

ID: W2742138103

TITLE: Hindcasting the dynamics of an Eastern Mediterranean marine ecosystem under the impacts of multiple stressors

AUTHOR: ['X. Corrales', 'Marta Coll', 'E. Ofir', 'Chiara Piroddi', 'Menachem Goren', 'Dor Edelist', 'JJ Heymans', 'Jeroen Steenbeek', 'Villy Christensen', 'Gideon Gal']

ABSTRACT:

MEPS Marine Ecology Progress Series Contact the journal Facebook Twitter RSS Mailing List Subscribe to our mailing list via Mailchimp HomeLatest VolumeAbout the JournalEditorsTheme Sections MEPS 580:17-36 (2017) - DOI: <https://doi.org/10.3354/meps12271> Hindcasting the dynamics of an Eastern Mediterranean marine ecosystem under the impacts of multiple stressors X. Corrales^{1,2,*}, M. Coll^{2,3}, E. Ofir¹, C. Piroddi², M. Goren⁴, D. Edelist⁵, J. J. Heymans⁶, J. Steenbeek^{2,3}, V. Christensen⁷, G. Gal¹ 1Kinneret Limnological Laboratory, Israel Oceanographic & Limnological Research, PO Box 447, 14950 Migdal, Israel 2Institut de Ciències del Mar (ICM-CSIC), Passeig Marítim de la Barceloneta, n° 37-49, 08003 Barcelona, Spain 3Ecopath International Initiative Research Association, 08003 Barcelona, Spain 4Department of Zoology and The Steinhardt Museum of Natural History, Tel Aviv University, Tel Aviv 69978, Israel 5Department of Maritime Civilizations, University of Haifa, Mount Carmel, Haifa 31905, Israel 6Scottish Association for Marine Science, Scottish Marine Institute, Oban PA37 1QA, UK 7University of British Columbia, Institute of Ocean and Fisheries, V6T 1Z4 Vancouver, Canada *Corresponding author: corrales@icm.csic.es ABSTRACT: An important challenge for conserving and managing marine ecosystems is to advance our understanding of how multiple human stressors, environmental factors and marine resources interact and influence each other. The ecosystems of the Israeli Mediterranean coast have undergone significant ecological changes in recent decades, caused primarily by the introduction of alien species, fishing and the warming of the waters. Here we used a food-web model representing the continental shelf of the Israeli Mediterranean coast to explore the historical dynamics of the area considering the combined effect of alien species, fishing activities and changes in sea surface temperature and primary productivity. The food-web model was fitted to available time series of data from the early 1990s to 2010 using the temporal dynamic module of the Ecopath with Ecosim modeling approach. An important challenge was to model the numerous alien species inhabiting the Eastern Mediterranean Sea, one of the most invaded marine ecosystems of the world. Historical model simulations satisfactorily matched observed data, especially regarding alien groups. However, lack of data from the pelagic environment limited our ability to compare model output with historical observations. Trophic interactions, climate change and fishing were important factors explaining the historical dynamics of the ecosystem, which showed a degradation pattern over time. Results also highlighted an increasing proportion of alien species in biomass and catch over time, with important effects on the food web. This study represents an important step forward in understanding the changes that are occurring in the Israeli continental shelf ecosystem and the Levantine Sea. KEY WORDS: Eastern Mediterranean Sea · Food-web model · Ecopath with Ecosim · Cumulative impacts · Alien species · Climate change · Fishing impact Full text in pdf format Supplementary material PreviousNextCite this article as: Corrales X, Coll M, Ofir E, Piroddi C and others (2017) Hindcasting the dynamics of an Eastern Mediterranean marine ecosystem under the impacts of multiple stressors. Mar Ecol Prog Ser 580:17-36. <https://doi.org/10.3354/meps12271> Export citation RSS - Facebook - Tweet - linkedIn Cited by Published in MEPS Vol. 580. Online publication date: September 29, 2017 Print ISSN: 0171-8630; Online ISSN: 1616-1599 Copyright © 2017 Inter-Research.

SOURCE: Marine ecology. Progress series

PDF URL: None

CITED BY COUNT: 57

PUBLICATION YEAR: 2017

TYPE: article

CONCEPTS: ['Geography', 'Mediterranean climate', 'Marine ecosystem', 'Fishing', 'Ecosystem', 'Oceanography', 'Ecology', 'Mediterranean sea', 'Fishery', 'Archaeology', 'Biology', 'Geology']