

## **6. Underway sampling: Dust collection**

### **a. Introduction**

Dust is one of the major contributors to the total sedimentary fluxes in the deep eastern Mediterranean. It is thought to contribute 2/3 of the total fluxes to an area in which we have the Bannock and Urania basin sediment trap moorings. Dust is originating mainly from continental regions by major wind movements. For the Mediterranean most of these fluxes are known to take place during May/June from the Sahara, but may occasionally also come from a more northern direction. Such dusty episodes are known to be irregular in size and distribution. If we want to examine thoroughly the whole process of sea sedimentation, we have to collect samples of this dust, in order to investigate its quality, quantity, provenance, and relative contribution to the total amount of sediments in the sea.

### **b. Technical – Sampling**

To collect the dust we have used two vacuum cleaners, which were inhaling the air through a filter. These dust collectors were placed on the front deck of RV Mare Oceano. Their position has been selected to be away from all the sources that possibly may pollute the air (ship 's chimney, air exhaust, e.t.a.) and as high as possible above the sea surface.

A timer was connected with the two dust collectors, which was switched on as soon as the collectors were turned on. This timer was recording the periods that the collectors were really working, since they were not operational continuously but only under favorable relative wind directions, i.e. away from the chimney. The recorded time was displayed in hours and decimal hours for each one of the dust collectors separately.

The two dust collectors had been placed vertically with the air intake looking upwards. Upon the vacuum' intakes we had adjusted one sheet-filter to each one. On each holder a sheet filter was placed so that the air should pass through the filters first. In this way the dust that was carried out by the air was collected on the filters' surface. Above the holders a metallic coverage was protecting the filters from the rain but it was placed in such a way so that not to prevent the entrance of the air.

The two dust collectors had a different type of filter, a glass fiber filter (GRASEBY P/N – G810) and a cellulose acetate filter (WHATMAN 41). From the glass fiber filter we collect the organic material, while the cellulose acetate filter's purpose was to collect the inorganic material. The two sheet filters were replaced every 24 hours with new ones. The already used filters were recorded and sealed in geochemical bags. The used glass fiber filters were stored in a freezer at a temperature of –20 °C while the cellulose acetate filters were stored in the lab. Each time a change of filters was taking place, the starting date and time were written down, in ship time and we were also recording the displayed value from the connected timer. The same process was being followed for the ending time as well.

**Table 6.1** - Samples collected during the Cruise

date: June 28 - July 7				
<b>aerosols - Dustcollector samples</b>				
cellulose filter			glassfiber filter	
UNDC1CA1			UNDC2GF1	
UNDC1CA2			UNDC2GF2	
UNDC1CA3			UNDC2GF3	
UNDC1CA4			UNDC2GF4	
UNDC1CA5			UNDC2GF5	
UNDC1CA6			UNDC2GF6	
UNDC1CA7			UNDC2GF7	

**Table 6.2 – Dust collector information**

<u>Date/Time of Day<sup>1</sup></u>	<u>Day #</u>	<u>Number of Filter<sup>2</sup></u>	<u>Type of Filter</u>	<u>Colour DC</u>	<u>Collector #</u>	<u>Counter Start</u>	<u>Counter End</u>	<u>hours Total</u>
29-6-2003/ 5.00 p.m.	1	UNDC1CA1	Cellulose	blue	1	4378.2	4399.7	21.5
	1	UNDC2GF1	Glass Fiber	yellow	2	4391.0	4412.4	21.4
30-5-2003/ 5.15 p.m.	2	UNDC1CA2	Cellulose	blue	1	4399.7	4422	22.3
	2	UNDC2GF2	Glass Fiber	yellow	2	4412.4	4434.6	22.2
1-7-2003/ 5.00 p.m.	3	UNDC1CA3	Cellulose	blue	1	4422	4436.7	14.7
	3	UNDC2GF3	Glass Fiber	yellow	2	4434.6	4449.3	14.7
2-7-2003/ 5.20 p.m.	4	UNDC1CA4	Cellulose	blue	1	4436.7	4455.5	18.8
	4	UNDC2GF4	Glass Fiber	yellow	2	4449.3	4468.1	18.8
3-7-2003/ 5.15 p.m.	5	UNDC1CA5	Cellulose	blue	1	4455.5	4468.6	13.1
	5	UNDC2GF5	Glass Fiber	yellow	2	4468.1	4481.1	13
4-7-2003/ 5.00 p.m.	6	UNDC1CA6	Cellulose	blue	1	4468.6	4484.4	15.8
	6	UNDC2GF6	Glass Fiber	yellow	2	4481.1	4496.9	15.8
5-7-2003/ 5.00 p.m.	7	UNDC1CA7	Cellulose	blue	1	4484.4	4507.9	23.5
	7	UNDC2GF7	Glass Fiber	yellow	2	4496.9	4520.4	23.5
End: 6-7-2003 // 5.00 p.m.								

**Notes:**

30-6 dust colour yellow / brown

1-7 dust a bith more blackish than yesterday

2-7 dust has a yellow / brown colour

3-7 DC off between 12.15 and 13.00 because of nearby passing ship  
dust colour: blackish brown

4-7 little dust today, colour greyish  
fire exercise on the front deck near the dust collector around 2 o'clock this afternoon

5-7 little dust, colour greyish, slightly brownish  
two samples were taken around the DC for comparison

1) UNDC-1 'shipdust'

2) UNDC-2 'ship dust - fire dust remains'

6-7 sample colour greyish, fairly large amount of dust  
the amount of dust on the GF filter is fairly larger than the amount on the CA filter