Chapter 7

The Influence of Air Temperature on the Quality Parameters of the Black Sea Coastal Waters

Sabina Zăgan
Constanta Maritime University, Romania

Mihaela-Greti Chițu
Ovidius University of Constanta, Romania

ABSTRACT

In this chapter, the authors point out the connection between some physical and chemical parameters of the Black Sea water under extreme air temperatures. In this context, the period from 2006 to 2012 was chosen as the study period, because it is characterized by very high values of air temperature, which significantly affect not only the quality of the Black Sea water in the superficial layer but also the marine ecosystem and life. Some quality parameters as water temperatures, oxygen regime or the degree of eutrophication have been collected and analyzed and they show noticeable variations relative to ambient air temperature changes, mainly if they are determined on the surface layer.

DOI: 10.4018/978-1-4666-8438-6.ch007
INTRODUCTION

Extreme weather events which are manifested in Dobrogea – rainfall, floods, prolonged droughts, coastal erosion, etc. – are influenced by the presence of the Black Sea, which by physicochemical and status parameters of sea water, has a marked influence on the climate and environment.

Black Sea is a semi-enclosed continental sea, which is included in the standing saltwater category of ecosystems. Its area is approximately 422,000 square kilometers or about 0.12% of the world oceans. Greatest length, along the parallel 42°12’ N, is 1,148 kilometers and greatest width, along the meridian 31°12’ E is 615 kilometers. The largest capes are Kimburn, Kherson, Sarich, Ingeburnu, Kerempeburnu, Emine, Kaliakra etc. The largest islands are Jarilchach and Zmeini. Maximum depth is 2212 meters (in the central-southern part, near Yalta is 2206 meters) and average depth is about 1,300 meters. Seasonal level variations are up to 20 centimeters.

Regarding relief of the Black Sea, the landscape consists of three steps which descend from zero meters. Continental shelf is the first step between 0 and 200 meters depth. Does the width in the NW part trough Gulf of Odessa and on the northern part trough the Sea of Azov (sea of peripheral type). Continental shelf has an horizontal area of 144,000 square kilometers, occupying about 35% of the total area of the entire basin. The sea bed stretching a little inclined over the seaside terrace. On Romanian coast line, only the submarine channel “St. George” forms a discontinuity into otherwise flat and gently sloping terrain. Continental shelf has contributed in the formation of the Danube Delta. Continental slope (slope) is the second step, located between 200 meters depth and 1500 meters depth. Is close to the shore in the south. Abyssal plain is the last step of relief between 1500 m and maximum depth of the sea. Has smooth profile.

The total length of the coastline of the Black Sea is 4,090 kilometers. Tidal variations are quit small, about 3 to 10 centimeters. Wave height: up to 6 – 7 meters and wave length is up to 90 to 100 meters. Total volume of water is about 540,000 cubical kilometers. Black Sea have a catchment basin area over 2 million square kilometers. The largest rivers flowing into the Black Sea are Danube, Dniester, Dnieper, Don, Kuban, Souther Bug, Rioni, Kazilirmak, Kamchia. The largest bays are Karkinitski, Bourgas, Kalamitski, Dneprovski, Dnestrovski, Synop, Samsun. Salinity of seawater at the surface is 18 ‰ and salinity of seawater at the bottom is 22 ‰. Volume of the hydrogen sulphide zone is 87% and volume of the oxygen zone is 13%.

The Black Sea is the largest brackish water basin in the world and his water balance components reflects a temperate continental climate, defined by a temperature at the sea surface of up to 29°C in summer and -1°C in winter. Romanian coastline is characterized by a dry continental climate with warm and long summers, when
Applications of Vibration-Based Energy Harvesting (VEH) Devices
Renewable and Alternative Energy: Concepts, Methodologies, Tools, and
Applications  (pp. 989-1014).
www.igi-global.com/chapter/applications-of-vibration-based-energy-
harvesting-veh-devices/169622?camid=4v1a