

The study of Heat Budget in Chabahar Bay

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Abstract

Heat budget is one of the most important factors in physical study of seas and oceans. Due to its effect on environmental factors and leveling marine structures as well as sea water level, study of this subject has a great importance. Conducting research on various analogs including the sunshine angel, cloudiness of the sky, albedo of water surface, special humidity, atmosphere structure, short-wave sunshine, net sunshine with long-wave, sensible heat transfer, evaporation heat transfer, heat transfer by oceanic streams and raining, wind speed, and local dimensionless (sensible and latent heat flux coefficient), calculated heat budget flux in the Bay the basis of data Iranian meteorological organization and the most recent formulation . The results show that in the year of 2005 in Chabahar Bay, the short-wave radiation flux has been (+227.56 w/m²), net long-wave flux (-59.91 w/m²), insensible evaporation heat flux (-112.16 w/m²) and sensible heat flux (-8.00 w/m²).

Considering the above mentioned parameters , heat budget flux in this Bay is equals to (+47.49 w/m²) . In order to achieve heat balance it is required that such heat flux exit from the Bay by water exchange between Oman Sea and Chabahar Bay and raining.

Key words : Heat budget, Chabahar Bay, Heat fluxes

Introduction

The heat changes stored in the upper layers of the ocean are the result of the imbalance between the incoming and outgoing heat through the sea surface. This surface heat transition is called heat flux. Heat budget involves the total heat fluxes coming into or going out of a water volume. Today a large number of research on heat budget have been undertaken and they have been computed for the various seas and oceans in the world. Since the climatic changes of any particular area are studied based on its heat budget, it becomes necessary to calculate the heat budget in a certain area including Chabahar Bay which enjoys a special strategic situation. The position of the Bay in Oman Sea which is between East Longitude (60°25' & 60°37') and North Latitude (25°17' & 25°26') in south east Iran. The entrance of the bay is 13.5 km wide and the water in this part is 14.5 m deep, but it lessens while approaching the extremes as the depth is equal to 5.5 m when we are 13.5 km away from the north and west extremes. From the north to the south, it is 17 km long while from the east to the west, at the widest point, it is 20 km wide. No significant river flows into the Bay. Using the data required to determine the heat fluxes which have been obtained and collected from different sources like the meteorology Organization, the National Center for ocean studies and many others, and based on the state-of-the art formulas, we deal with determining the heat flux for the individual heat budget sentences of the Bay during the year 2005 month by month.

Determining short-wave radiation flux (Q_{sw}) in Chabahar Bay :

In the heat budget flux equation, the first part is the extent of the radiant flux, and the water is uptaken in the desired place. To calculate the flux, the following formula is used ^[5].

$$Q_{sw} = (1 - \alpha) Q_c (1 - 0.62C + 0.0019\theta_N) \quad (1)$$