

A process-oriented approach for mining marine heatwaves with a time series of raster formatted products

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Main ideas: A marine heatwave (MHW) is defined as a coherent area of extreme warm sea surface temperature that persists for days to months. The MHW has a property of evolution from production through development to death in space and time. Thus, we propose a process-oriented approach for identifying and tracking MWHs, named as PoAITM. The PoAITM combines the dynamic characteristics and spatiotemporal topologies of MWH objects between the previous and next snapshots to identify and track them belonging to the same ones. The final MWH extracted with a property from production through development to death is defined as a MWH process.

Advantages: 1) The PoAITM combines the spatial distribution and temporal evolution of MWH to identify and track the MWH objects; 2) not only the spatial structure of MWH at current snapshot, also the previous and next ones are considered to track the MWH process; 3) the dynamic behaviors of MWH, e.g. developing, merging, splitting, are also found between the successive MWH objects.

Future work: Although, the MWH processes have been tracked by sea surface temperature remoted-based products during the period of January 1982 to December 2018, their dynamic evolutions and their relationships with extreme climate changes need further studies.

Biography: XUE Cunjin, Aerospace Information Research Institute, Chinese Academy of Sciences, associate Prof. PhD, major in marine spatiotemporal data mining, i.e. process-oriented data representing and storing model and process-oriented spatiotemporal clustering and association rule mining model.