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Modeling of production and destruction phytoplankton processes in shallow water based on stochastic approach.

The paper covers the water pollution process by the biogenic elements, entering with river runoff, as well as a result of widespread coastline erosion, the construction, expansion and technical reequipment of sea ports, the dredging, the increasing intensity of shipping industry, the presence of sea soil dumping, deep-water releases of treated wastewater, the rainstorm water, the interaction and sedimentation of pollutants to the water surface from the air. This process is considered as probabilistic [1]. An approach, involving the randomness of pollutant concentration formation in the coastal system, was used. The stochasticity is conditioned by many factors as following: anthropogenic, climatic, biological, morphological factors, with help of which the pollution and phytoplankton concentrations are defined in the control range. The development of stochastic mass transfer velocities models are included the designing of production velocity model of organic matter (OM) in water, and OM destruction models by the phyto-, zoo- and bacterial plankton. The relative velocity of mass transfer were considered as dependent from climate factors, as well as components of chemical-biological model. The Mitscherlich hypothesis about simultaneous influence of factors on the mass transfer velocity was used. The relative velocity of net OM production was calculated as the response to the influence of simple parameters, according to the principle of combined influence of factors such as water temperature, light intensity, and presence of biogenic elements in water.

REFERENCES

1. *Sukhinov, A.I., Chistyakov, A.E., Semenyakina, A.A., Nikitina, A.V.* Numerical modeling of an ecological condition of the Sea of Azov with application of schemes of the raised accuracy order on the multiprocessor computing system. *J. Computer researches and modeling.* **8**, (1). 151–168 (2016).

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