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TITLE: Extension of the growing season of phytoplankton in the western Baltic Sea in response to climate change

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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 622:1-16 (2019) - DOI: <https://doi.org/10.3354/meps12994> FEATURE ARTICLE Extension of the growing season of phytoplankton in the western Baltic Sea in response to climate change Norbert Wasmund*, Günther Nausch, Monika Gerth, Susanne Busch, Christian Burmeister, Regina Hansen, Birgit Sadkowiak Leibniz Institute for Baltic Sea Research, Seestr. 15, 18119 Rostock-Warnemünde, Germany *Corresponding author: norbert.wasmund@io-warnemuende.de ABSTRACT: Phenology of phytoplankton was investigated at a coastal station in the western Baltic Sea from 1988 to 2017 by means of microscopically determined biomass and chlorophyll a (chl a) data. The prolongation of the growing season in this marine area is much stronger than that known from terrestrial areas. The growing season, defined by biomass or chl a thresholds, increased by 125 or 129 d, respectively, and extends recently from February to December. The spring bloom started earlier at a rate of 1.4 d yr⁻¹ and the end of the autumn bloom was delayed by 3.1 d yr⁻¹. The duration of the growing season increased at a rate of 4.5 d yr⁻¹. The earlier start of the growing season was correlated with a slight increase in sunshine duration during spring, whereas the later end of the growing season was correlated with a strong increase in water temperature in autumn. The period with sea surface temperature >10°C shifted towards the end of November. Correlations of the duration of the growing season with the phosphate and nitrate concentrations were probably not causative. The shifts in the spring and autumn blooms led to a prolongation of the summer biomass minimum. The earlier spring bloom was caused, among other factors, by a shift of the biomass maximum of the dominant diatom *Skeletonema marinoi* from May to February/March. The delay in the autumn bloom was induced by a retardation of dominant dinoflagellates and diatoms, such as *Ceratium* spp. and *Dactyliosolen fragilissimus*. KEY WORDS: Phenology · Seasonality · Long-term changes · Climate change · Phytoplankton · Chlorophyll · Temperature · Nutrients · Baltic Sea Full text in pdf format Information about this Feature Article Supplementary material NextCite this article as: Wasmund N, Nausch G, Gerth M, Busch S, Burmeister C, Hansen R, Sadkowiak B (2019) Extension of the growing season of phytoplankton in the western Baltic Sea in response to climate change. Mar Ecol Prog Ser 622:1-16. <https://doi.org/10.3354/meps12994> Export citation RSS - Facebook - Tweet - linkedIn Cited by Published in MEPS Vol. 622. Online publication date: July 18, 2019 Print ISSN: 0171-8630; Online ISSN: 1616-1599 Copyright © 2019 Inter-Research.

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