Meteorological Causes to Fish Kills in the Danshuei River of Taiwan

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Abstract Text:

Sudden fish kills of Grey mullets (*Mugil cephalus*) have been occurred almost every year in the lower Danshui River of Taiwan. These fish kill events are generally believed to be caused by hypoxia; however, lacking of long-term water quality monitoring makes it difficult to determine the real causation. With available meteorological observations, we intend to explore the compound effects of air pressure, temperature, wind speed, wind direction and precipitation on the occurrence of fish kills by the self-organizing map (SOM) technique. Based on the unsupervised clustering results, fish kills can be classified into two categories: summer fish kills and non-summer fish kills. Summer fish kills were related to successive high temperature, low air pressure and concentrated precipitation; while non-summer fish kills were related to a low value of wind speed, a decreasing trend of air pressure and some precipitation. The information indicated how sequential meteorological conditions contributed to the occurrence of fish kills and pointed out the potential risks of climate change on the increasing risks of the grey mullet fish kills in the Danshuei River. Consequently, managers should consider initiating a long-term continuous monitoring program, and take actions when warning signs appear to prevent the fish kill outbreaks.