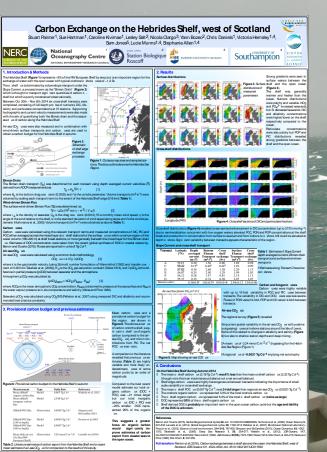
The Hebrides Shelf



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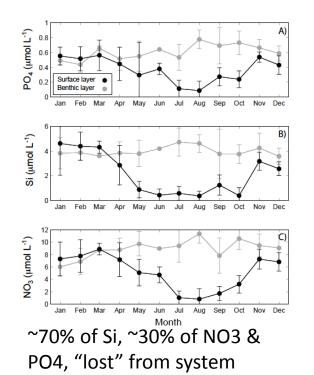
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(and many more)

		ental stoich	ine Kivimae ¹ , Lesk	ey Salt ² , Nicola C		1, Yann Bozer		
		lational ceanography Centr	Stati	nc 2 on Biologique		3	Southampt	
1. Introduction & Continental shelve quanti ed ¹ . Here v export from the He	es are highly are examine th	productive systems but the e role of elemental stoichiome	processes that regula try as a contributing fi	te cross-shelf carbo actor in uencing the	n export are poorly e ciency of carbon		J.	
nutrients and parti measured with star instruments follow litre water samples ganic carbon (PIC) Historic observatio	oulate concer ndard autoan ing best prac by elemental concentration ns of inorgan	4 six cross-shelf transects wen trations at 37 stations (Figure alyser techniques whilst discol ice guidelines ⁹ . Particulate or analysis or chemical digestion s by inductivity coupled plase c and organic nutrient concer	 Concentrations c ved inorganic carbon ganic carbon, nitroge biogenic silica (bS) b na atomic mass spectr trations were collated 	If inorganic nutrient: (DIC) was measured in and phosphorous (chemical digestion ometry. I from the literature a	s (NO3, PO4, S) were using two VINDTA 3C were measured on 1 and particulate inor-	1000		
2. Results and Dis Annual Cycle The mean annual Shelf is shown in F incident with ann	cussion cycle of inorg igure 2. An in ual minima in	I to provide the seasonal cont anic nutrients within surface () verse relationship is evident b the benthic layer and summ)-20 m) and benthic (3 etween the two layers er minima in surface v	0 m above seabed) I with winter maxima vaters coincident wi	in surface waters co- th annual maxima in	gure 1: Habridies sh distribution of his	Inspire showing sampling toric inorganic and organic	a locations in October 201 nutrient observations
Predictiable stoich A cyclical seasona particular, the surl phytoplankton sp	iometric shifts I shift in inorg lace ocean shi ecies in spring	strophic consumption in surfa anic nutrient stoichiometry es ftstowards high NP in spring with low NP (high P) deman y in balance with the Red eld	ists (Figure 3) which i and low NP in summ Is and slower-growing	s driven by autotrop er and autumn. We r species in summer	hic and heterotrophic pro slate this pattern is to fas with high N.P (high N) de	-growing 💈	An Feb Mar Ar Ma An A	
Figure 3: Nutrient rat for a) the surface lays benthic layer. The vert horizontal blue lines, black lines represent Red aid ratio (108C White squares ind cruise data for comp the reduced mappi sonal storidhometric benthic layer.	ical red lines, and diagonal the standard t5Si:16N:1P). cate DY017 terison. Note tude of sea-	George Contraction of the second seco				(,) peud (os		
The particulate po P poor relative to	ol wasC-rich N (high N:P). (NO,PO, tumn 2014 reveal important s relative to N (high CP), P poor comparison to global particula	relative to C (high CP) te datasets (not sho	, Si poor relative to P own) revealed minor	(low S:P) and predomina	datac (4). toly Figure 4 (be 2014 keft) the	etry for the Hebrides Shelf (istribution) low): Mean particulate stoir mixed layer and right) ben	
Organic nutrients Organic nutrient of 1). The organic nu	observations f	Ing either regionally or seasor rom this region are sparse (Fi der goes seasonal variation in um organic nutrient concent season and season and season restant season restant restant season restant resta	gure 1c) and currently	only allow calculati		ble	individual sub-regions	
 Stoichiometric o ocean gradients Oross shelf gradi 	aichiometry d fi erences bet ients suggest	aracterised all pools in autum ween pools, vertically betwee more e cient N loss via the or videspread both seasonally an	n 2014 (Figure 5). In layers and horizont ganic pool and more (ally between region e cient Clossviath	s indicate important shel e inorganic pool relative t	to Participation		
Dcean	Shelf break	Shelf	Ocean	Shelf break	Shelf	Ocean	Shelf break	Shelf
5979:3:14:1	6209:3:14:		157:7:16:1	142:8:18:1	148:7:18:1	854:73:1	307:91:1	765 : 69 : 1
3298: 5 : 16 : 1	2960:5:16:	4550:5:14:1	252:14:19:1	260:12:26:1	187:9:19:1	1432:83:	381:40:1	1638 : 142 :
00 m nominal sut-off depth	Figure 5: Me terns and gra	I : NO ₃ : PO ₄ an auturnal stoichiometic pat- dients for al the increasic nutri-	300 m nominal cut-off depth	POC:bSi:	PON : POP	300 m nom cut-off dep	ind the DOC:	DON : DOP
Arrent	ent pool, b) ti	e particulate pool and c) the or-	80			8)	~	
References: ¹ Psinter, :Vol 2. M. N. Hill. Londs		vatues) sunnal of Geophysical Research 121,4 6-77. – Stemer er al (2006), Limnolog	522-4544. ² Dickson, A.G. et y and Oceanography 53(3),	al (2007). Quide to best p 1169-1180. Martiny et a	nactices for ocean CC2 measure I (2014). Scienti c Data 1, 1400-	iments PICES Speci 8, doi: 140010.1410	# Publication 3: 191 pp ⁹ Ri 38/adata 142014.140048.	ad eld et al (1963). The Se

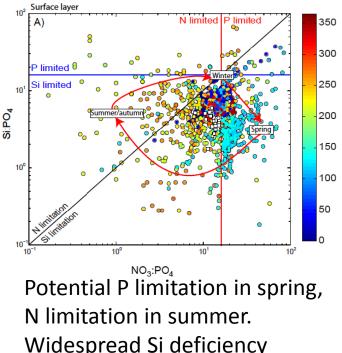
Elemental stoichiometry (C, Si, N, P) of the Hebrides Shelf

1) Opposing annual cycles in surface and benthic water inorganic nutrients – auto-/heterotrophic activity



2) Cyclical trends in nutrient stoichiometry – inversely linked to autotrophic demands Significant lateral and vertical gradients in stoichiometry

Ocean



D 5979:3:14:1 6209:3:14:1 6332:5:12:1 3298:5:16:1 2960:5:16:1 4550:5:14:1 0 300 m nominal cut-off depth A)

Shelf break

Shelf