



CONTRIBUTION TO THE UNDERSTANDING OF THE YELLOW TIDES PHENOMENON IN THE COASTAL WATERS OF THE SOUTHERN ADRIATIC – BAY OF BOKA KOTORSKA

Vera VUKANIĆ^{1,*}, Miodrag MALOVIĆ²

¹Department of Biology, Faculty of Sciences and Mathematics, University of Priština in Kosovska Mitrovica, Kosovska Mitrovica, Serbia, ORCID: 0000-0002-3494-5876

²University of Belgrade, Innovation Centre of Faculty of Technology and Metallurgy, Belgrade, Serbia, ORCID: 0000-0002-0691-4626

*Correspondence: veravukanic@yahoo.com; vera.vukanic@pr.ac.rs

Main task

To investigate the composition and abundance of zooplankton and phytoplankton during the yellow tide caused by dinoflagellate bloom in the Bay of Kotor, and to assess the environmental factors contributing to the bloom and its impact on the plankton community.

Main results

The Bay of Kotor is characterised by increased phytoplankton production compared to other bays within Boka Kotorska Bay complex, but the maximum values did not exceed 600,000 cells/L. During the study, elevated temperatures and eutrophication caused an explosive phytoplankton bloom, which turned the water yellow-red. Two species of dinoflagellates dominated: *Prorocentrum scutellum* and *Prorocentrum micans*. In the zooplankton, *Penilia avirostris*, *Paracalanus parvus*, *Centropages kröyeri*, *Oithona nana*, and *Monotula subtilis* were dominant. In the surface layer, affected by the bloom, *C. kröyeri* dominated with over 90%. *O. nana* dominated throughout the rest of the water column, all the way down to the bottom.

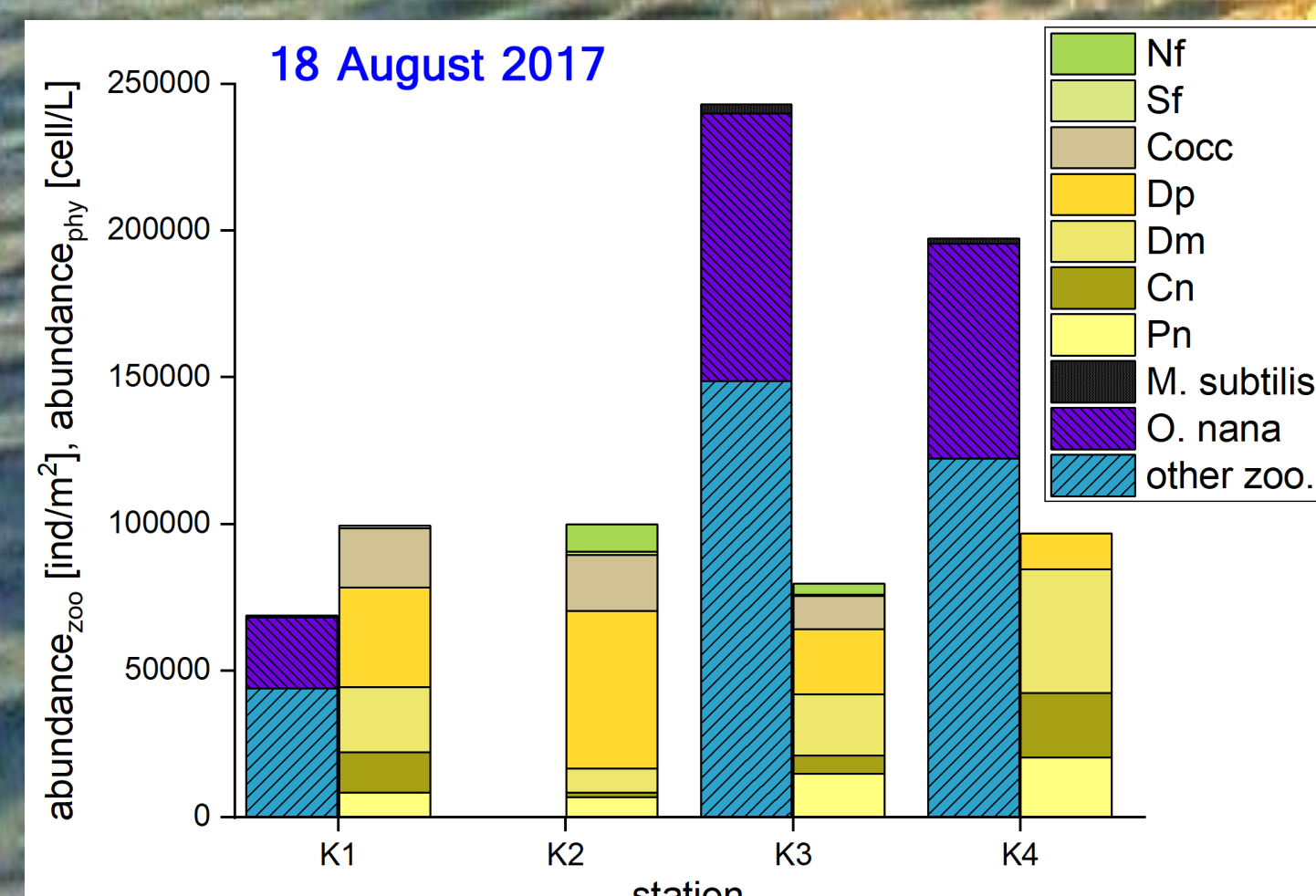
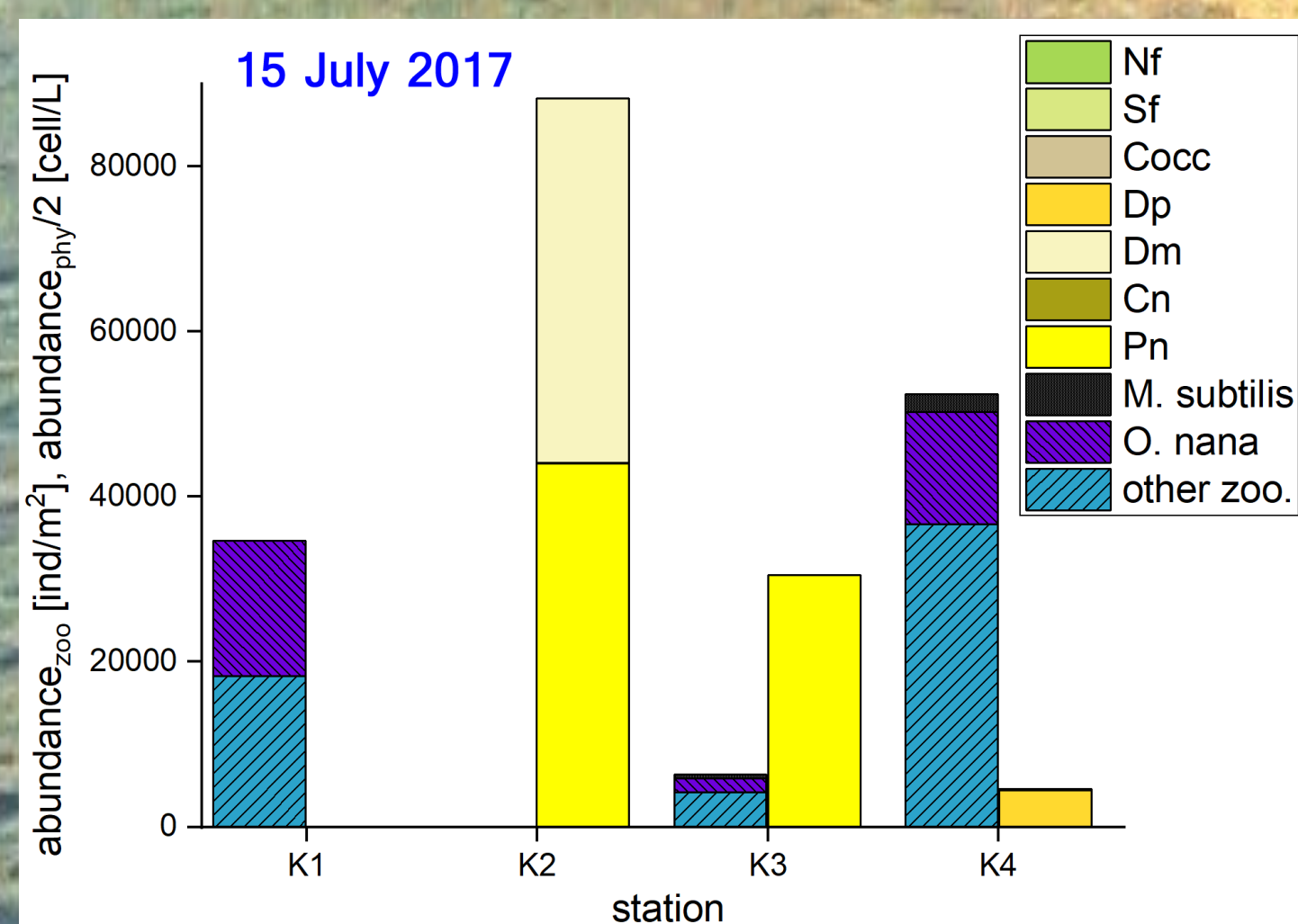
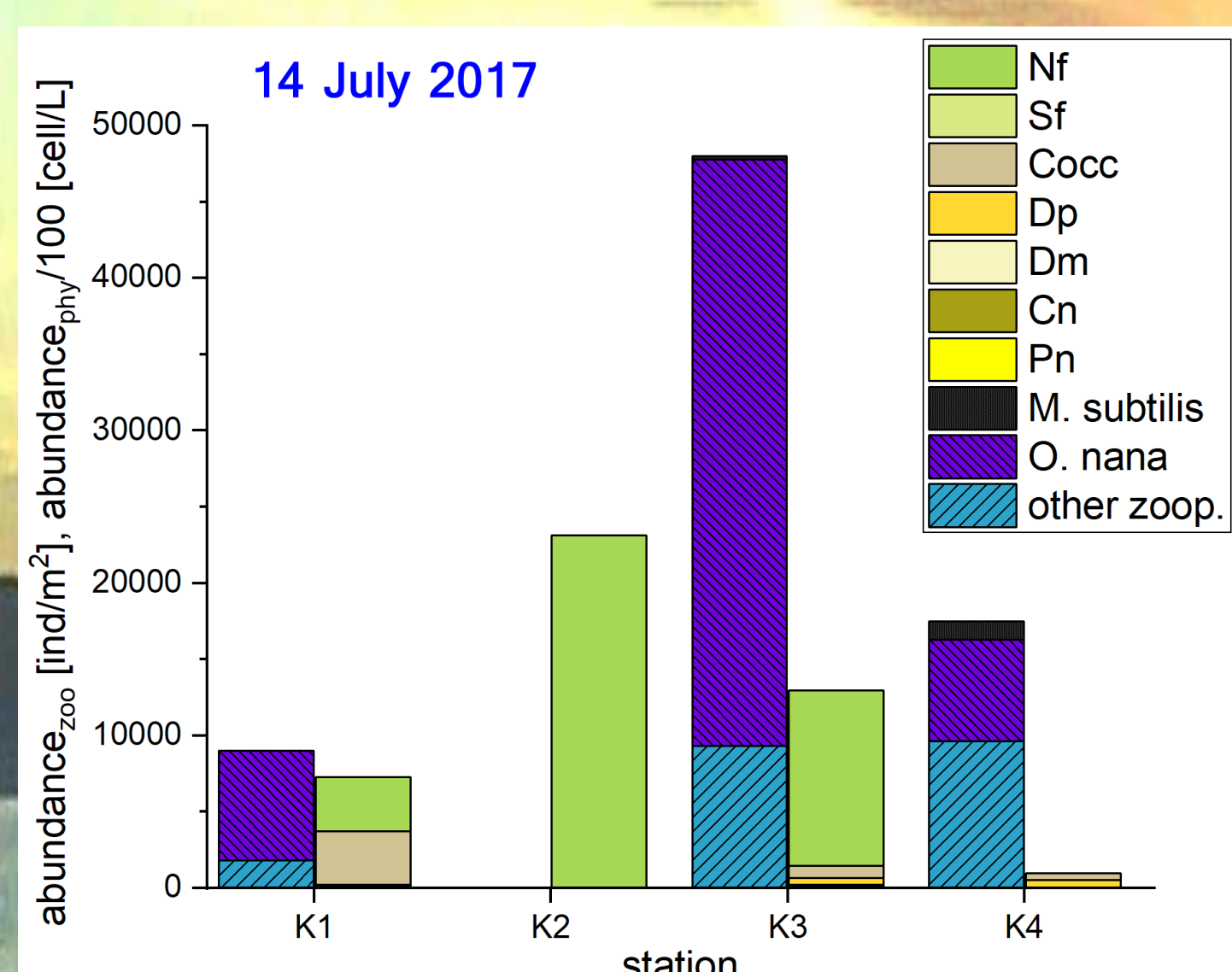


Figure 3. Zooplankton and phytoplankton abundances on 2017/7/14, 2017/7/15 and 2017/8/18

Material & methods

This study analyses zooplankton and phytoplankton samples collected from several stations in the Bay of Kotor over two months during the summer of 2016/17. Zooplankton was collected with Nansen nets (100 and 150 μ m), and phytoplankton with 5-litre Niskin bottles. Salinity and temperature were measured simultaneously with a CTD multisonde (Sea-Bird Electronics Inc., USA).

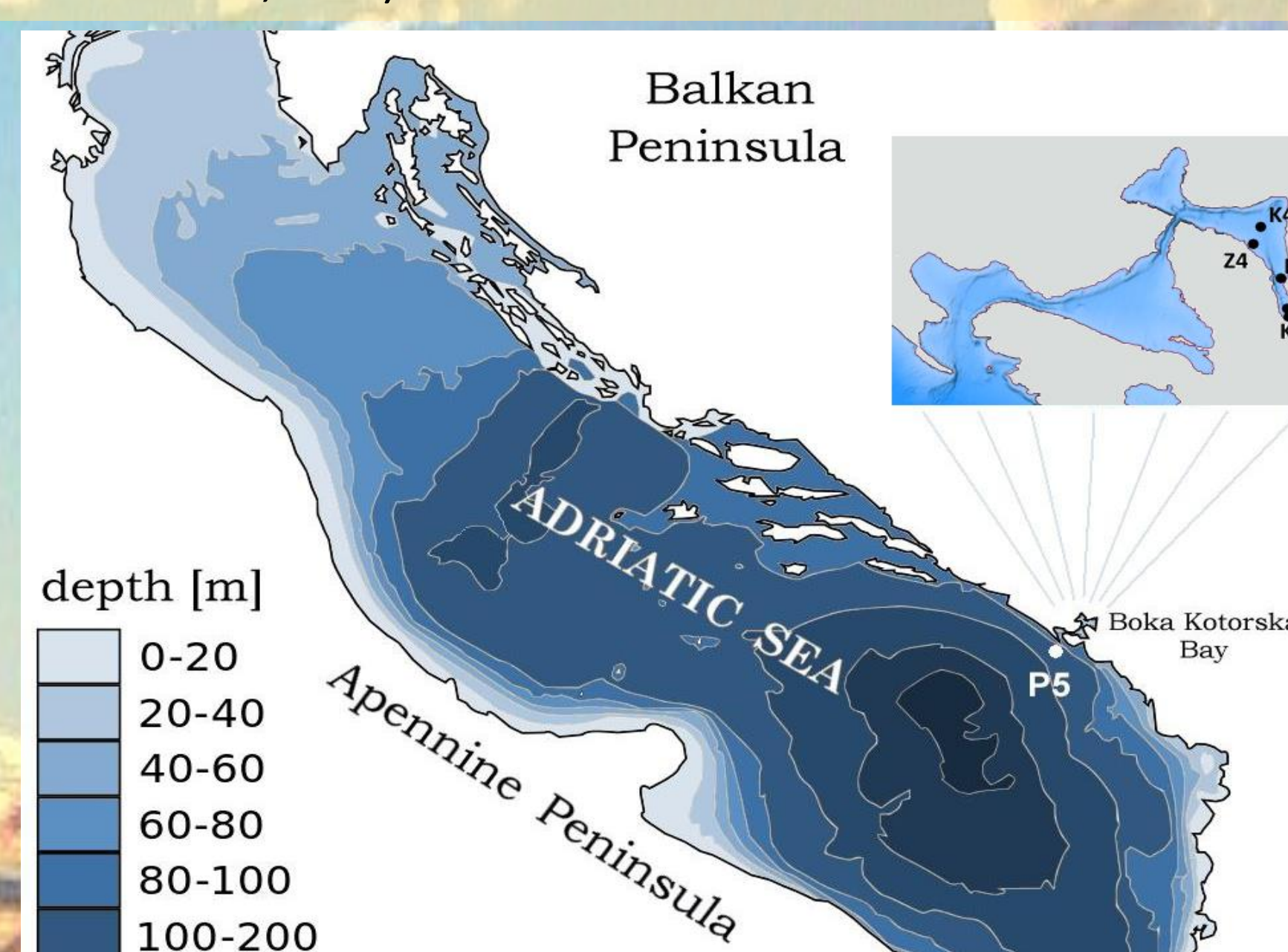


Figure 1. Study area in the southeastern Adriatic – Bay of Boka Kotorska



Figure 2. Yellow tide in the Bay of Tivat (a) and the Bay of Kotor (b,c)

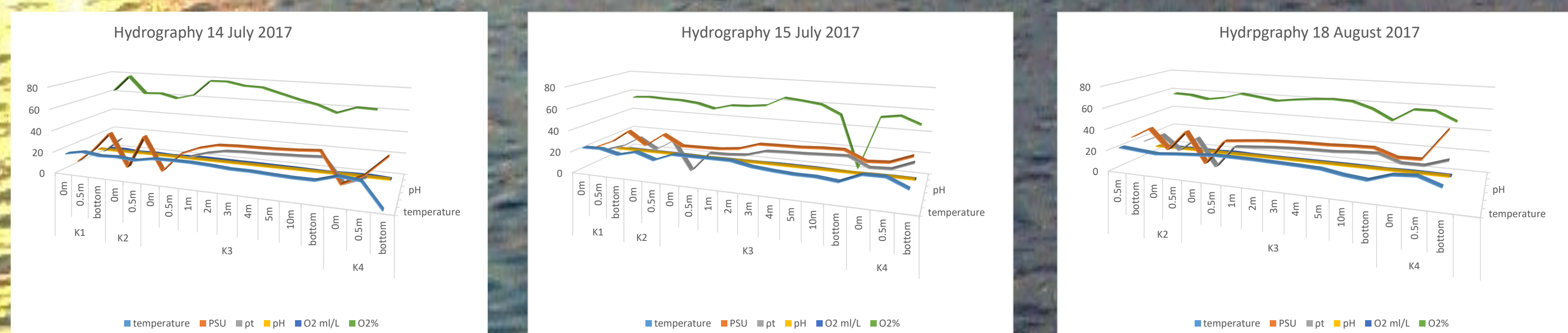


Figure 4. Changes of hydrological parameters on 2017/7/14, 2017/7/15 and 2017/8/18

Conclusion

Intense warming of the Bay of Kotor, prior to heavy rains, led to high surfacewater temperatures reaching 29°C. After the rains and runoff from the land, large quantities of soil with mineralised faecal matter were introduced into the Bay, causing a sudden increase in organic salt deposits, followed by a phytoplankton bloom and disruption of the ecological balance. In the shallow part of the Bay, the entire plankton community degraded due to the abrupt development of *Prorocentrum* sp.

KEYWORDS: zooplankton, phytoplankton, Bay of Kotor, Adriatic

Acknowledgements:

This work was supported in part by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia through grants 451-03-137/2025-03/200123 and 451-03-136/2025-03/200287