

Estudio sobre la capacidad de resuspensión de las corrientes de densidad. Aplicación al caso del embalse de Flix.

Albert Herrero Casas

ABSTRACT

On Christmas day of 2001 there was a pollution incident in the Flix reservoir. Due to that, thousands of fishes were killed and the water supply of cities like Tarragona was polluted with mercury. This thesis studies the phenomenon of density currents as a possible explanation of this incident. The work is structured as follows.

In part 1, the facts that happened those days are exposed chronologically.

After that, in part 2, several hypothesis that were made by the media are discussed arriving to conclusions about the likeliness of each one.

Part 3 is an introduction to the hypothesis developed in this thesis, related with the density currents. This hypothesis is worked deeply in parts 4 and 5.

In the first of them, all about the mercury is discussed, beginning with its characteristics as an element and following with the industrial process that is carried out in Flix, the toxicity of mercury in animals and the transformation processes between several forms of this element, some more toxic than others.

Part 5 is the main chapter of the thesis. In it, the phenomenon of density currents is explained and a new equation to involve the temperature in the study is added. With this purposed a previous program has been developed to Bang 1DT, which is used to study the general behavior of the phenomenon and its application to the Flix incident. Sixth chapter provides several management and recovery of polluted sediments at the bottom of water masses. This are de MNR (Monitory Natural Recovery), the excavation and the capping. For each one of them, positive and negative points are discussed, as well as their applicability in different situations.

Part 7 talks about resuspension. Firstly, several risks of the techniques discussed in the previous part are explained from the point of view of the movement of sediment. On the other hand, there's also a study about the influence of sediment structure in resuspension.

Lastly, parts 8 and 9 include, respectively, the general conclusions of the thesis and possible future work ways.