CAREHeat: deteCtion and threAts of maRinE Heat waves Project

ROSALIA SANTOLERI[1], ANGELA LANDOLFI [1], EMANUELE ORGANELLI [1], FEDERICO SERVA [1], MARCO BELLACICCO [1], SALVATORE MARULLO [1], VINCENZO DE TOMA [1], ANDREA PISANO [1], LUISA BARROS [2], RITA CUNHA [2], TIAGO GARCIA [2], ANA OLIVEIRA [2], CHUNXUE YANG [1], ALCIDE DI SARRA [3], ROBERTO IACONO [3], ERNESTO NAPOLITANO [3], ERIC GREINER [4], NATHALIE VERBRUGGE [4], ALEXANDRE MIGNOT [5], SIMON VAN GENNIP[5], MARIE HELEN RIO [6]

[1] *CNR-ISMAR, Rome - Italy*
[2] *+ATLANTIC, Lisboa - Portugal*
[3] *ENEA, Frascati Italy*
[4] *CLS, Toulouse - France*
[5] *Mercator Ocean, Toulouse, France*
[6] *ESA-ESRIN, Frascati Italy*

Marine Heat Waves (MHWs), persistent and anomalously sea water temperature warm events, are known to have significant impacts on marine ecosystems as well as on air-sea exchanges. Detecting and predicting the occurrence, intensity and duration of these extreme events, and understanding their impacts on marine ecosystems is a key step towards developing science-based solutions for sustainable development. The project deteCtion and threAts of maRinE Heat waves CAREHeat, funded by ESA, aims at improving the current MHW detection and characterization methodology, as well as advancing the understanding of the physical processes involved, and the corresponding ecological and biogeochemical changes. This is being to be achieved following a multidisciplinary approach capitalizing on the large potential offered by satellite Earth observations, complemented with in situ field measurements, physical and biogeochemical ocean reanalyses and emerging machine learning technologies. In this presentation an overview of the CAREHeat Project activities and its preliminary results will be provided. In particular the assessment of the major gaps in scientific knowledge, existing products and tools in MHW detection will be discussed. The new MHW Global Atlas covering the entire satellite era (1981-today) will be presented and analysed to investigate the year-to year variability of MWH in spatial extension, intensity, duration and rate of evolution. The impact of climatic signal and climate mode on the MWH spatial and temporal distribution will be discussed. A first preliminary analysis on impact of MWH on marine ecosystem will be presented.