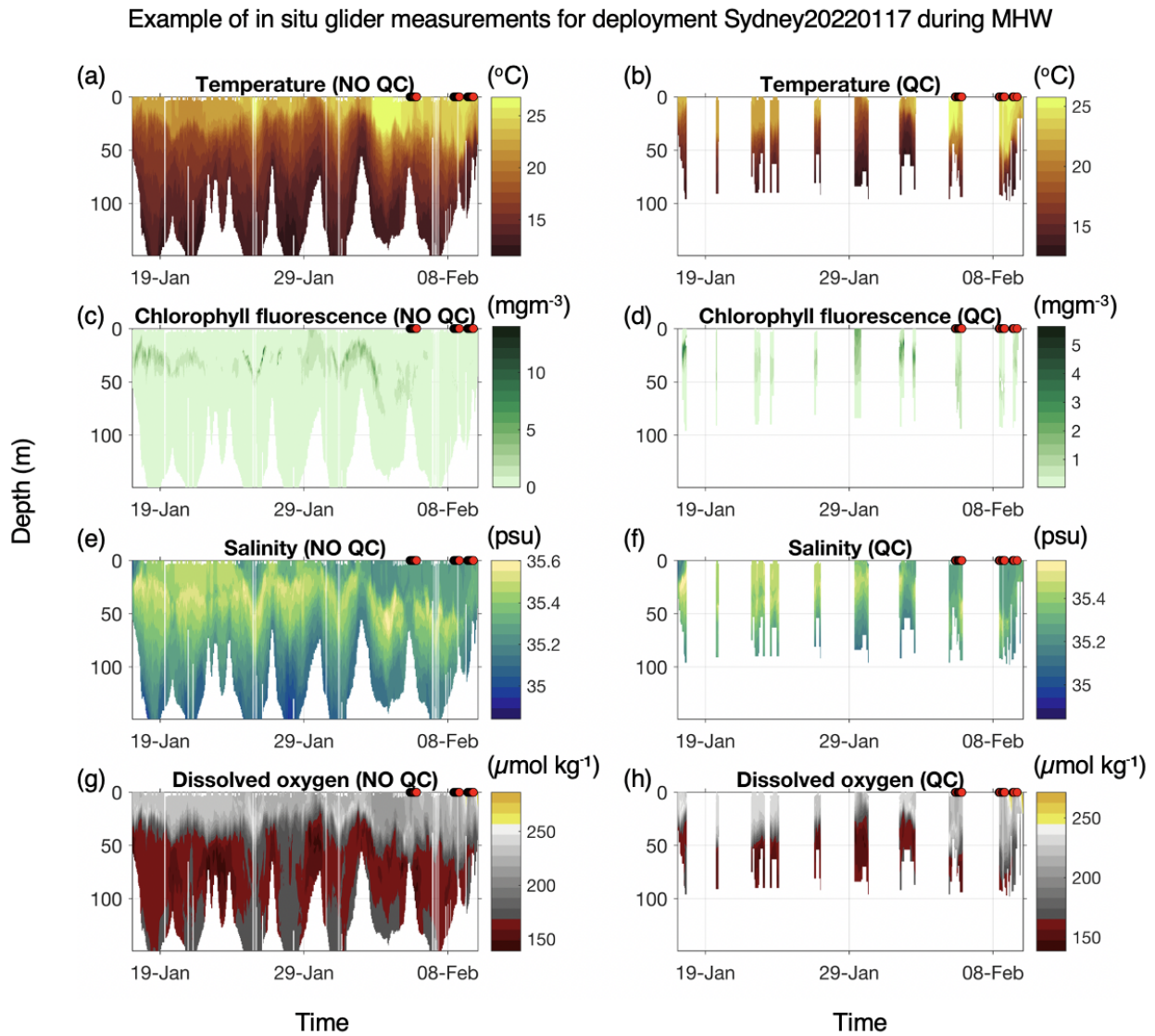


1 S1. Additional figures and tables

2



3

4 Fig. S1. Example of *in situ* glider measurements during deployment Sydney20220117 including the period the glider
5 encountered a MHW (red dots), showing (a,b) temperature, (c,d) chlorophyll fluorescence, (e,f) salinity and (g,h) dissolved
6 oxygen before (left) and after (right) quality control (QC) respectively. Panels(b,d,f,h) show data after IMOS QC flags
7 (retention of flagged good data only) are applied and additional steps including depth restriction to the continental shelf
8 and bottom boundary layer removal. Panel (d) includes additional QC for chlorophyll fluorescence, consisting of a
9 quenching correction (night-time data only) and removal of outliers.

10

11

12

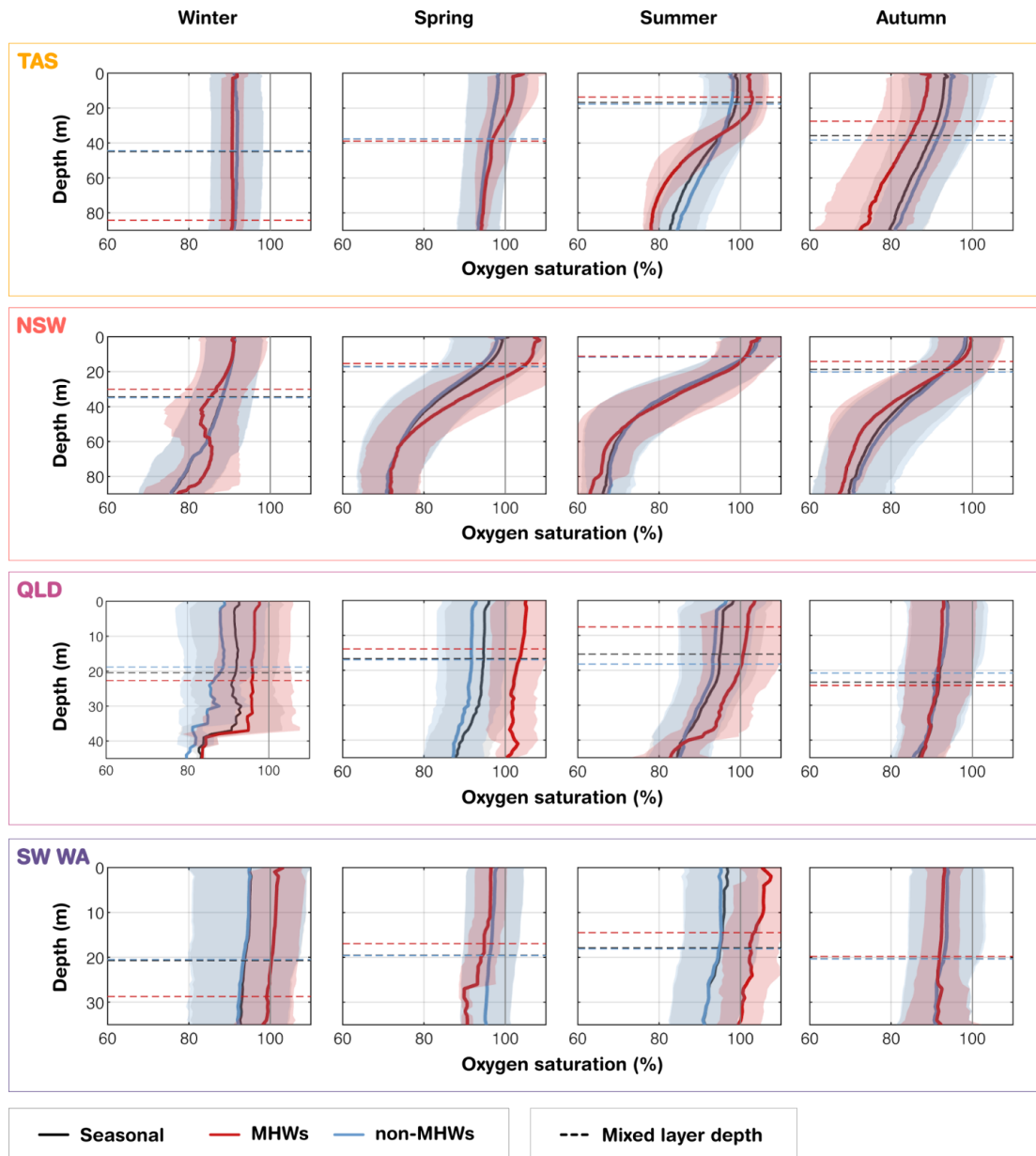
13

14 Table S1. Seasonal number of profiles (for chlorophyll only) with and without MHWs by region, as northeastern Australia
15 (Queensland region, QLD), southwest Western Australia (SW WA), southeastern Australia (New South Wales, NSW) and
16 eastern Tasmania (TAS).

		Number of profiles				
		Summer (DJF)	Autumn (MAM)	Winter (JJA)	Spring (SON)	Total profiles
QLD	MHW	473	1,008	466	276	5,317
	Non MHW	872	542	713	967	
	Total	1,345	1,550	1,179	1,243	
SW WA	MHW	504	272	85	96	9,054
	Non MHW	1,866	1,848	2,326	2,057	
	Total	2,370	2,120	2,411	2,153	
NSW	MHW	158	408	166	589	9,314
	Non MHW	1,053	1,422	1,832	3,686	
	Total	1,211	1,830	1,998	4,275	
TAS	MHW	265	429	6	62	5,320
	Non MHW	763	1,171	733	1,891	
	Total	1,028	1,600	739	1,953	

17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32

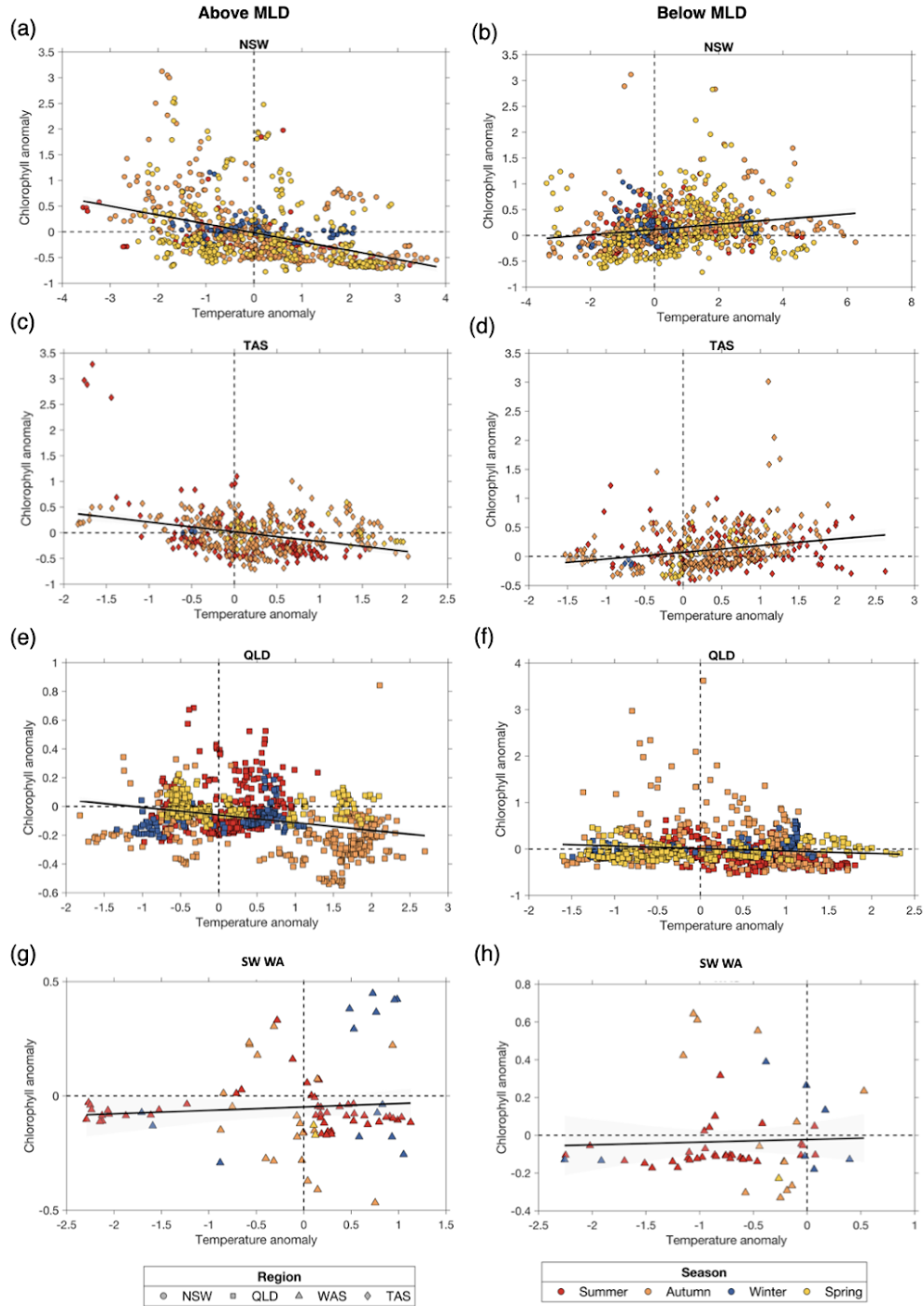
33



34

35 Fig. S2. Vertical dissolved oxygen saturation (%) for each region and season. Horizontal dashed lines are the mean mixed
 36 layer depths for the season, MHWs (red), mean (black) and non-MHWs (blue) conditions. Shaded areas represent the
 37 respective standard deviations. Seasons are defined as winter (June-August), spring (September-November), summer
 38 (December-February), and autumn (March-May).

Chlorophyll anomalies vs temperature anomalies above MLD versus below MLD



39

40 Fig. S3. Scatterplots of chlorophyll anomalies (mg m^{-3}) versus temperature anomalies ($^{\circ}\text{C}$) for each region,
 41 (a,b) NSW, (c,d) TAS, (e,f) QLD, and (g,h) SW WA, above and below the mixed layer depth, respectively. Data

42 points are colored by seasons (summer: red, autumn: orange, winter: blue, spring: yellow). The best-fit linear
43 curve is shown by the black, solid line, with shaded areas representing the error margins.

Dissolved oxygen anomalies vs temperature anomalies above versus below the MLD

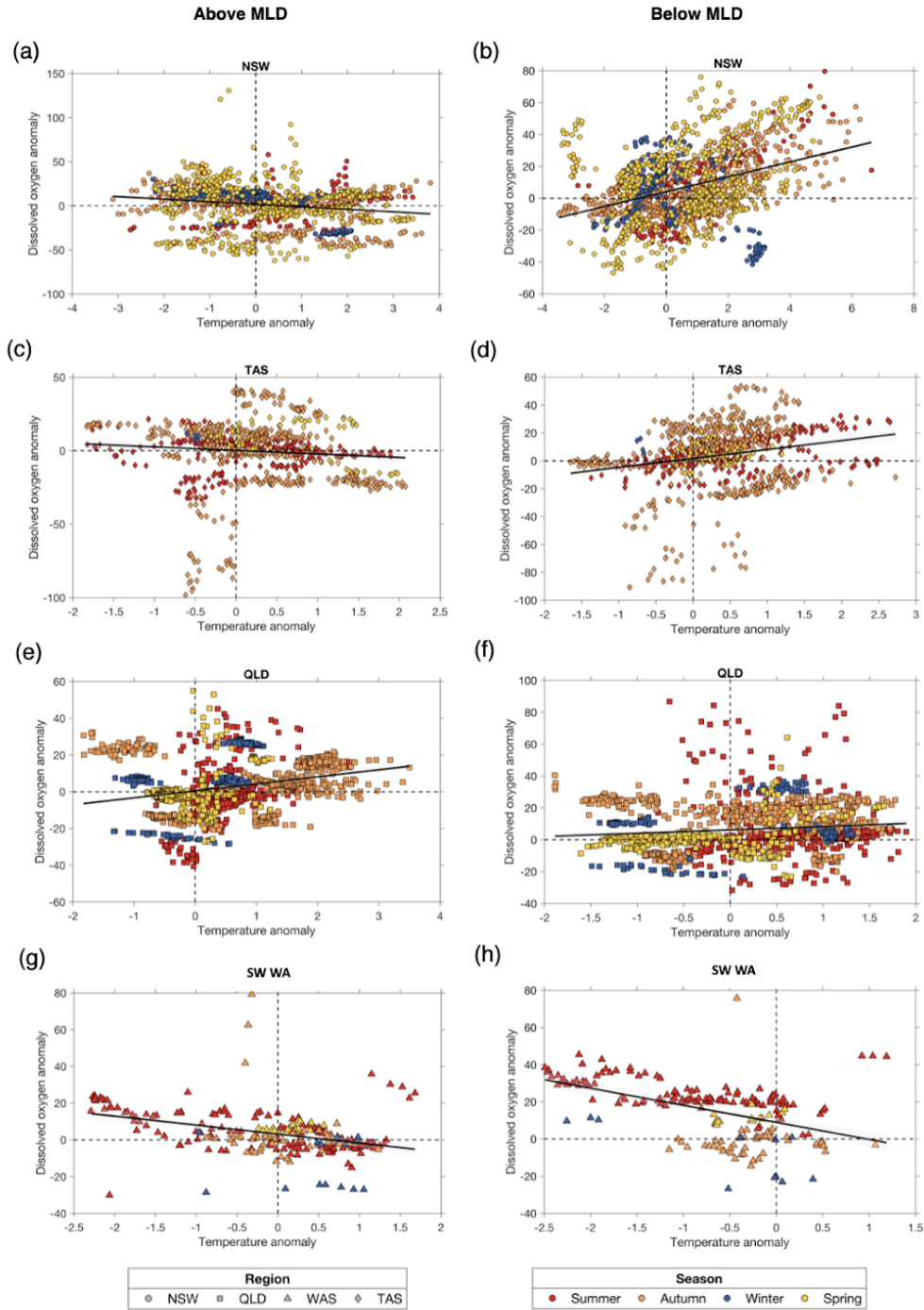


Fig. S4. Relationship between dissolved oxygen anomalies ($\mu\text{mol kg}^{-1}$) and temperature anomalies ($^{\circ}\text{C}$) for each region, (a,b) NSW, (c,d) TAS, (e,f) QLD, and (g,h) SW WA above and below the mixed layer depth respectively. Data points are colored by seasons (red = summer, orange = autumn, blue = winter, yellow = spring). Solid lines indicate the line of best fit, with shaded areas representing the error margins.

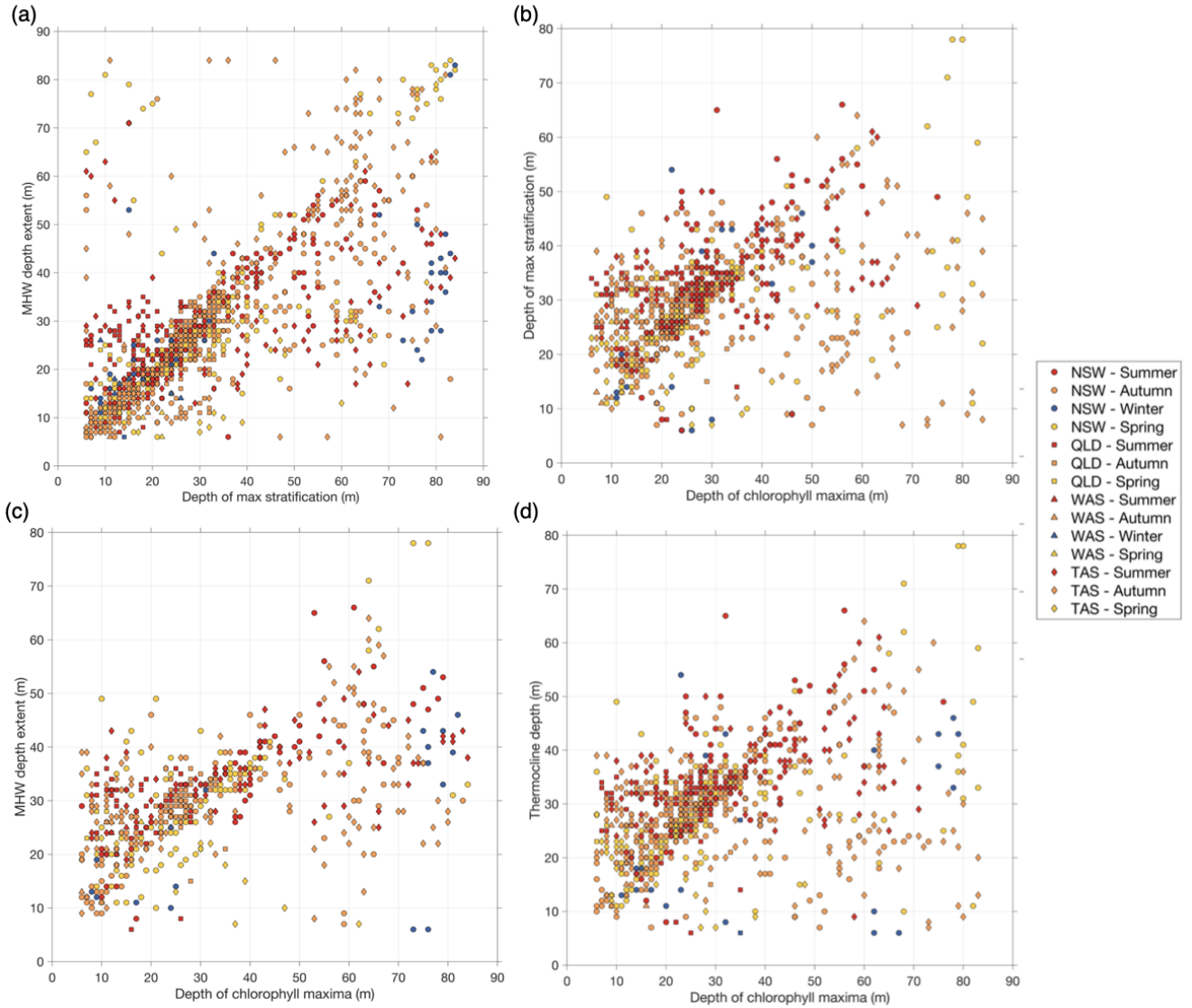
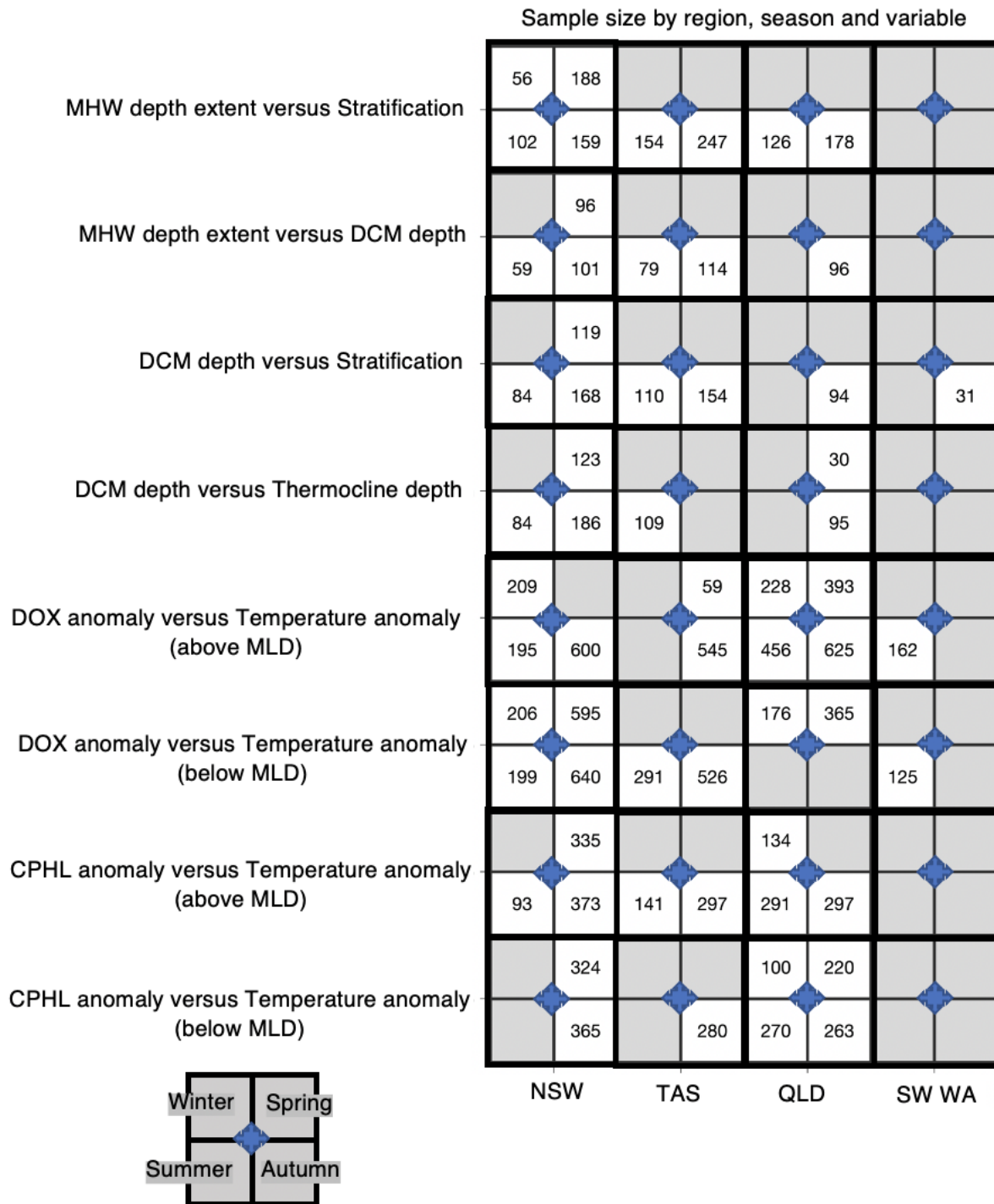


Fig. S5. Relationship between (a) MHW depth extent (m) versus depth of maximum stratification (m), (b) depth of maximum stratification (m) versus depth of chlorophyll maxima (m), (c) MHW depth extent (m) versus depth of chlorophyll maxima (m), (d) thermocline depth (m) versus depth of chlorophyll maxima (m). Data points are color-coded by season (red = summer, orange = autumn, blue = winter, yellow = spring) and marker shapes distinguish the regions.



56

57 Fig. S6. same as Fig. 10 but with the number of data points.