The following supplement accompanies the article

Effect of oyster aquaculture on seagrass *Zostera marina* at the estuarine landscape scale in Willapa Bay, Washington (USA)

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Supplement

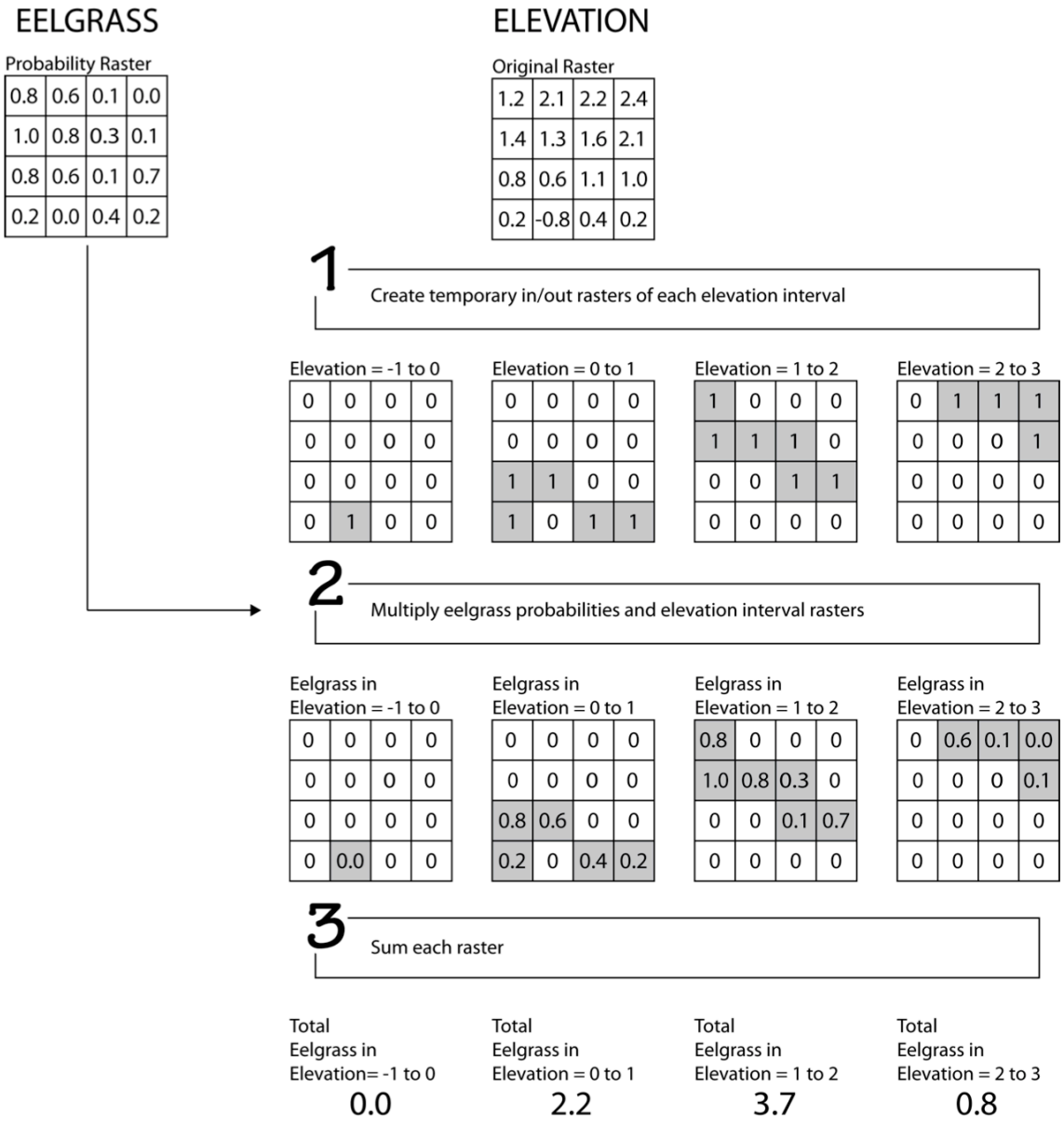

Fig. S1: Process for calculating eelgrass area by elevation.

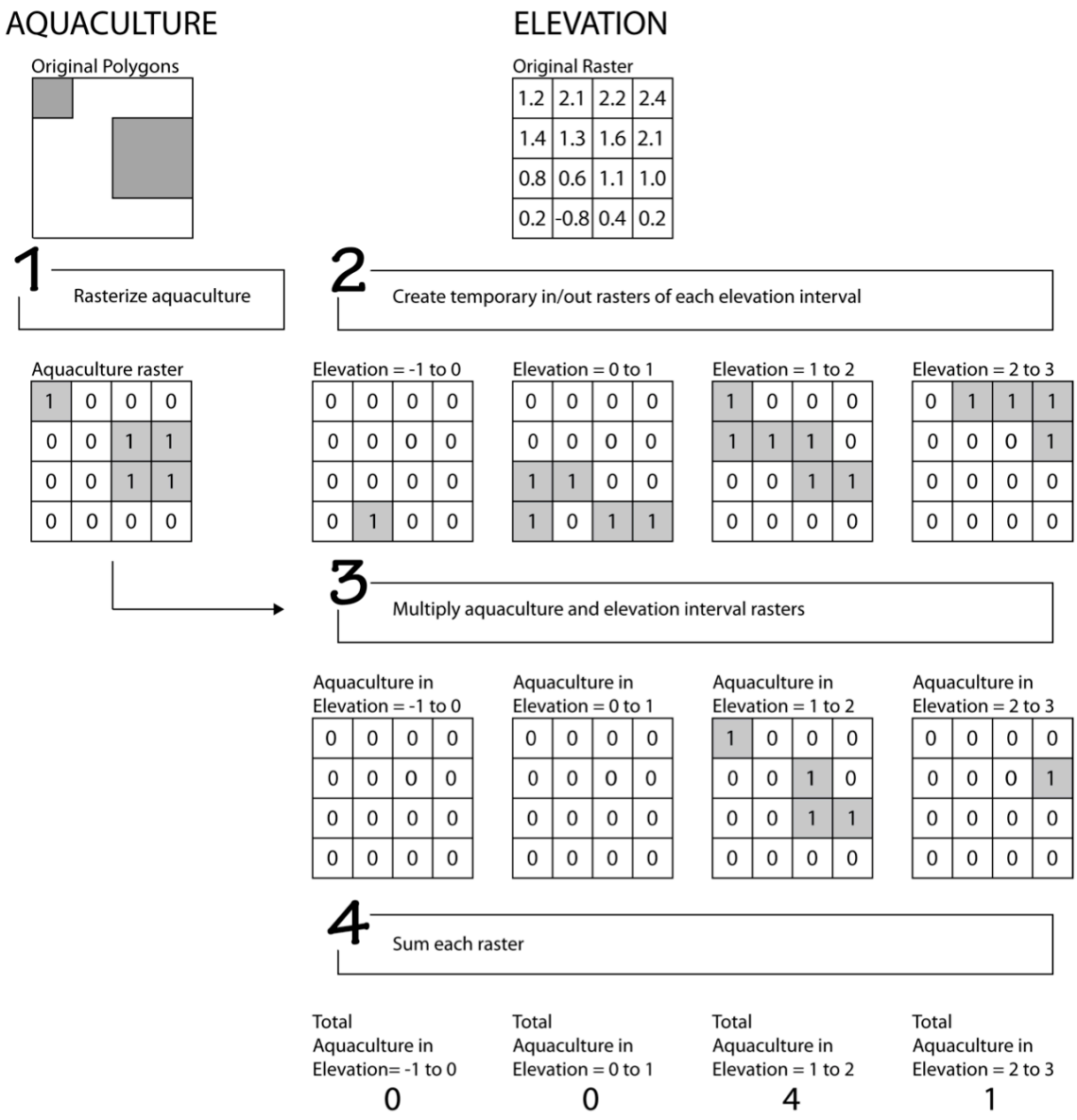

Fig. S2. Process for calculating oyster aquaculture area by elevation.

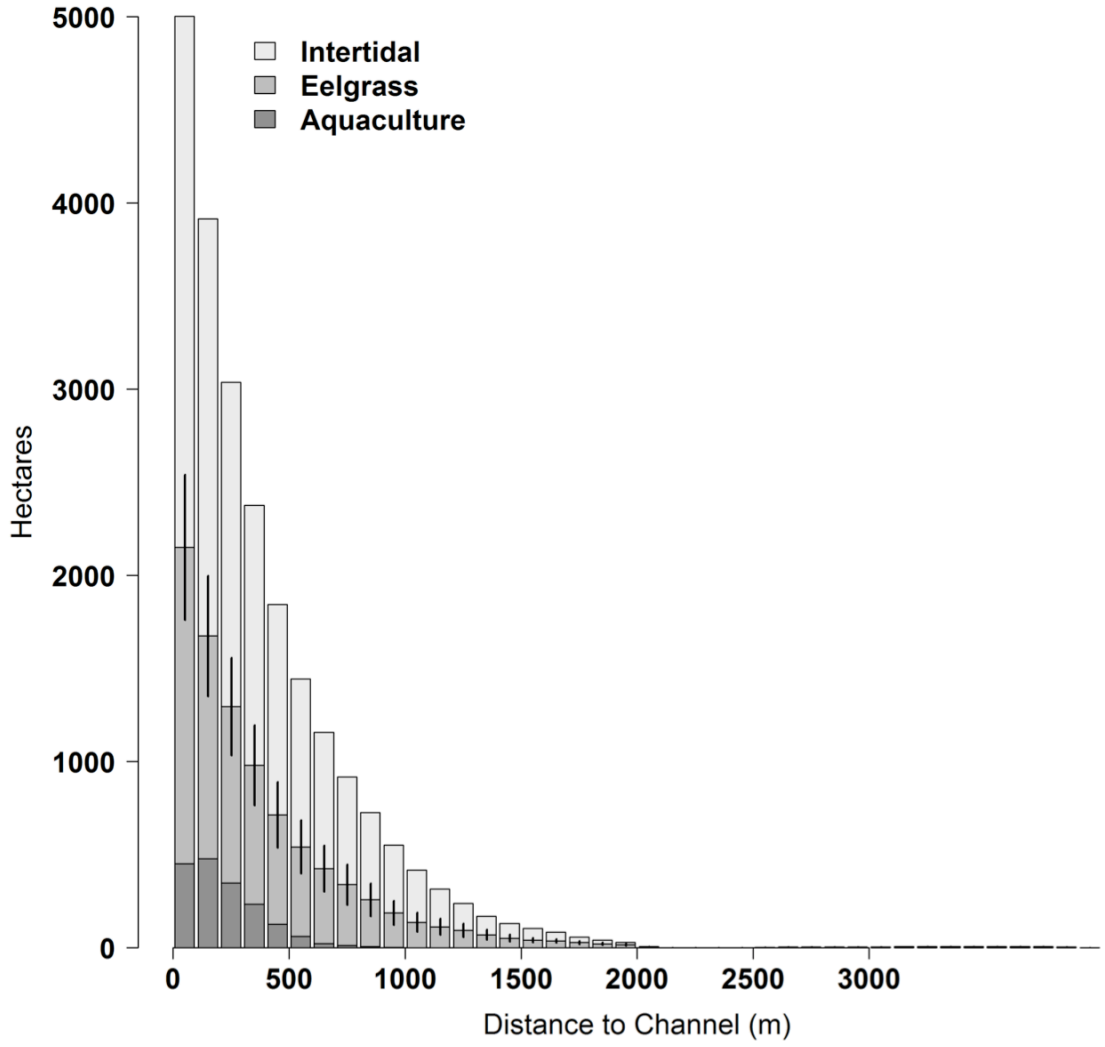

Fig. S3. Frequency distribution of the area (ha) of intertidal zone, eelgrass, and aquaculture by distance to the nearest channel (m) in Willapa Bay. Washington (small bars for eelgrass represent SE).

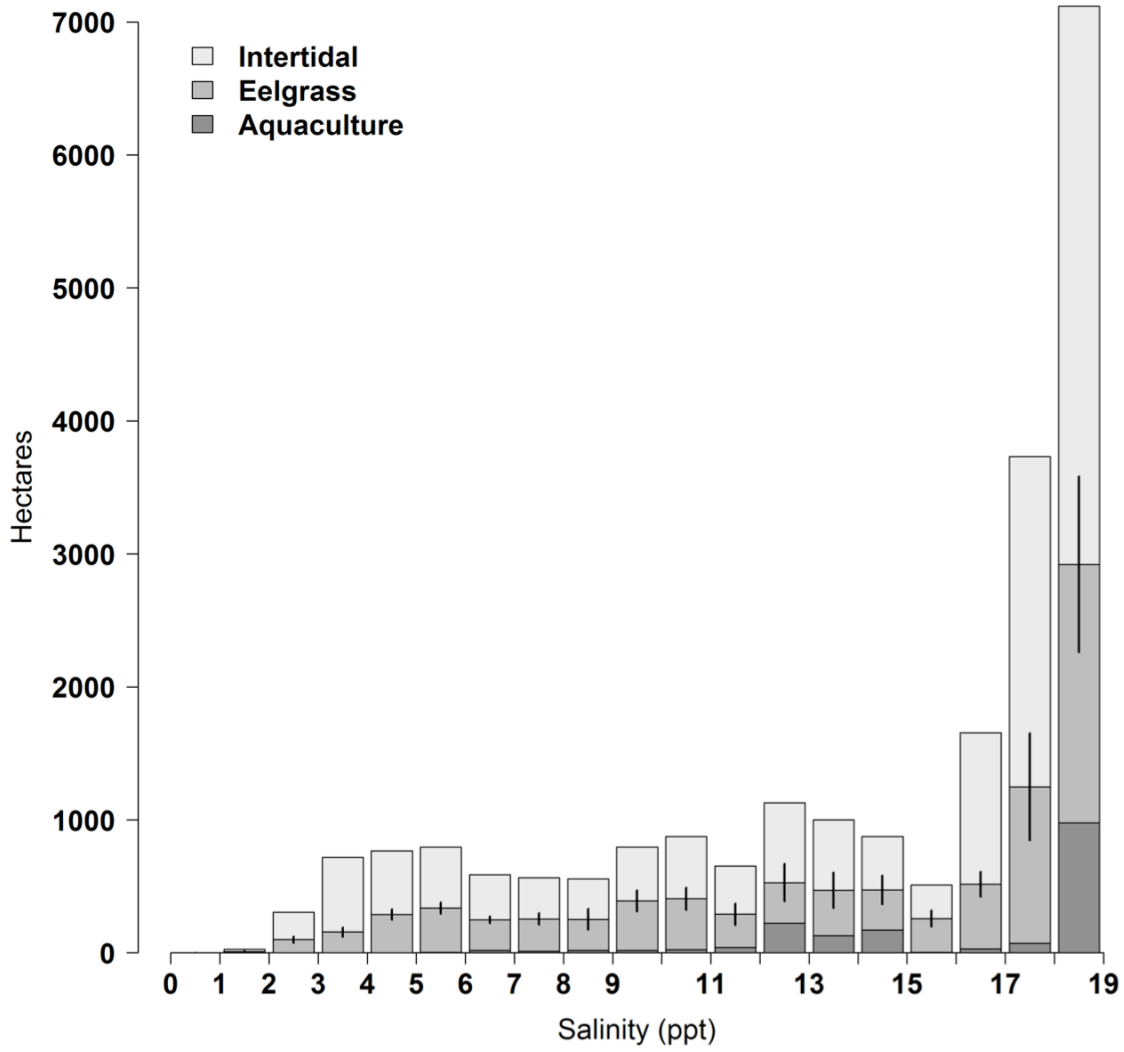

Fig. S4. Frequency distribution of the area (ha) of intertidal zone, eelgrass, and aquaculture by wet season salinity (5th quantile) in Willapa Bay, Washington (small bars for eelgrass represent SE).

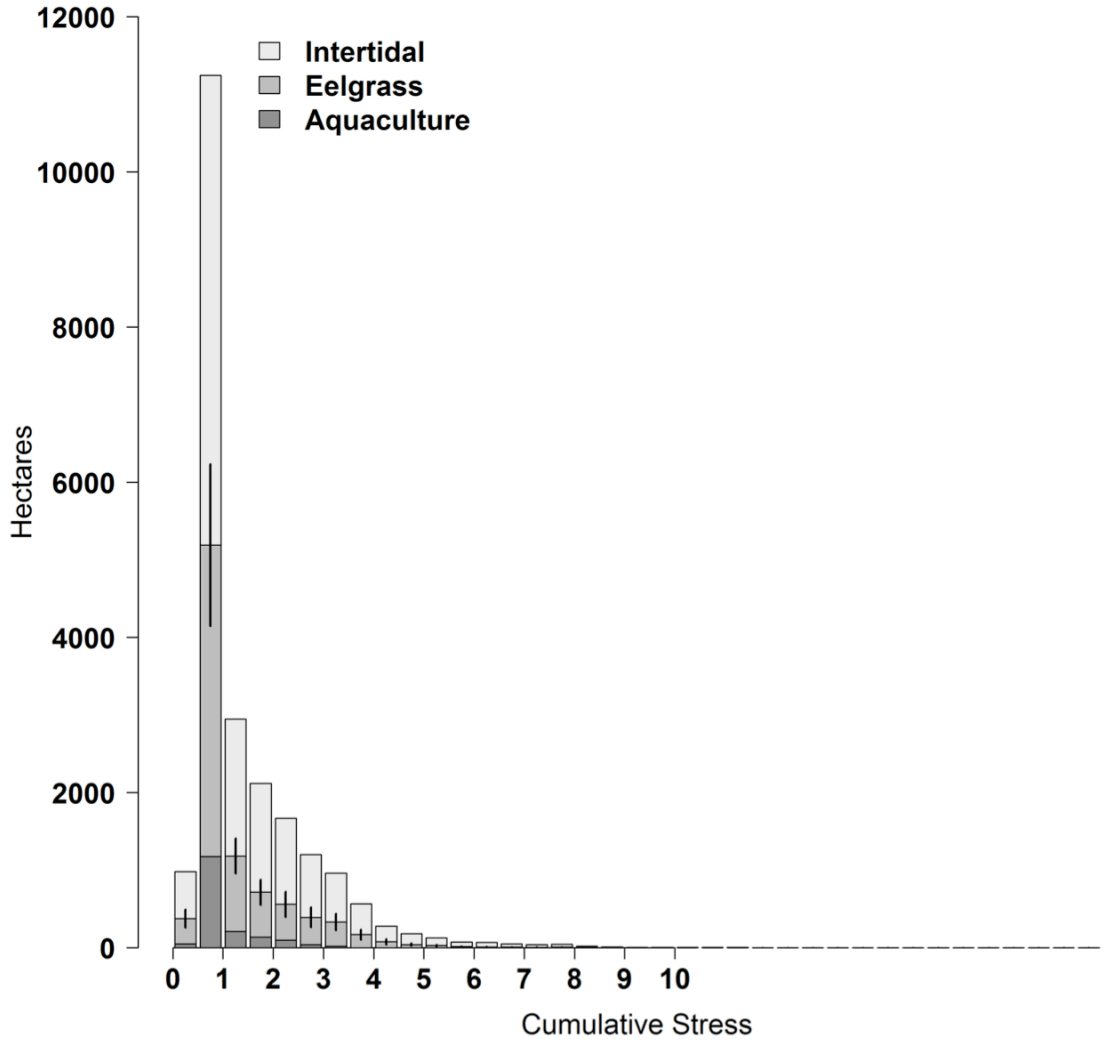

Fig. S5. Frequency distribution of the area (ha) of intertidal zone, eelgrass, and aquaculture by cumulative wind driven wave stress in Willapa Bay, Washington (small bars represent SE)

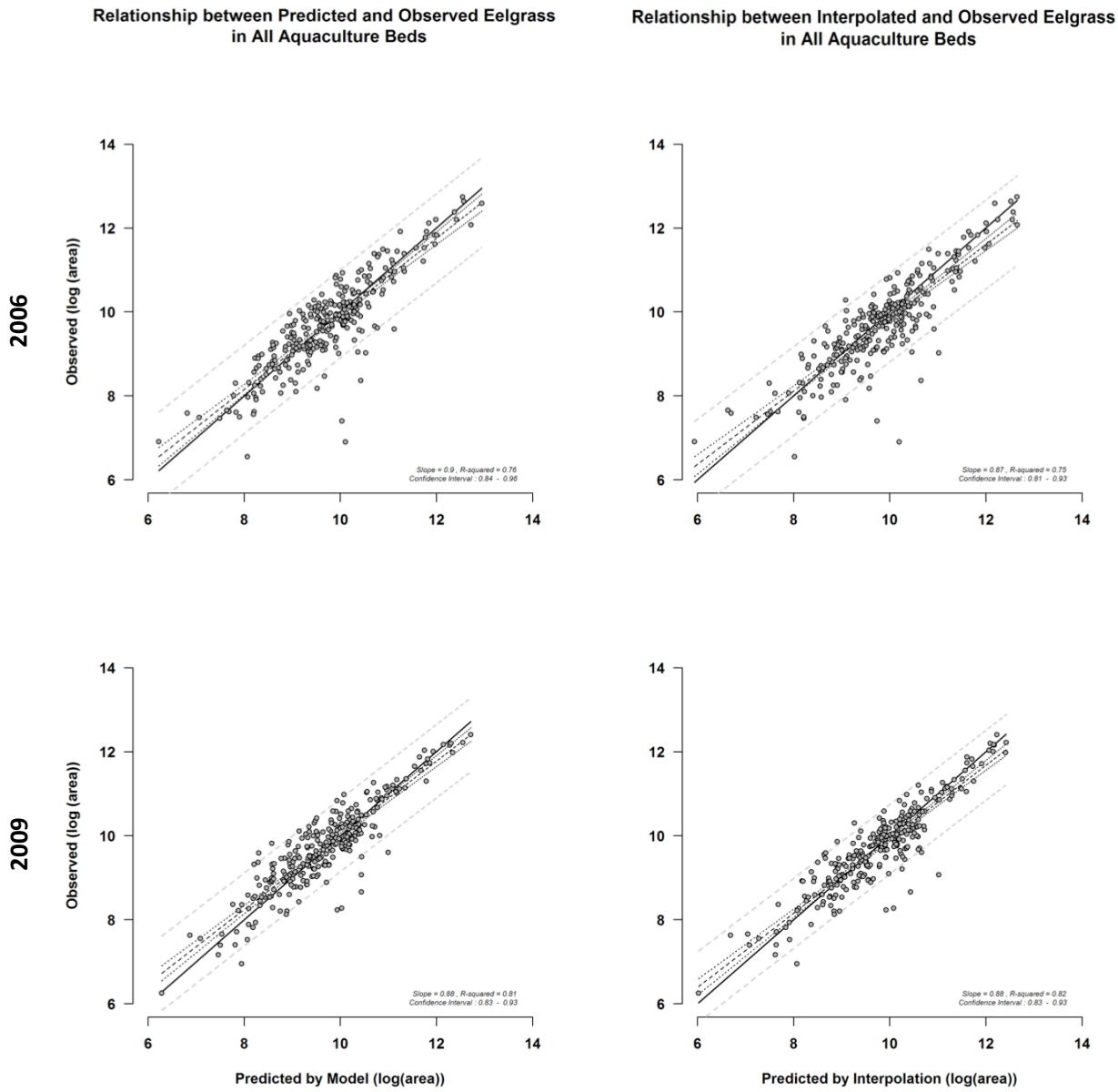

Fig. S6. Relationship between predicted and observed eelgrass, Z. *marina* area (m^2) in all aquaculture beds in 2006 and 2009 (left column) and the relationship between Interpolated and observed *Z. marina* in all aquaculture beds for 2006 and 2009 (right column). Model fit lines and confidence intervals overlap the 1:1 line which indicates they had the same amount of *Z. marina* cover present as predicted, however a group of beds fell well below and outside the 95% confidence and prediction intervals.

Table S1. Relative contribution of predictor variables to the GAM model for *Z. marina* in 2006 and 2009. The contribution of individual predictors are shown for a model with smoothing for each predictor. The final model incorporates a tensor smooth including three predictors and individual smoothes for two predictors. EDF = estimated degrees of freedom, χ^2 = chi-square and reflects the relative importance of each predictor in the model. The p-values are provided but are only useful for identifying predictors that do not contribute to the model.

2006

Individual Smoothes Deviance Explained: 35.3%

Predictors	**EDF**	**X^2**	**p-value**	**Contribution**
Elevation	5.364	232.71	<0.001	50.4 %
Salinity	5.962	37.69	<0.001	8.2 %
Distance to Estuary Mouth	8.609	129.55	<0.001	28.0 %
Cumulative Wave Stress	5.869	18.35	0.011	4.0 %
Distance to Nearest Channel	3.473	43.65	<0.001	9.4 %

Actual Model: Tensor and Individual Smoothes Deviance Explained: 41.2 %

Predictors	**EDF**	**X^2**	**p-value**	**Contribution**
Elevation & Salinity & Distance to Estuary Mouth	44.414	657.287	<0.001	93.9 %
Cumulative Wave Stress	1.312	7.501	0.0153	1.1 %
Distance to Nearest Channel	3.618	35.398	<0.001	5.1 %

2009

Individual Smoothes Deviance Explained: 47.2%

Predictors	**EDF**	**X^2**	**p-value**	**Contribution**
Elevation	4.670	244.32	<0.001	61.3 %
Salinity	5.048	17.51	0.009	4.4 %
Distance to Estuary Mouth	7.824	97.38	<0.001	24.4 %
Cumulative Wave Stress	3.501	14.70	0.008	3.7 %
Distance to Nearest Channel	3.031	24.46	<0.001	6.1 %

Actual Model: Tensor and Individual Smoothes Deviance Explained: 53.5 %

Predictors	**EDF**	**X^2**	**p-value**	**Contribution**
Elevation & Salinity & Distance to Estuary Mouth	31.651	546.44	<0.001	94.8 %
Cumulative Wave Stress	1.002	8.952	0.003	1.6 %
Distance to Nearest Channel	3.062	21.148	<0.001	3.7 %