

ANALYSIS OF DISTRIBUTION OF BIOGENIC ELEMENTS IN WATER ECOSYSTEMS OF ARAL SEA AREA METHOD OF MAIN COMPONENTS.

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Summary. In the article coarsed the results of analysis allocation of biogen elements in hydrous ecosystem of Aral sea as a method of main component. The conducted analysis show that in the whole the studied system of characteristic condition and allocation of biogen elements in the investigated hydrous object do not discern with its stability correlation vocoder connections, in separate parts of research correlation vocoder connections among studied datas fail or are even not absent.

Key words. *Biogenic elements, water ecosystems, Aral sea area, main component, abiotic factors.*

The last decades are characterized the sharp strengthening of the anthropogenic loading on reservoirs and currents [10]. Reasons stipulating anthropogenic degradation of water objects are very heterogeneous ; contamination, obstruction and exploitation of hydrotechnical building, inefficient use of water resources[1, 3, 5-6, 9];

Change of the hydrological and hidrochemical mode of the river Амударьи, and also the increasing anthropogenic loading resulted in considerable transformation of natural environment of region. An anthropogenic factor resulting in the numerous successions of biogeosenosis substantially changes and destroys composition and intercommunications of organisms. General information about distribution of present in water ecosystems biogenic elements (BE) is got by means of the generalized integral indexes. However for the all-round estimation of being features in natural water of BE and development of their distribution it is necessary to analyse the considerable rows of watching change ability of measureable integral indexes [7].

Presently the use of multidimensional statistical methods and, in particular, method of main components (MC) very perspective for description of features of distribution of BE in water ecosystems [2, 8, 11]. The method of MC unites three statistical analyses cross-correlation, dispersible and regressive, and also the analysis of conformities to low of associate distribution and changeability of great number of indexes allows to conduct simultaneously.

At comparison of different indexes of BE it is possible to go across the method of MC from the initial sufficient wide set of parameters to description of the state of BE by the new set of the uncorrelated variables named MC. A method of MC in fact is the method of transformation of wide set of information for description of the investigated processes, ah arrangements and considerations only of the most

substantial parameters that is important in the looked after fluctuations of indexes and system on the whole.

Material and methods.

In a present are used work data of supervisions from 2015 to 2017 in spring, summer periods of year, and also November month in Dautkul Lake. On the initial stage next parameters are used: horizons of sampling of water of h, O₂, maintenance of the self-weighted organic substances (WOS) or maintenance of seston, common maintenance of phosphorus of Public, total maintenance of nitrogen of Nsum, maintenance of mineral nitrogen of Nmin, organic nitrogen of Norg. Possibilities of application of these parameters come into question in works of Berdavseva at el. (1984), Leonov at el. (1990), Skopinseva at el. (1986). The table of contents of oxygen was determined by the method of Winkler. Determinations of Public, Nsum, Nmin and Norg was executed in accordance with practical guidances [12]. Methodology of analysis of row of supervisions by means of method of MC is considered in-process [2,4].

Results and their discussion Changeability of indexes in the different terms of supervisions differentiates substantially, that effects on the ambiguousness of estimation of distribution of BE in the investigated reservoir. The conducted analysis showed that value colour in a sprig period (March month) correlates with maintenance of P ($r=0,78$). In the subsequent terms of supervisions this connections some loses the meaningfulness. Average annual maintenance of Nsum in all terms of supervisions is in a greater degree determined by the deposit of Noug ($r=0,68$). It is also possible to look after, that the sizes of temperature of water and percentage of cut-in oxygen in inverse ratio are related to horizon of supervisions in summer periods. The percentage of oxygen in this period strongly correlates with the sizes of temperature of water ($r=0,82$).

The conducted analysis shows that the system of descriptions of the state and distribution of biogenic elements studied on the whole in the investigated water object does not differ in stability of cross-correlation connections, in the separate terms of supervisions cross-correlations between the studied indexes weaken or even are absent. Coefficients correlations specify on a presence to stochastic connection between the discussed variables.

Inflicted- consecutive dependences promote to expose the analysis of correlations of parameters, characterizing MC, that determine the underlying structure of processes and phenomena of the studied system. We are distinguishing 4 MC, that explain to 80-90% changeability of components of water ecosystem (table 1). I of MC in March explains 49% dispersions of all totality of distribution of BE in the system. The negative loading is formed by maintenance of P in a water environment. The table of contents of P in water environment. The table of contents of P in water reflects an important role in forming of supply of BE in a spring period. In June of I of MC explains to 35% dispersion of distribution of BE in the system. Her positive loading is determined colour and Nmin, and negative-by maintenance of O₂ (actual and relative).

Table 1

Own values (numerator) and their accumulated relations (denominator) for the distinguished main components.

Period of Supervisions (monts)	I	II	III	IV
March	5.42/0.49	2.60/0.65	1.57/0.82	-
June	5.74/0.35	3.44/0.58	2.34/0.74	1.14/0.86
November	4.01/0.26	3.18/0.44	2.51/0.61	1.45/0.80

In November the contribution of I MC to dispersion of the system made 26% , her positive loading is determined by permanganate oxidableness. Presumably, in this season action of abiotics factors of environment in this season it is not very expressed already.

The contribution of II MC to dispersion of the system in March makes 16%, in June-23%, her positive loading is formed by the indexes of colour, and negative – by the components of nitrogen (Nsum and Norg). In November, as well as in March the contribution of II MC to dispersion of the system makes 18%. The positive loading is formed by variables, characterizing maintenance of forms of nitrogen (Nsum, and Norg) and phosphorus. The negative loading of II MC is expressed mainly by relative maintenance of O₂.

The contribution of III MC to March in dispersion of the system 17%. Positive and negative loading her formed by the self-weighted organic substances. In June the contribution of III MC to general dispersion of the system made 16%. Positive and negative loading to it from MC by variables, characterizing maintenance in the water environment of Norg and factions of phosphorus. In November the contribution of III MC to dispersion of the system made 17%. The negative loading is formed by the concentrations of forms of nitrogen (Nmin) and phosphorus.

IV of MC is distinguished on the series of supervisions, conducted in June-November. Deposit given to MC 12-19% made in dispersion of the system. Her loading in different periods of supervisions depend mainly on variables, characterizing maintenance in the environment of Public, Nsum, and Norg.

Therefore semantic interpretation to it MC, probably, contacts with influence of forms of nitrogen and phosphorus on development of oxidizing transformation of organic substances.

A component analysis showed that transformation of distribution of BE in separate periods can be described by different variables. Educued by means of analysis a role and meaningfulness of indexes find out logical enough replacement from one term of supervisions of influence of variable in an orientation processes of transfer of substances in a water object.

The role of internal and external streams in forming of balances of separate forms of phosphorus and nitrogen is different. The got results confirm

that external streams (receipt and bearing-out, exchange between water and bottom of lake) are most substantial at forming of annual balance of BE, and internal – at forming of balance of Public and Norg in a living substance.

But, it is necessary to take into account that a situation can change during a year, that in turn can be reflected in correlation of factions of BE in the investigated reservoir. The amount of basic factions in loading is not very considerable. In shallow reservoirs the receipt of phosphorus from the ground sedimentations renders the direct affecting eutrophication reservoir.

It is set that intraspecific distribution of speeds of biochemical transformation of Public and Norg is determined in a considerable degree by a temperature and transparency of water, and also by luminosity of water surface. High speed of consumption of phosphorus inorganic makes 0,39gs of P/ of a year, and excretions - 0,097 мг P/ of a year [9]. Forming of quality of water in water objects is a process difficult, many-sided, depending on the complex of the various factors related to functioning of water ecosystems, so with the terms of surrounding landscape and bed of reservoir. Research results allow to explain the looked after features of functioning of water ecosystems and specificity of dynamics of biogenic elements, where they come forward as one of parts of starting mechanism in the process of eutrophication reservoirs.

Thus, the method of MC can be applied at generalization of considerable rows of supervisions with the purpose of organization of present information. Having a small set of different descriptions of environment and biotas even, it is possible to get an idea about the state of ecosystem on the whole and to changeability of failing components of water ecosystems in South Aral Sea Area.

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Rezyume. *Maqolada biogen elementlari Orolning suvli ekosistemasida joylashish analiz rezultatlari asosiy komponent metodi sifatida kiritilgan. Utkazilgan analiz kursatgichi buyicha, urganilgan xarakteristik xolat sistemasi xamda bigen elementlarining tekshirilaetgan suvli obektta joylashishi korreliatsion aloqalarning stabilligi bilan farq qilmaydi, boshqa kuzatishlarda korreliatsion aloqalar kursatgichlari orasida sustlashadi eki umuman bulmaydi.*

Резюме. *В статье приведены результаты анализа распределения биогенных элементов в водных экосистемах Приаралья методом главных компонент. Проведенный анализ показывает, что в целом изучаемая система характеристик состояния и распределения биогенных элементов в исследуемом водном объекте не отличается стабильностью корреляционных связей, в отдельные сроки наблюдений корреляционные связи между изучаемыми показателями ослабевают или даже отсутствуют.*

Kalit so'zlar. *Biogen elementi, suv ekosistemasi, Orol atrofi, asosiy komponent, abiotik faktorlar.*

Ключевые слова. *Биогенный элемент, водная экосистема, приаралье, главный компонент, абиотические факторы.*