

Chapter 2

Assessing the Impacts of Land Use and Land Cover Changes 1984–2020 on Wetland Habitats in the Gediz Delta (Turkey)

Anis Guelmami

*Tour du Valat, Research Institute for
the Conservation of Mediterranean
Wetlands, France*

*the Conservation of Mediterranean
Wetlands, France*

Lisa Ernoul

*Tour du Valat, Research Institute for
the Conservation of Mediterranean
Wetlands, France*

Dilara Arslan

Tour du Valat, Research Institute for

ABSTRACT

Monitoring land use / land cover changes is essential for planning and management activities to conserve a particular habitat. In this study, the authors mapped land use / land cover changes in the Gediz Delta (Turkey) between 1984-2020 using Earth Observation and Geographic Information Systems. The maps were built upon the Horizon-2020 satellite-based wetlands observation service processing methodology and algorithms. The authors compared changes inside and outside the Ramsar Area in the Gediz Delta. The results indicate more than 147% increase in built-up areas and decreases of 33% in natural wetland habitats and 27% in natural drylands. The urbanization occurred mainly outside of the Ramsar designated site, but within the Ramsar site, there were increases in artificial wetland habitats and sea waters, with losses in natural wetland habitats. This study provides important monitoring information for managing the land resource in order to conserve the delta and its biodiversity in the future.

DOI: 10.4018/978-1-7998-9289-2.ch002

INTRODUCTION

Wetlands are an essential part of human well-being and play an integral role for many organisms to complete their life cycles (Mitsch and Gosselink, 2000; Ramsar Convention Secretariat, 2016). They provide valuable ecosystem services to people such as provisioning water and food, flood regulation, erosion prevention, groundwater discharge, water purification, nutrient recycling, carbon storage, and recreational activities (Ramsar Convention Secretariat 2016). Despite their vital importance, wetlands have been one of the most transformed ecosystems over the last hundred years, with a loss of 87% of the world's wetlands since the 1700s. This trend increased four-fold in the 19th century (Davidson, 2014; Ramsar Convention on Wetlands, 2018). Agricultural extension, creation of artificial wetlands and urban development have been the main drivers of natural wetland loss and degradation over the last 200 years and continue to threaten the remaining 12.1 million km² worldwide (Zedler and Kercher, 2005; Hu et al., 2017; Ramsar Convention on Wetlands, 2018). It is estimated that approximately 35% of wetlands have been disturbed or irreversibly destroyed after the 1970s (Ramsar Convention on Wetlands, 2018). On the other hand, human-made wetlands (such as dams and reservoirs, salinas, rice fields, etc.) have increased since the 1970s (and earlier) and as of 2018 they constitute 12% of existing wetlands around the world (Ramsar Convention on Wetlands, 2018). In the Mediterranean Basin, natural wetlands have decreased by 48% since the 1970s, mainly through the conversion into agricultural lands, human-made wetlands and built-up areas (MWO, 2018). The human-made wetlands have been shown to host an important biodiversity and play a key role for waterbirds, but the changes in water supplies and management for these new wetlands are often a detriment to natural wetlands (Ramsar Convention on Wetlands, 2018; MWO, 2018).

There are several important international conventions that aim to protect wetlands including the Ramsar Convention, the Convention on International Trade in Endangered Species, the Convention on Biological Diversity, the Convention on Migratory Species and the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (Christoffersen, 1997). Following this trend, Turkey has also showed the will to protect its wetlands at the international level by signing the Ramsar Convention in 1994 and at the national level by issuing a “Regulation for Protection of the Wetlands” in 2002. This has resulted in the designation of 14 wetlands as Ramsar sites and 56 that are protected by national laws (GDNCNP, 2020). Although this is a good step forward, it represents a much lower percentage of designation compared to other Mediterranean countries (for example there are more than 70 Ramsar sites in Spain, 50 in Algeria and 35 in mainland France). It is also important to note that despite these measures, wetlands in Turkey continue to be threatened by human activities such as intensive agriculture, urbanization, illegal

10 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/assessing-the-impacts-of-land-use-and-land-cover-changes-1984-2020-on-wetland-habitats-in-the-gediz-delta-turkey/316197

Related Content

An Overview of the Role of Plant Functional Traits in Tropical Dry Forests

Abhinav Yadav, Pramit Verma and Akhilesh Singh Raghubanshi (2022). *Research Anthology on Ecosystem Conservation and Preserving Biodiversity* (pp. 92-117). www.irma-international.org/chapter/an-overview-of-the-role-of-plant-functional-traits-in-tropical-dry-forests/303160

Forest Fire Scenarios in Digital Platforms: The Case of Portugal

Liliana Gonçalves and Lídia Oliveira (2022). *Research Anthology on Ecosystem Conservation and Preserving Biodiversity* (pp. 730-757). www.irma-international.org/chapter/forest-fire-scenarios-in-digital-platforms/303193

FishEye - An Integrated Marine Species' Visualization

Tiago Nascimento and Sandra Pereira Gama (2022). *Research Anthology on Ecosystem Conservation and Preserving Biodiversity* (pp. 666-685). www.irma-international.org/chapter/fisheye---an-integrated-marine-species-visualization/303190

Status and Opportunities for Forest Resources Management Using Geospatial Technologies in Northeast India

Kasturi Chakraborty, Thota Sivasankar, Junaid Mushtaq Lone, K. K. Sarma and P. L. N. Raju (2022). *Research Anthology on Ecosystem Conservation and Preserving Biodiversity* (pp. 758-773). www.irma-international.org/chapter/status-and-opportunities-for-forest-resources-management-using-geospatial-technologies-in-northeast-india/303194

Receding Dependence on Forests: A Study of the Paliyar Tribes in India

T. Anantha Vijayah (2022). *Research Anthology on Ecosystem Conservation and Preserving Biodiversity* (pp. 166-180). www.irma-international.org/chapter/receding-dependence-on-forests/303163