

Tyn y Fron: Notes from field visits for tensiometers and OLF

15/06/05	Attached logger to tensios and degassed					
19/07/05	Downloaded data and on inspection noticed that all sensors were giving the same, non sensible, readings. This was attributed to a storm event that may have caused some sort of electrical surge in the logger. The same was observed in all manipulation plot loggers.					
26/07/05	Degassed tensios and cut grass Re-installed tensios at 10 cm depth. Not all but those that were lose as a result of the dry conditions					
01/09/05	Changed the wiring.					
1/11/05	Data was downloaded. All holes were full of water because the pump battery had run out. All gutters were blocked, mainly with dead worms.					
09/11/05	Traps full of water and gutter blocked. Do not know for how long it was blocked. Ignore any data between collected in the afternoon of this day.					
30/11/05	problem with data download – gap in data on 27/11/05, only one hour missing.					
07/12/05	grass cut by tensios. Also cut the cable of tensio 1.50- removed from the site OLF trap 3 blocked 06/12/05. Unblocked 7/12/05 Data missing from 5-7/12/05					
14/12/05	Any tips that may have occurred on the 14 th and 15 th of December are due to soil sampling in the pits					
30/12/05	Trap 3 was not tipping even though water was flowing into the trap.					
4/01/06	Trap 3 bucket had fallen to the side, which was why it was not tipping. Been repaired and is now tipping.					
10/1/06	Tensios degassed					
20/01/06	Traps all working correctly					
25/01/06	Alex worked on the plots, see table below Notes from Alex- tipping bucket removal for sediment sampling					
	<table><tr><td>Plot</td><td>Date</td><td>Time disconnected</td><td>Time reconnected</td><td>Tips</td></tr></table>	Plot	Date	Time disconnected	Time reconnected	Tips
Plot	Date	Time disconnected	Time reconnected	Tips		

				audible
	1	25/01/2006	14:24	15:00
	2	25/01/2006	15:52	16:12
	3	26/01/2006	10:35	10:55
01/02/06	Battery at 0%. Stopped logging on 16 Jan. Changed battery. Needs new descant. Traps all working correctly. Batteries changed			
17/02/06	Plot 3.1 only has two Tensiometers (no 50). The cage here had been moved and the 10cm tensiometer was sitting in water, needs to be reinstalled when the 50 is put back in. Vents checked. Needed clearing on 3.3 50cm Delta T Battery OK. Traps all working correctly. Batteries changed			
28/02/06	Delta-T not logging, restarted.			
24/03/06	Trap 2 T/B had come off its rocker			
30/03/06	Trap 2 blocked – sediment needs to be removed. Plot 2 has a similar problem to that of Rhos 2 where rivers of water are running onto the over land flow traps.			
05/04/06	~ 1600-1630GMT - Glued nuts on OLF tipping buckets. Tips at this time should be disregarded. Trap 1 was off its rocker.			
06/04/06	– re-installed 50cm tension @ plot 3.			
07/04/06	Alex was collecting sediment samples, tips should be ignored between 10 and 6.			
20/04/06	~1430-1530 GMT tips should be ignored as checking t.b. rocker nuts were still glued – all ok. Degassed tensios. Changed battery on Delta-T. Ground was very wet and trampled by sheep around the cages. Changed big battery.			
04/05/06	Cut grass and checked vents – all OK Repaired damaged lawn edging on plot 1			
09/05/06	Trap 1 tinytag appears not to be working although reed switch may also sometimes get stuck – removed. Delta-t logger had stopped programme re-sent and logger restarted.			
10/05/06	T/b 3 working ok. T/b 2 - 3 beeps / 2 tips. This must be factor into the determination of previous flow rates. Problem fixed but requires recalibration.			

	T1 – recalibration required – new tiny tag fitted.
18/05/06	Batteries changed for OLF, all working OK
25/05/06	Trap 2 blocked Both Trap 1 and 2 need sump pipes replacing Trap 3 is collapsing, in need of urgent attention
31/05/06	Battery changed for OLF all working OK
01/06/06	Repaired hole for Trap 1, need to look at Trap 3 Cut grass and degassed
12/06/06	Replaced sumps for Tyn Fron, cleared out sediment from sump. Enlarged pits to house the pump on the dexian frame, ignore tips from t/b during 1-6.30. Need to repair lawn edging. Sheep had chewed battery cable, but no water in the pit and only 1 rain event on the 11/06/06, so no effect. Fixed battery.
21/06/06	Checked battery for OLF- OK
29/06/06	Cut grass and degassed
04/07/06	Lined pit 3.1, tipping bucket calibration for all plots
07/07/06	Degassed tensios. One found lose at 3.1
14/07/06	Degassed tensios.
18/07/06	Replaced lawn edging with deeper stuff and filled in edges with soil. sump covers fitted- ignore tips.
19/07/06	Permeameter. Degassed tensios and in trees. Finished edging and filling.
20/07/06	Permeameter
21/07/06	Permeameter
27/07/06	Reinstalled 3.1 10cm and 3.2 10cm
01/08/06	Battery lead disconnected on delta t. logger box changed aspect. Changed battery for olf and delta t. logging on delta t stopped on 25 th July 0350GMT. Delta t stopped at around 1515 and restarted for 1520 GMT as settings screwed up after battery failure. Battery had fallen down when logger box was knocked. Downloaded tiny tag.
03/08/06	Degassed

16/08/06	Degassed. Tensiometer at plot 2 nearest left when looking uphill was found bent over 90 degrees. Straightened.
23/08/06	Degassed. Replaced tensiometer for plot 3.3 10cm. changed big battery.
30/08/06	Fitted new sump covers. Replaced lawn edging.
31/08/06	Traps all OK. Delta t had stopped logging- low battery. Need to look into this as it doesn't last a month.
28/09/06	All tensios degassed and grass cut. Changed big battery.
04/10/06	OLF time. Last record shown was 0930 GMT although actual time on computer was 0923. Therefore OLF logger slightly ahead. Therefore, TT reset.
12/10/06	855 GMT pump batt. Changed. All pumps working
19/10/06	T/B's were checked after concerns of so few tips being recorded. T/B seem to be working correctly as Delta-T was showing 6 tips after pouring water down the gutter. Couldn't check Tiny tag as no cable. Ignore any tips between 10-11am BST. Trap 2 was slightly blocked, although water could still flow, cleared by blowing through the pipe. 3.1 30cm tensiometers still missing.
26/10/06	Trap 2 hole full of water
27/10/06	Grass in cages cut
08/11/06	Float switches in all 3 OLF traps replaced
27/11/06	Cage had been removed by sheep and pulled out 10 cm tension and damaged 50 cm tension at plot 1. No 30 cm depth tension present.
28/11/06	Reinstalled 10 cm tensio and removed 50 cm tensio.
06/12/06	Cut grass. Reinstalled tensios. 30 and 50 cm at plot 1. Plot 3, 30 cm tension wire cut therefore replaced with another.
13/12/06	All pits full of water Marked out plots
14/12/06	Battery replaced at 8.00, leaves cleared from trenches
04/01/07	OLF traps full of water . Pumps 1 & 3 started working once new battery was installed. Pump in trap 2 did not and is therefore still full of water. It was discovered that a tension in cage 3 had had

	the tubing removed. This was replaced . Couldn't download from tiny tag as pit was still draining and in heavy rainfall.
17/01/07	All OLF traps full of water. Changed battery and trap 3 pump started working and hole drained. Trap 2 and 3 pumps didn't work. Trap 2 pump was replaced and started working. Trap 3 pump was removed.
23/01/07	Work carried out between 12:00 and 16:00. Replaced pump in trap 1. Worked fine. Downloaded tinytag to check if OK- it was. Changed layout in holes of traps 2 and 3 to ensure float switches couldn't catch on anything. Checked delta-T logger was recording correct number of tips for traps 2 and 3- it was.
28/02/07	The rubber tubing from one of the tensiometers in plot 3 had come off but there was no evidence of damage so must have been the wind. This was put back on.
06/03/07	All holes full of water and big battery dead.
08/03/07	Big battery replaced and all pumps and switches appear to be working OK.
15/03/07	Carried out ring infiltration experiment in the morning.
22/03/07	Cut grass
04/04/07	Delta T battery had run out less than a day after replaced on the monthly download. Replaced for one with lots of charge. Hopefully just a dud battery. Accidentally lost that days data. Ignore tips ~07:30-08:30GMT. All recorded fine. BUT with a full gutter plot 1 tipped every 6 or 7 seconds whereas plots 2 and 3 tipped every ~ 10 seconds. 10cm tensio in plot1 had inner wire exposed but didn't look to be cut. Didn't have spare tensio so taped around the exposed wire.
13/04/07	Delta T battery OK. Downloaded trap 1 tinytag then replaced battery, seal and desiccant.
23/04/07	Degassed all tensios. Cut grass in plot 2~ 1545-1605
13/06/07	Removed tensio 1.10 as not working
28/06/07	All holes full of water, but drained OK when big battery replaced. Trap 2 pump sounded slightly funny though and did not drain hole as quick as other holes.

	Trap 3 gutter had evidence of a mouse nest but probably wouldn't have stopped water flowing. Cut grass in control tensio cage
24/07/07	Pump Battery voltage 12.1
31/07/07	All holes OK
15/08/07	Re-dug trenches around plots
31/08/07	All traps OK
04/09/07	Marked out survey quadrats
19/09/07	Destructive harvest in buffer strip of plots
25/09/07	One of tensiometers had tubing pulled off, put back on but not de-gassed
01/10/07	One of tensiometers had tube pulled off again Lots of nest material in gutters One of foam protective covers for tensios destroyed
02/10/07	Float switches cleaned and sprayed with WD40. Cleared gutters. Cut grass in cage in control plot. In 3.1 the pump was rehoused as stake loose (ignore tips) In 3.2 pump replaced as sounded dodgy In 3.3 filled in gap between lawn edging and soil 10cm hole (with 50cm tensio) had been pulled out (fox?)
09/10/07	All OLF traps OK. Frog in gutter of plot 3, when jumps onto TB it tips!
12/10/07	De-gassed all tensios
18/10/07	50cm tensio in plot 3 had tubing pulled off again. Replaced with new tubing, degassed then put the foam cover on this tensio instead of other. Replaced 3.10cm tensio tube also as previous one was very short. Put experimental corrugated plastic material on plot 1 OLF gutter to try and discourage voles from using it as nest site. Wasn't quite long enough so used plastic sheets to cover one end.
24/10/07	No nest under plastic cover of OLF trap and some nest material under wooden cover which suggests plastic sheet working.
25/10/07	Still no nest under plastic cover of OLF trap but also no nest under wooden cover (although this was cleared out yesterday!)

23/10/07	Took N cores and checked all traps clear. No obvious problems.
30/10/07	14:00. Checked tipping buckets. Ignore tips during this time. Plot 3.2 and 3.3 working OK. Nothing on 3.1, problem with Reed Switch, removed tiny tag and tipping bucket.
22/11/07	Pits flooded when arrived. All drained OK. Problem must have been caused by pit 3 as the pump in this pit was sounding dodgy (but was working) and there had been a build up of soil under float switch which could have caused it to stay on. All traps working OK when left. Re-installed tipping bucket in pit 1 with new reed switch (15:35GMT). All working OK.
27/11/07	Pit 3 water slightly above float switch as lump of grass had fallen from edge of pit onto it. Don't think water high enough to effect tipping bucket. All pits OK.
11/12/07	Pits full of water, battery replaced and all pits emptied.
20/12/07	Found cage off tensios in plot 2, 10cm one loose, one other had tubing off, put this back on, no other obvious problems.
03/01/08	Tinytag in plot 1 not working, wet. Big battery had run out but water not quite up to tipping bucket height. Connector had come off delta T battery, when downloaded data only up to the 18/12/07 BUT when downloaded on 9/1/08 data from 18 th to 24 th appeared! Had to clear little bit of debris out of gutters.
09/01/08	Pits flooded, changed big battery and all drained OK. Downloaded Delta-T (see above!) then improved battery connection to avoid it coming off again. Re-inserted 10cm tensios in plots 2 and 3 because seemed too deep. Plot 3 30cm tensio also seemed to be very deep. Put new (not brand new) Tinytag on plot 1 TB but didn't seem to be working properly so removed and brought back to Bangor. Carried out TB calibration on plot 2 so ignore tips around 11:30. Calibration plot 1 = 6,7,7,8,7,8 and plot 2 = 5,6,6,6,6,6.
15/1/08	Powered down Delta-T, took lithium battery out then started up again and re-submitted the program at around 11:00. 3.1: detached OLF pipe from TB to sample 10:10-10:40. 3.3: detached OLF pipe from TB to sample 10:40-11:10.
18/1/08	Re-installed plot 1 tipping bucket with working Tinytag, started at 12:00. 3.1: detached OLF pipe from TB to sample 12:00-12:30. 3.2: detached OLF pipe from TB to sample 12:10-12:40.

	<p>3.3: detached OLF pipe from TB to sample 12:20-12:50.#</p> <p>The pit at plot two was filling with water quicker then it could be emptied by the pump. Trench had overtopped too and looked like it had been entering the plot.</p>
22/01/08	<p>After being dried out and changing the battery the Tinytag that was on the tipping bucket offloaded the data. However looks like stopped recording tips on the 12/12/07 (pits flooded?) and then Tinytag stopped working altogether on 26/12/07.</p>
23/01/08	<p>Delta T was 'standing by' and program was default rather than manip. There was therefore no data. Battery was also very low. Changed this and started logging with manip program. Checked this few hours later and was OK.</p> <p>Pits flooded so changed big battery and all drained OK.</p>
29/01/08	<p>Enlarged trenches above the plots, made the trench for the control plot much deeper to avoid water overtopping the trench.</p>
30/01/08	<p>Delta T downloaded OK but afterwards reverted back to default program and was using new laptop which does not have programs. Returned later with old laptop and retrieved correct program and all seemed OK.</p>
06/02/08	<p>Tested pits 2 and 3 TB's. Recording tips OK. Ignore tips. Tinytag in pit 1 downloaded OK but wasn't recording any tips when tested (there was also a blockage that cleared). Changed with dried out Tinytag that was in Tyn Fron before, recorded tips OK.</p>
11/02/08	<p>Checked tiny tag and delta T, both logging correctly. Checked bit battery, OK for power. Plots all clear.</p>
19/02/08	<p>OLF data for trap 3 for last month or so doesn't seem right, recording 1's and 2's in blocks when no rainfall!</p> <p>Tested today and delta T recording correct number of tips with every test! Most recent data also all zero which is what would expect as no rain. Remember to check data after a rainfall event as this seems to be when started going strange previously.</p>
04/03/08	<p>All pits full of water. Big battery had run out. When this was replaced all pits drained OK.</p>
13/03/08	<p>All pits OK!!! Although pit 2 has had bad collapse of walls and pit 1 pump sounds a bit weak.</p> <p>Wasn't sure which 50cm tensio was in plot 2 but one vent was buried and de-gassed all the tensios in this plot.</p>
18/03/08	<p>All pits OK although pit 2 wall collapse even worse.</p>
27/03/08	<p>All pits OK</p>

02/04/08	All pits OK
15/04/08	<p>All pumps working OK when arrived, however very intense rain/sleet/ hail caused pretty extensive overland flow and control plot pump couldn't handle amount of water running into the pit, mainly because receiving water from large area outside of trap. Gap in lawn edging caused by sheep meant OLF water was flowing into OLF trap! Eventually calmed and pump could handle amount of water. Replaced big battery. Put some lawn edging in across gap.</p> <p>Pit 1 TB wasn't tipping one way. Has it been like this since last tampered with (09/01/08?) Don't think can have been because recorded 2 tips on 23/03/08 04:49. After this however doesn't record any tips when other 2 plots record large event, suggesting problem could have been from 23/03/08 onwards. Removed and brought back to Bangor for inspection.</p> <p>Plot 2 10cm and 50cm tensios replaced with newly repaired and calibrated tensios in new holes. (253 and 234 removed, 288 and 383 inserted)</p> <p>Plot 3 50cm tensio replaced with newly repaired and calibrated tensio. (251 removed and 391 inserted).</p> <p>Cut grass in control plot tensio cage.</p>
17/04/08	<p>Put working tipping bucket back into pit 1 and started Tinytag.</p> <p>Stapled lawn edging inserted on 15/04/08 to wood. Still gap in wood but lawn edging in pretty solid.</p>
23/04/08	Imogens soil sampling
30/04/08	<p>Delta T had stopped and was on default program! Started again OK. No useful data at all though.</p> <p>Inserted piece of wood in gap in control plot OLF trap.</p>
01/05/08	<p>Checked delta T and was OK</p> <p>Something done to plot 1?</p>
07/05/08	Drains installed in all pits.
08/05/08	<p>Checked and downloaded delta T: was OK.</p> <p>Inserted larger elbow joins and tube from sump to TB in plot 1 OLF trap. Also removed pump and float switch. Ignore any tips at this time.</p>
15/05/08	Replaced elbows and tubing from OLF gutter to TB – ignore tips.

05/06/08	New OLF gutter covers put out in fenced off plots.
09/07/08	17:00 (BST or GMT – ask Zoe): Plot 1: Reed switch on wrong side of tipping bucket – corrected Plot 2: Not working Plot 3: OK
15/07/08	Replaced reed switch on tipping bucket at plot 2 12:33 GMT and working OK.
23/07/08	Installed plywood boxes in TB pits to shore up sides. Late afternoon – ignore any tips at this time.
14/08/08	Ignore tips on all TB's at around 16:30 – all working OK Plot 2: Drain in pit only just low enough on TB! Plot 3: OLF gutter cover had been damaged by what seems to be birds pecking through plastic. Holes repaired. Tidied up delta T box.
28/08/08	Plot 1 TB reading lots of large values. Dried out tinytag, although it didn't seem wet. Needs checking. Plot 1 also had damage to the gutter cover from birds. Needs repairing.
09/09/08	14:20 GMT. Checked calibration on all TB and that correct number of tips was recorded by the loggers. Plots 2 and 3 reading OK. Trap 1 was not recording any tips, even though it had done recently. Gutter cover on trap 1 repaired from bird damage. On trap 3 the cover had come unfastened at the sump end. This was reattached.
10/09/08	13:00 Changed Tiny tag on trap 1. At first it didn't seem to make any difference but after the connection was squeezed (looked to be water in there), it seemed to work. Was working when I left it but will need to redo the connection ASAP
02/10/08	Voies had chewed through the wire for TB1. Brought back to Bangor for repair. Covers for gutters had no additional damage, but will need repairing.
07/10/08	TB1 replaced back in the field. Will need recalibrating.
04/11/08	Adjusted the screw height on TB3 to see if it avoids the constant numbers after a storm event. Recalibrated TB 1 and 3. Tips were recording OK on the laptop.
24/11/08	Replaced the covering on the OLF gutters for the treatment plots, dug the pits out and reset the frames for the tipping buckets. For 3.2 the cable for the tipping bucket had been chewed, needs a new float switch as damage too close to TB to enable it to be

	fixed. Trenches may need enlarging soon. Checked tips for plots 3.1 and 3.3. Correct number recorded on the logger as those counted. Ignore tips during this time – 2-5pm
08/12/08	TB2 replaced back in the field. Unable to test as laptop stopped working in the rain. Covers removed from the tipping bucket holes at plots 3.1 and 3.3 to help stop vole damage to wires.
09/12/08	Miles checked that tipping bucket 3.2 was working ok.
16/12/08	Hannah noticed that in the corner of plots 3.1 and 3.3 near the tipping bucket there was a small gap under the fence large enough for a Badger or Fox to pass under. In 3.1 the black strip and old DeltaT cable had been ripped away from the guttering. It looked like this was the work of a fox/badger foraging for food. Possibly trying to dig out the voles that are nesting under the gutter. Holes need blocking. Tipping bucket 3.2 had a lot of sediment on top of it and it looked as if the pit had flooded at some point since the download last week. A length of piping was pushed down the drain and there appeared to be nothing blocking it.
21/01/09	Failed to unblock drain. Need to ask contractor to look at it.
06/02/09	Gwyn has dug a trench in the field to take the water out of the pit of 3.2. The ground is currently too wet to allow Eddie (drain man) to come and look at it.
12/02/09	Checked the vents for tensiometers. Not all were clear 3.1 and 3.2 were the worst.
17/03/09	Swapped all tensiometers with recalibrated ones.
23/04/09	Moved tensio 1.10 from channel 1 to 10. <u>Swapped tensios 1.30, 1.50, 2.10 and 2.30</u> <u>1.30</u> In serial 242 Out serial 241 Depth 33.2 cm <u>1.50</u> In serial number unreadable Out serial 262 Depth 54.5 cm <u>2.10</u> In serial 171 Out serial NA Depth 12.5cm <u>2.30</u> In serial 201 Out 238 33.0 cm
13/05/09	Cut the grass in the tensiometers cage of the control plot.

18/08/09	M3.1	10cm 222	30 cm 242	50 cm ?
	M3.2	10cm 171	30 cm 201	50 cm 258
	No info. Avail. For 3.3			
