Impact of climate change on the Black Sea ecosystem

Mariam Tsetskhladze

E-mail: mariam.tsetskhladze960@ens.tsu.edu.ge
Department of Geography, Faculty of Exact and Natural Sciences
Ivane Javakhishvili Tbilisi State University
3, I. Chavchavadze Ave., Tbilisi, 0179, Georgia

Climate change is having a major impact on the world's oceans and the physical, chemical, and biological processes that occur in them. Rising temperatures are disrupting marine ecosystems, causing species to migrate and biodiversity to decline. Ocean acidification, caused by excess CO_2, threatens biodiversity, including calcium-rich organisms such as coral reefs and shellfish, leading to the degradation of food chains in marine ecosystems. Lack of oxygen caused by warm waters reduces mixing of water masses, creates hypoxic zones, and negatively affects ocean flora and fauna.

Global changes have also affected other parts of the ocean, particularly regional ecosystems such as the Black Sea, where unique ecological conditions and biodiversity are facing increasing threats from the cascading effects of climate change. The Black Sea is a dynamic and diverse environment with a unique combination of biological, chemical and physical properties. The ecosystem is characterized by clear stratification, creating a unique transitional environment combining fresh water from rivers, especially the Danube, Dnieper and Dniester, and the salt waters of the Mediterranean Sea.

The biodiversity of the Black Sea ecosystems is represented by numerous species of micro- and macroalgae, planktonic and benthic invertebrates, fish populations and marine mammals. The presence of invasive species, such as the gelatinous plankton *Mnemiopsis leidyi*, remains a problem for the Black Sea, which has further complicated the dynamics of the food chain in the Black Sea, led to a decrease in fish populations and a change in the trophic structure of the ecosystem.