Table S1. Mean and standard deviation (SD) of *Laminaria hyperborea* kelp canopy stipe length, ungrazed stipe surface area (SA) and lamina weight used to standardize epiphytic response variables, and the control variables used in the statistical analyses.

Group	Stipe length[1] (cm)	Ungrazed SA[1] (cm^2)	Lamina weight[1] (g)	Kelp age[1] (years)	Kelp density[1] (ind m^{-2})	Wave exposure[2] (m^2 s^{-1})	Mean current speed[2] (m s^{-1})	Light exposure index[2]
Ref-L	96 (30)	98 (97)	626 (385)	6 (3)	9 (8)	81 511 (69 732)	0,01 (0,02)	0,02 (0,04)
FF-L	76 (25)	98 (113)	756 (360)	5 (1)	3 (3)	150 964 (112 948)	0,04 (0,04)	-0,06 (0,06)
Ref-H	65 (21)	42 (43)	559 (259)	5 (2)	7 (7)	379 474 (277 787)	0,03 (0,03)	-0,04 (0,07)
FF-H	57 (13)	130 (119)	530 (254)	6 (1)	5 (2)	79 598 (53 607)	0,04 (0,01)	-0,07 (0,06)

1 denotes measured data, 2 denotes modelled data

Table S2. Variance inflation factors (VIF) for the control variables used in statistical models to assess the impact of fish farm effluents on the epiphytic community of *Laminaria hyperborea* kelp canopy plants.

Control variable	VIF
Kelp age	1.30
Kelp density	3.17
Current speed	2.57
Wave exposure	1.34
Light exposure	1.60

Table S3. Species list of macroalgae found growing epiphytically on stipes of *Laminaria hyperborea* canopy plants in the Frøya and Smøla archipelagos, Norway, August 2015. Morphological group is a rough grouping of the species to examine whether there were trends relating to fish farming.

Species	Authority	Morphological group
Phaeophyceae		
Alaria esculenta	(Linnaeus) Greville	Other
Chaetopteris plumosa	(Lyngbye) Kützing	Corticated
Desmarestia aculeata	(Linnaeus) J.V.Lamouroux	Other
Desmarestia viridis	(O.F.Müller) J.V.Lamouroux	Other
Desmarestia sp.	J.V.Lamouroux	Other
Dictyota dichotoma	(Hudson) J.V.Lamouroux	Foliose
Ectocarpus sp.	Lyngbye	Uniseriate
Hincksia sp.	J.E.Gray	Uniseriate
Laminaria hyperborea	(Gunnerus) Foslie	Other
Laminariales indet.		Other
Litosiphon laminariae	(Lyngbye) Harvey	Other
Mesogloia vermiculata	(Smith) S.F.Gray	Other
Pogotrichium filiforme	Reinke	Uniseriate
Pylaiella littoralis	(Linnaeus) Kjellman	Uniseriate
Pylaiella sp.	Bory	Uniseriate
Scytosiphon lomentaria	(Lyngbye) Link	Other
Sphacelaria cirrosa	(Roth) C. Agardh	Corticated
Sphacelaria plumula	Zanardini	Corticated
Sphacelaria rigidula	Kützing	Corticated
Sphacelaria spp.	Lyngbye	Corticated
Chlorophyta		
Acrosiphonia arcta	(Dillwyn) Gain	Uniseriate
Bryopsis plumosa	(Hudson) C.Agardh	Uniseriate
Chaetomorpha ligustica	(Kützing) Kützing	Uniseriate
Chaetomorpha melagonium	(F.Weber & D.Mohr) Kützing	Uniseriate
Chaetomorpha spp.	Kützing	Uniseriate
Cladophora rupestris	(Linnaeus) Kützing	Uniseriate
Cladophora spp.	Kützing	Uniseriate
Codium fragile	(Suringar) Hariot	Other
Derbesia marina	(Lyngbye) Solier	Uniseriate
Rhizoclonium spp.	Kützing	Uniseriate
Spongomorpha aeruginosa	(Linnaeus) Hoek	Uniseriate
Ulva lactuca	Linnaeus	Foliose
Ulva prolifera	O.F. Müller	Foliose
Ulva spp.	Linnaeus	Foliose
Rhodophyta		
Aglaothamnion tenuissimum	(Bonnemaison) Feldmann-Mazoyer	Uniseriate
Antithamnion nipponicum	Yamada & Inagaki	Uniseriate
Apoglossum ruscifolium	(Turner) J.Agardh	Foliose
Bonnemaisonia hamifera	Hariot	Uniseriate
Callithamnion corymbosum	(Smith) Lyngbye	Uniseriate
Callithamnion tetragonum	(Withering) S.F.Gray	Uniseriate

Ceramium virgatum	Roth	Corticated
Ceramium spp.	Roth	Corticated
Corallina officinalis	Linnaeus	Other
Cryptopleura ramosa	(Hudson) L.Newton	Foliose
Dasysiphonia japonica	Yendo	Corticated
Delesseria sanguinea	(Hudson) J.V.Lamouroux	Foliose
Delesseriaceae spp.	Bory	Foliose
Euthora cristata	(C.Agardh) J.Agardh	Foliose
Haraldiophyllum bonnemaisonii	(Kylin) A.D.Zinova	Foliose
Lomentaria clavellosa	(Lightfoot ex Turner) Gaillon	Other
Membranoptera alata	(Hudson) Stackhouse	Foliose
Metacallophyllis laciniata	(Hudson) A.Vergés & L.Le Gall	Foliose
Nitophyllum punctatum	(Stackhouse) Greville	Foliose
Palmaria palmata	(Linnaeus) F.Weber & D.Mohr	Foliose
Phycodrys rubens	(Linnaeus) Batters	Foliose
Polysiphonia brodiei	(Dillwyn) Sprengel	Corticated
Polysiphonia elongata	(Hudson) Sprengel	Corticated
Polysiphonia fibrillosa	(Dillwyn) Sprengel	Corticated
Polysiphonia stricta	(Mertens ex Dillwyn) Greville	Corticated
Symphyocladiella parasitica	(Hudson) D.Bustamante, B.Y.Won, S.C.Lindstrom & T.O. Cho	Corticated
Ptilota gunneri	P.C.Silva, Maggs & L.M.Irvine	Corticated
Rhodochorton purpureum	(Lightfood) Rosenvinge	Uniseriate
Rhodomela lycopodioides	(Linnaeus) C.Agardh	Corticated
Rhodomela sp.	C.Agardh	Corticated
Scagelia pylaisaei	(Montagne) M.J.Wynne	Uniseriate
Spermothamnion repens	(Dillwyn) Magnus	Uniseriate
Spermothamnion sp.	Areschoug	Uniseriate

Table S4. Results of vector fitting to community data of epiphytic biomass on *Laminaria hyperborea* kelp canopy stipes collected from 12 sites in the Frøya and Smøla archipelagos, Norway. Significance (p) and explained variation (r^2) are shown for control variables and the *a-priori* factor *Group* fitted to the 2-dimensional ordination space (Fig. 6). Italics show the results when excluding the high wave-exposure site (in Ref-H); bold indicates significance (□ = 0.05).

Model info	**Control variable**					
	Group	Kelp age	Kelp density	Current speed	Wave exposure	Light exposure
n = 95	**r^2 = 0.11, p = 0.005**	**r^2 = 0.14, p = 0.003**	**r^2 = 0.27, p = 0.001**	**r^2 = 0.12, p = 0.007**	**r^2 = 0.15, p = 0.001**	**r^2 = 0.17, p = 0.001**
n = 86 (-site 7)	***r^2 = 0.08, p = 0.043***	***r^2 = 0.13, p = 0.002***	***r^2 = 0.13, p = 0.003***	*r^2 = 0.02, p = 0.356*	*r^2 < 0.01, p = 0.945*	***r^2 = 0.10, p = 0.016***

Table S5. Results of PERMDISP on the epiphyte community of *Laminaria hyperborea* kelp canopy stipes collected from 5 m depth at fish farm sites (low effluent levels: FF-L, high effluent levels: FF-H) and reference sites (Ref-L, Ref-H) in the Frøya (Ref-L, FF-L) and Smøla (Ref-H, FF-H) archipelagos, Norway. The degree of dispersion is shown for each level within *Group* for the epiphytic macroalgae community, and for the epiphyte community including bryozoans.

	Group			
Community	Ref-L	Ref-H	FF-L	FF-H
Macroalgae	1.370	1.326	1.219	0.931
Macroalgae + bryozoans	1.230	1.336	1.407	0.652

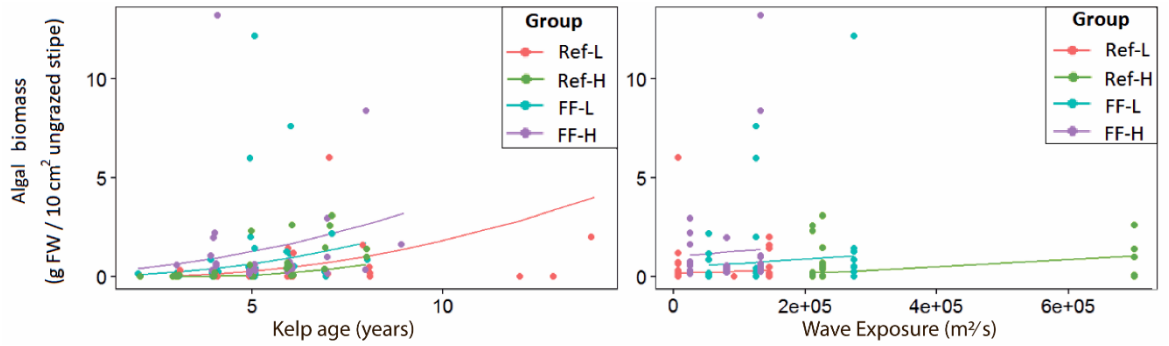

Figure S1. Model predictions (lines) for kelp age (left) and wave exposure (right) over collected data (points) of algal epiphytes on stipes of *Laminaria hyperborea* kelp canopy plants at fish farm sites (low levels: FF-L, high levels: FF-H) and reference sites (Ref-L, Ref-H) in the Frøya (Ref-L, FF-L) and Smøla (Ref-H, FF-H) archipelagos, Norway. The points have been jittered to reduce overplotting.

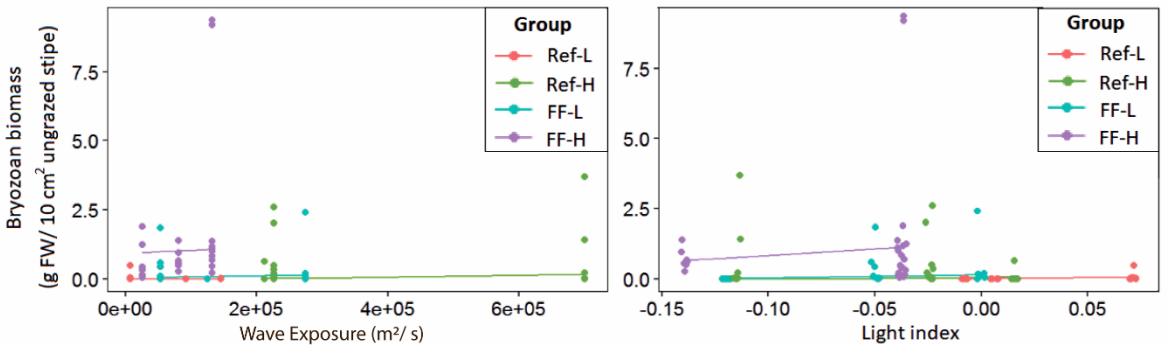

Figure S2. Model predictions (lines) for wave exposure (left) and light (right) over collected data (points) of the biomass of bryozoan epiphytes present on stipes of *Laminaria hyperborea* kelp canopy plants at fish farm sites (low levels: FF-L, high levels: FF-H) and reference sites (Ref-L, Ref-H) in the Frøya (Ref-L, FF-L) and Smøla (Ref-H, FF-H) archipelagos, Norway. The points have been jittered to reduce overplotting.

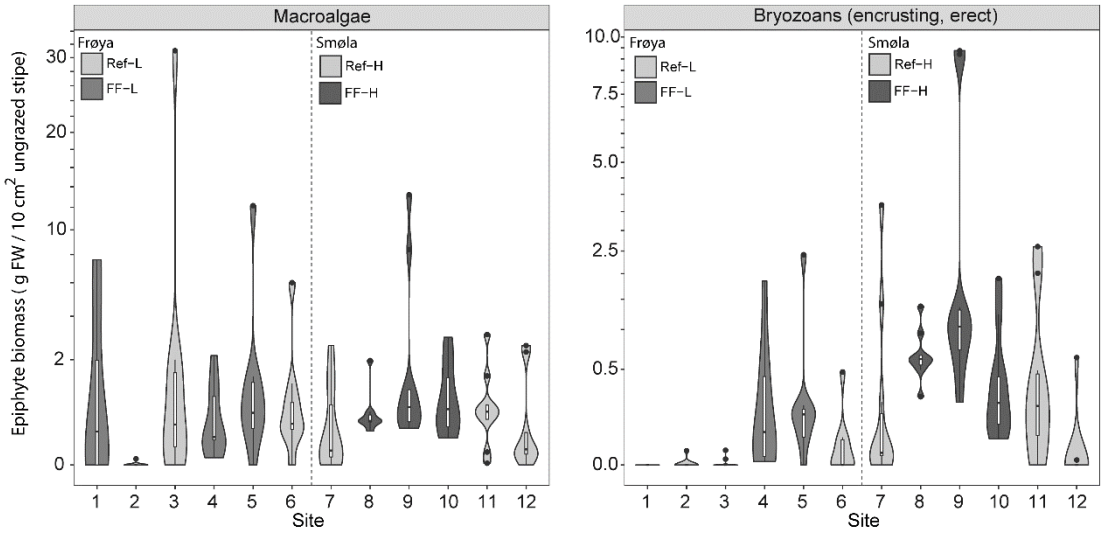

Figure S3. Biomass of epiphytes present on stipes of *Laminaria hyperborea* kelp canopy plants at fish farm sites (low levels: FF-L, high levels: FF-H) and reference sites (Ref-L, Ref-H) in the Frøya (Ref-L, FF-L) and Smøla (Ref-H, FF-H) archipelagos, Norway. The two areas are separated by a vertical dashed line (left-hand side = FF-L and Ref-L, right = FF-H and Ref-H). Note that the y-axis is on a square root scale. For plot explanation see Figure 4.

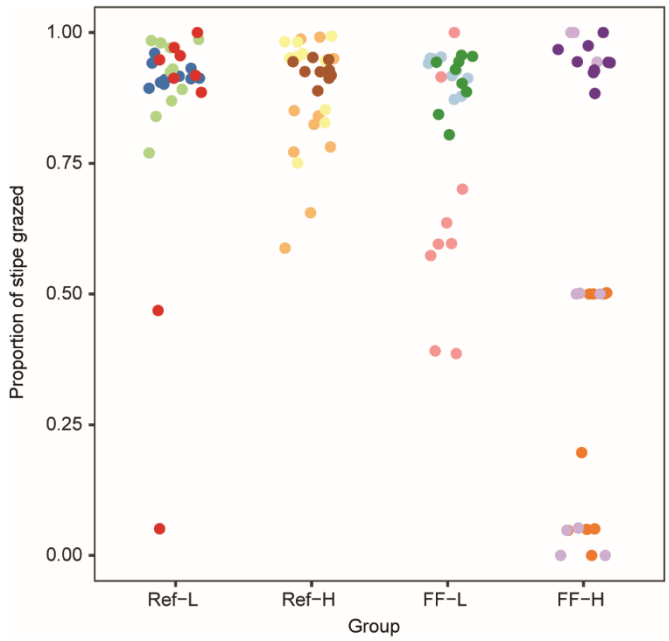

Figure S4. Urchin grazing on stipes of *Laminaria hyperborea* kelp canopy plants at fish farm sites (low levels: FF-L, high levels: FF-H) and reference sites (Ref-L, Ref-H) in the Frøya (Ref-L, FF-L) and Smøla (Ref-H, FF-H) archipelagos, Norway. Different colors represent the 12 sampling sites. The points have been jittered to reduce overplotting.

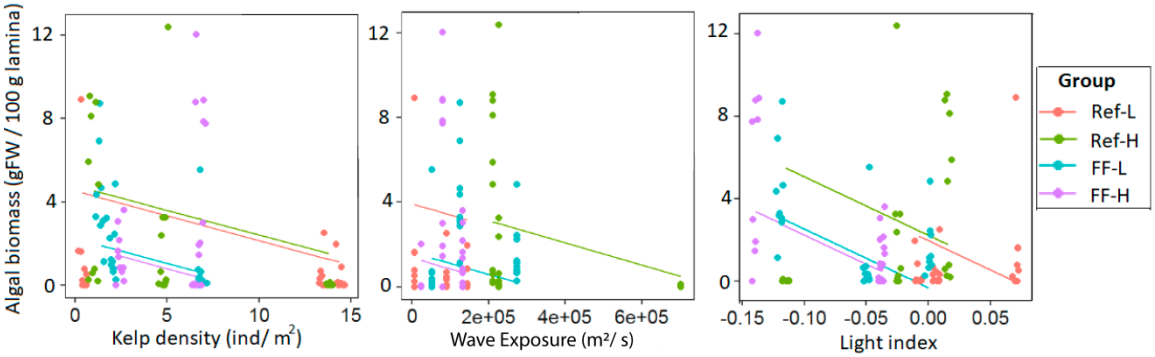

Figure S5. Model predictions (lines) for kelp density (left), wave exposure (middle) and light (right) over collected data (points) of algal epiphytes on laminas of *Laminaria hyperborea* kelp canopy plants at fish farm sites (low levels: FF-L, high levels: FF-H) and reference sites (Ref-L, Ref-H) in the Frøya (Ref-L, FF-L) and Smøla (Ref-H, FF-H) archipelagos, Norway. The points have been jittered to reduce overplotting.

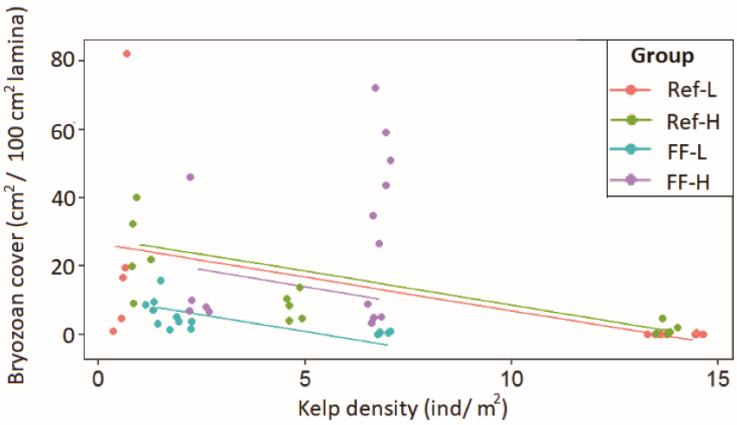

Figure S6. Model predictions for kelp density (lines) over collected data (points) of encrusting bryozoan cover on laminas of *Laminaria hyperborea* kelp canopy plants at fish farm sites (low levels: FF-L, high levels: FF-H) and reference sites (Ref-L, Ref-H) in the Frøya (Ref-L, FF-L) and Smøla (Ref-H, FF-H) archipelagos, Norway. The points have been jittered to reduce overplotting.