Heat flows in the marine mixed-layer produced by a hurricane in the Gulf of Mexico.

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ABSTRACT

A thermodynamic model applied to the marine mixed layer of Gulf of Mexico is used to consider the heat flows by net radiation, by sensible and latent heat as well as by turbulent penetration from the thermocline during the passage of the Hurricane Lili, which appeared between September 30 and October 4 of 2002.

The model is based on two equations of conservation, the thermal energy equation and the mechanical energy equation, both integrated vertically in the mixed layer.

A comparative study is carried out for determinate the influences of different factors that appear in the thermal energy equation.

Data NARR/NCEP (resolution 32 km) during the passage of the hurricane are used in this work and correspond to cloudiness, air surface temperature, humidity and the surface wind.

The results show that the model produces a cooling of the water in surface such that the computed sensible and latent heat flows agrees with the observed from data NARR/NCEP. This cooling is produced mainly by the cold water penetration through the thermocline and secondly by the sensible and latent heat flows.