

Sector of Neutron Activation Analysis and Applied
Research, Division of Nuclear Physics FLNP JINR

BIVALVE MOLLUSKS IN BIOMONITORING OF THE SOUTH AFRICAN ATLANTIC COASTAL WATERS

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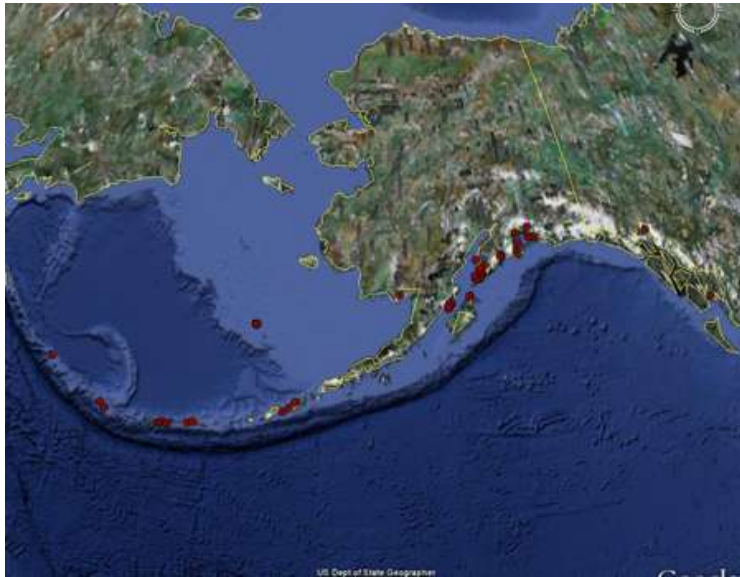
Consortium



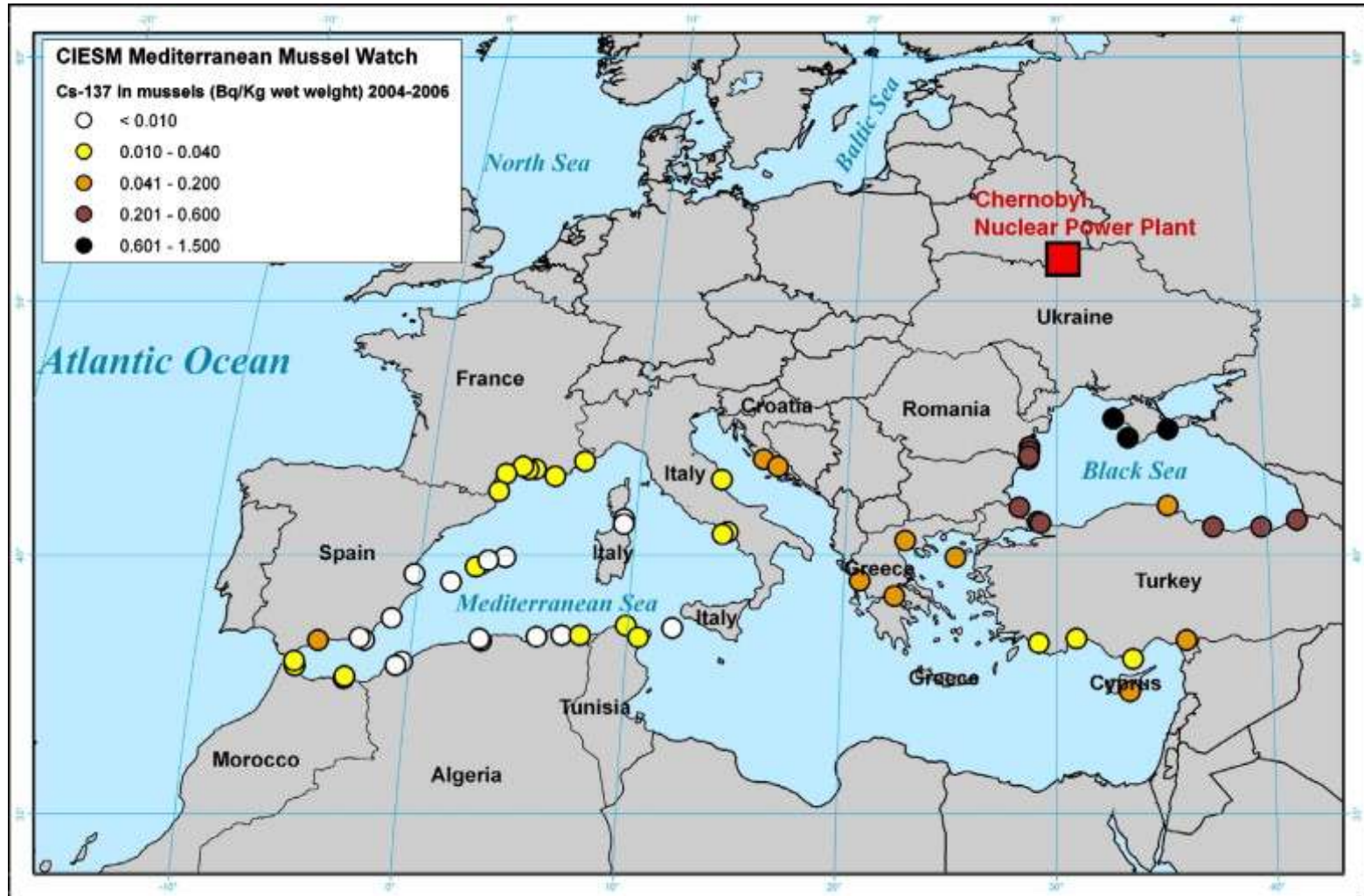
- ❖ Frank Laboratory of Neutron Physics of the JINR
- ❖ Institute for Biology of Inland Waters of the RAS
- ❖ Physics Dept., Saldanha Military Academy (Stellenbosch University)

- ❖ Institute of Problems of Ecology and Evolution of the RAS
- ❖ Physics Dept., Stellenbosch University
- ❖ Nuclear Physics Department, iThemba LABS of the NRF
- ❖ Materials Research Department, iThemba LABS of the NRF

USA Mussel Watch Program



Mediterranean Mussel Watch Program





Black mussel
(*Mytilus galloprovincialis*)

Pacific oyster
(*Crassostrea gigas*)



Study area



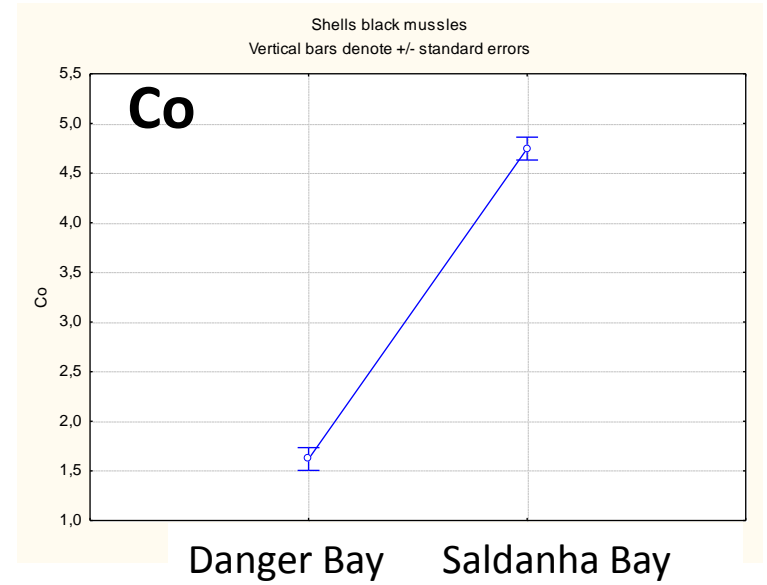
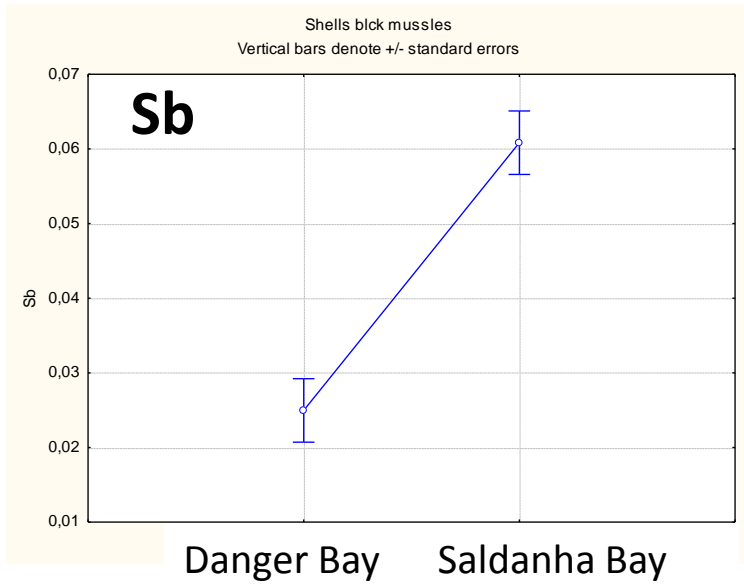
NAA at reactor IBR-2

H	38 elements																He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La*	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac**											Rf	Db	Sg	Bh	Hs
	*	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu		
	**	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lw		

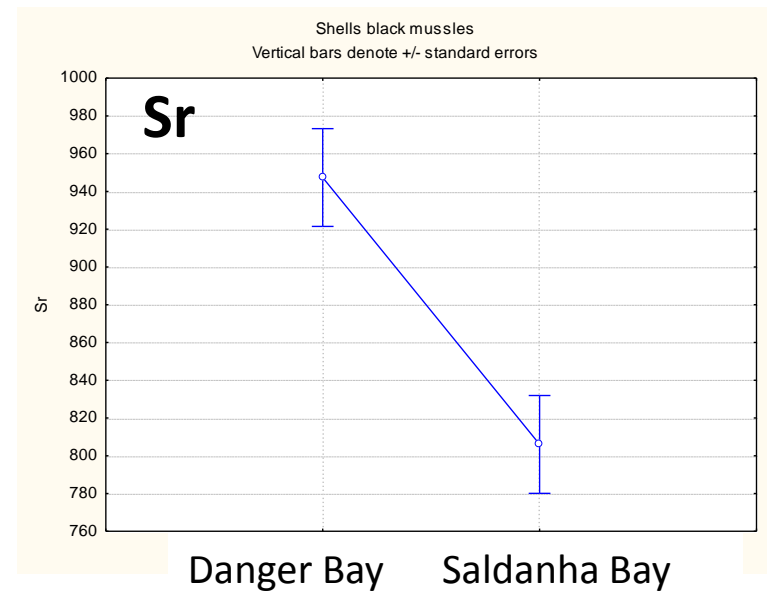
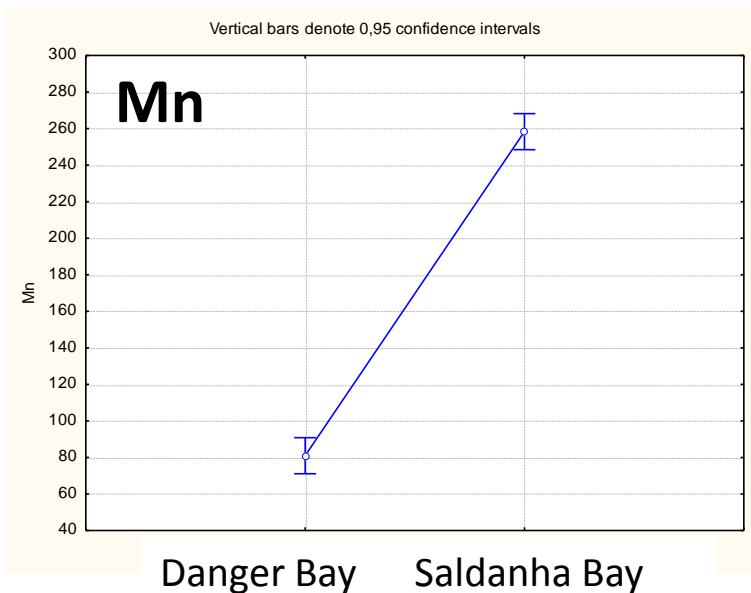
Comparison between two Bays: Black mussel



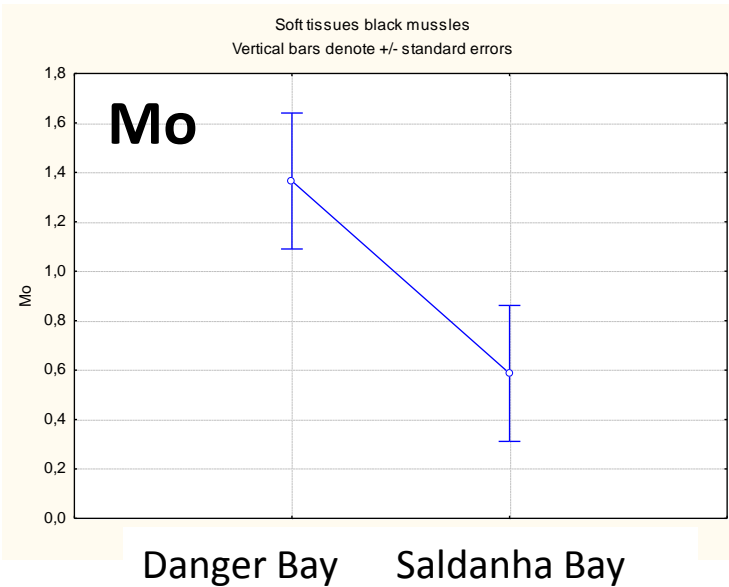
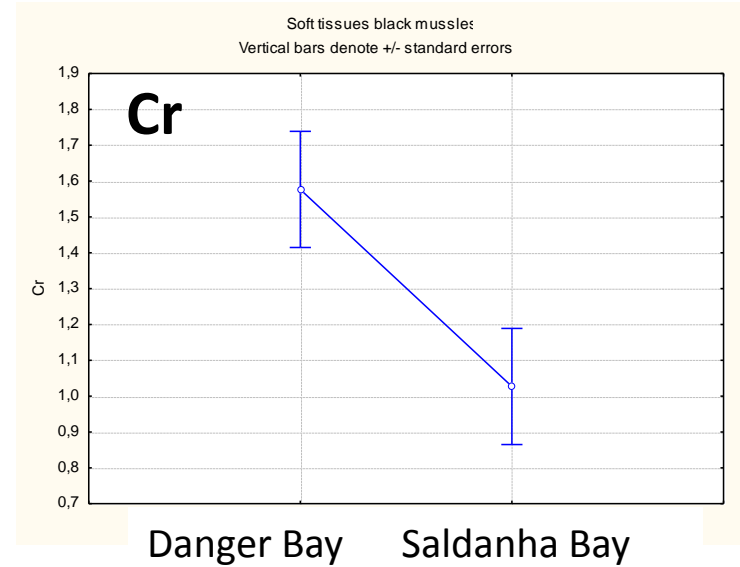
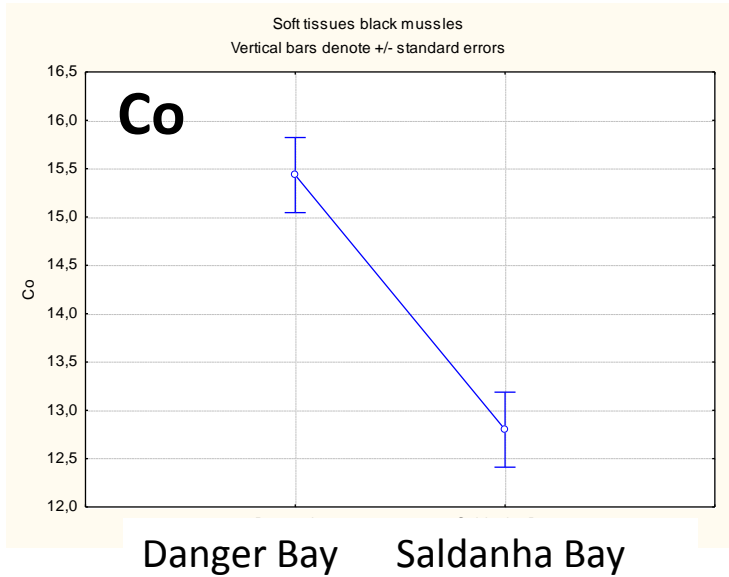
Black mussels



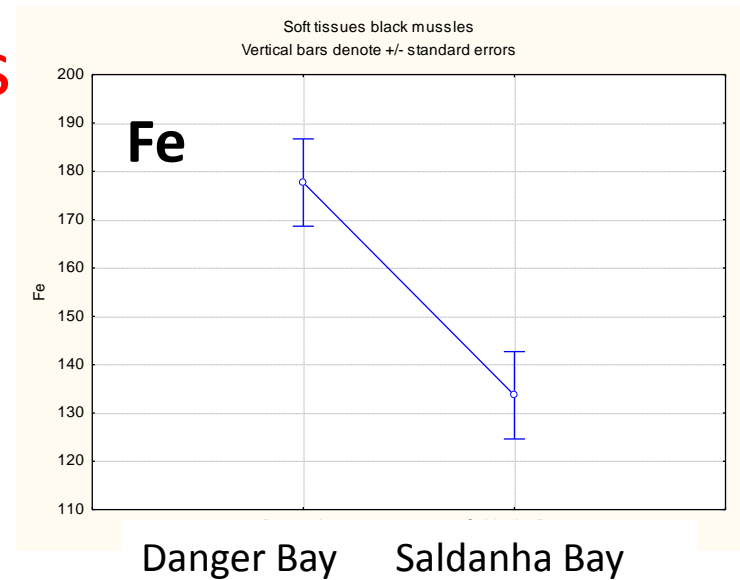
shells



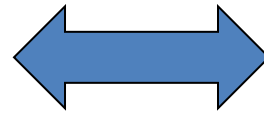
Black mussels



Soft
tissues

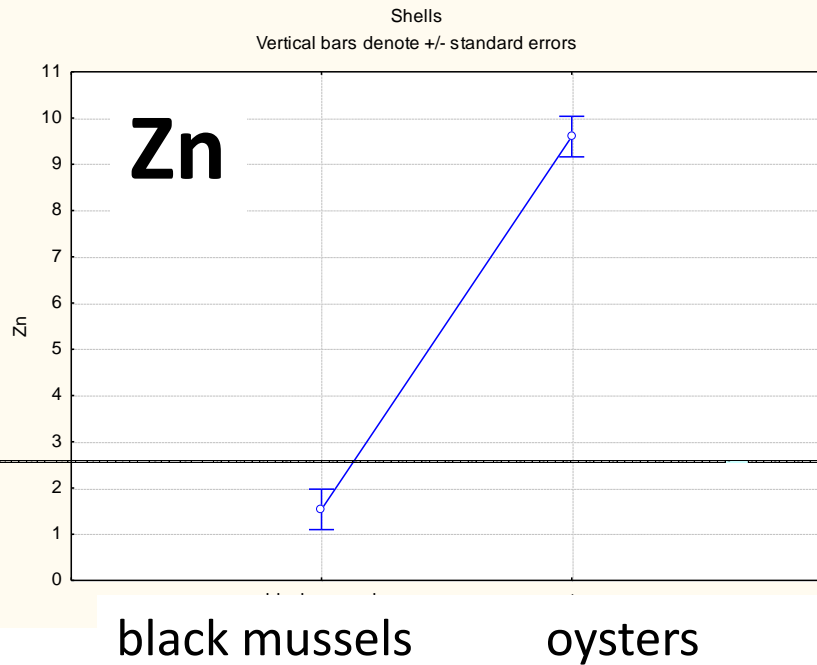


Comparison between Black mussel and Pacific oyster

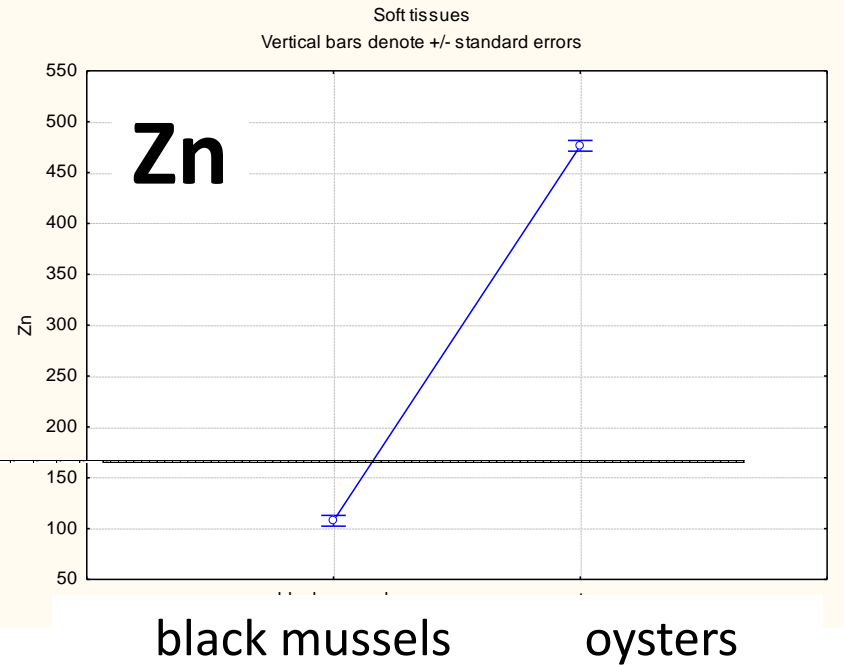


Black Mussels – Oysters

Shells

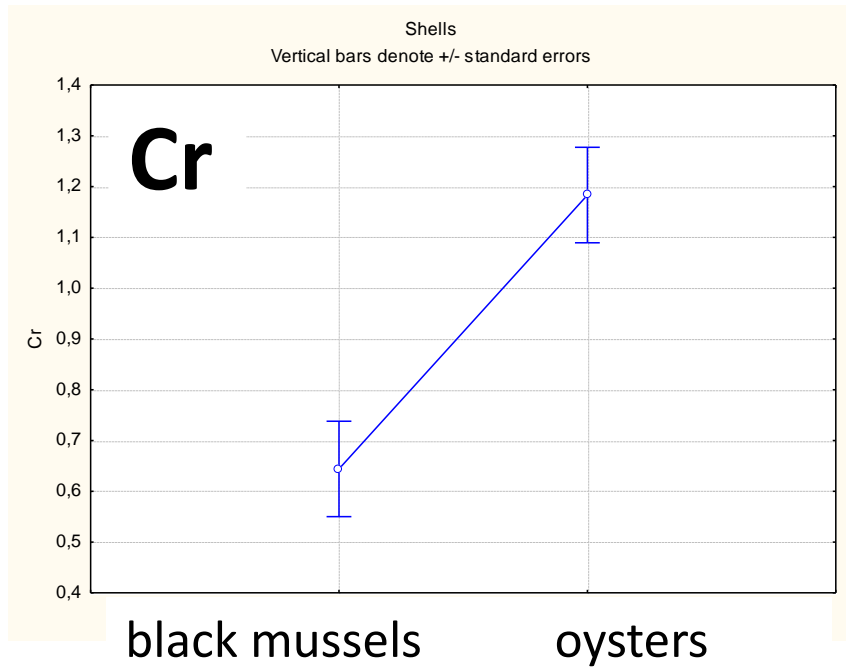


Soft tissues

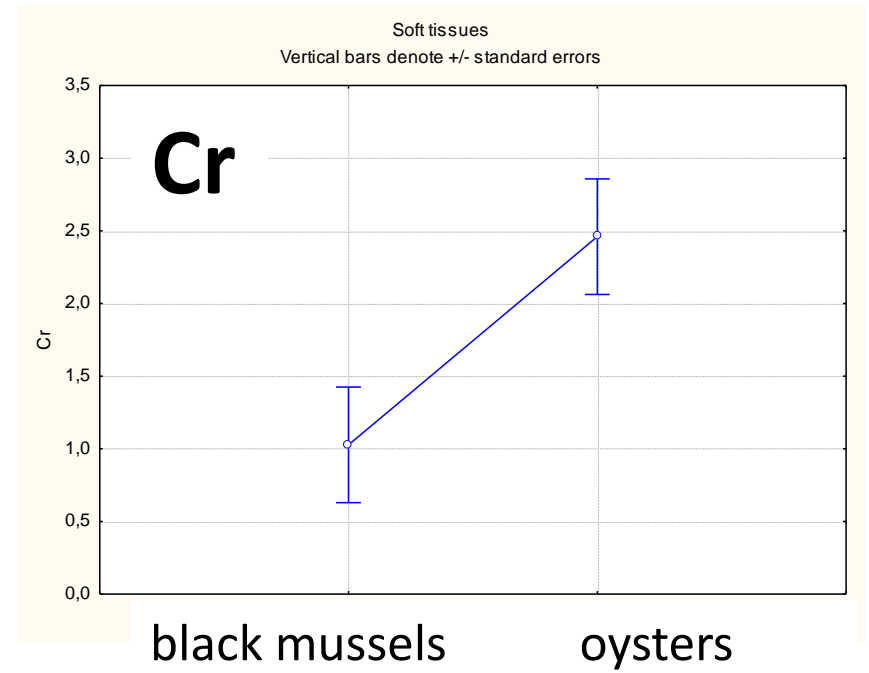


Black Mussels – Oysters

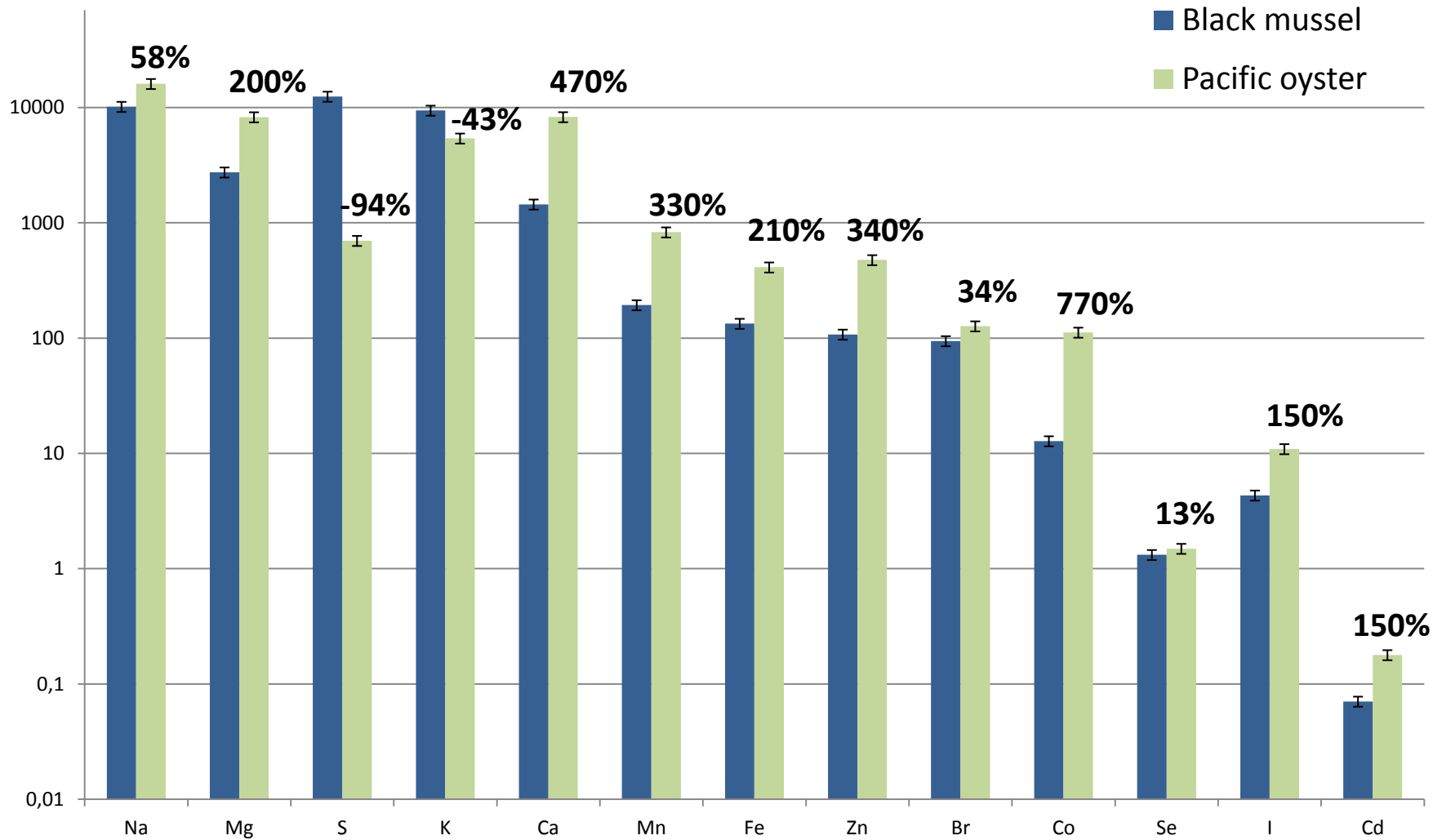
Shells



Soft tissues



Elements distribution in the mollusks soft tissues



Conclusion

- ❖ Bivalve mollusks could be good biomonitors to trace geochemical peculiarities of aquatic ecosystems
- ❖ Pacific oysters are richer in major as well as trace elements than Black mussels

Thank you for attention!

