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表面水温について(III)
——天気の影響(1)*——

小長俊二**

The Water Temperature at the Sea Surface (III)
An Influence of the Weather Condition (1)

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Abstract: It is important to know the relation between the oceanographical condition and the meteorological one. Many investigators have solved it on an averaged value in a long term or on a climatic condition.

Some large variations in a few days were found at the sea surface: typhoon 5906 gave us the appropriate data to consider the relation; the water temperature at the sea surface was decreased about 2°C during only a week in the region of south of Shikoku. This typhoon passed very slowly by West Japan, and the area was under its influence during more than 3 days.

In this paper, we considered the variations of the water temperature and chlorinity from the viewpoint of the evaporation and the precipitation.

On the evaporation we used the following equation,

$$E = k(e_w - e_a)W, \qquad \text{where}$$

k : evaporation factor
e_w: vapor pressure at the sea surface,
e_a: vapor pressure in the air, altitude of a m,
W: wind velocity.

We assumed that the water temperature decreased linearly with the depth from the surface and that on cooling the water by the evaporation there was no inversion layer, but homogeneous temperature layer was created; the following equation showed the vertical distribution of the temperature,

$$\theta = \theta_0 - bz \qquad \text{where}$$

θ : the water temperature of the depth of z cm, or of the surface after cooling during t days,
θ_0 : initial surface temperature
b : temperature gradient.

And we assumed that the saturated vapor pressure at the sea surface was proportional to the surface temperature, i, e.,

$$e_W = e_{W_0} - c(\theta_0 - \theta) \qquad \text{where}$$

e_{W_0}: the saturated vapor pressure at the sea surface when the surface water temperature was θ_0°C,
e_W : the saturated vapor pressure at the sea surface when the surface water temperature was θ°C,
c : const..

And the precipitation was computed from the decrease of the water temperature and chlorinity.

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** 神戸海洋気象台 Kobe Marine Observatory.