

Prediction of the environmental impacts of discharged dissociated water

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We developed the model which calculated diffusion of dissociated water by the methane hydrate production. We calculated the extension of the area where the dissociated water influences the marine environment. The dissociated water discharged in surface layer, middle layer and bottom deep layer respectively. We used water temperature, salinity, current and bottom topography data with the results of surveys of the marine environment. The data of Earth Simulator was used as an initial condition of the far-field model. We made the flow pattern of 1km mesh. For the initial condition of the near-field, an average vertical distribution of the current velocity and the water temperature and salinity was made from the observation data, and the influence area of the temperature and salinity was calculate. The discharged dissociated water assumed that the fresh water of the same water temperature as the seawater of the bottom of the sea was discharged, and calculated the diffusion of the water temperature and salinity. The diffusing the dissociated water went up in the direction of the surface of the sea, because the densities of dissociated water are lower than seawater in the surrounding. The discharged dissosicated water is salinity near the fresh water or it. It extends, and it has diffused horizontally by the flow of the each level. There is little influence on the marine organism in bottom of the sea,if the densities of the discahrged dissociated water are lower than peripheral seawater.