Didier Aurelle, Séverine Thomas, Cécile Albert, Marc Bally, Alberte Bondeau, Charles-François Boudouresque, Abigail E. Cahill, François Carlotti, Anne Chenuil, Wolfgang Cramer, Hendrik Davi, Aurélien De Jode, Alexander Ereskovsky, Anne-Marie Farnet, Catherine Fernandez, Thierry Gauquelin, Pascal Mirleau, Anne-Christine Monnet, Bernard Prévosto, Vincent Rossi, Stéphane Sartoretto, France Van Wambeke, Bruno Fady

Appendix S1: Historical and projected trends of environmental changes in the Mediterranean region

This section details the literature references used to establish Table 1 in the main manuscript, i.e. historical and projected environmental trends. It deals with the following parameters:

- air temperature including temperature extremes and heat waves (Tables S1a and S1b), precipitation (Tables S2a and S2b) and surface solar radiation precipitation (Tables S3a and S3b) **on land**;
- sea temperature including temperature extremes and heat waves (Table sS4a and S4b), salinity (Tables S5a and S5b), sea level (Tables S6a and S6b), and pH (Tables S7a and S7b) **at sea**;
- urbanisation (Tables S8a and S8b) and land use change (Tables S9a and S9b) **for social changes**.

These parameters were selected based on a) their relevance to the potential adaptation processes and b) sufficient studies available for the Mediterranean region. Lines that are shaded in grey refer to local information as opposed to basin wide and are not taken into account for median calculation in Table 1.

Med = Mediterranean
SAT = Surface Air Temperature
HW = Heatwave

Table S1a: Historical trends for Air Temperature

	Description	Region	Source	Study period	Trend (°C/decade)	Reference
AIR TEMPERATURE	**MEAN**					
	Annual & seasonal SAT (over land and sea)	Whole Med	CRU & HADCRUT4 datasets & CMIP5 ensemble mean	1860-2005	**0.05**	Mariotti *et al.* (2015)
				1960-2005	**0.2**	
	Annual (over land)	Whole Med	in situ data	1901-1998	**0.08**	Giorgi (2002)
	Annual SAT (over land)	Spain	in situ data (476 stations)	1961 to 2006	**0.3**	del Rio *et al.* (2012)
	(over land)	Maltese islands	in situ data	1951 to 2010	**0.19**	Galdies (2012)
	Annual (over land)	Athens, Greece	in situ data	1897-2000	**0.05**	Founda *et al.* (2004)
				1992-2001	**2.07**	
	EXTREMES AND HEAT WAVES					
	(over land)	East Med	in situ data	~ 1960-2000	**HW intensity, length and number have increased by a factor ~7**	Kuglitsch *et al.* (2010)
	(over land and sea)	North Med	in situ data & gridded data set	1958-2008	**More warm/hot extremes and fewer cold extremes in general but high regional variations in winter**	Efthymiadis *et al.* (2011)
	(over land)	Athens, Greece	in situ data	1891 to 2007	**Significant frequency increase of hot summer days and HW episodes**	Founda & Giannakopoulos (2009)
	(over land)	Athens, Greece	in situ data	1897-2001	**Increased frequency of occurrence and duration of warm events during 1990-2001**	Founda *et al.* (2004)

Table S1b: Projected trends for Air Temperature.

	Description	Region	Source	Study period	Scenario	Trend (°C/decade)	Reference
AIR TEMPERATURE	**MEAN**						
	Summer SAT (over land)	Whole Med	Multi Global Model Ensemble (AR4, IPCC 2007)	2081-2100 versus 1961-1980	A1B	**0.38**	Giorgi & Lionello (2008)
	(over sea)					**0.3**	
	Annual and seasonal (over land)	Whole Med	Multi-model ensemble 6 Regional Climate Models and 2 GCMs	2071-2100 versus 1961-1990	A1B	**[Range: 0.22 to 0.45]**	Planton *et al.* (2012)
	(over sea)					**[Range: 0.18 to 0.27]**	
	Annual SAT (over land and sea)	Whole Med	CMIP5 model simulations (AR5, IPCC 2013). 54 Ensemble runs 25 GCMs	2098 versus 1860	RCP 4.5	**0.19**	Mariotti *et al.* (2015)
				2071-2098 versus 1980-2005		**0.24**	
	2-m (over land and sea)	Whole Med	CIRCE models	2021–2050 versus 1961–1990	A1B	**[Range: 0.27 to 0.36]**	Gualdi *et al.* (2013)
	Seasonal SAT	Whole Med	CMIP5 model simulations (AR5, IPCC 2013). 28 Ensemble runs 16 GCMs	2071-2100 versus 1961-1990	A1B	**[Range: 0.3 to 0.44]**	Lionello & Scarascia (2018)
	EXTREMES AND HEAT WAVES						
	(over land)	Europe	Multimodel Ensemble of Climate Projections, GCMs and RCMs	pre-industrial to the +1.5°C threshold	gloabl increase +1.5°C	**HW twice as likely over the Med**	Jacob *et al.* (2018)
		Whole Med	21 models, Eurocordex	1989-2008	Not applicable	**WARNING: most models overestimate summertime Temp extremes in Med regions**	Vautard *et al.* (2013)
	Annual maximum daytime T (over land)	Whole Med	GLACE-CMIP5	1861–2099	RCP 8.5 and + 2°C target	**0.3**	Seneviratne *et al.* (2013)
	Annual maximum daytime T (over land)	Whole Med	CMIP5 ensemble mean	2044 versus 1861–1880	RCP 8.5 and + 2°C target (reached in 2044)	**0.14**	Seneviratne *et al.* (2016)
	(over sea)					**0.2**	
	air and water (over land and sea)	East and Middle East Med	PRECIS regional climate model	1950 to 2099	A1B	**Number of HW days likely to increase drastically**	Lelieveld *et al.* (2014)
	(over land)	Cities in Spain France, Italy Greece, Cyprus	CMIP5 ensemble mean	2051-2100 versus 1951-2000	RCP 8.5	**Increase in HW days and drought in most Med cities**	Guerreiro *et al.* (2018)
	Summer SAT Max & Min (over land)	Athens, Greece	3 Ensemble models (RACMO2, REMO and HadRM3)	2071-2100 versus 1961-1990	A1B	**[Range: 0.31 to 0.39]**	Founda & Giannakopoulos (2009)

Table S2a: Historical trends for Precipitation

	Description	Region	Source	Study period	Trend (mm/month/decade by default)	Reference
PRECIPITATIONS	Seasonal & annual (over land)	Whole Med	63 pluviometric stations	1950 to 2000	**Mainly lack of trend or non-significant trends**	Norrant & Douguédroit (2006)
	Wet season monthly (over land)	Whole Med	292 stations	1850 to 2000	**Mid XIX to 1960s: wet season precipitation increased 1950 to 2000: decrease of 2.2**	Xoplaki et al. (2004)
	Annual (over land)	Whole Med	CRU dataset	1902 to 2005	**-2 [Range: -1.6 to -2.3]**	Mariotti *et al.* (2015)
	Wet season (Oct-March)	Whole Med	gridded data	1950-1999	**Trends in many regions are not statistically significant Downward trend of last 20th century decades (of -2.2) is not part of a longer trend**	Xoplaki *et al.* (2006)
	Annual	Med sea	Indirect estimates (<1979) + land gauges	1958–2006	**Negative long-term trend by 4% of climatology/decade**	Mariotti (2010)
				1979-2006	**No trend**	
	(over land)	Whole Med	AMIP-type simulations	1951-2000	**[Range: -1.5 to +0.5]**	Gualdi *et al.* (2013)
	Annual average	Whole Med	observations (CRU dataset)	1901-1998	**No significant trend (% / 100 year)**	Giorgi (2002)
DROUGHT	Annual (over land and sea)	North Med	in situ data + gridded data set	1958-2008	**No basin-wide trends in precipitation and droughts found**	Ulbrich *et al.* (2013)
	Annual (over land)	Whole Med	in situ data + gridded data set	1901-2000	**Drier conditions in most W & central Med Wetter conditions in NW Iberia & Turkey**	Sousa *et al.* (2011)

Table S2b: Projected trends for Precipitation

	Description	Region	Source	Study period	Scenario	Trend (mm/month/decade by default)	Reference
PRECIPITATIONS	Annual & seasonal	Whole Med	CMIP5 multi-model simulations (AR5, IPCC 2013). 54 Ensemble runs 25 GCMs	2005 to 2098	RCP 4.5	**-0.3 [Range: -0.69 to +0.06]**	Mariotti *et al.* (2015)
	Seasonal	Whole Med	28 CMIP5 simulations	2081-2100 versus 1961-1980	RCP 8.5	**Annual over whole basin : -4% /K [Range: -8 to - 28% depending on season and region]**	Lionello & Scarascia (2018)
	(over land)	Whole Med	6 CIRCE models	2021–2050 versus 1961–1990	A1B	**WARNING: high difficulty to predict precipitation trends [Range: -2.5 to +1.5 over 2001-2050]**	Gualdi *et al.* (2013)
	Winter + summer monthly average (over land and sea)	Whole Med	ARPEGE & OPAMED Regional climate model SAMM (IPCC, 2001)	2070-2099 versus 1961-1990	A2	**WARNING: significant differences depending on model and methods used [Range: -1 to +1 mm/day]**	Somot *et al.* (2008)
	Seasonal	Whole Med	28 CMIP5 simulations	2060-2089 versus 1960-1989	RCP 8.5	**Increase of number of dry days by 10–15%**	Polade *et al.* (2014)
	Mean and extremes	NW Med	GCM and RCM (EMCORDEX), SAFRAN rain gauge data	2071–2100 versus 1976–2005	RCP 4.5	**WARNING: biais of model with respect to topography Intensification of extremes No change on monthly average**	Colmet-Daage *et al.* (2018)
					RCP 8.5	**Decrease in monthly average from Apr to Oct**	
	Mean annual	French Med basin	RCM + 3 downscaling methods (anomaly method, quantile mapping and weather typing)	2035-2065 versus 1970-2000	A2	**WARNING: significant spacial uncertainty related to downscaling and bias-correction Decrease of -0.5% / decade**	Quintana-Seguí *et al.* (2010)
	River flow	French Med basin	RCM + 3 downscaling methods (anomaly method, quantile mapping and weather typing)	2035-2065 versus 1970-2000	A2	**Enhanced low (-20%) and high river flows (from a 10 yr return to a 2 yr return flood)**	Quintana-Segu *et al.* (2011)
DROUGHT	Land surface water availability	Whole Med	CMIP3 multi-model simulation (AR4, IPCC 2007) (7 member ensemble)	2070-2099 versus 1961-1990	IPCC-AR4	**-20%**	Mariotti *et al.* (2008)
	Land daily runoff					**Decrease**	
	Soil moisture					**1.6 mm/decade**	
	Fresh water deficit at sea					**-24% over sea, decrease of runoff**	
	Consecutive dry days (over land)	Whole Med	European RCMs (ENSEMBLES project)	2021-2050 versus 1961-2000	A1B	**Longer mean dry spell [Range of increase: <5 to >15 days/yr]**	Quintana-Seguí *et al.* (2016)

Table S3a: Historical trends for Surface solar radiation

	Description	Region	Source	Study period	Trend (W/m2/decade)	Reference
SURFACE SOLAR RADIATION (SSR)	Monthly (over land and sea)	Eastern Med	Satelite observations (CM SAF SARAH) + GEBA observations	1983–2013	**2 ± 0.5 (or 1 ± 0.2%/decade)**	Alexandri *et al.* (2017)
	Annual mean (over land and sea)	North Med	3 simulations + GEBA observations (includes aerosol effect)	1980-2009	**[Range: 0.5 to 2.5]**	Nabat *et al.* (2014)
	Monthly (over land)	NW Med	3 simulations from satellite data + GEBA observations	1983–2015	**4 [Range: -2 to +5]**	Pfeifroth *et al.* (2018)
	Annual mean (over land)	France and Italy	GEBA pbservations 8 stations	1971-2012	**1.4**	Sanchez-Lorenzo *et al.* (2015)
	Monthly (over land)	Athens, Greece	Reconstruction from sunshine < 1955. Observation >1955	1953 - 1982 (dimming period)	**Decrease -2.3 %/decade. Lower limit compared to other studies in the Mediterranean**	Kazadzis *et al.* (2018)
				1983 - 2012 (brightening period)	**Increase +0.8 %/decade (lower limit in the reported positive changes in SSR around Europe)**	

Table S3b: Projected trends for Surface solar radiation

	Description	Region	Source	Scenario	Study period	Trend (W/m2/decade)	Reference
SSR	(over land and sea)	North Med	CMIP5 models (AR5, IPCC 2013) (39 GCMs)	RCP 8.5	2049 versus 2006	**+ 1 [Range: -1 to 4]**	Wild *et al.* (2015)
		South Med				**- 0.5 [Range: -1 to 0.5]**	
	Annual and seasonal (over land)	Whole Med	11 EURO-CORDEX RCMs	RCP 4.5	2031-2060 versus 1971-2000	**General increase but large variations amongst models [Range: -1 to +2]**	Bartók (2018)

Table S4a: Historical trends for Sea temperature

	Descri-ption	Region	Source	Study period	Trend (°C/decade)	Reference
SEA TEMPERATURE	MEAN					
	SURFACE (SST)	Whole Med Sea	satelilte data	1982-2007	**0.27**	Macias *et al.* (2013)
		Whole Med Sea	satellite data AVHRR	1982 - 2012	**0.37**	Shaltout & Omstedt (2014)
		Whole Med Sea	satellite data	1982-2016	**0.36**	Pastor *et al* . (2019)
		Whole Med Sea	physical circulation model based on ocean-atmosphere meteorological forcing + satellite data	1992-2005	**0.61**	Criado-Aldeanueva *et al.* (2008)
		Whole Med Sea	subsurface ocean profilers, CTDs, moorings drifting buoys (Hadley Centre Sea Surface Temp dataset)	1957-2006	**0.09**	Belkin (2009)
				1982-2006	**0.29**	
		Whole Med Sea	satellite data	1985-2008	**0.37**	Skliris *et al.* (2012)
		West Med sea	satellite data AVHRR	1985-2006	**0.3**	Nykjaer (2009)
		East Med sea			**0.5**	
		NW Med sea	CMEMS satellite data	2007-2016	**0.47**	Bensoussan *et al.* (2019)
		Bay of Marseille (nearshore)	discrete measurements with bucket at Marseilles's tide recorder	1895 - 1956	**0.26**	Romano *et al.* (2010)
		Corsica, France and Spain (nearshore, 5m)	T-MEDNet database (9 data loggers in marine protected areas)	2007-2016	**0.65**	Bensoussan *et al.* (2019)
	UPPER LAYER (0-150m depth)	Alboran to Catalan Sea along the Spanish coast	observation + atlases	1900-2015	**0.008**	Vargas-Yáñez *et al.* (2017)
				1943-2015	**0.03**	
		West Med sea	CTD data	1950-2000	**0.26**	Rixen *et al.* (2005)
	INTERMEDIATE WATER	Alboran to Catalan Sea along the Spanish coast	observation + atlases	1943-2015	**0.02**	Vargas-Yáñez *et al.* (2017)
		Sicily Strait (400m) LIW	moorings	1993-2018	**0.28**	Schroeder *et al.* (2019)
				2011-2018	**0.67**	
		Western algero provencal Basin (WIW)	observations	1959-1996	**0.068**	Bethoux & Gentili (1999)
	DEEP WATER	Alboran to Catalan Sea along the Spanish coast	observation + atlases	1943-2015	**0.04**	Vargas-Yáñez *et al.* (2017)
		Western algero provencal Basin (2000m depth)	observations	1959-1996	**0.035**	Bethoux & Gentili (1999)

Table S4a: (continued)

	Description	Region	Source	Study period	Trend (°C/decade)	Reference
SEA TEMPERATURE	**EXTREMES AND HEAT WAVES (HW)**					
	SST extrapolation	Whole Med sea	in situ data + satellite + models	past century (1900-2016)	**Marine HW: Increased frequency +0.5 to +2 event /decade Increased intensity + 0.1 to +0.75 °C/decade Increased duration +0 to +10 days / decade**	Oliver *et al.* (2018)
	SST & 5m depth	Whole Med sea	satelite data + in situ (5m depth)	1982–2004-2011-2017	**Increased marine HW frequency and duration**	Bensoussan *et al.* (2019)
	Frequency of SST > 27,16°C	Balearic islands	satellite data for 1985-2009 models for 1975-1999	1975-2009	**Frequency = 0.25 event / year (i.e. 1 every 4 years)**	Jordà (2012)

Table S4b: Projected trends for Sea temperature

	Descri--ption	Region	Source	Study period	Scenario	Trend (°C/decade)	Reference
SEA TEMPERATURE	**MEAN**						
	SURFACE (SST)	Whole Med sea	AOGCM (AR3, IPCC 2001) + ARPEGE + OPAMED8	2070-2099 versus 1961-1990	A2	**0.22**	Somot *et al.* (2006)
		Whole Med sea	ARPEGE & OPAMED regional climate models (IPCC, 2001)	2070-2099 versus 1961-1990	A2	**0.26**	Somot *et al.* (2008)
		Whole Med sea	Atmosphere-Ocean Regional Climate Model	2070-2099 versus 1961-1990	A2	**0.22 [Range 0.2 to 0.24]**	Tsimplis *et al.* (2008)
		Whole Med sea	NENOMED 8, ARPEGE-Climate, 6-members ensemble mean (AR4, IPCC 2007)	2070-2099 versus 1961-1990	B1, A1B, A2	**0.15 to 0.27**	Adloff *et al.* (2015)
	UPPER (100 m)	Whole Med sea	Atmosphere-Ocean Regional Climate Model	2070-2099 versus 1961-1990	A2	**~ 0.18**	Tsimplis *et al.* (2008)
	INTER-MEDIATE (1000 m)					**~ 0.11**	
	DEEP (2000m)					**~ 0.01 to 0.02**	
	EXTREMES AND HEAT WAVES						
	(upper 50 m)	Whole Med sea	NEMO + reanalysis from Copernicus (CMEMS)	2041–2050 versus 2001–2010	RCP 8.5	**Increased frequency, duration and spatial extent**	Galli *et al.* (2017)
	(upper 16 m)	Whole Med sea	6 coupled regional climate models, IPCC 2013	2021-2050 and 2071-2100 versus 1976-2005	RCP 2.6, 4.5 and 8.5	**Increased frequency from 0.3 to 0.7 event/year Increased duration (up to x 5) Increased intensity**	Darmaraki *et al.* (2019)
		Balearic Islands	ensemble mean, IPCC 2000	2100 versus 2010	A1B	**0.38°C/decade Increased frequency from 0.22 to 1 event/yr Increased magnitude from 19 to 3425 °C-days**	Jordà *et al.* (2012)

Table S5a: Historical trends for Salinity

	Descri-ption	Region	Source	Study period	Trend (per decade)	Reference
SALINITY	**ALL DEPTH**	Whole Med sea	satellite data	1992-2005	**no clear trend**	Criado-Aldeanueva *et al.* (2008)
		Whole Med sea (0-1500 m deep)	CIRCE reanalysis	1985-2007	**positive trend**	Ulbric *et al.* (2013)
	UPPER LAYER	Whole Med sea (0-100 m)	12 models (AOGCMs) + MEDAR observations	1950-2000	**[Range: -0.08 to +0.13]**	Marco & Tsimplis (2008)
		West Med sea (0-200 m)	RADMED data	1900-1943-2015	**since 1900: [Range: -0.001 to 0.034] since 1943: [Range: -0.003 to 0.1]**	Vargas-Yáñez *et al.* (2017)
	INTERMEDIATE WATER	Whole Med sea (100-500 m)	12 models (AOGCMs) + MEDAR observations	1950-2000	**[Range: -0.09 to +0.055]**	Marco & Tsimplis (2008)
		West Med sea (200-600 m)	RADMED data	1900-1943-2015	**since 1900: [Range: 0.003 to 0.007] since 1943: [Range: 0.01 to 0.02]**	Vargas-Yáñez *et al.* (2017)
		Sicily Channel (400 m)	CTD observations	1993-2016	**0.06**	Schroeder *et al.* (2017)
	DEEP WATER	Whole Med sea (700-2000 m)	12 models (AOGCMs) + MEDAR observations	1950-2000	**[Range: -0.09 to +0.05]**	Marco & Tsimplis (2008)
		West Med sea (600 m-bottom)	RADMED data	1900-1943-2015	**since 1900: [Range: 0.004 to 0.006] since 1943: 0.01**	Vargas-Yáñez *et al.* (2017)

Table S5b: Projected trends for Salinity

	Descri-ption	Region	Source	Study period	Scenario	Trend (/decade)	Reference
SALINITY	**SURFACE**	Whole Med sea	CMIP5 models	2081–2100 versus 1986–2005	RCP8.5	**~ 0.05**	Collins *et al.* (2013)
		Whole Med sea	6 CIRCE models	2021–2050 versus 1961–1990	A1B	**WARNING: very large uncertainties + model improvement required** **Overall reduced salinity by -0.05 (median) [Range: -0.06 to +0.01]**	Gualdi *et al.* (2013)
		Whole Med sea	AOGCM (AR3, IPCC 2001) + ARPEGE + OPAMED8	2099 versus 1960	A2	**0.034**	Somot *et al.* (2006)
	ALL DEPTH	Whole Med sea (yearly average)	12 atmosphere-ocean general circulation models (AOGCMs)	2100 versus 2000	committed CC, A1B, A2	**WARNING: projections in the Med Sea highly unreliable** **Overall increased salinity by +0.04 (median) [Range : -0.014 to +0.2]**	Marcos & Tsimplis (2008)
		Whole Med sea	Atmosphere-Ocean Regional Climate Model	2070-2099 versus 1961-1990	A2	**0.036**	Tsimplis *et al.* (2008)
	DEEP	Whole Med sea	AOGCM (AR3, IPCC 2001) + ARPEGE + OPAMED8	2099 versus 1960	A2	**0.016**	Somot *et al.* (2006)

Table S6a: Historical trends for Sea level

	Region	Source	Study period	Trend (cm/decade)	Reference
SEA LEVEL (SL)	Whole Med sea	Sea level reconstruction	1945 to 2000	**0.7 (less than half global mean)**	Calafat & Gomis (2009)
	Whole Med sea	Satellite data	1992-2005	**2.1 ± 0.6 [regional range -10 to + 10] (possible drop since 2001)**	Criado-Aldeanueva *et al.* (2008)
	West Med sea	Historical observation from tide-gauges	1870 to 2010	**1.25 (± 0.25)**	Zerbini *et al.* (2017)
	West Med sea (relative SL)	Multi proxi reconstruction (67 points)	14 ka prior to 1900	**[Range: 0.20 to 0.55]**	Vacchi *et al.* (2016)
		Tide gauges (9 stations)	~1875-2012	**1.2 [Range 0.75 to 2.4]**	
	West Med sea (relative SL)	Multi proxi reconstruction (98 points)	12 ka to present	**Rapid rise from ~12.0 to ~8.0 ka BP Then sudden slowdown Minimal changes during the late-Holocene (since ~4.0 ka BP)**	Vacchi *et al.* (2018)
	North Med sea	In situ data	~1900-2010	**[Range: 1.1 to 1.3]**	Ulbrich *et al.* (2013)
	NE Aegean sea (relative SL)	Literature review (>100 points)	4 ka to prior 1900	**[Range: 0.6 to 0.9]**	Vacchi *et al.* (2014)
	Adriatic sea	Tide gauges (30)	1872-2012	**1.25 and acceleration negligible compared to global SL rise**	Galassi & Spada (2014)
	Naples Habour (Italy) (relative SL)	Multi proxi reconstruction	500 to 1950	**1.2**	Vacchi *et al.* (2020)

Table S6b: Projected trends for Sea level

	Description	Region	Source	Study period	Scenario	Trend (cm/decade)	Reference
SEA LEVEL	steric sea level	Whole Med sea	Atmosphere-Ocean Regional Climate Model	2070-2099 versus 1961-1990	A2	**1.2**	Tsimplis *et al.* (2008)
	thermosteric sea level	Whole Med sea	6-members ensemble mean (AR4, IPCC 2007)	2070-2099 versus 1961-1990	B1, A1B, A2	**[Range: 3.1 to 4.5]**	Adloff *et al.* (2015)
	all components (TIM, GIA, and steric)	Whole Med sea	Various models	2040-2050 versus 1990-2000	MIN50 and MAX50 scenarios	**[Range: 2 to 5]**	Galassi & Spada (2014)
	TIM, steric + land-ice contribution	Whole Med sea	4 GCM of CMIP5	2100 versus 1985–2005	RCP 8.5 + medium land-ice scenario	**[Range: ~ 6 to 8]**	Hinkel *et al.* (2014)
	no GIA component	Whole Med sea	Averages of grids downloaded from the Integrated Climate Data Center	2081–2100 versus 1986–2005	IPCC AR5 CPs 2.6 to 8.5	**[Range: 3.6 to 5.7]**	Perini *et al.* (2017)
	dynamic sea level variability	Whole Med sea	CMIP5 multi-model ensemble (21 models)	2081–2100 versus 1986–2005	CMIP5 RCP 4.5	**~ 2**	Church *et al.* (2013)
	relative SL	West Med sea	Multiproxi reconstruction (inc. bio indicators) (67 points)			**WARNING : models non capable to project relative SL reliably**	Vacchi *et al.* (2016)
	relative SL	West Med sea	Cores / radiocarbon dating + multi proxies (98points)			**WARNING: models innacurate + need to better define GIA rate + discrepancies in Med region**	Vacchi *et al.* (2018)

Table S7a: Historical trends for pH

	Description	Region	Source	Study period	Trend (pH unit per decade)	Reference
pH	all water masses (top-bottom)	all water masses along a METEOR cruise transect crossing the Mediterranean Sea from 6 to 35°E	pH = f(apparent oxygen utilisation, salinity, and temperature) EU/MEDAR/MEDATLAS II data base	preindustrial to 2001	**[Range: -0.005 to -0.014]**	Touratier & Goyet (2011)
	surface deep water	Whole Med sea	high-resolution ocean model + historical runs	1800 to 2001	**-0.004** **[Range: -0.0003 to -0.003]**	Palmieri *et al.* (2015)
	surface	NW Med	pH calculated from salinity, temp and PCO2	1967-2003	**~ -0.014**	Howes *et al.* (2015)
	below winter mixed layer (300m to bottom)	Whole Med sea	TroCA method pH calculated from in alkalinity, total inorganic carbon + CTD and PCO2 in situ measurements	pre-industrial to 2013	**WARNING : NOT PER DECADE Mean: -0,1 from pre-industrial to 2013 [Range: -0.055 to -0.156]**	Hassoun *et al.* (2015)
	surface	Villefranche Bay, France (1m deep)	pH =f(temperature, salinity, total alkalinity, and total inorganic carbon)	2007 to 2015	**-0.028 ± 0.003 (units pH_T)**	Kapsenberg *et al.* (2017)
	near surface (10 m)	Dyfamed site (North Mediterranean Sea)	pH =f(temperature, salinity, total alkalinity, and total inorganic carbon)	1995-2011	**-0.018**	Yao *et al.* (2016)
	water column	Strait of Gibraltar	observations + statistical models	2012-2015	**-0.044**	Flecha *et al.* (2015)

Table S7b: Projected trends for pH

	Region	Source	Study period	Scenario	Trend (pH unit per decade)	Reference
pH	Whole Med sea	ARPEGE + NEMO-MED 8	2100 versus 1860	A2	**No concensus at global scale nor at Mediterranean scale**	Orr *et al.* (2016)
	NW Med sea	equilibrium calculations	2100 versus 2000	A2	**-0.03**	Hilmi *et al.* (2014)
				B1	**-0.012**	
	Ligurian sea (NW)	extrapolation of data	2100 versus 2000	exponential scenario	**Order of -0.03**	Geri *et al.* (2014)

Table S8a: Historical trends for Urbanisation

	Description	Region	Source	Study period	Trend	Reference
LAND USE CHANGE	rangelands and grazing	North Med	Literature review	Various periods	Agricultural land abandonment, afforestation	MacDonald *et al.* (2000)
	annual and perennial crops	Med climatic region	Census data on agriculture	1960 to 2010	Everywhere: intensification, specialisation, loss of crop diversity. South: turn from self-subsistance to cash/export crops.	Scheidel & Krausmann (2011)

Table S8b: Projected trends for Urbanisation

	Description	Region	Source	Study period	Scenario	Trend	Reference
LAND USE CHANGE	land systems	Med climatic region	CLUMondo model	2050 versus 2010	"growth"' scenario	Intensification of land management, loss of agro-silvo-pastoral mosaic systems Increased irrigation and pressure on freshwater resources	Malek *et al.* (2018)
					"sustainable" scenario	Preservation of wetlands and traditionnal landscapes, increased productivity of rain-fed systems, efficiency of irrigated systems	

Table S9a: Historical trends for Land use change

	Description	Region	Source	Study period	Trend	Reference
URBANISATION	nb of cities > 1 M inhabitants	Med countries	UN data	1950 to 2000	*ca.* 10 cities to *ca.* 30 cities	Hervieu (2008)
	population living in urban areas	Med countries	UN demographic statistics	1950 to 2010	6% / decade [35% in 1950 to 69% in 2010] north & south +4%/decade east +7%/decade	Salvati (2014)
	land use change	Med countries	ISMEA-IAMB survey	1978 to 1998	150,000 ha primary land converted to urban zones	Hervieu (2008)

Table S9b: Projected trends for Land use change

	Description	Region	Source	Study period	Scenario	Trend	Reference
URBANISATION	population living in urban areas	Med countries	UN demographic statistics	2050 versus 2010	Elaboration on UN demographic statistics	2.75% / decade [69% in 2010 to 80% in 2050] North +2.75%/decade East +3.25%/decade South +3.75%/decade	Salvati (2014)

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