

Preface

This monograph presents major hydrological, physicochemical and biological processes determining the formation of hydro-physical properties and chemical composition of terrestrial surface waters. Generalized hydro-physical, hydro-chemical and hydro-biological parameters affecting the surface water quality, in particular in Ukraine, are provided; a methodology for determining classes and categories of surface waters based on their ecological quality indexes is suggested.

As per hydrological processes, the authors place special emphasis on the interrelation between water runoff and chemical composition of water objects, on hydrodynamic processes, effects of hydro-physical factors on dissolved oxygen concentrations, water turbidity and color, as well as on the role of bottom sediments in forming water chemistry. For physicochemical processes the emphasis is placed on acid–base and redox equilibriums, settling out of slightly soluble compounds, heavy metals' complexing ability and their distribution in the «water—suspended solids—benthic sediment» system. For biological processes the priority is given to the role of hydrobionts in forming of surface water characteristics (pH, Eh, concentrations of dissolved oxygen, biogenic elements, organic compounds, as well as buffer capacity of freshwater ecosystems to bind heavy metals in complex compounds).

General description of anthropogenic factors affecting the process of forming natural waters' properties is presented.

The monograph is intended for specialists of ecological organizations, scientists, lecturers and students of higher education institutions who investigate the patterns of formation of water properties and work on the development of methodologies to model and design such properties.

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