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Forsmark site investigation

Sampling and analyses of surface waters

Results from sampling in the Forsmark area, March 2004–June 2005

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December 2005

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Abstract

A two years and four months long comprehensive chemical investigation campaign of surface waters in the Forsmark area commenced in March 2002 and was completed in June 2004. This was followed by a less extensive long-term monitoring programme which was initiated in July 2004. This report, the third in the present series, comprises documentation of the fieldwork as well as compilation and tabulation of surface water data obtained during the period March 2004–June 2005, i.e. the last four months of the chemical investigation campaign as well as the first year of the following monitoring programme.

The first four months included 22 sampling objects and seven sampling occasions while the sampling in the subsequent monotoring programme was reduced to 11 sampling objects and the sampling frequency was once per month. The sampling focussed on streams, lakes, shallow sea bays and one deep sea location (one sampling occasion) in order to characterise the surface waters of the area. The results obtained included field measurements of redox potential, pH, dissolved oxygen, electrical conductivity, salinity, measurement depth, barometric pressure, turbidity, chlorophyll, light/PAR (Photosynthetic Active Radiation) and water temperature as well as chemical analyses of major constituents, nutrient salts, carbon species, trace metals and isotopes. Besides presenting new results, the report addresses several questions which have arisen during the investigation concerning; a) quality of bromide and fluoride analyses, b) high and varying tritium contents, c) high carbon-14 (pmC) values, and d) reliability of uranium and thorium isotope determinations. The surface redox measurements, or Oxidising-Reducing Potential (ORP) are evaluated in diagrams and it is concluded that the ORP-data series reflects closely the redox situation in the surface waters at different sampling locations, although the actual values reflect large uncertainties.

Fresh waters in the Forsmark area are well buffered with high alkalinity, high pH and high calcium concentrations. Furthermore, waters recently affected by brackish sea water still show high sodium chloride concentrations and there is a clear relationship between the movement/alteration of the coastline and the salinity of the water samples collected at the sampling locations in the area. Generally, the new data confirm the knowledge and conclusions presented in previous reports from the earlier investigation periods. The additional deep sea sampling location, at the same latitude as Forsmark, adds important information on the Baltic Sea water composition less influenced by the landmass.

The tritium content of the shallow sea bays seems to be enhanced close to the nuclear power plant. The pmC values, on the other hand, show the highest values in some stream and lake waters south of the reactor facilities. A change of laboratory for uranium and thorium isotope determinations have resulted in lowered detection limits and thereby increased resolution that can distinguish between ^{238}U and ^{234}U.

Sammanfattning

En omfattande kemisk undersökningskampanj på två år och fyra månader rörande ytvatten i Forsmarksområdet, startade i mars 2002 och avslutades i juni 2004. Det åtföljdes av ett reducerat program för långtidsövervakning som påbörjades i juli 2004. Denna rapport, den tredje i ordningen, innehåller dokumentation av fältarbetet samt presentation och sammanställning av erhållna data under perioden mars 2004 till och med juni 2005, det vill säga de sista fyra månaderna av undersökningskampanjen och första året av det därefter följande övervakningsprogrammet.

De första fyra månaderna omfattade 22 provpunkter och sju provtagningstillfällen. Därefter reducerades provtagningen till 11 provpunkter och provtagningsfrekvensen minskades till en gång per månad. Provtagningen skedde i vattendrag, sjöar, grunda havsvikar samt en djuphavspunkt (ett provtillfälle) för att karakterisera ytvattnen i området. De erhållna resultaten omfattar fältmätningar av redoxpotential, pH, löst syre, elektrisk konduktivitet, salinitet, mätdjup, barometertryck, turbiditet, klorofyll, siktdjup/PAR (Photosynthetic Active Radiation) och vattentemperatur samt kemiska analyser av huvudkomponenter, närsalter, kolföreningar, spårelement och isotoper. Förutom att presentera nya resultat, behandlar rapporten frågeställningar som uppstått rörande bromid och fluoridanalysernas kvalitet, höga och varierande tritiumhalter, höga kol-14 (pmC) värden samt tillförlitligheten hos uran- och thoriumisotopbestämningarna. Vidare utvärderas redoxmätningarna (ORP) i form av diagram. Slutsatsen är att ORP-data speglar redoxsituationen i ytvattnen i de olika provpunkterna även om värdena som sådana är behäftade med en stor osäkerhet.

Sötvattnen i Forsmarksområdet är väl buffrade med hög alkalinitet, högt pH och höga kalciumkoncentrationer. Vidare visar vatten som nyligen påverkats av bräckt havsvatten fortfarande höga salthalter och det finns ett klart samband mellan kustlinjens förändring och saliniteten hos prov tagna i olika provpunkter i området. Generellt sett bekräftar nya data kunskapen och slutsatserna i föregående rapporter som omfattar tidigare undersökningsperioder. Den tillfälliga provpunkten ute i havet ger dock ytterligare information om vattensammansättningen ute i Östersjön i jämnhöjd med Forsmark.

Tritiuminnehållet i vattenproven verkar öka nära kärnkraftverket och då särskilt i de grunda havsvikarna. Kol-14 (pmC) däremot, uppvisar de högsta värdena i några av vattendragen och sjöarna sydväst om reaktorområdet. Byte av laboratorium för uran- och thoriumisotopbestämningar har inneburit sänkta detektionsgränser och därmed tillräcklig upplösning för att ge skiljda ^{238}U- och ^{234}U-värden.

Contents

1 Introduction

This document reports the performance and results from the activities *Surface water sampling and analyses* and *Long-term monitoring of surface waters* performed within the site investigation at Forsmark /1/. The work was conducted according to activity plans and method descriptions listed in Table 1-1 and are part of both the hydrochemistry and the surface ecosystem investigation programmes. Both activity plans and method descriptions are SKB's internal controlling documents. The report treats: 1) the last four months of the surface water sampling campaign (March 2004–June 2004), and 2) the first year of the long-term surface water monitoring programme (July 2004–June 2005). The first and second year of the surface water sampling campaign is reported in /2/ and /3/ respectively. Furthermore, a detailed evaluation of surface water data from March 2002 to March 2004 is presented in /4/. The obtained data from the activities are reported in the SICADA database and are traceable by the activity plan numbers.

The surface water activities include sampling, chemical analyses and field measurements. The sampling objects consist of lake waters, stream waters and sea waters from shallow bays in the Forsmark area, as well as one deep sea location 4.5 nautical miles outside Forsmark harbour. The monitoring programme implies a reduced number of sampling locations as well as reduced sampling frequency (once per month) compared to the previous comprehensive campaign (generally twice per month). The locations of all sampling locations are shown in Figure 3-1.

Table 1-1. Controlling documents for performance of the activities.

Activity plans	**Number**	**Version**
Undersökningar i Forsmarksområdet: Ytvattenprovtagning mars–maj 2004.	AP PF 400-04-21	1.0
Undersökningar i Forsmarksområdet: Långtidsövervakning av ytvatten juli 2004–juli 2005.	AP PF 400-04-71	1.0
Method description	**Number**	**Version**
Metodbeskrivning för ytvattenprovtagning vid platsundersökningar.	SKB MB 900.004	2.0
Measurement system description	**Number**	**Version**
Mätsystembeskrivning för YSI Multiparametersystem för vattenmätningar.	SKB MD 910.003	1.0

Water sampling and measurement procedures are also described in SKB PIR-04-09 "Metodik för provtagning av ekologiska parametrar i hav", SKB PIR-04-06, "Metodik för provtagning av ekologiska parametrar i sjöar och vattendrag", and SKB PIR-04-12, "Översikt över provhanterings- och analysrutiner för vattenprov" (SKB internal documents).

2 Objectives and scope

A surface water campaign comprising sampling and analyses of lake waters, stream waters and shallow bay waters was carried out twenty times a year over a period of two years and four months (March 2002–June 2004) in order to characterise the surface waters of the area. Examples of issues addressed include groundwater formation, identification of discharge or recharge areas, nutrient transport and biological production. From July 2004 sampling of surface waters was included in a long-term monitoring programme. The monitoring programme implies reduction of sampling occasions and also of sampling locations, see Figure 3-1.

The comprehensive first surface water campaign was aimed at obtaining overall knowledge of the surface water chemistry of the candidate area at Forsmark and to establish baselines which allow detection of changes caused by the construction and operation of a future repository of nuclear waste. The ongoing surface water monitoring programme, on the other hand, concentrates on the prioritised northwestern part of the area /5/ and aims at creating long-term series of data. The main objectives are to obtain further information on natural variations and also to allow identification of eventual perturbation effects from the ongoing investigations.

The present monitoring programme includes water sampling and sonde measurements in the different lake systems; Lake Fiskarfjärden (until 2005), Lake Bolundsfjärden, Lake Eckarfjärden and Lake Labboträsket. Measurements are being performed also in Lake Norra Bassängen in order to monitor salinity changes. One sampling location remains in a shallow sea bay (Forslings grund) and an additional deep sea water location was sampled at one occasion. Sampling of stream water continues at four localities (Kungsträsket, Bolundsskogen, Norr Eckarfjärden, Öster Gunnarsbo) and an electrical conductivity logger is installed in Lilleputt-sundet, also to monitor salinity changes.

Both the comprehensive campaign and the monitoring programme include water sampling for chemical analysis as well as direct measurements of physical and chemical parameters such as redox potential, pH, dissolved oxygen, electrical conductivity, salinity, measurement depth, barometric pressure, turbidity, chlorophyll, light/PAR (Photosynthetic Active Radiation) and water temperature. The extent of the sampling varied at different occasions. Analyses of major constituents and surface water supplements (nutrient salts, chlorophyll etc) were conducted frequently (20 times and 12 times a year for the main campaign and monitoring programme respectively) while extended analyses including also isotopes and trace elements were performed once per season (four times a year). Some special isotopes (∂^{37}Cl, ∂^{13}C, ^{14}C (pmC), ^{87}Sr/^{86}Sr, ∂^{34}S, U- and Th-isotopes as well as Ra- and Rn-isotopes) were determined only once a year, in July.

3 Sampling points and sampling scheme

The former surface water sampling campaign (until June 2004) included six lakes, four shallow sea bays and eight streams. The present monitoring programme, which started in July 2004, has been reduced to include five lakes, one shallow sea bay location and four streams. Lake Fiskarfjärden was excluded from the monitoring programme for 2005. Furthermore, a deep sea location close to Engelska grundet was sampled on one occasion (June 2004); this was not inluded in the original programme and sampling was performed by a different contractor (Dept. of System Ecology, Stockholm University). Three samples were collected at different depths (at the surface, at 20 m and close to the bottom at 55 m).

The locations of all sampling locations are presented in Figure 3-1. Table 3-1 lists the id-codes, coordinates and names together with clarifying comments. The sampling scheme for the period March 2004–June 2005 is given in Table 3-2.

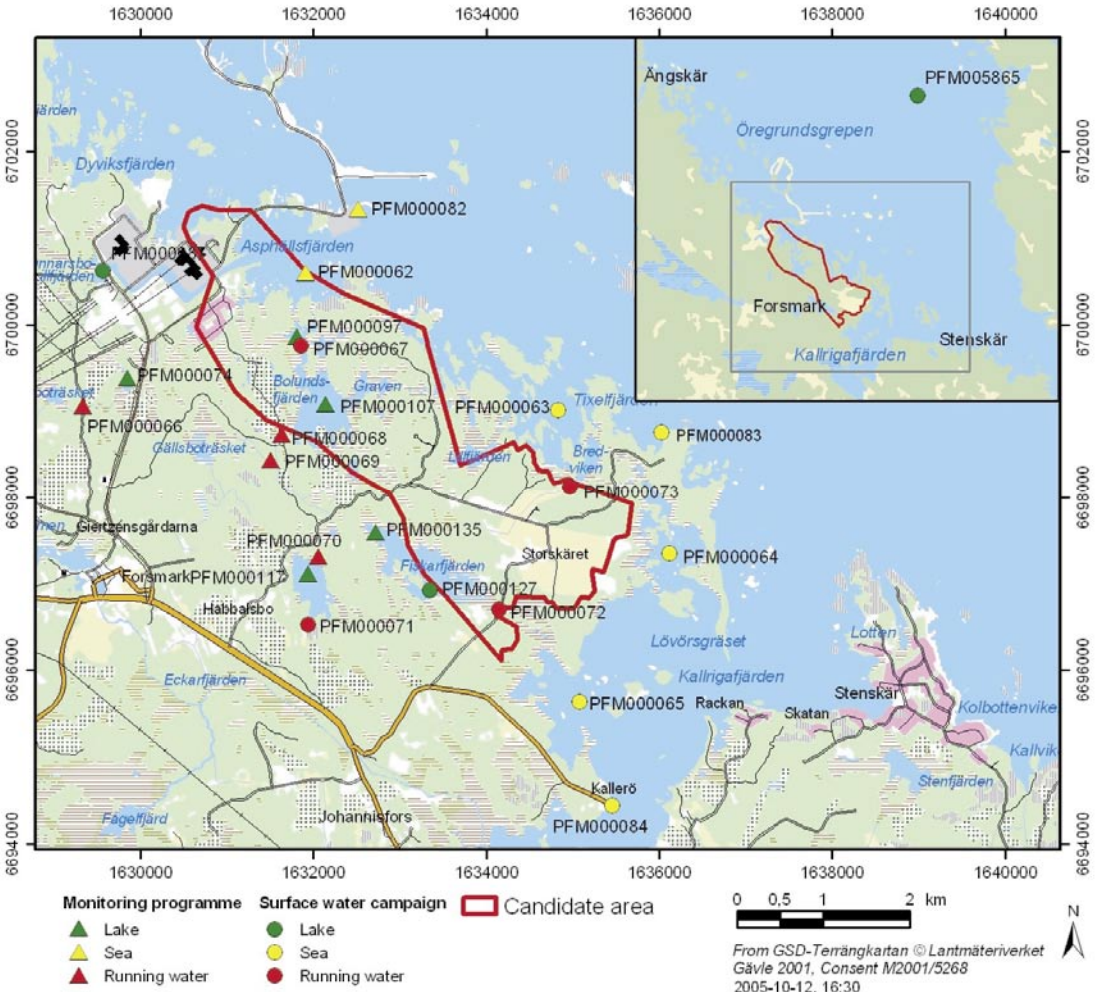


Figure 3-1. *Sampling locations within the surface water campaign (all locations, infilled triangles and circles) and the later monitoring programme (reduced number, infilled triangles). Some of the locations constitute alternatives for the regular sampling positions (see Table 3-1).*

Table 3-1. Sampling locations (Id-code, coordinates, name and comments). The surface water campaign includes all listed locations; locations within the later monitoring programme are marked with blue.

Sampling locations	Coordinates (RT90 RHB70)	Name	Comments
Lakes			
PFM000074	16 29 854, 66 99 393	Labboträsket	
PFM000087	16 29 574, 67 00 617	Gunnarsbo-Lillfjärden	
PFM000097*	16 31 814, 66 99 868	Norra bassängen	
PFM000107	16 32 065, 66 99 031	Bolundsfjärden	
PFM000117	16 31 946, 66 97 118	Eckarfjärden	
PFM000127**	16 33 350, 66 96 924	Fiskarfjärden	
PFM000135**	16 32 722, 66 97 594	Fiskarfjärden	Alternative to PFM000127
Shallow sea bays and deep sea location			
PFM000062	16 31 921, 67 00 605	SV Forslingens grund	
PFM000063	16 34 833, 66 99 014	Tixelfjärden	
PFM000064	16 36 121, 66 97 347	Kallriga, norra	
PFM000065	16 35 083, 66 95 635	Kallriga, södra	(V-högbåden)
PFM000082	16 32 528, 67 01 336		Alternative to PFM00062
PFM000083	16 36 023, 66 98 757		Alternative to PFM00063
PFM000084	16 35 455, 66 94 442		Alternative to PFM00064 and PFM000065
PFM005865	16 38 071, 67 07 581	Engelska grundet (vincinity)	Deep sea water point, sampled once
Streams			
PFM000066	16 29 343, 66 99 064	Öster Gunnarsboträsket	
PFM000067	16 31 859, 66 99 753	Lillputtsundet	
PFM000068	16 31 641, 66 98 735	Kungsträsket	
PFM000069	16 31 510, 66 98 440	Bolundsskogen	
PFM000070	16 32 061, 66 97 319	Norr Eckarfjärden	
PFM000071	16 31 944, 66 96 533	Söder Eckarfjärden	
PFM000072	16 34 151, 66 96 708	Flottbron	
PFM000073	16 35 004, 66 98 073	Söder Bredviken	

* Only sonde measuremnts from July 2004.
** Excluded 2005.

Table 3-2. Surface water sampling scheme from March 2004–June 2005.

Year	Month	Week	Activity nr	Programme type*
2004	March	12	AP PF 400-04-21	M
2004	April	15, 17	AP PF 400-04-21	M,E
2004	May	19, 21	AP PF 400-04-21	M,M
2004	June	23, 25	AP PF 400-04-21	M,M
2004	July	28	AP PF 400-04-71	E+
2004	August	34	AP PF 400-04-71	M
2004	September	38	AP PF 400-04-71	M
2004	October	42	AP PF 400-04-71	E
2004	November	46	AP PF 400-04-71	M
2004	December	50	AP PF 400-04-71	M
2005	January	3	AP PF 400-04-71	E
2005	February	7	AP PF 400-04-71	M
2005	March	11	AP PF 400-04-71	M
2005	April	15	AP PF 400-04-71	E
2005	May	19	AP PF 400-04-71	M
2005	June	24	AP PF 400-04-71	M

* M = main programme (SKB class 3 including surface water supplements), E = extended programme (SKB class 5 including surface water supplements), E+ = extended programme and special isotopes (∂^{37}Cl, ∂^{13}C, ^{14}C (pmC), ^{87}Sr/^{86}Sr, ∂^{34}S, U- and Th-isotopes as well as Ra- and Rn-isotopes).

4 Equipment

4.1 Sampling equipment

Water samples were collected using an online pumping setup consisting of an electrical peristaltic pump system, PPS (ASF Thomas SR 10/100, powered by 12 VDC, 7 Ah cells), connected to 4–8 m long teflon-tubes (FEP 140) of 5 mm inner diameter. A manually operated regulator (ELFA, DCM 24–40 pwm) was used to adjust the water flow to a maximum of 1.3–2.9 litres/minute (depending on tube length, tube diameter and pumping level). The sampling equipment is presented in Figure 4-1.

4.2 Multiparameter sondes

Field measurements were performed using two multiparameter sondes (YSI 6600 EDS and YSI 600 QS). A terminal (YSI 650 MDS) is connected to each sonde through a cable for logging data (Figure 4-2). The calibration of the sondes was carried out according to the measurement system description SKB MD 910.003 (SKB internal controlling document).

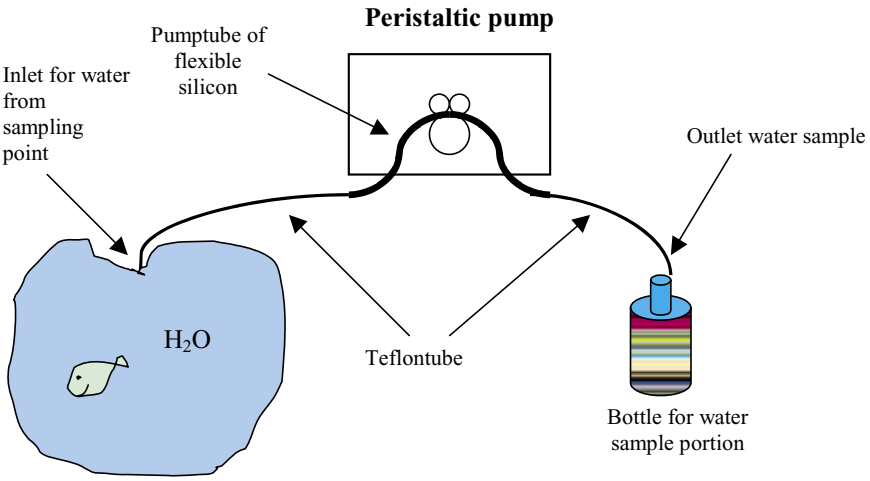


Figure 4-1. *Schematic presentation of the peristaltic pump system (PPS).*

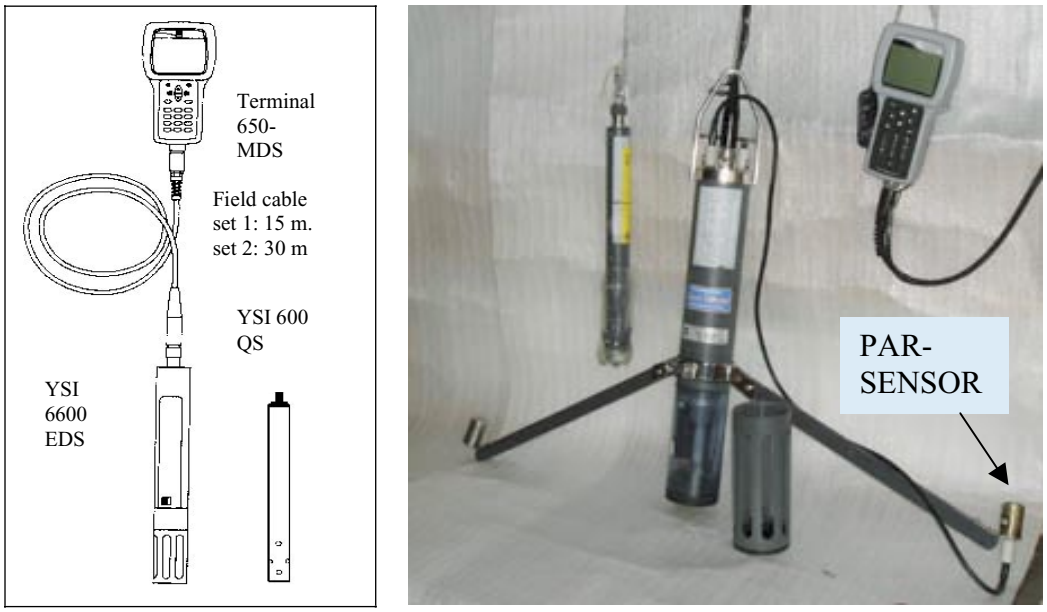


Figure 4-2. *Measurement sondes used in the field investigations.*

Table 4-1. Parameters measured by the two different YSI sondes.

Parameter	YSI 6600 EDS	YSI 600 QS
Date/time	Yes	Yes
Temperature (°C)	Yes	Yes
pH	Yes	Yes
Dissolved oxygen (mg/L)	Yes	Yes
ORP (Redox potential, mV)	Yes	Yes
Electrical conductivity (mS/cm)	Yes	Yes
Salinity (ppt)	Yes	Yes
Depth (m)	Yes	Yes
Barometric pressure (mm Hg)	Yes	Yes
Turbidity (NTU)	Yes	No
Chlorophyll (µg/l)	Yes	No
Light/PAR* (µmoles s^{-1} m^{-2})	Yes	No

* Photosynthetic Active Radiation.

4.3 General field equipment

- Ruttner samplers were used as back up if the portable pump system should fail.
- The exact locations of the sampling location positions were found using a GPS (Garmin 172C) with an average accuracy of +/– 0.5–1.0 m.
- Water depth was measured using an echo sounder (Plastimo, Echotest, LCD digital sounder) with an accuracy of +/– 0.05 m.
- Water transparency was estimated using a Secchi disc and aqua scope.
- Disposable filters (Millipore, 0.40 µm, ∅ = 22 mm) were used together with 60 mL syringes to filter specific sample portions of the sampled water in the field.
- Stopwatch (GUL), a water-filled plastic bottle (50 mL) and measuring-tape (Hultafors) were used for flow/runoff estimates in stream waters.
- Digital cameras (Nikon Coolpix 5000 and Olympus 400 mju) were used for documentation of stream waters.

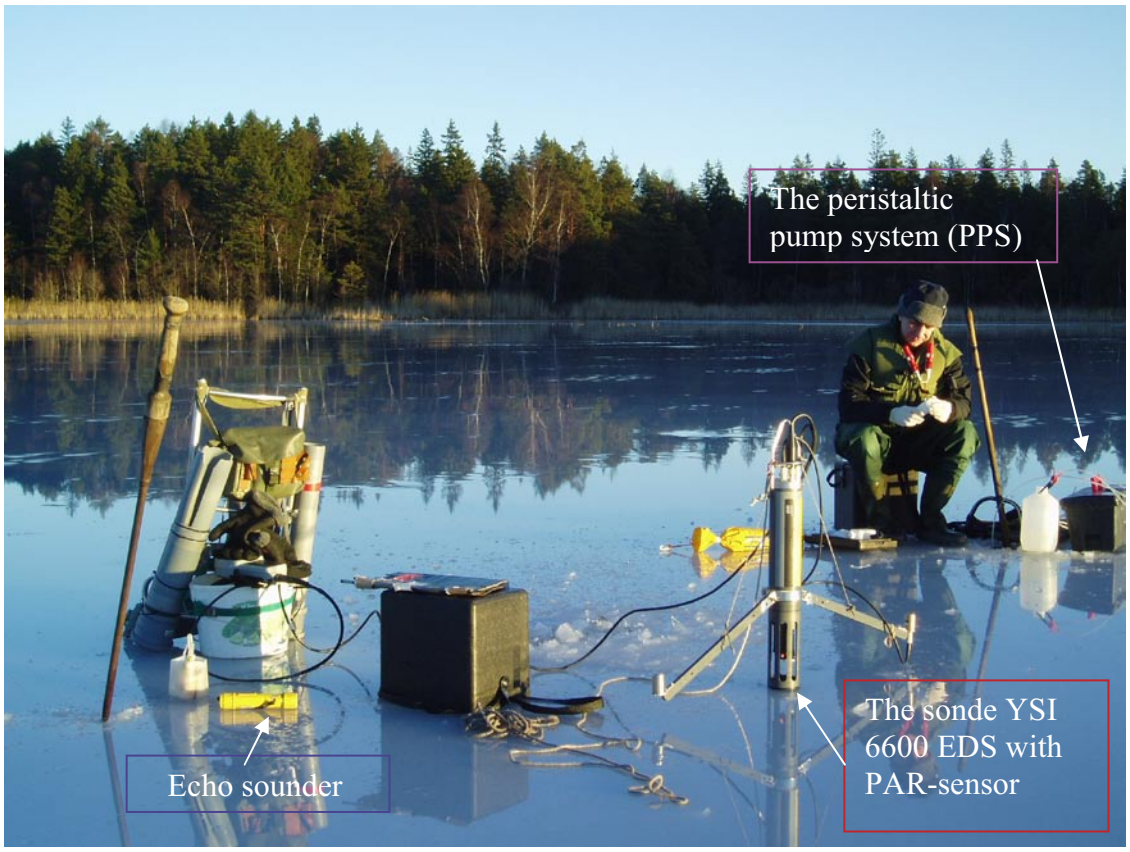


Figure 4-3. *Field equipment used during sampling at Lake Eckarfjärden (PFM 117) 2004-12-07. In the foreground are the echo sounder and the YSI 6600 EDS sonde with PAR-sensor. In the background is the peristaltic pump system (PPS) used to fill sample bottles.*

5 Performance

5.1 Presampling preparations

Prior to sampling, the sample bottles were cleaned (according to the routines for respective SKB class), labelled and packed in insulated boxes/bags. Acid additions were made in advance in bottles intended for trace metal analyses; these were placed in separate plastic bags to avoid contamination. The peristaltic pump system (PPS), including the Teflon tubes, was washed using acid (0.5 M HCl) and rinsed with deionised water before use. The equipment was kept well protected in plastic bags or in tight containers. The Disposable filters (Millipore) were rinsed with MilliQ-water (50 mL) and placed in plastic bags to prevent contamination. Calibration of the sondes was performed according to the measurement system description SKB MD 910.003.

5.2 Water sampling

Water samples were collected using a peristaltic pump system, PPS, and Ruttner samplers were used as backup if the PPS-system should fail. Lake and sea water samples were collected close to the surface (at 0.5 m depth) and in winter time also from approximately 0.5 m above the lake or sea bottom in case of ice coverage. Stream water samples were collected at approximately 0.1 m depth. The PPS-system and sample bottles were rinsed initially with water from the sampling locations prior to filling, except for bottles with acid additions. To avoid contamination, the field crew was obliged to wear rubber gloves and great care was taken not to contaminate bottles or equipment. Bottles and samples containing added acid were handled and stored separately to avoid contaminating other sample portions.

Figure 5-1. *Sampling of surface water in the field. Left: In the foreground is the peristaltic pumpsystem (PPS). Right: Filtration of water in the field using a disposable filter (Millipore, 0.40 µm, ∅ = 22 mm) and a syringe. Söder Bredviken PFM 000073 .*

Each sample consists of several sample portions and is labelled with the same sample number. The preparation of the sample portions in the field differs depending on their eventual use. Details of the collected sample portions, the components to be analysed and sample preparations carried out are summarised in Table 5-1.

Table 5-1. Filled bottles, components to be analysed and preparation of samples in the field.

Class 3: frequent
Class 5: four times per year (each season)
Class 5+: once a year (July)

Bottle volume (mL)	Number of bottles	SKB-label	Components	Preparation of sample in field	Filling instructions
125	1	Green	Na, K, Ca, Mg, Li, Sr, S, Si, Br, I	–	Fill up
5,000 (Collecting bottle)	1	Green	Chlorophyll a, c, Pheopigment, Alkalinity, pH, Conductivity, Tot-N, Tot-P, POP, PON, POC, Anions (Br, SO_4, Cl, F, I), TOC, DOC, DIC (only for control)	–	Fill up
25	2	Green	Ammonia, NOx, Silicate	Filtering with syringe/0.45 µm filter	Fill to mark
50	1	Green	TOC	–	Leave 1 cm
50	2	Green	DIC/DOC	Filtering with syringe/0.45 µm filter	Leave 1 cm
Winkler bottles[1]	2	Green	Oxygen	1 mL Mn(II) reagent + 2 mL alkaline iodine reagent and mix	Flow over 3 x
Winkler bottles[2]	2	Green	H_2S[2]	1 mL ZnAc + 1 mL 1M NaOH and mix	Flow over x 3
100	1	Red	Trace metals	–	Fill up
500[2]	1	Red	Fe(II)/Fetot[2]	Filtering with syringe/0.40 µm filter	Fill up
500	1	Green	Tritium	–	Flow over x 1
100	1	Green	Deuterium, O-18	–	Fill up from bottom
1,000	1	Green	^{34}S	–	Fill up
100	1	Green	^{37}Cl	–	Fill up
100	1	Green	$^{87}Sr/\ ^{86}Sr$	–	Fill up
100	1	Green	U- and Th-isotopes	–	Fill up
500	1	Green	Ra- and Rn-isotopes	–	Fill up

[1] Winkler samples only when sonde measurements of oxygen show values below 4 mg/L.
[2] Included in the comprehensive surface water campaign and only at reduced groundwater conditions.

5.3 Field measurements

The multiparameter sondes were used for measurements at depth involving pH, water temperature, barometric pressure, ORP, PAR, turbidity, electrical conductivity, salinity, dissolved oxygen and chlorophyll. Light penetration was measured in lakes and at sea locations with a secchi disc according to the Swedish standard BIN SR 111. Photo documentation of stream waters was performed to facilitate evaluation of the investigation data. Photos were taken of each marked out (using a wooden stake) stream water sampling location.

In stream waters measurements were performed using a YSI 6600 EDS sonde if the water level was high enough, otherwise the smaller YSI 600 QS sonde was used. Chlorophyll, PAR and turbidity data were not reported.

At lake and sea localities the multiple sonde (YSI 6600 EDS) was used to measure a profile at each sampling point. Measurements were conducted at every metre from the surface to the bottom, see Table 5-2. In addition, PAR was logged just below the surface and during the ice season above the ice, in the air. Besides PAR measurements at discrete depths, continuous PAR-profile loggings were also performed. PAR-profiles were obtained by setting the sonde mode to ‘continuous logging’. The sonde was then submerged from surface to bottom and hoisted up again. The produced PAR-data were used for regression analyses of PAR versus depth.

Figure 5-2. *Measuring a profile (PFM000064) in the ice covered Baltic Sea with the multiple sonde (YSI 6600 EDS).*

Table 5-2. Logging depths at sampling locations in lakes and shallow sea bays (i.e. sampling locations in the continuing monitoring programme, activity plan nr 400-04-21, are marked in blue).

Sampling locations	Name	Sonde logging depth (m)										
		0.5	1.0	1.5	2.0	2.5	3.0	4.0	4.5	5.0	6.0	6.5	7.0
Lakes													
PFM000074	Labboträsket	X											
PFM000087	Gunnarsbo-Lillfjärden	X	X	X									
PFM000097	Norra bassängen	X											
PFM000107	Bolundsfjärden	X	X										
PFM000117	Eckarfjärden	X	X	X									
PFM000127*	Fiskarfjärden												
PFM000135*	Fiskarfjärden, alt	X	X										
Shallow sea bays													
PFM000062	SV Forslingens grund	X	X		X		X						
PFM000063	Tixelfjärden	X	X		X		X	X	X				
PFM000064	Kallriga, norra	X	X										
PFM000065	Kallriga, södra	X											
PFM000082	Alternative to PFM00062	X	X		X		X	X		X	X	X	
PFM000083	Alternative to PFM00063	X	X		X		X	X		X	X	X	
PFM000084	Alternative to PFM00064 and PFM000065	X	X		X	X							

* Excluded 2005.

To facilitate mass transport calculations of different chemical components in the water systems of the area it was necessary to measure water flow/runoff in the streams. A simple “floating bottle” method was used when no possibilities for more precise measurements were available. The cross-section mean area of the stream was estimated, forming a rectangle, see Figure 5-3. The time for the bottle (close to neutral in weight in water) to float the distance (L) from point A to B was measured with a stopwatch. This procedure was repeated three times in each stream. The average water velocity (m/s) multiplied with the average area (m^2) resulted in a rough water runoff estimate (m^3/s).

Figure 5-3. *Schematic presentation for estimating water runoff in natural stream waters (see text for explanation). Sampling location PFM000073 (Söder Bredviken).*

5.4 Sample treatment and chemical analyses

An overview of sample treatment and analytical methods is given in Appendix 1. The routines are applicable independently of the sampling method or type of sampling object.

5.5 Data handling/post processing

Two field protocols (activity log and sampling protocol) contain meta data (id-code, date, time, sample no, field crew etc), a few measured data and weather observations as well as comments on field conditions which may influence the analytical results. The field protocols supply basic information for creating activities and activity comments in the SKB SICADA database. In addition, the few measured parameters and weather conditions, noted on the sampling protocol, are stored as data tables in SICADA.

Furthermore, eventual deviations from the sampling programme or from the normal routines are also documented in special reports/comment files. The comment files are stored in the SICADA file archive, see Table 5-3.

5.5.1 Chemical analytical data

The following routines for quality control and data management are generally applied for hydrochemical analysis data, independently of sampling method or type of sampling object.

Several components are determined by more than one method and/or laboratory. Moreover, duplicate analyses by an independent laboratory are performed as a standard procedure on each fifth or tenth collected sample. All analytical results are stored in the SICADA database. The applied hierarchy path “Hydrochemistry/Hydrochemical investigation/Analyses/Water in the database” contains two types of tables, raw data tables and primary data tables (final data tables).

Data on *basic water analyses* are inserted into the raw data tables for further evaluation. The evaluation results in a final reduced data set for each sample. These data sets are compiled in a primary data table named "water composition". The evaluation is based on:

- Comparison of the results from different laboratories and/or methods. The analyses are repeated if a large disparity is noted (generally more than 10%).
- Calculation of charge balance errors according to the equation below. Relative errors within ± 10% are considered acceptable in surface waters.

$$\text{Relative error}\,(\%) = 100 \times \frac{\sum cations(equivalents) - \sum anions(equivalents)}{\sum cations(equivalents) + \sum anions(equivalents)}$$

- General expert judgement of plausibility based on earlier results and experience.

All results from *special analyses of trace metals and isotopes* are inserted directly into primary data tables. In those cases where the analyses are repeated or performed by more than one laboratory, a "best choice" notation will indicate those results which are considered most reliable.

An overview of the data management is given in Figure 5-4.

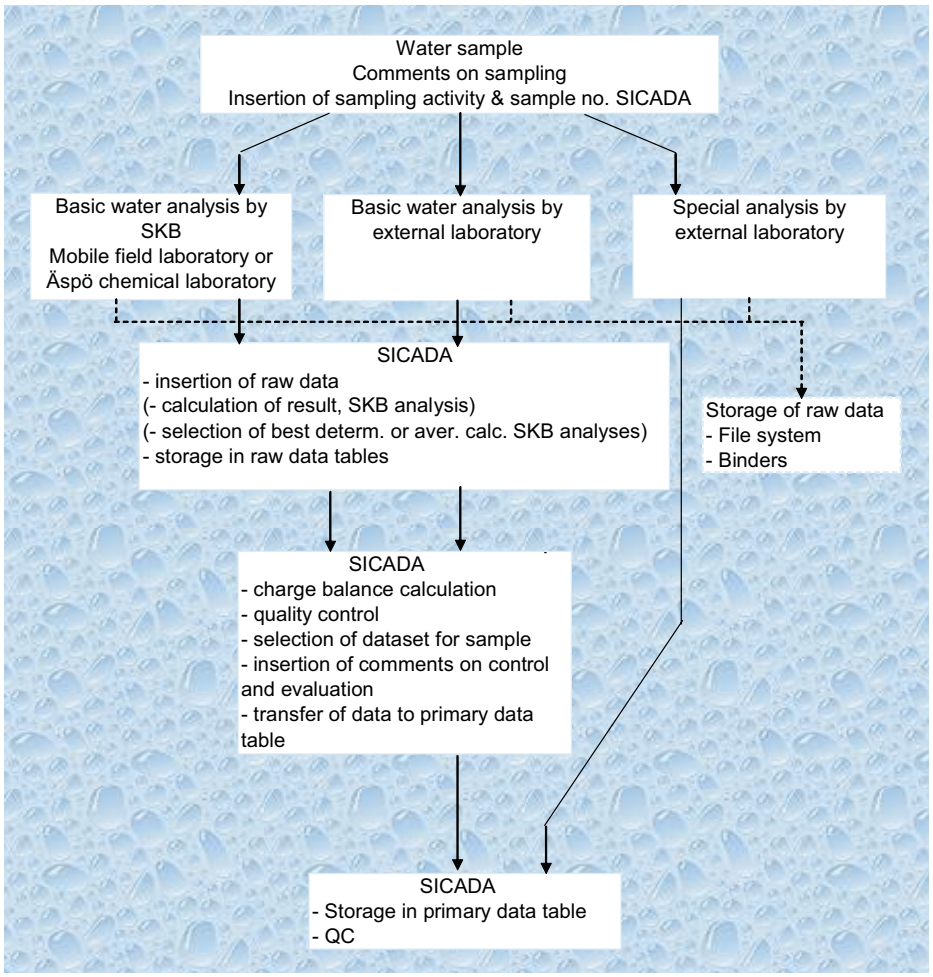


Figure 5-4. *Overview of data management for analytical data.*

5.5.2 Field measurement data

The logged data from sonde measurements are exported digitally from the YSI Terminal 650-MDS to the specified SICADA data table using an especially developed Excel-macro. The original raw data file, calibration file and calibration protocol from each sonde, as well as photographs and comments on sampling and measurements, are stored in the SICADA file archive, see Table 5-3.

Table 5-3. File types stored in the SICADA file archive.

Type of file	Example of file name	No per sampling session
Raw data file	L580438.dat	1 or 2*
Comments	Kommentarer V38.xls	1
Calibration data file	000113CF.txt	1 or 2*
Calibration protocol	Stora sonden V38år04.xls	1 or 2*
Photography	PFM66.jpg	1–8
Light data file	PAR-profiler V38_04.xls	1

* Depending on the number of measuring sondes used.

5.5.3 Other relevant information and data

Information about weather conditions and related parameters during the sampling occasions are compiled in a separate table in SICADA called “Weather_data” which contains the following columns:

Air temperature	Wind velocity	Runoff/Water flow
Cloudiness	Wind direction	Water depth
Precipitation	Light penetration (lakes and sea)	Snow/ice depth

These data are not presented in this report.

5.6 Nonconformities

The only nonconformities that occurred during the reported sampling period involve omitted sampling locations due to, for example, problems with ice or wild life considerations. The reasons for deviations from the programme are compiled in Tables 5-4 and 5-5.

No PAR-measurements (light) were performed during week 12, 2004. The sonde was sent for repair during that period and the substitute sonde had no PAR-sensor.

Table 5-4. Collected surface water samples and conducted field measurements.

Week/year		12/04	15/04	17/04	19/04	21/04	23/04	25/04	28/04	34/04	38/04	42/04	46/04	50/04	03/05	07/05	11/05	15/05	19/05	24/05	Sum (x)
Activity plan nr:	**AP PF 400-04-21**								**AP PF 400-04-71**												
Sondes																					
YSI 600 QS																					
YSI 6600			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
YSI 6600[A]		X																			
Sea	**Name**																				
PFM000062	SV-Forslingen		X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	17
PFM000063	Tixelfjärden	X	X	X	X	X	X	X													7
PFM000064	Kallrigafjärden	X	X	X	X	X	X	X													7
PFM000065	V-Högbåden	X		X	X	X	X	X													6
PFM000082	Alt PFM000062	X															X				2
PFM000083	Alt PFM000063																				0
PFM000084	Alt PFM000064, 65		X																		1
Stream																					
PFM000066	Ö-Gunnarsbo	X	X	X	X	X	X	X	X	E	E	X	X	X	X	X	X	X	X	X	17
PFM000067	Lillputtsundet	X	X	X	X	X	X	X													7
PFM000068	Kungsträsket	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	19
PFM000069	Bolundsskogen	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	19
PFM000070	N-Eckarfjärden	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	19
PFM000071	S-Eckarfjärden	X	X	X	X	X	X	X													7
PFM000072	Flottbron	X	X	X	X	X	X	X													7
PFM000073	S-Bredviken	X	X	X	X	X	X	E													6
Lake																					
PFM000074	Labboträsket	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	19
PFM000087	Gunnarsbo-Lill-fjärden	X	X	X	X	X	X	X													7
PFM000097	Norra bassängen	X	X	X	X	X	X	X	B	B	B	B	B	B	B	B	B	B	B	B	7
PFM00107	Bolundsfjärden	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	19
PFM00117	Eckarfjärden	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	19
PFM00135	Fiskarfjärden	X	D	X	D	X	D	X	X	X	X	X	X	X							10
Sum (X)		**18**	**17**	**18**	**17**	**18**	**17**	**17**	**9**	**8**	**8**	**9**	**9**	**9**	**8**	**8**	**8**	**8**	**8**	**8**	**222**

Explanation to codes/abbreviations:

X: Collected sample.
A: Exchange unit without PAR-sensor.
B: Sonde measurement only.
D: No sample, due to sensitive wildlife.
E: No sample, due to low water flow or dry conditions.

Table 5-5. Comments on measurements/water sampling.

Week/year		12/04	15/04	17/04	19/04	21/04	23/04	25/04	28/04	34/04	38/04	42/04	46/04	50/04	03/05	07/05	11/05	15/05	19/05	24/05
Activity plan nr:	**AP PF 400-04-21**								**AP PF 400-04-71**											
Sonds																				
YSI 600 QS																				
YSI 6600			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
YSI 6600[A]		X																		
Sea	**Name**																			
PFM000062	SV-Forslingen					D								U				J	C	J
PFM000063	Tixelfjärden	M, V	M		M	Q														
PFM000064	Kallrigafjärden	V	K																	
PFM000065	V-Högbåden	V																		
PFM000082	Alt PFM62	M, V																		
PFM000083	Alt PFM63																			
PFM000084	Alt PFM64, 65		R, V																	
Stream																				
PFM000066	Ö-Gunnarsbo	F								F	F	H	H			F, S	F, I, Z			
PFM000067	Lillputtsundet																			
PFM000068	Kungsträsket	F												F		F, S	F, I, Z			
PFM000069	Bolundsskogen	F, Z	Z	Z	Z											F, Z	F, I			
PFM000070	N-Eckarfjärden	F					H	H	H	H	H	H	H				F, I, Z			
PFM000071	S-Eckarfjärden	F	F		H	H	H	H												
PFM000072	Flottbron	F, Z	F, Z	H, Z	H, Z	H	H	H												
PFM000073	S-Bredviken	F, O	F	H	H	H	H	F												
Lake																				
PFM000074	Labboträsket	V, Z	Z			M		M		M	M	M	M	U, Z		Z	I, Z			
PFM000087	Gunnarsbo-Lillfj	V, Z	U, Z					J												
PFM000097	Norra bassängen	V				M			M		M	M, Q	M, Q	J, M		J			Q	
PFM00107	Bolundsfjärden	V, Z	Z										U		U	J, Z	Z	J		
PFM00117	Eckarfjärden	V, Z	Z			Q									J, Z	C, Z	Z		J	J
PFM00135	Fiskarfjärden	V				Q		M	M				Q	C, J						

Explanation to codes/abbreviations:

A: Exchange unit without PAR-sensor.
C: Minor sonde problem – data logged and/or noted in field protocol.
D: Water transparency estimated without aquascope.
F: No flow estimation.
H: Stagnant water or nearly stagnant water – no flow estimation, flow approx 0 m^3/s.
I: Faulty depth logging by YSI 6600 – reason probably sensor freezing.
J: Incorrect PAR-values at one or several depths (mainly caused by waves or clouds).
K: Sample taken at another position, “close by”, due to weak ice (applies only to surface samples).
M: Bottom water and transect data logged more shallowly than usual due to low water level.
O: Risk for contamination from melting icewater, mainly in surface samples.
Q: Risk for incorrect sonde values for PAR, Turbidity and Chlorophyll, due to plants and/or particles in the water.
R: No water transparency estimation.
S: Peristaltic pump system out of order, sample collected with Rutner-sampler.
U: Incorrect sonde-data logging, noted in field protocol.
V: No PAR-data logging.
Z: Winkler samples (2) collected, due to low oxygen concentration.

6 Results

6.1 General

The surface water investigation period from March 2004 to June 2005 includes records of 240 water analyses (i.e. number of analysed samples) and records of 425 field measurements. Furthermore, the accompanying field documentation is quite extensive. The data are compiled in the attached Appendices and stored in the SICADA database where they are traceable by the two activity plan numbers.

Fresh waters in the Forsmark area are well buffered with high alkalinity, high pH and high calcium concentrations. In addition, waters recently affected by brackish sea water still show high sodium chloride concentrations. The relationship between the position of the coastline and the salinity of the water samples collected at the sampling locations in the area has been demonstrated in /3/. Furthermore, a detailed evaluation of surface water data from March 2002 to March 2004 was presented in /4/.

The results presented and compiled in this report are restricted to field work performed after March 2004 except for the ORP-measurements which are accounted for since 2002. Special focus has been put on questions concerning:

- Quality of bromide and fluoride analyses.
- Variation in tritium content and anomalously high carbon-14 (pmC) values.
- Reliability of uranium and thorium isotope determinations.
- Redox measurements; seasonal variation of ORP-values.

6.2 Water analyses

6.2.1 Major components

The basic water analyses include the major constituents Na, K, Ca, Mg, Sr, S, SO_4^{2-}, Cl^-, Si and HCO_3^- as well as the minor constituents Fe, Li, Mn, Br, F^-, I and HS^-. Furthermore, batch measurements of pH and electrical conductivity are included. The basic water analysis data are compiled together with field measurements of pH and water temperature in Appendix 5, Table A5-1.

The charge balance errors give an indication of the quality and uncertainty of the analyses of major constituents. The errors exceed ± 5% in ten cases and ± 10% in seven cases out of 240 datasets. Furthermore, duplicate analyses by a second laboratory are conducted regularly. Comparison between results from different laboratories and methods shows acceptable agreement in most cases. Generally, the difference in concentrations between laboratories/methods for each analysed constituent is less than ± 10%. A constituent showing larger deviation is bromide; see Figures 6-4 and 6-5.

To provide a rough check of the data, the chloride concentrations are plotted versus the corresponding electrical conductivity values in Figure 6-1. As shown, the near surface groundwater data generally agree well with a thought regression line although some of the field values show a deviation.

Sulphate by ion chromatography and sulphate calculated from total sulphur by ICP are compared in Figure 6-2. As shown, within the analytical error all the sulphur is present as sulphate.

Total silicon concentrations by ICP, and SiO_4 as silicon concentrations (SiO_4-Si) by spectrophotometry, are compared in Figure 6-3. The diagram shows very good agreement although somewhat higher total silicon concentrations may be expected/explained.

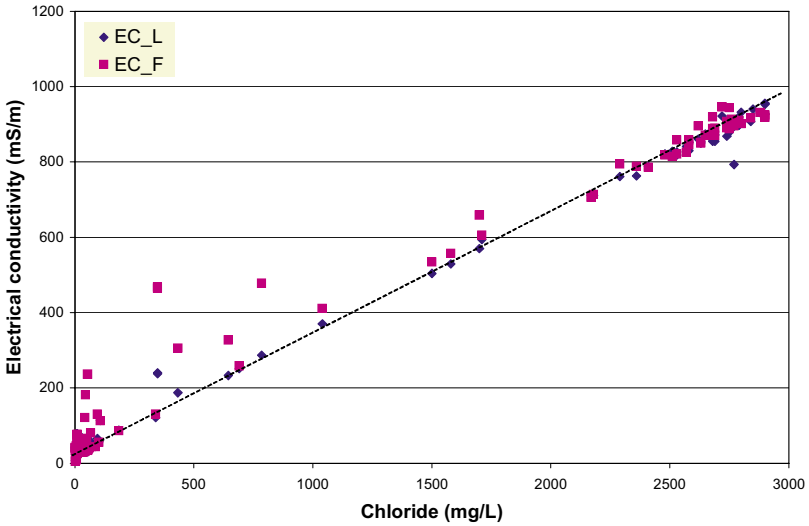


Figure 6-1. *Electrical conductivity versus chloride concentrations. EC_L = Laboratory value, EC_F = Field value.*

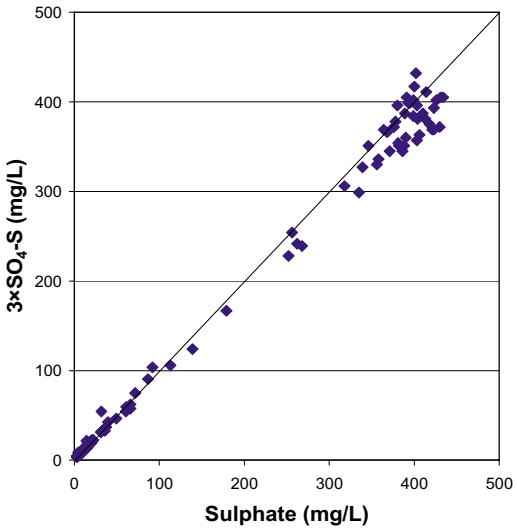


Figure 6-2. *Sulphate (SO_4^- by IC) versus sulphate calculated from total sulphur ($3\times SO_4^-S$) by ICP.*

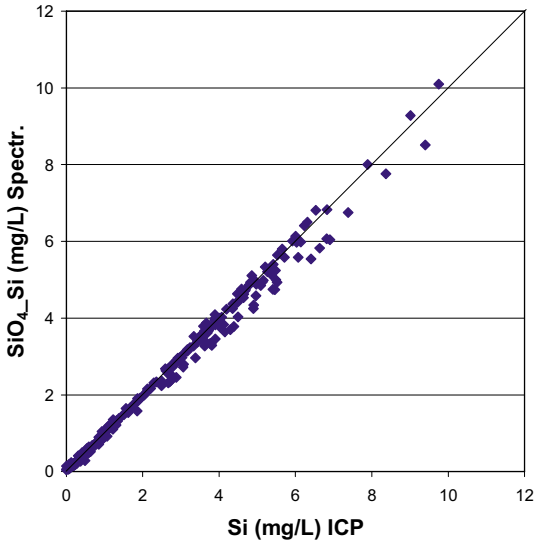


Figure 6-3. *SiO_4-Si determined by spectrophotometry versus total Si analysed by ICP.*

Bromide and fluoride

Bromide and fluoride determinations by ion chromatography are difficult at high chloride concentrations. For example, the bromide peak gets a significant contribution from the tail of the chloride peak which is difficult to correct for. This results in an enhanced bromide concentration. In addition, since the detection limit (< 0.2 mg/L) is normally not low enough for fresh waters, duplicate analyses by ICP (bromine) have been performed on most samples. Selected bromide/bromine values for each sample are plotted versus the corresponding chloride concentrations in Figure 6-4 as a consistency check. Points that differ significantly from the linear trend are most probably erroneous. A comparison of the analytical results by ion chromatography (IC) and by ICP is presented in Figure 6-5. As demonstrated, high bromide concentrations (mainly sea water) by ion chromatography show deviations which systematically increase with higher bromide concentrations.

Fluoride analyses were performed by ion chromatography and since 2005-04 also by potentiometry (ion selective electrode). The latter method was used mainly for samples with high chloride concentration (sea water). Erroneous fluoride analyses conducted prior to April 2005 (due to dilution of samples to below the detection limit) are not included in SICADA or in Appendix 5, Table A5-1.

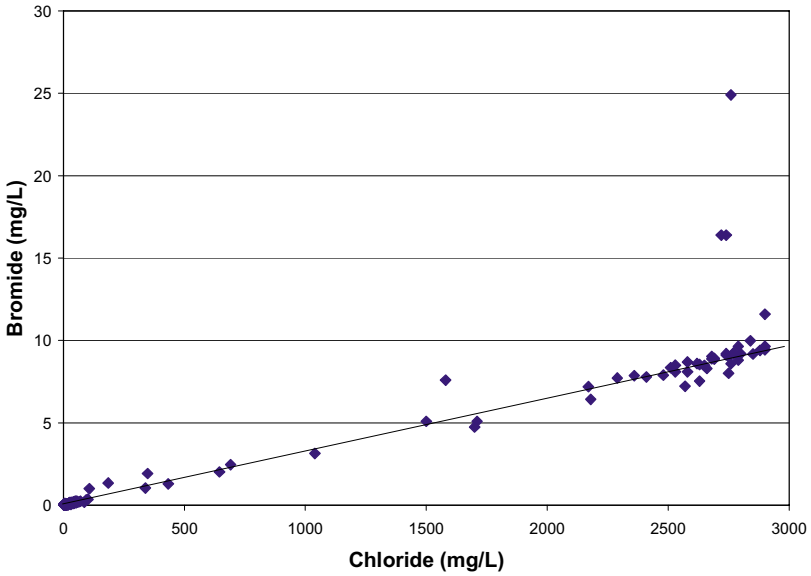


Figure 6-4. *Bromide versus chloride.*

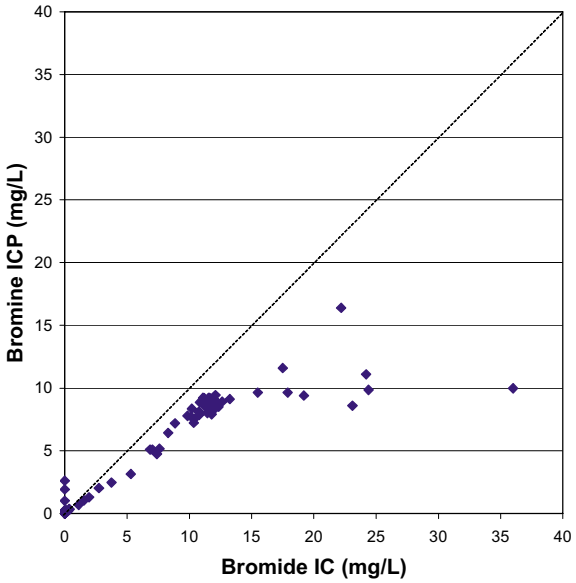


Figure 6-5. *Comparison of bromine by ICP technique and bromide by ion chromatography.*

6.2.2 Trace metals

The analyses of trace and rare-earth elements include Al, As, Sc, Cd, Cr, Cu, Co, Hg, Ni, Zn, Pb, V, U, Th , Rb, Y, Zr, Mo, In, Sb, Cs, Ba, La, Hf, Tl, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu. The trace element data are compiled in Appendix 5, Table A5-4.

These elements are generally present at low concentrations in the groundwater and the risk for contamination is high. Especially data on common metals like Al, Cr, Cu, Co, Ni and Zn must be used with caution. Generally, the distribution of data is borehole specific but outliers do exist; significantly large deviating concentrations are rejected in the SICADA database.

6.2.3 Surface water supplements

The surface water supplements include NH_4-N, NO_2-N, NO_3-N+NO_2-N, NO_3-N, tot-N, tot-P, PO_4-P, TOC, DOC, DIC and sometimes at a few sampling occasions also dissolved oxygen. The analytical data are compiled in Appendix 5, Table A5-2. The DIC values should be used with care and bicarbonate values (by alkalinity titration) are considered more reliable.

6.2.4 Isotopes

The isotope determinations include the stable isotopes δD, $\delta^{18}O$, $^{10}B/^{11}B$, $\delta^{34}S$, $\delta^{13}C$, $\delta^{37}Cl$ and $^{87}Sr/^{86}Sr$ as well as the radioactive isotopes Tr (TU), ^{14}C (pmC), ^{238}U, ^{235}U, ^{234}U, ^{232}Th, ^{230}Th, ^{226}Ra and ^{222}Rn. The isotope data available at the printing date of this report are compiled in Appendix 5, Table A5-3.

Tritium and carbon-14

The tritium and carbon-14 (as pmC) determinations in surface waters (lakes, streams, sea bays) have been questioned due both to the large spread of values and to the unexpectedly high values. It has been suggested that the adjacent nuclear power plant may have influenced the natural conditions for these isotopes. Statistical information illustrating the spread of the tritium values (from start of 2002) is compiled in Table 6-1 and is illustrated in Figure 6-6 which shows bar charts at each sampling location. Some relation between the presence of tritium and distance from the nuclear power reactors may possibly be observed for sampled sea water locations and also PFM000067 (Lillputtsundet). In order to better understand the tritium data, repeated tritium determinations from the outlet of reactor cooling water commenced in July 2005. The only sample analysed so far revealed enhanced tritium content (120.7 TU). The deep sea water location sampled on one occasion showed 12.7, 12.4 and 10.3 TU at 0 m, 20 m and 55 m depths, respectively.

The corresponding statistical information for pmC values (from the start of 2002) is compiled in Table 6-2 and illustrated in Figure 6-7 which shows bar charts at each sampling location. The table indicates somewhat enhanced pmC values for some stream waters (PFM000068-70), and lake waters (PFM000074 and PFM000117). These sampling locations are clustered in one area just south of the nuclear power plant. Furthermore, two stream waters show lower pmC values then the rest, suggesting groundwater discharge.

Table 6-1. Tritium; average, median, minimum and maximum values as well as the variance at different surface water sampling locations. Sampling period July 2002 to May 2005; bottom samples omitted (blue=sea, yellow=stream, green=lake).

Id-code	No of analyses	Tritium average (TU)	Tritium median (TU)	Tritium min (TU)	Tritium max (TU)	Variance
PFM000062	12	13.6	13.8	10.1	17.3	4.2
PFM000063	9	16.7	17.1	14.1	18.6	1.6
PFM000064	8	13.9	13.6	12.2	17.8	3.3
PFM000065	9	13.3	12.2	11.2	16.6	4.1
PFM000066	13	11.6	11.7	9.3	14.2	2.7
PFM000067	10	12.4	12.8	6.7	17.0	7.3
PFM000068	14	11.1	10.9	8.5	13.6	2.5
PFM000069	9	11.8	11.2	10.1	13.9	1.7
PFM000070	12	12.0	12.6	6.6	15.4	5.6
PFM000071	3	10.1	11.9	5.3	13.3	18.2
PFM000072	10	12.0	12.1	10.2	13.8	1.2
PFM000073	4	11.0	11.1	10.3	11.3	0.2
PFM000074	13	12.3	12.5	9.8	14.7	2.2
PFM000082	4	16.1	16.2	12.6	19.3	7.6
PFM000083	1	16.1	–	–	–	–
PFM000084	1	11.7	–	–	–	–
PFM000087	10	13.6	13.4	11.5	16.0	2.7
PFM000097	8	12.1	12.2	8.2	15.3	5.6
PFM000107	13	12.5	13.0	10.4	15.6	1.8
PFM000117	12	12.5	12.8	9.1	15.5	4.1
PFM000127	3	11.3	13.1	7.6	13.3	10.5
PFM000135	5	11.7	11.6	9.2	14.7	3.9
PFM005865	1	12.7*		–	–	–

* Surface sample, deep sea water location.

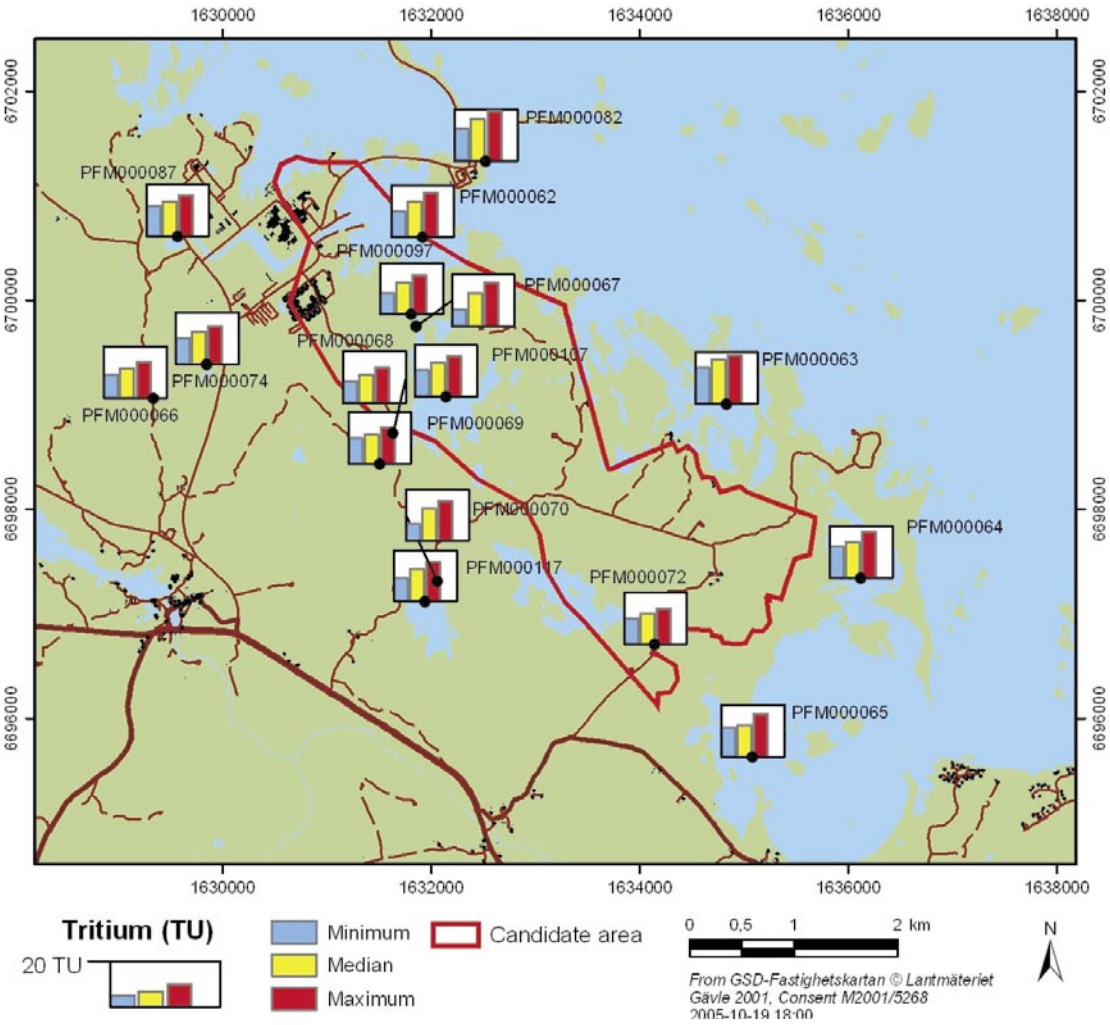


Figure 6-6. *Tritium content of the surface waters at the different sampling locations. The bars represent the minimum, median and maximum values and the length of the y-axis corresponds to 20 TU (Tritium Units). Sampling period April 2002 to May 2005.*

Table 6-2. Carbon-14 as pmC; average, median, minimum and maximum values as well as the variance at different surface water sampling locations. Sampling period April 2002 to August 2004; bottom samples omitted (blue=sea, yellow=stream, green=lake).

Id-code	No of analyses	pmC average	pmC median	pmC min	pmC max	Variance
PFM000062	6	108.8	108.8	107.2	110.9	1.82
PFM000063	8	108.6	109.2	105.4	111.1	4.50
PFM000064	6	107.9	108.2	106.1	109.1	1.22
PFM000065	4	107.9	107.9	106.6	109.1	1.73
PFM000066	3	111.2	113.1	106.8	113.6	14.40
PFM000067	4	111.4	111.6	109.7	112.6	1.50
PFM000068	4	113.4	113.6	111.1	115.5	3.25
PFM000069	4	114.9	115.5	112.8	116.2	2.54
PFM000070	3	114.8	114.1	112.8	116.2	4.74
PFM000071	3	96.5	95.5	93.3	100.8	14.90
PFM000072	4	109.9	109.8	108.8	111.1	0.91
PFM000073	1	100.6	100.6			
PFM000074	5	116.4	116.1	113.8	118.4	4.76
PFM000082	4	108.9	109.0	107.9	109.4	0.54
PFM000083	1	110.1	110.1			
PFM000084	1	100.1	100.1			
PFM000087	8	113.3	113.8	109.1	114.9	3.20
PFM000097	4	112.1	112.2	109.9	114.0	2.87
PFM000107	7	111.7	111.3	109.1	113.8	2.31
PFM000117	6	113.9	113.5	111.0	116.2	4.09
PFM000127	3	109.9	110.0	108.8	110.8	1.01
PFM000135	2	109.3	109.3	108.8	110.8	–
PFM005865*	1	–	–			

* Surface sample, deep sea water location.

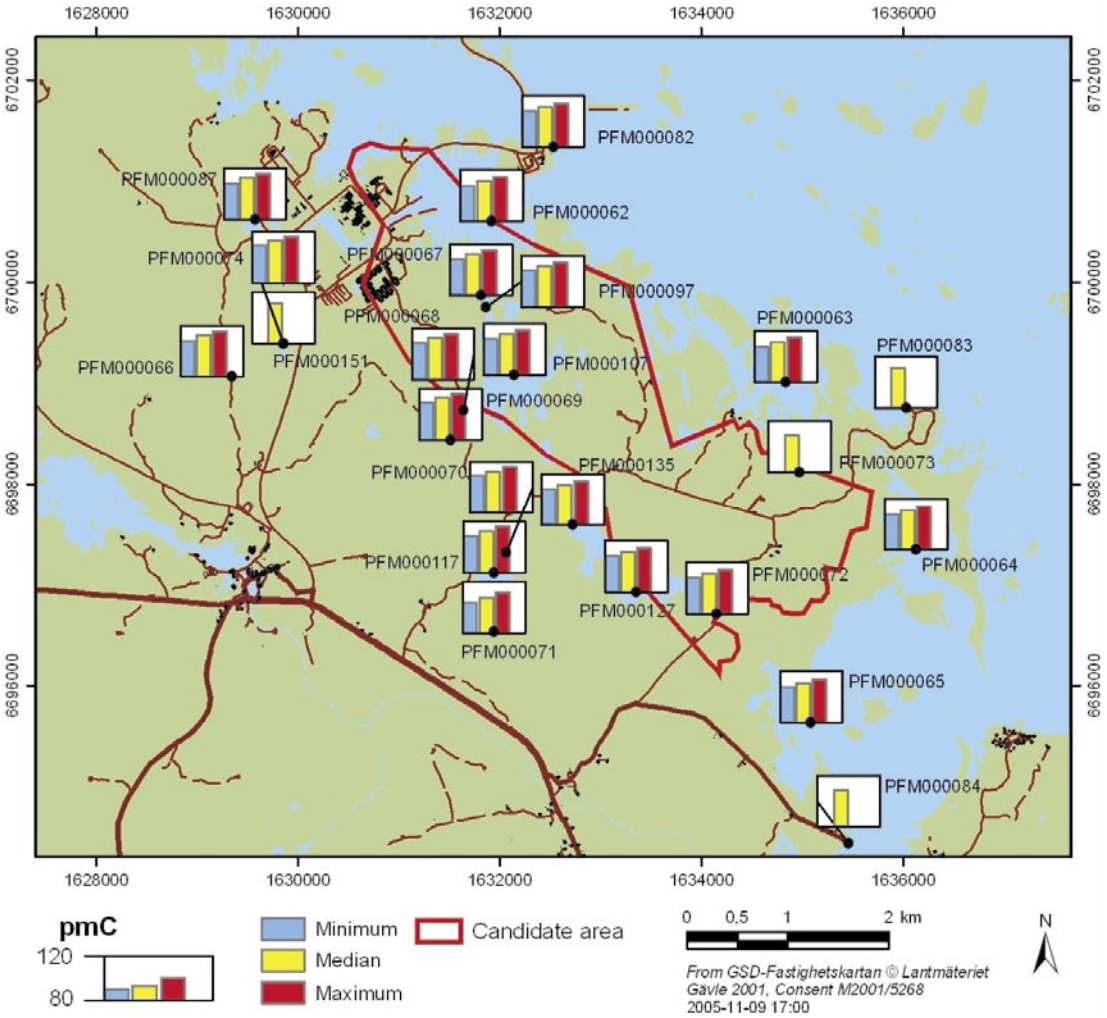


Figure 6-7. *Values of pmC (percent modern Carbon) in the surface waters at the different sampling locations. The bars represent the minimum, median and maximum values and the scale on the y-axis is between 80 and 120 pmC. Sampling period April 2002 to August 2004.*

Uranium and thorium isotopes

The early results (until 2003-06-05) of uranium and thorium isotope determinations are regarded as questionable since the laboratory (Lab 1) reports the same value of ^{238}U and ^{234}U in all samples. Furthermore, most of the data were below the detection limit. The data are, however, included (in italics) in Appendix 5, Table A5-5. An alternative laboratory (Lab 2) produced sufficiently low detection limits such that it was possible to differentiate between ^{238}U and ^{234}U. However, ^{235}U and ^{232}Th determinations are not performed. The ICP analyses of uranium and both new and old ^{238}U-determinations are compared from Lab 1 and Lab 2 in Table 6-3. The agreement is generally good, apart from three cases (out of a total of 21 analyses) where Lab 1 data deviate considerably. The remaining analyses from Lab 1 can therefore not be regarded as erroneous, but give less useful information as they are often below the high detection limit.

Table 6-3. Comparison of uranium (µg/L) calculated from ^{238}U-determinations and Uranium (µg/L) by ICP-MS. The expression used is given in Appendix 1.

Id-code	Date	Sample no	U-238 (mBq/kg)		U (µg/L) calc. from U-238	U (µg/L) ICP
PFM000062		4322	< 50	Lab 1	< 4.0	0.601
PFM000062		4333	50	Lab 1	4.0	0.560
PFM000062		8547	8.1	Lab 2	0.653	0.859
PFM000063		4321	< 50	Lab 1	< 4.0	0.640
PFM000063		4324	50	Lab 1	4.0	0.550
PFM000063		4445	< 50	Lab 1	< 4.0	0.934
PFM000063		4450	< 50	Lab 1	< 4.0	0.820
PFM000064		4323	100	Lab 1	8.1	0.764
PFM000064		4330	< 50	Lab 1	< 4.0	0.715
PFM000065		4325	< 50	Lab 1	< 4.0	0.647
PFM000065		4446	< 50	Lab 1	< 4.0	1.48
PFM000074		4453	70	Lab 1	5.6	2.12
PFM000074		8544	15.3	Lab 2	1.23	1.22
PFM000082		4438	< 50	Lab 1	< 4.0	0.826
PFM000082		4439	< 50	Lab 1	< 4.0	0.909
PFM000087		4442	60	Lab 1	4.8	3.07
PFM000087		4449	< 50	Lab 1	< 4.0	3.28
PFM000097		4452	60	Lab 1	4.8	2.67
PFM000107		4444	< 50	Lab 1	< 4.0	2.03
PFM000107		4447	< 50	Lab 1	< 4.0	2.36
PFM000107		8546	30.8	Lab 2	2.48	2.39
PFM000117		4440	< 50	Lab 1	< 4.0	1.30
PFM000117		4451	50	Lab 1	4.0	1.27
PFM000117		8549	15.4	Lab 2	1.24	1.33
PFM000135		4443	< 50	Lab 1	< 4.0	1.11
PFM000135		8548	12.9	Lab 2	1.04	1.05
PFM005865		8616	7.8	Lab 2	–	–
PFM005865		8617	8.4	Lab 2	–	–
PFM005865		8618	7.7	Lab 2	–	–

* Lab 1 = previous laboratory, Lab 2 = new laboratory.

6.3 Field measurements

The field measurement data including redox potential, pH, dissolved oxygen, electrical conductivity, salinity, measurement depth, barometric pressure, turbidity, chlorophyll, light/PAR (Photosynthetic Active Radiation) and water temperature are compiled in Appendix 2. The PAR-profile logs are presented as diagrams including regression constants in Appendix 3. Three sets of data are of lower quality; 1) water flow data, 2) sonde measurements (YSI 6600 EDS) of chlorophyll, and 3) turbidity measurements also by the sonde.

- The water flow rate estimations (Appendix 4) by the float method /6/ are of low accuracy compared to measurements using discharge weirs and gauges. They were performed in order to allow comparison between early data obtained when there was no other available method and new data from installed measurement stations.
- The chlorophyll measurements have been problematic, possibly due to the fact that humic substances and chlorophyll have similar fluorescence in the wavelength used by the sonde. Since the inland waters show high concentrations of humic substances and the sonde interprets humus as chlorophyll, the amount of chlorophyll tends to be overestimated.
- The turbidity measurements performed in the sea and in lakes often display negative values. This may be due to bad probe sensitivity in clear waters (turbidity weak waters).

Comments on the low quality of chlorophyll and turbidity data as well as explanations to these circumstances are stored in the SICADA database.

6.3.1 Electrical conductivity, pH and dissolved oxygen

pH-measurement

Field measurements of pH are plotted against the corresponding laboratory values in Figure 6-8. The observed disagreement is reasonable considering the change of water temperature, change of pressure and the time delay prior to the laboratory measurement. However, in some cases, the disagreement seems to be greater than expected.

Electrical conductivity

Electrical conductivities measured in the field are plotted against the corresponding laboratory values in Figure 6-9. The agreement is acceptable except in a few cases.

Dissolved oxygen

The field measurements of dissolved oxygen were expected to be less reliable, especially at low concentration (< 4 mg/L), see evaluation of the equipment (Jämförelse mellan sondmätningar och laboratorieresultat i Forsmark och Simpevarp 2002–2003, Ulf Ericsson, Medins Sjö- och Åbiologi AB, 2003-06-03). In Figure 6-10 measured oxygen concentrations below 4 mg/L are plotted versus corresponding analytical results. Generally, the field measurements show somewhat higher values.

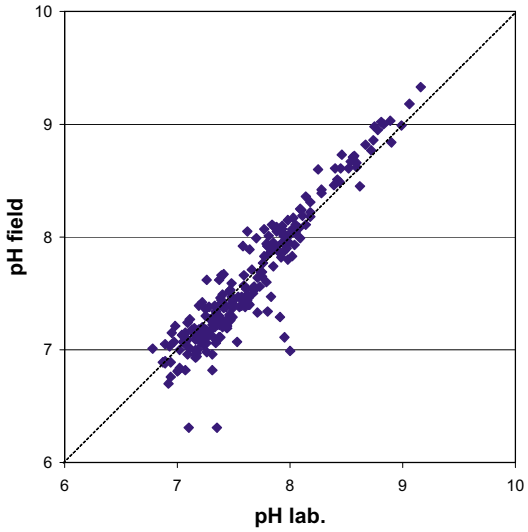


Figure 6-8. *Field-pH values versus laboratory-pH values. Field-pH and laboratory-pH values are measured at prevailing water temperature and at 25°C respectively.*

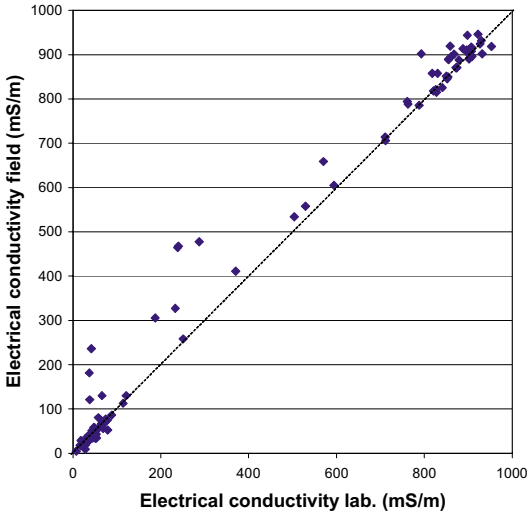


Figure 6-9. *Electrical conductivity (25°C). Field measurements versus laboratory values.*

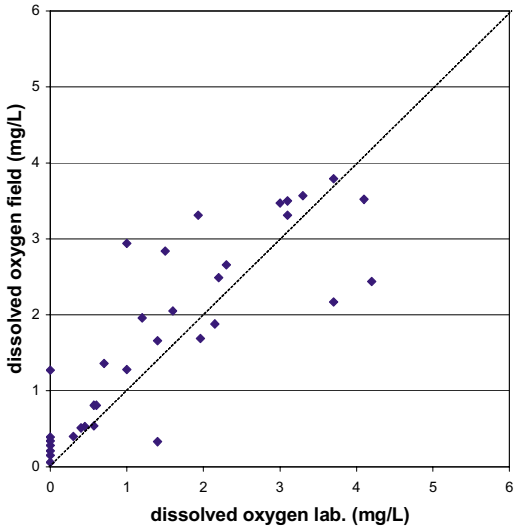


Figure 6-10. *Dissolved oxygen. Field measurement versus laboratory analytical results. Values below detection limit are plotted as zero. Analyses are performed when the measured values record less than 4 mg/L.*

6.3.2 ORP-measurements and redox conditions

It is difficult and sometimes also time consuming to measure reliable redox potentials (Eh) in natural waters. Redox potential measurements or preferably ORP-measurements (Oxidising-Reducing Potential) have been conducted using the multipurpose measurement sonde in surface waters from lakes, streams and shallow sea bays. The recorded ORP-values should be used with great caution and merely considered as an indication of the redox conditions in the waters, rather than actual Eh-values. Due to these circumstances, the denoted ORP-value will be used instead of the Eh-value in the following text. Figures 6-11 to 6-13 present the seasonal variation of the ORP-values in lakes, streams and shallow sea bays respectively. As expected, the redox potential decreases in the lakes and streams during winter time due to ice coverage and low biological production. This phenomenon is less pronounced in the sea bays. Figures 6-14 to 6-16 compare the concentration of dissolved oxygen and ORP-values in selected sea and stream locations over the same measurement period. As shown these trends are similar. In surface waters there is, however, a possibility of having negative redox potential in the presence of dissolved oxygen.

Factors that may affect certainty/reliability of the ORP-values are short measurement time (10–15 minutes) and complicated redox conditions (mixed potentials etc).

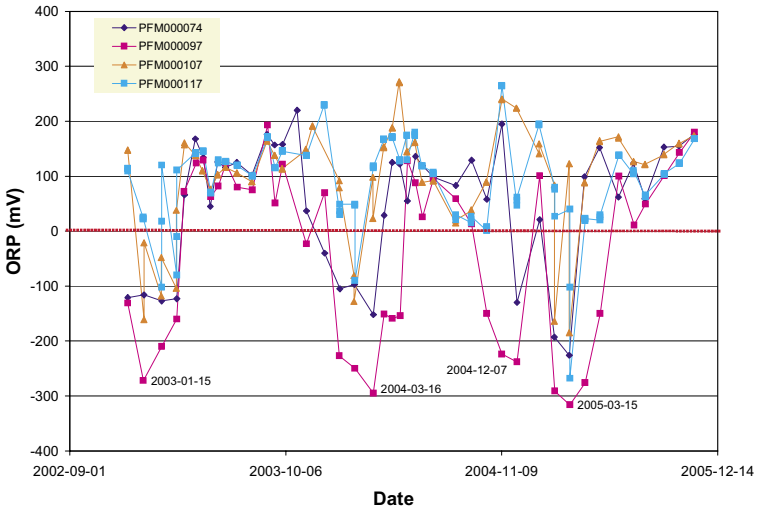


Figure 6-11. *Seasonal variation of ORP-values in lake waters from start of measurements (December 2002 until October 2005).*

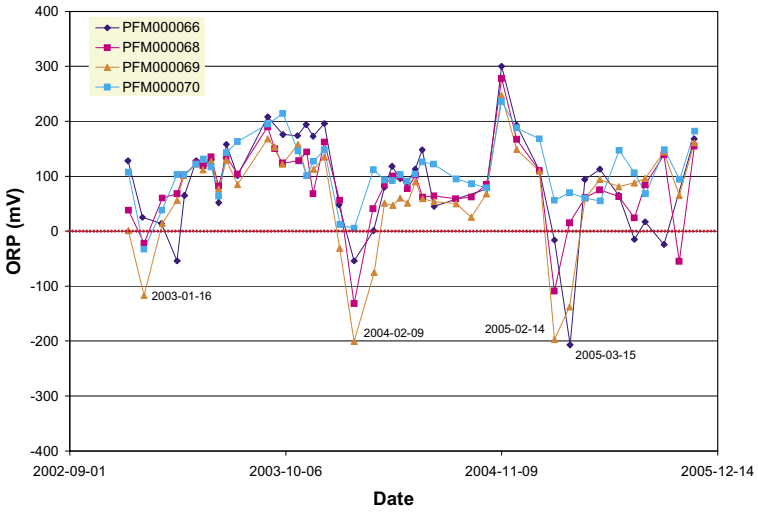


Figure 6-12. *Seasonal variation of ORP-values in stream waters from start of measurements (December 2002 until October 2005).*

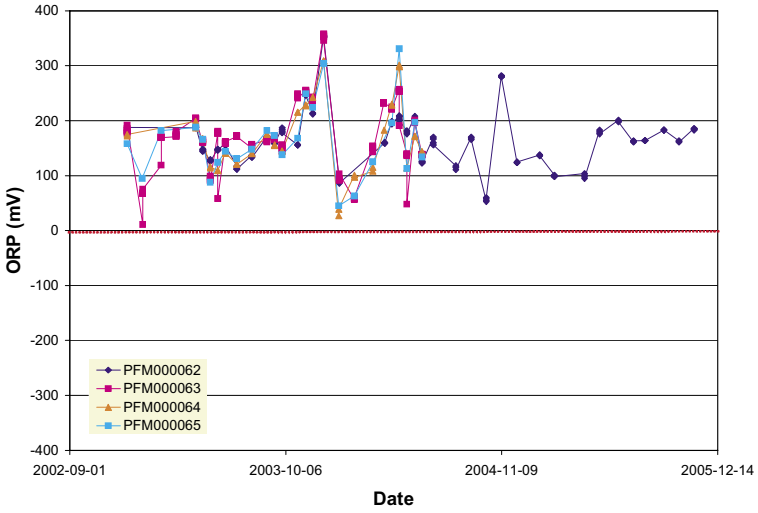


Figure 6-13. *Seasonal variation of ORP-values at sea bay locations from start of measurements (December 2002 until October 2005).*

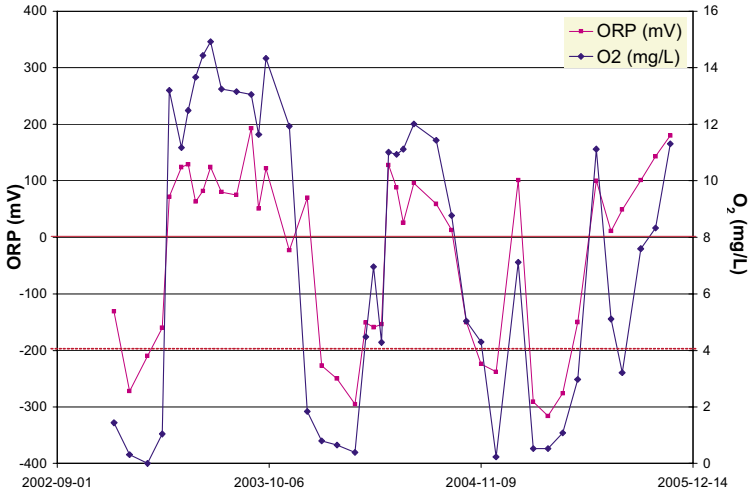


Figure 6-14. *Seasonal variation of ORP- and dissolved oxygen values in Lake Norra Bassängen (PFM000097) (December 2002 until October 2005).*

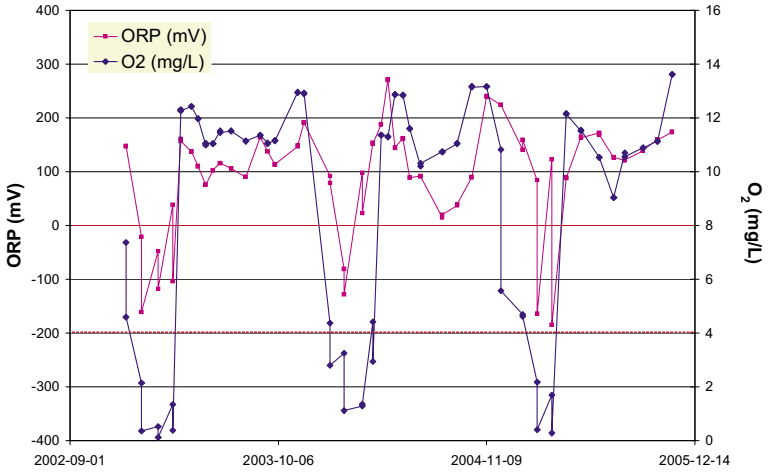


Figure 6-15. *Seasonal variation of ORP- and dissolved oxygen values in lake Bolundsfjärden (PFM000107) (December 2002 until October 2005).*

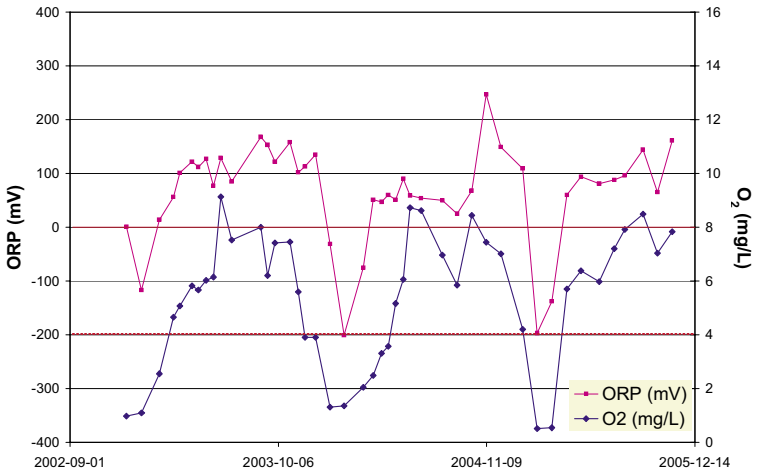


Figure 6-16. *Seasonal variation of ORP- and dissolved oxygen values in Bolundsskogen stream (PFM000069) (December 2002 until October 2005).*

7 Summary and discussion

The chemical investigation routines for surface waters are well established after more than three years of field work, reporting and data administration. Also, the first year of the long-term surface water monitoring programme has passed without any major nonconformities or surprises.

The main experiences and conclusions from surface water sampling and analyses since March 2004 are summarised below:

- The statements/findings regarding the character of surface waters, based on the first two years of sampling and analyses, remain unchanged also after the third year.
- The additional deep sea water location contributes new information on sea water composition unaffected by dilution from fresh water discharge. The chloride concentration corresponds to the highest values measured in the shallow bays.
- Bromide and fluoride concentrations determined by ion chromatography (IC) are less reliable in saline waters. Generally, bromine values by ICP are selected/reported when available. Several fluoride values are missing due to the necessity of dilution to below the detection limit. In saline waters, measurements using an ion selective electrode have replaced the IC method from April 2005.
- Both tritium and pmC show somewhat higher values close to the nuclear power plant. However, while tritium is enhanced in the sea water, pmC is enhanced inland, south-west of the power plant. These findings necessitated changes in the sampling programme. From August 2005 sampling for tritium analyses is also performed in the outlet of cooling water from the power plant. Furthermore, a reference sampling location for precipitation is planned far from the influence of the nuclear facilities in central Sweden.
- A change of laboratory for uranium and thorium isotope determinations have resulted in lowered detection limits and thereby a resolution that is adequate to distinguish between ^{238}U and ^{234}U. There is good agreement between recalculated ^{238}U-values and corresponding element analyses (µg/L).
- The ORP measurements seem to closely reflect the redox situation in the surface waters. The seasonal variation is similar within each surface water category (lakes, streams, sea locations) but differs between the three groups. Furthermore, the ORP trends and the corresponding trends for dissolved oxygen show similar behaviour. However, due to high measurement uncertainty, the actual ORP-values should be used with caution.

References

1 **SKB, 2001.** Site investigations. Investigation methods and general execution programme. SKB TR-01-29, Svensk Kärnbränslehantering AB.

2 **Nilsson A-C, Karlsson S, Borgiel M, 2003.** Forsmark site investigation. Sampling and analyses of surface waters. Results from sampling in the Forsmark area, March 2002 to March 2003. SKB P-03-27, Svensk Kärnbränslehantering AB.

3 **Nilsson A-C, Borgiel M, 2005.** Forsmark site investigation. Sampling and analyses of surface waters. Results from sampling in the Forsmark area, March 2003 to March 2004. SKB P-04-146, Svensk Kärnbränslehantering AB.

4 **Sonesten L, 2004.** Evaluation of surface water chemistry data from the Forsmark area. March 2002–March 2004. SKB R-05-41, Svensk Kärnbränslehantering AB.

5 **SKB, 2005.** Forsmark site investigation. Programme for further investigations of geosphere and biosphere. SKB R-05-14, Svensk Kärnbränslehantering AB.

6 **Johansson P-O, 2005.** Forsmark site investigation. Manual discharge measurements in brooks, April 2002–April 2005. SKB P-05-153, Svensk Kärnbränslehantering AB.

Appendix 1

Methods for sampling and analyses

Table A1-1. Sample handling routines and analytical methods.

Component group	Component/ element	Sample container (material)	Volume (mL)	Filtering	Preparation/ Conservation*	Analysis method	Analysis within – or delivery time to lab.
Anions 1	HCO_3 pH(lab) cond (lab)	Plastic	250	Yes (not in the field)	No	Titration Pot. meas, Cond. meas	The same day – maximum 24 hours
Anions 2	Cl, SO_4, Br^-, F^-, I^-	Plastic	100	Yes (not in the field)	No	Titration (Cl^-) IC (Cl^-, SO4, Br^-, F^-) ISE (F^-)	Not critical (month)
	Br, I	Plastic	100	Yes (not in the field)	No	ICP MS	Not critical (month)
Cations, Si and S according to SKB class 3	Na, K, Ca, Mg, S(tot), Si(tot), Li, Sr	Plastic (at low conc. acid washed bottles)	100	Yes (not in the field)	Yes (not in the field, 1 mL HNO_3)	ICP-AES ICP-MS	Not critical (month)
Cations, Si and S according to SKB class 4 and 5	Na, K, Ca, Mg, S(tot), Si(tot), Fe, Mn, Li, Sr	Plastic (Acid washed)	100	Yes (immediately in the field)	Yes (1 mL HNO_3)	ICP-AES ICP-MS	Not critical (month)
Fe(II), Fe(tot)	Fe(II), Fe(tot)	Plastic (Acid washed)	500	Yes	Yes (5 mL HCl))	Spectrophotometry Ferrozine method	As soon as possible the same day
Hydrogen sulphide	HS-	Glass (Winkler)	About 120×2	No	Ev 1 mL 1 M NaOH+ 1 mL 1M ZnAc	Spectrophotometry	Immediately or if conserved, a few days
Environmental metals	Al, As, Ba, B, Cd, Co, Cr, Cu, Hg, Mo, Ni, P, Pb, V, Zn	Plastic	100	Yes	Yes (1 mL HNO_3)	ICP-AES ICP-MS	Not critical (month)
Lantanoids, U, Th and so on.	Sc, Rb, Y, Zr, I, Sb, Cs, La, Hf, Tl, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, U, Th	Plastic	100	Yes	Yes (1 mL HNO_3)	ICP-AES ICP-MS	Not critical (month)
Dissolved organic Carbon, dissolved inorganic Carbon	DOC, DIC	Plastic	250 25	Yes	Frozen, transported in isolated bag	UV oxidation, IR Carbon analysator Shimadzu TOC5000	Short transportation time

Component group	Component/ element	Sample container (material)	Volume (mL)	Filtering	Preparation/ Conservation*	Analysis method	Analysis within – or delivery time to lab.
Total organic Carbon	TOC	Plastic	250 25	No	Frozen, transported in isolated bag	UV oxidation, IR Carbon analysator Shimadzu TOC5000	Short transportation time
Environmental isotopes	^{2}H, ^{18}O	Plastic	100	No	– –	MS	Not critical (month)
Tritium, Chlorine-37	^{3}H (enhanced.) Chlorine-37	Plastic (dry bottle) Plastic	500 100	No No	– –	LSC ICP MS	Not critical (month)
Carbon isotopes	^{13}C, ^{14}C	Glass (brown)	100×2	No	–	(A)MS	A few days
Sulphur isotopes	^{34}S	Plastic	500–1000	Yes	–	Combustion, ICP MS	No limit
Strontium-isotopes	$^{87}Sr/^{86}Sr$	Plastic	100	Yes	–	TIMS	Days or week
Uranium and Thorium isotopes	^{234}U, ^{235}U, ^{238}U, ^{232} Th, ^{230}Th,	Plastic	50	Nej	–	Chemical separat. Alfa/ gamma spectrometry	No limit
Boron isotopes	^{10}B	Plastic	100	Yes	Yes (1 mL HNO_3)	ICP-MS	No limit
Radon and Radium isotopes	^{222}Rn, ^{226}Ra	Plastic	500	No	No	EDA, RD-200	Immediate transport
Dissolved gas (content and composition)	Ar, N_2, CO_2, O_2, CH_4, H_2, CO, C_2H_2, C_2H_4, C_2H_6, C_3H_8	Cylinder of stainless steel	200	No	No	GC	Immediate transport
Colloids	Filter series and fractionation (see below)	Polycarbonate filter	0.45, 0.2 and 0.05 µm	–	N_2 atmosphere	ICP-AES ICP-MS	Immediate transport
Humic and fulvic acids	Fractionation	Fractions are collected in plastic bottles	250	–	N_2 atmosphere	UV oxidation, IR (DOC)	Immediate transport
Archive samples with acid	–	Plast (washed in acid)	100×2 **	Yes	Yes (1 mL HNO_3)	–	Storage in freeze container
Archive samples without acid	–	Plastic	250×2 **	Yes	No	–	Storage in freeze container
Carbon isotopes in humic and fulvic acids	^{13}C, ^{14}C (pmc)	DEAE cellulose (anion exchanger)	–	–	–	(A)MS	A few days
Nutrient salt + silicate	NO_2, NO_3, NO_2+NO_3, NH_4, PO_4, SiO_4	Sample tubes, plastic	25×2	Yes (in the field)	No, frozen immediately***	Spectrophotometry	Short transportation time

Component group	Component/ element	Sample container (material)	Volume (mL)	Filtering	Preparation/ Conservation*	Analysis method	Analysis within – or delivery time to lab.
Total concentrations of Nitrogen and Phosphorous	N-tot, P-tot	Plastic	100	No	No, frozen immediately***	Spectrophotometry	Short transportation time
Particulate Carbon, Nitrogen and Phosphorous	POC, PON, POP	Plastic	1000	Yes (within 4 h) prepared filters. Blank filters	Filtering, the filters are frozen immediately 2 filters/sample	Elementar-analysator (N, C) own method 990121 (P)	Short transportation time
Chlorophyll	Chlorophyll a, c and pheopigment	Plastic	1000–2000	Yes (within 4 h)	Filtering, the filters are frozen immediately	Spectrophotometry Fluorometry	Short transportation time
Oxygen	Dissolved O_2	Winkler, glass	2×ca 120	No	Mn (II) reagent Iodide reagent	Spectrophotometry SIS SS-EN 25813	Within 3 days
Archive samples for supplementary radio nuclides		Plastic	5000	No	50 mL HNO_3	–	Storage in freeze container

* Suprapur acid is used for conservation of samples.

** Mi□

*** The sample is transported in froze□

Abbreviations and definitions:

IC	Ion chromatograph
ISE	Ion selective electrode
ICP-AES	Inductively Coupled Plasma Atomic Emission Spectrometry
ICP-MS	Inductively Coupled Plasma Mass Spectrometry
INAA	Instrumental Neutron Activation Analysis
MS	Mass Spectrometry
TIMS	Thermal Ionization Mass Spectrometer
LSC	Liquid Scintillation Counting
(A)MS	(Accelerator) Mass Spectrometry
GC	Gas Chromatography

Table A1-2. Reporting limits and measurement uncertainties.

Component	Method	Reporting limits or range		Unit	Measurement uncertainty [2]	"Total" uncertainty [3]
HCO_3	Alkalinity titration	1		mg/L	4%	<10%
Cl^-	Mohr-titration	> 70		mg/L	5%	<10%
Cl^-	IC	1–100			6%	10%
SO_4	IC	1		mg/L	10%	15%
Br^-	IC	0.2		mg/L	9%	20%
Br^-	ICP	0.001			15%	
F^-	IC	0.1		mg/L	10%	20%
F^-	Potentiometric	–			–	
I^-	ICP	0.001		mg/L	15%	20%
Na	ICP	0.1		mg/L	4%	10%
K	ICP	0.4		mg/L	6%	15%
Ca	ICP	0.1		mg/L	4%	10%
Mg	ICP	0.09		mg/L	4%	10%
S(tot)	ICP	0.160		mg/L	21%	15%
Si(tot)	ICP	0.03		mg/L	4%	15%
Sr	ICP	0.002		mg/L	4%	15%
Li	ICP	0.2[1]	2	mg/L	10%	20%
Fe	ICP	0.4[1]	4	mg/L	6%	10%
Mn	ICP	0.03[1]	0.1	µg/L	8%	10%
Fe(II), Fe(tot)	Spectrophotometry	0.02 (DL=0.005 mg/L)		mg/L	15% (>30 µg/L)	20%
HS^-	Spectrophotometry	SKB 0.03 (DL=0.02)		mg/L	10%	30%
NO_2 as N	Spectrophotometry	0.1		µg/L	2%	20%
NO_3 as N	Spectrophotometry	0.2		µg/L	5%	20%
NO_2+NO_3 as N	Spectrophotometry	0.2		µg/L	0.2 (0.2–20 µg/L) 2% (> 20 µg/L)	20%
NH_4 as N	Spectrophotometry	0.8		µg/L	0.8 (0.8–20 µg/L) 5% (> 20 µg/L)	20%
		50 (SKB)			20%	
PO_4 as P	Spectrophotometry	0.7		µg/L	0.7 (0.7–20 µg/L) 3% (> 20 µg/L)	20%
SiO_4	Spectrophotometry	1		µg/L	3% (>200 µg/L)	–
O_2	Jodometrisc titration	0.2–20		mg/L	5%	–
Chlorophyll a, c pheopigment[4]	See table A1-2	0.5		µg/L	5%	–
PON[4]	See table A1-2	0.5		µg/L	5%	–
POP[4]	See table A1-2	0.1		µg/L	5%	–
POC[4]	See table A1-2	1		µg/L	4%	–
Tot-N[4]	See table A1-2	10		µg/L	4%	–
Tot-P[4]	See table A1-2	0.5		µg/L	6%	–
Al, Zn	ICP	0.2		µg/L	12%	20%
Ba, Cr, Mo, Pb	ICP	0.01		µg/L	7–10%	20%
Cd, Hg	ICP	0.002		µg/L	9 resp 5%	20%
Co, V	ICP	0.005		µg/L	8 resp 5%	20%
Cu	ICP	0.1		µg/L	8%	20%
Ni	ICP	0.05		µg/L	8%	20%
P	ICP	1		µg/L	6%	10%
As	1CP	0.01		µg/L	20%	Correct order of size(low conc.)
La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb	ICP	0.0051	0.05	µg/L	10%	Correct order of size (low conc.)

Component	Method	Reporting limits or range		Unit	Measurement uncertainty [2]	"Total" uncertainty [3]
Sc, In, Th	ICP	0.05[1]	0.5	µg/L	10%	Correct order of size (low conc.)
Rb, Zr, Sb, Cs, Tl	ICP	0.025[1]	0.25	µg/L	10%	Correct order of size (low conc.)
Y, Hf	ICP	0.005[1]	0.05	µg/L	10%	Correct order of size (low conc.)
U	ICP	0.001[1]	–	µg/L	12%	Correct order of size (low conc.)
DOC	See table A1-1	0.5		mg/L	8%	30%
TOC	See table A1-1	0.1		mg/L	10%	30%
$\delta^{2}H$	MS	2		‰ SMOW[5]	1‰	–
$\delta^{18}O$	MS	0.1		‰ SMOW[5]	0.2‰	–
^{3}H	LSC	0.8 eller 0.1		TU[6]	0.8 eller 0.1	Correct order of size
^{37}Cl	ICP MS	0.2‰ (20 mg/L)		‰ SMOC[7]	–	–
$\delta^{13}C$	A (MS)	–		‰ PDB[8]	–	–
^{14}C pmC	A (MS)	–		pmC[9]	–	–
$\delta^{34}S$	ICP MS	0.2‰		‰ CDT[10]	0.3‰	–
$^{87}Sr/^{86}Sr$	TIMS	–		No unit (ratio)[11]	–	–
$^{10}B/^{11}B$	ICP MS	–		No unit (ratio)[11]	–	–
^{234}U, ^{235}U, ^{238}U, ^{232}Th, ^{230}Th	Alfa spectr.	0.0005		Bq/L[13]	5%	–
^{222}Rn, ^{226}Rn	LSC	0.03		Bq/L	5%	–

[1] Reporting limits at salinity ≤ 0.4% (520 mS/m) and ≤ 3.5% (3810 mS/m) respectively.

[2] Measurement uncertainty reported by consulted laboratory, generally 95% confidence interval.

[3] Estimated total uncertainty by experience (includes effects of sampling and sample handling).

[4] Determined only in surface waters and near surface groundwater.

[5] Per mille deviation[13] from SMOW (Standard Mean Oceanic Water).

[6] TU = Tritium Units, where one TU corresponds to a Tritium/hydrogen ratio of 10^{-18} (1 Bq/L Tritium = 8.45 TU).

[7] Per mille deviation[13] from SMOC (Standard Mean Oceanic Chloride).

[8] Per mille deviation[13] from PDB (the standard PeeDee Belemnite).

[9] The following relation is valid between pmC (percent modern carbon) and Carbon-14 age:
$pmC = 100 \times e^{((1950-y-1.03t)/8274)}$
where y = the year of the C-14 measurement and t = C-14 age.

[10] Per mille deviation[13] from CDT (the standard Canyon Diablo Troilite).

[11] Isotope ratio without unit.

[12] The following expressions are applicable to convert activity to concentration, for uranium-238 and thorium-232:
1 ppm U = 12.4 Bq/kg^{238}U
1 ppm Th = 3.93 Bq/kg^{232}Th

[13] Isotopes are often reported as per mill deviation from a standard. The deviation is calculated as: $\delta^{y}I = 1000\times(K_{sample}-K_{standard})/K_{standard}$, where K= the isotope ratio and $^{y}I = {}^{2}H$, ^{18}O, ^{37}Cl, ^{13}C or ^{34}S etc.

Appendix 2

Field measurements

IDCODE	START_DATE	STOP_DATE	Meas. depth (m)	Water depth (m)	SNO	Water temp. (°C)	pH	EC (mS/m)	Salinity (%)	Turbidity* NTU	Light (µmol/ m²s)	O_2 diss. (mg/L)	Chloro-phyll* (ug/l)	ORP (mV)	Atm. pressure (hPa)
PFM000062	2004-04-06 07:00	2004-04-06 16:00	0.5	3.3	8386	1.3	7.89	889	4.86	–1.3	106	13.4	2.5	160	994.9
PFM000062	2004-04-06 07:00	2004-04-06 16:00	1.0	3.3		1.3	7.90	889	4.86	–1.2	84	13.4	2.5	159	995.3
PFM000062	2004-04-06 07:00	2004-04-06 16:00	2.0	3.3		1.3	7.90	889	4.86	–1.2	49	13.4	2.1	159	995.6
PFM000062	2004-04-06 07:00	2004-04-06 16:00	3.0	3.3	8387	1.3	7.90	889	4.86	–1.0	30	13.4	5.6	160	996.0
PFM000062	2004-04-19 08:00	2004-04-19 21:00	0.5	3.4	8399	4.8	8.07	919	5.11	–0.9	993	13.7	3.1	199	1005.1
PFM000062	2004-04-19 08:00	2004-04-19 21:00	1.0	3.4		4.8	8.08	919	5.11	–0.8	670	13.7	2.8	198	1005.8
PFM000062	2004-04-19 08:00	2004-04-19 21:00	2.0	3.4		4.8	8.09	919	5.11	–0.6	352	13.7	4.3	196	1006.5
PFM000062	2004-04-19 08:00	2004-04-19 21:00	3.0	3.4		4.8	8.11	919	5.11	–0.6	189	13.7	3.5	194	1007.7
PFM000062	2004-05-03 08:00	2004-05-03 19:00	0.5	3.6	8452	4.9	8.01	944	5.25	–1.2	663	14.1	1.1	209	1004.1
PFM000062	2004-05-03 08:00	2004-05-03 19:00	1.0	3.6		4.9	8.01	943	5.25	–1.1	1250	14.1	1.6	207	1005.8
PFM000062	2004-05-03 08:00	2004-05-03 19:00	2.0	3.6		4.8	8.00	944	5.25	–1.0	375	14.1	2.9	203	1006.8
PFM000062	2004-05-03 08:00	2004-05-03 19:00	3.0	3.6		4.8	8.02	944	5.26	–0.9	254	14.2	3.1	200	1006.6
PFM000062	2004-05-17 08:00	2004-05-17 22:00	0.5	3.6	8488	9.2	8.09	896	5.02	–1.2	621	12.7	2.0	182	1016.8
PFM000062	2004-05-17 08:00	2004-05-17 22:00	1.0	3.6		9.2	8.09	896	5.02	–1.0	432	12.7	1.4	180	1018.0
PFM000062	2004-05-17 08:00	2004-05-17 22:00	2.0	3.6		9.2	8.10	896	5.02	–1.1	270	12.7	0.9	178	1017.8
PFM000062	2004-05-17 08:00	2004-05-17 22:00	3.0	3.6		9.1	8.10	896	5.02	–1.1	169	12.7	1.5	176	1017.0
PFM000062	2004-06-01 08:00	2004-06-01 21:00	0.5	3.5		11.4	7.82	850	4.75	–1.1	1116	11.3	0.5	208	1022.4
PFM000062	2004-06-01 08:00	2004-06-01 21:00	1.0	3.5		11.3	7.84	850	4.75	–0.9	744	11.3	1.5	205	1023.6
PFM000062	2004-06-01 08:00	2004-06-01 21:00	2.0	3.5		11.3	7.85	851	4.76	–0.9	255	11.3	1.5	201	1025.7
PFM000062	2004-06-01 08:00	2004-06-01 21:00	3.0	3.5		11.2	7.85	850	4.76	–0.5	181	11.3	3.0	197	1027.5
PFM000062	2004-06-14 08:00	2004-06-14 22:00	0.5	3.5	8529	13.6	7.87	871	4.88	0.3	969	11.1	1.0	126	1004.4
PFM000062	2004-06-14 08:00	2004-06-14 22:00	1.0	3.5		13.6	7.87	870	4.88	0.0	348	11.1	0.2	126	1006.1
PFM000062	2004-06-14 08:00	2004-06-14 22:00	2.0	3.5		13.6	7.88	870	4.88	0.6	382	11.1	2.2	124	1007.7
PFM000062	2004-06-14 08:00	2004-06-14 22:00	3.0	3.5		13.6	7.88	869	4.87	0.5	192	11.1	1.2	123	1008.6
PFM000062	2004-07-05 08:00	2004-07-05 19:30	0.5	3.8	8547	12.0	7.88	902	5.07	–1.2	135	11.4	0.8	170	1001.1
PFM000062	2004-07-05 08:00	2004-07-05 19:30	1.0	3.8		11.9	7.89	902	5.07	–0.9	106	11.4	2.0	167	1000.8
PFM000062	2004-07-05 08:00	2004-07-05 19:30	2.0	3.8		11.7	7.90	903	5.07	0.3	54	11.5	1.7	160	1000.4
PFM000062	2004-07-05 08:00	2004-07-05 19:30	3.0	3.8		11.6	7.90	904	5.08	2.0	26	11.5	1.7	156	1000.6
PFM000062	2004-08-16 07:00	2004-08-16 21:30	0.5	4.0	8610	19.3	8.11	902	5.06	–0.7	614	9.1	2.7	118	1011.8

IDCODE	START_DATE	STOP_DATE	Meas. depth (m)	Water depth (m)	SNO	Water temp. (°C)	pH	EC (mS/m)	Salinity (%)	Turbidity* NTU	Light (µmol/ m²s)	O_2 diss. (mg/L)	Chloro-phyll* (ug/l)	ORP (mV)	Atm. pressure (hPa)
PFM000062	2004-08-16 07:00	2004-08-16 21:30	1.0	4.0		19.3	8.13	902	5.06	–0.6	444	9.1	2.5	115	1012.1
PFM000062	2004-08-16 07:00	2004-08-16 21:30	2.0	4.0		19.3	8.11	899	5.05	–0.7	226	9.1	5.2	116	1012.7
PFM000062	2004-08-16 07:00	2004-08-16 21:30	3.0	4.0		19.3	8.17	899	5.05	–0.5	113	9.1	2.8	111	1012.8
PFM000062	2004-09-13 10:00	2004-09-13 20:00	0.5	3.7	8629	13.8	7.90	931	5.25	–0.8	254	10.6	3.0	170	993.3
PFM000062	2004-09-13 10:00	2004-09-13 20:00	1.0	3.7		13.8	7.91	930	5.24	–0.9	226	10.6	2.8	169	993.8
PFM000062	2004-09-13 10:00	2004-09-13 20:00	2.0	3.7		13.8	7.93	930	5.24	–0.7	141	10.6	2.9	167	994.4
PFM000062	2004-09-13 10:00	2004-09-13 20:00	3.0	3.7		13.8	7.93	930	5.24	–0.8	81	10.6	2.4	166	994.7
PFM000062	2004-10-11 08:00	2004-10-11 19:00	0.5	3.8	8658	10.8	7.95	918	5.16	–1.5	391	11.4	2.8	53	1026.6
PFM000062	2004-10-11 08:00	2004-10-11 19:00	1.0	3.8		10.9	7.95	918	5.16	–1.5	368	11.4	2.5	55	1027.3
PFM000062	2004-10-11 08:00	2004-10-11 19:00	2.0	3.8		10.8	7.96	918	5.16	–1.6	162	11.4	3.2	58	1027.9
PFM000062	2004-10-11 08:00	2004-10-11 19:00	3.0	3.8		10.8	7.97	918	5.16	–1.6	93	11.4	3.3	60	1027.9
PFM000062	2004-11-08 10:00	2004-11-08 19:00	0.5	3.6	8720	7.6	8.09	924	5.17	–1.6	37	11.7	2.8	282	1010.1
PFM000062	2004-11-08 10:00	2004-11-08 19:00	1.0	3.6		7.6	8.10	925	5.18	–1.5	28	11.7	1.7	281	1010.1
PFM000062	2004-11-08 10:00	2004-11-08 19:00	2.0	3.6		7.5	8.11	923	5.16	–1.3	12	11.7	3.3	280	1010.5
PFM000062	2004-11-08 10:00	2004-11-08 19:00	3.0	3.6		7.5	8.10	924	5.17	–1.4	6	11.7	3.9	280	1010.5
PFM000062	2004-12-07 07:00	2004-12-07 16:00	0.5	4.0	8742	2.5	7.91	909	5.01	–0.4	112	14.0	2.1	124	971.0
PFM000062	2004-12-07 07:00	2004-12-07 16:00	1.0	4.0		2.6	7.90	906	4.99	–0.5	74	13.9	3.1	124	972.4
PFM000062	2004-12-07 07:00	2004-12-07 16:00	2.0	4.0		2.6	7.91	907	4.99	–0.4	32	13.9	1.9	124	973.8
PFM000062	2004-12-07 07:00	2004-12-07 16:00	3.0	4.0		2.6	7.91	908	5.00	–0.4	16	13.9	1.7	125	975.6
PFM000062	2005-01-18 08:00	2005-01-18 16:00	0.5	4.6	8755	1.6	7.92	907	4.97	–0.8	26	13.9	1.8	138	964.9
PFM000062	2005-01-18 08:00	2005-01-18 16:00	1.0	4.6		1.6	7.92	907	4.97	–0.8	17	14.0	1.7	137	965.4
PFM000062	2005-01-18 08:00	2005-01-18 16:00	2.0	4.6		1.6	7.92	907	4.97	–0.8	9	14.1	1.9	137	966.1
PFM000062	2005-01-18 08:00	2005-01-18 16:00	3.0	4.6		1.6	7.92	906	4.97	–0.8	5	14.1	1.4	136	966.9
PFM000062	2005-02-14 07:30	2005-02-14 19:00	0.5	4.2	8792	-0.3	7.77	913	4.95	5.9	45	15.5	2.6	101	989.3
PFM000062	2005-02-14 07:30	2005-02-14 19:00	1.0	4.2		-0.3	7.78	914	4.96	5.9	31	15.5	2.6	100	990.0
PFM000062	2005-02-14 07:30	2005-02-14 19:00	2.0	4.2		-0.3	7.79	914	4.96	0.7	15	15.5	2.8	99	990.2
PFM000062	2005-02-14 07:30	2005-02-14 19:00	3.0	4.2		-0.3	7.80	914	4.96	0.2	9	15.5	3.1	98	990.5
PFM000062	2005-04-11 08:00	2005-04-11 21:00	0.5	3.7	8869	1.6	8.02	946	5.20	0.3	235	15.0	1.0	104	995.0
PFM000062	2005-04-11 08:00	2005-04-11 21:00	1.0	3.7		1.5	8.03	947	5.21	0.2	156	15.0	1.0	101	995.8
PFM000062	2005-04-11 08:00	2005-04-11 21:00	2.0	3.7		1.6	8.05	945	5.19	0.3	56	15.0	1.9	98	995.9
PFM000062	2005-04-11 08:00	2005-04-11 21:00	3.0	3.7		1.6	8.06	946	5.20	0.2	40	15.0	2.5	95	995.7
PFM000062	2005-05-09 08:00	2005-05-09 19:00	0.5	3.5	8881	5.3	8.24	908	5.05	4.2	295	13.9	2.0	183	997.5
PFM000062	2005-05-09 08:00	2005-05-09 19:00	1.0	3.5		5.3	8.23	908	5.05	4.3	207	13.9	1.6	181	997.8

IDCODE	START_DATE	STOP_DATE	Meas. depth (m)	Water depth (m)	SNO	Water temp. (°C)	pH	EC (mS/m)	Salinity (%)	Turbidity* NTU	Light (µmol/ m²s)	O_2 diss. (mg/L)	Chloro-phyll* (ug/l)	ORP (mV)	Atm. pressure (hPa)
PFM000062	2005-05-09 08:00	2005-05-09 19:00	2.0	3.5		5.3	8.24	907	5.04	–0.1	119	13.9	1.9	178	998.4
PFM000062	2005-05-09 08:00	2005-05-09 19:00	3.0	3.5		5.3	8.24	907	5.04	0.0	74	13.8	1.6	176	998.5
PFM000062	2005-06-13 08:00	2005-06-13 19:30	0.5	3.8		11.9	7.96	904	5.08	0.7	394	11.3	1.2	201	1014.3
PFM000062	2005-06-13 08:00	2005-06-13 19:30	1.0	3.8		11.9	7.97	903	5.07	0.8	252	11.2	1.2	200	1012.9
PFM000062	2005-06-13 08:00	2005-06-13 19:30	2.0	3.8		11.8	7.97	903	5.07	0.8	530	11.2	0.7	199	1012.1
PFM000062	2005-06-13 08:00	2005-06-13 19:30	3.0	3.8		11.7	7.98	904	5.08	1.4	310	11.2	0.9	198	1013.2
PFM000063	2004-03-15 08:00	2004-03-15 19:00	0.5	4.5	8343	0.6	7.39	659	3.52	0.7		12.3	7.0	154	991.0
PFM000063	2004-03-15 08:00	2004-03-15 19:00	1.0	4.5		0.8	7.39	754	4.06	0.6		12.3	6.6	153	991.0
PFM000063	2004-03-15 08:00	2004-03-15 19:00	2.0	4.5		0.8	7.47	823	4.47	0.2		12.5	5.0	151	991.6
PFM000063	2004-03-15 08:00	2004-03-15 19:00	3.0	4.5		0.7	7.53	846	4.59	0.3		12.5	5.6	150	992.0
PFM000063	2004-03-15 08:00	2004-03-15 19:00	4.0	4.5	8347	1.3	7.36	851	4.64	0.7		9.1	6.8	143	993.0
PFM000063	2004-04-04 08:30	2004-04-04 19:30	0.5	4.2	8372	3.9	7.71	788	4.32	–0.3	84	13.5	2.8	233	992.8
PFM000063	2004-04-04 08:30	2004-04-04 19:30	1.0	4.2		3.4	7.80	802	4.39	–0.6	66	13.6	3.6	233	993.6
PFM000063	2004-04-04 08:30	2004-04-04 19:30	2.0	4.2		3.0	7.85	818	4.48	–0.7	34	13.8	2.8	233	994.8
PFM000063	2004-04-04 08:30	2004-04-04 19:30	3.0	4.2		2.7	7.85	847	4.65	–0.5	18	13.8	4.3	233	995.8
PFM000063	2004-04-04 08:30	2004-04-04 19:30	4.0	4.2	8370	2.4	7.62	858	4.70	2.9	8	11.7	6.5	231	997.7
PFM000063	2004-04-19 08:00	2004-04-19 21:00	0.5	5.0	8404	7.7	8.07	858	4.78	0.0	719	12.4	2.4	225	1006.4
PFM000063	2004-04-19 08:00	2004-04-19 21:00	1.0	5.0		7.7	8.06	858	4.78	0.1	483	12.4	1.6	221	1008.7
PFM000063	2004-04-19 08:00	2004-04-19 21:00	2.0	5.0		7.7	8.05	859	4.79	0.2	253	12.4	1.8	221	1008.9
PFM000063	2004-04-19 08:00	2004-04-19 21:00	3.0	5.0		6.7	8.08	880	4.90	0.1	109	12.7	6.0	221	1009.2
PFM000063	2004-04-19 08:00	2004-04-19 21:00	4.0	5.0		5.6	8.08	896	4.98	–0.2	67	13.1	3.5	221	1009.6
PFM000063	2004-04-19 08:00	2004-04-19 21:00	4.5	5.0		5.5	7.92	899	5.00	0.3	50	12.5	5.0	222	1009.4
PFM000063	2004-05-03 08:00	2004-05-03 19:00	0.5	4.5	8446	10.2	8.05	895	5.02	3.0	392	12.0	3.0	257	1002.5
PFM000063	2004-05-03 08:00	2004-05-03 19:00	1.0	4.5		10.1	8.05	895	5.02	2.9	334	12.0	4.0	254	1004.4
PFM000063	2004-05-03 08:00	2004-05-03 19:00	2.0	4.5		10.1	8.05	895	5.02	3.1	125	12.0	3.8	253	1005.3
PFM000063	2004-05-03 08:00	2004-05-03 19:00	3.0	4.5		7.4	7.97	917	5.13	4.9	35	12.6	4.3	253	1006.0
PFM000063	2004-05-03 08:00	2004-05-03 19:00	4.0	4.5		6.5	7.92	926	5.17	5.9	13	12.8	5.1	253	1006.0
PFM000063	2004-05-03 08:00	2004-05-03 19:00	4.5	4.5		6.4	7.88	926	5.17	6.4	9	12.6	6.9	191	1007.3
PFM000063	2004-05-17 08:00	2004-05-17 22:00	0.5	4.5	8479	11.8	7.95	890	5.00	–0.5	870	11.3	1.2	140	1015.2
PFM000063	2004-05-17 08:00	2004-05-17 22:00	1.0	4.5		11.8	7.94	890	5.00	–0.3	499	11.3	1.3	139	1017.1
PFM000063	2004-05-17 08:00	2004-05-17 22:00	2.0	4.5		11.8	7.94	890	5.00	–0.4	425	11.3	1.6	138	1019.4
PFM000063	2004-05-17 08:00	2004-05-17 22:00	3.0	4.5		11.6	7.92	891	5.00	–0.2	170	11.4	2.7	137	1019.5
PFM000063	2004-05-17 08:00	2004-05-17 22:00	4.0	4.5		10.7	7.94	892	5.00	1.8	57	11.6	2.8	136	1018.5

IDCODE	START_DATE	STOP_DATE	Meas. depth (m)	Water depth (m)	SNO	Water temp. (°C)	pH	EC (mS/m)	Salinity (%)	Turbidity* NTU	Light (µmol/ m²s)	O_2 diss. (mg/L)	Chloro-phyll* (ug/l)	ORP (mV)	Atm. pressure (hPa)
PFM000063	2004-05-17 08:00	2004-05-17 22:00	4.5	4.5		10.7	7.90	892	5.00	6.3	25	11.5	3.7	48	1016.9
PFM000063	2004-06-01 08:00	2004-06-01 21:00	0.5	5.1		14.0	7.95	870	4.88	–2.2	868	11.1	1.1	201	1023.4
PFM000063	2004-06-01 08:00	2004-06-01 21:00	1.0	5.1		14.0	7.94	870	4.88	–2.1	1688	11.1	0.8	199	1024.9
PFM000063	2004-06-01 08:00	2004-06-01 21:00	2.0	5.1		14.0	7.95	871	4.88	–2.1	473	11.1	1.0	198	1026.2
PFM000063	2004-06-01 08:00	2004-06-01 21:00	3.0	5.1		14.0	7.96	871	4.88	–2.0	309	11.1	0.9	196	1027.2
PFM000063	2004-06-01 08:00	2004-06-01 21:00	4.0	5.1		12.7	7.77	865	4.85	–1.0	238	10.7	3.4	198	1028.1
PFM000063	2004-06-01 08:00	2004-06-01 21:00	4.5	5.1		12.6	7.71	866	4.85	–1.0	176	10.4	2.9	198	1029.2
PFM000063	2004-06-14 08:00	2004-06-14 22:00	0.5	5.2	8527	15.6	8.04	870	4.88	–0.4	905	10.7	1.1	139	1007.5
PFM000063	2004-06-14 08:00	2004-06-14 22:00	1.0	5.2		15.5	8.04	870	4.88	–0.3	975	10.7	0.7	138	1010.3
PFM000063	2004-06-14 08:00	2004-06-14 22:00	2.0	5.2		15.4	8.04	870	4.88	–0.3	446	10.7	1.2	138	1011.7
PFM000063	2004-06-14 08:00	2004-06-14 22:00	3.0	5.2		15.4	8.04	870	4.88	–0.4	279	10.7	1.9	137	1013.0
PFM000063	2004-06-14 08:00	2004-06-14 22:00	4.0	5.2		14.6	7.92	870	4.88	0.9	140	10.5	2.0	138	1013.4
PFM000063	2004-06-14 08:00	2004-06-14 22:00	4.5	5.2		14.4	7.82	870	4.88	1.6	107	10.4	1.8	139	1013.6
PFM000064	2004-03-15 08:00	2004-03-15 19:00	0.5	1.5	8344	0.9	7.00	411	2.14	4.2		6.6	19.7	108	989.2
PFM000064	2004-03-15 08:00	2004-03-15 19:00	1.0	1.5	8348	1.8	6.93	714	3.86	2.1		6.1	7.5	115	990.4
PFM000064	2004-04-05 07:00	2004-04-05 19:30	0.5	1.0	8369	4.8	7.66	130	0.65	5.4	51	13.7	41.8	183	998.4
PFM000064	2004-04-19 08:00	2004-04-19 21:00	0.5	1.4	8400	11.0	8.11	558	3.03	10.9	205	11.6	10.9	230	1004.4
PFM000064	2004-04-19 08:00	2004-04-19 21:00	1.0	1.4		10.9	8.09	558	3.03	21.2	40	11.6	13.0	228	1006.3
PFM000064	2004-05-03 08:00	2004-05-03 19:00	0.5	1.4	8445	14.5	8.05	605	3.31	12.1	116	10.8	9.2	301	999.2
PFM000064	2004-05-03 08:00	2004-05-03 19:00	1.0	1.4		14.4	8.03	604	3.30	12.3	34	10.8	10.1	298	999.5
PFM000064	2004-05-17 08:00	2004-05-17 22:00	0.5	1.7	8484	13.1	8.07	815	4.55	3.0	730	11.5	3.7	114	1015.7
PFM000064	2004-05-17 08:00	2004-05-17 22:00	1.0	1.7		13.1	8.06	815	4.55	4.0	423	11.5	4.2	114	1017.5
PFM000064	2004-06-01 08:00	2004-06-01 21:00	0.5	1.8		15.8	8.08	821	4.58	1.6	1191	11.2	1.9	172	1026.1
PFM000064	2004-06-01 08:00	2004-06-01 21:00	1.0	1.8		15.8	8.08	821	4.59	1.8	357	11.2	2.0	171	1028.2
PFM000064	2004-06-14 08:00	2004-06-14 22:00	0.5	1.8	8523	16.7	8.07	845	4.73	2.9	581	10.6	8.6	144	1001.5
PFM000064	2004-06-14 08:00	2004-06-14 22:00	1.0	1.8		16.7	8.08	845	4.73	2.3	358	10.6	2.5	143	1002.2
PFM000065	2004-03-15 08:00	2004-03-15 19:00	0.5	1.0	8350	1.2	7.18	327	1.68	0.5		9.8	10.5	125	991.9
PFM000065	2004-04-19 08:00	2004-04-19 21:00	0.5	1.1	8403	9.6	8.01	534	2.89	26.3	46	12.3	13.7	196	1002.6
PFM000065	2004-05-03 08:00	2004-05-03 19:00	0.5	1.0	8453	12.1	8.15	795	4.42	40.3	6	11.4	12.7	331	993.7
PFM000065	2004-05-17 08:00	2004-05-17 22:00	0.5	1.1	8482	12.8	8.25	706	3.90	5.0	523	12.0	3.4	113	1015.0
PFM000065	2004-06-01 08:00	2004-06-01 21:00	0.5	1.3		16.5	8.22	786	4.37	1.1	197	11.1	2.6	197	1020.9
PFM000065	2004-06-14 08:00	2004-06-14 22:00	0.5	1.4	8531	16.0	8.10	818	4.57	2.3	505	11.2	2.5	134	1001.4
PFM000066	2004-03-16 07:00	2004-03-16 19:00	0.1	0.3	8357	0.2	7.06	41.3	0.20			4.1		1	977.8

IDCODE	START_DATE	STOP_DATE	Meas. depth (m)	Water depth (m)	SNO	Water temp. (°C)	pH	EC (mS/m)	Salinity (%)	Turbidity* NTU	Light (µmol/ m²s)	O_2 diss. (mg/L)	Chloro-phyll* (ug/l)	ORP (mV)	Atm. pressure (hPa)
PFM000066	2004-04-05 07:00	2004-04-05 19:30	0.1	0.4	8327	4.2	6.98	28.1	0.13			4.5		80	992.6
PFM000066	2004-04-19 08:00	2004-04-19 21:00	0.1	0.3	8406	9.5	7.27	31.5	0.15			5.9		118	999.3
PFM000066	2004-05-04 07:00	2004-05-04 20:00	0.1	0.3	8444	13.0	7.28	33.6	0.16			5.7		96	994.6
PFM000066	2004-05-17 08:00	2004-05-17 22:00	0.1	0.2	8480	13.7	7.44	33.6	0.16			6.8		89	1002.2
PFM000066	2004-06-01 08:00	2004-06-01 21:00	0.1	0.2		12.9	7.38	32.0	0.15			7.6		113	1017.0
PFM000066	2004-06-14 08:00	2004-06-14 22:00	0.1	0.2	8532	15.6	7.46	31.1	0.15			6.7		148	994.1
PFM000066	2004-07-06 07:00	2004-07-06 16:00	0.1	0.1	8543	13.3	7.38	23.6	0.11			7.7		45	1004.4
PFM000066	2004-10-12 07:00	2004-10-12 16:00	0.1	0.1	8652	3.3	7.46	19.7	0.09			8.5		77	1024.6
PFM000066	2004-11-08 10:00	2004-11-08 19:00	0.1	0.1	8718	4.5	7.52	35.1	0.17			8.4		300	1010.8
PFM000066	2004-12-06 07:30	2004-12-06 19:00	0.1	0.3	8734	0.3	7.30	32.5	0.15			9.4		193	997.8
PFM000066	2005-01-17 08:00	2005-01-17 20:00	0.1	0.4	8760	0.8	7.09	33.8	0.16			5.0		110	988.7
PFM000066	2005-02-14 07:30	2005-02-14 19:00	0.1	0.3	8796	-0.1	7.13	39.3	0.19			4.3		–16	996.7
PFM000066	2005-03-15 07:00	2005-03-15 16:00	0.1	0.2	8836	-0.1	6.89	46.2	0.22			0.5		–207	1004.5
PFM000066	2005-04-11 08:00	2005-04-11 21:00	0.1	0.4	8871	7.1	7.16	27.6	0.13			5.3		94	1000.7
PFM000066	2005-05-09 08:00	2005-05-09 19:00	0.1	0.3	8880	9.1	7.47	33.2	0.16			7.8		113	1000.2
PFM000066	2005-06-13 08:00	2005-06-13 19:30	0.1	0.3		14.7	7.37	31.4	0.15			6.5		65	1006.9
PFM000067	2004-03-16 07:00	2004-03-16 19:00	0.1	0.3	8362	3.3	7.09	42.2	0.20			3.8		–101	998.0
PFM000067	2004-04-05 07:00	2004-04-05 19:30	0.1	0.3	8375	6.8	7.12	31.3	0.15			8.3		62	1000.3
PFM000067	2004-04-20 07:00	2004-04-20 20:00	0.1	0.3	8398	12.8	8.01	38.4	0.19			11.3		63	1007.1
PFM000067	2004-05-05 07:00	2004-05-05 12:00	0.1	0.3	8455	14.0	8.11	36.8	0.18			10.2		49	996.4
PFM000067	2004-05-18 07:00	2004-05-18 16:00	0.1	0.2	8493	13.8	8.39	34.8	0.17			10.5		118	994.6
PFM000067	2004-06-02 07:00	2004-06-02 16:00	0.1	0.2	8515	16.8	8.49	55.5	0.27			10.9		63	1023.8
PFM000067	2004-06-15 07:00	2004-06-15 18:00	0.1	0.1	8536	17.6	8.66	40.9	0.20			10.7		72	995.1
PFM000068	2004-03-15 08:00	2004-03-15 19:00	0.1	0.3	8345	-0.1	7.07	41.9	0.20			5.8		41	987.2
PFM000068	2004-04-05 07:00	2004-04-05 19:30	0.1	0.4	8378	2.7	6.94	25.3	0.12			6.1		84	982.4
PFM000068	2004-04-21 07:00	2004-04-21 16:00	0.1	0.4	8428	7.9	7.15	29.3	0.14			5.7		100	1001.4
PFM000068	2004-05-04 07:00	2004-05-04 20:00	0.1	0.3	8450	12.0	7.19	33.0	0.16			5.6		100	993.8
PFM000068	2004-05-18 07:00	2004-05-18 16:00	0.1	0.3	8483	12.2	7.23	36.2	0.17			6.6		77	998.9
PFM000068	2004-06-02 07:00	2004-06-02 16:00	0.1	0.3	8516	11.1	7.21	36.8	0.18			7.3		102	1023.5
PFM000068	2004-06-15 07:00	2004-06-15 18:00	0.1	0.2	8538	12.9	7.41	40.5	0.20			8.7		62	991.6
PFM000068	2004-07-06 07:00	2004-07-06 16:00	0.1	0.2	8542	11.8	7.27	34.7	0.17			7.4		64	1004.1
PFM000068	2004-08-15 17:30	2004-08-15 22:00	0.1	0.1	8607	14.5	7.39	41.0	0.20			5.5		59	997.3
PFM000068	2004-09-13 10:00	2004-09-13 20:00	0.1	0.1	8630	12.3	7.40	43.6	0.21			5.1		62	992.8

IDCODE	START_DATE	STOP_DATE	Meas. depth (m)	Water depth (m)	SNO	Water temp. (°C)	pH	EC (mS/m)	Salinity (%)	Turbidity* NTU	Light (µmol/ m²s)	O_2 diss. (mg/L)	Chloro-phyll* (ug/l)	ORP (mV)	Atm. pressure (hPa)
PFM000068	2004-10-11 08:00	2004-10-11 19:00	0.1	0.5	8650	5.1	7.38	36.0	0.17			7.8		85	1020.6
PFM000068	2004-11-08 10:00	2004-11-08 19:00	0.1	0.6	8721	4.3	7.44	35.8	0.17			8.3		278	1011.0
PFM000068	2004-12-06 07:30	2004-12-06 19:00	0.1	0.7	8737	0.3	7.19	30.2	0.14			10.0		167	994.8
PFM000068	2005-01-17 08:00	2005-01-17 20:00	0.1	0.7	8757	0.5	7.06	30.3	0.14			7.4		110	988.1
PFM000068	2005-02-14 07:30	2005-02-14 19:00	0.1	0.5	8794	-0.1	7.03	36.8	0.17			4.0		–109	996.5
PFM000068	2005-03-14 08:00	2005-03-14 20:00	0.1	0.6	8827	-0.1	7.21	44.1	0.21			6.0		15	990.5
PFM000068	2005-04-12 07:30	2005-04-12 17:00	0.1	0.6	8874	5.1	7.18	26.2	0.12			7.7		61	1004.5
PFM000068	2005-05-09 08:00	2005-05-09 19:00	0.1	0.6	8885	7.3	7.28	32.6	0.16			8.0		75	1000.4
PFM000068	2005-06-13 08:00	2005-06-13 19:30	0.1	0.6		13.3	7.22	30.1	0.14			6.9		63	1008.5
PFM000069	2004-03-17 07:00	2004-03-17 16:00	0.1	0.2	8366	-0.1	6.81	34.8	0.16			2.1		–75	998.9
PFM000069	2004-04-05 07:00	2004-04-05 19:30	0.1	0.4	8374	2.5	6.82	31.1	0.15			2.5		51	985.2
PFM000069	2004-04-21 07:00	2004-04-21 16:00	0.1	0.4	8391	7.3	7.00	30.7	0.15			3.3		47	1003.3
PFM000069	2004-05-04 07:00	2004-05-04 20:00	0.1	0.3	8443	11.9	7.04	36.3	0.18			3.6		60	993.9
PFM000069	2004-05-18 07:00	2004-05-18 16:00	0.1	0.2	8476	11.6	7.12	37.9	0.18			5.2		51	998.1
PFM000069	2004-06-02 07:00	2004-06-02 16:00	0.1	0.2	8478	11.4	7.11	38.9	0.19			6.1		90	1021.7
PFM000069	2004-06-15 07:00	2004-06-15 18:00	0.1	0.2	8539	13.2	7.30	40.5	0.20			8.7		59	991.6
PFM000069	2004-07-06 07:00	2004-07-06 16:00	0.1	0.2	8541	12.1	7.31	39.2	0.19			8.6		54	1002.4
PFM000069	2004-08-16 07:00	2004-08-16 21:30	0.1	0.1	8611	13.6	7.45	31.0	0.15			7.0		50	1002.2
PFM000069	2004-09-13 10:00	2004-09-13 20:00	0.1	0.1	8634	12.3	7.40	43.8	0.21			5.9		25	993.5
PFM000069	2004-10-11 08:00	2004-10-11 19:00	0.1	0.2	8651	4.7	7.42	40.9	0.20			8.4		68	1022.9
PFM000069	2004-11-08 10:00	2004-11-08 19:00	0.1	0.2	8722	4.3	7.39	42.3	0.20			7.4		247	1010.4
PFM000069	2004-12-06 07:30	2004-12-06 19:00	0.1	0.3	8739	0.1	7.10	43.6	0.21			7.0		149	992.0
PFM000069	2005-01-17 08:00	2005-01-17 20:00	0.1	0.4	8753	0.5	6.97	39.6	0.19			4.2		109	986.9
PFM000069	2005-02-14 07:30	2005-02-14 19:00	0.1	0.2	8793	-0.1	6.90	47.7	0.23			0.5		–197	997.2
PFM000069	2005-03-14 08:00	2005-03-14 20:00	0.1	0.2	8832	-0.1	7.01	54.1	0.26			0.5		–138	993.3
PFM000069	2005-04-12 07:30	2005-04-12 17:00	0.1	0.3	8872	4.4	7.07	29.7	0.14			5.7		60	1000.1
PFM000069	2005-05-09 08:00	2005-05-09 19:00	0.1	0.2	8888	7.0	7.16	37.3	0.18			6.4		94	999.4
PFM000069	2005-06-13 08:00	2005-06-13 19:30	0.1	0.2		13.6	7.15	39.2	0.19			6.0		81	1007.5
PFM000070	2004-03-16 07:00	2004-03-16 19:00	0.1	0.3	8346	0.7	7.24	5.0	0.02			11.7		112	1000.6
PFM000070	2004-04-05 07:00	2004-04-05 19:30	0.1	0.3	8377	6.6	7.22	19.8	0.09			7.3		93	991.0
PFM000070	2004-04-20 07:00	2004-04-20 20:00	0.1	0.3	8405	9.5	7.55	28.4	0.14			8.9		92	1002.6
PFM000070	2004-05-04 07:00	2004-05-04 20:00	0.1	0.3	8447	13.2	7.50	28.0	0.13			7.6		103	993.8
PFM000070	2004-05-17 08:00	2004-05-17 22:00	0.1	0.2	8487	14.8	7.29	26.1	0.12			6.3		91	1006.0

IDCODE	START_DATE	STOP_DATE	Meas. depth (m)	Water depth (m)	SNO	Water temp. (°C)	pH	EC (mS/m)	Salinity (%)	Turbidity* NTU	Light (µmol/ m²s)	O_2 diss. (mg/L)	Chloro-phyll* (ug/l)	ORP (mV)	Atm. pressure (hPa)
PFM000070	2004-06-01 08:00	2004-06-01 21:00	0.1	0.2		15.4	7.22	25.1	0.12			6.1		104	1013.4
PFM000070	2004-06-14 08:00	2004-06-14 22:00	0.1	0.1	8528	15.7	7.15	26.8	0.13			5.2		126	995.6
PFM000070	2004-07-05 08:00	2004-07-05 19:30	0.1	0.1	8540	14.8	7.11	22.9	0.11			6.9		122	1002.2
PFM000070	2004-08-16 07:00	2004-08-16 21:30	0.1	0.0	8605	13.8	7.20	29.4	0.14			6.4		95	1001.9
PFM000070	2004-09-14 07:00	2004-09-14 16:00	0.1	0.1	8635	12.4	7.22	28.0	0.13			5.1		86	994.3
PFM000070	2004-10-11 08:00	2004-10-11 19:00	0.1	0.1	8653	6.2	7.39	9.4	0.04			9.0		79	1024.6
PFM000070	2004-11-08 10:00	2004-11-08 19:00	0.1	0.1	8719	4.4	7.59	20.7	0.10			10.5		236	1010.5
PFM000070	2004-12-06 07:30	2004-12-06 19:00	0.1	0.2	8736	0.5	7.33	21.6	0.10			10.4		188	978.4
PFM000070	2005-01-17 08:00	2005-01-17 20:00	0.1	0.3	8759	1.1	7.12	17.9	0.08			9.6		168	986.3
PFM000070	2005-02-14 07:30	2005-02-14 19:00	0.1	0.3	8797	0.6	7.27	26.6	0.13			8.3		56	995.8
PFM000070	2005-03-14 08:00	2005-03-14 20:00	0.1	0.2	8834	-0.1	7.42	32.2	0.15			3.3		70	994.3
PFM000070	2005-04-12 07:30	2005-04-12 17:00	0.1	0.3	8873	7.8	7.67	27.4	0.13			10.0		60	1003.0
PFM000070	2005-05-10 07:00	2005-05-10 16:00	0.1	0.2	8887	10.6	7.64	21.1	0.10			9.5		55	1015.1
PFM000070	2005-06-14 07:00	2005-06-14 16:00	0.1	0.2		16.7	7.40	7.8	0.04			7.1		147	1014.5
PFM000071	2004-03-16 07:00	2004-03-16 19:00	0.1	0.2	8341	0.0	7.20	40.3	0.19			6.8		67	997.4
PFM000071	2004-04-04 08:30	2004-04-04 19:30	0.1	0.3	8376	4.4	7.41	33.7	0.16			10.8		153	998.1
PFM000071	2004-04-20 07:00	2004-04-20 20:00	0.1	0.2	8389	6.4	7.47	39.0	0.19			9.3		162	1002.9
PFM000071	2004-05-04 07:00	2004-05-04 20:00	0.1	0.2	8458	11.7	7.56	39.7	0.19			9.2		125	996.5
PFM000071	2004-05-17 08:00	2004-05-17 22:00	0.1	0.1	8491	13.7	7.34	41.1	0.20			7.1		93	1005.0
PFM000071	2004-06-01 08:00	2004-06-01 21:00	0.1	0.1		14.0	7.60	40.4	0.20			8.4		144	1014.3
PFM000071	2004-06-14 08:00	2004-06-14 22:00	0.1	0.1	8530	13.6	7.47	42.4	0.21			7.7		143	996.7
PFM000072	2004-03-17 07:00	2004-03-17 16:00	0.1	0.6	8365	0.0	6.76	47.4	0.22			0.2		–145	1004.3
PFM000072	2004-04-05 07:00	2004-04-05 19:30	0.1	1.0	8358	1.5	7.05	32.2	0.15			6.8		135	1014.5
PFM000072	2004-04-19 08:00	2004-04-19 21:00	0.1	0.9	8401	8.8	7.19	36.7	0.18			3.5		144	1000.0
PFM000072	2004-05-04 07:00	2004-05-04 20:00	0.1	0.9	8442	10.6	7.27	39.6	0.19			2.7		80	993.5
PFM000072	2004-05-17 08:00	2004-05-17 22:00	0.1	0.8	8490	7.7	7.24	41.8	0.20			5.1		139	1005.3
PFM000072	2004-06-01 08:00	2004-06-01 21:00	0.1	0.9		9.5	7.20	37.5	0.18			6.0		157	1015.8
PFM000072	2004-06-15 07:00	2004-06-15 18:00	0.1	0.5	8537	12.2	7.29	41.6	0.20			4.1		92	997.2
PFM000073	2004-03-17 07:00	2004-03-17 16:00	0.1	0.4	8364	-0.1	7.54	34.1	0.16			8.7		–9	1005.4
PFM000073	2004-04-05 07:00	2004-04-05 19:30	0.1	0.3	8384	6.1	7.74	73.1	0.36			10.7		114	987.0
PFM000073	2004-04-21 07:00	2004-04-21 16:00	0.1	0.2	8429	7.8	7.88	52.5	0.26			9.3		135	1012.1
PFM000073	2004-05-04 07:00	2004-05-04 20:00	0.1	0.2	8451	9.9	7.80	77.1	0.38			8.0		135	992.0
PFM000073	2004-05-17 08:00	2004-05-17 22:00	0.1	0.2	8485	13.3	8.04	70.3	0.35			10.6		125	1004.0

IDCODE	START_DATE	STOP_DATE	Meas. depth (m)	Water depth (m)	SNO	Water temp. (°C)	pH	EC (mS/m)	Salinity (%)	Turbidity* NTU	Light (µmol/ m²s)	O_2 diss. (mg/L)	Chloro-phyll* (ug/l)	ORP (mV)	Atm. pressure (hPa)
PFM000073	2004-06-01 08:00	2004-06-01 21:00	0.1	0.2		13.4	7.99	75.0	0.37			10.6		158	1014.6
PFM000074	2004-03-16 07:00	2004-03-16 19:00	0.5	0.4	8351	0.8	6.96	50.8	0.24	2.5		2.0	32.1	–152	1006.8
PFM000074	2004-04-05 07:00	2004-04-05 19:30	0.5	1.0	8383	2.3	6.82	32.9	0.16	–1.5	73	6.7	6.6	29	996.5
PFM000074	2004-04-20 07:00	2004-04-20 20:00	0.5	1.2	8411	9.7	7.21	35.4	0.17	–1.8	47	8.9	6.3	125	1004.9
PFM000074	2004-05-04 07:00	2004-05-04 20:00	0.5	1.0	8448	13.6	7.26	36.6	0.18	–2.0	55	6.5	5.9	122	996.3
PFM000074	2004-05-18 07:00	2004-05-18 16:00	0.5	0.9	8486	13.9	7.45	36.2	0.17	–1.8	823	7.9	6.0	55	1004.7
PFM000074	2004-06-02 07:00	2004-06-02 16:00	0.5	0.9	8517	14.8	7.37	35.3	0.17	–2.4	741	7.9	6.0	136	1027.2
PFM000074	2004-06-15 07:00	2004-06-15 18:00	0.5	0.7	8522	17.2	7.49	36.6	0.18	0.3	463	10.1	1.0	119	997.4
PFM000074	2004-07-06 07:00	2004-07-06 16:00	0.5	0.7	8544	16.5	7.47	34.8	0.17	–0.9	170	9.6	8.4	98	1004.0
PFM000074	2004-08-16 07:00	2004-08-16 21:30	0.5	0.3	8609	18.2	7.65	36.7	0.18	–1.7	128	11.1	7.2	83	1002.5
PFM000074	2004-09-14 07:00	2004-09-14 16:00	0.5	0.5	8632	14.2	7.83	35.4	0.17	–1.3	478	10.0	6.5	129	995.8
PFM000074	2004-10-12 07:00	2004-10-12 16:00	0.5	0.7	8655	4.4	7.92	34.0	0.16	–2.3	205	12.1	6.1	58	1026.8
PFM000074	2004-11-09 07:00	2004-11-09 16:00	0.5	0.5	8725	4.5	7.94	39.4	0.19	–2.1	18	11.7	6.6	195	1013.4
PFM000074	2004-12-07 07:00	2004-12-07 16:00	0.5	0.9	8741	2.8	7.07	58.6	0.28	–0.1	1	0.8	13.0	–130	971.7
PFM000074	2005-01-18 08:00	2005-01-18 16:00	0.5	1.0	8756	1.1	6.96	38.4	0.18	–0.3	18	4.4	9.0	21	966.1
PFM000074	2005-02-14 07:30	2005-02-14 19:00	0.5	1.1	8799	1.5	6.89	56.2	0.27	2.4	8	1.3	12.5	–193	994.7
PFM000074	2005-03-14 08:00	2005-03-14 20:00	0.5	0.8	8828	0.7	6.88	57.1	0.27	0.7	2	0.8	45.0	–226	992.0
PFM000074	2005-04-11 08:00	2005-04-11 21:00	0.5	0.9	8870	4.9	7.38	28.8	0.14	–0.2	59	7.7	5.0	99	1002.5
PFM000074	2005-05-09 08:00	2005-05-09 19:00	0.5	0.9	8884	10.1	7.62	34.9	0.17	–0.3	125	8.0	6.0	152	1000.3
PFM000074	2005-06-13 08:00	2005-06-13 19:30	0.5	0.7		16.8	7.60	33.6	0.16	0.0	252	14.5	6.3	62	1012.3
PFM000082	2004-03-16 07:00	2004-03-16 19:00	0.5	6.3	8354	0.4	7.99	826	4.47	0.0		14.2	6.6	–12	995.6
PFM000082	2004-03-16 07:00	2004-03-16 19:00	1.0	6.3		0.4	7.94	856	4.65	0.2		14.2	5.7	–10	995.5
PFM000082	2004-03-16 07:00	2004-03-16 19:00	2.0	6.3		0.1	7.95	888	4.82	0.6		14.1	3.7	–9	995.5
PFM000082	2004-03-16 07:00	2004-03-16 19:00	3.0	6.3		0.1	7.96	889	4.83	0.6		14.1	3.7	–8	995.7
PFM000082	2004-03-16 07:00	2004-03-16 19:00	4.0	6.3		0.1	7.95	890	4.83	0.7		14.0	5.0	–7	995.8
PFM000082	2004-03-16 07:00	2004-03-16 19:00	5.0	6.3		0.1	7.96	890	4.83	0.7		14.0	5.1	–7	996.0
PFM000082	2004-03-16 07:00	2004-03-16 19:00	6.0	6.3	8359	0.3	7.92	888	4.83	0.6		13.5	3.1	–5	996.5
PFM000082	2005-03-14 08:00	2005-03-14 20:00	0.5	6.5	8833	2.6	7.83	911	5.02	–0.1	53	14.7	2.0	152	995.1
PFM000082	2005-03-14 08:00	2005-03-14 20:00	1.0	6.5		2.5	7.85	911	5.01	–0.2	48	14.7	2.0	153	994.9
PFM000082	2005-03-14 08:00	2005-03-14 20:00	2.0	6.5		3.0	7.87	910	5.02	–0.1	25	14.6	2.7	153	995.1
PFM000082	2005-03-14 08:00	2005-03-14 20:00	3.0	6.5		3.1	7.88	910	5.02	–0.1	17	14.5	2.1	155	994.9
PFM000082	2005-03-14 08:00	2005-03-14 20:00	4.0	6.5		3.0	7.89	912	5.03	–0.1	10	14.6	1.2	153	994.7
PFM000082	2005-03-14 08:00	2005-03-14 20:00	5.0	6.5		3.0	7.90	913	5.03	–0.1	4	14.6	2.2	152	995.7

IDCODE	START_DATE	STOP_DATE	Meas. depth (m)	Water depth (m)	SNO	Water temp. (°C)	pH	EC (mS/m)	Salinity (%)	Turbidity* NTU	Light (µmol/ m²s)	O_2 diss. (mg/L)	Chloro-phyll* (ug/l)	ORP (mV)	Atm. pressure (hPa)
PFM000082	2005-03-14 08:00	2005-03-14 20:00	6.0	6.5	8831	2.7	7.89	917	5.06	0.1	3	14.2	1.5	152	995.5
PFM000084	2004-04-06 07:00	2004-04-06 16:00	0.5	3.0	8390	3.5	7.53	258	1.32	5.3	155	11.4	7.8	179	1003.3
PFM000084	2004-04-06 07:00	2004-04-06 16:00	1.0	3.0		3.5	7.46	265	1.36	5.4	56	11.4	8.0	179	1003.8
PFM000084	2004-04-06 07:00	2004-04-06 16:00	2.0	3.0		1.5	7.46	890	4.87	–0.7	16	12.7	4.0	185	1003.7
PFM000084	2004-04-06 07:00	2004-04-06 16:00	2.5	3.0	8388	1.4	7.69	901	4.93	–0.9	14	13.1	2.5	180	1003.5
PFM000087	2004-03-16 07:00	2004-03-16 19:00	0.5	1.8	8355	2.9	7.11	51.5	0.25	0.7		3.5	10.9	–168	1008.3
PFM000087	2004-03-16 07:00	2004-03-16 19:00	1.0	1.8		3.8	7.04	60.4	0.29	2.2		0.5	17.2	–248	1009.1
PFM000087	2004-03-16 07:00	2004-03-16 19:00	1.5	1.8	8356	4.1	7.01	63.0	0.31	0.2		0.1	18.0	–279	1010.6
PFM000087	2004-04-05 07:00	2004-04-05 19:30	0.5	2.0	8385	4.6	6.31	33.5	0.16	–1.9	51	8.7	6.3	460	999.5
PFM000087	2004-04-05 07:00	2004-04-05 19:30	1.0	2.0		6.0	6.15	52.7	0.26	3.7	22	5.4	11.9	–80	1000.8
PFM000087	2004-04-05 07:00	2004-04-05 19:30	1.5	2.0	8373	5.5	6.31	67.0	0.33	34.9	8	0.3	12.7	–97	1002.4
PFM000087	2004-04-20 07:00	2004-04-20 20:00	0.5	2.0	8408	10.6	7.56	36.1	0.17	–1.4	21	10.6	6.2	137	1005.6
PFM000087	2004-04-20 07:00	2004-04-20 20:00	1.0	2.0		10.2	7.47	38.6	0.19	–1.5	10	10.2	6.5	139	1006.0
PFM000087	2004-04-20 07:00	2004-04-20 20:00	1.5	2.0		9.3	7.09	60.1	0.29	0.3	4	10.1	12.0	24	1006.3
PFM000087	2004-05-04 07:00	2004-05-04 20:00	0.5	1.9	8457	14.2	7.69	37.4	0.18	–1.9	135	9.2	5.8	169	997.5
PFM000087	2004-05-04 07:00	2004-05-04 20:00	1.0	1.9		13.7	7.63	37.5	0.18	–1.7	33	8.5	6.7	167	998.1
PFM000087	2004-05-04 07:00	2004-05-04 20:00	1.5	1.9		10.7	7.04	56.5	0.28	1.4	18	5.3	9.1	–46	998.1
PFM000087	2004-05-18 07:00	2004-05-18 16:00	0.5	1.9	8489	14.4	8.05	36.0	0.17	–1.4	944	11.4	6.2	132	1001.9
PFM000087	2004-05-18 07:00	2004-05-18 16:00	1.0	1.9		14.3	8.02	36.0	0.17	–1.3	286	11.5	8.2	133	1002.6
PFM000087	2004-05-18 07:00	2004-05-18 16:00	1.5	1.9		12.6	7.41	39.7	0.19	–0.9	140	5.8	11.0	92	1002.7
PFM000087	2004-06-02 07:00	2004-06-02 16:00	0.5	2.1	8512	16.5	7.93	34.3	0.16	–2.3	349	12.1	6.0	115	1025.3
PFM000087	2004-06-02 07:00	2004-06-02 16:00	1.0	2.1		15.9	7.89	34.3	0.16	–2.3	248	12.0	5.7	117	1026.4
PFM000087	2004-06-02 07:00	2004-06-02 16:00	1.5	2.1		13.0	7.31	39.5	0.19	–1.7	195	6.8	8.6	124	1029.6
PFM000087	2004-06-15 07:00	2004-06-15 18:00	0.5	1.8	8534	18.2	8.18	31.8	0.15	–1.1	266	12.8	7.3	133	995.6
PFM000087	2004-06-15 07:00	2004-06-15 18:00	1.0	1.8		17.7	8.02	32.6	0.16	–1.1	152	11.9	5.9	134	995.7
PFM000087	2004-06-15 07:00	2004-06-15 18:00	1.5	1.8		16.1	7.21	42.6	0.21	1.2	137	5.5	11.4	82	995.9
PFM000097	2004-03-16 07:00	2004-03-16 19:00	0.5	0.8	8363	5.3	7.07	306	1.59	2.5		0.4	14.3	–295	1004.7
PFM000097	2004-04-05 07:00	2004-04-05 19:30	0.5	0.7	8371	6.5	6.96	182	0.92	12.6	99	4.5	10.6	–151	1012.2
PFM000097	2004-04-20 07:00	2004-04-20 20:00	0.5	0.7	8410	11.5	6.99	236	1.22	1.2	103	7.0	9.4	–159	1006.2
PFM000097	2004-05-05 07:00	2004-05-05 12:00	0.5	0.7	8454	13.8	7.11	121	0.61	3.3	63	4.3	12.7	–154	997.9
PFM000097	2004-05-18 07:00	2004-05-18 16:00	0.5	0.6	8475	13.9	8.67	37.7	0.18	2.4	101	11.0	5.4	128	994.1
PFM000097	2004-06-02 07:00	2004-06-02 16:00	0.5	0.7	8514	16.0	8.45	44.0	0.21	–1.8	50	10.9	3.4	88	1022.0
PFM000097	2004-06-15 07:00	2004-06-15 18:00	0.5	0.6	8535	17.0	8.84	43.4	0.21	0.1	205	11.1	5.8	26	995.0

IDCODE	START_DATE	STOP_DATE	Meas. depth (m)	Water depth (m)	SNO	Water temp. (°C)	pH	EC (mS/m)	Salinity (%)	Turbidity* NTU	Light (µmol/ m²s)	O_2 diss. (mg/L)	Chloro-phyll* (ug/l)	ORP (mV)	Atm. pressure (hPa)
PFM000097	2004-07-05 08:00	2004-07-05 19:30	0.5	0.5		19.1	8.72	39.8	0.19	–0.5	398	12.0	3.8	96	1007.2
PFM000097	2004-08-16 07:00	2004-08-16 21:30	0.5	0.6		18.0	8.76	44.0	0.21	–1.2	102	11.4	5.0	59	1003.4
PFM000097	2004-09-14 07:00	2004-09-14 16:00	0.5	0.5		13.6	8.04	46.3	0.22	–0.4	297	8.8	4.3	13	993.0
PFM000097	2004-10-12 07:00	2004-10-12 16:00	0.5	0.5		6.4	7.60	345	1.81	4.3	61	5.0	8.9	–150	1023.0
PFM000097	2004-11-09 07:00	2004-11-09 16:00	0.5	0.5		6.8	7.33	256	1.32	9.6	76	4.3	24.9	–224	1013.8
PFM000097	2004-12-07 07:00	2004-12-07 16:00	0.5	0.7		4.0	7.30	137	0.68	8.5	0	0.2	21.4	–238	980.2
PFM000097	2005-01-18 08:00	2005-01-18 16:00	0.5	1.1		2.9	7.42	855	4.70	–1.3	4	7.1	0.9	101	977.8
PFM000097	2005-02-15 07:00	2005-02-15 18:00	0.5	1.0		4.5	7.47	808	4.45	2.3	0	0.5	7.7	–291	1004.9
PFM000097	2005-03-15 07:00	2005-03-15 16:00	0.5	0.8		3.5	7.10	776	4.24	1.3	4	0.5	9.0	–316	1003.3
PFM000097	2005-04-12 07:30	2005-04-12 17:00	0.5	0.8		9.3	7.35	655	3.59	6.4	239	1.1	6.5	–276	1005.3
PFM000097	2005-05-10 07:00	2005-05-10 16:00	0.5	0.7		13.4	7.19	481	2.59	15.2	195	3.0	5.6	–150	1008.5
PFM000097	2005-06-14 07:00	2005-06-14 16:00	0.5	0.7		16.5	8.73	89.5	0.44	1.1	632	11.1	2.5	100	1017.1
PFM000107	2004-03-15 08:00	2004-03-15 19:00	0.5	1.8	8342	3.5	7.06	42.4	0.20	–0.3		1.3	13.7	98	996.6
PFM000107	2004-03-15 08:00	2004-03-15 19:00	1.0	1.8	8349	4.0	7.07	43.6	0.21	–0.2		1.4	14.0	23	998.5
PFM000107	2004-04-04 08:30	2004-04-04 19:30	0.5	1.6	8381	6.6	7.07	34.0	0.16	–1.8	113	4.4	8.4	154	1003.2
PFM000107	2004-04-04 08:30	2004-04-04 19:30	1.0	1.6	8382	6.3	7.00	46.7	0.23	–1.8	29	2.9	9.0	152	1004.5
PFM000107	2004-04-20 07:00	2004-04-20 20:00	0.5	1.6	8409	10.8	8.04	36.3	0.18	–1.5	128	11.4	5.7	188	1006.0
PFM000107	2004-04-20 07:00	2004-04-20 20:00	1.0	1.6		10.7	8.03	36.4	0.18	–1.5	53	11.4	5.9	188	1006.1
PFM000107	2004-05-03 08:00	2004-05-03 19:00	0.5	1.7	8449	14.8	8.51	35.7	0.17	–1.3	7	11.3	5.9	272	993.6
PFM000107	2004-05-03 08:00	2004-05-03 19:00	1.0	1.7		14.7	8.48	35.8	0.17	–1.4	2	11.3	4.9	270	993.8
PFM000107	2004-05-17 08:00	2004-05-17 22:00	0.5	1.8	8477	15.3	8.72	33.6	0.16	–1.7	77	12.9	4.9	144	1010.0
PFM000107	2004-05-17 08:00	2004-05-17 22:00	1.0	1.8		15.3	8.69	33.6	0.16	–1.8	43	12.9	3.5	145	1010.1
PFM000107	2004-06-01 08:00	2004-06-01 21:00	0.5	1.7		17.8	8.95	34.5	0.17	–2.3	113	12.9	3.7	162	1017.2
PFM000107	2004-06-01 08:00	2004-06-01 21:00	1.0	1.7		17.8	8.95	34.6	0.17	–2.3	63	12.8	4.3	161	1017.4
PFM000107	2004-06-14 08:00	2004-06-14 22:00	0.5	1.7	8525	18.4	9.02	33.6	0.16	–0.3	200	11.6	3.3	89	1001.2
PFM000107	2004-06-14 08:00	2004-06-14 22:00	1.0	1.7		18.3	9.01	33.8	0.16	–0.9	109	11.6	3.2	89	1001.6
PFM000107	2004-07-05 08:00	2004-07-05 19:30	0.5	1.7	8546	19.2	9.00	32.7	0.16	–1.8	307	10.2	4.3	92	1009.0
PFM000107	2004-07-05 08:00	2004-07-05 19:30	1.0	1.7		19.1	8.99	32.6	0.16	–1.9	198	10.3	3.3	91	1010.9
PFM000107	2004-08-15 17:30	2004-08-15 22:00	0.5	1.6	8612	20.5	8.99	33.9	0.16	–0.9	7	10.8	3.8	15	1001.2
PFM000107	2004-08-15 17:30	2004-08-15 22:00	1.0	1.6		20.5	8.99	33.9	0.16	–0.8	3	10.7	3.2	20	1002.0
PFM000107	2004-09-13 10:00	2004-09-13 20:00	0.5	1.7	8631	15.2	8.86	35.1	0.17	–1.0	48	11.0	4.6	37	995.4
PFM000107	2004-09-13 10:00	2004-09-13 20:00	1.0	1.7		15.2	8.86	35.2	0.17	–1.0	32	11.1	4.2	39	996.4
PFM000107	2004-10-11 08:00	2004-10-11 19:00	0.5	1.8	8654	6.9	8.42	35.7	0.17	–2.2	49	13.2	3.6	90	1024.9

IDCODE	START_DATE	STOP_DATE	Meas. depth (m)	Water depth (m)	SNO	Water temp. (°C)	pH	EC (mS/m)	Salinity (%)	Turbidity* NTU	Light (µmol/ m^2s)	O_2 diss. (mg/L)	Chloro-phyll* (ug/l)	ORP (mV)	Atm. pressure (hPa)
PFM000107	2004-10-11 08:00	2004-10-11 19:00	1.0	1.8		6.9	8.43	35.7	0.17	–2.1	33	13.2	2.4	89	1025.3
PFM000107	2004-11-09 07:00	2004-11-09 16:00	0.5	1.7	8723	4.2	8.19	36.7	0.18	–2.1	27	13.2	3.5	239	1009.2
PFM000107	2004-11-09 07:00	2004-11-09 16:00	1.0	1.7		4.2	8.20	36.7	0.18	–2.1	16	13.2	3.7	241	1009.0
PFM000107	2004-12-06 07:30	2004-12-06 19:00	0.5	1.7	8732	2.1	7.54	39.5	0.19	–1.7	38	10.8	3.6	224	995.6
PFM000107	2004-12-06 07:30	2004-12-06 19:00	1.0	1.7	8738	3.2	7.43	42.1	0.20	–1.7	22	5.6	3.9	224	995.4
PFM000107	2005-01-17 08:00	2005-01-17 20:00	0.5	1.8	8751	2.3	7.02	51.0	0.24	–1.4	22	4.7	5.0	141	991.8
PFM000107	2005-01-17 08:00	2005-01-17 20:00	1.0	1.8	8754	2.3	6.82	468	2.47	–1.2	6	4.6	2.8	159	994.5
PFM000107	2005-02-14 07:30	2005-02-14 19:00	0.5	1.9	8800	2.7	7.15	80.5	0.39	–1.2	2	2.2	6.8	84	993.7
PFM000107	2005-02-14 07:30	2005-02-14 19:00	1.0	1.9	8801	3.8	6.84	465	2.46	–1.1	0	0.4	4.3	–164	993.7
PFM000107	2005-03-14 08:00	2005-03-14 20:00	0.5	1.6	8829	2.0	7.15	130	0.64	–0.6	8	1.7	6.1	123	996.0
PFM000107	2005-03-14 08:00	2005-03-14 20:00	1.0	1.6	8830	4.2	6.70	478	2.54	–0.4	2	0.3	3.1	–185	998.3
PFM000107	2005-04-11 08:00	2005-04-11 21:00	0.5	1.8	8868	7.4	7.92	113	0.56	–0.1	276	12.2	3.5	89	1006.8
PFM000107	2005-04-11 08:00	2005-04-11 21:00	1.0	1.8		7.4	7.92	113	0.56	–0.1	111	12.1	3.0	88	1008.1
PFM000107	2005-05-09 08:00	2005-05-09 19:00	0.5	1.9	8882	11.6	8.61	86.3	0.43	–0.2	297	11.5	3.6	165	1003.3
PFM000107	2005-05-09 08:00	2005-05-09 19:00	1.0	1.9		11.6	8.62	86.4	0.43	0.0	200	11.6	2.5	163	1004.2
PFM000107	2005-06-13 08:00	2005-06-13 19:30	0.5	1.8		17.1	8.72	81.9	0.40	0.4	1777	10.5	2.2	172	1016.3
PFM000107	2005-06-13 08:00	2005-06-13 19:30	1.0	1.8		17.1	8.72	81.7	0.40	0.4	461	10.5	2.0	169	1016.9
PFM000117	2004-03-16 07:00	2004-03-16 19:00	0.5	2.0	8353	2.3	7.37	32.7	0.16	–0.6		3.5	9.4	115	996.6
PFM000117	2004-03-16 07:00	2004-03-16 19:00	1.0	2.0		3.3	7.31	32.8	0.16	–0.4		2.4	9.9	119	1000.0
PFM000117	2004-03-16 07:00	2004-03-16 19:00	1.5	2.0		3.9	7.31	33.4	0.16	–0.5		1.7	11.5	117	1001.5
PFM000117	2004-04-04 08:30	2004-04-04 19:30	0.5	2.1	8380	6.5	7.18	29.7	0.14	–2.0	62	5.3	7.4	167	1002.4
PFM000117	2004-04-04 08:30	2004-04-04 19:30	1.0	2.1		6.6	7.14	33.2	0.16	–1.8	29	3.8	7.2	167	1002.9
PFM000117	2004-04-04 08:30	2004-04-04 19:30	1.5	2.1	8379	6.4	7.16	35.0	0.17	–1.7	16	4.2	8.2	167	1003.5
PFM000117	2004-04-20 07:00	2004-04-20 20:00	0.5	2.2	8407	10.2	8.01	28.3	0.14	–1.3	121	12.0	7.6	172	1004.7
PFM000117	2004-04-20 07:00	2004-04-20 20:00	1.0	2.2		10.2	8.00	28.3	0.14	–1.3	60	12.0	6.7	171	1005.3
PFM000117	2004-04-20 07:00	2004-04-20 20:00	1.5	2.2		10.2	7.98	28.3	0.14	–1.3	31	12.0	6.6	170	1006.2
PFM000117	2004-05-04 07:00	2004-05-04 20:00	0.5	2.2	8456	13.6	8.31	27.6	0.13	–1.2	257	10.7	7.3	130	996.7
PFM000117	2004-05-04 07:00	2004-05-04 20:00	1.0	2.2		13.6	8.29	27.6	0.13	–1.2	170	10.7	7.5	129	997.2
PFM000117	2004-05-04 07:00	2004-05-04 20:00	1.5	2.2		13.6	8.28	27.6	0.13	–1.3	85	10.6	7.8	127	998.0
PFM000117	2004-05-17 08:00	2004-05-17 22:00	0.5	2.1	8492	15.8	8.46	25.7	0.12	–1.5	84	12.1	5.2	175	1008.1
PFM000117	2004-05-17 08:00	2004-05-17 22:00	1.0	2.1		15.5	8.44	25.7	0.12	–1.2	48	12.2	4.0	174	1008.4
PFM000117	2004-05-17 08:00	2004-05-17 22:00	1.5	2.1		15.4	8.45	25.7	0.12	7.3	29	12.3	69.4	130	1008.5
PFM000117	2004-06-01 08:00	2004-06-01 21:00	0.5	2.1		16.9	8.62	24.0	0.11	–2.0	307	12.3	6.8	180	1016.6

IDCODE	START_DATE	STOP_DATE	Meas. depth (m)	Water depth (m)	SNO	Water temp. (°C)	pH	EC (mS/m)	Salinity (%)	Turbidity* NTU	Light (µmol/ m²s)	O_2 diss. (mg/L)	Chloro-phyll* (ug/l)	ORP (mV)	Atm. pressure (hPa)
PFM000117	2004-06-01 08:00	2004-06-01 21:00	1.0	2.1		16.9	8.61	24.0	0.11	–2.2	150	12.3	4.4	176	1017.8
PFM000117	2004-06-01 08:00	2004-06-01 21:00	1.5	2.1		16.9	8.61	24.0	0.11	–2.0	146	12.3	5.0	174	1018.4
PFM000117	2004-06-14 08:00	2004-06-14 22:00	0.5	2.1	8533	18.4	8.61	22.9	0.11	–0.8	147	11.1	4.9	118	998.3
PFM000117	2004-06-14 08:00	2004-06-14 22:00	1.0	2.1		18.1	8.63	22.8	0.11	–0.7	61	11.3	3.6	119	998.4
PFM000117	2004-06-14 08:00	2004-06-14 22:00	1.5	2.1		17.8	8.65	22.9	0.11	–1.0	45	11.7	3.3	119	998.7
PFM000117	2004-07-05 08:00	2004-07-05 19:30	0.5	2.1	8549	19.9	8.73	21.1	0.10	–1.0	145	10.3	5.2	107	1000.5
PFM000117	2004-07-05 08:00	2004-07-05 19:30	1.0	2.1		19.9	8.72	21.1	0.10	0.0	89	10.3	4.9	105	1001.2
PFM000117	2004-07-05 08:00	2004-07-05 19:30	1.5	2.1		19.6	8.73	21.1	0.10	–1.4	58	10.5	5.0	104	1001.6
PFM000117	2004-08-16 07:00	2004-08-16 21:30	0.5	2.1	8608	20.4	8.77	18.4	0.09	–1.4	62	10.0	2.6	21	1002.1
PFM000117	2004-08-16 07:00	2004-08-16 21:30	1.0	2.1		20.4	8.77	18.4	0.09	–1.3	38	10.1	3.5	26	1002.5
PFM000117	2004-08-16 07:00	2004-08-16 21:30	1.5	2.1		20.0	8.75	18.4	0.09	–1.3	24	10.1	4.5	30	1002.7
PFM000117	2004-09-13 10:00	2004-09-13 20:00	0.5	2.2	8628	15.3	8.82	18.4	0.09	–1.1	292	11.0	2.6	15	995.5
PFM000117	2004-09-13 10:00	2004-09-13 20:00	1.0	2.2		15.3	8.81	18.4	0.09	–1.1	290	11.1	3.1	21	996.4
PFM000117	2004-09-13 10:00	2004-09-13 20:00	1.5	2.2		15.2	8.82	18.4	0.09	–1.1	169	11.1	4.0	27	997.2
PFM000117	2004-10-12 07:00	2004-10-12 16:00	0.5	2.3	8657	6.6	8.61	18.9	0.09	–2.2	277	12.4	3.3	1	1027.0
PFM000117	2004-10-12 07:00	2004-10-12 16:00	1.0	2.3		6.5	8.60	18.9	0.09	–2.2	143	12.4	1.7	5	1029.1
PFM000117	2004-10-12 07:00	2004-10-12 16:00	1.5	2.3		6.3	8.58	18.9	0.09	–2.2	138	12.5	2.9	8	1030.6
PFM000117	2004-11-09 07:00	2004-11-09 16:00	0.5	2.2	8726	4.2	8.36	20.5	0.10	–2.0	121	13.1	2.1	264	1014.3
PFM000117	2004-11-09 07:00	2004-11-09 16:00	1.0	2.2		4.2	8.36	20.5	0.10	–2.0	105	13.1	3.1	264	1015.0
PFM000117	2004-11-09 07:00	2004-11-09 16:00	1.5	2.2		4.2	8.36	20.5	0.10	–2.1	66	13.1	3.2	265	1016.9
PFM000117	2004-12-07 07:00	2004-12-07 16:00	0.5	2.2	8731	1.8	8.03	22.3	0.11	–1.6	11	13.3	3.7	47	971.7
PFM000117	2004-12-07 07:00	2004-12-07 16:00	1.0	2.2		2.5	7.85	23.4	0.11	–1.5	9	10.8	4.3	56	975.2
PFM000117	2004-12-07 07:00	2004-12-07 16:00	1.5	2.2	8733	3.1	7.57	25.8	0.12	–1.5	6	7.9	5.1	62	976.5
PFM000117	2005-01-17 08:00	2005-01-17 20:00	0.5	2.2	8752	2.3	7.53	26.5	0.13	–1.4	0	10.1	3.8	194	987.4
PFM000117	2005-01-17 08:00	2005-01-17 20:00	1.0	2.2		3.6	7.46	28.5	0.14	–1.4	0	6.1	5.2	195	988.6
PFM000117	2005-01-17 08:00	2005-01-17 20:00	1.5	2.2	8750	3.9	7.38	30.7	0.15	–1.4	0	2.8	5.3	193	990.0
PFM000117	2005-02-15 07:00	2005-02-15 18:00	0.5	2.0	8798	3.3	7.41	30.0	0.14	0.0	34	2.4	5.2	80	1012.1
PFM000117	2005-02-15 07:00	2005-02-15 18:00	1.0	2.0		3.9	7.38	31.1	0.15	–0.1	16	1.2	5.2	76	1010.9
PFM000117	2005-02-15 07:00	2005-02-15 18:00	1.5	2.0	8795	4.7	7.34	32.8	0.16	0.0	7	0.3	7.9	27	1010.4
PFM000117	2005-03-15 07:00	2005-03-15 16:00	0.5	1.8	8835	2.0	7.27	31.5	0.15	–0.6	20	1.9	5.7	40	1007.1
PFM000117	2005-03-15 07:00	2005-03-15 16:00	1.0	1.8		3.7	7.26	33.2	0.16	–0.5	8	0.6	6.4	–102	1010.1
PFM000117	2005-03-15 07:00	2005-03-15 16:00	1.5	1.8	8839	4.6	7.22	35.7	0.17	–0.4	5	0.2	7.8	–268	1013.2
PFM000117	2005-04-12 07:30	2005-04-12 17:00	0.5	2.3	8867	6.4	7.85	27.7	0.13	–0.4	489	11.9	3.6	19	1006.0

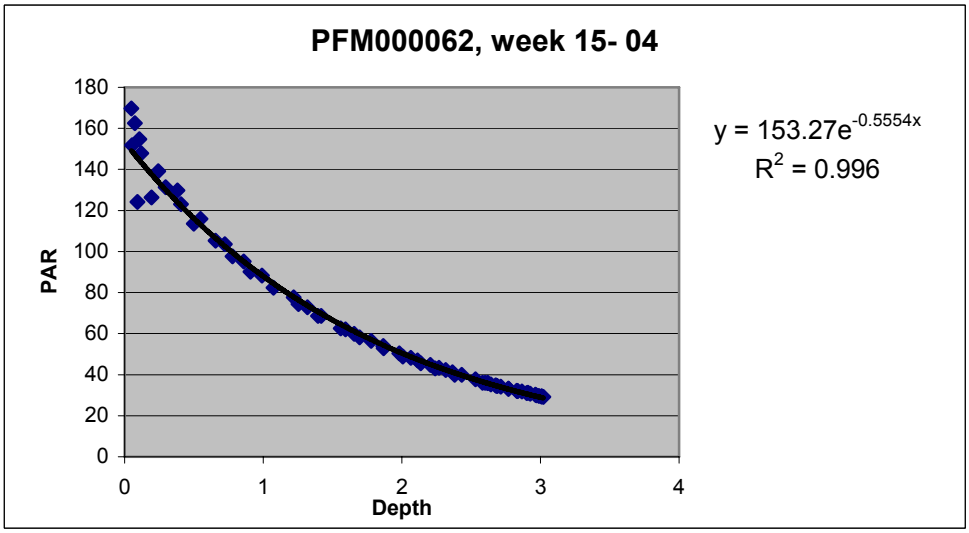
IDCODE	START_DATE	STOP_DATE	Meas. depth (m)	Water depth (m)	SNO	Water temp. (°C)	pH	EC (mS/m)	Salinity (%)	Turbidity* NTU	Light (µmol/ m²s)	O_2 diss. (mg/L)	Chloro-phyll* (ug/l)	ORP (mV)	Atm. pressure (hPa)
PFM000117	2005-04-12 07:30	2005-04-12 17:00	1.0	2.3		6.4	7.86	27.6	0.13	–0.4	120	12.0	3.7	22	1006.8
PFM000117	2005-04-12 07:30	2005-04-12 17:00	1.5	2.3		6.4	7.86	27.6	0.13	–0.4	42	12.0	3.6	23	1005.6
PFM000117	2005-05-10 07:00	2005-05-10 16:00	0.5	2.1	8883	11.2	8.52	24.6	0.12	–0.1	402	12.2	3.2	20	1009.5
PFM000117	2005-05-10 07:00	2005-05-10 16:00	1.0	2.1		11.2	8.52	24.6	0.12	0.0	426	12.2	4.0	26	1011.2
PFM000117	2005-05-10 07:00	2005-05-10 16:00	1.5	2.1		11.1	8.52	24.6	0.12	0.0	192	12.2	3.7	30	1011.9
PFM000117	2005-06-14 07:00	2005-06-14 16:00	0.5	2.1		17.1	8.60	21.1	0.10	0.0	575	11.0	3.4	138	1017.8
PFM000117	2005-06-14 07:00	2005-06-14 16:00	1.0	2.1		17.0	8.60	21.1	0.10	0.3	280	11.0	2.8	137	1018.9
PFM000117	2005-06-14 07:00	2005-06-14 16:00	1.5	2.1		16.8	8.51	21.1	0.10	0.2	404	11.0	2.5	139	1021.2
PFM000135	2004-03-17 07:00	2004-03-17 16:00	0.5	1.6	8360	1.9	7.30	62.5	0.30	–0.4		15.4	12.0	89	1006.8
PFM000135	2004-03-17 07:00	2004-03-17 16:00	1.0	1.6	8361	2.3	7.11	65.8	0.32	0.0		18.3	11.8	96	1010.4
PFM000135	2004-04-21 07:00	2004-04-21 16:00	0.5	1.3	8402	10.8	8.17	35.2	0.17	–1.1	53	11.0	5.7	145	1005.2
PFM000135	2004-04-21 07:00	2004-04-21 16:00	1.0	1.3		10.8	7.94	35.6	0.17	–1.0	26	10.5	5.8	53	1006.1
PFM000135	2004-05-18 07:00	2004-05-18 16:00	0.5	1.1	8481	15.4	8.71	31.2	0.15	–0.4	160	11.1	5.4	45	1003.7
PFM000135	2004-05-18 07:00	2004-05-18 16:00	1.0	1.1		14.9	8.19	37.0	0.18	18.7	63	9.7	12.4	–97	998.4
PFM000135	2004-06-14 08:00	2004-06-14 22:00	0.5	1.0	8526	19.3	9.03	30.9	0.15	–0.5	70	11.8	2.0	156	997.3
PFM000135	2004-06-14 08:00	2004-06-14 22:00	1.0	1.0		19.2	9.04	30.9	0.15	1.7	44	11.7	2.3	155	998.1
PFM000135	2004-07-06 07:00	2004-07-06 16:00	0.5	1.4	8548	18.5	9.18	29.2	0.14	–1.0	219	11.0	3.2	92	1005.5
PFM000135	2004-07-06 07:00	2004-07-06 16:00	1.0	1.4		18.2	9.14	29.2	0.14	0.6	152	11.0	3.4	80	1006.5
PFM000135	2004-08-16 07:00	2004-08-16 21:30	0.5	1.4	8603	19.1	9.28	30.6	0.15	6.1	177	10.4	6.0	53	1005.1
PFM000135	2004-08-16 07:00	2004-08-16 21:30	1.0	0.0		19.1	9.26	30.6	0.15	13.8	131	10.5	6.8	47	1006.6
PFM000135	2004-09-13 10:00	2004-09-13 20:00	0.5	1.4	8627	15.7	9.33	30.9	0.15	–0.5	271	11.9	3.4	–8	996.7
PFM000135	2004-09-13 10:00	2004-09-13 20:00	1.0	1.4		15.7	9.33	30.9	0.15	–0.2	244	11.9	4.7	–24	998.9
PFM000135	2004-10-11 08:00	2004-10-11 19:00	0.5	1.2	8656	6.6	8.98	31.5	0.15	–2.0	221	13.8	3.3	89	1030.2
PFM000135	2004-10-11 08:00	2004-10-11 19:00	1.0	1.2		6.6	8.98	31.5	0.15	–1.9	160	13.8	2.3	89	1031.5
PFM000135	2004-11-08 10:00	2004-11-08 19:00	0.5	1.6	8724	3.5	8.60	33.7	0.16	–2.0	3	13.4	2.3	242	1010.9
PFM000135	2004-11-08 10:00	2004-11-08 19:00	1.0	1.6		3.5	8.60	33.7	0.16	2.9	2	13.4	6.4	242	1011.2
PFM000135	2004-12-06 07:30	2004-12-06 19:00	0.5	1.6	8735	2.0	7.66	42.3	0.20	–1.7	10	7.1	3.3	256	978.9
PFM000135	2004-12-06 07:30	2004-12-06 19:00	1.0	1.6	8740	3.1	7.49	42.2	0.20	–1.6	5	4.2	3.1	253	982.3

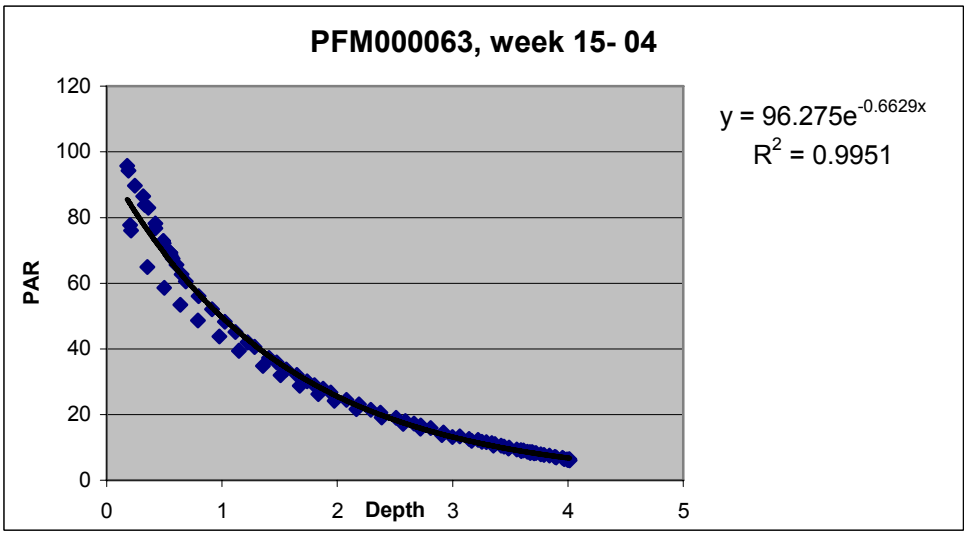
SNO = Corresponding water sample no
EC = Electrical conductivity
NTU = Nephelometric Turbidity Unit
ORP = Oxidising Reducing Potential
* Measurements with low reliability

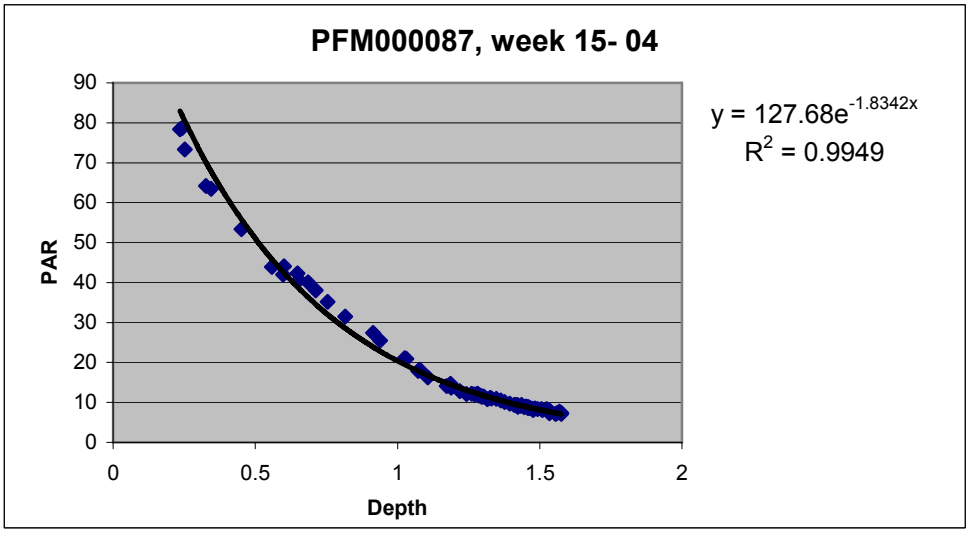
Appendix 3

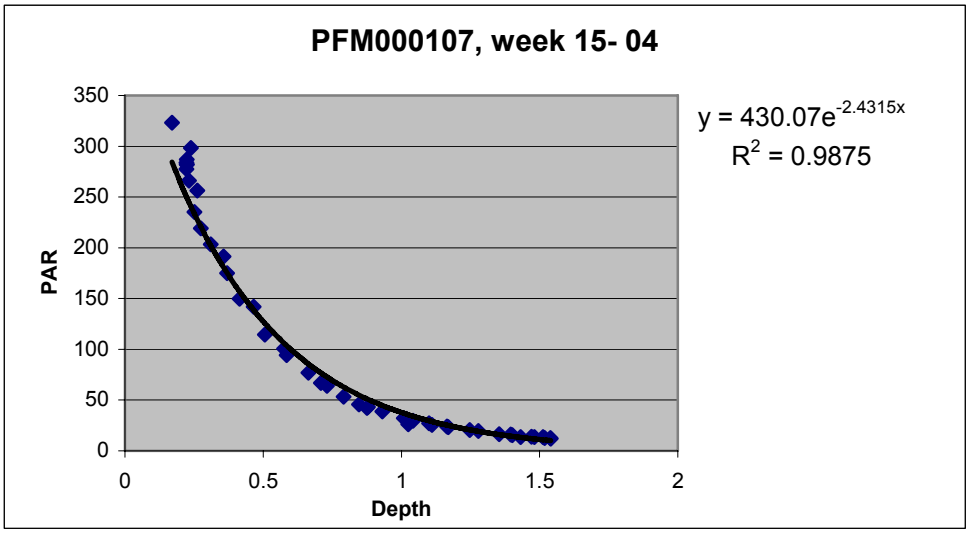
PAR-profile logs

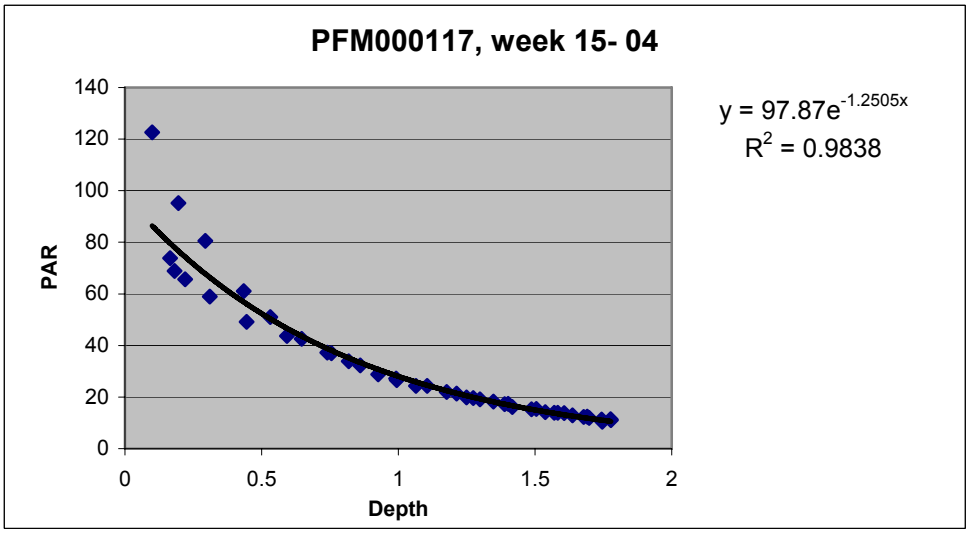
PAR versus depth, regression constants included.

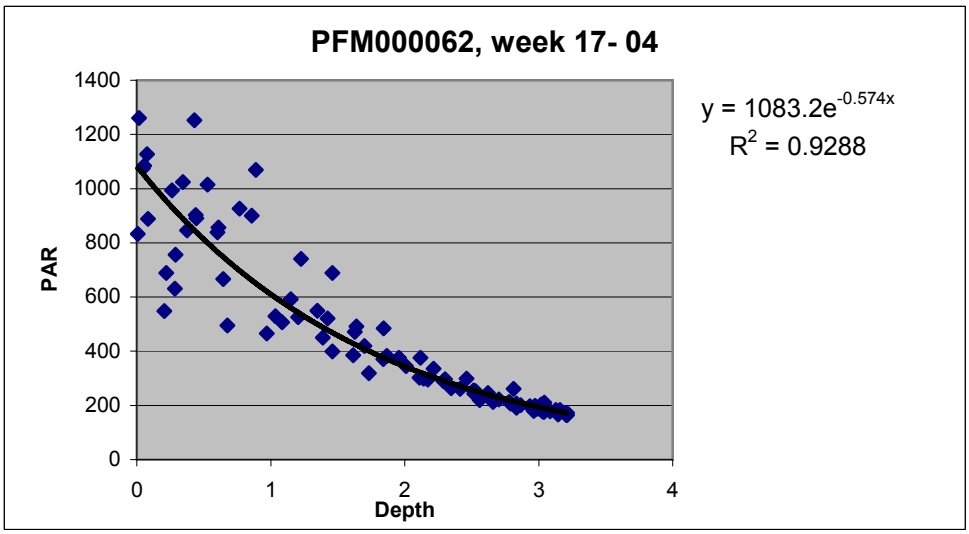


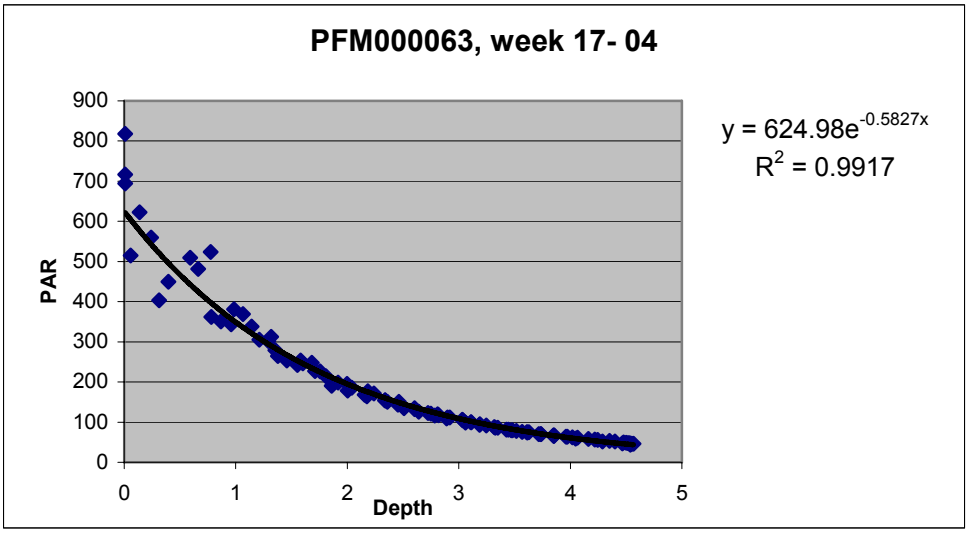


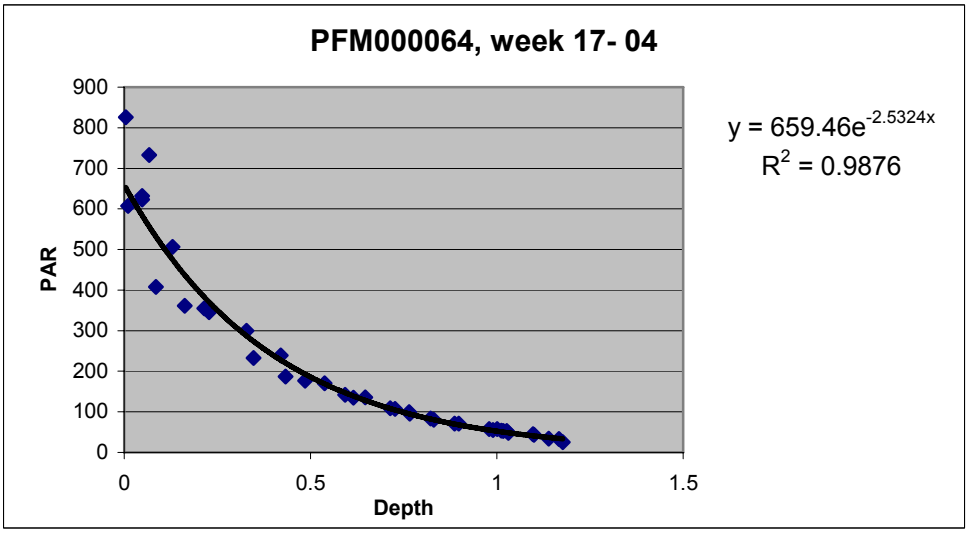


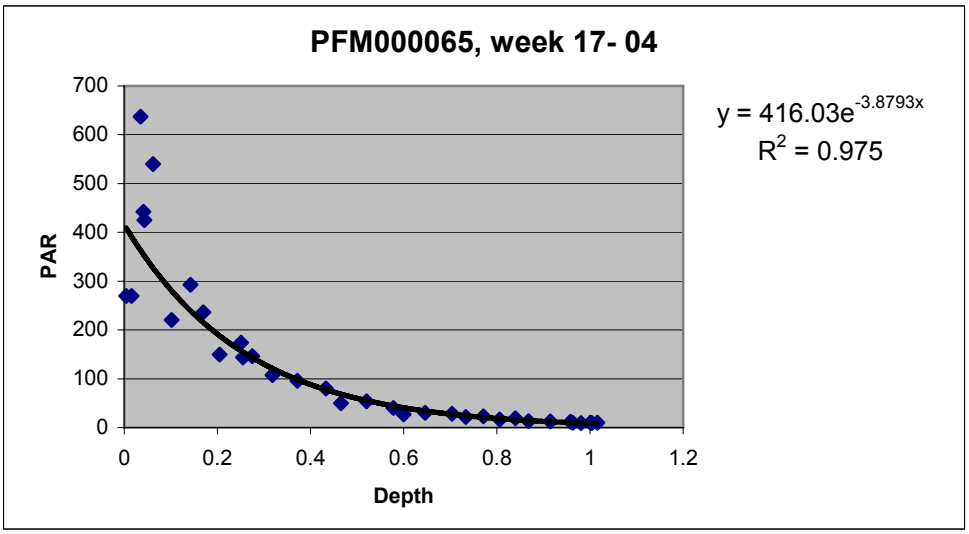

PFM000107, week 15- 04
y = 430.07e-2.4315x
R2 = 0.9875
PAR
Depth
350
300
250
200
150
100
50
0
0
0.5
1
1.5
2

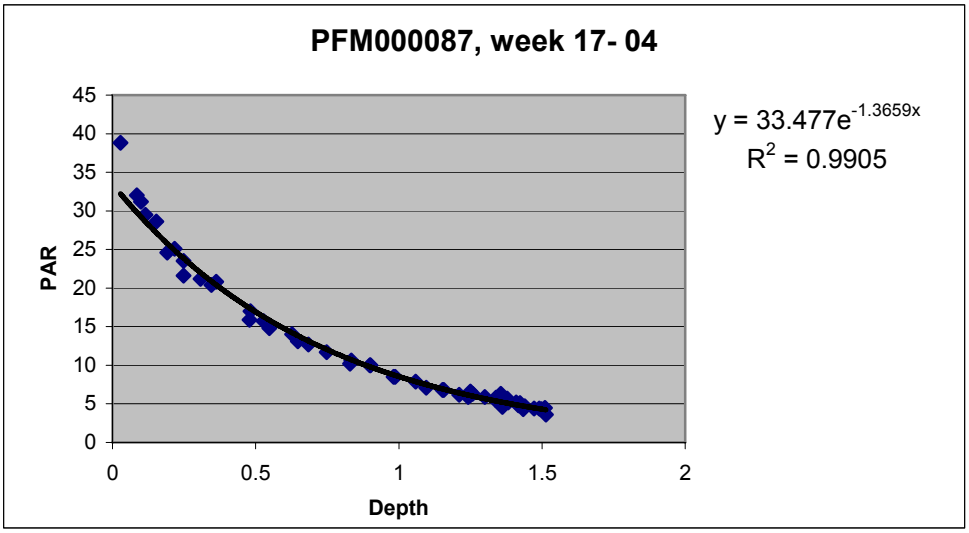

PFM000117, week 15- 04
y = 97.87e-1.2505x
R2 = 0.9838
PAR
Depth
140
120
100
80
60
40
20
0
0
0.5
1
1.5
2

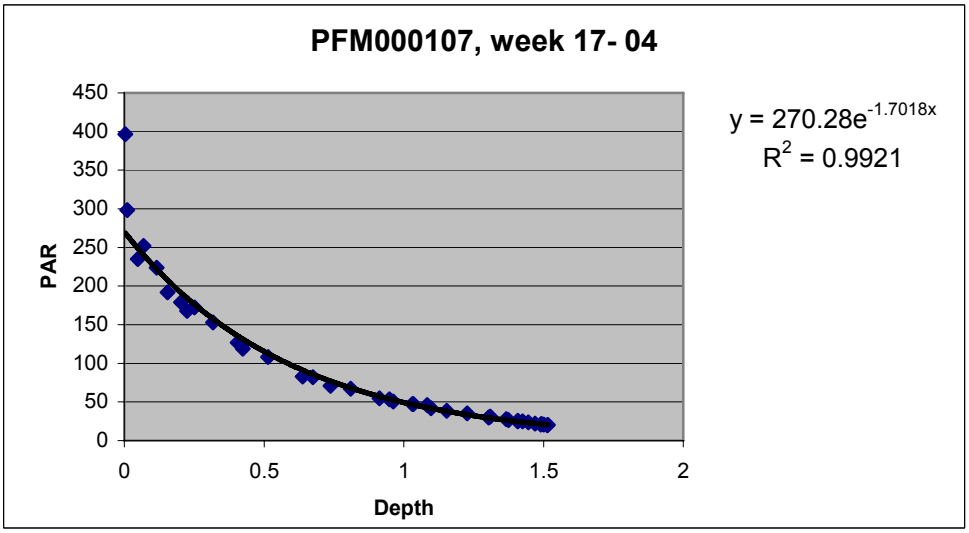

PFM000062, week 17- 04
y = 1083.2e-0.574x
R2 = 0.9288
PAR
Depth
1400
1200
1000
800
600
400
200
0
0
1
2
3
4

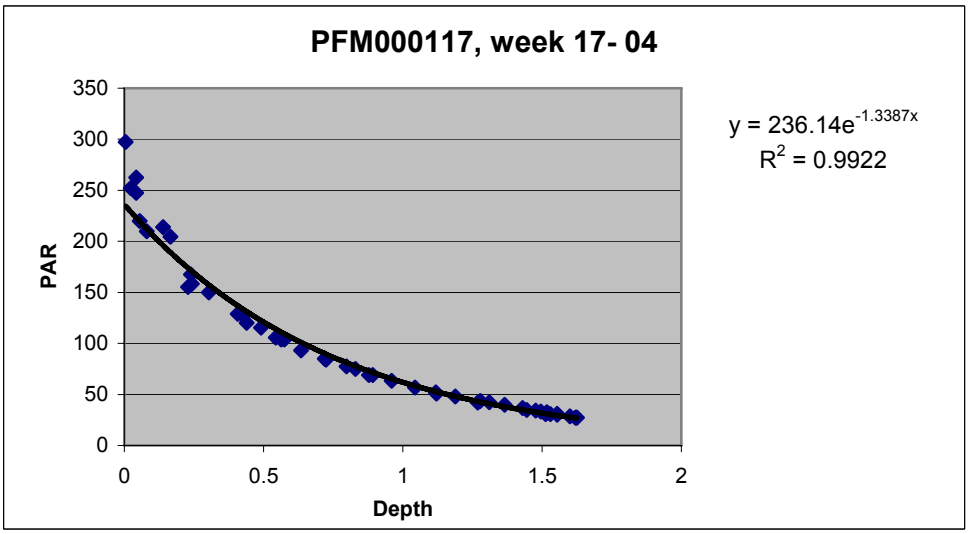

PFM000063, week 17- 04
PAR
Depth
y = 624.98e-0.5827x
R2 = 0.9917

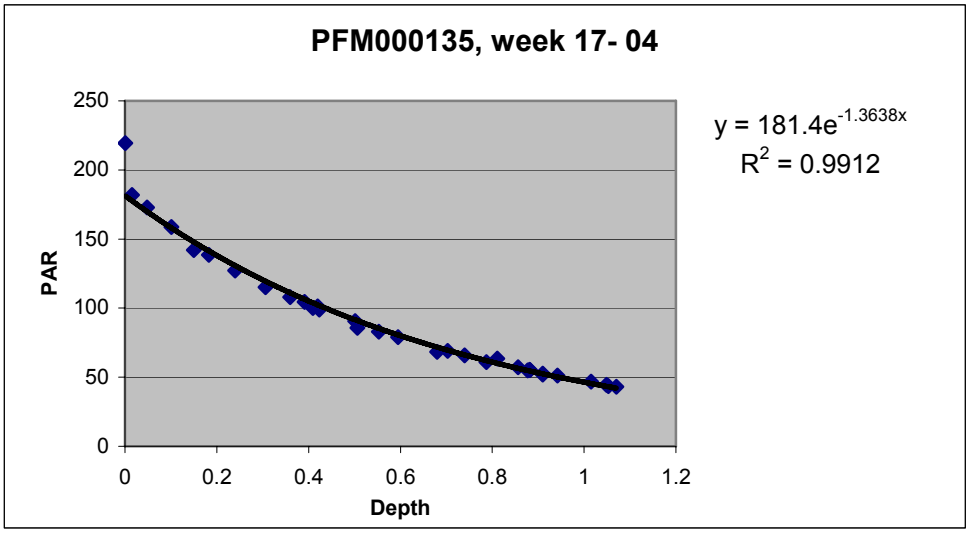

PFM000064, week 17- 04
PAR
Depth
y = 659.46e-2.5324x
R2 = 0.9876

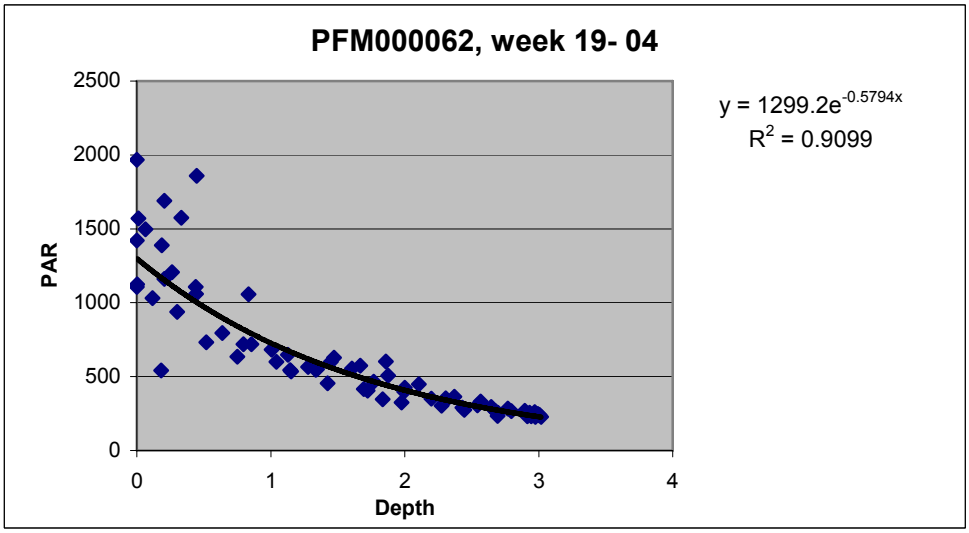

PFM000065, week 17- 04
PAR
Depth
y = 416.03e-3.8793x
R2 = 0.975

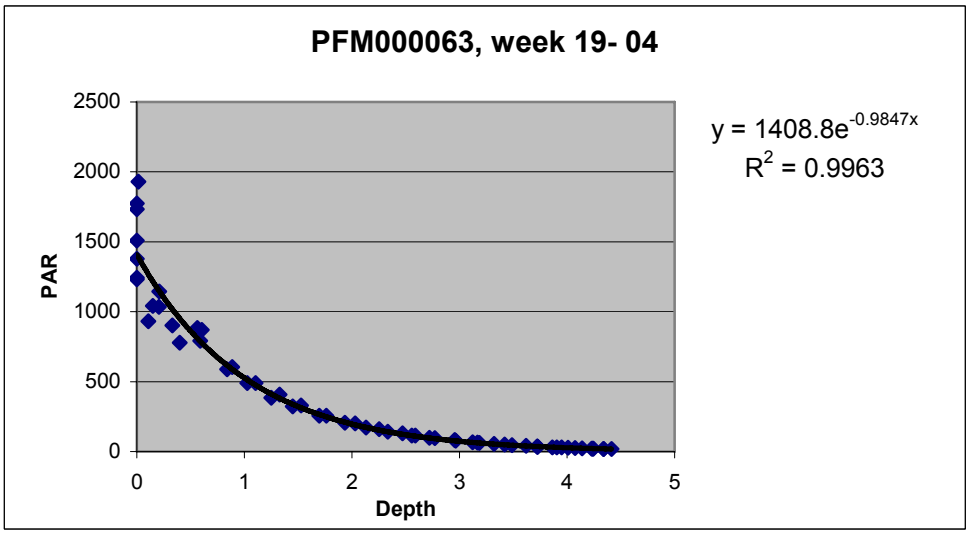

PFM000087, week 17- 04
y = 33.477e-1.3659x
R2 = 0.9905
PAR
Depth
0
5
10
15
20
25
30
35
40
45
0
0.5
1
1.5
2

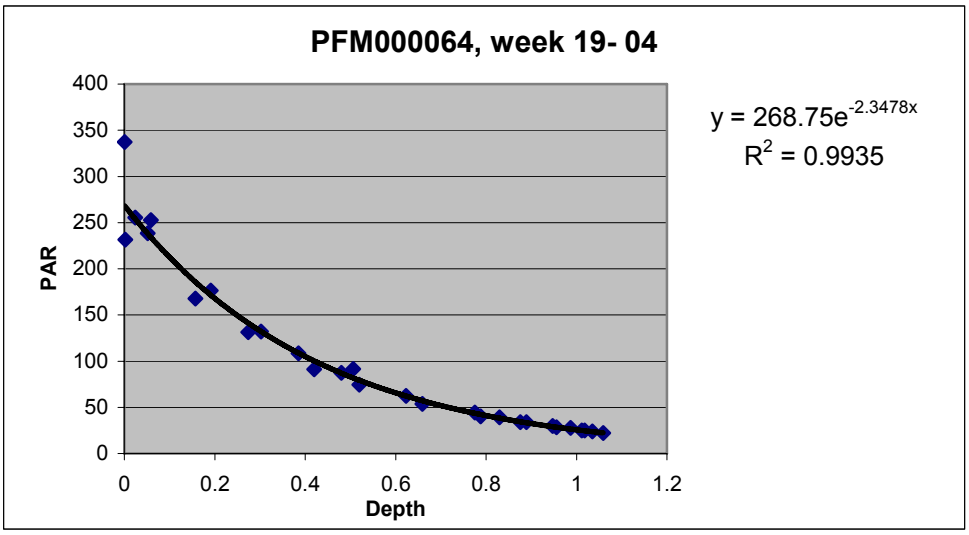

PFM000107, week 17- 04
y = 270.28e-1.7018x
R2 = 0.9921
PAR
Depth
0
50
100
150
200
250
300
350
400
450
0
0.5
1
1.5
2

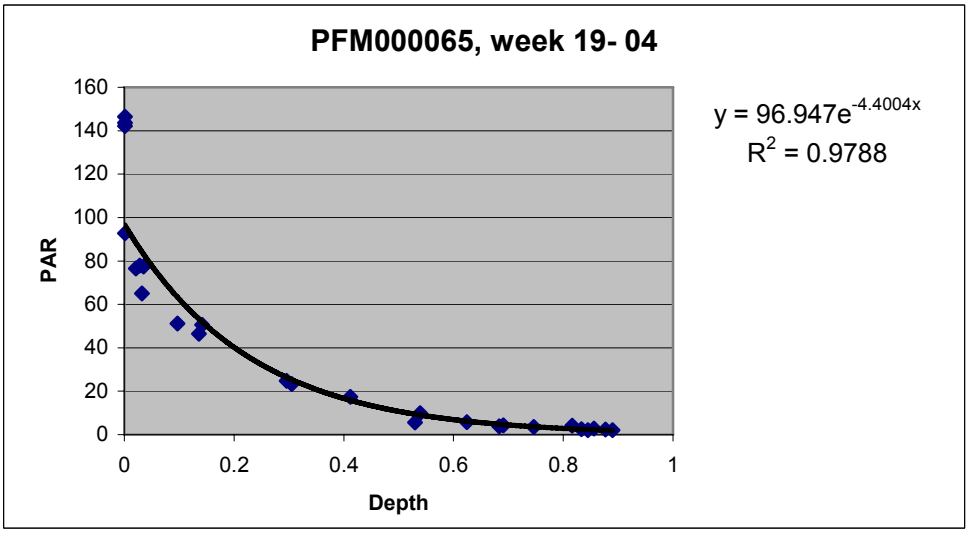

PFM000117, week 17- 04
y = 236.14e-1.3387x
R2 = 0.9922
PAR
Depth
0
50
100
150
200
250
300
350
0
0.5
1
1.5
2

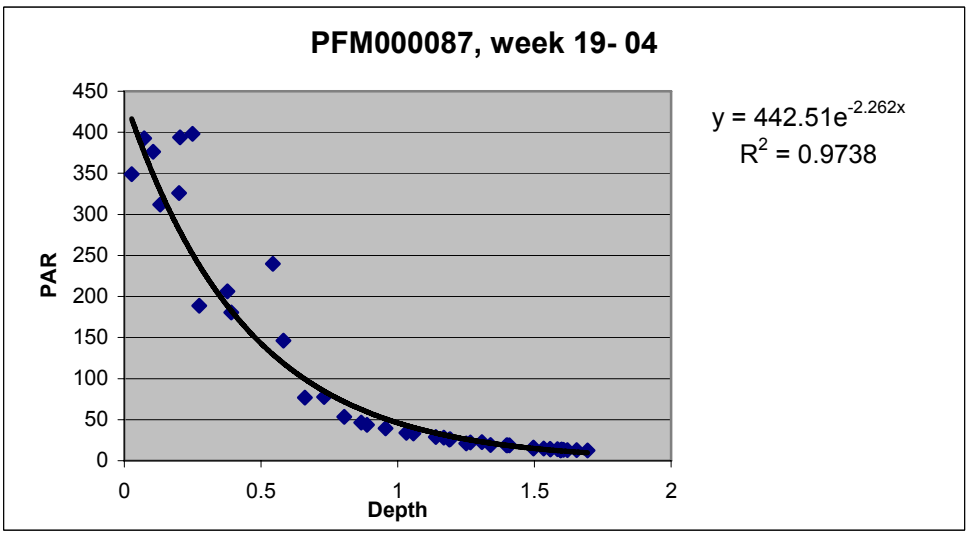

PFM000135, week 17- 04
y = 181.4e-1.3638x
R2 = 0.9912
PAR
Depth
250
200
150
100
50
0
0
0.2
0.4
0.6
0.8
1
1.2

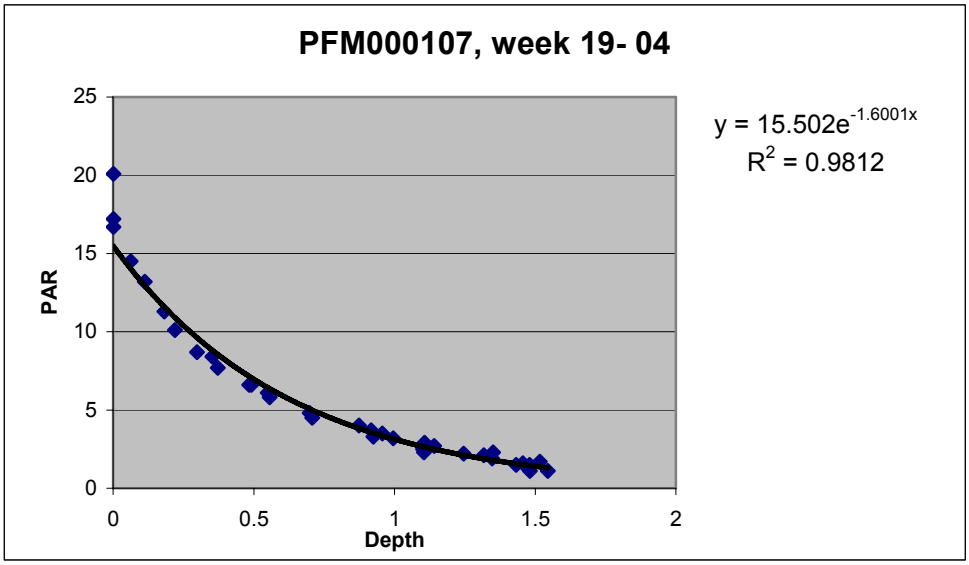

PFM000062, week 19- 04
y = 1299.2e-0.5794x
R2 = 0.9099
PAR
Depth
2500
2000
1500
1000
500
0
0
1
2
3
4

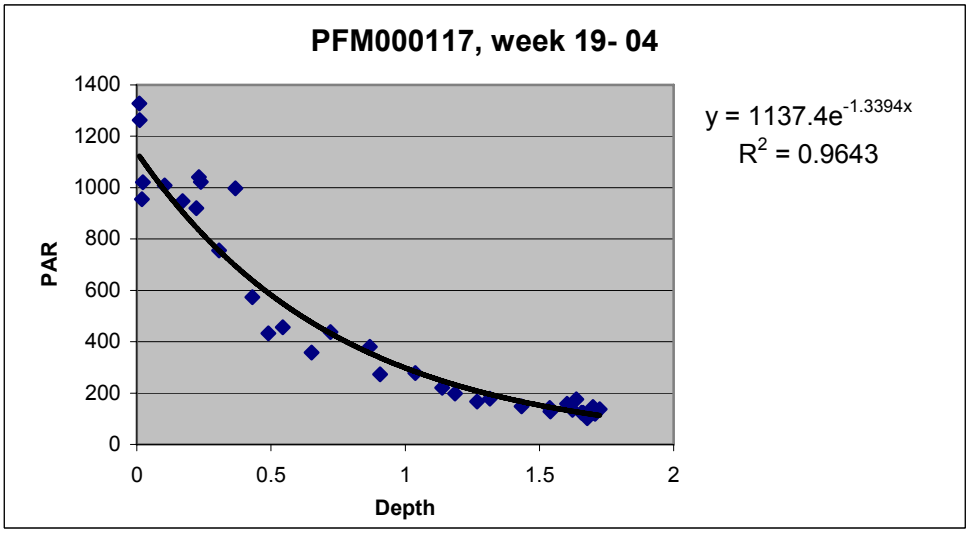

PFM000063, week 19- 04
y = 1408.8e-0.9847x
R2 = 0.9963
PAR
Depth
2500
2000
1500
1000
500
0
0
1
2
3
4
5

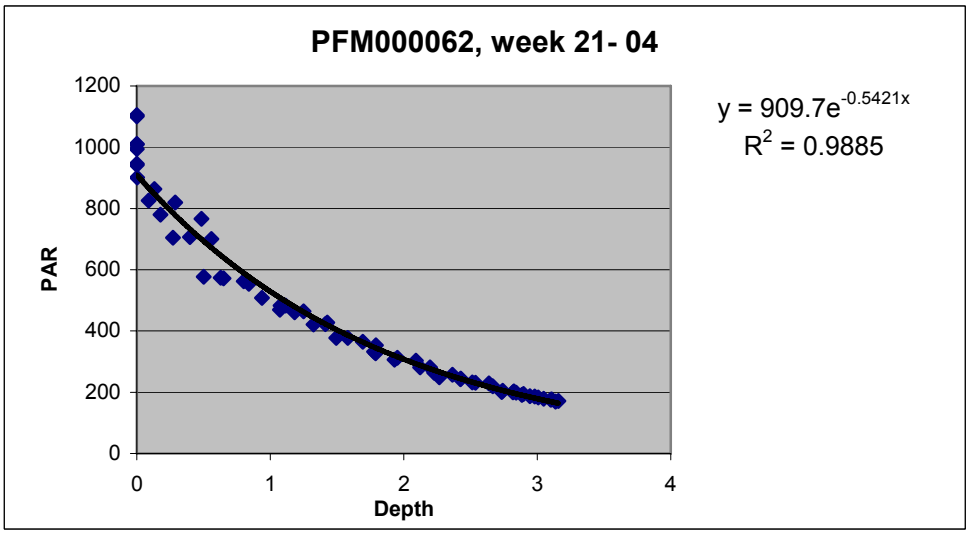

PFM000064, week 19- 04
PAR
Depth
y = 268.75e-2.3478x
R2 = 0.9935

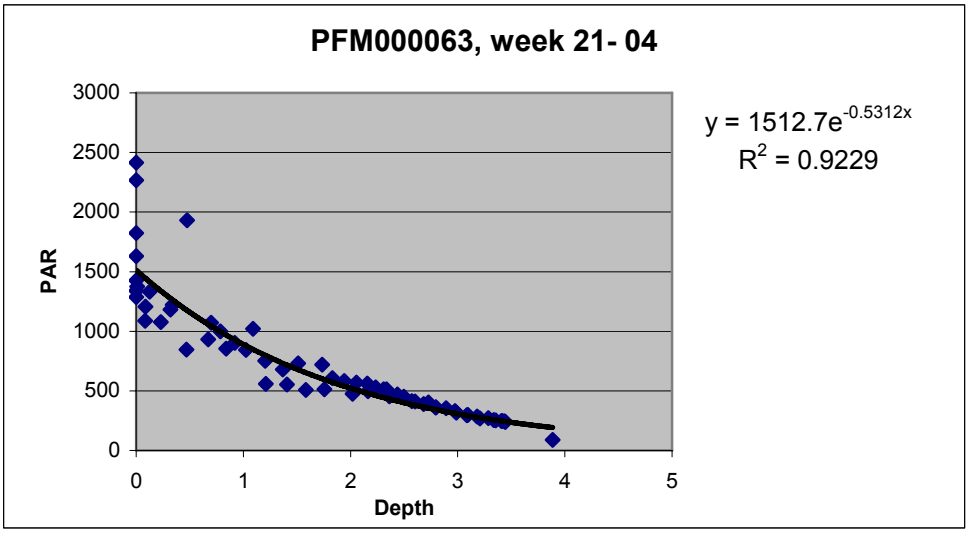

PFM000065, week 19- 04
PAR
Depth
y = 96.947e-4.4004x
R2 = 0.9788

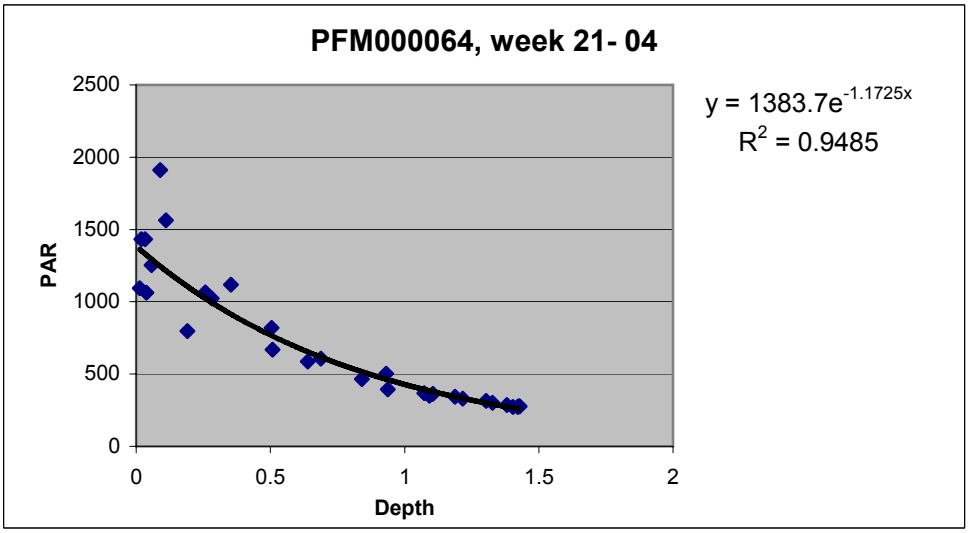

PFM000087, week 19- 04
PAR
Depth
y = 442.51e-2.262x
R2 = 0.9738

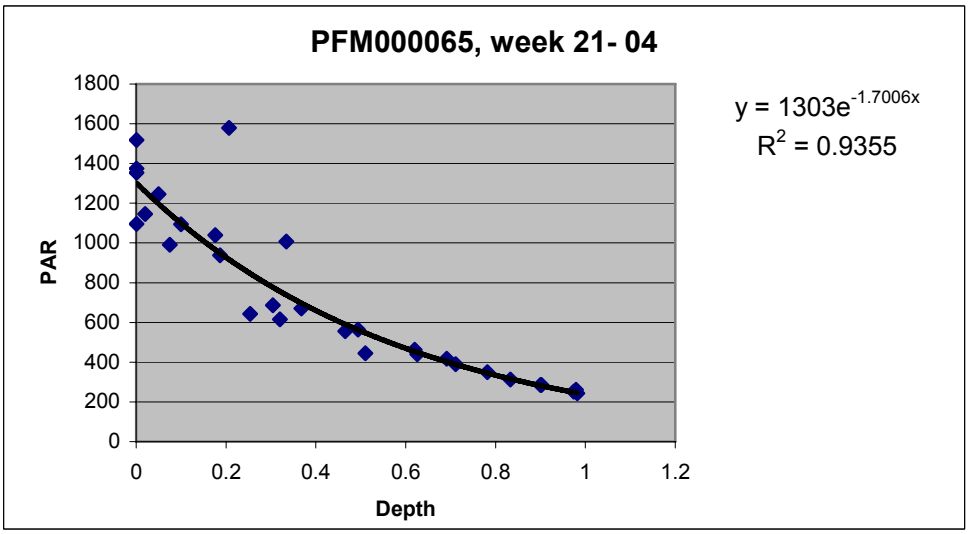

PFM000107, week 19- 04
y = 15.502e-1.6001x
R2 = 0.9812
PAR
Depth
0
5
10
15
20
25
0
0.5
1
1.5
2

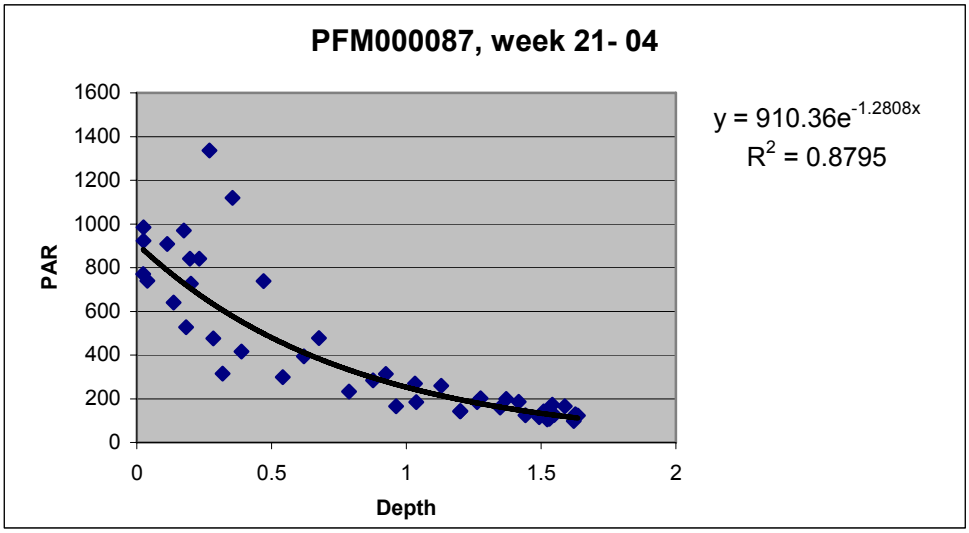

PFM000117, week 19- 04
y = 1137.4e-1.3394x
R2 = 0.9643
PAR
Depth
0
200
400
600
800
1000
1200
1400
0
0.5
1
1.5
2

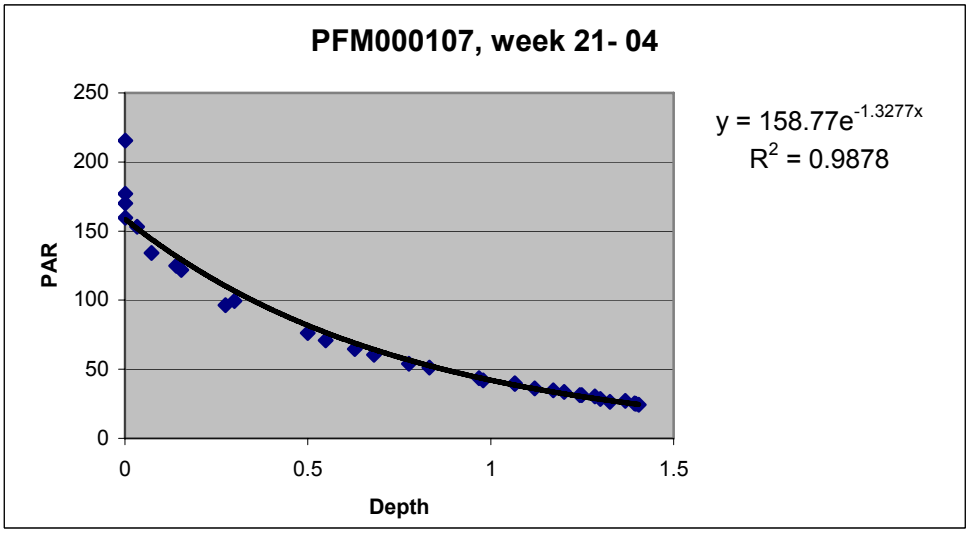

PFM000062, week 21- 04
y = 909.7e-0.5421x
R2 = 0.9885
PAR
Depth
0
200
400
600
800
1000
1200
0
1
2
3
4

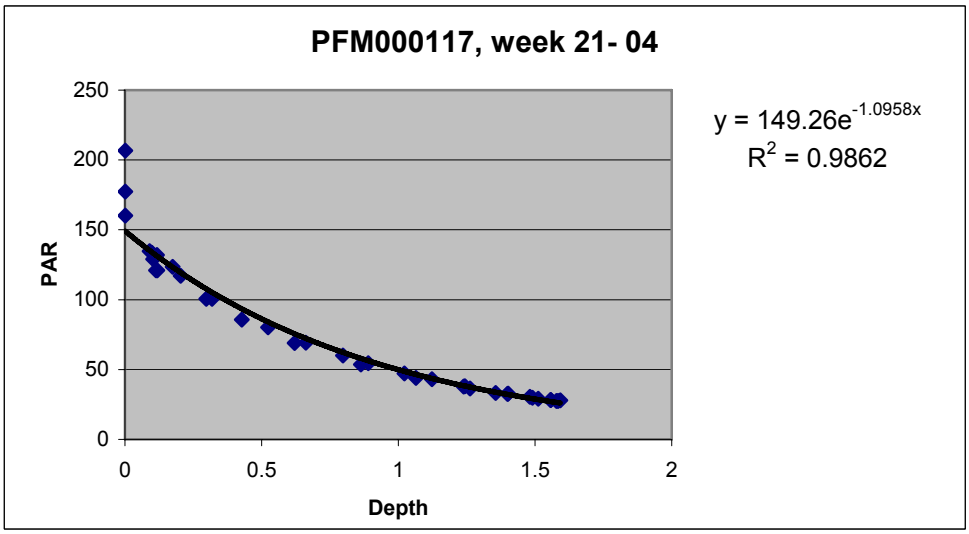

PFM000063, week 21- 04
PAR
Depth
y = 1512.7e-0.5312x
R2 = 0.9229

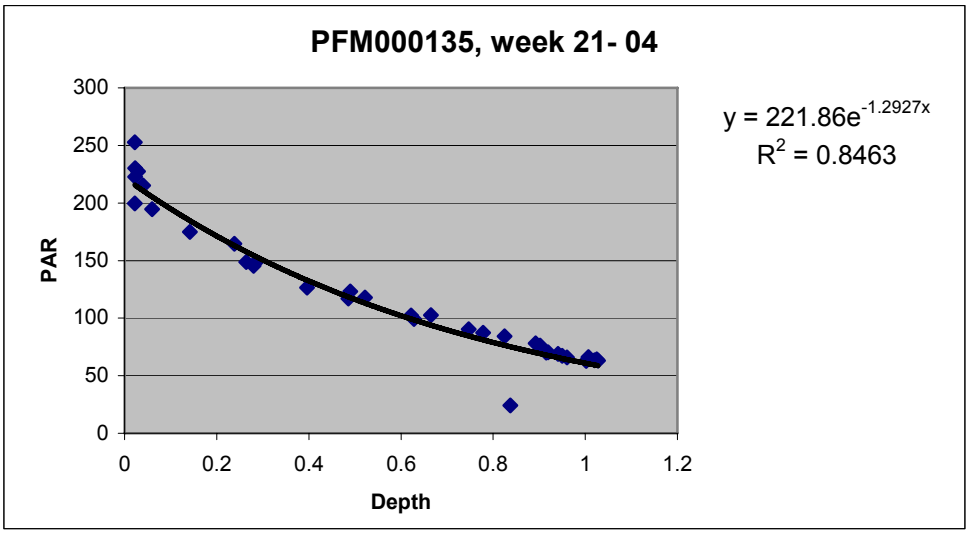

PFM000064, week 21- 04
PAR
Depth
y = 1383.7e-1.1725x
R2 = 0.9485

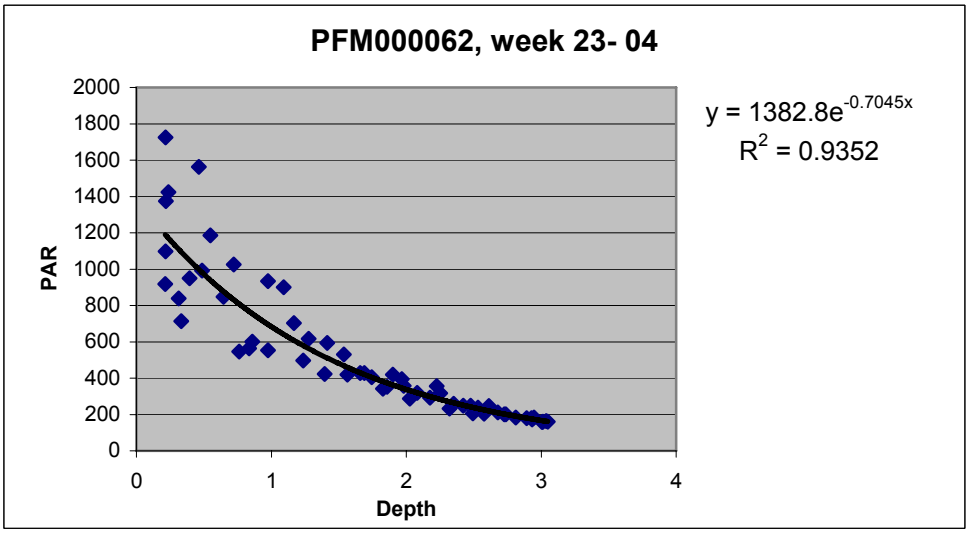

PFM000065, week 21- 04
PAR
Depth
y = 1303e-1.7006x
R2 = 0.9355

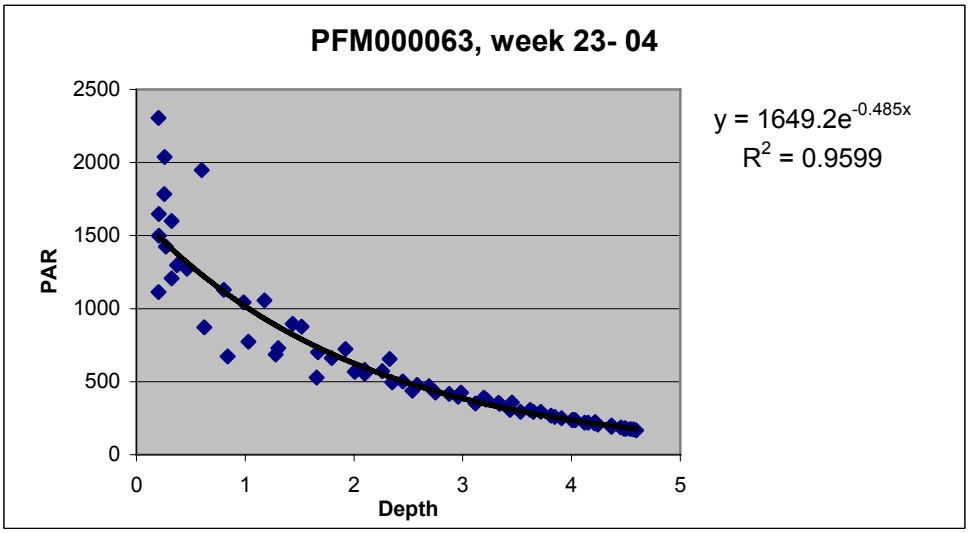

PFM000087, week 21- 04
y = 910.36e-1.2808x
R2 = 0.8795
PAR
Depth
1600
1400
1200
1000
800
600
400
200
0
0
0.5
1
1.5
2

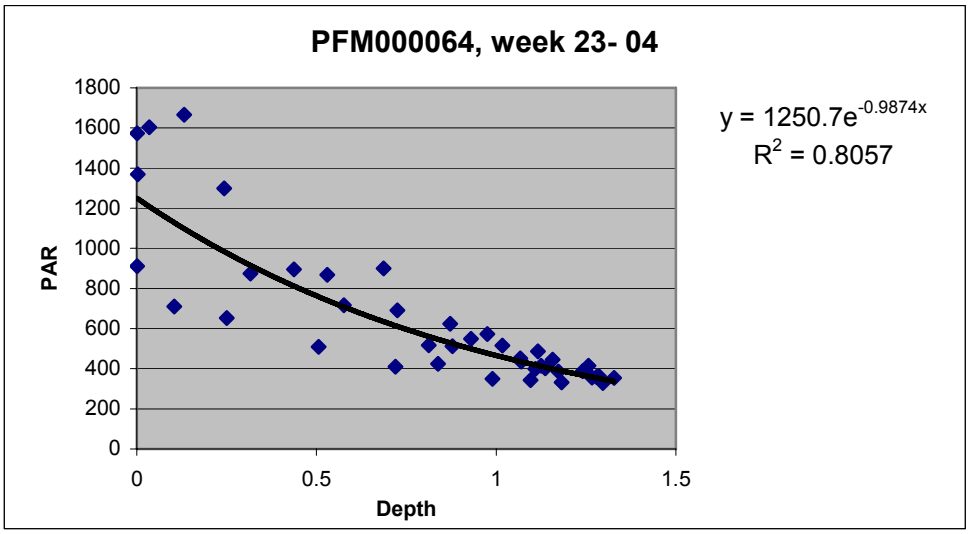

PFM000107, week 21- 04
y = 158.77e-1.3277x
R2 = 0.9878
PAR
Depth
250
200
150
100
50
0
0
0.5
1
1.5

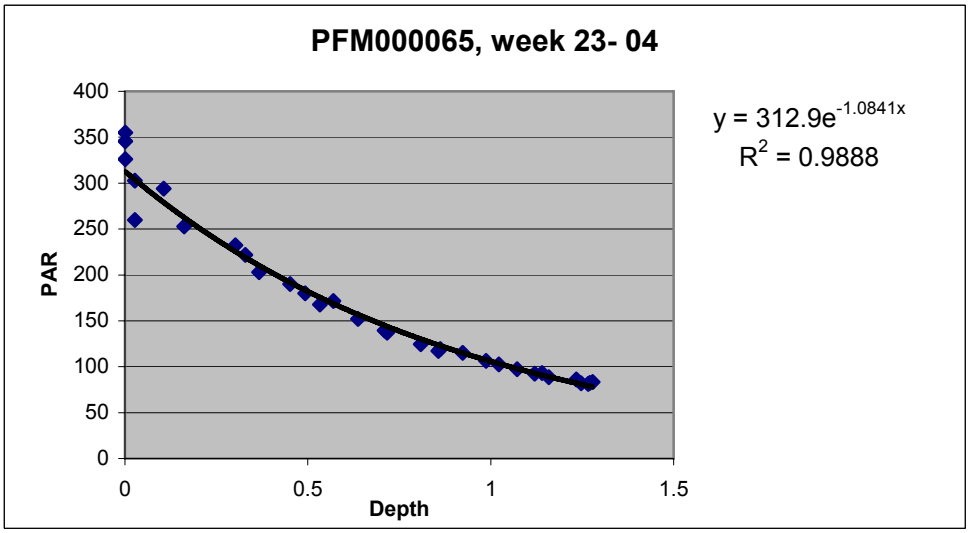

PFM000117, week 21- 04
y = 149.26e-1.0958x
R2 = 0.9862
PAR
Depth
250
200
150
100
50
0
0
0.5
1
1.5
2

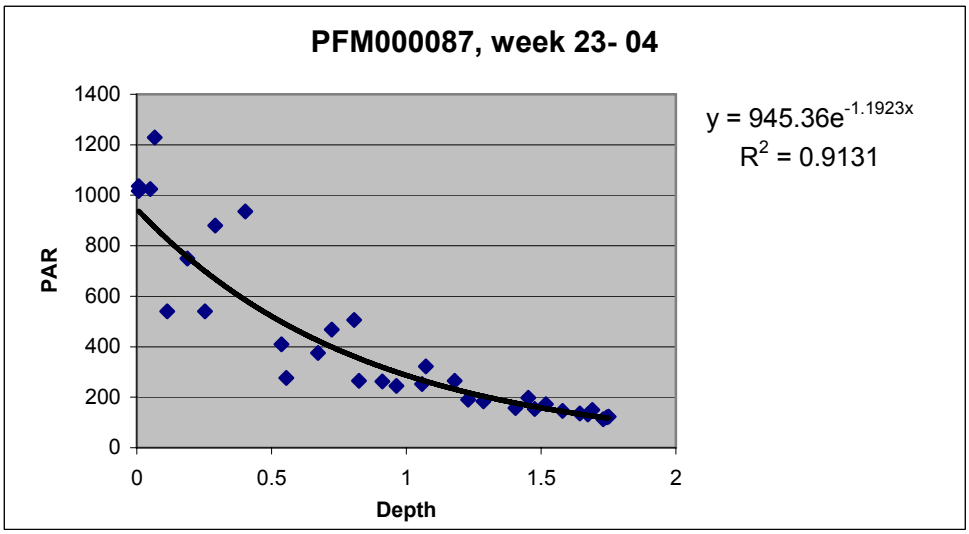

PFM000135, week 21- 04
y = 221.86e-1.2927x
R2 = 0.8463
PAR
Depth
300
250
200
150
100
50
0
0
0.2
0.4
0.6
0.8
1
1.2

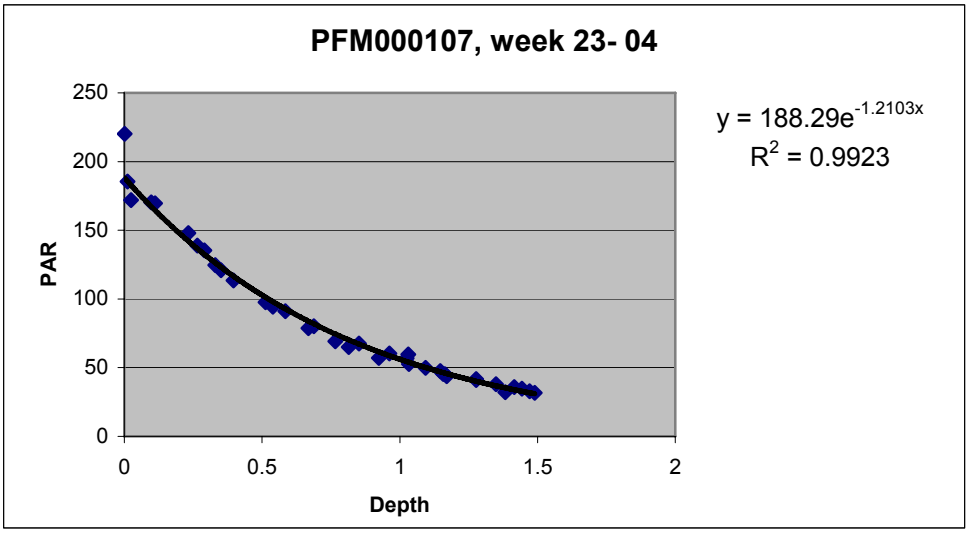

PFM000062, week 23- 04
y = 1382.8e-0.7045x
R2 = 0.9352
PAR
Depth
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
1
2
3
4

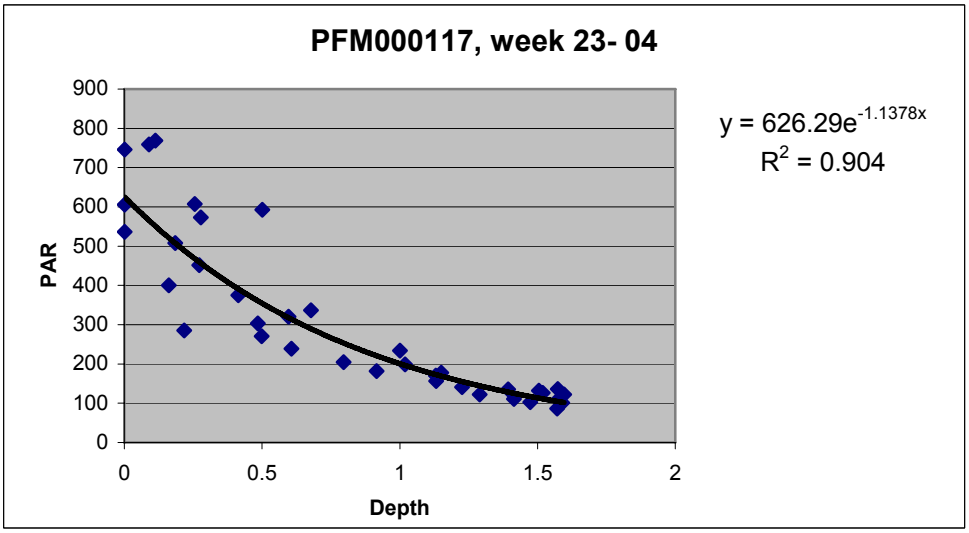

PFM000063, week 23- 04
y = 1649.2e-0.485x
R2 = 0.9599
PAR
Depth
2500
2000
1500
1000
500
0
0
1
2
3
4
5

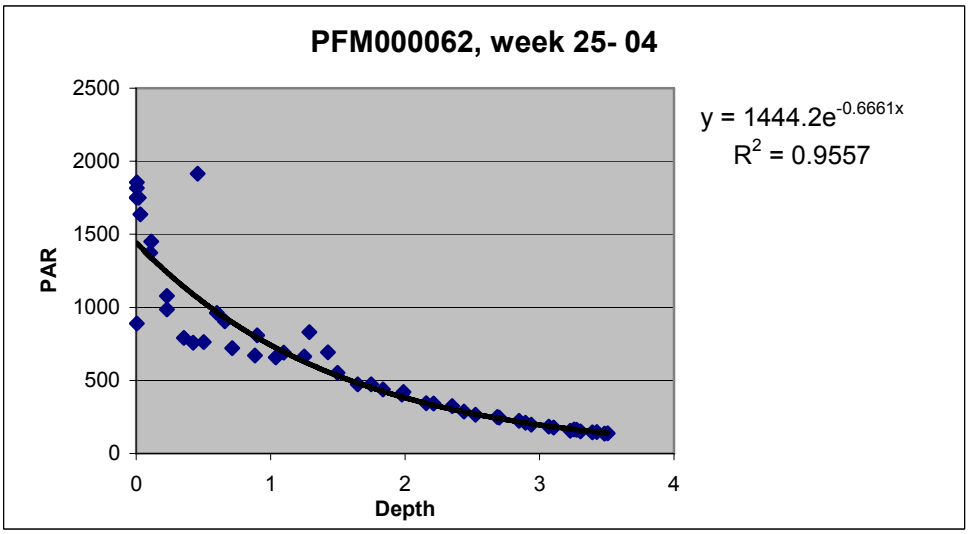

PFM000064, week 23- 04
y = 1250.7e-0.9874x
R2 = 0.8057
PAR
Depth
1800
1600
1400
1200
1000
800
600
400
200
0
0
0.5
1
1.5

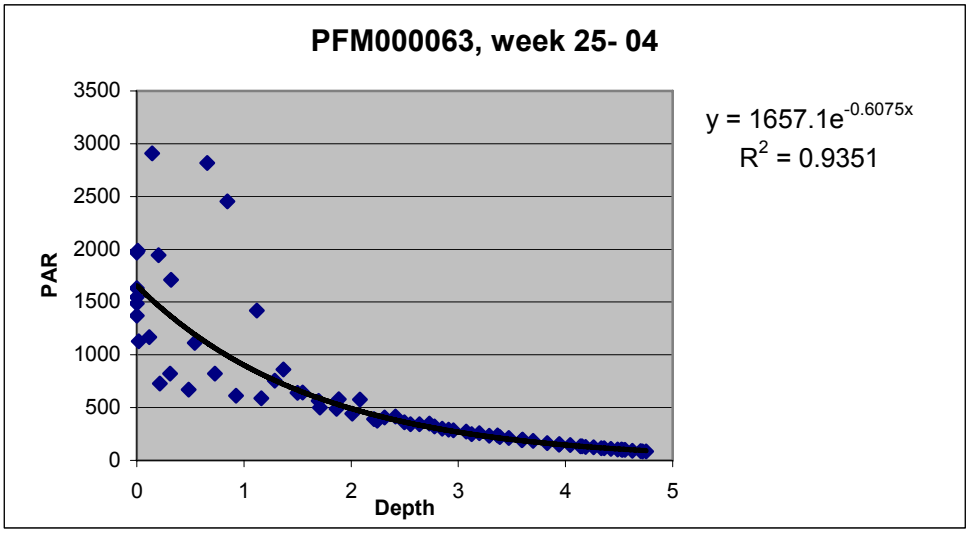

PFM000065, week 23- 04
y = 312.9e-1.0841x
R2 = 0.9888
PAR
Depth
400
350
300
250
200
150
100
50
0
0
0.5
1
1.5

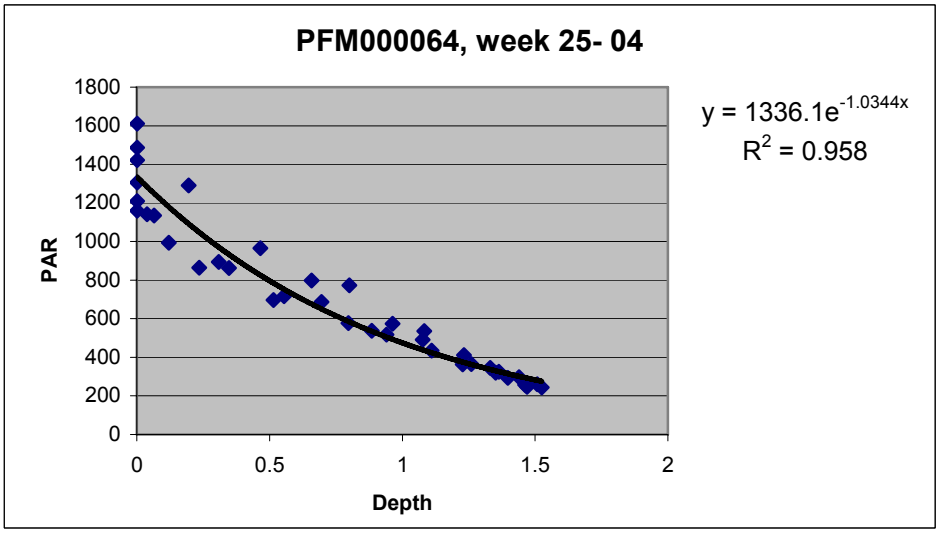

PFM000087, week 23- 04
y = 945.36e-1.1923x
R2 = 0.9131
PAR
Depth
1400
1200
1000
800
600
400
200
0
0
0.5
1
1.5
2

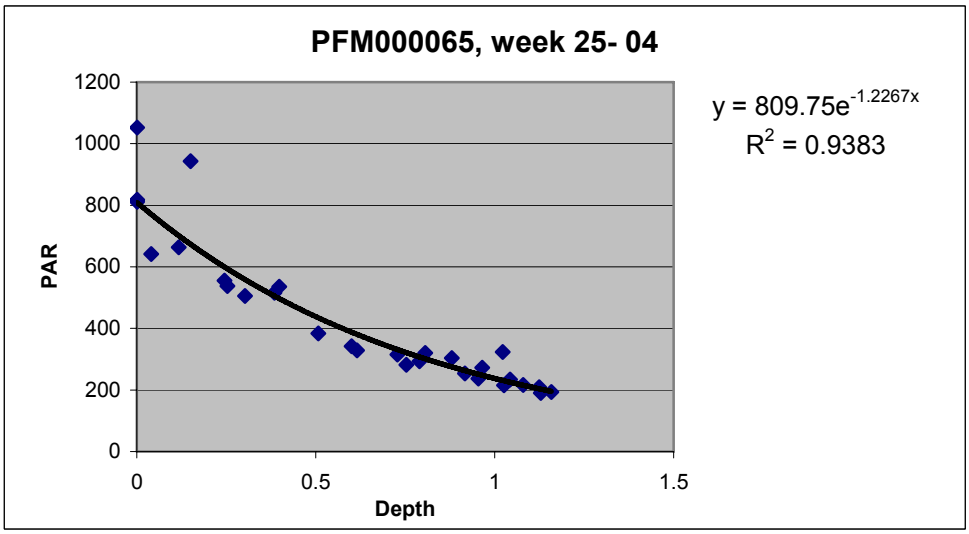

PFM000107, week 23- 04
y = 188.29e-1.2103x
R2 = 0.9923
PAR
Depth
250
200
150
100
50
0
0
0.5
1
1.5
2

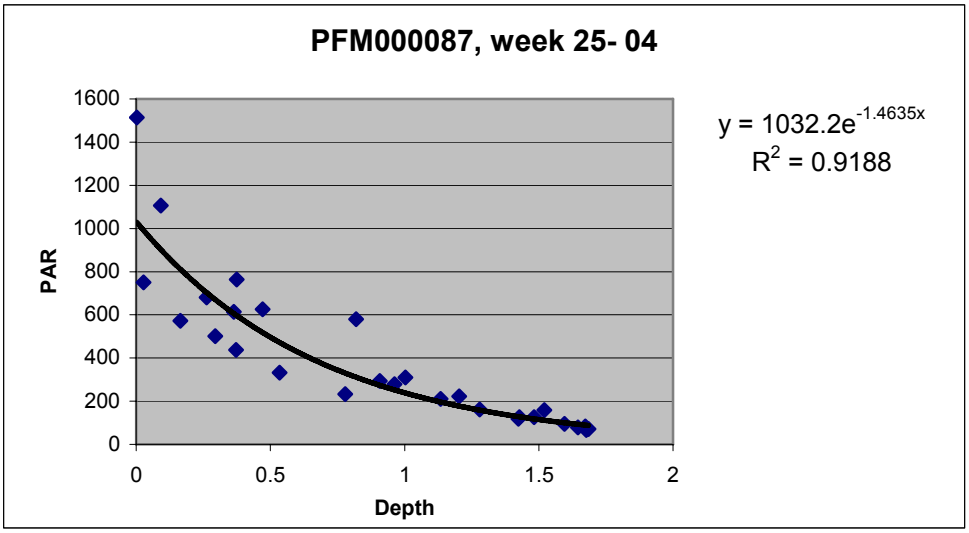

PFM000117, week 23- 04
y = 626.29e-1.1378x
R2 = 0.904
PAR
Depth
900
800
700
600
500
400
300
200
100
0
0
0.5
1
1.5
2

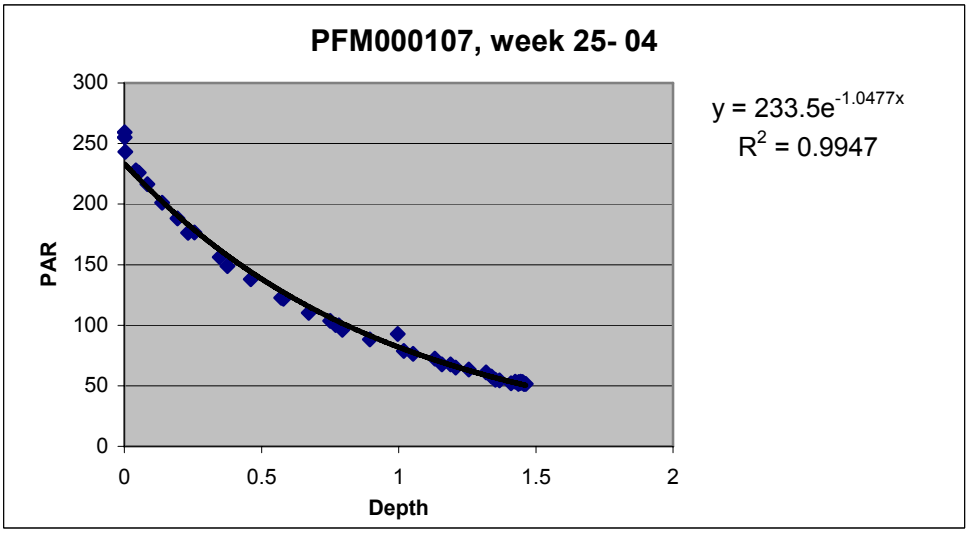

PFM000062, week 25- 04
y = 1444.2e-0.6661x
R2 = 0.9557
PAR
Depth
2500
2000
1500
1000
500
0
0
1
2
3
4

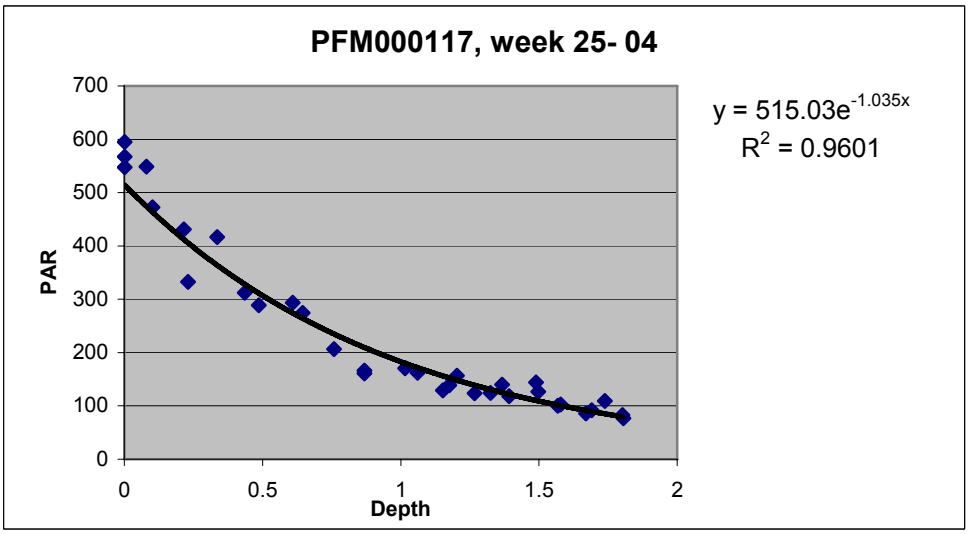

PFM000063, week 25- 04
PAR
Depth
y = 1657.1e-0.6075x
R2 = 0.9351

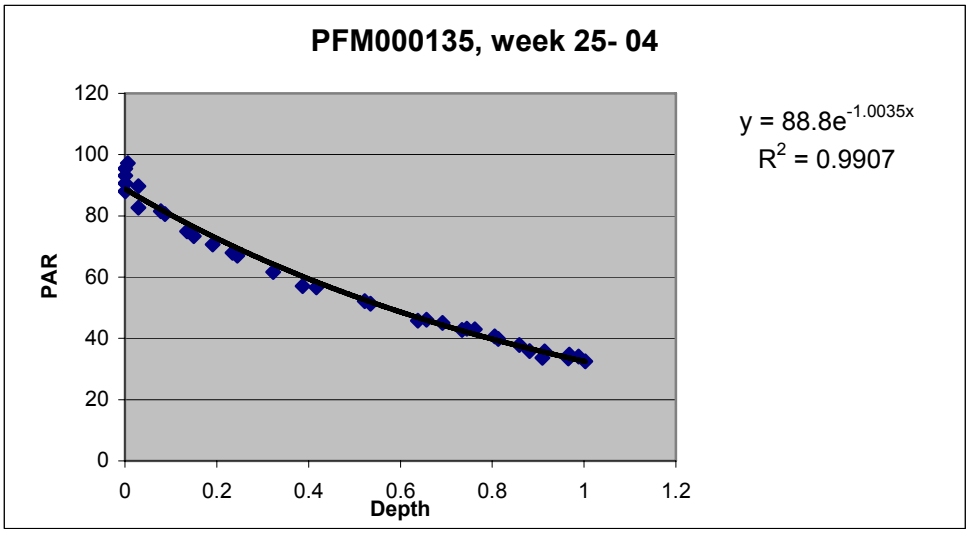

PFM000064, week 25- 04
PAR
Depth
y = 1336.1e-1.0344x
R2 = 0.958

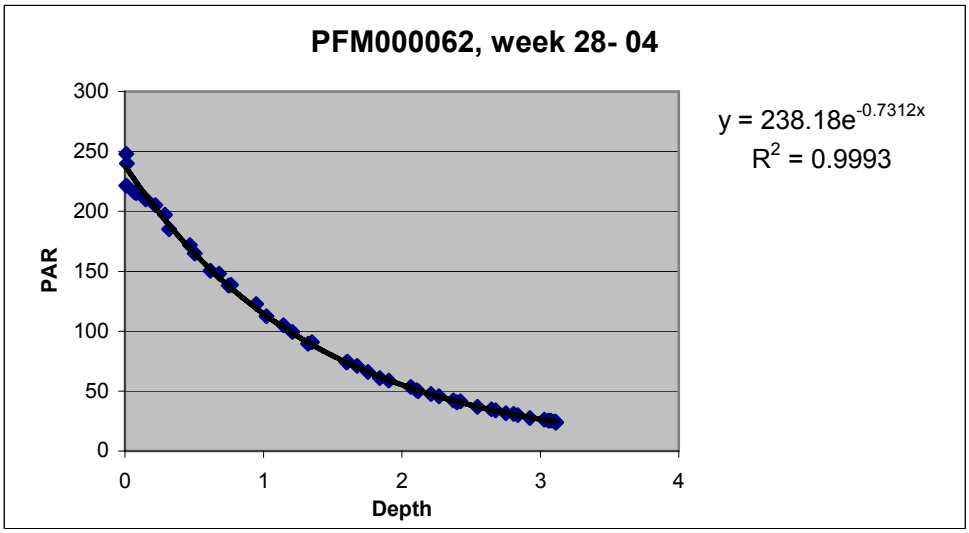

PFM000065, week 25- 04
PAR
Depth
y = 809.75e-1.2267x
R2 = 0.9383

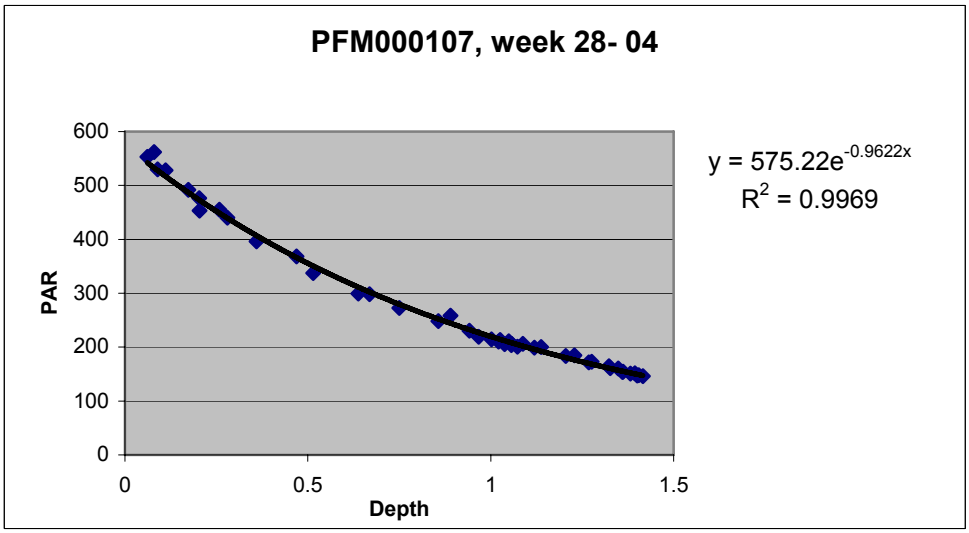

PFM000087, week 25- 04
PAR
Depth
y = 1032.2e-1.4635x
R2 = 0.9188

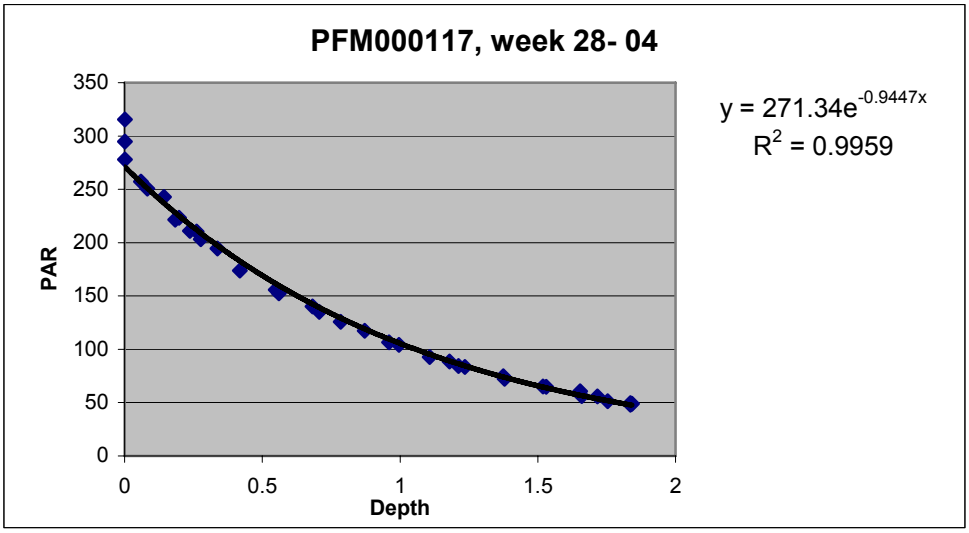

PFM000107, week 25- 04
PAR
Depth
y = 233.5e-1.0477x
R2 = 0.9947

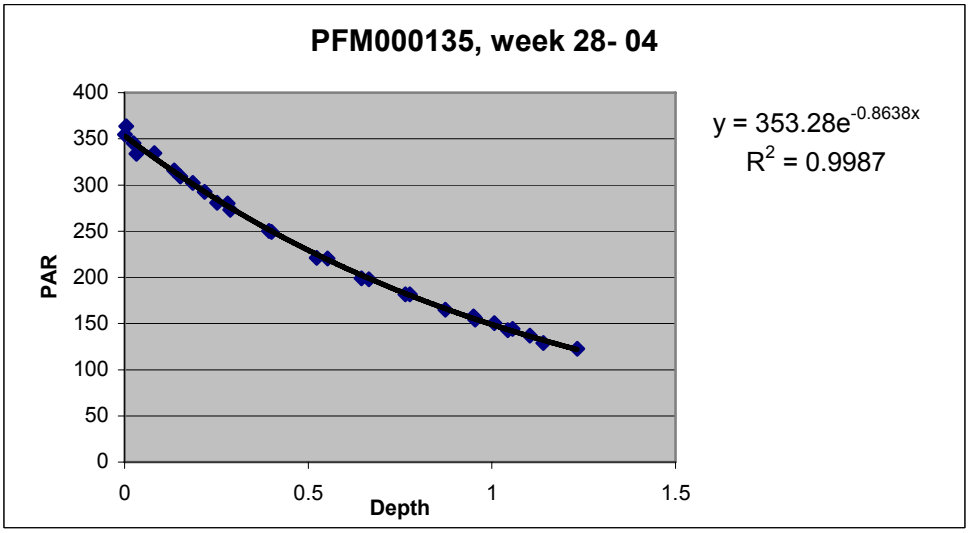

PFM000117, week 25- 04
PAR
Depth
y = 515.03e-1.035x
R2 = 0.9601

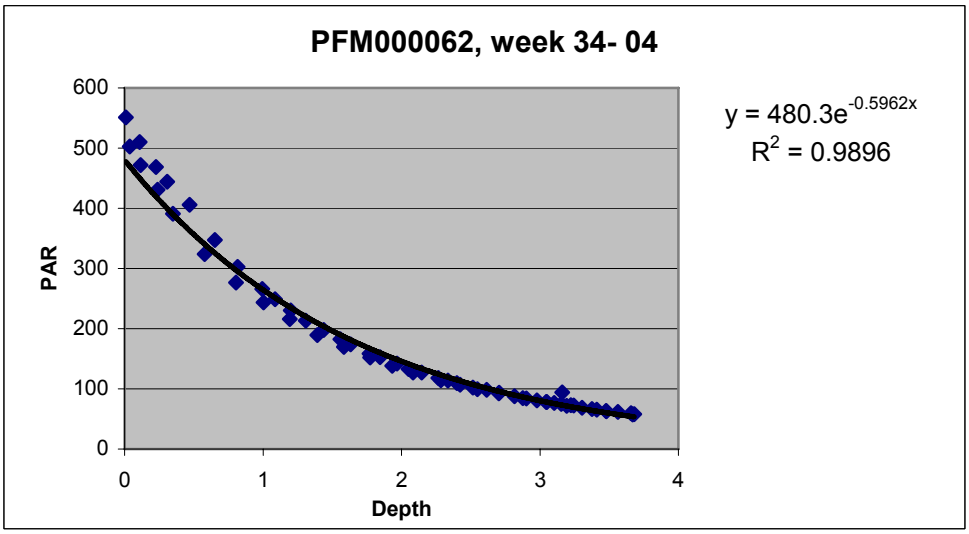

PFM000135, week 25- 04
y = 88.8e-1.0035x
R2 = 0.9907
PAR
Depth
0
20
40
60
80
100
120
0
0.2
0.4
0.6
0.8
1
1.2

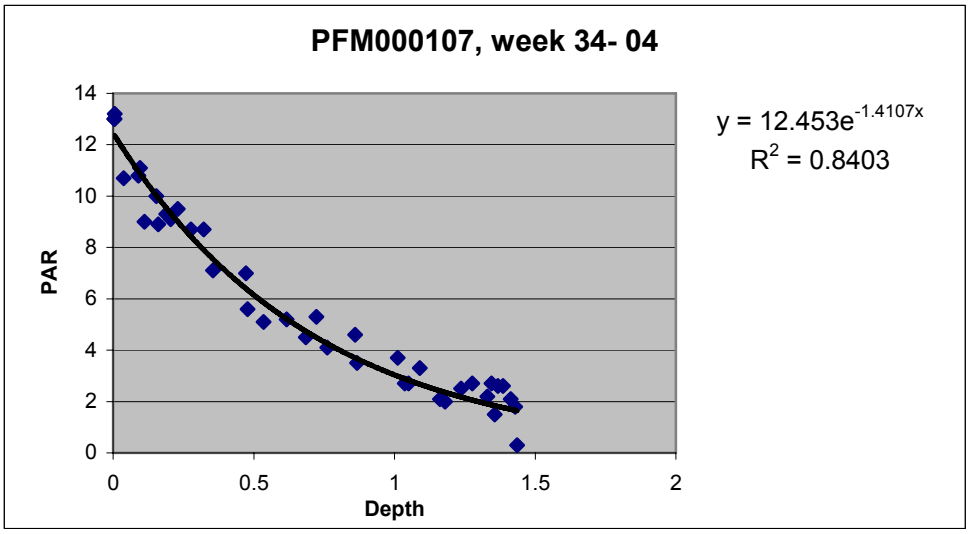

PFM000062, week 28- 04
y = 238.18e-0.7312x
R2 = 0.9993
PAR
Depth
0
50
100
150
200
250
300
0
1
2
3
4

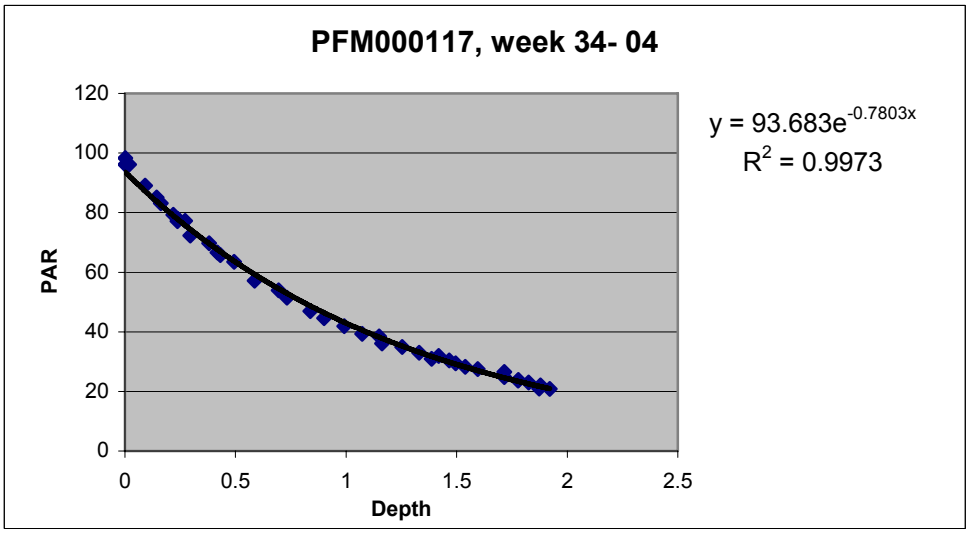

PFM000107, week 28- 04
y = 575.22e-0.9622x
R2 = 0.9969
PAR
Depth
0
100
200
300
400
500
600
0
0.5
1
1.5

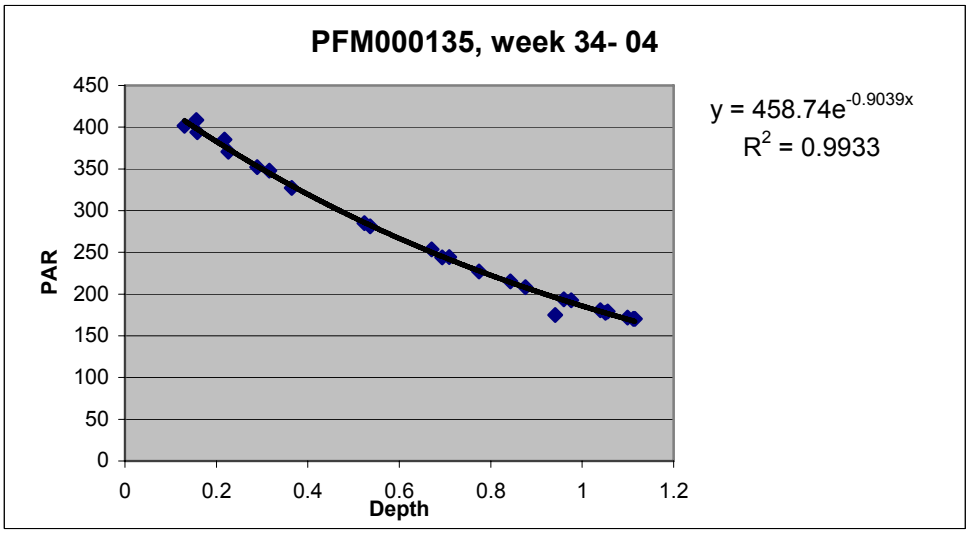

PFM000117, week 28- 04
PAR
Depth
y = 271.34e-0.9447x
R2 = 0.9959

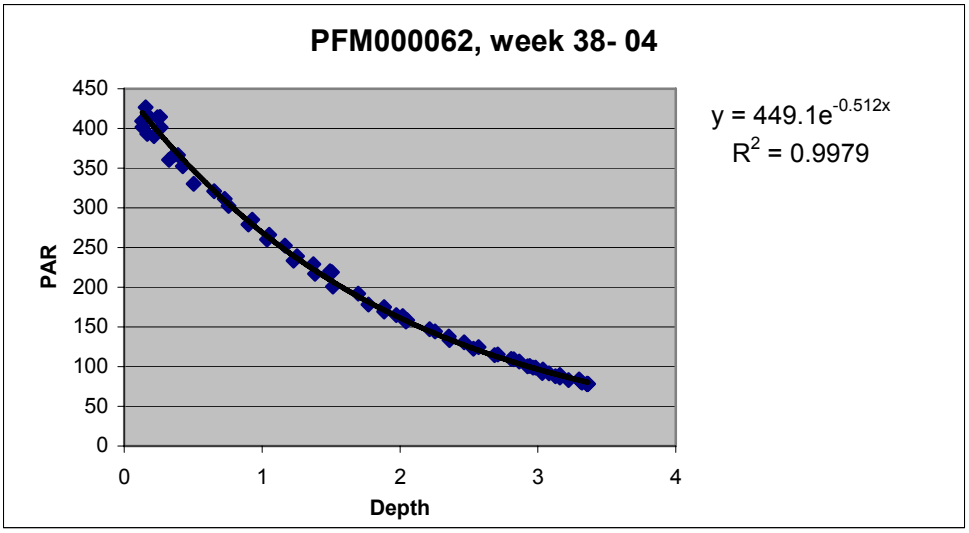

PFM000135, week 28- 04
PAR
Depth
y = 353.28e-0.8638x
R2 = 0.9987

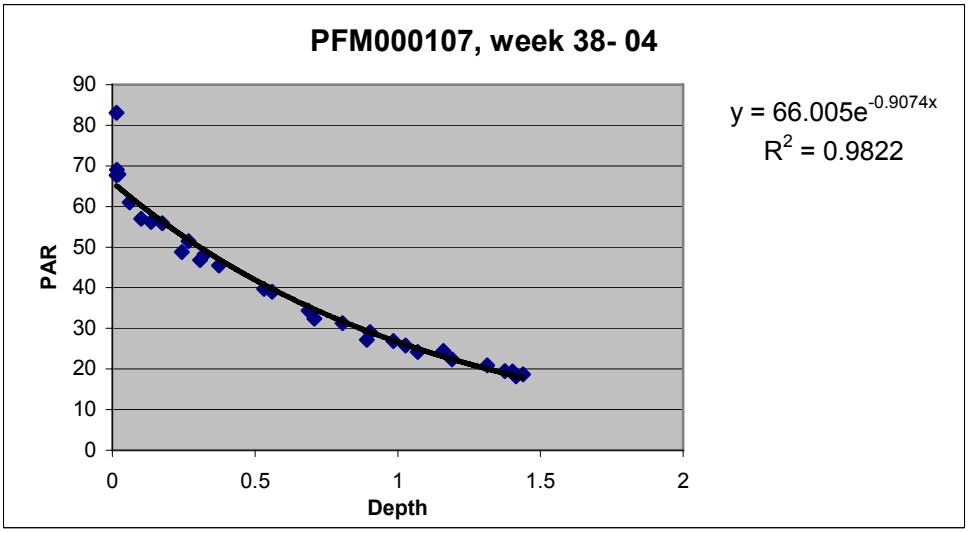

PFM000062, week 34- 04
PAR
Depth
y = 480.3e-0.5962x
R2 = 0.9896

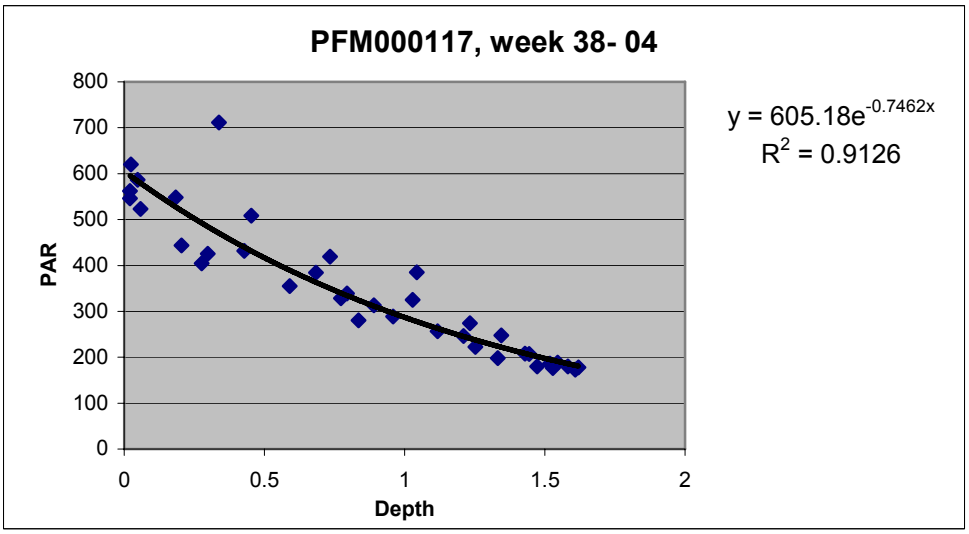

PFM000107, week 34- 04
y = 12.453e-1.4107x
R2 = 0.8403
PAR
Depth
0
2
4
6
8
10
12
14
0
0.5
1
1.5
2

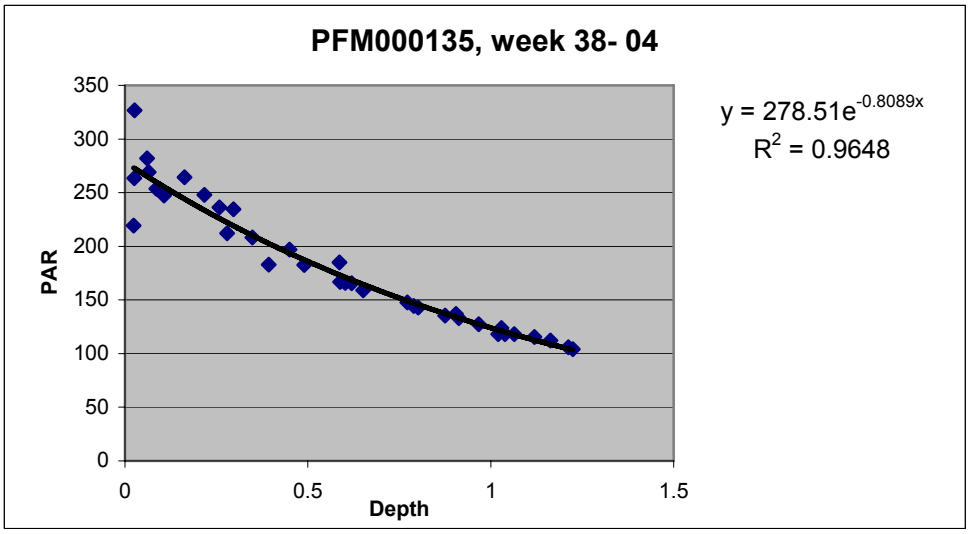

PFM000117, week 34- 04
y = 93.683e-0.7803x
R2 = 0.9973
PAR
Depth
0
20
40
60
80
100
120
0
0.5
1
1.5
2
2.5

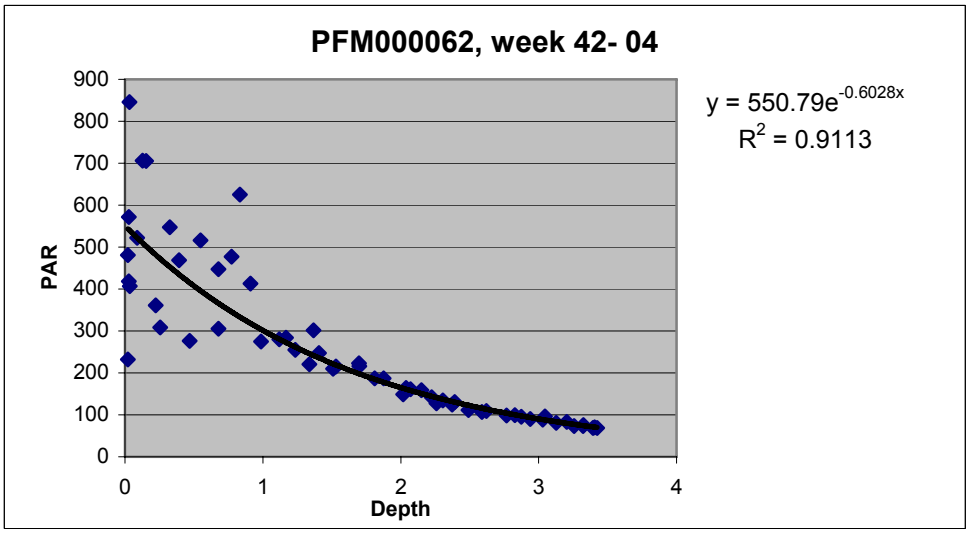

PFM000135, week 34- 04
y = 458.74e-0.9039x
R2 = 0.9933
PAR
Depth
0
50
100
150
200
250
300
350
400
450
0
0.2
0.4
0.6
0.8
1
1.2

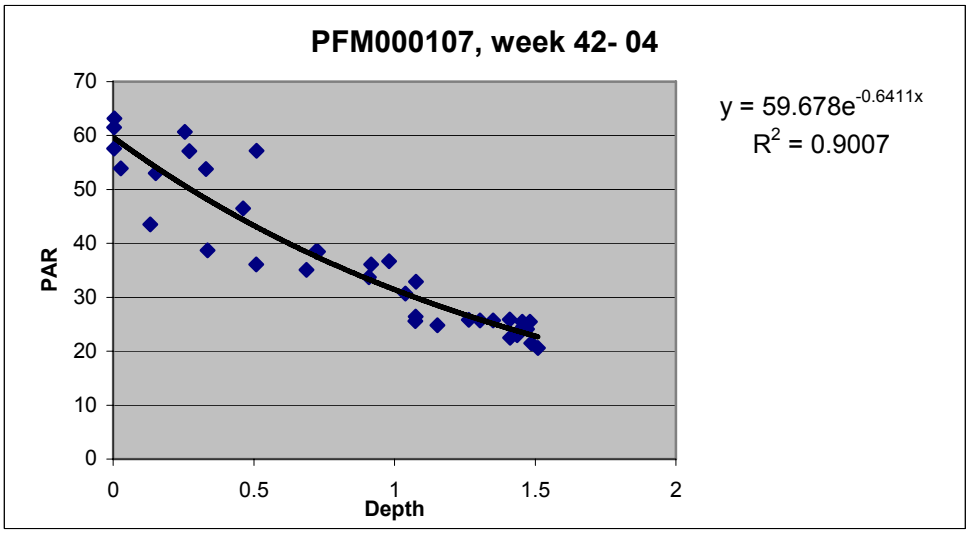

PFM000062, week 38- 04
PAR
Depth
y = 449.1e-0.512x
R2 = 0.9979

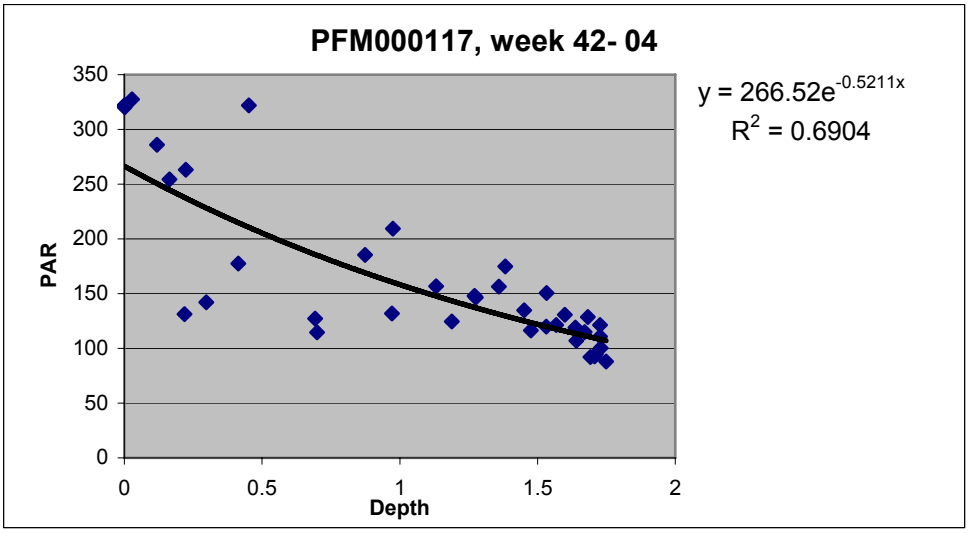

PFM000107, week 38- 04
PAR
Depth
y = 66.005e-0.9074x
R2 = 0.9822

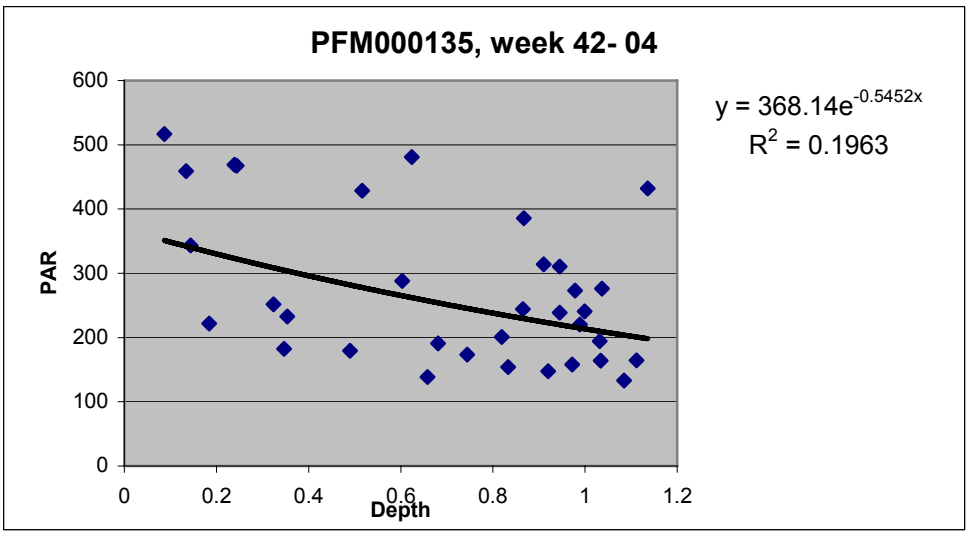

PFM000117, week 38- 04
PAR
Depth
y = 605.18e-0.7462x
R2 = 0.9126

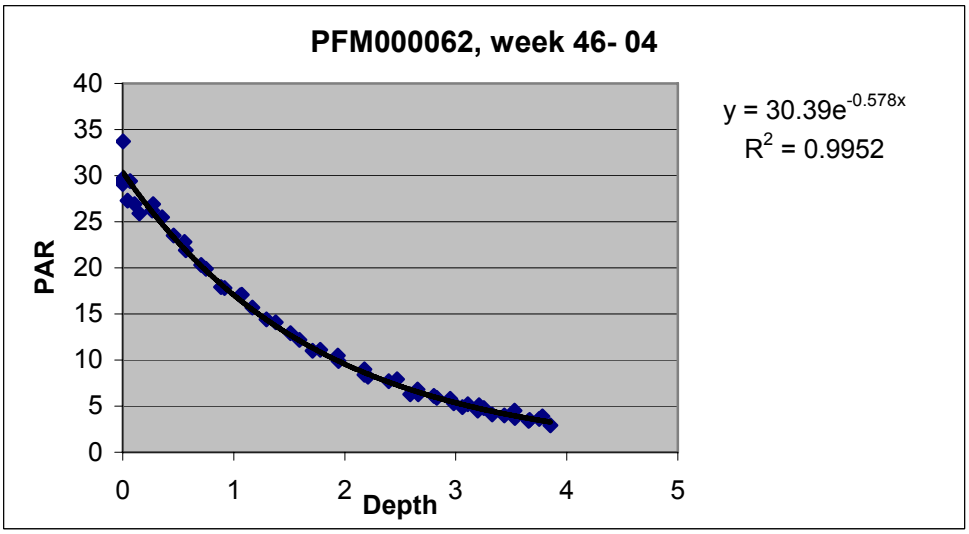

PFM000135, week 38- 04
PAR
Depth
y = 278.51e-0.8089x
R2 = 0.9648

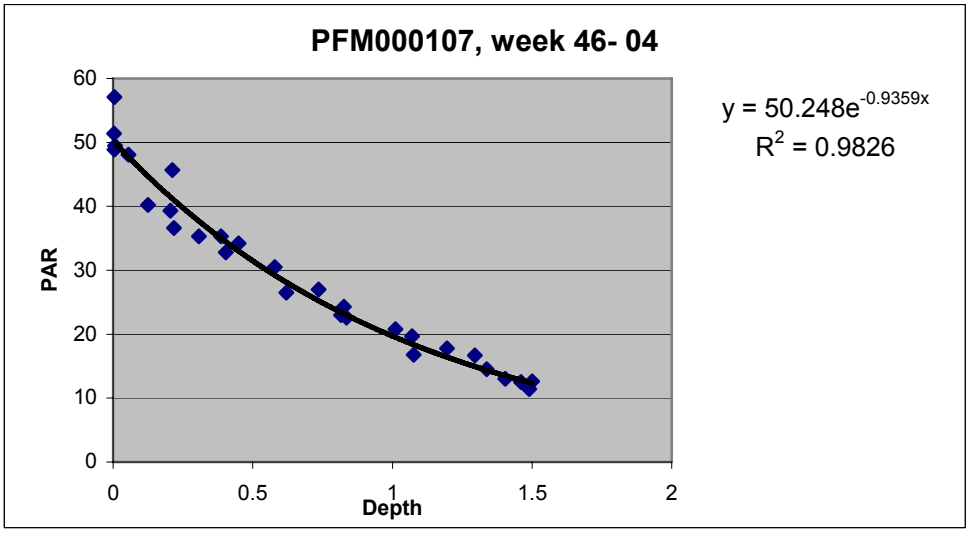

PFM000062, week 42- 04
PAR
Depth
y = 550.79e-0.6028x
R2 = 0.9113

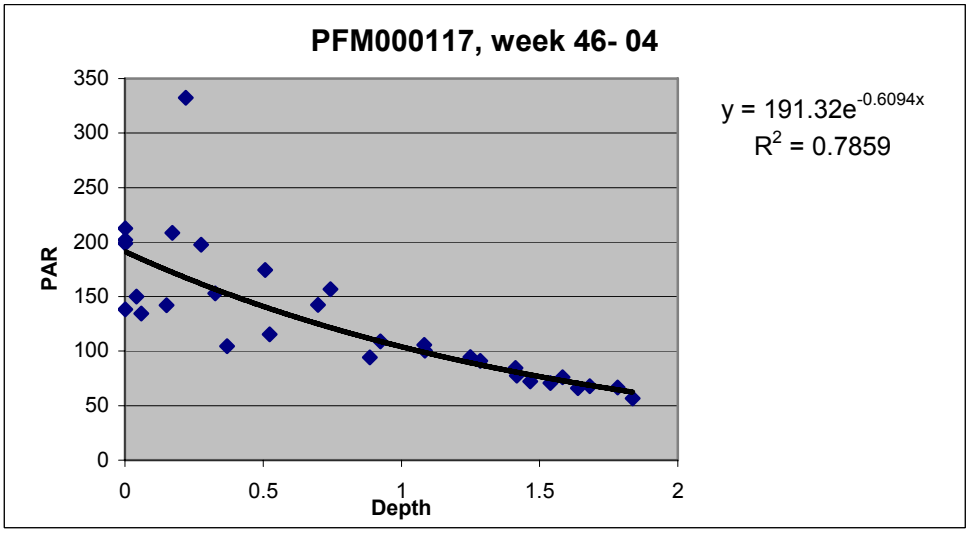

PFM000107, week 42- 04
PAR
Depth
y = 59.678e-0.6411x
R2 = 0.9007

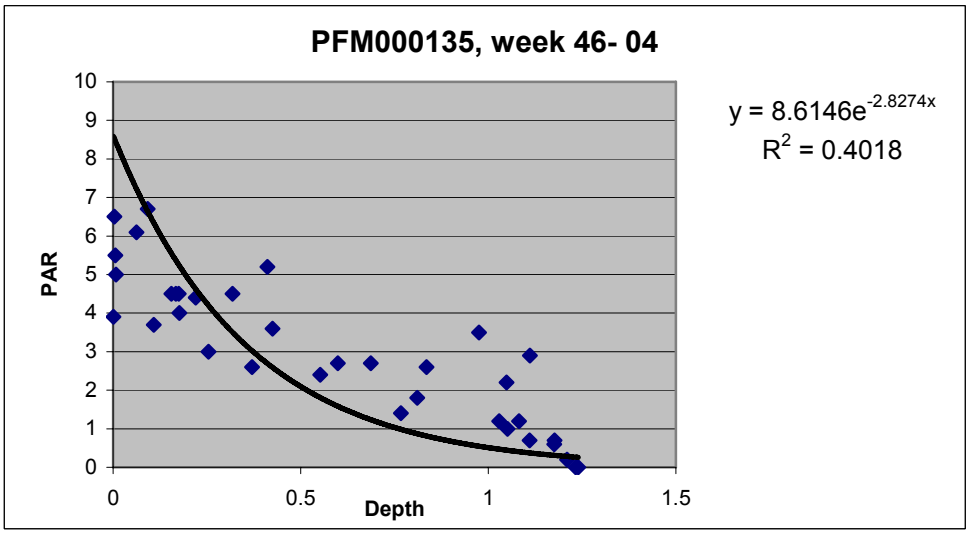

PFM000117, week 42- 04
y = 266.52e-0.5211x
R2 = 0.6904
PAR
Depth
0
50
100
150
200
250
300
350
0
0.5
1
1.5
2

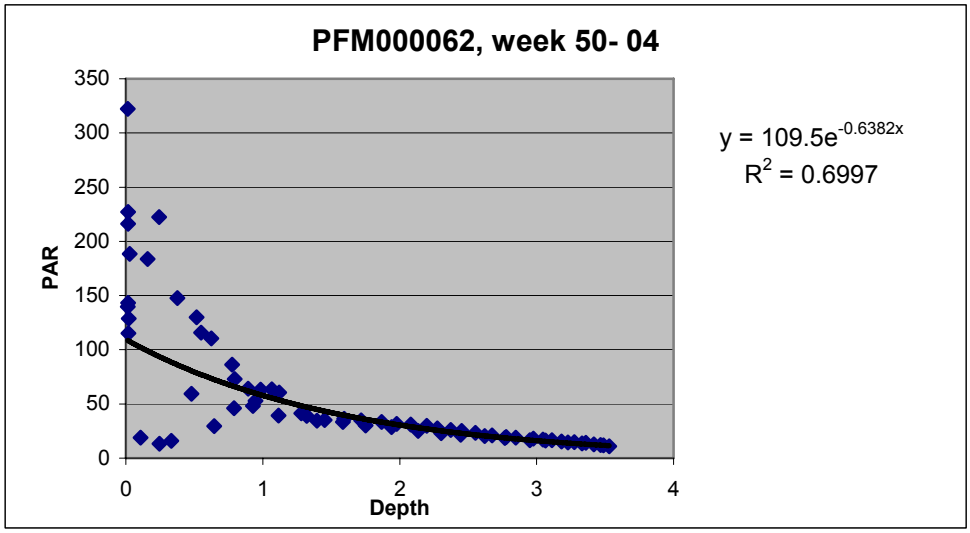

PFM000135, week 42- 04
y = 368.14e-0.5452x
R2 = 0.1963
PAR
Depth
0
100
200
300
400
500
600
0
0.2
0.4
0.6
0.8
1
1.2

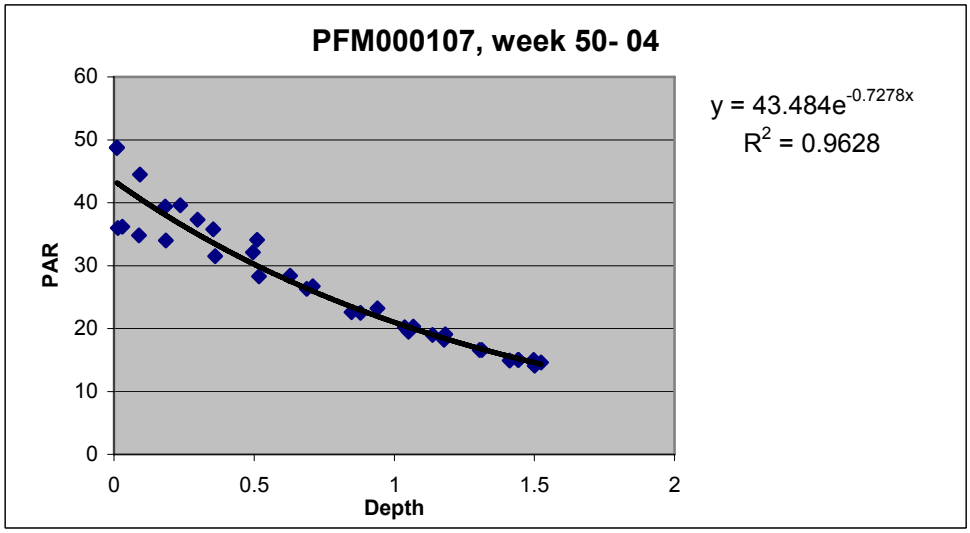

PFM000062, week 46- 04
y = 30.39e-0.578x
R2 = 0.9952
PAR
Depth
0
5
10
15
20
25
30
35
40
0
1
2
3
4
5

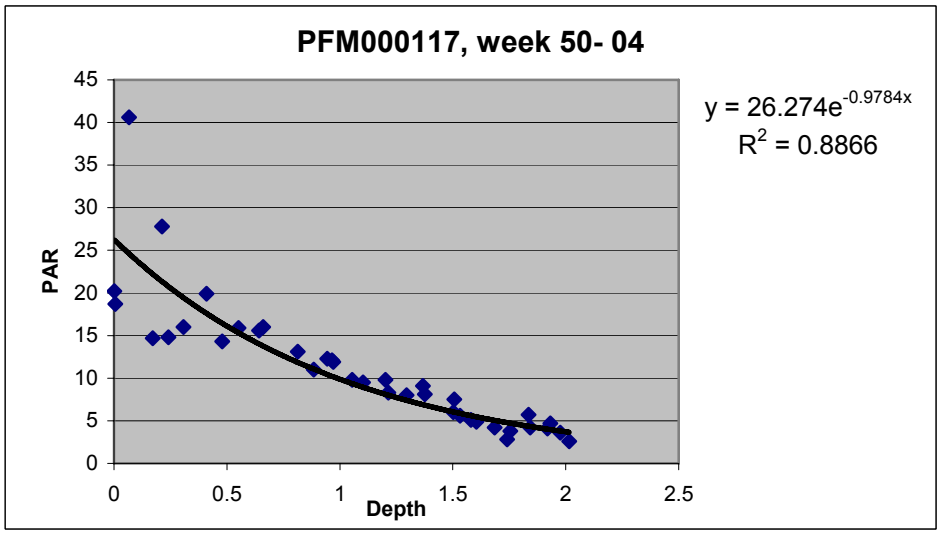

PFM000107, week 46- 04
y = 50.248e-0.9359x
R2 = 0.9826
PAR
Depth
0
10
20
30
40
50
60
0
0.5
1
1.5
2

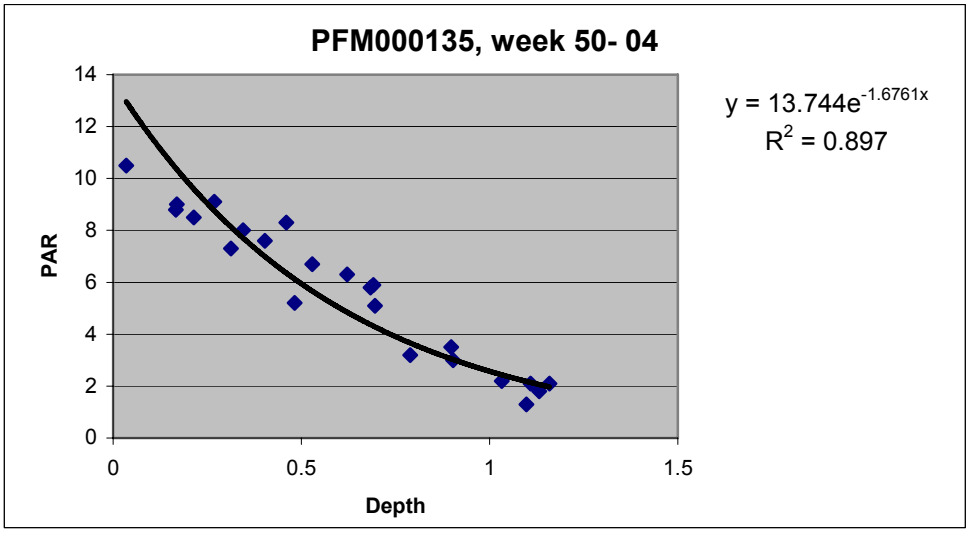

PFM000117, week 46- 04
y = 191.32e-0.6094x
R2 = 0.7859
PAR
Depth
0
50
100
150
200
250
300
350
0
0.5
1
1.5
2

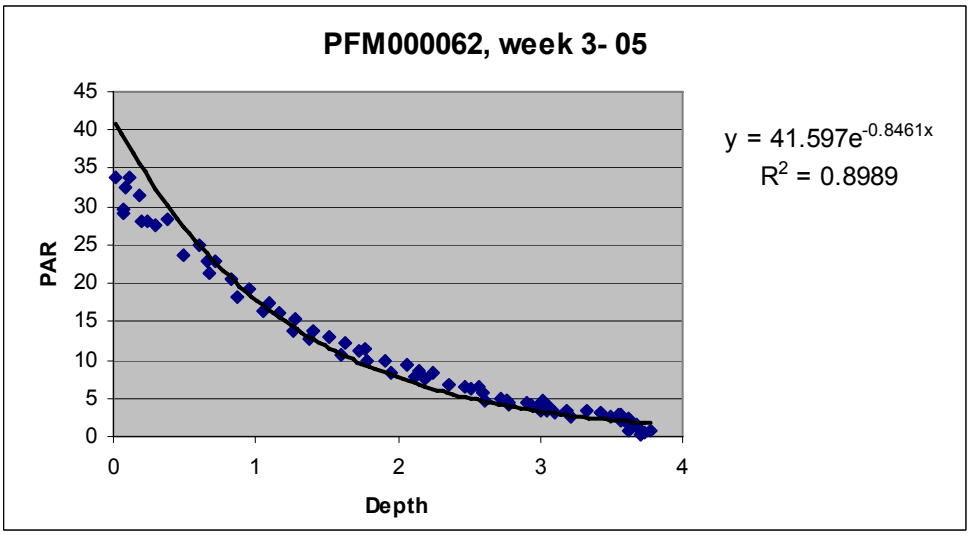

PFM000135, week 46- 04
y = 8.6146e-2.8274x
R2 = 0.4018
PAR
Depth
0
1
2
3
4
5
6
7
8
9
10
0
0.5
1
1.5

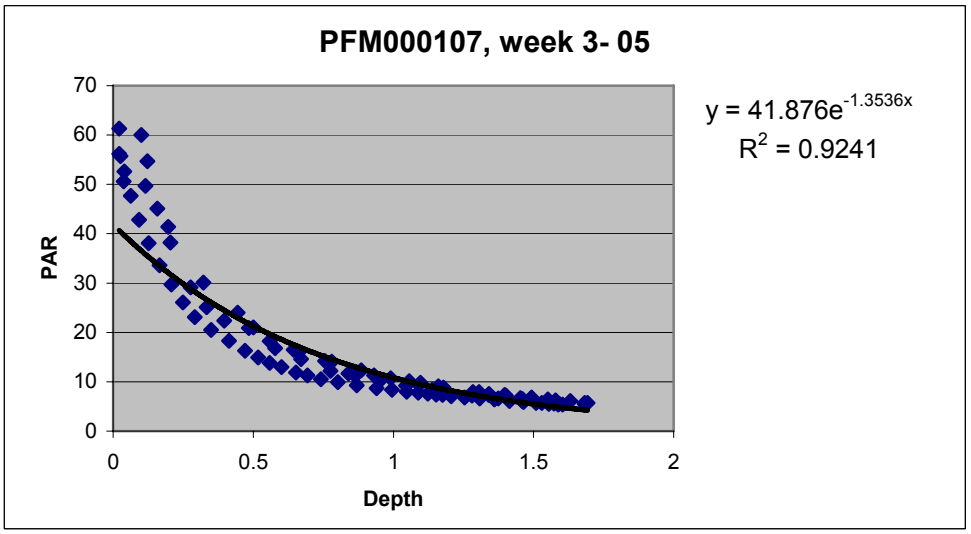

PFM000062, week 50- 04
PAR
Depth
y = 109.5e-0.6382x
R2 = 0.6997

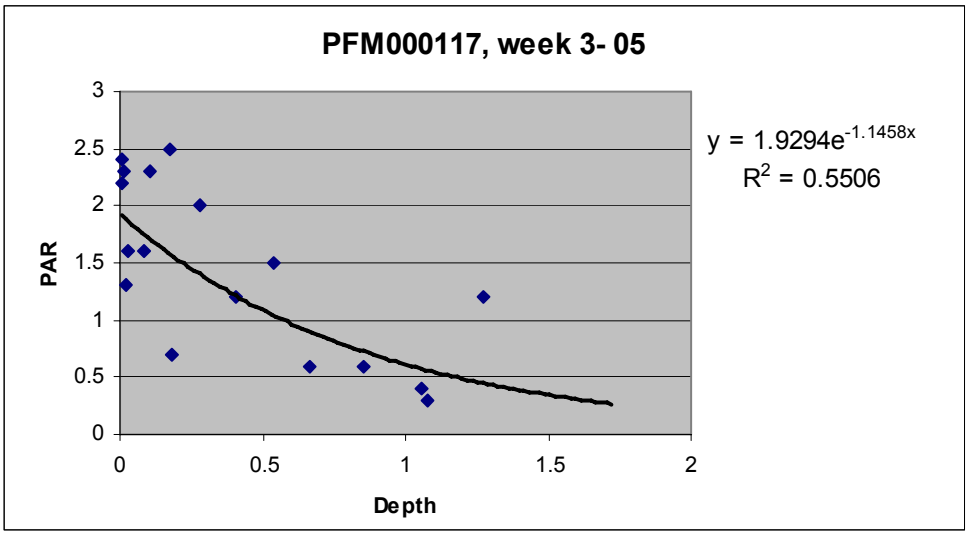

PFM000107, week 50- 04
PAR
Depth
y = 43.484e-0.7278x
R2 = 0.9628

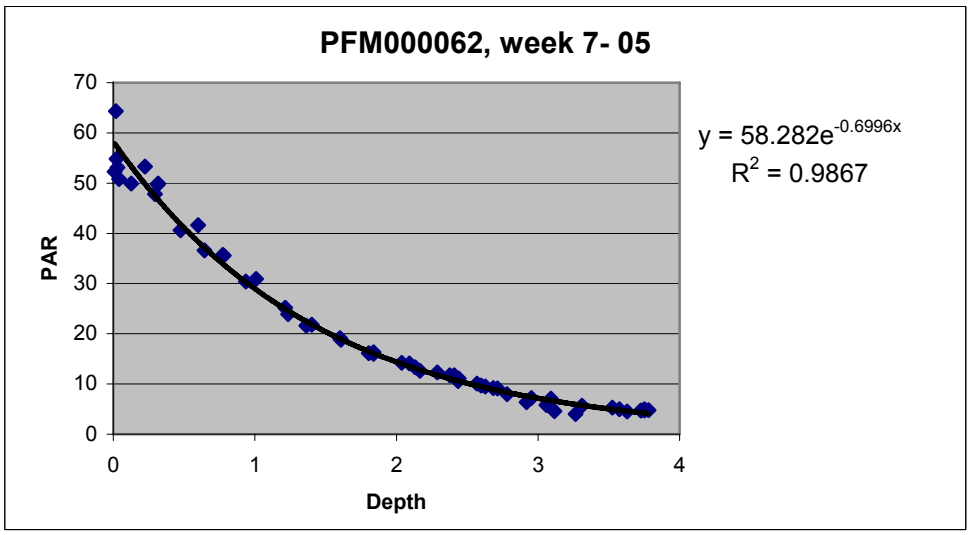

PFM000117, week 50- 04
PAR
Depth
y = 26.274e-0.9784x
R2 = 0.8866

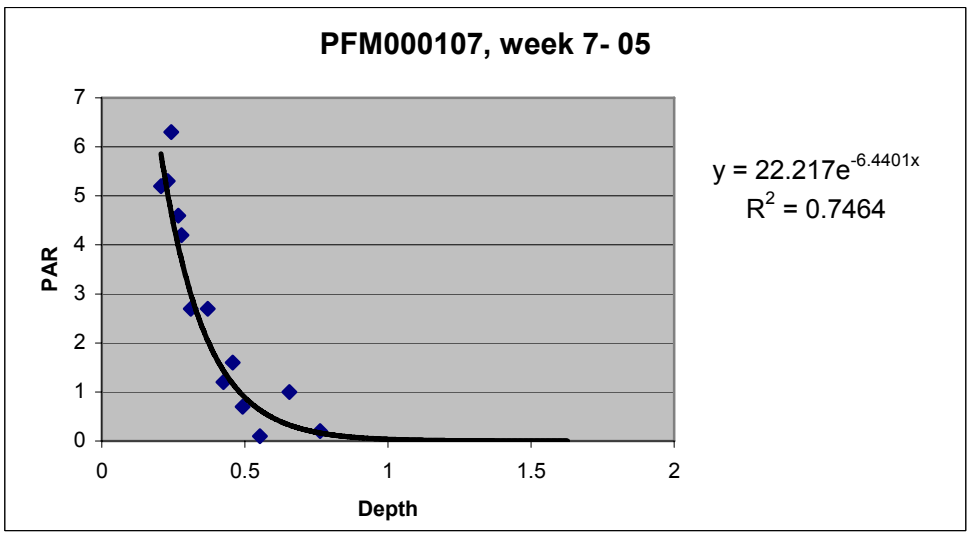

PFM000135, week 50- 04
PAR
Depth
y = 13.744e-1.6761x
R2 = 0.897

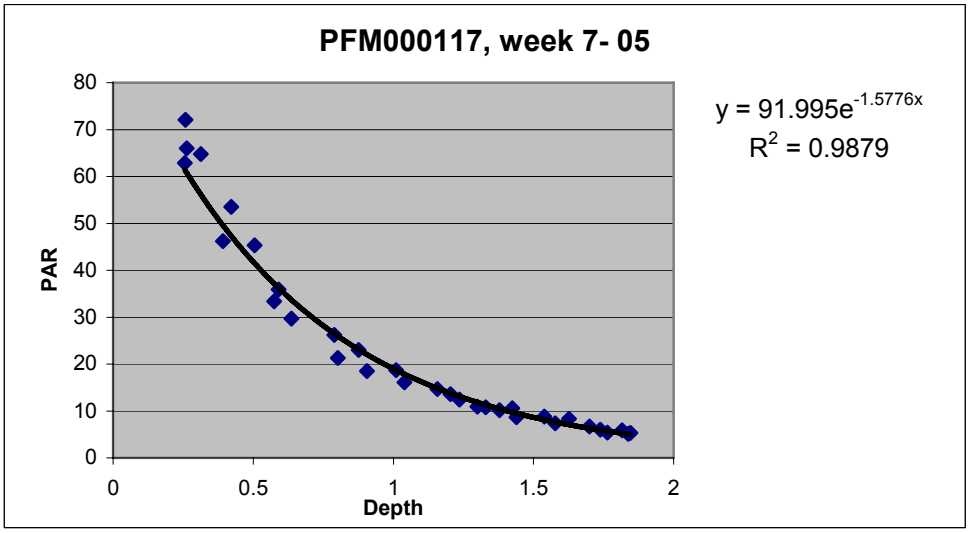

PFM000062, week 3- 05
PAR
Depth
y = 41.597e-0.8461x
R2 = 0.8989

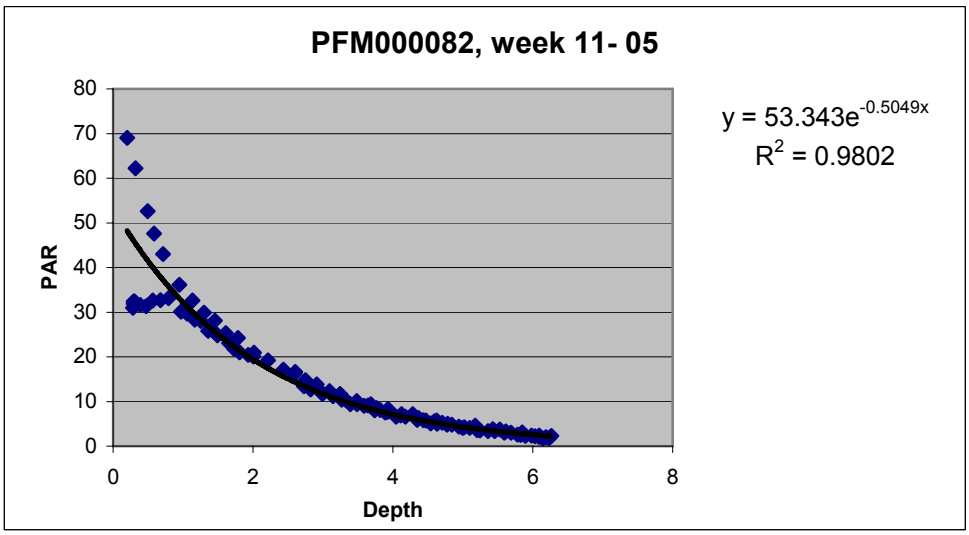

PFM000107, week 3- 05
PAR
Depth
y = 41.876e-1.3536x
R2 = 0.9241

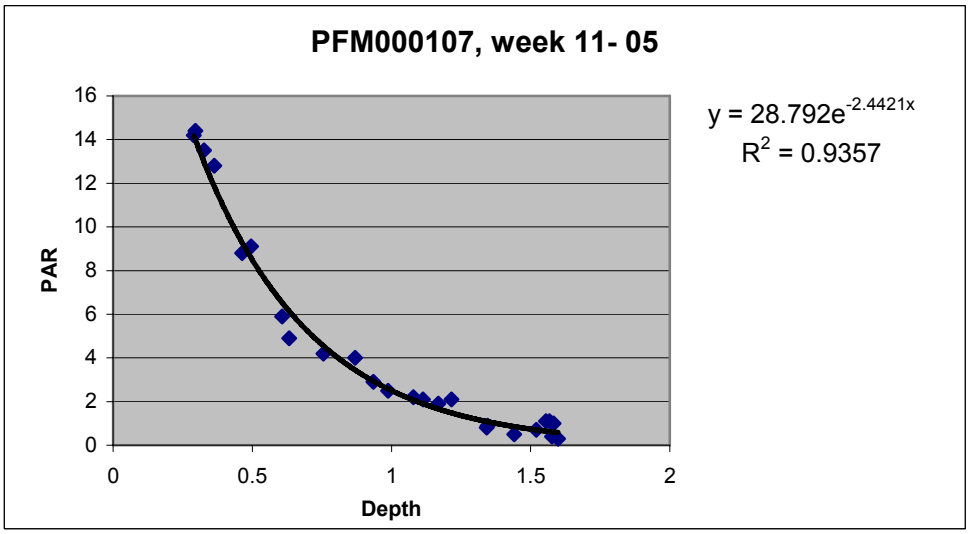

PFM000117, week 3- 05
PAR
Depth
y = 1.9294e-1.1458x
R2 = 0.5506

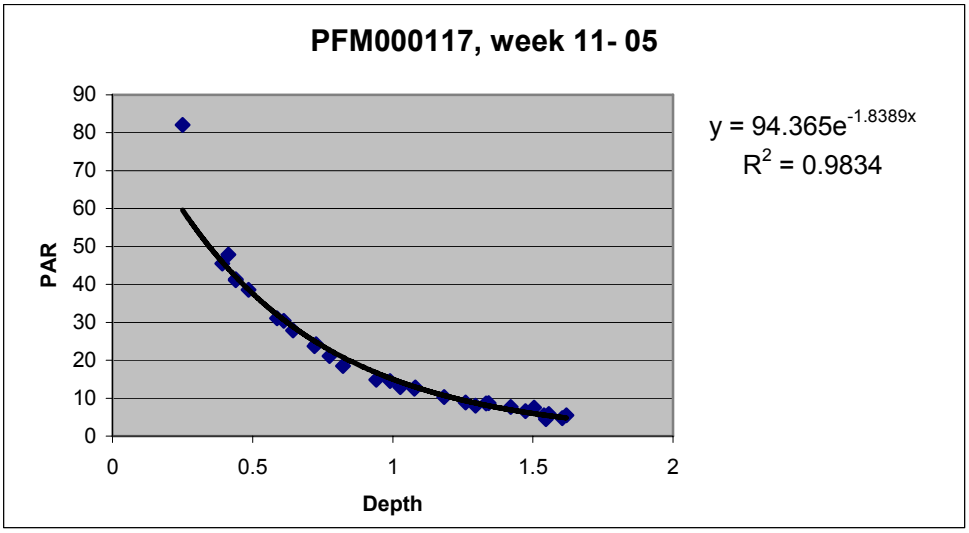

PFM000062, week 7- 05
PAR
Depth
y = 58.282e-0.6996x
R2 = 0.9867

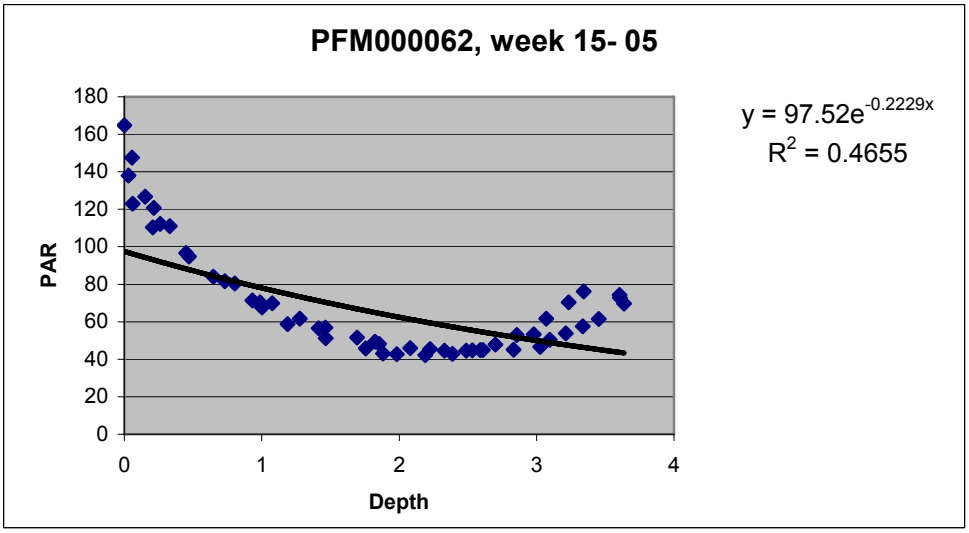

PFM000107, week 7- 05
PAR
Depth
y = 22.217e-6.4401x
R2 = 0.7464

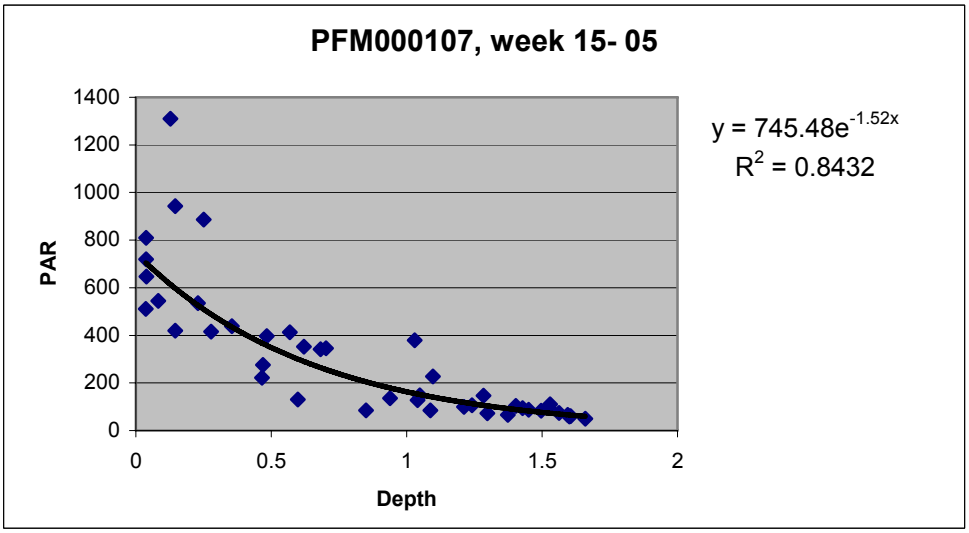

PFM000117, week 7- 05
y = 91.995e-1.5776x
R2 = 0.9879
PAR
Depth
0
10
20
30
40
50
60
70
80
0
0.5
1
1.5
2

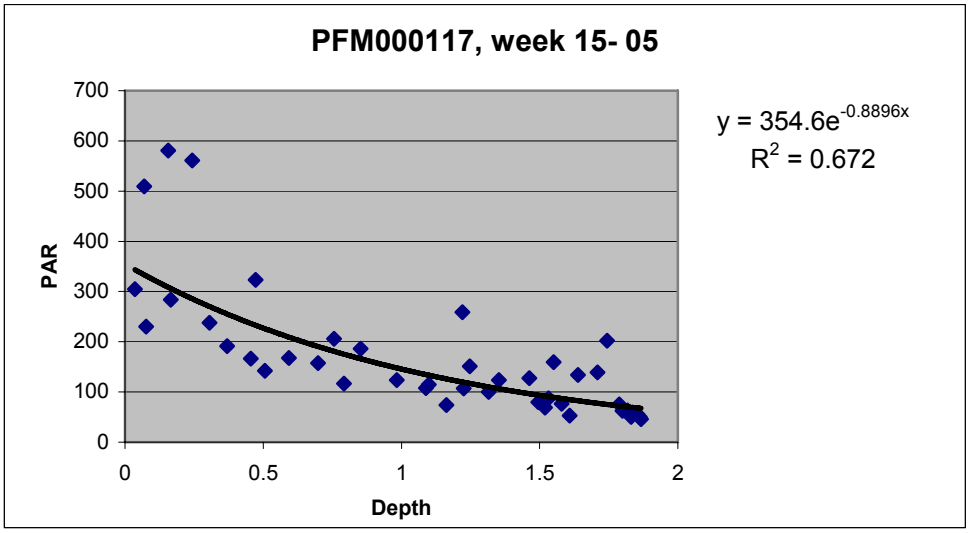

PFM000082, week 11- 05
y = 53.343e-0.5049x
R2 = 0.9802
PAR
Depth
0
10
20
30
40
50
60
70
80
0
2
4
6
8

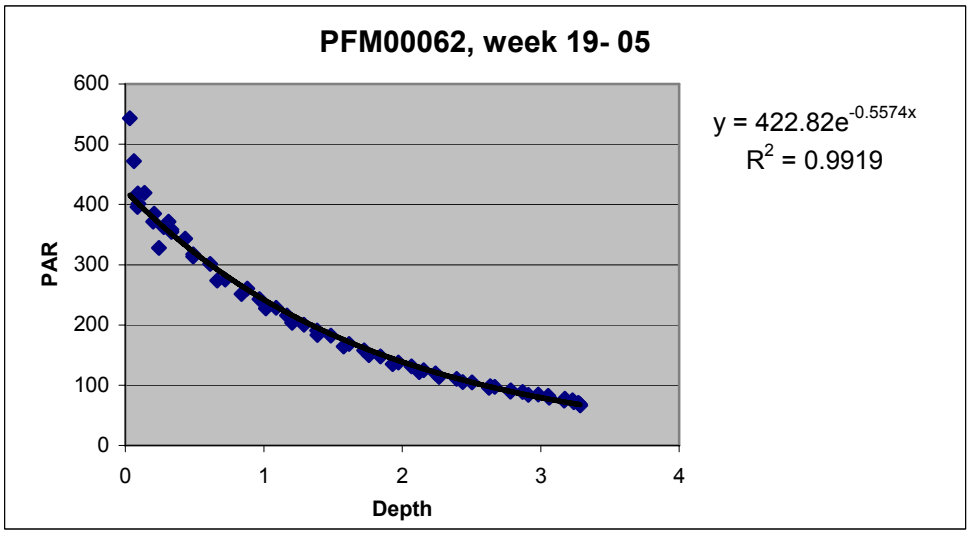

PFM000107, week 11- 05
y = 28.792e-2.4421x
R2 = 0.9357
PAR
Depth
0
2
4
6
8
10
12
14
16
0
0.5
1
1.5
2

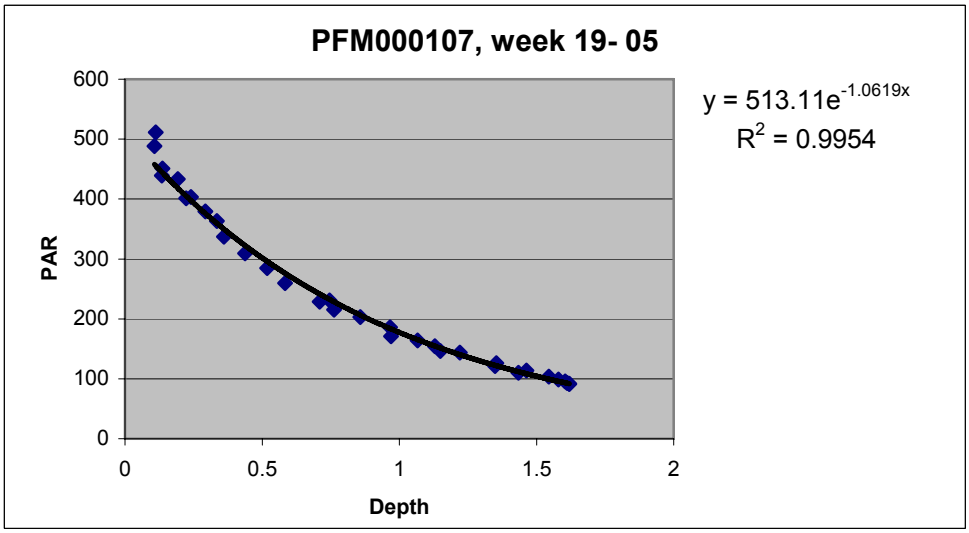

PFM000117, week 11- 05
PAR
Depth
y = 94.365e-1.8389x
R2 = 0.9834

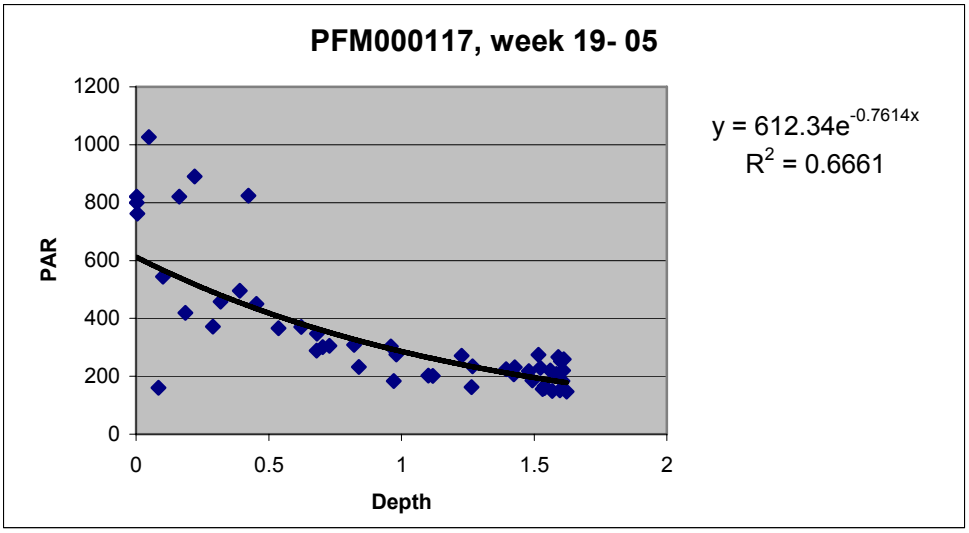

PFM000062, week 15- 05
PAR
Depth
y = 97.52e-0.2229x
R2 = 0.4655

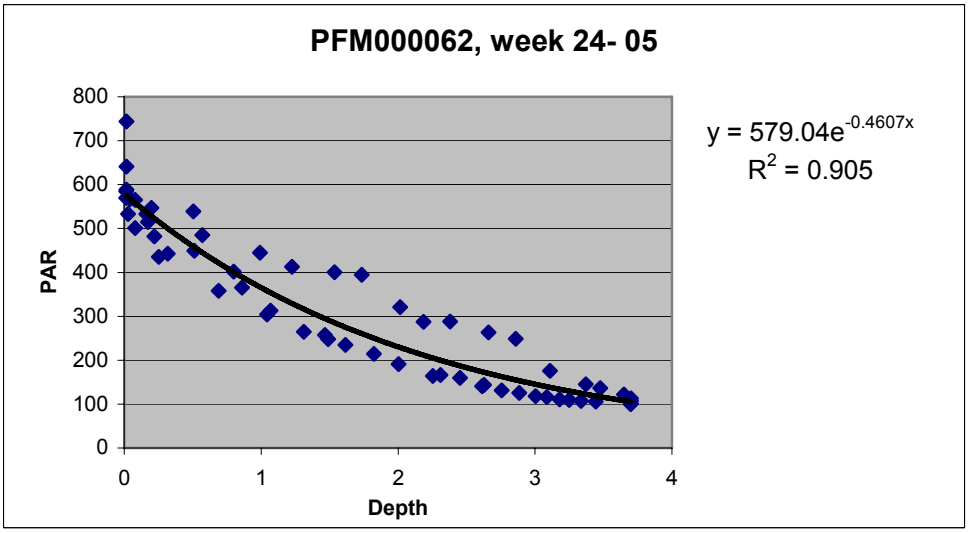

PFM000107, week 15- 05
PAR
Depth
y = 745.48e-1.52x
R2 = 0.8432

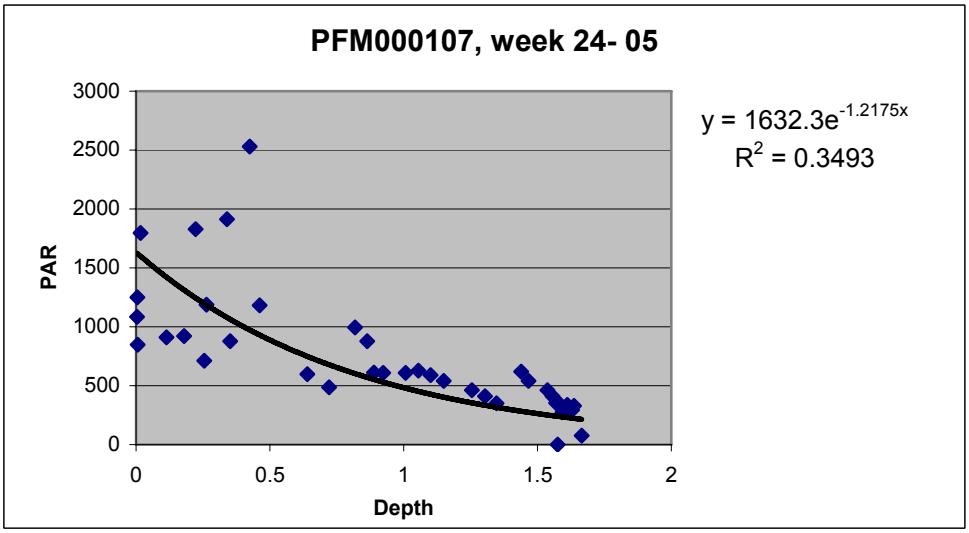

PFM000117, week 15- 05
PAR
Depth
y = 354.6e-0.8896x
R2 = 0.672

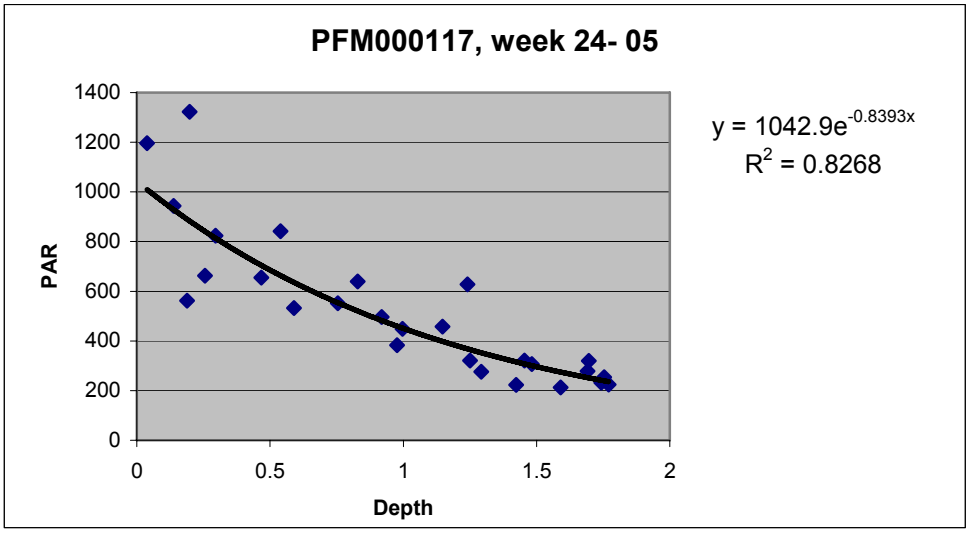

PFM00062, week 19- 05
PAR
Depth
y = 422.82e-0.5574x
R2 = 0.9919


PFM000107, week 19- 05
PAR
Depth
y = 513.11e-1.0619x
R2 = 0.9954


PFM000117, week 19- 05
PAR
Depth
y = 612.34e-0.7614x
R2 = 0.6661


PFM000062, week 24- 05
PAR
Depth
y = 579.04e-0.4607x
R2 = 0.905


PFM000107, week 24- 05
PAR
Depth
y = 1632.3e-1.2175x
R2 = 0.3493


PFM000117, week 24- 05
PAR
Depth
1400
1200
1000
800
600
400
200
0
0
0.5
1
1.5
2
y = 1042.9e-0.8393x
R2 = 0.8268

Appendix 4

Water flow measurements

IDCODE	START_DATE	STOP_DATE	Simple flow rate* (m^3/s)	Code**
PFM000066	2004-03-30 07:30	2004-03-30 07:50	0.094	K
PFM000066	2004-04-29 14:15	2004-04-29 14:20	0.049	K
PFM000066	2004-05-07 08:00	2004-05-07 08:05	0.038	K
PFM000066	2004-05-14 08:25	2004-05-14 08:30	0.029	K
PFM000066	2004-05-28 08:00	2004-05-28 08:10	0.027	K
PFM000066	2004-06-11 08:30	2004-06-11 08:40	0.006	K
PFM000066	2004-06-23 07:00	2004-06-23 07:05		F
PFM000066	2004-06-29 12:15	2004-06-29 12:25		F
PFM000066	2004-08-06 12:30	2004-08-06 12:30		M
PFM000066	2004-08-12 09:00	2004-08-12 09:00		P
PFM000066	2004-08-27 14:00	2004-08-27 14:00		G
PFM000066	2004-08-31 08:15	2004-08-31 08:15		G
PFM000066	2004-09-07 08:00	2004-09-07 08:00		G
PFM000066	2004-10-08 12:30	2004-10-08 12:30		P
PFM000066	2004-10-15 13:00	2004-10-15 13:00		P
PFM000066	2004-11-01 10:00	2004-11-01 10:00		M
PFM000067	2004-03-31 11:30	2004-03-31 11:45	0.080	K
PFM000067	2004-04-29 13:40	2004-04-29 13:45	0.056	K
PFM000067	2004-05-07 11:00	2004-05-07 11:05	0.044	K
PFM000067	2004-05-14 10:35	2004-05-14 10:40	0.035	K
PFM000067	2004-05-28 08:55	2004-05-29 08:42	0.047	K
PFM000067	2004-06-11 14:20	2004-06-11 14:40	0.028	K
PFM000067	2004-06-23 13:00	2004-06-23 13:30	0.016	K
PFM000067	2004-06-29 12:30	2004-06-29 12:40	0.012	K
PFM000067	2004-08-06 14:45	2004-08-06 14:50	*0.0087*	K
PFM000067	2004-08-12 15:30	2004-08-12 15:35	*0.00789*	K
PFM000067	2004-08-27 14:30	2004-08-27 14:40	*0.0081*	K
PFM000067	2004-08-31 08:35	2004-08-31 08:45	*0.0088*	K
PFM000067	2004-09-08 10:10	2004-09-08 10:10		O
PFM000067	2004-10-08 13:05	2004-10-08 13:05		M
PFM000067	2004-10-15 13:40	2004-10-15 13:40		M
PFM000067	2004-11-02 09:10	2004-11-02 09:20	*0.0144*	K
PFM000068	2004-03-30 10:45	2004-03-30 10:55	0.14	K
PFM000068	2004-04-29 14:42	2004-04-29 14:47	0.075	K
PFM000068	2004-05-07 08:15	2004-05-07 08:20		O
PFM000068	2004-05-14 08:35	2004-05-14 08:40		O
PFM000068	2004-05-22 14:54	2004-05-22 15:05	0.043	K
PFM000068	2004-06-11 10:25	2004-06-11 10:35	0.014	K
PFM000068	2004-06-23 11:30	2004-06-23 12:00		O
PFM000068	2004-06-29 12:55	2004-06-29 13:00		O
PFM000068	2004-08-06 10:45	2004-08-06 10:50		O
PFM000068	2004-08-12 15:40	2004-08-12 15:40		O
PFM000068	2004-08-27 14:45	2004-08-27 14:45		M
PFM000068	2004-08-31 08:50	2004-08-31 08:50		M
PFM000068	2004-09-07 10:30	2004-09-07 10:30		O
PFM000068	2004-10-08 13:30	2004-10-08 13:30		O
PFM000068	2004-10-15 13:55	2004-10-15 13:55		O
PFM000068	2004-11-02 10:00	2004-11-02 10:00		O
PFM000069	2004-03-31 13:10	2004-03-31 13:20	0.11	K
PFM000069	2004-04-29 15:05	2004-04-29 15:10	0.053	K
PFM000069	2004-05-07 08:20	2004-05-07 08:25	0.031	K

PFM000069	2004-05-14 08:40	2004-05-14 08:45	0.028	K
PFM000069	2004-05-28 07:05	2004-05-28 07:15	0.032	K
PFM000069	2004-06-11 10:10	2004-06-11 10:20	0.017	K
PFM000069	2004-06-23 05:30	2004-06-23 05:40	0.009	K
PFM000069	2004-06-29 08:55	2004-06-29 09:00	0.008	K
PFM000069	2004-08-06 11:00	2004-08-06 11:05	*0.0059*	K
PFM000069	2004-08-12 15:45	2004-08-12 15:50	*0.0059*	K
PFM000069	2004-08-27 14:50	2004-08-27 14:50		M
PFM000069	2004-08-31 09:00	2004-08-31 09:00		M
PFM000069	2004-09-07 10:40	2004-09-07 10:40		M
PFM000069	2004-10-08 13:35	2004-10-08 13:45	*0.0099*	K
PFM000069	2004-10-15 14:00	2004-10-15 14:10	*0.0096*	K
PFM000069	2004-11-02 08:30	2004-11-02 08:40	*0.0128*	K
PFM000070	2004-03-29 15:40	2004-03-29 16:00	0.025	K
PFM000070	2004-04-29 13:00	2004-04-29 13:05	0.017	K
PFM000070	2004-05-07 08:35	2004-05-07 08:40		P
PFM000070	2004-05-14 09:05	2004-05-14 09:10		P
PFM000070	2004-05-28 06:50	2004-05-28 07:00		P
PFM000070	2004-06-11 07:40	2004-06-11 07:50		P
PFM000070	2004-06-23 06:00	2004-06-23 06:10		P
PFM000070	2004-06-29 07:15	2004-06-29 07:20		P
PFM000070	2004-08-06 09:00	2004-08-06 09:00		P
PFM000070	2004-08-12 15:30	2004-08-12 15:30		P
PFM000070	2004-08-27 15:10	2004-08-27 15:10		P
PFM000070	2004-08-31 09:30	2004-08-31 09:30		I
PFM000070	2004-09-07 11:20	2004-09-07 11:20		M
PFM000070	2004-10-08 14:20	2004-10-08 14:20		I
PFM000070	2004-10-15 14:30	2004-10-15 14:30		I
PFM000070	2004-11-02 10:15	2004-11-02 10:15		I
PFM000071	2004-03-29 16:10	2004-03-29 16:15		C
PFM000071	2004-04-29 13:30	2004-04-29 13:35		P
PFM000071	2004-05-07 09:00	2004-05-07 09:05		P
PFM000071	2004-05-14 09:35	2004-05-14 09:40		P
PFM000071	2004-05-28 06:35	2004-05-28 06:40		P
PFM000071	2004-06-11 07:15	2004-06-11 07:25		P
PFM000071	2004-06-23 06:20	2004-06-23 06:30		P
PFM000071	2004-06-29 07:30	2004-06-29 07:40		P
PFM000071	2004-08-06 09:30	2004-08-06 09:30		P
PFM000071	2004-08-12 09:35	2004-08-12 09:35		P
PFM000071	2004-08-27 15:15	2004-08-27 15:15		I
PFM000071	2004-08-31 09:40	2004-08-31 09:40		I
PFM000071	2004-09-07 11:40	2004-09-07 11:40		I
PFM000071	2004-10-08 14:50	2004-10-08 14:50		I
PFM000071	2004-10-15 15:00	2004-10-15 15:00		I
PFM000071	2004-11-02 10:35	2004-11-02 10:35		I
PFM000072	2004-03-29 15:00	2004-03-29 15:05		C
PFM000072	2004-04-29 15:20	2004-04-29 15:25		O
PFM000072	2004-05-07 10:30	2004-05-07 10:35		P
PFM000072	2004-05-14 09:55	2004-05-14 10:00		O
PFM000072	2004-05-28 05:35	2004-05-28 06:10	0.073	K
PFM000072	2004-06-11 08:55	2004-06-11 09:05		P
PFM000072	2004-06-23 05:00	2004-06-23 05:10		P
PFM000072	2004-06-29 05:00	2004-06-29 05:10		P
PFM000072	2004-08-06 06:45	2004-08-06 06:45		P
PFM000072	2004-08-12 09:45	2004-08-12 09:45		P
PFM000072	2004-08-27 15:35	2004-08-27 15:35		I
PFM000072	2004-08-31 09:50	2004-08-31 09:50		G
PFM000072	2004-09-07 16:05	2004-09-07 16:05		I
PFM000072	2004-10-08 15:15	2004-10-08 15:15		I

PFM000072	2004-10-15 15:15	2004-10-15 15:15	I
PFM000072	2004-11-02 10:55	2004-11-02 10:55	O
PFM000073	2004-03-29 15:20	2004-03-29 15:25	P
PFM000073	2004-04-29 15:30	2004-04-29 15:35	P
PFM000073	2004-05-07 10:20	2004-05-07 10:20	P
PFM000073	2004-05-14 09:45	2004-05-14 09:50	P
PFM000073	2004-05-28 06:20	2004-05-28 06:30	P
PFM000073	2004-06-11 13:20	2004-06-11 13:30	G
PFM000073	2004-06-23 05:10	2004-06-23 05:20	G
PFM000073	2004-06-29 05:15	2004-06-29 05:25	G
PFM000073	2004-08-06 07:00	2004-08-06 07:00	P
PFM000073	2004-08-12 09:15	2004-08-12 09:15	G
PFM000073	2004-08-27 15:45	2004-08-27 15:45	P
PFM000073	2004-08-31 10:00	2004-08-31 10:00	I
PFM000073	2004-09-07 15:00	2004-09-07 15:00	G
PFM000073	2004-10-08 15:25	2004-10-08 15:25	G
PFM000073	2004-10-15 15:25	2004-10-15 15:25	P
PFM000073	2004-11-02 11:10	2004-11-02 11:10	P

Extra measurements without water sampling are given in italic.
* Simple flow rate = based on simple method described in the text.
** Code = see end of table.

Code	**Code description**
A	Blocked flow; no measurement
B	Too much water vegitation, no measurement
C	Water compleately frosen, no measurement
D	Too much ice, no measurement
E	Flow rate too high, no measurement
F	Flow rate too low, no measurement
G	Dry conditions, no measurements
H	Measurement not possible, estimated value
I	Measurement not possible, see protocol
K	Comment missing
L	Flow rate value available
M	Low water level
N	Lake, Sea, no measurement
O	Too much wind, no measurement
P	Stationary water

Appendix 5

Compilation of hydrochemical data from water analyses

Table A5-1. Water composition.

Idcode	Sample no	Depth m	Sampling date	RCB %	Na mg/L	K mg/L	Ca mg/L	Mg mg/L	HCO_3^- mg/L	Cl^- mg/L	SO_4^{2-} mg/L	SO_4-S mg/L	Br mg/l	F^- mg/L	Si mg/L	Fe mg/L	Mn mg/L	Li mg/L	Sr mg/L	I^- mg/L	pH_L	pH_F	Temp_F °C	EC mS/m
PFM000062	8386	0.5	2004-04-06	–2.3	1420	54.5	76.0	169	79.3	2680	423	123	8.89		0.54			0.024	1.07	0.008	7.86	7.89	1.3	855
PFM000062	8387	3.0	2004-04-06	–2.2	1430	54.7	76.0	169	79.6	2690	421	123	8.92		0.54			0.024	1.07	0.008	7.83	7.9	1.3	855
PFM000062	8399	0.5	2004-04-19	–2.3	1420	54.2	75.1	171	79.6	2680	418	125	9.04		0.32	<0.004	0.0015	0.023	1.11	0.011	8.02	8.07	4.8	859
PFM000062	8452	0.5	2004-05-03	–2.3	1460	55.4	77.0	175	84.5	2750	399	128	9.04		0.42			0.024	1.14	0.009	7.96	8.01	4.9	898
PFM000062	8488	0.5	2004-05-17	–0.6	1520	57.9	82.1	182	73.2	2770	395	133	9.24		0.20			0.025	1.15	0.011	7.86	8.09	9.2	909
PFM000062	8508	0.5	2004-06-01	–0.7	1440	54.8	78.1	173	74.7	2630	378	126	8.55		0.21			0.023	1.09	0.010	7.92	7.82	11.4	854
PFM000062	8529	0.5	2004-06-14	0.4	1490	52.9	74.8	172	76.2	2650	382	117	8.50		0.22			0.021	1.04	0.020	7.90	7.87	13.6	874
PFM000062	8547	0.5	2004-07-05	–1.7	1490	60.0	73.6	187	76.9	2800	410	129	9.20		0.31	0.039	0.0060	0.028	1.09	0.012	7.89	7.88	12	932
PFM000062	8610	0.5	2004-08-16	0.6	1570	55.5	73.3	185	79.7	2770	404	127	9.22		0.27			0.027	1.10	0.010	8.14	8.11	19.3	793
PFM000062	8629	0.5	2004-09-13	–1.8	1540	55.9	75.9	190	80.9	2880	434	135	9.40		0.46			0.021	1.13	0.015	7.97	7.9	13.8	930
PFM000062	8658	0.5	2004-10-11	–1.8	1550	56.5	75.9	190	78.8	2900	426	134	11.6		0.47	0.022	<0.003	0.025	1.12	0.013	7.93	7.95	10.8	953
PFM000062	8720	0.5	2004-11-08	–0.8	1580	57.1	79.5	196	80.4	2900	414	137	9.65		0.41			0.024	1.16	0.010	7.88	8.09	7.6	927
PFM000062	8742	0.5	2004-12-07	–0.6	1530	55.6	77.2	189	77.5	2790	393	133	9.65		0.59			0.021	1.13	0.010	7.84	7.91	2.5	898
PFM000062	8755	0.5	2005-01-18	–0.3	1520	57.8	77.4	185	78.1	2740	391	135			0.78	0.005	0.0021	0.017	1.12	0.022	7.80	7.92	1.6	896
PFM000062	8792	0.5	2005-02-14	–2.4	1450	57.3	75.8	184	80.5	2760	380	132	8.60		0.82			0.023	1.09	0.011	7.76	7.77	–0.3	888
PFM000062	8869	0.5	2005-04-11	0.2	1530	62.5	79.6	187	79.9	2720	402	144	16.4	0.34	0.63	0.005	0.0022	0.028	1.27	0.078	7.99	8.02	1.6	922
PFM000062	8881	0.5	2005-05-09	1.3	1610	62.0	79.7	181	80.1	2760	400	139		0.35	0.23			0.026	1.30		8.10	8.24	5.3	907
PFM000062	8920	0.5	2005-06-13	–3.3	1470	59.4	77.9	171	77.8	2810	375	134	11.1	0.33	0.25	<0.02	<0.003	0.037	1.20		8.00	7.96	11.9	862
PFM000063	8343	0.5	2004-03-15	–2.1	904	33.8	70.2	107	106	1700	262	80.5	4.75		2.66			0.016	0.701	0.013	7.37	7.39	0.6	570
PFM000063	8347	4.0	2004-03-15	–2.1	1400	51.8	76.2	165	85.7	2630	388	117	7.54		1.62			0.022	1.04	0.013	7.25	7.36	1.3	850
PFM000063	8372	0.5	2004-04-04	–2.1	1260	48.1	74.1	149	90.9	2360	356	110	7.87		0.74			0.021	0.960	0.007	7.66	7.71	3.9	763
PFM000063	8370	4.0	2004-04-04	–1.9	1380	52.3	76.4	164	81.4	2580	390	120	8.70		1.22			0.023	1.04	0.008	7.26	7.62	2.4	830
PFM000063	8404	0.5	2004-04-19	–2.3	1340	51.4	73.5	162	78.2	2530	403	119	8.51		0.32	0.009	0.0065	0.023	1.05	0.010	7.93	8.07	7.7	818
PFM000063	8446	0.5	2004-05-03	–1.9	1400	53.1	75.8	168	79.0	2620	376	124	8.60		0.37			0.023	1.10	0.009	7.88	8.05	10.2	861
PFM000063	8479	0.5	2004-05-17	–0.7	1500	57.0	82.5	180	75.3	2740	403	132	9.20		0.25			0.025	1.15	0.011	7.85	7.95	11.8	902
PFM000063	8507	0.5	2004-06-01	–0.8	1470	56.2	80.5	177	77.0	2690	389	129	8.87		0.20			0.023	1.12	0.011	7.99	7.95	14	872
PFM000063	8527	0.5	2004-06-14	0.5	1500	53.6	75.4	173	77.2	2660	381	118	8.30		0.25			0.024	1.05	0.013	7.93	8.04	15.6	873
PFM000064	8344	0.5	2004-03-15	–1.5	560	22.4	72.4	68.5	145	1040	179	55.6	3.15		4.48			0.012	0.477	0.013	7.16	7.00	0.9	370
PFM000064	8348	1.0	2004-03-15	–2.0	1160	43.3	73.0	138	94.0	2180	335	99.6	6.43		1.92			0.019	0.873	0.012	7.16	6.93	1.8	711
PFM000064	8369	0.5	2004-04-05	–5.8	165	7.73	38.0	21.0	90.3	339	65.9	20.8	1.05	<0.2	2.61			0.005	0.166	0.006	7.39	7.66	4.8	121
PFM000064	8400	0.5	2004-04-19	–2.4	835	32.5	63.4	102	88.1	1580	268	79.7	7.60		1.29	0.059	0.0207	0.016	0.681	0.008	7.84	8.11	11	529

Idcode	Sample no	Depth m	Sampling date	RCB %	Na mg/L	K mg/L	Ca mg/L	Mg mg/L	HCO_3^- mg/L	Cl^- mg/L	SO_4^{2-} mg/L	SO_4-S mg/L	Br mg/l	F^- mg/L	Si mg/L	Fe mg/L	Mn mg/L	Li mg/L	Sr mg/L	I^- mg/L	pH_L	pH_F	Temp_F °C	EC mS/m
PFM000064	8445	0.5	2004-05-03	–2.2	909	34.9	66.6	110	97.9	1710	256	84.7	5.10		1.07			0.016	0.738	0.008	7.62	8.05	14.5	594
PFM000064	8484	0.5	2004-05-17	–0.5	1380	52.2	81.2	165	74.9	2510	368	122	8.35		0.32			0.022	1.06	0.011	7.77	8.07	13.1	828
PFM000064	8504	0.5	2004-06-01	–0.6	1390	52.6	80.7	166	83.7	2530	364	123	8.10		0.26			0.023	1.06	0.010	8.08	8.08	15.8	826
PFM000064	8523	0.5	2004-06-14	0.8	1460	52.2	77.1	170	80.2	2580	371	115	8.10		0.25			0.023	1.03	0.014	7.92	8.07	16.7	852
PFM000065	8350	0.5	2004-03-15	–1.9	344	14.1	55.5	42.6	124	645	113	35.3	2.03	<0.2	3.67			0.007	0.307	0.011	7.13	7.18	1.2	233
PFM000065	8403	0.5	2004-04-19	–1.7	805	31.0	64.3	97.6	95.2	1500	252	76.0	5.10		1.82	0.073	0.0367	0.015	0.659	0.009	7.81	8.01	9.6	504
PFM000065	8453	0.5	2004-05-03	–2.1	1220	46.6	72.4	147	86.9	2290	339	109	7.72		0.49			0.021	0.964	0.009	7.98	8.15	12.1	761
PFM000065	8482	0.5	2004-05-17	–1.4	1170	44.4	73.7	139	84.8	2170	318	102	7.20		0.60			0.019	0.894	0.010	8.09	8.25	12.8	712
PFM000065	8502	0.5	2004-06-01	–0.4	1330	50.6	79.2	159	89.4	2410	346	117	7.79		0.27			0.023	1.02	0.010	8.18	8.22	16.5	788
PFM000065	8531	0.5	2004-06-14	0.9	1410	50.4	75.1	163	80.5	2480	358	112	7.90		0.27			0.022	1.00	0.014	7.93	8.1	16	821
PFM000066	8357	0.1	2004-03-16	–0.1	5.7	2.51	76.9	3.8	251	6.3	7.6	2.82	0.094	<0.2	5.65			<0.004	0.081	0.011	7.34	7.06	0.2	43.4
PFM000066	8327	0.1	2004-04-05	1.7	3.9	1.92	51.9	2.5	162	4.1	6.8	2.29	0.067		3.73			<0.004	0.054	0.003	7.26	6.98	4.2	28.5
PFM000066	8406	0.1	2004-04-19	2.0	4.2	2.07	56.6	2.6	174	4.4	7.6	2.61	0.026	0.21	3.43	0.078	0.0103	0.001	0.061	0.004	7.33	7.27	9.5	30.4
PFM000066	8444	0.1	2004-05-04	1.1	4.5	2.21	59.4	2.8	189	4.0	6.2	2.44	0.035	0.20	2.89			<0.004	0.067	0.004	7.45	7.28	13	32.8
PFM000066	8480	0.1	2004-05-17	4.3	5.0	2.30	63.4	3.1	189	4.5	6.4	2.36	0.046	0.23	2.36			<0.004	0.071	0.003	7.62	7.44	13.7	34.4
PFM000066	8513	0.1	2004-06-01	2.2	5.0	2.06	60.0	3.1	189	4.3	5.4	2.11	0.040	0.21	2.06			<0.004	0.069	0.004	7.60	7.38	12.9	36.1
PFM000066	8532	0.1	2004-06-14	2.4	5.3	2.03	57.7	3.1	183	4.4	4.9	1.98	0.050	0.22	1.69			<0.004	0.071	0.019	7.63	7.46	15.6	37.7
PFM000066	8543	0.1	2004-07-06	2.2	5.1	1.50	51.1	3.0	164	4.2	4.3	1.76	0.043	0.20	1.50	0.113	0.0089	<0.004	0.064	0.005	7.55	7.38	13.3	30.2
PFM000066	8652	0.1	2004-10-12	2.8	5.9	2.75	48.1	3.0	151	5.4	8.0	2.93	0.113	<0.2	2.86			<0.004	0.058	0.009	7.38	7.46	3.3	28.3
PFM000066	8718	0.1	2004-11-08	3.2	6.5	3.09	66.2	3.5	188	5.8	21.1	7.47	0.047	<0.2	4.19			<0.004	0.075	0.003	7.46	7.52	4.5	36.0
PFM000066	8734	0.1	2004-12-06	3.0	5.5	2.96	59.5	3.3	176	5.2	13.9	5.13	0.036	<0.2	3.88			<0.004	0.065	0.003	7.25	7.3	0.3	33.2
PFM000066	8760	0.1	2005-01-17	2.9	4.8	2.44	63.2	3.3	185	4.9	13.8	5.12	0.008	<0.2	5.46	0.047	0.0156	<0.004	0.066		7.09	7.09	0.8	34.2
PFM000066	8796	0.1	2005-02-14	1.1	5.9	2.63	76.1	3.8	237	5.8	12.8	4.76	0.042	<0.2	6.07			<0.004	0.078	0.004	7.04	7.13	–0.1	41.5
PFM000066	8836	0.1	2005-03-15	1.6	6.4	2.86	88.4	4.5	278	6.4	9.8	3.64	0.049	0.24	6.82			<0.004	0.091	0.007	6.87	6.89	–0.1	46.6
PFM000066	8871	0.3	2005-04-11	–0.5	3.5	1.82	49.3	2.5	158	4.7	7.1	2.77	0.046	<0.2	4.29			<0.004	0.050	0.007	7.13	7.16	7.1	28.2
PFM000066	8880	0.1	2005-05-09	3.6	4.6	2.23	64.4	3.2	194	4.4	7.3	2.74	<0.2	<0.2	3.90			<0.004	0.064		7.48	7.47	9.1	34.2
PFM000066	8922	0.1	2005-06-13	5.5	5.2	2.15	61.3	3.3	183	3.8	4.6	2.09	0.053	<0.2	3.31	0.0976	0.0034	<0.004	0.068	0.005	7.53	7.37	14.7	31.8
PFM000067	8362	0.1	2004-03-16	1.3	16.2	2.97	64.6	5.2	196	27.1	15.7	5.45	0.142	<0.2	4.82			<0.004	0.094	0.010	7.16	7.09	3.3	42.5
PFM000067	8375	0.1	2004-04-05	1.2	14.2	2.13	44.0	3.8	132	25.4	10.4	3.63	0.130		2.92			<0.004	0.071	0.003	7.27	7.12	6.8	31.0
PFM000067	8398	0.1	2004-04-20	0.3	20.6	2.40	48.2	4.7	134	44.0	13.6	4.50	0.160	0.21	2.02	0.087	0.0102	0.002	0.093	0.005	7.94	8.01	12.8	36.8
PFM000067	8455	0.1	2004-05-05	–0.1	18.5	2.21	45.2	4.6	134	36.4	12.3	4.26	0.121	0.21	0.99			<0.004	0.087	0.004	8.05	8.11	14	35.9
PFM000067	8493	0.1	2004-05-18	3.7	19.2	2.38	44.5	4.8	118	36.4	12.5	4.57	0.141	0.21	0.33			<0.004	0.088	0.003	8.28	8.39	13.8	35.0
PFM000067	8515	0.1	2004-06-02	0.8	44.1	2.95	52.4	7.6	114	101	19.4	6.70	0.370	0.23	0.14			<0.004	0.150	0.006	8.44	8.49	16.8	56.8
PFM000067	8536	0.1	2004-06-15	2.4	29.8	2.78	44.1	6.2	110	61.1	15.6	5.59	0.200	0.24	0.17			0.004	0.113	0.007	8.59	8.66	17.6	42.1
PFM000068	8345	0.5	2004-03-15	1.3	12.2	2.69	68.4	4.8	214	19.2	10.7	3.88	0.082	0.21	6.01			<0.004	0.095	0.009	7.53	7.07	–0.1	42.5
PFM000068	8378	0.5	2004-04-05	2.3	6.9	1.67	41.8	2.8	125	10.1	9.5	3.12	0.063	0.22	3.54			<0.004	0.058	0.004	7.17	6.94	2.7	25.0
PFM000068	8428	0.5	2004-04-21	1.8	7.5	1.89	46.4	3.1	138	11.5	11.6	3.88	0.062	0.23	3.45	0.143	0.0110	<0.004	0.067	0.005	7.27	7.15	7.9	28.5
PFM000068	8450	0.5	2004-05-04	0.2	9.0	2.07	51.8	3.5	165	12.4	10.0	3.77	0.067	0.23	3.54			<0.004	0.075	0.005	7.44	7.19	12	32.1

Idcode	Sample no	Depth m	Sampling date	RCB %	Na mg/L	K mg/L	Ca mg/L	Mg mg/L	HCO_3^- mg/L	Cl^- mg/L	SO_4^{2-} mg/L	SO_4-S mg/L	Br mg/l	F^- mg/L	Si mg/L	Fe mg/L	Mn mg/L	Li mg/L	Sr mg/L	I^- mg/L	pH_L	pH_F	Temp_F °C	EC mS/m
PFM000068	8483	0.5	2004-05-18	5.5	12.9	2.26	56.8	4.3	154	20.5	12.6	4.67	0.110	0.27	4.65			<0.004	0.089	0.005	7.42	7.23	12.2	36.3
PFM000068	8516	0.5	2004-06-02	2.3	13.8	2.11	57.4	4.5	172	21.9	11.0	4.14	0.100	0.27	4.52			<0.004	0.090	0.005	7.44	7.21	11.1	37.8
PFM000068	8538	0.5	2004-06-15	2.8	18.3	2.03	60.5	5.3	178	31.2	10.9	4.04	0.130	0.31	5.36			0.005	0.101	0.005	7.59	7.41	12.9	45.5
PFM000068	8542	0.5	2004-07-06	2.0	14.4	1.17	52.3	4.4	157	22.8	11.4	4.21	0.107	0.24	3.69	0.361	0.0347	0.004	0.093	0.005	7.47	7.27	11.8	36.0
PFM000068	8607	0.5	2004-08-15	–1.4	21.8	1.51	54.1	5.4	179	36.1	12.2	4.59	0.120	0.29	3.52			<0.004	0.096	0.005	7.57	7.39	14.5	36.1
PFM000068	8630	0.5	2004-09-13	0.3	21.9	0.77	60.6	5.9	189	38.6	10.3	4.04	0.151	0.28	5.16			<0.004	0.107	0.005	7.63	7.4	12.3	43.6
PFM000068	8650	0.5	2004-10-11	1.5	16.1	2.42	52.6	4.8	161	26.9	11.4	4.17	0.181	0.23	4.97			<0.004	0.090	0.009	7.36	7.38	5.1	37.6
PFM000068	8721	0.5	2004-11-08	2.5	14.7	2.20	55.4	4.6	166	23.6	10.2	4.09	0.130	0.23	4.78			<0.004	0.090	0.008	7.39	7.44	4.3	38.1
PFM000068	8737	0.5	2004-12-06	4.2	10.9	2.79	47.9	3.8	133	16.7	14.8	5.41	0.071	<0.2	4.68			<0.004	0.073	0.004	7.15	7.19	0.3	30.7
PFM000068	8757	0.5	2005-01-17	3.2	8.2	2.07	50.1	3.7	143	11.6	14.6	5.50	0.009	<0.2	4.91	0.128	0.0137	<0.004	0.070		7.06	7.06	0.5	30.7
PFM000068	8794	0.5	2005-02-14	2.2	11.2	2.35	62.9	4.5	190	15.5	13.4	5.10	0.074	0.21	5.49			<0.004	0.087	0.005	6.93	7.03	–0.1	38.3
PFM000068	8827	0.5	2005-03-14	1.9	14.6	2.47	72.7	5.7	228	22.1	10.4	3.91	0.118	0.28	6.63			<0.004	0.103	0.007	6.98	7.21	–0.1	44.8
PFM000068	8874	0.4	2005-04-12	4.7	7.0	1.77	45.5	3.2	130	9.7	9.1	3.41	0.049	0.25	3.81			<0.004	0.061	0.007	7.19	7.18	5.1	26.8
PFM000068	8885	0.3	2005-05-09	3.9	10.3	2.03	54.1	4.1	159	15.5	9.4	3.51	<0.2	0.24	3.79			<0.004	0.075		7.31	7.28	7.3	33.3
PFM000068	8925	0.1	2005-06-13	5.4	11.3	1.88	48.4	4.1	140	15.4	8.22	3.43	0.112	0.24	3.80	0.213	0.0118	<0.004	0.076	0.006	7.35	7.22	13.3	30.7
PFM000069	8366	0.1	2004-03-17	–0.3	18.6	2.99	81.3	6.1	256	34.7	10.9	3.94	0.169		7.89			<0.004	0.115	0.014	7.00	6.81	–0.1	53.0
PFM000069	8374	0.1	2004-04-05	1.3	9.7	1.89	49.6	3.6	149	15.5	12.7	4.34	0.080		4.36			<0.004	0.069	0.002	7.01	6.82	2.5	30.7
PFM000069	8391	0.1	2004-04-21	–0.2	9.3	1.81	45.5	3.3	134	16.8	16.3	5.21	0.085	0.24	3.99			<0.004	0.067	0.004	7.18	7.00	7.3	31.5
PFM000069	8443	0.1	2004-05-04	0.7	11.5	2.13	53.9	3.9	163	18.4	13.9	5.08	0.096	0.25	4.69			<0.004	0.081	0.005	7.23	7.04	11.9	36.2
PFM000069	8476	0.1	2004-05-18	3.9	14.6	2.37	58.5	4.6	162	24.4	14.6	5.31	0.120	0.28	5.42			<0.004	0.090	0.005	7.31	7.12	11.6	37.8
PFM000069	8478	0.1	2004-06-02	1.8	15.4	2.25	58.7	4.8	176	25.6	12.1	4.54	0.120	0.27	5.27			<0.004	0.092	0.005	7.37	7.11	11.4	40.9
PFM000069	8539	0.1	2004-06-15	2.5	18.6	2.02	59.9	5.3	177	31.7	11.1	4.22	0.130	0.30	5.48			0.005	0.100	0.012	7.47	7.3	13.2	45.4
PFM000069	8541	0.0	2004-07-06	1.2	18.8	1.10	55.1	5.1	166	32.9	11.0	4.10	0.134	0.27	4.07	0.097	0.0025	<0.004	0.094	0.004	7.46	7.31	12.1	40.4
PFM000069	8611	0.1	2004-08-16	–1.3	23.3	0.74	56.8	5.8	187	38.3	12.9	4.77	0.124	0.30	3.83			<0.004	0.100	0.004	7.57	7.45	13.6	37.8
PFM000069	8634	0.1	2004-09-13	0.3	22.0	0.60	60.4	5.9	188	38.9	10.4	4.10	0.152	0.29	5.13			<0.004	0.106	0.023	7.64	7.4	12.3	43.5
PFM000069	8651	0.1	2004-10-11	0.8	20.5	2.20	56.8	5.6	173	37.2	11.4	4.39	0.151	0.23	5.71			<0.004	0.098	0.007	7.40	7.42	4.7	42.6
PFM000069	8722	0.1	2004-11-08	1.7	19.5	1.88	62.1	5.5	186	34.4	11.1	4.33	0.160	0.26	5.92			<0.004	0.104	0.007	7.33	7.39	4.3	43.3
PFM000069	8739	0.1	2004-12-06	2.1	18.2	3.17	64.9	5.4	188	33.4	14.1	5.34	0.130	0.22	6.83			<0.004	0.104	0.005	7.24	7.1	0.1	43.9
PFM000069	8753	0.1	2005-01-17	2.7	11.8	2.42	65.4	4.9	185	18.7	19.2	7.13	0.010	0.20	6.41	0.126	0.0190	<0.004	0.092		7.17	6.97	0.5	40.3
PFM000069	8793	0.1	2005-02-14	0.6	15.3	2.56	77.0	5.7	237	25.4	16.5	6.09	0.106	<0.2	7.38			<0.004	0.106	0.006	6.89	6.9	–0.1	48.2
PFM000069	8832	0.1	2005-03-14	–1.8	19.7	2.55	81.8	6.7	274	36.1	10.5	3.81	0.168	0.30	8.37			<0.004	0.118	0.009	6.78	7.01	–0.1	54.3
PFM000069	8872	0.1	2005-04-12	2.7	8.9	1.79	47.9	3.7	138	15.0	12.0	4.28	0.056	0.22	4.39			<0.004	0.067	0.007	7.07	7.07	4.4	29.9
PFM000069	8888	0.1	2005-05-09	2.9	13.7	2.16	59.1	4.9	173	23.7	11.6	4.18	<0.2	0.29	4.90			<0.004	0.085		7.13	7.16	7.0	38.1
PFM000069	8923	0.1	2005-06-13	6.3	19.3	2.35	60.1	5.6	166	29.7	10.1	4.26	0.180	0.26	4.81	0.119	0.0075	<0.004	0.098	0.006	7.35	7.15	13.6	39.7
PFM000070	8346	0.1	2004-03-16	2.6	1.9	0.51	10.0	0.7	29.6	2.3	3.0	1.11	0.082	<0.2	0.54			<0.004	0.011	0.005	7.09	7.24	0.7	7.1
PFM000070	8377	0.1	2004-04-05	2.8	4.1	1.37	35.1	1.9	107	4.2	5.6	2.12	0.038		2.12			<0.004	0.037	0.004	7.35	7.22	6.6	19.7
PFM000070	8405	0.1	2004-04-20	–2.8	6.0	1.80	48.7	2.6	152	15.8	9.4	2.77	0.083	0.20	2.20	0.048	0.0253	<0.004	0.053	0.006	7.67	7.55	9.5	32.6

Idcode	Sample no	Depth m	Sampling date	RCB %	Na mg/L	K mg/L	Ca mg/L	Mg mg/L	HCO_3^- mg/L	Cl^- mg/L	SO_4^{2-} mg/L	SO_4-S mg/L	Br mg/l	F^- mg/L	Si mg/L	Fe mg/L	Mn mg/L	Li mg/L	Sr mg/L	I^- mg/L	pH_L	pH_F	Temp_F °C	EC mS/m
PFM000070	8447	0.1	2004-05-04	1.3	5.7	1.74	46.8	2.6	150	5.3	6.7	2.59	0.038	<0.2	1.32			<0.004	0.052	0.006	7.67	7.5	13.2	27.3
PFM000070	8487	0.1	2004-05-17	5.3	5.8	1.68	45.8	2.6	135	5.2	6.6	2.53	0.040	<0.2	0.89			<0.004	0.052	0.004	7.49	7.29	14.8	26.4
PFM000070	8511	0.1	2004-06-01		5.8	1.55	43.6	2.6	140	5.2	6.0	2.37	0.029	<0.2	0.56					0.006	7.37	7.22	15.4	26.1
PFM000070	8528	0.1	2004-06-14	3.9	6.0	1.07	48.3	2.8	150	4.8	4.0	1.70	0.028	0.20	1.89			<0.004	0.058	0.003	7.24	7.15	15.7	29.2
PFM000070	8540	0.1	2004-07-05	3.0	4.9	0.81	40.6	2.3	129	3.7	3.1	1.40	0.030	<0.2	2.29	0.184	0.0586	0.002	0.048	0.006	7.37	7.11	14.8	25.6
PFM000070	8605	0.1	2004-08-16	–1.3	6.9	0.88	50.3	3.0	178	5.0	3.2	1.60	0.032	<0.2	4.48			<0.004	0.059	0.006	7.40	7.2	13.8	25.9
PFM000070	8635	0.1	2004-09-14	2.6	6.5	1.01	53.2	3.0	170	5.9	2.9	1.49	0.037	<0.2	5.09			<0.004	0.061	0.004	7.41	7.22	12.4	31.2
PFM000070	8653	0.1	2004-10-11	2.7	6.5	2.51	45.2	2.6	142	6.7	6.4	2.45	0.098	<0.2	4.64			<0.004	0.050	0.009	7.19	7.39	6.2	27.3
PFM000070	8719	0.1	2004-11-08	4.6	6.5	2.01	35.5	2.6	110	5.7	6.3	2.50	0.043	<0.2	1.23			<0.004	0.047	0.005	7.48	7.59	4.4	21.8
PFM000070	8736	0.1	2004-12-06	4.9	7.0	2.19	38.1	2.9	117	6.3	6.8	2.73	0.037	<0.2	1.23			<0.004	0.051	0.005	7.71	7.33	0.5	23.1
PFM000070	8759	0.1	2005-01-17	7.3	3.8	1.50	33.0	2.1	90.2	3.6	6.7	2.73	0.009	<0.2	3.06	0.078	0.0073	<0.004	0.037		7.16	7.12	1.1	18.4
PFM000070	8797	0.1	2005-02-14	3.9	5.9	1.82	45.9	2.8	138	5.3	8.0	3.22	0.035	<0.2	3.66			<0.004	0.050	0.004	7.11	7.27	0.6	26.1
PFM000070	8834	0.1	2005-03-14	3.3	6.9	2.18	57.2	3.4	177	6.4	7.8	3.00	0.042	<0.2	3.77			<0.004	0.061	0.005	7.22	7.42	–0.1	34.7
PFM000070	8873	0.1	2005-04-12	4.4	5.5	1.87	51.3	2.9	154	5.3	6.1	2.41	0.023	<0.2	2.70			<0.004	0.052	0.009	7.41	7.67	7.8	28.0
PFM000070	8887	0.1	2005-05-10	4.8	5.6	1.68	45.3	2.8	136	5.4	5.6	2.10	<0.2	0.24	0.93			<0.004	0.048		7.71	7.64	10.6	27.8
PFM000070	8918	0.1	2005-06-14	5.4	5.8	1.62	37.3	2.8	115	4.6	4.7	1.94	0.051	<0.2	0.49	0.0219	0.0043	<0.004	0.045	0.006	7.42	7.40	16.7	22.0
PFM000071	8341	0.5	2004-03-16	–0.2	4.7	2.00	75.6	3.8	249	3.4	7.4	2.69	0.052	0.24	4.01			<0.004	0.077	0.011	7.22	7.20	0.0	41.5
PFM000071	8376	0.5	2004-04-04	0.9	3.4	1.79	64.8	3.0	209	2.6	5.2	1.78	0.033		3.65			<0.004	0.064	<0.001	7.49	7.41	4.4	34.7
PFM000071	8389	0.5	2004-04-20	0.3	3.7	1.93	71.6	3.3	234	2.8	5.3	1.77	0.049	0.23	3.17			<0.004	0.075	0.006	7.57	7.47	6.4	39.5
PFM000071	8458	0.5	2004-05-04	0.5	3.7	1.93	73.0	3.4	239	2.3	4.2	1.57	0.018	0.24	3.72			<0.004	0.076	0.005	7.68	7.56	11.7	38.6
PFM000071	8491	0.5	2004-05-17	3.9	3.6	2.83	79.1	3.6	242	2.2	3.9	1.57	0.022	0.22	3.73			<0.004	0.083	0.006	7.80	7.34	13.7	42.6
PFM000071	8506	0.5	2004-06-01	–0.1	3.7	2.00	79.9	3.6	265	1.9	4.0	1.59	0.034	0.23	3.90			<0.004	0.084	0.009	7.79	7.6	14	41.9
PFM000071	8530	0.5	2004-06-14	2.1	3.9	2.03	84.1	3.9	269	1.7	3.0	1.17	0.042	0.25	4.35			<0.004	0.091	0.012	7.83	7.47	13.6	48.8
PFM000072	8365	0.1	2004-03-17	–0.4	29.5	4.47	50.4	7.8	178	42.3	22.4	7.46	0.152	0.21	2.59			<0.004	0.101	0.016	6.94	6.76	0	46.2
PFM000072	8358	0.1	2004-04-05	0.8	17.5	2.88	40.8	5.3	133	24.2	18.7	6.31	0.150		1.86			<0.004	0.077	0.005	6.89	7.05	1.5	33.4
PFM000072	8401	0.1	2004-04-19	–0.2	19.8	3.33	44.0	5.8	145	30.1	20.1	6.37	0.130	0.21	1.52	0.039	0.0011	0.004	0.088	0.008	7.31	7.19	8.8	36.2
PFM000072	8442	0.1	2004-05-04	0.3	20.9	3.45	43.4	6.0	150	27.5	17.3	6.24	0.135	0.20	1.68			<0.004	0.092	0.008	7.38	7.27	10.6	41.1
PFM000072	8490	0.1	2004-05-17	3.4	24.4	3.69	42.2	6.5	135	33.4	16.6	6.01	0.140	0.20	1.25			<0.004	0.092	0.005	7.41	7.24	7.7	38.1
PFM000072	8509	0.1	2004-06-01	0.0	26.0	3.45	37.9	6.4	137	36.0	15.8	5.83	0.130	0.21	0.86			<0.004	0.086	0.007	7.33	7.2	9.5	37.0
PFM000072	8537	0.1	2004-06-15	1.5	34.0	3.10	40.5	7.3	150	46.6	11.6	4.34	0.190	0.25	0.87			0.006	0.098	0.014	7.91	7.29	12.2	51.4
PFM000073	8364	0.1	2004-03-17	–1.2	6.5	8.42	80.8	9.2	276	7.2	35.9	10.9	0.075	0.21	4.02			0.006	0.146	0.003	7.61	7.54	–0.1	50.9
PFM000073	8384	0.1	2004-04-05	1.8	9.5	7.38	128	13.7	385	10.6	65.9	19.2	0.073	0.49	3.43			0.011	0.218	<0.001	7.85	7.74	6.1	72.6
PFM000073	8429	0.1	2004-04-21	–13	10.5	8.13	121	14.4	535	10.6	60.6	18.1	0.076	0.49	1.78	0.096	0.1180	0.012	0.226	0.004	7.95	7.88	7.8	78.8
PFM000073	8451	0.1	2004-05-04	–1.2	11.2	8.30	123	15.7	415	9.7	60.9	19.8	0.062	0.48	1.38			0.012	0.242	0.004	7.98	7.8	9.9	74.1
PFM000073	8485	0.1	2004-05-17		13.0	8.65	123	15.9	409	9.7	37.3	12.4	0.110	0.49	2.10					0.010	8.05	8.04	13.3	73.1
PFM000073	8505	0.1	2004-06-01	–1.2	14.2	7.94	130	16.7	486	8.6	31.4	10.5	0.110	0.49	2.78			0.013	0.254	0.012	8.09	7.99	13.4	78.0
PFM000074	8351	0.5	2004-03-16	1.2	7.5	2.77	82.4	4.2	258	10.1	10.2	3.66	0.076	<0.2	6.23			<0.004	0.089	0.008	7.16	6.96	0.8	47.1

Idcode	Sample no	Depth m	Sampling date	RCB %	Na mg/L	K mg/L	Ca mg/L	Mg mg/L	HCO_3^- mg/L	Cl^- mg/L	SO_4^{2-} mg/L	SO_4-S mg/L	Br mg/l	F^- mg/L	Si mg/L	Fe mg/L	Mn mg/L	Li mg/L	Sr mg/L	I^- mg/L	pH_L	pH_F	Temp_F °C	EC mS/m
PFM000074	8383	0.5	2004-04-05	3.7	5.2	1.95	52.5	2.7	156	6.0	7.5	2.47	0.030	0.21	3.79			<0.004	0.057	<0.001	7.31	6.82	2.3	28.3
PFM000074	8411	0.5	2004-04-20	1.3	5.3	2.10	55.6	2.8	172	7.4	7.6	2.58	0.023	0.23	3.50	0.033	0.0061	0.001	0.065	0.004	7.43	7.21	9.7	31.2
PFM000074	8448	0.5	2004-05-04	1.1	5.9	2.23	60.1	3.0	191	6.9	6.2	2.35	0.036	0.22	3.17			<0.004	0.071	0.004	7.47	7.26	13.6	33.9
PFM000074	8486	0.5	2004-05-18	7.7	7.7	2.41	65.3	3.4	180	9.5	5.8	2.32	0.047	0.23	3.05			<0.004	0.077	0.003	7.61	7.45	13.9	36.7
PFM000074	8517	0.5	2004-06-02	2.4	7.7	2.12	63.8	3.4	199	9.4	5.3	2.14	0.044	0.23	2.74			<0.004	0.076	0.005	7.49	7.37	14.8	36.6
PFM000074	8522	0.5	2004-06-15	2.5	9.0	2.01	65.0	3.8	205	10.5	4.6	2.04	0.064	0.26	3.03			<0.004	0.084	0.011	7.62	7.49	17.2	43.3
PFM000074	8544	0.5	2004-07-06	3.0	9.5	1.11	60.0	3.7	188	10.9	4.4	1.90	0.047	0.24	2.66	0.039	0.0077	0.002	0.084	0.006	7.54	7.47	16.5	44.3
PFM000074	8609	0.2	2004-08-16	–0.9	12.2	1.00	59.1	4.1	206	13.3	5.6	2.39	0.054	0.27	5.37			<0.004	0.085	0.005	7.75	7.65	18.2	32.3
PFM000074	8632	0.3	2004-09-14	1.2	11.9	0.88	58.5	4.1	192	14.3	4.9	2.27	0.050	0.24	6.14			<0.004	0.085	0.004	8.02	7.83	14.2	35.4
PFM000074	8655	0.5	2004-10-12	1.0	11.5	1.31	56.8	3.9	184	14.5	4.6	2.92	0.069	0.21	6.03	0.030	<0.003	<0.004	0.081	0.008	7.87	7.92	4.4	35.6
PFM000074	8725	0.3	2004-11-09	1.8	11.5	2.02	69.3	3.9	219	15.8	5.0	2.28	0.061	<0.2	5.53			<0.004	0.087	0.006	7.79	7.94	4.5	42.8
PFM000074	8741	0.5	2004-12-07	1.9	19.7	2.47	72.7	4.6	219	30.9	11.8	4.27	0.052	0.27	5.31			<0.004	0.089	0.004	6.97	7.07	2.8	47.0
PFM000074	8756	0.5	2005-01-18	2.2	6.2	2.39	62.2	3.3	184	7.4	14.1	5.16	<0.2	<0.2	5.41	0.035	0.0119	0.001	0.067	0.008	7.09	6.96	1.1	38.6
PFM000074	8799	0.5	2005-02-14	–0.5	18.4	2.76	120	6.2	391	28.6	7.8	3.35	0.093	0.27	9.40			<0.004	0.142	0.015	6.94	6.89	1.5	68.3
PFM000074	8828	0.5	2005-03-14	2.4	12.9	2.81	87.9	5.0	270	18.7	10.2	3.66	0.077	<0.2	6.90			<0.004	0.096	0.004	6.89	6.88	0.7	49.7
PFM000074	8870	0.5	2005-04-11	19.6	4.7	1.79	46.1	2.4	92.5	6.4	6.3	2.25	0.032	0.21	3.62	0.024	0.0068	0.001	0.049	0.003	7.28	7.38	4.9	17.9
PFM000074	8884	0.5	2005-05-09	3.8	7.1	2.44	65.3	3.4	193	9.9	7.3	2.76	<0.2	0.21	4.15			<0.004	0.070		7.37	7.62	10.1	35.7
PFM000074	8919		2005-06-13	4.21	7.3	2.08	60.7	3.4	184	8.9	4.14	1.9	0.063	<0.2	3.38	0.045	0.0043	<0.004	0.07	0.006	7.67	7.60	16.8	33.9
PFM000082	8354	0.5	2004-03-16	–1.8	1380	50.9	74.8	163	102	2570	386	115	7.23		0.83			0.021	1.02	0.012	7.70	7.99	0.4	841
PFM000082	8359	6.0	2004-03-16	–1.8	1470	54.5	79.2	173	88.0	2750	406	121	8.01		0.96			0.023	1.10	0.014	7.58	7.92	0.3	879
PFM000082	8833	0.5	2004-03-16	–2.66	1480	59.7	78.5	172	80.7	2790	404	135	9.86	0.34	0.72	<0.02	<0.003	0.023	1.21	0.012	7.77	7.83	2.6	897
PFM000082	8831	6.0	2005-03-14	–4.5	1430	59.3	85.9	174	92.8	2840	399	134	9.98	0.36	1.30			0.023	1.27	0.012	7.64	7.89	2.7	907
PFM000084	8390	0.5	2004-04-06	–1.0	376	15.4	54.6	45.9	98.2	691	139	41.3	2.47	0.60	4.12			0.010	0.33	0.004	7.47	7.53	3.5	251
PFM000084	8388	2.5	2004-04-06	–2.6	1440	55.5	76.6	171	77.2	2740	430	124	9.12		0.59			0.024	1.08	0.007	7.75	7.69	1.4	868
PFM000087	8355	0.5	2004-03-16	0.6	11.1	3.35	88.9	5.5	285	14.7	15.1	4.93	0.086	<0.2	6.53			<0.004	0.104	0.011	7.20	7.11	2.9	51.6
PFM000087	8356	1.5	2004-03-16	–4.5	8.0	4.78	116	6.9	368	10.9	31.8	18.1	0.074		9.01			<0.004	0.117	0.011	7.11	7.01	4.1	63.0
PFM000087	8385	0.5	2004-04-05	–1.0	6.4	2.18	53.7	3.1	176	9.1	9.8	3.03	0.024	0.25	3.89			<0.004	0.063	<0.001	7.35	6.31	4.6	30.9
PFM000087	8373	1.5	2004-04-05	0.3	8.5	5.10	123	7.2	361	11.3	49.3	15.5	0.110		9.75			<0.004	0.117	0.010	7.10	6.31	5.5	65.0
PFM000087	8408	0.5	2004-04-20	1.0	6.7	2.55	57.9	3.8	179	8.8	14.8	4.58	0.040	0.28	3.33	0.059	0.0126	<0.004	0.074	0.004	7.73	7.56	10.6	33.8
PFM000087	8457	0.5	2004-05-04	–0.4	7.3	2.61	61.5	3.9	202	8.3	11.4	4.00	0.029	0.28	2.76			<0.004	0.080	0.003	7.74	7.69	14.2	36.4
PFM000087	8489	0.5	2004-05-18	6.2	8.1	2.85	62.8	4.4	179	9.0	11.3	4.24	0.051	0.28	1.85			<0.004	0.085	0.003	8.02	8.05	14.4	36.3
PFM000087	8512	0.5	2004-06-02	6.9	8.8	2.69	56.8	4.5	161	9.8	10.8	3.95	0.046	0.29	1.34			<0.004	0.083	0.005	8.04	7.93	16.5	38.8
PFM000087	8534	0.5	2004-06-15	2.5	9.6	2.71	51.3	4.8	167	10.1	10.2	3.74	0.057	0.29	1.01			0.004	0.084	0.008	8.18	8.18	18.2	33.3
PFM000097	8363	0.5	2004-03-16	–1.9	210	9.60	127	25.8	279	433	71.6	25.0			6.31			0.006	0.272	0.008	7.20	7.07	5.3	187
PFM000097	8371	0.5	2004-04-05	1.4	25.2	2.48	43.4	5.0	126	45.1	13.4	4.66	0.210		2.97			<0.004	0.076	0.005	7.31	6.96	6.5	36.7
PFM000097	8410	0.5	2004-04-20	–0.6	25.1	2.46	48.3	5.4	135	53.9	15.0	4.93	0.190	0.24	1.94	0.082	0.0099	<0.004	0.098	0.005	8.00	6.99	11.5	41.5
PFM000097	8454	0.5	2004-05-05	–0.5	21.6	2.28	45.4	5.0	135	42.5	12.9	4.56	0.103	0.21	0.85			<0.004	0.092	0.003	7.95	7.11	13.8	37.8

Idcode	Sample no	Depth m	Sampling date	RCB %	Na mg/L	K mg/L	Ca mg/L	Mg mg/L	HCO_3^- mg/L	Cl^- mg/L	SO_4^{2-} mg/L	SO_4-S mg/L	Br mg/l	F^- mg/L	Si mg/L	Fe mg/L	Mn mg/L	Li mg/L	Sr mg/L	I^- mg/L	pH_L	pH_F	Temp_F °C	EC mS/m
PFM000097	8475	0.5	2004-05-18	2.8	30.4	2.67	35.4	6.1	92.4	56.9	14.9	5.27	0.230	0.23	0.09			<0.004	0.088	0.005	8.54	8.67	13.9	37.9
PFM000097	8514	0.5	2004-06-02	1.3	34.3	2.77	38.3	6.5	94.4	70.7	16.1	5.60	0.250	0.22	0.05			<0.004	0.106	0.005	8.62	8.45	16.0	44.0
PFM000097	8535	0.5	2004-06-15	0.8	41.0	3.18	31.5	7.3	69.4	86.0	17.9	6.25	0.190	0.24	<0.03			<0.004	0.107	0.011	8.90	8.84	17.0	52.3
PFM000107	8342	0.5	2004-03-15	1.1	14.5	3.00	67.4	5.1	208	22.7	15.4	5.39	0.130	<0.2	5.21			<0.004	0.094	0.012	7.26	7.06	3.5	43.5
PFM000107	8349	1.0	2004-03-15	1.8	16.8	3.08	69.4	5.2	207	28.6	15.7	5.45	0.131	<0.2	4.86			<0.004	0.097	0.011	7.24	7.07	4.0	45.7
PFM000107	8381	0.5	2004-04-04	0.7	11.7	2.26	50.8	3.8	155	20.6	11.7	3.76	0.094	0.24	3.73			<0.004	0.072	0.002	7.05	7.07	6.6	32.8
PFM000107	8382	1.0	2004-04-04	1.1	19.5	3.43	64.6	5.7	199	32.8	16.3	5.30	0.145	0.29	4.59			<0.004	0.097	0.002	7.02	7.00	6.3	43.5
PFM000107	8409	0.5	2004-04-20	–1.4	17.4	2.28	46.5	4.4	137	37.9	13.0	4.25	0.130	0.22	2.13	0.096	0.0096	<0.004	0.084	0.005	8.04	8.04	10.8	34.9
PFM000107	8449	0.5	2004-05-03	0.0	17.1	2.17	45.2	4.3	135	32.5	11.9	4.33	0.130	0.20	1.23			<0.004	0.084	0.004	8.42	8.51	14.8	36.8
PFM000107	8477	0.5	2004-05-17	4.4	17.5	2.33	44.7	4.5	117	32.9	12.4	4.42	0.140	0.23	0.43			<0.004	0.084	0.004	8.57	8.72	15.3	34.3
PFM000107	8503	0.5	2004-06-01	–0.2	19.0	2.25	40.6	4.7	119	37.9	12.5	4.48	0.170	0.21	0.18			<0.004	0.084	0.006	8.78	8.95	17.8	34.7
PFM000107	8525	0.5	2004-06-14	2.1	22.2	2.40	39.4	5.2	106	43.4	13.7	4.89	0.170	0.25	0.13			<0.004	0.091	0.014	8.81	9.02	18.4	39.8
PFM000107	8546	0.5	2004-07-05	2.2	23.3	2.09	33.1	5.2	88.2	44.4	13.8	4.80	0.172	0.25	0.18	0.052	0.0036	<0.004	0.088	0.006	8.83	9.00	19.2	37.3
PFM000107	8612	0.5	2004-08-15	–1.0	27.7	2.58	29.9	5.5	88.5	52.7	15.2	5.27	0.156	0.25	0.42			<0.004	0.083	0.005	8.99	8.99	20.5	30.0
PFM000107	8631	0.5	2004-09-13	–0.8	27.7	2.71	31.5	5.7	88.6	55.5	15.3	5.40	0.183	0.24	0.12			<0.004	0.088	0.004	8.74	8.86	15.2	35.0
PFM000107	8654	0.5	2004-10-11	–2.0	27.7	3.02	33.8	5.8	96.1	54.8	14.2	7.21	0.255	0.21	0.08	0.038	<0.003	<0.004	0.089	0.009	8.28	8.42	6.9	37.2
PFM000107	8723	0.5	2004-11-09	1.7	27.3	2.97	38.0	5.8	109	50.3	12.9	4.86	0.200	0.20	<0.03			<0.004	0.091	0.007	8.11	8.19	4.2	37.4
PFM000107	8732	0.5	2004-12-06	1.7	28.1	3.05	42.9	6.2	125	51.1	13.0	4.98	0.190	0.21	0.31			<0.004	0.098	0.004	7.69	7.54	2.1	45.2
PFM000107	8738	1.0	2004-12-06	1.3	26.1	2.99	48.4	6.1	145	48.1	11.7	4.39	0.180	0.25	1.11			<0.004	0.102	0.005	7.49	7.43	3.2	42.4
PFM000107	8751	0.5	2005-01-17	1.8	17.4	2.86	61.3	5.5	183	29.3	15.1	5.76	<0.2	0.20	4.50	0.158	0.0411	<0.004	0.099	0.011	7.10	7.02	2.3	42.7
PFM000107	8754	1.0	2005-01-17	22.0	354	15.5	67.9	41.8	153	347	91.8	34.6	<0.2	<0.2	2.88	0.156	0.0722	0.005	0.321	0.012	7.07	6.82	2.3	240
PFM000107	8800	0.5	2005-02-14	–0.2	36.1	3.55	66.4	7.0	197	66.4	21.0	7.47	0.226	0.20	4.96			<0.004	0.104	0.006	7.07	7.15	2.7	57.6
PFM000107	8801	1.0	2005-02-14	18.0	319	14.1	63.7	37.9	156	348	86.6	30.2	1.93		2.49			0.006	0.282	0.006	7.02	6.84	3.8	238
PFM000107	8829	0.5	2005-03-14	–0.9	48.2	3.99	70.0	9.1	208	94.6	22.0	7.41	0.336	0.21	5.52			<0.004	0.120	0.007	6.95	7.15	2.0	65.9
PFM000107	8830	1.0	2005-03-14	–1.5	422	17.9	71.7	50	166	785	112	38.7	2.62	0.38	2.77	0.206	0.098	0.006	0.353	0.006	6.92	6.70	4.2	287.0
PFM000107	8868	0.5	2005-04-11	24.3	133	6.72	54.2	17.9	137	107	39.4	14.2	1.01	0.29	2.73	0.136	0.0355	0.004	0.152	0.007	7.80	7.92	7.4	114
PFM000107	8882	0.5	2005-05-09	–0.6	96.4	5.27	50.7	13.8	133	185	32.5	10.9	1.35	<0.2	0.57			<0.004	0.124		8.40	8.61	11.6	88.0
PFM000107	8921	0.5	2005-06-13	–0.3	93.2	5.21	44.1	12.9	113	178	27.1	9.89	0.698	<0.2	0.18	0.03	0.0032	<0.004	0.119	0.006	8.67	8.72	17.1	82
PFM000117	8353	0.5	2004-03-16	0.9	7.2	2.38	57.0	3.3	182	7.3	11.2	3.87	0.046	<0.2	3.34			<0.004	0.063	0.010	7.34	7.31	2.3	33.7
PFM000117	8352	1.5	2004-03-16	0.5	6.9	2.18	60.6	3.1	194	7.0	10.4	3.65	0.043	<0.2	3.59			<0.004	0.062	0.009	7.41	7.37	3.9	35.3
PFM000117	8380	0.5	2004-04-04	1.8	6.1	2.04	53.4	2.9	165	6.6	9.8	3.33	0.045	0.21	3.24			<0.004	0.056	0.005	7.25	7.18	6.5	29.5
PFM000117	8379	1.5	2004-04-04	1.4	7.2	2.17	61.3	3.3	192	7.6	10.7	3.59	0.051	0.24	3.61			<0.004	0.064	0.006	7.26	7.16	6.4	34.3
PFM000117	8407	0.5	2004-04-20	1.1	5.7	1.86	48.3	2.6	153	6.0	8.3	2.84	0.046	<0.2	2.21	0.046	0.0287	<0.004	0.052	0.008	7.97	8.01	10.2	27.3
PFM000117	8456	0.5	2004-05-04	1.0	5.5	1.69	46.9	2.6	150	5.3	7.3	2.71	0.013	<0.2	1.26			<0.004	0.051	0.006	8.18	8.31	13.6	26.9
PFM000117	8492	0.5	2004-05-17	6.7	5.8	1.87	46.1	2.7	131	5.2	7.1	2.79	0.032	<0.2	0.55			<0.004	0.051	0.004	8.39	8.46	15.8	26.2
PFM000117	8510	0.5	2004-06-01	1.9	5.8	1.74	42.3	2.6	135	5.3	6.9	2.64	0.039	<0.2	0.10			<0.004	0.050	0.006	8.59	8.62	16.9	24.7
PFM000117	8533	0.5	2004-06-14	5.6	6.0	1.99	41.5	2.8	123	5.4	6.9	2.70	0.033	<0.2	0.14			0.004	0.052	0.005	8.52	8.61	18.4	24.0

Idcode	Sample no	Depth m	Sampling date	RCB %	Na mg/L	K mg/L	Ca mg/L	Mg mg/L	HCO_3^- mg/L	Cl^- mg/L	SO_4^{2-} mg/L	SO_4-S mg/L	Br mg/l	F^- mg/L	Si mg/L	Fe mg/L	Mn mg/L	Li mg/L	Sr mg/L	I^- mg/L	pH_L	pH_F	Temp_F °C	EC mS/m
PFM000117	8549	0.5	2004-07-05	3.9	5.9	1.52	34.7	2.6	107	5.6	6.9	2.57	0.032	<0.2	0.36	0.008	0.0012	<0.004	0.048	0.006	8.46	8.73	19.9	24.0
PFM000117	8608	0.5	2004-08-16	0.7	6.8	1.53	26.8	2.6	93.5	5.8	6.9	2.67	0.041	<0.2	1.17			<0.004	0.044	0.005	8.72	8.77	20.4	16.0
PFM000117	8628	0.5	2004-09-13	4.2	6.7	1.92	28.7	2.7	90.7	6.1	7.0	2.63	0.038	0.21	1.25			<0.004	0.046	0.008	8.67	8.82	15.3	18.3
PFM000117	8657	0.5	2004-10-12	3.4	6.5	1.86	30.1	2.7	95.5	5.8	6.4	3.05	0.076	<0.2	1.06		<0.003	<0.004	0.048	0.009	8.45	8.61	6.6	20.1
PFM000117	8726	0.5	2004-11-09	4.5	6.9	1.90	33.8	2.7	107	5.6	6.1	2.41	0.042	<0.2	0.93			<0.004	0.048	0.005	8.14	8.36	4.2	28.5
PFM000117	8731	0.5	2004-12-07	4.6	7.2	2.09	37.9	2.9	118	6.1	6.4	2.65	0.043		1.08			<0.004	0.052		8.01	8.03	1.8	23.1
PFM000117	8733	1.5	2004-12-07	3.1	7.0	2.14	44.5	2.9	141	6.0	6.3	2.65	0.038	<0.2	1.56			<0.004	0.056	0.005	7.59	7.57	3.1	26.4
PFM000117	8752	0.5	2005-01-17	2.2	7.1	2.26	43.6	3.2	141	6.6	7.3	2.95	<0.2	<0.2	1.85	0.013	0.0074	<0.004	0.056	0.011	7.68	7.53	2.3	27.7
PFM000117	8750	1.5	2005-01-17	2.8	6.3	2.28	56.4	3.1	173	6.3	8.1	3.24	<0.2	0.20	3.38	0.049	0.0789	0.001	0.060	0.010	7.43	7.38	3.9	32.3
PFM000117	8798	0.5	2005-02-15	1.2	7.1	2.28	51.1	3.2	167	6.4	7.4	2.95	0.036	<0.2	2.50			<0.004	0.059	0.004	7.39	7.41	3.3	33.9
PFM000117	8795	1.5	2005-02-15	1.5	7.1	2.34	55.3	3.2	179	6.2	7.3	2.93	0.035	<0.2	2.77			<0.004	0.061	0.004	7.34	7.34	4.7	32.2
PFM000117	8835	0.5	2005-03-15	2.1	7.3	2.30	54.2	3.4	173	6.6	7.9	3.07	0.038	0.21	3.07			<0.004	0.061	0.005	7.29	7.27	2.0	31.3
PFM000117	8839	1.5	2005-03-15	1.5	6.9	2.37	65	3.4	206	7.9	8.1	2.88	0.034		3.85	0.0841	0.167	<0.004	0.066	0.004	7.31	7.22	4.6	35.7
PFM000117	8867	0.5	2005-04-12	5.0	5.6	1.92	52.5	3.0	155	5.4	6.1	2.48	0.034	0.21	2.67	0.042	0.0475	0.001	0.053	0.006	7.81	7.85	6.4	28.0
PFM000117	8883	0.5	2005-05-10	6.2	5.8	1.74	47.1	2.9	136	6.0	5.7	2.27	<0.2	0.21	0.85			<0.004	0.050			8.52	11.2	
PFM000117	8924	0.5	2005-06-14	6.5	5.7	1.69	36.7	2.8	110	4.8	4.81	2.08	0.045	<0.2	0.27	<0.02	0.0032	<0.004	0.046	0.006	8.50	8.60	17.1	21.4
PFM000135	8360	0.5	2004-03-17	–0.3	33.4	5.39	83.4	9.2	276	48.6	31.1	10.4	0.240	<0.2	3.89			0.005	0.147	0.026	7.37	7.3	1.9	65.2
PFM000135	8361	1.0	2004-03-17	–0.1	34.1	5.60	91.9	9.8	301	49.7	33.4	10.9	0.250	0.23	4.96			0.006	0.157	0.008	7.38	7.11	2.3	67.3
PFM000135	8402	0.5	2004-04-21	–0.4	17.5	3.04	44.2	5.2	146	26.6	17.2	5.53	0.120	0.21	0.36	0.043	0.0040	0.003	0.082	0.010	8.03	8.17	10.8	34.0
PFM000135	8481	0.5	2004-05-18	3.9	20.2	3.27	34.6	5.8	108	27.9	16.3	5.70	0.150	0.21	0.12			0.004	0.081	0.010	8.56	8.71	15.4	31.2
PFM000135	8526	0.5	2004-06-14	1.9	22.7	3.51	30.7	6.2	104	32.1	17.2	6.13	0.170	0.23	0.30			0.006	0.082	0.026	8.89	9.03	19.3	35.3
PFM000135	8548	0.5	2004-07-06	0.9	23.5	3.20	24.3	5.9	84.7	34.0	18.0	6.35	0.150	0.21	0.68	0.036	0.0036	0.005	0.073	0.012	9.06	9.18	18.5	30.3
PFM000135	8603	0.5	2004-08-16		28.8	3.60	21.1	6.1		39.7	19.9	7.00	0.146	0.24	1.91			<0.004	0.070	0.009		9.28	19.1	
PFM000135	8627	0.5	2004-09-13	–0.4	28.9	3.33	22.3	6.2	83.3	42.2	18.9	6.76	0.155	0.24	0.46			<0.004	0.072	0.005	9.16	9.33	15.7	31.2
PFM000135	8656	0.5	2004-10-11	–1.1	29.3	3.86	24.8	6.2	93.0	41.2	16.1	5.77	0.206	<0.2	0.07	0.038	<0.003	<0.004	0.075	0.011	8.75	8.98	6.6	32.5
PFM000135	8724	0.5	2004-11-08	1.2	27.9	3.67	30.5	6.3	111	39.2	14.5	5.45	0.184	<0.2	<0.03			<0.004	0.079	0.009	8.25	8.6	3.5	34.2
PFM000135	8735	0.5	2004-12-06	1.3	31.4	4.15	44.4	7.4	157	44.2	15.4	5.89	0.190	<0.2	0.08			<0.004	0.101	0.011	7.59	7.66	2.0	43.1
PFM000135	8740	1.0	2004-12-06	0.6	30.6	4.08	43.8	7.2	157	43.9	14.7	5.44	0.200	0.23	0.13			<0.004	0.100	0.012	7.40	7.49	3.1	43.1
PFM005865	8616	0.0	2004-08-20	–1.0	1520	55.9	74.4	183	80.1	2790	413	127	8.82		0.26			0.030	1.10	0.010	8.12			919
PFM005865	8617	20.0	2004-08-20	–0.7	1560	57.9	77.0	189	82.4	2850	423	131	9.18		0.45			0.030	1.14	0.011	7.72			940
PFM005865	8618	55.0	2004-08-20	–0.4	1600	59.1	78.8	193	83.9	2900	431	135	9.44		0.50			0.029	1.16	0.011	7.61			956

RCB = Relative Charge Balance error
pH_L = lab. pH
pH_F = field pH
Temp_F = water temperature in the field
EC = Electrical Conductivity
< ”value” = below detection limit

Table A5-2. Surface water suppliments.

Idcode	Sample no	Sampling date	Depth m	NH_4_N mg/L	NO_2_N mg/L	NO_2_N+ NO_3_N mg/L	N tot mg/L	P tot mg/L	PO4_P mg/L	POP mg/L	PON mg/L	SiO_2_Si mg/L	Chl. A µg/L	Chl. C µg/L	Pheop. µg/L	POC mg/L	TOC mg/L	DOC mg/L	DIC mg/L	O_2 mg/L	Abs. Coeff.
PFM000062	8386	2004-04-06	0.5	0.0025		0.0344	0.256	0.0080	<0.0005	0.0049	0.0331	0.472	1.4	0.2	0.7	0.223	3.7	3.7	13.9		
PFM000062	8387	2004-04-06	3.0	0.0025		0.0318	0.249	0.0085	<0.0005	0.0048	0.0331	0.469	1.2	<0.2	1.3	0.216	3.7	3.7	13.6		
PFM000062	8399	2004-04-19	0.5	0.0014	0.0006	0.0023	0.231	0.0072	0.0007	0.0053	0.0505	0.289	3.0	<0.2	0.5	0.369	4.0	3.9	14.0		
PFM000062	8452	2004-05-03	0.5	0.0010		0.0064	0.252	0.0084	0.0005	0.0092	0.0506	0.359	3.6	0.6	1.4	0.387	3.8	3.6	14.6		
PFM000062	8488	2004-05-17	0.5	0.0015		0.0018	0.240	0.0089	0.0003	0.0051	0.0325	0.157	1.3	0.2	0.6	0.327	3.7	3.6	13.4		
PFM000062	8508	2004-06-01	0.5	0.0007		0.0004	0.245	0.0111	<0.0005	0.0058	0.0379	0.169	2.1	0.2	0.7	0.271	4.1	4.0	12.2		
PFM000062	8529	2004-06-14	0.5	0.0009		0.0004	0.276	0.0151	0.0003	0.0082	0.0520	0.194	1.7	0.2	0.6	0.339	3.9	3.9	13.4		
PFM000062	8547	2004-07-05	0.5	0.0006	0.0002	0.0004	0.250	0.0101	0.0007	0.0054	0.0382	0.321	1.4	0.2	0.3	0.244	3.8	3.7	14.0		
PFM000062	8610	2004-08-16	0.5	0.0011		0.0005	0.243	0.0104	0.0006	0.0059	0.0554	0.271	2.0	0.2	0.2	0.279	3.6	3.6	13.3		
PFM000062	8629	2004-09-13	0.5	0.0010		0.0005	0.228	0.0083	0.0006	0.0049	0.0366	0.420	1.3	<0.2	0.4	0.197	4.6	4.9	14.2		0.009
PFM000062	8658	2004-10-11	0.5	0.0010	0.0004	0.0019	0.244	0.0114	0.0008	0.0057	0.0412	0.462	2.8	0.3	0.5	0.239	3.9	3.7	14.4		0.005
PFM000062	8720	2004-11-08	0.5	0.0028		0.0071	0.245	0.0092	0.0007	0.0051	0.0381	0.489	2.8	0.4	0.6	0.259	3.7	3.4	14.1		
PFM000062	8742	2004-12-07	0.5	0.0017		0.0359	0.244	0.0099	0.0032	0.0037	0.0227	0.645	1.5	0.2	0.4	0.163	3.8	3.7	15.1		0.260
PFM000062	8755	2005-01-18	0.5	0.0037	0.0016	0.0748	0.280	0.0108	0.0057	0.0029	0.0167	0.756	1.1	0.2	0.2	0.125	3.8	3.6	14.5		0.300
PFM000062	8792	2005-02-14	0.5	0.0016		0.0843	0.336	0.0132	0.0061	0.0052	0.0300	0.796	1.4	0.2	0.2	0.230	3.7	3.7	13.4		2.80
PFM000062	8869	2005-04-11	0.5	0.0041	0.0024	0.0117	0.266	0.0135	0.0017	0.0090	0.0364	0.514	3.9	0.4	<0.2	0.217	3.7	3.6	15.0		0.440
PFM000062	8881	2005-05-09	0.5	0.0014		0.0006	0.227	0.0094	0.0005	0.0053	0.0316	0.180	1.4	<0.2	<0.2	0.261	4.3	4.0	13.2		0.220
PFM000062	8920	2005-06-13	0.5	0.0009		0.0004	0.230	0.0106	0.0003	0.0059	0.0326	0.14	1.3	<0.2	0.8	0.233	3.8	3.8	13.1		0.220
PFM000063	8343	2004-03-15	0.5	0.0287		0.365	0.927	0.0160	0.0020	0.0090	0.0473	2.55	1.6	0.4	0.9	0.342	10.7	10.9	19.2		
PFM000063	8347	2004-03-15	4.0	0.0953		0.105	0.519	0.0144	0.0011	0.0080	0.0482	1.53	3.4	0.7	1.1	0.319	4.6	4.6	16.3		
PFM000063	8372	2004-04-04	0.5	0.0077		0.0508	0.355	0.0118	0.0007	0.0077	0.0577	0.665	2.1	0.3	0.9	0.378	4.9	4.8	14.9		
PFM000063	8370	2004-04-04	4.0	0.0268		0.0423	0.422	0.0234	0.0010	0.0143	0.127	1.10	5.8	1.1	2.6	0.942	4.3	4.2	14.3		
PFM000063	8404	2004-04-19	0.5	0.0010	0.0004	0.0008	0.259	0.0109	0.0007	0.0077	0.0450	0.294	1.8	<0.2	0.2	0.322	4.3	4.3	13.5		
PFM000063	8446	2004-05-03	0.5	0.0012		0.0007	0.328	0.0181	0.0006	0.0130	0.100	0.265	4.7	0.6	1.3	0.753	4.3	4.2	14.3		
PFM000063	8479	2004-05-17	0.5	0.0017		0.0019	0.303	0.0147	0.0006	0.0087	0.0567	0.210	1.3	0.2	0.7	0.428	4.2	4.0	13.7		
PFM000063	8507	2004-06-01	0.5	0.0013		0.0016	0.263	0.0105	0.0006	0.0054	0.0436	0.157	1.7	<0.2	0.7	0.312	4.1	4.1	12.7		
PFM000063	8527	2004-06-14	0.5	0.0012		0.0005	0.303	0.0142	0.0007	0.0109	0.0620	0.262	1.5	<0.2	0.5	0.366	4.2	4.2	13.4		
PFM000064	8344	2004-03-15	0.5	0.0753		0.560	1.58	0.0275	0.0018	0.0184	0.180	4.63	15.9	4.4	0.9	1.18	17.1	16.6	27.2		
PFM000064	8348	2004-03-15	1.0	0.0611		0.213	0.683	0.0135	0.0010	0.0088	0.0574	1.90	6.3	1.2	1.1	0.373	7.1	7.0	18.3		
PFM000064	8369	2004-04-05	0.5	0.0032		0.606	1.33	0.0413	0.0035	0.0264	0.317	2.63	18.7	6.1	<0.2	2.04	10.7	10.5	15.1		
PFM000064	8400	2004-04-19	0.5	0.0086	0.0036	0.174	0.803	0.0337	0.0027	0.0462	0.289	1.28	11.5	0.2	1.7	2.17	8.8	8.7	14.9		
PFM000064	8445	2004-05-03	0.5	0.0069		0.0571	0.708	0.0339	0.0039	0.0361	0.288	0.919	10.4	1.5	3.9	1.89	8.6	8.3	17.0		

Idcode	Sample no	Sampling date	Depth m	NH_4_N mg/L	NO_2_N mg/L	NO_2_N+ NO_3_N mg/L	N tot mg/L	P tot mg/L	PO4_P mg/L	POP mg/L	PON mg/L	SiO_2_Si mg/L	Chl. A µg/L	Chl. C µg/L	Pheop. µg/L	POC mg/L	TOC mg/L	DOC mg/L	DIC mg/L	O_2 mg/L	Abs. Coeff.
PFM000064	8484	2004-05-17	0.5	0.0015		0.0006	0.499	0.0319	0.0008	0.0196	0.128	0.274	3.7	0.4	1.3	0.962	5.7	5.4	14.3		
PFM000064	8504	2004-06-01	0.5	0.0023		0.0008	0.438	0.0254	0.0017	0.0174	0.109	0.200	2.2	<0.2	0.9	0.615	5.5	5.4	13.6		
PFM000064	8523	2004-06-14	0.5	0.0015		0.0006	0.476	0.0287	0.0009	0.0165	0.119	0.205	2.4	0.2	1.1	0.632	5.2	5.0	14.1		
PFM000065	8350	2004-03-15	0.5	0.0373		0.319	1.21	0.0160	0.0015	0.0075	0.0431	3.87				0.285	19.3	19.9	22.4		
PFM000065	8403	2004-04-19	0.5	0.0058	0.0036	0.251	0.918	0.0357	0.0013	0.0187	0.121	1.81	24.4	<0.2	3.0	0.965	9.7	9.1	16.0		
PFM000065	8453	2004-05-03	0.5	0.0025		0.0013	0.523	0.0306	0.0021	0.0246	0.164	0.279	15.1	2.0	7.8	1.12	6.4	5.8	15.1		
PFM000065	8482	2004-05-17	0.5	0.0019		0.0013	0.523	0.0277	0.0008	0.0164	0.119	0.506	4.4	0.5	2.0	1.01	7.2	6.9	15.2		
PFM000065	8502	2004-06-01	0.5	0.0024		0.0017	0.419	0.0222	0.0012	0.0111	0.0742	0.216	2.2	0.2	0.4	0.477	5.8	5.7	13.4		
PFM000065	8531	2004-06-14	0.5	0.0016		0.0006	0.352	0.0209	0.0011	0.0120	0.0733	0.238	2.8	0.2	1.0	0.456	4.9	5.0	14.0		
PFM000066	8357	2004-03-16	0.1	0.0107		0.0064	0.718	0.0106	0.0008	0.0050	0.0328	5.80				0.203	16.4	16.4	46.4		
PFM000066	8327	2004-04-05	0.1	0.0055		0.0105	0.531	0.0076	0.0005	0.0036	0.0322	3.76				0.253	12.6	11.9	29.1		
PFM000066	8406	2004-04-19	0.1	0.0088	0.0003	0.0020	0.562	0.0071	0.0006	0.0029	0.0224	3.37				0.146	13.6	13.5	30.2		
PFM000066	8444	2004-05-04	0.1	0.0198		0.0025	0.662	0.0069	0.0012	0.0030	0.0249	2.90				0.152	14.8	14.5	31.4		
PFM000066	8480	2004-05-17	0.1	0.0116		0.0029	0.713	0.0081	0.0008	0.0046	0.0264	2.34				0.264	16.3	15.7	33.2		
PFM000066	8513	2004-06-01	0.1	0.0071		0.0019	0.706	0.0078	0.0007	0.0040	0.0247	2.02				0.192	16.0	16.1	30.1		
PFM000066	8532	2004-06-14	0.1	0.0066		0.0028	0.773	0.0096	0.0012	0.0064	0.0380	1.67				0.242	17.0	16.9	29.0		
PFM000066	8543	2004-07-06	0.1	0.0146	0.0004	0.0083	0.795	0.0087	0.0012	0.0049	0.0274	1.48				0.199	16.7	16.6	27.4		
PFM000066	8652	2004-10-12	0.1	0.0019	0.0003	0.0017	0.700	0.0072	0.0008	0.0042	0.0268	2.81				0.180	16.1	16.2	28.0		0.097
PFM000066	8718	2004-11-08	0.1	0.0064		0.0054	0.775	0.0185	0.0012	0.0060	0.0382	4.23				0.413	15.2	14.7	33.4		
PFM000066	8734	2004-12-06	0.1	0.0069		0.0327	0.754	0.0096	0.0010	0.0053	0.0328	3.95				0.218	16.0	16.0	32.0		2.12
PFM000066	8760	2005-01-17	0.1	0.0153	0.0009	0.0171	0.695	0.0062	0.0008	0.0023	0.0185	4.74				0.127	17.0	17.1	35.7		2.40
PFM000066	8796	2005-02-14	0.1	0.0097		0.0054	0.715	0.0064	<0.0005	0.0030	0.0209	5.58				0.132	18.2	17.9	42.4		25.0
PFM000066	8836	2005-03-15	0.1	0.0473		0.0012	0.790	0.0112	0.0015	0.0063	0.0397	6.07				0.257	18.5	18.9	48.5	0.5	2.86
PFM000066	8871	2005-04-11	0.3	0.0046	0.0003	0.0024	0.531	0.0094	0.0011	0.0034	0.0230	3.70				0.117	12.6	12.3	29.4		1.92
PFM000066	8880	2005-05-09	0.1	0.0085		0.0037	0.642	0.0070	0.0007	0.0034	0.0315	3.45				0.317	14.5	13.7	34.9		2.26
PFM000066	8922	2005-06-13	0.1	0.0067		0.0017	0.783	0.0128	0.0009	0.0057	0.0371	2.86				0.273	16.9	16.5	29.0		2.96
PFM000067	8362	2004-03-16	0.05	0.0466		0.0235	1.18	0.0116	0.0011	0.0042	0.0333	4.93				0.254	24.9	25.0	37.6	3.7	
PFM000067	8375	2004-04-05	0.05	0.0164		0.0139	0.737	0.0090	0.0005	0.0041	0.0445	2.95				0.285	15.9	15.9	24.8		
PFM000067	8398	2004-04-20	0.05	0.0074	0.0003	0.0012	0.769	0.0140	<0.0005	0.0063	0.0673	1.98				0.453	16.5	16.3	22.1		
PFM000067	8455	2004-05-05	0.05	0.0214		0.0019	0.815	0.0132	0.0015	0.0086	0.142	1.01				1.390	15.4	15.4	22.0		
PFM000067	8493	2004-05-18	0.05	0.0164		0.0042	0.858	0.0143	0.0010	0.0094	0.0759	0.330				0.616	16.4	16.3	18.3		
PFM000067	8515	2004-06-02	0.05	0.0097		0.0010	0.825	0.0132	0.0006	0.0063	0.0549	0.152				0.424	16.0	15.7	18.9		
PFM000067	8536	2004-06-15	0.05	0.0136		0.0056	0.927	0.0126	0.0017	0.0060	0.0479	0.195				0.320	16.1	16.1	17.6		
PFM000068	8345	2004-03-15	0.5	0.0854		0.0887	1.22	0.0130	0.0007	0.0064	0.0533	6.13				0.443	25.2	23.8	39.9		

Idcode	Sample no	Sampling date	Depth m	NH_4_N mg/L	NO_2_N mg/L	NO_2_N+ NO_3_N mg/L	N tot mg/L	P tot mg/L	PO4_P mg/L	POP mg/L	PON mg/L	SiO_2_Si mg/L	Chl. A µg/L	Chl. C µg/L	Pheop. µg/L	POC mg/L	TOC mg/L	DOC mg/L	DIC mg/L	O_2 mg/L	Abs. Coeff.
PFM000068	8378	2004-04-05	0.5	0.0112		0.0342	0.697	0.0088	0.0007	0.0045	0.0277	3.57				0.178	16.0	16.5	24.2		
PFM000068	8428	2004-04-21	0.5	0.0282	0.0011	0.0266	0.782	0.0110	0.0016	0.0058	0.0375	3.44				0.313	16.4	16.5	26.3		
PFM000068	8450	2004-05-04	0.5	0.0317		0.0087	0.850	0.0110	0.0012	0.0062	0.0462	3.53				0.368	17.8	17.9	27.8		
PFM000068	8483	2004-05-18	0.5	0.0208		0.0108	0.843	0.0110	0.0011	0.0049	0.0310	4.62				0.340	18.7	19.0	28.1		
PFM000068	8516	2004-06-02	0.5	0.0100		0.0052	0.807	0.0095	0.0011	0.0042	0.0328	4.47				0.281	18.4	18.3	31.1		
PFM000068	8538	2004-06-15	0.5	0.0125		0.0069	0.823	0.0095	0.0015	0.0042	0.0273	5.14				0.195	19.5	19.2	30.3		
PFM000068	8542	2004-07-06	0.5	0.0248	0.0011	0.0156	0.910	0.0135	0.0017	0.0070	0.0462	3.61				0.412	20.0	19.1	29.0		
PFM000068	8607	2004-08-15	0.5	0.0223		0.0381	0.928	0.0122	0.0028	0.0031	0.0277	3.48				0.167	19.2	14.0	27.7		
PFM000068	8630	2004-09-13	0.5	0.0137		0.0760	0.981	0.0140	0.0020	0.0041	0.0315	4.98				0.243	19.4	19.1	35.7		0.189
PFM000068	8650	2004-10-11	0.5	0.0033	0.0018	0.0157	0.912	0.0150	<0.0005	0.0059	0.0398	4.88				0.320	20.2	20.0	29.6		0.173
PFM000068	8721	2004-11-08	0.5	0.0186		0.0222	0.889	0.0115	0.0012	0.0048	0.0285	4.86				0.244	18.4	18.3	30.3		
PFM000068	8737	2004-12-06	0.5	0.0181		0.148	1.17	0.0200	0.0020	0.0101	0.0623	4.71				0.487	23.9	23.5	25.5		4.68
PFM000068	8757	2005-01-17	0.5	0.0263	0.0031	0.0822	0.952	0.0094	0.0012	0.0029	0.0176	4.34				0.135	20.9	20.1	26.2		3.34
PFM000068	8794	2005-02-14	0.5	0.0501		0.0586	1.05	0.0093	0.0007	0.0043	0.0340	5.00				0.240	22.9	23.1	35.8		31.4
PFM000068	8827	2005-03-14	0.5	0.0890		0.0798	1.06	0.0119	0.0017	0.0059	0.0429	5.82				0.320	21.4	21.5	41.2		3.04
PFM000068	8874	2005-04-12	0.4	0.0102	0.0008	0.0329	0.695	0.0132	0.0009	0.0056	0.0400	3.29				0.322	14.7	14.2	24.1		2.26
PFM000068	8885	2005-05-09	0.3	0.0145		0.0110	0.819	0.0135	0.0011	0.0066	0.0442	3.33				0.377	17.7	17.8	29.4		2.78
PFM000068	8925	2005-06-13	0.1	0.0102		0.0207	0.979	0.0182	0.0020	0.0078	0.0493	3.33				0.379	22.1	21.7	25.9		4.50
PFM000069	8366	2004-03-17	0.05	0.0116		0.0023	0.985	0.0150	0.0017	0.0066	0.0413	8.00				0.272	27.3	28.1	47.6	1.6	
PFM000069	8374	2004-04-05	0.05	0.0041		0.0071	0.605	0.0125	0.0008	0.0058	0.0415	4.37				0.285	15.3	15.0	29.5	2.2	
PFM000069	8391	2004-04-21	0.05	0.0158	0.0006	0.0089	0.610	0.0117	0.0017	0.0056	0.0414	3.98				0.239	14.1	14.2	25.7	3.1	
PFM000069	8443	2004-05-04	0.05	0.0136		0.0026	0.697	0.0104	0.0012	0.0036	0.0247	4.74				0.141	15.9	15.7	30.3	3.3	
PFM000069	8476	2004-05-18	0.05	0.0056		0.0012	0.750	0.0102	0.0009	0.0043	0.0258	5.40				0.253	17.3	17.6	29.6		
PFM000069	8478	2004-06-02	0.05	0.0044		0.0033	0.777	0.0104	0.0009	0.0037	0.0272	5.21				0.187	17.4	17.1	30.1		
PFM000069	8539	2004-06-15	0.05	0.0050		0.0015	0.803	0.0095	0.0014	0.0035	0.0240	5.24				0.161	18.7	18.7	30.6		
PFM000069	8541	2004-07-06	0.01	0.0050	0.0003	0.0047	0.823	0.0097	0.0012	0.0032	0.0236	4.02				0.168	18.6	18.1	30.4		
PFM000069	8611	2004-08-16	0.05	0.0143		0.0340	0.937	0.0138	0.0033	0.0028	0.0273	3.81				0.154	19.2	19.3	30.0		
PFM000069	8634	2004-09-13	0.05	0.0290		0.0808	1.03	0.0218	0.0073	0.0046	0.0330	4.94				0.245	19.2	18.7	36.1		0.184
PFM000069	8651	2004-10-11	0.05	0.0204	0.0025	0.0175	0.926	0.0164	0.0018	0.0043	0.0429	5.58				0.356	19.0	18.8	31.6		0.146
PFM000069	8722	2004-11-08	0.05	0.0209		0.0060	0.860	0.0140	0.0021	0.0040	0.0280	6.01				0.259	18.3	18.4	33.6		
PFM000069	8739	2004-12-06	0.05	0.0193		0.0384	0.883	0.0191	0.0037	0.0078	0.0378	6.83				0.258	18.6	18.2	36.5		3.18
PFM000069	8753	2005-01-17	0.05	0.0157	0.0052	0.104	0.883	0.0098	0.0013	0.0013	0.0181	5.54				0.140	20.4	19.8	34.7		3.36
PFM000069	8793	2005-02-14	0.05	0.0029		0.0018	0.841	0.0111	0.0006	0.0049	0.0318	6.75				0.200	22.5	22.3	47.4	0.4	37.2
PFM000069	8832	2005-03-14	0.05	0.0108		0.0016	0.855	0.0128	0.0006	0.0064	0.0493	7.76				0.322	22.3	21.4	52.0	0.6	4.04

Idcode	Sample no	Sampling date	Depth m	NH_4_N mg/L	NO_2_N mg/L	NO_2_N+ NO_3_N mg/L	N tot mg/L	P tot mg/L	PO4_P mg/L	POP mg/L	PON mg/L	SiO_2_Si mg/L	Chl. A µg/L	Chl. C µg/L	Pheop. µg/L	POC mg/L	TOC mg/L	DOC mg/L	DIC mg/L	O_2 mg/L	Abs. Coeff.
PFM000069	8872	2005-04-12	0.1	0.0043	0.0005	0.0240	0.559	0.0121	0.0010	0.0054	0.0485	3.78				0.371	12.8	12.6	26.8		2.04
PFM000069	8888	2005-05-09	0.1	0.0073		0.0049	0.710	0.0124	0.0015	0.0050	0.0325	4.25				0.290	16.7	16.5	33.5		
PFM000069	8923	2005-06-13	0.1	0.0120		0.0295	0.865	0.0180	0.0029	0.0057	0.0385	4.04				0.281	19.0	18.8	28.5		3.54
PFM000070	8346	2004-03-16	0.1	0.218		0.0282	0.821	0.0043	0.0006	0.0023	0.0209	0.600				0.209	5.6	5.4	6.2		
PFM000070	8377	2004-04-05	0.1	0.129		0.0179	0.849	0.0065	0.0005	0.0027	0.0322	2.15				0.235	15.7	15.3	19.7		
PFM000070	8405	2004-04-20	0.1	0.114	0.0014	0.0170	1.02	0.0091	<0.0005	0.0047	0.0402	2.16				0.309	16.6	16.8	22.7		
PFM000070	8447	2004-05-04	0.1	0.0684		0.0116	1.03	0.0106	0.0016	0.0054	0.0515	1.33				0.426	17.0	17.1	23.4		
PFM000070	8487	2004-05-17	0.1	0.0566		0.0143	0.952	0.0101	0.0012	0.0063	0.0259	0.87				0.277	16.9	16.8	19.6		
PFM000070	8511	2004-06-01	0.1	0.0286		0.0094	0.883	0.0068	<0.0005	0.0034	0.0117	0.55				0.129	16.7	16.4	24.0		
PFM000070	8528	2004-06-14	0.1	0.0298		0.0037	0.867	0.0088	0.0009	0.0051	0.0480	1.85				0.334	17.8	17.8	27.7		
PFM000070	8540	2004-07-05	0.1	0.0619	0.001	0.0477	0.931	0.0138	0.0013	0.0094	0.0865	2.31				0.692	18.2	17.6	24.7		
PFM000070	8605	2004-08-16	0.1	0.258		0.0216	1.14	0.0076	0.0018	0.0032	0.0381	4.41				0.334	17.9	17.7	30.0		
PFM000070	8635	2004-09-14	0.1	0.180		0.0204	1.03	0.0083	0.0010	0.0035	0.0376	4.85				0.289	17.9	17.1	32.6		0.136
PFM000070	8653	2004-10-11	0.1	0.284	0.0011	0.0318	1.04	0.0057	<0.0005	0.0028	0.0228	4.53				0.181	16.5	16.5	26.8		0.100
PFM000070	8719	2004-11-08	0.1	0.0797		0.0399	1.16	0.0078	<0.0005	0.0042	0.0470	1.35				0.466	16.4	16.1	20.2		
PFM000070	8736	2004-12-06	0.1	0.158		0.0434	1.27	0.0066	0.0008	0.0033	0.0399	1.29				0.357	17.4	17.1	22.3		0.860
PFM000070	8759	2005-01-17	0.1	0.104	0.0016	0.0299	0.990	0.0078	0.0009	0.0030	0.0279	2.72				0.233	21.6	21.6	17.9		3.58
PFM000070	8797	2005-02-14	0.1	0.165		0.0547	1.23	0.0071	<0.0005	0.0033	0.0271	3.37				0.211	24.6	24.5	24.4		31.2
PFM000070	8834	2005-03-14	0.1	0.428		0.0214	1.54	0.0108	0.0010	0.0051	0.0387	3.34				0.315	22.5	21.9	29.9	1.9	2.24
PFM000070	8873	2005-04-12	0.1	0.166	0.0014	0.0156	1.05	0.0087	0.0010	0.0034	0.0378	2.34				0.265	16.4	16.3	26.7		1.66
PFM000070	8887	2005-05-10	0.1	0.0275		0.0072	0.949	0.0110	0.0012	0.0062	0.0621	0.831				0.474	16.4	16.5	21.8		1.40
PFM000070	8918	2005-06-14	0.1	0.0075		0.0030	0.938	0.0100	0.0012	0.0039	0.0283	0.415				0.231	17.2	17.2	21.3		1.44
PFM000071	8341	2004-03-16	0.5	0.0536		0.0564	0.772	0.0428	0.0170	0.0175	0.130	4.00				1.48	12.0	10.5	32.2		
PFM000071	8376	2004-04-04	0.5	0.0155		0.0241	0.506	0.0130	0.0059	0.0029	0.0175	3.60				0.115	12.2	12.1	34.0		
PFM000071	8389	2004-04-20	0.5	0.0267	0.0007	0.0156	0.542	0.0213	0.0100	0.0060	0.0316	3.14				0.254	11.3	11.0	32.2		
PFM000071	8458	2004-05-04	0.5	0.0294		0.0048	0.556	0.0228	0.0111	0.0052	0.0289	3.66				0.177	12.4	12.3	37.0		
PFM000071	8491	2004-05-17	0.5	0.0335		0.0059	1.38	0.0383	0.0197	0.0096	0.0106	3.69				0.124	13.8	13.8	36.0		
PFM000071	8506	2004-06-01	0.5	0.0126		0.0042	0.539	0.0318	0.0167	0.0077	0.0270	3.82				0.212	11.8	11.7	42.2		
PFM000071	8530	2004-06-14	0.5	0.0163		0.0015	0.580	0.0466	0.0236	0.0161	0.0439	4.25				0.323	12.0	12.0	37.6		
PFM000072	8365	2004-03-17	0.1	0.0443		0.0056	1.23	0.0334	0.0027	0.0286	0.138	2.68				0.769	20.0	19.7	34.3	<0.2	
PFM000072	8358	2004-04-05	0.1	0.0060		0.0028	0.817	0.0188	0.0013	0.0115	0.0709	1.90				0.464	13.1	13.0	25.6		
PFM000072	8401	2004-04-19	0.1	0.0080	0.0005	0.0039	0.845	0.0162	0.0020	0.0071	0.0423	1.51				0.267	14.6	14.4	25.6	4.1	
PFM000072	8442	2004-05-04	0.1	0.0208		0.0099	0.959	0.0197	0.0047	0.0420	0.143	1.67				0.929	15.1	14.9	26.5	2.3	
PFM000072	8490	2004-05-17	0.1	0.0253		0.0054	1.05	0.0212	0.0058	0.0052	0.0327	1.20				0.356	17.0	17.2	26.2		

Idcode	Sample no	Sampling date	Depth m	NH_4_N mg/L	NO_2_N mg/L	NO_2_N+ NO_3_N mg/L	N tot mg/L	P tot mg/L	PO4_P mg/L	POP mg/L	PON mg/L	SiO_2_Si mg/L	Chl. A µg/L	Chl. C µg/L	Pheop. µg/L	POC mg/L	TOC mg/L	DOC mg/L	DIC mg/L	O_2 mg/L	Abs. Coeff.
PFM000072	8509	2004-06-01	0.1	0.0325		0.0122	1.07	0.0294	0.0112	0.0063	0.0443	0.822				0.370	17.4	16.6	24.6		
PFM000072	8537	2004-06-15	0.1	0.0283		0.0136	1.19	0.0463	0.0121	0.0173	0.0968	0.843				0.581	18.7	18.4	26.4		
PFM000073	8364	2004-03-17	0.05	0.467		0.697	1.94	0.211	0.1480	0.0471	0.200	3.77				1.03	8.6	8.6	38.6		
PFM000073	8384	2004-04-05	0.05	0.0174		1.26	1.78	0.0334	0.0124	0.0125	0.0400	3.43				0.250	6.1	5.9	55.3		
PFM000073	8429	2004-04-21	0.05	0.0482	0.0074	0.121	0.936	0.0729	0.0333	0.0272	0.113	1.76				0.811	9.8	10.2	50.1		
PFM000073	8451	2004-05-04	0.05	0.0370		0.0645	0.785	0.0736	0.0109	0.0065	0.0399	1.38				0.265	8.0	7.9	50.9		
PFM000073	8485	2004-05-17	0.05	0.0235		0.0139	0.945	0.1480	0.0786	0.0518	0.0857	2.07				0.713	10.7	10.7	46.1		
PFM000073	8505	2004-06-01	0.05	0.0244		0.0107	0.935	0.1500	0.0615	0.0424	0.0550	2.73				0.404	11.1	10.5	56.1		
PFM000074	8351	2004-03-16	0.5	0.0054		0.0123	0.733	0.0064	0.0005	0.0015	0.0146	6.41	0.4	<0.2	0.7	0.107	17.4	17.4	43.8	1.2	
PFM000074	8383	2004-04-05	0.5	0.0054		0.0115	0.497	0.0044	<0.0005	0.0014	0.0137	3.77	<0.2	<0.2	0.3	0.085	12.6	12.3	27.4		
PFM000074	8411	2004-04-20	0.5	0.0023	0.0002	0.0016	0.562	0.0066	<0.0005	0.0020	0.0284	3.44	0.3	<0.2	<0.2	0.205	13.1	13.0	31.3		
PFM000074	8448	2004-05-04	0.5	0.0152		0.0021	0.644	0.0072	0.0006	0.0030	0.0281	3.18	1.0	<0.2	0.8	0.189	14.5	14.1	31.5		
PFM000074	8486	2004-05-18	0.5	0.0049		0.0018	0.732	0.0080	0.0010	0.0039	0.0299	3.04	1.3	<0.2	0.8	0.270	16.1	15.8	35.0		
PFM000074	8517	2004-06-02	0.5	0.0022		0.0006	0.739	0.0098	0.0005	0.0047	0.0379	2.69	1.3	<0.2	<0.2	0.290	16.0	15.9	33.9		
PFM000074	8522	2004-06-15	0.5	0.0057		0.0014	0.858	0.0115	0.0013	0.0051	0.0557	2.97	2.1	<0.2	1.0	0.417	17.9	17.6	28.9		
PFM000074	8544	2004-07-06	0.5	0.0071	<0.0001	0.0006	0.895	0.0104	0.0007	0.0050	0.0559	2.67	2.0	<0.2	0.3	0.387	17.9	17.6	29.4		
PFM000074	8609	2004-08-16	0.2	0.0081		0.0006	0.980	0.0094	0.0020	0.0045	0.0541	5.24	1.6	<0.2	0.6	0.367	17.8	18.2	32.7		
PFM000074	8632	2004-09-14	0.3	0.0081		0.0006	0.924	0.0091	0.0008	0.0037	0.0465	5.98	1.4	<0.2	0.4	0.355	18.3	17.8	30.1		0.096
PFM000074	8655	2004-10-12	0.5	0.0086	0.0002	0.0017	0.817	0.0062	0.0006	0.0036	0.0361	5.97	1.4	<0.2	<0.2	0.272	16.2	16.8	29.3		0.076
PFM000074	8725	2004-11-09	0.3	0.0053		0.0016	0.761	0.0052	<0.0005	0.0032	0.0265	5.64	1.0	<0.2	0.3	0.227	14.8	15.9	31.4		
PFM000074	8741	2004-12-07	0.5	0.0332		0.0261	0.818	0.0085	0.0009	0.0039	0.0352	5.22	0.6	<0.2	<0.2	0.286	19.3	18.8	41.4	0.6	2.80
PFM000074	8756	2005-01-18	0.5	0.0170	0.0007	0.0238	0.675	0.0056	0.0006	0.0018	0.0133	4.75	0.4	0.6	0.7	0.118	15.7	15.7	33.7		2.20
PFM000074	8799	2005-02-14	0.5	0.0575		0.0005	0.929	0.0132	<0.0005	0.0071	0.0668	8.51	1.9	<0.2	0.4	0.450	19.8	19.6	55.7	<0.2	27.8
PFM000074	8828	2005-03-14	0.5	0.0085		0.0069	0.686	0.0063	<0.0005	0.0019	0.0231	6.04	0.4	<0.2	0.5	0.115	17.5	17.7	45.4	0.6	2.26
PFM000074	8870	2005-04-11	0.5	0.0053	0.0004	0.0050	0.453	0.0063	0.0007	0.0026	0.0258	3.27	0.2	<0.2	<0.2	0.158	10.4	10.5	22.4		1.00
PFM000074	8884	2005-05-09	0.5	0.0016		0.0027	0.668	0.0076	<0.0005	0.0034	0.0356	3.64	1.0	<0.2	0.3	0.273	15.2	14.9	34.6		2.16
PFM000074	8919	2005-06-13	0.5	0.0043		0.0013	0.762	0.0101	0.0007	0.0037	0.0294	2.98	0.8	<0.2	0.2	0.213	16.3	16.3	29.8		2.50
PFM000082	8354	2004-03-16	0.5	0.0035		0.0775	0.344	0.0093	0.0006	0.0053	0.0295	0.795	2.1	0.4	0.3	0.212	4.9	4.7	14.3		
PFM000082	8359	2004-03-16	6.0	0.0887		0.0546	0.398	0.0313	0.0088	0.0090	0.0394	0.849	4.2	0.7	0.9	0.257	4.0	3.9	15.5		
PFM000082	8833	2005-03-14	0.5	0.0013		0.0516	0.241	0.0107	0.0029	0.0042	0.0262	0.627	2.8	0.2	0.8	0.149	3.6	3.6	9.3		0.220
PFM000082	8831	2005-03-14	6.0	0.109		0.0862	0.404	0.0150	0.0060	0.0057	0.0275	1.21	1.8	0.2	0.4	0.159	3.6	3.5	13.3		0.300
PFM000084	8390	2004-04-06	0.5	0.0284		0.986	1.66	0.0304	0.0039	0.0185	0.0846	3.83	3.1	0.5	0.8	0.611	12.5	11.8	17.0		
PFM000084	8388	2004-04-06	2.5	0.0044		0.0348	0.286	0.0117	0.0009	0.0074	0.0430	0.507	1.9	0.2	1.3	0.277	3.8	3.7	13.2		
PFM000087	8355	2004-03-16	0.5	0.0161		0.0036	0.799	0.0083	0.0009	0.0026	0.0233	6.81	0.2	<0.2	0.3	0.142	19.8	19.6	48.1	3.1	

Idcode	Sample no	Sampling date	Depth m	NH_4_N mg/L	NO_2_N mg/L	NO_2_N+ NO_3_N mg/L	N tot mg/L	P tot mg/L	PO4_P mg/L	POP mg/L	PON mg/L	SiO_2_Si mg/L	Chl. A µg/L	Chl. C µg/L	Pheop. µg/L	POC mg/L	TOC mg/L	DOC mg/L	DIC mg/L	O_2 mg/L	Abs. Coeff.
PFM000087	8356	2004-03-16	1.5	0.343		0.0005	1.30	0.0121	0.0017	0.0056	0.0477	9.28	1.5		2.1	0.325	26.7	26.4	57.2	<0.2	
PFM000087	8385	2004-04-05	0.5	0.0150		0.0112	0.515	0.0062	0.0009	0.0026	0.0192	3.99	<0.2	<0.2	0.3	0.106	12.3	12.1	28.6		
PFM000087	8373	2004-04-05	1.5	0.149		0.0011	1.15	0.0122	0.0007	0.0068	0.0739	10.1	2.1	<0.2	2.8	0.532	26.8	26.8	64.6	<0.2	
PFM000087	8408	2004-04-20	0.5	0.0011	0.0003	0.0017	0.539	0.0086	<0.0005	0.0036	0.0338	3.27	1.1	<0.2	<0.2	0.227	12.0	12.2	27.1		
PFM000087	8457	2004-05-04	0.5	0.0130		0.0016	0.654	0.0096	0.0012	0.0052	0.0488	2.78	1.7	0.2	0.9	0.312	14.5	13.8	30.6		
PFM000087	8489	2004-05-18	0.5	0.0033		0.0004	0.744	0.0109	0.0015	0.0067	0.0620	1.83	3.2	0.2	1.7	0.633	15.7	15.9	25.1		
PFM000087	8512	2004-06-02	0.5	0.0016		0.0005	0.769	0.0112	0.0005	0.0056	0.0538	1.32	1.2	<0.2	1.8	0.391	15.6	15.7	27.2		
PFM000087	8534	2004-06-15	0.5	0.0046		0.0011	0.890	0.0162	0.0018	0.0067	0.0726	1.08	6.0	0.6	<0.2	0.450	16.8	16.2	24.0		
PFM000097	8363	2004-03-16	0.5	0.0091		0.0028	1.24	0.0184	0.0024	0.0101	0.0891	6.50	1.0	<0.2	0.6	0.599	32.0	31.2	44.0	<0.2	
PFM000097	8371	2004-04-05	0.5	0.0092		0.0091	0.709	0.0087	0.0006	0.0042	0.0465	2.97	1.0	0.2	0.5	0.311	15.8	15.1	22.1		
PFM000097	8410	2004-04-20	0.5	0.0015	0.0003	0.0013	0.762	0.0122	<0.0005	0.0073	0.0674	1.92	1.5	<0.2	<0.2	0.445	16.1	16.0	20.3		
PFM000097	8454	2004-05-05	0.5	0.0141		0.0029	0.826	0.0154	0.0019	0.0086	0.0863	0.888	2.8	0.3	1.4	0.603	15.9	15.1	21.5		
PFM000097	8475	2004-05-18	0.5	0.0048		0.0012	0.891	0.0138	0.0009	0.0072	0.0605	0.100	2.6	<0.2	1.6	0.713	16.9	16.7	14.8		
PFM000097	8514	2004-06-02	0.5	0.0017		0.0006	0.845	0.0127	0.0005	0.0063	0.0414	0.054	1.0	<0.2	0.4	0.310	16.4	16.6	15.9		
PFM000097	8535	2004-06-15	0.5	0.0062		0.0008	0.996	0.0150	0.0016	0.0065	0.0861	0.037	2.2	<0.2	0.4	0.840	18.0	17.8	11.0		
PFM000107	8342	2004-03-15	0.5	0.0874		0.0243	1.23	0.0111	0.0004	0.0046	0.0514	5.33	0.7	<0.2	0.3	0.438	25.5	24.3	39.7	1.0	
PFM000107	8349	2004-03-15	1.0	0.125		0.0047	1.24	0.0117	<0.0005	0.0053	0.0529	5.11	0.7	0.2	0.6	0.432	24.1	22.2	38.6	0.7	
PFM000107	8381	2004-04-04	0.5	0.0351		0.0282	0.862	0.0086	0.0005	0.0035	0.0338	3.79	1.0	0.3	0.8	0.225	18.7	19.0	27.0		
PFM000107	8382	2004-04-04	1.0	0.0751		0.0139	1.19	0.0113	0.0008	0.0043	0.0449	4.76	1.5	0.5	0.6	0.325	25.3	24.7	36.9	1.0	
PFM000107	8409	2004-04-20	0.5	0.0068	0.0003	0.0012	0.724	0.0106	<0.0005	0.0063	0.0497	2.11	1.2	<0.2	<0.2	0.323	15.4	15.4	20.8		
PFM000107	8449	2004-05-03	0.5	0.0156		0.0016	0.773	0.0114	0.0011	0.0075	0.0655	1.25	2.4	0.3	0.9	0.429	15.6	15.6	22.1		
PFM000107	8477	2004-05-17	0.5	0.0079		0.0004	0.818	0.0117	0.0012	0.0062	0.0614	0.430	1.2	<0.2	0.5	0.462	16.3	15.6	20.7		
PFM000107	8503	2004-06-01	0.5	0.0065		0.0012	0.827	0.0112	0.0013	0.0061	0.0541	0.184	1.4	<0.2	0.3	0.373	15.8	15.6	18.1		
PFM000107	8525	2004-06-14	0.5	0.0046		0.0004	0.866	0.0109	0.0013	0.0053		0.218	1.6	<0.2	0.3		16.4	16.7	15.4		
PFM000107	8546	2004-07-05	0.5	0.0069	0.0001	0.0016	0.930	0.0114	0.0007	0.0067	0.0603	0.185	1.6	<0.2	0.4	0.393	16.9	17.0	14.3		
PFM000107	8612	2004-08-15	0.5	0.0041		0.0004	1.08	0.0168	0.0013	0.0082	0.122	0.442	3.5	0.3	<0.2	0.894	16.7	16.9	12.3		
PFM000107	8631	2004-09-13	0.5	0.0081		0.0006	1.05	0.0128	0.0011	0.0062	0.0856	0.118	2.4	0.2	0.5	0.764	16.2	15.6	14.3		0.040
PFM000107	8654	2004-10-11	0.5	0.0109	0.0003	0.0010	0.964	0.0115	<0.0005	0.0054	0.0462	0.077	0.8	<0.2	<0.2	0.368	15.7	15.6	17.0		0.093
PFM000107	8723	2004-11-09	0.5	0.0132		0.0014	0.926	0.0086	0.0006	0.0041	0.0327	0.141	0.9	<0.2	<0.2	0.278	15.8	15.0	19.1		
PFM000107	8732	2004-12-06	0.5	0.0391		0.0084	0.949	0.0083	0.0015	0.0022	0.0188	0.412	0.5	<0.2	<0.2	0.199	16.0	15.7	21.4		0.960
PFM000107	8738	2004-12-06	1.0	0.0826		0.0062	0.968	0.0077	0.0008	0.0028	0.0278	1.19	0.4	<0.2	<0.2	0.217	16.7	16.4	26.1		1.18
PFM000107	8751	2005-01-17	0.5	0.0368	0.0011	0.0448	1.07	0.0103	0.0011	0.0043	0.0374	4.03	0.5	<0.2	<0.2	0.274	20.5	20.4	33.5		1.94
PFM000107	8754	2005-01-17	1.0	0.388	0.0012	0.0310	1.22	0.0106	0.0011	0.0056	0.0410	2.45	0.4	<0.2	<0.2	0.289	14.6	14.6	28.6		1.68
PFM000107	8800	2005-02-14	0.5	0.0912		0.0337	1.09	0.0098	<0.0005	0.0053	0.0331	4.58	0.2	<0.2	<0.2	0.230	22.7	22.4	34.0	3.7	31.0

Idcode	Sample no	Sampling date	Depth m	NH_4_N mg/L	NO_2_N mg/L	NO_2_N+ NO_3_N mg/L	N tot mg/L	P tot mg/L	PO4_P mg/L	POP mg/L	PON mg/L	SiO_2_Si mg/L	Chl. A µg/L	Chl. C µg/L	Pheop. µg/L	POC mg/L	TOC mg/L	DOC mg/L	DIC mg/L	O_2 mg/L	Abs. Coeff.
PFM000107	8801	2005-02-14	1.0	0.324		0.0254	1.18	0.0125	<0.0005	0.0045	0.0358	2.24	0.2	<0.2	<0.2	0.261	15.5	15.6	26.5	0.3	14.8
PFM000107	8829	2005-03-14	0.5	0.118		0.0413	1.15	0.0107	<0.0005	0.0043	0.0307	4.93	0.2	<0.2	<0.2	0.242	22.5	22.2	36.1	2.0	3.26
PFM000107	8830	2005-03-14	1.0	0.637		0.0014	1.40	0.0120	<0.0005	0.0056	0.0461	2.45	<0.2	<0.2	0.5	0.310	14.4	14.7	24.5	<0.2	1.54
PFM000107	8868	2005-04-11	0.5	0.0849	0.0009	0.0156	0.751	0.0091	0.0011	0.0034	0.0412	2.36	1.3	<0.2	<0.2	0.325	13.4	13.4	21.9		1.84
PFM000107	8882	2005-05-09	0.5	0.0124		0.0016	0.745	0.0109	0.0008	0.0051	0.0498	0.481	1.1	<0.2	0.4	0.306	14.0	14.0	21.1		1.50
PFM000107	8921	2005-06-13	0.5	0.0066		0.0016	0.830	0.0139	0.0012	0.0052	0.0525	0.115	1.4	0.2	<0.2	0.388	14.0	14.0	15.4		1.12
PFM000117	8353	2004-03-16	0.5	0.630		0.0246	1.93	0.0098	0.0008	0.0039	0.0404	3.52	1.4	0.2	0.3	0.320	23.3	22.3	30.9	3.0	
PFM000117	8352	2004-03-16	1.5	0.673		0.0105	1.78	0.0102	0.0008	0.0042	0.0426	3.79	0.8	<0.2	0.9	0.318	22.2	22.2	32.5	1.4	
PFM000117	8380	2004-04-04	0.5	0.351		0.0151	1.42	0.0091	0.0010	0.0038	0.0467	3.23	1.1	0.2	0.4	0.340	21.3	21.6	28.9		
PFM000117	8379	2004-04-04	1.5	0.560		0.0144	1.68	0.0092	0.0010	0.0039	0.0561	3.66	1.4	0.2	1.0	0.432	22.0	21.3	33.8		
PFM000117	8407	2004-04-20	0.5	0.127	0.0008	0.0086	1.04	0.0084	<0.0005	0.0052	0.0637	2.17	2.2	<0.2	0.2	0.447	17.8	17.8	21.5		
PFM000117	8456	2004-05-04	0.5	0.0305		0.0050	0.978	0.0095	0.0015	0.0065	0.0788	1.26	3.7	0.4	1.7	0.565	17.2	17.2	22.7		
PFM000117	8492	2004-05-17	0.5	0.0121		0.0013	0.999	0.0083	0.0007	0.0065	0.0793	0.554	1.8	0.3	0.6	0.602	17.8	17.4	21.7		
PFM000117	8510	2004-06-01	0.5	0.0050		0.0013	1.04	0.0107	0.0012	0.0054	0.0644	0.122	1.9	<0.2	1.3	0.507	17.7	16.7	20.8		
PFM000117	8533	2004-06-14	0.5	0.0087		0.0008	1.10	0.0101	0.0014	0.0061	0.118	0.161	3.0	0.3	0.4	0.607	18.0	17.0	19.2		
PFM000117	8549	2004-07-05	0.5	0.0099	0.0001	0.0029	1.12	0.0070	0.0007	0.0057	0.0929	0.355	2.8	0.3	<0.2	0.717	17.7	18.4	17.3		
PFM000117	8608	2004-08-16	0.5	0.0136		0.0006	1.16	0.0079	0.0011	0.0036	0.0680	1.23	1.8	0.3	0.3	0.591	17.2	17.5	13.7		
PFM000117	8628	2004-09-13	0.5	0.0093		0.0009	1.13	0.0079	0.0010	0.0037	0.0643	1.21	1.7	0.2	0.6	0.551	16.8	17.1	14.5		0.036
PFM000117	8657	2004-10-12	0.5	0.0265	0.0003	0.0025	1.13	0.0069	0.0006	0.0031	0.0487	1.05	1.2	<0.2	<0.2	0.423	16.4	16.6	15.7		0.030
PFM000117	8726	2004-11-09	0.5	0.105		0.0070	1.18	0.0059	<0.0005	0.0030	0.0184	1.04	1.3	0.2	<0.2	0.222	15.0	15.8	18.2		
PFM000117	8731	2004-12-07	0.5	0.166		0.0111	1.28	0.0065	0.0005	0.0028	0.0443	1.16	1.0	0.2	<0.2	0.369	17.2	17.0	21.7		0.720
PFM000117	8733	2004-12-07	1.5	0.391		0.0077	1.47	0.0069	0.0006	0.0033	0.0467	1.64	0.5	<0.2	0.2	0.430	17.1	17.3	25.7		0.960
PFM000117	8752	2005-01-17	0.5	0.298	0.0009	0.0201	1.51	0.0069	0.0008	0.0038	0.0509	1.58	1.1	0.2	<0.2	0.446	19.3	19.3	23.2		2.64
PFM000117	8750	2005-01-17	1.5	0.715	0.0007	0.0096	1.87	0.0098	0.0012	0.0043	0.0559	2.96	0.9	0.3	0.2	0.466	21.1	21.1	31.9	1.5	1.00
PFM000117	8798	2005-02-15	0.5	0.556		0.0140	1.68	0.0079	0.0006	0.0038	0.0518	2.35	0.9	<0.2	<0.2	0.419	19.9	20.2	26.8	4.2	12.0
PFM000117	8795	2005-02-15	1.5	0.589		0.0099	1.64	0.0079	0.0007	0.0038	0.0500	2.50	0.7	<0.2	<0.2	0.384	18.5	18.3	27.7	1.4	12.0
PFM000117	8835	2005-03-15	0.5	0.505		0.0230	1.67	0.0095	0.0015	0.0045	0.0416	2.79	0.7	<0.2	<0.2	0.342	20.5	20.7	29.7	2.2	1.74
PFM000117	8839	2005-03-15	1.5	0.677		0.0009	1.73	0.0101	0.0017	0.0057	0.0628	3.43	0.7	<0.2	0.6	0.531	19.3	18.7	33.1	<0.2	
PFM000117	8867	2005-04-12	0.5	0.202	0.001	0.0106	1.08	0.0085	0.0008	0.0035	0.0369	2.31	1.2	<0.2	0.2	0.236	16.4	16.1	23.1		1.62
PFM000117	8883	2005-05-10	0.5	0.0040		0.0012	0.911	0.0079	0.0005	0.0044	0.0800	0.710	2.8	0.4	0.3	0.608	16.2	16.2	20.8		1.36
PFM000117	8924	2005-06-14	0.5	0.0073		0.0012	1.00	0.0090	0.0013	0.0032	0.0398	0.198	1.8	0.3	<0.2	0.369	16.7	17.0	18.2		1.10
PFM000135	8360	2004-03-17	0.5	0.136		0.0028	1.74	0.0263	0.0029	0.0144	0.0954	4.09	2.4	0.6	0.8	0.600	26.0	26.3	45.9		
PFM000135	8361	2004-03-17	1.0	0.0421		0.0006	1.71	0.0212	0.0028	0.0084	0.0650	4.95	1.4	0.3	0.7	0.434	28.1	29.1	51.4		
PFM000135	8402	2004-04-21	0.5	0.0181	0.0003	0.0045	0.928	0.0180	0.0028	0.0098	0.0945	0.356	2.8	<0.2	0.1	0.627	14.9	14.8	23.1		

Idcode	Sample no	Sampling date	Depth m	NH_4_N mg/L	NO_2_N mg/L	NO_2_N+ NO_3_N mg/L	N tot mg/L	P tot mg/L	PO4_P mg/L	POP mg/L	PON mg/L	SiO_2_Si mg/L	Chl. A µg/L	Chl. C µg/L	Pheop. µg/L	POC mg/L	TOC mg/L	DOC mg/L	DIC mg/L	O_2 mg/L	Abs. Coeff.
PFM000135	8481	2004-05-18	0.5	0.0052		0.0007	1.19	0.0189	0.0025	0.0114	0.156	0.119	2.8	0.3	1.3	1.34	16.2	16.2	15.6		
PFM000135	8526	2004-06-14	0.5	0.0168		0.0006	1.33	0.0171	0.0023	0.0128	0.0938	0.302	2.1	<0.2	0.3	0.728	17.2	17.3	15.3		
PFM000135	8548	2004-07-06	0.5	0.0213	<0.0001	0.0024	1.47	0.0193	0.0009	0.0084	0.0943	0.688	1.8	<0.2	0.3	0.749	17.5	17.4	13.6		
PFM000135	8603	2004-08-16	0.5	0.0072		0.0002	1.59	0.0175	0.0021	0.0093	0.223	2.05	6.5	0.4	2.1	1.52	18.2	17.9	11.2		
PFM000135	8627	2004-09-13	0.5	0.0108		0.0009	1.43	0.0165	0.0021	0.0077	0.104	0.460	2.5	<0.2	1.3	0.951	17.8	17.7	12.9		0.029
PFM000135	8656	2004-10-11	0.5	0.0152	0.0002	0.0010	1.27	0.0124	<0.0005	0.0048	0.0586	0.075	0.8	<0.2	<0.2	0.498	16.0	16.2	15.1		0.022
PFM000135	8724	2004-11-08	0.5	0.0239		0.0018	1.20	0.0106	0.0006	0.0039	0.0445	0.054	1.0	<0.2	0.2	0.374	15.9	15.2	19.4		
PFM000135	8735	2004-12-06	0.5	0.202		0.0064	1.46	0.0103	0.0007	0.0045	0.0447	0.193	0.9	<0.2	0.9	0.374	17.2	16.9	27.1		0.600
PFM000135	8740	2004-12-06	1.0	0.439		0.0017	1.67	0.0113	0.0007	0.0054	0.0561	0.235	1.2	0.2	0.5	0.511	16.5	16.3	29.1		0.580
PFM005865	8616	2004-08-20	0	0.0009		0.0004	0.249	0.0090	0.0004			0.252	2.4	0.4	<0.2						
PFM005865	8617	2004-08-20	20	0.0058		0.0065	0.243	0.0106	0.0017			0.474									
PFM005865	8618	2004-08-20	55	0.0068		0.0076	0.240	0.0122	0.0024			0.473								10.4	

Chl. A = Chlorophyll a
Chl. C = Chlorophyll c
Pheop. = Pheopigment
Abs. Coeff. = Absorption Coefficient 436 nm (colour)
< ”value” = below detection limit

Table A5-3. Isotopes I (H-, O-, B-, S-, Cl- and C-isotopes).

Idcode	Sample no	Depth m	Sampling date	^{14}C pmC	$\delta^{13}C$ ‰ PDB	$\delta^{34}S$ ‰ CDT	$\delta^{37}Cl$ ‰ SMOC	$^{87}Sr/^{86}Sr$ no unit	$\delta^{2}H$ ‰ SMOW	^{3}H TU	$\delta^{18}O$ ‰ SMOW
PFM000062	8399	0.5	2004-04-19			21.0	–0.21	0.709485	–64.6	14.4	–8.3
PFM000062	8547	0.1	2004-07-05	107.2	–1.68	21.0	Canceled	0.709501	–65.0	13.8	–8.3
PFM000062	8658	0.5	2004-10-11						–43.0	10.1	–4.5
PFM000062	8755	0.5	2005-01-18						–60.6	12.3	–8.0
PFM000062	8869	0.5	2005-04-11						–60.9	12.2	–8.2
PFM000063	8404	0.5	2004-04-19			20.2	–0.58	0.709536	–63.8	14.1	–8.3
PFM000064	8400	0.5	2004-04-19			19.2	–0.27	0.710128	–71.4	12.4	–9.5
PFM000065	8403	0.5	2004-04-19			18.2	–0.22	0.710247	–71.9	11.2	–9.8
PFM000066	8406	0.1	2004-04-19			5.9	0.24	0.723237	–87.0	9.3	–12.2
PFM000066	8543	0.05	2004-07-06						–77.1	12.1	–10.1
PFM000066	8652	0.1	2004-10-12						–63.2	11.5	–8.3
PFM000066	8760	0.1	2005-01-17						–85.6	9.3	–11.8
PFM000066	8871	0.3	2005-04-11						–79.8	11.7	–11.4
PFM000067	8398	0.05	2004-04-20			9.9	0.01	0.722373	–80.7	10.9	–10.7
PFM000068	8428	0.5	2004-04-21			2.8	–0.10	0.723752	–81.1	10.7	–11.1
PFM000068	8542	0.1	2004-07-06						–77.9	11.1	–10.5
PFM000068	8650	0.5	2004-10-11						–67.9	9.9	–9.5
PFM000068	8757	0.5	2005-01-17						–78.8	9.3	–11.0
PFM000068	8874	0.4	2005-04-12						–75.2	10.8	–10.6
PFM000069	8541	0.01	2004-07-06						–79.9	12.5	–10.5
PFM000069	8651	0.05	2004-10-11						–68.3	10.9	–9.7
PFM000069	8753	0.05	2005-01-17						–82.8	11.8	–12.0
PFM000069	8872	0.1	2005-04-12						–81.2	13.6	–11.8
PFM000070	8405	0.1	2004-04-20				–0.08	0.724542	–74.5	13.3	–9.6
PFM000070	8540	0.1	2004-07-05						–70.4	12.9	–8.6
PFM000070	8653	0.1	2004-10-11						–58.5	9.8	–7.5
PFM000070	8759	0.1	2005-01-17						–76.0	11.2	–10.2
PFM000070	8873	0.1	2005-04-12						–67.7	12.7	–9.0
PFM000072	8401	0.1	2004-04-19			1.5	–0.08	0.721718	–74.6	12.1	–9.6
PFM000073	8429	0.05	2004-04-21			–8.7	–0.23	0.728286	–81.9	11.2	–11.6
PFM000074	8411	0.5	2004-04-20			9.4	0.00	0.723310	–86.9	9.8	–12.1
PFM000074	8544	0.1	2004-07-06	118.2	–7.02	–	Canceled	0.722780	–75.8	13.1	–9.8

PFM000074	8655	0.5	2004-10-12						–61.2	12.5	–7.9
PFM000074	8756	0.5	2005-01-18						–80.5	9.9	–11.6
PFM000074	8870	0.5	2005-04-11						–79.1	10.2	–11.4
PFM000087	8408	0.5	2004-04-20			3.8	0.50	0.723648	–86.3	11.5	–12.1
PFM000097	8410	0.5	2004-04-20			8.9	–0.16	0.722003	–79.0	10.8	–10.5
PFM000107	8409	0.5	2004-04-20			7.4	–0.23	0.722509	–79.1	13.0	–10.7
PFM000107	8546	0.5	2004-07-05	111.3	–6.48	8.0	Canceled	0.722086	–63.2	11.1	–7.3
PFM000107	8654	0.5	2004-10-11						–49.4	13.0	–5.4
PFM000107	8751	0.5	2005-01-17						–75.7	13.1	–10.2
PFM000107	8754	1	2005-01-17						–65.2	11.3	–8.6
PFM000107	8868	0.5	2005-04-11						–70.0	12.0	–9.6
PFM000117	8407	0.5	2004-04-20			5.5	0.06	0.724511	–74.5	12.7	–9.6
PFM000117	8549	0.5	2004-07-05	111.0	–3.70	–	Canceled	0.724387	–65.6	14.4	–7.4
PFM000117	8657	0.5	2004-10-12						–53.1	14.6	–6.0
PFM000117	8752	0.5	2005-01-17						–64.1	9.6	–7.6
PFM000117	8750	1.5	2005-01-17						–68.7	13.0	–8.1
PFM000117	8867	0.5	2005-04-12						–66.9	12.1	–8.9
PFM000135	8402	0.5	2004-04-21			1.5	0.22	0.721377	–75.1	9.2	–9.7
PFM000135	8548	0.5	2004-07-06	109.4	–3.94	2.7	Canceled	0.720804	–56.2	11.7	–5.4
PFM000135	8656	0.5	2004-10-11						–57.9	14.7	–7.9
PFM005865	8616	0.0	2004-08-20			20.9	–0.31	0.709466	–64.1	12.7	–8.2
PFM005865	8617	20	2004-08-20			20.9	–0.26	0.709460	–64.2	12.4	–8.2
PFM005865	8618	55	2004-08-20			21.2	–0.24	0.709455	–64.4	10.3	–8.1

The units are explaned in Appendix 1.

Table A5-4. Trace elements.

Idcode	Sample no	Depth m	Sampling date	Al µg/L	Cd µg/L	Cr µg/L	Cu µg/L	Co µg/L	Hg µg/L	Ni µg/L	Zn µg/L	Pb µg/L	V µg/L	Mo µg/L	Ba µg/L	U µg/L	Th µg/L	Sc µg/L	Rb µg/L	Y µg/L	Zr µg/L	Sb µg/L
PFM000062	8399	0.5	2004-04-19	2.96	<0.04	0.095	1.06	<0.04	<0.002	0.587	1.77	<0.2	0.149	1.550	18.2	0.754	<0.4	<0.8	17.7	0.041	<0.2	<0.2
PFM000062	8547	0.5	2004-07-05	170	<0.04	<0.08	<0.4	<0.04	<0.002	<0.4	<2	<0.2	0.189	1.900	16.1	0.859	<0.4	<0.8	17.6	0.130	0.477	<0.2
PFM000062	8658	0.5	2004-10-11	153	0.119	<0.1	1.28	<0.05	<0.002	0.957	2.58	1.360	0.169	1.450	16.2							
PFM000062	8755	0.5	2005-01-18	81.4	<0.04	0.084	0.75	<0.04	<0.002	1.020	<2	<0.2	0.174	2.140	17.6							
PFM000062	8869	0.5	2005-04-11	13.8	<0.02	0.154	<1	<0.05	<0.002	1.020	<2	<0.1	0.129	1.710	18.1							
PFM000063	8404	0.5	2004-04-19	2.96	<0.02	0.065	0.72	0.066	<0.002	0.817	1.68	<0.1	0.232	1.550	17.1	0.839	<0.2	<0.4	17.2	0.046	<0.1	0.111
PFM000064	8400	0.5	2004-04-19	13.4	0.021	0.127	1.20	0.304	<0.002	2.050	1.61	0.176	0.457	1.700	18.5	1.75	<0.2	<0.4	11.3	0.216	0.201	0.115
PFM000065	8403	0.5	2004-04-19	30.8	0.014	0.164	1.33	0.314	<0.002	2.120	2.49	0.088	0.333	1.230	17.5	1.64	0.023	<0.05	10.7	0.301	0.193	0.112
PFM000066	8406	0.1	2004-04-19	8.59	0.004	0.121	0.94	0.046	<0.002	0.469	1.14	0.032	0.236	0.569	22.6	1.96	<0.02	<0.05	2.07	0.143	0.204	0.065
PFM000066	8543	0.1	2004-07-06	9.09	<0.002	0.099	0.76	0.064	<0.002	0.440	1.01	0.027	0.194	0.309	20.3	1.02	<0.02	<0.05	2.44	0.101	0.132	0.066
PFM000067	8398	0.05	2004-04-20	12.4	0.004	0.208	0.71	0.047	0.0026	0.405	0.99	0.117	0.328	0.571	16.5	1.95	0.024	<0.05	2.62	0.185	0.215	0.090
PFM000068	8428	0.5	2004-04-21	14.5	0.006	0.143	0.75	0.062	0.0030	0.560	1.14	0.058	0.222	0.608	18.8	2.83	0.036	<0.05	2.21	0.192	0.289	0.082
PFM000068	8542	0.5	2004-07-06	27.5	0.004	0.197	1.02	0.132	<0.002	0.687	2.31	0.054	0.260	0.415	22.2	2.38	0.034	<0.05	1.93	0.288	0.316	0.082
PFM000069	8541	0.01	2004-07-06	22.2	0.004	0.138	1.44	0.079	<0.002	0.595	2.36	0.073	0.213	0.354	23.6	2.89	<0.02	<0.05	1.78	0.194	0.210	0.066
PFM000070	8405	0.1	2004-04-20	10.8	0.003	0.129	0.78	0.048	<0.002	0.339	1.04	0.043	0.278	0.282	16.3	1.29	0.025	<0.05	2.07	0.163	0.210	0.084
PFM000070	8540	0.1	2004-07-05	18.2	0.009	0.081	0.77	0.103	0.0049	0.365	1.29	0.136	0.230	<0.05	18.9	0.357	<0.02	<0.05	2.30	0.126	0.128	0.076
PFM000072	8401	0.1	2004-04-19	4.61	<0.002	0.136	0.33	0.057	<0.002	0.315	1.22	0.065	0.275	0.458	23.4	1.00	<0.02	<0.05	2.69	0.043	0.095	0.086
PFM000073	8429	0.05	2004-04-21	4.53	0.018	0.087	1.64	0.325	<0.002	1.490	1.07	0.065	0.454	1.760	41.3	22.5	<0.02	<0.05	1.96	0.065	0.270	0.147
PFM000074	8411	0.5	2004-04-20	28.8	0.009	0.161	1.04	0.035	<0.002	0.480	1.13	0.043	0.223	0.616	23.0	2.29	<0.02	<0.05	2.00	0.173	0.361	0.073
PFM000074	8544	0.5	2004-07-06	120	<0.002	0.135	0.73	0.019	<0.002	0.406	0.82	0.106	0.201	0.283	28.3	1.22	<0.02	<0.05	1.71	0.127	0.269	0.051
PFM000074	8655	0.5	2004-10-12	102	<0.002	0.102	0.29	0.033	<0.002	0.180	1.24	0.053	0.166	0.255	23.2							
PFM000074	8756	0.5	2005-01-18	14.5	<0.002	0.144	1.25	0.051	<0.002	0.550	1.31	0.029	0.225	0.595	22.1							
PFM000074	8870	0.5	2005-04-11	10.7	<0.002	0.091	0.83	0.032	<0.002	0.358	0.55	0.028	0.286	0.525	18.4							
PFM000087	8408	0.5	2004-04-20	12.6	0.005	0.109	0.86	0.039	<0.002	0.428	0.96	0.022	0.215	0.842	27.5	4.07	<0.02	<0.05	2.27	0.149	0.261	0.068
PFM000097	8410	0.5	2004-04-20	37.2	0.003	0.173	0.63	0.044	<0.002	0.470	1.51	0.120	0.367	0.580	17.3	2.05	0.026	<0.05	2.67	0.225	0.417	0.082
PFM000107	8409	0.5	2004-04-20	15.5	0.003	0.153	0.72	0.058	0.0024	0.426	1.24	0.113	0.310	0.474	15.7	1.80	0.025	<0.05	2.47	0.187	0.253	0.078

Idcode	Sample no	Depth m	Sampling date	Al µg/L	Cd µg/L	Cr µg/L	Cu µg/L	Co µg/L	Hg µg/L	Ni µg/L	Zn µg/L	Pb µg/L	V µg/L	Mo µg/L	Ba µg/L	U µg/L	Th µg/L	Sc µg/L	Rb µg/L	Y µg/L	Zr µg/L	Sb µg/L
PFM000107	8546	0.5	2004-07-05	244	0.005	0.203	1.12	0.075	<0.002	0.535	1.27	0.338	0.455	0.959	15.2	2.39	<0.02	<0.05	3.27	0.160	0.415	0.137
PFM000107	8654	0.5	2004-10-11	36.4	0.005	0.087	0.48	0.049	<0.002	0.312	0.65	0.113	0.230	0.753	15.9							
PFM000107	8751	0.5	2005-01-17	40.1	0.003	0.173	0.84	0.081	<0.002	0.606	1.93	0.069	0.217	0.504	23.6							
PFM000107	8754	1	2005-01-17	53.8	0.005	0.171	0.63	0.084	<0.002	0.500	7.61	0.104	0.215	0.610	29.1							
PFM000107	8868	0.5	2005-04-11	24.6	0.004	0.136	0.41	0.065	<0.002	0.365	0.68	0.124	0.226	0.407	22.7							
PFM000117	8407	0.5	2004-04-20	25.1	0.003	0.147	0.87	0.040	<0.002	0.363	0.71	0.037	0.289	0.273	17.2	1.46	0.028	<0.05	1.99	0.220	0.367	0.089
PFM000117	8549	0.5	2004-07-05	20.9	0.003	0.060	0.67	0.026	<0.002	0.270	0.89	0.046	0.248	0.300	12.8	1.33	<0.02	<0.05	2.40	0.045	0.136	0.114
PFM000117	8657	0.5	2004-10-12	191	0.003	0.137	0.45	0.036	<0.002	0.202	2.11	0.080	0.292	0.209	10.9							
PFM000117	8752	0.5	2005-01-17	16.1	<0.002	0.079	0.43	0.035	<0.002	0.265	2.52	0.026	0.222	0.270	15.6							
PFM000117	8750	1.5	2005-01-17	13.7	<0.002	0.129	0.56	0.047	<0.002	0.301	0.48	0.015	0.210	0.234	21.9							
PFM000117	8867	0.5	2005-04-12	20.9	0.003	0.183	0.55	0.050	<0.002	0.486	1.18	0.163	0.187	0.245	17.5							
PFM000135	8402	0.5	2004-04-21	5.94	0.006	0.114	0.48	0.057	<0.002	0.302	0.67	0.136	0.314	0.469	15.5	1.38	<0.02	<0.05	2.42	0.086	0.130	0.094
PFM000135	8548	0.5	2004-07-06	71.8	0.004	0.097	0.71	0.067	<0.002	0.389	0.66	0.237	0.477	0.763	13.8	1.05	<0.02	<0.05	3.49	0.066	0.146	0.138
PFM000135	8656	0.5	2004-10-11	57	0.003	0.090	0.37	0.055	<0.002	0.160	0.84	0.115	0.254	0.571	13.7							

Idcode	Sample no	Depth m	Sampling date	Cs µg/L	La µg/L	Hf µg/L	Tl µg/L	Ce µg/L	Pr µg/L	Nd µg/L	Sm µg/L	Eu µg/L	Gd µg/L	Tb µg/L	Dy µg/L	Ho µg/L	Er µg/L	Tm µg/L	Yb µg/L	Lu µg/L
PFM000062	8399	0.5	2004-04-19	<0.2	<0.04	<0.04	<0.2	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
PFM000062	8547	0.5	2004-07-05	<0.2	<0.04	<0.04	<0.2	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
PFM000062	8658	0.5	2004-10-11																	
PFM000062	8755	0.5	2005-01-18																	
PFM000062	8869	0.5	2005-04-11																	
PFM000063	8404	0.5	2004-04-19	<0.1	0.023	<0.02	<0.1	0.032	<0.02	0.022	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
PFM000064	8400	0.5	2004-04-19	<0.1	0.173	<0.02	<0.1	0.234	0.039	0.138	0.028	<0.02	0.030	<0.02	0.027	<0.02	<0.02	<0.02	<0.02	0.030
PFM000065	8403	0.5	2004-04-19	<0.03	0.243	0.008	<0.03	0.309	0.052	0.196	0.035	0.006	0.041	0.0061	0.035	0.008	0.023	<0.005	0.023	<0.005
PFM000066	8406	0.1	2004-04-19	<0.03	0.057	0.009	<0.03	0.066	0.019	0.076	0.016	<0.005	0.018	<0.005	0.019	<0.005	0.014	<0.005	0.014	<0.005
PFM000066	8543	0.1	2004-07-06	<0.03	0.045	0.007	<0.03	0.048	0.013	0.054	0.011	0.008	0.015	<0.005	0.014	<0.005	0.012	<0.005	0.012	<0.005
PFM000067	8398	0.05	2004-04-20	<0.03	0.103	0.010	<0.03	0.137	0.028	0.110	0.023	<0.005	0.023	<0.005	0.023	<0.005	0.016	<0.005	0.016	<0.005
PFM000068	8428	0.5	2004-04-21	<0.03	0.134	0.013	<0.03	0.166	0.036	0.139	0.030	<0.005	0.029	<0.005	0.027	0.006	0.018	<0.005	0.020	<0.005
PFM000068	8542	0.5	2004-07-06	<0.03	0.220	0.015	<0.03	0.348	0.058	0.223	0.046	0.012	0.049	0.0094	0.045	0.011	0.033	<0.005	0.031	0.006
PFM000069	8541	0.01	2004-07-06	<0.03	0.117	0.010	<0.03	0.117	0.032	0.120	0.025	0.010	0.028	0.0062	0.026	0.006	0.020	<0.005	0.021	<0.005
PFM000070	8405	0.1	2004-04-20	<0.03	0.070	0.010	<0.03	0.064	0.019	0.081	0.017	<0.005	0.019	<0.005	0.020	<0.005	0.015	<0.005	0.016	<0.005
PFM000070	8540	0.1	2004-07-05	<0.03	0.065	0.006	<0.03	0.100	0.017	0.072	0.013	0.008	0.016	<0.005	0.016	<0.005	0.013	<0.005	0.013	<0.005
PFM000072	8401	0.1	2004-04-19	<0.03	0.019	<0.005	<0.03	0.026	0.006	0.026	0.006	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005
PFM000073	8429	0.05	2004-04-21	<0.03	0.030	0.008	<0.03	0.047	0.008	0.033	0.007	<0.005	0.007	<0.005	0.007	<0.005	<0.005	<0.005	0.006	<0.005
PFM000074	8411	0.5	2004-04-20	<0.03	0.059	0.012	<0.03	0.061	0.018	0.074	0.016	<0.005	0.018	<0.005	0.018	<0.005	0.013	<0.005	0.014	<0.005
PFM000074	8544	0.5	2004-07-06	<0.03	0.052	0.008	<0.03	0.079	0.015	0.055	0.013	0.010	0.013	<0.005	0.013	<0.005	0.010	<0.005	0.009	<0.005
PFM000074	8655	0.5	2004-10-12																	
PFM000074	8756	0.5	2005-01-18																	
PFM000074	8870	0.5	2005-04-11																	
PFM000087	8408	0.5	2004-04-20	<0.03	0.040	0.009	<0.03	0.049	0.013	0.057	0.014	<0.005	0.014	<0.005	0.017	<0.005	0.014	<0.005	0.015	0.010
PFM000097	8410	0.5	2004-04-20	<0.03	0.094	0.013	<0.03	0.127	0.025	0.097	0.021	<0.005	0.021	<0.005	0.023	<0.005	0.015	<0.005	0.017	<0.005
PFM000107	8409	0.5	2004-04-20	<0.03	0.114	0.010	<0.03	0.147	0.030	0.115	0.024	<0.005	0.026	<0.005	0.024	0.006	0.017	<0.005	0.018	<0.005
PFM000107	8546	0.5	2004-07-05	<0.03	0.104	0.012	<0.03	0.181	0.026	0.090	0.016	0.007	0.019	<0.005	0.014	<0.005	0.009	<0.005	0.009	<0.005

Idcode	Sample no	Depth m	Sampling date	Cs µg/L	La µg/L	Hf µg/L	Tl µg/L	Ce µg/L	Pr µg/L	Nd µg/L	Sm µg/L	Eu µg/L	Gd µg/L	Tb µg/L	Dy µg/L	Ho µg/L	Er µg/L	Tm µg/L	Yb µg/L	Lu µg/L
PFM000107	8654	0.5	2004-10-11																	
PFM000107	8751	0.5	2005-01-17																	
PFM000107	8754	1	2005-01-17																	
PFM000107	8868	0.5	2005-04-11																	
PFM000117	8407	0.5	2004-04-20	<0.03	0.073	0.014	<0.03	0.076	0.023	0.095	0.021	<0.005	0.023	<0.005	0.025	0.006	0.018	<0.005	0.018	0.006
PFM000117	8549	0.5	2004-07-05	<0.03	0.011	0.007	<0.03	0.012	<0.005	0.016	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
PFM000117	8657	0.5	2004-10-12																	
PFM000117	8752	0.5	2005-01-17																	
PFM000117	8750	1.5	2005-01-17																	
PFM000117	8867	0.5	2005-04-12																	
PFM000135	8402	0.5	2004-04-21	<0.03	0.031	0.006	<0.03	0.041	0.009	0.037	0.008	<0.005	0.009	<0.005	0.010	<0.005	0.008	<0.005	0.009	<0.005
PFM000135	8548	0.5	2004-07-06	<0.03	0.039	0.006	<0.03	0.067	0.010	0.037	0.007	<0.005	0.007	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005
PFM000135	8656	0.5	2004-10-11																	

< ”value” = below reporting limit

Table A5-5. Isotopes II (U-, Th-, Ra- and Rn-isotpoes).

Idcode	Sample no	Depth m	Sampling date	^{238}U mBq/L	^{234}U mBq/L	^{230}Th mBq/L	^{226}Ra Bq/L	^{222}Rn Bq/L
PFM000062	8547	0.5	2004-07-05	8.1	10.5	–0.5	–0.01	–0.02
PFM000074	8544	0.5	2004-07-06	15.3	17.6	–0.5	–0.02	0.02
PFM000107	8546	0.5	2004-07-05	30.8	33.8	–0.5	–0.01	–0.03
PFM000117	8549	0.5	2004-07-05	15.4	15.7	–0.5	–0.01	–0.03
PFM000135	8548	0.5	2004-07-06	12.9	15.4	–0.5	–0.01	–0.02
PFM005865	8616	0	2004-08-20	7.8	9.5	–0.5	–0.03	0.03
PFM005865	8617	20	2004-08-20	8.4	9.5	0.3	–0.03	–0.03
PFM005865	8618	55	2004-08-20	7.7	9.8	0.2	–0.03	–0.03

< ”value” = below detection limit