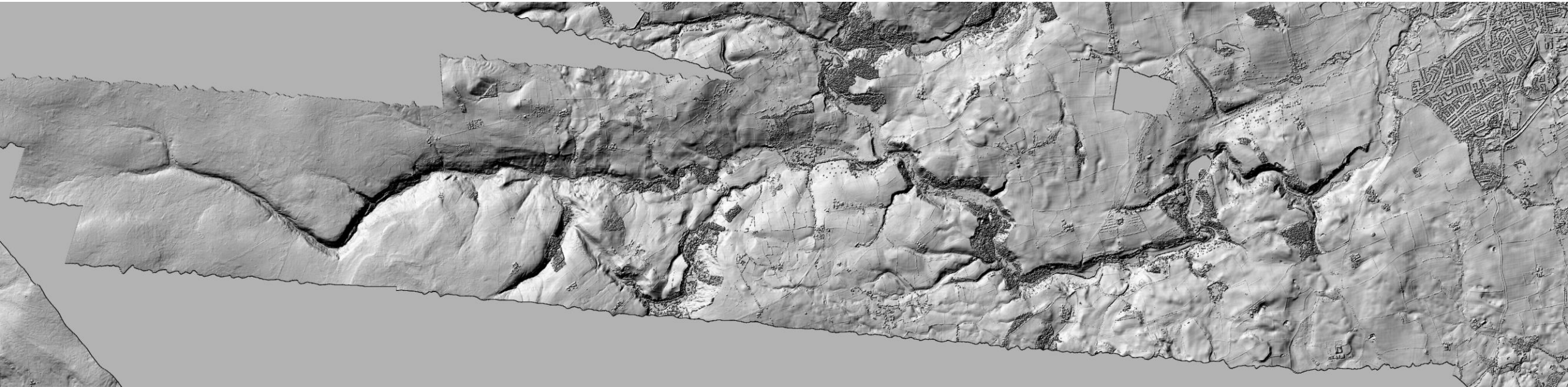
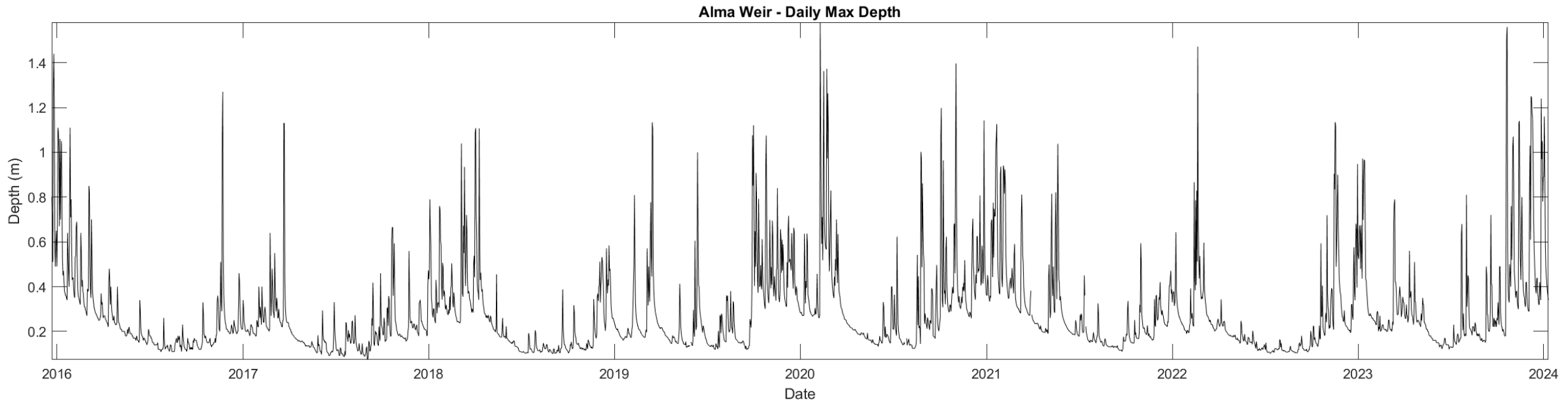


River Skell - Catchment



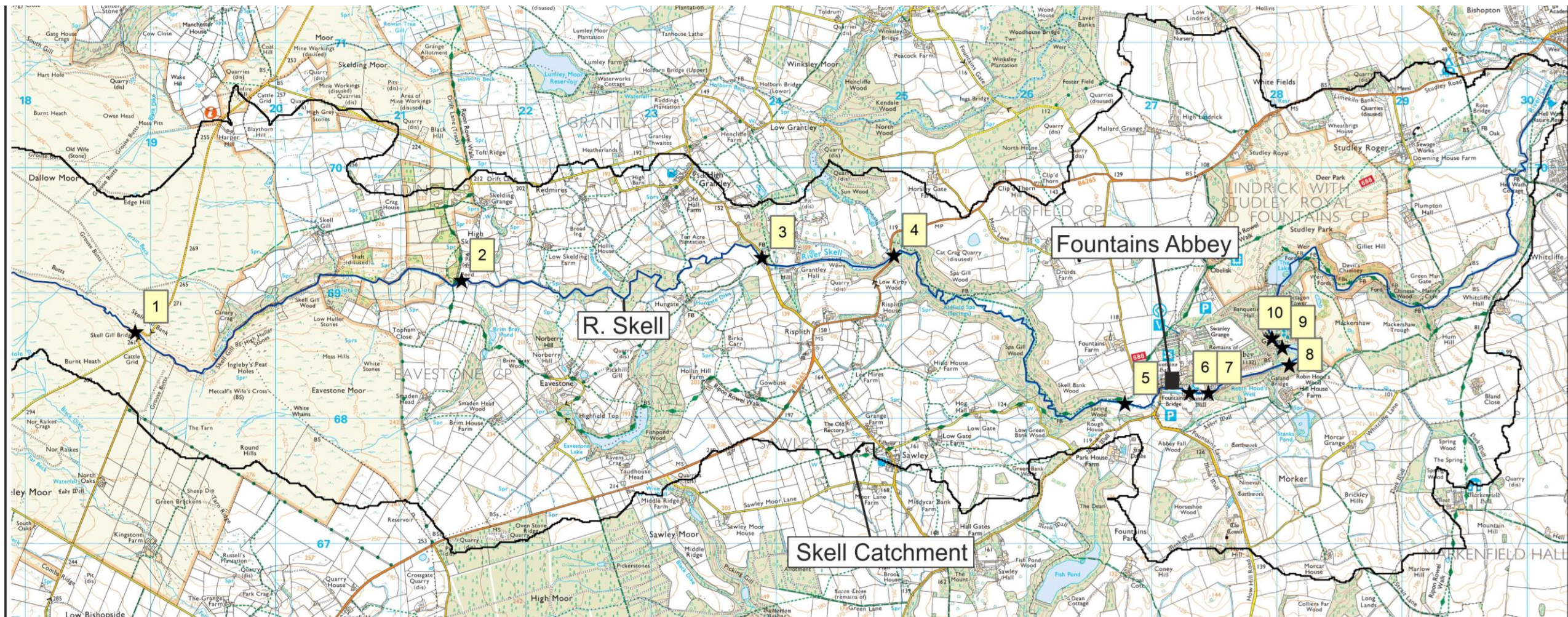
Data from EA

River Skell - Hydrology



Data from EA

River Skell – Volunteer Data

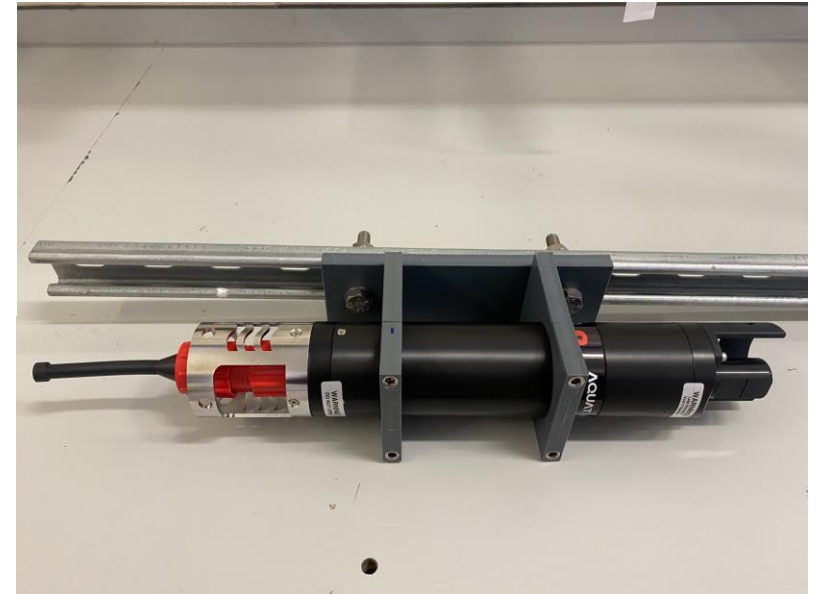


River Skell – Volunteer Data

- Monthly visits to collect samples from 10 sites
- Simple robust sampling system (adding pump sampler for summer 2024)
- Samples processed in lab in Leeds
 - Turbidity
 - Concentration of dry solids
 - Suspended Sediment Size (d10, d50, d90)
 - Nitrate Concentration
 - pH
 - Conductivity

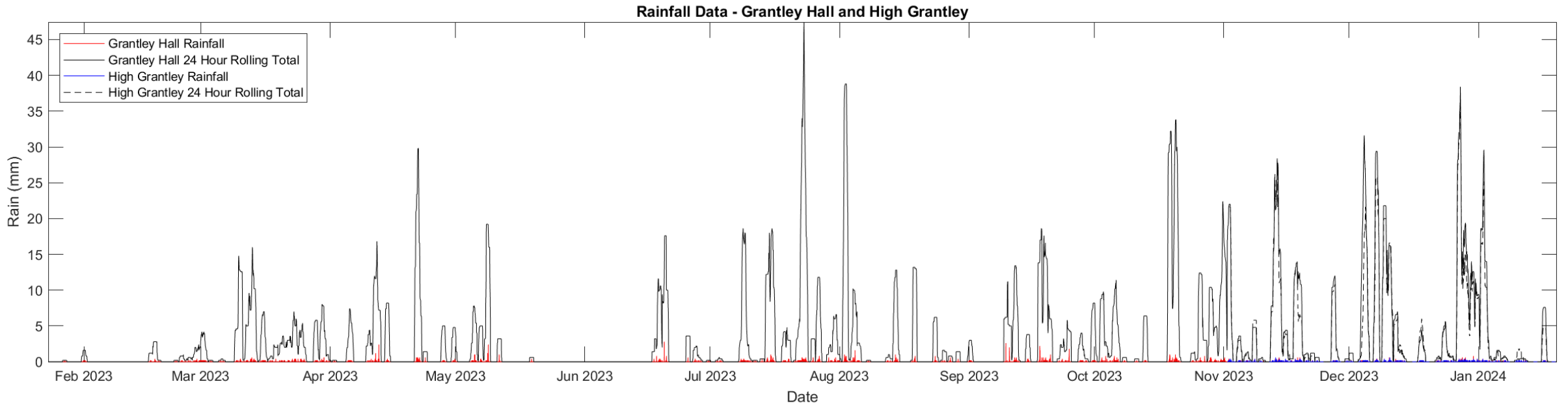


River Skell - Instruments



- Davis-Hobo Weather Station – Hourly upload
- Hobo Water Level Sensors – manual download
- Aquatech Turbidity Sensors – manual download

River Skell - Rainfall



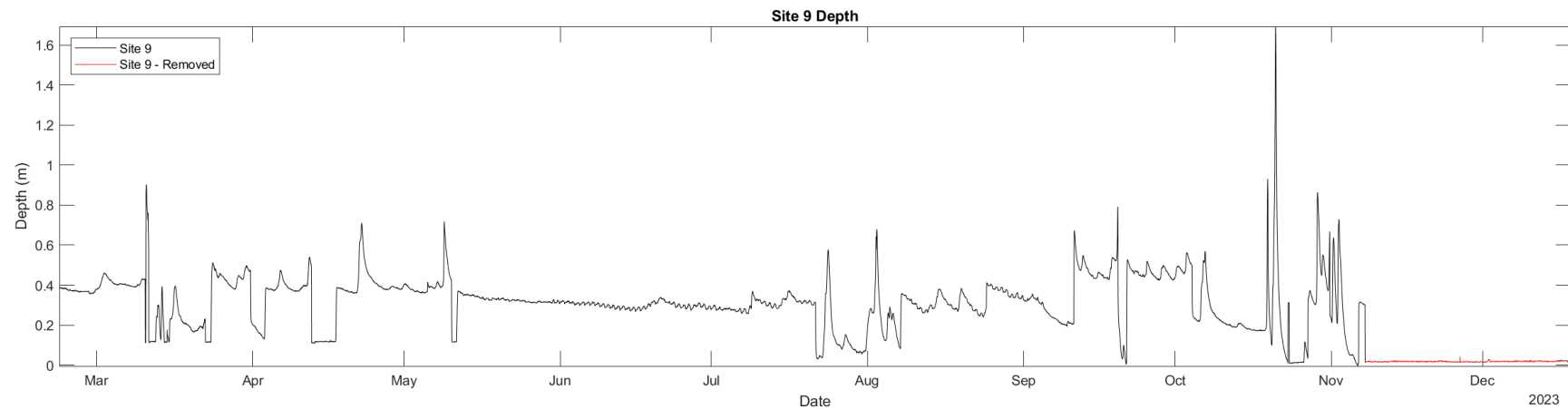
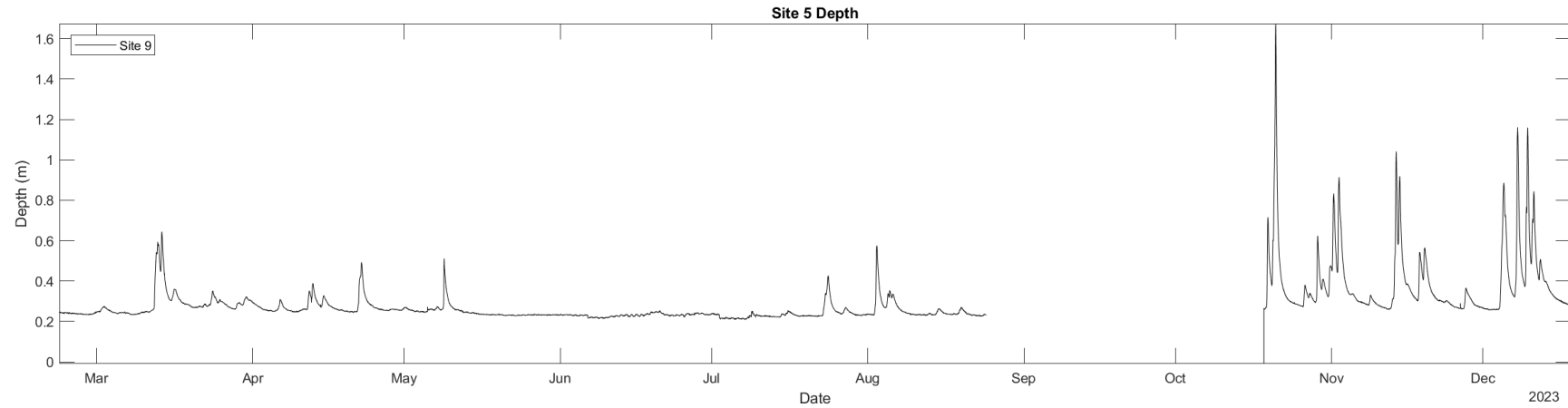
Data from this project

River Skell - Instruments

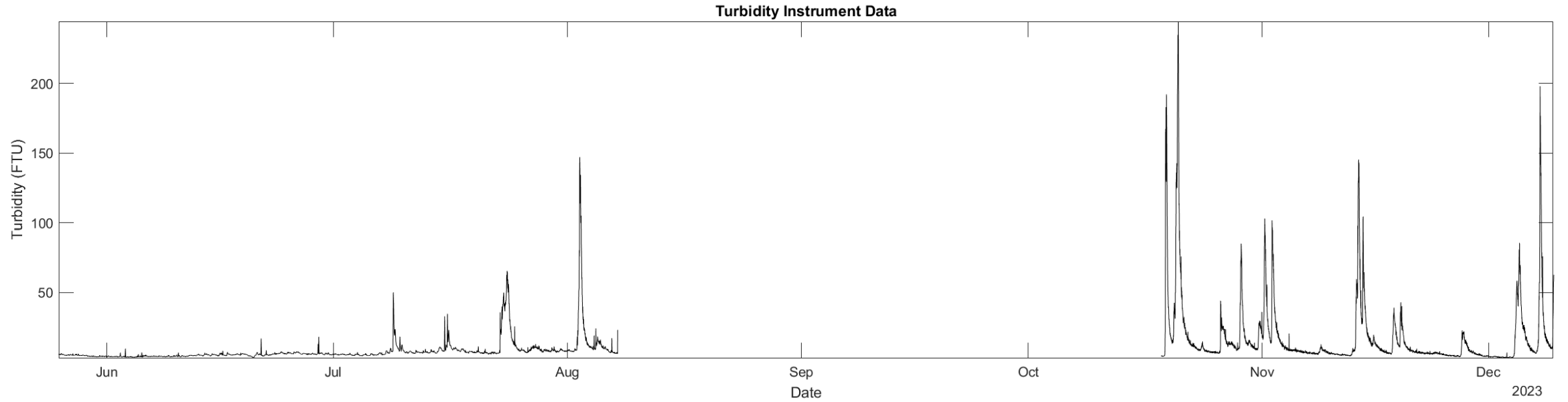


- ▲ Calibration pressure sensor (atmospheric)
- ▲ Pressure sensor deployment
- ⊗ Turbidity sensor deployment
- ▲ Weather Stations

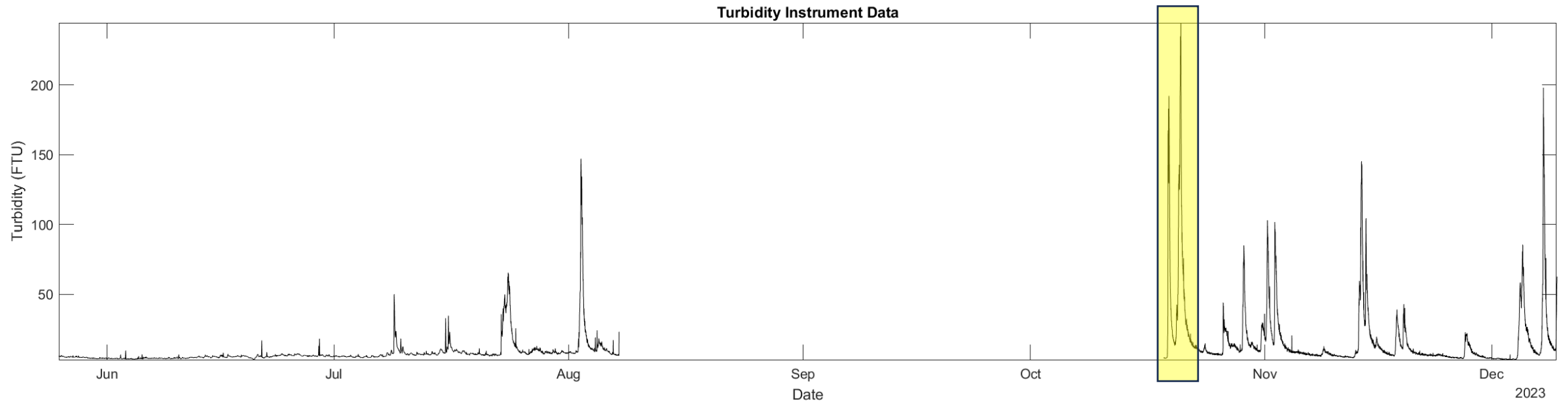
River Skell – Depth Data



River Skell – Turbidity Data



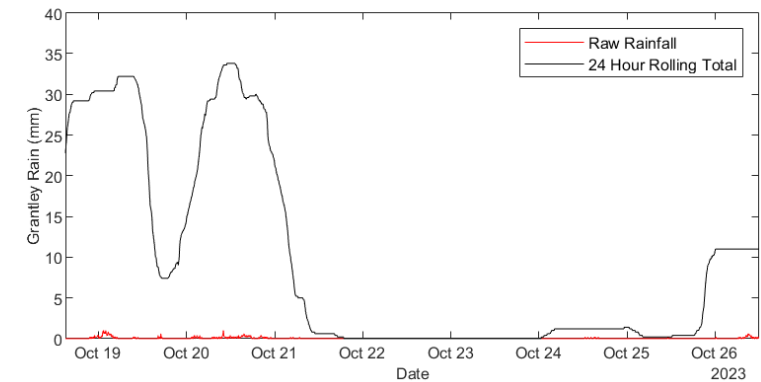
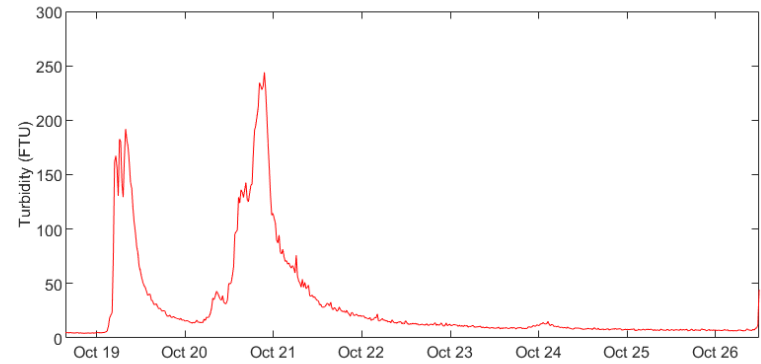
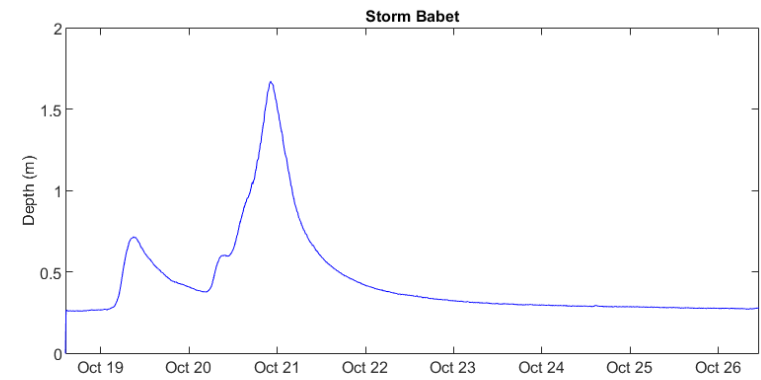
River Skell – Turbidity Data



Data Case Study

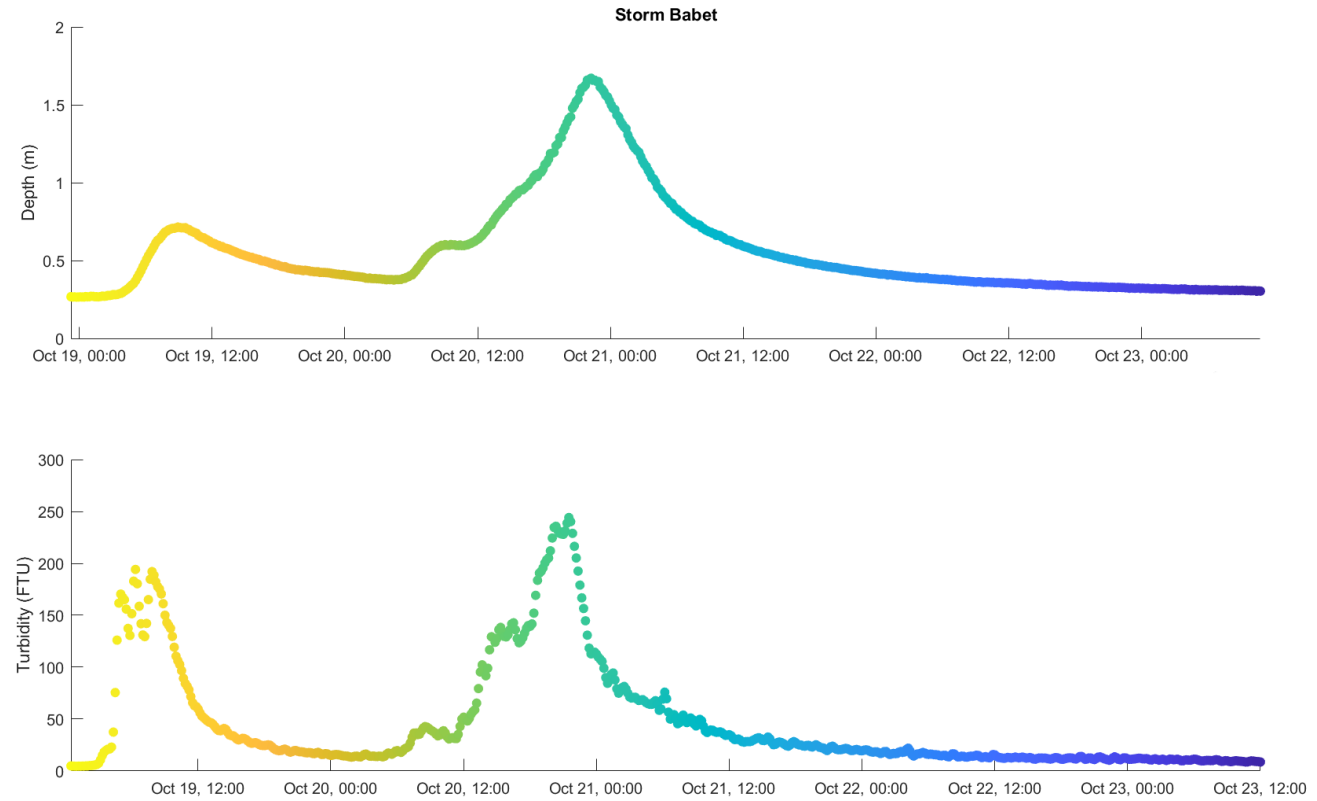
Storm Babet

- Large Storm 19th-21st October 2023
- Two ~ 30 mm rainfall events
- Significant and rapid rise in both level and turbidity
- Fast drop after the 1st event, slower after the 2nd



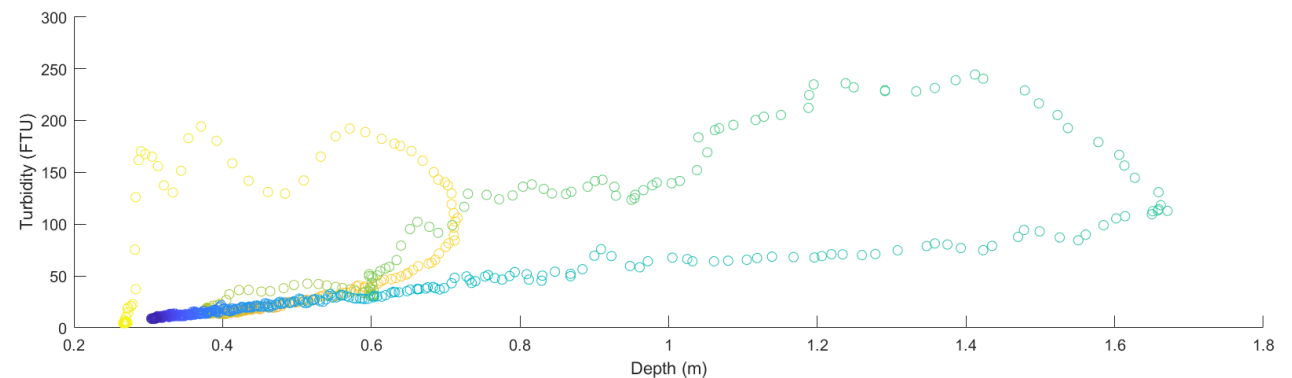
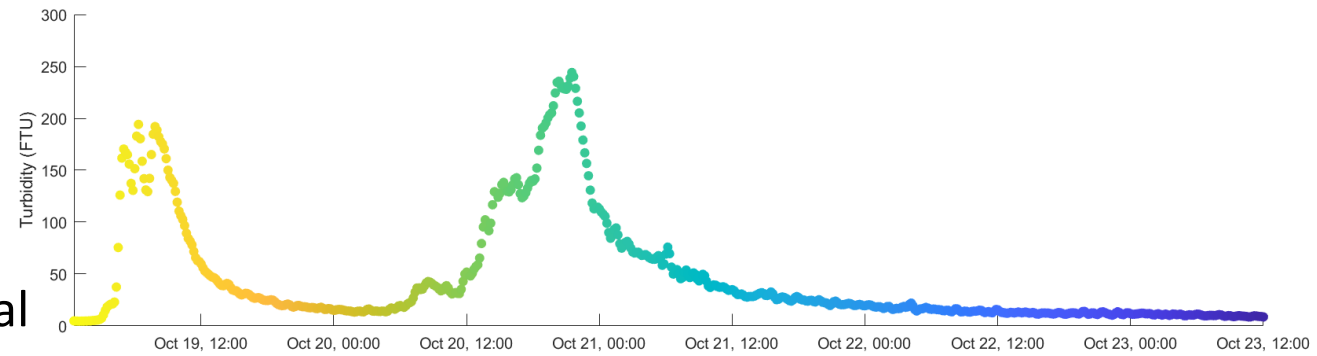
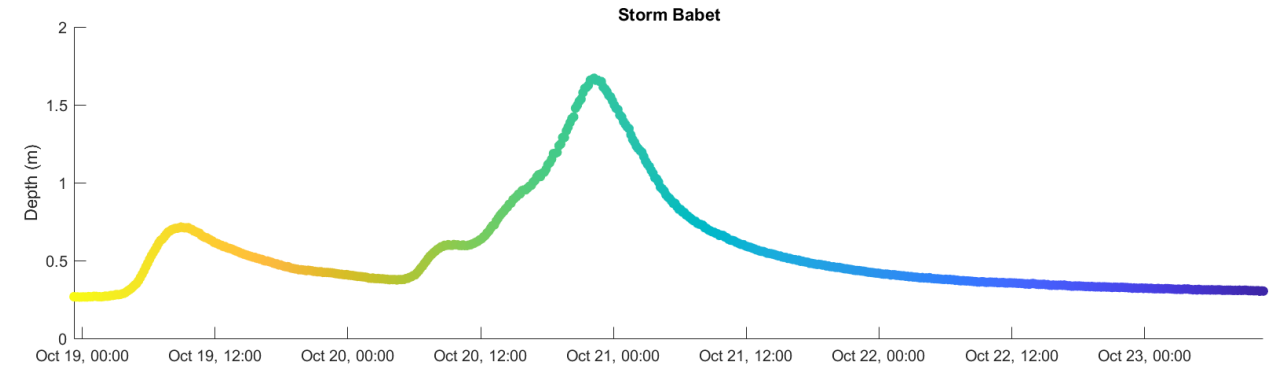
Storm Babet

- Time coded plot of level and turbidity data
- Very rapid initial rise in turbidity



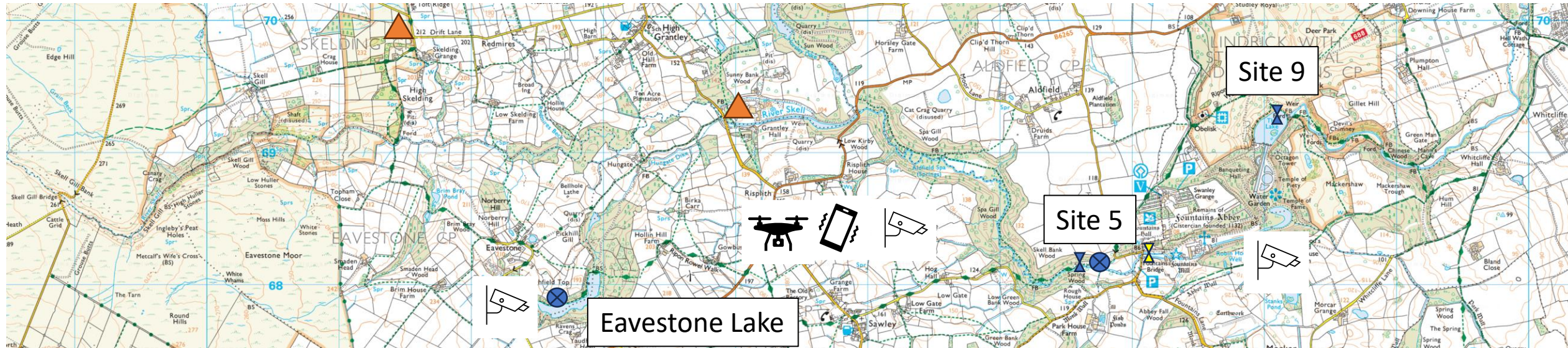
Storm Babet

- Time coded plots.
- Expected hysteresis, fast rising limb.
- Extremely fast rise in turbidity, preceding the increase in water depth.
- Very significant sediment discharge before the arrival of the water.



Skell Valley – Monitoring Natural Flood Management Interventions

Skell Valley – Monitoring Natural Flood Management Interventions



 Level Board and Camera

 Repeat UAV Surveys

 Repeat Phone LIDAR

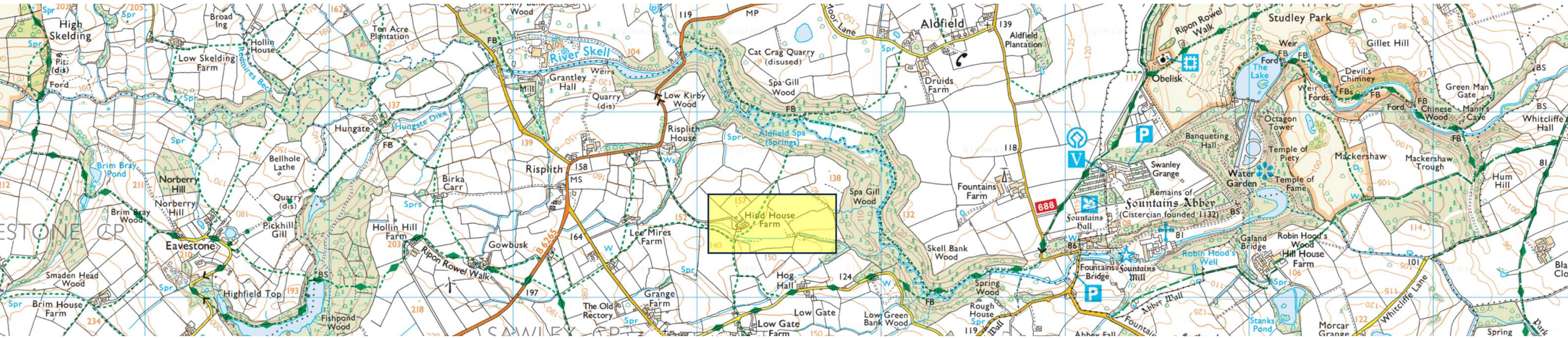
 Calibration pressure sensor (atmospheric)

 Pressure sensor deployment

 Turbidity sensor deployment

 Weather Stations

Skell Valley – Monitoring NFM



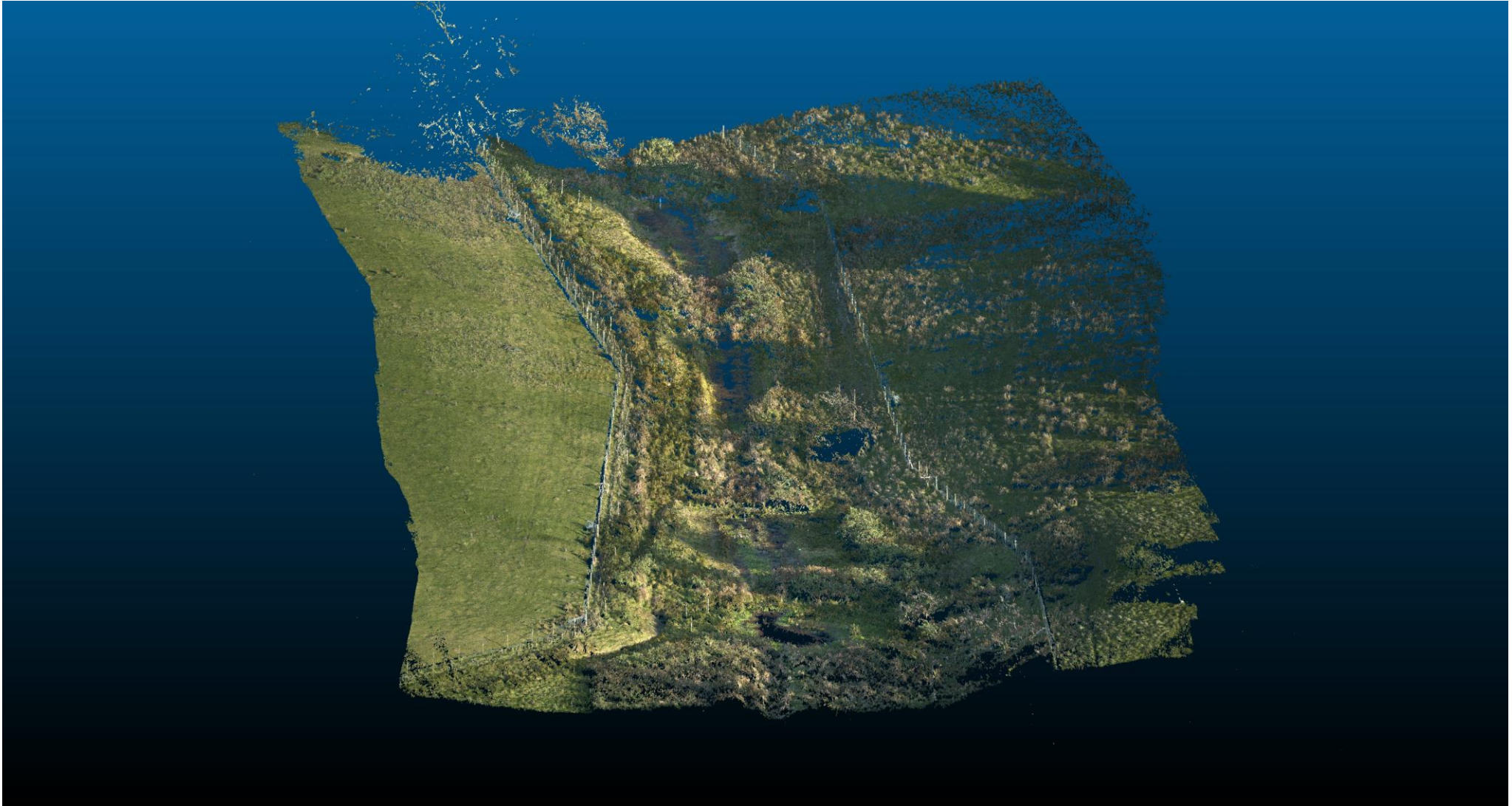
Hind House Farm

- New fencing to provide stock free buffer around wetland area
- Four interlinked ponds with leaky dams
- New tree planting
- Monitored with level boards and trail cams, drone surveys and phone LIDAR

Skell Valley – Monitoring NFM

Hind House NFM
10.11.2023

Skell Valley – Monitoring NFM



Skell Valley – Monitoring NFM



Skell Valley – Monitoring NFM



We are not directly monitoring ecological change – but it is hard to miss...

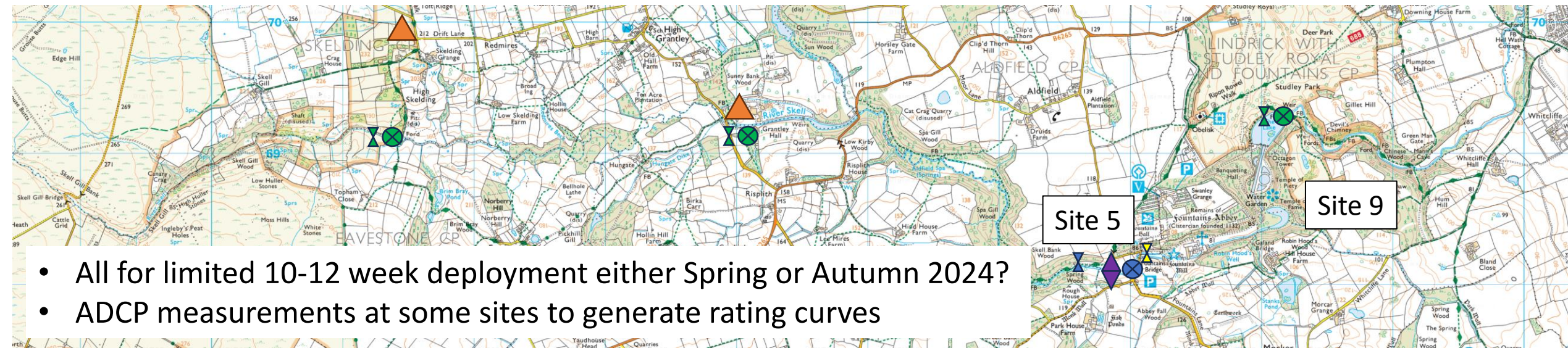
Future Monitoring Deployments

Future Monitoring Deployments



- ⚠ Calibration pressure sensor (atmospheric)
- ⚠ Pressure sensor deployment
- ⚠ Proposed pressure sensor deployment (with modem)
- ⊗ Turbidity sensor deployment
- ⊗ Proposed Turbidity sensor deployment (with modem)
- ◆ Pump Sampler
- ▲ Weather Stations

Future Monitoring Deployments



- All for limited 10-12 week deployment either Spring or Autumn 2024?
- ADCP measurements at some sites to generate rating curves

- ⚠ Calibration pressure sensor (atmospheric)
- ⚡ Pressure sensor deployment
- ⚡ Proposed pressure sensor deployment (with modem)
- ⊗ Turbidity sensor deployment
- ⊗ Proposed Turbidity sensor deployment (with modem)
- ◆ Pump Sampler
- ▲ Weather Stations

Opportunity mapping in the Skell valley

Dr Stephanie Bond, iCASP, University of Leeds

Previous research looked at risk of overland flow and sediment erosion within the Skell valley. We used this research to ground-truth opportunities for NFM alongside farmers.

- NFM opportunity maps on farms contain sensitive site information – contact s.g.bond@leeds.ac.uk for any enquiries