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TITLE: Impact of multiple stressors on sea bed fauna in a warming Arctic

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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 608:1-12 (2019) - DOI: https://doi.org/10.3354/meps12803 FEATURE ARTICLE Impact of multiple stressors on sea bed fauna in a warming Arctic Lis L. Jørgensen1,*, Raul Primicerio2, Randi B. Ingvaldsen1, Maria Fossheim1, Natalia Strelkova3, Trude H. Thangstad1, Igor Manushin3, Denis Zakharov3 1Institute of Marine Research, 9294 Tromsø, Norway 2University of Tromsø -The Arctic University of Norway, 9037 Tromsø, Norway 3Knipovich Polar Research Institute of Marine Fisheries and Oceanography, 183038 Murmansk, Russia *Corresponding author: lis.lindal.joergensen@imr.no ABSTRACT: The Arctic Barents Sea is experiencing a record temperature increase, a poleward shift in the distributions of commercial fish stocks, and invasion by the snow crab, a new predator. To evaluate benthic community vulnerability when exposed to seawater warming, bottom trawling, and predation from a new predator, we used a trait-based approach and applied this to an extensive dataset of >450 megabenthic taxa, from a 1.5 million km2 area. Taxon rank values were obtained after sorting the taxa by temperature median and temperature range, i.e. the temperature sensitivity trait, and by body height, mean weight, and mobility, i.e. the trawl vulnerability trait, and were given as a size-based prey classification, i.e. the predation trait. The taxon rank values were then used to calculate the mean community sensitivity. Our study showed a recent significant increase in community mean temperature ranks, indicating an increased importance of species with affinity for warmer waters and a reduced importance of coldwater species. Commercial fish stocks and snow crabs are expanding into the western part of the Barents Sea, thereby simultaneously increasing the exposure of large immobile species to trawling and of small prey species to crab predation. Overall, we found a high level of vulnerability to the 3 investigated stressors in the northwestern Barents Sea, which may lead to alterations in community structure and diversity. Mapping vulnerability to multiple stressors enables authorities managing human activities to identify vulnerable areas that warrant special measures, including protection from trawling and reduction of the snow crab stock. KEY WORDS: Climate warming · Sea ice reduction · Trawling · Snow crab invasion · Megabenthos · Sensitivity · Vulnerable species Full text in pdf format Information about this Feature Article Supplementary material NextCite this article as: Jørgensen LL, Primicerio R, Ingvaldsen RB, Fossheim M and others (2019) Impact of multiple stressors on sea bed fauna in a warming Arctic. Mar Ecol Prog Ser 608:1-12. https://doi.org/10.3354/meps12803 Export citation RSS - Facebook - Tweet - linkedIn Cited by Published in MEPS Vol. 608. Online publication date: January 03, 2019 Print ISSN: 0171-8630; Online ISSN: 1616-1599 

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