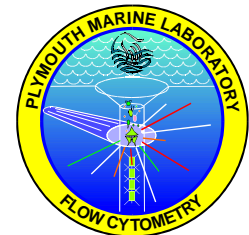


FLOW CYTOMETRY: LAB. AND SHIPBOARD APPLICATIONS

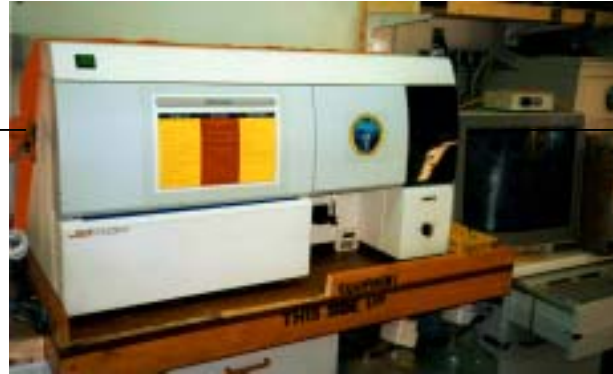
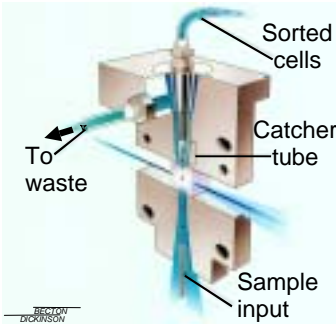


**Plymouth
Marine
Laboratory**

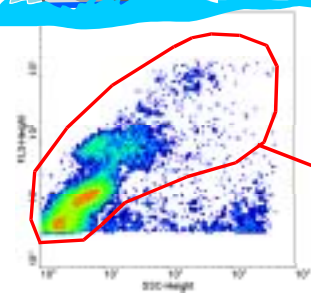
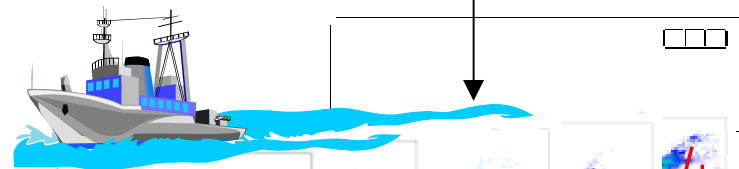
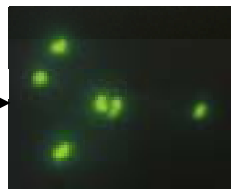
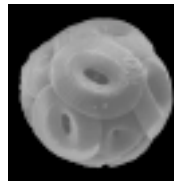
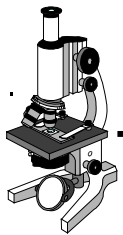
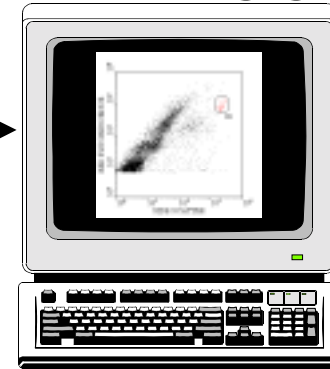


TOOLS AVAILABLE

SORTING



ANALYSIS

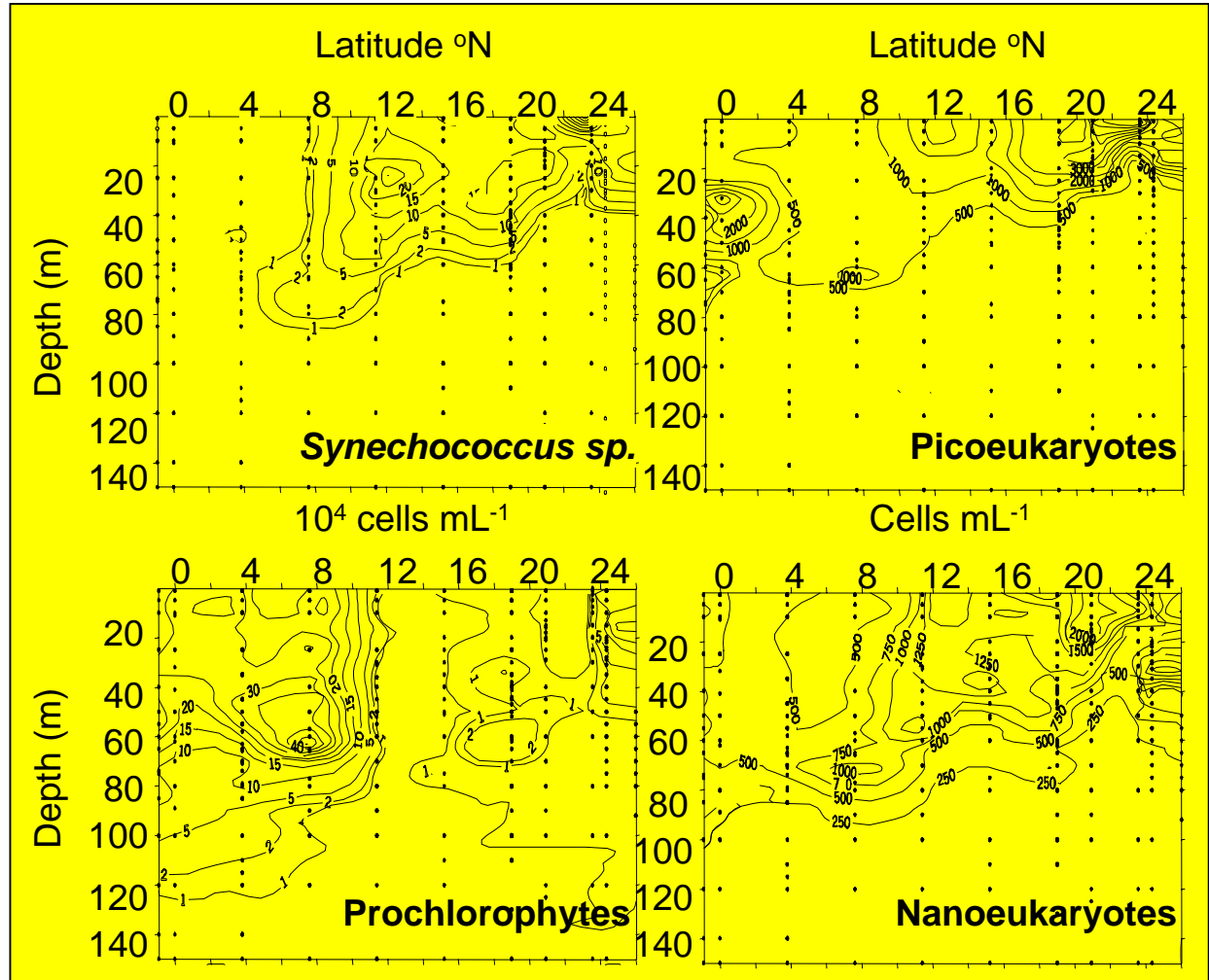
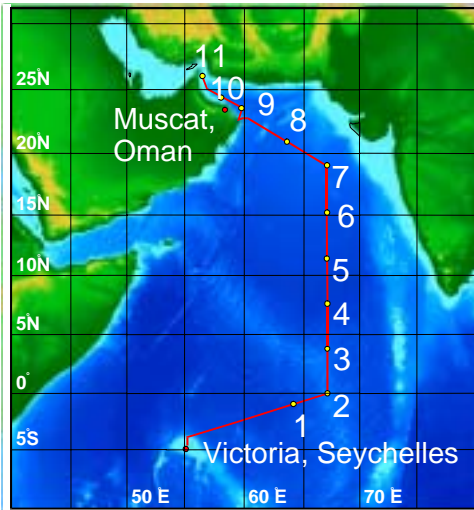


Rhytoplankton abundance

Station	R1	R2	R3	R4	R5
	Total pplk per ml	Picoeuc per ml	Dino per ml	Sm cocco per ml	Others per ml
1	15071	11887	3	420	2027
2	6132	1393	0	303	3877
3	8061	1523	0	610	4873
4	9203	4010	0	297	4223
5	7739	1353	0	603	4600
6	7065	2313	0	797	3037
7	11568	8183	0	577	1530
8	29603	23923	3	387	1493
9	19955	17130	0	510	1860
10	13984	7430	0	503	1793

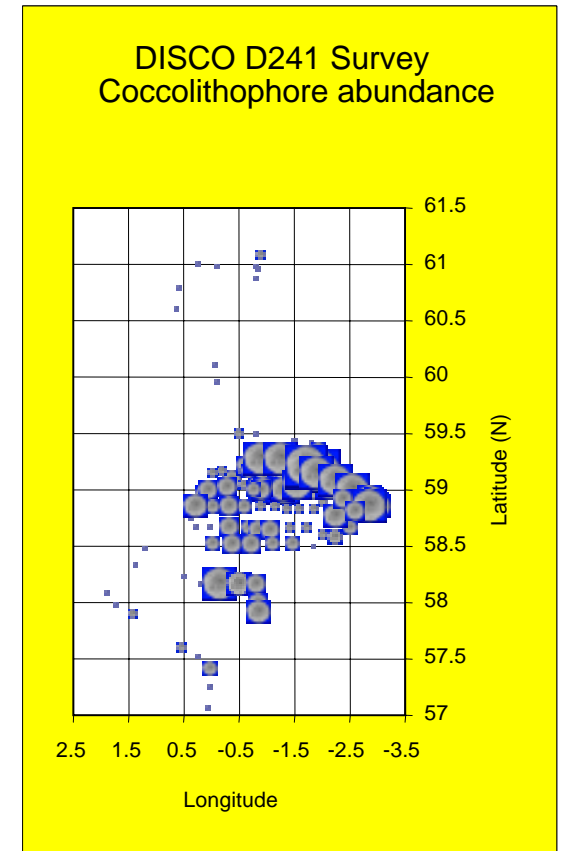
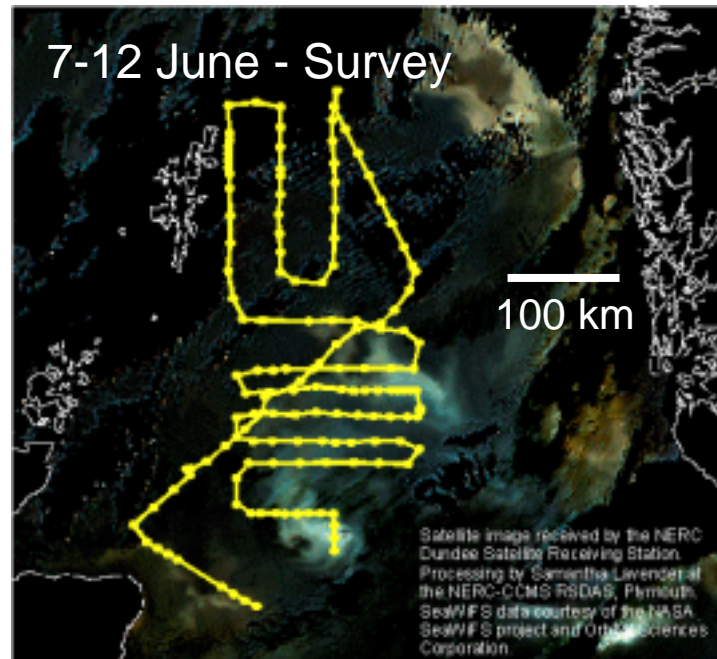
PHYTOPLANKTON STANDING STOCKS

AMBITION. September 2001



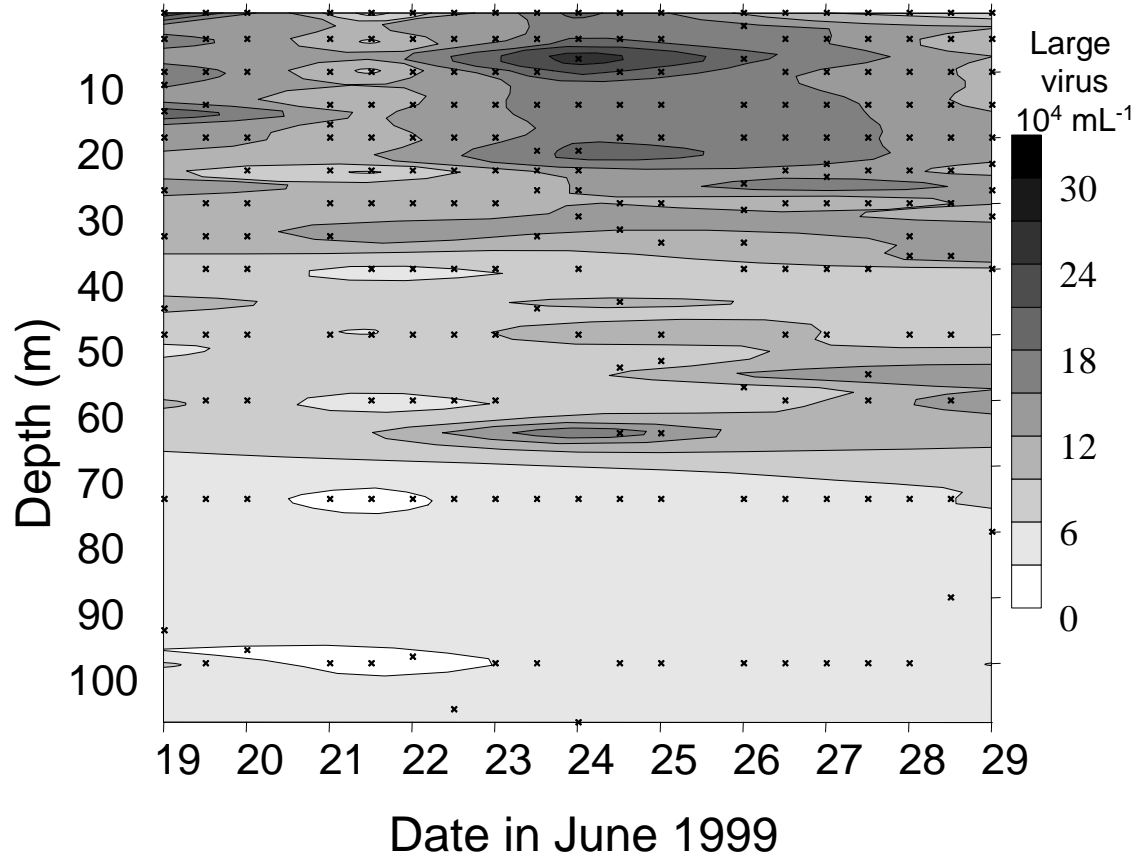
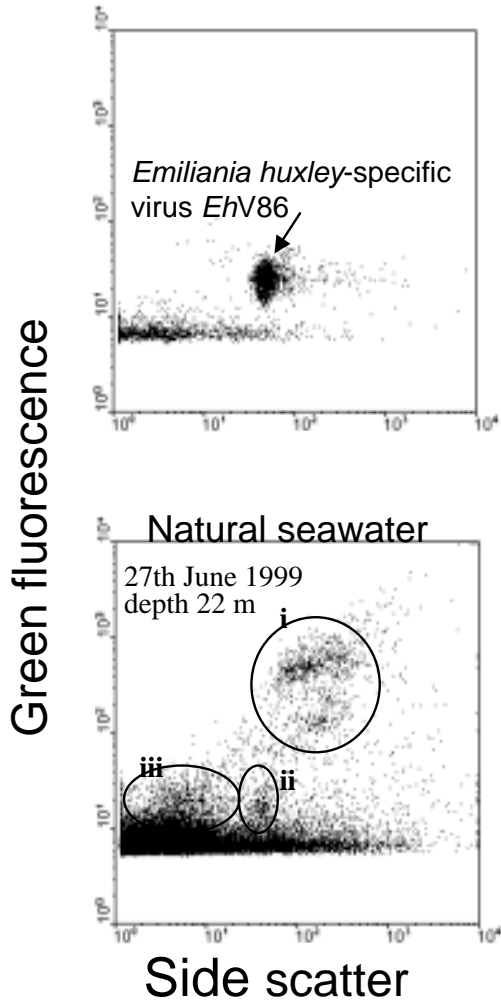
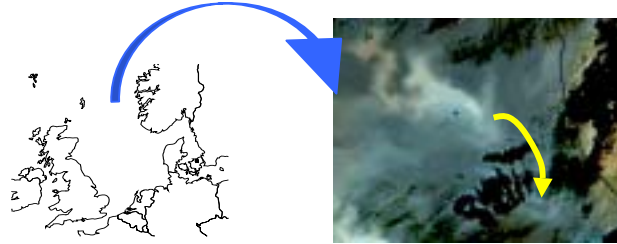
FINE-SCALE MAPPING

DISCO - Dimethyl Sulphide Biogeochemistry within a
coccolithophore bloom June 1999

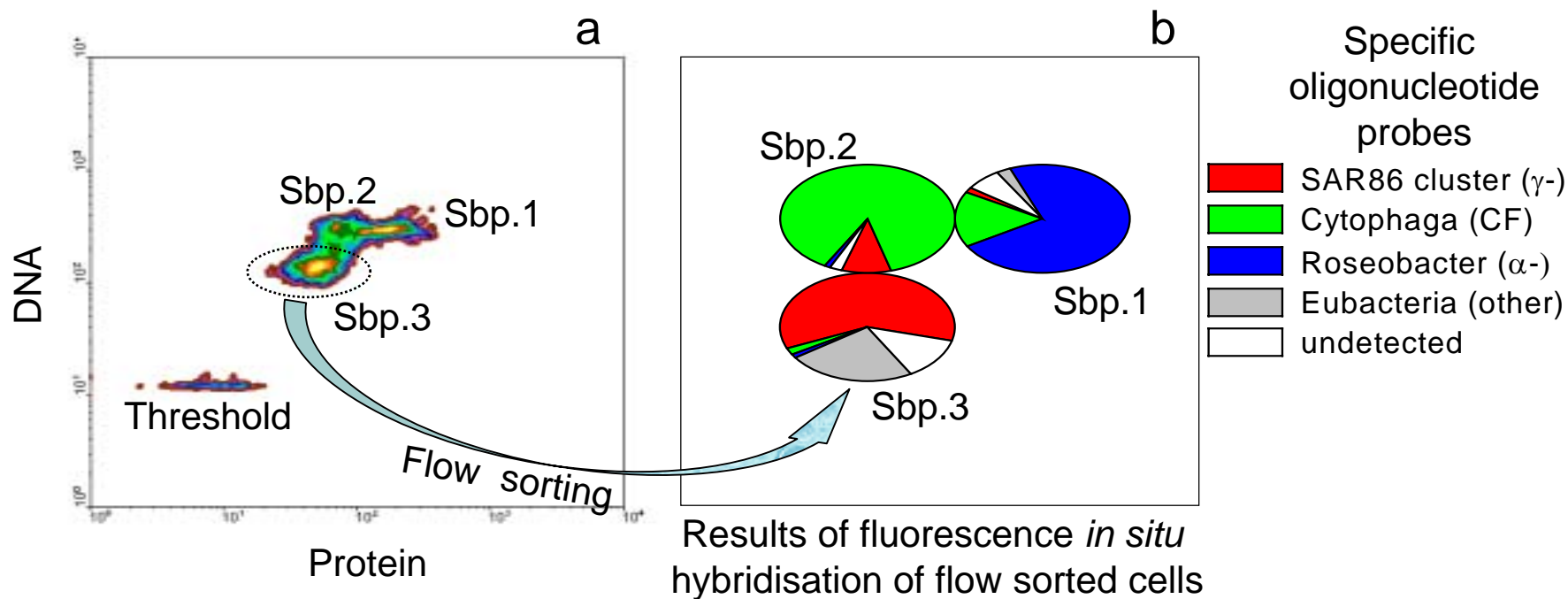
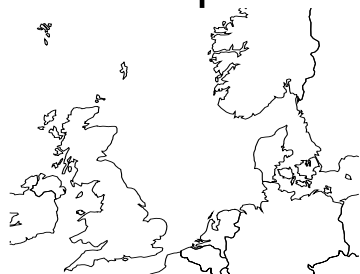


Burkill, PH, Archer, SD, Robinson, C, Nightingale, PD, Groom, SB,
Tarran, GA and Zubkov, MV (in press). Deep-Sea Res. II
Zubkov, MV, Fuchs, BM, Tarran, GA, Burkill, PH and Amann, R (submitted) AEM

ANALYSING NOVEL PLANKTON - VIRUSES



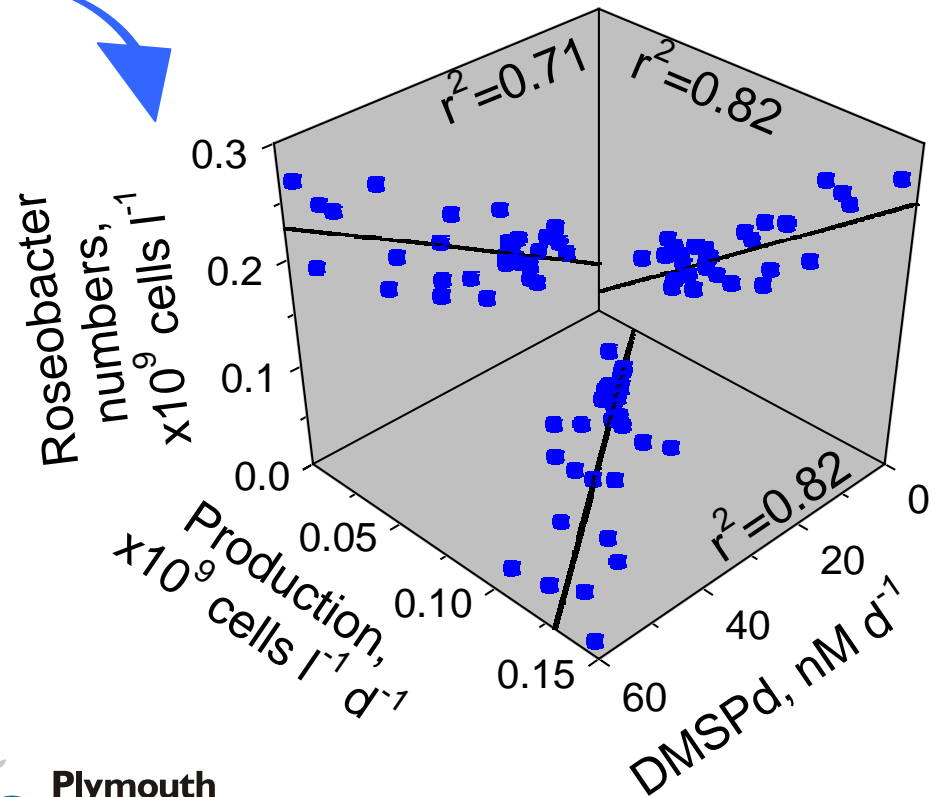
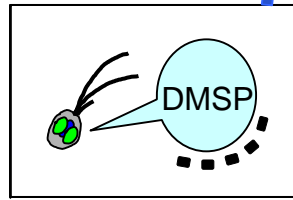
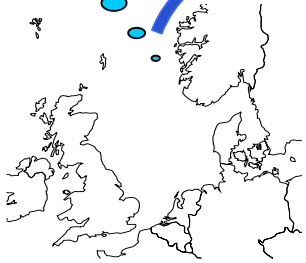
Flow cytometric subpopulation signatures (a) and taxonomic composition (b) of the bacterioplankton in the North Sea



Zubkov, MZ, Fuchs, BM, Archer, SD, Kiene, RP, Amann, R and Burkill, PH (2001)
 Environmental Microbiology 3(5), 304 - 311

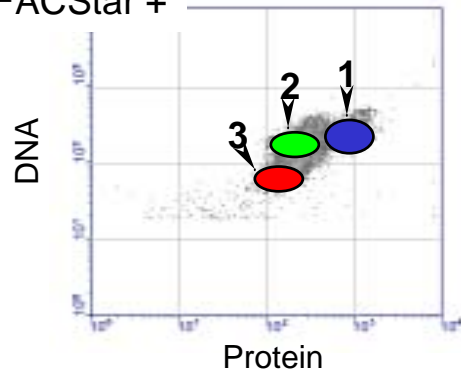
Linking genetically defined bacteria to a functional role in marine plankton

Comparison of *Roseobacter* numbers, bacterial production and dissolved DMSP uptake rate in an SF₆ Lagrangian experiment



DMSP - Dimethylsulphoniopropionate
- algal osmolite
precursor of the climatically active
gas, dimethylsulfide (**DMS**)

FACStar +



Phylogenetic affiliation of dominant bacterioplankton sub-populations

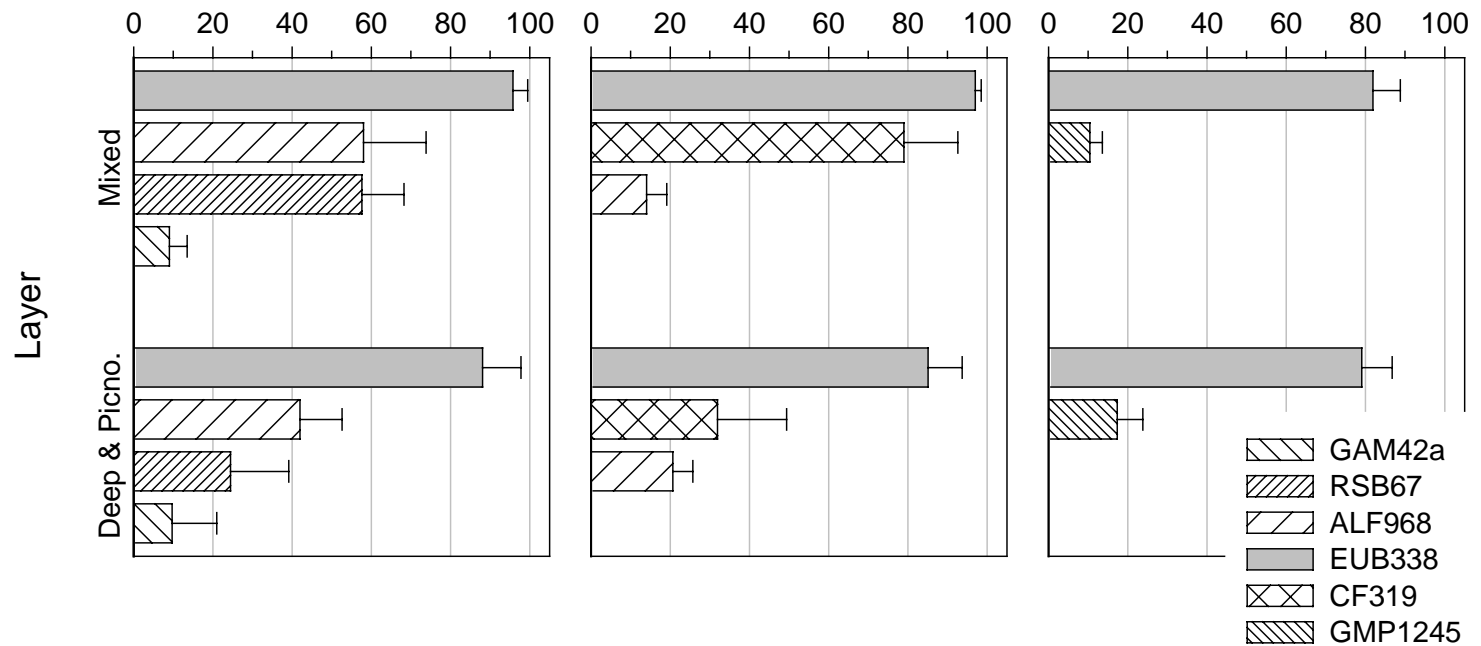
Results of fluorescence *in situ* hybridisation of flow sorted cells

HNA-hs (1)

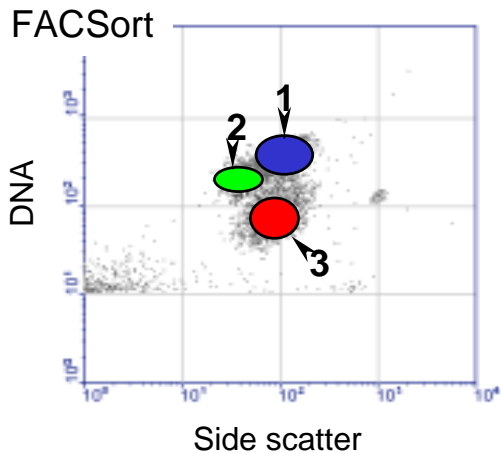
HNA-Is (2)

LNA (3)

Hybridisation, %

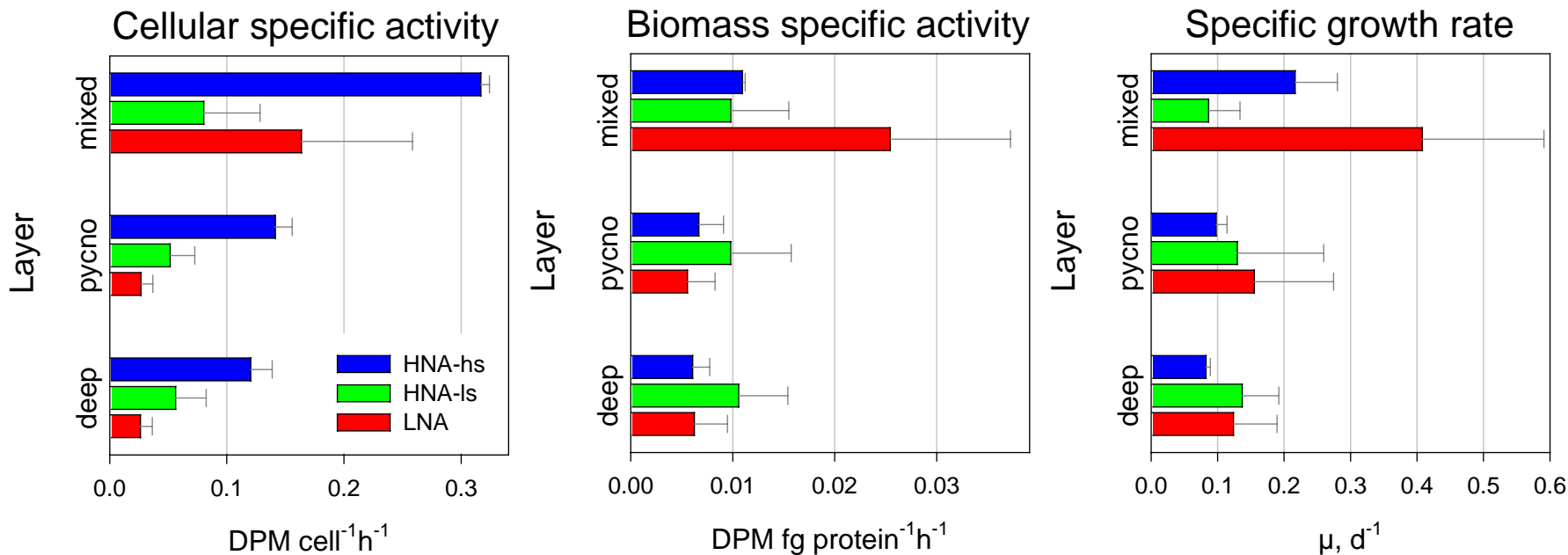


Zubkov, MV, Fuchs, BM, Burkill, PH and Amann, R (2001)
Appl. & Env. Microbiology 67 (11), 5210 - 5218



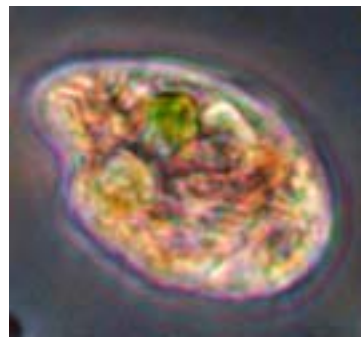
Cellular and biomass specific rates of protein synthesis of bacterioplankton subpopulations

Results of radioassays of tracer-labelled flow sorted cells



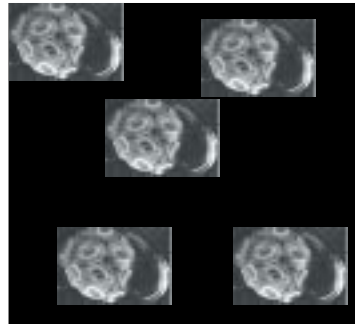
Functional role of microzooplankton in DMSP dynamics

Laboratory experiments involving:



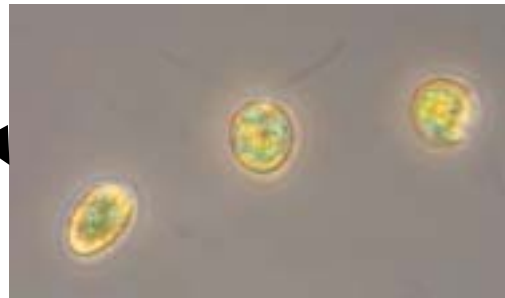
Oxyrrhis marina

+



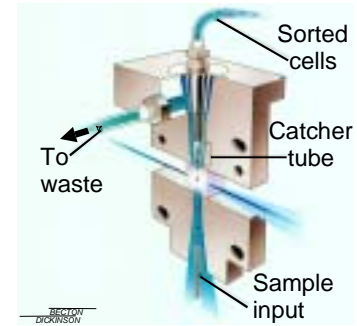
Emiliana huxleyi

+



Dunaliella tertiolecta

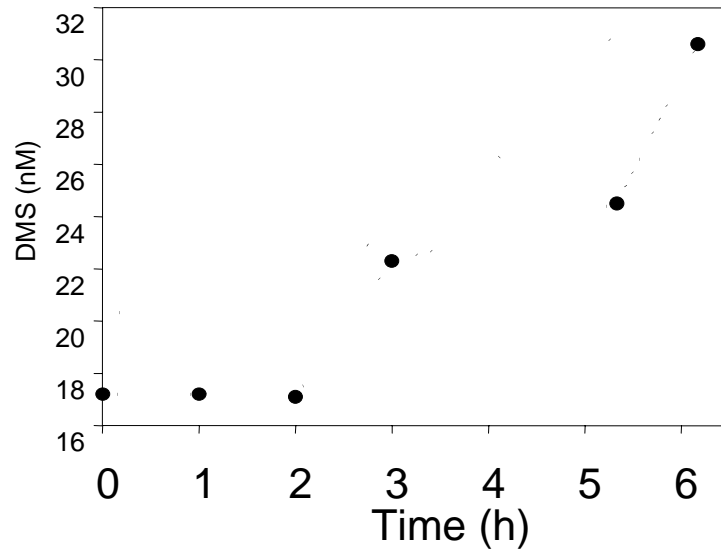
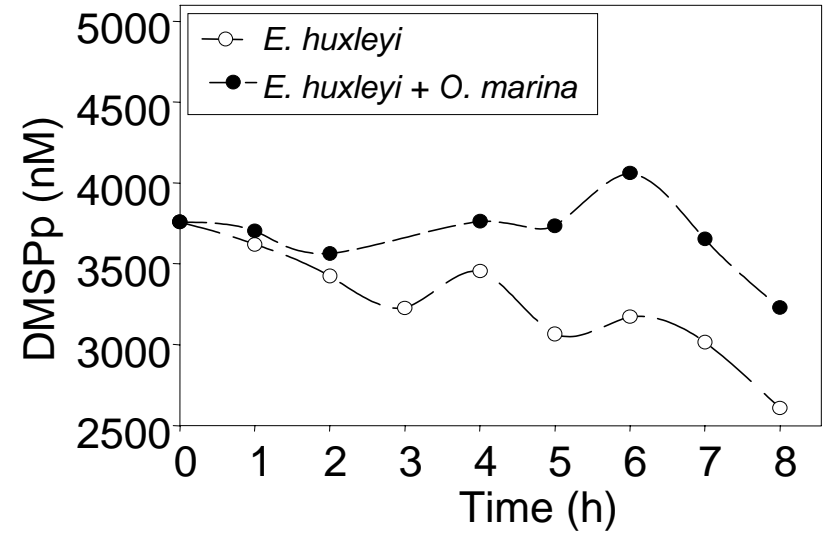
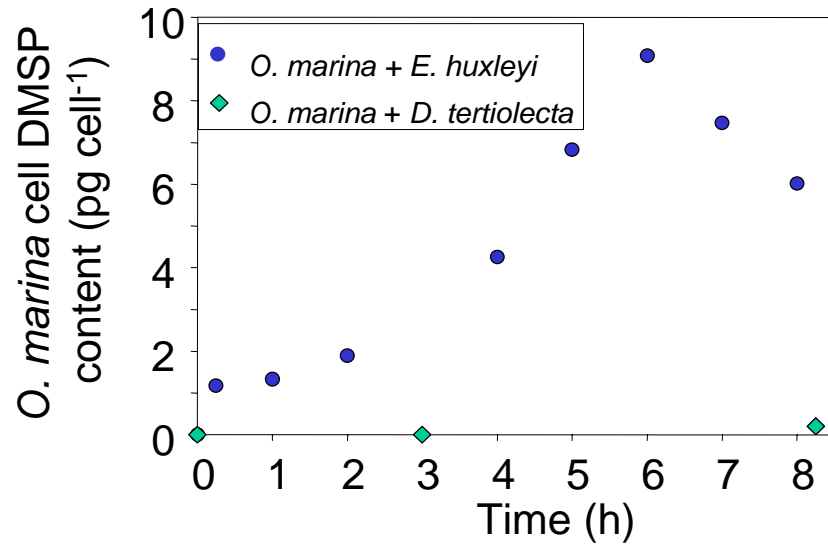
SORTING



GC ANALYSIS



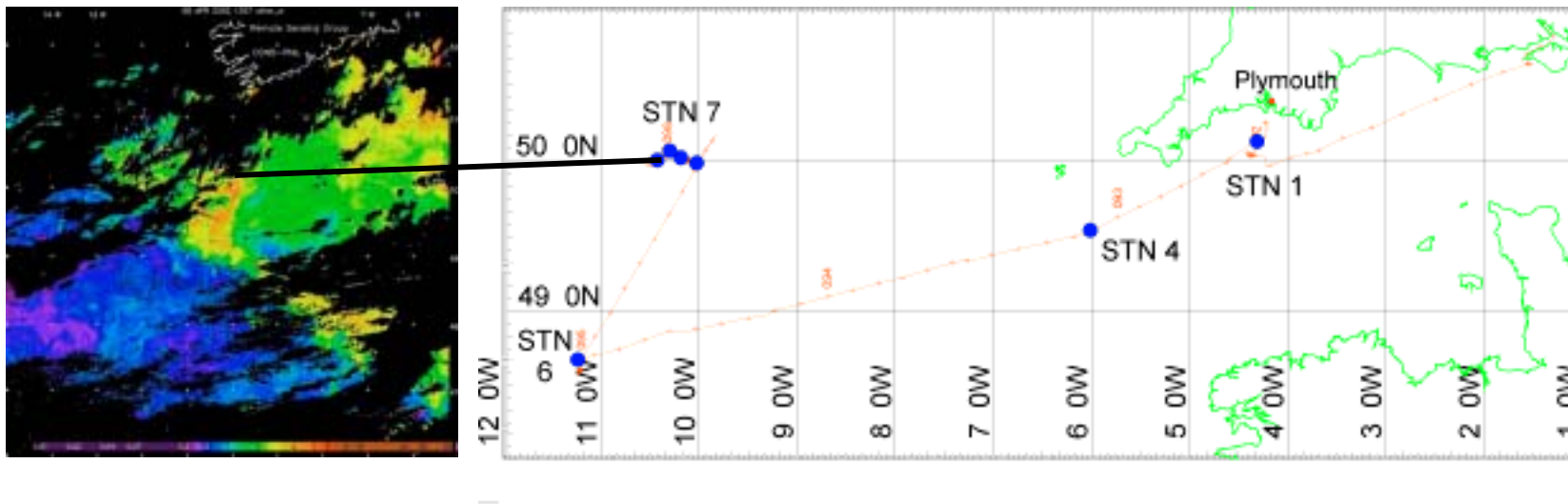
Fate of DMSP and production of DMS



MICROZOOPLANKTON HERBIVORY IN SHELF SEAS

Chlorophyll
8 April 2002

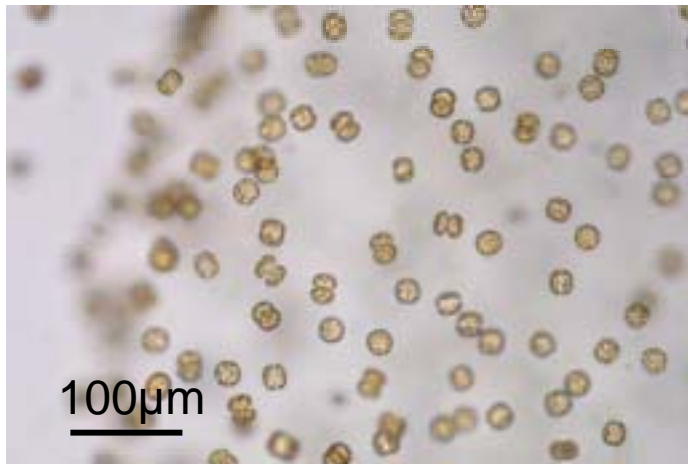
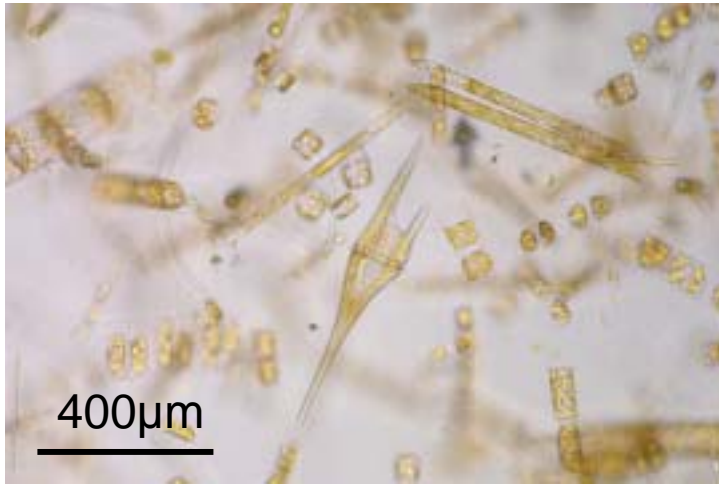
The Celtic Sea.....Last week



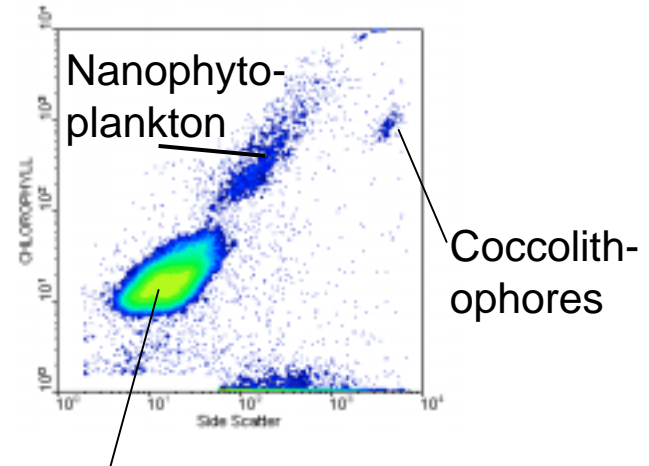
Cruise objective: To study the dynamics of the developing Spring bloom
on the continental shelf

First cruise of Plymouth Marine Laboratory clg.
MDB1 RRS Discovery cruise 261

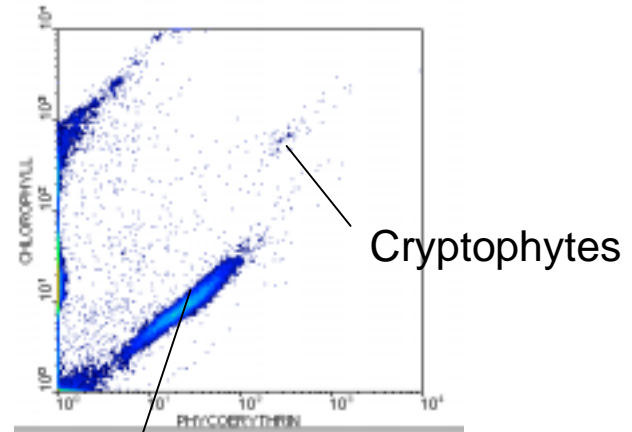
THE PHYTOPLANKTON COMMUNITY



Thalassiosira sp. ? *subtilis*



Picoeukaryotes



Synechococcus

FATE OF PHYTOPLANKTON

(measured using a dilution technique)

Experiments set up by Claire Widdicombe)

TOTAL COMMUNITY (total chl)

Station	Microzooplankton grazing rate (Turnover %)
1	21.28
4	NS
6	NS
7	NS
7	24.42
7	NS
7	7.69
7	

GROUPS ANALYSED BY AFC

Station	Microzooplankton grazing rate (Turnover %)			
	Syn	Cocco	Peuk	Neuk
1	15.29	34.84	37.05	25.04
4	16.80	NS	NS	16.14
6	34.95	75.17	39.37	45.51
7	6.12	NS	12.51	-44.18
7	14.98	NS	28.00	37.54
7	NS	NS	NS	NS
7	-7.97	-204.3	21.27	71.21
7	-9.06	54.95	44.97	38.37

FLOW CYTOMETRY: GETTING WET!

SSCAPA

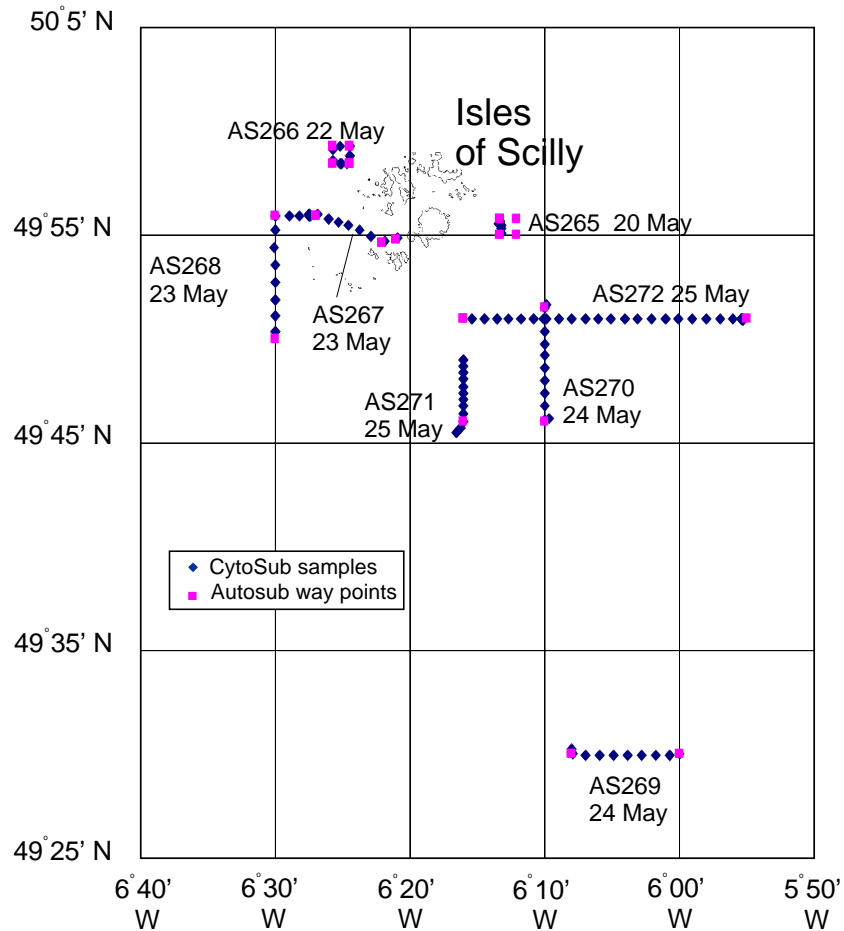


RESULT - CYTOSUB

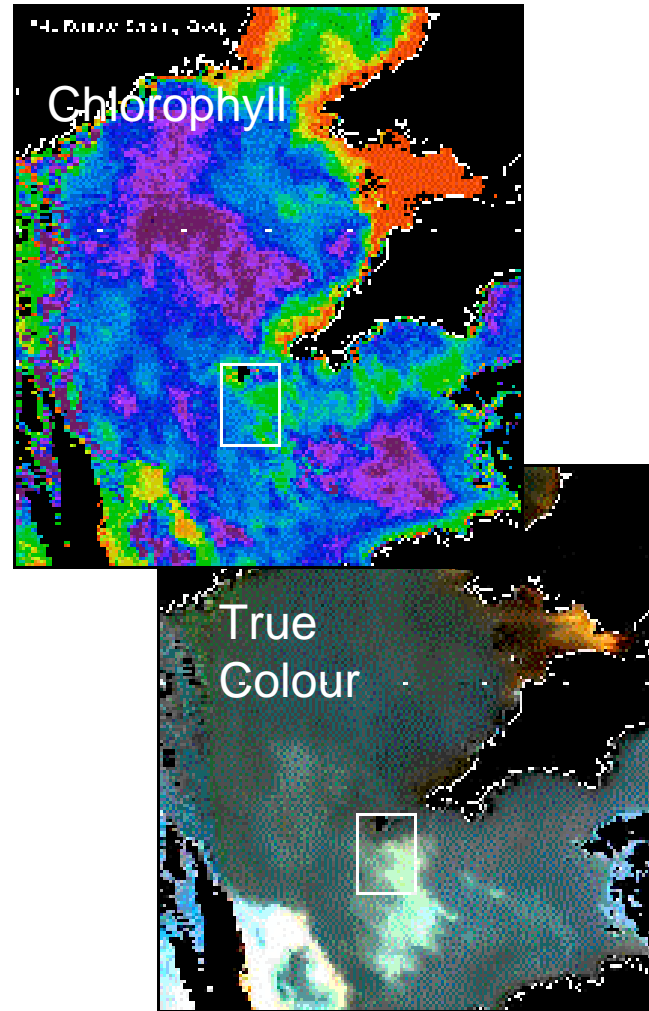


USING CYTOSUB IN AUTOSUB

SSCAPA - Field trials in Autosub
Isles of Scilly 18 - 26 May 2001
Autosub (AS) missions and dates



SeaWiFS images - 24 May



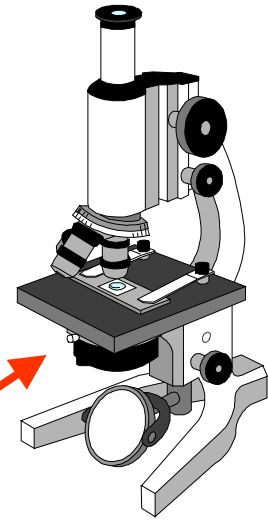
VERIFYING CYTOSUB DATA



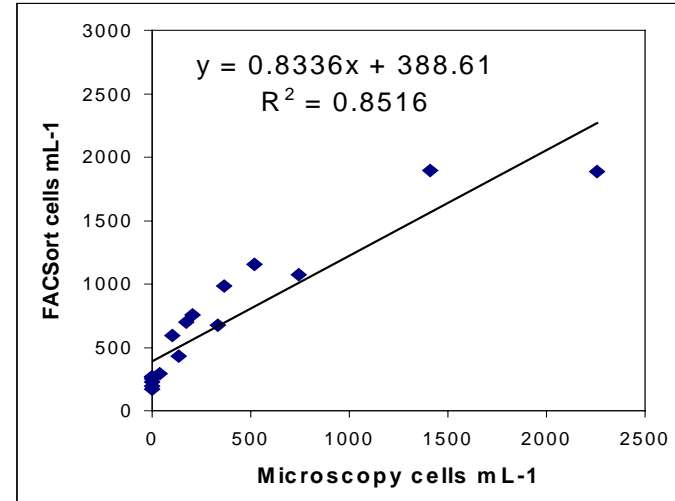
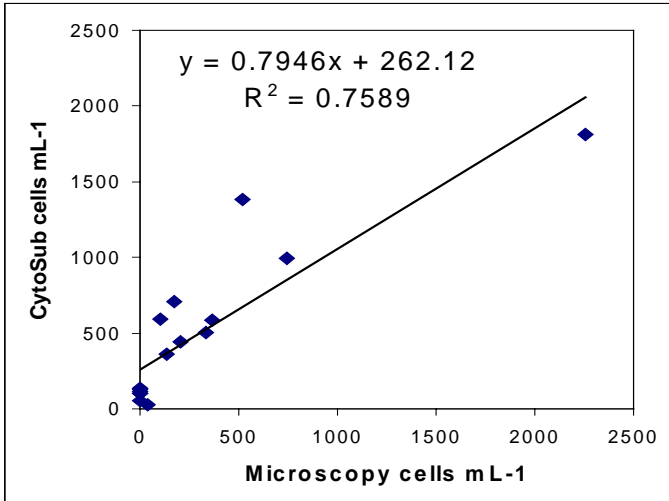
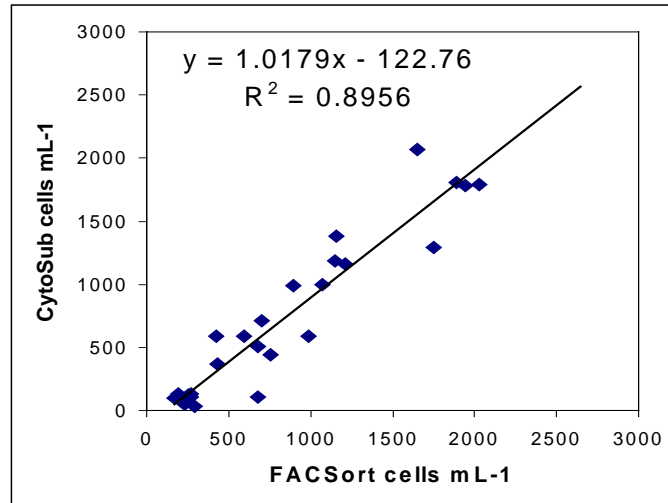
AQUA-MONITOR



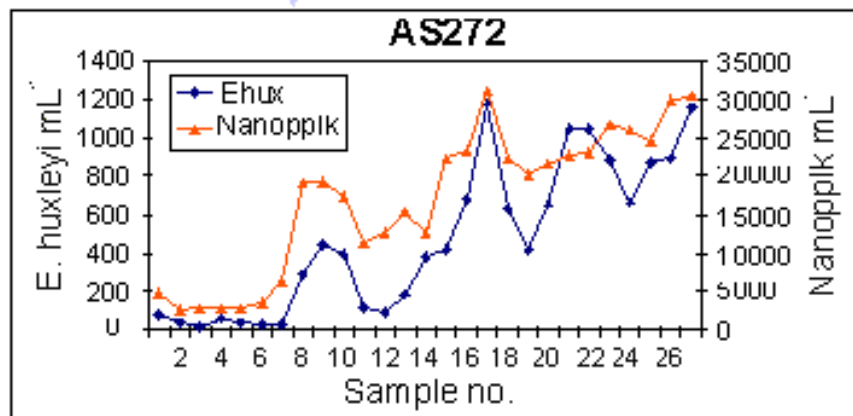
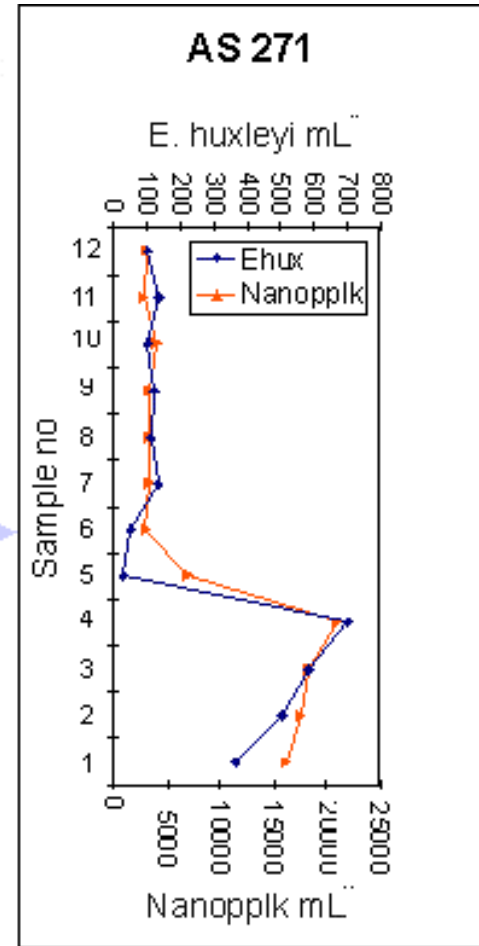
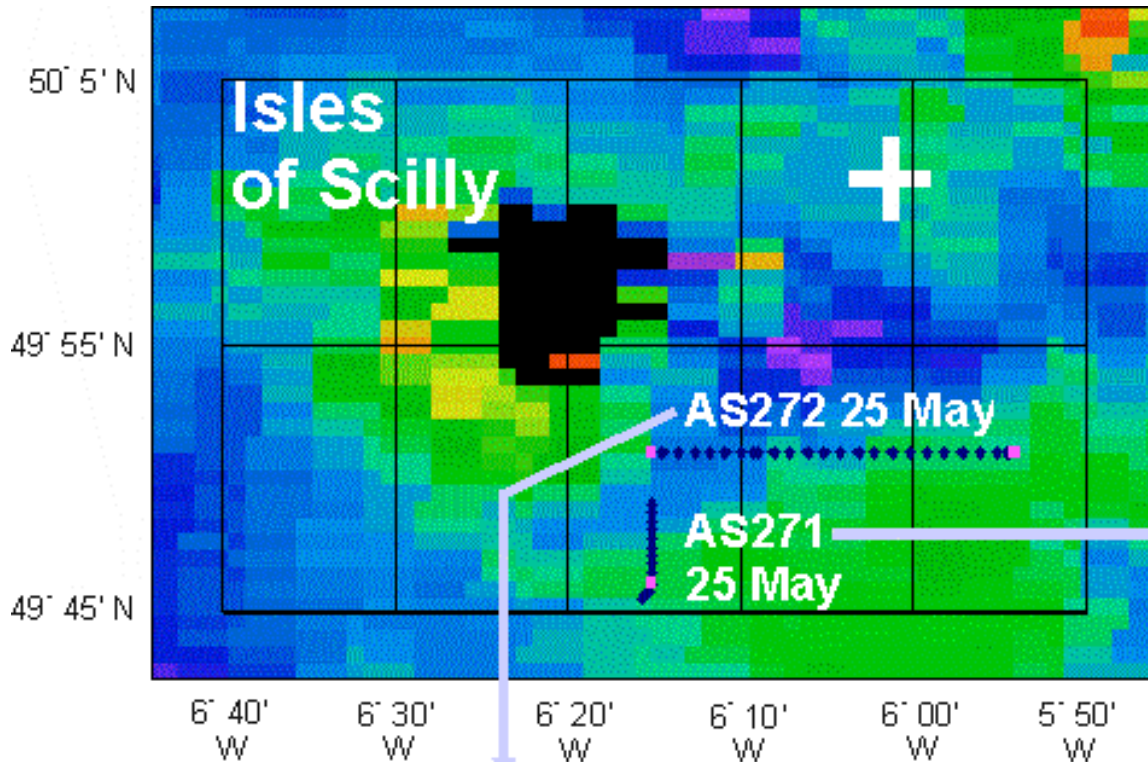
Preserved samples



VERIFYING CYTOSUB: COMPARING COUNTS OF *Emiliana huxleyi*



SEA-TRUTHING



THE FUTURE

