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Swedish University of Agricultural Sciences

Faculty of Natural Resources and
Agricultural Sciences

Longitudinal Heterogeneity of Two Pre-Reservoirs in the Harz Mountains (Germany)

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Abstract

The understanding of longitudinal heterogeneity in pre-reservoirs is crucial for the development of a sophisticated monitoring program which shall be able to represent the water bodies in a resource efficient way. The present study was conducted at two pre-reservoirs in the Harz mountains (Germany), the Rappbode and Hassel pre-reservoirs which are connected to the largest drinking water reservoir in Germany (Rappbode reservoir).

Analyzed were the routine monitoring data from the bi-weekly sampling of the inflow and the outflow of the water bodies. Additionally, in summer 2012, two sampling campaigns of the transects were conducted (6 sampling points per pre-reservoir). Focus was laid on the heterogeneity of major ions, nutrients and dissolved metals, algae (chlorophyll concentration) and CO_2 and CH_4 concentrations. A further field of investigation was the emission of these GHG from the pre-reservoirs, using a floating chamber during the transect sampling campaigns.

It was found out that the current monitoring program represents the pre-reservoir considerably well. However, a heterogeneous distribution of the algae was discovered, making it not suitable for the representation of the reservoirs if only a few spots are sampled. Ebullition fluxes were recognized in the transition zone of the pre-reservoirs, contributing to an emission of the GHG to the atmosphere.

The findings of this study confirm the use of the inflow and outflow of the reservoirs as routine spots but to for an extensive and more precise conclusion a more sustainable way in the monitoring should be found.

Popular Science Summary

Water reservoirs make up a considerable amount of fresh water bodies in our landscapes and their importance flood protection, drinking water production, recreation etc. increases. Reservoirs show characteristics of both streams and lakes; the inflow zone is still very similar to a stream because the water has a higher flow velocity so that particulate matter is transported along with it and a higher nutrient availability is found. In the transition zone the water is already flowing with a decreased velocity and particles will settle. The deep water zone close to the dam, the lacustrine zone, mainly shows characteristics of a lake with very low water movement, long residence times and a low concentration of dissolved nutrients. In some cases pre-reservoirs are installed in front of larger water reservoirs to act as buffers, especially if the downstream reservoir is used for drinking water abstraction and a high water quality is required. For the collection of long term data sets, a monitoring program is set up which provides information on the behavior and processes in the reservoirs.

In this study two pre-reservoirs in the Harz mountains (Germany) have been investigated with two major research questions in mind. First, data from the relatively new monitoring program of the Hassel- and Rappbode pre-reservoirs were analyzed to see how well the current routine monitoring spots at the inflow and outflow of the reservoirs represent the reservoir even though heterogeneous conditions can be expected as I described above. A second research question dealt with the emission of greenhouse gases from the two reservoirs. As greenhouse gases are known to be a great contributor to climate change, the emission coming from water bodies receives more and more attention in the field of natural sciences.

The results show that for many parameters the inflow and the outflow are representing the reservoir well because the change between these two points is considerably small. However, the biological parameters (chlorophyll distribution) is very heterogeneous and no conclusions about the chlorophyll distribution can be drawn from the routine monitoring. The greenhouse gas emissions of the reservoirs showed that the reservoirs are both emitters of methane. It was even possible to document methane bubbles (ebullition). These bubbles move from the sediment and while reaching the water surface the very high point emission of the gas can be documented. For carbon dioxide a net drawdown was found but as we sampled during the day and photosynthesis required carbon dioxide a diurnal sampling has to be conducted before it can be identified if the reservoirs are sinks or sources of carbon dioxide.

To have a proficient and sustainable monitoring of the water reservoirs in the Harz mountains, it is important to understand if the current undertakings to monitor the water bodies are representable. As this study started to analyze the long term data collection which seems to be appropriate at the current sampling points, future data sets can be build up on that.

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1 Introduction

1.1 Reservoirs

Water reservoirs have an immense influence on our todays water availability and conventional use. In the recent past the dominant form of surface waters was estimated to be no longer lakes but water reservoirs. The International Committee on Large Dams (ICOLD) estimated that the number of large dams in the world, defined as having a storage volume of more than three million cubic metres, reached a number of 50 000 in the world (in 2000) of which half are operated in China (ICOLD Committee on Public Awareness & Education 2007). This number is obviously exceeded if all the small reservoirs are taking into account and which often serve a similar purpose as the larger ones. However, the natural properties of water reservoirs are similar to those of a lake but also include some characteristics of a running water (Steinberg, Calmano, Klapper, Wilken & Bernhardt 1995). The characteristics is often very much influenced by the purpose of the water reservoir i.e. if it is used for irrigation purposes, flood protection and/or drinking water abstraction, the water level will vary not only due to natural variations in the water flow such as seasonal variability but also due to anthropogenic regulations. Especially in cases when the water reservoir is used for drinking water extraction, the water quality is of great importance and subject of national and international guidelines and regulations (e.g (European Parliament Environment Committee n.d.)). Therefore, water reservoirs are often thought to be a subject to more intense horizontal heterogeneity than lakes (Tadonléké, Marty & Planas 2012). In densely populated areas such as Germany, the management of drinking water is very important and requires good knowledge of the area and especially sources which can lead to the pollution of drinking water. As Pütz & Benndorf (1998) mention, most catchment areas around water reservoirs face anthropogenic influences which impacts the water quality to a great extent. One option in the management of drinking water reservoirs is the installation of pre-reservoirs. Pre-reservoirs are usually considerably smaller water reservoirs which act as buffering systems before the main collection reservoir. In Germany, currently (anno 2005) 70 water reservoirs have 160 pre-reservoirs which are used to a different extent before the main reservoir (DWA 2005) i.e. as buffering system, additional flood water protection system, and others. The pre-reservoirs can be characterized as standing waters, however, with characteristics of streams, influenced by the inflow and outflow areas with distinct ecosystems. Pre-reservoirs are usually not facing highly altering water tables because they are fed mainly by the inflowing streams and are operated as overflow dams with no additional outlet in the hypolimnetic region of the reservoir. Important functions of pre-reservoirs are:

- elimination of nutrients
- reduction of turbidity
- reduction of drift material
- reduction of microbial contamination

(DWA 2005)

Within this study, two water reservoirs are of interest. The Hassel pre-reservoir and the Rappbode pre-reservoir are both located in the Harz mountains in mid-central Germany. The area of the Harz mountains lies within the federal states of Lower Saxony, Saxony Anhalt and Thuringia and build up the highest mountain range of the country. The pre-reservoirs analyzed in this study are part of the Bode system, a water reservoir system with the Rappbode reservoir as core. The Rappbode main reservoir is fed by the two pre-reservoirs, the Rappbode pre-reservoir (RVS, for German *Rappbode Vorsperre*) and the Hassel pre-reservoir (HVS, for German *Hassel Vorsperre*). These are monitored by the Helmholtz-Centre for Environmental Research UFZ (UFZ) in Magdeburg. Since spring 2011 a monitoring program was set up and studies concerning the reservoir systems are conducted on the pre-reservoirs in the Harz mountains. The routine monitoring takes place approximately every second week.

1.2 Longitudinal Heterogeneity of Reservoirs

The system of a water reservoir combines characteristics from lakes and streams. According to Thornton (1990) a water reservoir can be distinguished into three zones (Figure 1.1), the riverine zone which is characterized by the inflow, a shorter water residence time, more shallow water with higher nutrient availability which consequently often results in a biomass development. Hence, primary production is often light limited (mixed layer (Zm)$<$photic layer (Zp)). The following zone, the transition zone is characterized by a broader basin, decreased flow velocity and increased residence time. The transition zone is suspected to be the region in which the highest biological activity can be found; lighter material transported into the water body (e.g clay and silt material) will settle down in this area, favoring biomass production. The final zone of the reservoir includes the deepest part with the most lake-like characteristics, with a

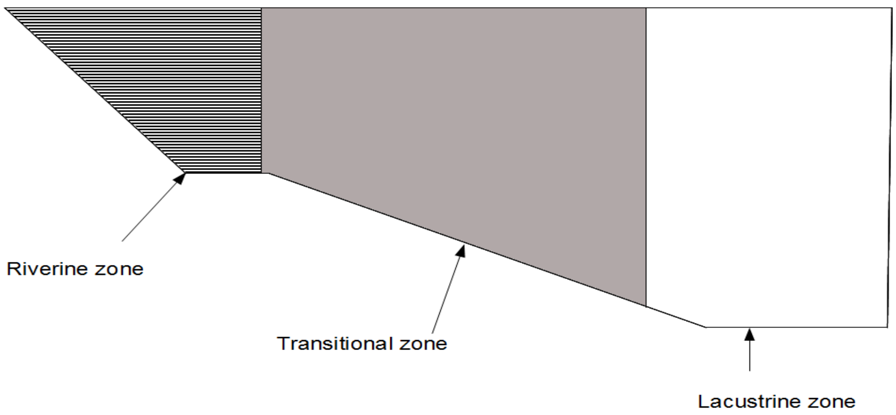


Figure 1.1: Schematic illustration of the longitudinal zonation in an idealized reservoir; modified after Thornton (1990)

long residence time, low concentrations of dissolved nutrients, higher water transparency and a deeper photic layer.
In a lake environment the seasonality produces known pattern of oxygen depletion with the development of an anoxic hypolimnion throughout the summer months. In a dammed water course, the development of such anoxic conditions will depend on the flow, e.g. movement of the water through the basin. Here, Thornton (1990) gives a schematic picture for the development of anoxic conditions in a reservoir during the summer months (Figure 1.2).

1.2.1 Processes and Crucial Parameters

Lakes and reservoirs are influenced by many components and driven by many processes. Some of them are measurable and/or can be quantitatively specified whereas others can only be estimated through the use of models or recalculation from other parameters. Moreover, many parameters' function in the ecosystem is understood to a great extent as for example the cycling of iron; whereas other components are only partially understood. Even though the limnology is characteristic for every lake there are general factors which are described by several studies and can be summarized into the most important chemical-biological processes. For example, nutrients have a significant role in the development of the ecosystem properties assigned to a lake system. These originate often from anthropogenic sources as for example fertilizers used on agricultural areas in the catchment. Although a decrease in point sources was achieved over the last decades, there is still great input from diffuse sources remaining (Umweltbundesamt 2010). Especially nitrogen (N) and phosphorus

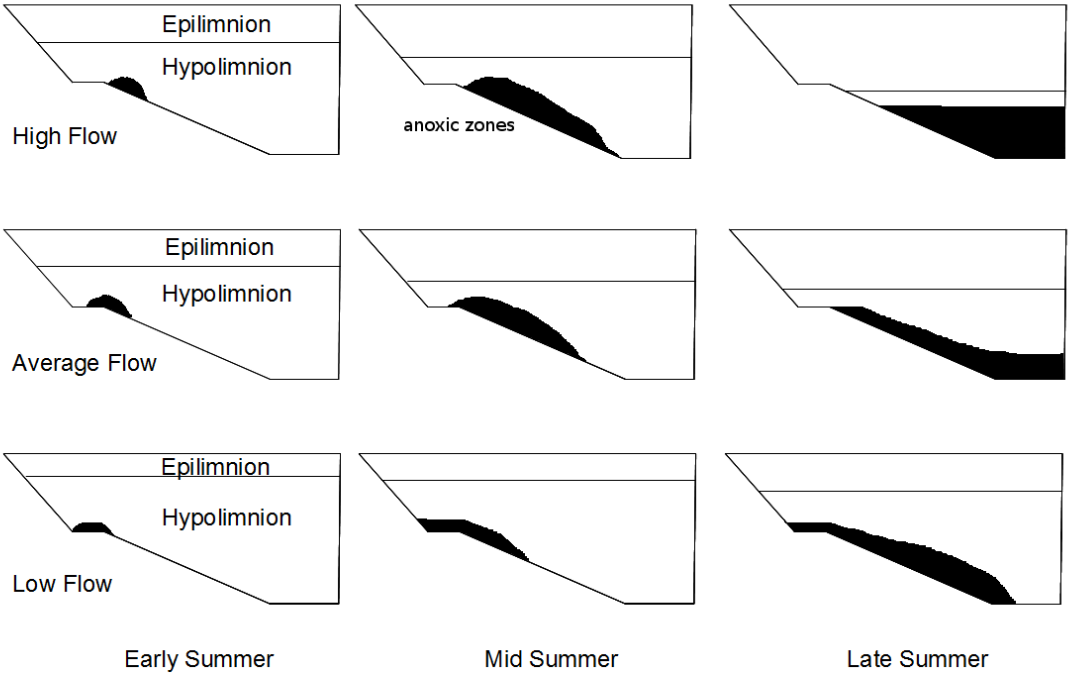


Figure 1.2: Longitudinal development of anoxic zones during summer in reservoirs, depending on average flow; modified after Thornton (1990)

(P) compounds are of high interest due to their important role in biomass development in an aquatic environment.

Several decomposition reactions are known to take place in the processes of microbial decomposition of organic matter, dependent on the oxygen availability and the type of microorganisms present. The most important reactions are summarized below for the break-down of organic substances (here as CO_2O). Further details on the decomposition are found in studies such as Boehrer & Schultze (2008) Stumm & Morgan (1981) and others.

Respiration:

$$\mathrm{CH_2O^+O_2 \longrightarrow CO_2 + H_2O}$$

Denitrification:

$$\mathrm{5\,CH_2O + 4\,NO_3^- + 4\,H^+ \longrightarrow 5\,CO_2 + 2\,N_2 + 7\,H_2O}$$

Manganese reduction:

$$\mathrm{CH_2O + 2\,MnO_2 + 4\,H^+ \longrightarrow CO_2 + 2\,Mn^{2+} + H_2O}$$

Iron reduction:

$$\mathrm{CH_2O + 4\,Fe(OH)_3 + 8\,H^+ \longrightarrow CO_2 + 4\,Fe^{2+} + 11\,H_2O}$$

Sulphate reduction:

$$\mathrm{2\,CH_2O + SO_4^{2-} + 2\,H^+ \longrightarrow 2\,CO_2 + H_2S + 2\,H_2O}$$

Methanogenesis:

$$\mathrm{4\,CH_3OH \longrightarrow 3\,CH_4 + CO_2 + 2\,H_2O}$$
$$\mathrm{CH_3COOH + H_2O \longrightarrow CH_4 + CO_2 + H_2O}$$

Beside these elements, silicon (Si) also plays an important role in the development of organic material such as algae. It is a significant element for especially diatoms and other microorganisms used to build up frustules (Azam & Chisholm 1976). As further important parameters can major elements, such as the cations calcium (Ca^{2+}), magnesium (Mg^{2+}), sodium (Na^+) and potassium (K^+) as well as major anions are carbonate (CO_3^{2-})/ bicarbonate (HCO_3^-), sulphate (SO_4^{2-}) and chloride (Cl^-) be considered. These have different origins in the freshwater, for instance weathering processes of the soil, fluvial deposition, or input through fertilizers. Hence, the composition of ions is largely depending on the present minerals, land use and catchment characteristics.

Water reservoirs are furthermore of interest in many studies because they are more and more recognized as a source of greenhouse gas (GHG) emission. Greenhouse gases are addressed since several decades in various ways throughout the disciplines of natural sciences. Especially the augmented concentration of the long-living carbon dioxide and methane are being studied to fully understand their cycling and contribution to climate change. Many sources of the GHG are identified and recognized with their contribution to the overall emission concentration. However, since the 1990's water reservoirs are mentioned as sources of GHG emission and a focus on it has been set (Abril, Guérin, Richard, Delmas, Galy-Lacaux, Gosse, Tremblay, Varfalvy, Dos Santos & Matvienko 2005). The reason for the water reservoirs to develop GHG is mainly, especially if newly created, a high overturn of organic material which has been submerged by the flooding and which enhances the bioactivity through the availability of nutrients and labile carbon sources; if the reservoir has already been flooded for some time, other factors become important in the development of the gases (Demarty, Bastien, Hesslein & Gill 2009), however with high variability in temporal and spatial emission rates. The methane pathways are illustrated in a simplified manner and shown in Figure 1.3 for a lake during summer stratification. Beside the pathways illustrated in the figure, ebullition of methane is also possible. Methane will be

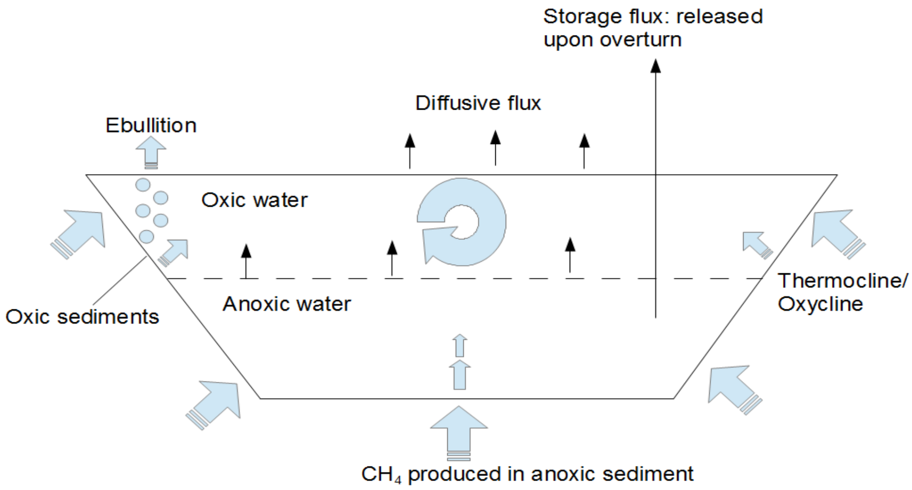


Figure 1.3: Methane pathways in a lake during summer stratification; modified after Bastviken et al. (2002)

accumulated in the lake sediment and with increasing partial pressure it be released as a bubble. If the bubble is able move towards the surface and is not oxidized on the way upwards, it can be documented with proper equipment e.g. floating chambers and beside the diffusive flux measurable continuously, so an ebullition flux can be calculated (St. Louis, Kelly, Duchemin, Rudd & Rosenberg 2000). A detailed and small scale study of the GHG characteristics is also important because general assumptions of GHG patterns can hardly be made because the development is highly dependent on climate, soil, vegetation etc. (Soumis, Duchemin, Canuel & Lucotte 2004).

Generally, lakes show contrasting patterns for the production, exchange and consumption of CH_4 and CO_2 (Casper, Maberly, Hall & Finlay 2000). Normally, lakes can be assumed to be potential sources for CO_2 as many are supersaturated with respect to the overlying atmosphere (Cole, Caraco, Kling & Kratz 1994). Especially in newly created water reservoirs the photosynthesis and the uptake of carbon dioxide by the surface vegetation is stopped due to the flooding of the land but the breakdown of organic material will produce CO_2 from that time on. Therefore, depending on their size, the region they are located in and the temperature regime, reservoirs are hypothetically supposed to emit more CO_2 per unit area than natural lakes (Åberg, Bergström, Algesten, Söderback & Jansson 2004). However, as Finlay et al. (2009) point out, the flux of carbon dioxide will depend on a series of factors (e.g. metabolism, chemistry, climate). Figure 1.4 shows a conceptual scheme of carbon fluxes in lakes.

Carbon dioxide is on the one hand known to be product of aerobic decomposition of

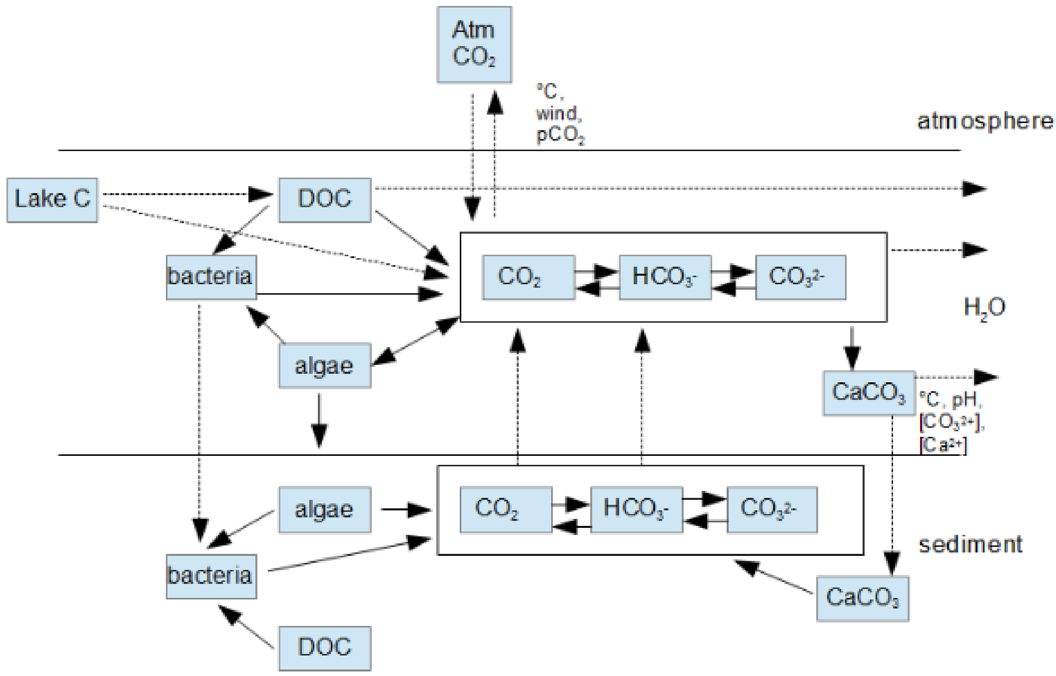


Figure 1.4: Conceptual model of CO_2 fluxes in lakes; modified after Finlay et al. (2009)

organic material, e.g. respiration within the lake body and its sediments and it is then consumed by photosynthesis (also to a small extent by chemosynthesis). CO_2 can furthermore be produced by the oxidation of CH_4 by methanogenes. It is also highly soluble (saturation in freshwater of approx. 39 mol m^{-3} at $20°C$ (Casper et al. 2000). Methane, on the other hand, is mainly produced during anaerobic decomposition (Repo, Huttunen, Naumov, Chichulin, Lapshina, Bleuten W. & Martikainen P. 2007) and therefore often stored in the sediment of the lake/reservoir. The gas is mainly released from the sediment through ebullition. Methane is, contrary to CO_2, much more insoluble (approximate saturation in freshwater of 1.6 mol m^{-3}) (Casper et al. 2000). The ebullition can contribute significantly to the release of GHG to the atmosphere. However, ebullition is very much associated with point source occurrence which is difficult to estimate with the available techniques (e.g. floating chamber, thin boundary layer method, inverted funnels) (Repo et al. 2007) (Walter, Smith & Chapin 2007).

1.3 Monitoring and Assessment of Reservoirs

Routine monitoring is an important step in the assessment of water bodies. As Rinke et al. (2013) state, a more extensive monitoring which goes further the regular assessment of biogeochemical processes, very difficult. Due to the impact of the heterogeneous landscape surrounding the reservoirs, detailed observations are only possible on a small scale. However, the smaller the chosen scale becomes, the more complex (costly and laborious) becomes the monitoring program.

The reservoirs fall into the monitoring system of the Rappbode Reservoir Observatory which aims at a monitoring system of the area, including the two pre-reservoirs. This monitoring systems will serve scientific and monitoring studies, as well as the reservoir management and assessment of especially the downstream located drinking water reservoir. The reservoirs used for analysis in this study are monitored every second week. It is conducted commonly by three employees of the UFZ. Preparation of the sampling campaign is done one day in advance. The equipment necessary is transported by car to the sampling sites. The travel distance to the sites is more than 90 km (e.g. to Hasselfelde) with only forest roads in the vicinity of the reservoirs. The sampling requires the collection of water samples from the water bodies as well as the manual measurement with probes. With the manual collection of data a functioning of the probes can be expected so that a continuous bi-weekly data set is created. However, this resource extensive program requires an optimal planning process in order to sustain an economical and practical justification.
The data collected in the monitoring program shall be reliable and reasonably for further analyses which requires an optimal sampling practice during the campaign. This incorporates the justification of the sampling points in such a manner as these points are representative for the reservoirs and the analyses conducted with the data later on.

2 Aims and Objectives

The major aim of this study is to produce basic knowledge in order to get an overview of the two pre-reservoirs in the Harz mountains with the aim to justify and/or improve the monitoring routine and to understand major processes in the water bodies.
Therefore, this study aims at the evaluation of the routine monitoring to examine the heterogeneity of the water bodies via the calculation of mass flows and the determination of gradients for several parameters, including an error estimation. For a more detailed understanding of the processes in the water bodies, data of two transect sampling in the summer of 2012 are object of this study.
Independently, GHG data will be looked at and with the calculation of fluxes and through comparison to several extrapolation steps, the sampling of GHG data will be validated. Finally, the aim of the study shall be the formulation of recommendations for future monitoring routines which ought to mirror the state of the water body with the best results but minimized efforts in order to save resources and disturbances in the ecosystem.

2.1 Research Questions

From this, the following research questions can be formulated:

- In how far do the current routine sampling points represent the reservoirs?
- In what way are the pre-reservoirs contributing to greenhouse gas emissions?
- Can the routine monitoring be improved for future measurements?

3 Study Site

3.1 The Bode System

The Bode system is composed of the Rappbode reservoir, the Wendefurth reservoir, the storage reservoir Königshütte, the flood protection reservoir Kalte Bode and the Hassel- and Rappbode pre-reservoirs. The plan to use the area for the construction of water reservoirs was already established in the late 19th century but not until the 1960s the water reservoirs were completed and now serve as flood protection, for drinking water abstraction, energy production, recreation and for low water elevation (Schöpfer, Björnsen, Dietze & Schimrosczyk 2007). The reservoirs are administered by the *Talsperrenbetrieb Sachsen-Anhalt* (Talsperrenbetrieb Sachsen-Anhalt 2013). Figure 3.1 shows the Bode system with the named reservoirs.

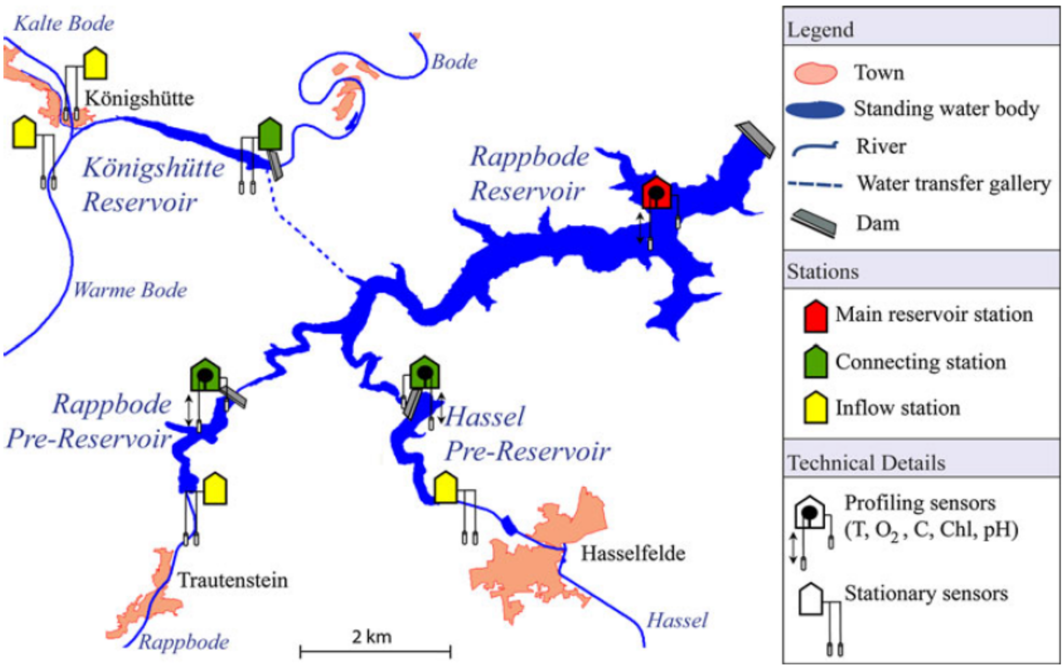


Figure 3.1: Map of the Bode system in the Harz, taken from Rinke et al. (2013)

As one part of the Bode catchment, the Hassel- and Rappbode pre-reservoirs are directly connected to the Rappbode main reservoir and serve as contributors. With a straight line distance of approximately two kilometres between the two pre-reservoirs, the reservoirs are located very close to each other (Figure 3.1). Both dams are straight gravity dams (Wouters 2011). Main contributor to the Rappbode pre-reservoir is the river Rappbode which has its source above Benneckenstein, passing through Trautenstein. At Trautentein the sampling point for the inflow into the water reservoir can be found. The Rappbode pre-reservoir has a total catchment area of 48.1 km^2 , with an annual discharge of approximately 28.2 Mm^3 and a corresponding residence time of 16.2 days (Rinke et al. 2013). Main contribution to the Hassel pre-reservoir is the river Hassel which originates near Stiege and passes through Hasselfelde, where the sampling point for the inflow into the water reservoir is located (Hasselaue). The water reservoir has a catchment area of 44.5 km^2 with an annual discharge of 19.4 Mm^3[1] and a residence time of 27.3 days (Rinke et al. 2013). There are four other considerably smaller streams contributing to the inflow of the Hassel water reservoir, and eight considerably smaller streams flowing into the Rappbode pre-reservoir. However, those streams have not received much attention yet and the influence remains uncertain, even though smaller studies began to estimate the influence of those streams on the water reservoirs (see Weiß (2012)); in case of the RVS the range of inflow contributing from smaller streams can be estimated be in a range of 5–10%. Arial photographs (google Pro) show the area of the reservoirs (3.2 and 3.3). The figures also indicate the partial areas which are later used for the error estimation of the individual sampling spots compared to the single spot sampling. These individual areas are assigned as approximate representative areas to the depth gradients found in the pre-reservoirs. These are also included in the figures named above.

3.2 Geology and land use

The area of study is located in the regional/ geological unit of the Harz. The area can be further distinguished into Upper Harz (Oberharz), Middle Harz (Mittelharz) and Lower Harz (Unterharz) (Schwarzer 2005). The formation and folding of the mountain range began in the Palaeozoic era with nowadays elevations of 500–1140 m.a.s.l. The formation of the range is aligned from northwest to southeast and is characterized by steep mountain ridges, stone runs and long, narrow shaped valleys.

Figure 3.4 shows the area of the pre-reservoirs as stratigraphic units. The inflow area of the pre-reservoirs is mainly composed of olisthostrome. In both valleys in which the pre-reservoirs are located, greywacke and deposition from the Devon era are dominating. The cambisoils developed from the present soils are known to be typical for low mountain ranges (Mittelgebirge). They are mainly used for forestry as their use

[1] Please note that the data here is of very recent origin (2013). The data used for the calculation in the analysis part are not updated yet but are used as they are based on the area/volume gradients and therefore represent a better basis for calculation.

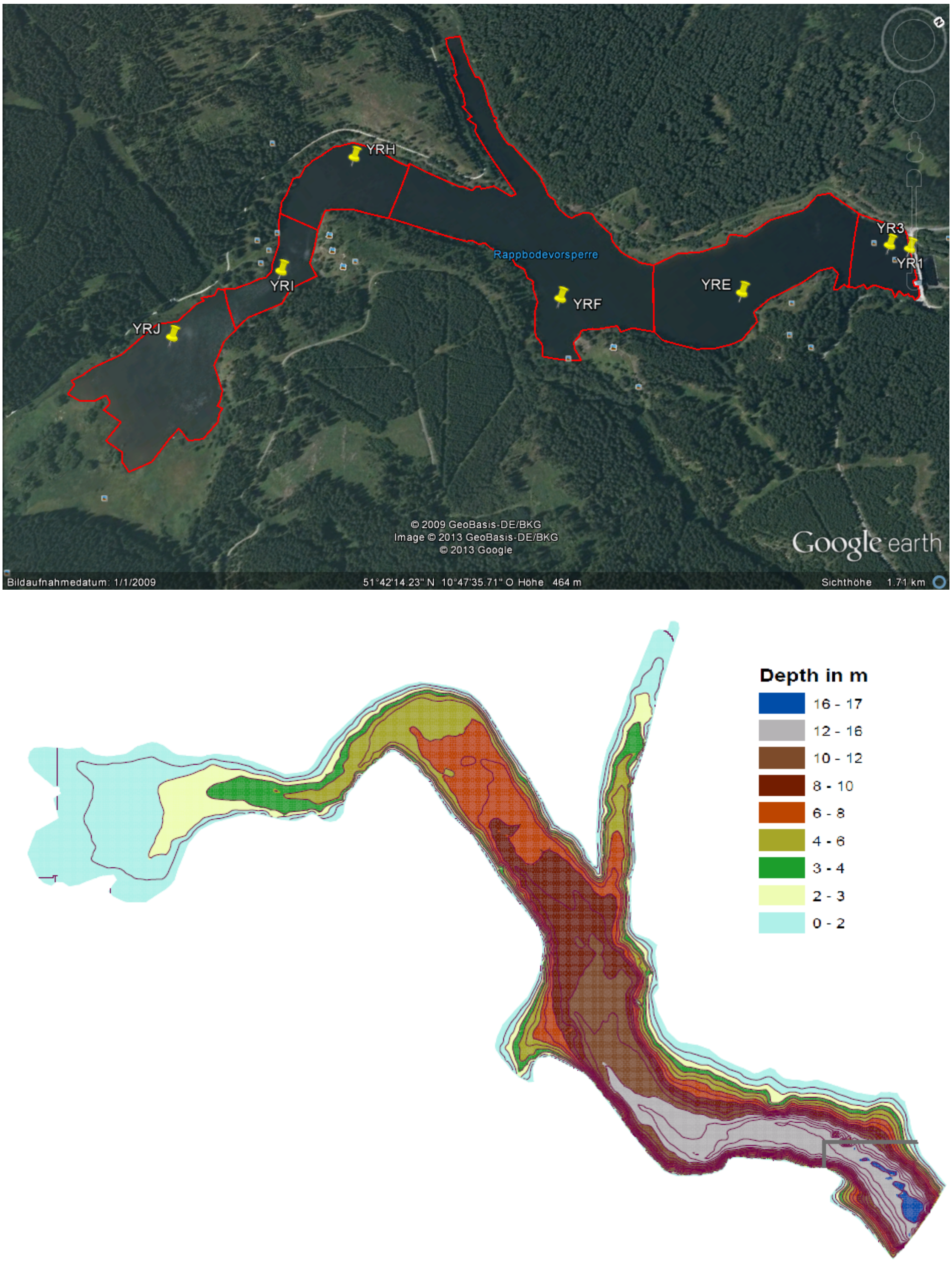
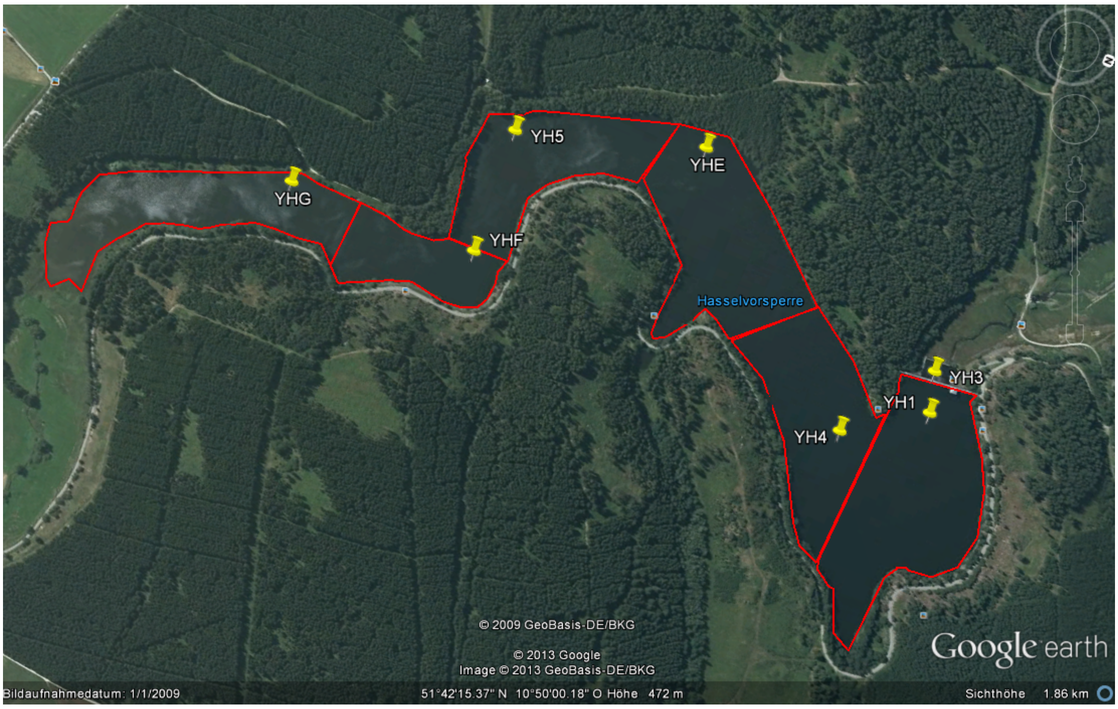


Figure 3.2: Rappbode pre-reservoir, aerial photographs taken with google maps; depth profiles based on maps provided by UFZ



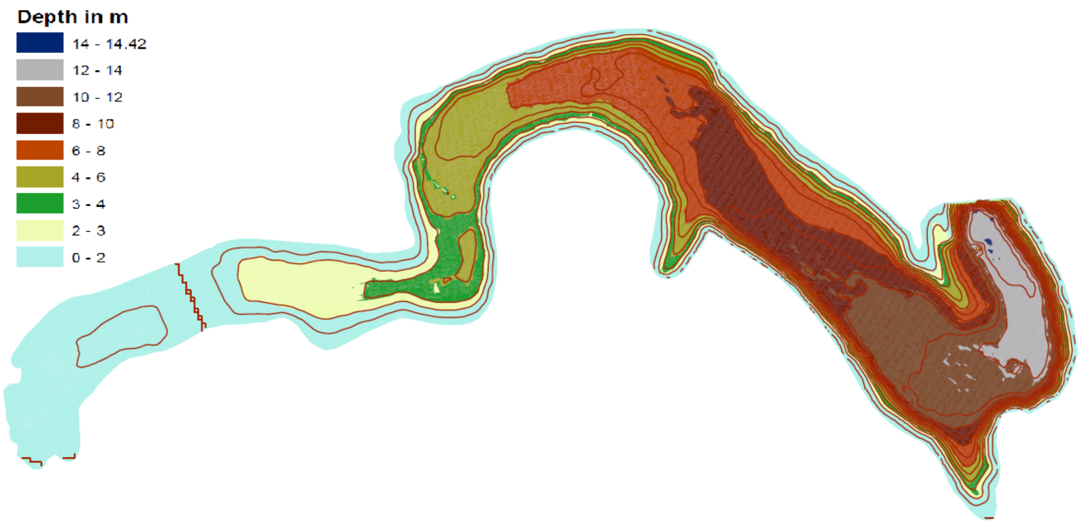


Figure 3.3: Hassel pre-reservoir, aerial photographs taken with google maps; depth profiles based on maps provided by UFZ

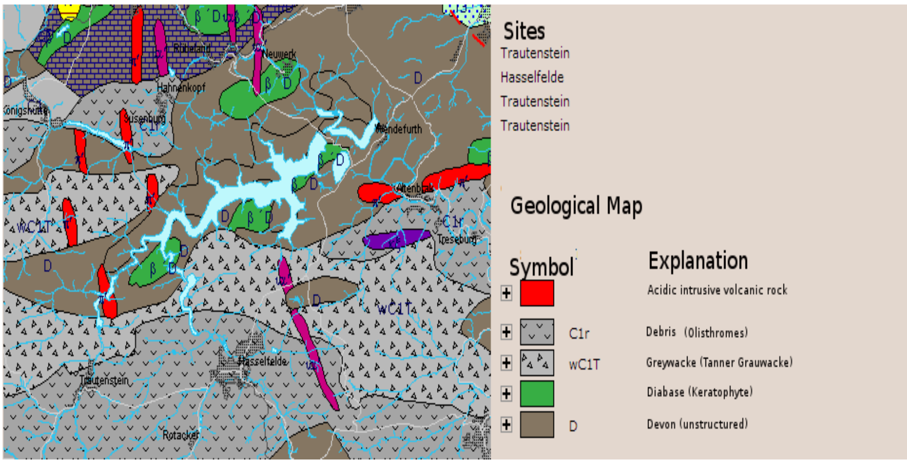


Figure 3.4: Geological units of the Harz mountains with the focus on the Rappbode area; from LAGB (2013)

in agriculture is limited (Scheffer, Schachtschabel & Blume 2010); here, coniferous trees dominate the forested area.

In the Rappbode catchment almost three quarter of the land is forested. Grassland is with 22 % the second most common land use form in the catchment (Figure 3.5). As it can be seen in Figure 3.6, the land use of the Hassel catchment is different from the Rappbode catchment as the land is also used for agriculture (25 %) to a larger extent so that forest only covers 37 % of the area. Urban areas do not contribute significantly to the land use patterns of the catchments.

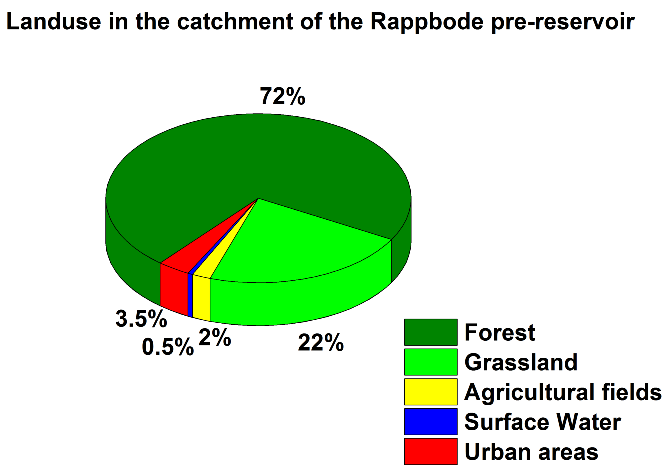


Figure 3.5: Land use forms in the Rappbode pre-reservoir catchment; modified after (Pirk 2012)

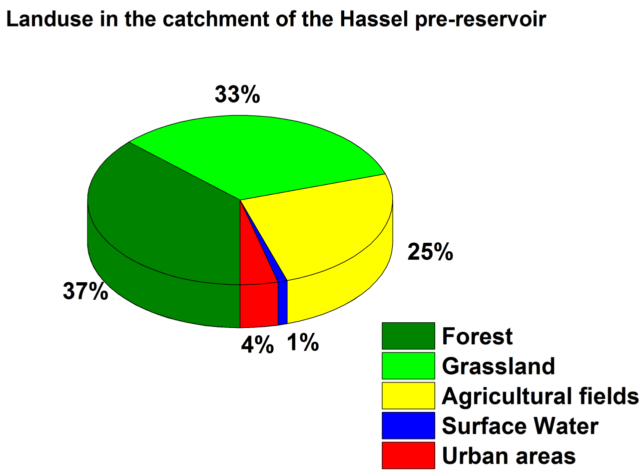


Figure 3.6: Landuse forms in the Hassel pre-reservoir catchment; modified after (Pirk 2012)

3.3 Climate

The climate in the Harz area is, due to its mountainous topography, varying from precipitation around 500 mm yr^{-1} in the eastern Harz region, towards the city of Magdeburg, to relatively high precipitation in some valleys with over 1000 mm precipitation per year (Lübker n.d.). For Hasselfelde and Trautenstein the precipitation values as average from 1981–2010 lie at 812 mm and 860 mm, respectively (DWD 2013). The mean temperature is not continuously monitored in the area around the pre-reservoirs; generally, for the region around Harzgerode (404 m.a.s.l., Eastern Harz region) an annual mean temperature of 6.8 $^{\circ}\mathrm{C}$ is documented (Lübker n.d.).

4 Material and Methods

4.1 Sampling

The monitoring data is provided by the UFZ in Magdeburg. It will be described in several sections so that the sampled parameters can be evaluated and explained separately. The monitoring of the pre-reservoirs takes place approximately every two weeks, conducted by employees of the UFZ. In this study, data from April 2011 until July 2012 is used for the analysis and testing of hypotheses.
For a better overview of the time span in which the sampling took place, the following graph shows the dates of the routine monitoring. The elevated point depict the transect sampling in the summer of 2012 on June 18th and 19th and July 30th and 31st. Also, June 4th is pointed out on which a comparative sampling of the deepest point and the outflow took place (this day was chosen to represent the comparison campaign. However, some of the measurements at the dam were conducted on June 26th). Therefore, samples were taken at the buoy (YH3) and from two sites on the dam; the open outflow and next to the control station of the dam (see Picture below). The outflow and point of maximum depth are lying relatively close to each other and nevertheless both sampled individually. In June (4th and 26th) the outflow is sampled with a multiparameter probe and GHG samples are taken to be analyzed with gas chromatography in the laboratory. This measure is taken to identify whether homogeneity can be assumed for the two sampling points and if the dam influences the stratification in the close vicinity of the dam. The results are presented in Section 5.1.

4.1.1 Chemical Data

There are three sampling points for the monitoring; the inflow (YHZ, YRZ), the outflow (YH1, YR1) and the point of maximum depth which is located close to the outflow (YH3, YR3). Samples for the water chemistry analyses are taken with a falling weight water sampler; samples for the outflow are collected from the surface at a reasonable distance from the dam. Samples for the point of maximum depth are collected in 2 m, 5 m, 8 m, 10 m, 12 m and above ground (estimated with a hand-held depth-sounder).

Figure 4.1: Sampling points at the dam

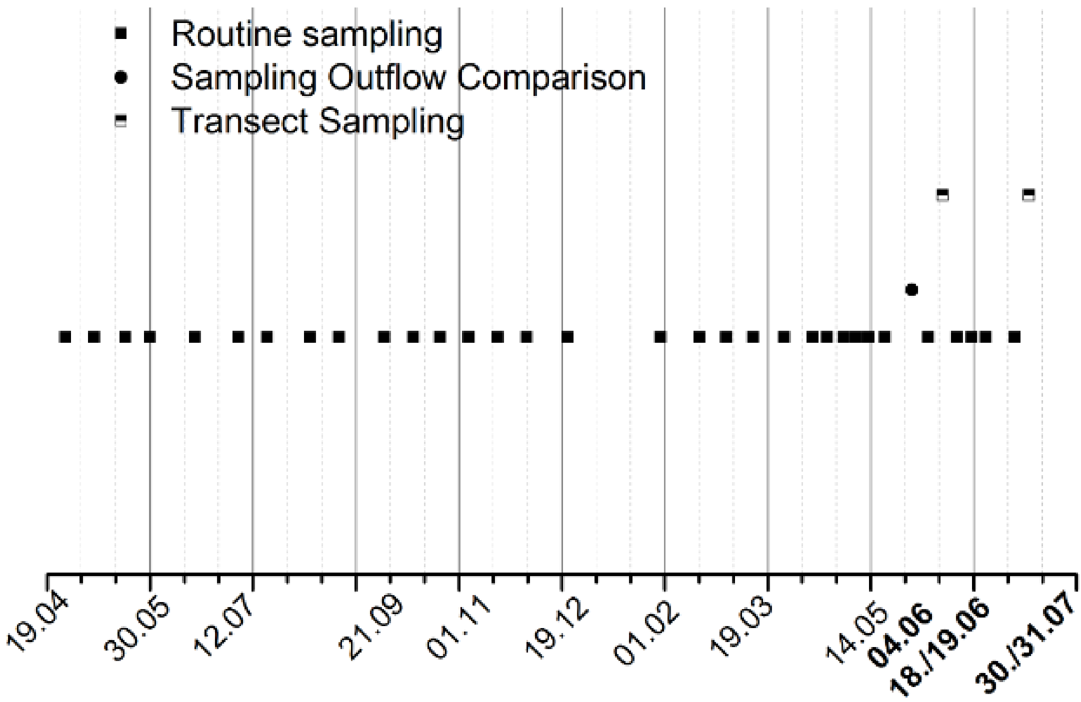


Figure 4.2: Time frame of the study period in 2011 and 2012 of the studied reservoirs

Figure 4.3: Example of sampling box with flasks for water samples and syringes for gas analysis

For the abstraction of water for gas analysis, the thin boundary layer method is used as the routine method; the method is described for example by Tremblay, Varfalvy, Roehm & Garneau (2005). Prepared syringes with a volume of 30 ml and cross valves are filled with water from the respective depth through a connection tube from the water sampler. At the inflow the samples are taken manually from the running water and stored in a box until reaching shore, than stored in a cooled box until measurement the following day. At the site, other limnological data are measured with a multiparameter probe (IDRONAUT-172, Brugherio (Italy)). If not indicated otherwise, the data is obtained from this probe. The depth profile of the probe is measured as pressure [dbar], after calibration to air pressure at the site, and is corrected to real depth [m] as described by Boehrer & Schultze (2008). The conductivity is recalculated to a temperature compensated conductivity [25 $^\circ$C] after Boehrer & Schultze (2008).

4.1.2 Biological Data

The algae differentiation profiles were measured with the bbe FluoroProbe (Moldaenke, Schwentinental, Germany)(Moldaenke GmbH 2012) which uses six LEDs to measure fluorescent excitation of the photosynthetic pigments of the algae (at wavelengths of 370 nm, 470 nm, 525 nm, 570 nm, 590 nm and 610 nm) as well as the detection of other fluorescent matter such as natural humic substances. The determination of the different algae is possible by differentiation of fluorescent maxima caused by different pigments present in the algae; chlorophyll-a and -b, present to a large extent in *chlorophyceae* shows a maximum of fluorescence at 470 nm, whereas the pigment phycocyanin, present in *cyanophyceae*, shows high fluorescence at 610 nm. In the 525 nm region xantothophyll fuxoxanthin is fluorescent, showing the presence of *bacillariophyceae* as well as the peridin is detected showing abundance of *dinophyceae*. For the *cryptophyceae* a maximum at 570 nm can be found (Moldaenke

GmbH 2012). Hence, the software provided by the company distinguishes between *green-algae*, *blue-green algae* [1] *diatoms*, *cryptophyta*, *humic substances* and the *total concentration*. The probe can be used for the determination of chlorophyll in water [µg l^{-1}]. In Beutler, Wiltshire, Meyer, Moldaenke, Lüring, Meyerhöfer, Hansen & Dau (2002) the probe was tested compared to the HPLC method of determination the algae distribution in water. Data is available from April 2011 until July 2012.

4.1.3 Transect Sampling

The two sampling campaigns took place on June 18th (HVS) and 19th (RVS) and July 30th (HVS) and 31st (RVS) of 2012. For the sampling, coordinates were set according to pre-existing points in the data base of the UFZ. Here, the same parameters were determined as in the monitoring program. Additionally, the collection of data for GHG measurements took place at each coordination point. Table 4.1 shows the depth gradients sampled at each sampling point in the Hassel and Rappbode reservoirs, respectively. For a detailed picture of the reservoir, see section 5.4 in which the areas of similar depth are indicated. For the sampling campaign in June and July the CTM 644 and the bbe FluoroProbe by Moldaenke were used.

4.1.4 Greenhouse Gas Data

During the two transect sampling campaigns a floating chamber method was used in addition to the thin boundary layer method in order to assess GHG fluxes. The floating chamber is connected to a GASMET DX4010 (Avensys INC., Toronto, Canada), a mobile Fourier transform infrared (FTIR) spectroscopy device. Figure 4.4 shows the floating chamber connected to the FTIR spectrometry device (Figure 4.5) via one inlet and one outlet tube. A zero measurement with pure nitrogen gas is carried out in the laboratory and saved for calibration; although it is theoretically necessary to do this before each measurement, the slight increase in uncertainty is accepted because this operation is not possible during field work. A volume of 2.9 L min^{-1} are continuously sucked through the floating chamber which passes through a desiccant to prevent condensation of water in the device. Measurements were conducted usually three times at each point in the transect for a duration of 10 –12 minutes. The relevant data is stored on a portable computer.
Several studies evaluated the uncertainties the several methods imply. Duchemin, Lucotte & Canuel (1999) have shown that the thin boundary method underestimates the CO_2 fluxes of the water body over the chamber method especially in calm weather conditions (low wind speed) (St. Louis et al. 2000), but it seems to be a reasonable

[1] it is recognized that the taxonomy is currently under revision; *blue-green algae* were placed in the domain of algae, but are nowadays part of the domain of bacteria (phylum: cyanobacteria) (Oren 2004)

method to use for a routine monitoring. A complete description of a comparative study can be found in Tremblay et al. (2005). In Figure 4.6 it is schematically shown how the floating chamber captures gas within the airtight room which is connected with the GASMET via inlet and outlet valves. The exchange of gases is indicated through arrows (diffusive flux) and bubbles (ebullition).

Figure 4.4: Floating chamber

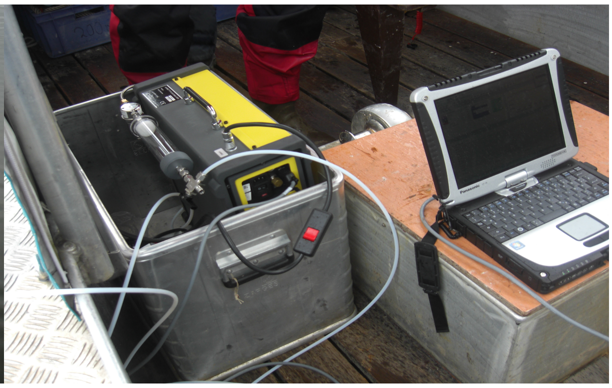


Figure 4.5: Gasmet DX 4010

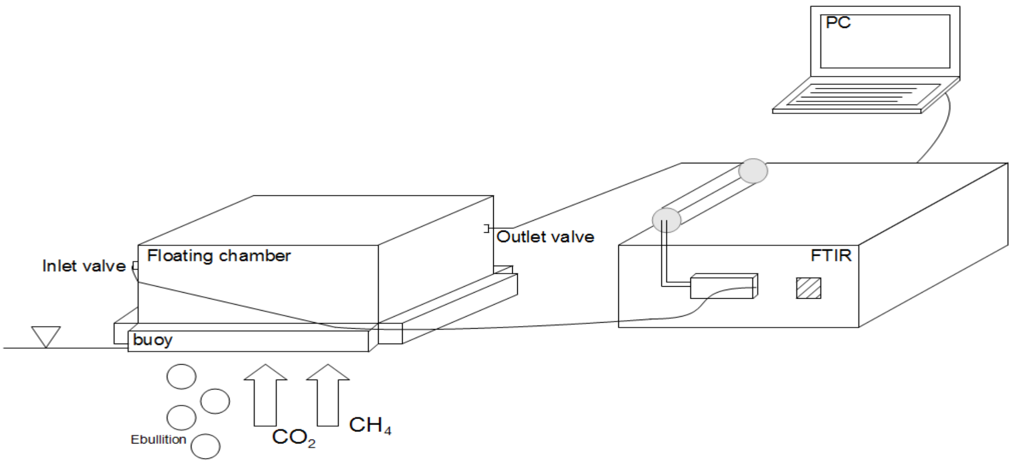


Figure 4.6: Scheme of a floating chamber similar used to the one in the study, own graphic

4.2 Analytical Methods

4.2.1 Limnlogical Data

The samples collected in the field were stored in the facilities of the institute until processing in the laboratories of the UFZ in Magdeburg. Nitrogen and phosphorus ions (NO_2, NO_3, NH_4–N, DNb, SRP, DP) were pre-filtered on site over nucleopore membranes (0.2 µm) before further analysis in the lab. In the study the following parameters are taken into account in the analysis (mean of analysis in parathesis):

- Cations: K^+, Na^+, Mg^{2+}, Ca^{2+} (ICP-OES)
- Anions: Cl^-, ${SO_4}^{2-}$ (ion chromatography with surpressor technique)
- heavy metals: Cu (diss.), Mn (diss.), Fe (diss.), Ni (diss.) (ICP-OES)
- nutrients: TP, DP, SRP, NO_3-N, Si (photometry).

4.2.2 Gas Chromotography

Gas chromatography (GC) is used to analyze the samples for carbon dioxide and methane. The used device in this study is a gas chromatograph from SRI Instruments (SRI Instruments 2013). The GC is able to measure partial pressure of CO_2 and CH_4 in gaseous samples. As carrier gas hydrogen (H_2) is used which is produced from distilled water via a hydrogen generator connected to the GC. The gaseous sample is directly injected to the sample loop. Using a catalytic converter, CO_2 is converted to CH_4. The substances are detected with a flame ionization detector, based on the principle of ionization of the gas in the oxyhydrogen flame and is plotted as a peak which can be visualized, integrated and analyzed with a corresponding computer software (Koschorreck 2012). The total concentration of the gas in the sample is determined with the calculation of:

$$C\,[mmol^{-1}] = \frac{p \times 4.09 \times 10^{-5} \times (V_{gas} + \alpha \times V_{H_2O})}{V_{H_2O}}$$

The Bunsen coefficient α is dependent on the gas analyzed and the temperature and is calculated as follows,
for CO_2:

$$\alpha = temp.[°\mathrm{C}] \times (-0.0213) + 1.29983333$$

and for CH_4:

$$\alpha = temp.[°\mathrm{C}] \times (-0.0008) + 0.051$$

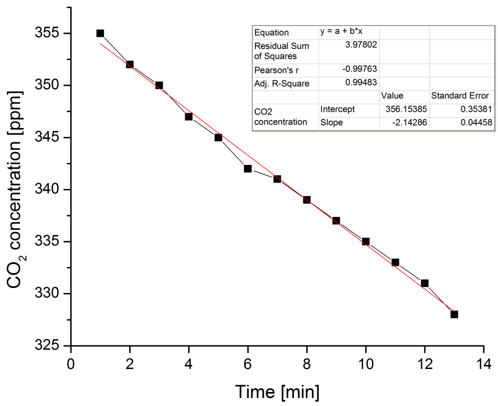


Figure 4.7: Example diffusive flux

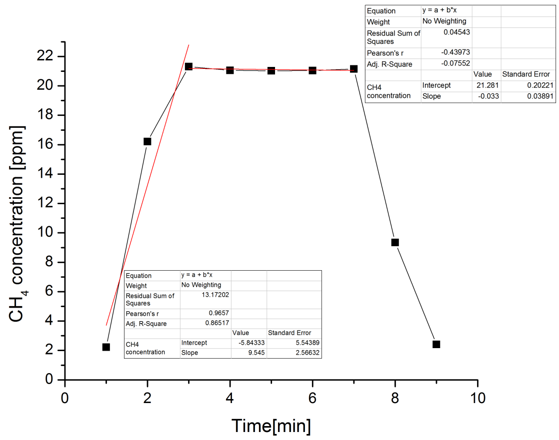


Figure 4.8: Example ebullition flux

4.2.3 GHG Flux Calculation

The GHG flux for the sampling campaign in June and July is calculated via the slope of the measured concentration of the gas against the time; an example is presented in Figure 4.7. In case of ebullition fluxes, the observation looked like 4.8. Here, two slopes are calculated. The linear regression results in the rate in ppm d^{-1}. The flux will be calculated with:

$$F\,[mmol\,m^{-2}\,d^{-1}] = \frac{ppm\,d^{-1} \times F \times h}{1000}$$

with h being the height of the chamber which is 0.143 m in this study and

$$F\,[mol\,m^{-3}] = \frac{1\,bar \times 10^5}{8.134\frac{J}{mol\,K} \times temp.[K]}$$

On the basis of the work by Tremblay et al. (2005) the correlation coefficients are used as estimators for ebullition of gas; correlation coefficients higher than 0.85 for CO_2 and 0.9 for CH_4 are used to estimate ebullition e.g. correlation coefficients lower than those values indicate diffusive exchange on the water-air interface. In case of GHG ebullition the slope of the curve will vary greatly and is calculated separately, resulting in two fluxes, a diffusive flux and an ebullition flux.

4.3 Data Analysis

4.3.1 Calculation of Mass Flow

The calculation of the mass flow in the pre-reservoirs is of crucial importance for the understanding of the processes in the reservoirs. For the calculation of the loadings

from the HVS and RVS, the discharge values from the *Landesbetrieb für Hochwasserschutz und Wasserwirtschaft Sachsen-Anhalt* (LHW) are used. This data is collected at the inflow of the water reservoirs in Trautenstein (RVS) and Hasselfelde (HVS). In case of the RVS, the inflow sampling point (gauge) is only about hundred metres away from the actual inflow into the reservoir but in case of the Hassel pre-reservoir the sampling and logging point is located about 2500 m away from the real inflow which implies several uncertainties which have to be taken into account while analyzing the results. In both cases, indirect inflow (Q_{in}) into the water bodies such as run off from land surface, interflow and groundwater inflow is neglected. Furthermore, the residence time is not included in the calculation of the mass flows.The time lag between the passage through the water can have crucial impacts on the water composition but it lies beyond the scope to evaluate these here.
The raw data provided by the LHW on an annual basis is corrected against weed invasion, ice cover etc. and data is available from September 2011 until the end of the year [2]. For the year 2012, a corrected Q is calculated via a regression based on the water level and corrected values from past years. The used equation is as follows: for RVS:

$$Q_{corr.} = 0.000639 \times W^2 - 0.042 \times W + 0.56$$

for HVS:

$$Q_{corr.} = 0.000896 \times W^2 - 0.01477 \times W + 0.059$$

with $Q_{corr.}$ = the corrected discharge in m^3 s^{-1} and W = water level in [cm]. To use the data of the inflow of water into the reservoir an alternative solution must be found in order to be able to calculate mass flows. Therefore, the data of the inflow is extrapolated to mirror the complete catchment of the reservoir from the inflow sampling point to the dam. In that case, one accepts that the catchment area below the gauge is behaving in a similar way than around the area of the gauge. There are no reliable data for the outflow of the respective reservoirs; this implies that the data of the LHW is used again, with the knowledge that this way indulges the impact transpiration and influence of direct precipitation onto the water body, as well as the indirect impact by interception and evaporation influencing the water body below the gauge. For the extrapolation of the inflow data to the catchment area to obtain a correction factor the following formula is used:

$$\mathrm{F = EZG_{total}[km^2]/EZG_{gauge}[km^2]}$$

with the key values for the pre-reservoirs:

$$\mathrm{F_{Rappbode}} = 48\ \cdot 1\,\mathrm{km}^2/39.1\mathrm{km}^2 = 1.23$$

[2]inflow data and regression formula provided by the UFZ Magdeburg

and

$$\mathrm{F}_{\mathrm{Hassel}} = 44 \cdot 5\,\mathrm{km}^2/28.8\mathrm{km}^2 = 1.545$$

In the following, the data used for the calculation of the load of the reservoirs is corrected against this factor.

The mass flow is then calculated as the multiplication of the discharge (Q$_{in}$) (Q$_{out}$) and the concentration [mg s^{-1}]:

$$\mathrm{massflow}_{\mathrm{in/out}} = \mathrm{Q}_{\mathrm{in/out}}\ [\mathrm{l\ s}^{-1}] * \mathrm{c}_{\mathrm{in/out}}\ [\mathrm{mg\ l}^{-1}] = [\mathrm{mg\ s}^{-1}]$$

These formulas entirely neglect the fact that there are inflowing streams into the water bodies and the uncertainties evolving from that have to be accepted. The absolute changes (slope) are calculated through subtraction of the inflow load to the outflow load; a positive absolute value displays an element input, a negative absolute value an element outflow.

4.3.2 Error Estimation

The error estimation for the pre-reservoirs is done in order to find out in how far a single-spot monitoring is representing the entire water body. For this, the sampled depths were firstly assigned to defined layers which they represent in the water column. The meter-wise volumes of the layers was provided by the UFZ Magdeburg. In order to estimate the impact of a sampling at several sampling points the values of the assigned depth layers were also extrapolated to an area which represented the surroundings of the sampling point. For the single-spot sampling it was assumed that the calculated value directly represents the entire water body. The areas which were measured using Google Earth Pro are of the following sizes and can be seen in Figures 3.2 and 3.3. Finally, the relative error was calculated which gives an idea about the over- or under-estimation possibly made by the single-spot sampling.

Table 4.1: Sampling points in the Hassel and Rappbode reservoirs

	Point	Coordinates[a]	Approx. distance from dam [m]	Sampled depths [m]
Hassel pre-reservoir				
	YH1	4 419306 5731168	0	surface
	YH3	4 419370 5731202	65	2, 5, 8, 10, 12, 14[b]
	YH4	4 419427 5731054	275	0, 2, 5, 8, 10
	YHE	4 419144 5730764	730	0, 2, 5, 7.5
	YH5	4 419209 5730480	1000	0, 2, 5
	YHF	4 419371 5730477	1200	0, 2, 3.5
	YHG	4 419404 5730193	1500	0, 2
Rappbode pre-reservoir				
	YR1	4 417057 5731260	0	surface
	YR3	4 417000 5731225	35	2, 5, 8, 10, 12, 16
	YRE	4 416944 5730981	310	0, 2, 5, 8, 10, 13.5
	YRF	4 416784 5730762	600	0, 2, 5, 7.5
	YRH	4 416395 5730631	870	0, 2, 5.5
	YRI	4 416475 5730414	1280	0, 2, 3.5
	YRJ	4 416468 5730215	1510	0, 1.5

[a] Gauss-Krüger coordinate system

[b] the depth of the sample closest to the lake bottom was estimated with a hand-held depth-sounder the specific day and location

Table 4.2: Depth-Volume layers of HVS and RVS

	Sample depth [m]	Assigned layer [m]	Volume layer [l]
Hassel	0	0-1	2.5E+08
	2	1-3	3.9E+08
	5	3-7	5.2E+08
	8	7-9	1.5E+08
	10	9-11	8.7E+07
	12	11-13	2.7E+08
	13	13-bottom	2.2E+06
Rappbode	0	0-1	1.8E+08
	2	1-3	2.9E+08
	5	3-7	4.1E+08
	8	7-9	1.2E+08
	10	9-11	7.3E+07
	12	11-13	3.5E+07
	16	13-bottom	1.3E+07

Table 4.3: Areas estimated from aerial photographs of HVS and RVS

	Sample Point	m^2
Hassel	YH3	52068
	YH4	38541
	YHE	46284
	YH5	35185
	YHF	19712
	YHG	38374
	$\sum$	230164
Rappbode	YR3	114712
	YRE	47330
	YRF	73656
	YRH	20346
	YRI	12169
	YRJ	37156
	$\sum$	305368

5 Results

5.1 Comparison at Outflow

As mentioned in section 4.1, the outflow and the point of maximum depth, located close to the outflow, were sampled in early June to obtain results for comparison. Selected results are shown in the following graphs. It can be seen that the three sampling points did not differ significantly from each other in both water bodies. The only parameter which seems to be off to a certain extent is the pH which is most likely due to a slow responding pH sensor of the probe [1]. The oxycline was located in a depth of approximately 3.7 m and 4 m in the Hassel and Rappbode pre-reservoir, respectively, indicating summer stratification of both reservoirs. The anoxic zone began in 10 m and around 11 m in Hassel and Rappbode pre-reservoir, respectively, showing the early state of the stratification period as it is expected that the anoxic layer migrates upwards with the proceeding of the summer months. The GC measurements made at the outflow area of the pre-reservoir revealed a similar distribution of GHG in the area. At YH1 the concentration of CO_2 was found to be less steeply increasing than at YH3 or the control station. YH1 showed a slight increase of methane in the middle of the water column. However, the concentrations at the bottom were not found to be as high as at the point of maximum depth (data for the RVS is found in the Appendix D). However, the data from the algae probe indicated a difference in the two points (YH3 and YH1). The total concentration of the algae was mainly composed of diatoms but was the maximum of algae found at YH3 clearly visible in a depth of around 3m. At the dam, the algae concentration was highest in the upper 3m and only decreasing below this depth. There is no bbe FluoroProbe data available for the Rappbode pre-reservoir.

[1] Personal communication with UFZ, Magdeburg, 2012

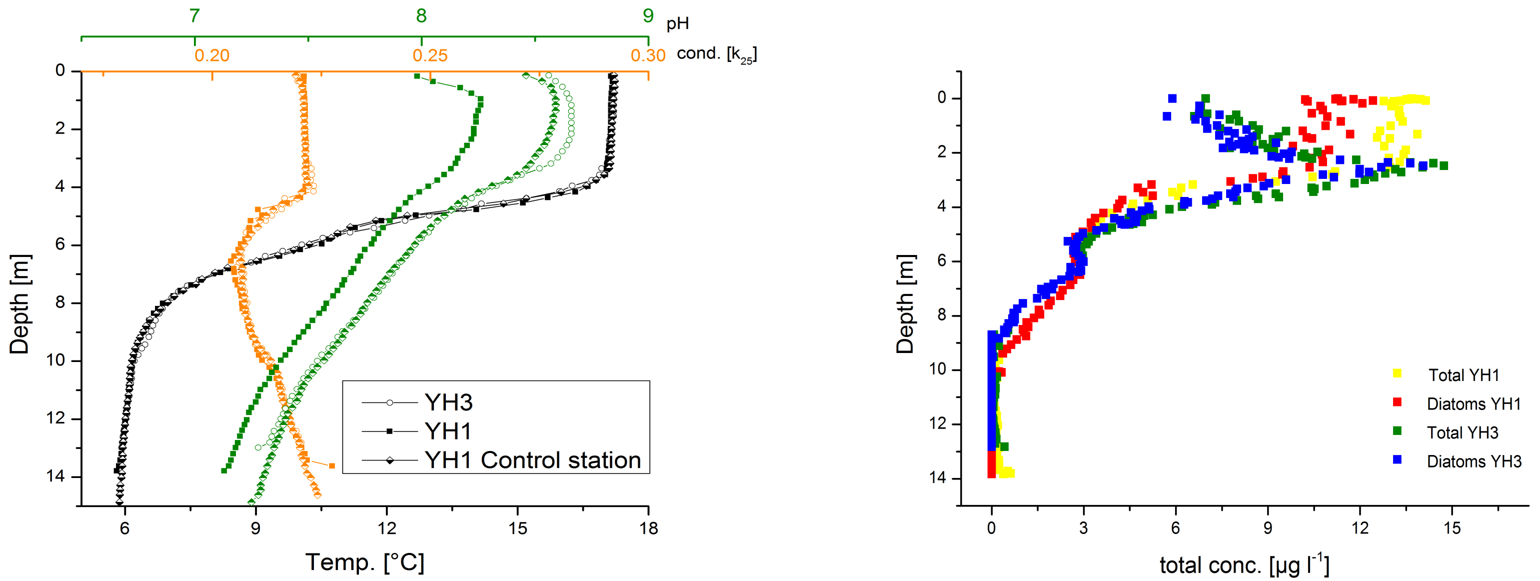


Figure 5.1: Comparison of Outflow at HVS, physical parameters (left) and algae (chlorophyll conc. [μg^{-1}]) (right), June 2012

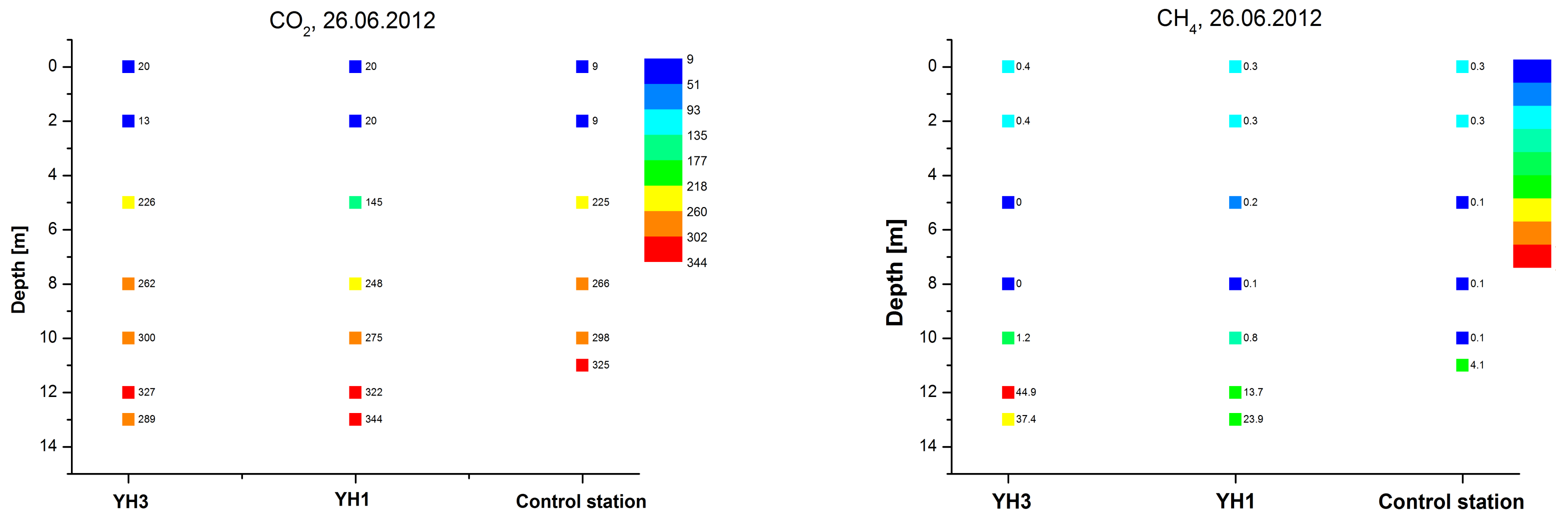


Figure 5.2: Comparison of Outflow at HVS, CO_2 (left) and CH_4 (right), June 2012

5.2 Monitoring Data

5.2.1 Mass Flows

The mass flows shown in this section are calculated as described above in section 4.3.1 and presented from the time interval September 2011–Dec 2011. Here, the monitoring data is presented in several diagrams as it illustrates well the retention and mobilization of masses within the water bodies. For representation the groups of anions and cations, heavy metals, and phosphorus species were chosen. Due to missing discharge data for 2012 and with merely an approximation of the water flow, no reliable statements about the actual mass flow can be made for this year and a complete graph is shown in the Appendix(B). An example of raw data (TP) is also given as representation for the inflow and the outflow (Figure 5.3 and 5.7). Also available in the Appendix are tables showing the measured and calculated discharge values for the pre-reservoirs (Appendix A).
Anions and cations mass flows are shown in Figure 5.6. Cl^- and Ca^{2+}, Mg^{2+} and Na^+ are generally retained in the RVS pre-reservoir. The dimensions differed from around 26 kg d^{-1} (Cl^-) to 50 kg d^- (Ca^{2+}), respectively. $SO_4{}^{2-}$ and K^+ were mainly stable in the period of September 2011 to December 2011 and no change from inflow to the outflow can be seen. Overall, the changes from inflow to outflow did not exceed 20 % for the RVS. However, the sampling day Dec, 19th is not included in the average because it followed a phase of extreme flow which exceeded the volume of 2.5 m^3 s^{-1} and was the last sampling before the winter period. For 2012 a wider spreading was observed which underlines again the importance of accurate discharge values for the analysis regarding the heterogeneity in the water reservoirs.
The mass flows for Fe and Mn indicate retention in the reservoir (RVS); however, changes in the range of over 50% might occur. For instance, the mass per day for iron in the period from September 2011 to December 2011 changed on average by 55%. Copper and manganese were mobilized between 4.5 g d^{-1} and 3.5 kg d^{-1} , respectively, which was also calculated with an overall change from the inflow to the outflow of over 30%.
Phosphorus (TP) is generally subject to fluctuations and responded quickly to changes in discharge. The orthophosphates (SRP), the readily available P, was retained in the water body with an average of 5 g d^{-1} (2011, without Dec. 19). The P species were generally captured well in the sampling way as the overall changes lie below 20%.
Both NO_3-N and Si as important nutrients for organism growth were retained in the water body with a mass flow of 3 kg d^{-1} and 27 kg d^{-1}, respectively. The changes of this nutrient in the water body exceeded 50% and can therefore not be assumed to be described well with a monitoring at only two spots for the Rappbode pre-reservoir. The presentation of the raw data obtained from the inflow and the outflow also show similar pattern, mainly responding to high flood events during the sampling period.

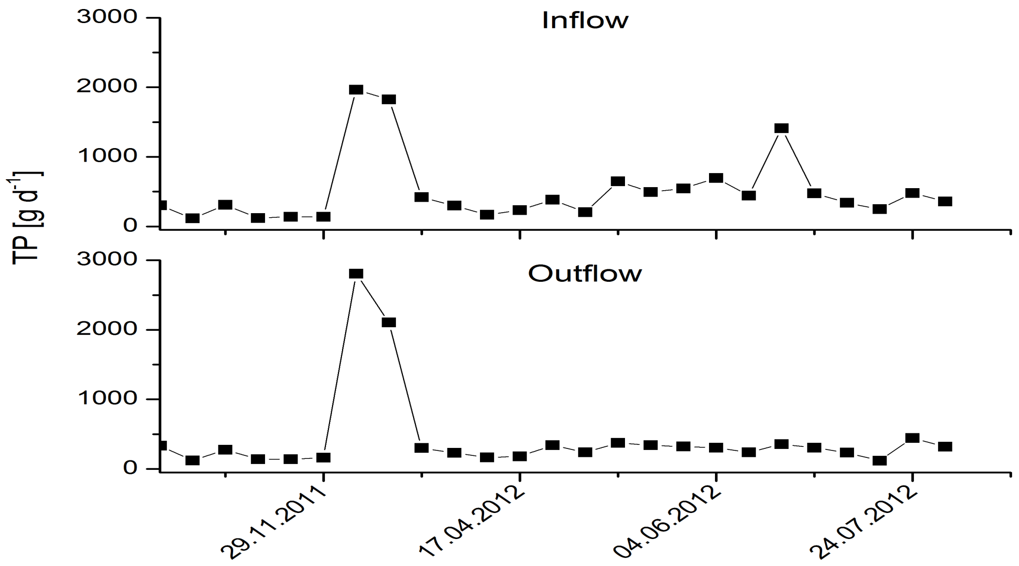


Figure 5.3: RVS inflow and outflow TP concentrations, Sep. 2011–Jul 2012

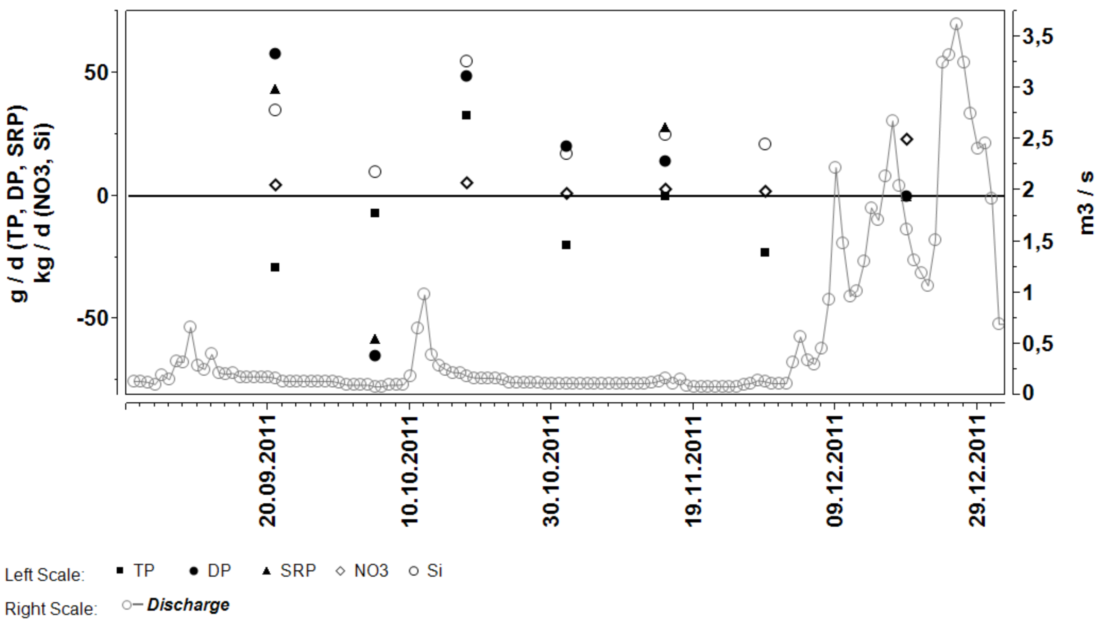


Figure 5.4: RVS mass flow diagram, P species, NO_3-N, Si, Sep. 2011–Dec. 2011

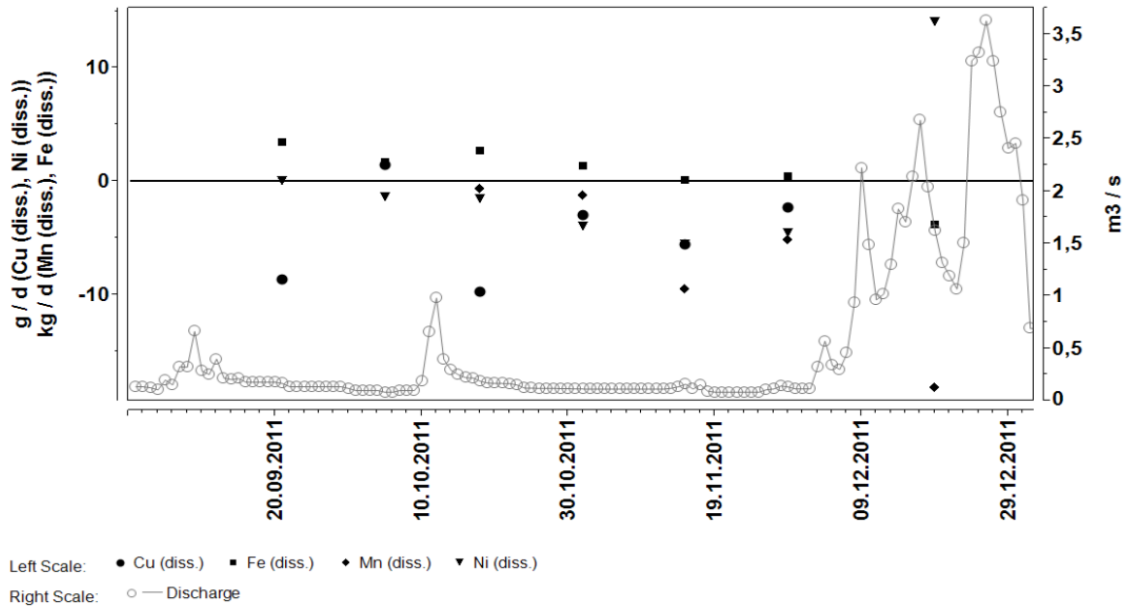


Figure 5.5: RVS mass flow diagram, metals (Cu, Fe, Mn, Ni), Sep. 2011–Dec. 2011

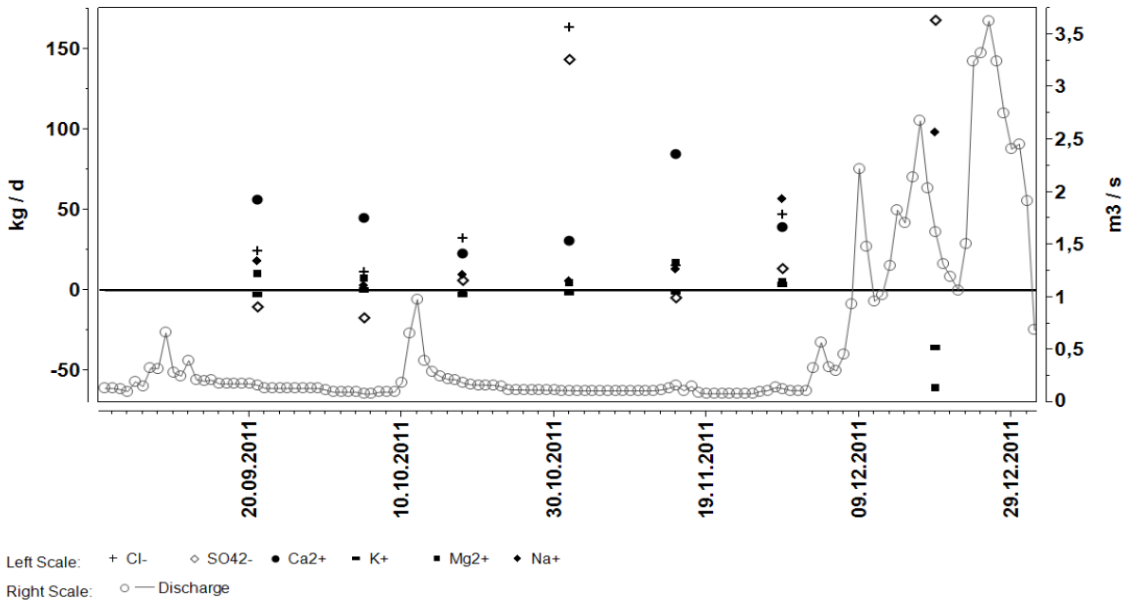


Figure 5.6: RVS mass flow diagram, anions and cations (Cl^-, $SO_4{}^{2-}$, Ca^{2+}, Mg^{2+}, Na^+, K^+), Sep. 2011–Dec. 2011

For the Hassel pre-reservoir the mass flows are presented as mass flow diagrams for the period of September 2011–December 2011 with the corresponding discharge, too. Here also the values of from Dec. 19^{th} might not fall into the scale of the diagram but due to the high flow event, the mass flows often resulted in high mass flow, which have to be analyzed separately.

The nutrients were mainly retained in the reservoir; the P species were responding to changes in water flow, whereas Si and NO_3-N were stable. On average, between the three fall months, approximately 40 g d^{-1} TP are retained in the HVS reservoir. The mass flows of the metals in the Hassel pre-reservoir show that there was little change between the inflow and outflow, indicating that no exchange of metal phases occurred during the passage.
In general it can be said that the relative changes in the HVS are higher compared to the RVS; for the presented parameters a changed from inflow to outflow was often found to be higher than 30% (Na^+, K^+, TP, Ni, Cu excluded). The nutrients were also the most responsive to changes in masses induced by alterations in discharge in the Hassel pre-reservoir.

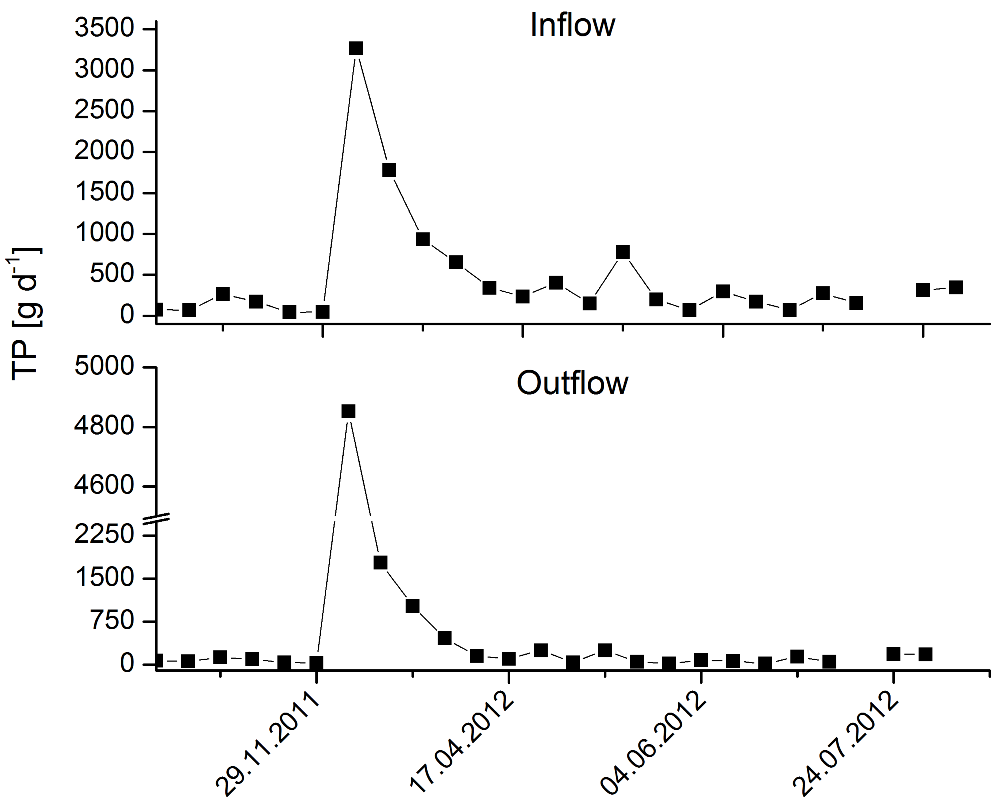


Figure 5.7: HVSrohdatenTP

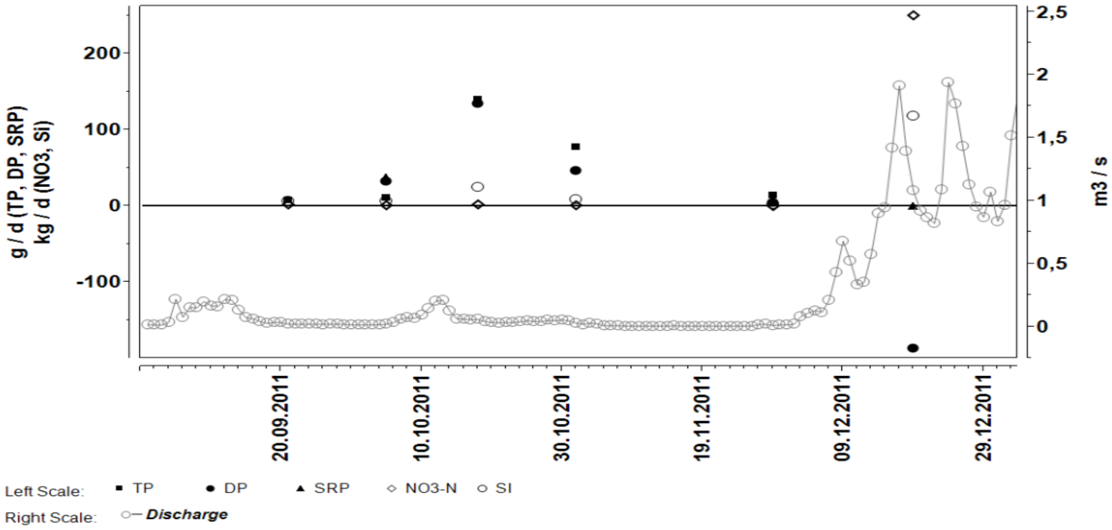


Figure 5.8: HVS mass flow diagram, P species, NO_3-N, Si, Sep. 2011–Dec. 2011

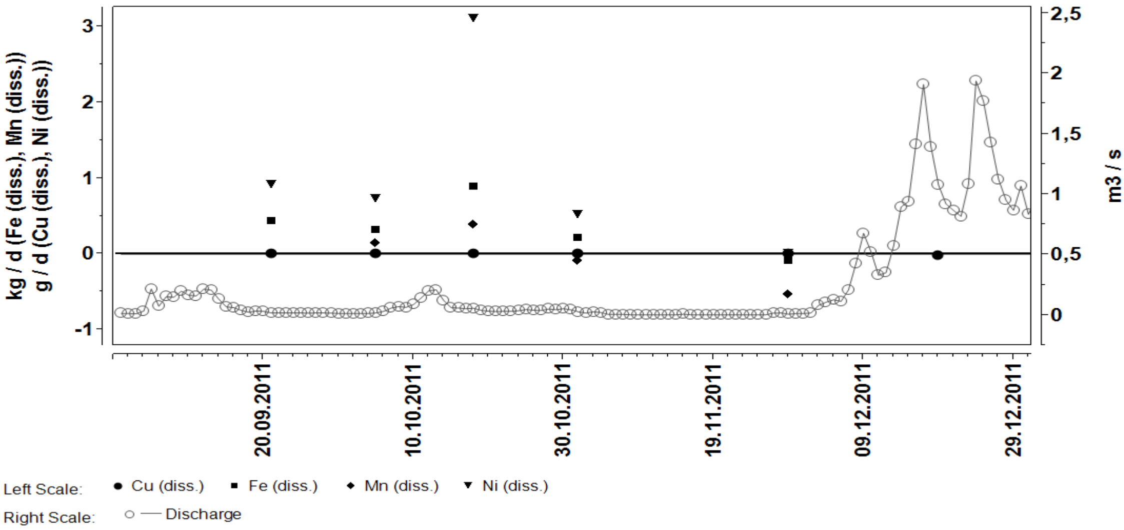


Figure 5.9: HVS mass flow diagram, metals (Cu, Fe, Mn, Ni), Sep. 2011–Dec. 2011

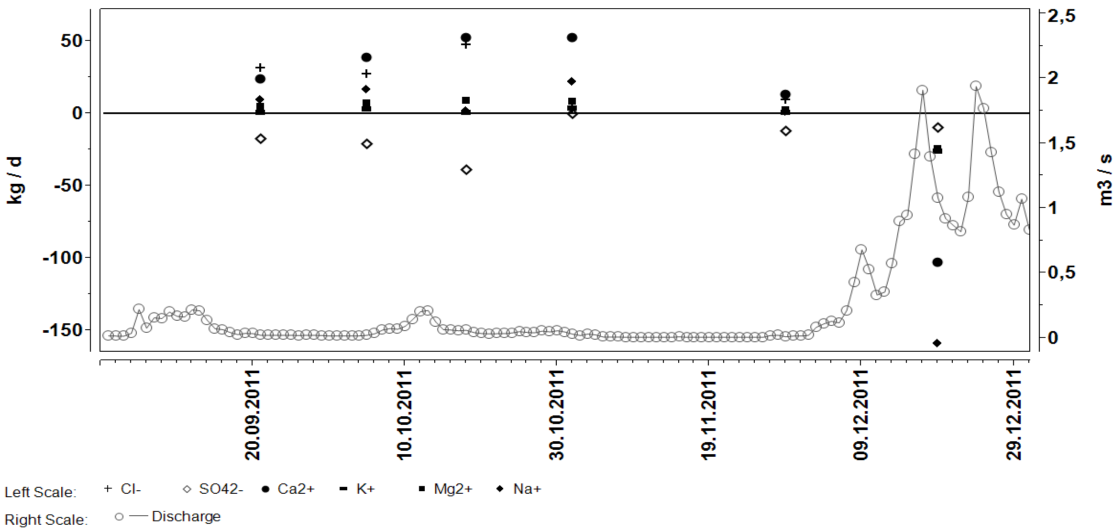


Figure 5.10: HVS mass flow diagram, anions and cations (Cl^-, ${SO_4}^{2-}$, Ca^{2+}, Mg^{2+}, Na^+, K^+), Sep. 2011–Dec. 2011

5.3 Transect Data

The data in the following section was obtained from the sampling campaign on June 18th and 19th and July 30th and 31st. The following graphs show the temperature gradient at the deepest part of the reservoir at YH3 and YR3 in June and July, respectively. It can be seen that a thermocline evolved from approximately two metres below surface indicating a pronounced stratification of the water layers. The seechi depths for the sampling point can be found in Appendix C, showing a considerable decrease in the depth of visibility over the summer (see algae development).

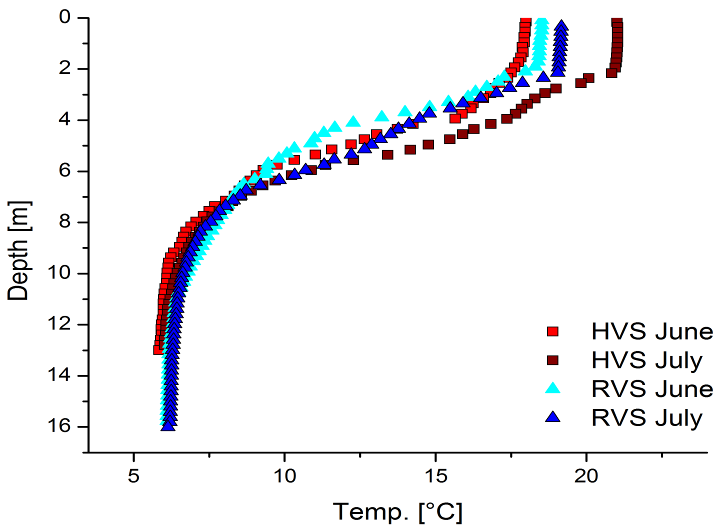


Figure 5.11: Summer stratification by temperature gradient in HVS and RVS

5.3.1 Multiparameter Data

The oxygen plays a very important role in the development and presence of many parameters within a water body and will therefore receive attention in the data representation. The oxygen development the reservoir is supposed to follow a certain pattern, described in the introduction. The results from the transect sampling campaign are summarized in Figures 5.12 (RVS shown in Appendix E) and show clearly the development of an anoxic hypolimnion within the summer months. Values below 5% dissolved oxygen saturation are shown in black to emphasize the upward movement of the anoxic hypolimnion; in June only in the deep layers at YH3 anoxic conditions were registered between 10 metres and the ground. In July, oxygen above 5% could only be found above four metres; leaving only the inflow region in with conditions of saturation or oversaturation. However, there was no indication of a wave-like behavior in the development of anoxic conditions as it is suggested by

Thornton (1990) but rather a homogeneous development upward.

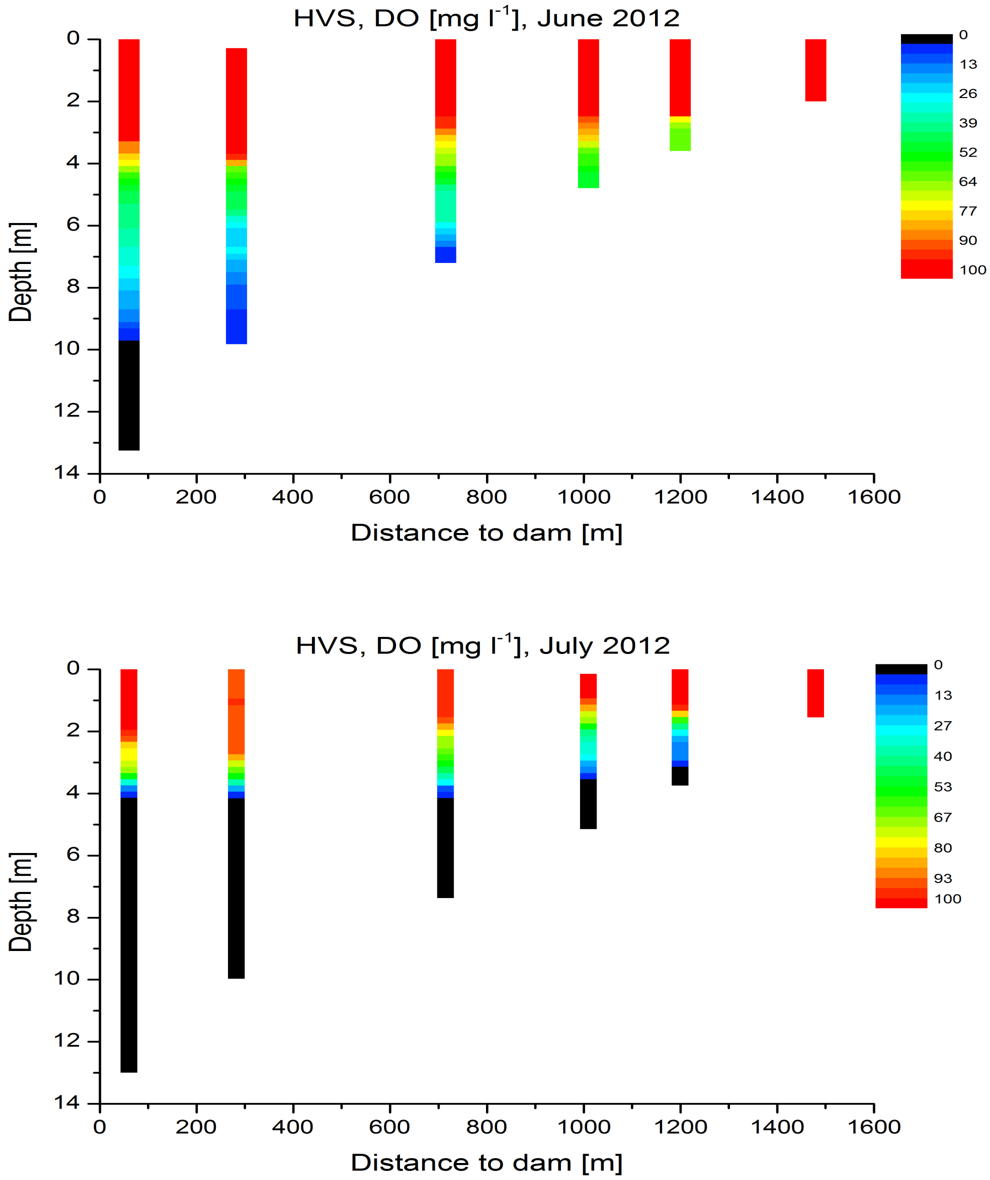


Figure 5.12: Dissolved oxygen development in the HVS, June and July 2012

5.3.2 GHG Floating Chamber

The greenhouse gas data collected with the floating chamber is presented in the following section. Figure 5.13 shows the CO_2 diffusive fluxes measured in the transect of the Hassel pre-reservoir in June and July 2012 as the mean value of the taken samples $\pm$ SD. Fluxes are mainly recognized to be negative in the pre-reservoirs, with values between -9 mmol m^{-2} d^{-1} and -27 mmol m^{-2} d^{-1}. Only the June measurement at YHF showed a positive flux in two out of three samples which results in a high standard deviation and ultimately indicating a carbon dioxide source. In June the YH3 flux was slightly higher than the following, indicating a higher diffusive CO_2 flux, whereas YH4 had the highest sink capacity in both months.

The fluxes of methane in the reservoirs will be presented in Table 5.1 and 5.2 because the measurements with the floating chamber documented some ebullition fluxes. As described in section 4.1.4 the calculation of the fluxes is based on the slope of the data points in the measurements.

For the HVS in June, diffusive fluxes were registered from the point YH5 towards the inflow of the reservoir, showing no ebullition in the deep regions of the reservoir. However, the initial diffusive fluxes were relatively high compared with the overall impression of values but with the ebullition fluxes exceeding 90% of the total flux (June). In July, the fluxes were generally lower, and less ebullition was captured in the floating chamber, in two cases (YHE and YHF) the ebullition was weak, being less than 50% of the total flux.
The RVS showed similar patterns of CH_4 ebullition at the sampling points close to the outlet, with ebullition fluxes measured at YRH and YHI. Note that the ebullition flux at YRH is much off the range from the other calculated values. This might be explained by a error in the measurement as the ebullition was captured directly with the start of the measurement.

Table 5.1: CH_4 fluxes, HVS 2012

	Point	Diffusive mmol m^{-2} d^{-1}	Ebullition mmol m^{-2} d^{-1}
June			
	YH3	0.4±0.12	–
	YH4	1.2±0.38	–
	YHE	3.0±1.88	–
	YH5	1.7	38.17
	YH5	6.6	75.20
	YH5	1.6	16.66
	YHF	3.5	–
	YHF	3.6	79.75
	YHF	4.0	–
	YHG	2.5	–
	YHG	1.8	–
	YHG	3.3	33.6
July			
	YH3	0.7±0.13	–
	YH4	0.9±0.38	–
	YHE	0.5	–
	YHE	0.5	0.46
	YHE	0.4	–
	YH5	0.6	–
	YH5	0.9	–
	YH5	0.6	22.17
	YHF	0.4	0.88
	YHF	0.6	–
	YHF	0.9	–
	YHG	1.7±0.59	–

Table 5.2: CH_4 fluxes from RVS, 2012

	Point	Diffusive mmol m^{-2} d^{-1}	Ebullition mmol m^{-2} d^{-1}
June			
	YR3	0.3±0.03	–
	YRE	0.4±0.05	–
	YRF	0.4±0.05	–
	YRH	0.6±0.04	–
	YRI	0.2	42.80
	YRI	0.2	–
	YRJ	0.3	22.85
	YRJ	1.8	–
	YRJ	0.8	–
July			
	YR3	0.5±0.20	–
	YRE	0.8±0.07	–
	YRF	0.7±0.17	–
	YRH	1.2	–
	YRH	1.0	–
	YRH	0.2	173.26
	YRI	0.5	7.41
	YRI	1.5	–
	YRI	1.4	58.72
	YRJ	0.8±0.37	–

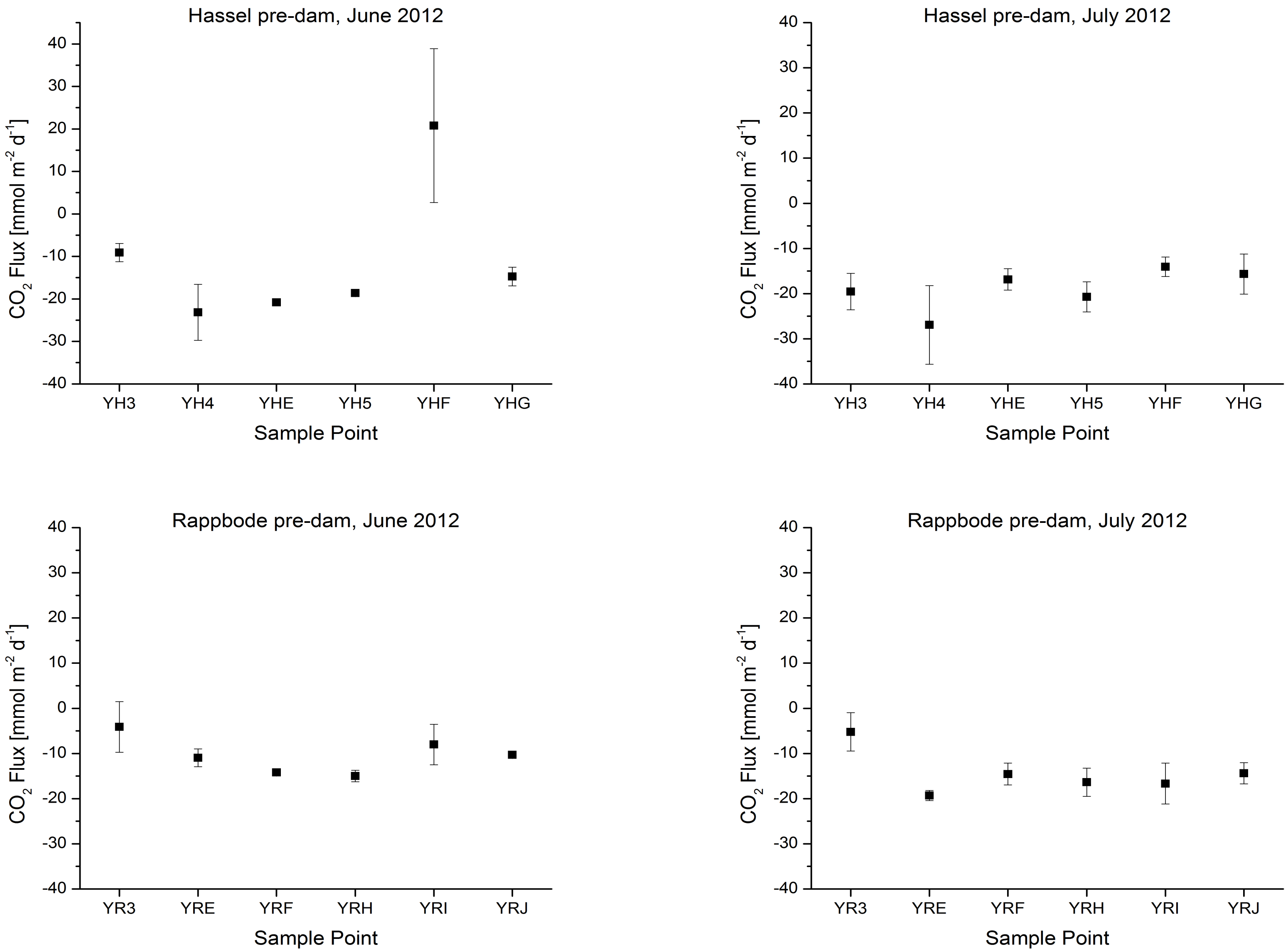


Figure 5.13: Diffusive fluxes CO_2, June/July 2012; HVS above; RVS below

5.3.3 GC Data

The results of the gas chromatography measurement in the water reservoirs are first analyzed in their general appearance in the water body; these results are later used for further discussion. Because Hassel- and Rappbode pre-reservoirs showed similar pattern, only the graphical representation for the HVS is shown here (see Appendix F for RVS) The results show similar values for both months; close to the surface very low concentrations of CO_2 with a slight augmentation toward the deeper parts of the water body were found. The maximum concentration was measured in the region of maximum depth with around 360 μM.
The CH_4 concentration of the Hassel pre-reservoir showed that there was low concentration present throughout the water column. In June an augmentation of the methane concentration could be estimated at YH3. In medium depth from eight to ten metres, no or very little methane was found. In July the same pattern can be observed, however, the values close to the lake bottom were augmented.

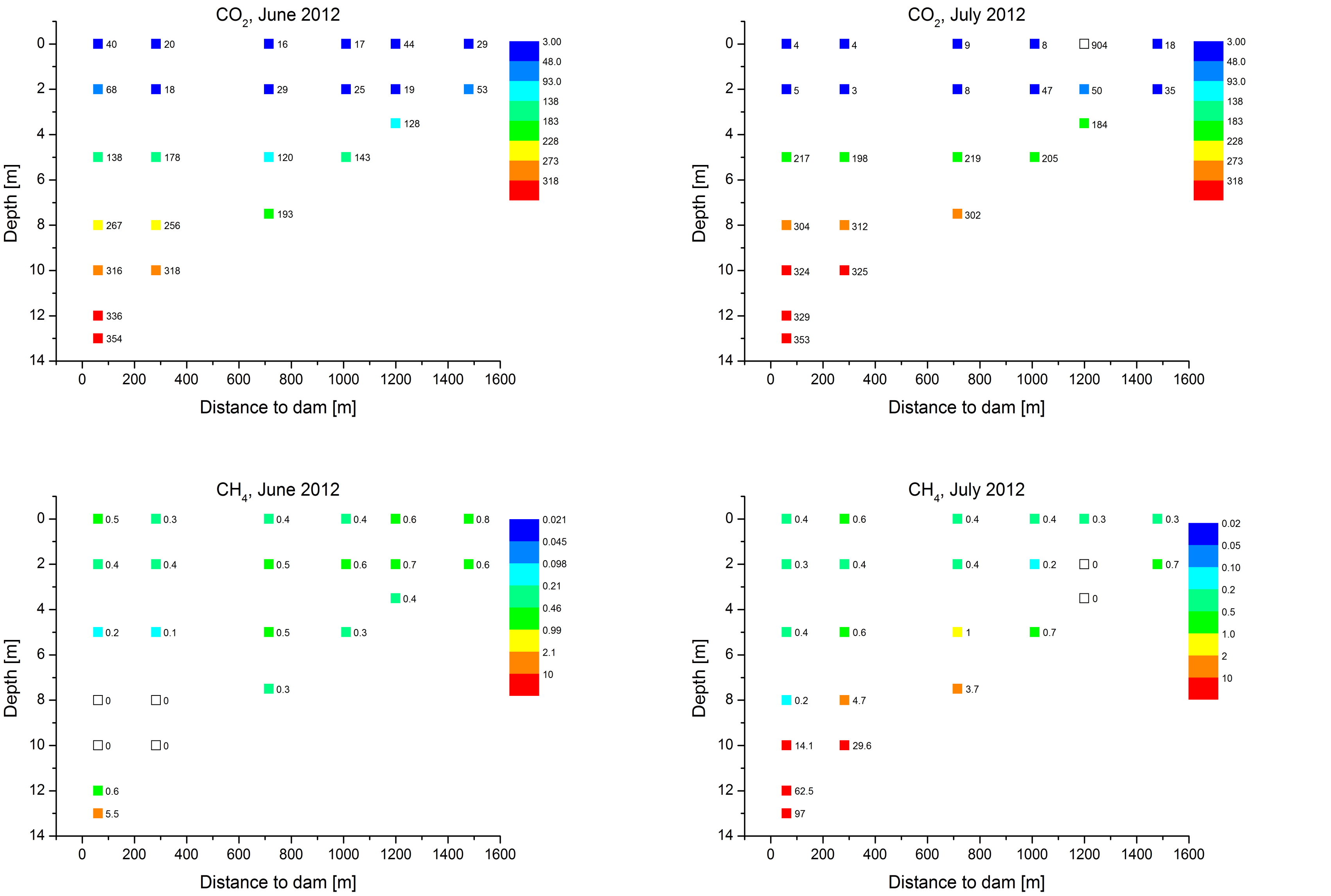


Figure 5.14: Hassel pre-reservoir CO_2 and CH_4 [μM] concentrations, June/July 2012

5.3.4 Phytoplankton

The Figures 5.15 and 5.16 show the total concentration of chlorophyll measured from the excitation of the planktonic algae in [$\mu g\, l^{-1}$] for the months of June and July in the Hassel pre-reservoir. The maximum of the algae was found close to the dam outlet (YH3) in a depth of approximately 2 m. Medium concentrations were registered around two metres in the transition areas of the reservoir, only towards the inflow a constant distribution of algae in the water column could be seen.
In July, however, a maximum concentration of approximately 44 $\mu g\, l^{-1}$ was found in the shallow water close to the inflow point of the reservoir (seechi depth was found to be 1.1 m at YHI). The algae was distributed in the upper two metres of the reservoir in maximum concentration but was found in medium concentrations throughout the transect in the upper three metres. In July, algae was present in concentrations around 11 to 16 $\mu g\, l^{-1}$ until five metres below surface in the entire reservoir. Here as well as in June, the probe indicates that the dominating algae species were diatoms, together with cyanobacteria. Augmentation in the bottom regions was most likely due to accumulation of dead algae still registered by the probe.
The Rappbode reservoir showed an phytoplankton maximum in the riverine zone of the water body. The maximum of approximately 15 $\mu g\, l^{-1}$ was only registered close to the surface. However, concentrations of 4–10 $\mu g\, l^{-1}$ were found in the top four metres of the reservoir.
In July, the overall concentration was augmented to a maximum of 23 $\mu g\, l^{-1}$ and was found around three metres below the surface in the lacustrine and transition zone (YRF). Further towards the inflow, maximum concentrations were found in the surface layers; however, algae were present until a depth of approximately six metres. The probe indicated a dominating composition of diatoms and cyanobacteria.
Generally, the Hassel pre-reservoir was found to have approximately twice the total concentration than the Rappbode reservoir, both in June and July 2012.

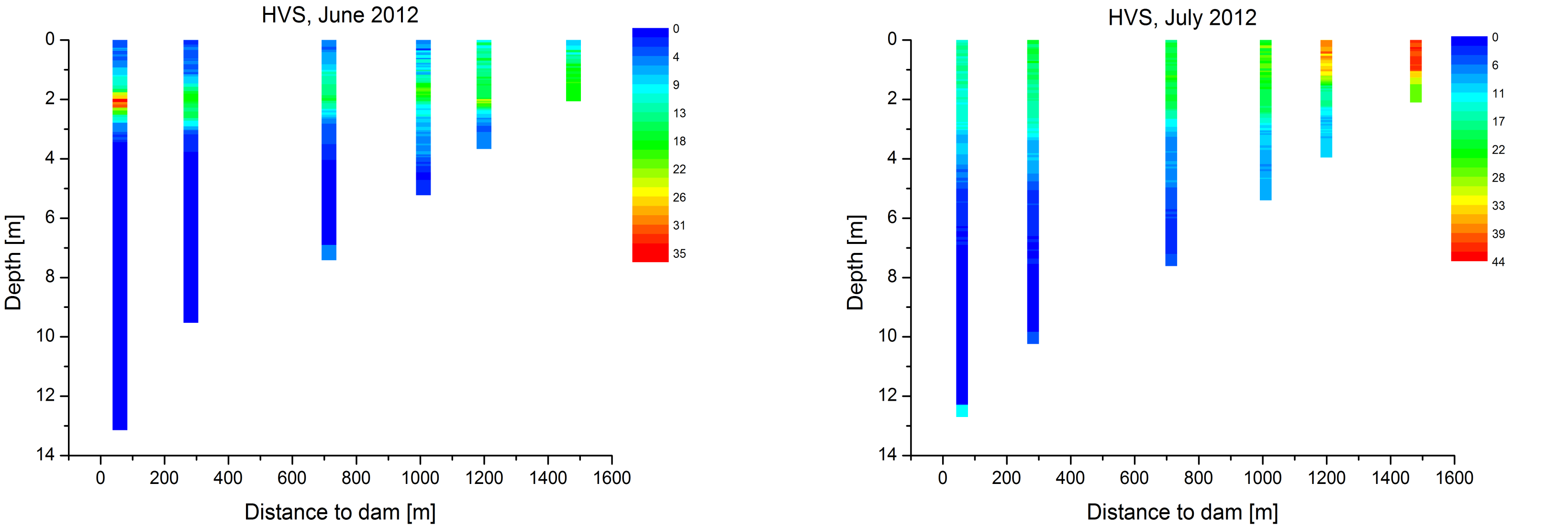


Figure 5.15: Total algae concentration [$\mu g\,l^{-1}$], HVS, June (left) and July (right) 2012

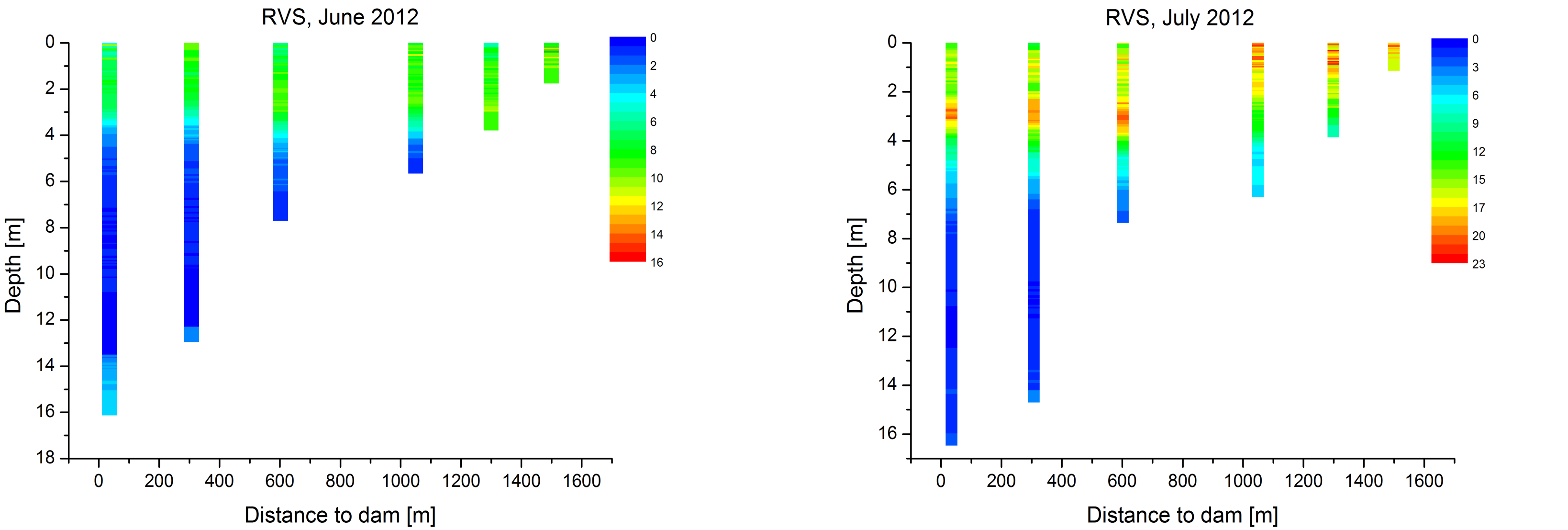


Figure 5.16: Total algae concentration [$\mu g\,l^{-1}$], RVS, June (left) and July (right) 2012

5.4 Single-spot vs Transect Sampling

In this section the error estimation for a single spot sampling, compared to a stepwise sampling through the transect is shown. For direct presentation the GHG are chosen due to their attention within this study. Further, the masses for anions, cations and TP were analyzed. The calculated results can be found in tabulated form in the Appendix H.
As mentioned in section 4.3.2, the pre-reservoirs are divided into separate areas of similar depth. This serves as a mean to determine an error which occurs through the sampling of one single spot instead of being able to analyze the transect of the water body.

The diagrams show that the approximation of carbon in form of carbon dioxide can be approximated well. With an extrapolation of the single monitoring spot for representation of the water body, the patterns found from the individual area calculation are comparable. Within the single-spot monitoring the values for CO_2 were found to be generally higher than taking the sum of the individual areas. For example, the maximum mass of CO_2 was estimated to be 3.2 tons in June for the layer 3–7 m if YH3 is taken the reference point and 2.7 tons in the same layer, if all sampling points are considered. In July, higher masses of carbon dioxide were found in the Hassel pre-reservoir. However, the estimation of element in the water showed that the consideration of several sampling points resulted in less calculated tons of CO_2 in the water. The carbon in the form of CH_4 was accumulated in the upper layers in June. Also, the single spot and the transect sampling showed compliance with around 2 kg of carbon in form of CH_4. However, the layer 1–3 metres showed the maximum mass with 2.4 kg for the YH3 sample and a mass of 3.1 kg when the six sampling points were analyzed. In the deeper layers only small values for the mass of carbon were obtained. In June, the mass of carbon did not change intensely in the upper layer, but a constant increase towards the deeper layers was found. Here, the single spot calculation of the carbon mass resulted in values approximately double as high as if the entire water body is sampled in the layers between 9–13 m.

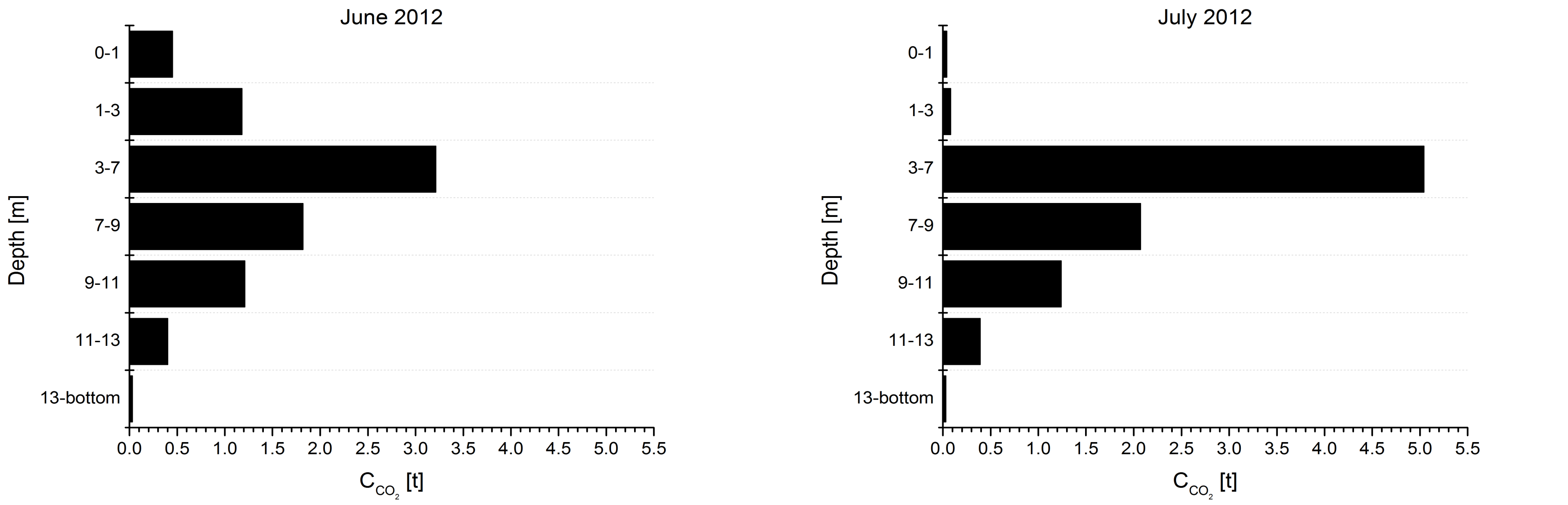


Figure 5.17: Carbon [t] in depth gradient, extrapolated to the entire pre-reservoir from sampling point YH3, CO_2

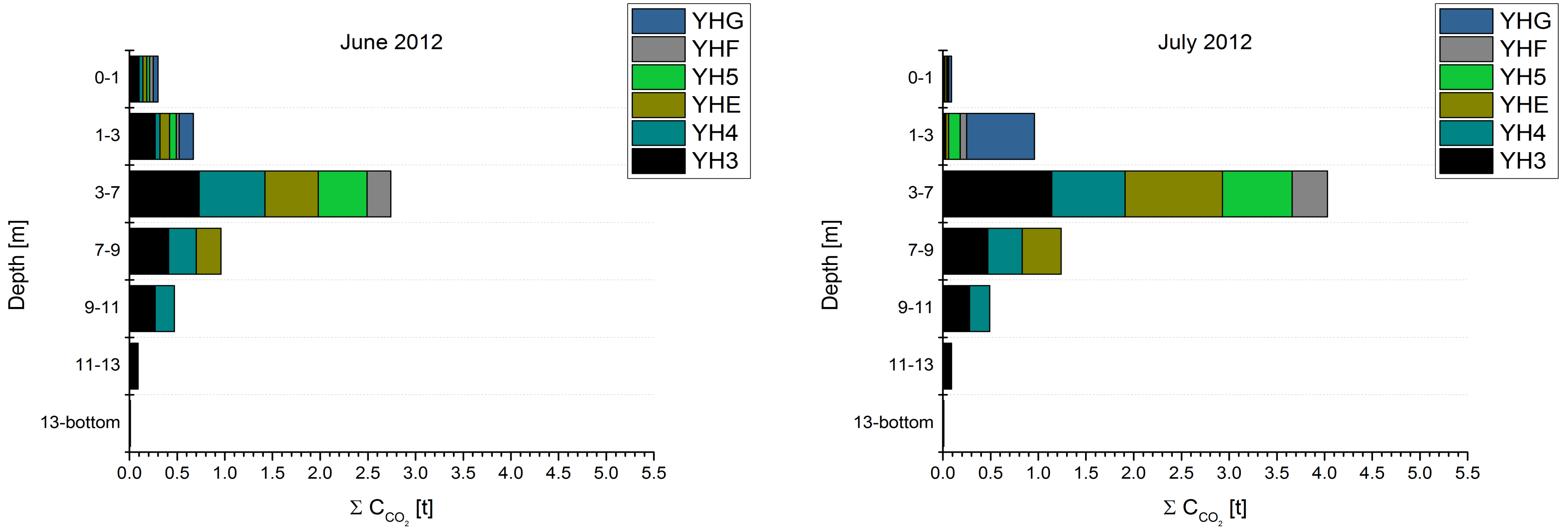


Figure 5.18: Hassel pre-reservoir: Individual areas of C mass calculation summed up and plotted according to depth layers, CO_2

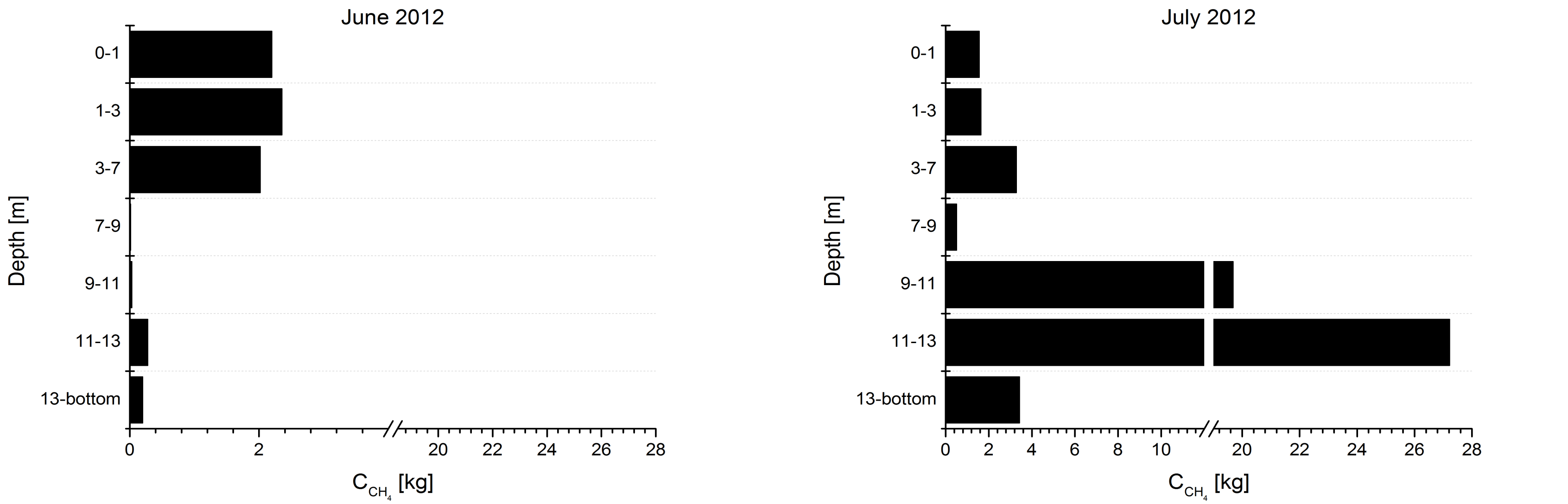


Figure 5.19: Carbon [t] in depth gradient, extrapolated to the entire pre-reservoir from sampling point YH3, CH_4

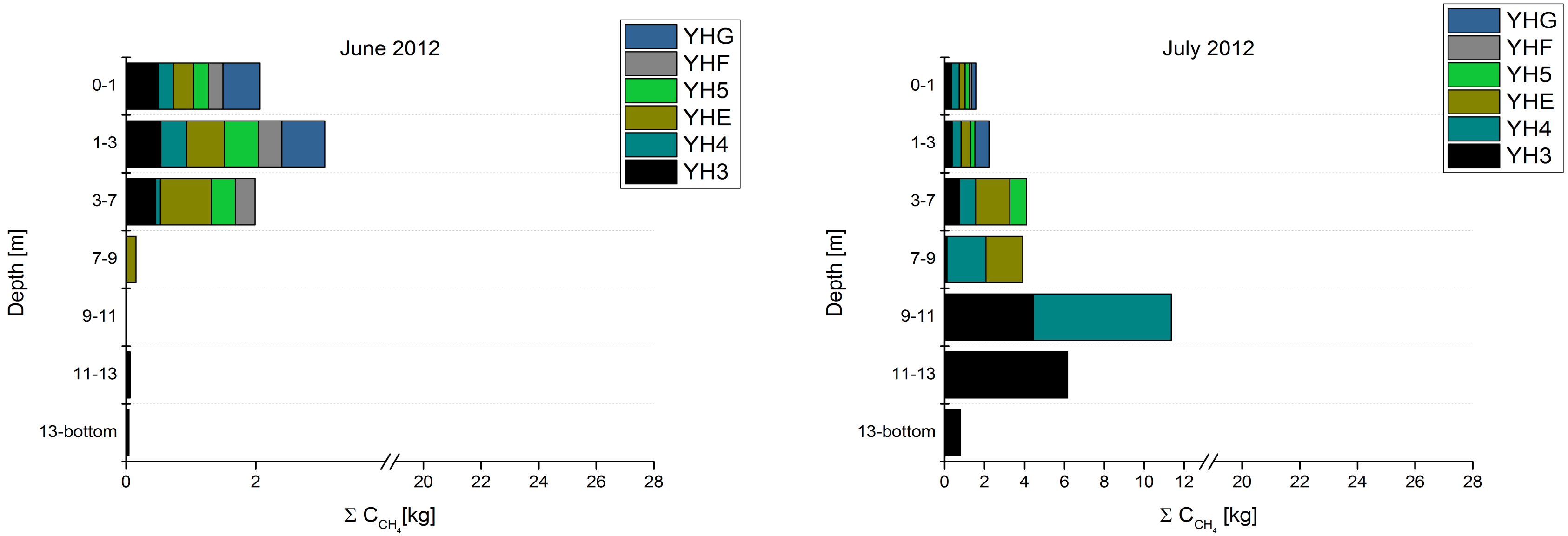


Figure 5.20: Hassel pre-reservoir: Individual areas of C mass calculation summed up and plotted according to depth layers, CH_4

Other parameters, such as Anions, Cations and TP behave in a similar manner. The masses calculated for the single-spot monitoring point and the transect data can be represented by the single spot to around 100% for the anions and Ca^{2+}. In the case of TP, the mass of P is overestimated with 39% in the transect sampling in the uppermost layer and does not show quite a correspondence as the other parameter do.
For the Rappbode reservoir similar results are obtained, as all parameters analyzed (Cl^{-}, $SO_4{}^{2-}$, Ca^{2+}, TP) correlate well for the extrapolation from a single-spot sampling compared to a transect sampling in the upper layers. For the deeper zones of the reservoirs differences occur which can be traced back to the inexact area and layer volume estimation. Close to 100% accordance between 0-3 m are noticed within with a decrease to around 50% accordance in the deeper layers.
In the RVS the extrapolation reveals that the chemical-analytical parameter are well represented by the extrapolation to the entire area.

6 Discussion

6.1 Chemistry

For this study, a data set of monitoring data of approximately one year and a detailed data set from two transect sampling campaigns were available. Before discussing the results in this section, it has to be mentioned that uncertainties have to be faced and kept in mind while evaluating the data. However, as it is aimed to gain an insight into the water bodies and to evaluate the extent of the routine monitoring, these uncertainties have to be accepted. The results provided for the similarity of the two sampling points close to the outflow of the reservoirs is also included in this study and as described in the result section, it seems to be appropriate to treat both sampling points as identical because no great difference occured between the two points, so that the point of maximum depth (YR3/ YH3) can be considered to resemble the outflow. Naturally, the spots do not entirely resemble each other, especially closer to the sediment which can be assumed to be accumulated higher the closer the dam is approached.

It was shown by Thornton (1990) that reservoirs on average flow develop a wave-like pattern of anoxic conditions close to the lake bottom; however, it cannot be confirmed that the transition zone is an area of increased oxygen demand within the water column compared to the rest of the water body. The anoxic hypolimnion in the summer months is equally developed, starting from the deeper parts and not quite reaching the more shallow parts in the riverine zone. Therefore, as the development is supposingly well predictable in the water body, a sampling in the deepest part reflects the oxygen behavior of the sampled part from the two transect campaigns.

The sampling of the inflow and the outflow of the water bodies got established as routine monitoring spots and this data can now show if changes within the transect of the water body occur. The data can be used to justify a routine monitoring of these two spots or used to recommend if additional/other spots should be found instead; if the mass flow changes from inflow to outflow changes to a great extent, one can argue that the changes around the water body call for additional sampling points and a more intensive monitoring program.

However, the results of the RVS data show that the changes for the explicit period from fall to winter 2011. The changes are mainly around 20% which can be considered to be adequate, taking into account the uncertainties which come along with the analysis, to justify a monitoring program at the present inflow and outflow. In general, one can consider the pre-reservoirs as considerable sinks for the analyzed parameters. The Rappbode pre-reservoir transports mainly metals during baseflow and other major elements are retained in the water body. There is only a small export of elements including phosphorus which is, as mentioned before, very sensitive to changes in discharge. It has also taken into account that the time span of the data analysis falls into the mixing period of the lakes which is further influencing the distribution of the elements. In order to understand the seasonal pattern of the mass flows an annual study has to be conducted here. Further attention is also needed in the evaluation of the Rappbode pre-reservoir as the inflow sampling point is located rather far from the main inflow point of the reservoir. Also note that the RVS has a considerable higher discharge than the HVS and no predictions can be made how the reservoir acts in these high flow event.

For the Hassel pre-reservoir the analyzed mass flows indicate an a sink capacity at baseflow of the reservoir as well. The relatively low discharge of the reservoir can support this. As already seen in the mass flow diagrams in the result section, the diagram shows that here mainly metals were acting as sources, of which Ni and Mn are dominant and iron and copper were washed out only occasionally.

It has to be mentioned again that the residence time was not included in the calculations of the mass flow. The change of water from the inflow to the outflow takes place in about one month. This time lag is most likely responsible for many changes which influence the mass flows but for a brought overview of the mobilization and retention of the elements in the pre-reservoirs this estimation will serve.

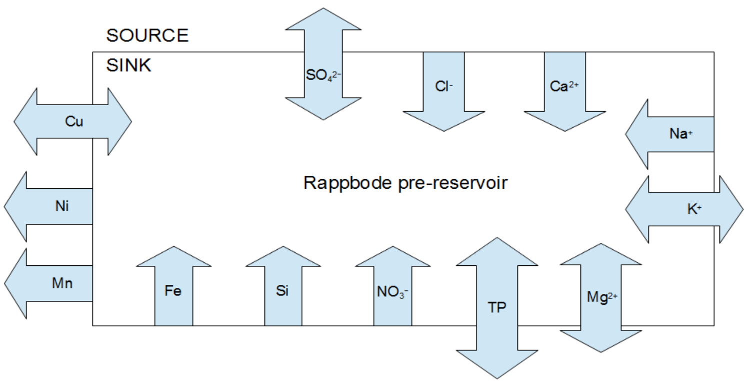


Figure 6.1: Sink and source directions of analyzed parameters used in the results for the Rappbode pre-reservoir at baseflow conditions. Arrows not proportional to values, only indicating the direction of flow.

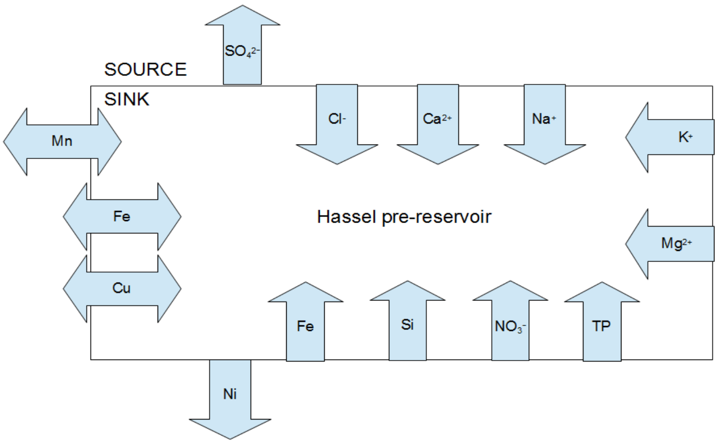


Figure 6.2: Sink and source directions of analyzed parameters used in the results for the Hassel pre-reservoir at baseflow conditions. Arrows not proportional to values, only indicating the direction of flow.

As Rinke et al. (2013) show in their work, some parameters, such as DOC respond quickly to extreme weather events which cannot be captured by bi-weekly sampling of the water. Furthermore, the results (of the analytical, chemical data) show a variation in in the mass loads for some parameters, such as the metals and nutrients. This indicates a need for more regular monitoring; a quasi-continuous sampling of the water bodies, as suggested by Rinke et. al (2013), would most like be the most accurate method for a long-term observation and analysis of the reservoir limnology.

6.2 Greenhouse Gases

It can be shown that the estimation of the mass distribution within the reservoirs is, especially for the upper layers, a generally good approximation if the one spot sample is extrapolated to the entire catchment. This means that one can assume a heterogeneous distribution throughout the water body and support the idea of a single-spot monitoring at the point of maximum depth. One spot (YHF) did not show the pattern which was observed at all other spots due to the fact that here two out of three floating chamber measurements registered a positive flux for carbon dioxide in June. The standard deviations of the other spots and measurements, however, indicates that the sampling catches the pattern which is observed throughout the water body.

The general statement that lakes tend to emit both CO_2 and CH_4 whereas forest tend to take up both CH_4 and CO_2 (St. Louis et al. 2000) shows no direct compliance with

the findings of the study. The emission of CH_4 was found to take place, however, the findings show as well sink capacity for CO_2 for the reservoirs. As for instance Soumis et al. (2004) reports, it can be assumed that the reservoirs might follow a diurnal cycle of CO_2 emissions. During the day photosynthesis activity eventually turns the water bodies into CO_2 sinks whereas during the night a source capacity might be developed. These assumptions can only be confirmed in a long time (24 hours) sampling.
The pre-reservoirs' emission of the greenhouse gas methane was confirmed by the measured ebullition fluxes, mainly found in the transition zone of the reservoir which indicates a higher carbon content in the sediments and lower partial pressure giving possibility for the methane to travel upward to the surface, contributing to the air-water exchange. To determine the overall carbon content and contribution to the GHG emissions of the reservoirs, a more detailed study, possibly as described in the guidelines given by the UNESCO on GHG measurements (UNESCO 2010) should take place.
As the analysis of the GC data has shown, an increase in GHG in the deeper parts of the reservoir were found in later summer. The anoxic conditions were supporting the development of especially methane. However, as very similar conditions were found in the upper layers within the transect, the one spot sampling for the analysis of carbon dioxide and methane as parameters can be taken as an option to assess the state in the pre-reservoirs.

6.3 Phytoplankton

Caputo, Nasseli-Flores, Ordonez & Armengol (2008) state that reservoirs are known for their tendency to develop longitudinal gradients in plankton assemblages. This is supposed to be especially more evident in the epilimnetic regions during a stratification period of the water body. However, the bbe FluoroProbe suggested a maximum concentration of algae (measured as chlorophyll) of the HVS in the region of the water body which supposed to have more oligotrophic conditions. In the rest of the reservoir almost constant concentrations were found which indicates available nutrients and overall similar conditions for growth. In July, a gradient developed, indicating a change in conditions which allows the algae to use available resources. In the RVS, no gradients were observed during the two samplings but only an increment of concentration in the entire reservoir. One of the major aims in the operation of pre-reservoirs is the improvement of the water quality. The first of the steps necessary in this is the conversion from dissolved to particulate matter in a biochemical way (by phytoplankton) (Pütz & Benndorf 1998). With optimal retention times the fast growing organisms, such as diatoms, outcompete slower growers like blue-green algae and enable sedimentation within the water body towards the dam. This is expected as the decrease in nutrient concentration and a reduction of organic matter by sedimentation

from the riverine zone towards the lacustrine area of the reservoir (Caputo et al. 2008). The results from the sampling in June conducted in order to investigate the outflow region, showed an increased chlorophyll concentration directly at the dam. This could be explained by an increased concentration of algae at the dam wall. A change in water flow e.g. change in stratification patterns could be assumed as well, however, the other parameters examined at this point contradict this possibility.
As Pütz & Benndorf (1998) suggests, the residence time of the epilimnetic water should be optimal because this plays an important role in the development of gradients in pre-reservoirs. Furthermore, the mixing conditions and the depth of the photic layers influence the development and growth of algae. This has to be taken into account while monitoring the water bodies.
The diatoms seem to dominate in the reservoirs but a detailed division of the species was not done or intended so it remains questionable in how far the algae distribution is changing within the reservoir with changing environmental conditions as Caputo et al. (2008) proposes. The difference to other studies such as those of Caputo et al. (2008) could indicate inflow of polluted water from other sources than the inflow which gives the algae alternative resources. In question of a monitoring program it can be stated that a sampling of only a minimum number of locations in the lake does not provide a proficient picture of the algae conditions in the reservoirs. In order to develop a monitoring program which includes a good estimation of this, the pattern of algae distribution in both reservoirs has to be looked at in detail. The distribution is very dependent on the location in the reservoir, suggesting a transect sampling as the preferable method to estimate the algae concentration and distribution in the water bodies. It was not tested in how far the nutrient distribution correlated with the algae concentration and development in the reservoirs. As Horn, Horn, Paul, Uhlmann & Roeske (2006) point out, the nutrient availability is highly connected to the composition of the species and especially dependent on the limiting nutrients of the water body (most often phosphates (SRP)).

6.4 Practical Implications

A monitoring program as it is set up for the two pre-reservoirs in the Harz mountains has to fulfill certain criteria to justify the time and financial resources which are invested into it. As Rinke et al. (2013) nicely summarizes “besides high robustness, affordable prices and sufficient measurement precision, a low energy consumption is important”. As the results showed, a bi-weekly monitoring of the inflow and the outflow represented the pre-reservoirs relatively well. However, as the results are only valid for the examined period of time, the monitoring should be continued throughout the year and it has to be taken into account that the acquisition of samples in the winter months requires more time, energy and therefore financial resources. Nevertheless, a sampling year-round helps to understand if the reservoirs show similar pattern as they were observed now. It is also of importance to remember the position of the pre-reservoirs as they are directly connected to the Rappbode drinking water reservoir and the function of the reservoirs should be closely monitored to meet all existing regulations.

But especially for the understanding of the primary production/algae distribution in the pre-reservoirs, a more intensely monitoring program should be aimed at. The probe available at the UFZ gives a great possibility to assess the composition of the algae in the reservoir. However, for this an increased monitoring effort has to be considered. The algae differ within the reservoir locations and will, due to seasonal patterns, also vary temporally.

The evaluation of the GHG in the reservoirs implies a great gain in knowledge. However, the practical implementation of the measurement is connected to resource intensive procedures. The FTIR is relatively room-intensive and heavy. If enough room is available around the boat, the measurement itself can be conducted while other samples are taken. Turbulences around the chamber should be kept to a minimum because it may enhance gas transfer on the surface (Matthews, St. Louis & Hesslein 2003). However, the method should not be meant for the routine monitoring, as a sampling in the transect is required.

7 Conclusion

This study investigated several parameters in order to justify and give recommendations for the existing monitoring program of the pre-reservoirs in the Harz mountains. To conclude the results and discussion the following statements can be used:

- the current sampling spots represent the pre-reservoir considerably well; however,
  - for a more precise analysis an improvement in the discharge documentation has to be achieved
  - for the parameter exceeding the chosen level of change, a transect sampling should be conducted in order to identify the locations/mechanisms responsible for the changes
- if greenhouse gases shall play an further role in the investigations of the pre-reservoirs, a routine monitoring at the present spots is not sufficient
  - ebullition plays an important role in the emission of methane
  - ebullition is highly dependent on locations
  - diurnal patterns of CO_2 are not observable within a bi-weekly monitoring
- the sampling with the bbe FluoroProbe at the routine monitoring spots does not represent the reservoir and has to be extended if the potential shall be used

However, if detailed information, especially regarding a set of parameters and their significance/correspondence to each other shall be examined, further studies have to be conducted which would allow a more extensive view. Many calculations are based on assumptions, for instance the discharge of the water bodies. The discharge is such an important parameter in the system and before more reliable results can be produced a more sustainable way for the monitoring of the water flow has to be found. This study can be useful for the improvement of the current monitoring program and the development in future investigations concerning the catchment areas of the pre-reservoirs.

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A Discharge

Table A.1: Flow Rates RVS, by UFZ for 2012, continued on following pages

Date	Q [m^3/s]	Date	Q [m^3/s]	Date	Q [m^3/s]
01.09.2011	0.14	01.10.2011	0.10	31.10.2011	0.12
02.09.2011	0.14	02.10.2011	0.10	01.11.2011	0.12
03.09.2011	0.13	03.10.2011	0.10	02.11.2011	0.11
04.09.2011	0.11	04.10.2011	0.10	03.11.2011	0.11
05.09.2011	0.20	05.10.2011	0.08	04.11.2011	0.11
06.09.2011	0.15	06.10.2011	0.08	05.11.2011	0.11
07.09.2011	0.33	07.10.2011	0.10	06.11.2011	0.11
08.09.2011	0.32	08.10.2011	0.10	07.11.2011	0.11
09.09.2011	0.66	09.10.2011	0.10	08.11.2011	0.11
10.09.2011	0.29	10.10.2011	0.19	09.11.2011	0.11
11.09.2011	0.25	11.10.2011	0.66	10.11.2011	0.11
12.09.2011	0.40	12.10.2011	0.98	11.11.2011	0.11
13.09.2011	0.22	13.10.2011	0.40	12.11.2011	0.11
14.09.2011	0.21	14.10.2011	0.29	13.11.2011	0.12
15.09.2011	0.22	15.10.2011	0.25	14.11.2011	0.14
16.09.2011	0.18	16.10.2011	0.22	15.11.2011	0.16
17.09.2011	0.18	17.10.2011	0.22	16.11.2011	0.11
18.09.2011	0.18	18.10.2011	0.19	17.11.2011	0.16
19.09.2011	0.18	19.10.2011	0.17	18.11.2011	0.09
20.09.2011	0.18	20.10.2011	0.17	19.11.2011	0.08
21.09.2011	0.17	21.10.2011	0.17	20.11.2011	0.08
22.09.2011	0.14	22.10.2011	0.17	21.11.2011	0.08
23.09.2011	0.14	23.10.2011	0.15	22.11.2011	0.08
24.09.2011	0.14	24.10.2011	0.12	23.11.2011	0.08
25.09.2011	0.14	25.10.2011	0.12	24.11.2011	0.08
26.09.2011	0.14	26.10.2011	0.12	25.11.2011	0.08
27.09.2011	0.14	27.10.2011	0.12	26.11.2011	0.11
28.09.2011	0.14	28.10.2011	0.12	27.11.2011	0.12
29.09.2011	0.14	29.10.2011	0.12	28.11.2011	0.14
30.09.2011	0.12	30.10.2011	0.12	29.11.2011	0.13

Date	Q [m^3/s]	Date	Q [m^3/s]	Date	Q [m^3/s]
30.11.2011	0.12	09.01.2012	0.69	18.02.2012	0.69
01.12.2011	0.12	10.01.2012	0.69	19.02.2012	0.69
02.12.2011	0.12	11.01.2012	0.69	20.02.2012	0.69
03.12.2011	0.33	12.01.2012	0.69	21.02.2012	1.62
04.12.2011	0.57	13.01.2012	0.69	22.02.2012	0.69
05.12.2011	0.34	14.01.2012	0.69	23.02.2012	0.69
06.12.2011	0.30	15.01.2012	0.69	24.02.2012	0.69
07.12.2011	0.46	16.01.2012	0.69	25.02.2012	0.69
08.12.2011	0.94	17.01.2012	0.69	26.02.2012	0.69
09.12.2011	2.23	18.01.2012	0.69	27.02.2012	0.69
10.12.2011	1.49	19.01.2012	0.69	28.02.2012	0.69
11.12.2011	0.97	20.01.2012	0.69	29.02.2012	0.69
12.12.2011	1.02	21.01.2012	0.69	01.03.2012	0.69
13.12.2011	1.30	22.01.2012	0.69	02.03.2012	0.69
14.12.2011	1.83	23.01.2012	0.69	03.03.2012	0.69
15.12.2011	1.71	24.01.2012	0.69	04.03.2012	0.69
16.12.2011	2.14	25.01.2012	0.69	05.03.2012	0.69
17.12.2011	2.68	26.01.2012	0.69	06.03.2012	0.69
18.12.2011	2.04	27.01.2012	0.69	07.03.2012	0.69
19.12.2011	1.62	28.01.2012	0.69	08.03.2012	0.69
20.12.2011	1.32	29.01.2012	0.69	09.03.2012	0.69
21.12.2011	1.20	30.01.2012	0.69	10.03.2012	0.69
22.12.2011	1.07	31.01.2012	0.69	11.03.2012	0.69
23.12.2011	1.51	01.02.2012	0.69	12.03.2012	0.69
24.12.2011	3.25	02.02.2012	0.69	13.03.2012	0.69
25.12.2011	3.32	03.02.2012	0.69	14.03.2012	0.69
26.12.2011	3.63	04.02.2012	0.69	15.03.2012	0.69
27.12.2011	3.25	05.02.2012	0.69	16.03.2012	0.69
28.12.2011	2.76	06.02.2012	0.69	17.03.2012	0.69
29.12.2011	2.41	07.02.2012	0.69	18.03.2012	0.69
30.12.2011	2.46	08.02.2012	0.69	19.03.2012	0.69
31.12.2011	1.92	09.02.2012	0.69	20.03.2012	0.69
01.01.2012	0.69	10.02.2012	0.69	21.03.2012	0.69
02.01.2012	0.69	11.02.2012	0.69	22.03.2012	0.69
03.01.2012	0.69	12.02.2012	0.69	23.03.2012	0.69
04.01.2012	0.69	13.02.2012	0.69	24.03.2012	0.69
05.01.2012	0.69	14.02.2012	0.69	25.03.2012	0.69
06.01.2012	0.69	15.02.2012	0.69	26.03.2012	0.69
07.01.2012	0.69	16.02.2012	0.69	27.03.2012	0.69
08.01.2012	0.69	17.02.2012	0.69	28.03.2012	0.69

Date	Q [m^3/s]	Date	Q [m^3/s]	Date	Q [m^3/s]
29.03.2012	0.69	11.05.2012	0.69	23.06.2012	0.69
30.03.2012	0.69	12.05.2012	0.69	24.06.2012	0.69
31.03.2012	0.69	13.05.2012	0.69	25.06.2012	0.69
01.04.2012	0.69	14.05.2012	0.69	26.06.2012	0.69
02.04.2012	0.69	15.05.2012	0.69	27.06.2012	0.69
03.04.2012	0.12	16.05.2012	0.69	28.06.2012	0.69
04.04.2012	0.69	17.05.2012	0.69	29.06.2012	0.69
05.04.2012	0.69	18.05.2012	0.69	30.06.2012	0.69
06.04.2012	0.69	19.05.2012	0.69	01.07.2012	0.69
07.04.2012	0.69	20.05.2012	0.69	02.07.2012	0.69
08.04.2012	0.69	21.05.2012	0.69	03.07.2012	0.69
09.04.2012	0.69	22.05.2012	0.69	04.07.2012	0.69
10.04.2012	0.69	23.05.2012	0.69	05.07.2012	0.69
11.04.2012	0.69	24.05.2012	0.69	06.07.2012	0.69
12.04.2012	0.69	25.05.2012	0.69	07.07.2012	0.69
13.04.2012	0.69	26.05.2012	0.69	08.07.2012	0.69
14.04.2012	0.69	27.05.2012	0.69	09.07.2012	0.69
15.04.2012	0.69	28.05.2012	0.69	10.07.2012	0.69
16.04.2012	0.69	29.05.2012	0.69	11.07.2012	0.69
17.04.2012	0.69	30.05.2012	0.69	12.07.2012	0.69
18.04.2012	0.69	31.05.2012	0.69	13.07.2012	0.69
19.04.2012	0.69	01.06.2012	0.69	14.07.2012	0.69
20.04.2012	0.69	02.06.2012	0.69	15.07.2012	0.69
21.04.2012	0.69	03.06.2012	0.69	16.07.2012	0.69
22.04.2012	0.69	04.06.2012	0.69	17.07.2012	0.69
23.04.2012	0.69	05.06.2012	0.69	18.07.2012	0.69
24.04.2012	0.69	06.06.2012	0.69	19.07.2012	0.69
25.04.2012	0.69	07.06.2012	0.69	20.07.2012	0.69
26.04.2012	0.69	08.06.2012	0.69	21.07.2012	0.69
27.04.2012	0.69	09.06.2012	0.69	22.07.2012	0.69
28.04.2012	0.69	10.06.2012	0.69	23.07.2012	0.69
29.04.2012	0.69	11.06.2012	0.69	24.07.2012	0.69
30.04.2012	0.69	12.06.2012	0.69	25.07.2012	0.69
01.05.2012	0.69	13.06.2012	0.69	26.07.2012	0.69
02.05.2012	0.69	14.06.2012	0.69	27.07.2012	0.69
03.05.2012	0.69	15.06.2012	0.69	28.07.2012	0.69
04.05.2012	0.69	16.06.2012	0.69	29.07.2012	0.69
05.05.2012	0.69	17.06.2012	0.69	30.07.2012	0.69
06.05.2012	0.69	18.06.2012	0.69	31.07.2012	0.69
07.05.2012	0.69	19.06.2012	0.69		
08.05.2012	0.69	20.06.2012	0.69		
09.05.2012	0.69	21.06.2012	0.69		
10.05.2012	0.69	22.06.2012	0.69		

Table A.2: Flow Rates HVS, corrected by UFZ for 2012, continued on following pages

Date	Q [m/s]	Date	Q [m/s]	Date	Q [m/s]
01.09.2011	0.02	01.10.2011	0.02	31.10.2011	0.05
02.09.2011	0.02	02.10.2011	0.02	01.11.2011	0.03
03.09.2011	0.01	03.10.2011	0.02	02.11.2011	0.02
04.09.2011	0.04	04.10.2011	0.02	03.11.2011	0.03
05.09.2011	0.22	05.10.2011	0.02	04.11.2011	0.02
06.09.2011	0.08	06.10.2011	0.03	05.11.2011	0.01
07.09.2011	0.16	07.10.2011	0.06	06.11.2011	0.01
08.09.2011	0.15	08.10.2011	0.07	07.11.2011	0.01
09.09.2011	0.20	09.10.2011	0.07	08.11.2011	0.01
10.09.2011	0.17	10.10.2011	0.09	09.11.2011	0.01
11.09.2011	0.16	11.10.2011	0.14	10.11.2011	0.01
12.09.2011	0.22	12.10.2011	0.20	11.11.2011	0.01
13.09.2011	0.21	13.10.2011	0.21	12.11.2011	0.01
14.09.2011	0.14	14.10.2011	0.12	13.11.2011	0.01
15.09.2011	0.07	15.10.2011	0.06	14.11.2011	0.01
16.09.2011	0.06	16.10.2011	0.06	15.11.2011	0.01
17.09.2011	0.04	17.10.2011	0.06	16.11.2011	0.01
18.09.2011	0.03	18.10.2011	0.06	17.11.2011	0.01
19.09.2011	0.04	19.10.2011	0.04	18.11.2011	0.01
20.09.2011	0.03	20.10.2011	0.04	19.11.2011	0.01
21.09.2011	0.02	21.10.2011	0.03	20.11.2011	0.01
22.09.2011	0.02	22.10.2011	0.03	21.11.2011	0.01
23.09.2011	0.02	23.10.2011	0.03	22.11.2011	0.01
24.09.2011	0.02	24.10.2011	0.04	23.11.2011	0.01
25.09.2011	0.02	25.10.2011	0.05	24.11.2011	0.01
26.09.2011	0.02	26.10.2011	0.04	25.11.2011	0.01
27.09.2011	0.02	27.10.2011	0.04	26.11.2011	0.01
28.09.2011	0.02	28.10.2011	0.05	27.11.2011	0.02
29.09.2011	0.02	29.10.2011	0.05	28.11.2011	0.02
30.09.2011	0.02	30.10.2011	0.06	29.11.2011	0.01

Date	Q [m/s]	Date	Q [m/s]	Date	Q [m/s]
30.11.2011	0.02	09.01.2012	3.25	18.02.2012	0.20
01.12.2011	0.02	10.01.2012	2.75	19.02.2012	1.04
02.12.2011	0.02	11.01.2012	2.20	20.02.2012	0.97
03.12.2011	0.08	12.01.2012	1.79	21.02.2012	0.71
04.12.2011	0.11	13.01.2012	1.61	22.02.2012	0.44
05.12.2011	0.13	14.01.2012	1.43	23.02.2012	0.59
06.12.2011	0.12	15.01.2012	1.11	24.02.2012	0.71
07.12.2011	0.21	16.01.2012	0.97	25.02.2012	1.11
08.12.2011	0.43	17.01.2012	0.90	26.02.2012	0.83
09.12.2011	0.68	18.01.2012	0.90	27.02.2012	0.83
10.12.2011	0.53	19.01.2012	0.71	28.02.2012	0.71
11.12.2011	0.33	20.01.2012	1.04	29.02.2012	0.77
12.12.2011	0.35	21.01.2012	0.83	01.03.2012	0.77
13.12.2011	0.57	22.01.2012	1.11	02.03.2012	0.71
14.12.2011	0.90	23.01.2012	1.27	03.03.2012	0.71
15.12.2011	0.94	24.01.2012	1.99	04.03.2012	0.65
16.12.2011	1.42	25.01.2012	1.70	05.03.2012	0.59
17.12.2011	1.91	26.01.2012	1.52	06.03.2012	0.54
18.12.2011	1.40	27.01.2012	1.27	07.03.2012	0.54
19.12.2011	1.08	28.01.2012	1.04	08.03.2012	0.49
20.12.2011	0.92	29.01.2012	0.90	09.03.2012	0.54
21.12.2011	0.87	30.01.2012	0.90	10.03.2012	0.49
22.12.2011	0.82	31.01.2012	0.71	11.03.2012	0.44
23.12.2011	1.09	01.02.2012	0.65	12.03.2012	0.44
24.12.2011	1.94	02.02.2012	0.49	13.03.2012	0.39
25.12.2011	1.77	03.02.2012	0.39	14.03.2012	0.39
26.12.2011	1.43	04.02.2012	0.27	15.03.2012	0.35
27.12.2011	1.13	05.02.2012	0.27	16.03.2012	0.35
28.12.2011	0.95	06.02.2012	0.35	17.03.2012	0.31
29.12.2011	0.87	07.02.2012	0.27	18.03.2012	0.27
30.12.2011	1.07	08.02.2012	0.35	19.03.2012	0.27
31.12.2011	0.84	09.02.2012	0.20	20.03.2012	0.24
01.01.2012	0.97	10.02.2012	0.20	21.03.2012	0.20
02.01.2012	1.52	11.02.2012	0.17	22.03.2012	0.31
03.01.2012	1.89	12.02.2012	0.17	23.03.2012	0.31
04.01.2012	1.52	13.02.2012	0.14	24.03.2012	0.24
05.01.2012	1.79	14.02.2012	0.14	25.03.2012	0.14
06.01.2012	4.06	15.02.2012	0.14	26.03.2012	0.12
07.01.2012	2.99	16.02.2012	0.12	27.03.2012	0.17
08.01.2012	3.12	17.02.2012	0.12	28.03.2012	0.17

Date	Q [m/s]	Date	Q [m/s]	Date	Q [m/s]
29.03.2012	0.14	11.05.2012	0.09	23.06.2012	0.14
30.03.2012	0.14	12.05.2012	0.07	24.06.2012	0.09
31.03.2012	0.14	13.05.2012	0.05	25.06.2012	0.09
01.04.2012	0.14	14.05.2012	0.04	26.06.2012	0.05
02.04.2012	0.12	15.05.2012	0.04	27.06.2012	0.04
03.04.2012	0.12	16.05.2012	0.04	28.06.2012	0.04
04.04.2012	0.20	17.05.2012	0.04	29.06.2012	0.01
05.04.2012	0.27	18.05.2012	0.04	30.06.2012	0.01
06.04.2012	0.17	19.05.2012	0.03	01.07.2012	0.07
07.04.2012	0.17	20.05.2012	0.03	02.07.2012	0.04
08.04.2012	0.14	21.05.2012	0.01	03.07.2012	0.03
09.04.2012	0.12	22.05.2012	0.01	04.07.2012	0.01
10.04.2012	0.17	23.05.2012	0.01	05.07.2012	0.01
11.04.2012	0.17	24.05.2012	0.01	06.07.2012	0.01
12.04.2012	0.17	25.05.2012	0.00	07.07.2012	0.01
13.04.2012	0.17	26.05.2012	0.00	08.07.2012	0.01
14.04.2012	0.14	27.05.2012	0.00	09.07.2012	0.01
15.04.2012	0.14	28.05.2012	0.00	10.07.2012	0.00
16.04.2012	0.09	29.05.2012	0.00	11.07.2012	0.00
17.04.2012	0.07	30.05.2012	0.00	12.07.2012	0.01
18.04.2012	0.07	31.05.2012	0.01	13.07.2012	0.03
19.04.2012	0.07	01.06.2012	0.03	14.07.2012	0.27
20.04.2012	0.04	02.06.2012	0.03	15.07.2012	0.27
21.04.2012	0.04	03.06.2012	0.04	16.07.2012	0.20
22.04.2012	0.05	04.06.2012	0.05	17.07.2012	0.31
23.04.2012	0.12	05.06.2012	0.24	18.07.2012	0.31
24.04.2012	0.12	06.06.2012	0.07	19.07.2012	0.24
25.04.2012	0.12	07.06.2012	0.05	20.07.2012	0.17
26.04.2012	0.09	08.06.2012	0.04	21.07.2012	0.12
27.04.2012	0.07	09.06.2012	0.03	22.07.2012	0.09
28.04.2012	0.05	10.06.2012	0.01	23.07.2012	0.07
29.04.2012	0.05	11.06.2012	0.01	24.07.2012	0.05
30.04.2012	0.04	12.06.2012	0.03	25.07.2012	0.04
01.05.2012	0.04	13.06.2012	0.01	26.07.2012	0.04
02.05.2012	0.03	14.06.2012	0.01	27.07.2012	0.03
03.05.2012	0.09	15.06.2012	0.01	28.07.2012	0.05
04.05.2012	0.07	16.06.2012	0.01	29.07.2012	0.09
05.05.2012	0.07	17.06.2012	0.01	30.07.2012	0.07
06.05.2012	0.17	18.06.2012	0.01	31.07.2012	0.07
07.05.2012	0.14	19.06.2012	0.01		
08.05.2012	0.17	20.06.2012	0.35		
09.05.2012	0.09	21.06.2012	0.31		
10.05.2012	0.09	22.06.2012	0.20		

B Mass flows pre-reservoirs Sep. 2011–Jul. 2012

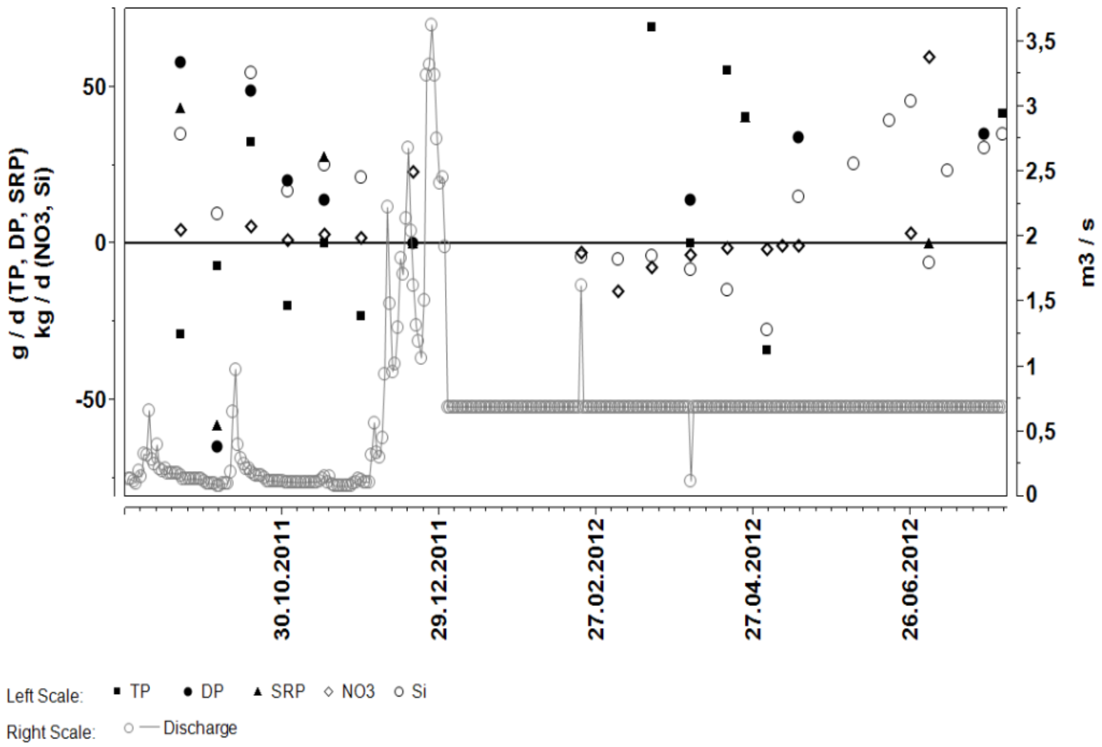


Figure B.1: Mass flow (nutrients), 2011-2012 Rappbode pre-reservoir

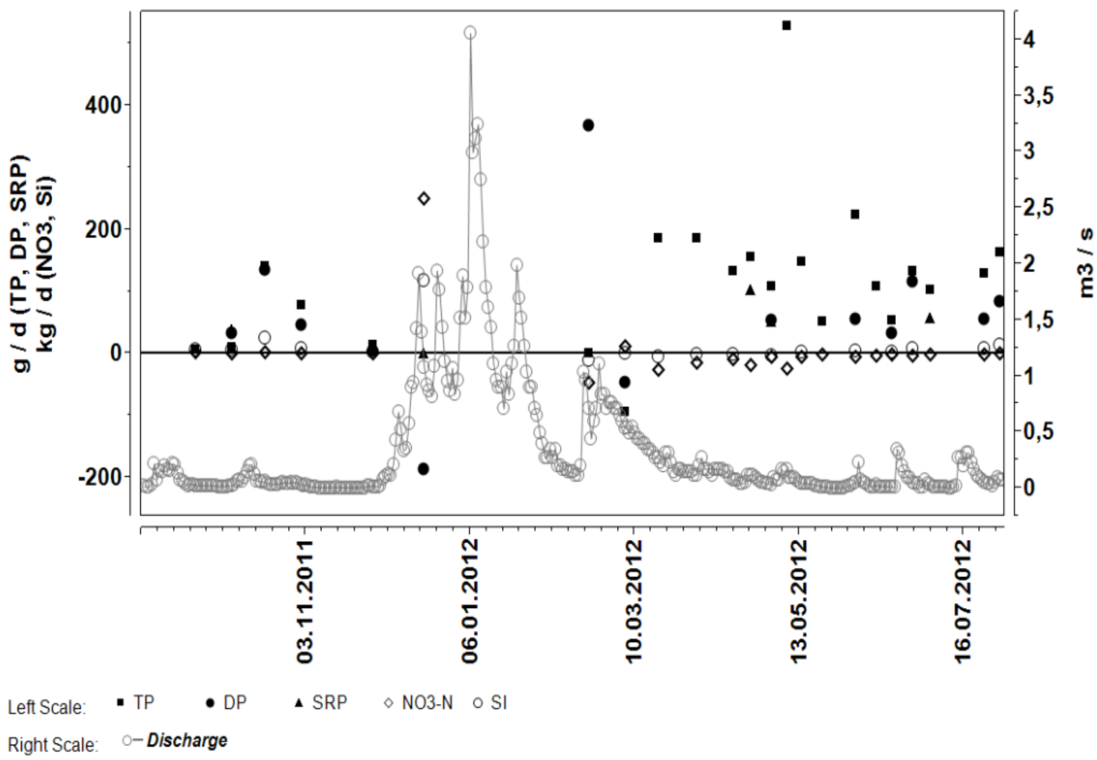


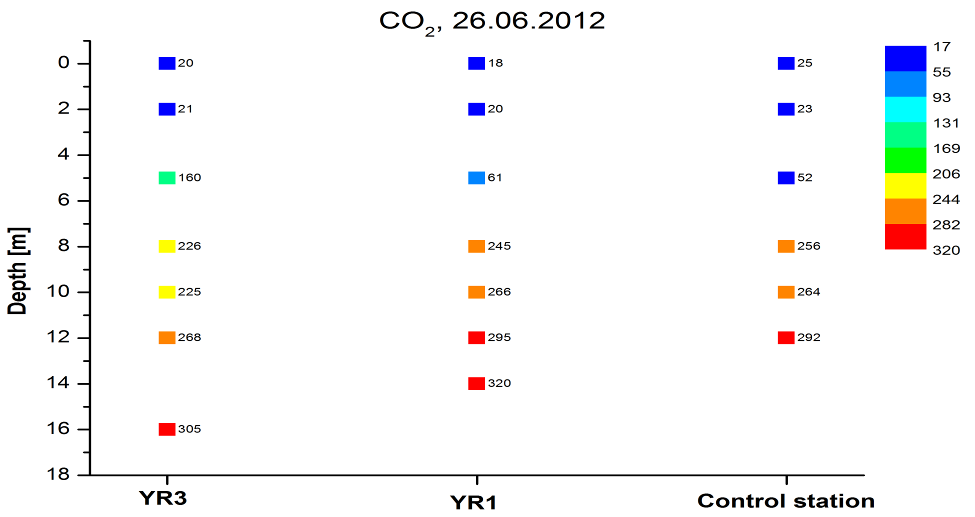
Figure B.2: Mass flow (nutrients), 2011-2012 Hassel pre-reservoir

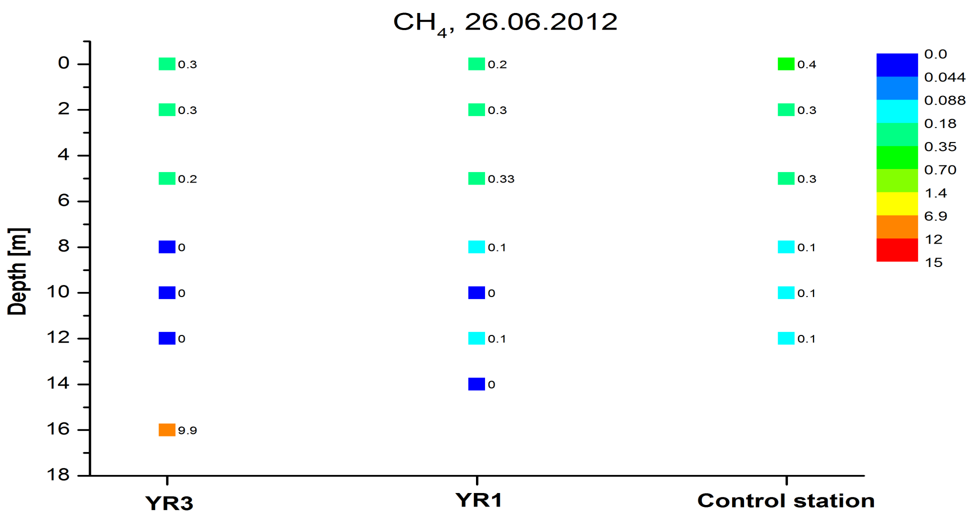
C Seechi Depths in HVS and RVS in June/July 2012

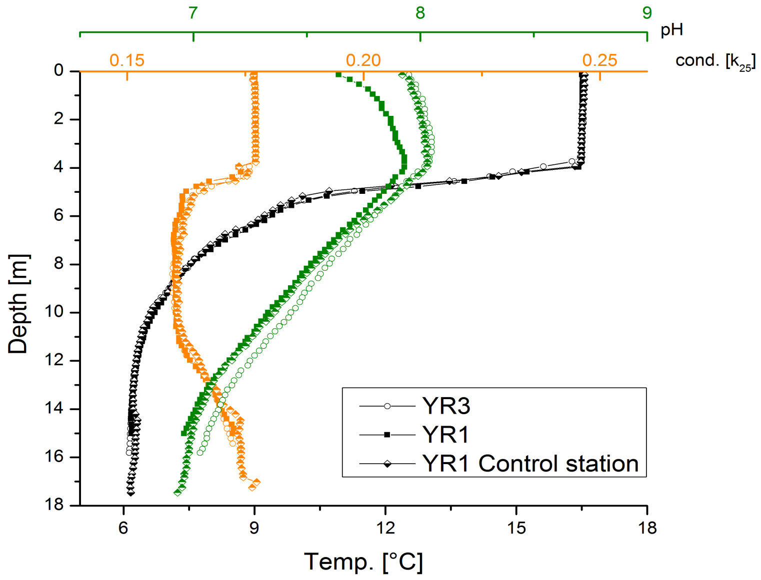
Table C.1: Seechi depths for HVS and RVS in June, July 2012

	Distance to dam [m]	Seechi Depth [m]	Distance to dam [m]	Seechi Depth [m]
June 2012	HVS		RVS	
	61	3.1	35	2.6
	283	3.2	308	2.5
	715	2.6	603	2.3
	1010	2.4	1050	2.3
	1200	1.1	1300	2.2
	1480	1.9	1500	1.8
July 2012				
	61	1.8	35	1.8
	283	1.5	308	1.6
	715	1.2	603	1.7
	1010	1.3	1050	1.6
	1200	1	1300	1.4
	1480	0.9	1500	1.3

D RVS Comparison Outflow

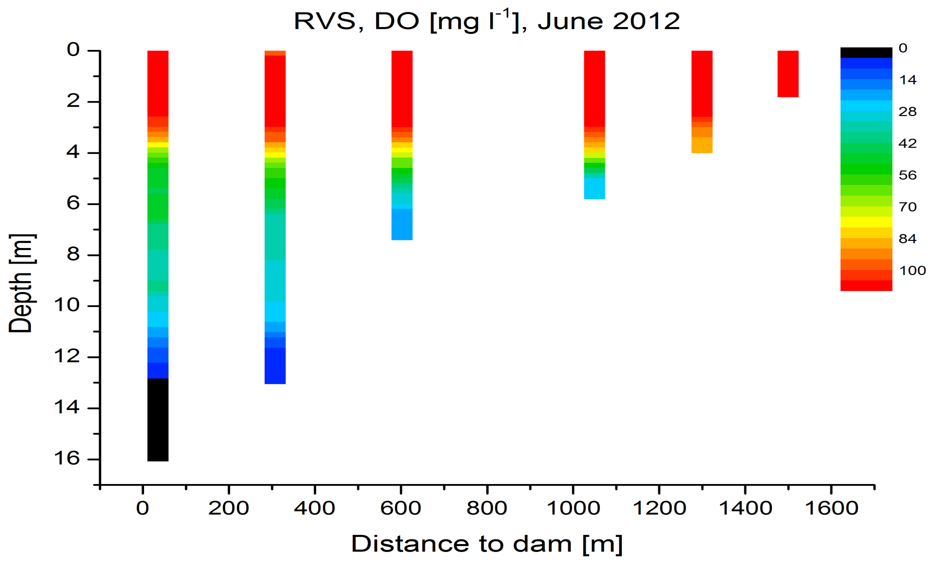


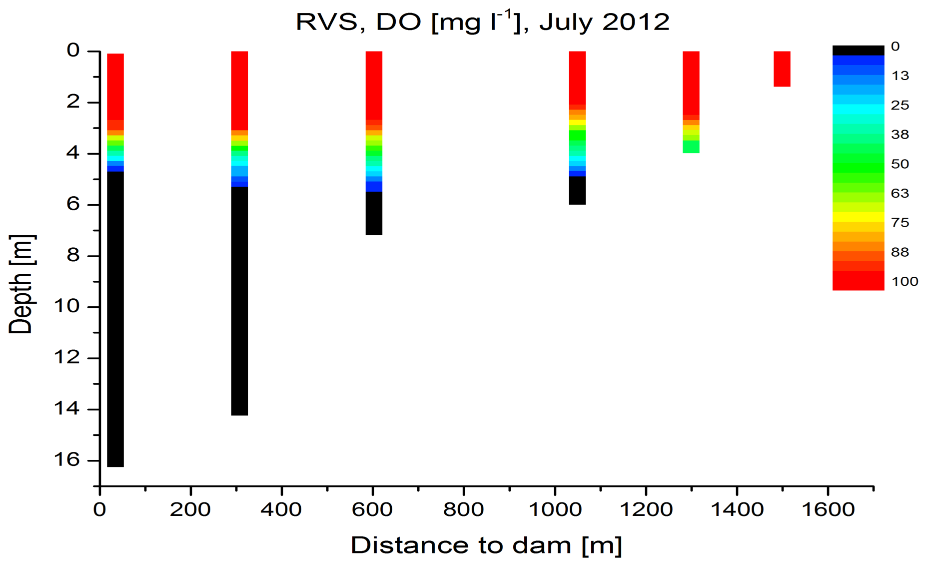




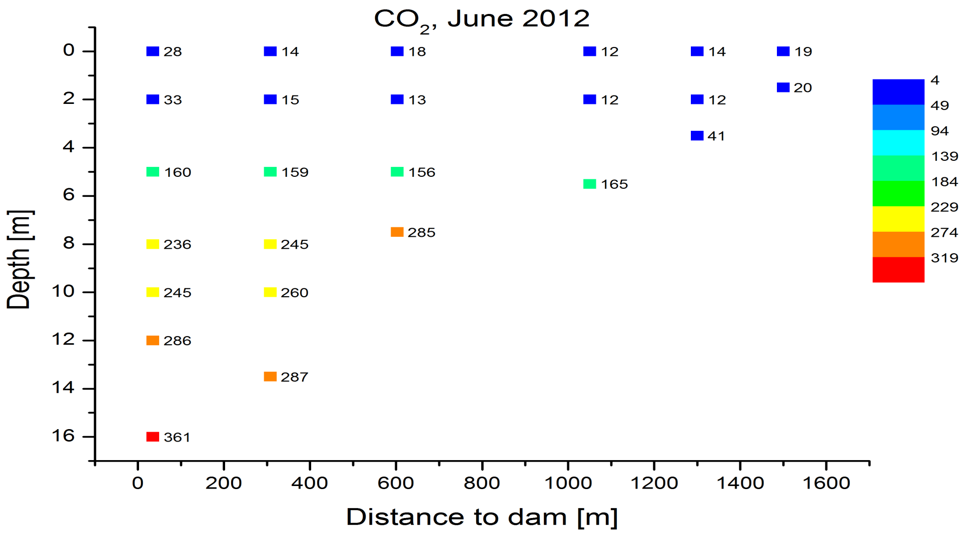
7
8
9
pH
0.15
0.20
0.25
cond. [k25]
Depth [m]
0
2
4
6
8
10
12
14
16
18
6
9
12
15
18
Temp. [°C]
YR3
YR1
YR1 Control station

E Dissolved Oxygen, RVS

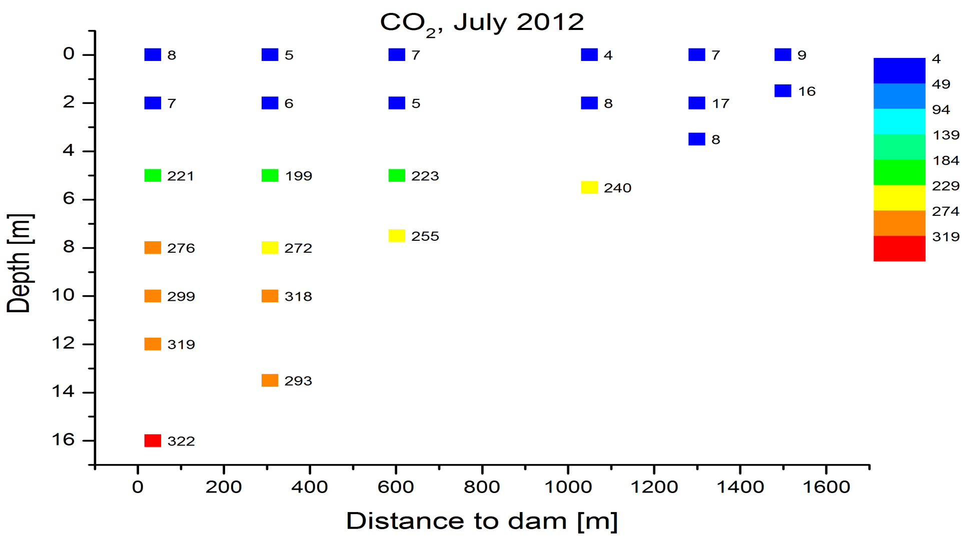




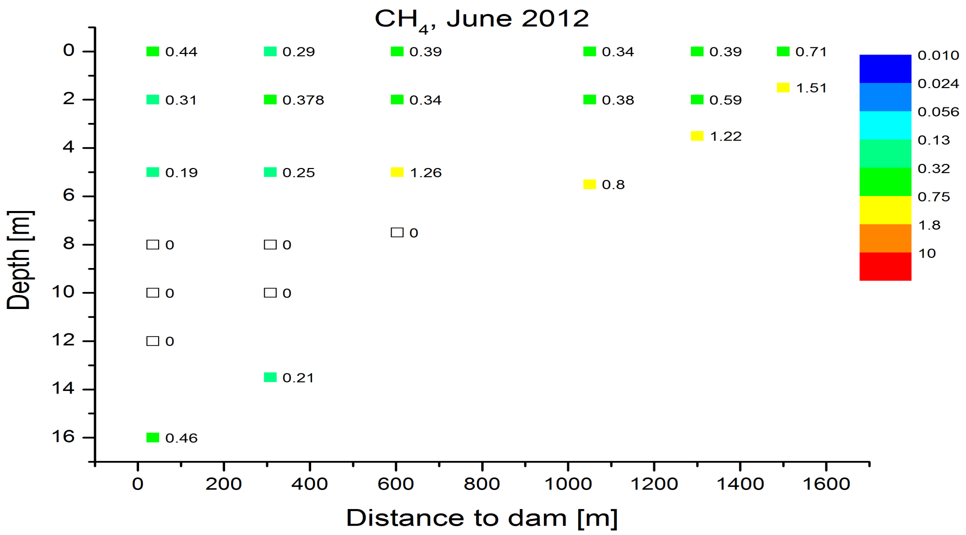
F GC Data RVS

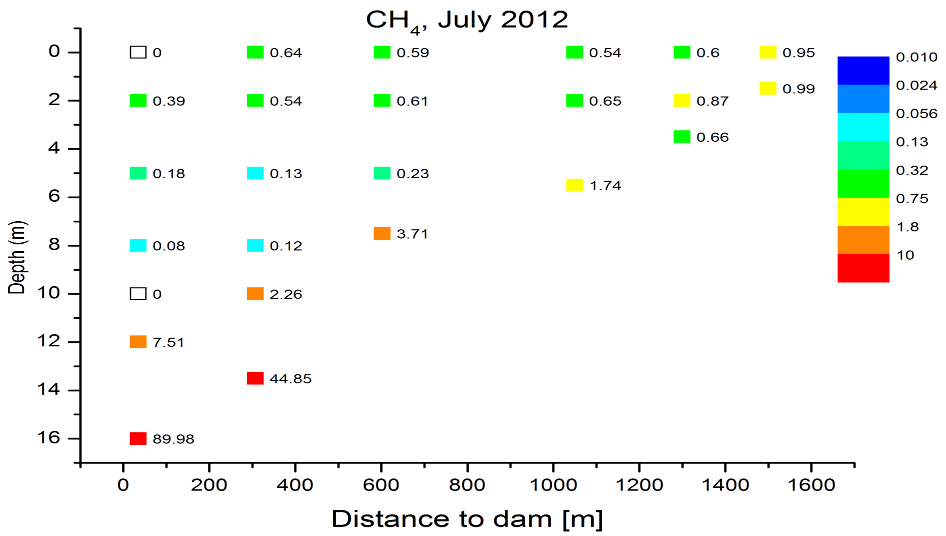


CO2, June 2012
Depth [m]
Distance to dam [m]
28
14
18
12
14
19
20
33
15
13
12
12
41
160
159
156
165
285
236
245
245
260
286
287
361
4
49
94
139
184
229
274
319



CO2, July 2012
Depth [m]
Distance to dam [m]
8
5
7
4
7
9
16
7
6
5
8
17
8
221
199
223
240
255
276
272
299
318
319
293
322
4
49
94
139
184
229
274
319


CH4, June 2012
Depth [m]
Distance to dam [m]
0.44
0.29
0.39
0.34
0.39
0.71
1.51
0.31
0.378
0.34
0.38
0.59
1.22
0.19
0.25
1.26
0.8
0
0.46
0.21
0.010
0.024
0.056
0.13
0.32
0.75
1.8
10


CH4, July 2012
Depth (m)
Distance to dam [m]
0.64
0.59
0.54
0.6
0.95
0.99
0.39
0.54
0.61
0.65
0.87
0.66
0.18
0.13
0.23
1.74
0.08
0.12
3.71
2.26
7.51
44.85
89.98
0.010
0.024
0.056
0.13
0.32
0.75
1.8
10

G bbe data

Table G.1: YH3, bbe FluoroProbe data [µg l^{-1}], June 18th 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	0.0	0.5	1.9	0.0	0.8	2.4
0.16	3.5	0.0	0.0	0.7	0.9	4.2
0.35	0.0	0.5	2.6	0.0	0.6	3.1
0.52	5.5	0.0	0.0	0.5	0.7	6.0
0.57	0.0	0.0	2.7	0.0	1.1	2.7
0.58	6.0	0.0	0.0	0.4	0.6	6.4
0.62	0.0	0.0	2.4	0.7	1.1	3.1
0.74	3.7	0.0	0.0	1.9	1.1	5.6
0.82	1.3	0.0	2.5	0.3	1.2	4.1
0.85	0.0	0.0	4.3	0.0	1.0	4.3
0.89	0.0	0.0	3.6	0.2	0.9	3.9
0.95	0.0	0.0	4.7	0.0	0.4	4.7
1.10	0.3	0.0	3.4	0.7	1.5	4.4
1.19	3.0	0.0	4.2	0.8	0.3	8.1
1.26	0.1	0.0	7.4	0.0	0.3	7.5
1.34	0.0	0.0	7.8	0.0	0.1	7.8
1.44	0.0	0.0	9.5	0.0	0.1	9.5
1.47	0.0	0.0	10.1	0.0	0.1	10.1
1.49	0.0	0.0	10.7	0.0	0.1	10.7
1.64	0.0	0.0	10.6	0.0	0.3	10.6
1.79	0.0	0.0	13.0	0.0	0.0	13.0
1.91	0.0	0.0	15.2	0.0	0.0	15.2
2.02	0.0	0.0	23.4	0.0	0.0	23.4
2.13	0.0	0.0	26.8	0.0	0.0	26.8
2.24	0.0	0.0	34.5	0.0	0.0	34.5
2.35	0.0	0.0	29.7	0.4	0.0	30.1
2.43	0.0	0.0	31.6	0.0	0.0	31.6
2.54	0.0	0.0	22.6	0.0	0.0	22.6
2.64	0.0	0.0	20.0	0.0	0.0	20.0
2.78	0.0	0.0	12.0	0.0	0.2	12.0
2.85	0.0	0.0	10.1	0.7	0.3	10.9
2.97	0.0	0.0	8.1	0.8	0.5	8.9

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
3.05	0.0	0.0	4.4	0.6	1.1	5.0
3.14	0.0	0.0	4.5	0.8	1.1	5.3
3.36	0.0	0.2	2.6	0.8	1.2	3.5
3.45	0.0	0.0	2.0	0.7	1.1	2.7
3.53	1.5	0.0	1.1	0.7	1.1	3.3
3.62	0.0	0.0	1.1	0.7	1.4	1.7
3.70	0.2	0.0	0.6	0.4	1.4	1.2
3.79	0.9	0.1	0.0	0.4	1.5	1.4
3.88	0.0	0.0	1.1	0.1	1.3	1.2
3.96	0.4	0.1	0.0	0.7	1.4	1.1
4.02	0.0	0.0	0.3	1.0	1.3	1.3
4.13	0.0	0.0	0.5	0.5	1.4	0.9
4.21	0.0	0.0	0.0	0.8	1.5	0.8
4.32	0.0	0.0	0.0	0.8	1.5	0.8
4.42	0.0	0.0	0.0	0.8	1.5	0.8
4.49	0.3	0.0	0.0	0.8	1.4	1.1
4.61	0.0	0.0	0.0	0.6	1.6	0.6
4.71	0.0	0.0	0.0	0.7	1.5	0.7
4.81	0.3	0.0	0.0	0.6	1.5	0.8
4.91	0.6	0.0	0.0	0.4	1.5	1.0
5.01	0.0	0.0	0.2	0.4	1.6	0.6
5.09	0.0	0.0	0.0	0.8	1.5	0.8
5.13	0.0	0.0	0.4	0.4	1.4	0.8
5.20	0.0	0.0	0.0	0.5	1.5	0.5
5.34	0.0	0.0	0.0	0.4	1.6	0.4
5.40	0.3	0.0	0.0	0.5	1.5	0.7
5.55	0.1	0.0	0.0	0.5	1.6	0.6
5.65	0.0	0.0	0.0	0.6	1.6	0.6
5.70	0.2	0.0	0.0	0.3	1.5	0.5
5.83	0.0	0.0	0.1	0.4	1.6	0.5
5.95	0.0	0.0	0.2	0.1	1.6	0.3
6.04	0.0	0.0	0.0	0.5	1.6	0.5
6.12	0.1	0.0	0.0	0.4	1.5	0.5
6.20	0.1	0.0	0.0	0.4	1.5	0.5
6.28	0.2	0.0	0.0	0.3	1.6	0.5
6.37	0.2	0.0	0.0	0.4	1.5	0.5
6.50	0.0	0.0	0.2	0.2	1.5	0.4
6.59	0.0	0.0	0.4	0.1	1.5	0.5
6.68	0.4	0.0	0.0	0.3	1.5	0.7
6.76	0.1	0.0	0.0	0.3	1.6	0.4
6.84	0.0	0.0	0.3	0.1	1.5	0.4
6.93	0.0	0.0	0.4	0.1	1.6	0.5
6.99	0.0	0.0	0.3	0.0	1.6	0.3
7.07	0.0	0.0	0.4	0.1	1.5	0.5
7.16	0.0	0.0	0.4	0.1	1.6	0.5

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
7.28	0.0	0.0	0.3	0.0	1.6	0.3
7.39	0.0	0.0	0.5	0.0	1.5	0.5
7.49	0.0	0.0	0.0	0.3	1.7	0.3
7.55	0.0	0.0	0.5	0.0	1.6	0.5
7.63	0.0	0.0	0.3	0.0	1.7	0.3
7.69	0.0	0.0	0.4	0.0	1.6	0.4
7.76	0.0	0.0	0.4	0.0	1.6	0.4
7.84	0.0	0.0	0.2	0.0	1.7	0.2
7.92	0.0	0.0	0.2	0.1	1.7	0.3
8.03	0.0	0.0	0.4	0.0	1.6	0.4
8.14	0.0	0.0	0.2	0.0	1.7	0.2
8.25	0.0	0.0	0.2	0.0	1.7	0.2
8.30	0.0	0.0	0.0	0.1	1.8	0.1
8.40	0.0	0.0	0.0	0.0	1.7	0.1
8.52	0.0	0.0	0.0	0.0	1.8	0.0
8.60	0.1	0.0	0.0	0.0	1.8	0.1
8.66	0.0	0.0	0.0	0.0	1.8	0.0
8.75	0.0	0.0	0.0	0.0	1.8	0.0
8.85	0.0	0.0	0.0	0.1	1.8	0.1
8.90	0.1	0.0	0.0	0.0	1.8	0.1
8.99	0.0	0.0	0.0	0.1	1.8	0.1
9.04	0.0	0.0	0.0	0.0	1.8	0.0
9.16	0.0	0.0	0.0	0.0	1.8	0.0
9.23	0.0	0.0	0.0	0.0	1.8	0.0
9.27	0.0	0.0	0.0	0.1	1.9	0.1
9.34	0.0	0.0	0.0	0.1	1.9	0.1
9.40	0.0	0.0	0.0	0.3	1.9	0.3
9.44	0.0	0.0	0.0	0.2	1.9	0.2
9.44	0.0	0.0	0.0	0.5	1.9	0.5
9.51	0.0	0.0	0.0	0.3	1.9	0.3
9.57	0.0	0.0	0.0	0.4	1.9	0.4
9.66	0.0	0.0	0.0	0.4	1.9	0.4
9.77	0.0	0.0	0.0	0.4	2.1	0.4
9.86	0.0	0.0	0.3	0.3	2.0	0.6
9.95	0.2	0.0	0.0	0.5	2.1	0.6
10.05	0.0	0.0	0.1	0.3	2.1	0.4
10.14	0.0	0.0	0.0	0.4	2.1	0.4
10.21	0.0	0.0	0.0	0.4	2.1	0.4
10.28	0.0	0.0	0.0	0.3	2.1	0.3
10.37	0.0	0.0	0.0	0.3	2.1	0.3
10.48	0.0	0.0	0.0	0.3	2.1	0.3
10.61	0.0	0.0	0.0	0.3	2.1	0.3
10.71	0.0	0.0	0.0	0.3	2.1	0.3
10.84	0.0	0.0	0.0	0.2	2.1	0.2
10.97	0.0	0.0	0.0	0.3	2.1	0.3

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
11.07	0.0	0.0	0.0	0.3	2.1	0.3
11.18	0.0	0.0	0.0	0.2	2.0	0.2
11.27	0.0	0.0	0.0	0.2	2.0	0.2
11.35	0.0	0.0	0.0	0.2	2.0	0.2
11.44	0.0	0.0	0.0	0.2	2.0	0.2
11.55	0.0	0.0	0.0	0.3	2.0	0.3
11.61	0.0	0.0	0.0	0.2	2.0	0.2
11.70	0.0	0.0	0.0	0.3	2.0	0.3
11.78	0.0	0.0	0.0	0.4	2.0	0.4
11.83	0.0	0.0	0.0	0.5	2.1	0.5
11.95	0.0	0.0	0.0	0.4	2.0	0.4
12.05	0.0	0.0	0.0	0.4	2.0	0.4
12.19	0.0	0.0	0.0	0.4	2.0	0.4
12.32	0.0	0.1	0.0	0.4	2.0	0.4
12.45	0.0	0.1	0.0	0.4	2.0	0.4
12.53	0.0	0.2	0.0	0.2	2.0	0.4
12.69	0.0	0.2	0.0	0.2	2.0	0.3
12.78	0.0	0.2	0.0	0.2	2.0	0.4
12.89	0.0	0.2	0.0	0.6	1.9	0.8

Table G.2: YH4, bbe FluoroProbe data [µg l^{-1}], June 18th 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	0.0	0.0	1.3	1.0	1.1	2.3
0.14	0.0	0.1	2.5	0.0	1.1	2.6
0.13	1.4	0.0	1.8	0.3	0.7	3.5
0.19	1.8	0.0	1.4	0.1	0.9	3.3
0.27	0.0	0.0	2.4	0.1	1.0	2.6
0.35	0.3	0.0	2.0	0.2	1.2	2.5
0.42	0.2	0.0	2.7	0.0	0.9	2.9
0.50	2.3	0.0	2.3	0.0	0.7	4.6
0.60	0.1	0.3	2.8	0.2	0.8	3.3
0.69	0.0	0.0	3.6	0.0	0.8	3.6
0.72	0.0	0.0	3.9	0.3	0.7	4.2
0.75	0.0	0.0	3.1	0.4	1.0	3.4
0.80	0.0	0.0	3.2	0.4	1.0	3.6
0.89	0.7	0.0	4.2	0.0	0.4	4.9
0.92	0.0	0.0	4.3	0.0	0.8	4.4
0.96	1.0	0.0	4.0	0.0	0.6	4.9
1.01	1.3	0.0	3.5	0.0	0.5	4.8
1.07	1.9	0.0	3.8	0.0	0.7	5.7
1.08	0.1	0.0	3.9	0.3	0.9	4.3
1.09	0.0	0.0	4.4	0.0	0.5	4.4
1.14	0.0	0.0	4.0	0.3	0.7	4.2
1.17	0.0	0.0	4.2	0.0	0.9	4.2
1.25	0.6	0.0	4.2	0.0	0.8	4.9
1.34	0.0	0.0	4.0	0.0	0.9	4.0
1.42	0.0	0.0	6.3	0.0	0.4	6.3
1.49	0.0	0.0	7.4	0.0	0.4	7.4
1.57	0.0	0.0	7.7	0.0	0.4	7.7
1.66	0.0	0.0	8.3	0.0	0.3	8.3
1.73	0.0	0.0	10.9	0.0	0.4	10.9
1.83	0.0	0.0	11.9	0.0	0.0	11.9
1.83	0.0	0.0	14.1	0.0	0.0	14.1
1.84	0.0	0.0	13.3	0.0	0.1	13.3
1.89	0.0	0.0	13.9	0.0	0.0	13.9
1.98	0.0	0.0	17.0	0.0	0.0	17.0
2.07	0.0	0.0	18.8	0.0	0.0	18.8
2.23	0.0	0.0	18.3	0.0	0.0	18.3
2.33	0.0	0.0	17.0	0.0	0.0	17.0
2.40	0.0	0.0	14.6	0.0	0.0	14.6
2.54	0.0	0.0	14.1	0.0	0.0	14.1
2.67	0.0	0.0	15.9	0.0	0.0	15.9
2.79	0.0	0.0	14.8	0.0	0.0	14.8
2.89	0.0	0.0	11.9	0.0	0.1	11.9

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
2.98	0.0	0.0	8.0	0.9	0.8	8.9
3.17	0.7	0.0	3.8	1.5	1.2	6.0
3.28	0.2	0.0	3.7	1.3	1.2	5.2
3.30	0.0	0.0	2.7	1.1	1.4	3.8
3.44	0.0	0.0	1.7	1.2	1.2	2.9
3.60	0.0	0.3	1.4	0.2	1.4	1.9
3.70	1.3	0.0	0.0	1.1	1.4	2.4
3.83	0.4	0.0	0.3	1.0	1.5	1.6
3.94	0.8	0.0	0.0	1.0	1.4	1.8
4.03	0.0	0.0	0.6	0.6	1.4	1.2
4.11	0.0	0.0	0.0	1.1	1.4	1.1
4.21	0.2	0.0	0.0	0.9	1.5	1.1
4.31	0.0	0.0	0.0	0.9	1.5	0.9
4.39	0.0	0.0	0.0	0.6	1.5	0.6
4.48	0.0	0.0	0.0	0.8	1.4	0.8
4.56	0.0	0.0	0.0	0.7	1.6	0.7
4.67	0.5	0.0	0.0	0.6	1.4	1.1
4.78	0.5	0.0	0.0	0.6	1.5	1.1
4.87	0.0	0.0	0.1	0.6	1.5	0.7
5.01	0.0	0.0	0.0	0.7	1.5	0.7
5.06	0.0	0.0	0.0	0.8	1.6	0.8
5.13	0.0	0.0	0.0	0.5	1.6	0.5
5.22	0.5	0.0	0.0	0.3	1.5	0.8
5.29	0.0	0.0	0.0	0.5	1.6	0.5
5.39	0.0	0.0	0.3	0.4	1.5	0.7
5.51	0.2	0.0	0.0	0.6	1.5	0.8
5.58	0.4	0.0	0.0	0.3	1.5	0.6
5.64	0.0	0.0	0.0	0.4	1.6	0.4
5.77	0.4	0.0	0.0	0.4	1.5	0.7
5.84	0.0	0.0	0.0	0.2	1.6	0.2
5.94	0.3	0.0	0.0	0.2	1.6	0.5
6.06	0.0	0.0	0.0	0.3	1.6	0.3
6.15	0.0	0.0	0.0	0.2	1.6	0.2
6.29	0.0	0.0	0.2	0.1	1.6	0.3
6.39	0.0	0.0	0.2	0.1	1.7	0.2
6.49	0.4	0.0	0.0	0.0	1.6	0.4
6.60	0.2	0.0	0.0	0.3	1.6	0.4
6.73	0.0	0.0	0.2	0.1	1.7	0.3
6.84	0.0	0.0	0.4	0.0	1.6	0.4
6.97	0.0	0.0	0.2	0.2	1.6	0.4
7.12	0.0	0.0	0.3	0.0	1.7	0.3
7.24	0.0	0.0	0.3	0.0	1.7	0.3
7.39	0.0	0.0	0.3	0.0	1.7	0.3
7.45	0.3	0.0	0.0	0.1	1.7	0.4
7.57	0.2	0.0	0.0	0.1	1.8	0.2

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
7.66	0.0	0.0	0.3	0.0	1.6	0.3
7.73	0.0	0.0	0.3	0.0	1.7	0.3
7.79	0.4	0.0	0.0	0.1	1.7	0.5
7.88	0.0	0.0	0.0	0.2	1.7	0.3
7.94	0.0	0.0	0.2	0.0	1.8	0.2
8.01	0.0	0.0	0.3	0.0	1.7	0.3
8.08	0.3	0.0	0.0	0.0	1.7	0.3
8.11	0.0	0.0	0.0	0.1	1.8	0.1
8.17	0.1	0.0	0.0	0.2	1.8	0.3
8.22	0.1	0.0	0.0	0.1	1.8	0.2
8.28	0.0	0.0	0.3	0.0	1.7	0.3
8.37	0.1	0.0	0.0	0.1	1.8	0.2
8.46	0.1	0.0	0.0	0.2	1.7	0.2
8.54	0.0	0.0	0.0	0.2	1.8	0.2
8.62	0.0	0.0	0.2	0.0	1.7	0.3
8.71	0.0	0.0	0.0	0.1	1.8	0.1
8.75	0.0	0.0	0.0	0.2	1.8	0.2
8.85	0.0	0.0	0.0	0.1	1.8	0.1
8.94	0.0	0.0	0.2	0.0	1.8	0.2
9.05	0.0	0.0	0.1	0.1	1.8	0.2
9.16	0.0	0.0	0.0	0.1	1.9	0.1
9.27	0.0	0.3	0.3	0.0	1.8	0.6

Table G.3: YHE, bbe FluoroProbe data [µg l^{-1}], June 18^{th} 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	1.0	0.0	2.6	0.0	1.0	3.6
0.07	3.0	0.0	1.1	1.2	1.0	5.4
0.06	4.1	0.0	1.5	0.7	0.5	6.3
0.06	0.0	0.0	4.1	0.0	0.7	4.1
0.06	1.3	0.0	2.9	0.5	0.8	4.7
0.03	0.0	0.0	3.1	0.9	0.6	4.0
0.07	1.3	0.0	3.6	0.6	0.2	5.6
0.12	0.0	0.9	3.8	0.6	0.5	5.3
0.27	0.0	0.2	4.4	0.0	0.7	4.6
0.36	2.6	0.0	2.7	0.1	0.7	5.4
0.49	0.1	0.0	3.6	0.5	1.1	4.2
0.59	0.0	0.0	4.1	1.3	0.6	5.4
0.65	0.0	0.1	3.4	1.4	1.0	4.9
0.67	1.9	0.0	3.8	1.0	0.9	6.8
0.72	2.7	0.0	4.5	0.0	0.6	7.2
0.85	0.8	0.0	4.4	1.1	1.1	6.2
0.91	0.0	0.0	6.2	0.8	0.7	7.0
0.99	0.0	0.0	7.1	0.0	0.5	7.1
1.08	0.0	0.0	6.9	0.5	0.6	7.4
1.16	0.0	0.0	7.5	0.5	0.4	8.0
1.27	0.0	0.0	9.0	0.0	0.3	9.0
1.32	0.0	0.0	10.3	1.1	0.0	11.4
1.34	0.0	0.0	11.1	0.7	0.0	11.7
1.41	0.0	0.0	10.6	0.5	0.1	11.1
1.47	0.4	0.0	11.3	0.2	0.0	11.9
1.56	0.0	0.0	12.1	0.3	0.0	12.5
1.56	0.0	0.0	13.8	0.0	0.0	13.8
1.65	0.0	0.0	12.1	0.5	0.1	12.5
1.75	0.0	0.0	12.8	1.0	0.0	13.8
1.85	0.0	0.0	14.3	0.0	0.0	14.3
1.92	0.0	0.0	14.1	0.0	0.0	14.1
1.97	0.0	0.0	14.1	0.0	0.0	14.1
2.05	0.0	0.0	13.4	0.6	0.0	14.0
2.12	0.0	0.0	14.9	0.4	0.1	15.3
2.17	0.0	0.0	14.7	0.4	0.0	15.2
2.22	0.0	0.0	15.3	0.9	0.0	16.2
2.31	0.0	0.0	12.7	1.2	0.3	13.9
2.39	0.0	0.0	11.0	1.5	0.6	12.5
2.50	0.0	0.0	9.6	2.2	0.9	11.8
2.58	0.0	0.0	7.5	2.4	1.4	9.9
2.64	0.0	0.0	5.6	2.5	1.3	8.1
2.70	1.8	0.0	5.1	2.8	1.5	9.6

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
2.78	0.0	0.2	5.5	2.0	1.7	7.7
2.85	0.0	0.1	3.7	2.7	1.6	6.4
2.91	0.7	0.0	2.7	2.4	1.6	5.8
2.98	0.0	0.0	2.9	2.3	1.5	5.2
3.03	0.0	0.0	2.6	2.0	1.4	4.7
3.08	0.0	0.0	1.7	2.0	1.6	3.8
3.11	0.6	0.1	1.6	1.9	1.5	4.2
3.17	0.0	0.0	1.3	2.4	1.6	3.7
3.22	0.0	0.0	1.0	2.6	1.6	3.6
3.28	0.2	0.0	1.7	1.8	1.5	3.7
3.40	0.0	0.0	1.3	2.4	1.6	3.6
3.54	1.4	0.0	0.3	2.2	1.5	3.9
3.59	0.3	0.0	0.7	2.3	1.4	3.3
3.67	0.3	0.0	0.9	2.0	1.4	3.2
3.77	0.2	0.0	0.5	2.1	1.6	2.8
3.85	0.0	0.0	0.8	1.9	1.3	2.7
3.92	0.0	0.0	0.7	1.9	1.4	2.6
3.96	0.6	0.0	0.3	1.8	1.5	2.7
4.02	0.5	0.0	0.5	1.4	1.5	2.4
4.12	0.7	0.0	0.0	1.5	1.6	2.1
4.19	0.0	0.0	0.5	1.1	1.4	1.6
4.30	0.0	0.0	0.2	1.1	1.5	1.3
4.39	0.0	0.0	0.2	1.0	1.6	1.2
4.45	0.6	0.0	0.0	0.7	1.4	1.3
4.53	0.7	0.0	0.0	0.6	1.5	1.2
4.61	0.0	0.0	0.0	0.7	1.6	0.7
4.72	0.0	0.1	0.0	0.5	1.7	0.5
4.80	0.3	0.0	0.0	0.6	1.5	0.9
4.89	0.0	0.0	0.0	0.3	1.6	0.3
4.96	0.0	0.0	0.0	0.7	1.5	0.7
5.07	0.0	0.0	0.0	0.5	1.5	0.6
5.11	0.0	0.0	0.0	0.5	1.6	0.5
5.21	0.0	0.0	0.0	0.4	1.6	0.4
5.31	0.3	0.0	0.0	0.3	1.5	0.7
5.40	0.0	0.0	0.0	0.3	1.6	0.3
5.51	0.1	0.0	0.0	0.2	1.6	0.3
5.60	0.0	0.0	0.0	0.4	1.6	0.4
5.67	0.0	0.0	0.0	0.1	1.6	0.1
5.76	0.0	0.0	0.1	0.1	1.5	0.1
5.87	0.0	0.0	0.2	0.0	1.6	0.3
5.92	0.0	0.0	0.0	0.3	1.5	0.3
5.99	0.0	0.0	0.0	0.3	1.6	0.3
6.05	0.0	0.0	0.0	0.3	1.6	0.3
6.19	0.0	0.0	0.0	0.2	1.6	0.2
6.24	0.0	0.1	0.0	0.2	1.6	0.3

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
6.30	0.1	0.0	0.0	0.0	1.6	0.1
6.36	0.0	0.0	0.2	0.3	1.5	0.4
6.46	0.0	0.0	0.0	0.2	1.6	0.2
6.52	0.0	0.0	0.0	0.2	1.7	0.2
6.54	0.0	0.0	0.0	0.3	1.7	0.3
6.58	0.0	0.0	0.0	0.2	1.7	0.2
6.72	0.0	0.0	0.0	0.8	1.8	0.8
6.80	0.0	0.0	0.3	0.3	1.6	0.6
6.87	0.3	0.0	0.0	0.6	1.7	0.9
6.97	0.1	0.0	0.0	0.6	1.8	0.7
6.98	0.0	0.0	0.0	0.6	1.8	0.6
7.07	0.2	0.0	0.0	0.6	1.8	0.8
7.16	2.5	0.1	1.0	1.1	1.5	4.6

Table G.4: YH5, bbe FluoroProbe data [µg l^{-1}], June 18th 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	4.2	0.0	0.0	0.0	1.4	4.2
0.03	9.0	0.0	0.0	0.0	0.0	9.0
0.03	6.4	0.0	0.0	0.0	1.4	6.4
0.05	1.9	0.0	0.6	1.4	1.8	3.9
0.08	0.0	0.0	2.8	0.0	1.7	2.8
0.07	8.7	0.0	0.0	0.8	0.5	9.4
0.06	7.5	0.0	0.0	1.0	0.6	8.5
0.08	4.2	0.5	1.0	0.0	1.6	5.6
0.25	0.0	0.0	3.7	1.1	0.0	4.8
0.40	0.9	1.2	0.8	3.2	0.6	6.0
0.47	6.7	0.0	0.0	0.0	0.0	6.7
0.55	0.0	0.0	1.5	0.0	2.6	1.5
0.61	10.0	0.0	0.0	0.0	0.4	10.0
0.68	1.1	0.0	5.4	0.0	0.0	6.5
0.72	2.7	0.0	3.8	0.0	0.3	6.4
0.77	8.7	0.0	0.0	0.1	0.7	8.8
0.87	0.0	0.0	5.3	0.5	0.0	5.8
0.91	8.1	0.0	2.5	0.0	0.0	10.6
1.03	0.0	0.0	6.4	0.0	0.0	6.4
1.08	7.4	0.0	0.0	0.0	1.8	7.4
1.15	0.0	0.5	6.3	0.0	0.1	6.8
1.18	4.6	0.0	4.6	0.0	0.0	9.2
1.25	4.3	0.0	3.5	0.0	1.2	7.8
1.28	10.7	0.0	1.3	1.9	0.0	13.9
1.31	0.0	0.0	7.3	0.0	0.6	7.3
1.31	0.0	0.0	9.0	0.0	0.1	9.0
1.35	0.5	0.0	5.5	1.2	1.0	7.2
1.43	7.7	0.0	4.0	0.0	0.7	11.7
1.49	0.0	0.0	8.0	3.0	0.7	11.0
1.53	0.0	0.0	11.1	1.2	0.0	12.3
1.58	0.0	0.0	11.5	0.4	0.2	11.9
1.65	0.0	0.0	11.7	0.0	0.3	11.7
1.66	0.0	0.0	12.6	1.6	0.3	14.1
1.71	0.0	0.0	15.3	2.3	0.0	17.6
1.73	0.0	0.0	18.6	0.3	0.0	18.9
1.81	0.0	0.0	17.3	0.6	0.0	17.8
1.85	0.0	0.0	19.2	0.0	0.0	19.3
1.89	0.0	0.0	18.9	1.7	0.0	20.6
1.93	0.0	0.0	20.5	0.2	0.0	20.7
1.97	0.0	0.0	19.5	0.3	0.0	19.8
2.02	0.0	0.0	17.8	0.8	0.0	18.6
2.06	0.0	0.0	19.1	0.9	0.0	20.0

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
2.12	0.0	0.0	18.6	0.0	0.0	18.6
2.18	0.0	0.0	16.3	0.6	0.0	16.9
2.23	0.0	0.0	13.9	1.1	0.3	15.1
2.26	2.2	0.0	14.2	0.7	0.1	17.0
2.31	0.1	0.0	13.0	1.1	0.2	14.1
2.36	0.0	0.0	10.3	2.2	0.2	12.6
2.43	0.0	0.0	8.0	2.0	0.6	10.0
2.48	0.0	0.0	7.4	1.8	1.0	9.2
2.53	0.5	0.0	6.2	2.2	1.0	9.0
2.56	0.0	0.0	6.1	1.3	1.5	7.5
2.57	0.0	0.0	8.0	0.6	1.0	8.6
2.62	1.5	0.0	6.9	1.0	1.0	9.3
2.67	0.0	0.0	7.5	1.3	0.8	8.9
2.73	0.2	0.0	7.1	1.7	1.1	9.1
2.77	0.0	0.0	8.8	1.4	0.2	10.3
2.83	0.1	0.0	6.9	0.9	0.8	7.9
2.83	1.6	0.0	4.2	3.1	1.5	8.9
2.87	0.1	0.0	5.2	2.0	1.5	7.3
2.91	0.0	0.0	4.3	4.0	1.5	8.3
2.96	0.0	0.2	4.9	2.7	1.0	7.8
3.01	0.0	0.0	5.9	2.1	1.1	8.1
3.04	0.0	0.1	4.9	2.1	1.4	7.1
3.08	0.0	0.0	3.1	3.3	1.8	6.4
3.15	0.0	0.0	3.3	3.1	2.0	6.4
3.19	0.0	0.5	4.0	2.9	1.6	7.4
3.24	0.1	0.0	4.4	2.9	1.2	7.4
3.30	0.1	0.0	4.4	2.4	1.1	7.0
3.34	2.6	0.4	3.1	1.2	1.4	7.3
3.37	0.0	0.0	3.0	2.0	1.6	5.0
3.42	1.0	0.0	3.1	2.2	1.3	6.2
3.47	1.4	0.0	3.0	2.0	1.4	6.4
3.51	2.5	0.4	2.1	0.8	1.5	5.7
3.53	2.0	0.5	2.7	0.3	1.4	5.5
3.62	0.0	0.3	2.1	2.4	1.8	4.7
3.65	0.0	0.0	2.9	2.4	1.3	5.3
3.75	0.0	0.3	3.8	2.0	1.3	6.0
3.75	2.9	0.0	2.7	1.5	1.1	7.1
3.81	0.0	0.0	2.3	3.4	1.6	5.7
3.89	0.0	0.0	2.3	2.6	1.6	4.9
3.93	0.0	0.0	3.2	2.2	1.1	5.4
4.01	1.8	0.0	1.5	2.7	1.4	6.0
4.11	2.2	0.0	0.0	2.8	1.7	5.0
4.13	1.6	0.0	0.0	2.7	1.6	4.2
4.15	2.5	0.0	0.0	2.6	1.6	5.1
4.20	2.8	0.0	0.0	2.3	1.6	5.0

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
4.21	0.0	0.0	1.2	2.8	1.3	4.0
4.24	1.1	0.0	1.4	1.8	1.4	4.3
4.34	0.0	0.2	1.3	1.9	1.6	3.3
4.37	0.1	0.0	0.4	2.2	1.7	2.7
4.43	2.5	0.0	0.0	0.9	1.5	3.4
4.47	1.4	0.0	0.0	2.0	1.7	3.4
4.51	0.8	0.0	0.0	1.9	1.9	2.7
4.58	0.3	0.0	0.0	1.8	1.8	2.0
4.67	0.3	0.0	0.0	1.4	1.6	1.7
4.72	0.2	0.0	0.5	0.6	1.4	1.3
4.78	0.0	0.0	0.0	1.0	1.5	1.1
4.82	0.0	0.0	0.5	0.5	1.4	1.0
4.90	0.0	0.0	0.0	0.8	1.5	0.8
4.97	1.1	1.3	0.2	0.0	1.6	2.6

Table G.5: YHF, bbe FluoroProbe data [µg l^{-1}], June 18^{th} 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	0.0	0.7	8.7	0.0	0.9	9.3
0.12	4.9	0.0	4.8	0.0	1.6	9.7
0.19	7.3	0.0	6.0	0.0	0.0	13.2
0.25	0.0	0.8	8.7	0.0	1.2	9.5
0.34	9.5	0.0	4.6	1.0	0.6	15.1
0.44	0.0	0.0	9.3	0.4	1.3	9.7
0.54	4.8	0.0	6.4	1.9	1.5	13.1
0.64	5.1	0.0	8.3	0.3	0.7	13.7
0.72	0.0	0.2	11.8	0.0	0.0	12.0
0.78	4.4	0.0	8.7	0.0	0.5	13.0
0.87	11.0	0.0	5.3	0.0	0.5	16.3
0.96	2.1	0.0	10.1	0.0	0.3	12.2
1.03	4.1	0.0	9.4	0.0	0.2	13.4
1.11	0.0	0.0	11.4	0.0	0.5	11.4
1.18	0.1	0.0	10.9	0.4	0.8	11.4
1.22	2.7	0.0	10.0	0.5	0.0	13.2
1.30	0.1	0.0	11.4	0.4	0.6	11.9
1.32	1.0	0.0	12.8	0.0	0.2	13.8
1.39	0.4	0.0	13.5	0.0	0.2	13.9
1.50	3.9	0.2	11.5	1.0	0.0	16.5
1.56	0.0	0.0	14.0	0.2	0.3	14.3
1.60	0.0	0.0	15.4	0.4	0.3	15.7
1.69	0.0	0.0	15.4	0.6	0.0	16.0
1.74	0.0	0.0	15.2	0.9	0.0	16.1
1.79	0.0	0.0	15.8	0.0	0.0	15.8
1.84	0.0	0.0	15.7	0.0	0.0	15.7
1.92	0.0	0.0	16.0	0.0	0.1	16.0
1.97	0.0	0.0	15.6	0.5	0.0	16.0
2.00	0.0	0.0	15.5	0.0	0.0	15.5
2.05	0.0	0.0	14.6	1.0	0.0	15.6
2.15	0.0	0.0	14.9	0.5	0.1	15.4
2.20	0.0	0.0	15.9	0.4	0.0	16.3
2.25	0.0	0.0	22.3	1.2	0.0	23.4
2.31	0.0	0.0	20.7	1.1	0.0	21.9
2.34	0.0	0.0	19.9	2.2	0.0	22.1
2.40	0.0	0.0	16.2	2.8	0.3	19.0
2.42	0.0	0.0	17.1	2.4	0.0	19.5
2.45	0.0	0.0	16.5	3.1	0.2	19.6
2.51	0.0	0.0	12.7	2.9	0.6	15.6
2.53	0.0	0.0	14.1	2.1	0.2	16.2
2.55	0.0	0.0	11.0	2.3	0.6	13.4
2.60	0.0	0.0	8.7	1.9	1.0	10.6

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
2.64	0.0	0.0	7.4	2.8	1.1	10.1
2.68	0.0	0.1	7.8	2.3	0.9	10.2
2.71	1.4	0.0	4.4	3.0	1.4	8.8
2.75	0.0	0.0	5.5	2.1	1.1	7.6
2.78	0.0	0.0	5.6	2.4	1.1	8.0
2.83	1.0	0.0	5.5	1.6	1.3	8.1
2.88	0.1	0.0	3.5	1.8	1.5	5.3
2.93	0.0	0.0	4.1	2.6	1.5	6.7
2.95	1.4	0.0	3.5	1.8	1.1	6.8
3.00	1.2	0.0	2.5	2.3	1.2	6.1
3.04	1.2	0.0	2.4	1.7	1.4	5.3
3.08	0.0	0.1	2.5	2.1	1.4	4.6
3.13	0.7	0.0	1.6	2.5	1.5	4.8
3.15	0.0	0.0	1.7	2.1	1.8	3.8
3.20	0.0	0.3	1.8	1.8	1.8	3.9
3.27	0.0	0.0	1.8	2.2	1.6	4.1
3.32	0.6	0.1	0.9	2.4	1.7	4.0
3.36	0.0	0.0	1.9	2.6	1.3	4.4
3.42	0.3	0.0	1.7	3.1	1.4	5.1

Table G.6: YHG, bbe FluoroProbe data [µg l^{-1}], June 18^{th} 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	0.0	0.0	4.7	0.0	1.4	4.7
0.15	0.0	0.0	6.1	0.9	1.5	7.0
0.26	4.2	0.0	4.2	0.0	2.0	8.3
0.35	0.0	0.0	7.5	0.0	1.6	7.5
0.45	0.8	0.0	7.6	0.4	0.6	8.8
0.60	11.5	0.0	3.2	0.0	1.0	14.7
0.68	1.1	0.0	8.3	0.3	1.3	9.8
0.75	7.0	0.0	6.9	0.0	0.6	13.9
0.81	3.5	0.0	7.2	1.1	1.5	11.8
0.90	4.4	0.0	9.6	0.0	0.8	14.0
1.03	6.2	0.0	7.8	1.2	0.9	15.3
1.07	7.5	0.0	10.0	1.4	0.5	19.0
1.14	0.0	0.0	14.5	0.4	0.9	14.9
1.20	0.4	0.0	18.2	0.0	0.0	18.6
1.28	0.0	0.0	15.6	2.5	0.0	18.1
1.32	0.0	0.0	17.5	0.0	0.1	17.5
1.39	0.2	0.0	15.4	1.3	0.3	16.9
1.41	0.0	0.0	17.1	0.4	0.3	17.5
1.46	0.0	0.0	17.7	0.0	0.1	17.7
1.51	0.0	0.2	17.3	0.0	0.2	17.5
1.58	0.0	0.0	17.8	0.0	0.4	17.8
1.61	0.0	0.0	17.6	0.0	0.2	17.6
1.67	2.2	0.0	16.8	1.2	0.0	20.3
1.72	0.0	0.1	17.5	0.3	0.4	17.9
1.81	0.0	0.0	18.0	0.5	0.2	18.5

Table G.7: YR3, bbe FluoroProbe data, June 19^{th} 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	5.4	0.0	0.0	0.8	1.9	6.1
0.22	0.0	0.0	2.9	1.5	2.1	4.4
0.37	0.0	0.0	2.4	2.3	2.0	4.7
0.40	8.9	0.0	0.0	0.8	1.3	9.8
0.40	1.7	0.2	4.9	0.0	1.3	6.8
0.48	0.0	0.0	4.4	1.5	1.2	5.8
0.56	5.2	0.0	2.4	1.1	1.2	8.6
0.62	4.0	0.4	2.6	0.1	1.7	7.1
0.70	0.0	0.4	5.8	0.0	1.4	6.1
0.74	0.9	0.0	4.8	0.0	1.4	5.7
0.81	0.0	0.0	5.5	0.0	1.5	5.5
0.87	0.0	0.0	6.0	0.0	1.2	6.0
0.98	6.4	0.0	3.2	0.0	0.8	9.6
1.06	0.0	0.0	6.2	0.6	1.0	6.9
1.15	0.6	0.0	5.6	0.7	1.1	6.8
1.22	0.0	0.0	6.5	0.1	1.2	6.6
1.29	0.0	0.2	6.3	0.2	1.1	6.7
1.39	0.0	0.1	6.0	0.8	1.2	6.9
1.45	0.0	0.0	6.4	1.3	0.6	7.7
1.49	0.0	0.5	6.2	0.0	1.1	6.7
1.57	0.0	0.0	5.9	0.3	1.4	6.2
1.61	0.0	0.1	6.1	0.3	1.3	6.5
1.68	0.0	0.0	6.1	0.5	1.3	6.5
1.72	0.4	0.0	6.2	0.4	0.9	6.9
1.76	1.0	0.0	5.6	0.7	1.3	7.2
1.82	0.0	0.0	6.6	0.0	1.0	6.6
1.87	0.0	0.0	6.0	0.5	1.4	6.5
1.94	1.2	0.3	6.4	0.0	1.0	7.9
2.02	0.0	0.0	6.9	0.5	1.0	7.3
2.07	0.0	0.0	6.6	1.3	1.1	7.9
2.17	0.0	0.0	6.3	0.8	1.2	7.1
2.21	0.0	0.0	5.8	0.9	1.6	6.7
2.27	0.9	0.0	4.9	1.9	1.4	7.7
2.35	0.0	0.0	5.5	1.8	1.4	7.3
2.39	0.0	0.0	5.8	1.2	1.6	7.0
2.44	0.0	0.0	6.2	1.2	1.3	7.4
2.53	0.0	0.0	5.5	1.2	1.7	6.7
2.59	0.0	0.0	6.4	0.5	1.3	6.9
2.62	0.0	0.0	5.8	1.2	1.5	7.0
2.70	0.0	0.0	5.7	1.4	1.6	7.1
2.77	0.0	0.0	5.6	1.2	1.7	6.8
2.82	0.0	0.0	6.1	0.8	1.4	6.9
2.89	0.0	0.0	6.0	0.8	1.6	6.8
2.91	0.0	0.0	5.6	1.4	1.5	7.0
2.97	0.0	0.0	5.8	1.2	1.5	7.0
3.04	0.0	0.0	6.0	1.0	1.4	7.0

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
3.06	0.0	0.0	6.4	0.3	1.2	6.7
3.15	0.0	0.0	5.6	1.1	1.3	6.7
3.20	0.0	0.0	5.6	1.1	1.3	6.7
3.21	0.0	0.0	5.8	0.5	1.4	6.3
3.27	0.0	0.0	5.3	1.4	1.5	6.7
3.31	0.0	0.0	5.3	0.8	1.5	6.1
3.35	0.0	0.0	4.7	0.8	1.8	5.5
3.40	0.0	0.0	5.6	0.7	1.5	6.2
3.44	0.0	0.0	5.5	0.7	1.3	6.2
3.46	0.0	0.0	4.4	1.3	1.6	5.7
3.52	0.0	0.0	3.6	1.6	1.8	5.2
3.61	0.0	0.1	4.2	0.7	1.6	4.9
3.70	0.0	0.0	3.1	1.2	1.6	4.3
3.78	0.0	0.0	3.2	0.8	1.5	4.1
3.82	0.0	0.0	3.5	0.8	1.4	4.3
3.87	0.0	0.0	3.3	1.0	1.5	4.3
3.91	0.0	0.0	3.0	0.8	1.6	3.7
3.97	0.0	0.0	2.4	1.0	1.7	3.4
4.00	0.0	0.0	2.3	0.7	1.6	3.1
4.05	0.0	0.0	2.5	0.5	1.5	3.0
4.13	0.1	0.0	1.8	1.1	1.5	3.0
4.19	0.0	0.0	2.0	1.0	1.5	3.1
4.22	0.0	0.0	1.5	1.2	1.7	2.7
4.29	0.0	0.0	1.4	1.0	1.7	2.4
4.36	0.0	0.0	1.2	1.1	1.7	2.2
4.38	0.3	0.0	1.1	0.9	1.5	2.4
4.46	0.0	0.0	1.1	1.2	1.6	2.2
4.49	0.0	0.0	1.2	1.0	1.5	2.2
4.50	0.0	0.0	1.3	0.8	1.5	2.1
4.56	0.0	0.0	1.0	0.9	1.5	2.0
4.62	0.1	0.0	0.8	1.1	1.4	2.0
4.66	0.4	0.0	0.6	1.1	1.5	2.2
4.72	0.0	0.0	1.1	0.9	1.4	2.0
4.79	0.2	0.0	0.9	0.8	1.5	2.0
4.83	0.0	0.0	0.7	1.2	1.5	1.9
4.89	0.0	0.0	0.9	1.0	1.4	1.8
4.94	0.0	0.0	0.5	0.9	1.5	1.4
4.98	0.0	0.0	0.7	0.9	1.4	1.6
5.03	0.5	0.0	0.3	1.0	1.4	1.8
5.06	0.0	0.0	0.5	0.9	1.4	1.5
5.10	0.0	0.0	0.5	0.9	1.4	1.4
5.13	0.2	0.0	0.4	0.9	1.5	1.5
5.18	0.0	0.0	0.5	1.0	1.3	1.5
5.20	0.0	0.0	0.6	0.9	1.4	1.4
5.26	0.0	0.0	0.3	1.3	1.5	1.5

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
5.30	0.5	0.0	0.2	1.1	1.4	1.8
5.34	0.0	0.0	0.5	0.8	1.4	1.3
5.41	0.0	0.0	0.4	1.0	1.3	1.4
5.45	0.0	0.0	0.3	1.2	1.3	1.5
5.51	0.0	0.0	0.4	0.9	1.4	1.4
5.55	0.3	0.0	0.0	1.1	1.3	1.4
5.57	0.2	0.0	0.1	1.1	1.3	1.4
5.67	0.2	0.0	0.0	1.1	1.3	1.3
5.70	0.0	0.0	0.2	1.0	1.4	1.1
5.76	0.0	0.0	0.3	0.9	1.3	1.2
5.81	0.4	0.0	0.0	1.1	1.3	1.5
5.85	0.0	0.0	0.4	0.8	1.3	1.2
5.93	0.2	0.0	0.0	1.1	1.3	1.3
6.00	0.4	0.0	0.0	0.9	1.3	1.3
6.07	0.0	0.0	0.4	0.8	1.3	1.2
6.14	0.1	0.0	0.3	0.9	1.2	1.3
6.21	0.0	0.0	0.3	0.8	1.3	1.1
6.29	0.0	0.0	0.2	0.8	1.3	1.0
6.38	0.0	0.0	0.2	0.7	1.3	0.9
6.45	0.0	0.0	0.2	0.8	1.2	1.0
6.51	0.0	0.0	0.2	0.7	1.2	0.9
6.56	0.0	0.0	0.1	1.1	1.2	1.2
6.63	0.2	0.0	0.0	0.8	1.3	0.9
6.71	0.1	0.0	0.0	0.7	1.3	0.8
6.79	0.0	0.0	0.2	0.6	1.2	0.7
6.89	0.0	0.0	0.0	0.8	1.3	0.8
6.99	0.1	0.0	0.0	0.7	1.3	0.8
7.07	0.3	0.0	0.0	0.6	1.2	0.9
7.16	0.1	0.0	0.0	0.8	1.3	0.9
7.24	0.1	0.0	0.0	0.7	1.2	0.8
7.32	0.0	0.0	0.1	0.6	1.2	0.7
7.40	0.0	0.0	0.1	0.5	1.2	0.7
7.47	0.0	0.0	0.1	0.6	1.2	0.6
7.56	0.0	0.0	0.0	0.6	1.3	0.6
7.65	0.1	0.0	0.0	0.6	1.3	0.7
7.72	0.2	0.0	0.0	0.8	1.2	1.0
7.79	0.2	0.0	0.0	0.6	1.2	0.8
7.81	0.0	0.0	0.0	0.6	1.3	0.6
7.89	0.1	0.0	0.0	0.6	1.3	0.7
7.92	0.1	0.0	0.0	0.7	1.3	0.8
8.03	0.0	0.0	0.0	0.6	1.3	0.6
8.11	0.0	0.0	0.0	0.6	1.3	0.6
8.16	0.0	0.0	0.0	0.7	1.3	0.7
8.23	0.1	0.0	0.0	0.5	1.2	0.6
8.30	0.0	0.0	0.1	0.5	1.3	0.6

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
8.38	0.1	0.0	0.0	0.6	1.2	0.7
8.42	0.0	0.0	0.1	0.5	1.2	0.6
8.50	0.2	0.0	0.0	0.5	1.2	0.7
8.57	0.2	0.0	0.0	0.5	1.2	0.7
8.65	0.0	0.0	0.0	0.6	1.3	0.6
8.69	0.1	0.0	0.0	0.5	1.3	0.6
8.70	0.1	0.0	0.0	0.5	1.2	0.6
8.78	0.0	0.0	0.1	0.5	1.2	0.5
8.84	0.0	0.0	0.0	0.5	1.3	0.5
8.92	0.1	0.0	0.0	0.5	1.3	0.6
8.99	0.1	0.0	0.0	0.5	1.3	0.7
9.04	0.2	0.0	0.0	0.5	1.2	0.6
9.13	0.2	0.0	0.0	0.4	1.3	0.6
9.22	0.0	0.0	0.0	0.5	1.3	0.6
9.25	0.3	0.0	0.0	0.4	1.2	0.7
9.34	0.3	0.0	0.0	0.5	1.2	0.8
9.42	0.2	0.0	0.0	0.5	1.2	0.7
9.49	0.0	0.0	0.2	0.5	1.3	0.7
9.55	0.1	0.0	0.0	0.5	1.2	0.6
9.60	0.2	0.0	0.0	0.5	1.3	0.6
9.65	0.2	0.0	0.0	0.5	1.2	0.7
9.73	0.1	0.0	0.0	0.5	1.3	0.6
9.79	0.0	0.0	0.3	0.4	1.2	0.7
9.86	0.0	0.0	0.2	0.4	1.2	0.6
9.89	0.3	0.0	0.0	0.5	1.2	0.8
9.98	0.0	0.0	0.4	0.3	1.2	0.6
10.04	0.0	0.0	0.2	0.4	1.2	0.6
10.13	0.0	0.0	0.3	0.4	1.2	0.7
10.23	0.3	0.0	0.0	0.5	1.3	0.7
10.29	0.0	0.0	0.3	0.5	1.2	0.8
10.36	0.0	0.0	0.4	0.4	1.2	0.8
10.45	0.0	0.0	0.3	0.4	1.2	0.6
10.51	0.4	0.0	0.0	0.5	1.3	0.9
10.60	0.0	0.0	0.3	0.4	1.2	0.7
10.68	0.0	0.0	0.3	0.4	1.2	0.7
10.75	0.0	0.0	0.4	0.4	1.2	0.8
10.85	0.0	0.0	0.4	0.3	1.2	0.7
10.95	0.0	0.0	0.3	0.4	1.2	0.7
11.06	0.0	0.0	0.2	0.5	1.2	0.7
11.13	0.0	0.0	0.3	0.3	1.2	0.6
11.21	0.0	0.0	0.4	0.3	1.2	0.6
11.33	0.2	0.0	0.0	0.5	1.3	0.6
11.42	0.0	0.0	0.3	0.3	1.2	0.5
11.54	0.1	0.0	0.0	0.4	1.3	0.5
11.59	0.1	0.0	0.0	0.4	1.3	0.5

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
11.70	0.1	0.0	0.0	0.4	1.3	0.4
11.77	0.0	0.0	0.0	0.4	1.3	0.4
11.77	0.2	0.0	0.0	0.4	1.3	0.6
11.89	0.1	0.0	0.0	0.4	1.3	0.5
11.96	0.1	0.0	0.0	0.4	1.3	0.4
12.08	0.1	0.0	0.0	0.3	1.3	0.4
12.19	0.0	0.0	0.0	0.3	1.3	0.3
12.28	0.0	0.0	0.0	0.3	1.2	0.3
12.37	0.0	0.0	0.0	0.3	1.3	0.3
12.51	0.0	0.0	0.0	0.3	1.3	0.3
12.58	0.0	0.0	0.0	0.3	1.2	0.3
12.71	0.0	0.0	0.0	0.3	1.3	0.3
12.77	0.0	0.0	0.0	0.3	1.2	0.3
12.90	0.0	0.0	0.0	0.3	1.2	0.3
12.96	0.0	0.0	0.0	0.3	1.3	0.3
13.06	0.0	0.0	0.0	0.3	1.3	0.3
13.08	0.0	0.0	0.0	0.3	1.3	0.3
13.16	0.0	0.0	0.0	0.2	1.3	0.2
13.22	0.0	0.0	0.0	0.3	1.3	0.3
13.27	0.0	0.0	0.0	0.3	1.3	0.3
13.40	0.0	0.0	0.0	0.3	1.3	0.3
13.48	0.0	0.0	0.0	0.3	1.3	0.3
13.60	0.0	0.0	0.0	0.3	1.3	0.3
13.67	0.0	0.0	0.0	0.5	1.3	0.5
13.74	0.1	0.0	0.0	0.5	1.3	0.6
13.81	0.1	0.1	0.0	1.0	1.3	1.2
13.85	0.4	0.3	0.0	1.5	1.3	2.2
13.94	0.2	0.1	0.0	1.3	1.3	1.6
13.97	0.2	0.1	0.0	1.8	1.3	2.1
14.03	0.2	0.2	0.0	1.9	1.3	2.2
14.14	0.3	0.3	0.0	1.9	1.3	2.4
14.18	0.2	0.2	0.0	2.2	1.3	2.6
14.30	0.1	0.2	0.0	2.2	1.3	2.5
14.34	0.3	0.2	0.0	2.1	1.3	2.7
14.43	0.2	0.2	0.0	2.2	1.3	2.6
14.44	0.3	0.3	0.0	2.5	1.3	3.0
14.49	0.4	0.3	0.0	2.2	1.3	3.0
14.65	0.3	0.3	0.0	2.3	1.3	2.9
14.67	0.4	0.3	0.0	2.4	1.3	3.1
14.80	0.3	0.3	0.0	2.4	1.3	3.1
14.91	0.3	0.3	0.0	2.5	1.3	3.1
14.96	0.4	0.4	0.0	2.6	1.3	3.3
15.12	0.3	0.3	0.0	2.6	1.3	3.2
15.15	0.2	0.3	0.0	2.7	1.3	3.2
15.27	0.4	0.3	0.0	2.5	1.3	3.2
15.38	0.4	0.4	0.0	2.6	1.3	3.4
15.43	0.6	0.4	0.0	2.6	1.2	3.6
15.55	0.6	0.3	0.0	2.6	1.2	3.5
15.65	0.3	0.4	0.1	2.6	1.3	3.4
15.73	0.4	0.4	0.0	2.6	1.3	3.4
15.80	0.3	0.5	0.2	2.4	1.3	3.4

Table G.8: YRE, , bbe FluoroProbe data [µg l^{-1}], June 19th 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	0.0	0.2	6.0	0.0	1.8	6.2
0.07	0.0	0.0	6.2	2.2	1.2	8.4
0.19	1.0	0.9	6.8	0.0	1.1	8.6
0.29	0.0	0.0	6.8	2.3	1.0	9.1
0.40	2.6	0.3	6.9	0.0	1.1	9.7
0.51	0.0	0.0	7.3	1.9	0.9	9.2
0.66	0.0	0.0	8.3	0.0	0.9	8.3
0.72	0.0	0.0	6.6	1.7	1.3	8.2
0.85	0.7	0.0	6.6	0.9	1.7	8.2
0.94	0.0	0.0	7.0	1.9	1.2	8.9
1.00	0.0	0.0	7.0	2.2	1.0	9.3
1.08	2.2	0.0	6.5	0.7	1.3	9.3
1.12	0.0	0.0	7.3	1.0	1.0	8.3
1.22	0.0	0.0	6.5	2.0	1.6	8.5
1.23	0.0	0.0	6.5	1.8	1.1	8.3
1.22	0.0	0.0	7.6	0.7	1.0	8.3
1.23	0.0	0.2	6.2	1.5	1.5	7.9
1.24	0.0	0.0	6.0	2.4	1.3	8.4
1.30	0.0	0.0	7.9	0.4	1.0	8.2
1.41	0.0	0.0	6.8	0.9	1.3	7.8
1.48	0.0	0.0	5.7	2.2	1.6	7.8
1.59	0.0	0.0	6.2	1.7	1.5	7.8
1.61	0.0	0.0	6.5	0.6	1.4	7.1
1.72	0.0	0.0	6.0	1.7	1.7	7.7
1.83	0.0	0.0	7.4	1.1	1.1	8.5
1.91	0.0	0.0	6.0	1.7	1.6	7.7
1.92	0.0	0.0	6.8	1.3	1.3	8.1
1.95	0.0	0.0	7.1	0.7	1.3	7.9
2.00	0.0	0.1	6.5	1.3	1.7	7.9
2.08	0.0	0.0	5.8	2.3	1.6	8.0
2.14	0.0	0.0	6.4	1.3	1.6	7.8
2.19	0.0	0.0	7.0	0.9	1.4	7.9
2.21	0.0	0.0	6.5	1.1	1.5	7.7
2.26	0.0	0.0	6.9	1.2	1.4	8.1
2.33	0.0	0.0	7.0	0.9	1.5	8.0
2.40	0.0	0.0	6.1	1.9	1.6	8.0
2.48	0.4	0.2	6.6	0.5	1.5	7.7
2.59	0.0	0.0	5.8	1.7	1.5	7.5
2.66	0.0	0.0	5.5	2.0	1.5	7.5
2.72	0.0	0.0	5.4	2.1	1.7	7.5
2.78	0.7	0.2	5.3	1.3	1.6	7.5
2.83	0.0	0.0	5.3	1.3	1.8	6.5
2.86	0.0	0.1	5.6	1.2	1.7	6.9
2.96	0.0	0.0	4.7	2.1	1.7	6.8
3.10	0.0	0.1	4.9	1.4	1.6	6.4
3.19	0.0	0.0	4.0	2.3	1.5	6.2

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
3.23	0.0	0.0	3.7	1.8	1.7	5.5
3.30	0.0	0.0	3.4	2.1	1.8	5.5
3.40	0.0	0.0	3.2	2.2	1.5	5.4
3.51	0.0	0.0	2.9	2.0	1.7	4.9
3.61	0.0	0.0	2.5	1.7	1.6	4.3
3.63	0.0	0.0	2.4	1.9	1.6	4.3
3.70	0.2	0.0	2.5	1.9	1.6	4.5
3.79	0.0	0.0	2.5	1.7	1.5	4.1
3.90	0.0	0.0	1.7	2.1	1.7	3.8
3.95	0.0	0.0	1.6	1.6	1.7	3.2
4.02	0.0	0.0	1.6	1.7	1.6	3.3
4.10	0.0	0.2	1.4	1.5	1.6	3.1
4.20	0.0	0.1	1.3	1.8	1.6	3.2
4.30	1.3	0.0	0.9	1.4	1.4	3.5
4.39	0.2	0.0	1.0	1.7	1.5	2.8
4.44	0.1	0.0	1.0	1.3	1.4	2.4
4.50	0.2	0.0	0.8	1.7	1.5	2.7
4.56	0.0	0.0	1.0	1.5	1.5	2.5
4.60	0.0	0.0	0.8	1.3	1.5	2.1
4.71	0.0	0.0	0.6	1.2	1.5	1.8
4.76	0.2	0.0	0.5	1.1	1.3	1.8
4.81	0.2	0.0	0.6	1.0	1.4	1.8
4.90	0.5	0.0	0.2	1.1	1.4	1.8
4.93	0.5	0.0	0.0	1.0	1.4	1.5
5.01	0.3	0.0	0.0	1.3	1.4	1.5
5.07	0.0	0.0	0.1	1.2	1.5	1.4
5.16	0.0	0.0	0.5	1.0	1.4	1.5
5.26	0.0	0.2	0.4	0.8	1.3	1.4
5.36	0.3	0.0	0.0	1.0	1.3	1.3
5.46	0.0	0.0	0.1	0.9	1.4	1.1
5.57	0.0	0.0	0.0	1.0	1.3	1.0
5.63	0.0	0.0	0.0	1.0	1.3	1.1
5.71	0.2	0.0	0.0	1.0	1.3	1.2
5.77	0.4	0.0	0.0	1.0	1.2	1.5
5.87	0.3	0.0	0.0	1.1	1.3	1.4
5.96	0.3	0.0	0.1	1.2	1.2	1.5
6.02	0.1	0.0	0.0	1.1	1.3	1.2
6.09	0.8	0.0	0.0	1.0	1.2	1.8
6.20	0.4	0.0	0.0	0.9	1.2	1.2
6.31	0.5	0.0	0.0	0.9	1.2	1.4
6.39	0.1	0.0	0.0	1.0	1.3	1.1
6.46	0.3	0.0	0.0	0.8	1.2	1.1
6.52	0.0	0.0	0.0	0.9	1.3	0.9
6.57	0.3	0.0	0.0	0.8	1.2	1.1
6.64	0.0	0.0	0.0	0.9	1.3	0.9

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
6.71	0.0	0.0	0.0	0.9	1.3	1.0
6.79	0.1	0.0	0.0	0.7	1.3	0.8
6.85	0.0	0.0	0.0	0.7	1.3	0.7
6.93	0.1	0.0	0.0	0.6	1.3	0.7
7.04	0.1	0.0	0.0	0.5	1.3	0.6
7.14	0.1	0.0	0.0	0.6	1.2	0.8
7.21	0.3	0.0	0.0	0.5	1.2	0.8
7.28	0.0	0.0	0.0	0.7	1.3	0.7
7.33	0.2	0.0	0.0	0.5	1.2	0.8
7.40	0.1	0.0	0.0	0.6	1.2	0.6
7.49	0.3	0.0	0.0	0.5	1.2	0.8
7.59	0.4	0.1	0.0	0.6	1.2	1.1
7.65	0.0	0.0	0.0	0.5	1.3	0.5
7.72	0.0	0.0	0.1	0.6	1.3	0.7
7.79	0.3	0.0	0.0	0.5	1.3	0.7
7.87	0.0	0.0	0.0	0.6	1.3	0.6
7.97	0.3	0.0	0.0	0.5	1.2	0.8
8.03	0.0	0.0	0.0	0.6	1.3	0.6
8.08	0.1	0.0	0.0	0.6	1.3	0.7
8.13	0.2	0.0	0.0	0.6	1.3	0.8
8.21	0.2	0.0	0.0	0.5	1.3	0.7
8.28	0.3	0.0	0.0	0.5	1.2	0.8
8.33	0.2	0.0	0.0	0.5	1.3	0.8
8.39	0.2	0.0	0.0	0.6	1.3	0.8
8.44	0.4	0.0	0.0	0.6	1.3	0.9
8.50	0.2	0.0	0.0	0.6	1.3	0.8
8.53	0.2	0.0	0.0	0.6	1.3	0.8
8.58	0.2	0.0	0.0	0.6	1.3	0.7
8.66	0.2	0.0	0.0	0.8	1.3	1.0
8.73	0.0	0.2	0.3	0.5	1.3	0.9
8.75	0.3	0.0	0.0	0.5	1.3	0.8
8.83	0.3	0.0	0.0	0.5	1.3	0.8
8.88	0.1	0.0	0.0	0.6	1.3	0.7
8.92	0.0	0.0	0.2	0.4	1.3	0.6
8.99	0.2	0.0	0.0	0.5	1.3	0.7
9.07	0.3	0.0	0.0	0.5	1.3	0.8
9.10	0.0	0.0	0.3	0.5	1.2	0.7
9.16	0.0	0.0	0.3	0.4	1.3	0.7
9.24	0.4	0.0	0.0	0.6	1.3	1.0
9.31	0.3	0.0	0.0	0.5	1.3	0.7
9.36	0.2	0.0	0.0	0.5	1.3	0.7
9.44	0.2	0.0	0.0	0.5	1.3	0.6
9.57	0.3	0.0	0.0	0.5	1.3	0.8
9.64	0.2	0.0	0.0	0.5	1.3	0.7
9.70	0.0	0.0	0.3	0.5	1.2	0.7

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
9.82	0.2	0.0	0.0	0.5	1.3	0.7
9.94	0.1	0.0	0.0	0.5	1.3	0.6
10.02	0.2	0.0	0.0	0.4	1.2	0.6
10.06	0.0	0.1	0.1	0.6	1.3	0.8
10.09	0.0	0.0	0.0	0.4	1.3	0.4
10.15	0.2	0.0	0.0	0.4	1.3	0.6
10.28	0.0	0.0	0.0	0.5	1.3	0.5
10.37	0.1	0.0	0.0	0.4	1.2	0.5
10.42	0.0	0.0	0.0	0.4	1.3	0.5
10.50	0.1	0.0	0.0	0.4	1.3	0.4
10.60	0.0	0.0	0.0	0.4	1.3	0.4
10.70	0.0	0.0	0.0	0.3	1.3	0.3
10.77	0.0	0.0	0.0	0.3	1.3	0.3
10.82	0.0	0.0	0.0	0.3	1.3	0.3
10.90	0.0	0.0	0.0	0.4	1.3	0.4
10.97	0.0	0.0	0.0	0.3	1.3	0.3
11.03	0.0	0.0	0.0	0.4	1.3	0.4
11.08	0.0	0.0	0.0	0.3	1.3	0.3
11.18	0.0	0.0	0.0	0.3	1.3	0.3
11.28	0.0	0.0	0.0	0.3	1.3	0.3
11.32	0.0	0.0	0.0	0.3	1.3	0.3
11.37	0.0	0.0	0.0	0.3	1.3	0.3
11.43	0.0	0.0	0.0	0.3	1.2	0.3
11.49	0.0	0.0	0.0	0.3	1.3	0.3
11.54	0.0	0.0	0.0	0.4	1.3	0.4
11.56	0.0	0.0	0.0	0.4	1.3	0.4
11.63	0.0	0.0	0.0	0.4	1.3	0.4
11.67	0.0	0.0	0.0	0.3	1.3	0.3
11.74	0.0	0.0	0.0	0.3	1.3	0.3
11.82	0.0	0.0	0.0	0.4	1.3	0.4
11.88	0.0	0.0	0.0	0.5	1.3	0.5
11.95	0.1	0.0	0.0	0.5	1.3	0.5
12.04	0.0	0.0	0.0	0.4	1.3	0.4
12.09	0.0	0.0	0.0	0.4	1.3	0.4
12.13	0.0	0.0	0.0	0.4	1.2	0.4
12.20	0.0	0.0	0.0	0.4	1.3	0.4
12.24	0.0	0.0	0.0	0.4	1.3	0.4
12.33	0.1	0.0	0.0	0.5	1.3	0.6
12.46	0.0	0.0	0.0	0.4	1.3	0.4
12.50	0.0	0.0	0.0	0.4	1.2	0.4
12.51	0.0	0.0	0.0	0.4	1.2	0.4
12.57	0.0	0.0	0.0	0.4	1.3	0.4
12.62	0.0	0.0	0.0	0.4	1.3	0.4
12.63	0.5	0.2	0.3	1.0	1.2	2.0

Table G.9: YRF, bbe FluoroProbe data [µg l^{-1}], June 19^{th} 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	5.9	0.0	0.0	0.6	1.9	6.5
0.17	6.3	0.0	0.0	3.0	1.3	9.3
0.25	0.0	0.0	2.2	2.2	2.3	4.4
0.30	1.9	0.0	3.1	1.4	1.7	6.4
0.41	0.0	0.0	5.2	1.4	0.9	6.5
0.49	3.3	0.0	1.7	3.6	1.7	8.6
0.52	2.1	1.0	5.5	0.0	0.7	8.7
0.55	0.0	0.0	4.3	1.8	1.0	6.1
0.64	0.0	0.0	3.7	2.9	1.8	6.6
0.72	0.0	0.3	5.8	0.8	0.8	6.8
0.77	0.0	0.0	5.9	0.0	1.5	5.9
0.81	0.0	0.1	6.7	0.0	0.8	6.8
0.88	0.0	0.0	6.5	0.0	1.0	6.5
0.91	2.8	0.0	5.2	0.0	1.2	8.0
0.97	0.0	0.1	5.9	1.7	0.6	7.7
0.99	1.8	0.4	5.4	0.0	1.1	7.5
1.06	0.0	0.0	7.1	0.0	0.8	7.1
1.12	0.0	0.0	6.7	0.0	0.7	6.7
1.19	2.6	0.0	5.9	0.6	0.8	9.0
1.23	0.0	0.0	6.3	1.4	0.9	7.7
1.26	0.0	0.8	7.5	0.7	0.9	9.0
1.31	0.1	0.0	6.4	0.9	1.0	7.4
1.38	0.0	0.0	5.8	1.9	1.7	7.7
1.45	1.2	0.0	5.6	1.1	1.5	7.9
1.49	0.0	0.0	6.5	1.2	1.5	7.7
1.55	0.4	0.0	7.4	0.9	0.7	8.7
1.56	0.0	0.0	6.2	2.0	1.2	8.2
1.60	0.6	0.2	6.8	1.6	0.6	9.2
1.67	0.0	0.5	6.8	0.9	1.1	8.2
1.75	0.0	0.0	7.2	1.2	1.3	8.3
1.82	0.0	0.0	6.2	2.0	1.3	8.2
1.86	0.0	0.0	7.0	1.2	1.3	8.2
1.94	0.0	0.0	7.6	1.2	0.7	8.8
2.04	0.0	0.0	7.1	1.5	1.1	8.6
2.11	0.0	0.0	6.1	2.4	1.3	8.5
2.17	0.0	0.0	6.6	2.0	1.2	8.6
2.24	0.0	0.0	6.5	2.0	1.4	8.5
2.28	0.0	0.1	7.5	1.7	1.0	9.2
2.27	0.0	0.0	7.1	1.7	1.2	8.9
2.31	0.0	0.0	6.8	2.7	1.2	9.6
2.41	0.0	0.0	6.8	2.5	1.6	9.3
2.50	0.0	0.0	7.0	1.8	1.3	8.8
2.53	0.0	0.0	6.6	2.3	1.4	8.9
2.59	0.0	0.0	6.9	1.8	1.4	8.7
2.67	0.0	0.0	6.7	1.9	1.6	8.5
2.74	0.0	0.0	6.9	1.9	1.4	8.8

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
2.76	0.0	0.0	6.9	1.9	1.5	8.8
2.82	0.0	0.0	6.7	2.6	1.4	9.3
2.89	0.0	0.0	7.0	1.8	1.4	8.8
2.95	0.0	0.3	6.8	2.4	1.4	9.5
3.03	0.0	0.1	7.6	1.4	1.2	9.1
3.09	0.0	0.0	6.6	2.4	1.5	9.0
3.13	0.0	0.0	7.3	1.6	1.3	8.9
3.17	0.0	0.0	6.8	1.9	1.4	8.8
3.20	0.0	0.0	6.5	2.1	1.7	8.6
3.25	0.0	0.2	6.9	2.1	1.6	9.1
3.31	0.0	0.0	6.9	1.9	1.4	8.7
3.34	0.0	0.0	5.9	2.5	1.6	8.4
3.36	0.0	0.0	5.1	2.3	1.8	7.4
3.45	0.0	0.0	5.8	1.9	1.6	7.7
3.53	0.0	0.1	5.1	2.3	1.6	7.5
3.62	0.0	0.0	5.4	2.4	1.5	7.7
3.72	0.0	0.0	5.6	1.8	1.6	7.4
3.73	0.0	0.0	4.0	1.9	1.6	6.0
3.76	0.0	0.1	4.4	1.4	1.5	5.9
3.82	0.0	0.0	4.4	1.7	1.5	6.1
3.90	0.0	0.0	4.3	1.5	1.5	5.8
3.94	0.0	0.1	4.1	1.7	1.5	5.9
3.96	0.0	0.2	3.8	1.3	1.6	5.3
3.96	0.0	0.0	4.0	1.4	1.6	5.3
4.01	0.3	0.0	3.3	1.8	1.7	5.4
4.13	0.0	0.0	3.1	1.8	1.7	4.9
4.25	0.0	0.2	2.9	1.2	1.5	4.3
4.34	0.0	0.1	2.6	1.3	1.6	4.0
4.40	0.0	0.1	2.5	1.4	1.6	4.0
4.46	0.0	0.0	1.9	1.7	1.6	3.6
4.53	0.0	0.0	2.3	1.3	1.5	3.6
4.60	0.0	0.2	2.3	0.8	1.4	3.3
4.66	0.0	0.0	1.7	1.5	1.6	3.1
4.69	0.0	0.0	1.4	1.6	1.7	3.1
4.75	0.0	0.3	1.9	0.9	1.7	3.2
4.86	0.0	0.0	1.2	1.6	1.6	2.8
4.91	0.0	0.0	1.0	1.3	1.5	2.4
4.93	0.7	0.0	0.8	1.4	1.4	3.0
4.98	0.0	0.0	1.3	1.4	1.4	2.7
5.02	0.8	0.1	1.3	1.1	1.3	3.3
5.08	0.0	0.0	0.9	1.5	1.6	2.4
5.16	0.3	0.0	1.1	1.0	1.3	2.4
5.21	0.0	0.0	0.5	1.6	1.5	2.1
5.28	0.9	0.0	0.5	1.2	1.4	2.6
5.30	0.3	0.0	0.3	1.5	1.4	2.1

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
5.38	0.0	0.0	0.8	1.1	1.4	1.9
5.47	0.1	0.0	0.6	1.0	1.4	1.7
5.52	0.0	0.0	0.2	1.4	1.4	1.6
5.56	1.2	0.0	0.0	1.1	1.3	2.3
5.65	0.1	0.1	0.6	0.7	1.3	1.6
5.74	0.1	0.0	0.5	1.1	1.3	1.7
5.84	0.2	0.0	0.3	1.4	1.3	1.8
5.95	0.7	0.0	0.0	1.2	1.3	1.8
6.07	0.3	0.0	0.2	1.0	1.2	1.6
6.10	0.0	0.1	0.5	0.8	1.2	1.4
6.13	0.4	0.1	0.3	1.0	1.2	1.8
6.21	1.0	0.0	0.1	1.0	1.2	2.1
6.29	0.5	0.0	0.0	1.2	1.2	1.7
6.34	0.3	0.0	0.2	1.1	1.1	1.6
6.44	0.8	0.1	0.0	1.1	1.1	2.0
6.50	0.7	0.1	0.0	1.0	1.2	1.8
6.55	0.1	0.2	0.6	0.6	1.2	1.5
6.63	0.5	0.0	0.0	0.9	1.2	1.5
6.67	0.5	0.0	0.0	1.0	1.2	1.5
6.76	0.4	0.0	0.0	0.8	1.2	1.2
6.84	0.0	0.0	0.1	0.7	1.2	0.9
6.92	0.3	0.0	0.0	0.7	1.3	1.1
7.00	0.4	0.0	0.2	0.7	1.1	1.3
7.04	0.3	0.0	0.0	0.7	1.2	1.1
7.12	0.0	0.0	0.3	0.6	1.2	0.9
7.16	0.3	0.0	0.0	0.8	1.2	1.1
7.23	0.5	0.0	0.0	0.6	1.2	1.1
7.30	0.4	0.0	0.0	0.8	1.2	1.2
7.37	0.4	0.0	0.0	0.8	1.2	1.3

Table G.10: YRH, bbe FluoroProbe data [µg l^{-1}], June 19^{th} 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	0.0	0.7	4.9	0.6	2.2	6.2
0.05	0.0	0.0	6.7	0.8	0.5	7.5
0.05	0.0	0.2	7.9	0.0	0.4	8.1
0.06	2.1	0.6	4.9	0.3	1.7	8.0
0.14	0.0	0.0	6.5	0.7	1.0	7.2
0.25	0.0	0.0	5.9	2.4	0.8	8.3
0.33	2.0	0.5	5.2	0.0	1.5	7.7
0.37	0.0	0.0	6.8	0.6	1.1	7.4
0.44	3.7	0.0	5.6	0.0	1.1	9.3
0.55	0.0	0.0	6.9	1.7	0.8	8.6
0.65	1.9	0.0	4.9	3.0	0.9	9.8
0.70	0.2	0.0	7.4	0.5	0.9	8.0
0.75	0.0	0.0	7.7	0.4	0.7	8.1
0.82	2.8	0.0	5.5	2.3	0.7	10.6
0.90	0.0	0.0	7.5	0.1	1.2	7.6
0.97	0.0	0.0	7.6	1.4	1.1	9.0
1.03	0.0	0.0	7.7	0.6	1.3	8.3
1.11	0.0	0.0	5.4	3.0	1.8	8.4
1.15	0.0	0.0	7.2	1.3	1.0	8.5
1.22	0.0	0.0	7.4	1.8	1.2	9.2
1.29	0.0	0.0	7.3	1.4	1.1	8.6
1.35	0.0	0.0	7.6	0.1	1.4	7.7
1.45	0.0	0.0	7.4	1.5	1.1	8.9
1.53	1.2	0.0	5.9	1.8	1.1	8.9
1.59	0.0	0.0	7.0	1.6	1.2	8.7
1.67	0.0	0.0	7.7	0.5	1.1	8.3
1.73	0.0	0.0	7.9	0.9	0.9	8.7
1.79	0.0	0.0	7.5	0.5	1.3	8.0
1.87	0.0	0.1	6.8	1.4	1.1	8.3
1.94	1.3	0.1	6.1	1.2	1.3	8.7
1.95	1.5	0.0	5.3	2.1	1.5	8.9
2.00	0.0	0.0	7.9	0.5	1.1	8.5
2.07	0.0	0.0	6.4	1.6	1.7	8.0
2.15	0.0	0.0	6.3	1.8	1.4	8.1
2.21	0.0	0.0	7.0	1.5	1.1	8.5
2.27	0.0	0.0	6.1	2.1	1.4	8.2
2.33	0.2	0.0	7.4	0.2	1.2	7.8
2.38	0.0	0.2	6.7	1.6	1.5	8.5
2.47	0.0	0.2	5.5	3.7	1.6	9.4
2.54	0.0	0.2	6.9	2.1	1.3	9.2
2.57	0.0	0.2	6.7	1.6	1.7	8.5
2.66	0.7	0.1	6.8	2.0	1.3	9.6
2.72	0.0	0.1	6.8	2.4	1.2	9.3
2.78	0.0	0.2	7.3	1.7	1.4	9.1
2.86	0.0	0.0	6.7	2.5	1.6	9.2
2.97	0.0	0.0	6.5	2.3	1.5	8.8

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
3.04	0.0	0.0	6.4	2.1	1.4	8.6
3.10	0.0	0.0	6.4	1.5	1.5	7.9
3.18	0.0	0.0	5.6	2.2	1.6	7.8
3.27	0.4	0.0	5.7	1.6	1.6	7.7
3.31	0.0	0.1	6.3	0.8	1.5	7.2
3.39	0.0	0.0	5.2	1.8	1.6	7.0
3.48	0.0	0.0	5.2	1.4	1.5	6.6
3.55	0.0	0.0	4.8	1.5	1.5	6.3
3.65	0.0	0.0	4.7	1.5	1.5	6.2
3.71	0.0	0.0	4.1	1.5	1.7	5.6
3.76	0.0	0.0	4.3	1.0	1.5	5.3
3.88	0.0	0.0	4.2	1.3	1.5	5.5
3.99	0.0	0.0	3.6	1.2	1.7	4.8
4.10	0.0	0.0	3.3	1.4	1.8	4.6
4.17	0.0	0.0	2.7	1.1	1.7	3.8
4.21	0.0	0.2	3.0	0.4	1.5	3.6
4.24	0.0	0.0	2.6	1.0	1.6	3.5
4.26	0.2	0.0	2.2	1.0	1.5	3.5
4.35	0.0	0.0	2.2	1.1	1.5	3.4
4.45	0.0	0.0	1.6	1.2	1.7	2.8
4.50	0.3	0.1	1.0	0.9	1.4	2.2
4.54	0.0	0.0	0.9	1.4	1.6	2.3
4.61	0.0	0.0	0.9	1.3	1.5	2.2
4.66	0.9	0.0	0.4	1.1	1.3	2.5
4.74	0.0	0.0	0.7	1.2	1.3	1.9
4.83	0.1	0.0	0.6	1.1	1.4	1.8
4.92	0.0	0.1	0.8	1.0	1.3	1.8
5.02	1.4	0.0	0.0	1.0	1.3	2.4
5.10	0.8	0.0	0.1	0.8	1.3	1.7
5.17	0.3	0.0	0.5	0.8	1.2	1.6
5.23	0.4	0.0	0.0	1.1	1.3	1.5
5.33	0.0	0.0	0.3	0.9	1.2	1.2

Table G.11: YRI, bbe FluoroProbe data [µg l^{-1}], June 19^{th} 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	0.0	0.1	3.9	1.8	0.8	5.8
0.26	0.0	0.0	4.6	0.7	1.1	5.3
0.54	5.0	0.0	2.6	0.7	1.0	8.3
0.77	0.0	0.8	5.9	0.3	1.4	6.9
0.86	1.1	0.8	6.0	0.0	1.1	7.9
0.88	0.1	0.0	5.6	0.3	1.8	6.0
0.98	0.5	0.0	6.6	0.8	1.2	7.9
1.04	0.0	0.6	7.2	0.0	0.9	7.7
1.14	1.5	0.2	7.4	0.0	0.8	9.1
1.20	0.0	0.3	7.7	0.7	1.1	8.7
1.27	1.4	0.0	5.4	2.1	1.3	8.9
1.32	0.0	0.0	7.5	1.4	1.1	8.9
1.36	0.0	0.0	8.5	0.6	0.6	9.1
1.43	0.3	0.0	7.0	0.9	1.5	8.3
1.50	0.0	0.5	8.0	0.3	1.1	8.8
1.58	0.2	0.0	6.9	1.5	1.5	8.6
1.64	1.4	0.0	5.9	2.3	1.1	9.7
1.72	0.0	0.0	6.3	2.4	1.6	8.7
1.81	1.8	0.0	6.0	1.4	1.5	9.1
1.87	0.0	0.4	6.5	1.3	1.5	8.2
1.93	0.0	0.0	6.7	1.1	1.4	7.7
2.00	1.4	0.0	6.3	1.2	1.2	8.8
2.04	0.0	0.0	6.4	1.4	1.4	7.9
2.10	1.3	0.0	6.4	1.5	1.2	9.2
2.18	0.4	0.1	6.0	2.1	1.4	8.5
2.28	0.0	0.2	6.6	1.2	1.4	8.0
2.32	0.0	0.3	6.9	1.2	1.1	8.4
2.34	0.8	0.0	6.6	1.1	1.3	8.5
2.42	0.1	0.0	7.2	1.7	1.0	9.0
2.50	0.0	0.1	6.8	1.5	1.5	8.3
2.55	1.0	0.0	6.1	1.8	1.4	8.9
2.60	0.0	0.0	6.5	1.9	1.5	8.4
2.66	0.0	0.0	6.9	1.8	1.2	8.7
2.69	1.4	0.0	6.2	2.0	1.3	9.6
2.74	0.0	0.4	5.8	2.4	1.8	8.6
2.80	0.9	0.0	6.0	2.5	1.4	9.5
2.83	0.2	0.0	6.7	2.6	1.2	9.5
2.88	0.6	0.3	6.8	1.4	1.5	9.0
2.92	1.1	0.1	6.0	2.8	1.5	10.0
2.96	0.0	0.3	6.6	2.3	1.4	9.2
3.00	0.9	0.1	6.1	2.6	1.5	9.6
3.04	0.0	0.5	6.7	2.1	1.4	9.3
3.09	1.2	0.0	6.1	2.8	1.4	10.0
3.15	0.4	0.2	7.2	2.2	1.4	10.0
3.25	2.3	0.5	6.1	1.9	1.2	10.8
3.31	0.0	0.4	6.6	2.1	1.5	9.0
3.40	0.0	0.2	6.4	2.2	1.5	8.9
3.46	0.0	0.6	6.7	1.3	1.5	8.6

Table G.12: YRJ, bbe FluoroProbe data [µg l^{-1}], June 19^{th} 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	0.0	2.8	5.0	0.0	2.3	7.8
0.09	1.6	0.0	5.2	0.5	1.5	7.3
0.16	0.0	0.0	6.3	0.0	0.8	6.3
0.24	10.7	0.4	0.0	2.8	1.0	13.9
0.27	0.0	0.0	6.2	2.2	1.4	8.4
0.36	0.0	0.0	5.0	2.4	1.5	7.3
0.39	0.0	1.2	6.3	0.5	1.7	8.0
0.46	0.7	0.0	4.6	3.8	1.8	9.1
0.47	9.8	0.0	3.7	0.4	0.0	13.9
0.49	3.9	0.0	4.6	0.0	1.8	8.5
0.49	0.0	0.5	7.8	0.0	1.3	8.3
0.53	0.0	0.0	6.5	0.9	1.6	7.4
0.57	5.1	0.0	5.1	1.5	0.0	11.7
0.60	0.0	0.8	7.9	0.1	0.9	8.8
0.66	0.0	0.0	8.0	0.0	1.4	8.0
0.71	12.1	0.0	0.0	3.5	1.2	15.5
0.75	0.0	0.0	7.1	1.1	1.6	8.3
0.78	0.7	0.0	8.0	0.9	1.1	9.6
0.79	2.0	0.0	7.4	0.0	1.1	9.4
0.91	0.8	0.0	5.1	3.3	1.7	9.2
0.95	2.5	0.0	5.5	3.3	0.7	11.2
1.01	0.3	0.0	7.0	1.3	1.2	8.6
1.03	0.0	0.0	7.2	1.6	1.3	8.8
1.05	0.0	0.6	7.4	0.6	1.1	8.6
1.15	6.7	0.0	2.8	2.8	1.5	12.3
1.19	0.0	0.8	6.9	1.1	1.4	8.8
1.24	0.0	0.0	6.4	1.8	1.7	8.2
1.29	0.0	0.5	8.7	0.0	0.7	9.3
1.33	1.7	0.0	6.1	2.0	1.5	9.8
1.38	0.0	0.0	7.2	2.6	0.7	9.8
1.41	0.4	0.0	7.5	2.2	0.8	10.0
1.43	0.0	0.0	7.1	1.7	1.4	8.8

Table G.13: YH3, bbe FluoroProbe data [µg l^{-1}], July 30^{th} 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	5.0	3.9	1.9	4.0	2.3	14.8
0.18	0.0	5.4	8.0	0.0	1.9	13.4
0.30	1.6	5.2	6.6	1.4	1.2	14.8
0.40	7.0	3.5	2.8	4.5	1.4	17.7
0.48	7.9	3.6	3.9	2.0	1.7	17.3
0.54	4.6	5.2	5.5	0.0	1.8	15.3
0.61	3.7	4.7	5.1	1.9	2.0	15.4
0.66	7.0	4.4	5.5	0.4	0.9	17.3
0.76	0.0	5.5	7.8	0.2	2.1	13.5
0.83	3.9	4.9	5.3	1.6	2.2	15.7
0.94	0.0	5.9	7.7	0.0	2.1	13.6
0.97	3.6	5.2	7.2	0.0	1.5	15.9
1.02	2.8	4.7	5.8	2.2	2.1	15.4
1.07	5.5	4.1	5.1	2.0	1.7	16.7
1.08	6.2	3.9	2.5	4.1	2.4	16.7
1.18	6.6	5.4	3.3	1.3	2.1	16.6
1.26	2.5	5.0	6.3	0.0	2.0	13.8
1.34	2.9	4.0	6.1	2.5	1.8	15.4
1.40	3.7	4.6	6.1	1.6	1.8	16.0
1.44	1.6	5.4	6.9	0.8	1.9	14.8
1.50	3.4	3.9	5.5	2.6	1.9	15.4
1.53	0.0	5.5	6.5	2.2	2.3	14.2
1.60	4.8	4.3	4.7	3.4	1.8	17.3
1.70	3.7	4.7	5.1	2.3	2.2	15.7
1.84	0.0	5.2	5.9	1.7	3.0	12.7
1.91	2.7	6.4	4.5	0.9	2.8	14.4
2.01	2.4	6.3	4.5	0.8	2.7	13.8
2.14	4.7	6.5	0.6	3.9	3.1	15.6
2.21	3.1	7.1	1.0	3.1	3.5	14.3
2.32	1.4	7.6	2.2	1.6	3.7	12.7
2.38	3.3	7.6	0.0	3.1	3.9	14.0
2.45	0.0	8.7	2.6	1.5	3.8	12.9
2.53	3.3	7.3	0.0	3.3	3.7	13.8
2.62	2.4	7.9	0.8	1.9	3.7	13.0
2.69	2.0	7.4	0.6	2.9	3.9	13.0
2.76	2.8	7.0	0.0	3.7	4.0	13.4
2.85	2.5	7.7	0.2	3.3	4.0	13.6
2.89	2.9	8.0	1.0	2.3	4.0	14.3
2.97	0.1	8.0	2.9	1.8	4.1	12.8
3.02	1.1	7.8	2.2	1.8	3.9	12.9
3.07	0.0	6.9	2.7	1.8	4.1	11.4
3.10	1.8	6.6	0.9	3.0	4.1	12.2
3.14	1.7	6.9	2.2	2.3	3.9	13.1

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
3.21	1.3	6.2	1.8	2.4	4.0	11.7
3.24	0.0	6.8	2.3	1.9	4.1	10.9
3.30	0.0	5.8	2.2	1.5	4.3	9.5
3.40	1.1	3.9	1.6	1.6	4.2	8.3
3.52	2.2	3.2	0.8	2.9	4.3	9.0
3.62	2.6	3.5	1.0	2.1	4.2	9.1
3.69	2.0	3.5	1.0	2.7	4.2	9.2
3.74	3.2	3.3	0.7	2.7	4.2	9.8
3.85	2.3	3.2	1.2	2.9	4.2	9.6
3.92	2.3	3.2	1.7	2.6	4.1	9.8
3.99	2.1	3.5	1.7	2.2	4.2	9.5
4.06	2.2	2.8	1.6	2.4	4.0	8.9
4.10	2.4	2.7	1.5	2.1	3.8	8.8
4.19	1.1	2.9	2.7	0.7	3.7	7.4
4.28	1.8	2.8	2.0	1.4	3.7	8.0
4.35	2.7	2.3	1.4	1.6	3.6	7.9
4.41	3.1	1.2	1.1	1.5	3.1	6.9
4.47	2.9	1.4	1.3	1.1	2.9	6.6
4.56	1.8	1.1	1.7	0.8	2.8	5.5
4.66	3.9	0.8	0.6	1.5	2.7	6.7
4.72	3.5	0.6	0.7	1.4	2.5	6.2
4.77	3.3	0.5	0.7	1.6	2.6	6.1
4.85	2.6	0.7	0.9	1.1	2.5	5.3
4.95	3.8	0.3	0.1	1.7	2.5	5.9
5.01	1.8	0.3	1.2	0.7	2.2	4.0
5.04	2.5	0.2	0.6	0.9	2.2	4.2
5.13	3.1	0.0	0.2	1.3	2.1	4.5
5.22	1.7	0.3	1.2	0.3	2.0	3.5
5.28	1.9	0.1	0.9	0.7	2.0	3.5
5.36	1.6	0.3	1.2	0.3	1.9	3.4
5.45	1.9	0.2	0.8	0.4	1.9	3.3
5.52	1.4	0.3	1.2	0.5	1.9	3.4
5.58	2.4	0.1	0.3	0.7	1.9	3.3
5.65	2.6	0.0	0.4	0.8	1.8	3.7
5.69	2.1	0.0	0.6	0.8	1.8	3.4
5.77	2.5	0.0	0.4	0.4	1.8	3.3
5.85	2.5	0.1	0.4	0.4	1.7	3.4
5.91	1.2	0.0	0.6	0.5	1.7	2.3
5.96	1.8	0.0	0.5	0.6	1.8	3.0
6.03	1.9	0.0	0.4	0.3	1.7	2.5
6.16	1.7	0.0	0.5	0.5	1.7	2.8
6.23	1.1	0.0	0.6	0.3	1.7	2.0
6.32	1.1	0.0	0.8	0.1	1.7	2.0
6.36	2.0	0.0	0.0	0.3	1.6	2.2
6.40	1.8	0.0	0.0	0.3	1.6	2.1

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
6.48	1.3	0.0	0.0	0.5	1.7	1.8
6.55	0.8	0.0	1.0	0.3	1.7	2.0
6.65	0.5	0.0	0.7	0.3	1.6	1.6
6.76	0.8	0.0	0.7	0.2	1.6	1.7
6.84	1.6	0.0	0.0	0.3	1.7	1.9
6.94	1.1	0.0	0.4	0.2	1.6	1.7
7.00	1.7	0.0	0.0	0.3	1.7	2.0
7.11	1.7	0.0	0.0	0.2	1.6	1.8
7.17	1.3	0.0	0.0	0.3	1.7	1.6
7.24	1.1	0.0	0.5	0.1	1.7	1.7
7.31	0.7	0.0	0.4	0.1	1.7	1.2
7.37	0.8	0.0	0.5	0.3	1.8	1.5
7.47	1.6	0.0	0.0	0.2	1.7	1.7
7.57	0.8	0.0	0.4	0.3	1.7	1.4
7.65	0.8	0.0	0.0	0.4	1.8	1.2
7.72	1.0	0.0	0.0	0.2	1.8	1.2
7.79	0.6	0.0	0.0	0.4	1.8	1.0
7.84	1.0	0.0	0.0	0.4	1.9	1.4
7.93	0.7	0.0	0.0	0.3	1.8	1.0
8.01	0.8	0.0	0.0	0.2	1.9	1.1
8.04	0.6	0.0	0.0	0.3	1.9	0.9
8.11	1.1	0.0	0.0	0.4	1.9	1.4
8.22	0.3	0.0	0.3	0.3	1.9	0.9
8.29	0.0	0.0	0.0	0.4	1.9	0.4
8.36	0.3	0.0	0.0	0.4	1.9	0.7
8.45	0.0	0.0	0.5	0.5	1.9	1.1
8.58	0.3	0.0	0.0	0.4	2.0	0.7
8.66	0.3	0.0	0.0	0.4	1.9	0.7
8.72	0.2	0.0	0.0	0.2	1.9	0.4
8.80	0.3	0.0	0.0	0.4	1.9	0.7
8.88	0.1	0.0	0.0	0.5	2.0	0.5
8.97	0.0	0.0	0.4	0.3	1.9	0.7
9.07	0.0	0.0	0.0	0.2	2.0	0.2
9.14	0.1	0.4	0.7	0.0	2.1	1.2
9.25	0.0	0.0	0.0	0.1	1.9	0.1
9.36	0.0	0.0	0.0	0.2	2.0	0.2
9.43	0.0	0.0	0.0	0.3	1.9	0.3
9.52	0.0	0.0	0.0	0.1	1.9	0.1
9.60	0.0	0.0	0.0	0.1	1.9	0.1
9.68	0.0	0.0	0.0	0.2	2.0	0.2
9.76	0.0	0.0	0.0	0.3	1.9	0.3
9.82	0.0	0.0	0.0	0.2	1.9	0.2
9.89	0.0	0.1	0.0	0.3	2.0	0.4
10.00	0.0	0.1	0.0	0.3	1.9	0.3
10.09	0.1	0.0	0.0	0.5	2.0	0.7

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
10.23	0.0	0.0	0.0	0.3	1.9	0.3
10.29	0.0	0.0	0.0	0.3	2.0	0.3
10.36	0.0	0.0	0.0	0.3	1.9	0.3
10.43	0.2	0.0	0.0	0.4	1.9	0.6
10.51	0.0	0.1	0.0	0.3	2.0	0.4
10.57	0.0	0.1	0.0	0.0	1.9	0.1
10.64	0.4	0.4	0.3	0.0	2.0	1.1
10.70	0.0	0.0	0.0	0.3	1.9	0.3
10.79	0.0	0.1	0.0	0.0	1.8	0.1
10.88	0.0	0.2	0.0	0.2	2.0	0.4
10.98	0.0	0.2	0.0	0.3	1.9	0.5
11.06	0.0	0.1	0.0	0.1	1.9	0.2
11.13	0.0	0.1	0.0	0.2	1.9	0.3
11.18	0.0	0.2	0.0	0.0	1.9	0.2
11.24	0.0	0.1	0.0	0.2	1.8	0.3
11.33	0.0	0.2	0.0	0.2	1.9	0.4
11.41	0.0	0.8	0.3	0.0	2.0	1.1
11.48	0.0	0.1	0.0	0.4	1.9	0.5
11.58	0.0	0.2	0.0	0.1	1.8	0.3
11.67	0.0	0.3	0.0	0.1	1.8	0.4
11.76	0.0	0.3	0.0	0.2	1.8	0.5
11.81	0.0	0.2	0.0	0.4	1.8	0.7
11.85	0.0	0.2	0.0	0.5	1.8	0.7
11.91	0.0	0.4	0.0	0.2	1.9	0.6
12.00	0.0	0.3	0.0	0.2	1.9	0.6
12.08	0.2	0.4	0.0	0.3	1.8	0.9
12.14	0.0	0.2	0.0	1.1	1.8	1.2
12.21	0.2	0.3	0.0	0.7	1.7	1.2
12.31	0.1	0.4	0.0	0.4	1.8	0.9
12.38	0.0	0.4	0.0	0.4	1.9	0.7
12.43	0.0	0.2	0.0	0.7	2.0	0.9
12.47	0.0	0.5	1.0	0.9	1.8	2.5
12.50	0.0	1.8	7.7	2.6	1.4	12.1

Table G.14: YH4, bbe FluoroProbe data [µg l^{-1}], July 30th 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	13.0	3.8	0.0	6.0	2.4	22.7
0.03	1.2	6.1	5.8	5.1	1.9	18.2
0.17	9.2	6.8	1.0	3.6	2.6	20.6
0.35	2.4	7.5	7.0	0.7	2.2	17.6
0.46	7.4	6.0	3.4	2.7	2.7	19.6
0.51	6.8	5.8	3.6	4.0	2.4	20.2
0.56	3.8	6.2	7.1	3.2	2.1	20.3
0.69	4.4	6.8	6.7	2.1	1.5	20.0
0.79	4.5	6.3	4.6	4.5	2.6	19.8
0.88	0.0	6.8	7.3	3.6	2.3	17.7
0.92	10.6	6.1	3.6	2.7	1.6	23.0
0.99	0.0	7.4	10.3	0.0	2.0	17.7
1.09	0.0	6.9	6.5	3.5	2.4	16.9
1.18	1.9	7.8	9.2	0.4	2.1	19.3
1.30	0.9	7.6	7.5	1.1	2.3	17.0
1.38	3.0	7.2	6.3	2.4	2.1	18.8
1.47	2.7	7.1	6.7	3.2	2.2	19.6
1.55	0.1	7.6	6.9	2.0	2.6	16.6
1.59	0.5	8.1	9.1	0.3	2.3	18.0
1.70	0.0	6.9	7.0	1.8	2.7	15.7
1.81	1.0	7.3	8.1	1.6	2.5	18.0
1.90	0.1	8.0	8.2	0.1	2.5	16.3
2.00	0.0	7.7	9.1	0.2	2.3	16.9
2.08	2.3	6.1	6.1	2.8	2.4	17.4
2.18	0.4	6.8	7.0	1.3	2.6	15.4
2.20	2.9	7.2	5.1	1.6	2.6	16.8
2.26	1.6	7.4	6.8	0.5	2.6	16.3
2.37	1.7	6.7	5.4	2.0	2.6	15.8
2.47	2.3	7.0	5.1	1.7	2.7	16.0
2.56	0.8	6.9	5.6	2.5	2.6	15.7
2.66	2.1	7.4	5.7	1.2	2.7	16.3
2.76	0.0	7.3	7.0	0.5	3.0	14.7
2.84	0.0	8.1	5.2	0.9	3.2	14.2
2.93	0.0	7.7	4.1	1.5	3.6	13.3
2.96	4.4	7.0	0.4	4.0	3.7	15.8
3.03	0.0	7.9	3.5	2.0	3.7	13.4
3.07	2.6	6.9	1.4	2.5	4.0	13.3
3.19	0.0	6.9	3.1	2.7	4.2	12.6
3.28	0.0	7.1	4.3	2.0	4.1	13.4
3.35	0.0	5.8	3.5	1.9	4.2	11.2
3.41	0.3	5.6	2.6	3.2	4.3	11.7
3.47	0.0	5.7	3.8	1.7	4.2	11.2
3.49	0.0	5.0	2.7	1.9	4.3	9.6

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
3.59	1.5	3.5	1.7	2.3	4.4	9.0
3.66	1.7	3.2	1.4	2.7	4.4	9.1
3.74	1.0	3.1	1.4	2.6	4.6	8.1
3.84	2.7	2.8	1.3	2.2	4.3	9.0
3.93	1.6	2.7	1.6	2.4	4.4	8.3
4.02	4.6	2.0	0.5	3.3	4.2	10.5
4.08	2.0	2.6	2.0	2.4	4.2	9.0
4.16	3.4	2.2	1.6	2.6	4.0	9.8
4.27	3.5	1.6	1.6	2.4	3.8	9.0
4.34	3.4	1.2	1.7	2.1	3.5	8.3
4.41	4.7	1.0	1.0	2.3	3.4	9.0
4.47	4.5	0.7	1.0	2.2	3.2	8.5
4.50	5.4	0.8	0.8	1.8	3.2	8.9
4.61	4.2	0.8	1.6	1.1	3.0	7.6
4.71	3.9	0.7	1.7	1.0	3.0	7.2
4.79	4.1	0.5	1.0	1.5	2.9	7.1
4.83	2.7	0.8	1.9	0.5	2.8	6.0
4.91	2.8	0.5	1.6	0.9	2.6	5.8
4.97	3.0	0.2	0.8	0.9	2.3	4.8
5.03	2.1	0.2	0.8	0.7	2.2	3.9
5.16	2.5	0.0	0.5	0.7	1.9	3.7
5.27	1.7	0.3	1.0	0.2	2.0	3.3
5.40	2.0	0.0	0.9	0.6	1.8	3.4
5.48	2.3	0.0	0.5	0.7	1.8	3.4
5.54	2.4	0.0	0.4	0.5	1.8	3.3
5.61	2.1	0.3	0.9	0.1	1.7	3.5
5.72	2.4	0.1	0.8	0.4	1.8	3.8
5.77	1.6	0.3	0.9	0.3	1.8	3.0
5.88	2.1	0.0	0.2	0.4	1.8	2.7
5.97	1.8	0.2	0.6	0.2	1.7	2.9
6.06	1.7	0.1	0.3	0.5	1.8	2.7
6.13	2.2	0.0	0.1	0.5	1.7	2.8
6.15	2.3	0.0	0.0	0.4	1.7	2.7
6.23	1.9	0.0	0.4	0.4	1.7	2.8
6.32	1.6	0.0	0.4	0.4	1.7	2.4
6.39	2.3	0.0	0.0	0.5	1.7	2.8
6.46	2.2	0.0	0.4	0.4	1.7	3.0
6.56	1.8	0.0	0.6	0.2	1.7	2.6
6.66	1.6	0.0	0.3	0.3	1.7	2.2
6.72	1.8	0.0	0.0	0.3	1.7	2.1
6.82	1.3	0.0	0.3	0.3	1.7	1.8
6.92	1.3	0.0	0.4	0.4	1.7	2.0
7.02	1.0	0.0	0.3	0.3	1.8	1.6
7.16	0.9	0.0	0.2	0.4	1.8	1.5
7.26	1.7	0.0	0.0	0.3	1.8	2.0

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
7.32	1.4	0.0	0.1	0.4	1.8	1.8
7.41	1.1	0.0	0.3	0.3	1.8	1.7
7.47	0.7	0.3	0.7	0.0	1.8	1.7
7.57	1.6	0.1	0.4	0.2	1.7	2.2
7.67	1.4	0.0	0.0	0.5	1.7	1.9
7.75	1.1	0.0	0.0	0.3	1.7	1.5
7.86	1.1	0.0	0.0	0.5	1.7	1.6
7.97	1.2	0.1	0.0	0.3	1.7	1.6
7.98	0.7	0.1	0.0	0.4	1.7	1.1
8.06	0.9	0.0	0.0	0.5	1.7	1.4
8.15	0.7	0.1	0.0	0.4	1.8	1.1
8.25	0.7	0.0	0.0	0.5	1.7	1.2
8.31	0.6	0.0	0.0	0.5	1.7	1.2
8.40	0.7	0.0	0.0	0.4	1.8	1.1
8.46	0.7	0.0	0.0	0.4	1.8	1.1
8.55	0.4	0.0	0.0	0.4	1.8	0.8
8.68	0.4	0.1	0.0	0.2	1.8	0.6
8.80	0.2	0.0	0.0	0.4	1.8	0.6
8.88	0.4	0.0	0.0	0.4	1.8	0.8
8.98	0.3	0.1	0.0	0.2	1.8	0.6
9.02	0.1	0.0	0.0	0.4	1.9	0.6
9.10	0.2	0.1	0.0	0.3	1.8	0.5
9.18	0.2	0.0	0.0	0.4	1.8	0.6
9.28	0.5	0.0	0.0	0.6	1.9	1.0
9.37	0.2	0.1	0.0	0.2	1.9	0.5
9.48	0.1	0.1	0.0	0.2	1.8	0.4
9.58	0.4	0.1	0.0	0.5	1.8	1.0
9.62	0.0	0.1	0.0	0.4	1.8	0.5
9.68	0.0	0.1	0.0	0.2	1.8	0.4
9.80	0.2	0.1	0.0	0.4	1.8	0.8
9.88	0.1	0.1	0.0	0.6	1.9	0.8
9.94	0.5	0.3	0.0	0.3	1.8	1.0
10.04	0.7	1.3	2.3	0.0	1.7	4.3

Table G.15: YHE, bbe FluoroProbe data [µg l^{-1}], July 30th 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	0.0	7.8	6.9	3.8	1.7	18.4
0.03	10.7	7.1	0.6	4.7	1.4	23.1
0.03	14.0	5.8	0.0	5.6	1.4	25.3
0.03	9.0	7.7	5.8	0.5	1.1	23.0
0.04	0.0	9.7	6.7	0.9	2.6	17.3
0.11	7.7	5.7	4.0	5.2	1.6	22.6
0.16	0.0	8.5	7.3	1.8	2.7	17.5
0.30	3.0	6.9	4.8	5.6	2.4	20.4
0.46	1.6	9.4	7.7	0.0	2.5	18.7
0.57	0.0	9.1	9.6	0.2	1.8	19.0
0.65	5.5	7.9	8.0	0.1	1.2	21.5
0.68	4.4	7.9	6.7	1.4	2.1	20.4
0.81	0.0	8.1	9.8	1.2	1.4	19.1
0.88	3.5	8.7	8.1	1.2	1.5	21.6
0.96	0.0	9.8	9.8	0.0	2.1	19.6
1.03	5.1	8.9	7.6	0.0	2.0	21.5
1.07	0.0	8.3	9.5	2.0	1.6	19.9
1.14	2.6	7.7	7.5	2.1	1.9	19.8
1.24	2.6	8.2	7.5	2.2	1.9	20.5
1.31	1.3	7.9	9.1	2.6	1.4	20.9
1.40	7.2	7.5	3.3	6.1	2.1	24.0
1.48	5.8	9.1	6.3	1.9	2.1	23.1
1.56	2.1	8.6	7.9	1.7	2.0	20.2
1.64	0.0	9.1	9.0	0.4	2.1	18.5
1.72	0.0	9.3	9.6	1.0	2.0	19.9
1.79	3.0	8.6	6.9	2.4	2.1	20.8
1.86	0.0	9.2	9.2	1.4	2.1	19.7
1.93	0.0	10.0	7.0	1.7	3.0	18.7
1.99	0.0	10.5	7.1	0.9	3.2	18.5
2.05	2.7	9.3	5.0	4.1	2.7	21.2
2.11	0.0	10.9	8.6	1.2	2.8	20.8
2.18	1.3	9.7	6.9	2.3	3.2	20.2
2.28	0.0	9.7	7.6	2.1	3.5	19.3
2.39	0.0	8.7	6.8	2.9	3.4	18.4
2.45	0.0	9.5	6.8	2.1	3.4	18.4
2.53	0.0	8.9	6.5	2.6	3.7	18.0
2.59	0.0	8.4	5.8	2.1	3.6	16.2
2.68	0.0	8.4	6.1	1.9	3.7	16.4
2.77	0.0	7.4	4.9	2.8	4.0	15.1
2.87	0.0	7.1	3.6	1.7	4.1	12.4
2.98	0.0	6.2	3.3	2.8	4.3	12.3
3.06	0.0	6.1	3.5	2.0	4.2	11.6
3.12	1.1	5.4	2.2	3.2	4.5	11.9

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
3.14	0.8	5.0	2.2	2.6	4.4	10.7
3.20	0.0	4.7	3.0	2.0	4.5	9.7
3.30	0.0	4.8	2.1	2.1	4.6	9.0
3.40	0.7	4.2	1.4	2.1	4.8	8.3
3.47	0.1	2.8	1.0	2.7	4.7	6.6
3.52	1.6	2.8	0.4	2.3	4.6	7.1
3.60	0.5	2.7	1.1	1.9	4.7	6.2
3.69	2.2	2.3	0.4	1.9	4.6	6.8
3.80	2.2	2.3	0.4	1.6	4.6	6.5
3.87	2.3	1.9	0.2	2.7	4.5	7.1
3.96	2.9	1.8	0.8	2.5	4.3	7.9
4.01	1.7	2.6	1.6	1.2	4.5	7.1
4.09	2.4	1.7	0.9	1.7	4.3	6.8
4.16	3.0	1.6	1.0	1.5	4.2	7.0
4.24	1.8	2.0	1.6	1.2	4.3	6.5
4.29	3.5	1.5	1.1	1.7	4.1	7.8
4.40	2.8	1.6	1.8	1.1	3.9	7.2
4.47	3.3	1.3	1.5	1.3	3.6	7.4
4.54	2.0	1.7	2.2	0.7	3.6	6.6
4.63	2.9	1.2	1.6	1.2	3.5	6.9
4.69	3.1	1.2	2.2	0.4	3.0	6.8
4.74	2.9	1.1	2.3	0.3	2.9	6.6
4.82	3.2	1.1	2.3	0.4	2.9	6.8
4.88	2.9	0.6	1.7	1.0	2.6	6.1
4.93	4.5	0.7	1.2	0.9	2.7	7.4
5.01	3.0	0.6	1.6	0.8	2.5	6.1
5.09	2.7	0.9	2.3	0.0	2.4	5.9
5.18	2.8	0.5	1.6	0.6	2.2	5.4
5.27	2.8	0.6	1.6	0.5	2.3	5.5
5.39	2.8	0.4	1.6	0.7	2.2	5.5
5.44	1.8	0.6	2.1	0.2	2.0	4.6
5.51	2.2	0.5	1.5	0.4	2.0	4.6
5.59	2.0	0.5	1.7	0.3	2.0	4.5
5.68	2.1	0.2	1.2	0.5	1.8	4.0
5.75	2.2	0.3	1.2	0.5	1.8	4.1
5.81	2.3	0.3	1.2	0.4	1.7	4.2
5.91	2.1	0.2	0.9	0.5	1.7	3.7
5.99	2.1	0.2	0.9	0.6	1.8	3.8
6.08	2.3	0.2	0.7	0.5	1.7	3.6
6.16	2.6	0.1	0.7	0.5	1.7	3.8
6.22	2.0	0.1	1.1	0.4	1.7	3.6
6.26	2.5	0.0	0.5	0.6	1.7	3.6
6.31	1.9	0.0	0.7	0.6	1.8	3.2
6.37	2.1	0.0	0.7	0.7	1.7	3.5
6.40	1.6	0.0	1.0	0.4	1.7	3.0

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
6.46	0.8	0.0	1.9	0.8	1.7	3.5
6.54	0.4	0.1	1.5	0.5	1.7	2.4
6.62	2.0	0.0	0.4	0.5	1.6	2.9
6.66	2.4	0.0	0.2	0.6	1.7	3.2
6.71	1.9	0.2	0.8	0.2	1.7	3.1
6.75	2.2	0.0	0.5	0.5	1.7	3.2
6.79	2.2	0.0	0.4	0.6	1.7	3.1
6.85	1.6	0.2	0.5	0.3	1.7	2.6
6.98	2.0	0.2	0.6	0.4	1.7	3.2
7.03	2.2	0.1	0.4	0.4	1.7	3.1
7.11	1.3	0.2	0.4	0.4	1.7	2.3
7.15	1.5	0.1	0.3	0.3	1.6	2.3
7.26	1.1	0.2	0.6	0.4	1.7	2.2
7.37	1.4	0.1	0.1	0.6	1.7	2.2
7.42	2.3	0.6	0.8	0.8	1.4	4.4

Table G.16: YH5, bbe FluoroProbe data [µg l^{-1}], July 30^{th} 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	0.0	6.2	2.8	0.0	0.9	9.0
0.02	0.0	7.6	5.4	0.2	1.7	13.2
0.01	0.0	5.8	6.7	2.5	0.5	14.9
0.07	0.0	7.3	10.7	0.1	1.6	18.1
0.07	7.4	4.3	0.6	8.3	1.2	20.7
0.16	3.1	6.8	11.0	0.0	0.0	20.9
0.30	0.0	6.8	10.1	6.4	1.0	23.2
0.39	13.6	6.5	4.8	4.0	0.5	28.9
0.49	0.0	8.6	11.6	0.0	1.8	20.2
0.59	0.0	9.4	15.0	0.2	0.3	24.6
0.65	0.0	9.6	11.4	0.6	2.1	21.7
0.65	4.0	8.6	8.8	2.3	1.8	23.6
0.72	7.2	7.5	8.3	3.6	1.2	26.6
0.81	2.2	8.6	11.5	1.7	1.4	23.9
0.89	0.9	9.4	13.6	0.0	1.0	24.0
0.92	0.0	10.2	10.8	1.4	2.3	22.4
1.00	5.6	7.8	7.2	5.6	1.4	26.1
1.09	8.9	8.0	7.9	2.5	1.3	27.3
1.17	1.0	9.2	11.1	0.0	2.4	21.3
1.25	0.0	9.9	12.6	0.8	1.6	23.3
1.24	6.6	7.4	8.6	4.1	1.2	26.7
1.29	0.0	8.5	13.0	1.3	1.2	22.7
1.34	3.9	8.5	8.8	1.8	1.5	23.1
1.39	5.4	8.9	10.7	0.4	1.1	25.3
1.48	0.0	8.7	10.5	1.4	1.8	20.6
1.56	9.3	7.4	5.5	3.0	1.8	25.2
1.57	5.0	7.9	7.5	2.3	1.8	22.6
1.66	0.9	9.2	11.1	0.0	1.8	21.2
1.71	0.0	9.3	8.7	1.1	2.3	19.0
1.72	4.0	10.0	6.7	1.2	2.5	21.8
1.79	6.3	8.6	3.7	3.6	2.7	22.2
1.87	0.0	10.5	7.1	1.0	2.6	18.6
1.99	0.0	9.9	6.7	1.8	2.7	18.3
2.07	0.2	9.5	5.9	3.3	2.8	19.0
2.18	0.8	9.3	6.2	2.8	2.9	19.0
2.22	1.6	9.0	6.7	1.9	2.7	19.2
2.24	1.0	7.4	7.2	3.6	2.6	19.1
2.36	0.0	7.9	9.4	1.4	2.3	18.6

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
2.43	0.0	8.2	7.2	2.5	2.9	18.0
2.50	1.2	7.1	7.7	2.8	2.7	18.7
2.57	0.0	7.4	8.7	2.5	3.0	18.5
2.65	0.0	7.7	8.4	1.9	2.9	18.0
2.70	0.0	6.8	7.0	2.0	3.4	15.7
2.76	0.0	7.0	7.3	1.5	3.1	15.8
2.83	0.0	6.4	6.3	1.9	3.4	14.6
2.91	0.0	6.2	5.0	1.8	3.4	13.0
3.01	0.0	5.9	5.2	1.4	3.6	12.4
3.08	0.0	5.5	4.3	0.0	3.9	9.9
3.12	0.4	5.2	4.4	0.9	3.7	10.9
3.18	1.3	4.7	3.4	1.7	3.8	11.0
3.24	0.0	4.8	4.1	0.6	3.9	9.5
3.27	1.5	3.9	2.6	0.5	4.0	8.5
3.32	1.5	4.1	2.7	1.4	3.9	9.7
3.35	1.8	3.4	1.7	1.9	4.1	8.8
3.42	2.0	4.1	2.8	0.1	4.0	8.9
3.41	2.7	3.4	2.1	1.3	4.1	9.4
3.48	3.6	3.0	1.5	1.4	4.2	9.5
3.54	4.2	2.8	1.9	1.0	4.3	10.0
3.58	4.4	3.0	1.7	1.2	4.3	10.2
3.63	4.8	2.4	1.2	1.7	4.2	10.1
3.69	4.6	2.3	1.1	1.5	4.1	9.4
3.76	3.4	2.6	1.6	1.4	4.3	9.0
3.84	4.8	2.5	1.0	2.0	4.3	10.3
3.92	3.5	2.6	1.9	0.8	4.2	8.8
4.00	4.0	2.0	1.6	1.3	4.0	8.9
4.04	4.5	1.8	0.8	1.4	4.1	8.5
4.11	4.3	1.8	1.3	1.3	3.9	8.8
4.16	3.3	2.0	1.9	0.8	4.1	7.9
4.23	2.7	1.9	2.2	0.8	3.8	7.5
4.29	3.3	1.5	1.5	1.4	3.8	7.7
4.39	2.8	1.2	2.0	1.0	3.4	7.1
4.47	3.4	1.1	1.8	1.2	3.4	7.6
4.56	2.6	1.0	2.0	1.1	3.1	6.6
4.63	4.1	1.0	1.6	0.9	3.1	7.6
4.66	3.7	1.0	1.8	1.2	3.1	7.8
4.73	4.0	1.1	2.2	0.6	3.0	7.9
4.80	5.0	1.3	2.6	0.0	2.9	8.9
4.85	5.1	1.4	3.0	0.3	2.8	9.8
4.89	4.0	1.4	2.6	0.0	2.7	8.0
4.96	4.7	1.2	2.5	0.5	2.6	8.9
5.03	3.9	1.2	2.6	0.1	2.6	7.9
5.09	4.2	1.0	2.1	0.7	2.6	8.0
5.20	3.5	1.3	2.4	0.5	2.4	7.6

Table G.17: YHG, bbe FluoroProbe data [µg l^{-1}], July 30th 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	3.6	8.7	24.5	2.5	1.3	39.3
0.04	10.7	7.5	22.2	3.5	0.0	44.0
0.12	8.4	8.3	23.4	2.5	0.4	42.7
0.16	6.1	9.3	25.9	0.4	0.0	41.7
0.21	7.3	7.7	21.6	4.0	1.1	40.6
0.31	3.5	9.0	25.3	1.9	0.4	39.7
0.40	3.2	8.4	24.6	3.9	0.6	40.1
0.46	7.8	8.8	24.1	2.0	0.3	42.6
0.50	4.9	8.9	25.2	1.9	0.2	40.8
0.56	6.5	9.1	24.6	1.3	0.4	41.5
0.59	4.0	9.4	25.7	0.6	0.5	39.6
0.70	3.0	8.8	25.9	1.7	0.5	39.4
0.76	8.6	8.2	23.1	2.2	0.3	42.1
0.84	7.5	8.5	23.3	1.6	0.5	40.9
0.89	4.1	8.8	26.4	1.4	0.3	40.7
0.94	6.8	7.6	22.9	3.5	0.5	40.8
1.04	2.7	8.8	26.1	1.4	0.7	39.0
1.07	6.8	8.7	24.5	2.0	0.3	41.9
1.14	9.4	7.5	21.6	3.4	0.6	41.9
1.22	5.9	8.3	22.5	2.9	0.6	39.6
1.27	1.9	8.1	22.8	0.0	0.7	32.8
1.29	5.8	7.2	19.4	2.0	0.9	34.4
1.31	5.3	7.9	20.8	0.5	0.7	34.4
1.34	3.1	8.0	21.8	0.7	1.1	33.5
1.40	4.7	7.8	20.9	0.8	0.6	34.2
1.47	4.2	7.5	19.2	0.3	0.8	31.2
1.48	5.3	7.4	18.0	0.3	1.0	31.0
1.53	4.0	7.3	18.8	1.0	0.9	31.1
1.58	3.8	7.5	18.6	0.0	1.0	29.8
1.64	4.9	6.6	16.9	1.0	0.9	29.4
1.70	2.0	7.4	18.0	0.0	1.0	27.5
1.73	2.9	7.1	16.5	0.0	0.8	26.5
1.75	3.6	6.9	16.1	0.0	0.9	26.6
1.83	5.2	7.0	14.9	0.3	0.7	27.5
1.91	3.6	7.0	16.3	0.0	0.8	26.9

Table G.18: YR3, bbe FluoroProbe data [µg l^{-1}], July 31st 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	0.0	1.6	8.3	0.4	2.5	10.3
0.13	0.0	1.2	7.6	1.5	2.7	10.3
0.18	4.7	0.0	6.7	1.7	2.4	13.0
0.35	4.2	0.2	7.6	1.5	1.9	13.5
0.49	6.2	0.0	6.4	1.6	2.1	14.2
0.54	5.0	0.0	9.2	0.7	1.5	14.9
0.69	5.9	0.9	8.3	0.6	1.6	15.6
0.81	4.9	0.1	7.5	2.3	2.2	14.7
0.89	2.9	0.4	8.8	1.6	2.4	13.7
0.99	2.2	0.0	8.1	3.3	2.7	13.6
1.02	7.7	0.0	5.8	3.3	2.7	16.7
1.13	4.5	0.5	7.5	2.3	2.5	14.8
1.22	7.0	0.0	6.3	2.7	2.4	16.0
1.30	0.0	1.5	10.4	0.5	2.7	12.3
1.35	2.8	1.3	9.7	0.3	2.3	14.2
1.46	4.1	0.4	8.6	2.0	2.1	15.2
1.56	4.7	0.3	8.8	0.8	2.1	14.6
1.65	3.1	1.0	9.5	0.3	2.2	14.0
1.71	6.5	0.1	6.2	2.9	2.3	15.7
1.80	3.0	0.5	8.1	1.9	2.7	13.5
1.86	6.0	0.2	6.6	2.5	2.4	15.3
1.93	3.4	0.8	8.5	1.3	2.4	14.1
2.00	2.5	1.1	9.7	0.4	2.1	13.6
2.11	3.9	0.4	7.6	2.0	2.4	14.0
2.24	1.2	0.6	9.2	1.6	2.5	12.6
2.33	2.1	0.7	9.3	1.7	2.1	13.8
2.41	5.6	0.0	6.9	3.0	2.5	15.4
2.48	5.3	0.3	7.9	2.9	2.5	16.4
2.58	5.7	0.9	9.8	0.9	2.5	17.1
2.65	0.7	1.7	13.5	0.9	3.1	16.8
2.72	1.8	1.4	13.1	1.2	3.0	17.6
2.81	2.9	1.3	11.8	1.6	3.2	17.6
2.90	3.1	1.6	13.2	1.2	3.1	19.1
2.97	4.6	1.3	13.1	1.6	3.1	20.6
3.06	1.9	1.9	14.5	0.9	3.5	19.1
3.18	2.3	1.7	14.1	1.4	3.4	19.5
3.27	3.2	2.1	14.4	1.0	3.3	20.5
3.38	0.5	1.9	14.4	0.8	3.4	17.7
3.45	0.3	1.6	14.1	1.2	3.4	17.2
3.55	0.0	1.8	14.0	0.9	3.4	16.6
3.69	0.0	1.5	13.8	1.0	3.3	16.3
3.78	0.0	1.6	12.4	1.0	3.2	15.0
3.89	0.0	1.7	12.8	0.5	3.4	14.9
3.96	0.0	1.0	10.9	1.4	3.1	13.3
4.05	0.0	0.8	9.4	1.5	3.0	11.7
4.16	0.0	0.6	8.4	1.5	2.8	10.5
4.25	0.0	0.8	7.9	1.3	2.9	10.0

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
4.35	0.0	0.6	7.6	1.6	2.9	9.8
4.45	0.0	0.6	6.7	1.8	2.8	9.1
4.51	0.0	0.6	6.9	1.4	2.6	8.9
4.61	0.0	0.6	6.1	1.8	2.5	8.4
4.71	0.0	0.6	6.0	2.1	2.5	8.7
4.81	0.0	0.6	5.3	2.3	2.4	8.2
4.88	0.0	0.6	5.5	2.0	2.4	8.1
4.98	0.5	0.4	4.6	2.3	2.4	7.8
5.07	0.0	0.6	3.7	2.1	2.4	6.3
5.10	0.9	0.2	2.8	2.5	2.2	6.4
5.18	1.6	0.3	2.8	2.4	2.2	7.1
5.30	1.0	0.3	2.7	2.3	2.2	6.3
5.39	1.6	0.3	1.9	1.9	2.1	5.7
5.44	2.1	0.2	1.6	2.3	2.0	6.2
5.51	1.8	0.0	1.7	2.2	2.0	5.7
5.61	1.1	0.2	1.8	2.1	2.0	5.2
5.71	2.1	0.0	1.1	2.2	1.9	5.4
5.81	2.2	0.1	0.9	1.8	1.8	4.9
5.91	2.3	0.2	0.9	1.7	1.8	5.1
6.01	1.6	0.3	0.9	1.4	1.7	4.2
6.12	1.9	0.1	0.7	1.5	1.7	4.3
6.21	2.3	0.0	0.4	1.7	1.6	4.4
6.33	2.1	0.1	0.6	1.5	1.6	4.3
6.45	2.5	0.0	0.1	1.5	1.5	4.1
6.53	1.6	0.1	0.7	1.5	1.5	3.9
6.61	1.6	0.0	0.6	1.3	1.5	3.5
6.72	1.5	0.1	0.5	1.3	1.4	3.4
6.83	1.3	0.2	0.7	1.0	1.4	3.2
6.96	1.5	0.0	0.5	1.3	1.4	3.2
7.03	1.1	0.0	0.5	1.1	1.4	2.7
7.12	1.3	0.0	0.6	1.2	1.4	3.0
7.23	1.1	0.0	0.5	1.0	1.3	2.5
7.37	0.9	0.0	0.5	0.6	1.2	2.0
7.45	1.0	0.0	0.5	0.8	1.3	2.2
7.54	0.3	0.1	0.9	0.5	1.3	1.8
7.65	1.1	0.0	0.4	0.7	1.3	2.2
7.72	0.5	0.1	0.5	0.6	1.3	1.7
7.76	0.7	0.0	0.3	0.7	1.3	1.6
7.83	1.1	0.0	0.1	0.7	1.3	1.9
7.92	1.1	0.0	0.1	0.6	1.3	1.8
8.00	1.4	0.0	0.0	0.8	1.3	2.1
8.06	0.7	0.0	0.3	0.5	1.2	1.5
8.13	1.0	0.0	0.0	0.6	1.3	1.6
8.24	0.5	0.0	0.3	0.5	1.3	1.3
8.35	0.3	0.0	0.3	0.6	1.3	1.2

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
8.47	0.9	0.0	0.0	0.6	1.3	1.5
8.57	0.8	0.0	0.0	0.6	1.3	1.4
8.64	0.7	0.0	0.0	0.7	1.3	1.4
8.75	0.7	0.0	0.0	0.6	1.3	1.4
8.88	0.7	0.0	0.0	0.7	1.3	1.4
8.98	0.7	0.0	0.0	0.7	1.3	1.4
9.04	0.7	0.0	0.0	0.9	1.3	1.6
9.17	0.9	0.0	0.0	0.7	1.3	1.6
9.29	0.9	0.0	0.0	0.7	1.3	1.6
9.35	0.9	0.0	0.0	0.8	1.3	1.7
9.43	0.8	0.1	0.0	0.6	1.3	1.5
9.50	0.8	0.1	0.0	0.7	1.3	1.6
9.59	0.9	0.1	0.1	0.7	1.3	1.8
9.70	0.7	0.0	0.0	0.7	1.3	1.5
9.80	0.8	0.1	0.0	0.7	1.3	1.5
9.91	0.7	0.1	0.0	0.8	1.3	1.5
9.98	0.7	0.1	0.0	0.7	1.4	1.5
10.10	0.3	0.1	0.0	0.7	1.4	1.1
10.21	0.4	0.1	0.0	0.7	1.4	1.2
10.34	0.1	0.1	0.0	0.7	1.4	0.9
10.43	0.2	0.1	0.0	0.7	1.4	1.0
10.50	0.4	0.1	0.0	0.6	1.4	1.1
10.62	0.3	0.1	0.0	0.7	1.4	1.0
10.69	0.3	0.1	0.0	0.7	1.4	1.0
10.78	0.4	0.1	0.0	0.7	1.3	1.2
10.90	0.2	0.1	0.0	0.7	1.4	1.1
11.02	0.2	0.1	0.0	0.6	1.4	0.9
11.06	0.2	0.1	0.0	0.5	1.4	0.9
11.15	0.2	0.1	0.0	0.5	1.4	0.9
11.16	0.1	0.2	0.0	0.4	1.4	0.7
11.29	0.1	0.2	0.0	0.4	1.4	0.7
11.42	0.0	0.1	0.0	0.5	1.4	0.7
11.47	0.2	0.1	0.0	0.5	1.4	0.8
11.53	0.2	0.2	0.0	0.5	1.4	0.8
11.63	0.2	0.2	0.0	0.4	1.4	0.8
11.74	0.3	0.2	0.0	0.4	1.4	0.9
11.86	0.3	0.2	0.0	0.5	1.4	1.0
11.97	0.2	0.2	0.0	0.3	1.4	0.8
12.04	0.2	0.2	0.0	0.4	1.4	0.8
12.16	0.1	0.2	0.0	0.4	1.4	0.7
12.24	0.2	0.2	0.0	0.4	1.4	0.7
12.34	0.1	0.2	0.0	0.3	1.4	0.7
12.41	0.1	0.2	0.0	0.4	1.4	0.7
12.48	0.1	0.3	0.0	0.3	1.4	0.7
12.55	0.1	0.3	0.0	0.4	1.4	0.7

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
12.66	0.2	0.3	0.0	0.4	1.4	0.9
12.73	0.3	0.3	0.0	0.5	1.3	1.0
12.83	0.3	0.3	0.0	0.4	1.3	1.0
12.91	0.4	0.3	0.0	0.4	1.3	1.1
13.01	0.6	0.3	0.0	0.4	1.3	1.3
13.10	0.4	0.4	0.0	0.5	1.3	1.2
13.18	0.6	0.4	0.0	0.4	1.3	1.3
13.27	0.5	0.4	0.0	0.4	1.3	1.3
13.40	0.6	0.4	0.0	0.4	1.3	1.3
13.51	0.5	0.4	0.0	0.5	1.3	1.4
13.60	0.6	0.4	0.0	0.5	1.3	1.5
13.67	0.7	0.4	0.0	0.5	1.2	1.6
13.76	0.6	0.5	0.0	0.4	1.3	1.5
13.88	0.7	0.5	0.0	0.4	1.2	1.6
13.98	0.8	0.6	0.0	0.4	1.2	1.7
14.07	0.9	0.5	0.0	0.5	1.2	1.9
14.15	0.9	0.6	0.0	0.5	1.2	1.9
14.24	0.8	0.5	0.0	0.5	1.2	1.8
14.29	0.9	0.6	0.0	0.4	1.2	1.9
14.42	0.9	0.5	0.0	0.5	1.3	2.0
14.53	1.0	0.5	0.0	0.5	1.3	2.0
14.61	0.9	0.5	0.0	0.4	1.3	1.8
14.68	0.8	0.5	0.0	0.4	1.3	1.7
14.81	1.0	0.5	0.0	0.4	1.3	1.8
14.92	0.9	0.5	0.0	0.4	1.4	1.9
14.98	0.9	0.4	0.0	0.5	1.4	1.9
15.06	0.9	0.4	0.0	0.5	1.4	1.8
15.11	0.7	0.4	0.0	0.4	1.4	1.5
15.20	0.9	0.4	0.0	0.3	1.4	1.7
15.29	0.8	0.4	0.0	0.5	1.4	1.7
15.37	1.0	0.4	0.0	0.4	1.4	1.8
15.44	0.9	0.5	0.0	0.4	1.4	1.8
15.52	0.9	0.4	0.0	0.4	1.4	1.8
15.60	1.0	0.4	0.0	0.4	1.5	1.7
15.70	1.0	0.4	0.0	0.5	1.5	1.9
15.77	1.0	0.4	0.0	0.5	1.5	1.9
15.81	1.0	0.5	0.0	0.4	1.5	1.9
15.91	0.9	0.5	0.0	0.4	1.5	1.7
15.98	1.0	0.4	0.0	0.4	1.5	1.8
16.04	0.8	0.4	0.0	0.4	1.5	1.6
16.12	0.7	0.3	0.0	0.5	1.6	1.6
16.23	0.9	0.9	0.7	0.0	1.7	2.6

Table G.19: YRE, bbe FluoroProbe data [µg l^{-1}], July 31^{st} 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	11.8	0.0	3.6	0.0	1.8	15.4
0.16	0.0	0.1	7.0	2.3	3.3	9.4
0.25	2.6	0.0	7.3	0.9	2.1	10.8
0.40	6.2	0.5	5.2	0.0	2.8	11.9
0.56	8.9	0.0	3.4	3.4	2.1	15.6
0.66	5.6	0.7	8.1	0.3	1.7	14.8
0.75	3.8	0.0	7.5	4.1	2.1	15.3
0.86	10.4	0.5	6.7	0.0	1.3	17.6
0.91	7.0	0.3	8.1	1.7	1.9	17.0
0.97	1.9	0.9	9.5	2.3	2.5	14.6
1.09	6.2	0.5	8.3	1.8	2.3	16.8
1.20	7.1	0.0	7.6	3.0	2.2	17.8
1.31	4.0	0.0	9.4	1.5	2.2	14.9
1.39	1.5	1.9	11.1	0.0	2.2	14.5
1.47	7.8	0.0	6.2	3.0	2.6	17.0
1.57	2.1	0.7	9.8	2.3	2.2	14.9
1.69	3.9	1.2	8.7	1.8	2.4	15.6
1.80	1.4	0.8	10.6	1.9	1.8	14.7
1.89	0.0	1.1	10.3	1.9	2.5	13.4
2.03	0.0	1.8	10.8	0.4	2.4	13.0
2.13	1.6	1.1	10.5	0.0	2.5	13.2
2.24	6.4	0.5	6.9	3.3	2.6	17.1
2.30	3.7	0.9	10.2	0.2	2.3	15.0
2.37	5.1	0.9	8.9	2.2	2.6	17.0
2.46	2.3	1.8	11.8	0.0	2.8	15.8
2.55	5.7	1.4	11.2	0.9	3.1	19.1
2.63	5.1	0.8	10.9	1.9	3.0	18.7
2.74	3.5	1.3	12.3	1.6	3.2	18.8
2.80	3.5	1.8	13.2	0.8	3.1	19.2
2.87	3.0	1.6	13.3	1.3	3.4	19.2
2.94	1.4	2.0	14.3	0.9	3.6	18.6
3.01	2.8	1.8	14.5	0.7	3.3	19.7
3.11	2.0	1.7	14.4	0.9	3.5	19.1
3.20	0.3	2.7	15.6	0.0	3.6	18.6
3.26	0.7	2.2	15.8	0.0	3.4	18.7
3.34	0.1	1.9	16.3	0.6	3.6	18.9
3.40	2.3	2.0	14.9	0.5	3.5	19.6
3.46	1.1	2.0	14.9	1.0	3.4	19.0
3.54	0.7	1.9	14.9	0.7	3.5	18.2
3.62	0.0	2.2	14.2	0.7	3.5	17.1
3.71	0.0	1.6	12.9	1.2	3.4	15.7
3.78	0.0	1.6	12.3	1.1	3.2	14.9
3.83	0.1	1.4	12.4	0.5	3.0	14.4
3.89	1.2	1.1	11.0	1.5	3.1	14.8
3.94	0.0	1.3	11.7	1.0	3.0	14.0
4.00	0.0	1.3	11.4	0.6	3.1	13.4
4.06	1.2	0.8	10.1	1.9	3.1	14.0

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
4.13	1.2	1.0	10.9	0.9	3.1	13.9
4.20	0.0	1.2	11.3	0.6	3.1	13.1
4.27	0.0	0.9	10.0	1.5	2.9	12.4
4.33	0.8	0.8	9.4	1.2	2.9	12.2
4.40	0.6	1.0	9.4	0.9	3.0	11.9
4.47	0.0	0.9	9.1	1.4	3.0	11.4
4.55	0.0	0.9	8.7	0.9	2.9	10.5
4.64	0.5	0.5	8.1	1.6	2.8	10.7
4.74	0.0	0.5	6.2	1.8	2.8	8.5
4.79	0.0	0.6	6.3	1.5	2.6	8.4
4.88	0.9	0.5	5.7	1.6	2.6	8.7
4.98	0.8	0.5	4.7	1.7	2.4	7.7
5.07	0.9	0.6	4.4	1.8	2.4	7.6
5.16	0.7	0.5	4.5	1.8	2.3	7.5
5.30	1.6	0.3	3.4	2.2	2.3	7.5
5.42	1.7	0.3	2.7	2.2	2.2	6.9
5.54	1.1	0.4	3.2	1.7	2.2	6.3
5.69	1.1	0.4	2.3	1.7	2.1	5.4
5.83	1.1	0.4	1.9	1.3	2.0	4.6
5.96	1.1	0.4	1.5	1.1	1.9	4.1
6.06	1.8	0.1	0.8	1.5	1.8	4.2
6.14	2.4	0.1	0.4	1.3	1.7	4.3
6.22	1.9	0.2	0.8	1.2	1.6	4.1
6.32	2.6	0.1	0.3	1.2	1.6	4.2
6.43	2.0	0.1	0.2	1.1	1.5	3.4
6.51	1.2	0.2	0.7	0.9	1.5	3.0
6.58	1.6	0.0	0.7	1.1	1.4	3.4
6.66	0.9	0.1	0.7	1.1	1.4	2.8
6.79	1.0	0.0	0.4	0.9	1.3	2.3
6.85	0.8	0.0	0.4	0.7	1.3	2.0
6.88	1.3	0.0	0.2	0.9	1.3	2.3
6.97	1.0	0.0	0.4	0.8	1.3	2.2
7.06	0.8	0.0	0.3	0.7	1.3	1.8
7.14	0.6	0.0	0.4	0.7	1.3	1.6
7.22	0.7	0.1	0.4	0.5	1.3	1.7
7.29	0.7	0.0	0.4	0.5	1.3	1.6
7.39	0.7	0.0	0.3	0.6	1.3	1.5
7.46	0.4	0.0	0.2	0.6	1.3	1.3
7.53	0.6	0.0	0.2	0.5	1.3	1.3
7.62	0.8	0.0	0.1	0.6	1.2	1.5
7.69	0.7	0.0	0.0	0.6	1.3	1.3
7.77	0.9	0.0	0.0	0.5	1.2	1.4
7.85	1.0	0.0	0.0	0.7	1.2	1.7
7.99	1.1	0.0	0.0	0.6	1.3	1.7
8.08	1.2	0.0	0.0	0.6	1.3	1.7

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
8.17	1.2	0.1	0.0	0.6	1.3	1.8
8.31	0.8	0.0	0.0	0.7	1.3	1.6
8.36	0.9	0.0	0.0	0.7	1.3	1.6
8.38	1.0	0.0	0.0	0.6	1.3	1.6
8.45	0.7	0.1	0.0	0.7	1.4	1.4
8.50	0.6	0.1	0.1	0.7	1.4	1.5
8.56	0.9	0.1	0.0	0.8	1.3	1.7
8.65	0.6	0.1	0.0	0.6	1.4	1.3
8.71	1.2	0.0	0.0	0.7	1.3	1.8
8.82	0.7	0.1	0.0	0.7	1.3	1.5
8.90	0.5	0.1	0.0	0.6	1.4	1.2
9.01	0.5	0.1	0.0	0.6	1.4	1.2
9.11	0.5	0.1	0.0	0.6	1.4	1.2
9.22	0.6	0.1	0.0	0.6	1.4	1.3
9.32	0.5	0.1	0.0	0.6	1.4	1.2
9.43	0.2	0.1	0.0	0.7	1.4	1.0
9.51	0.4	0.1	0.0	0.5	1.4	1.1
9.62	0.5	0.2	0.0	0.6	1.4	1.2
9.73	0.4	0.2	0.0	0.6	1.4	1.1
9.81	0.5	0.2	0.0	0.5	1.4	1.1
9.90	0.3	0.2	0.0	0.5	1.4	1.0
10.01	0.3	0.2	0.0	0.4	1.4	1.0
10.11	0.3	0.1	0.0	0.5	1.4	0.9
10.20	0.4	0.1	0.0	0.6	1.4	1.1
10.25	0.4	0.1	0.0	0.6	1.4	1.1
10.33	0.3	0.2	0.0	0.5	1.4	0.9
10.42	0.4	0.2	0.0	0.6	1.4	1.1
10.48	0.3	0.1	0.0	0.7	1.4	1.2
10.57	0.3	0.2	0.0	0.4	1.4	0.9
10.64	0.3	0.2	0.0	0.5	1.4	1.0
10.68	0.5	0.2	0.0	0.5	1.4	1.3
10.74	0.2	0.2	0.0	0.5	1.4	0.9
10.79	0.1	0.2	0.0	0.5	1.4	0.8
10.89	0.2	0.2	0.0	0.5	1.4	0.9
10.97	0.3	0.3	0.0	0.5	1.3	1.1
10.99	0.4	0.2	0.0	0.4	1.3	1.1
11.05	0.3	0.3	0.0	0.3	1.3	0.9
11.09	0.2	0.3	0.0	0.4	1.3	0.9
11.12	0.3	0.3	0.0	0.5	1.3	1.0
11.23	0.4	0.3	0.0	0.4	1.3	1.1
11.34	0.2	0.3	0.0	0.4	1.3	0.9
11.45	0.2	0.4	0.0	0.3	1.3	0.9
11.53	0.3	0.3	0.0	0.4	1.3	1.1
11.62	0.3	0.4	0.0	0.4	1.3	1.0
11.70	0.6	0.4	0.1	0.3	1.3	1.4

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
11.79	0.5	0.4	0.0	0.4	1.3	1.3
11.88	0.4	0.3	0.0	0.4	1.3	1.2
11.94	0.3	0.4	0.0	0.4	1.3	1.1
12.04	0.5	0.4	0.0	0.4	1.3	1.2
12.12	0.4	0.4	0.0	0.4	1.3	1.2
12.22	0.6	0.4	0.0	0.3	1.3	1.4
12.34	0.6	0.4	0.0	0.5	1.3	1.4
12.45	0.5	0.4	0.0	0.4	1.3	1.4
12.57	0.5	0.4	0.0	0.4	1.3	1.2
12.66	0.4	0.5	0.0	0.4	1.3	1.3
12.76	0.7	0.5	0.0	0.5	1.2	1.7
12.87	0.6	0.5	0.0	0.5	1.2	1.6
12.96	0.7	0.6	0.0	0.4	1.2	1.7
13.06	0.7	0.5	0.0	0.5	1.2	1.7
13.15	0.7	0.5	0.0	0.5	1.2	1.8
13.23	0.9	0.6	0.0	0.4	1.2	1.8
13.33	0.7	0.6	0.0	0.4	1.2	1.7
13.42	0.8	0.5	0.0	0.5	1.2	1.8
13.53	0.6	0.5	0.0	0.5	1.2	1.6
13.63	0.9	0.5	0.0	0.5	1.2	2.0
13.73	0.7	0.6	0.0	0.5	1.2	1.7
13.82	0.5	0.7	0.1	0.4	1.2	1.6
13.97	0.9	0.6	0.0	0.4	1.2	1.9
14.05	0.9	0.6	0.0	0.5	1.2	2.0
14.17	0.7	0.6	0.2	0.3	1.2	1.8
14.27	0.7	0.7	0.1	0.4	1.2	1.9
14.34	0.5	0.7	0.3	0.4	1.1	1.9
14.46	0.7	1.0	1.1	0.4	1.1	3.2

Table G.20: YRF, bbe FluoroProbe data [µg l^{-1}], July 31st 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	0.1	0.0	8.8	0.9	1.5	9.8
0.12	10.4	0.1	6.8	0.0	0.8	17.2
0.29	4.0	0.0	6.6	2.5	2.5	13.1
0.38	0.0	1.7	10.4	0.6	2.2	12.7
0.47	3.8	0.0	7.9	3.0	2.0	14.8
0.58	3.7	1.0	10.0	0.3	2.3	15.0
0.64	3.8	0.7	9.3	1.4	2.2	15.2
0.74	4.4	1.8	11.2	0.0	1.0	17.5
0.82	5.6	0.0	8.2	2.6	2.3	16.4
0.90	9.8	0.0	6.1	2.7	2.3	18.6
0.96	2.7	0.1	8.0	4.5	3.0	15.3
1.02	0.0	0.8	10.1	3.2	3.0	14.1
1.13	7.0	0.0	7.0	4.0	2.2	18.1
1.21	3.1	0.7	10.0	2.5	2.4	16.3
1.30	5.6	0.3	9.4	2.4	2.0	17.6
1.37	4.7	0.0	8.3	3.9	2.5	16.9
1.45	3.3	0.5	9.9	2.1	2.3	15.8
1.51	2.7	1.1	10.9	1.1	2.1	15.9
1.61	3.6	1.0	10.3	1.6	2.2	16.5
1.73	1.8	0.9	10.1	2.1	2.3	15.0
1.83	7.6	0.0	7.5	2.1	1.8	17.2
1.92	2.3	0.5	9.0	2.6	2.5	14.4
2.01	4.3	0.5	8.8	2.0	2.1	15.5
2.09	2.7	0.7	10.6	0.5	1.7	14.5
2.25	5.3	0.8	8.5	1.1	2.3	15.6
2.36	4.5	1.0	8.8	1.0	2.2	15.3
2.45	6.5	0.6	8.0	1.7	2.4	16.7
2.52	7.1	0.1	6.9	3.0	2.4	17.1
2.62	6.4	0.2	7.6	2.9	2.4	17.1
2.69	6.2	0.9	10.4	2.3	2.9	19.8
2.76	2.8	1.4	12.0	1.0	2.9	17.2
2.87	2.1	2.0	13.6	0.2	3.0	17.9
2.96	3.0	1.8	13.1	0.9	3.4	18.7
3.05	2.6	1.8	14.3	1.1	3.4	19.8
3.13	2.8	2.0	15.2	0.3	3.2	20.3
3.20	3.4	2.3	14.7	0.4	3.3	20.8
3.29	3.1	2.2	15.0	0.3	3.3	20.6
3.41	3.0	2.0	14.8	0.2	3.5	19.9
3.50	2.8	1.7	14.2	0.7	3.5	19.4
3.57	1.6	2.1	14.5	0.3	3.3	18.4
3.68	0.9	2.1	15.1	0.0	3.3	18.1
3.82	0.9	2.2	14.5	0.0	3.4	17.6
3.93	0.0	1.8	14.3	0.3	3.2	16.5
4.00	0.1	1.8	13.6	0.8	3.3	16.3
4.08	0.0	1.4	12.4	0.3	3.0	14.0
4.15	0.6	1.4	11.9	0.4	3.2	14.2
4.26	0.0	1.1	10.7	0.6	3.1	12.4

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
4.36	0.2	1.3	10.1	0.3	2.9	11.9
4.45	0.1	0.9	9.7	0.6	2.8	11.2
4.55	0.1	0.8	8.9	0.9	2.8	10.7
4.60	0.0	0.7	8.1	1.0	2.9	9.8
4.69	0.1	0.7	8.0	0.4	2.7	9.1
4.81	0.0	0.6	6.7	0.7	2.7	7.9
4.91	0.0	0.2	4.9	1.6	2.5	6.6
5.00	0.6	0.2	5.7	1.0	2.5	7.6
5.06	1.0	0.4	4.5	1.2	2.4	7.1
5.15	0.9	0.2	4.3	1.4	2.4	6.9
5.21	1.1	0.3	3.3	2.2	2.3	6.9
5.26	0.7	0.5	4.1	1.7	2.3	6.9
5.29	0.9	0.5	3.2	2.1	2.3	6.6
5.34	1.2	0.5	2.9	2.4	2.3	7.1
5.43	1.7	0.4	2.5	2.1	2.2	6.8
5.51	1.5	0.3	1.8	2.4	2.2	6.0
5.57	1.6	0.3	1.9	2.3	2.1	6.0
5.65	1.6	0.3	2.0	2.1	2.1	6.1
5.72	1.2	0.5	2.2	1.7	2.1	5.5
5.81	1.9	0.2	1.2	1.6	2.0	4.9
5.88	2.0	0.3	1.0	1.4	1.9	4.6
5.95	1.8	0.3	1.1	1.4	1.8	4.6
5.99	2.7	0.2	0.5	1.5	1.8	4.9
6.10	2.0	0.3	0.8	1.2	1.8	4.3
6.21	1.6	0.3	0.8	1.2	1.7	3.9
6.27	2.0	0.2	0.3	1.4	1.6	3.8
6.39	2.0	0.2	0.3	1.2	1.6	3.7
6.51	1.4	0.3	0.6	0.9	1.5	3.2
6.63	1.7	0.3	0.3	1.0	1.5	3.2
6.69	1.7	0.4	0.5	0.8	1.5	3.3
6.81	1.7	0.2	0.2	1.1	1.5	3.2
6.92	1.4	0.3	0.4	1.0	1.4	3.0
7.01	1.5	0.3	0.4	0.9	1.4	3.1
7.12	1.3	0.3	0.3	0.8	1.4	2.7

Table G.21: YRH, bbe FluoroProbe data [µg l^{-1}], July 31^{st} 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	0.0	2.2	11.3	0.0	3.3	13.5
0.01	0.0	0.0	11.6	2.4	2.9	14.1
0.11	0.0	0.7	15.7	0.0	1.4	16.3
0.26	8.7	0.0	7.2	4.1	2.2	20.0
0.33	11.3	0.6	7.6	2.1	2.0	21.6
0.42	0.6	0.9	14.0	1.3	1.9	16.7
0.46	6.1	0.6	9.4	3.3	2.5	19.3
0.57	3.0	0.7	12.8	3.1	1.8	19.6
0.65	2.0	0.1	12.8	2.9	2.6	17.8
0.74	0.0	2.1	14.0	0.0	2.5	16.1
0.79	8.0	0.0	9.5	2.9	2.4	20.4
0.85	7.5	0.1	9.4	3.6	2.5	20.6
0.88	4.7	0.6	11.6	3.9	1.8	20.8
0.96	0.0	1.5	14.2	1.7	2.5	17.4
1.04	4.2	0.6	10.5	3.9	2.6	19.2
1.11	3.5	0.0	10.7	5.2	2.5	19.4
1.18	0.0	0.8	12.5	3.5	2.5	16.8
1.21	6.8	0.9	9.7	3.7	2.2	21.0
1.26	0.9	1.1	12.7	2.3	2.4	17.0
1.34	4.2	0.5	9.0	4.4	2.6	18.1
1.39	4.3	0.1	9.3	4.3	2.4	18.0
1.42	4.4	0.4	9.6	3.1	2.4	17.5
1.41	6.8	0.5	9.5	2.3	2.1	19.1
1.42	0.0	1.5	13.3	0.6	2.5	15.4
1.50	4.2	0.7	10.8	1.7	2.3	17.4
1.58	2.6	0.8	11.4	1.9	2.2	16.7
1.65	3.4	1.3	11.0	1.1	2.6	16.8
1.72	2.4	0.5	10.3	3.2	2.5	16.3
1.78	3.6	0.9	10.8	1.7	2.4	17.1
1.85	6.5	0.4	8.1	3.2	2.5	18.2
1.89	4.8	0.5	9.8	2.7	2.2	17.7
1.98	4.4	0.0	10.2	3.2	2.2	17.8
2.04	4.9	0.3	9.8	2.8	2.3	17.7
2.08	3.5	0.5	10.5	2.4	2.4	16.9
2.14	3.5	0.8	10.7	2.4	2.3	17.3
2.20	5.0	0.9	9.8	2.1	2.6	17.7
2.22	2.7	1.1	11.3	1.4	2.5	16.5
2.29	3.9	0.8	10.4	2.2	2.6	17.3
2.35	4.0	0.7	9.1	3.4	2.6	17.1
2.40	3.4	1.2	9.7	1.6	2.8	15.8
2.46	4.3	0.3	8.4	3.0	2.8	16.1
2.50	3.7	0.7	8.9	2.1	2.3	15.4
2.56	2.8	0.8	9.9	1.4	2.5	15.0
2.62	2.5	0.8	9.7	1.9	2.6	14.9
2.68	0.2	1.1	11.1	0.8	2.7	13.1
2.74	3.2	0.8	9.0	1.7	2.8	14.7
2.79	2.5	0.9	8.9	1.4	2.7	13.6

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
2.84	1.1	1.3	10.4	0.4	2.6	13.3
2.87	4.0	0.6	8.5	1.7	2.6	14.9
2.89	2.2	0.8	9.4	1.7	2.7	14.1
2.94	2.7	1.2	9.9	0.4	2.5	14.2
3.01	1.5	0.8	8.5	1.1	2.7	11.9
3.06	2.4	0.6	7.9	1.3	2.7	12.2
3.10	2.6	0.7	7.9	1.6	2.7	12.7
3.15	0.4	1.2	9.7	0.2	2.7	11.5
3.18	1.1	1.1	9.5	0.5	2.8	12.1
3.23	1.9	0.9	8.9	0.9	2.7	12.6
3.31	2.0	1.2	9.4	0.0	2.8	12.6
3.37	1.2	1.0	9.1	0.8	2.8	12.1
3.42	1.0	1.1	9.7	0.6	2.8	12.4
3.43	1.7	1.1	9.2	0.7	2.9	12.7
3.46	0.4	1.1	10.2	0.5	2.9	12.2
3.49	0.5	1.2	10.1	0.3	2.9	12.0
3.56	0.2	1.2	10.1	0.4	3.0	12.0
3.64	0.6	1.5	10.1	0.0	2.9	12.2
3.71	1.3	0.9	9.3	0.9	3.0	12.5
3.79	1.0	1.2	9.6	0.6	2.9	12.4
3.86	0.0	1.3	9.9	0.2	2.9	11.4
3.94	0.0	1.2	8.9	0.5	2.9	10.6
4.00	0.0	1.0	8.9	0.5	2.8	10.3
4.07	0.0	1.1	9.3	0.3	2.9	10.7
4.10	0.0	0.7	7.9	0.8	2.7	9.4
4.11	0.2	0.9	7.7	0.5	2.9	9.3
4.18	0.2	0.9	7.8	0.4	2.8	9.2
4.27	0.3	0.6	6.3	0.8	2.7	7.9
4.34	0.0	0.6	6.2	0.5	2.6	7.3
4.42	0.0	0.6	6.3	0.5	2.6	7.4
4.50	0.0	0.5	5.4	0.8	2.7	6.7
4.56	0.0	0.3	4.9	1.2	2.6	6.4
4.63	1.1	0.3	4.0	1.0	2.4	6.3
4.71	0.7	0.4	3.8	0.8	2.4	5.7
4.81	1.0	0.2	3.4	1.3	2.5	5.9
4.86	1.0	0.4	3.3	1.2	2.4	5.9
4.93	1.2	0.3	3.3	1.3	2.4	6.1
5.00	0.7	0.4	3.2	1.3	2.4	5.6
5.07	0.8	0.5	3.3	1.0	2.3	5.6
5.13	0.6	0.4	3.4	1.2	2.3	5.7
5.19	0.6	0.5	3.5	1.1	2.4	5.7
5.24	0.4	0.7	3.6	0.8	2.3	5.5
5.30	0.6	0.6	3.7	1.0	2.4	5.9
5.38	1.0	0.2	3.8	1.3	2.4	6.3
5.44	1.1	0.3	3.4	1.3	2.4	6.0

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
5.51	1.6	0.2	3.2	1.6	2.3	6.7
5.58	1.5	0.3	3.2	1.4	2.3	6.4
5.65	1.9	0.3	2.9	1.5	2.2	6.6
5.71	1.8	0.3	2.7	1.6	2.3	6.4
5.75	2.1	0.1	2.7	1.5	2.3	6.5
5.83	1.3	0.4	3.2	1.3	2.3	6.1
5.94	1.8	0.5	2.5	1.0	2.2	5.8
6.06	1.3	0.4	2.4	1.1	2.1	5.3

Table G.22: YRI, bbe FluoroProbe data [µg l^{-1}], July 31st 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	4.4	0.0	8.8	3.5	1.7	16.6
0.12	0.0	0.0	9.4	4.3	2.3	13.8
0.15	0.0	2.3	12.8	0.0	1.2	15.1
0.18	10.7	0.0	5.4	3.2	2.5	19.3
0.30	11.2	0.0	7.2	2.2	1.0	20.5
0.36	4.5	0.0	10.2	0.5	2.7	15.2
0.42	6.4	0.7	8.9	2.3	1.9	18.2
0.48	3.2	0.0	8.7	4.2	3.1	16.2
0.55	10.4	0.4	8.4	3.5	1.1	22.7
0.60	2.4	0.8	13.2	2.4	1.7	18.8
0.69	1.3	0.0	13.4	2.2	1.7	16.9
0.78	8.1	2.0	9.0	0.0	2.9	19.0
0.87	6.1	0.6	11.8	1.8	1.3	20.3
0.92	5.7	0.3	10.5	3.3	1.2	19.9
0.97	0.0	0.0	9.6	7.8	2.8	17.4
1.01	15.4	0.0	5.1	2.6	2.3	23.2
1.06	3.0	0.0	11.0	3.7	2.0	17.8
1.07	10.6	0.0	6.9	4.0	2.2	21.4
1.17	0.0	1.2	11.8	1.8	3.1	14.8
1.23	5.9	0.0	8.5	3.5	3.2	17.9
1.29	6.9	0.0	9.1	2.8	2.3	18.8
1.37	7.4	0.3	9.7	1.7	2.2	19.1
1.43	9.4	0.7	5.5	3.5	2.7	19.1
1.46	6.1	0.4	9.3	2.3	2.2	18.0
1.55	4.0	0.0	9.4	3.7	2.7	17.1
1.70	1.7	1.6	12.1	0.0	2.3	15.3
1.80	2.0	0.6	11.5	0.0	2.4	14.1
1.85	4.9	0.2	8.8	1.7	2.3	15.6
1.91	3.2	0.9	10.1	0.0	2.4	14.3
1.96	6.2	0.0	7.6	3.1	2.1	16.9
2.03	3.4	0.0	8.2	3.2	2.7	14.9
2.13	4.7	0.5	8.1	2.5	2.2	15.8
2.25	5.5	0.5	8.5	2.1	1.8	16.7
2.32	2.2	1.0	9.3	1.4	2.4	13.8
2.36	5.6	0.3	7.9	2.1	2.1	15.8
2.43	5.9	0.2	7.0	2.7	2.5	15.8
2.54	0.0	1.5	10.6	1.3	2.5	13.3
2.62	0.2	1.6	10.8	0.1	2.5	12.7
2.71	2.1	1.7	9.8	0.0	2.7	13.5
2.76	2.4	0.9	8.6	1.9	2.5	13.8
2.83	5.3	1.2	8.1	0.7	2.3	15.3
2.92	0.1	1.3	9.9	0.9	2.5	12.2
3.00	2.2	1.1	8.0	1.1	2.7	12.4
3.07	1.4	1.4	8.8	0.5	2.5	12.0
3.16	2.3	0.7	7.3	1.6	2.7	11.9
3.31	0.6	1.1	8.6	0.1	2.6	10.4
3.45	0.0	1.2	8.3	0.3	2.6	9.8
3.62	0.0	0.9	7.3	0.5	2.5	8.7

Table G.23: YRJ, bbe FluoroProbe data [µg l^{-1}], July 31st 2012

Depth [m]	Green	Bluegreen	Diatoms	Cryptophyta	Yellow substances	total conc.
0.00	7.9	0.0	7.8	2.6	2.3	18.4
0.06	4.8	0.0	5.4	5.9	4.1	16.2
0.12	0.4	0.1	13.9	1.2	2.7	15.6
0.19	5.2	0.0	11.0	2.2	1.7	18.3
0.27	5.3	1.3	11.3	0.1	2.0	18.0
0.27	0.0	1.1	15.3	0.0	1.8	16.4
0.34	8.8	0.0	9.7	2.1	1.5	20.6
0.43	5.3	0.0	10.2	2.7	2.0	18.1
0.47	10.6	0.0	8.6	1.7	2.0	20.9
0.49	2.9	0.9	13.8	0.0	0.8	17.6
0.55	3.8	1.4	13.2	0.0	1.8	18.4
0.59	0.2	1.1	14.5	0.0	2.4	15.8
0.64	6.0	1.3	11.2	0.0	2.5	18.4
0.71	1.5	1.1	13.8	0.0	2.0	16.4
0.77	0.0	0.2	13.1	2.6	2.2	15.9
0.82	4.5	1.0	10.7	1.9	2.0	18.0
0.90	1.5	1.4	12.6	0.0	2.7	15.5

H Error Estimation – Single-spot vs Transect Sampling

Table H.1: HVS Depth Gradient Extrapolation CO_2 [t] and CH_4 [kg], June 2012

Parameter	Depth layer [m]	Volume [l]	Only YH3	YH3	YH4	YHE	YH5	YHF	YHG	$\sum$	Error [%]
CO_2	0-1	2.5E+08	0.45	0.1	0.04	0.04	0.03	0.04	0.05	0.3	50
	1-3	3.9E+08	1.18	0.27	0.05	0.1	0.07	0.03	0.15	0.67	77
	3-7	5.2E+08	3.21	0.73	0.69	0.56	0.51	0.25		2.74	17
	7-9	1.5E+08	1.82	0.41	0.29	0.26				0.96	88
	9-11	8.7E+07	1.21	0.27	0.2					0.47	154
	11-13	2.7E+07	0.4	0.09						0.09	342
	13-bottom	2.2E+06	0.03	0.01						0.01	342
CH_4	0-1	2.5E+08	2.19	0.50	0.23	0.31	0.24	0.22	0.57	2.06	6
	1-3	3.9E+08	2.35	0.53	0.40	0.58	0.53	0.36	0.66	3.06	-23
	3-7	5.2E+08	2.02	0.46	0.07	0.78	0.37	0.30		1.99	2
	7-9	1.5E+08	0.01	0.00	0.00	0.15				0.15	-93
	9-11	8.7E+07	0.03	0.01	0.00					0.01	342
	11-13	2.7E+07	0.27	0.06						0.06	342
	13-bottom	2.2E+06	0.20	0.04						0.04	342

Table H.2: HVS Depth Gradient Extrapolation CO_2 [t] and CH_4 [kg], July 2012

Parameter	Depth layer [m]	Volume [l]	Only YH3	YH3	YH4	YHE	YH5	YHF	YHG	$\sum$	Error [%]
CO_2	0-1	2.5E+08	0.04	0.01	0.01	0.02	0.01	0.01	0.03	0.09	-58
	1-3	3.9E+08	0.08	0.02	0.01	0.03	0.12	0.07	0.1	0.35	-78
	3-7	5.2E+08	5.04	1.14	0.77	1.02	0.73	0.37		4.03	25
	7-9	1.5E+08	2.07	0.47	0.36	0.41				1.24	67
	9-11	8.7E+07	1.24	0.28	0.21					0.49	153
	11-13	2.7E+07	0.39	0.09						0.09	342
	13-bottom	2.2E+06	0.03	0.01						0.01	342
CH_4	0-1	2.5E+08	1.6	0.4	0.4	0.3	0.2	0.1	0.2	1.6	0
	1-3	3.9E+08	1.6	0.4	0.5	0.5	0.2	0.0	0.7	2.2	-27
	3-7	5.2E+08	3.3	0.7	0.8	1.7	0.8	0.0		4.1	-20
	7-9	1.5E+08	0.5	0.1	2	1.9				3.9	-87
	9-11	8.7E+07	19.7	4.5	6.9					11.4	73
	11-13	2.7E+07	27.2	6.2						6.2	342
	13-bottom	2.2E+06	3.4	0.8						0.8	342

Table H.3: HVS Depth Gradient Extrapolation Cl^-, ${SO_4}^{2-}$ and Ca^{2+}, June 2012, in kg

Parameter	Depth layer [m]	Volume [l]	Only YH3	YH3	YH4	YHE	YH5	YHF	YHG	$\sum$	Error [%]
Cl^-	0-1	2.5E+08	6001.9	1357.8	992.2	1196.7	913.6	560	1047.5	6067.7	-1
	1-3	3.9E+08	9218.3	2085.4	1570	1829.9	1445.3	816.5	1536.2	9284	-1
	3-7	5.2E+08	12338.8	2791.3	2030.8	2513	1983	1056.7		10374.8	19
	7-9	1.5E+08	3360.7	760.3	557.6	741.2				2059	63
	9-11	8.7E+07	1810.9	409.7	301.8					711.4	155
	11-13	2.7E+07	596.1	134.9						134.9	342
	13-bottom	2.2E+06	48.3	10.9						10.9	342
${SO_4}^{2-}$	0-1	2.5E+08	5031.4	1138.2	940.9	1006.6	862.9	450.6	855.9	5255	-4
	1-3	3.9E+08	7800	1764.6	1306.1	1552.7	1198.4	668	1300.5	7790.2	0
	3-7	5.2E+08	10387.8	2350	1730.6	2099.5	1660.5	889.6		8730.2	19
	7-9	1.5E+08	2989	676.2	495.3	638.4				1809.9	65
	9-11	8.7E+07	1601.9	362.4	269.7	5297.2				5929.3	-73
	11-13	2.7E+07	476.3	107.8						107.8	342
	13-bottom	2.2E+06	37.3	8.4						8.4	342
Ca^{2+}	0-1	2.5E+08	5184.7	1172.9	855.3	1027.2	816	476.8	894.2	5242.5	-1
	1-3	3.9E+08	7839.5	1773.5	1312.7	1584.4	1264.7	681.5	1385.9	8002.6	-2
	3-7	5.2E+08	10282.3	2326.1	1721.8	2226.7	1725	952.9		8952.5	15
	7-9	1.5E+08	2772.2	627.1	461.6	594.8				1683.6	65
	9-11	8.7E+07	1610.6	364.4	258					622.4	159
	11-13	2.7E+07	495.4	112.1						112.1	342
	13-bottom	2.2E+06	40.4	9.1						9.1	342

Table H.4: HVS Depth Gradient Extrapolation Cl^{-}, ${SO_4}^{2-}$ and Ca^{2+}, July 2012, in kg

Parameter	Depth layer [m]	Volume [l]	Only YH3	YH3	YH4	YHE	YH5	YHF	YHG	$\sum$	Error [%]
Cl^{-}	0-1	2.5E+08	6436.1	1456	1111.9	1330.2	1077.6	581.8	1209.3	6766.9	-5
	1-3	3.9E+08	10045.5	2272.5	1774.5	1980.5	1656.1	887.3	1865.3	10436.2	-4
	3-7	5.2E+08	14448	3268.5	2348.7	2820.5	2103.9	1250.9		11792.4	23
	7-9	1.5E+08	3500.1	791.8	593.9	710.1				2095.7	67
	9-11	8.7E+07	1958.9	443.1	328					771.2	154
	11-13	2.7E+07	617.9	139.8						139.8	342
	13-bottom	2.2E+06	51.4	11.6						11.6	342
${SO_4}^{2-}$	0-1	2.5E+08	5618.8	1271.1	970.8	1155.6	878.5	479	924	5679	-1
	1-3	3.9E+08	8824.3	1996.3	1484.2	1719	1463.4	735.5	1405.6	8804	0
	3-7	5.2E+08	13129.7	2970.3	1986.6	2247.9	1692.8	989		9886.6	33
	7-9	1.5E+08	3531	798.8	627.6	691.4				2117.8	67
	9-11	8.7E+07	2028.5	458.9	301.8					760.7	167
	11-13	2.7E+07	536.2	121.3						121.3	342
	13-bottom	2.2E+06	42.4	9.6						9.6	342
Ca^{2+}	0-1	2.5E+08	5669.9	1282.7	970.8	1181.3	882.4	520.6	1034.7	5872.4	-3
	1-3	3.9E+08	8863.7	2005.2	1490.8	1829.9	1385.1	786.1	1602.6	9099.7	-3
	3-7	5.2E+08	11706	2648.2	2013.1	2470.6	1862	1047.7		10041.7	17
	7-9	1.5E+08	2849.6	644.7	495.3	613.5				1753.5	63
	9-11	8.7E+07	1593.2	360.4	282.8					643.2	148
	11-13	2.7E+07	514.5	116.4						116.4	342
	13-bottom	2.2E+06	41.9	9.5						9.5	342

Table H.5: HVS Depth Gradient Extrapolation TP, June 2012, in kg

Parameter	Depth layer [m]	Volume [l]	Only YH3	YH3	YH4	YHE	YH5	YHF	YHG	$\sum$	Error [%]
TP	0-1	2.5E+08	5.1	1.2	1	1.2	1	1	1.7	7.1	-28
	1-3	3.9E+08	9.9	2.2	1.9	1.8	1.9	1.1	2.6	11.5	-14
	3-7	5.2E+08	8.4	1.9	1.7	3.1	2.3	1.3		10.2	-18
	7-9	1.5E+08	2.2	0.5	0.4	0.6				1.4	51
	9-11	8.7E+07	1.3	0.3	0.2					0.5	147
	11-13	2.7E+07	0.6	0.1						0.1	342
	13-bottom	2.2E+06	0.1	0						0	-

Table H.6: HVS Depth Gradient Extrapolation TP, July 2012, in kg

Parameter	Depth layer [m]	Volume [l]	Only YH3	YH3	YH4	YHE	YH5	YHF	YHG	$\sum$	Error [%]
TP	0-1	2.5E+08	7.7	1.7	2	2.1	1.8	1.3	3.8	12.8	-40
	1-3	3.9E+08	14.2	3.2	3	4.1	3.3	2.2	5	20.8	-32
	3-7	5.2E+08	116	26.2	3.2	4.2	3.7	3		40.4	187
	7-9	1.5E+08	2	0.5	0.3	1				1.7	19
	9-11	8.7E+07	1.5	0.3	0.4					0.7	103
	11-13	2.7E+07	1.1	0.3						0.3	342
	13-bottom	2.2E+06	0.1	0						0	-

Table H.7: RVS Depth Gradient Extrapolation CO_2 [t] and CH_4 [kg], June 2012

Parameter	Depth layer [m]	Volume [l]	Only YR3	YR3	YRE	YRF	YRH	YRI	YRJ	$\sum$	Error [%]
CO_2	0-1	1.8E+08	0.23	0.09	0.02	0.03	0.01	0	0.02	0.17	37
	1-3	2.9E+08	0.43	0.16	0.03	0.04	0.01	0.01	0.03	0.28	53
	3-7	4.1E+08	2.92	1.1	0.45	0.69	0.2	0.03		2.47	19
	7-9	1.2E+08	1.28	0.48	0.21	0.37				1.06	21
	9-11	7.3E+07	0.79	0.3	0.13					0.43	85
	11-13	3.5E+07	0.45	0.17	0.07					0.24	88
	13-bottom	1.3E+07	0.22	0.08						0.08	166
CH_4	0-1	1.8E+08	1.3	0.5	0.1	0.3	0.1	0.1	0.3	1.3	2
	1-3	2.9E+08	1.5	0.6	0.3	0.4	0.1	0.1	8.6	10	-85
	3-7	4.1E+08	1.3	0.5	0.3	2	0.4	0.3		3.4	-63
	7-9	1.2E+08	0	0	0	0				0	-
	9-11	7.3E+07	0	0	0					0	-
	11-13	3.5E+07	0	0	0					0	-
	13-bottom	1.3E+07	0	0						0	-

Table H.8: RVS Depth Gradient Extrapolation CO_2 [t] and CH_4 [kg], July 2012

Parameter	Depth layer [m]	Volume [l]	Only YR3	YR3	YRE	YRF	YRH	YRI	YRJ	$\sum$	Error [%]
CO_2	0-1	1.8E+08	0.06	0.02	0.01	0.01	0	0	0.01	0.05	12
	1-3	2.9E+08	0.09	0.03	0.01	0.02	0.01	0.01	0.03	0.11	-12
	3-7	4.1E+08	4.03	1.51	0.56	0.98	0.29	0.01		3.35	20
	7-9	1.2E+08	1.5	0.56	0.23	0.33				1.12	33
	9-11	7.3E+07	0.97	0.36	0.16					0.52	85
	11-13	3.5E+07	0.5	0.19	0.07					0.26	93
	13-bottom	1.3E+07	0.2	0.07						73.4	166
CH_4	0-1	1.8E+08	0	0	0	0.4	0.1	0	0.4	1.3	-100
	1-3	2.9E+08	1.9	0.7	0.4	0.7	0.2	0.2	0.6	2.8	-33
	3-7	4.1E+08	1.2	0.4	0.1	0.4	0.8	0.2		1.9	-38
	7-9	1.2E+08	0.2	0	0	1.8				1.9	-91
	9-11	7.3E+07	0	0	0.4					0.4	-100
	11-13	3.5E+07	4.3	1.6	4					5.6	-23
	13-bottom	1.3E+07	19.8	7.5						7.5	166

Table H.9: RVS Depth Gradient Extrapolation Cl^-, $SO_4{}^{2-}$ and Ca^{2+}, June 2012, in kg

Parameter	Depth layer [m]	Volume [l]	Only YR3	YR3	YRE	YRF	YRH	YRI	YRJ	$\sum$	Error [%]
Cl^-	0-1	1.8E+08	3334.1	1252.5	513.9	835.8	282.1	131.4	401.1	3416.7	-2
	1-3	2.9E+08	5425.1	2037.9	877.8	1301.4	361.5	206.7	656.5	5441.7	0
	3-7	4.1E+08	7497.7	2816.5	1136.4	1798.5	477.5	300.4		6529.2	15
	7-9	1.2E+08	2174.2	816.7	304.4	485.7				1606.8	35
	9-11	7.3E+07	1271.7	477.7	193.7					671.4	89
	11-13	3.5E+07	608.3	228.5	90.4					318.9	91
	13-bottom	1.3E+07	246.7	92.7						92.7	166
$SO_4{}^{2-}$	0-1	1.8E+08	3071.9	1154	508.1	763.5	214.7	123.2	371.5	3134.9	-2
	1-3	2.9E+08	4918.4	1847.6	780.8	1258.2	331.7	194.8	602.1	5015.2	-2
	3-7	4.1E+08	7083.4	2660.9	1072.2	1678.6	458.2	272.4		6142.2	15
	7-9	1.2E+08	2235.9	839.9	335.1	533.4				1708.3	31
	9-11	7.3E+07	1330.5	499.8	206.2					706.0	88
	11-13	3.5E+07	636.9	239.3	96					335.2	90
	13-bottom	1.3E+07	231.5	87						87	166
Ca^{2+}	0-1	1.8E+08	3240.5	1217.3	525.5	840.4	229.6	137.4	423.9	3374	-4
	1-3	2.9E+08	5335.7	2004.4	831.6	1308.6	361.5	222.1	663.7	5391.8	-1
	3-7	4.1E+08	6752	2536.4	1123.6	1798.5	505.1	313.6		6277.2	8
	7-9	1.2E+08	1865.3	700.7	285.3	452.9				1438.9	30
	9-11	7.3E+07	1065.9	400.4	169.8					570.2	87
	11-13	3.5E+07	529.6	198.9	80.4					279.4	90
	13-bottom	1.3E+07	210.8	79.2						79.2	166

Table H.10: RVS Depth Gradient Extrapolation Cl^-, $SO_4{}^{2-}$ and Ca^{2+}, July 2012, in kg

Parameter	Depth layer [m]	Volume [l]	Only YR3	YR3	YRE	YRF	YRH	YRI	YRJ	$\sum$	Error [%]
Cl^-	0-1	1.8E+08	3727.5	1400.2	630	926.2	272.1	170.9	492.3	3891.7	-4
	1-3	2.9E+08	6051.1	2273.1	1007.2	1524.2	427	256.6	790.7	6278.8	-4
	3-7	4.1E+08	8947.5	3361.1	1354.7	2038.3	604.4	356.6		7715.1	16
	7-9	1.2E+08	2100	788.9	340.8	628.7				1758.4	19
	9-11	7.3E+07	1308.5	491.5	211.9					703.4	86
	11-13	3.5E+07	658.4	247.3	100.4					347.7	89
	13-bottom	1.3E+07	246.7	92.7						92.7	166
$SO_4{}^{2-}$	0-1	1.8E+08	3390.3	1273.6	484.8	826.8	200.9	128.4	369.2	3283.8	3
	1-3	2.9E+08	4888.6	1836.4	850.1	1128.8	361.5	211.4	594.8	4983	-2
	3-7	4.1E+08	7249.1	2723.1	1117.2	1588.6	494	262.5		6185.4	17
	7-9	1.2E+08	2705.3	1016.3	419.3	578				2013.6	34
	9-11	7.3E+07	1514.3	568.8	224.5					793.3	91
	11-13	3.5E+07	808.7	303.8	104.8					408.6	98
	13-bottom	1.3E+07	243.9	91.6						91.6	166
Ca^{2+}	0-1	1.8E+08	3746.2	1407.3	566.1	853.9	242.1	143.3	451.3	3664	2
	1-3	2.9E+08	5693.4	2138.7	910.2	1366.1	383.3	231.6	714.5	5744.4	-1
	3-7	4.1E+08	7621.9	2863.2	1219.9	1848.4	518.9	321.9		6772.2	13
	7-9	1.2E+08	1865.3	700.7	291	482.7				1474.4	27
	9-11	7.3E+07	1080.6	405.9	170.9					576.8	87
	11-13	3.5E+07	533.2	200.3	83.8					284	88
	13-bottom	1.3E+07	216.4	81.3						81.2	166

Table H.11: RVS Depth Gradient ExtrapolationTP, June 2012, in kg

Parameter	Depth layer [m]	Volume [l]	Only YR3	YR3	YRE	YRF	YRH	YRI	YRJ	$\sum$	Error [%]
TP	0-1	1.8E+08	3.9	1.5	0.6	0.9	0.2	0.1	0.6	3.9	2
	1-3	2.9E+08	6.3	2.4	1	1.6	0.5	0.2	1	6.6	-5
	3-7	4.1E+08	5.8	2.2	1.5	2.1	0.7	0.5		6.9	-16
	7-9	1.2E+08	1.5	0.6	0.3	0.6				1.4	8
	9-11	7.3E+07	0.7	0.3	0.1					0.4	78
	11-13	3.5E+07	0.4	0.2	0					0.2	75
	13-bottom	1.3E+07	0.5	0.2						0.2	166

Table H.12: RVS Depth Gradient ExtrapolationTP, June 2012, in kg

Parameter	Depth layer [m]	Volume [l]	Only YR3	YR3	YRE	YRF	YRH	YRI	YRJ	$\sum$	Error [%]
TP	0-1	1.8E+08	4.3	1.6	0.6	0.9	0.3	0.2	0.8	4.3	0
	1-3	2.9E+08	6.6	2.5	1.1	1.5	0.6	0.3	1.1	7.1	-8
	3-7	4.1E+08	13.3	5	1.4	2.1	0.7	0.5		9.7	37
	7-9	1.2E+08	1.4	0.5	0.2	0.5				1.2	11
	9-11	7.3E+07	1	0.4	0.1					0.5	101
	11-13	3.5E+07	0.6	0.2	0.1					0.3	79
	13-bottom	1.3E+07	0.5	0.2						0.2	166