ADAPT2CLIMA TOOL: A DECISION SUPPORT TOOL FOR SUPPORTING ADAPTATION PLANNING IN AGRICULTURE

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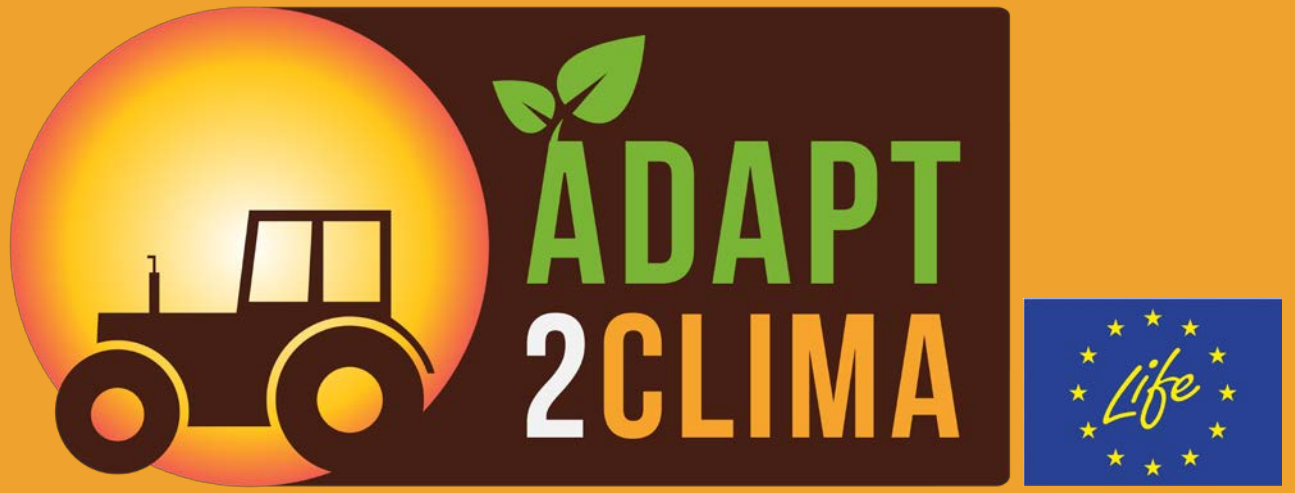

ADAPTtoCLIMATE CONFERENCE, Crete, 24-25 June 2019

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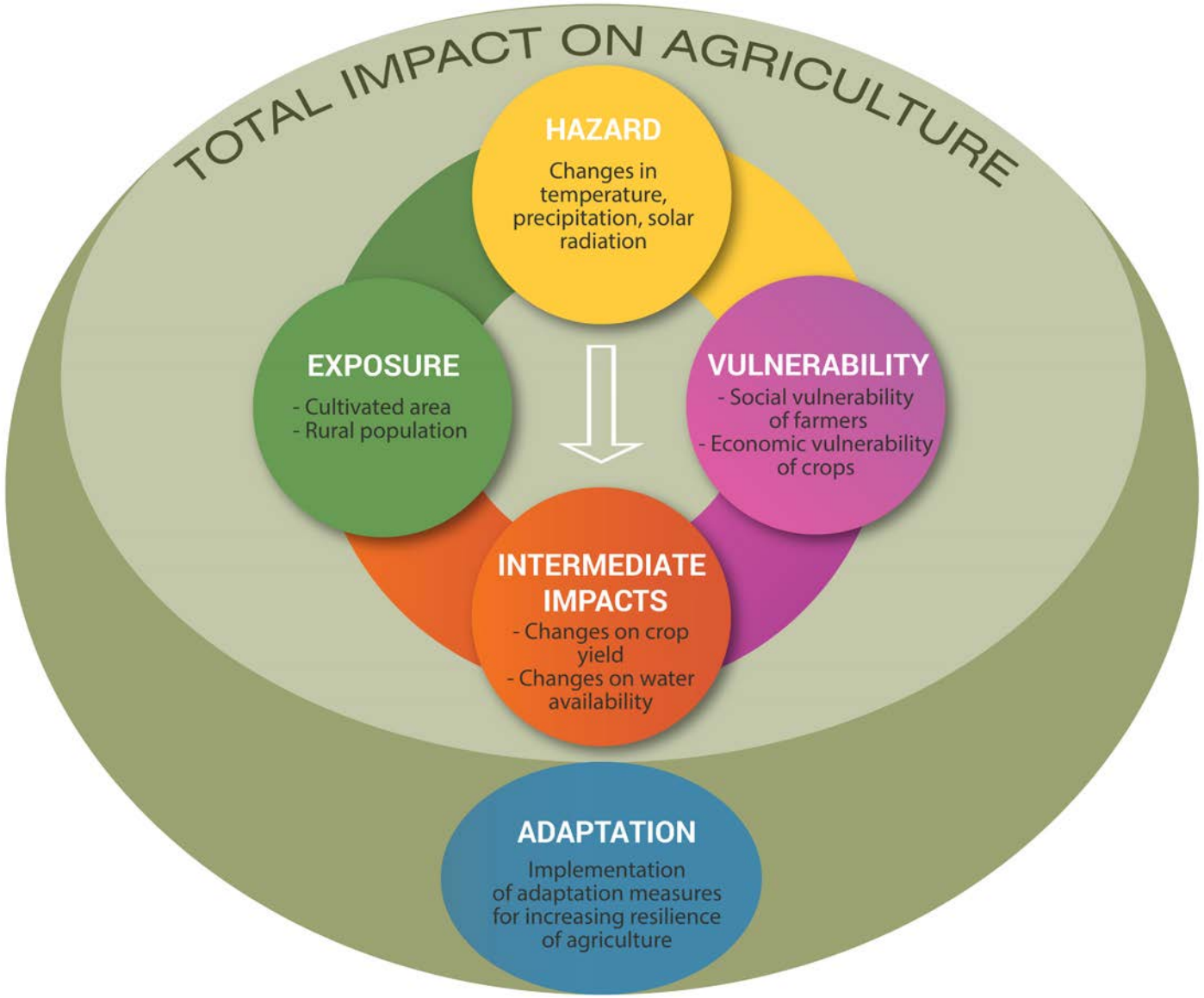
AIM OF THE ADAPT2CLIMA DECISION SUPPORT TOOL

The aim of the ADAPT2CLIMA tool is to enhance understanding of climate change and its impacts on agriculture in order to support farmers, policy makers and other relevant stakeholders (agronomists, agribusiness industry, etc.) in adaptation planning.

- The tool is applied at the three project areas of Sicily, Cyprus and Crete



TOTAL IMPACT ON AGRICULTURE

- Based on the updated IPCC (2014) terminology
- Assessment at geospatial level

Total impact on agriculture =

Impact on crops + Vulnerability

Impact on crops = Crop yield change * Cultivated area per crop

+

Vulnerability = Social vulnerability + Economic vulnerability

Social vulnerability = Size of agricultural population; Dependency on agriculture; Age of farmers)

Economic vulnerability = Economic importance of crops (in terms of revenues and value)

Total impact after adaptation = Total impact w/o adaptation – Adaptation

* All indicators are normalized using a 5degree scale to allow for their correlation

IMPACT ASSESSMENT METHODOLOGY

ADAPT 2CLIMA

CLIMATIC SCENARIOS

The main climate change scenarios examined refer to the average climatic conditions expected for the period 2031-2060 under RCP4.5 and 8.5 and therefore, the tool may serve for long-term adaptation planning.

Average climatic conditions expected according to the following representative concentration pathways (RCP):

- Stabilization of GHG concentration levels , with mitigation policies (RCP4.5)
- Increasing GHG concentration levels , no mitigation policies (RCP8.5)

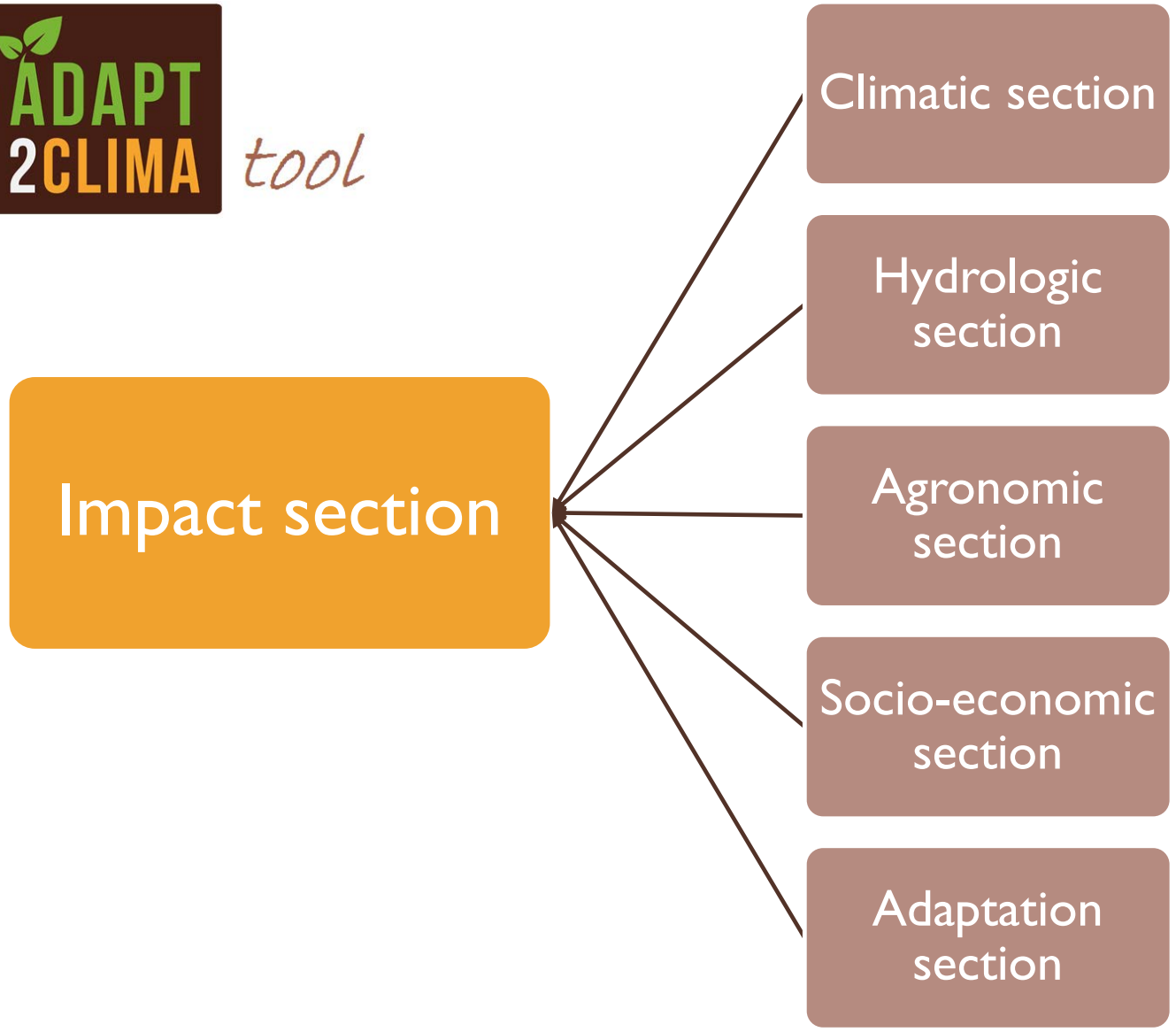
Additionally, extreme climatic scenarios under RCP8.5 are examined in order for the tool to be used for short-term adaptation planning by farmers, in case such extreme climatic conditions occur in the near future.

Extreme climatic conditions according to RCP8.5:

- Intense warm year
- Intense cold year
- Intense dry year
- Intense wet year

ADAPT 2CLIMA tool

STRUCTURE OF THE ADAPT2CLIMA TOOL



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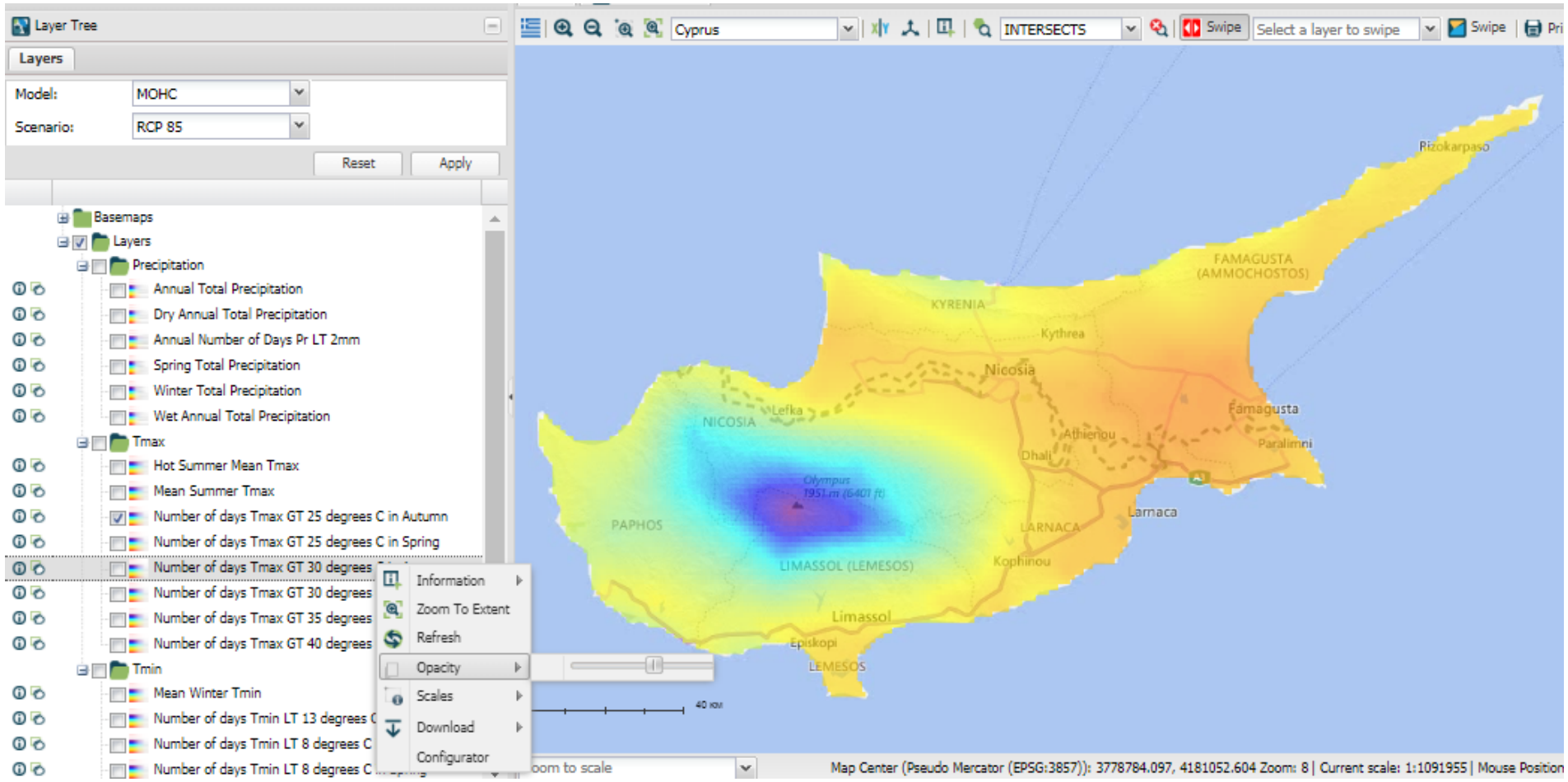
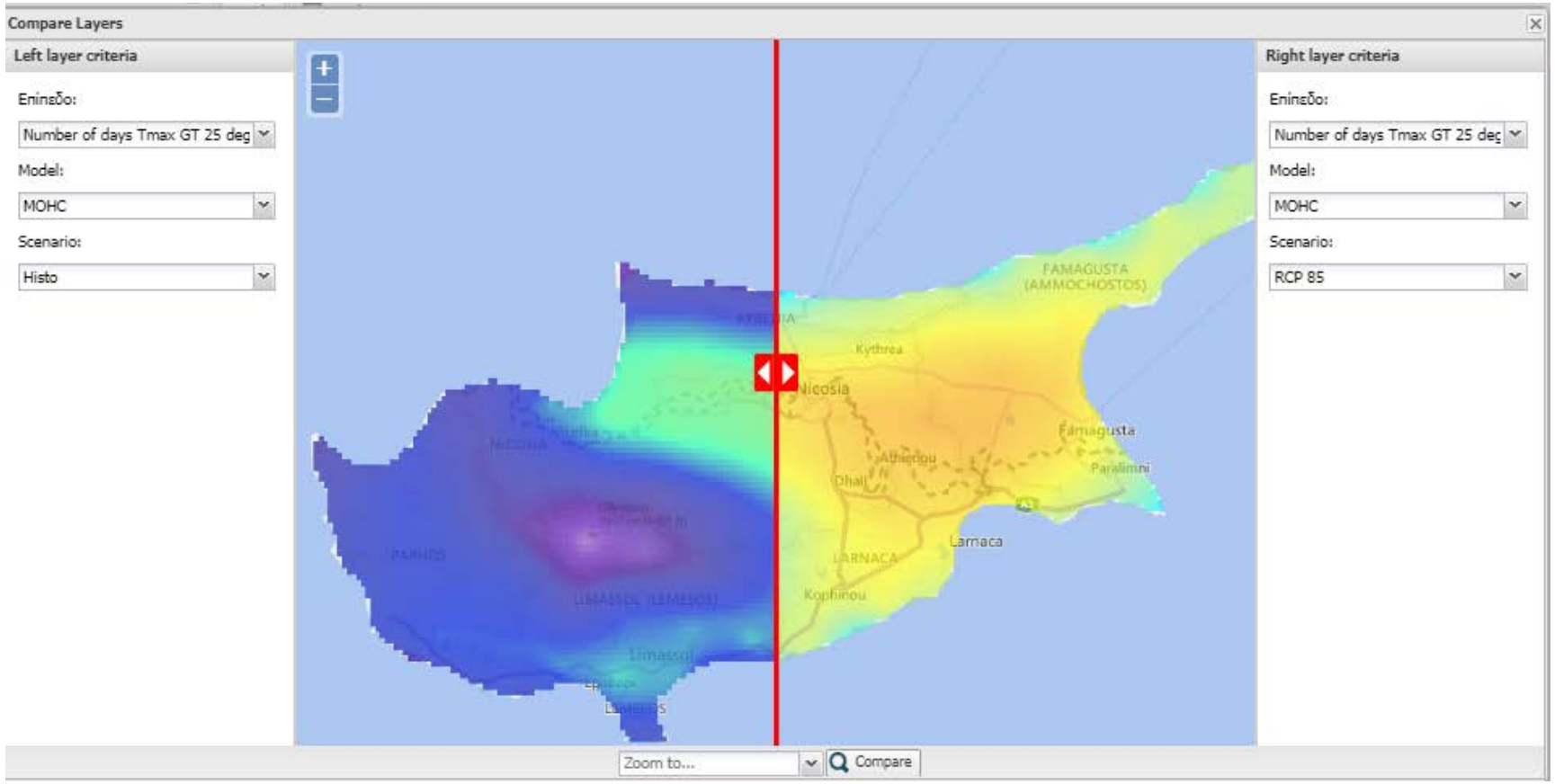
CLIMATIC SECTION

Current and future projections of climatic indices relevant to agriculture, based on state-of-the-art regional climate models for the three islands and pilot areas under study



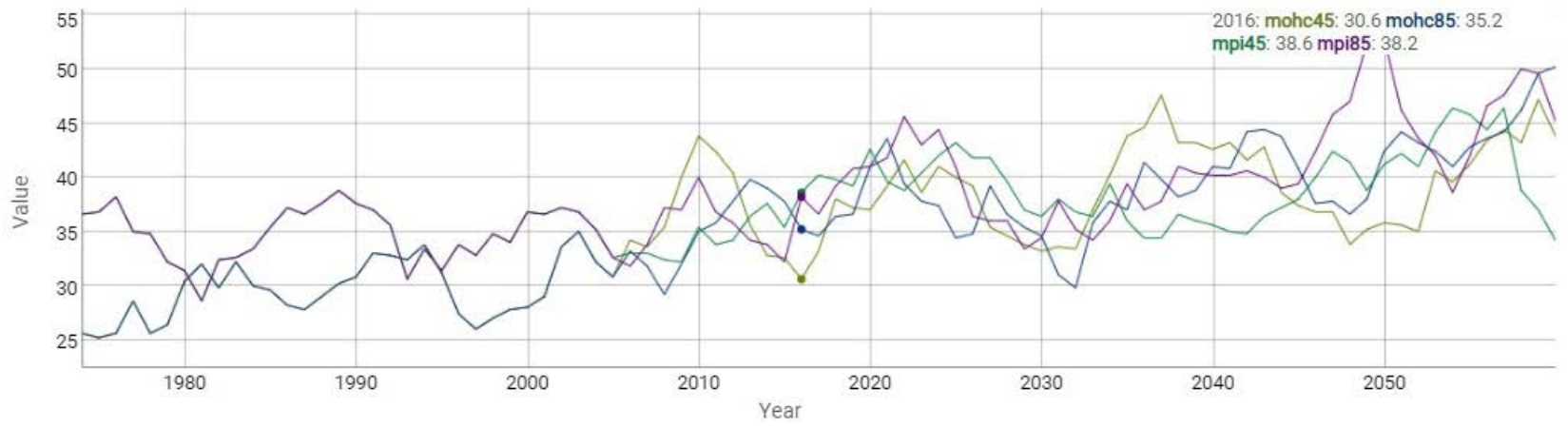
See more than one information layers at the same time by adjusting the opacity of layers



Compare information available for different indicators or for different climatic scenarios

Please select the following parameters for an interactive representation of the climatic variable.

Select Region:	Select Area:	Select Parameter Category:	Select Parameter:	
Crete	Messara	TMAX	number of days Tmax GT 25 degree...	Submit



#	Year	MOHC45	MOHC85	MPI45	MPI85
0	2060	43.8	50.2	34.2	45.2
1	2059	47.2	49.6	37	49.6
2	2058	43.2	46.2	38.8	50
3	2057	44.4	44.2	46.4	47.6
4	2056	43.4	43.6	44.4	46.6
5	2055	41.2	42.8	45.8	42

DIAGRAMS OF CLIMATIC TIMESERIES

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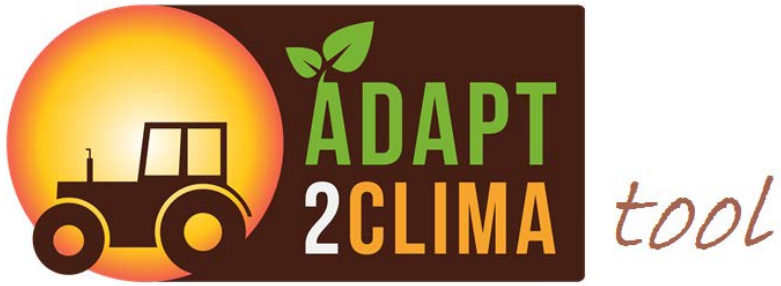
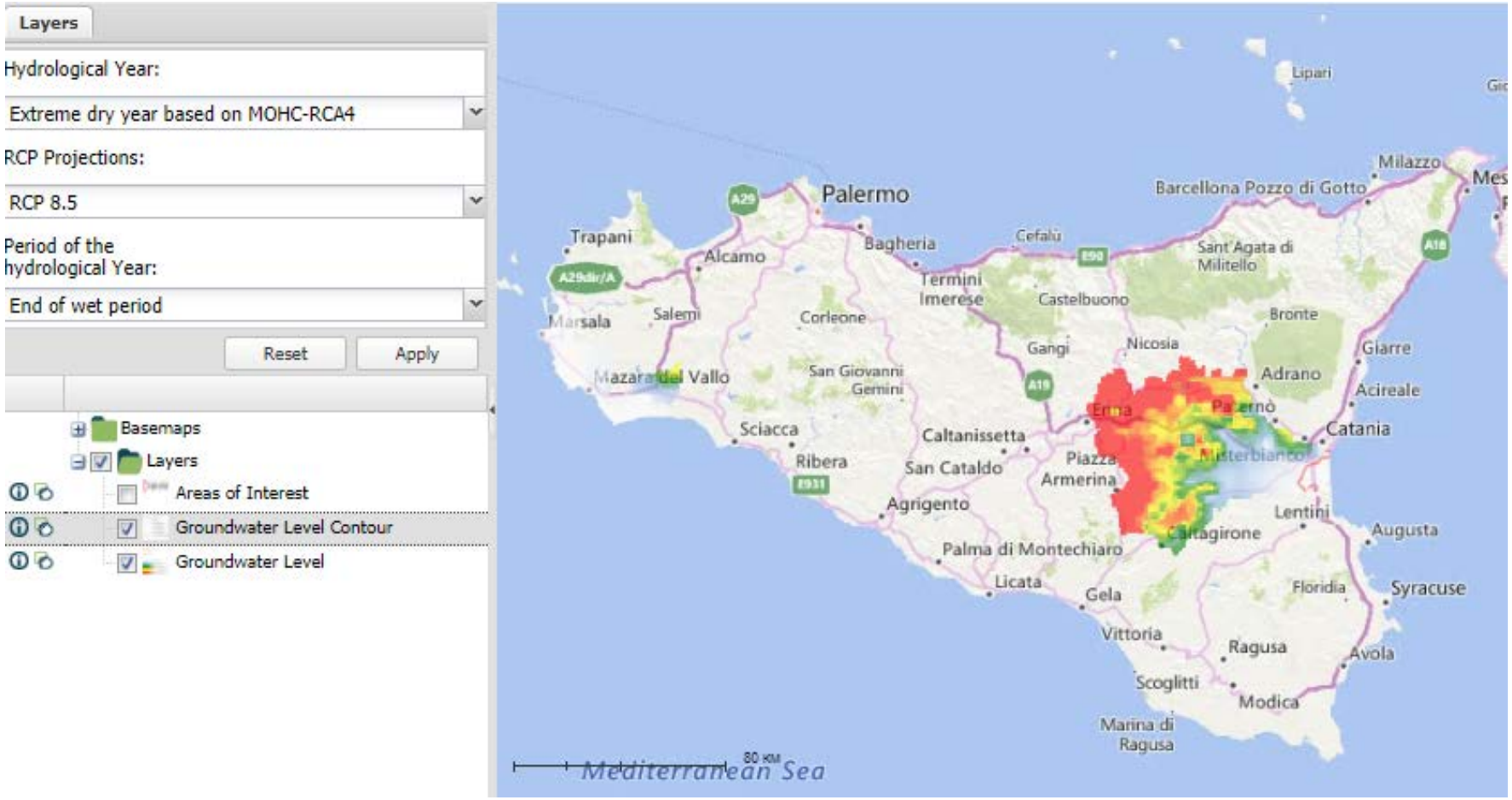


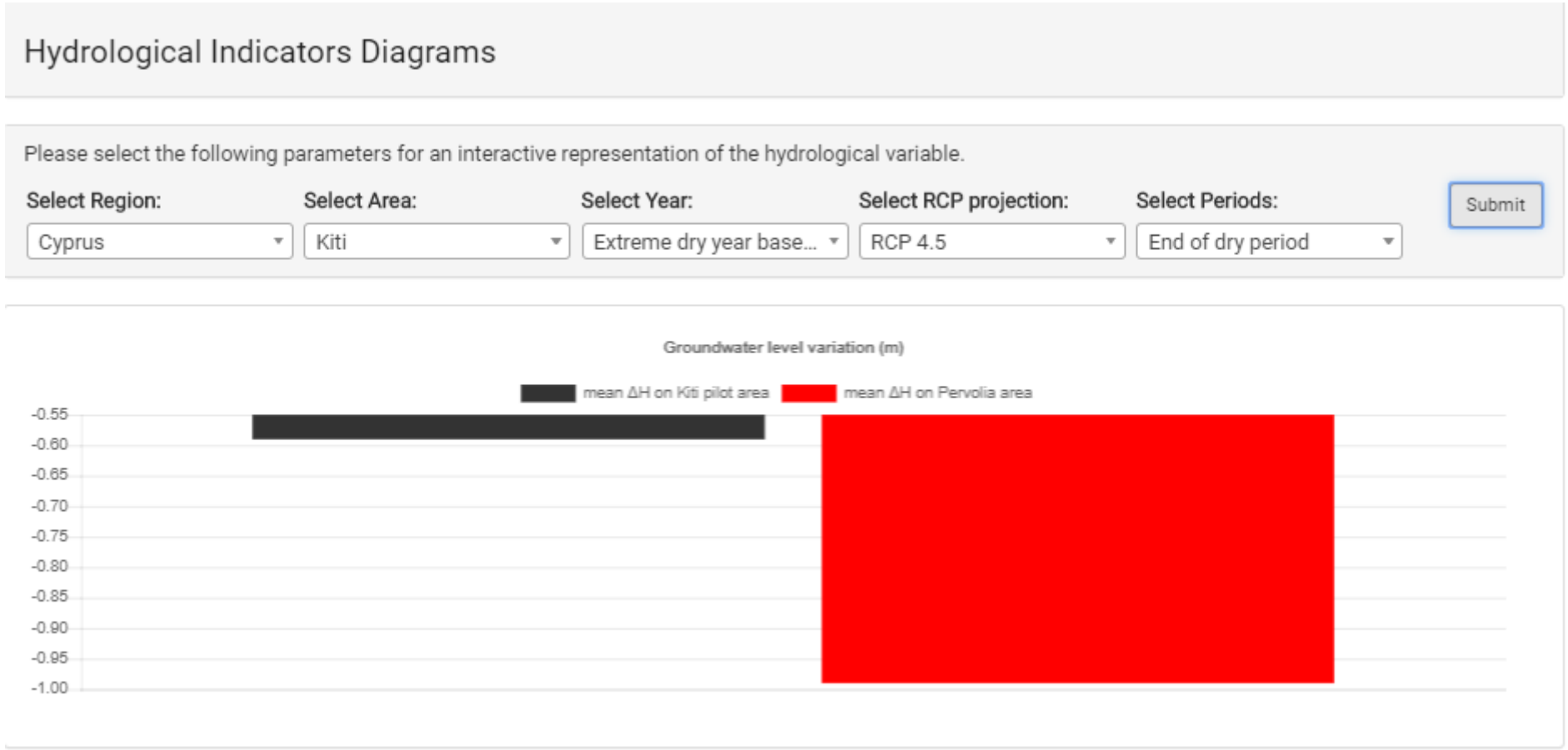
HYDROLOGIC SECTION

Future hydrological conditions related to agriculture for the three islands, based on the RCMs' output

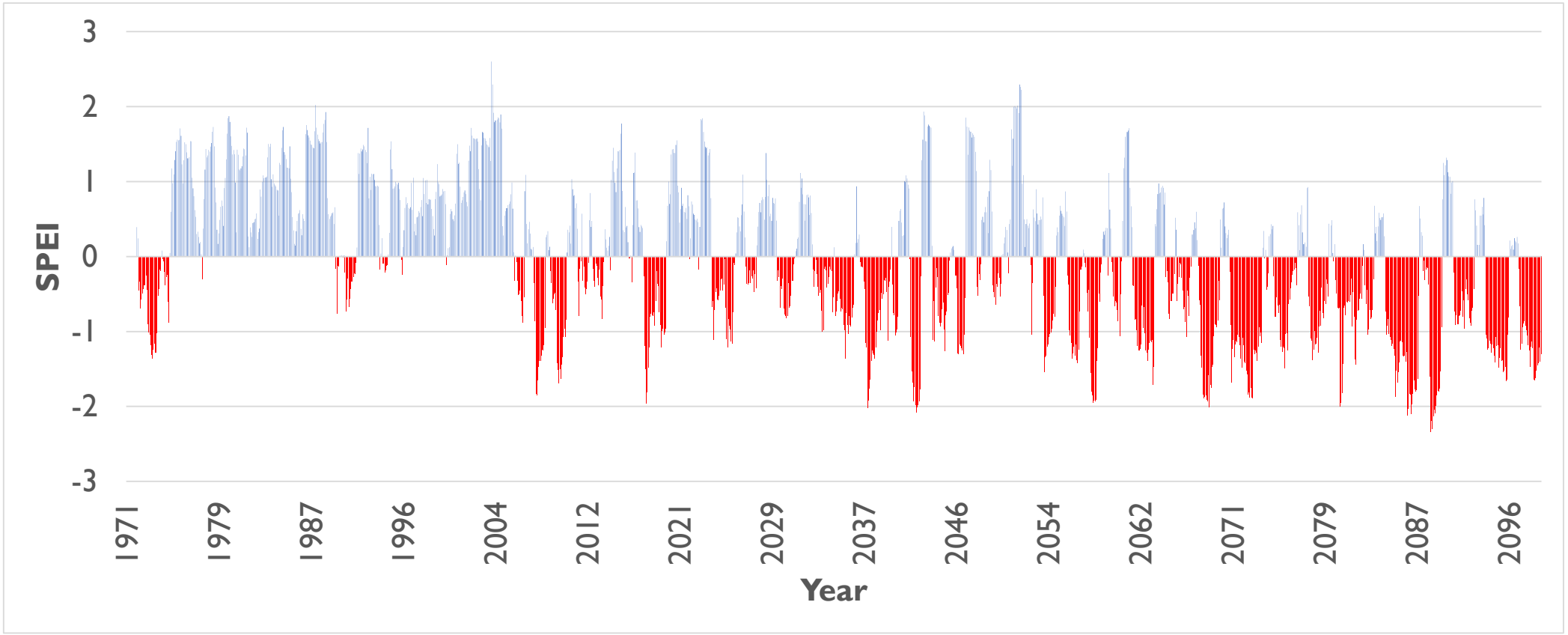


GROUNDWATER LEVEL & CONTOUR

GROUNDWATER LEVEL VARIATION



STANDARDIZED PRECIPITATION EVAPOTRANSPIRATION INDEX (SPEI)



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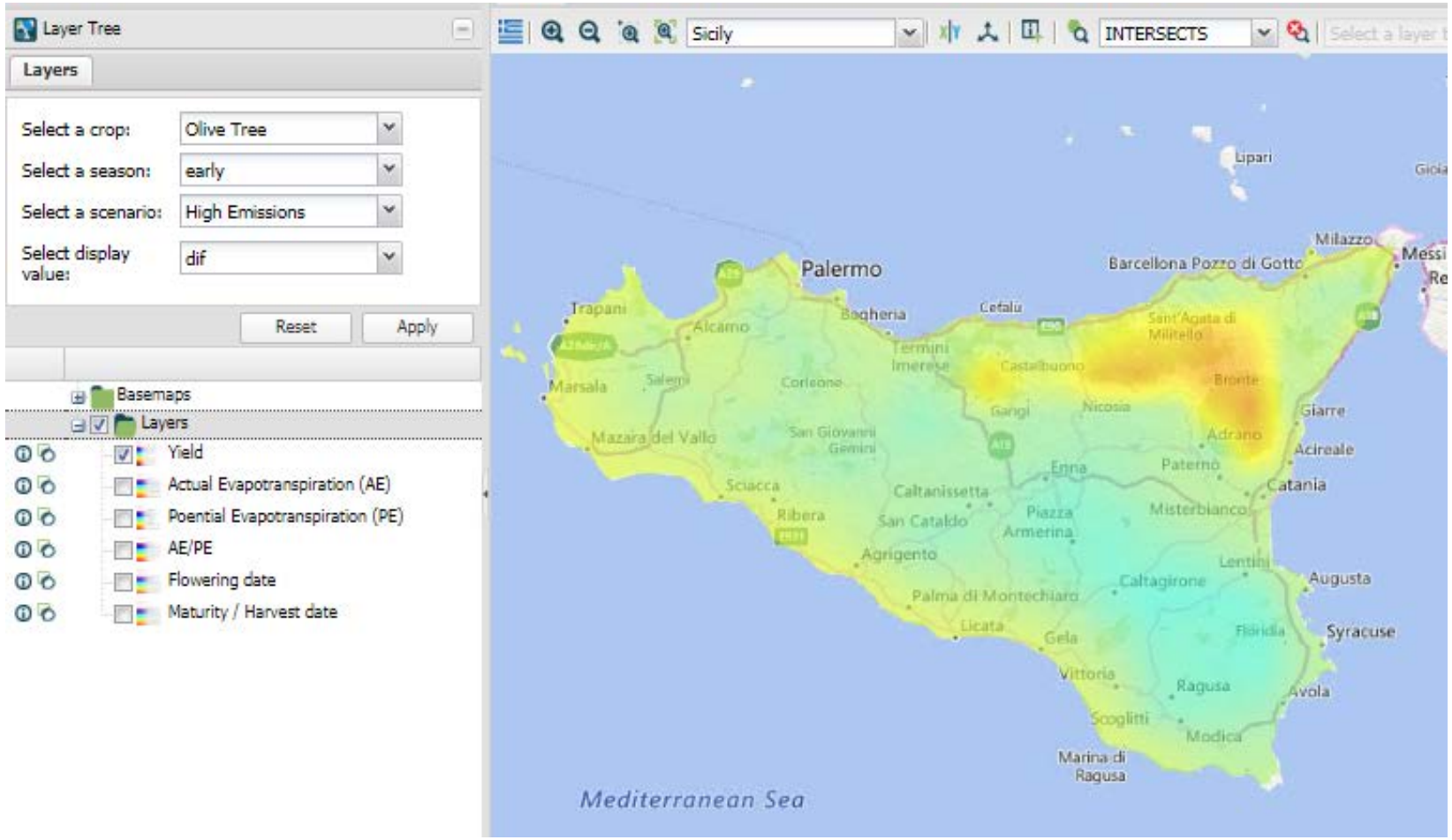
AGRONOMIC SECTION

Crop performance under different climate scenarios for different sowing seasons for the annual crops and precocity levels for the perennial crops.

AGRONOMIC SECTION



Crop performance indicators:

- Flowering date
- Maturity/harvest date
- Crop yield
- Actual evapotranspiration,
- Potential evapotranspiration
- Ratio between the two evapotranspirations

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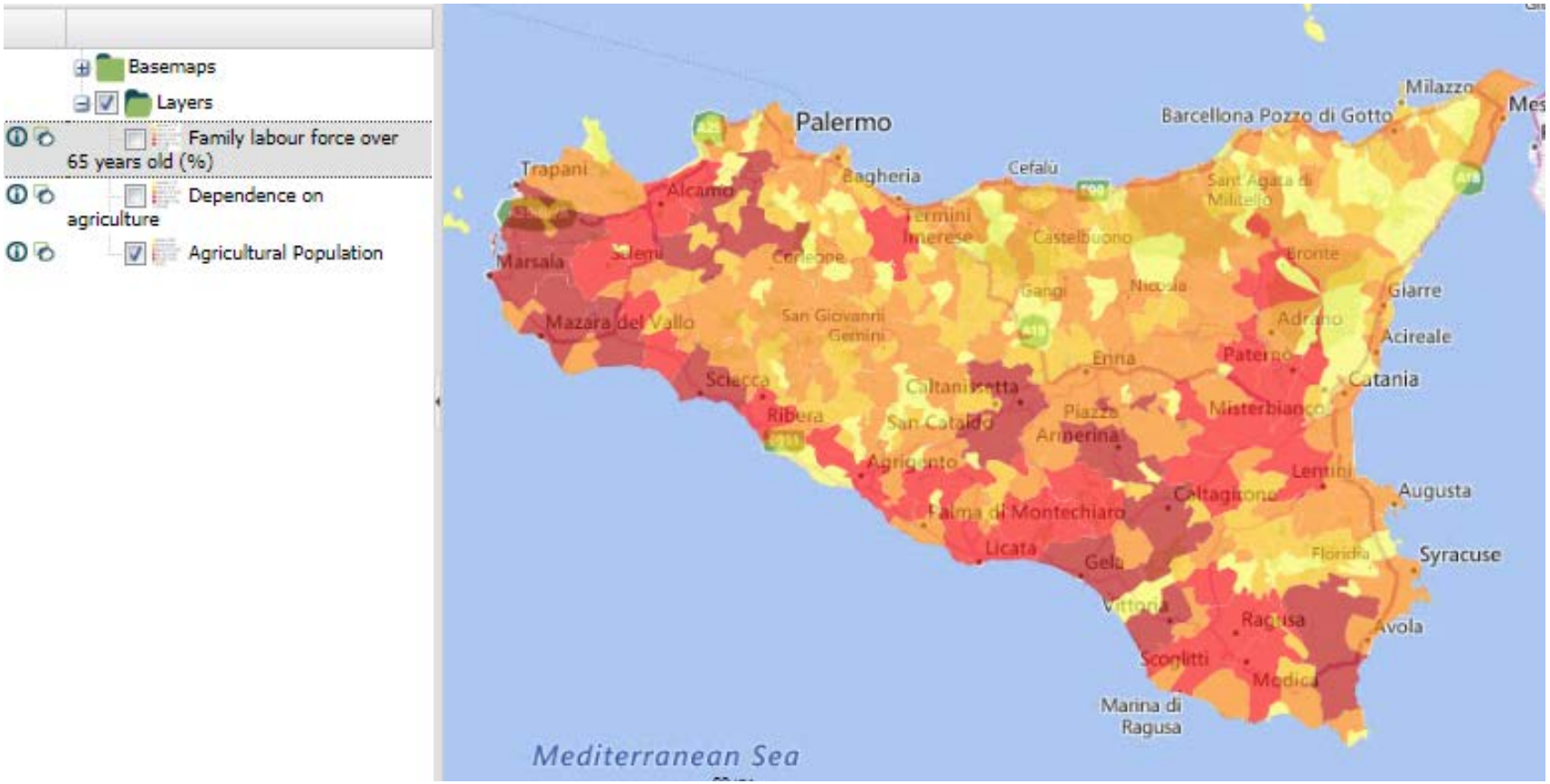
SOCIO-ECONOMIC SECTION

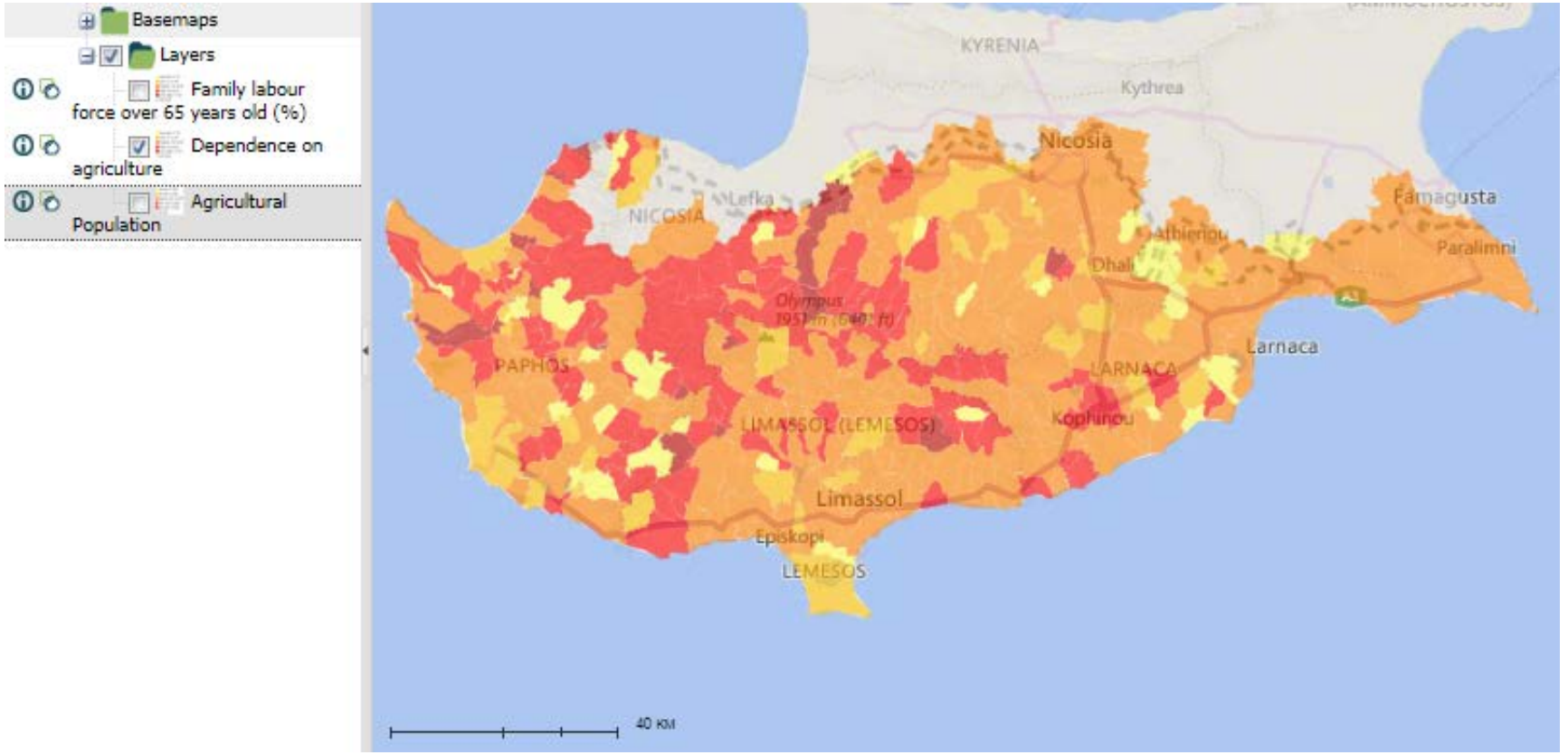
Socio-economic indicators used in the climate change impact assessment of the agricultural sector of the three islands

AGRICULTURAL POPULATION



*Presence of agricultural population in an area that may be potentially **exposed** to the climate change impacts, in case that a decrease in crop yield is expected for that area.*

DEPENDENCE ON AGRICULTURE



Level of economic dependence of farmers on the agricultural income, since agriculture does not constitute the main source of income for all farmers.

Those farmers that agriculture constitutes their exclusive or primary occupation, are more dependent on agriculture and as a result are more vulnerable to climate change impacts.

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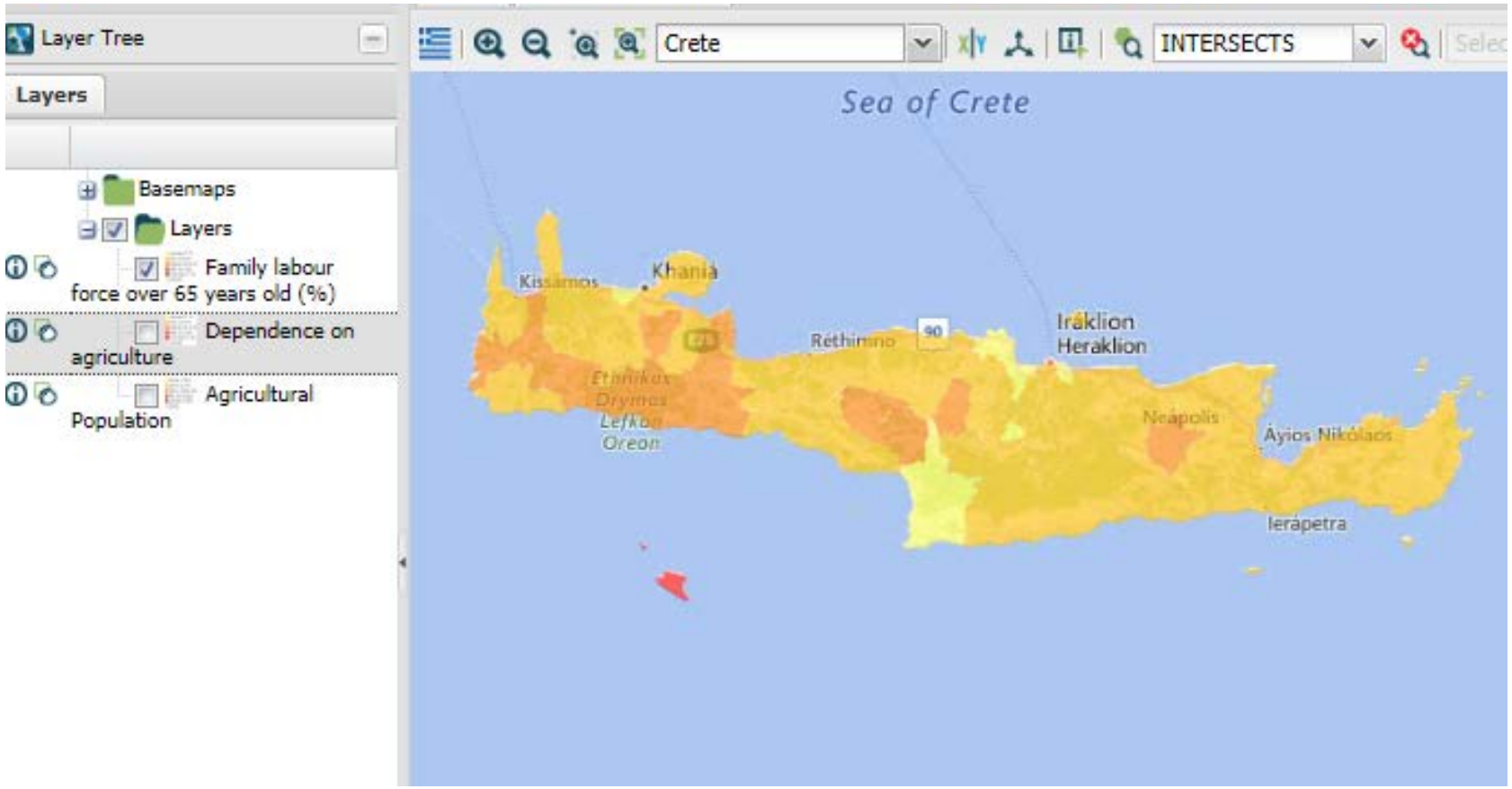
OLDER FARMERS (OVER 65 YRS OLD)



The age of farmers is considered relevant for the assessment, since older farmers are considered to be less adaptable to changing conditions.

The higher the percentage of older farmers, the higher the vulnerability.

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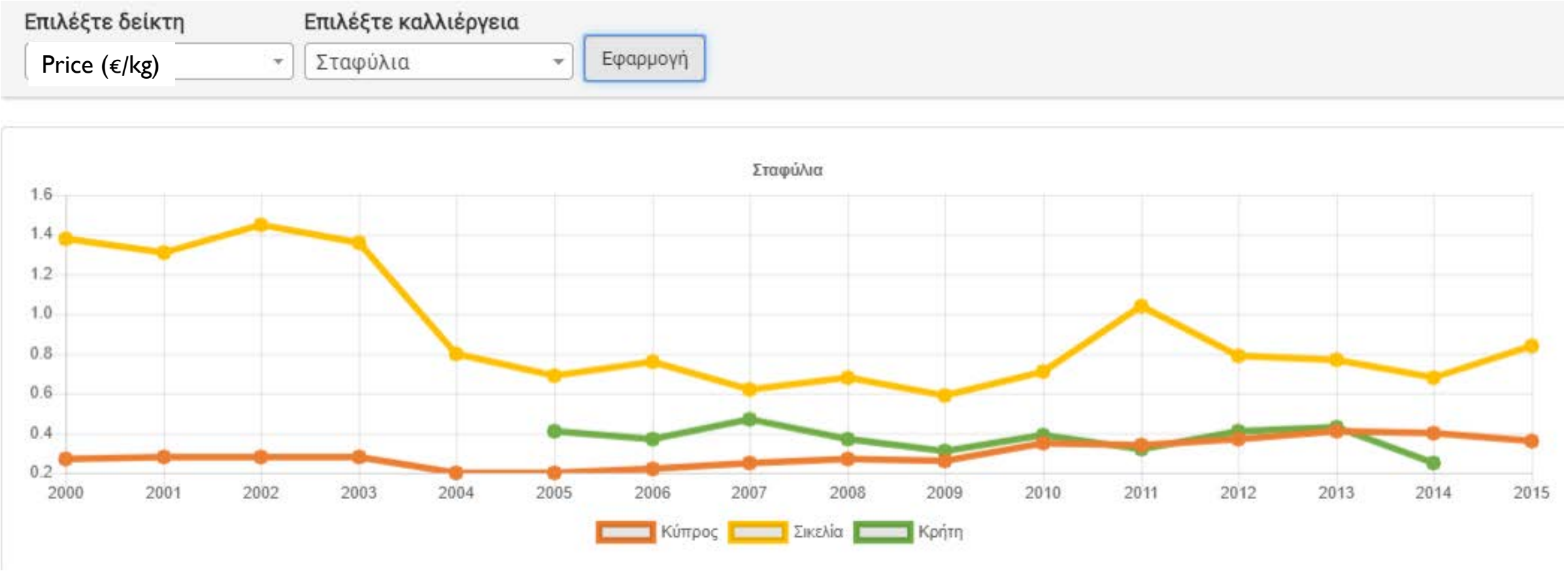
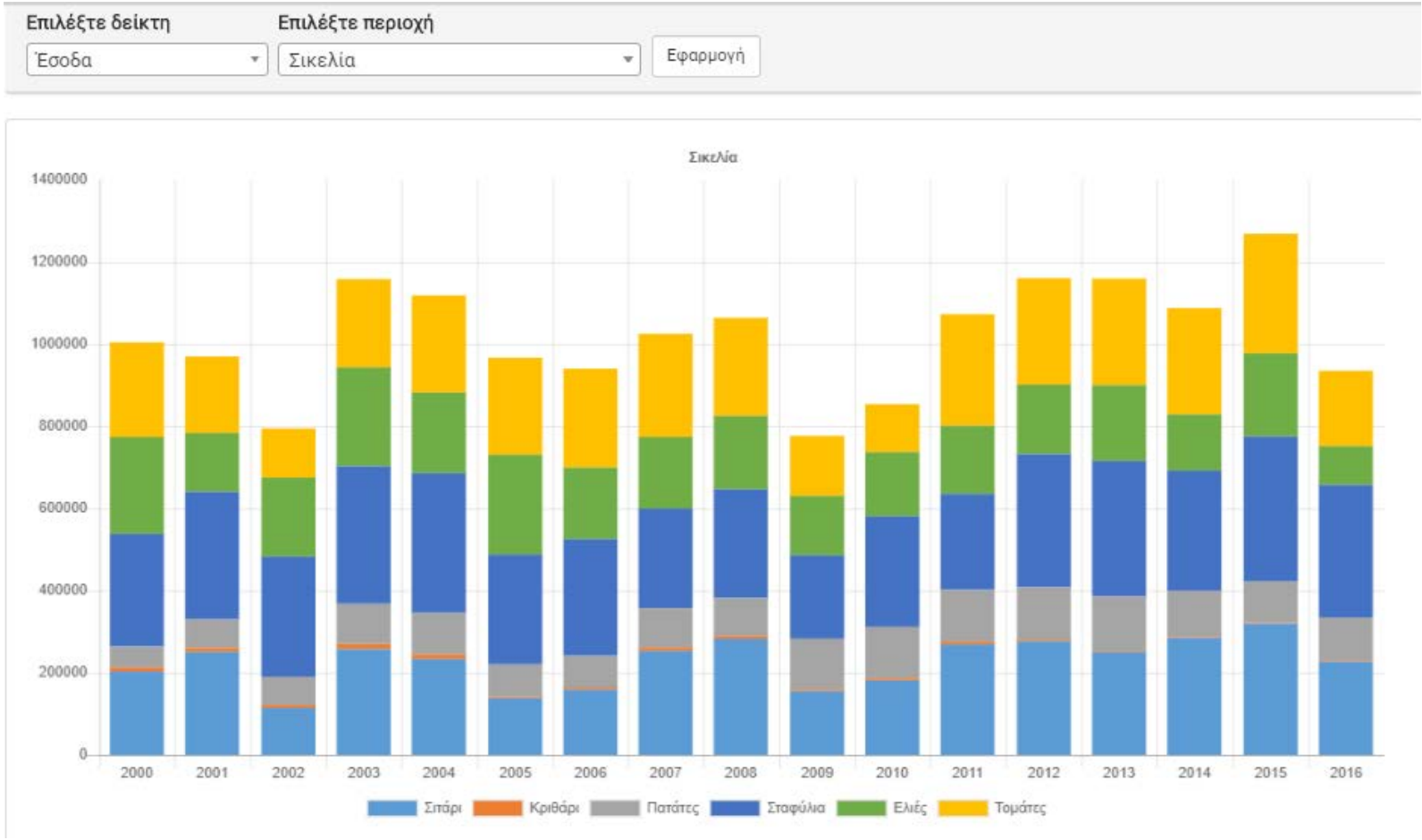
ECONOMIC INDICATORS (CROP SPECIFIC)

The economic indicators reflect the vulnerability of the agricultural economy of an area to the climate change impacts on crops due to the economic contribution of crops to the agricultural economy of the area.



PRICE: ECONOMIC IMPORTANCE OF A CROP IN TERMS OF PRICE.

The higher the price of a crop, the higher the vulnerability to climate change.



TOTAL REVENUES: CONTRIBUTION OF CROP REVENUES TO THE TOTAL REVENUES OF THE AGRICULTURAL SECTOR.

The higher the contribution of a crop to the revenues of the agricultural sector, the higher the vulnerability for the economy, in case of a decrease in the crop yield due to climate change.

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ADAPTATION SECTION

Available adaptation measures for addressing climate change impacts on crops and their evaluation against several adaptation related criteria

PRIORITIZATION OF ADAPTATION MEASURES

Measures Score

Measure / Criteria	Efficiency	Urgency	Usefulness	Difficulty	Contribution Adaptation	Economic Viability	Social Acceptance	Total
Use of green manure for vegetables.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Earlier planting of potatoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Breeding early maturing potato varieties for shorter rainy seasons	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Applying deficit irrigation strategies (e.g. regulated deficit irrigation) in olive groves.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Applying conservation tillage combined with vegetation cover in row-middle floors during winter and mulching it	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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IMPACT SECTION

Information on the magnitude of climate change impacts for each crop for the three project areas, as well as on the potential for enhancing their resilience through the implementation of selected adaptation measures.

IMPACTS AND ADAPTATION

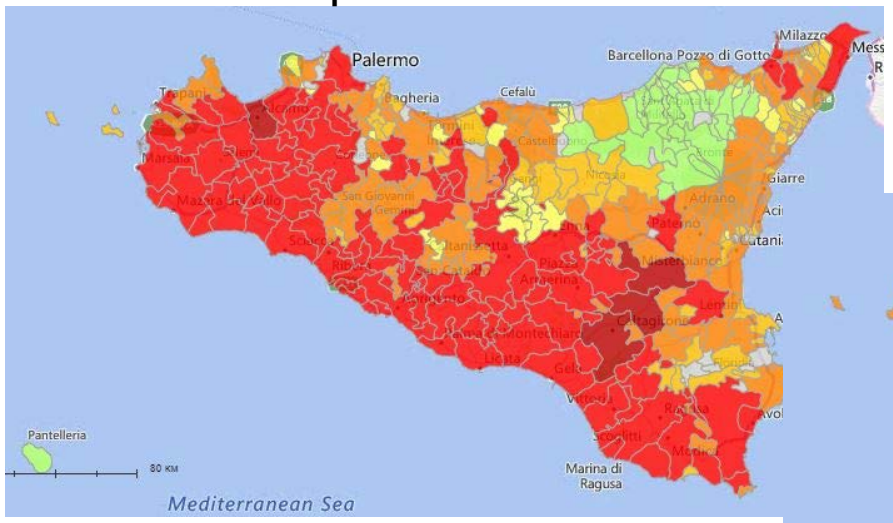
Climatic scenario / Crop	RCP 4.5	RCP 8.5	RCP 4.5	RCP 8.5	
	(a) Average of values for the municipalities where the crop is cultivated		(b) Average of values for all municipalities of Sicily		
Barley	0.14	0.00	0.08	0.00	
Wheat	0.41	0.01	0.33	0.01	
Tomatoes	2.80	2.80	1.79	1.79	2
Potatoes	0.12	0.05	0.03	0.01	
Olives	1.49	0.83	1.48	0.82	3
Grapes	2.67	1.71	2.49	1.59	1

OVERALL CLIMATE CHANGE IMPACT FOR THE AGRICULTURAL SECTOR OF SICILY

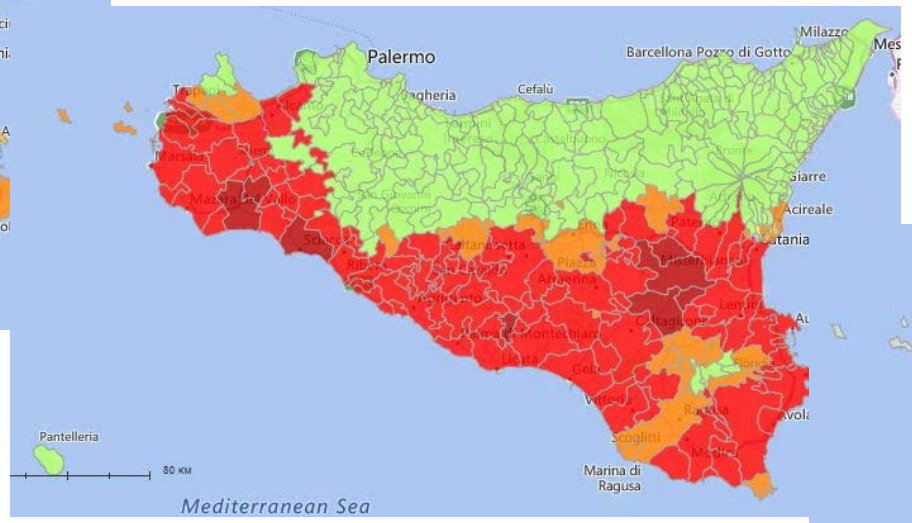
ADAPT 2CLIMA

IMPACT MAPS FOR THE AGRICULTURAL SECTOR OF SICILY

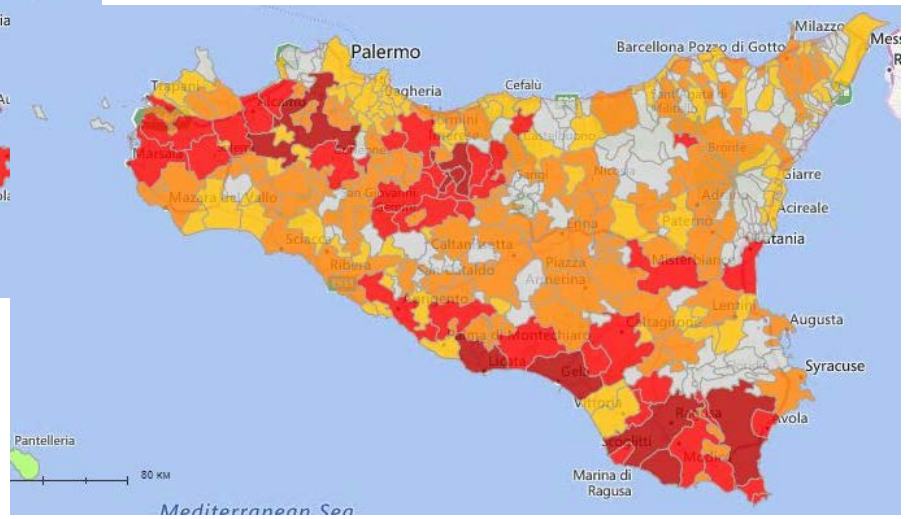
Grapes - RCP4.5



Olives - RCP4.5



Tomatoes - RCP4.5



Climatic scenario / Crop	RCP 4.5	RCP 8.5	RCP 4.5	RCP 8.5	
	(a) Average of values for the municipalities where the crop is cultivated		(b) Average of values for all municipalities of Crete		
Barley	0.2	0.0	0.1	0.0	
Wheat	0.1	0.0	0.1	0.0	
Tomatoes	1.3	1.5	0.6	0.7	3
Potatoes	0.1	0.0	0.0	0.0	
Olives	1.1	0.3	1.1	0.3	2
Grapes	2.6	1.4	2.5	1.3	1

OVERALL CLIMATE CHANGE IMPACT FOR THE AGRICULTURAL SECTOR OF CRETE

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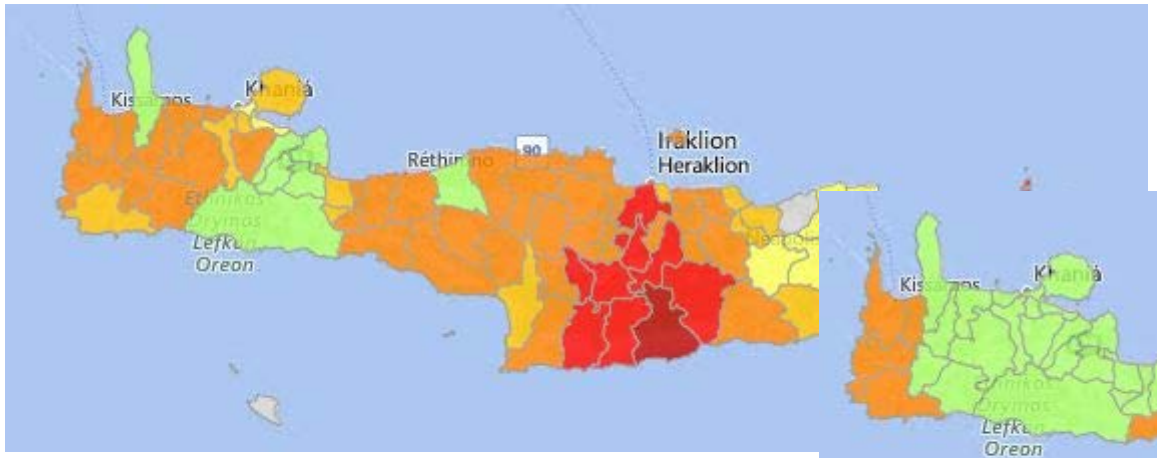
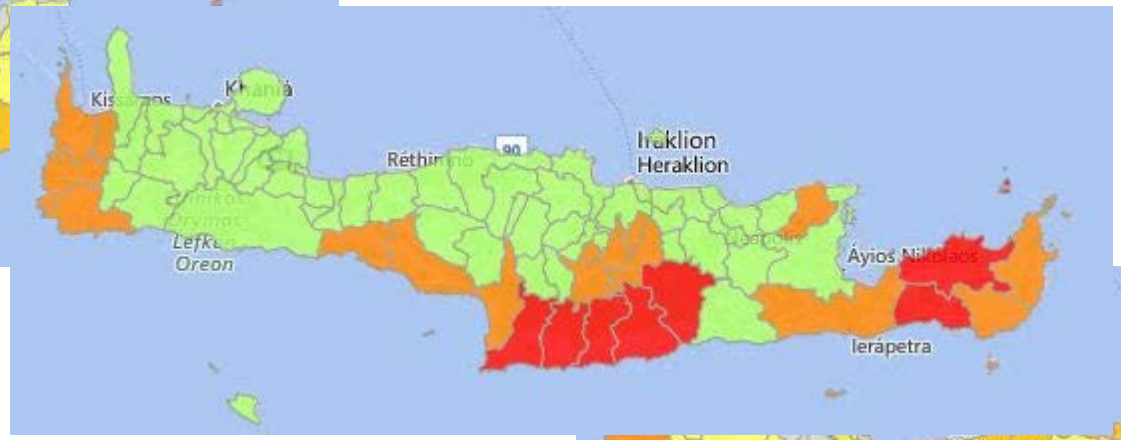
IMPACT MAPS FOR THE AGRICULTURAL SECTOR OF CRETE

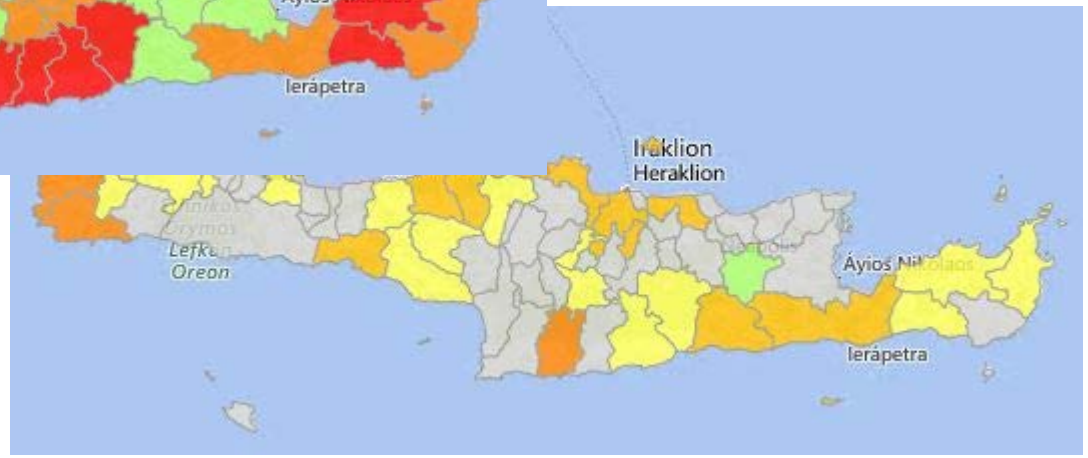
Grapes 4.5



Olives 4.5



Tomato 8.5



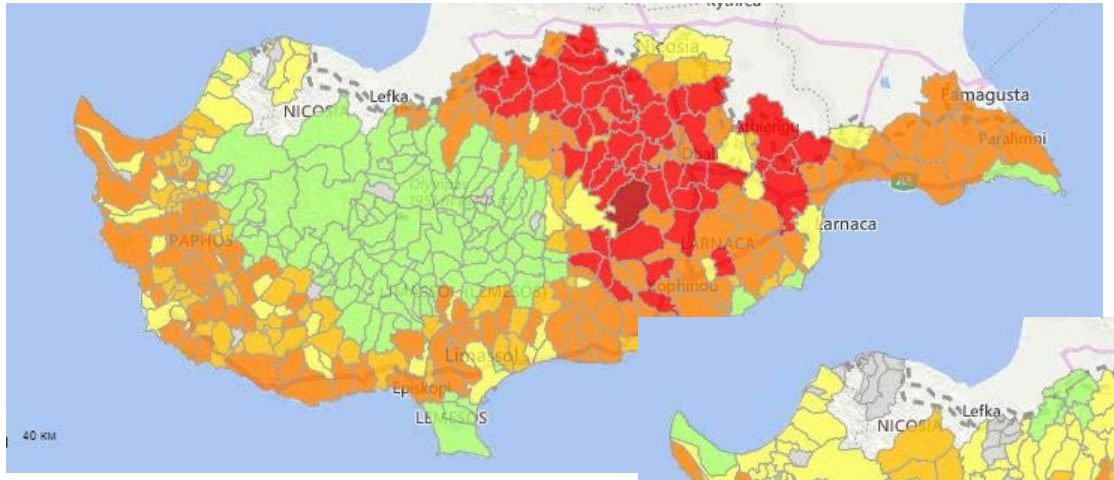
Climatic scenario / Crop	RCP 4.5	RCP 8.5	RCP 4.5	RCP 8.5	
	(a) Average of values for the municipalities where the crop is cultivated		(b) Average of values for all municipalities of Cyprus		
Barley	1.2	1.4	0.93	1.10	
Wheat	0.5	0.7	0.32	0.48	
Tomatoes	2.3	2.0	0.80	0.69	3
Potatoes	0.1	0.2	0.07	0.11	
Olives	1.8	1.3	1.74	1.25	1
Grapes	1.3	1.7	1.04	1.42	2

OVERALL CLIMATE CHANGE IMPACT FOR THE AGRICULTURAL SECTOR OF CYPRUS

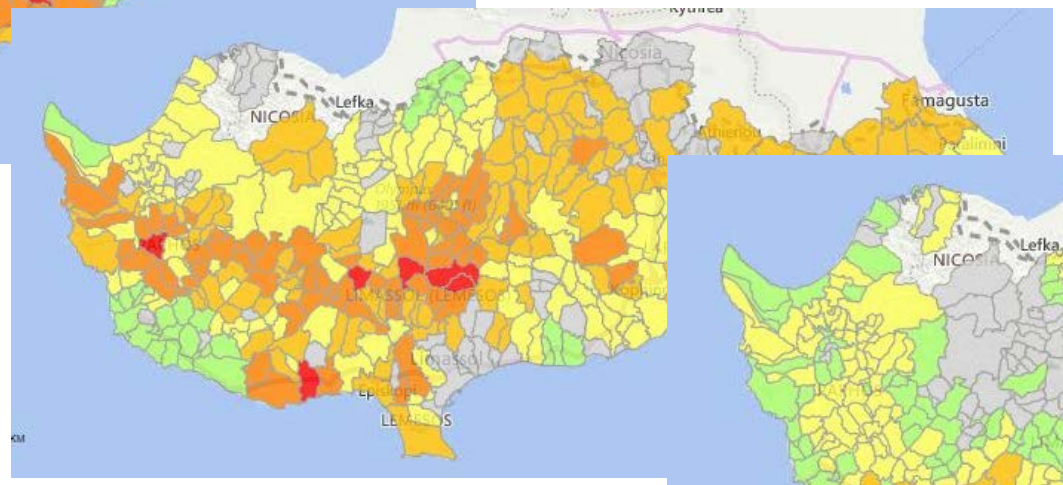
ADAPT 2CLIMA

IMPACT MAPS FOR THE AGRICULTURAL SECTOR OF CYPRUS

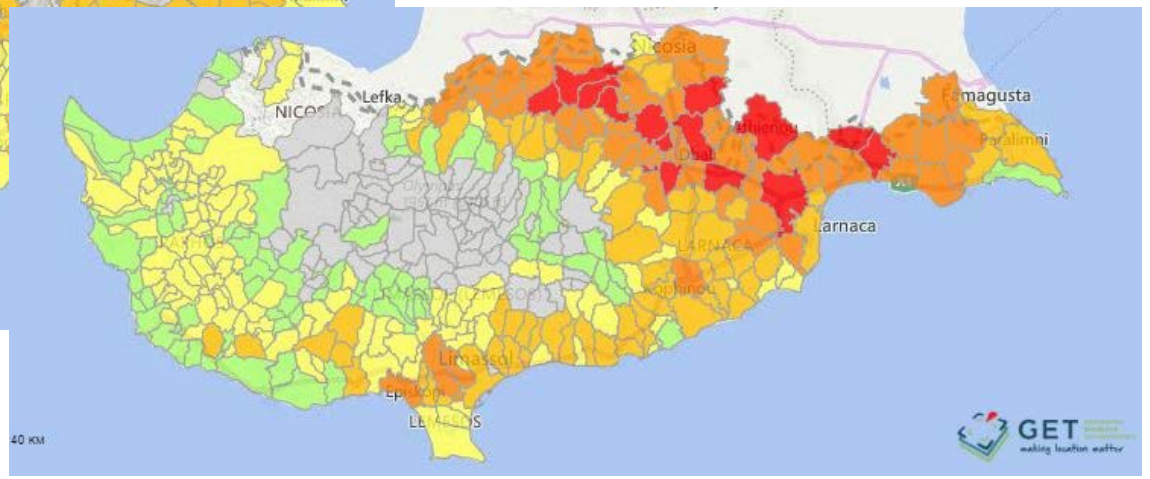
Olives 4.5



Grapes 8.5



Barley 8.5

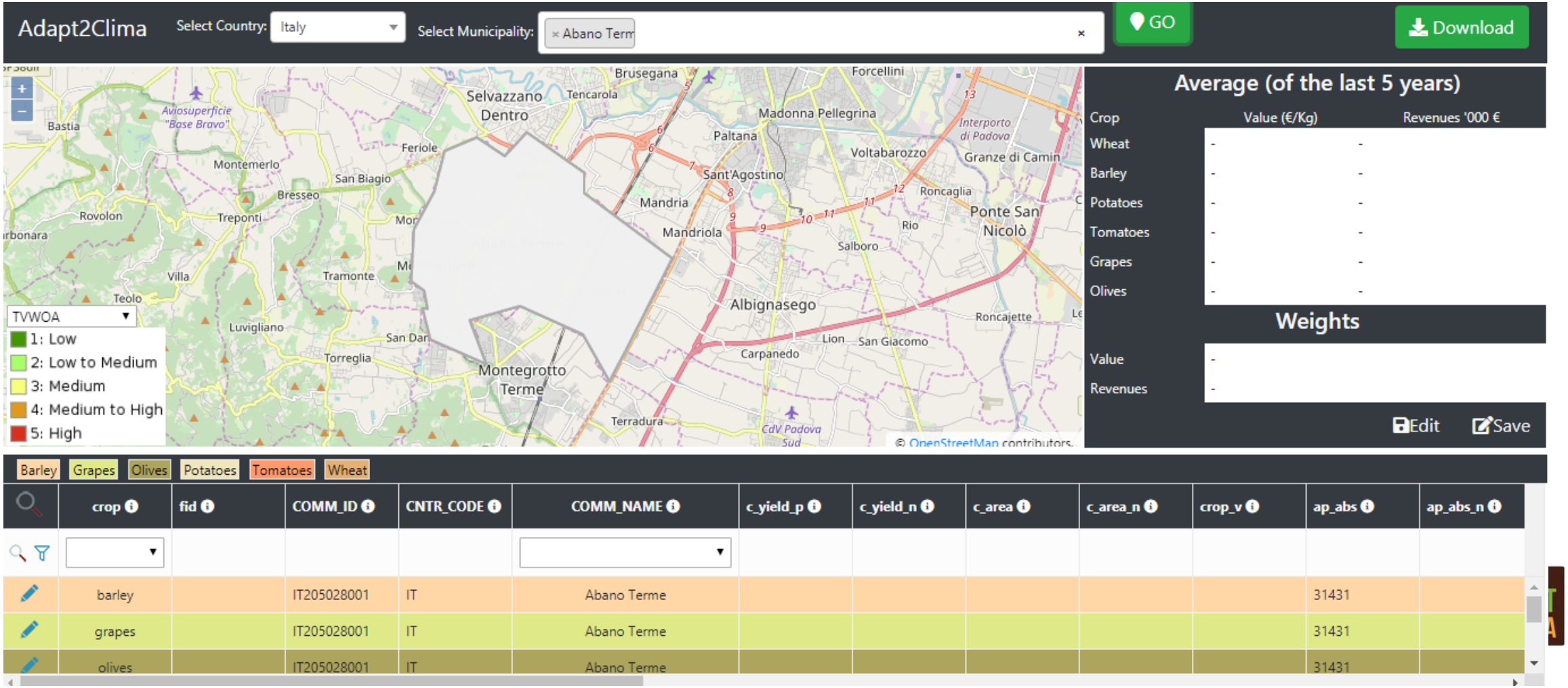


ADAPT 2CLIMA tool

REPLICATION

The tool may be also used by everyone wishing to develop a regional adaptation strategy for the agricultural sector of Italy, Greece and Cyprus, through the "apply the tool to your area" feature.

APPLY THE TOOL TO YOUR AREA



THANK YOU FOR YOUR ATTENTION!

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