

PHYTOPLANKTON FUNCTIONAL TRAITS AS MONITORING TOOL IN THE PRODUCTION AREA OF COZZA DI SCARDOVARI PDO

F. Bolinesi^{1,3}, E. Rossetti², O. Mangoni^{1,3}

¹ *Dipartimento di Biologia, Università degli Studi di Napoli Federico II, Complesso di Monte Sant'Angelo, via Cinthia 21, Napoli 80126, Italy*

² *Consorzio Cooperative Pescatori del Polesine O.P. S.C.Ar.L., Scardovari, Rovigo 45018, Italy*

³ *CoNISMa, Piazzale Flaminio 9, Roma 00196, Italy*



Food and Agriculture Organization of the United Nations

MINISTERO DELL'AGRICOLTURA DELLA SOVRANITÀ ALIMENTARE E DELLE FORESTE

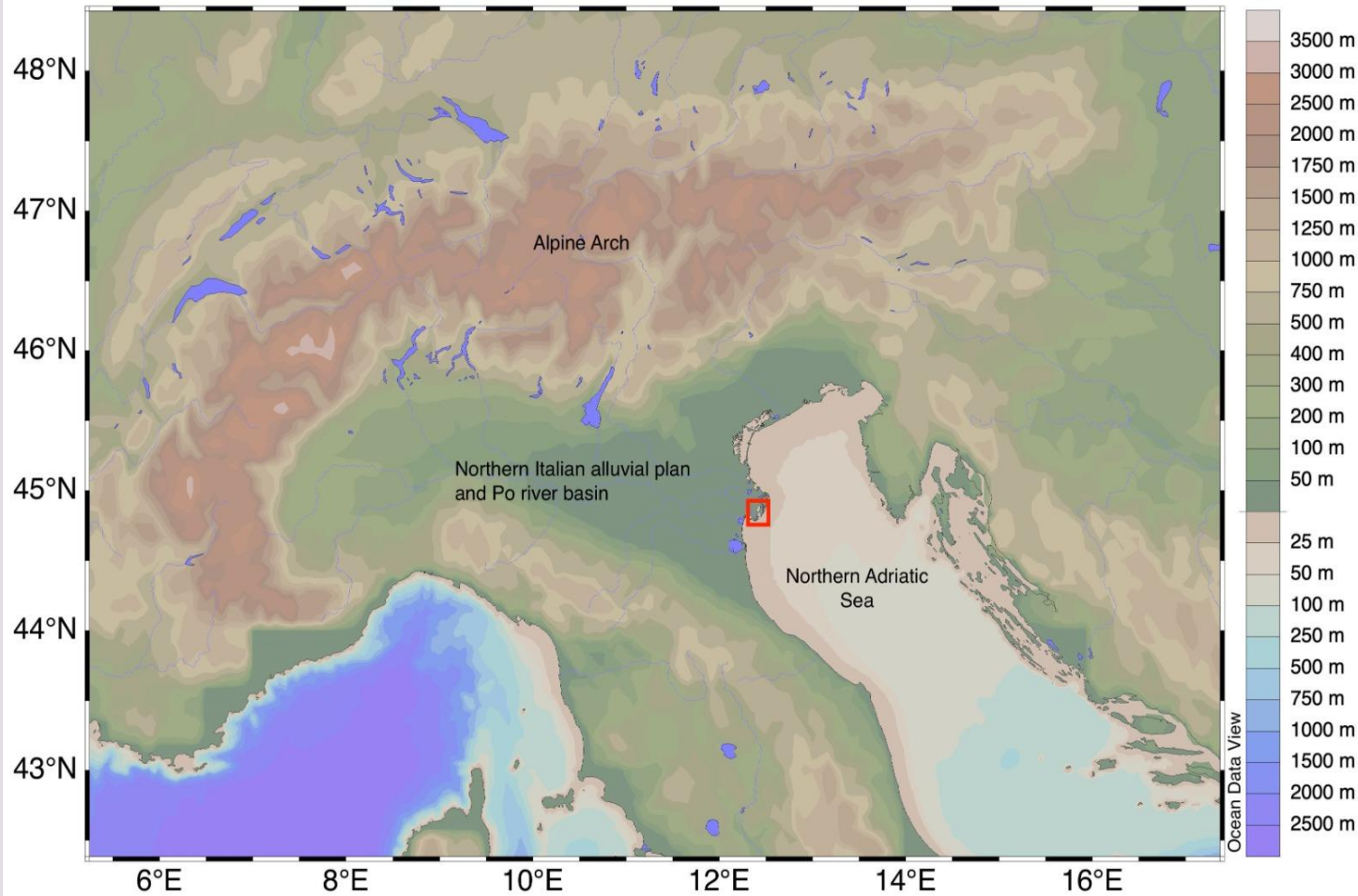
WORLDWIDE PERSPECTIVES ON GEOGRAPHICAL INDICATIONS

SECOND INTERNATIONAL CONFERENCE FOR RESEARCHERS, POLICY MAKERS AND PRACTITIONERS
INNOVATIONS AND TRADITIONS FOR SUSTAINABILITY

ROME, 18 – 21 FEBRUARY 2025

cirad **IGCI IPI** **oriGIn** **oriGIn** **FONDAZIONE QUALIVITA**

THE PO DELTA





SACCA DEGLI SCARDOVARI

ONE OF THE MOST IMPORTANT EUROPEAN SHELLFISH PRODUCTIONS

- 1500 OPERATORS
- 80 COMPANIES INVOLVED
- 14 COOPERATIVE

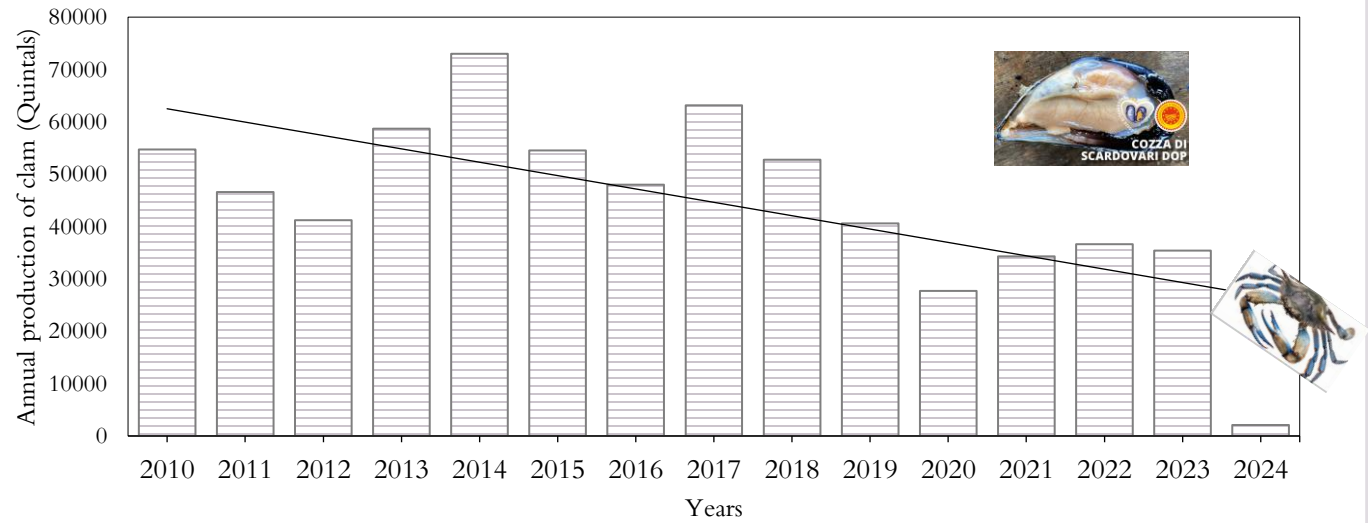
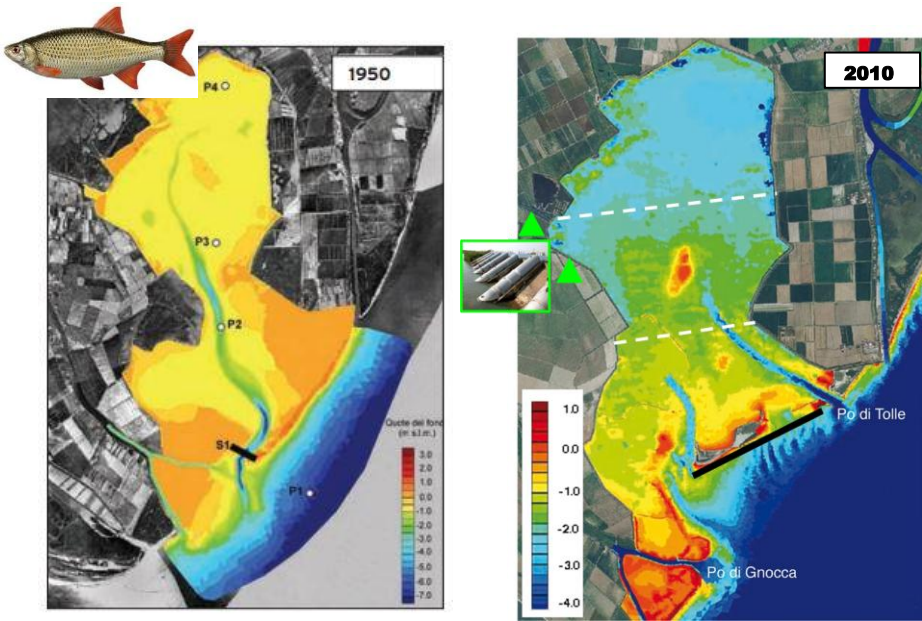


UNICA, ITALIANA, VERA



- Cooperativa Pescatori Delta Padano
- Cooperativa Pescatori Eridania
- Cooperativa Fra Pescatori dell'Adriatico
- Cooperativa Pescatori Maistra
- Cooperativa Pescatori Mitolcoltori
- Cooperativa Pescatori Ariano Polesine
- Cooperativa Pescatori di Pila

- Cooperativa Pescatori Po
- Cooperativa Pescatori S. Giulia
- Cooperativa Pescatori Polesine Camerini
- Cooperativa Pescatori S. Margherita
- Cooperativa Villaggio Pescatori
- Cooperativa Pilamare
- Cooperativa Cà Tiepolo

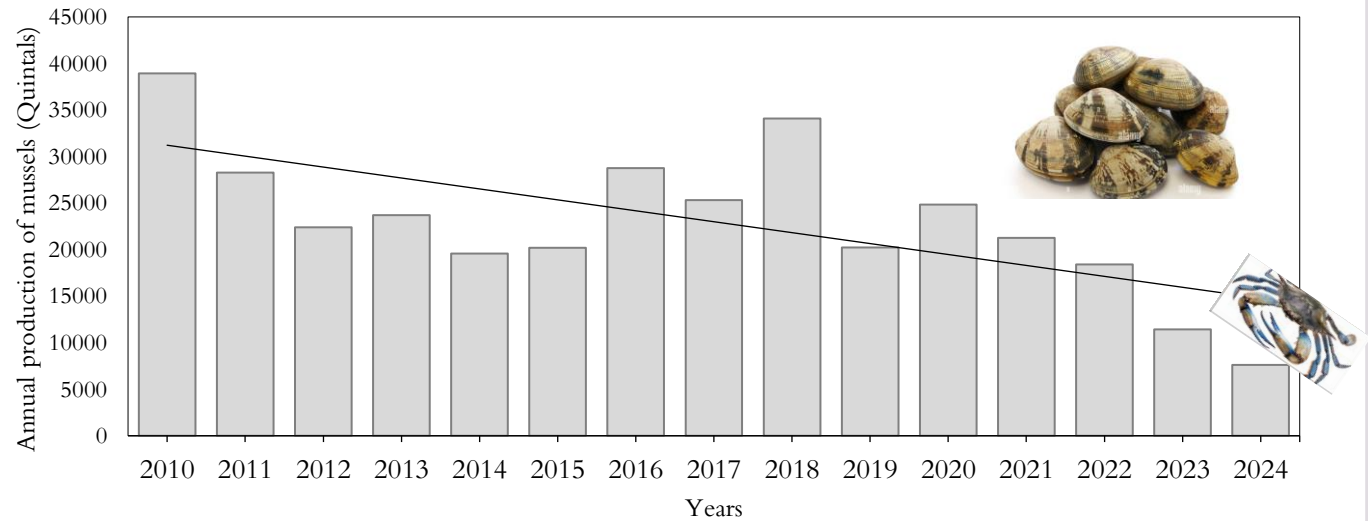


The Guardian
Invasive blue crabs threaten economy of whole regions of Italy, official say

Crustacean native to Americas is devastating shellfish production in Po delta, where it has no natural predators

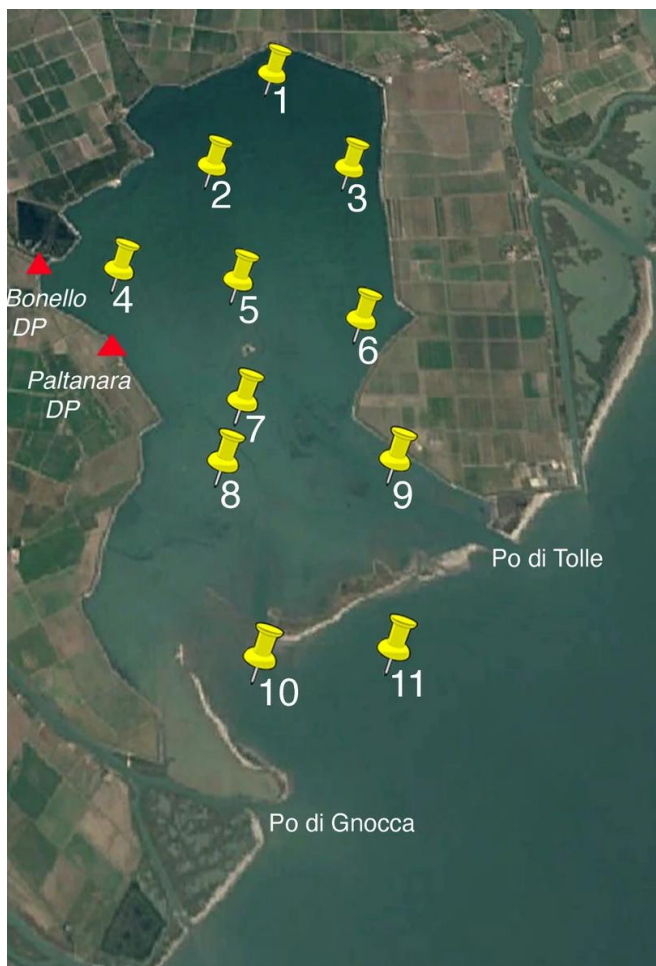


CRUSTACEAN COMPLICATIONS NEWSROOM
ITALY'S CLAM INDUSTRY THREATENED BY RISE IN BLUE CRABS **CNN**

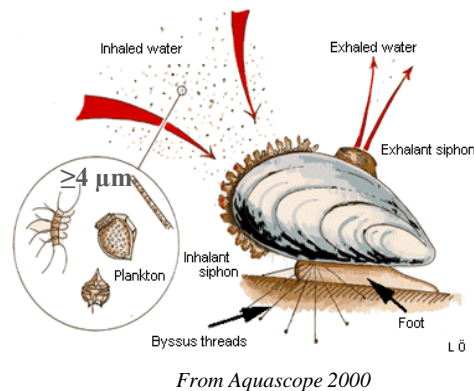


Bolinesi et al., *Sci Rep* **14**, 19424 (2024). <https://doi.org/10.1038/s41598-024-70492-6>

D'Alpaos, L. eds. *Consorzio di Bonifica Delta del Po & Taglio di Po*. 3–80 (Regione del Veneto, 2014).



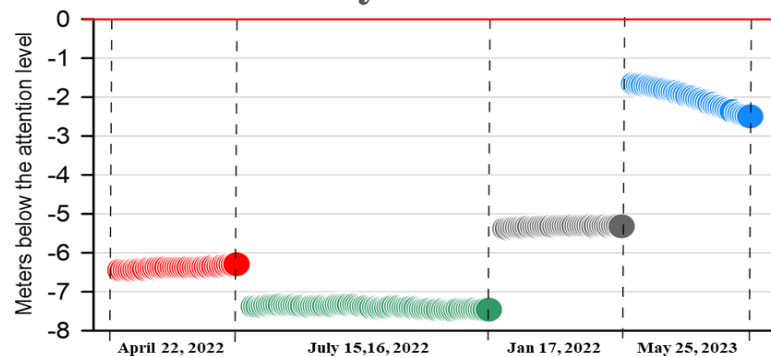
➤ PHYTOPLANKTON FUNCTIONAL TRAITS



- Total phytoplankton biomass
- Micro- (200-20 μm), nano- (20-2 μm), pico- (2-0.7 μm)
- Maximum quantum yield (Fv/Fm)
- Pigmentary spectra (pigment:Chl a ratios)

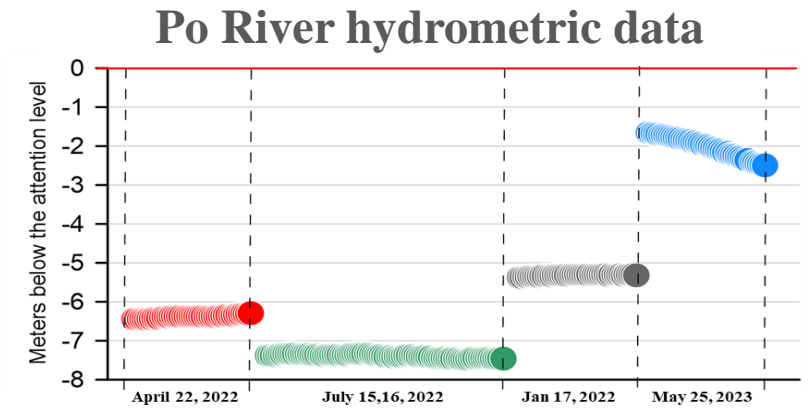
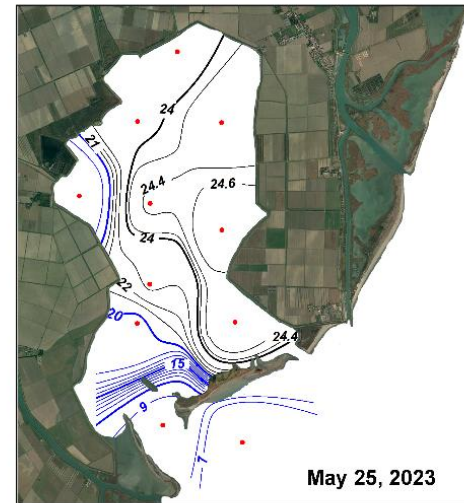
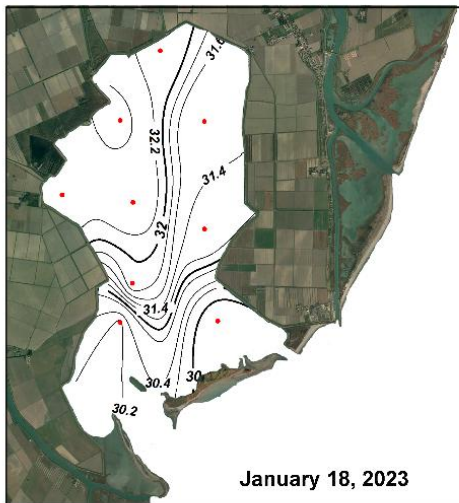
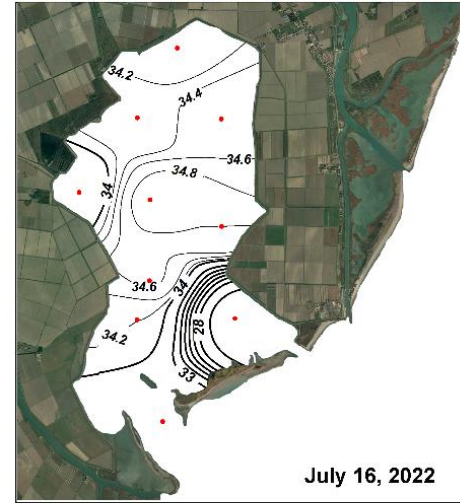
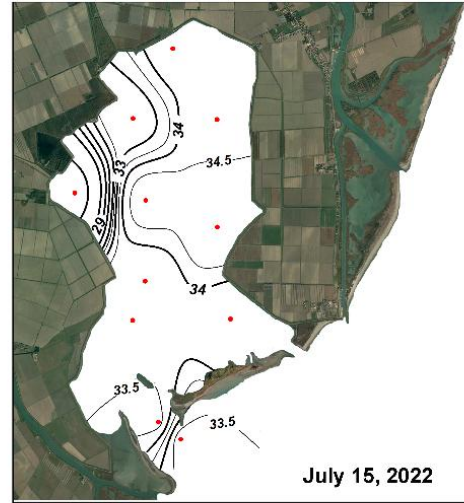
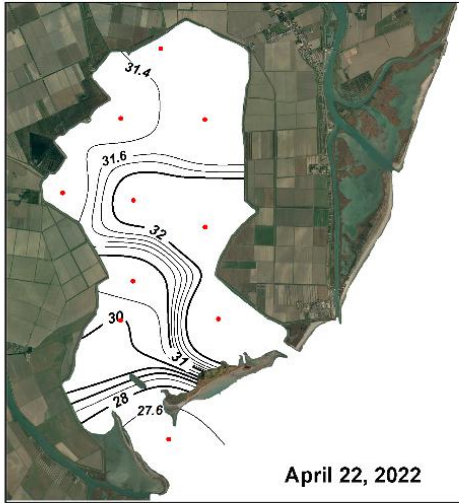
➤ PHYSICAL-CHEMICAL PROPERTIES OF THE WATER COLUMN

Po River hydrometric data

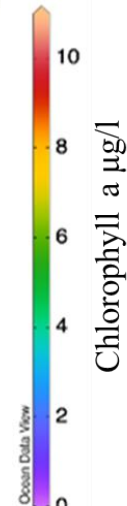
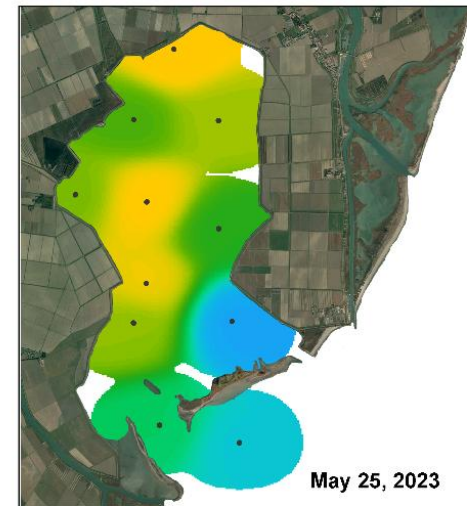
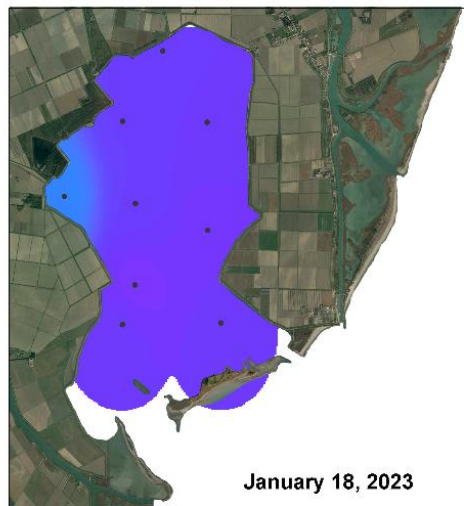
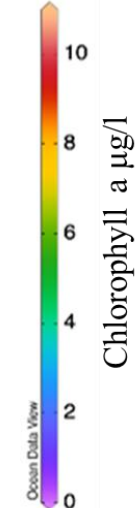
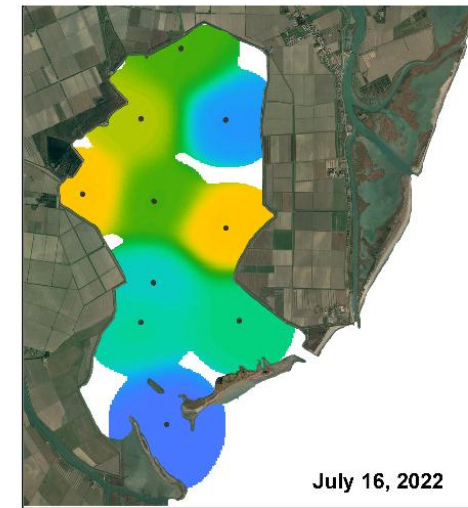
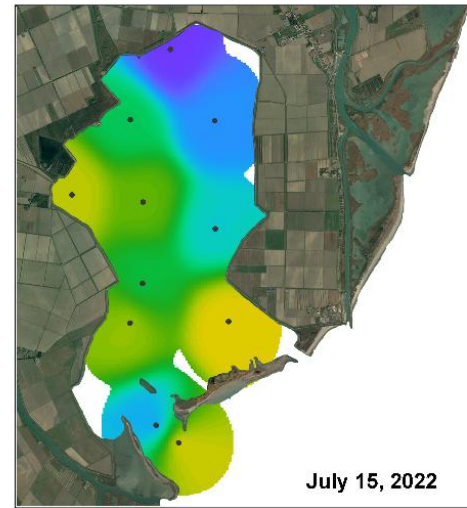
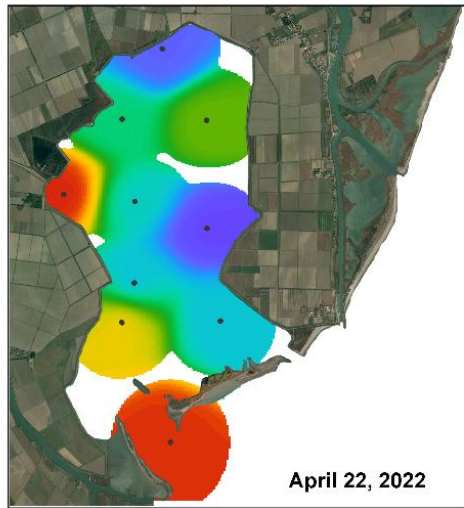


- Salinity
- Temperature
- Nutrient concentrations

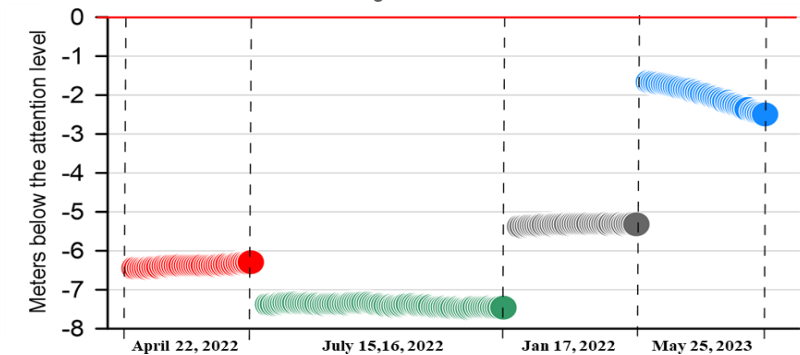
SALINITY DISTRIBUTION



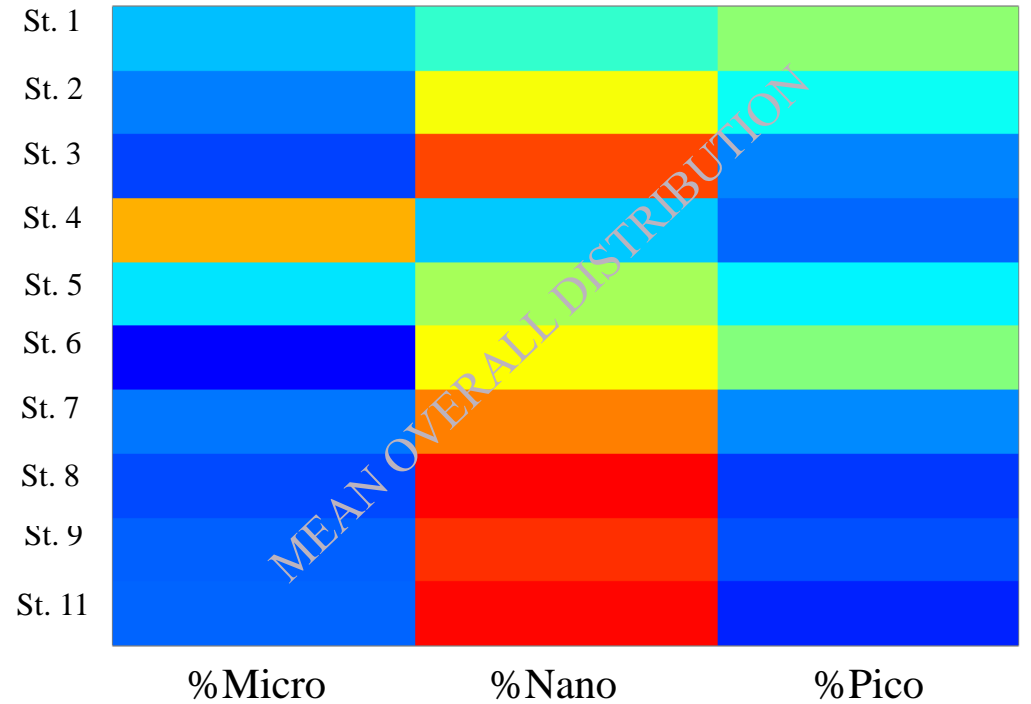
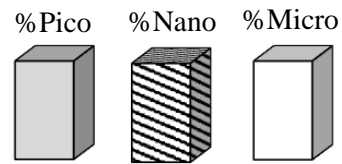
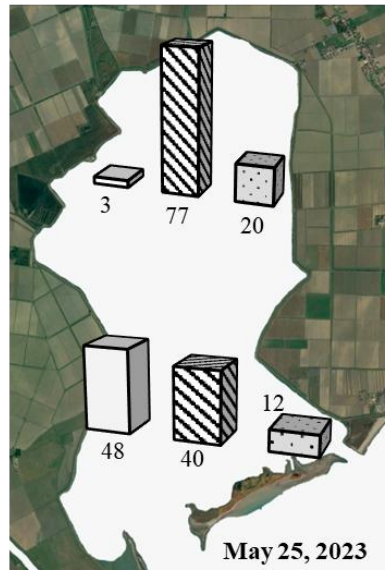
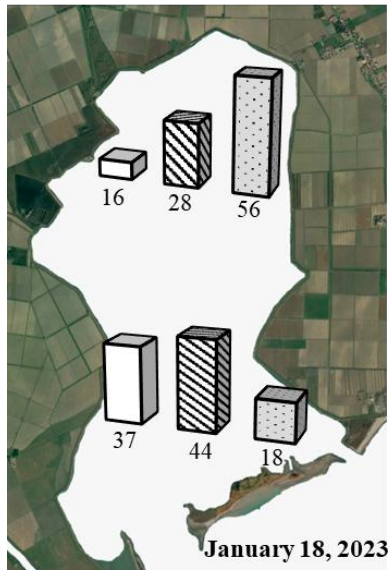
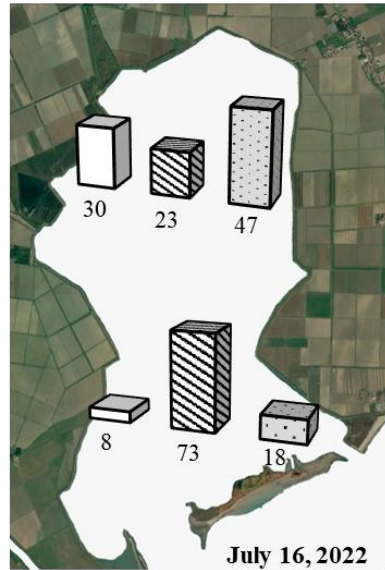
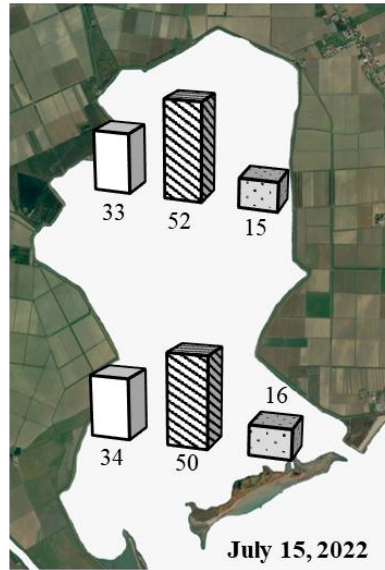
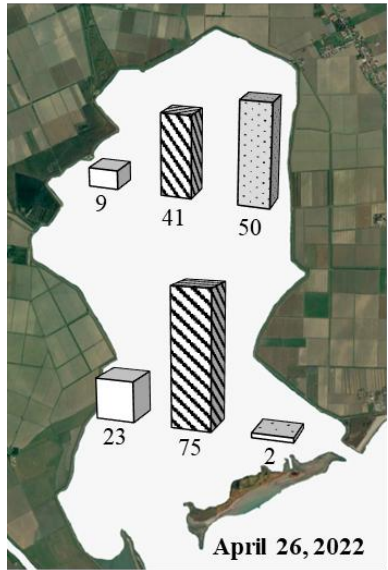
TOTAL PHYTOPLANKTON BIOMASS



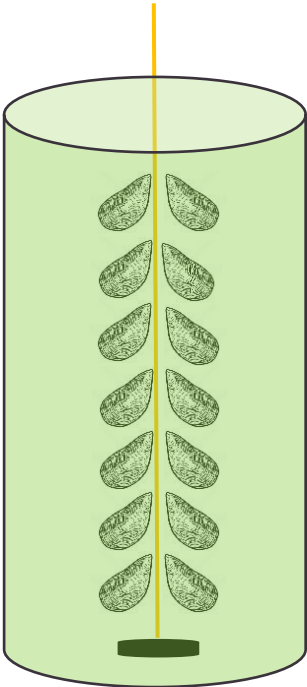
Po River hydrometric data



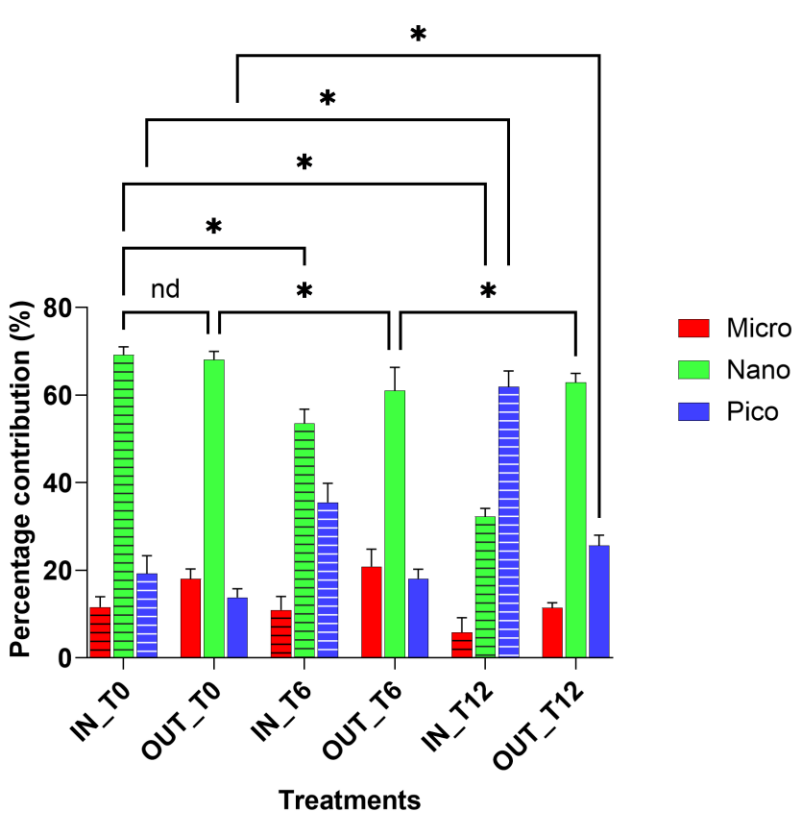
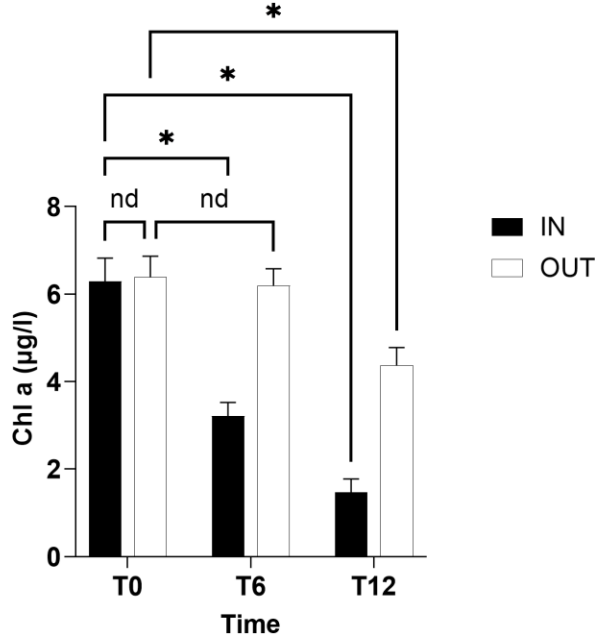
SIZE CLASS COMPOSITION



IN SITU MUSSEL FILTRATION ACTIVITY



N= 400 individuals
V= 600 l



BIBLIOGRAPHY

- Andreoli, C. et al. Phytoplankton and chemico-physical parameters of the Scardovari Lagoon (Po Delta, North Adriatic Sea) during 1991 and 1992. *Giorn. Bot. Ital.* 128, 1007–1027 (1994).
- Bolinesi, F., Rossetti, E. & Mangoni, O. Phytoplankton dynamics in a shellfish farming lagoon in a deltaic system threatened by ongoing climate change. *Sci Rep* **14**, 19424 (2024). <https://doi.org/10.1038/s41598-024-70492-6>
- Braga, F. et al. Mapping turbidity patterns in the Po river prodelta using multi-temporal Landsat 8 imagery. *Estuar. Coast. Shelf Sci.* 198, 555–567 (2017).
- Colombani, N., Giambastiani, B. M. S. & Mastrocicco, M. Impact of climate variability on the salinization of the coastal wetland-aquifer system of the Po Delta, Italy. *J. Water Supply Res. Technol. AQUA* <https://doi.org/10.2166/aqua.2017.115> (2017).
- Dame, R. F. & Prins, T. C. Bivalve carrying capacity in coastal ecosystems. *Aquat. Ecol.* 31, 409–421 (1998).
- D'Alpaos, L. Hydrodynamic circulation and the morphological evolution of the Sacca di Scardovari: Te po delta lagoons (eds Consorzio di Bonifica Delta del Po & Taglio di Po). 3–80 (Regione del Veneto, 2014)
- Ibáñez, C. Impacts of climate change on Mediterranean coastal wetlands and lagoons. In *Impacts of Climate Change in the Coastal Zone* (ed. Yáñez-Arancibia, A.) 127–142 (Instituto De Ecología A.C. INECOL, Instituto Nacional De Ecología INE-SEMARNAT, 2010).
- Nakamura, Y. & Kerciku, F. Effects of filter-feeding bivalves on the distribution of water quality and nutrient cycling in a eutrophic coastal lagoon. *J. Mar. Syst.* 26, 209–221 (2000)
- Pérez-Ruzafa, A., Pérez-Ruzafa, I. M., Newton, A. & Marcos, C. Coastal Lagoons: Environmental Variability, Ecosystem Complexity, and Goods and Services Uniformity. In *Coasts and Estuaries* 253–276 (Elsevier, 2019). <https://doi.org/10.1016/B978-0-12-814003-1.00015-0>.
- Sfriso, A., Facca, C., Bon, D., Giovannone, F. & Buosi, A. Using phytoplankton and macrophytes to assess the trophic and ecological status of some Italian transitional systems. *Cont. Shelf Res.* 81, 88–98 (2014).
- Surian, N. & Rinaldi, M. Morphological response to river engineering and management in alluvial channels in Italy. *Geomorphology* 50, 307–326 (2003). 20. Surian, N., Ziliani, L., Comiti, F., Lenzi, M. A. & Mao, L. Channel adjustments and alteration of sediment fluxes in gravel-bed rivers of North-Eastern Italy: Potentials and limitations for channel recovery. *River Res. Appl.* 25, 551–567 (2009).