Supporting Online Material

Table S1. Details of Marine Climate Change Experiments analysed for the current review.

[a] Climatic region of origin of experimental organism(s): P – Polar, T – Temperate, Tr – Tropical, C – Cosmopolitan.
[b] Organism type: P – Phytoplankton, M- Macrophytes, Z – Zooplankton, B = Benthic invertebrates, F – Fish. No. spp: specific number of species used in experiment or undefined multi-species community ('comm').
[c] Experimental venue: T – Tank/aquaria based, M – Mesocosm experiment, F – Field experiment, MC – Modelling component. NOTE: in some cases where the distinction between tank/aquaria and mesocosm experiment was ambiguous we classified the study based on the experimental terminology used in the original manuscript.

Reference	**Factors**	**Region[a]**	**Organism type – No. spp.[b]**	**Biological responses**	**Methods/Experimental design**	**Main findings**	**Experimental venue [c]**
(Albright, Mason, & Langdon 2008)	CO_2	Tr	B – 1	Settlement, growth	3 CO_2 treatments, n = 2 'seed' aquaria each. Treatment water and larvae then transferred to 'replicate' vessels for settlement/growth.	CO_2 had no significant effect on settlement; but skeletal extension rate was negatively correlated with CO_2	T
(Andersson et al. 2009)	CO_2	Tr	B – comms	Calcification	2 CO_2 treatments, n = 3 mesocosms each. Calcification of whole coral reef assemblages. HCL used to acidify.	Net loss of assemblage calcification	M
(Anestis et al. 2007)	Temp	T	B – 1	Mortality, behaviour	6 temp treatments, slow acclimatisation and then held for 30 days. Pseudoreplicated in analysis.	Mortality increased with temp, behavioural changes also recorded.	T
(Anthony, Connolly, & Hoegh-Guldberg 2007)	Temp, light, sediments	Tr	B – 1	Mortality	8 different combinations of temperature, light regimes, and sediments were established using two replicate tanks for each treatment level. Exposures lasted for 5 weeks.	Temperature and sediment exerted strong effects on coral mortality risk.	T, MC
(Anthony et al. 2008)	CO_2, temp	Tr	B, M – 3	Bleaching, productivity, calcification	3 CO_2 treatments crossed with 2 temps. 5 true replicates for each treatment, 8 week exposure	Results indicated that high CO_2 is a bleaching agent for corals and CCA under high irradiance, acting synergistically with warming to lower thermal bleaching thresholds	T
(Arnold et al. 2009)	CO_2	T	B – 1	Larval development	2 CO_2 treatments, 5 replicates each. Larvae grown out for 30 days, sacrificial pseudoreplication in analysis.	CO_2 influenced late stages of larval development.	T

Reference	Factors	Region[a]	Organism type – No. spp.[b]	Biological responses	Methods/Experimental design	Main findings	Experimental venue [c]
(Barry et al. 2004)	CO_2	C	B – comms	Survival	Exp. at 3600 m depth where liquid CO_2 pumped into containers. Sacrificial pseudoreplication in analysis.	High rates of mortality for flagellates, amoebae, and nematodes inhabiting sediments in close proximity to sites of CO_2 release	F
(Berge et al. 2006)	CO_2	T	B - 1	Growth and mortality	5 CO_2 treatments, 1 replicate each, 40 day exposures	CO_2 inhibited growth.	T
(Berkelmans & van Oppen 2006)	Temp	Tr	B - 1	Symbionts, upper thermal limit	Transplant experiment followed by tank exp with 4 temp levels and 3 reps for each.	Corals acclimatise to temp with shifts in symbiont type	F, T
(Bernhard et al. 2009)	CO_2	C	B – 1	Survival	6 CO_2 treatments for 14 day exposures. 2 replicates each.	Survival at high CO_2	T
(Bibby et al. 2007)	CO_2, predation pressure	T	B- 1	Shell thickness, behaviour	2 CO_2 levels crossed with 2 predator levels, 15 day exposure.	CO_2 disrupted shell growth and reduced metabolic rate, but interacted with predation cues to influence behaviour	T
(Burkhardt et al. 2001)	CO_2	C	P - 2	Rates of CO_2 uptake	Cultures grown at 4 CO_2 treatments, for 48 hrs. No treatment replication	CO_2 uptake not influenced by CO_2	T
(Byrne et al. 2009)	Temp, CO_2	T	B – 1	Fertilisation success	3 temp levels crossed with 4 CO_2 levels, 12 hour fertilisation exps. Gametes collected from 2 individuals	No effects of CO_2, but various negative effects of high temperature	T
(Byrne et al. 2010)	Temp, CO_2	T	B- 1	Fertilisation success	3 temp levels crossed with 3 CO_2 levels, crossed with 4 sperm concentrations. No replication of treatment combination	No effects of CO_2, or temp on fertilisation success	T
(Dashfield et al. 2008)	CO_2, bioturbation	P	B – comms	community structure, abundance and richness	2 CO_2 levels crossed with urchin density w/ 5 reps each. Treatments ran for 8 wks	Higher abundance of nematodes with urchins in normal CO_2.	M
(Dupont et al. 2008)	CO_2	P	B - 1	Larvae survivorship	3 CO_2 levels, one tank each. Experiment conducted 3 times	Considerable CO_2 effects on larval survival, development and size.	T
(Ehlers, Worm, & Reusch 2008)	Temp, genetic diversity	T	M – 1	Shoot density	Complex block design with 2 temperatures (warm and ambient) and 3 genetic diversity treatments; 6 weeks acclimation, followed by 4 weeks 'heat wave' treatment and then 6 weeks grow out at ambient temperature.	A strong negative effect of warming and a positive effect of genotypic diversity on shoot densities.	M

Reference	Factors	Region[a]	Organism type – No. spp.[b]	Biological responses	Methods/Experimental design	Main findings	Experimental venue [c]
(Ellis et al. 2009)	CO_2	T	B - 1	Larval viability and development	2 CO_2 treatments, 9 reps each. 30 day exposures	CO_2 reduced viability, increased development times and influenced behaviours	T
(Egilsdottir, Spicer, & Rundle 2009)	CO_2, salinity	T	B - 1	Embryo development	2 CO_2 treatments and 3 salinity treatments. Replication undefined. Extreme CO_2 treatment (pH 7.5, >2100 projections).	Salinity had greater influence on embryo development than CO_2	T
(Engel et al. 2005)	CO_2	C	P – 1	abundance	9 outdoor mesocosms, 3 CO_2 levels, 3 reps each. 19 day exposure	Growth rates and calcification increased with CO_2	M
(Epelbaum et al. 2009)	Temp, salinity	T	B – 2	Growth, survival, and reproduction	5 temps crossed with 5 salinities, with 4 replicates	High tolerances to environmental change	T
(Feng et al. 2008)	CO_2, light, temp	C	P – 1	growth, photosynthesis	2 CO_2 treatments crossed with 2 temp treatments, 3 reps each. Exposure for 7 generations.	Growth accelerated by elevated temperature at low irradiance. Photosynthesis increased with enhanced CO_2 and temperature at both irradiances.	T
(Fine & Tchernov 2007)	CO_2	Tr	B – 2	Calcification	3 CO_2 treatments over 12 months followed by return to normal conditions. No treatment replication	Corals showed some ability to recover and grow after periods of decalcification	T
(Fredersdorf et al. 2009)	Temp, UV, salinity	P	M – 1	Photosynthesis, germination	5 temp treatments crossed with 2 UV or 3 salinity treatments for short (days) exposures of sporophytes and zoospores. Sacrificial pseudoreplication in results.	Life stage specific responses to environmental change	T
(Fu et al. 2007)	CO_2, temp	C	P – 2	Growth and photosynthesis	Cultures grown at 2 CO_2 levels and 2 temps, with 3 replicates for each combination. Cultured for at least 14 days	Doubled CO_2 combined with elevated temperature increased photosynthetic rates for one species.	T
(Gazeau et al. 2007)	CO_2	T	B - 2	Calcification	A range of CO_2 treatments, 2-hr incubations. No true replication.	Calcification decreased with increasing CO_2	T
(Gooding, Harley, & Tang 2009)	CO_2, temp	T	B – 1	Growth and feeding rates	2 CO_2 treatments crossed with 2 temps. 5 or 6 replicates each, with 2 subsamples in each.	Increased temp and CO_2 resulted in increased growth and feeding rates	T
(Grossart et al. 2006)	CO_2	C	P – comms	Abundance, growth	3 CO_2 treatments for 20 days. Pseudoreplicated in results.	Abundance not affected by CO_2 but protein production elevated at higher CO_2.	M

Reference	Factors	Region[a]	Organism type – No. spp.[b]	Biological responses	Methods/Experimental design	Main findings	Experimental venue [c]
(Gutow 2001)	Temp	T	B – 1	Abundance, reproduction, development	3 temp treatments, 5 reps each, 24 wk exps	Reproduction did not occur at lowest temps, suggesting that current and near-future conditions will prevent establishment of permanent populations.	T
(Gutowska, Pörtner, & Melzner 2008)	CO_2	T	B – 1	Growth, calcification	3 CO_2 treatments, 6 week experiments. No replication of treatment.	No effects of CO_2 treatments	T
(Hare et al. 2007)	Temp, CO_2	C	P – comms	Photosynthesis, abundance	2 temp treatments crossed with 2 CO2 treatments, 1 week incubations. Pseudoreplicated in analysis	Increased photosynthesis and shifts in assemblage composition with increased temp and CO_2	T
(Havenhand & Schlegel 2009)	CO_2	P	B – 1	Fertilisation success	2 CO_2 levels. 10 replicate microscope slides used for each assay	No effect of CO_2	T
(Havenhand et al. 2008)	CO_2	T	B – 1	Fertilisation success	2 CO_2 levels. Sperm and eggs contained in treatments for a few hours.	Increased CO_2 resulted in lower fertilisation success.	T
(Hoffman, Hansen, & Klinger 2003)	Temp, UV	T	M – 2	Germination, growth	Exposed early life stages to four levels of UVR at three temperatures for 56 h, 6 reps each	Temperature mediates the net biological effect of UVR and vice versa.	T
(Hueerkamp et al. 2001)	Temp	Tr	B – 5	Survival, symbionts	3 temp. levels with pairwise comparisons of coral fragments from multiple individuals. 5 reps per species	Warming caused loss of symbionts but magnitude of response species-specific	T
(Imsland et al. 2007)	Temp, light	T	F – 1	Growth	Larvae reared at 2 light treatments and 6 temp treatments then grown out in seapens at ambient conditions. Pseudoreplicated in results.	Initial temp. effects on growth sustained through to maturity.	T, F.
(Ishida et al. 2005)	CO_2	C	B – comms	Abundance/mortality	In situ deep-sea CO_2 chambers. No true replication, pseudoreplicated in results.	Meiobenthos decreased whereas bacteria increased under high CO2.	F
(Isla, Lengfellner, & Sommer 2008)	Temp	C	Z – 1	Growth, respiration, fecundity	4 temp treatments, 2 replicates each, 3 month incubations.	Respiration and ingestion rates were found to increase with temperature. Increased mortality and reduced growth efficiency with increased temp.	M
(Jacobson, Prevodnik, & Sundelin 2008)	Temp, fungicide pollutant	T	B – 1	Reproduction	2 temps crossed with 2 pollutant levels, 12 rep microcosms each with 9wk exposure. Extreme temp. treatment (+6°C, >2100 projections).	Elevated temp. and pollutant resulted in higher mortality.	M

Reference	Factors	Region[a]	Organism type – No. spp.[b]	Biological responses	Methods/Experimental design	Main findings	Experimental venue [c]
(Jokiel et al. 2008)	CO_2	Tr	B – comms	Growth, recruitment, calcification	Replicate mesocosms (n=3) set up for 10 months at 2 CO_2 levels	Reduced growth and recruitment at high CO_2	M
(Jones, Mieszkowska, & Wethey 2009)	Temp	T	B – 1	Mortality	Thermal tolerance experiment coupled with field transplants. 3 replicate sets of 5 inds for tank study, >70 inds used for field transplant.	Thermal tolerance drives distribution shifts	T, F, MC
(Kim et al. 2006)	CO_2	C	P - comms	Abundance	3 CO_2 levels, 3 reps each, 14 day exposures.	Minimal effects of CO_2	M
(Koch et al. 2007)	Temp, sulphide	Tr	M – 2	Shoot density, growth	4 temp levels crossed with 2 sulphide levels, 4 rep mesocosms each	High thermal tolerance.	M
(Kuffner et al. 2007)	CO_2	Tr	B – comms	Recruitment rate and growth	2 CO_2 treatments, 3 true reps. Pseudoreplicated in results (use of subsamples)	Recruitment rate and growth of crustose coralline algae were inhibited by CO_2	M
(Kurihara & Ishimatsu 2008)	CO_2	C	Z – 1	Survival, development, reproduction	2 CO_2 treatments, copepods reared for 2 generations (10 days each generation). Pseudoreplicated.	Minimal effects of CO_2	T
(Kurihara & Shirayama 2004)	CO_2	T	B – 2	Fertilization, development	6 CO_2 levels, with brief exposures before and during fertilisation. Pseudoreplicated at treatment level	Fertilisation and development inhibited by CO_2	T
(Kurihara, Matsui, et al. 2008)	CO_2	T	B – 1	Survival, growth, feeding and moulting	3 CO_2 levels, animals reared for 30 or 15 weeks. Pseudoreplicated in analysis.	Wide range of CO_2 effects on life history	T
(Kurihara, Kato, & Ishimatsu 2007)	CO_2	T	B - 1	Early development, larval condition	Incubated for 48 h in seawater acidified to pH 7.4. Extreme treatments, short exposure.	High CO_2 affects development	T
(Kurihara, Asai, et al. 2008)	CO_2	T	B – 1	Larval development	2 CO_2 levels, 5 reps each. Extreme treatments, short exposure.	High CO_2 affects development	T
(Langdon & Atkinson 2005)	CO_2	Tr	B – 2	Production and calcification	2 CO_2 treatments, numerous assays. Pseudoreplicated in results	Production increased with increased CO_2 but calcification decreased.	M
(Langenbuch & Pörtner 2004)	CO_2	C	B – 1	Survival	4 CO_2 treatments, long exposures. Unrealistic treatments (pH 6.55, >2300 projections) and no replication.	Survival decreased with increasing CO_2	T

Reference	Factors	Region[a]	Organism type – No. spp.[b]	Biological responses	Methods/Experimental design	Main findings	Experimental venue [c]
(Leclercq, Gattuso, & Jaubert 2002)	CO_2	Tr	B – comms	Calcification	1 mesocosm tank, 3 CO_2 treatments at 4 wks each. No replication.	Increased CO_2 decreased total calcification	M
(Leclercq et al. 2002)	CO_2	Tr	B – comms	Calcification	One mesocosm, CO_2 manipulated for 24 hr periods. No replication at treatment level	Increased CO_2 decreased total calcification	M
(Ling et al. 2008)	Temp.	T	B – 1	Fertilisation success and larval development	12 temp. levels with triplicate experimental vessels and 2 trial runs.	Larval development inhibited by cold conditions, hence recent warming has facilitated range expansion	T, F
(Liu et al. 2008)	Temp, light	Tr	B – 1	Survival, reproduction	3 temp. levels crossed with 3 light levels, long exposures. Pseudoreplicated design.	Increased temp. resulted in higher reproduction	T
(Martin & Gattuso 2009)	CO_2, temp	T	M – 1	Survival, calcification and dissolution	2 temps. crossed with 2 CO_2, 1 mesocosm each, long exposure. Pseudoreplicated.	Lower survival at high temps. Calcification lower with increased temp. and CO_2.	M
(Martin et al. 2008)	CO_2	T	B – comms	Biomass	Field exp in seagrass meadow adjacent to volcanic vent, also small lab component	Lower abundance of calcifying organisms at higher CO_2	F, T
(Marubini, Ferrier-Pages, & Cuif 2003)	CO_2	Tr	B – 4	Calcification	2 CO_2 treatments, 3 rep tanks for each, 8 day exposures.	Increased CO_2 lead to lower calcification rates	M
(Marubini et al. 2001)	CO_2, light	Tr	B – 1	Calcification	Tank exp: 2 CO_2 levels by 3 light levels, 6 wk exposure. Mesocosm exp: 3 CO_2 levels by 4 light levels, 10 wks of growth. Pseudoreplicated	Decreased calcification with CO2, greatest at high light treatments	T, M
(Massa et al. 2008)	Temp	T	M - 1	Mortality and resilience	4 temp. exposures for 3 hours. Then maintained at ambient for 3 weeks. Pseudoreplicated.	High mortality with increased temps.	M
(McClintock et al. 2009)	CO_2	P	B – 4, M – 1	Dissolution	2 CO_2 treatments, shells placed in acidified water for 60 days	High CO_2 caused shell dissolution	T
(McDonald et al. 2009)	CO_2	T	B – 1	Development, growth, performance	2 CO_2 treatments, 5 beakers for each, wide range of response variables. Pseudoreplicated in results	Inconsistent effects of CO_2	T

Reference	**Factors**	**Region[a]**	**Organism type – No. spp.[b]**	**Biological responses**	**Methods/Experimental design**	**Main findings**	**Experimental venue [c]**
(Melzner et al. 2009)	CO_2	T	F – 1	Physiological performance	4 and 12 month exposures to three levels of CO_2. No replication at treatment level, temporally confounded.	No effects of CO_2	T
(Metzger et al. 2007)	Temp, CO_2	T	B – 1	Aerobic scope	Thermal tolerance exp. under 2 CO_2 levels. Extreme CO_2 treatments (pH 7.0, >2300 projections)	Increased CO_2 reduced thermal tolerance	T
(Michaelidis et al. 2005)	CO_2	T	B – 1	Growth, metabolism	2 CO_2 treatments, 3 month exposure. Pseudoreplicated.	Higher CO_2 resulted in lower growth and metabolism	T
(Miller et al. 2009)	CO_2	T	B – 1	Larval development	4 CO_2 treatments, 3 replicates.	Increased CO_2 affected larval development	T
(Morelissen & Harley 2007)	Temp	T	B - comms	herbivore growth and mortality, algal abundance, interactions	2 temp. treatments crossed with grazer removal treatments.	Inconsistent community level responses to warming	F
(Morley et al. 2009)	Temp	C	B – 3	Activity, thermal tolerance	Burrowing activity at elevated temperatures for 3 genera along latitudinal gradient. Pseudoreplicated	Latitude had minimal influence on thermal tolerance	T
(Munday, Dixson, et al. 2009)	CO_2	Tr	F – 1	Larval performance	Larvae reared at 3 CO_2levels: response to olfactory cues then tested.	CO_2 affected homing behaviours	T
(Munday, Donelson, et al. 2009)	CO_2	Tr	F – 1	Larval development	Larvae reared at 4 CO_2 levels, 4 replicate tanks each	No negative effects of CO_2 recorded, potential positive influences	T
(O'Connor 2009)	Temp, herbivore pressure	T	B – 1, M – 1	Net algal growth	4 temp treatments, 11 and 14 day exposures, with or without herbivores, paired replicates	Increasing temp. increased interaction strength and reversed a positive effect of temp. on algal growth.	T
(O'Donnell, Hammond, & Hofmann 2008)	CO_2, temp	T	B – 1	Thermal tolerance of larvae	Larvae cultured at 3 CO_2 levels and then exposed to short-term temp shocks. Pseudoreplicated in original culture stage	CO_2 reduced thermal tolerance	T
(Palacios & Zimmerman 2007)	CO_2, light	T	M – 1	Biomass, shoot density, growth	4 CO_2 levels, crossed with 2 light levels for 1 yr exposure.	CO_2 enrichment led to higher reproductive output and biomass	M

Reference	Factors	Region[a]	Organism type – No. spp.[b]	Biological responses	Methods/Experimental design	Main findings	Experimental venue [c]
(Parker, Ross, & O'Connor 2009)	CO_2, temp	T	B – 1	Fertilisation and embryonic development	Split plot design with 4 temp levels and 4 CO_2 levels, short-term development exposures. Use of HCL to manipulate pH	CO_2 lead to decreased fertilisation, and affected development. Interaction with high temp.	T
(Peck et al. 2008)	Temp	P	B – 1	Movement, feeding, metabolism	6 temp levels, pseudoreplicated in analysis. Short-term exposures	Thermal tolerance varies between species	T
(Peck, Webb, & Bailey 2004)	Temp	P	B – 3	Activity	6-10 temp levels, pseudoreplicated in analysis. Short-term acclimations	Low thermal tolerance of Antarctic species	T
(Peck et al. 2007)	Temp, O_2	P	P – 1	Activity	7 temp. levels crossed with 3 O2 levels, pseudoreplicated in analysis. Short term acclimations	Temp. influences physiological activity	T
(Peck, Clark, et al. 2009)	Temp	P	B – 14	Thermal tolerance	6-10 temp levels, pseudoreplicated in analysis. Short-term acclimations	Predators and small species may be more tolerant to warming.	T
(Peck, Massey, et al. 2009)	Temp	P	B – 1	Thermal tolerance	Individuals exposed to 2 temp. elevations in tanks. Pseudoreplicated.	Species specific thermal tolerances	T
(Petes, Menge, & Murphy 2007)	Temp, desiccation	T	B – 1	Growth and survival	Transplant experiments in intertidal mussel beds.	Temp. stress affected physiology	F
(Przeslawski, Davis, & Benkendorff 2005)	Temp, UV, salinity	T	B – 3	Larval mortality and development	3 UV treatments x 3 salinity treatments x 3 temps, 6 reps for each	Synergistic effects of combined stressors	T
(Reynaud et al. 2003)	Temp, CO_2	Tr	B – 1	Calcification and respiration	2 temps. crossed with 2 CO_2 treatments, 5 week exposure. No replication at treatment level.	Synergistic effects of increased temp. and CO_2 on calcification	T
(Riebesell et al. 2000)	CO_2	C	P – 2, P - comms	Calcification rates	2 spp incubated at a range of CO_2 levels for 8 generations. Natural assemblages also collected and exposed to various CO2 treatments. Use of HCL to obtain CO_2 treatments	strong inverse relationship between CO_2 and calcification	M

Reference	Factors	Region[a]	Organism type – No. spp.[b]	Biological responses	Methods/Experimental design	Main findings	Experimental venue [c]
(Ries, Cohen, & McCorkle 2009)	CO_2	T	B – 18	Calcification	4 CO_2 levels, 60 day incubations	Response to CO_2 varies between species	T
(Russell et al. 2009)	CO_2, nutrients	T	M – 1	Biomass, recruitment	2 CO_2 treatments crossed with 2 nutrient levels, 76 day exposure. Pseudoreplicated at treatment level	Synergistic effects of CO_2 and nutrients on biomass and recruitment for calcifying algae. Turf forming algae responded positively	M
(Sanford 2002)	Temp	T	B – 2	Growth and feeding activity	3 temp. treatments including a variable regime. 4 replicates each	Animals benefit from lower metabolic costs at lower temps.	T
(Sanford et al. 2006)	Temp	T	T – 1	Larval survival	2 populations, larvae reared at 6 temps, 2 reps each and maintained until grow out. Second experiment used 5 populations and 2 temps.	Larval growth and development faster at higher temps. Low survival at temp minima	T
(Sarà et al. 2008)	Temp, salinity	T	B – 1	Growth, respiration	3 temps crossed with 4 salinities, no true replication.	Wide physiological tolerance	T
(Schiel, Steinbeck, & Foster 2004)	Temp	T	B – comms	Community structure, diversity	10 years of warming from thermal effluent of power plant. Used before/after control/impact design to detect major shifts in benthic structure	Large, unpredicted changes. Interactions between temp and indirect effects from shifts in dominant species	F
(Schröer et al. 2009)	Temp	T	B – 1	Aerobic capacity	Animals collected from along a latitudinal gradient then acclimated to 6 temps and activity assessed. 5 rep individuals per treatment (no true replication).	Thermal tolerance increases with decreasing latitude	T
(Sciandra et al. 2003)	CO_2	C	P – 1	Calcification	2 CO_2 levels under nitrogen-limited conditions, 15 day exposures	C/P ratio unaffected by CO_2	T
(Shirayama & Thornton 2005)	CO_2	T	B – 3	Growth, survival	2 CO_2 levels, for 6 months. Pseudoreplicated in results	Elevated CO_2 had negative effects on growth for all species	T
(Sogard & Olla 2001)	Temp, food availability	T	F – 1	Growth	8 temps crossed with 2 food treatments, 6 reps each. 3 wk exposures in tanks.	Food availability affected thermal tolerance, temp. likely to drive distribution shifts.	T
(Sommer & Lengfellner 2008)	Temp, light	C	P/Z – comms	Assemblage dynamics	Mesocosm with 4 temp. treatments and 2 reps. Experiment repeated over 3 years at different light levels	Strong difference in spring bloom timing between light treatments, temp. negatively affected many assemblage metrics	M
(Sommer et al. 2007)	Temp	C	P/Z – comms	Assemblage dynamics	Mesocosm with 4 temp. treatments and 2 reps.	Temp. did not affect timing but did have negative effects on assemblage metrics	M

Reference	Factors	Region[a]	Organism type – No. spp.[b]	Biological responses	Methods/Experimental design	Main findings	Experimental venue [c]
(Sotka & Giddens 2009)	Temp	T	B – 1	Feeding behaviour	Series of feeding assays at two temps, with 2 biogeographically distinct populations	Biogeography has major role in the effects of warming on feeding choice	T
(Staehli et al. 2009)	Temp, salinity	T	B – 1	Mortality, bacterial infection	3 temp. treatments crossed with 2 salinities. Pseudoreplicated at treatment level.	Increased temp. led to higher infection rates	T
(Stillman 2003)	Temp	T	B - 4	Heart rate	Acclimated for 4 weeks to high and low temps, then thermal experiment on heart rates	Species living at high temps in wild had least ability to adapt to higher temp	T
(Swanson & Fox 2007)	CO_2	T	M – 2	Biomass, consumption by herbivores	large outdoor tanks, 2 CO_2 treatments crossed with 2 UV treatments, 55 day exposures. Pseudoreplicated at treatment level.	Species specific response to stressors	M
(Talmage & Gobler 2009)	CO_2	T	B – 3	Larval development	4 CO_2 levels, pseudoreplicated at the treatment level	CO_2 affected various aspects of larval development	T
(Thistle et al. 2007)	CO_2	C	B – comms	Behaviour	Deep sea cylinders filled with CO_2. Traps used to assess animal avoidance. No replication.	Animals attempted to escape from the advancing front of CO_2-rich seawater and presumably found exposure to it to be stressful.	F
(Torrents et al. 2007)	Temp	Tr	B – 1	Activity, calcification rate	4 different thermal tolerance exps, varying in duration and magnitude. Pseudoreplicated	Shallow population had greater thermal tolerance than deep samples	T
(Travers et al. 2009)	Temp, disease	T	B – 1	Mortality	Complex design to test effects of maturity and temp on susceptibility to disease	Susceptibility strongly influenced by maturity and temp.	T, F
(Vilchis et al. 2005)	Temp, food quantity and quality	T	B – 2	Survivorship, growth, and reproduction	3 temp. levels crossed with 3 food quantity and 3 food quality levels, 300 day expts.	Species specific responses to stressors, synergistic effects	T
(Vinueza et al. 2006)	Temp, herbivory	Tr	B – comms	Community structure, diversity	Caged manipulations of herbivores conducted during El nino and post El Nino conditions.	Communities respond rapidly to oceanographic conditions	F
(Watson et al. 2009)	CO_2	T	B – 1	Larval development	3 CO_2 levels, pseudoreplicated at the treatment level	CO_2 affects larval development	T
(Widdicombe & Needham 2007)	CO_2	T	B – 1	Activity	4 CO_2 treatments, replicated 4 times	No effects of CO_2	T

Reference	Factors	Region[a]	Organism type – No. spp.[b]	Biological responses	Methods/Experimental design	Main findings	Experimental venue [c]
(Wood, Spicer, & Widdicombe 2008)	CO_2	T	B – 1	Regeneration, metabolism	4 CO_2 treatments, 4 sediment cores in each, 20 inds per core Animals manipulated before 40 day exposure. 4 true replicates (cores) but pseudoreplicated in results	Short-term upregulation of physiological processes	M
(Yates & Halley 2006)	CO_2	Tr	B – comms	Calcification and dissolution	in situ chambers deployed and seeded with CO_2 from cylinders on surface structure. No replication	Calcification and dissolution are linearly correlated with CO_2	F
(Yoshimura et al. 2009)	CO_2	T	P – comms	Assemblage and organic C dynamics	4 CO_2 levels, 3 replicates each, 14 day incubations	CO_2 affected assemblage dynamics and reduced dissolved organic carbon	M

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