

The study of the index of germination of vegetable seeds on the compost under study obtained in samples 1 and 2 was carried out by determining the number of germinated radish seeds (*Raphanussativus*) and the length of seedlings in water extracts from compost compared with control (sample 3).

The results of the study indicate that the index of germination of radish seeds gradually increases with the duration of fermentation. The control sample was phytotoxic and contained viable weed seeds and pathogenic microflora.

The control sample, which did not contain Baikal EM preparation, was characterized by twice the number of meso- and thermophilic microorganisms than samples 1 and 2.

Despite changes in the composting process, the final pH values in 1, 2 and 3 samples are approximately one-to-one and vary in the range from 6.8 to 7.1 units. pH.

Analyzing the properties of the obtained compost, we can conclude that the introduction of microbiological additive of the preparation "Baikal EM" is expedient for fermentation in meso- and thermophilic modes. Compost in samples 1 and 2 can be used as a fertilizer, it is mature and does not contain seeds of harmful weeds and pathogens.

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## RESISTANCE OF LAKES OF BELARUS TO EUTROPHICATION IN THE CONDITIONS OF VARIABLE CLIMATE

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The consequences of climatic changes for the lakes of Belarus with different morphometry, trophic state, as well as the level of anthropogenic impact are described. It is shown that the most severe consequences of an increase in air temperature are expected for unstable mesotrophic with signs of lake oligotrophy, the least vulnerable are large stable mesotrophic and eutrophic lakes.

**Keywords:** lake, climate, climate change, lake resistance to eutrophication.

To effectively manage lake ecosystems and prevent the negative impact of climatic conditions and anthropogenic pressure on them, an analysis of the relationships between the abiotic and biotic components of limnosystems and external factors determining the nature of their response to changing climatic conditions is necessary.

The increase in water temperature that occurs during climate warming causes an increase in thermal stratification, which, in turn, is the cause of eutrophication of lakes. Therefore, in order to analyze the response of lake ecosystems to climatic fluctuations, the resistance of lakes to eutrophication was analyzed. To calculate the integral stability indices of 148 different types of lakes in Belarus, we used the method of randomized summary indicators described in [1]. The set of initial characteristics presented in [2] includes morphometric, hydrochemical, and hydrodynamic indicators.

The calculated stability indices vary from 0,144 for Lake Balduk to 0,777 for Lake Naroch and reflect the ability of lake ecosystems to withstand external natural and anthropogenic influences and internal processes that disrupt the structure and normal functioning of the entire ecosystem or separately its abiotic and biotic parts. Unstable mesotrophic lakes with signs of oligotrophy and mesotrophic deep lakes with small means of stability index (less than 0,452) are the most vulnerable to climate change. In conditions of climate warming, they will

experience an increase in thermal stability and the concentration of pollutants in the epilimnion, which will also lead to a restructuring of the entire ecosystem. Examples of such reservoirs are Dolgoe, Balduk, Voloso Yuzhny. All of them are located in Poozerie.

Medium-stable mesotrophic and eutrophic lakes (Richie, Snudy, Kroman, Sominskoye, etc.) with stability indices 0,452–0,558 are more resistant to changes in the natural regime. They differ in less depth than unstable lakes, as well as more intensive mixing of the water mass, contributing to the oxidation of pollutants. Therefore, the thermal stratification in them will increase slightly, and external water exchange, whose rate is higher than that of the lakes of the first group, will contribute to the removal of nutrients.

Stable mesotrophic and eutrophic medium-deep lakes (Naroch, Drivyaty, Lukomskoe) will experience the smallest changes with increasing water temperature. They are characterized by the highest values of integral indices of resistance to eutrophication (0,559–0,777). The water column in them isn't stratified, which does not contribute to the formation of vertical and horizontal heterogeneity of water masses. Relict lakes in Polesie (Vygonoshchanskoe, Chervonoe) are also quite stable. In the course of natural evolution, these limnosystems reached an extremely stable high-eutrophic state, therefore, even a significant increase in air and water temperature or an increase in anthropogenic load on them will not lead to a significant change in the trophic state of such lakes and their indices of resistance to eutrophication. However, due to shallow depths, the Polesie lakes are most vulnerable to a decrease in the regime of precipitation in the summer and a decrease in the level of groundwater.

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## RECOGNITION OF OBJECTS BASED ON THE COMPUTER VISION SYSTEM ON RASPBERRY PI

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The problem of pattern recognition has existed for a long time and the development of a universal algorithm that would solve all the problems of pattern recognition is necessary. Each task is individual and even when recognizing existing text written on a piece of paper or on a road sign, various image processing algorithms are required.

**Keywords:** Raspberry Pi, OpenCV, computer vision system, images recognition, photo camera.

The computer vision system is an open source library of algorithms and image processing functions, and general-purpose numerical algorithms.

One of the main functions of the computer vision system is the "special points" method. "Special points" are unique characteristics of an object that allow you to map an object to itself or to similar classes of objects.

When creating a system that will perform the function of pattern recognition, the need for compact equipment should be taken into account. A single-board computer Raspberry Pi is used as the basis for computing.

The tasks associated with processing images on personal computers cannot be classified as simple, especially since they cannot simply be transferred to low-power processors such as ARM. The first key point in the stable operation of OpenCV on RPi is the use of ARM NEON. That is, the use of a more powerful system core for quickly processing video stream and images, speech recognition and machine learning.

Even with an optimized OpenCV installation on the Raspberry Pi, a single-board computer can handle up to ~ 0,9 frames per second when using deep learning to detect objects using Python and OpenCV.

Optimization is necessary in order to demonstrate the object to the user, i.e. display on the screens. All marks will be displayed as selected rectangular areas:

```
CLASSES = ["background", "chair", "person", "sofa"]
COLORS = np.random.uniform(0, 255, size=(len(CLASSES), 3))
print("[INFO] loading model...")
net = cv2.dnn.readNetFromCaffe(args["prototxt"], args["model"])
```