



A Detection Method for Thermocline Formation in the Southern Sea of Korea

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In order to study variability of seasonal thermocline in the sea at the middle latitude, it should be followed the detection of thermocline presence depending on the region and time. For that purpose, in fact, visual inspection is the most appropriate method that researcher identifies the vertical seawater temperature profile from the observation data, however, it has a disadvantage that not only much effort of experts is needed for processing a large amount of data but also difficult to maintain its objectivity and consistency. Therefore, this study aims to develop a method for detecting thermocline formation using the critical condition for the vertical temperature gradient of seawater (ΔT (degree C/m)). First of all, a vertical structure of seawater temperature was modelled by the critical condition that the mixed and deep water layers should have values less than a certain ΔT and the thermocline should have ones more than a certain ΔT . An experiment was carried out to find the critical conditions of ΔT , in the three layers, corresponding with the result of visual inspection for thermocline presence using seawater temperature data observed from the southern sea of Korea in summer season. As a result, the critical conditions of ΔT in the mixed/ deep sea water layers and the thermocline were defined as <0.20 degree C/m and ≥ 0.5 degree C/m, respectively. Agreement between the result of thermocline detection using these critical ΔT conditions and the visual inspection was 87%, and the Kappa coefficient was 0.74, which showed high reliability. However, this experimental result has a limit that could be applied to regional scale in summer. Therefore, spatio-temporally extended experiment is needed in the future.