

# GEF2610 on F/F Trygve Braarud - 22.09.17

Marit Kollstuen

September 2017

## General information

We went to stations at three different locations displayed in Table 1. Group two started taking air-sea-flux measurements, then CTD measurements and lastly measurements of the optics. As we revisited the first station before we returned from the field trip, we took air-sea-flux measurements twice.

Table 1: Locations

Okshalffuen
Lat: 59.865
Long: 10.7013
Malmøykalven
Lat: 59. 8728
Long: 10.7366
Geitholmen
Lat: 59.8806
Long: 10.6467

## Group 2 - results

Air-sea-flux measurements

Optics

Table 2: Air-sea flux number 1

<b>First measurement</b>			
Time:	10:13	Weather:	2 (Cloudy)
Station:	Oksvaldfluen	Cloud cover, $C$ :	8/8 Octas
Windspeed, $V$ :	$3.9ms^{-1}$	Depth:	83.1m
Air density, $\rho_{air}$ :	$1.3kmm^{-3}$	$c_d$ :	$1 \cdot 10^{-3}$
Short-wave radiation, $Q_s$ :			
	Irradiance, $Q_q(air)$ :	$140\mu molm^{-2}s^{-1}$	
	Corrected irradiance, $Q_q(air)$	$molm^{-2}s^{-1}$	
	Energy irradiance just beneath surface, $Q_s(0)$	$70Wm^{-2}$	
Long-wave radiation, $Q_b$ :			
	$t_w$ (approximately 1.3m beneath the surface):	$14.9^\circ C$	
	$e_a$ :	71%	
	$Q_b$ :	$-19.4Wm^{-2}$	
Sensible heat, $Q_h$ :			
	$t_a$ :	$10.9^\circ C$	
	$Q_h$ :	$-29.3Wm^{-2}$	
Total heat, $Q_{tot}$ :			
	$Q_{tot} = Q_s + Q_b + Q_h$ :	$21.3Wm^{-2}$	
Kinetic energy, $Q_{kin}$ :			
	$Q_{kin} = \rho_{air}c_dV^3$ :	$0.077Wm^{-2}$	

Table 3: Air-sea flux number 2

<b>Second measurement</b>			
Time:	12:28	Weather:	2 (Cloudy)
Station:	Oksvaldfluen	Cloud cover, $C$ :	7/8 Octas
Windspeed, $V$ :	$1.5ms^{-1}$	Depth:	83.1m
Air density, $\rho_{air}$ :	$1.3kmm^{-3}$	$c_d$ :	$1 \cdot 10^{-3}$
Short-wave radiation, $Q_s$ :			
	Irradiance, $Q_q(air)$ :	$348\mu molm^{-2}s^{-1}$	
	Corrected irradiance, $Q_q(air)$	$molm^{-2}s^{-1}$	
	Energy irradiance just beneath surface, $Q_s(0)$	$174Wm^{-2}$	
Long-wave radiation, $Q_b$ :			
	$t_w$ (approximately 1.3m beneath the surface):	$14.9^\circ C$	
	$e_a$ :	65%	
	$Q_b$ :	$-29.9Wm^{-2}$	
Sensible heat, $Q_h$ :			
	$t_a$ :	$12.5^\circ C$	
	$Q_h$ :	$-6.8Wm^{-2}$	
Total heat, $Q_{tot}$ :			
	$Q_{tot} = Q_s + Q_b + Q_h$ :	$137.3Wm^{-2}$	
Kinetic energy, $Q_{kin}$ :			
	$Q_{kin} = \rho_{air}c_dV^3$ :	$4.4 \cdot 10^{-3}Wm^{-2}$	

Table 4: Optics - measurements

Station:	Geitholmen	Time:	11:05
Cloud cover:	7/8 octas	Sea:	1 (calm)
Seccidepth:	6m	$Q_{deck,ref}$ :	$382.1 Wm^{-2}$
<b>Depth, [m]</b>	<b>Air measurement, [<math>Wm^{-2}</math>]</b>	<b>Water measurement, [<math>Wm^{-2}</math>]</b>	<b>Normalized water-signal, [<math>Wm^{-2}</math>]</b>
air	382.1	270	270
1	333	130	149.2
2	358.9	88	93.7
5	383.7	24	24
10	393.8	6	5.8
15	391.8	2.1	2
20	386.5	0.9	0.88