

Bore Hole monitoring

Divers were installed at Tyn y Bryn farm on 03/08/05.

Diver installed and water level then measured.

The barodiver was installed initially in the bowl borehole but then reinstalled in the borehole above the tree shelterbelt on the 09/08/05. The reason for this was that because the water level in the borehole above the shelterbelt was much lower allowing me to install the barodiver lower thus hopefully maintaining a more constant temperature.

Bore hole details

Borehole 1 (yellow stuff around cap).

Total depth of hole 11.6 m.

Water level 225 cm at 1412 GMT 03/08/05.

Water level 185 cm at 1007 GMT 09/08/05.

Water level 223 cm at 1117 GMT 30/11/05.

Water level 283.5 cm (287 cm w/o diver) at 915 GMT 05/01/06.

Water level 299 cm (306.5 cm w/o diver) at 1117 (1122) GMT 01/02/06. The measuring point is 15 cm above the ground level, therefore the actual water level is 274 cm (291.5 cm w/o diver) at 1117 (1122) GMT 01/02/06.

Water level 332.5 cm at 836 GMT 28/02/06. The measuring point is 15 cm above the ground level, therefore the actual water level is 317.5 cm.

Water level 359 cm at 1600 GMT 30/03/06. The measuring point is 15 cm above the ground level, therefore the actual water level is 344 cm.

Water level 351 cm at 1052 GMT 02/05/06. The measuring point is 15 cm above the ground level, therefore the actual water level is 336 cm.

Water level 346.5 cm at 1515 GMT 29/06/06. The measuring point is 15 cm above the ground level, therefore the actual water level is 331.5 cm.

Water level 355.5cm with diver in, 360.0 with diver out at 1010 GMT 02/08/06. downloaded diver.

360cm at 1047 GMT 30/08/06.

Water level 349cm with diver in at 1115 GMT 03/10/06. The measuring point was 17 cm above the ground level, therefore the actual water level was 332 cm. Diver reset to sample every 30 minutes.

Water level 335 cm with diver in at 1408 GMT 31/10/06. The measuring point was 18 cm above the ground level, therefore the actual water level was 317 cm.

Water level 331 cm with diver in at 0956 GMT 28/11/06. The measuring point was 18 (16?) cm above the ground level, therefore the actual water level was 313 cm.

Water level 331.5 cm with diver in at 1235 GMT 03/01/07. The measuring point was 19 cm above the ground level, therefore the actual water level was 312.5 cm.

01/02/2007 12:10 GMT: Water level 314cm with measuring point above ground level subtracted and with diver in.

01/03/2007 09:00 GMT: Water level was 330cm with measuring point above ground level subtracted and with diver in.

29/03/2007 13:38 GMT: Water level was 344.5cm with measuring point above ground level subtracted and with diver in.

30/04/07 11:47 GMT Water level was 351cm with measuring point above ground level subtracted and with diver in.

30/05/07 16:02 GMT Water level was 351cm with measuring point above ground level subtracted and with diver in.

03/03/08 15:00 GMT Diver downloaded then removed. Wire left in hole.

Borehole 2

Total depth of hole 5.5 m.

Water level 116.5 cm at 1416 GMT 03/08/05.

Water level 125.5 cm at 1005 GMT 09/08/05.

Water level 119 cm at 1113 GMT 30/11/05.

Water level 122 cm (128 cm w/o diver) at 915 GMT 05/01/06.

Water level 128 cm (132.5 cm w/o diver) at 1113 (1115) GMT 01/02/06. The measuring point is 15 cm above the ground level, therefore the actual water level is 113 cm (117.5 cm w/o diver) at 1113 (1115) GMT 01/02/06.

Water level 120.5 cm at 838 GMT 28/02/06. The measuring point is 15 cm above the ground level, therefore the actual water level is 105.5 cm.

Water level 92 cm at 1605 GMT 30/03/06. The measuring point is 15 cm above the ground level, therefore the actual water level is 77 cm.

Water level 97.5 cm at 1056 GMT 02/05/06. The measuring point is 15 cm above the ground level, therefore the actual water level is 82.5 cm. The diver was quite dirty when it was removed during the download with grey silty, clay material.

Water level 86 cm at 0940 GMT 31/05/06. The measuring point is 15 cm above the ground level, therefore the actual water level is 61 cm. The diver was quite dirty when it was removed during the download with grey silty, clay material.

Water level 117.5 cm at 1513 GMT 29/06/06. The measuring point is 15 cm above the ground level, therefore the actual water level is 102.5 cm.

Water level 133.5 with diver in, 138.5 with diver out at 1005 GMT. Downloaded diver.

171 cm at 1056 GMT on 30/08/06. diver dirty. actual water level is 156 cm.

Water level 137cm with diver in at 1109 GMT 03/10/06. The measuring point was 13 cm above the ground level, therefore the actual water level was 124 cm. Diver reset to sample every 30 minutes.

Water level 80cm with diver in at 1411 GMT 31/10/06. The measuring point was 14 cm above the ground level, therefore the actual water level was 66 cm.

Between downloads there was a jump of 10 cm in diver values.

Water level 61cm with diver in at 0956 GMT 28/11/06. The measuring point was 11 cm above the ground level, therefore the actual water level was 50 cm.

Water level 71cm with diver in at 1242 GMT 03/01/07. The measuring point was 14 cm above the ground level, therefore the actual water level was 57 cm.

01/02/2007 12:20 GMT: Water level 93cm with measuring point above ground level subtracted and diver in .

01/03/2007 09:00 GMT: Water level 39.5cm with measuring point above ground level subtracted and diver in.

29/03/2007 13:39 GMT: Water level 85.5cm with measuring point above ground level subtracted and diver in.

30/04/2007 11:49 GMT: Water level 112 cm with measuring point above ground level subtracted and diver in.

30/05/2007 16:10 GMT: Water level 87cm with measuring point above ground level subtracted and diver in.

03/03/08 15:00 GMT Diver downloaded then removed. Wire left in hole.

Borehole 3 (Bowl)

Total depth of hole 5.89 m.

Water level 196.5 cm at 1456 GMT 03/08/05.

Water level 196.5 cm at 1023 GMT 09/08/05.

Water level 181.5 cm at 1152 GMT 30/11/05.

Water level 179.5 cm (181.25 cm w/o diver) at 942 GMT 05/01/06.

Water level 177 cm (178.5 cm w/o diver) at 1138 (1142) GMT 01/02/06. The measuring point is 13 cm above the ground level, therefore the actual water level is 164 cm (165.5 cm w/o diver) at 1138 (1142) GMT 01/02/06.

Water level 168 cm at 856 GMT 28/02/06. The measuring point is 13 cm above the ground level, therefore the actual water level is 155 cm.

Water level 137.5 cm at 1620 GMT 30/03/06. The measuring point is 13 cm above the ground level, therefore the actual water level is 124.5 cm.

Water level 134 cm at 1018 GMT 02/05/06. The measuring point is 13 cm above the ground level, therefore the actual water level is 121 cm.

Water level 180 cm at 1537 GMT 29/06/06. The measuring point is 17 cm above the ground level, therefore the actual water level is 163 cm.

Water level with diver in 212 and without diver 214. at around 1050GMT 02/08/06. downloaded divers.

262cm at 1139GMT 30/08/06. actual water level is 245 cm.

Water level 251cm with diver in at 1145 GMT 03/10/06. The measuring point was 15 cm above the ground level, therefore the actual water level was 236 cm. Diver reset to sample every 30 minutes.

Water level 151.5 cm with diver in at 1224 GMT 31/10/06. The measuring point was 18 cm above the ground level, therefore the actual water level was 133.5 cm.

16/11/06 Diver installed around 1150 GMT – testing it for LJ. Will be removed during next monthly download.

Water level 155 cm with diver in at 1013 GMT 28/11/06. The measuring point was 18 cm above the ground level, therefore the actual water level was 137 cm.

Water level 182 cm with diver in at 1303 GMT 03/01/07. The measuring point was 15 cm above the ground level, therefore the actual water level was 167 cm.

01/02/07 11:30 GMT: Water level 138cm with measuring point above ground level subtracted and diver in.

20/02/07. Below shelterbelt diver added to determine accuracy. Water level 176.5 cm with diver in at 1215 GMT. The measuring point was 17 cm above the ground level, therefore the actual water level was 159.5 cm.

01/03/07 09:20 GMT: Water level 147.5cm with measuring point above ground level subtracted and 2 divers in.

01/03/07 09:30 GMT: Water level 148cm with measuring point above ground level subtracted and diver in.

29/03/07 14:11 GMT: Water level 156cm with measuring point above ground level subtracted and diver in.

17/04/07 The bowl diver which had been dropped down the below s'belt bore hole was retrieved. This was reinstalled back into the bowl borehole and the diver, which was in the bowl borehole was reinstalled back below the s'belt.

Reinstalled 17/04/07 1030 GMT. Manual reading at this time was 199.5 cm – 16 = 183.5 cm.

30/04/07 11:57 GMT: Water level 187cm with measuring point above ground level subtracted and diver in.

30/05/07 16:46 GMT: Water level 173 cm with measuring point above ground level subtracted and diver in.

03/03/08 16:00 GMT: Baro diver installed here.

31/10/08 11:29 GMT Water level 104 cm with measuring point above ground level subtracted and diver in (115 cm – 11cm).

02/12/08 12:12 GMT Water level 109 cm with measuring point above ground level subtracted and diver in (120 cm – 11cm).

17/02/09 11:56 GMT Water level 126 cm with measuring point above ground level subtracted and diver in (137 cm – 11cm).

02/04/09 10:29 GMT Water level 116 cm with measuring point above ground level subtracted and diver in (127 cm – 11cm).

29/04/09 10:29 GMT Water level 127 cm with measuring point above ground level subtracted and diver in (138 cm – 11cm).

30/07/09 12:13 GMT Water level 128.5 cm with measuring point above ground level subtracted and diver in (139.5 cm – 11cm).

10/09/09 12:05 GMT Water level 166 cm with measuring point above ground level subtracted and diver in (177cm – 11cm).

Borehole 4 (Above shelterbelt)

Total depth of hole 1208.5 cm.

Water level 1142.5 cm at 1528 GMT 03/08/05.

Water level 1142.5 cm at 1031 GMT 09/08/05.

Water level 1152.5 cm at 1328 GMT 30/11/05.

Not possible to get a reading when diver was still in the bore hole. When diver was Water level depth 1147 cm at 1015 GMT 05/01/06.

Not possible to get a reading when diver was still in the bore hole. When diver was in the Water level depth 1148.5 cm at 1233 GMT 01/02/06. The measuring point is 31 cm above the ground level, therefore the actual water level is 1117.5 cm 1233 GMT 01/02/06.

Not possible to get a reading when diver was still in the bore hole. When diver was in the Water level depth 1146.5 cm at 923 GMT 28/02/06. The measuring point is 31 cm above the ground level, therefore the actual water level is 1115.5 cm 923 GMT 28/02/06.

Not possible to get a reading when diver was still in the bore hole. When diver was in the Water level depth 1132.5cm at 953 GMT 02/05/06. The measuring point is 31 cm above the ground level, therefore the actual water level is 1101.5 cm.

Not possible to get a reading when diver was still in the bore hole. When diver was in the Water level depth 1127 at 1035 GMT 31/05/06. The measuring point is 31 cm above the ground level, therefore the actual water level is 1096 cm.

Not possible to get a reading when diver was still in the bore hole. When diver was in the Water level depth 1136.5cm at 1545 GMT 29/06/06. The

measuring point is 31, 32, 27 (Ave. 30) cm above the ground level, therefore the actual water level is 1106.5 cm.

Downloaded Baro and Diver at around 1140GMT 02/08/06. Diver out 1152cm. muddy for 11cm of dipper.

1161 cm at 1125 GMT on 30/08/06. diver dirty (deep one). water level is 1131 cm.

Water level 1170cm with diver out at 1250 GMT 03/10/06. The measuring point was 32 cm above the ground level, therefore the actual water level was 1138 cm. Diver reset to sample every 30 minutes.

Water level 1168 cm with diver out at 0830 GMT 20/10/06. Measuring point 30 cm above g'level. therefore the actual water level was 1138 cm.

Diver wire lengthened so that it was further submerged. Water level 1164cm with diver in at 0852 GMT 20/10/06. The measuring point was 30cm above the ground level, therefore the actual water level was 1134 cm.

Water level 1154.5cm with diver in 1142 GMT 31/10/06. The measuring point was 30 cm above the ground level, therefore the actual water level was 1124.5 cm. There was a jump of almost 10 cm in diver readings during download.

16/11/06 BarroDiver installed around 1200 GMT – testing it for LJ. Will be removed during next monthly download.

Water level 1143 cm with diver in 1110 GMT 28/11/06. The measuring point was 30 cm above the ground level, therefore the actual water level was 1113 cm.

Water level 1125 cm with diver in 1358 GMT 03/01/07. The measuring point was 30 cm above the ground level, therefore the actual water level was 1095 cm.

01/02/07: Couldn't remove the screw in lid from the top of the bore hole.

01/03/07 10:08 GMT: Water level 1098.5cm with measuring point above ground level subtracted and diver in .

29/03/07 14:41 GMT: Water level 1113cm with measuring point above ground level subtracted and diver in .

30/04/07 13:34 GMT: Water level 1127 cm with measuring point above ground level subtracted and diver in .

30/05/07 17:25 GMT: Water level 1135.5 cm with measuring point above ground level subtracted and diver in. muddy

03/03/08 15:30 GMT Diver downloaded then removed. Wire left in hole.

Borehole 5 (Below shelterbelt)

Water level 775 cm at 1545 GMT 03/08/05.

Water level 765.5 cm at 1036 GMT 09/08/05.

Water level 705.5 cm at 1336 GMT 30/11/05.

Water level 679.5 cm (679.5 cm w/o diver) at 1036 GMT 05/01/06.

Water level 698 cm (698 cm w/o diver) at 1245 (1248) GMT 01/02/06. The measuring point is 9 cm above the ground level, therefore the actual water level is 689 cm (689 cm w/o diver) at 1245 (1248) GMT 01/02/06.

Water level 699 cm at 932 GMT 28/02/06. The measuring point is 9 cm above the ground level, therefore the actual water level is 690 cm.

Water level 643.5 cm at 1643 GMT 30/03/06. The measuring point is 9 cm above the ground level, therefore the actual water level is 634.5 cm.

Water level 674cm at 0940 GMT 02/05/06. The measuring point is 9 cm above the ground level, therefore the actual water level is 665 cm.

Water level 729cm at 1531 GMT 29/06/06. The measuring point is 7, 7, 5 (Ave. 6.3) cm above the ground level, therefore the actual water level is 723 cm.

Water level with diver in 766cm and diver out 766.5 at around 1300GMT 02/08/06. downloaded diver. Remind everyone to delete files from diver after download.

798cm at 1258 GMT 30/08/06. the actual water level is 792 cm.

Water level 818 cm with diver in at 1320 GMT 03/10/06. The measuring point was 7 cm above the ground level, therefore the actual water level was 811 cm. Diver reset to sample every 30 minutes. **Someone may have driven over the borehole as the exterior casing appears to be lower in the ground that before**

Water level 772 cm with diver in at 1213 GMT 31/10/06. The measuring point was 6 cm above the ground level, therefore the actual water level was 766 cm.

Water level 710 cm with diver in at 1125 GMT 28/11/06. The measuring point was 4 cm above the ground level, therefore the actual water level was 706 cm.

Water level 654.5 cm with diver in at 1407 GMT 03/01/07. The measuring point was 3 cm above the ground level, therefore the actual water level was 651.5 cm.

01/02/07 09:45 GMT: Water level 640 cm with measuring point above ground level subtracted and diver in.

Suspicious on reliability of diver so removed and inserted in bowl bore hole at same depth as diver situated there.

When came to download this diver now inserted in bowl bore hole would not download so brought it back to Bangor. Managed to download when back here.

17/04/07 took below s'belt logger from bowl bore hole and reinstalled below s'belt at 1045 GMT. The logger was not stopped and therefore the data prior to this time was from the bowl borehole.

Manual dip at 1100 GMT 17/04/07 was $707 \text{ cm} - 3 \text{ cm} = 704 \text{ cm}$.

30/04/07 13:45 GMT: Water level 724 cm with measuring point above ground level subtracted and diver in

30/05/07 17:42 GMT: Water level 744.5 cm with measuring point above ground level subtracted and diver in

15/08/07 approx 14:30 GMT: Replaced clamp thing holding diver to wire.

19/09/07 Diver removed from bore hole so that guy could sort out the problem we are having with compensating the data.

02/10/07 12:50 GMT diver re-installed although had been logging since 12:00GMT.

03/03/08 16:50 GMT Diver downloaded then removed. Wire left in hole.
