

16th October, 2020



11 years High-Resolution Water Monitoring

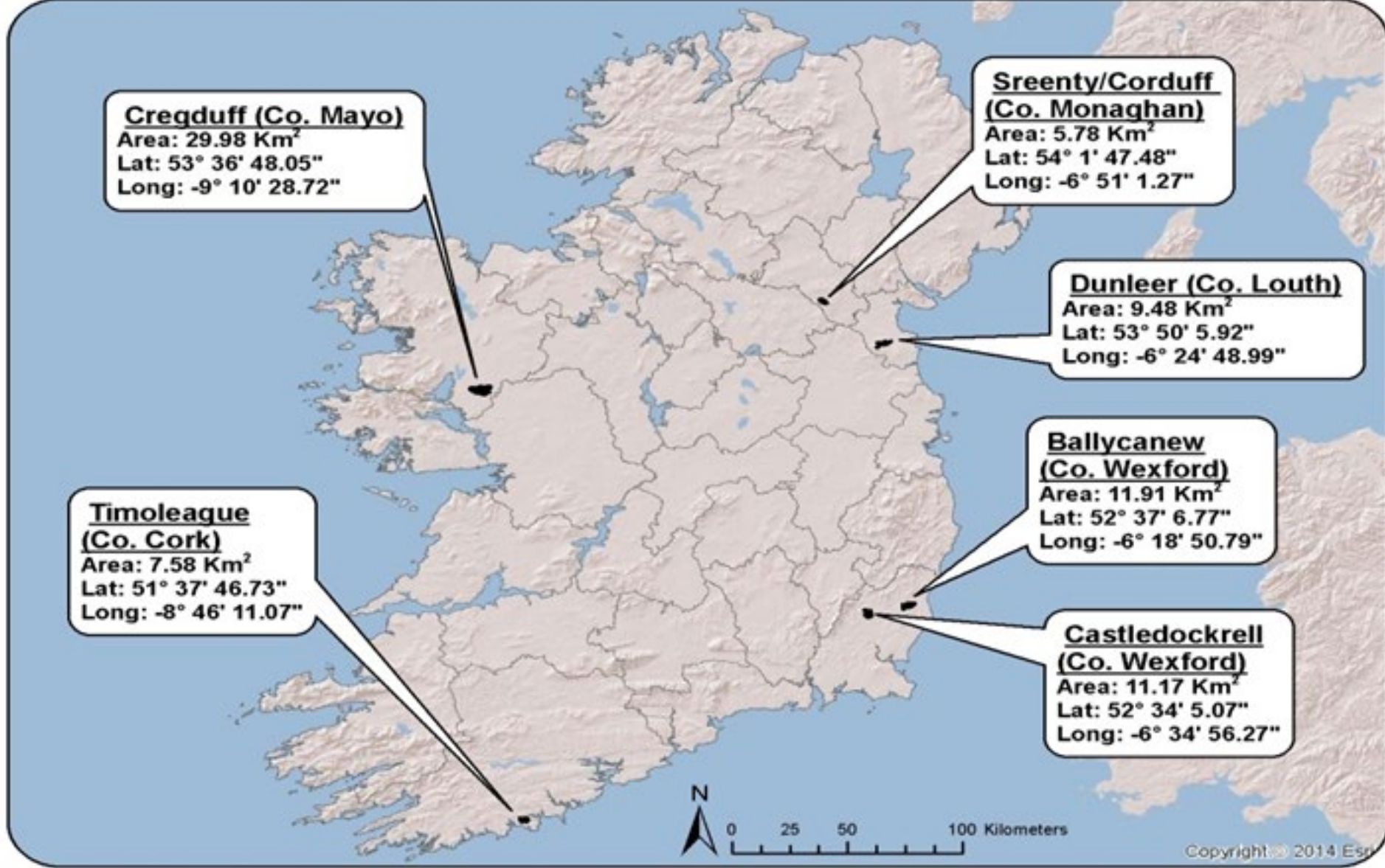
An overview of the equipment and methods undertaken
by the ACP in six agricultural catchments

David Ryan, Technologist, Agricultural Catchment Programme



What is the ACP ?

- **Funded by the Department of Ag. Food & Marine**
- **Established in 2008**
- **Nitrates Directive evaluation**
- **Agricultural impact on water quality**
- **Differing soil and drainage types**
- **Representative of the predominant farming types**
- **Experimental design repeated across six catchments**



Experimental Design

- Weather Data – Campbell Scientific met station
- Multi – level ground water monitoring
- Monthly snapshot sampling
- High resolution quality & quantity
 - every 10 minutes, < 450,000 data points / year / kiosk
- Bi-annual ecological sampling
- Data management - WISKI



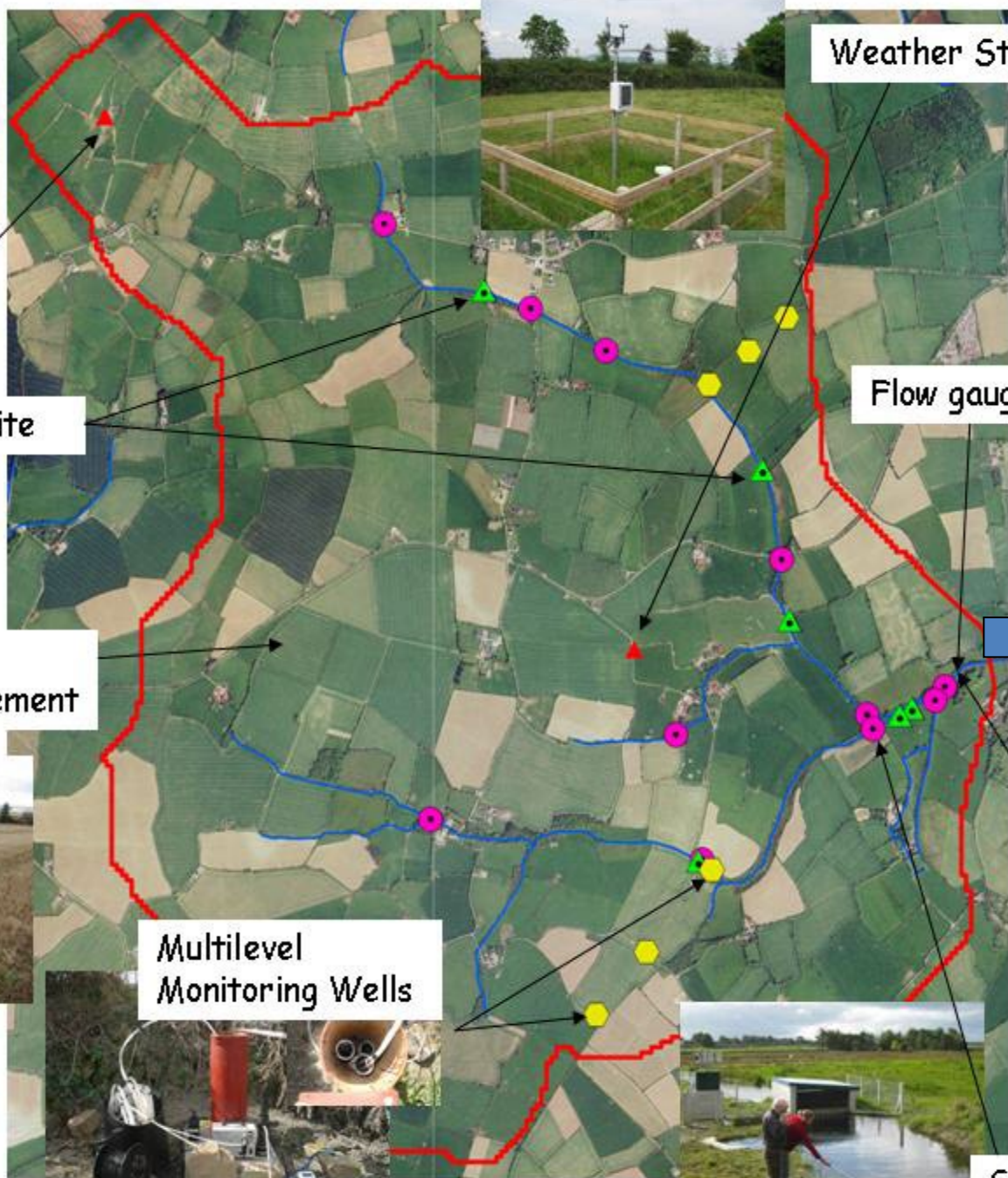
Rain Gauge



Weather Station



Flow gauging



Ecology Survey Site

Soil Sampling /
Nutrient Management



Continuous water
quality analysis



Multilevel
Monitoring Wells



Snapshot Site



Rain Gauge





Catchments Weather Information

Hourly Update

[Disclaimer](#)

Ballycanew



Castledockerell



Cregduff East



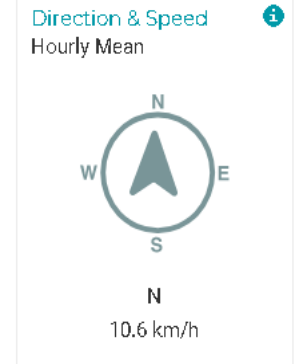
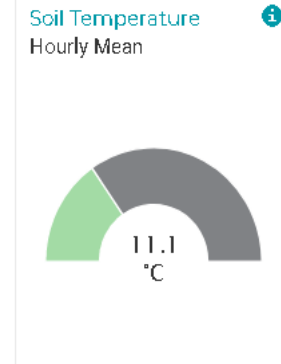
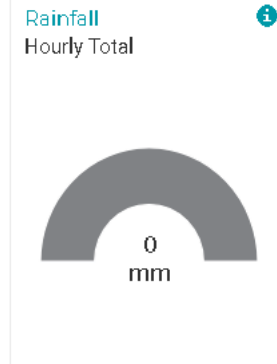
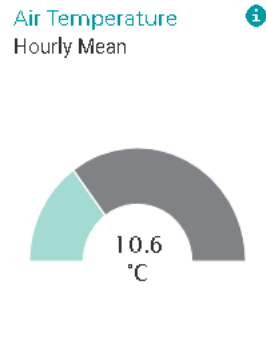
Cregduff West



Dunleer



Tue 13th Oct 2020, 17:00 - 18:00 IST



More Details

Timoleague



Creevy/Corduff



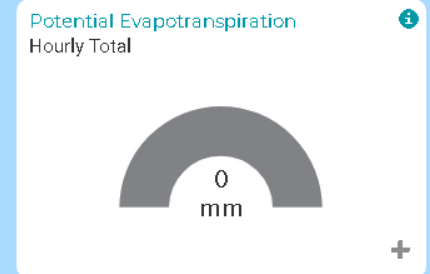
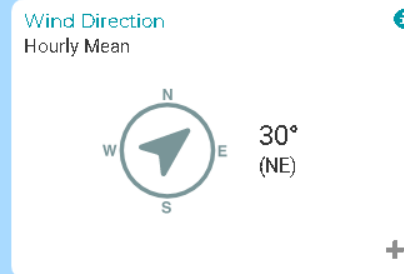
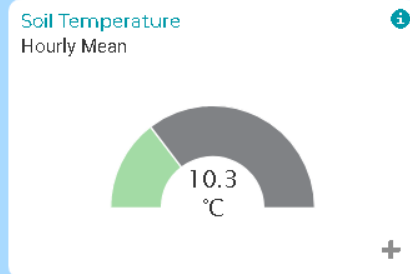
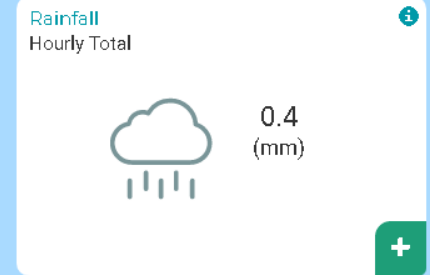
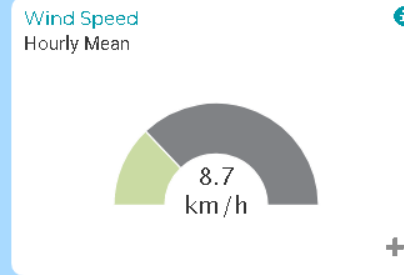
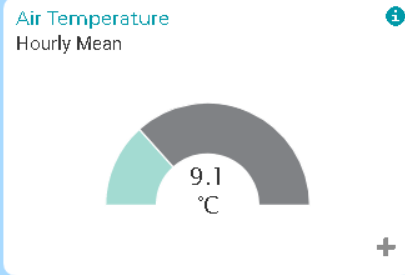
Sreenty/Corduff, County Monaghan

◀ Change Catchment



Description Of Catchment Area

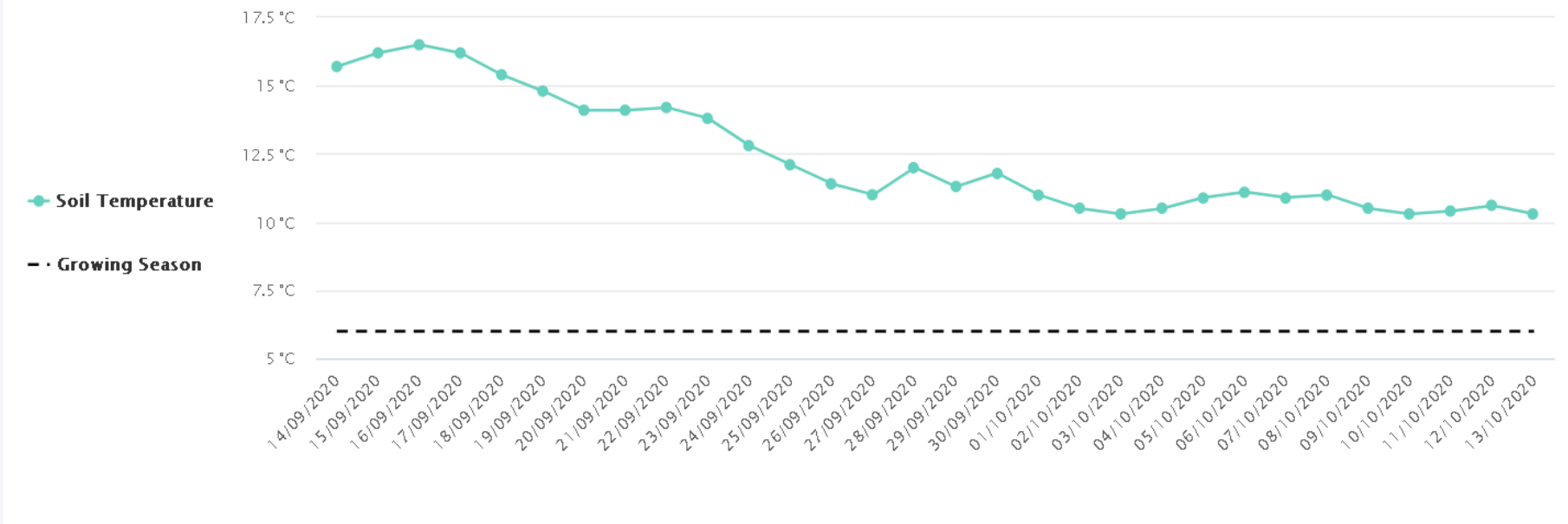
Tue 13th Oct 2020, 14:00 - 15:00 IST ⓘ



30 days ▼

[▲
Back to top](#)

Soil Temperature Daily Mean



Growing Season: The grass growing season closely approximates to the period during which the soil temperature is consistently above 6°C, at a depth of 100 mm (4 inches). Below this critical temperature little or no appreciable grass growth.

Date	Daily Mean (°C)	Daily Max (°C)	Daily Min (°C)
14/09/2020	15.7	16.4	15.2
15/09/2020	16.2	17	15.7

Reason for Download

Download Soil Temperature Data

Monthly Ground Water Sampling



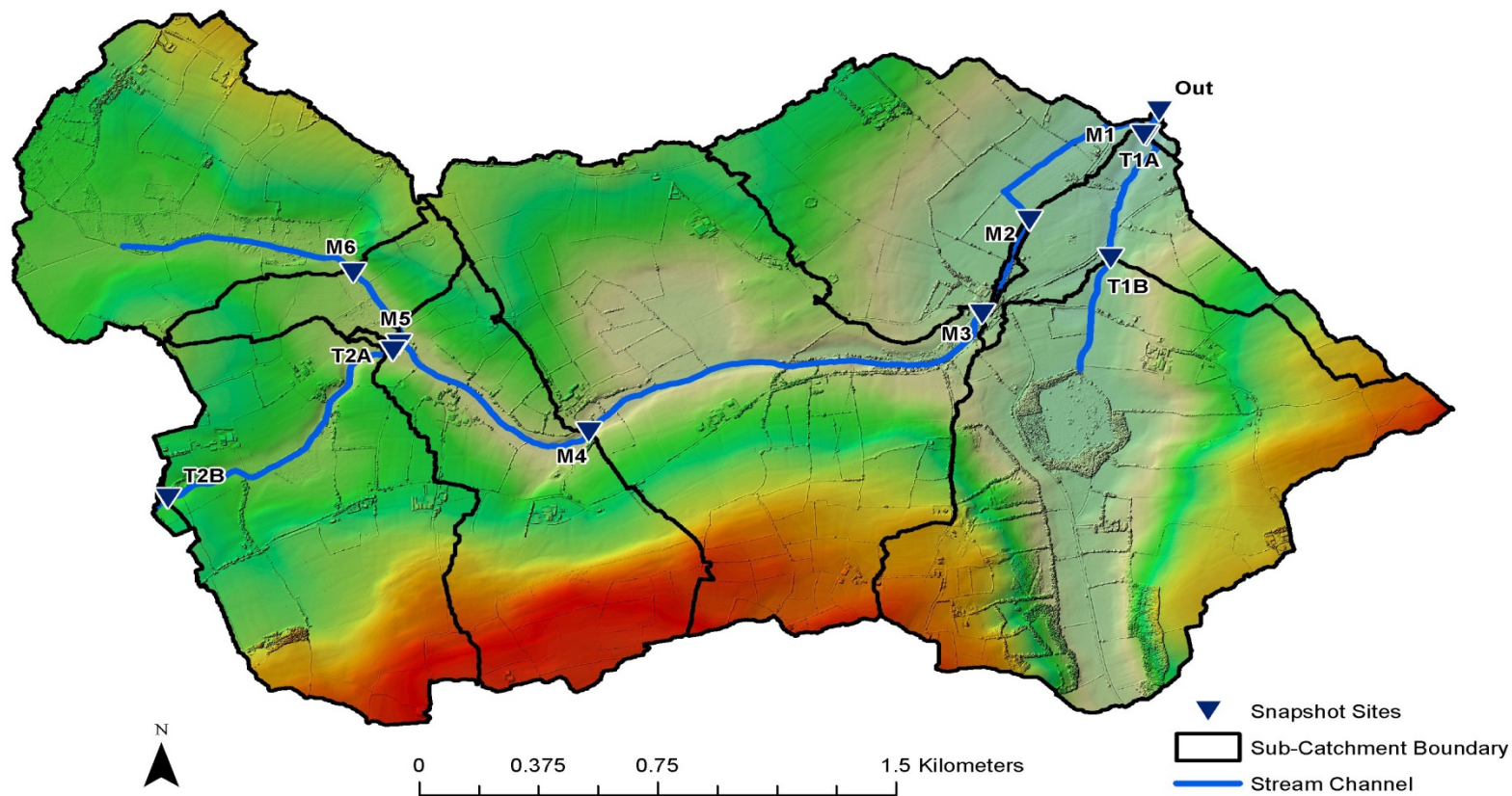
- Aquaread

Monthly Surface Water Sampling



- Total P
- Total Reactive P
- Total N
- Nitrate N
- Bi-annual Ecology
 - Aquaread
 - BOD
 - Alkalinity

Timoleague Catchment Snapshot Sites





Bi-Annual Ecological Survey

Outlet Hi-Res Monitoring - Kiosk



Outlet Hi-Res Monitoring - Kiosk

- **Hach Phosphax Sigma:** **Total & Ortho P (mg/L)**
- **Hach Nitratax:** **Nitrate N (mg/L)**
- **Hach Solitax:** **Turbidity (NTU) Sediment**
- **Hach UVAS TOC:** **Total Organic Carbon**
- **Hach 3400 sc:** **Conductivity (uS/cm)**
& Temp.(°C)

Dexdyne Ltd. Netrix SQL server –

- Real time data
- Text notification
- Remote monitoring

Measurement Reading

Total Phosphorus	<input type="text" value="0.03"/>	Flow Rate	<input type="text" value="0"/>
Ortho PhosphateP	<input type="text" value="0.02"/>	Flow Velocity	<input type="text" value="0"/>
Nitrate	<input type="text" value="7"/>	Flow Level	<input type="text" value="0"/>
Turbidity	<input type="text" value="1.75"/>	Temperature	<input type="text" value="10.68"/>
Conductivity	<input type="text" value="179.75"/>	Total Org Carbon	<input type="text" value="14.26"/>

Alarm Status

Phosphate Analyzer	<input checked="" type="radio"/>	<input type="radio"/>
SC1000 System	<input checked="" type="radio"/>	<input type="radio"/>
Low Tank Alarm	<input checked="" type="radio"/>	<input type="radio"/>
Pump Run Alarm	<input checked="" type="radio"/>	<input type="radio"/>

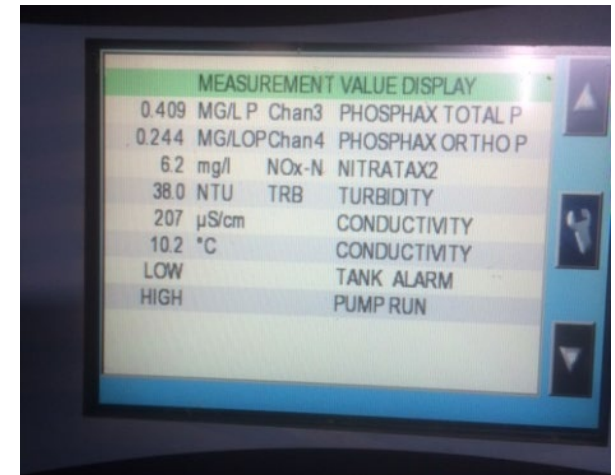
Controls

Reset	<input type="text" value="Off"/>
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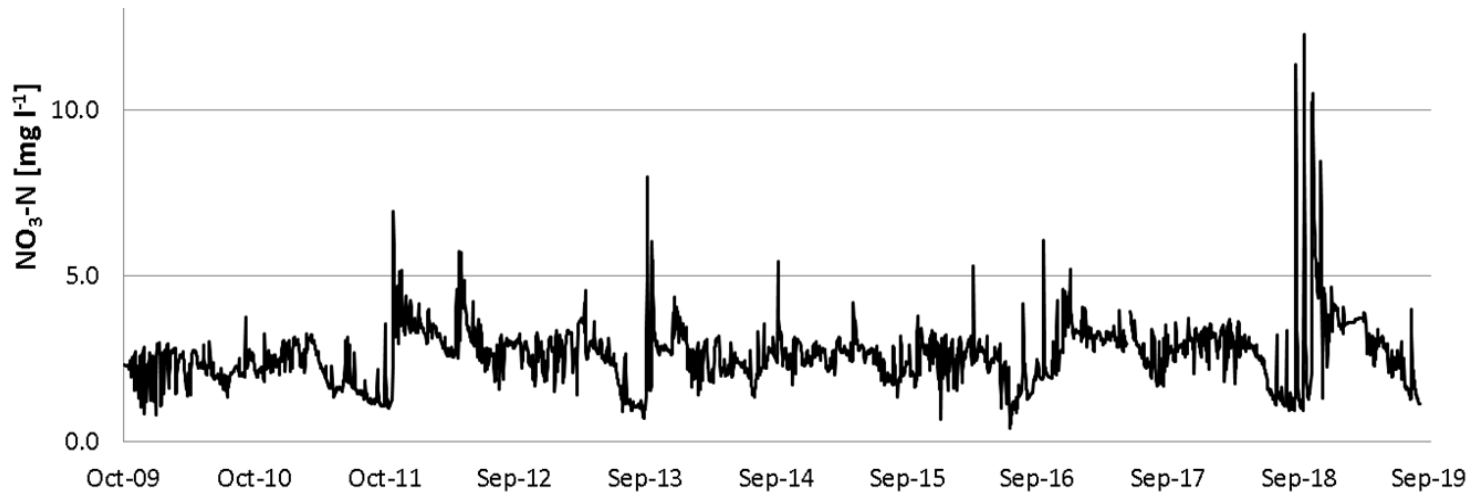


Data collection since 2009

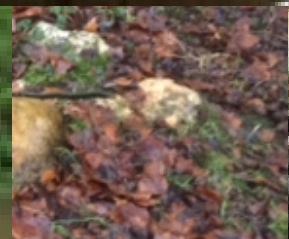
- Phosphax (TP and TRP) - **fortnightly**
- Nitrate, Turbidity, Total Organic Carbon, Temperature and EC data collected by SC1000 - **monthly**
- Solinst level loggers - **monthly**
- Flowlink & OTT (Orpheus mini & ecoLog) - **monthly**



Ballycanew nitrate-N high resolution time series



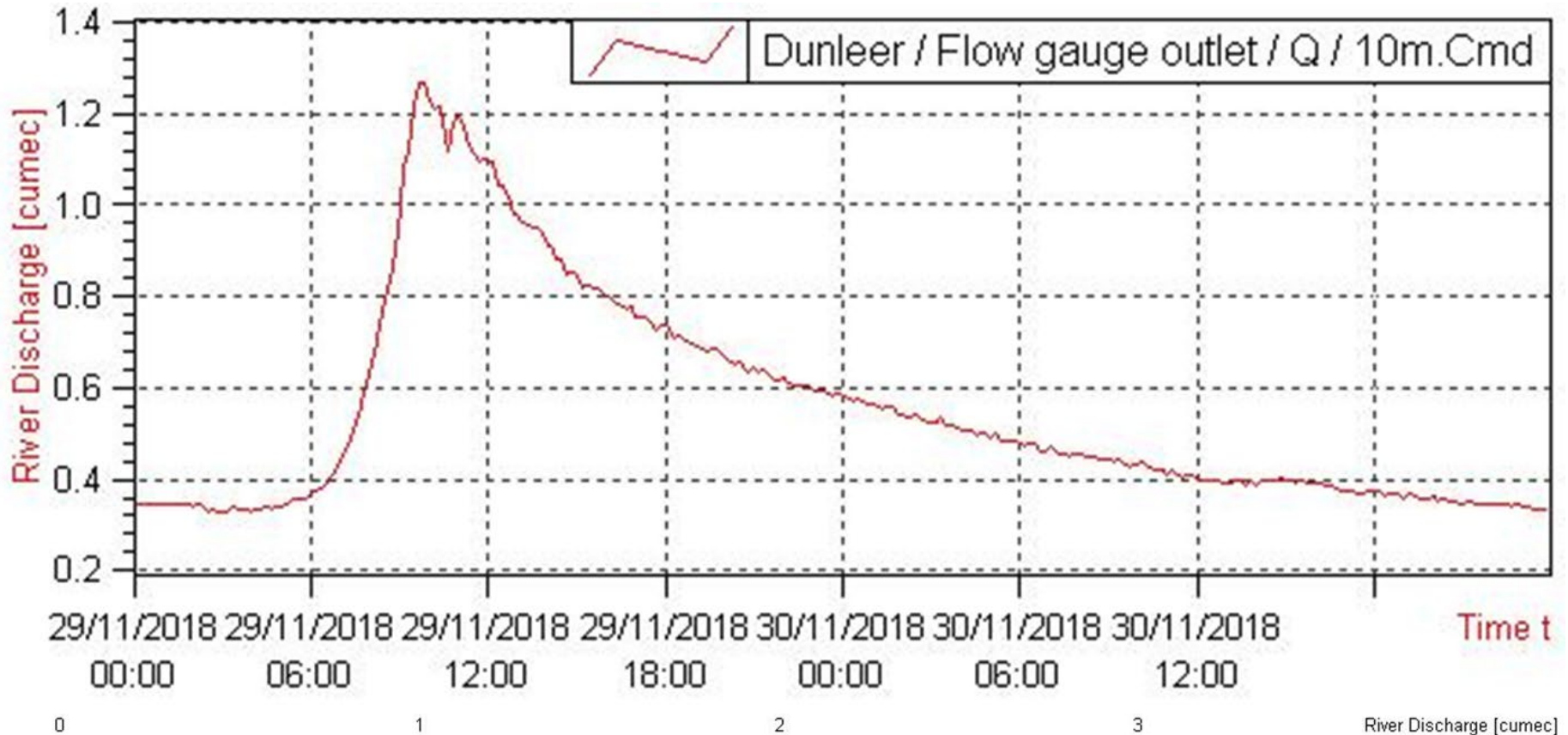
Eleven year daily average nitrate-N concentration in Ballycanew



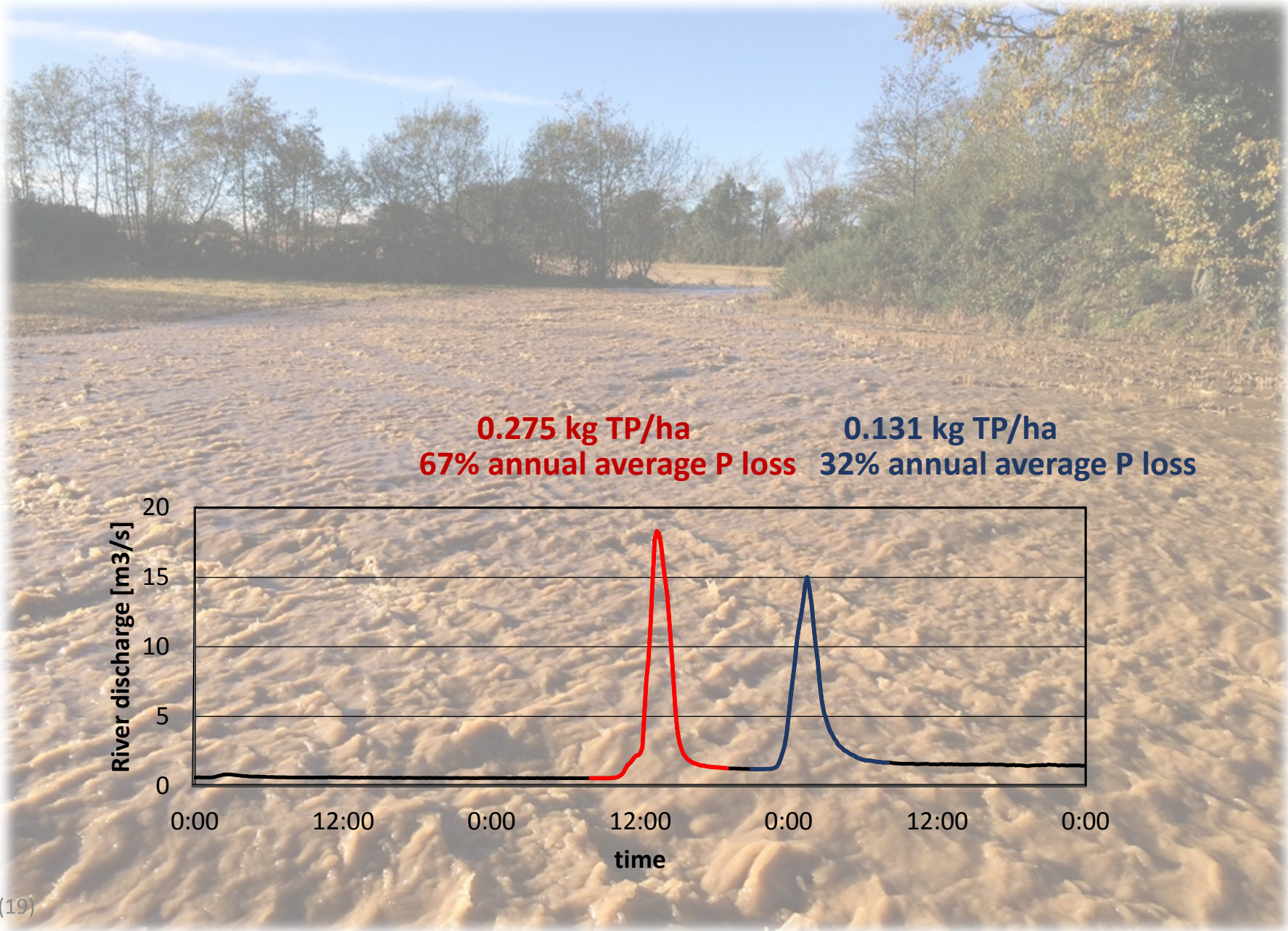
- Flow gauging – discharge rating curve



Hydrometrics combined with Nutrient Concentration



“N risky” catchment becoming “P risky” 13-14th Nov 2014



enced since 2009



Mobile water quality instrumentation for site specific measurements.



- ISCO Auto-samplers and velocimeters
- EXO1 mutli-parameter sondes
- Aquaread units
- Solinst level loggers



Teamwork and Training

