



Marine Environmental Monitoring by employing Data Buoy Network

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1-global climate change impact in coastal and marine ecosystem

The first chapter of this paper outlines the main consequence of global warming and how prediction of these effects of climate change could affect the coastal and marine ecosystems and structures.

Environmental change may be described as a fact of life on earth, as is the evolution and extinction of species. The earth's systems may be divided into the atmosphere (air), hydrosphere (water, predominantly the oceans), biosphere (life), geosphere (land, whether above or below the ocean surface), and finally cryosphere (snow and ice). It is important to appreciate that climate is affected by interactions within and among all these spheres.

For more than 50 years, the Earth's climate has been changing because of increasing greenhouse gas emissions from the burning of fossil fuels such as coal and oil, as well as deforestation and other human activities. In addition the warming of the Earth's atmosphere and waters, loss of land and sea ice, and rising global sea levels are not new phenomena. These global changes have been occurring at increasing rates in the last century, particularly in the last decade. Science predicts that climate change will continue, and accelerate in the years ahead, with significant impacts on everything from our coastlines and our health to water supplies, ecosystems, and other natural resources. [1]

The ocean and the atmosphere are closely linked systems, in which they exchange gases, particles (dust, aerosols) heat and momentum. Atmospheric reservoirs of carbon dioxide have risen dramatically in the last decades resulting in an increase since the beginning of the Industrial Revolution. Hence Carbon Dioxide is largely responsible for trapping heat in the atmosphere, and enhancing the natural green-house effect that other atmospheric gases (mainly water vapor) have on our planet. This alteration certainly affects the heat exchanges across the air-sea interface, with predictable consequences on marine processes such as ocean dynamics (stratification and circulation patterns), ecosystem productivity and distribution of organisms are considered to be the main concerns.

Furthermore the ocean also directly absorbs carbon dioxide from the atmosphere. Over the past decades a considerable amount of the anthropogenic carbon dioxide emissions have sunk into the oceans, causing the seawater to become more acidic (decrease in pH a process known as ocean acidification). It is considered that even if reducing the present-day carbon dioxide emissions succeeded, the Acidification process will still affect marine ecosystem during the full course of the century.