



Developing a regional climate change adaptation plan for Island Regions. The case of South Aegean region in Greece.

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 **ENVIROMETRICS**
Business Consultants and Engineers

- **Framework**
- **Geo - Social - Economic characteristics**
- **Methodology**
- **Climate projections**
- **Risk and vulnerability assessment**
- **Action plan**
- **Conclusions**

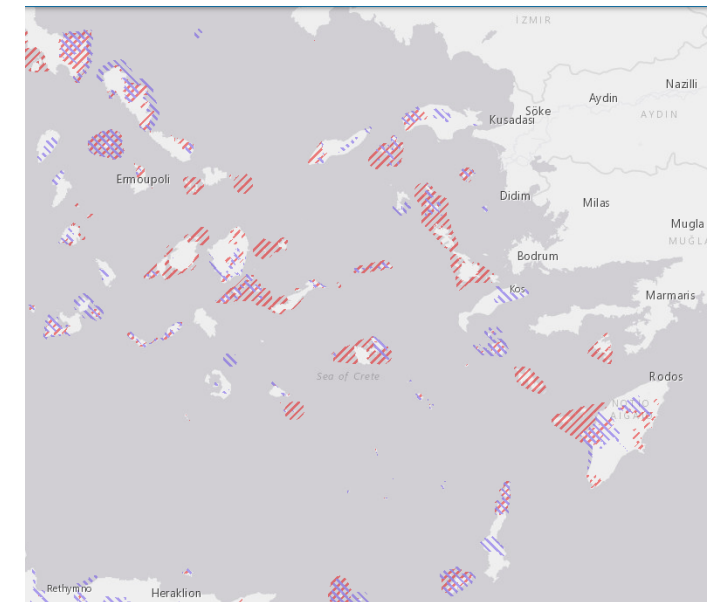
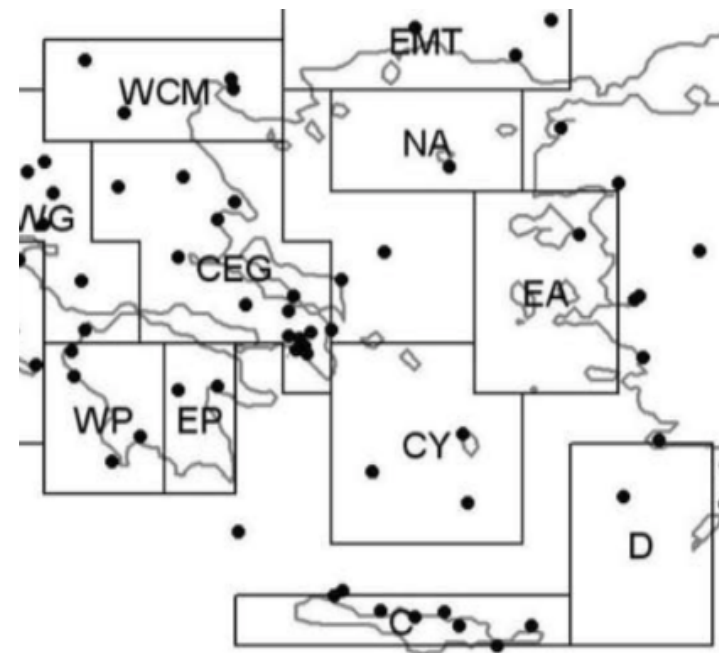
The Regional Plan for the Adaptation to Climate Change (RPACC) of the South Aegean Region (SAR) is compiled in the framework of the obligations and specifications deriving from the relevant national legislation (L. 41414 / 2016 and MD 11258/2017).

The overall objectives of RPACC are

- a. to contribute to enhancing the region's resilience to climate change, and
- b. Increase the preparedness and capacity to address the impacts of climate change at local and regional level, developing a coherent approach and improving coordination.

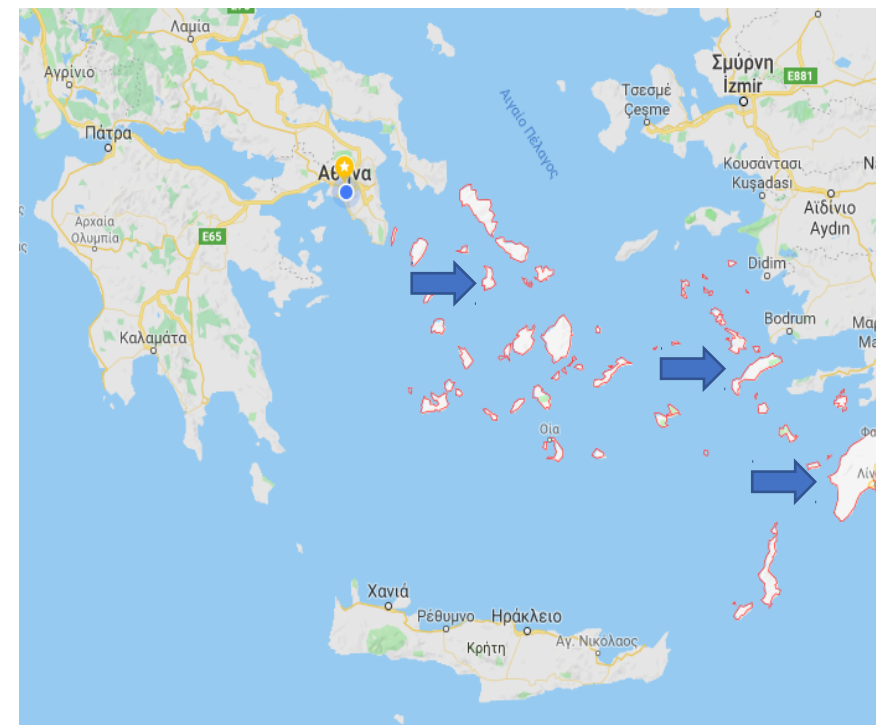
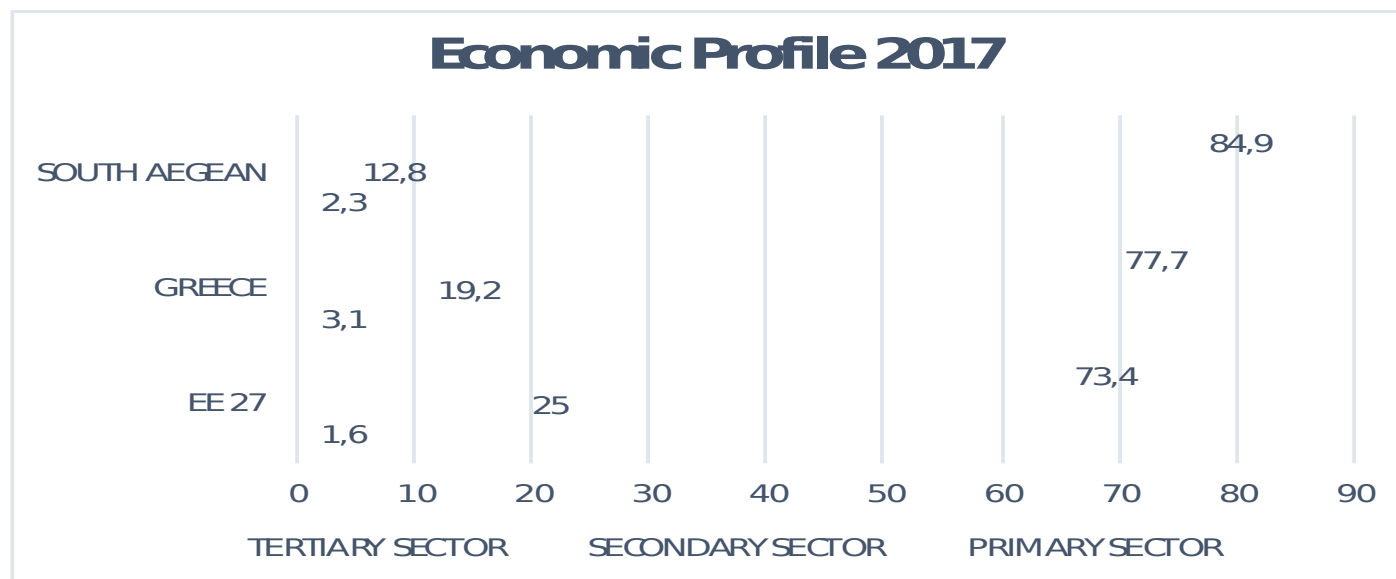


- Over 35 Major Islands divided into 2 groups: Cyclades and Dodecanese
- 31 sites proposed for inclusion in the NATURA 2000 network,
- 39 Corine Habitats as a whole, and
- A significant number of wetlands recorded at the Greek wetland sites of the Greek Biotope/Wetland Centre.
- Major cultural heritage sites (Delos, Santorini, Rodos)



Socio-economic profile of South Aegean Region

- 5286 km² area
- Population: 308.975 (2011 census)
- Rodos 115.490 (37,4%), Kos 33.388 (10,8%), Syros 21.507 (7%)
- 85% of towns and villages have less than 10.000 inhabitants
- The economy of the SAR is based on the tertiary Sector
- Average annual personal income 21.900 € (105% compared to national, 68% compared to EU)

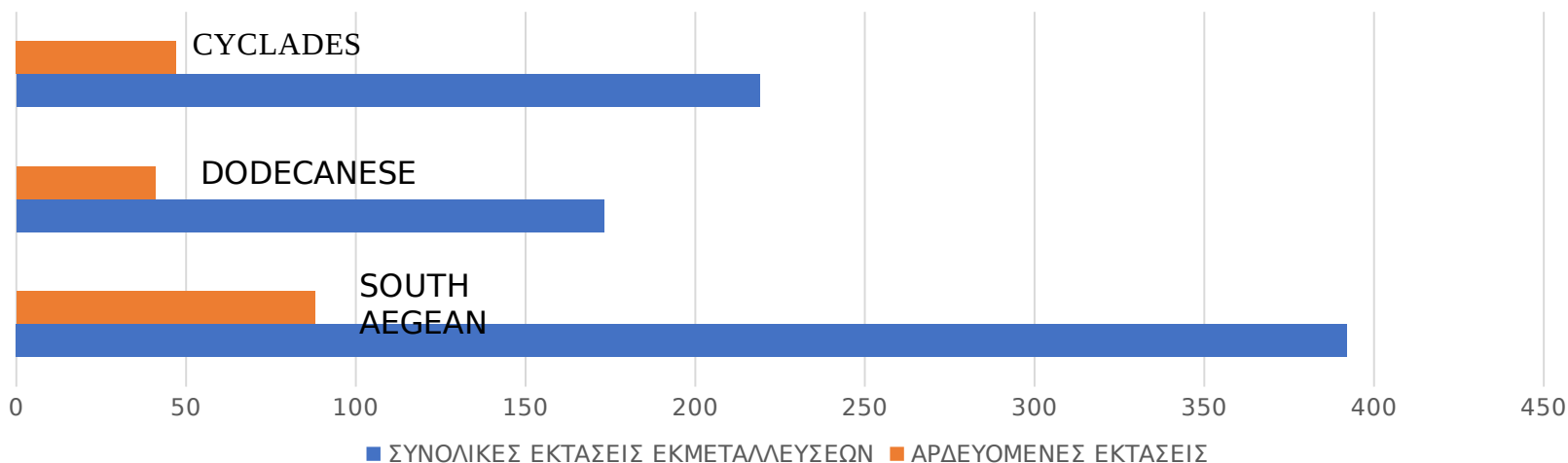


The Agricultural Sector of South Aegean Region

- in crop production mainly olive, vines, horticulture, citrus, legumes and cereals.
- livestock production based on beekeeping, sheep and goat farming and cattle farming
- 18 PDO & PGI
- fisheries and aquaculture

Key characteristics: the big distance from continental development poles, the small natural and productive size and the limited resources.

IRRIGATED LAND IN THE SAR

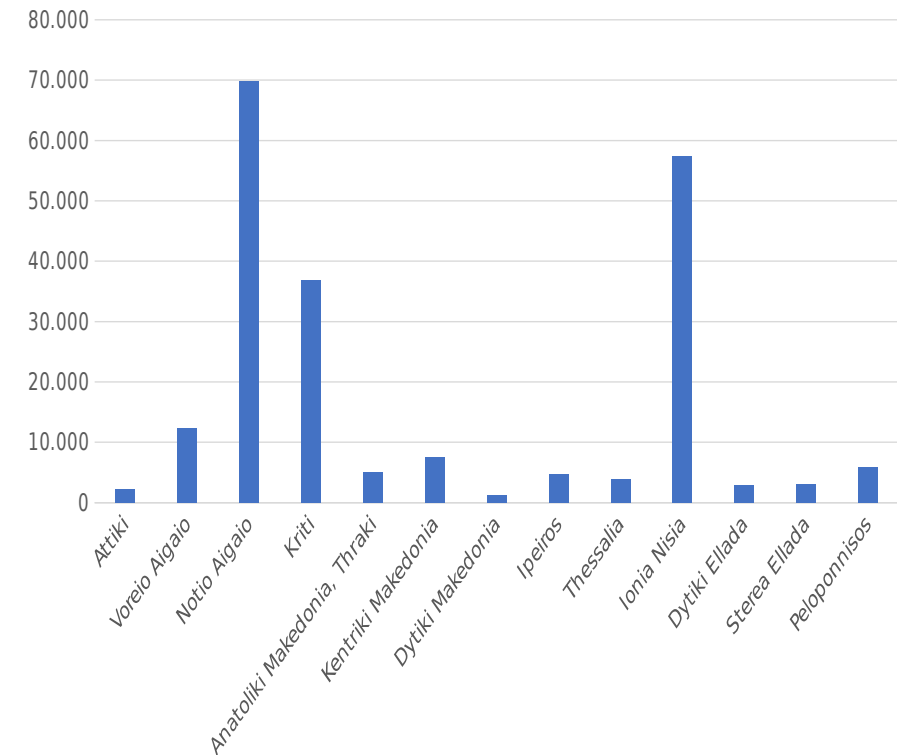


product	Name	category
cheese	Graviera Naxos	PDO
cheese	Kopanisti	PDO
cheese	San Michalis	PDO
cheese	Krasotiri Kos	PGI
Olive oil	Rodos	PGI
Faba beans	Fava Santorini	PDO
tomato	Tomato Santorini	PDO
potato	Potato Naxos	PGI
wine	MALVASIA Paros	PDO
wine	Paros	PDO
wine	Santorini	PDO
wine	Moshatos Rodos	PDO
wine	Rodos	PDO
wine	Aegean Pelagos	PGI
wine	Dodecanese	PGI
wine	Kos	PGI
wine	Cyclades	PGI
wine	Syros	PGI

The Touristic Sector of South Aegean Region

REGION	Dodecanese	Cyclades
International Air Arrivals 2014	3.009.682	558.616
% change 2009/14	+39%	+109%
Number of Hotels (2014)	1.043	1.039
4 – 5 stars	229	225
3 stars	258	212
1 – 2 stars	556	602
Rent Rooms Businesses	1.440	5.080

Number of nights spent at tourist accommodation relative to population size (per 1000 habitants)

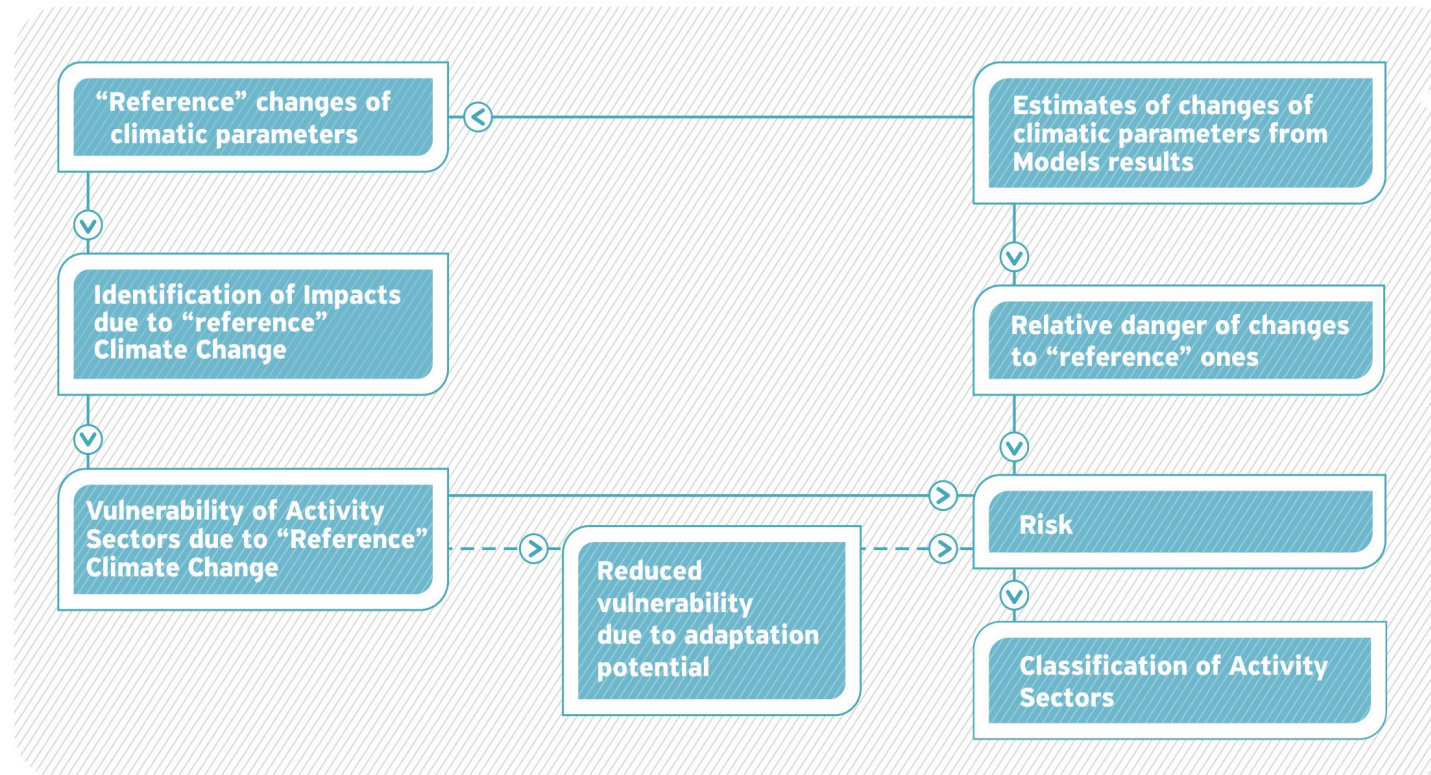


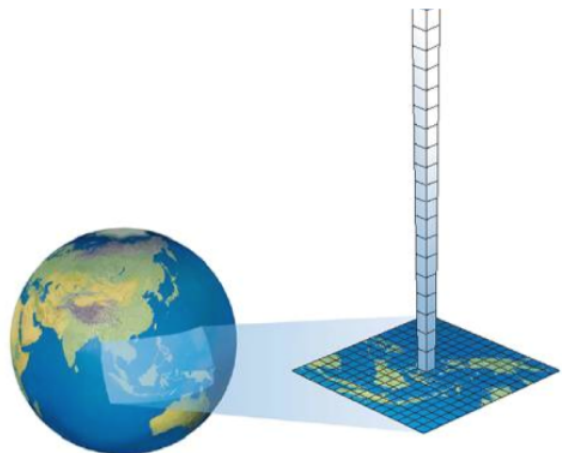
International **Air** Arrivals

2016	Karpathos	Kos	Mykonos	Rodos	Santorini	Total
2016	81.322	848.682	301.842	2.045.555	389.817	3.667.218
JAN	0	0	0	99	0	99
FEB	0	0	0	113	0	113
MAR	0	266	0	3.521	929	4.716
APR	368	13.739	2.930	63.836	9.720	90.593
MAY	6.192	100.867	21.985	233.518	41.621	404.183
JUN	14.822	141.262	46.327	339.716	62.544	604.671
JUL	21.041	190.561	86.814	449.803	95.743	843.962
AUG	21.330	189.592	93.176	437.718	96.867	838.683
SEPT	16.792	148.423	44.120	346.496	60.893	616.724
OCT	777	63.960	6.487	169.395	21.372	261.991
NOV	0	12	0	1.228	128	1.368
DEC	0	0	3	112	0	115

- For 2016, more than 11.5 million passengers were transported by **sea** to and from the islands of the region.
- Of these, the majority (9.1 m) moved to the Cyclades while 2.3 m to the Dodecanese.
- In the Cyclades: Paros (1.4 million), Santorini (1.3 million), Mykonos (1.2 million), Tinos (850 thousands) and
- in the Dodecanese: Rhodes (588 thousands), Kos (537 thousands) and Kalymnos with about 320 thousand visitors.

1. Definition of "reference" changes of climatic variables to assess the vulnerability of the different activities in light of the maximum expected variations from the results of the scenarios.
2. Identification of business processes and operational parameters per activity affected by the change in the climatic parameters
3. Definition of a scale of impacts based on the operational parameters per activity.
4. Vulnerability per activity in the event of the "reference" climate parameter changes.
5. Estimation of potential vulnerability reduction due to the possibility of adaptation.
6. Estimation of the magnitude of the expected changes from the model estimates in relation to the respective reference period (2 periods, 2021-2050 and 2051-2100) and per activity (2 scenarios, RCP4.5 and RCP8.5)
7. Assessment of the relative danger of the expected changes by combining vulnerability and danger.
8. Ranking, RCP4.5 and RCP8.5) as to the magnitude of the risk





Climate Models and GHG Scenarios utilized:

- Global Climatic Model EC-EARTH (ECMWF)
- Regional climatic model RACMO 2.2 (KNMI) with a 0.11° spacial resolution (i.e. 11x11km grid)
- RCP 4.5 (GHG stabilization) and
- RCP 8.5 (GHG growth)

Climatic indicators for the intensity of extreme weather events:

- 0 number days per year with a maximum daily temperature $> 35^{\circ}\text{C}$ (heat waves)
- 0 number of days of discomfort (calculated with HUMIDEX Index)
- 0 number days per year with a minimum temperature $< 0^{\circ}\text{C}$ (night frost)
- 0 maximum hourly precipitation per year
- 0 number of days with increased risk of forest fires computed with the FWI-Forest Weather Index-System

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Climatic variable utilized

- ✓ Mean temperature at 2m agl. ($^{\circ}\text{C}$)
- ✓ Maximum temperature at 2m agl. ($^{\circ}\text{C}$)
- ✓ Minimum temperature at 2m agl. ($^{\circ}\text{C}$)
- ✓ Mean relative humidity (%)
- ✓ Mean cloud cover (%)
- ✓ Sunshine duration (hr/day)
- ✓ Mean wind speed at 10m agl (m/s)
- ✓ Maximum wind speed at 10m agl (m/s)
- ✓ Total precipitation (mm/day)
- ✓ Maximum precipitation (mm/hr)
- ✓ Total snowfall (mm/day)

Day by day projections for 1961-90, 2021-50, 2051-2100

Critical Parameters at Selected Islands

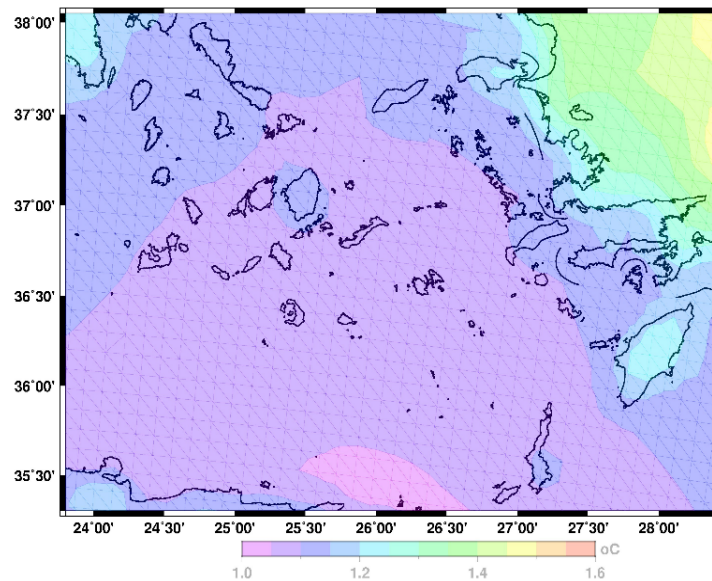
	1961-90	2021-2050		2071-2100	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
Mean Air Temperature 2 m (°C)					
Rhodes	16.6	17.8	18.2	18.7	20.2
Kos	16.4	17.5	17.9	18.5	19.8
Naxos	15.4	16.6	16.9	17.5	18.8
Santorini	16.5	17.6	17.9	18.5	19.7
Karpathos	17.2	18.2	18.5	19.1	20.4
Milos	16.3	17.4	17.8	18.3	19.6
Tinos	15.7	16.8	17.1	17.7	18.9
Patmos	16.2	17.3	17.7	18.3	19.5

	1961-90	2021-2050		2071-2100	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
Days with Humidex > 38oC					
Kos	0	0.7	2.1	3.4	19.9
Naxos	0	0.5	1	2.3	10.3
Santorini	0	0	0	0	1.1
Karpathos	0	0.1	0.5	0.7	9.8
Milos	0	0	0	0	2.5
Tinos	0	0	0	0	0.1
Patmos	0	0	0	0	0

Heating Degree Days	1961-1990	2021-2050		2071-2100	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
Rhodes	496	334	298	221	111
Kos	455	308	270	201	106
Naxos	627	449	399	308	175
Santorini	356	225	193	136	68
Karpathos	275	160	135	91	42
Milos	411	266	227	162	83
Tinos	516	354	308	230	127
Patmos	428	288	251	186	101
Cooling Degree Days	1961-1990	2021-2050		2071-2100	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
Rhodes	1	9	15	24	96
Kos	0	1	2	4	26
Naxos	0	0	1	2	11
Santorini	0	0	0	0	3
Karpathos	0	0	1	1	13
Milos	0	0	0	0	7
Tinos	0	0	0	0	2
Patmos	0	0	0	0	4

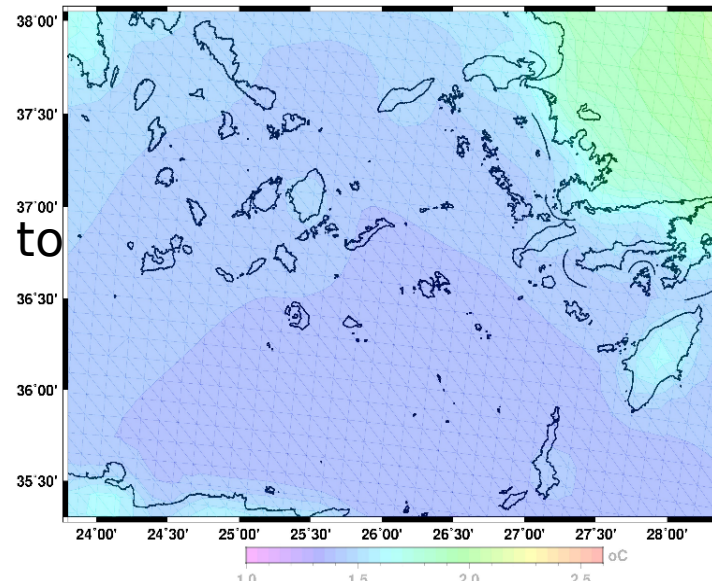
Mean surface (2m) temperature changes under the RCP4.5 and RCP8.5 scenarios

RCP 4.5

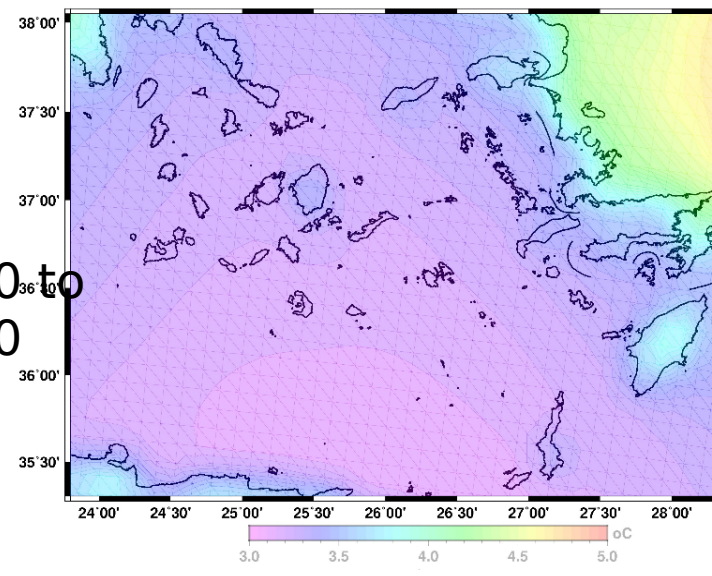
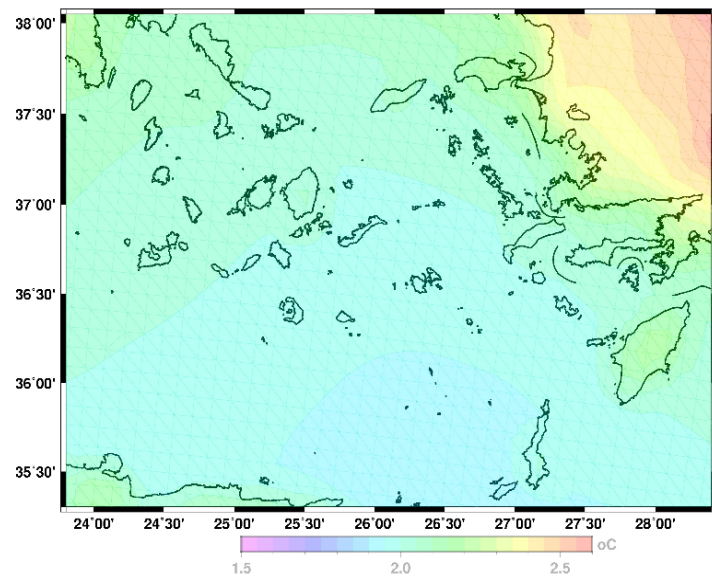


1961-1990 to
2021-2050

RCP 8.5



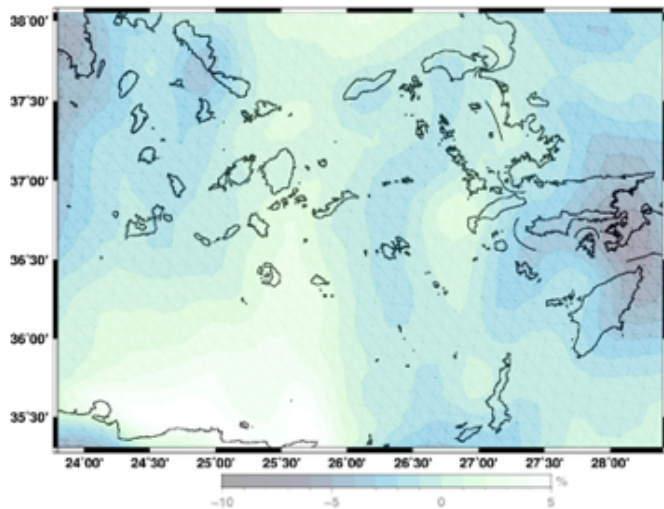
1961-1990 to
2071-2100



- Temperature increase in RCP8.5 is higher than in RCP4.5
- Up to 2050 RCP4.5 increase 1.0-1.2 oC & 1.9-2.2 oC in 2100
- RCP8.5 increase 1,5oC and 3.0-3.6oC in the period 2071-2100
- the rise in temperature is greatest in the Dodecanese islands, especially in Rhodes, and in the Northern Cyclades and less

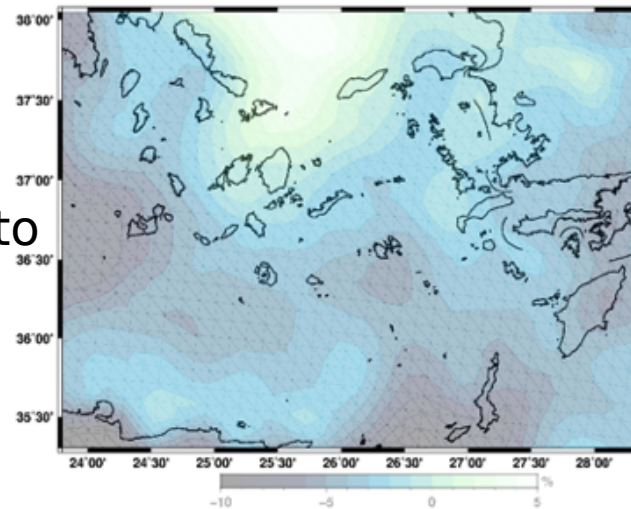
Mean daily precipitation changes under the

RCP4.5

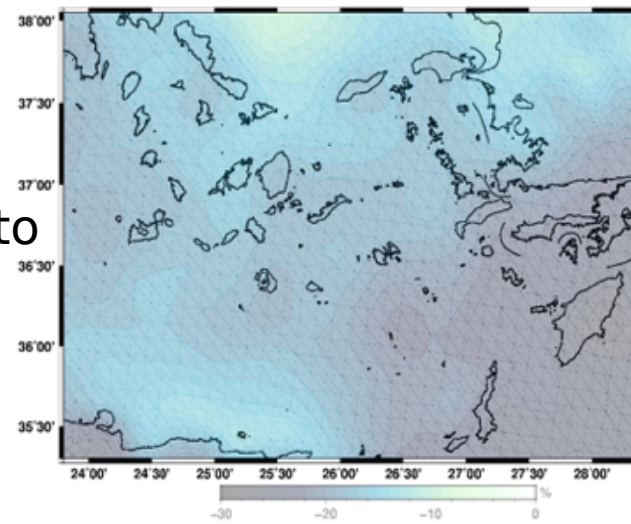
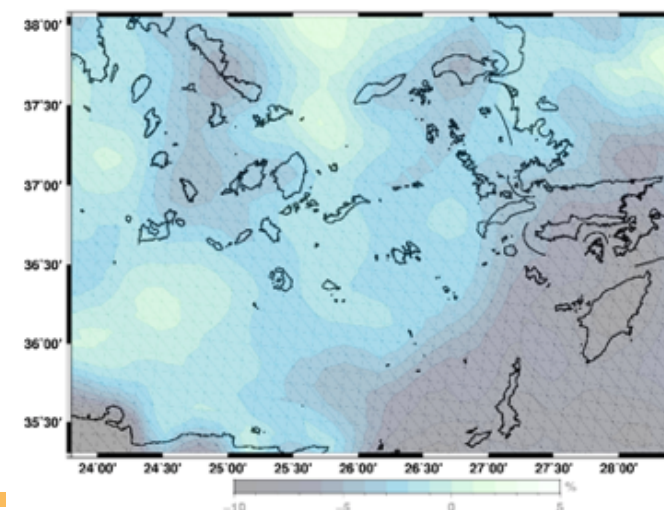


1961-1990 to
2021-2050

RCP8.5



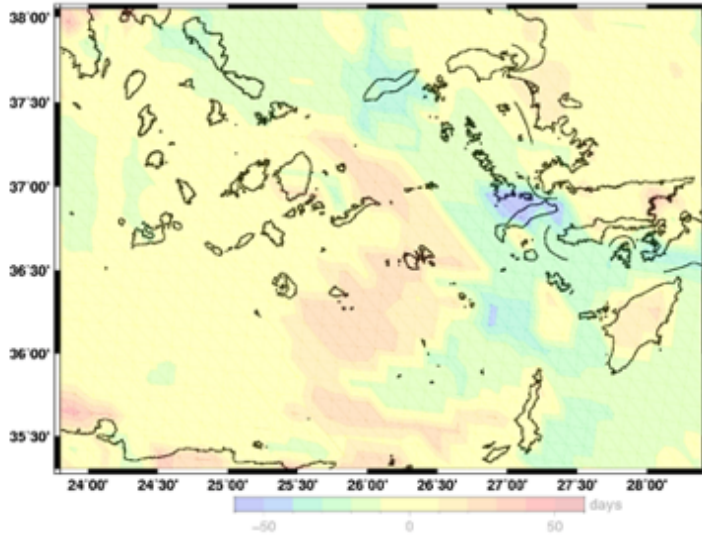
1961-1990 to
2021-2050



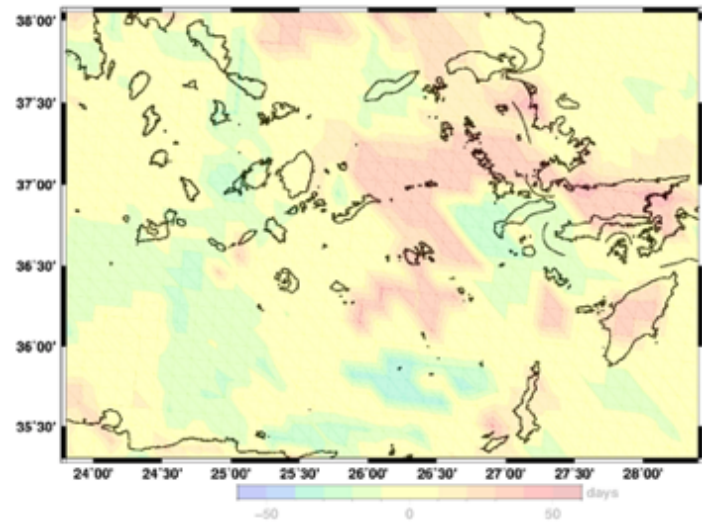
- RCP4.5 precipitation decline 5% until 2050 and 10% until 2100
- RCP8.5 precipitation decline 8% until 2100 and more than 20% for 2100
- The largest percentage declines in annual precipitation are predicted in both scenarios for the Dodecanese islands, which have historically recorded higher precipitation level than those of the Cyclades islands.
- Higher reduction for both scenarios during autumn

Drought period changes (days) under the RCP4.5 and RCP8.5 scenarios

RCP4.5

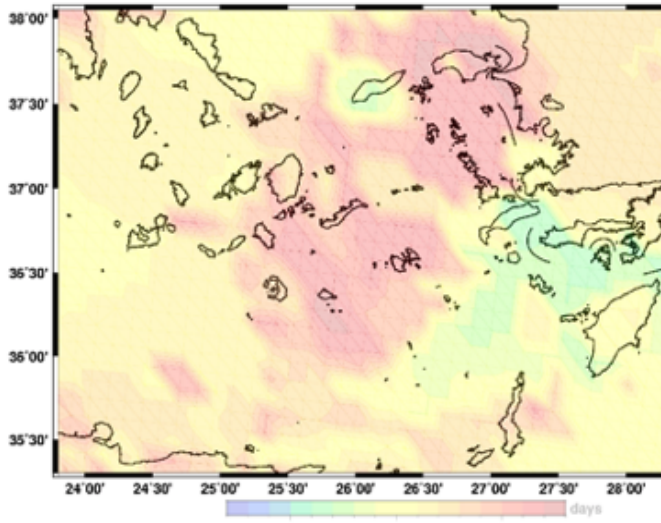
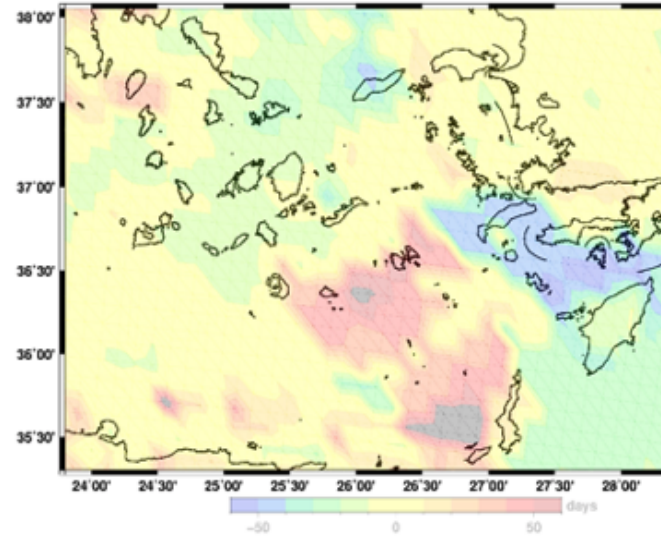


1961-1990
to
2021-2050



1961-1990
to
2071-2100

RCP8.5



- in the period 2021-2050, no major changes are expected in the greater part of the Region, with the exception of Kos and the islands of the northern Dodecanese and the Northern Cyclades, where reductions of 20-30 days are expected
- during the period 2071-2100, the maximum duration of dry periods is expected to increase up to 50 days in the Dodecanese (with the exception of Kos) for the RCP4.5 scenario and in the Central- Southern

Benchmark climate parameter values for the definition of the Reference Climate

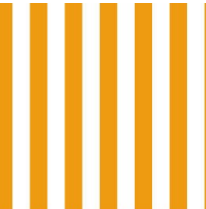
Parameters (difference from today's conditions)	Unit	Maximum Value	Definition of change for the climate parameters			
			Small	Medium	High	Extreme
Temperature						
Mean	Δ°C	4	0.5 < Δ < 1	1 < Δ < 2	2 < Δ < 4	Δ > 4
Mean Maximum	Δ°C	8	1 < Δ < 2	2 < Δ < 4	4 < Δ < 6	Δ > 6
DegreeDays net (Heating – Cooling)	Δ Growing DegreeDays	1000	Δ < 250	250 < Δ < 500	500 < Δ < 750	Δ > 750
Forest Weather Index (FWI)	Δ FWI	50	< 10	10 < Δ < 20	20 < Δ < 30	Δ > 30
Drought						
Mean Annual Precipitation	Δ %	25	3 < Δ < 5	5 < Δ < 10	10 < Δ < 15	Δ > 15
Days with precipitation <1mm	Δ days	40	3 < Δ < 10	10 < Δ < 20	20 < Δ < 30	Δ > 30
Wind						
Mean Speed	Δ m/s	3	< 0.5	0.5 < Δ < 1.0	1.0 < Δ < 1.5	Δ > 1.5
Days with maximum wind speed >10.8m/s	Δ days	40	5 < Δ < 10	10 < Δ < 20	20 < Δ < 30	Δ > 30
Heat waves						
Days with maximum T >35°C	Δ days	30	3 < Δ < 10	10 < Δ < 15	15 < Δ < 20	Δ > 20
Days with Humidex > 38	Δ days	40	5 < Δ < 10	10 < Δ < 20	20 < Δ < 30	Δ > 30
Cold invasions and Frost						
Days with minimum T < 0 °C	Δ days	60	Δ < 10	10 < Δ < 30	30 < Δ < 50	Δ > 50
Rainfall and Snowfall						
Two days height of precipitation	Δ%	40	Δ < 10	10 < Δ < 20	20 < Δ < 30	Δ > 30
Decrease of snowfall height	Δ%	40	5 < Δ < 10	10 < Δ < 20	20 < Δ < 30	Δ > 30
Increase of sea level						
Sea Level	Δmm	100	20 < Δ < 35	35 < Δ < 50	50 < Δ < 100	Δ > 100
Surges						
Increase of maximum height	Δ %	50	10 < Δ < 20	20 < Δ < 30	30 < Δ < 50	Δ > 50

Activity (by NACE Classification)	Main Impact	Functional Parameter	Units
Primary Sector (A, B)			
Agriculture and Livestock (A)	Production	Yearly Production	%
Fisheries, Aquaculture (A)	Fish stock	Yearly Production	%
Forestry (A)	Fires/Diseases	% area in danger	%
Mining and Quarrying (B)	Water and power availability	Yearly Production	%
Manufacturing €			
	Facilities/ Working conditions	Yearly Revenues	
Electricity, Gas, Steam & A/C Supply (D)			
Thermal Power Units	Power/Production efficiency	Yearly Production	%
Wind	Capacity factor	Yearly Production	%
Hydro Power	Water supply	Yearly Production	%
Photovoltaics	Capacity factor	Yearly Production	%
Energy Demand	Heating/Cooling/Losse	Consumption	%
Water Supply; Sewerage, Waste Management and Remediation Activities (E)			
Irrigation	Irrigation resources	Water resources	%
Water Supply	Drinking water resources	Water resources	%
Sewage & Waste Management	Flooding	Service interruption	%
Transport and Storage (H)			
Road Transport	Flooding/Damage/Deterioration	% km under risk	%
Rail	Flooding/Damage	% km under risk	%
Aviation	Lifting reduction / Deterioration	People/Goods activity	%
Ports	Docks/ Wave height	People/Goods activity	%
Built Environment (E, F, L, Q, R)			
Construction (F)	Structure Deterioration/Flooding	Repair costs per building	%
Historic City Centers	Discomfort	Humidex > 37 increase	%
Cultural Heritage Sites & Buildings	Structure Deterioration/Flooding	Restoration value	mil€
Hospitals, Health Service Facilities (Q)	Facility deterioration/Flooding	Operational ability reduction	%
Sewage & Waste Management	Flooding/Fires	Numbers	N

Activity (by NACE Classification)	Main Impact	Functional Parameter	Units
Accommodation and Food Service Activities (I)			
Winter and Ski Resorts	Snow fall	Snowfall amount	%
Summer Tourism	Attractiveness	Reduction of visits	%
Tertiary Sector (G, K, M, N, O, P, R, S)			
Financial & Insurance Activities (K)	Damages	Yearly Revenues	%
Professional, Scientific & Technical Activities (M)	Working Conditions	Yearly Revenues	%
Arts, Entertainment and Recreation ®	Working Conditions	Yearly Revenues	%
Wholesale & Retail Trade (G)	Working Conditions	Yearly Revenues	%
Other Service Activities (S)	Working Conditions	Yearly Revenues	%
Education (P)	Operating Conditions	Operating days reduction	%
Administrative & Support Service Activities (N)	Work load/working conditions	Services	%
Public Administration and Defence (O)	Work load/working conditions	Services	%
Human Health and Social Work Activities (Q)			
Population/Vulnerable Groups	Health Effects	Morbidity/100K	%
Population	Environmental Conditions	Humidex > 37 Ημερες	%
Coastal Regions			
Internal Water Bodies	Shore conditions/ Water quality	% Reduction of water	%
Beaches	Flooding	% Area in danger	%
Biodiversity and Nature			
Wetlands	Drought	% Area in danger	%
Landscapes of Natural Beauty	Deterioration	% Area in danger	%
Marine Environment	Acidity	pH (CO ₂)	N
Atmosphere	Quality (SOX, NOX, SP)	Pollutant Concentration	Conc%

Δραστηριότητες	Temperature increase	Drought	Wind	Hot days nights	Cold air invasion	Percipitation extreme	Sea level rise	Surges
Πρωτογενής τομέας (A, B)								
Agriculture, Forestry and Fishing (A)	3	4	1	4	-2	1	0	0
Fisheries, Aquaculture (A)	2	3	0	4	-3	2	0	0
Forestry (A)	2	0	0	0	0	0	1	1
Mining and Quarrying (B)	2	0	1	0	0	2	1	2
Agriculture, Forestry and Fishing (A)	4	3	1	4	0	1	0	0
Fisheries, Aquaculture (A)	0	1	0	0	0	1	0	0
Manufacturing (C)								
Manufacturing	1	1	1	1	-1	1	0	0
Electricity, Gas, Steam & A/C Supply (D)								
Thermal Power Units	1	0	0	0	0	0	0	0
Wind	0	0	-4	0	0	0	0	0
Photovoltaics	1	0	0	0	0	0	0	0
Energy Demand	1	0	0	3	0	0	0	0
Water Supply; Sewerage, Waste Management and Remediation Activities (E)								
Irrigation	3	4	0	3	0	1	3	0
Water Supply	3	4	0	3	0	1	0	0
Sewage & Waste Management	0	0	0	1	0	3	0	0
Transport and Storage (H)								
Road Transport	1	0	0	1	-1	3	1	0
Aviation	1	0	1	1	-1	1	0	0
Ports	0	0	1	0	0	0	2	4
Built Environment (E, F, L, Q, R)								
Construction	1	0	1	1	-1	1	0	0
Historic City Centers	1	0	0	4	-1	1	0	0
Hospitals, Health Service Facilities	1	1	0	2	-1	1	0	0
Sewage & Waste Management	0	0	0	1	0	1	0	0
Cultural Heritage Sites & Buildings	1	0	0	2	-1	1	0	0

Vulnerability scale	
Level	Impact
-4	Extreme positive
-3	High positive
-2	Medium positive
-1	Little positive
0	Negligible
1	Little negative
2	Medium negative
3	High negative
4	Extreme negative



Δραστηριότητες	Temperature increase	Drought	Wind	Hot days nights	Cold air invasion	Percipitation Extreme	Sea level rise	Surges
Accommodation and Food Service Activities (I)								
Summer Tourism	2	1	2	2	0	1	1	2
Tertiary Sector (G, K, M, N, O, P, R, S)								
Financial & Insurance Activities (K)	0	0	0	0	0	2	0	0
Professional, Scientific & Techical Activities (M)	0	0	0	0	0	0	0	0
Arts, Entertainment and Recreation (R)	1	0	0	1	-1	1	0	0
Wholesale & Retail Trade (G)	0	0	0	1	0	1	0	0
Other Service Activities (S)	0	1	0	0	0	0	0	0
Education (P)	0	0	0	1	0	0	0	0
Administrative & Support Service Activies (N)	1	1	1	2	-1	1	0	1
Public Administration and Defence (O)	1	0	0	2	0	0	0	0
Human Health and Social Work Activities (Q)								
Population/Vulnerable Groups	2	1	0	4	-1	2	0	0
Population	1	0	0	1	-1	2	0	0
Coastal Regions								
Internal Water Bodies	1	4	0	1	0	2	0	0
Beaches	0	0	0	0	0	2	4	4
Biodiversity and Nature								
Wetlands	1	4	0	1	0	2	4	2
Landscapes of Natural Beauty	1	1	0	1	0	3	1	1
Marine Environment	1	0	0	0	0	0	1	4
Atmosphere	1	0	1	1	0	0	0	0

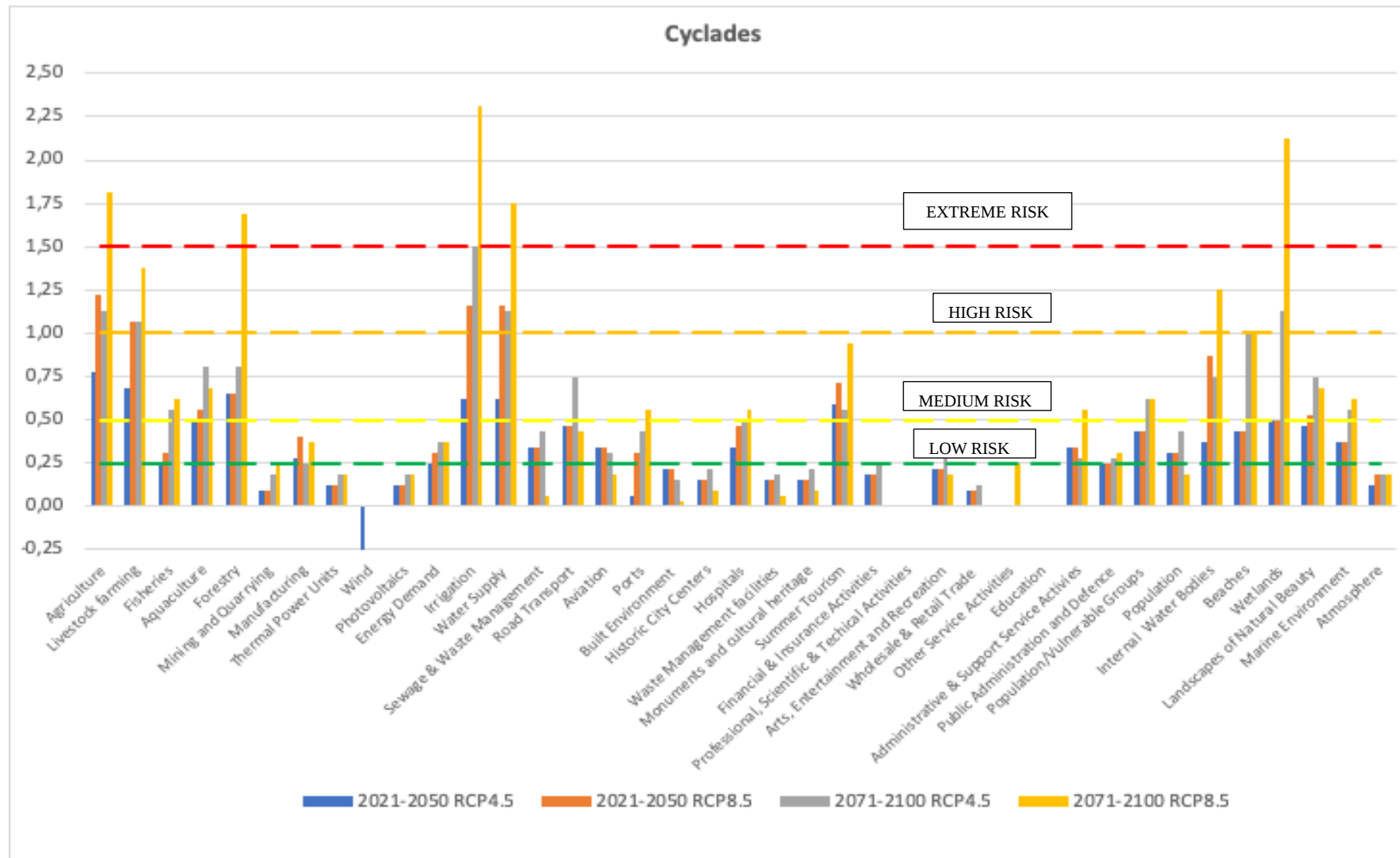
Κλίμακα τρωτότητας	
Βαθμός	Τρωτότητα
-4	Ακραία ευεργετική επίπτωση
-3	Μεγάλη ευεργετική επίπτωση
-2	Μέτρια ευεργετική επίπτωση
-1	Μικρή ευεργετική επίπτωση
0	Αμελητέα δυσμενής επίπτωση
1	Μικρή δυσμενής επίπτωση
2	Μέτρια δυσμενής επίπτωση
3	Μεγάλη δυσμενής επίπτωση
4	Ακραία δυσμενής επίπτωση

Reference Values and Ranking of Climatic Parameter Changes

Rank	Risk
0	Negligible
1	Small
2	Medium
3	High
4	Extreme

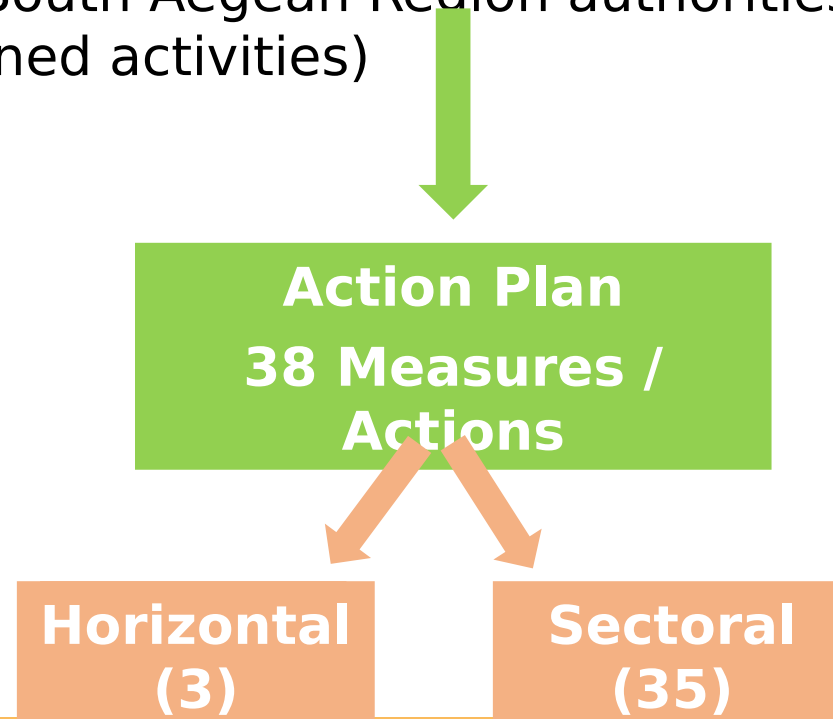
Climatic Parameters	Units	Reference values (actual)	Cyclades Ranking				Dodecanese Ranking			
			RCP4.5		RCP8.5		RCP4.5		RCP8.5	
			2021-50	2071-2100	2021-2050	2071-2100	2021-2050	2071-2100	2021-2050	2071-2100
Temperature										
Mean	Δ°C	4	2	3	2	3	2	3	2	3
Maximum	Δ°C	8	1	2	1	3	1	2	1	3
Heating Degree Days net	Δ Deg. Days	1000	-1	-2	-1	-2	-1	-2	-1	-2
Cooling Degree Days net	Δ Deg. Days	50	1	1	1	1	1	1	1	1
Forest Weather Index (FWI)	Δ FMI	50	1	2	1	3	1	2	1	3
Drought										
Mean Annual Precipitation	Δ%	25	0	-1	-2	-4	-1	-2	-2	-4
Days with precipitation <1mm	Δ days	40	-1/1	-2/+2	-2/+2	4	-1/1	-2/+2	-2/+1	-2
Wind										
Mean Speed	Δ m/s	3	0	0	0	0	0	0	0	0
Days with wind speed >15m/s	Δ days	40	1	-1	1	-1	1	-1	1	-1
Heat waves										
Days with maximum T >35°C	Δ days	30	1	1	1	1	1	1	1	1
Days with Humidex >38	Δ days	40	0	0	0	0	0/2	0/3	0/2	02-Apr
Cold invasions and Frost										
Days with minimum T <0°C	Δ	60	0	0	0	0	0	0	0	0
Rainfall and Snowfall										
2-day cum. precipitation	Δ%	40	1/2	1/3	1/2	-2/2	1/2	1/2	1/2	-2/1
Decrease of snowfall height	Δ%	40	-3	-3	-2	-4	0	-3	0	-3
Increase of sea level										
Sea Level	Δ cm	100	0	2	0	3	0	2	0	3
Surges										
Increase of maximum height	Δ%	50	1	1	1	1	1	1	1	1

Risk Rankings for all 27 NACE Activity Sectors



Objectives	Leadership and Enhancement of Administrative Capacity	Promote and diffuse knowledge & skills	Strengthening Resilience in Priority Areas
Systematization and improvement of the decision-making process (short and long-term)	√	√	
Connecting adaptation with promoting a sustainable development model through regional / local action plans	√	√	√
Promoting actions and adjustment policies in all sectors of the economy, focusing on the most vulnerable	√		√
Establishment of a mechanism for monitoring, evaluating and updating adaptation actions and policies	√	√	√
Strengthening the adaptive capacity of Greek society through information and awareness actions		√	

- Literature research on adaptation guideline and policy paper on national, EU, and international level
- Review of good adaptation practices (including other LIFE projects)
- Review of all operational programs at a regional and national level
- Consultation with the South Aegean Region authorities (completed, under development and planned activities)



Total Score = (Effectiveness Index + Benefit Index) / Cost Effectiveness



**Classification of measures based on the
vulnerability ranking of sectors and the climate risk**



Final Classification

Prioritizing Adaptation Measures Methodology

Measure Code	Action / Measure /	Target			Correlation with Sectors of National CCA Strategy	Funding Source	
		A	B	Γ			
Regional Observatory	Performance indicator					Π, ΥΜΕΠΕΡΑΑ, INTERREG, HORIZON, LIFE	
	Objective						Value
	(A): avoid the impact						3
	(B): reduce intensity and extent of impacts						2
	(C): rehabilitation of the impacts of climate change						1

Benefit category	Factors
Environmental Benefits	Degree, time and duration of improvement
Financial Benefits	Saving resources
Social Benefits	Population benefited
Grade: 1 if it meets one, 2 if it meets two, 3 if it meets all of the above	

Measure Code	Action / Measure /	Estimated Cost (A)	Effectiveness (B)	Cost / Benefit (scale 0-100) (A/B)	Performance indicator
NA_D1	Regional Climate Change Observatory	3.000.000€	6	5,00	3

Adaptation Measures Prioritized

Measure Code	Measure - Action	Total Score	Prioritization
NA_D4	Vulnerability assessment by individual activities of the primary sector	2800	H
NA_D1	Regional Climate Change Observatory	1410	H
NA_D29	Adaptation of tourism industry and infrastructure	997	H
NA_D30	Adaptation of tourism services (diversification of products)	880	H
NA_D38	Training of health care professionals for improvement of social structures and management of civil protection incidents	630	H
NA_D13	Promoting energy efficiency and the use of renewable energy sources	437	H
NA-D5	Adaptation of agricultural activities	384	H
NA_D16	Action plan for the protection of underground aquifers	224	H
NA-D3	Civil protection adaptation actions	214	H
NA_D31	Vulnerability assessment of costal areas and adaptation measures	208	H
NA_D14	Recording, assessment of water resources, projects and infrastructures at NUTS3 level	162	H
NA_D37	Development of a specific action plan to address health problems due to climate change and extreme effects	150	H
NA_D16	Action plan for optimal management of surface water resources	140	H
NA_D36	Actions to protect biodiversity of the marine environment from alien species	120	H
NA_D21	Adaptation and protection of infrastructures and means of road transport	93	H
NA_D27	Protection from flooding in urban and suburban areas	90	H
NA_D24	Institutional interventions for adaptation	84	H
NA_D19	Monitoring of the quality and quantitative status of water resources	70	H
NA_D8	Protection of forest ecosystems	67	H

The analysis of climatic vulnerability showed that in the case of RCP8.5 scenario more extreme climatic changes will occur.

Specifically, extreme **drought** events will be more severe due to great decrease in mean annual precipitation for both Dodecanese and Cyclades.

In Cyclades more days with precipitation lower than 1mm are predicted for RCP8.5 scenario than in Dodecanese.

In general, higher mean temperatures, increase of drought events, increase of sea level and higher Forest Weather Index will be

Based on the results of the analysis in the short and medium term up to 2050, the following activities are exposed to medium to high risk from the effects of climate change :

- the activities of the primary sector (agriculture, livestock farming and aquaculture);
- water resources (irrigation & water supply).

In the long run (2071-2100), climatic risk increases significantly for most areas in SAR and especially in the case of the unfavorable scenario, RCP8.5 reaches extreme values for the following sectors:

- Water resources,
- forest systems,
- agriculture and

Thank you for your attention

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