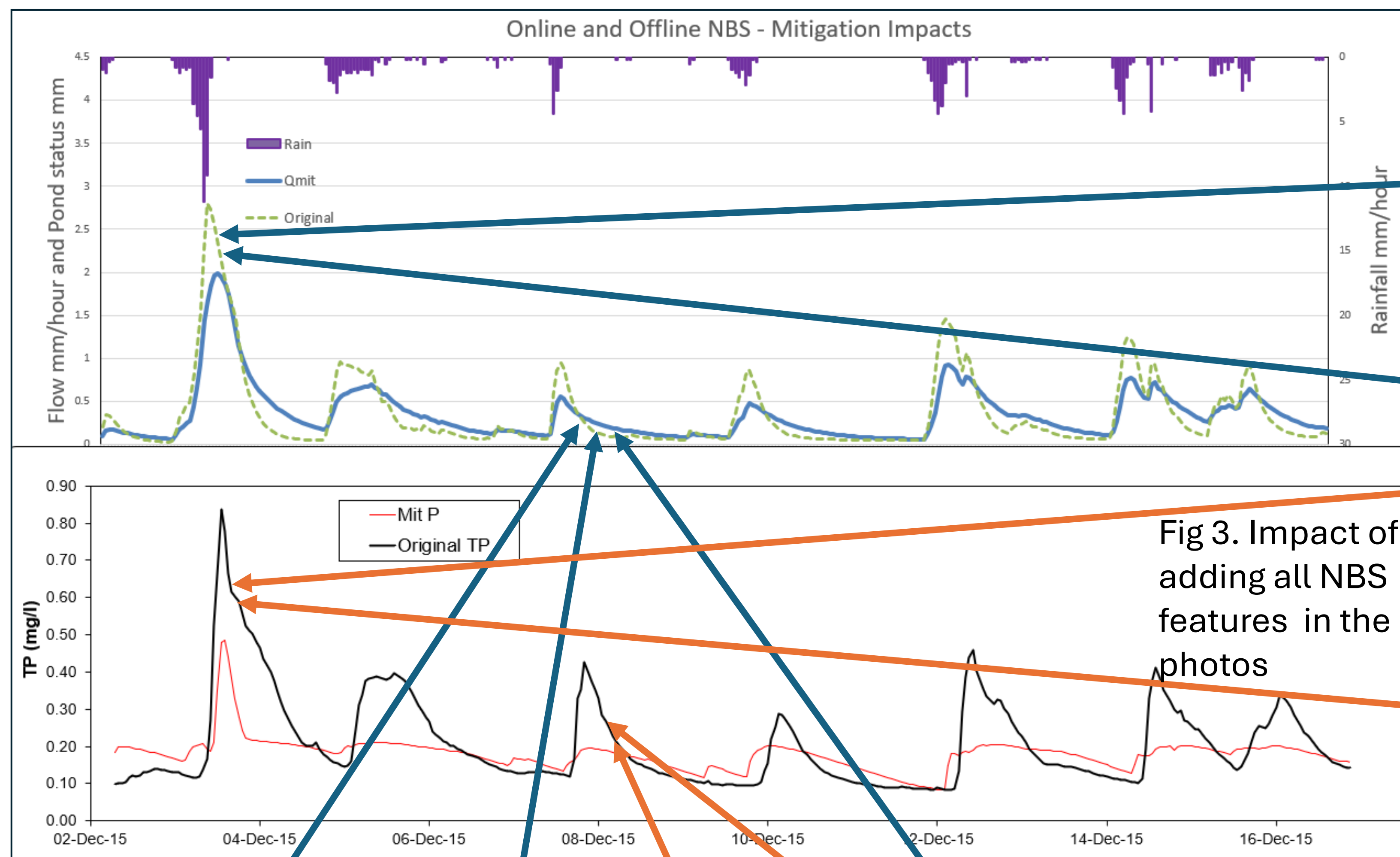
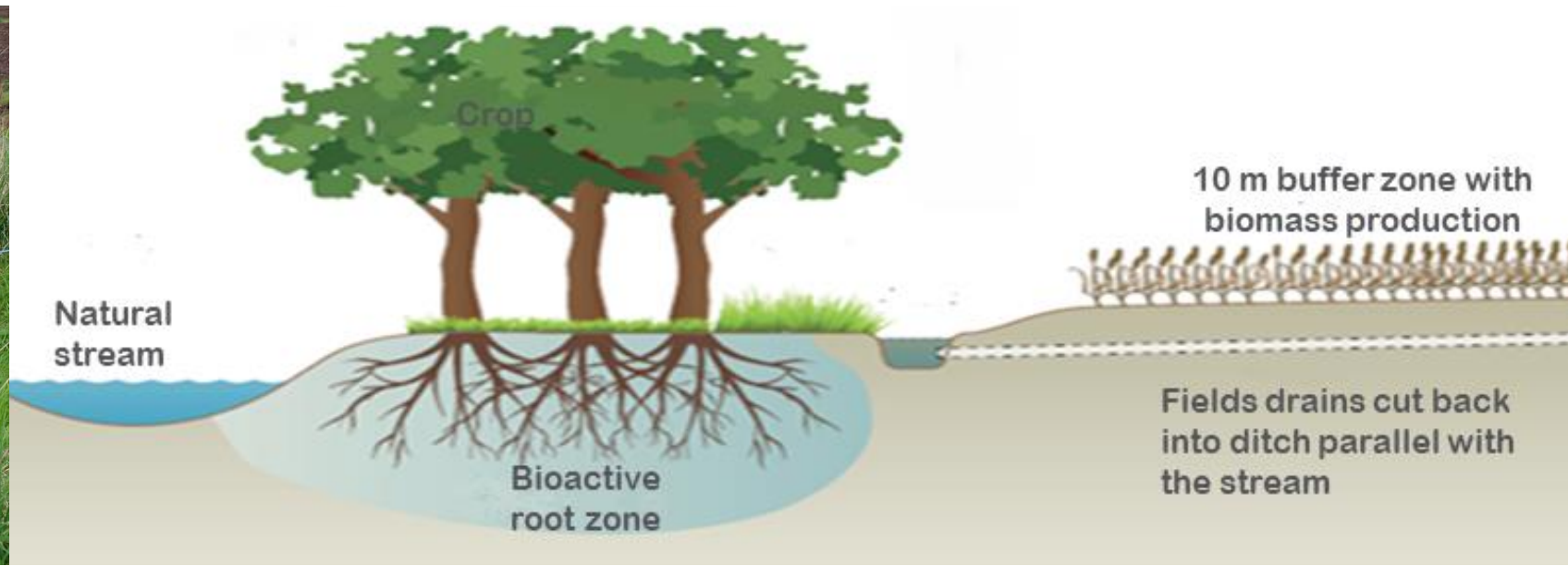
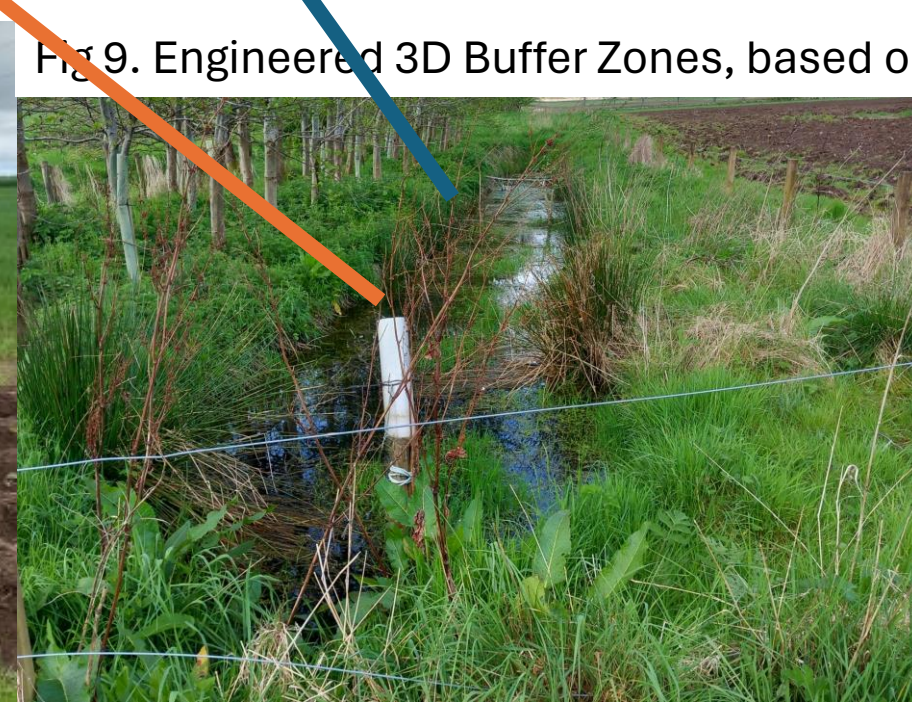
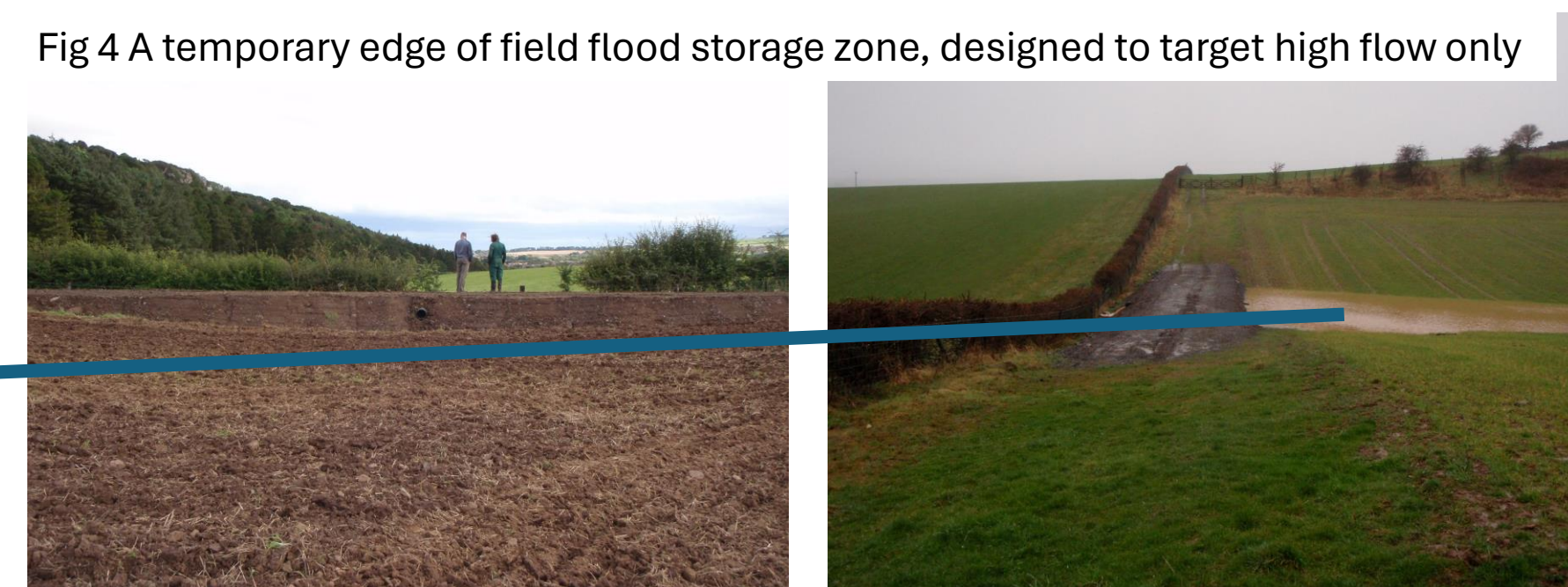


Fig 3. Impact of adding all NBS features in the photos



- Features work together to target high, medium and low flows for both water quantity and quality
 - Positioning in the right place is vital – flow accumulation maps (Fig 9)
 - Maintenance of features, such as sediment removal and vegetation management
 - Continued farm productivity is maintained
- Putting all these features together we can agree a Farm Integrated Runoff Management Plan (FIRM Plan, Fig 10)

Fig 10. Where in the Landscape? Example from Balrudeary Farm JHI

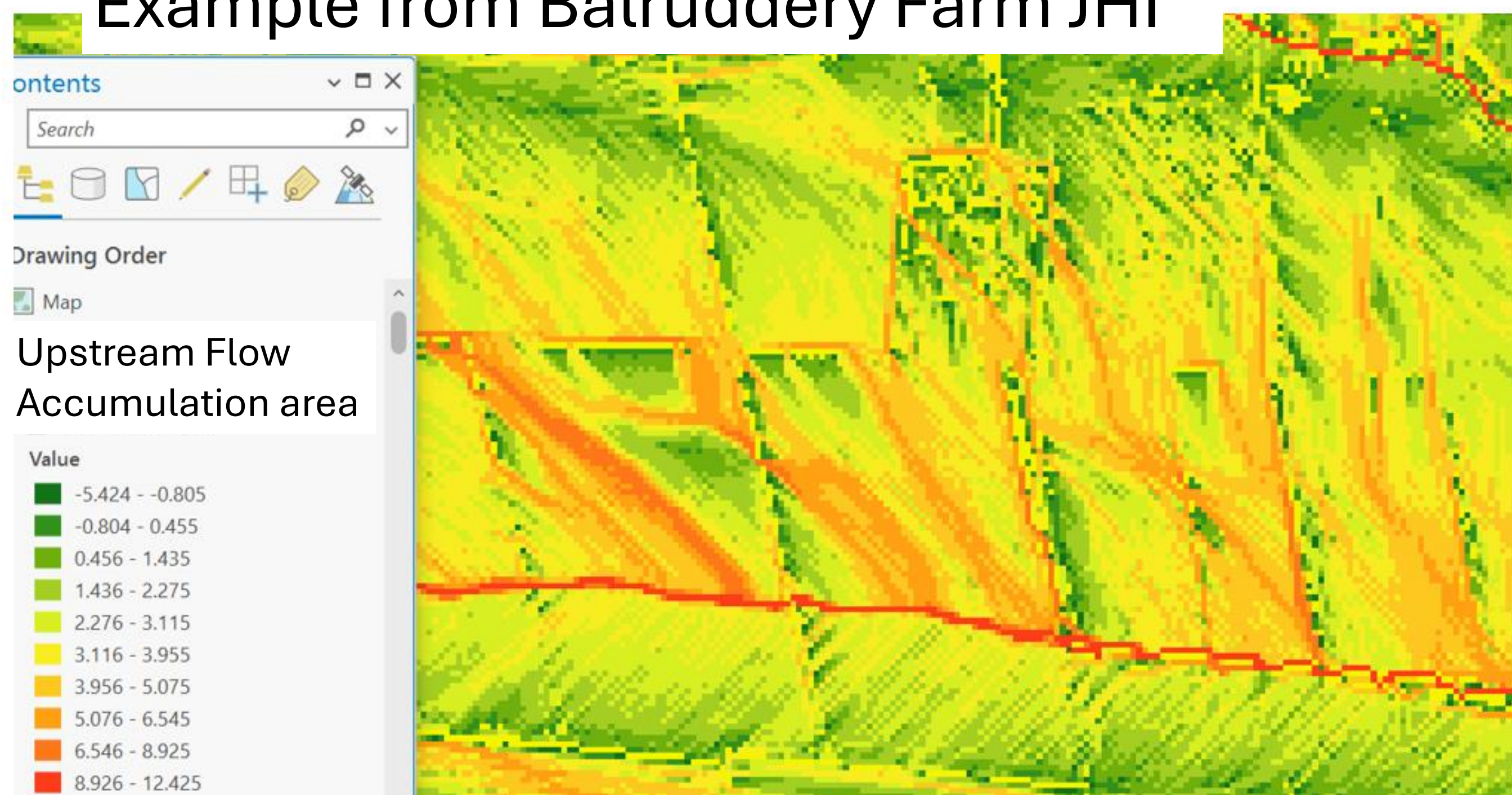
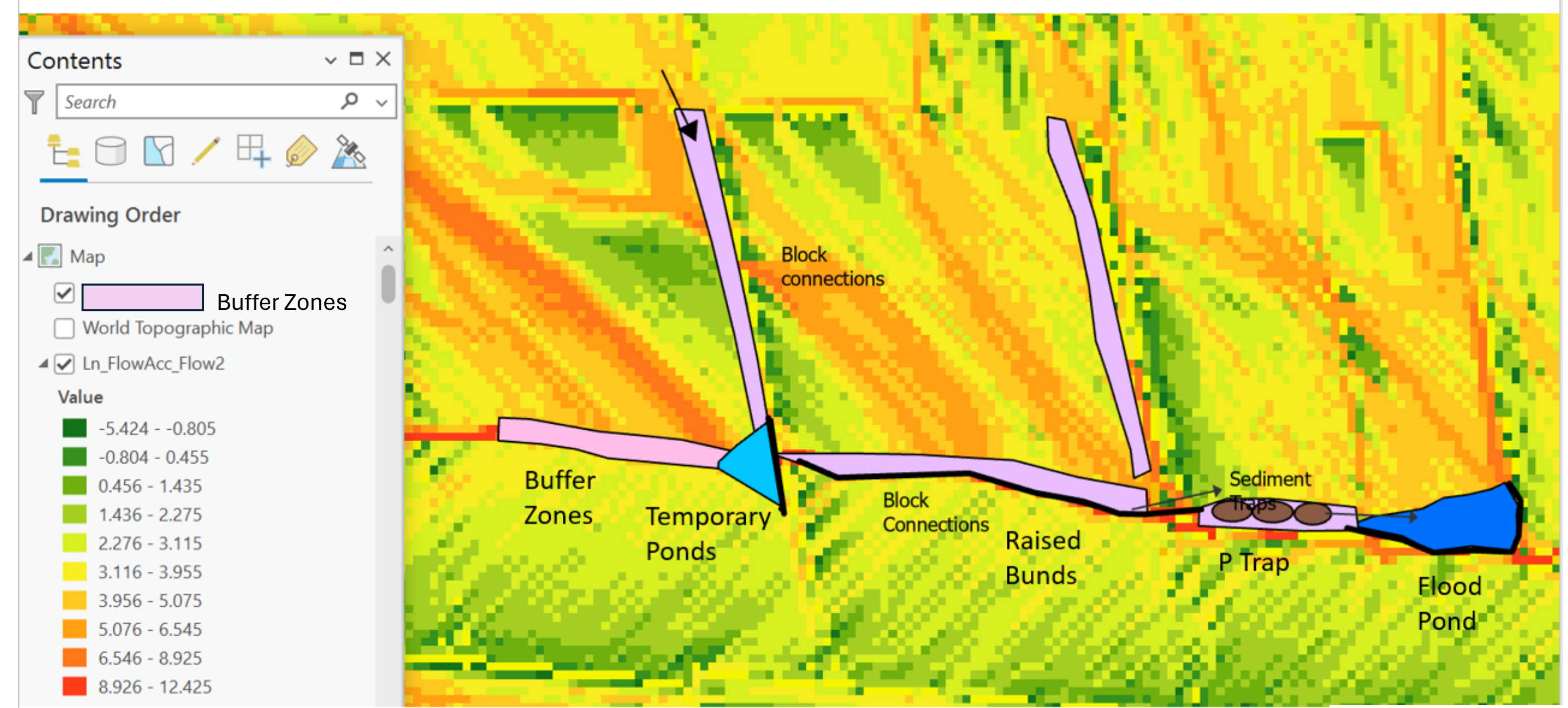


Fig 11. Farm Integrated Runoff Management (FIRM) Plan



We can only prove interventions work if we have good quality high resolution datasets!