

T-MEDNet observation network and resource platform on climate change effects in Mediterranean coastal ecosystems

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T-MEDNet Network*

Context: adaptation pressure on Mediterranean coastal ecosystems.

Climate change (CC) is having an increasing influence on the abundance, distribution and wellbeing of living organisms worldwide. In the Mediterranean, Sea Surface Temperature (SST) warming is obvious and ecosystems are already impacted by climate change, raising concerns for the conservation of essential marine coastal habitats. The increasing occurrence of mass mortality events affecting the benthic biota and success of thermophilic biota colonizing the Mediterranean Sea are some clear examples of ongoing consequences of environmental changes. Marine Protected Areas (MPAs) are natural infrastructures for the conservation of marine biodiversity. However, the development of sound management and adaptation plans is often constrained by the lack of information at the appropriate time and space scales. In particular, regarding the strong variability, both spatial and temporal, of hydrological conditions in nearshore and coastal areas.

Enhance monitoring and understanding of climate change effects.

T-MEDNet initiative is devoted to develop an observation network on climate change effects in marine coastal ecosystems, firstly by spreading the implementation of standard monitoring protocols on seawater temperature and biological indicators over the long-term. This is achieved through fostering international cooperation between marine scientists and MPA managers working in the coastal zone at Mediterranean scale (Figure 1).

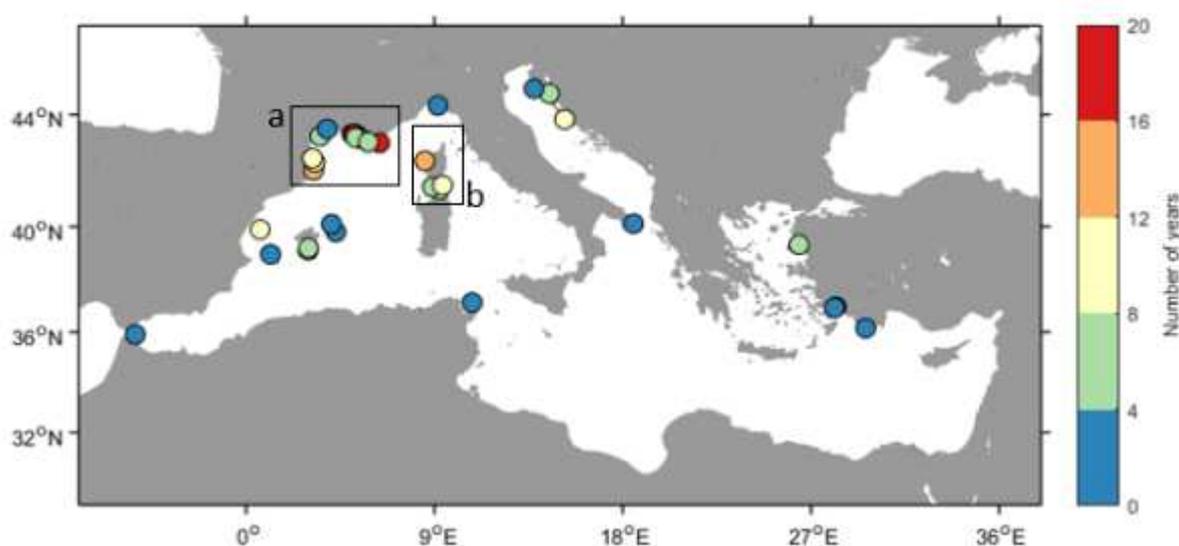


Figure 1: Location map on T-MEDNet multiyear temperature time series in the Mediterranean Sea. Colors show the length of the time series (in year) as indicated by the color bar.

In T-MEDNet, in situ temperature is continuously sampled at hourly frequency using data loggers deployed at standard depth levels, generally every 5 m down to 40 m depth or more. To date, the network counts 30+ members conducting observations in 40+ sites, since 1999 for the longest series, resulting in 12+ million in situ T samples. This dataset allows for the very first time to draw robust base lines on thermal regimes and track signals of change in coastal areas in different Mediterranean sub-basins. These data are being key to analyze biological responses to warming, considering episodic events, in particular the onset of mass mortality events, but also changes in distribution and phenology.

T-MEDNet platform on coastal warming and biological impacts.

T-MEDNet network and resource platform functionalities (www.t-mednet.org) ensure data quality check and management, data exploration, periodic reporting to members and public information display for stakeholders and sea practitioners. The obtained in situ baselines and trends are being used to complement classical CC approaches based on satellite derived SST. In the framework of the MPA-ADAPT project (<https://mpa-adapt.interreg-med.eu/>), data and knowledge transfer is being conducted for the development of sound adaptation plans for Marine Protected Areas face to climate change.

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