Can seabirds modify carbon burial in fjords ?

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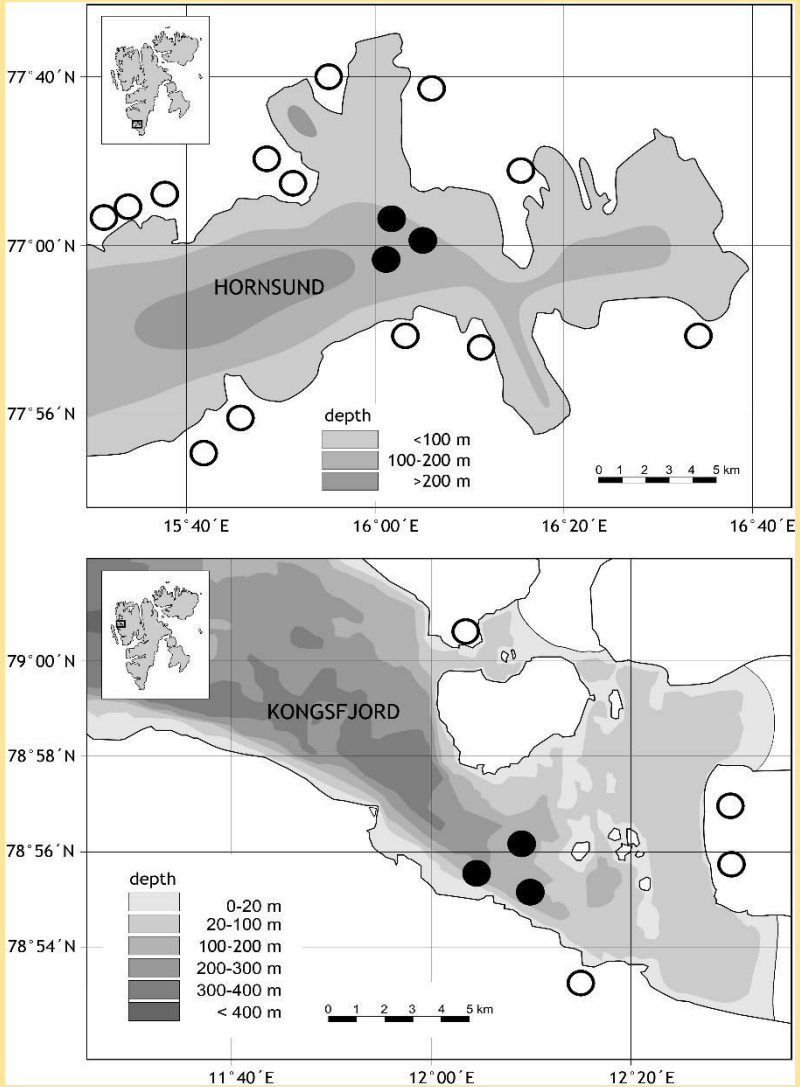
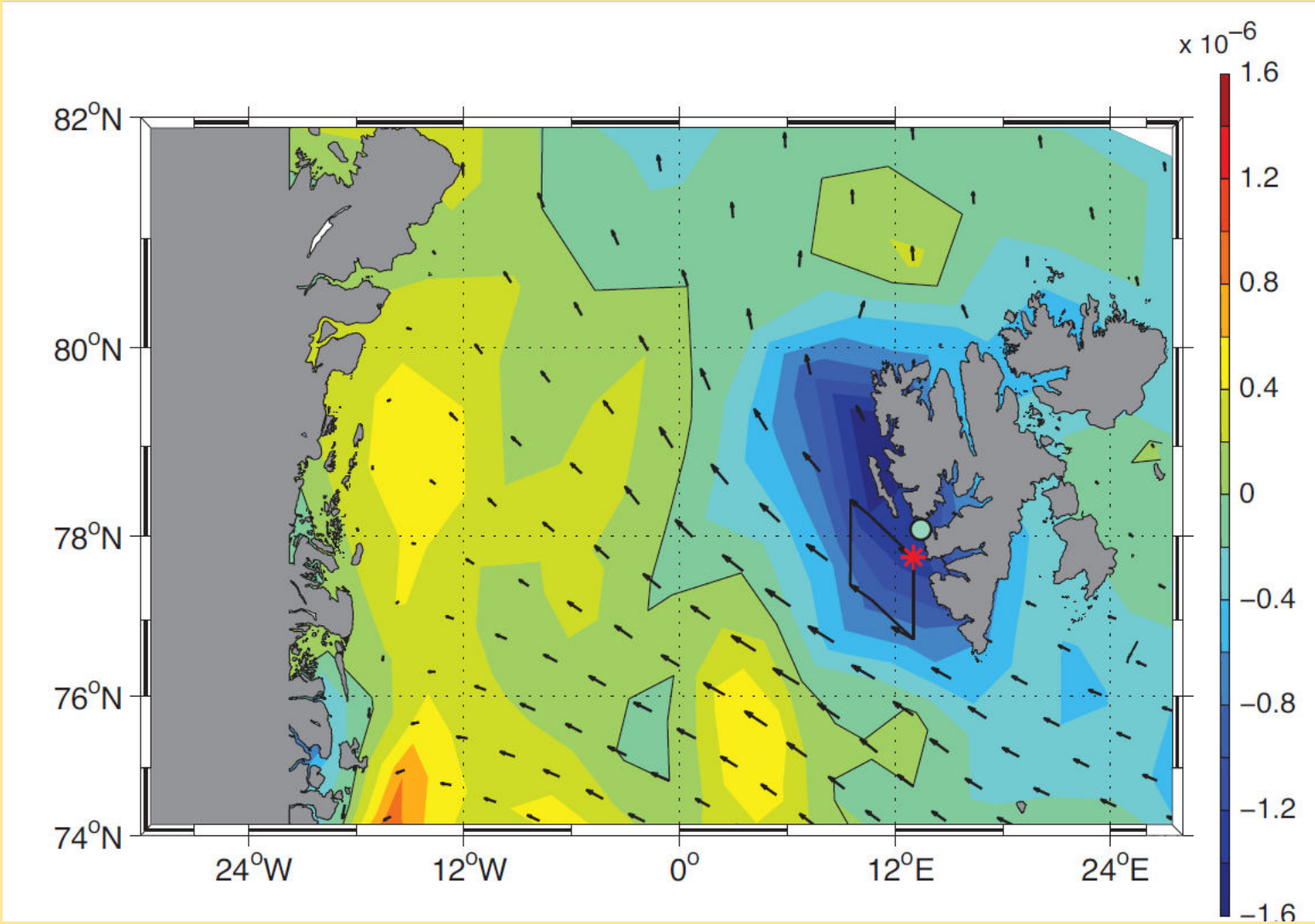


Black dots - sampling stations 2013-14.

Open circles - Major seabird colonies

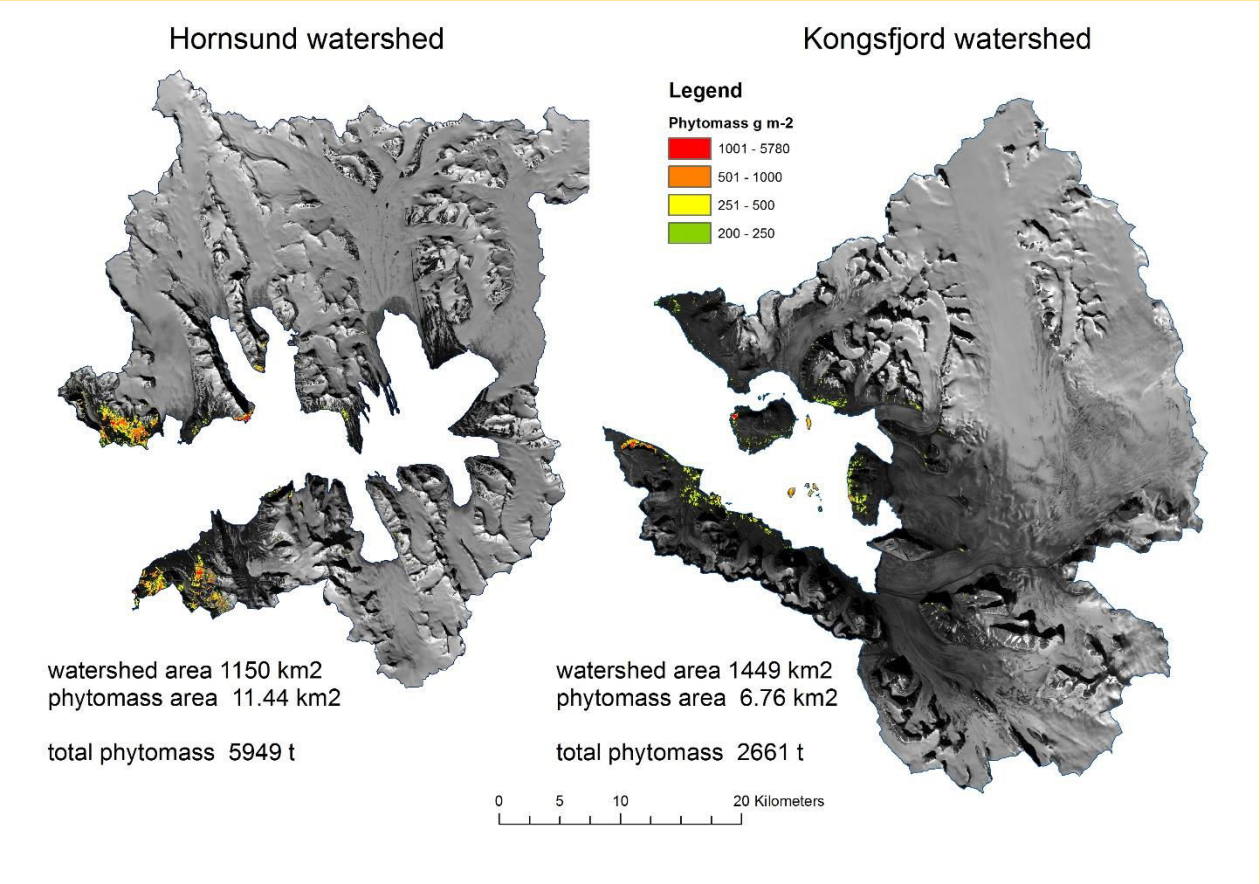
The surface wind stress (arrows) and wind stress curl (contoured colors) pattern in Fram Strait and the oceans surrounding Svalbard (Barents Sea, Greenland Sea and the Arctic Ocean) after Nilsen et al. 2016



Types of terrestrial vegetation used for biomass calculations in Hornsund and Kongsfjorden

595 tons of carbon

266 tons of carbon

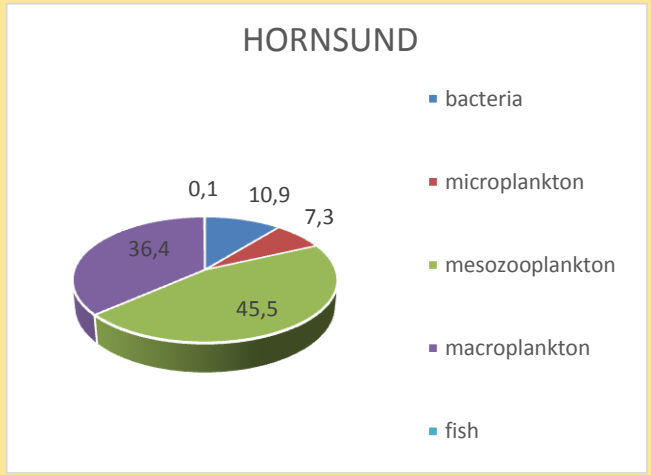


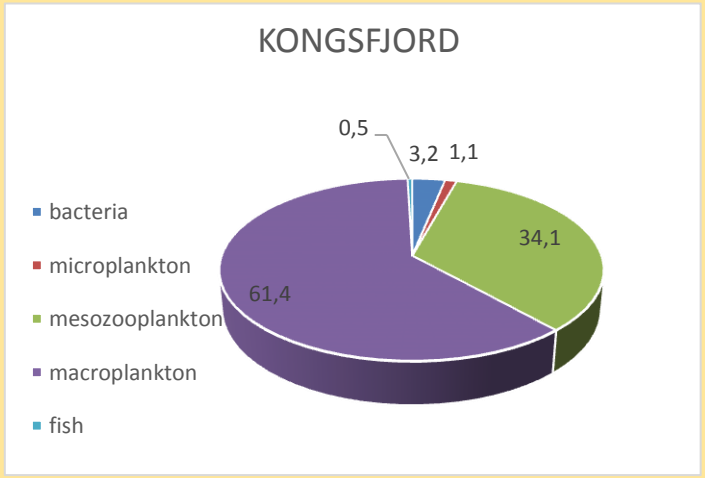
Landsart 8 (Digital Elevation Model of Svalbard) images with spatial resolution of 20m were acqiured from GloVis Viewer programe .

Carbon sources in both fjords (summer values of biomass)
Total carbon content in brackets

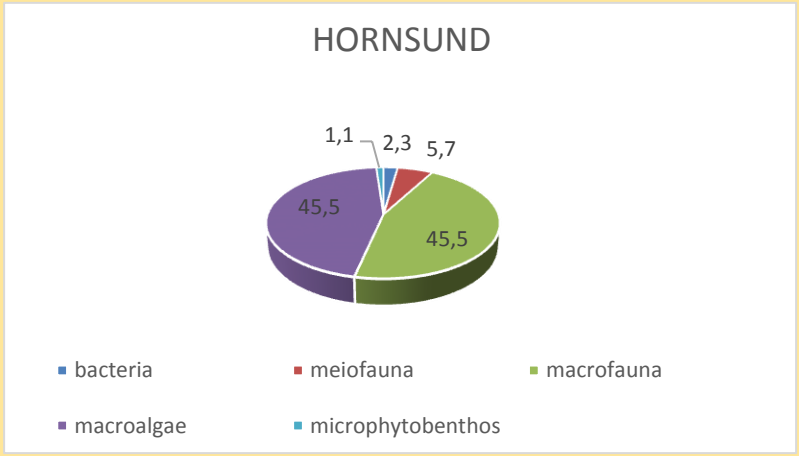
Biomass source	Hornsund	Kongsfjord
Microplankton g C/m^2 (100m water column)	0,8 (94 ton C)	2,5 (70 t C)
Mesozooplankton g C/m^3	0,050 (549 t C)	0,075 (893 t C)
Macroplankton g C m^3	0,040 (140 t C)	0,135 (415 t C)
Fish ton C/fjord	2,2	18,8
Pelagic microbs g C/m^2 (100m water column)	1,2	0,7
Meiofauna g C/m^2 (upper 1cm)	0,45 (58 t C)	0,2 (63 t C)
Macrofauna g C /m^2	4 (791 t C)	10 (1413 t C)
Benthic microbs g C/m^2 (upper 1cm)	0,11	0,52
Macroalgae ton C/fjord	1282	1936
Terrestrial vegetation ton C/fjord watershed	600	290
Sea birds consumption in July (30 days) ton C/ fjord	5573	3047
Organic carbon in suspensions mg C/dm3	0,19	0,33

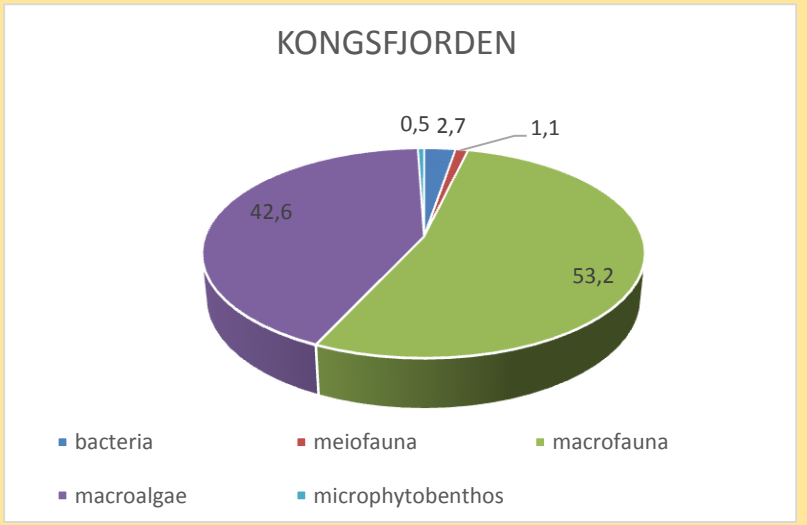
Percent share of biomass in water column - in g C/m^3





Percent share of organic carbon in sediment - in g C/m^2

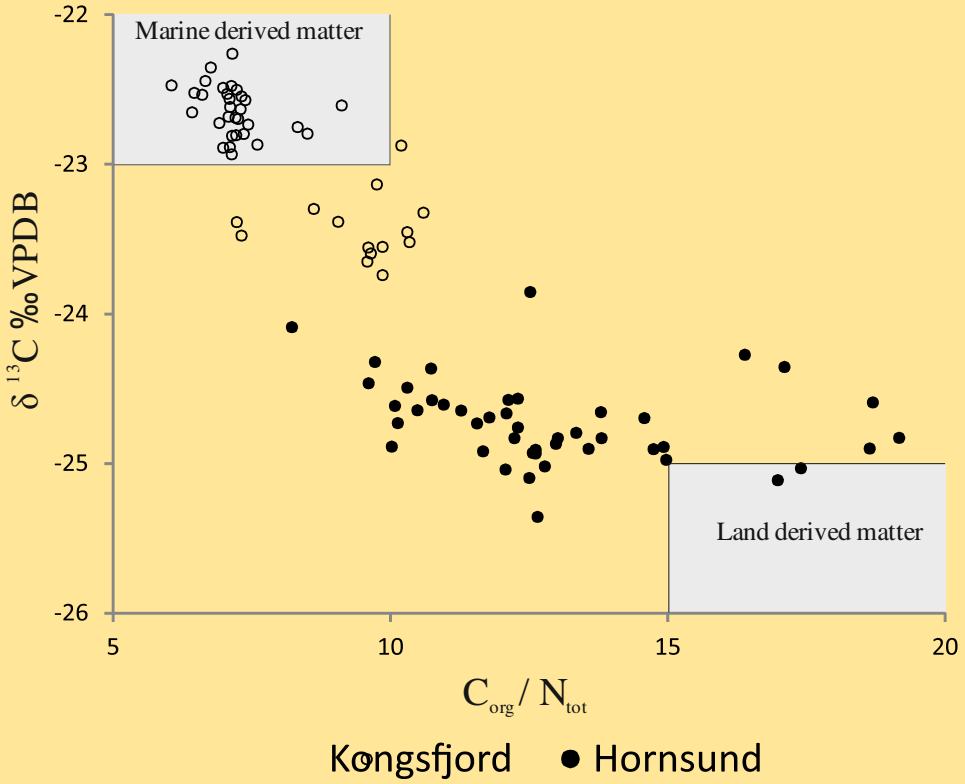




Carbon fate in both fjords – modified from Zaborska et al .2016

Process	Hornsund	Kongsfjord
Carbon content in sediment g C/m3 (upper 1 cm)	252,4	98,3
Carbon content in sediment mg/g	14,2	5,46
Carbon accumulation g C/m2/year (upper 1 cm)	42,6	32,5
Mass accumulation rate of sediment g/m2/year	3041	5947
Carbon burial g C/m2/year	41,4	16,3
Carbon mineralization (in top 20cm) g C/m2/year	1,3 (3%)	16,2 (50%)

Origin and degree of degradation of organic matter in surface sediments, modified from Zaborska et al. 2016.



Degree of organic matter decomposition in surface sediments,
modified from Zaborska et al 2016.