

CRELEV-2016

Cretan Sea and Levantine Basin Med-SHIP investigation in 2016

Project Acronym & Title: CRELEV-2016

Area: Cretan Sea, Levantine Basin

Research Vessel: RV Aegaeo, Hellenic Center for Marine Research - HCMR (GR)

Chief scientist: Giuseppe (Pino) Civitarese, Istituto Nazionale di Oceanografia e di Geofisica Sperimentale – OGS (Italy)

Other project partners: IOLR (Israël), GEOMAR (Germany), Univ. of Cyprus (Cyprus), HCMR (Greece), NIOF (Egypt)

Date: 2-9 June 2016



Map of the surveyed area



CRELEV-2016 Scientific Team



RV Aegaeo



Giuseppe Civitarese
CRELEV-2016 Chief Scientist

Giuseppe Civitarese, OGS (National institute of Oceanography and Experimental Geophysics), Trieste, Italy

Thanks to the lively collaboration among all the participants (from Italy, Germany, Egypt, Israel, Cyprus, and Greece), CRELEV-2016 fulfilled the scientific objectives and successfully contributed to the two main objectives of the MedSHIP programme: to document changes in physical and biogeochemical properties in the Mediterranean, where the shorter turnover time scale suggests we can observe the climate changes more accurately than in the global ocean.

Main objectives

With the CRELEV-2016 cruise, we want to observe the changes in physical and biogeochemical properties, and in thermohaline circulation in the Aegean/Cretan Sea and Levantine Basin. The Cretan Sea is a crucial region which participates on the Mediterranean thermohaline circulation with episodic dense water formation, according to the preconditioning (salt content and heat flux toward the atmosphere). After the event called Eastern Mediterranean Transient in the first half of 1990's, during which Cretan Sea substituted the Adriatic Sea as main source of the Eastern Mediterranean Dense Water, dense water formation processes were very limited, and the Eastern Mediterranean thermohaline circulation is now slowly returning to the pre-transient state.

The deep Mediterranean has high dissolved organic carbon, much of it is anthropogenic carbon, and we want to know how fast and where carbon is being taken up from the atmosphere. The salinity and temperature of the deep Mediterranean have been increasing with time; models suggest that stratification is increasing and oxygen concentrations are decreasing. We want to document these changes in the Mediterranean (in general) and in the Aegean/Cretan Sea, where the processes have shorter time scale, and consequently can be observed more accurately than in the global ocean.

Work progress and main achievements

After more than thirty years of oceanographic investigations, the consideration of the Mediterranean as a basin at steady state cannot longer be maintained. The Mediterranean is a changing environment. Several dramatic changes in the oceanographic and biogeochemical conditions have been observed during the past decades, emphasizing the need to more thoroughly investigate and understand the changing conditions and their drivers.

An outcome of the 43rd CIESM Workshop in 2011 (CIESM, 2012) was a recommendation for repeated oceanographic surveys of the Mediterranean in a programme called Med-SHIP to observe the changing circulation in a manner similar to the international GO-SHIP programme for the global ocean. The Mediterranean basin is now included in the GO-SHIP programme, and the Mediterranean marine science community is committed to regular, repeated MedSHIP sampling of the entire Mediterranean Sea. The CRELEV-2016 cruise is part of the Med-SHIP programme for 2016.

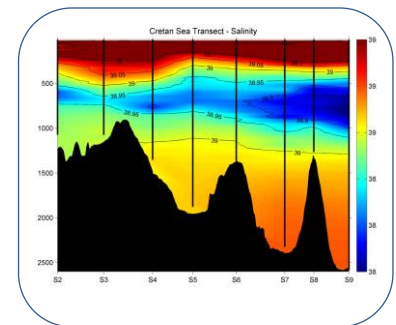
The first objective is to check the present oceanographic condition of the Aegean/Cretan Sea, in relation to the Eastern Mediterranean general circulation and in particular the circulation mode (cyclonic or anticyclonic) of the Ionian Sea. In fact, it was demonstrated that the Ionian Sea upper circulation reverses on decadal scale, determining two different pathways of the Atlantic Water, and consequently shaping the haline content of the Eastern Mediterranean sub-basins.

First preliminary results show the presence of old (20 years) dense and oxygenated water in the deepest part of the Cretan Sea, originated during the Eastern Mediterranean Transient and isolated from the circulation. The relatively high oxygen content suggests a low oxygen demand due to the oligotrophy of the basin. Nevertheless, the Cretan Sea seems to be now in a low salinity phase, according to the cyclonic circulation of the Ionian Sea.

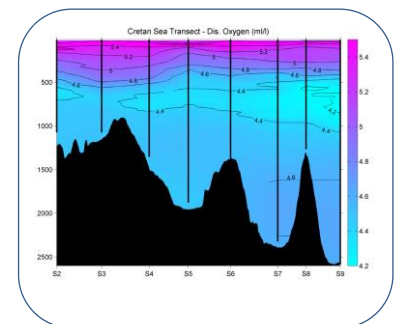
Biological analyses still in progress will give more information about the trophic state of the basin.



*CRELEV-2016 logo
(courtesy: Civitarese, OGS)*



*Salinity distribution in the Cretan Sea
(courtesy: Velaoras, HCMR)*



*Dissolved Oxygen distributio in the
Cretan Sea (courtesy: Velaoras, HCMR)*

[For more information:](#)

contact: G. Civitarese, gcivitarese@ogs.trieste.it