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Abstract

There are many borrow pits, caused by the sand mining at the bottom of the coastal sea in Japan. Borrow pits have been identified as a source of oxygen-deficient water killing benthic fauna by hydrogen sulfide. And, much nutrients such as nitrogen or phosphorus tend to release from the bottom of borrow pits, which is attributed to red tide. From these reasons, it has become more important to restore borrow pits for marine environment improvement. But, a large amount of earth and sand materials are needed to restore borrow pits. Then, we have examined the restoring borrow pits process by "slag mixture material" mixing the steelmaking slag that is the by-product of the steel industry with the dredged material generated by the sea route maintenance. In this study, firstly, by the experiment using "slag mixture material", we examined the sulfide generation control effect and the microalgae generation control effect by phosphorus release control. Then, by the developed "biogeochemical model" based on the experiment, we predicted the improvement effect when "slag mixture material" are applied to a borrow pit of Osaki area in Mikawa Bay. As a result of that, "slag mixture material" decreased 92 % of the reduction material release such as hydrogen sulfide. And, compared with dredged material, "slag mixture material" decreased 26 % of the reduction material release. The prediction shows the "slag mixture material" bring larger improvement effects. The restoring borrow pits process by "slag mixture material" mixing the steelmaking slag is more effective for marine environment improvement.