



The dataset consist of the historical and climate projection (CMIP6) for gridded atmospheric variables and the climate hazards/extreme events alongside the return values (likelihood) of hazards/extreme events. The dataset was developed during NEVERMORE project as part of WP3 from CMCC and NCSRSD.

Sitia, Crete island (Greece) (NUTS 3)

The Municipality of Sitia covers the Eastern part of the island of Crete with 633.22 km² and a population of 19,029 inhabitants. It is Europe’s municipality most “extreme climate hotspot”, mainly due to thermal drought conditions. Sustained high winds at the eastern part, and almost 300 sunshine days/year, with few rain events. Coastal erosion (especially southern coasts) has been accelerated in recent years. The economy is traditionally based on agricultural crops and olive trees, producing multiple Protected Destination of Origin (PDO) products, which has produced a steady increase in exports. Tourism has seen a rapid expansion in recent years.

Main challenge: Sitia is the EU region most exposed to climate pressures, mainly heat and droughts, during summer periods due to tourism and agriculture. Besides, the projected sea level rise is over 1m (by 2100) and storm surges will induce unexpected changes in the coastline due to coastal erosion. A main challenge for the region is to maintain sufficient and sustainable freshwater resources, of high environmental quality. Intense local scale weather patterns due to highly complex topography and air-sea interaction are making a sound response very challenging.

Mitigation and adaptation strategies: There is a lack of projects related to climate mitigation and adaptation linking local/regional policies to sustainable development and climate resilience, with citizen engagement. However, there is a holistic plan for the sustainable local development and preservation of the natural and cultural environment.

Preliminary Local Council of Stakeholders: Policy-makers: Sitia Municipality, Region of Crete; Academia: NCSRSD, Primary / Secondary Schools & Youth/citizens (educational courses); Civil society, NGOs, associations: Municipal Organisation of social and cultural development of Sitia (Dokas), Women associations; Private sector: Union of Agricultural Cooperatives, Farmers Cooperatives, Individual Farmers; Associations of Hotels / individual hotels, Wind Farms Operators; Municipal Civil Protection (risk reduction), Local Hospital/Health Centres.

Dataset

Hazard	Variables included	Name of file
Drought	<p>spi(time, y, x): Standard Precipitation Index (SPI)</p> <p>spi_classes(time, y, x): Classified SPI values (2:extremely wet, 1.5:very wet, 1:moderately wet, 0:near normal, -1:moderately dry, -1.5:severely dry, -2:extremely dry)</p> <p>extremely_dry_days (years, y, x): Days per year with spi <=-2</p> <p>return_period_values (return_period, y, x)</p>	Sitia_drought_day_ACCESS-CM2_historical+ssp245_19850101-21001231.nc
		Sitia_drought_day_ACCESS-CM2_historical+ssp585_19850101-21001231.nc
		Sitia_drought_day_CESM2_historical+ssp245_19850101-21001231.nc
		Sitia_drought_day_CESM2_historical+ssp585_19850101-21001231.nc
		Sitia_drought_day_CNRM-ESM2-1_historical+ssp245_19850101-21001231.nc
		Sitia_drought_day_CNRM-ESM2-1_historical+ssp585_19850101-21001231.nc
		Sitia_drought_day_EC-Earth3-Veg-LR_historical+ssp245_19850101-21001231.nc
		Sitia_drought_day_EC-Earth3-Veg-LR_historical+ssp585_19850101-21001231.nc
		Sitia_drought_day_HadGEM3-GC31-LL_historical+ssp245_19850101-21001231.nc
		Sitia_drought_day_HadGEM3-GC31-LL_historical+ssp585_19850101-21001231.nc
		Sitia_drought_day_IPSL-CM6A-LR_historical+ssp245_19850101-21001231.nc
		Sitia_drought_day_IPSL-CM6A-LR_historical+ssp585_19850101-21001231.nc
		Sitia_drought_day_MIROC6_historical+ssp245_19850101-21001231.nc
		Sitia_drought_day_MIROC6_historical+ssp585_19850101-21001231.nc
Sitia_drought_day_NorESM2-MM_historical+ssp245_19850101-21001231.nc		
Sitia_drought_day_NorESM2-MM_historical+ssp585_19850101-21001231.nc		

Hazard	Variables included	Name of file
Flood	rdisreturnmax2_tmean(time, y, x): river_discharge_return_max2year_index_per_time_period	Sitia_Flood_E-HYPEgrid-EUR-11_ICHEC-EC-EARTH_historical_and_rcp45_r12i1p1_CLMcom-CCLM4-8-17-v1.nc
	rdisreturnmax5_tmean(time, y, x): river_discharge_return_max5year_index_per_time_period	
	rdisreturnmax10_tmean(time, y, x): river_discharge_return_max10year_index_per_time_period	
	rdisreturnmax50_tmean(time, y, x): river_discharge_return_max50year_index_per_time_period	Sitia_Flood_E-HYPEgrid-EUR-11_ICHEC-EC-EARTH_historical_and_rcp85_r12i1p1_CLMcom-CCLM4-8-17-v1.nc
	rdisyearmax_tmean(time, y, x): river_discharge_maxima_index_per_time_period	
run_tmean(time, y, x): runoff_index_per_time_period		

Hazard	Variables included	Name of file
Heatwave	heatwave_season_duration(y, x, year): Heatwaves season duration in days	Sitia_Heatwave_ACCESS-CM2_historical+ssp245_19850101-21001231.nc
	heatwave_days(y, x, year): Annual count of days during the heatwave season with tasmax (daily maximum temperature) > of the 90th percentile of the reference period.	Sitia_Heatwave_ACCESS-CM2_historical+ssp585_19850101-21001231.nc
	su(y, x, year): Annual count of days when tasmax (daily maximum temperature) > 25°C.	Sitia_Heatwave_CNRM-ESM2-1_historical+ssp245_19850101-21001231
	hot_days(y, x, year): Annual count of days with tasmax (daily maximum temperature) > 30°C	Sitia_Heatwave_CNRM-ESM2-1_historical+ssp585_19850101-21001231.nc
	very_hot_days(y, x, year): Annual count of days with tasmax (daily maximum temperature) > 35°C	Sitia_Heatwave_EC-Earth3-Veg-LR_historical+ssp245_19850101-21001231.nc
	TXx(y, x, year, month): Monthly maximum value of daily maximum temperature	Sitia_Heatwave_EC-Earth3-Veg-LR_historical+ssp585_19850101-21001231.nc
	TXn(y, x, year, month): Monthly minimum value of daily maximum temperature	Sitia_Heatwave_HadGEM3-GC31-LL_historical+ssp245_19850101-21001231.nc
	TG_annual(y, x, year): Average tasmax (daily maximum temperature) per year.	Sitia_Heatwave_HadGEM3-GC31-LL_historical+ssp585_19850101-21001231
	TG_monthly(y, x, year): Average tasmax (daily maximum temperature) per month.	Sitia_Heatwave_IPSL-CM6A-LR_historical+ssp245_19850101-21001231.nc
	TG_seasonal(y, x, year): Average tasmax (daily maximum temperature) per heatwave season.	Sitia_Heatwave_IPSL-CM6A-LR_historical+ssp585_19850101-21001231.nc
	TR(y, x, year): (Number of tropical nights.) Annual count of days when TN (daily minimum temperature) > 20°C.	Sitia_Heatwave_MIROC6_historical+ssp245_19850101-21001231.nc
	return_period_values(y, x, return_period)	Sitia_Heatwave_MIROC6_historical+ssp585_19850101-21001231.nc
		Sitia_Heatwave_NorESM2-MM_historical+ssp245_19850101-21001231.nc
		Sitia_Heatwave_NorESM2-MM_historical+ssp585_19850101-21001231.nc

Hazard	Variables included	Name of file
Heavy Rain	<p>heavy_rain_days (y, x, year): Annual count of days when PRCP ≥ 20mm</p> <p>extreme_precipitation_days(y, x, year): Annual count of days when daily precipitation exceeds the 95th percentile of the reference period (January 1, 1985 to December 31, 2020).</p> <p>threshold(y, x): The threshold based on the 95th percentile of the reference period.</p> <p>return_period_values (y, x, return_period)</p>	Sitia_HeavyRain_ACCESS-CM2_historical+ssp245_19850101-21001231.nc
		Sitia_HeavyRain_ACCESS-CM2_historical+ssp585_19850101-21001231.nc
		Sitia_HeavyRain_CESM2_historical+ssp245_19850101-21001231.nc
		Sitia_HeavyRain_CESM2_historical+ssp585_19850101-21001231.nc
		Sitia_HeavyRain_CNRM-ESM2-1_historical+ssp245_19850101-21001231
		Sitia_HeavyRain_CNRM-ESM2-1_historical+ssp585_19850101-21001231.nc
		Sitia_HeavyRain_EC-Earth3-Veg-LR_historical+ssp245_19850101-21001231.nc
		Sitia_HeavyRain_EC-Earth3-Veg-LR_historical+ssp585_19850101-21001231.nc
		Sitia_HeavyRain_HadGEM3-GC31-LL_historical+ssp245_19850101-21001231.nc
		Sitia_HeavyRain_HadGEM3-GC31-LL_historical+ssp585_19850101-21001231
		Sitia_HeavyRain_IPSL-CM6A-LR_historical+ssp245_19850101-21001231.nc
		Sitia_HeavyRain_IPSL-CM6A-LR_historical+ssp585_19850101-21001231.nc
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		Sitia_HeavyRain_MIROC6_historical+ssp585_19850101-21001231.nc
Sitia_HeavyRain_NorESM2-MM_historical+ssp245_19850101-21001231.nc		
Sitia_HeavyRain_NorESM2-MM_historical+ssp585_19850101-21001231.nc		

Hazard	Variables included	Name of file
Strong Winds	strong_winds_days (y, x, year): Annual count of days when max wind speed > 20m/s	Sitia_StrongWinds_ACCESS-CM2_historical+ssp245_19850101-21001231.nc
		Sitia_StrongWinds_ACCESS-CM2_historical+ssp585_19850101-21001231.nc
	extreme_winds_days (y, x, year): Annual count of days when daily max wind speed exceeds the 98th percentile of the reference period (January 1, 1985 to December 31, 2020).	Sitia_StrongWinds_CESM2_historical+ssp245_19850101-21001231.nc
		Sitia_StrongWinds_CESM2_historical+ssp585_19850101-21001231.nc
		Sitia_StrongWinds_HadGEM3-GC31-LL_historical+ssp245_19850101-21001231.nc
		Sitia_StrongWinds_HadGEM3-GC31-LL_historical+ssp585_19850101-21001231
		Sitia_StrongWinds_IPSL-CM6A-LR_historical+ssp245_19850101-21001231.nc
		Sitia_StrongWinds_IPSL-CM6A-LR_historical+ssp585_19850101-21001231.nc
	threshold(y, x): The threshold based on the 98th percentile of the reference period.	Sitia_StrongWinds_MIROC6_historical+ssp245_19850101-21001231.nc
		Sitia_StrongWinds_MIROC6_historical+ssp585_19850101-21001231.nc
	return_period_values (y, x, return_period)	Sitia_StrongWinds_NorESM2-MM_historical+ssp245_19850101-21001231.nc
		Sitia_StrongWinds_NorESM2-MM_historical+ssp585_19850101-21001231.nc