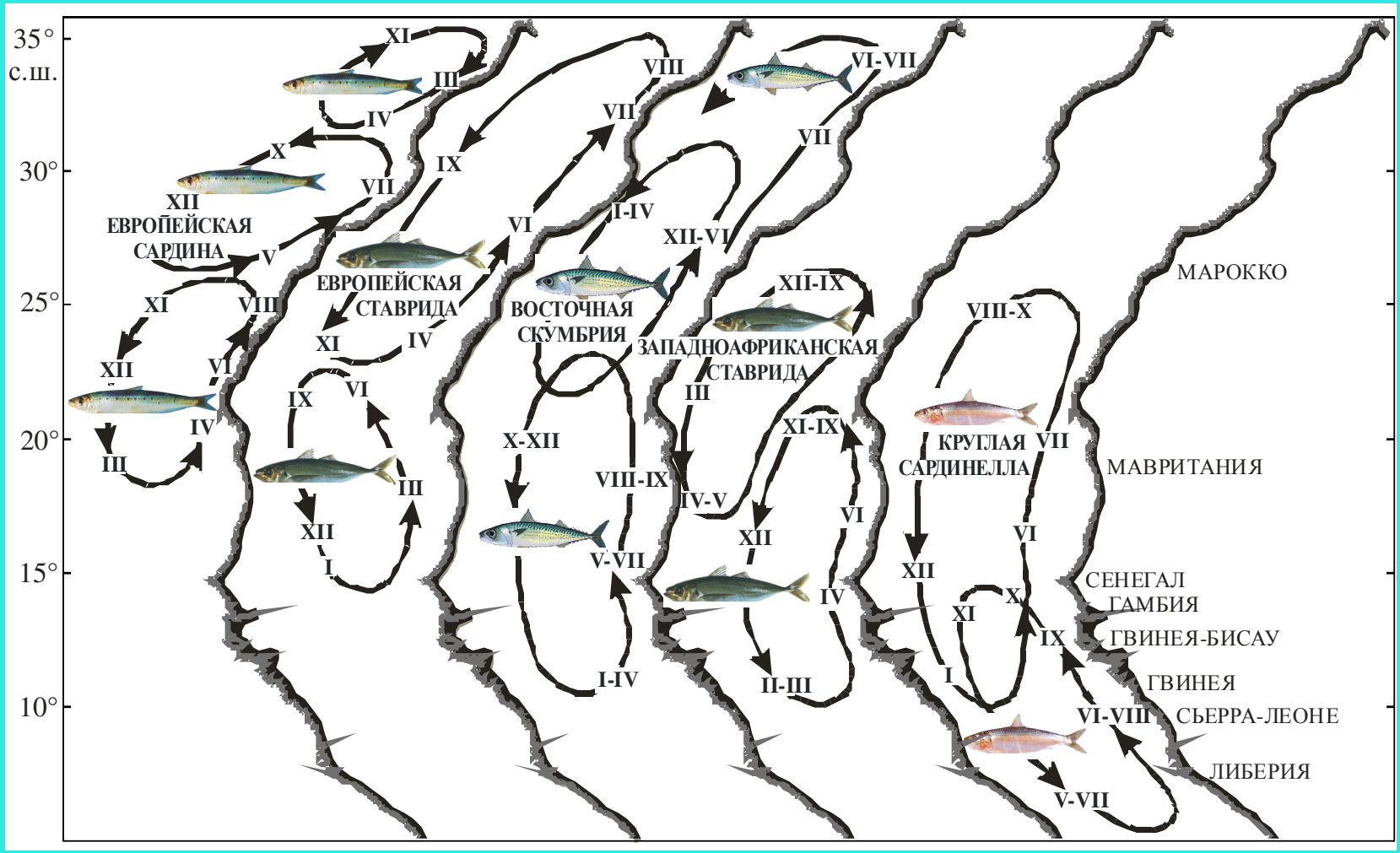
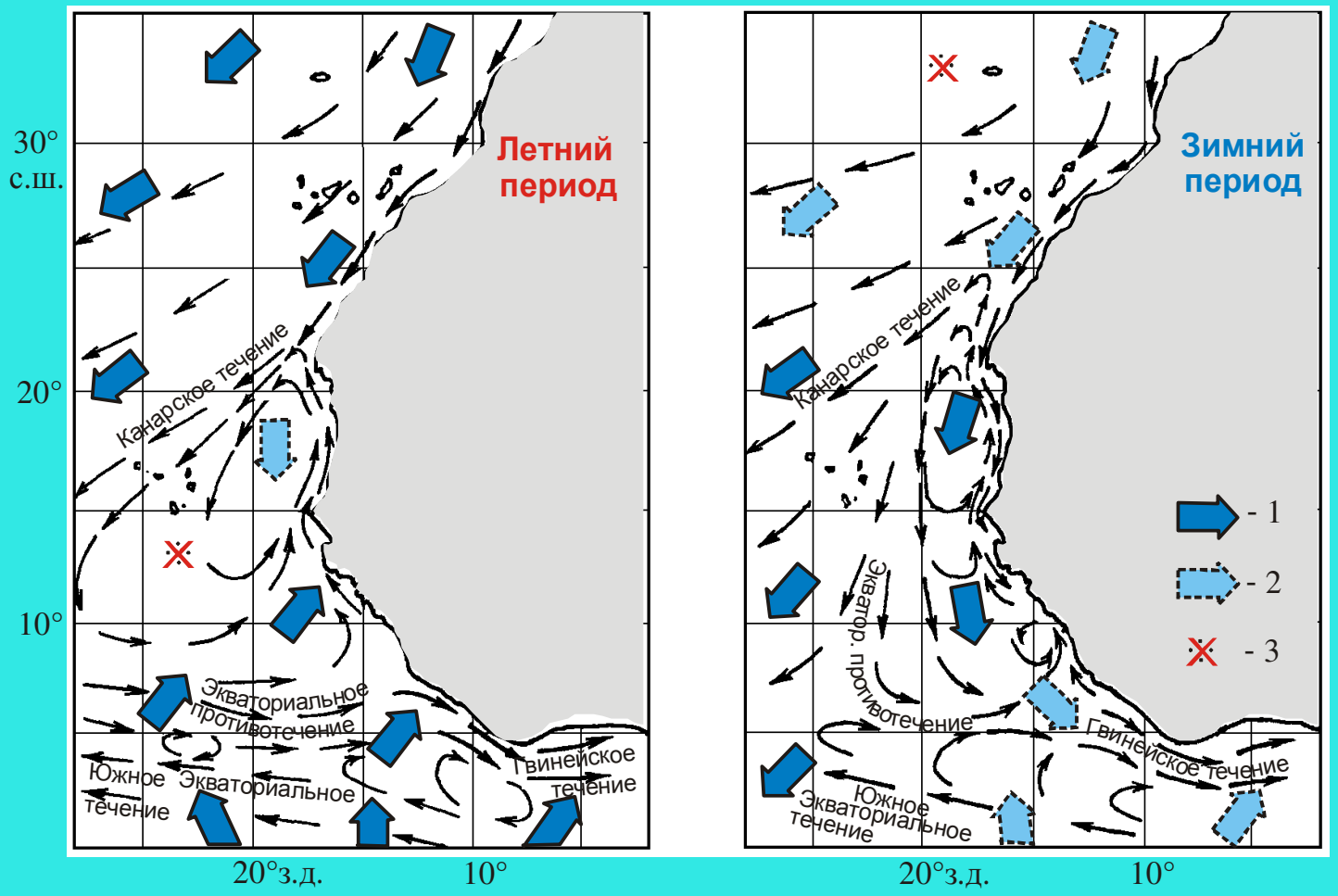
АТЛАНТИЧЕСКИЙ НАУЧНО-ИССЛЕДОВАТЕЛЬСКИЙ ИНСТИТУТ
РЫБНОГО ХОЗЯЙСТВА И ОКЕАНОГРАФИИ
(AtlantNIRO, Kaliningrad, Russia)

WATER STRUCTURE & DYNAMICS IN THE CANARY UPWELLING AND THEIR IMPACT ON PELAGIC FISH POPULATION

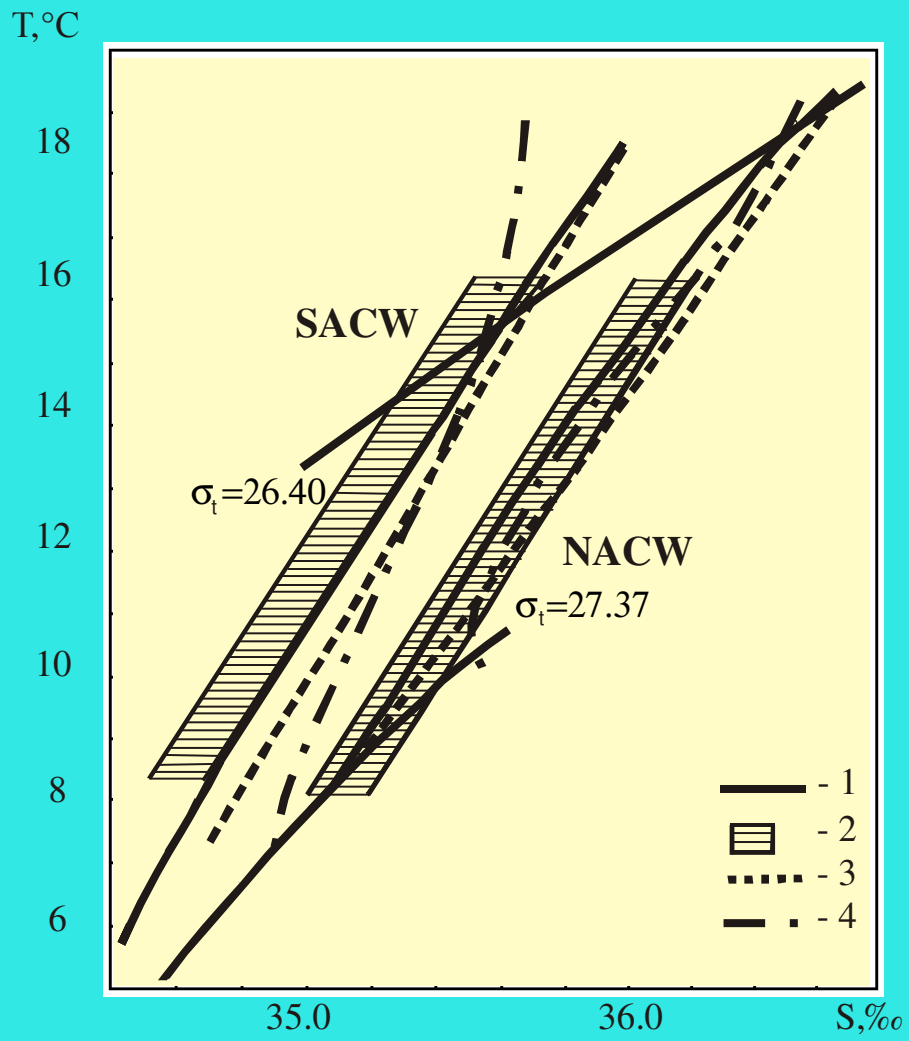


Migration areas and patterns for the Central Eastern Atlantic commercial pelagic fishes (Domanevsky, 1998)



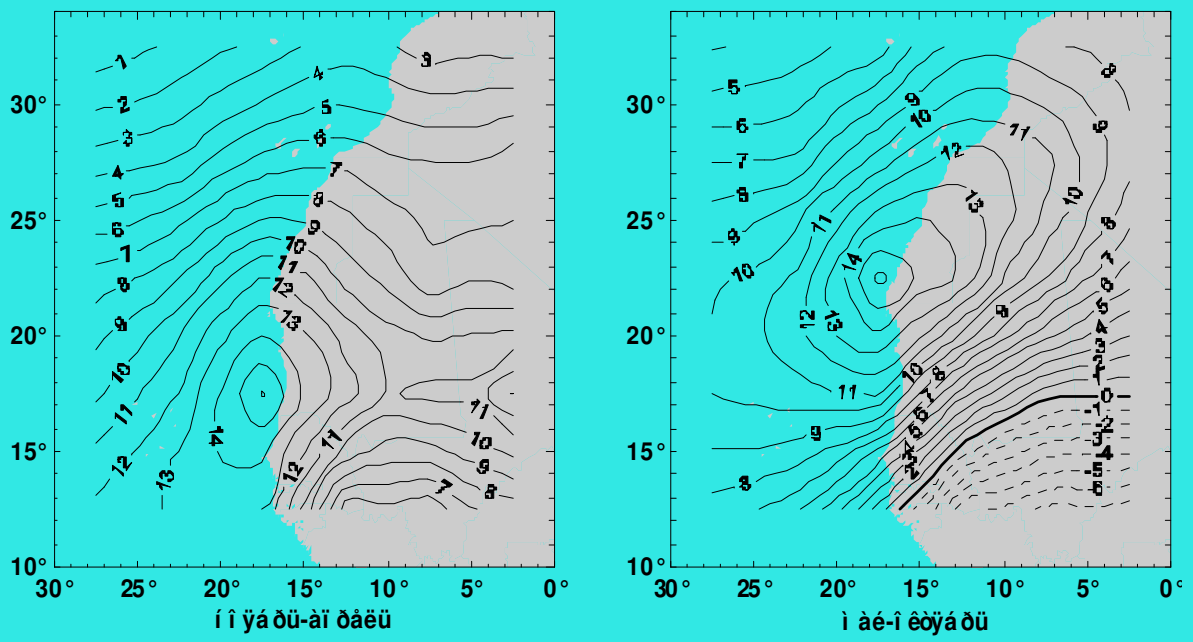
Surface water circulation along Northwest Africa in summer and winter

1 – направление преобладающих ветров; 2 – ветра слабых и изменчивых направлений; 3 – отсутствие сильных ветров устойчивого направления (Mittellstaedt, 1983)

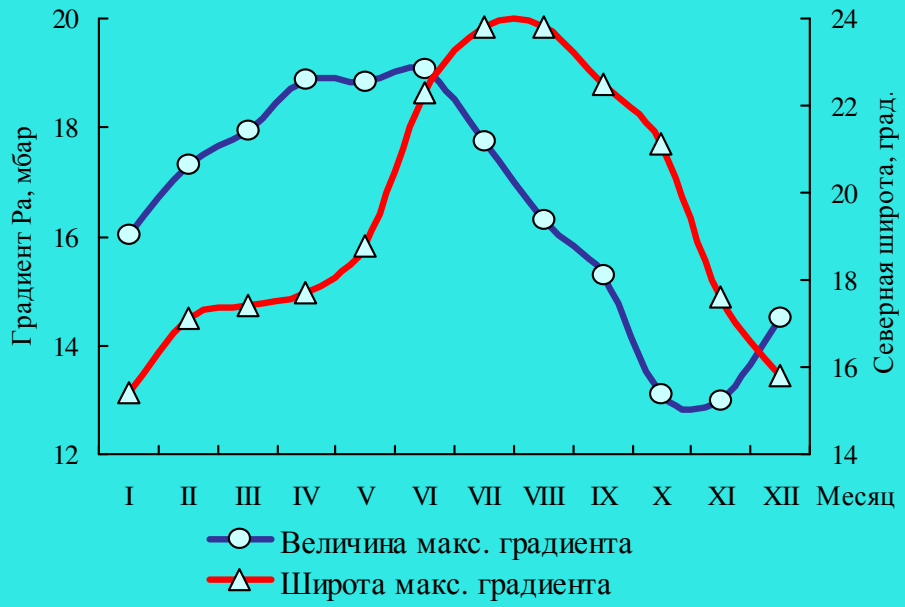


1 и 2 - соответствуют условиям открытого океана,
3 и 4 - соответствуют районам апвеллинга

Determination of NACW and SACW by different authors:
1 – Swerdrup et al. (1942), 2 – Swerdrup (1952), 3 – Элейн (1970), 4 – Tomczak (1978)

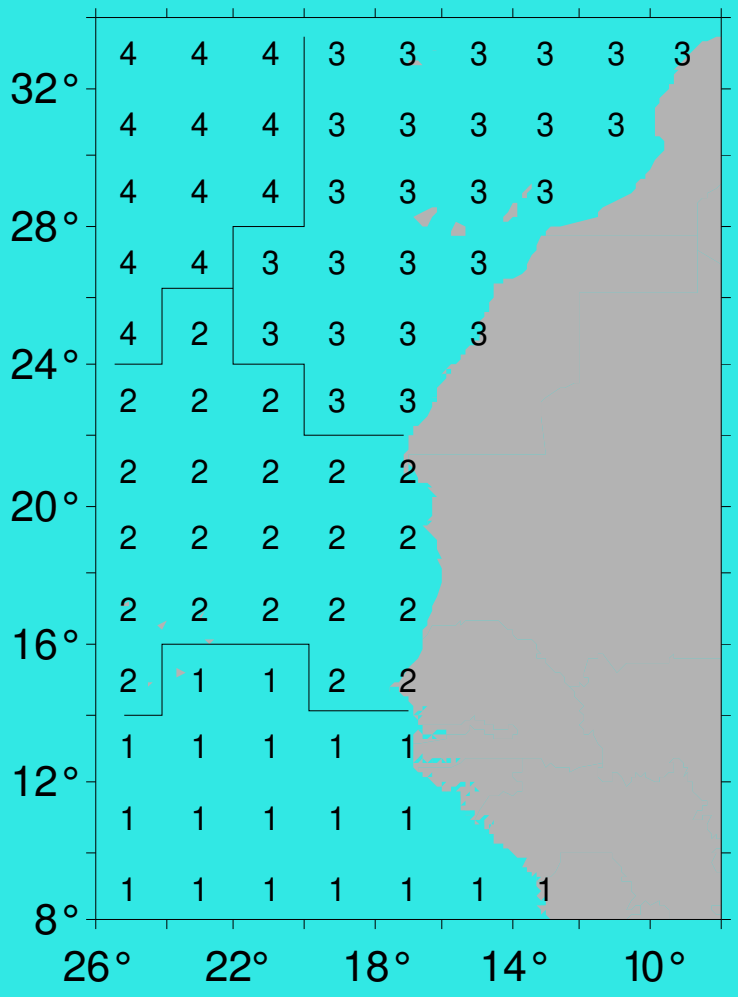


Distribution of the long-term means for the north-east component of the air geostrophic transport above the sea level (mb) in November-April (a) and May-October (б) (positive values correspond to the north-east direction)



The long-term means for the maximum of the north-east component of the atmospheric transport and its latitude

а



The Central Eastern Atlantic zoning basing classification of the SST anomaly monthly means by space (figures mean class number)

б

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
1950	1	1	1	1	1	1	1	1	1	1	1	1
1951	1	1	1	1	1	1	2	2	2	2	3	3
1952	3	3	3	3	3	3	1	1	1	1	1	1
1953	1	1	1	1	1	1	1	1	3	3	3	3
1954	3	3	4	4	4	4	4	4	3	3	3	3
1955	3	1	1	1	1	1	1	1	1	1	1	1
1956	1	1	3	3	3	3	3	4	4	4	4	4
1957	3	3	3	3	3	3	3	3	1	3	3	1
1958	1	1	1	1	1	1	1	1	1	1	3	3
1959	3	3	4	4	4	4	4	4	4	4	2	2
1960	2	2	2	2	2	2	2	2	2	2	2	2
1961	1	1	1	1	1	1	1	1	1	1	1	1
1962	1	1	1	1	1	1	1	1	1	1	1	1
1963	1	3	3	3	3	3	3	3	3	3	3	3
1964	3	3	3	3	3	3	2	2	2	2	2	2
1965	2	2	2	2	2	2	2	3	3	3	3	3
1966	3	3	3	3	3	3	3	3	3	3	3	3
1967	3	3	3	3	3	2	2	2	2	2	2	2
1968	2	2	2	2	2	2	2	2	2	1	1	1
1969	1	1	1	1	1	1	1	1	1	1	1	1
1970	1	1	3	3	3	3	3	3	3	3	4	4
1971	4	4	4	4	4	4	4	4	4	4	4	4
1972	4	4	4	4	4	4	4	4	4	4	4	4
1973	4	4	4	4	4	4	4	4	4	4	4	4
1974	4	4	4	4	4	4	4	4	4	4	4	4
1975	4	4	4	4	4	4	4	4	4	4	4	4
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1980	1	1	1	1	1	1	1	1	1	1	3	3
1981	3	3	3	3	3	3	3	1	1	1	1	1
1982	1	1	1	3	3	3	3	3	3	3	3	3
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1985	4	4	4	2	2	2	2	2	2	2	2	2
1986	2	2	2	2	4	4	4	4	4	4	3	3
1987	1	1	1	1	1	1	1	1	1	1	1	1
1988	1	3	3	3	3	3	3	3	3	3	3	3
1989	3	3	3	1	1	1	1	1	1	1	1	1
1990	1	1	1	1	1	1	1	1	1	1	1	3
1991	3	3	3	3	3	3	3	3	3	3	3	3
1992	3	3	3	3	3	4	4	4	4	4	4	4
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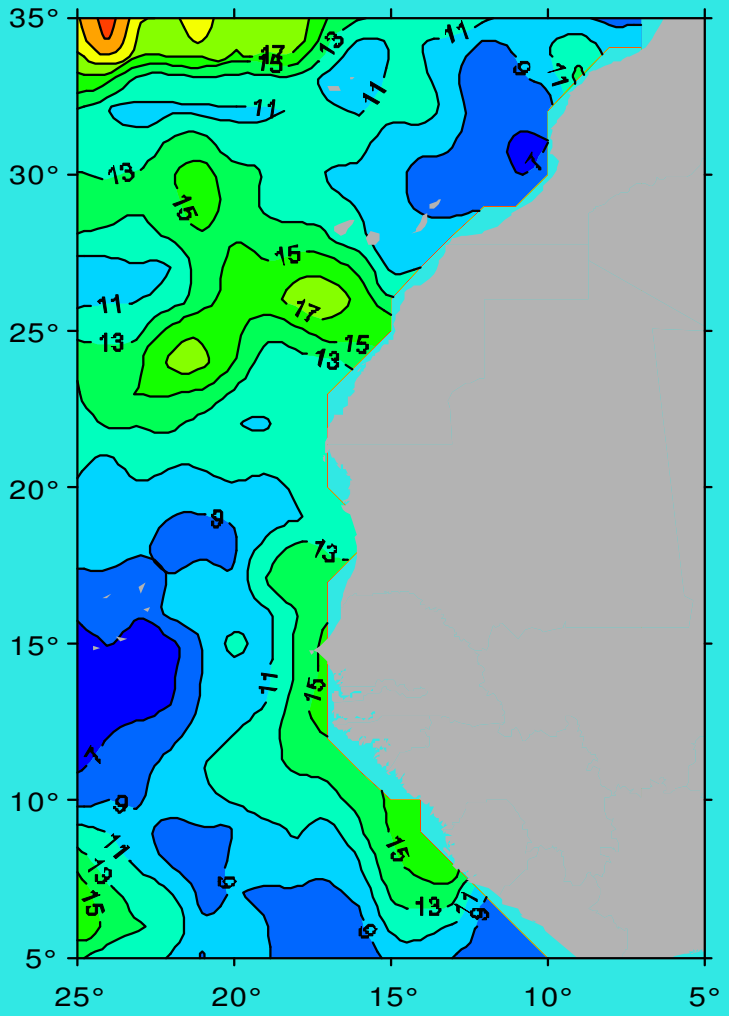
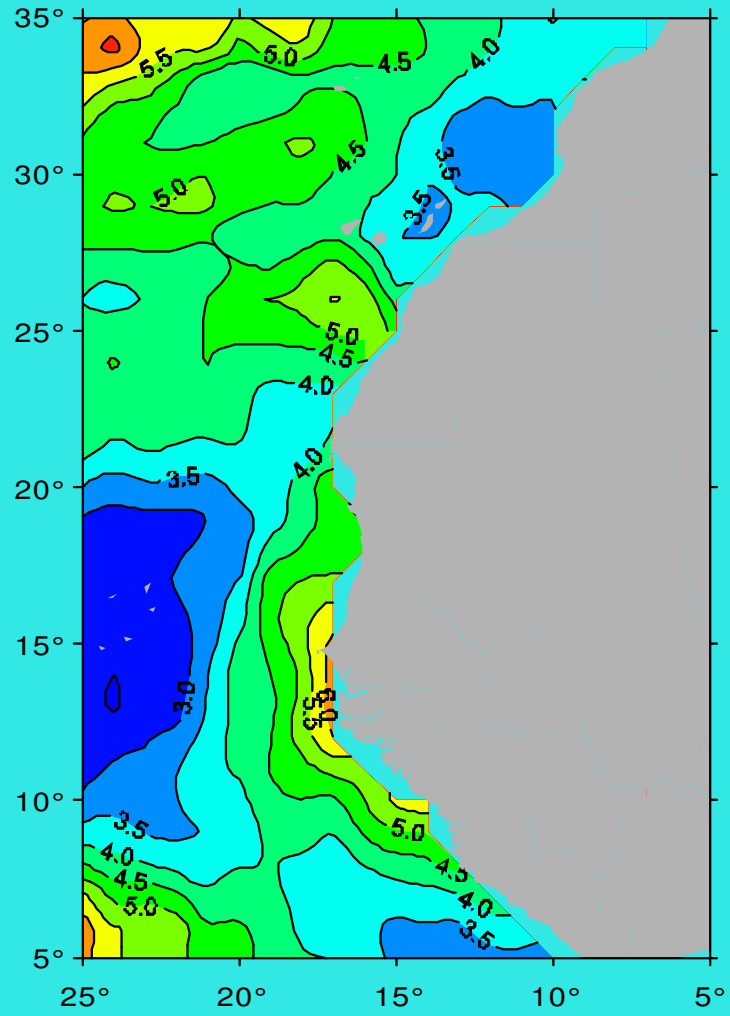
1994	4	4	4	4	4	4	4	4	4	4	2	2
1995	2	1	1	1	1	1	1	1	1	1	1	1
1996	1	1	1	1	1	1	1	1	1	1	1	1
1997	1	1	1	1	1	1	1	1	1	1	1	1
1998	1	1	1	1	1	1	1	1	2	2	2	2
1999	2	2	2	2	2	2	2	2	3	3	3	3
2000	3	3	3	3	3	3	3	3	3	3	3	3
2001	2	2	2	2	1	1	1	1	1	1	1	1
2002	1	1	1	1	1							

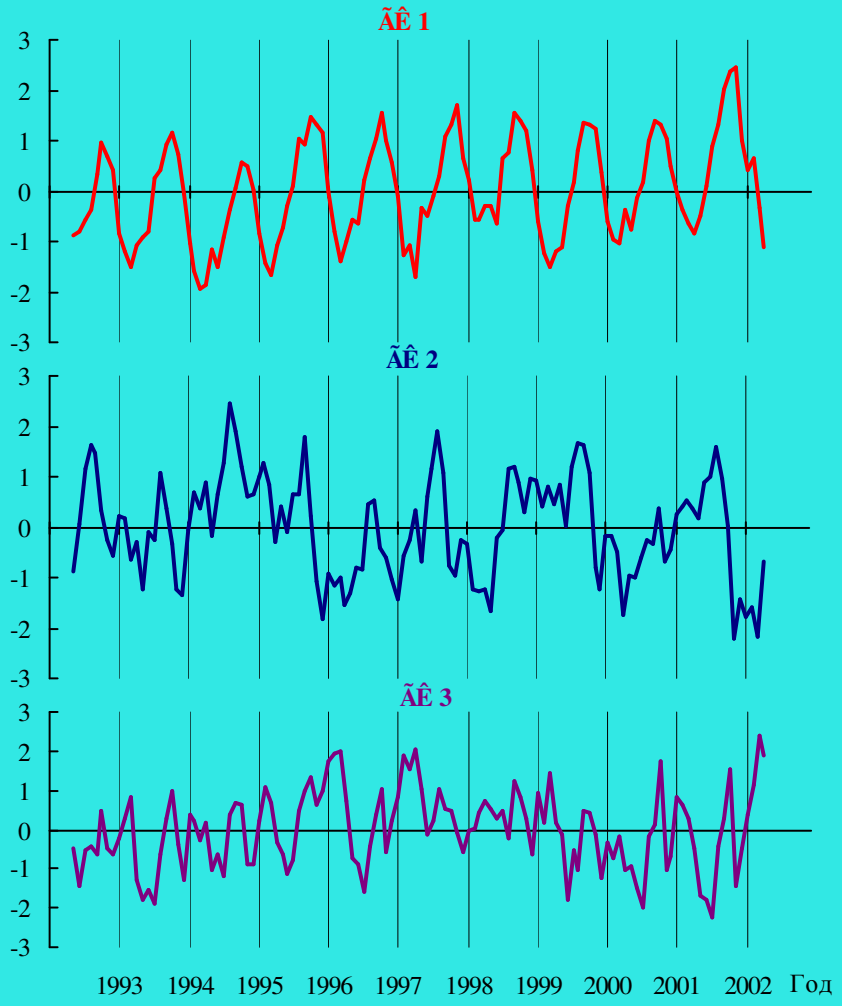
Distribution of the long-term mean sea level (a) and its standard deviation (б) in 1992-2002, cm



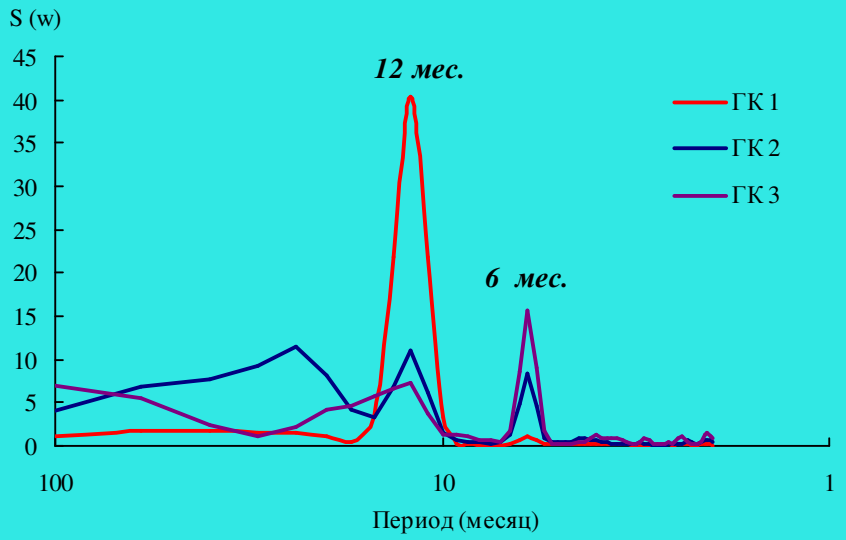
а)



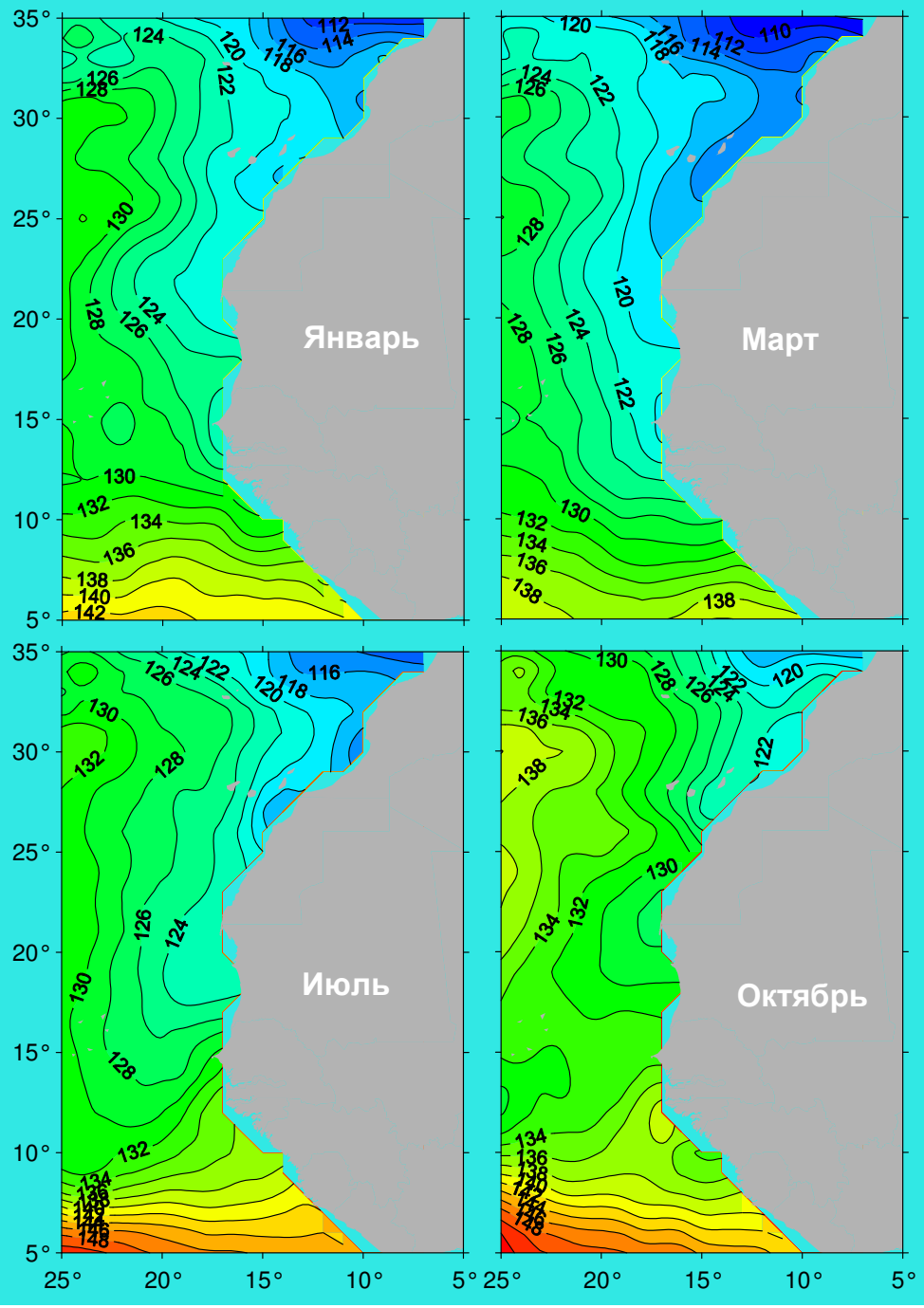
б)



Temporal variations for the first three PCs of the SLA decomposition

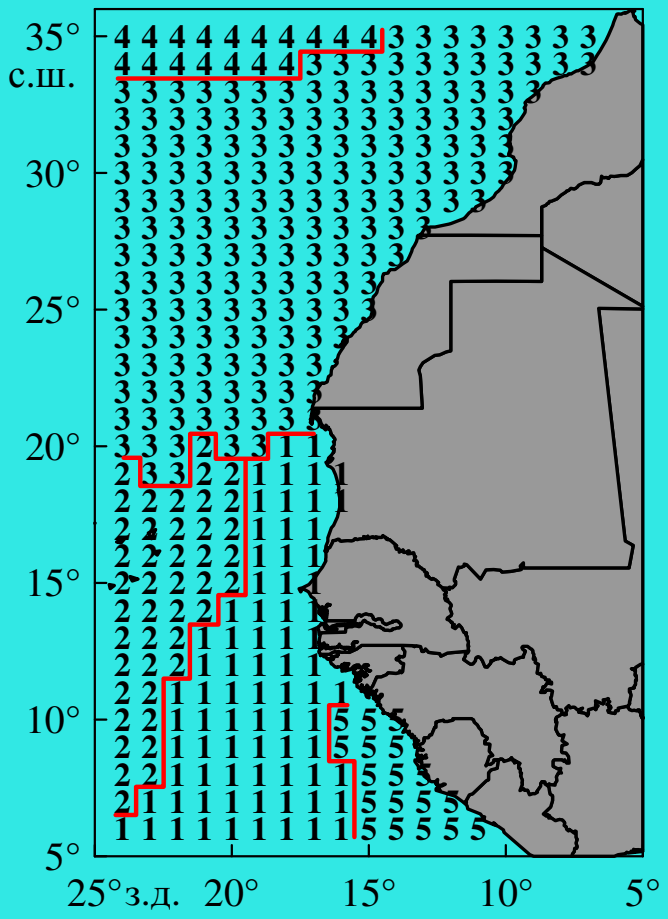


Spectral density function of the time series for the first three PCs of the SLA field decomposition

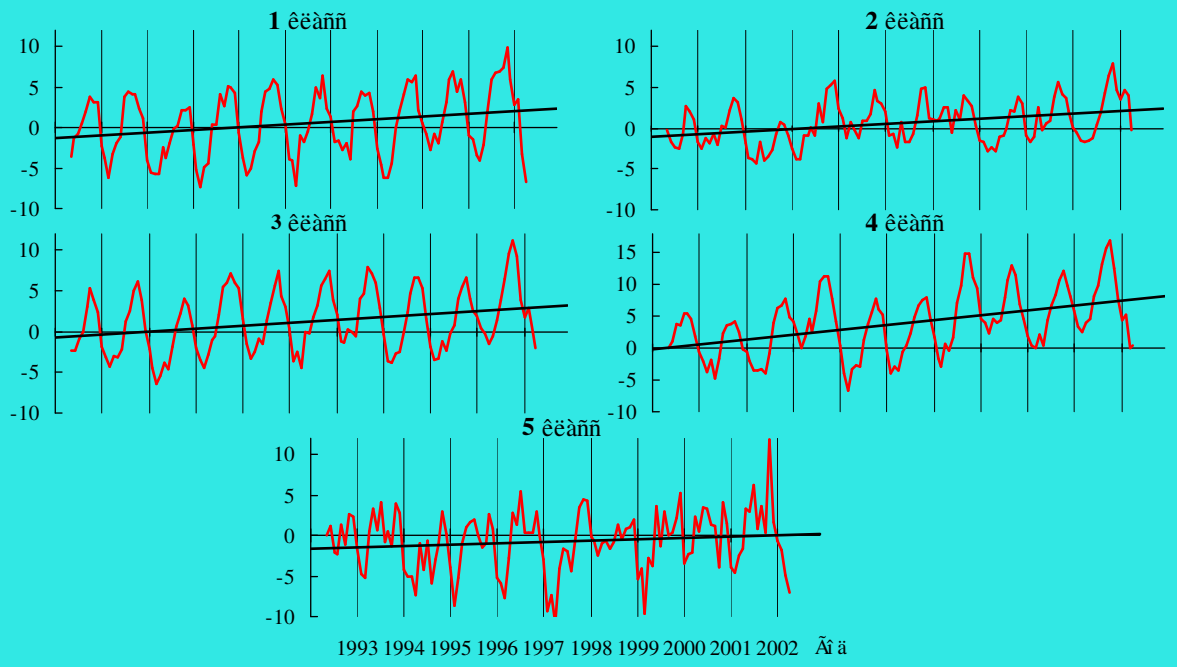


Distribution of the SLA long-term means in January, March, July, October in 1992-2002, cm

Канарский апвеллинг

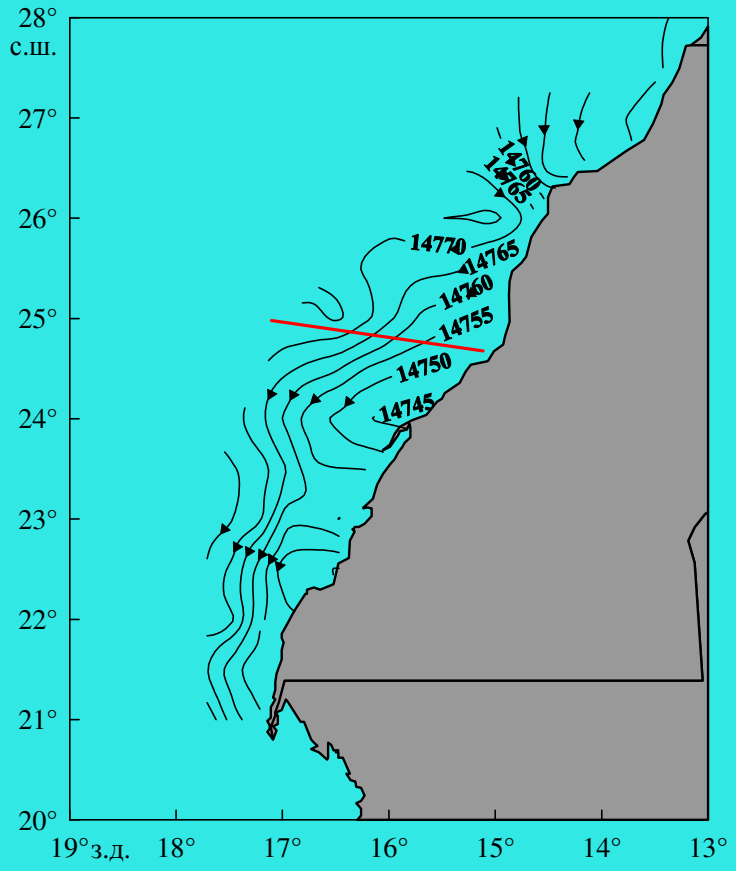


The Central Eastern Atlantic zoning basing classification of the SLA monthly means by space (figures mean class number)

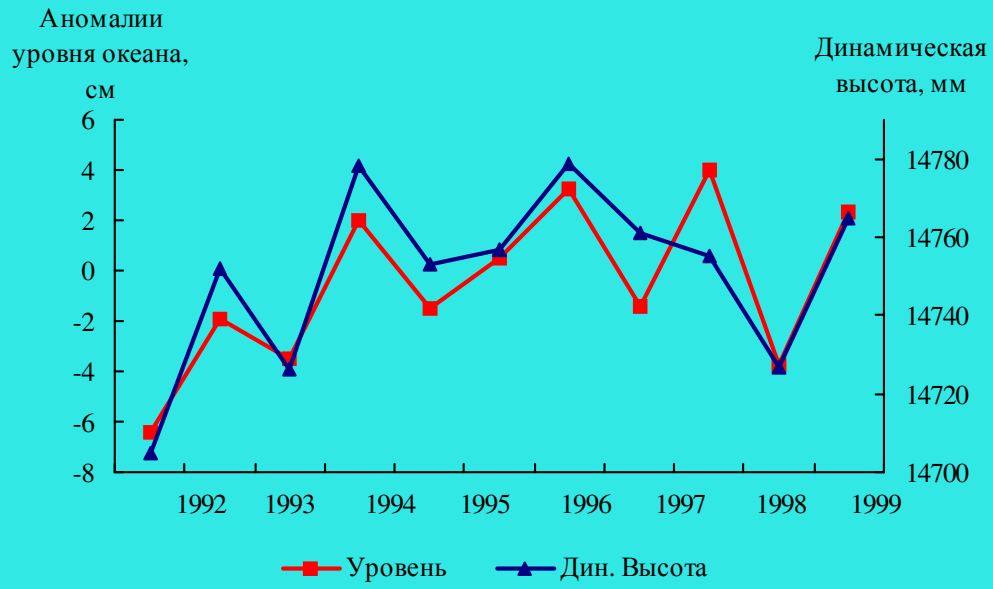


Temporal variability of the SLA monthly means averaged by spatial class

Канарский апвеллинг

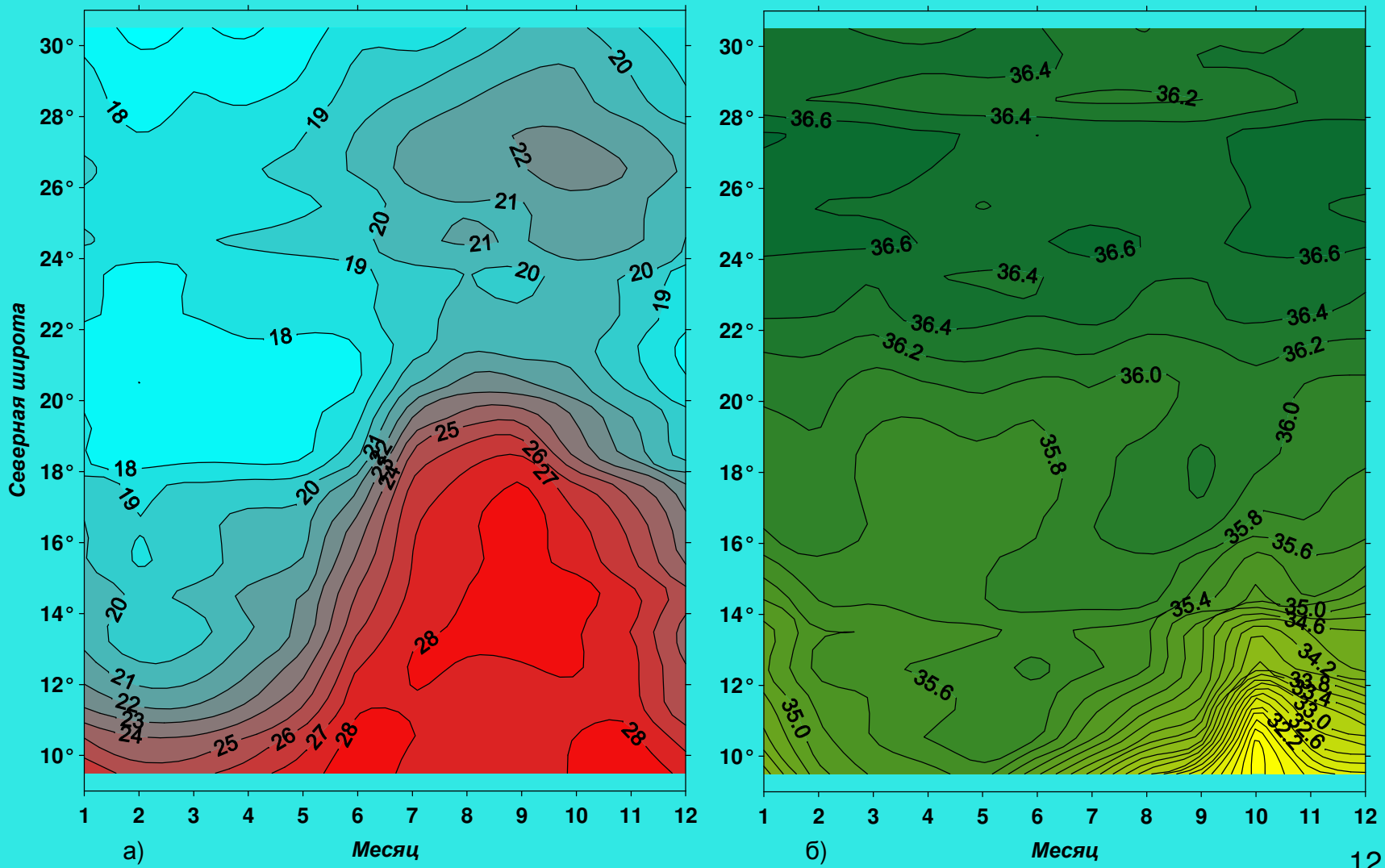


Dynamic topography of the sea surface relative to 200 db STM "AtlantNIRO" data, February 26 – April 5, 1998) (isolines are drawn in 5 dyn.mm)

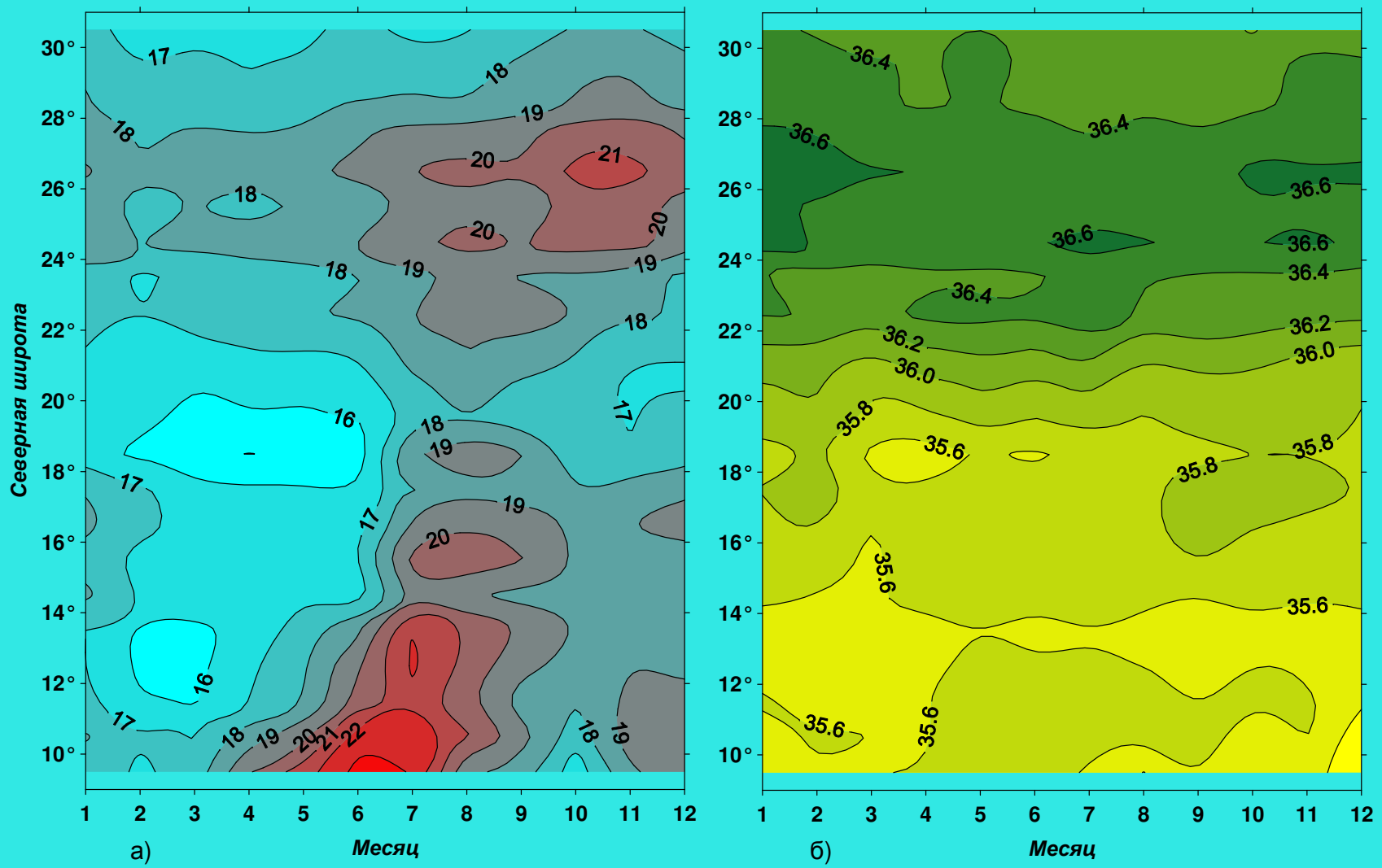


Oceanographic surveys data-based temporal variability of the sea surface mean dynamic height relative to 200 db and satellite altimetry data-based temporal variability of the SLA off Morocco

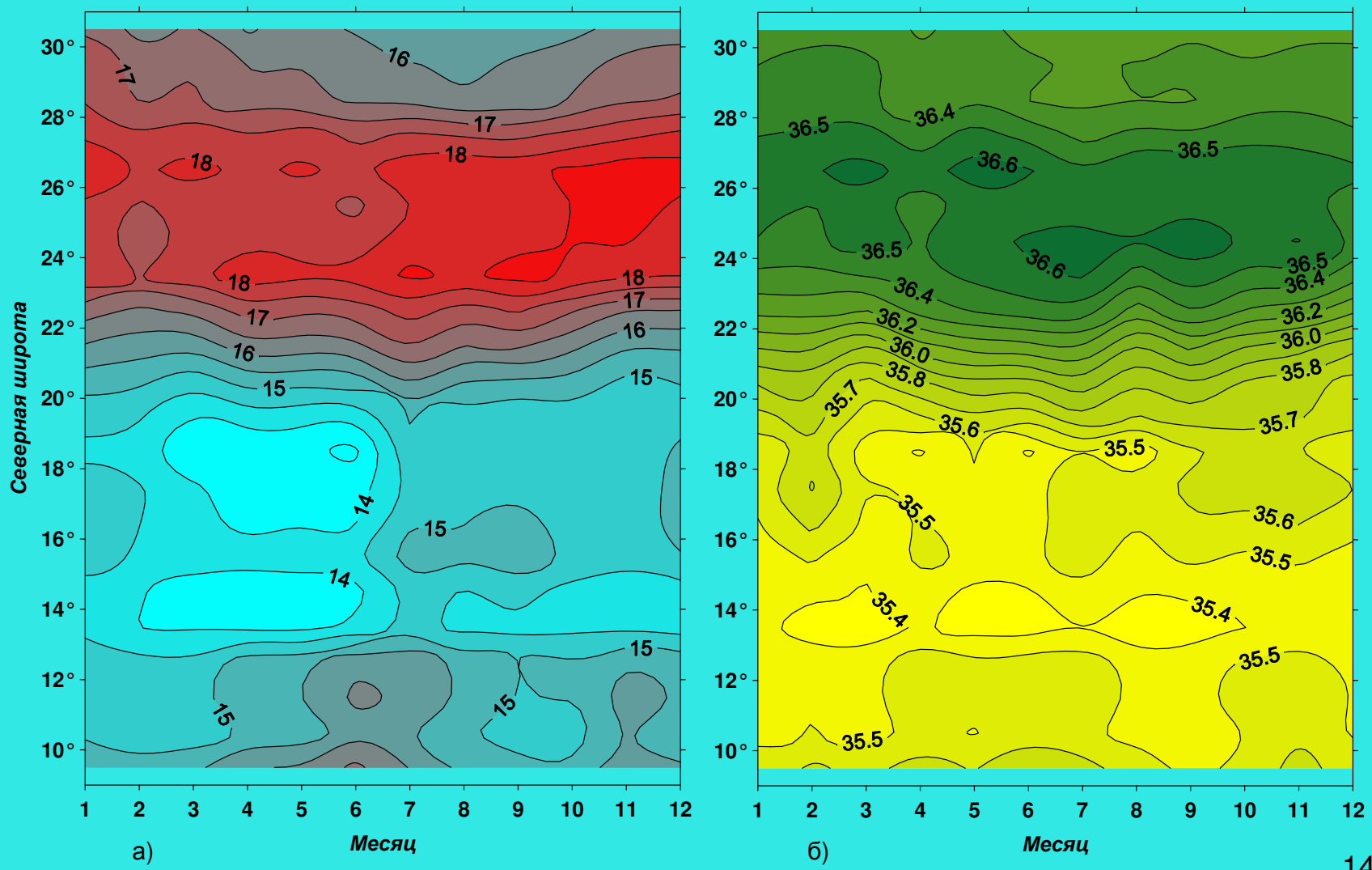
Spatial-temporal variability for the long-term temperature (a) and salinity (б) means at 0 m

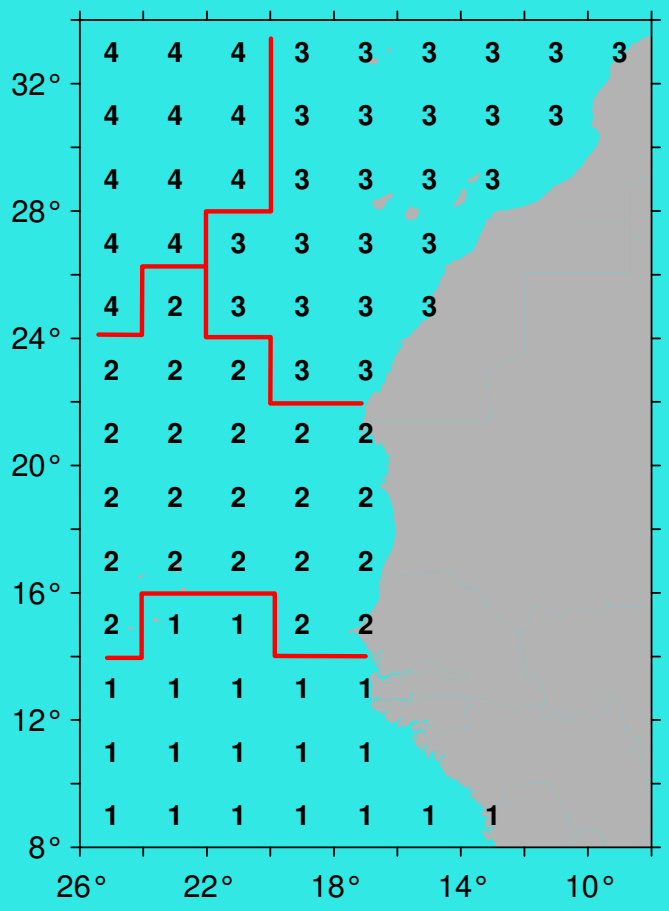


Spatial-temporal variability for the long-term temperature (a) and salinity (б) means at 50 m

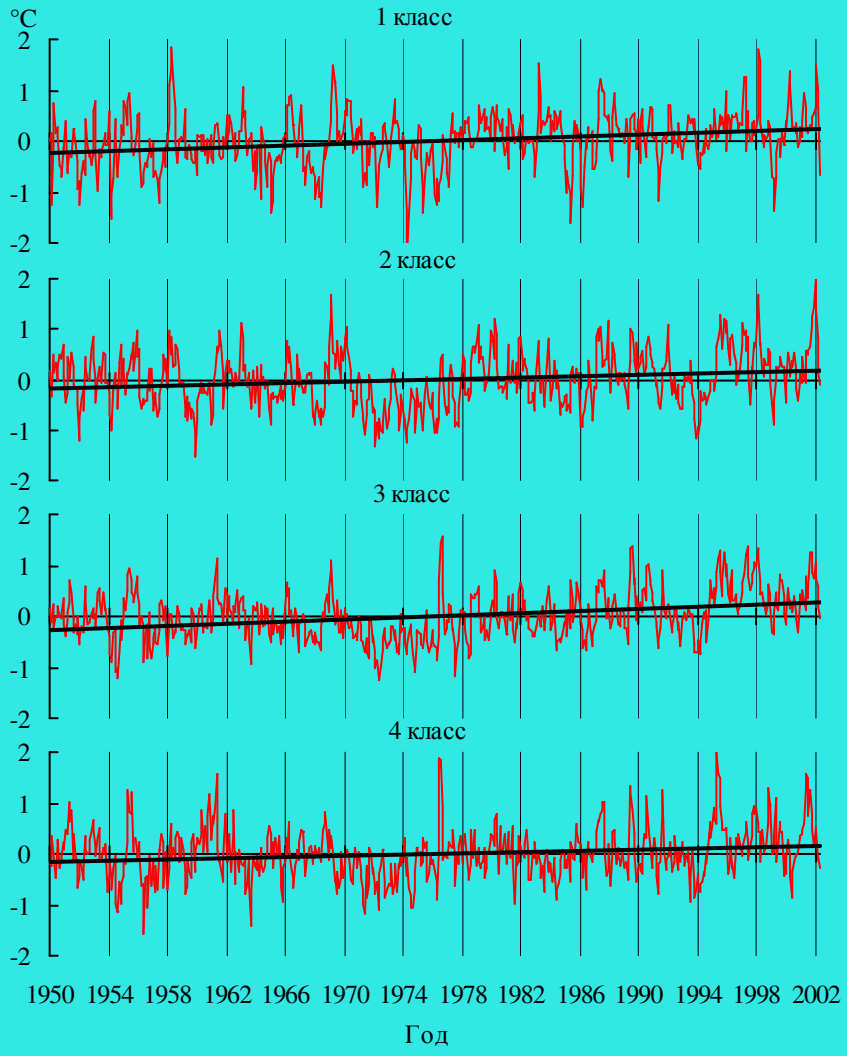


Spatial-temporal variability for the long-term temperature (а) and salinity (б) means at 100 m

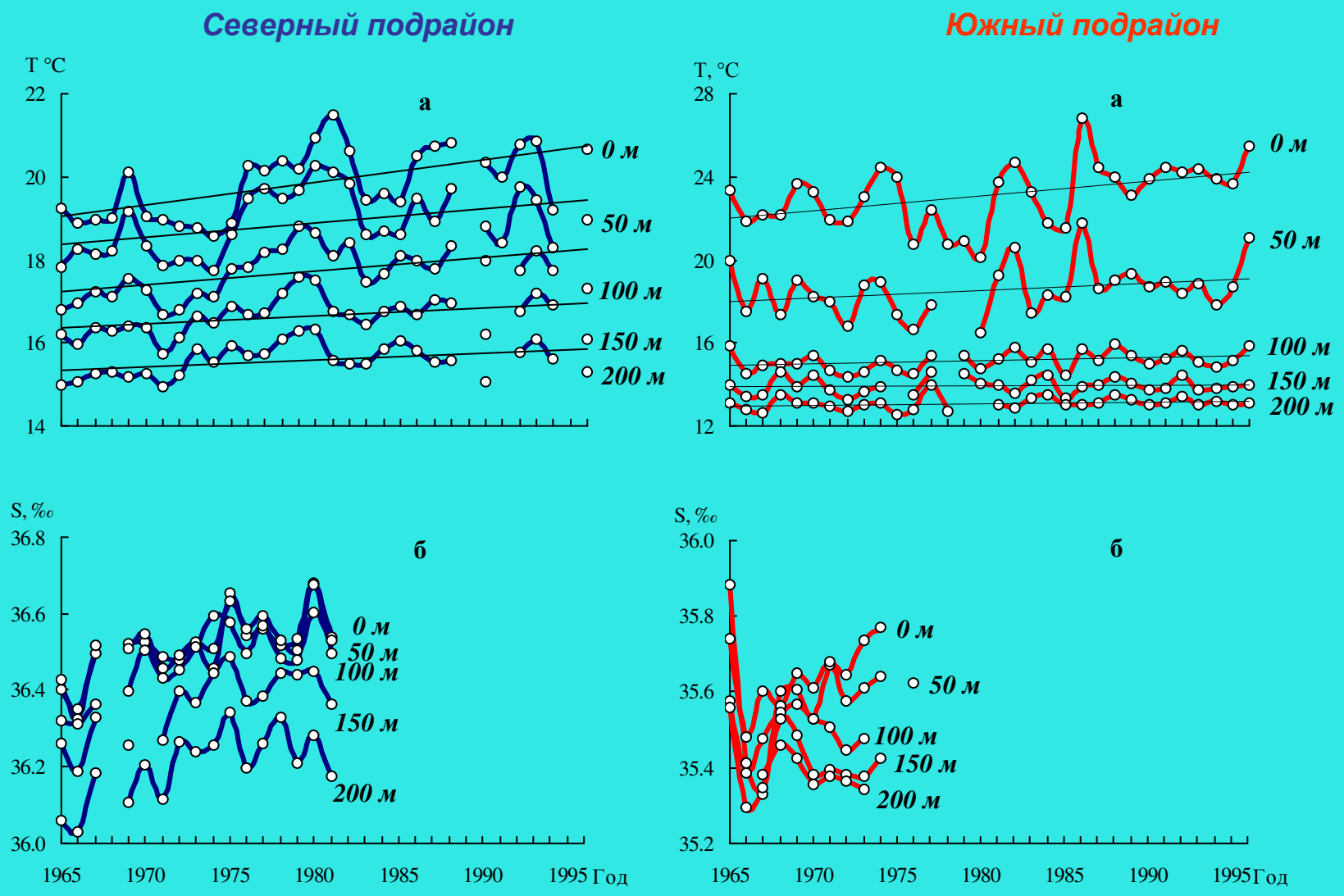




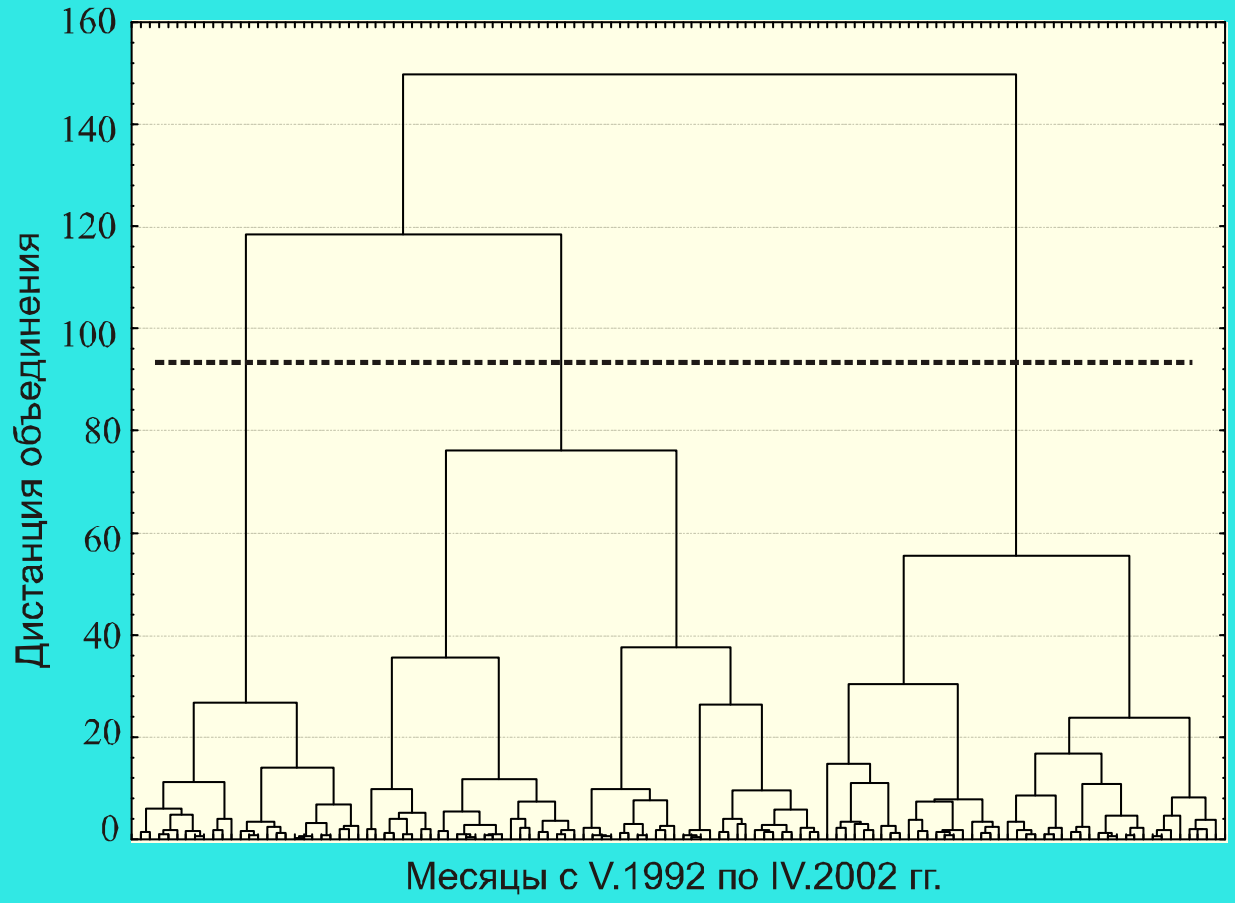
The Central Eastern Atlantic zoning basing classification of the SST anomaly monthly means by space (figures mean class number)



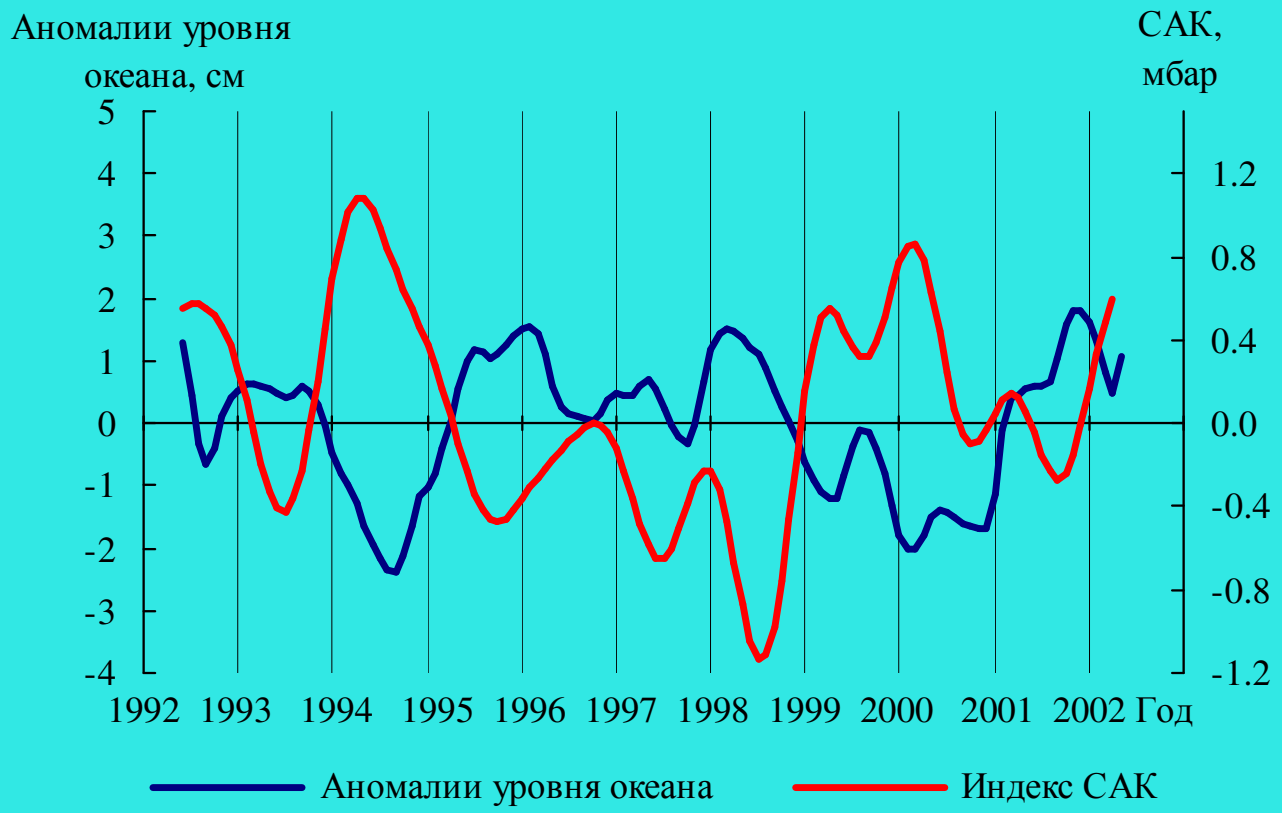
Temporal variability of the SST anomaly monthly means averaged by space classes



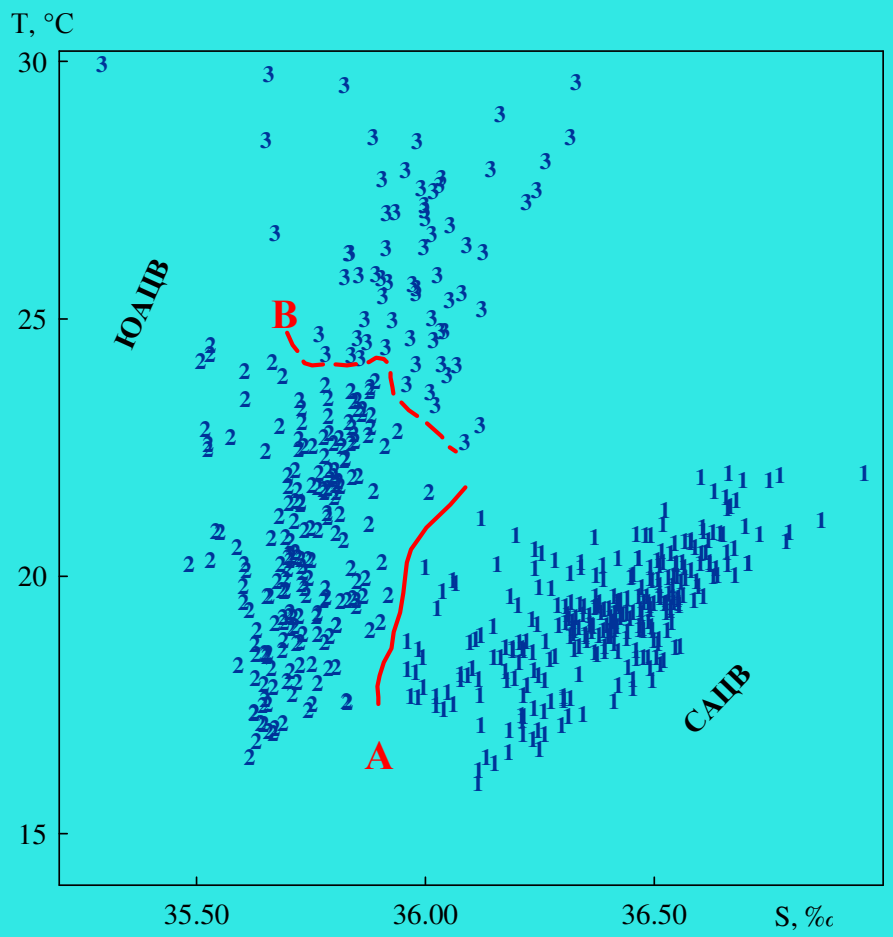
Variability of the temperature (a) and salinity (б)
annual means at different depths in the northern and southern sub-area



Ward's method-based hierarchical classification for the SLA interannual variability in the Central Eastern Atlantic (a dotted line shows the selected classification version)

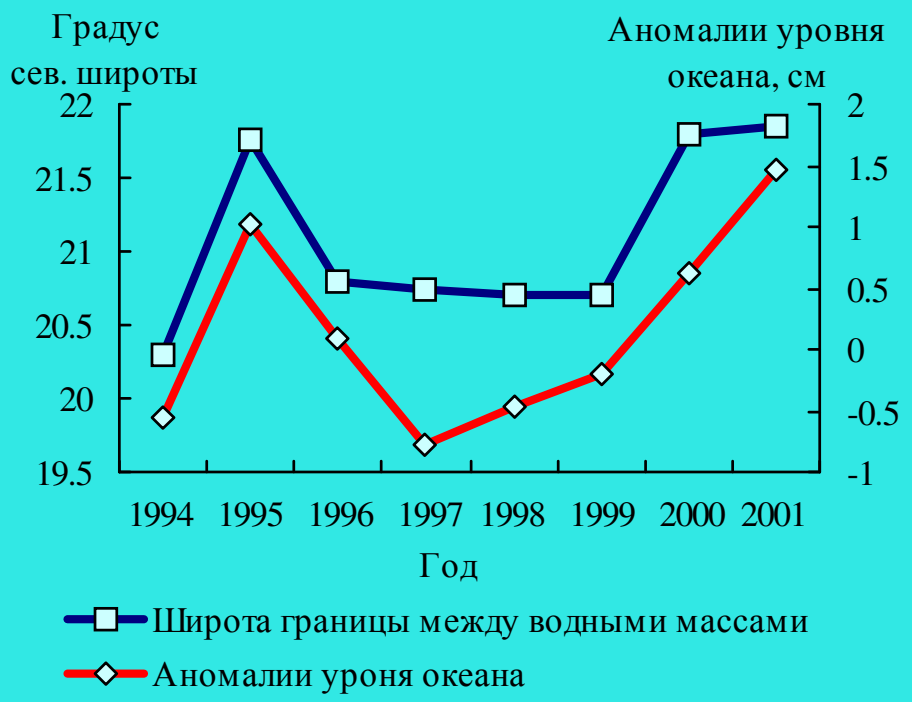


Variability of the sea level anomalies within the Canary Current; variability of the NAO index



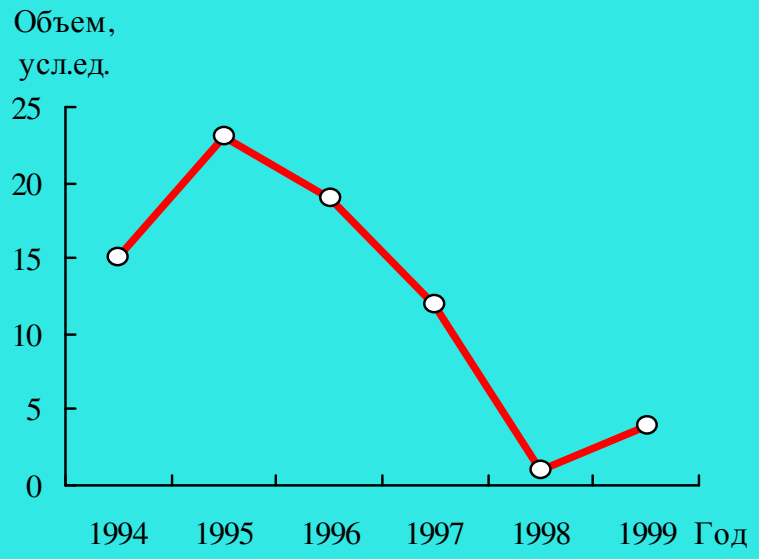
САЦВ – северная атлантическая центральная водная масса;
ЮАЦВ – южная атлантическая центральная водная масса;
цифры – номера классов;
линии А и В – границы между классами

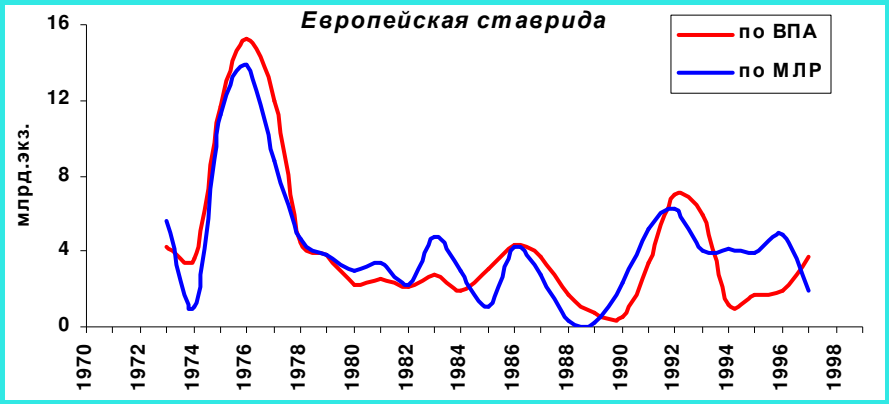
Temperature and salinity weighted means-based T,S-diagram for water masses within 0 and 100m (bottom) (Data of the 1994-2001 summer surveys conducted in the zones of Morocco and Mauritania) (САЦВ - NACW; ЮАЦВ - SACW: figures - class numbers; lines A and B - boundaries between classes)

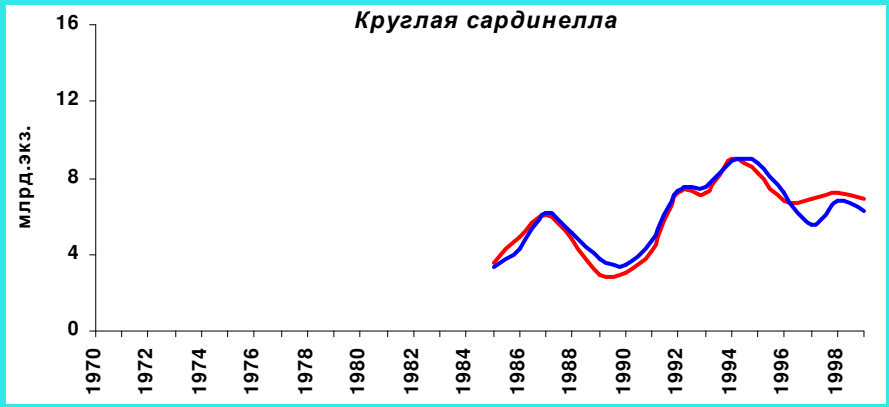


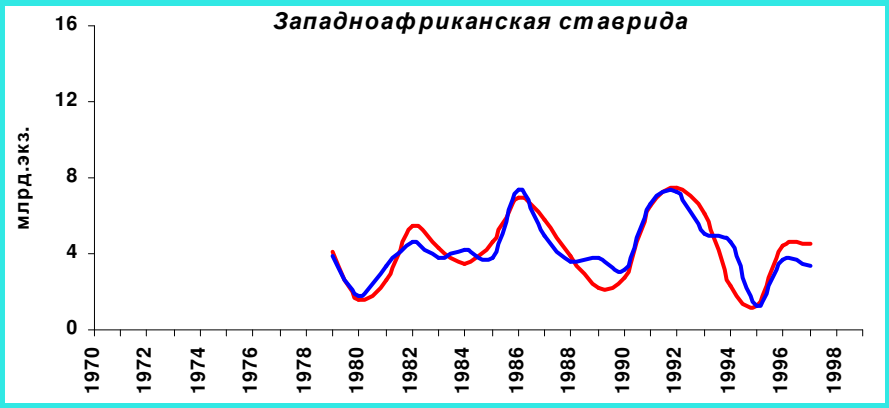
Variability of the boundary location between water masses of north and south origin in summer and sea level anomaly means in sub-area 1 (NECC)

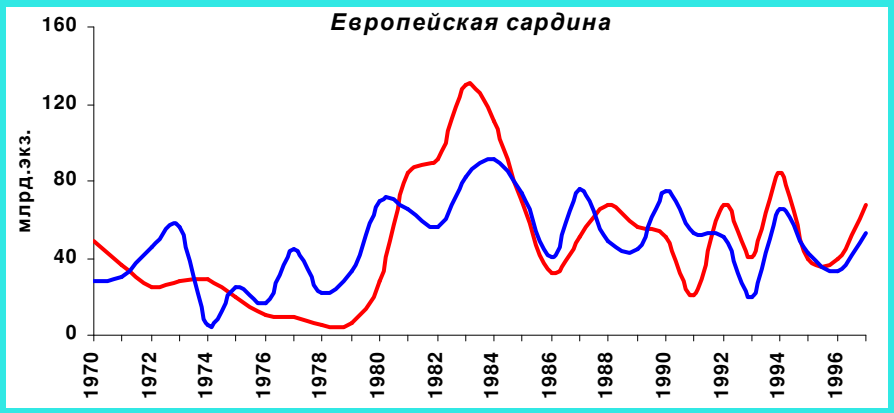
Variation of the SACW volume between 50 and 250 m to the north of 21 °N (T,S-analysis-based oceanographic data collected in 1994-1999)





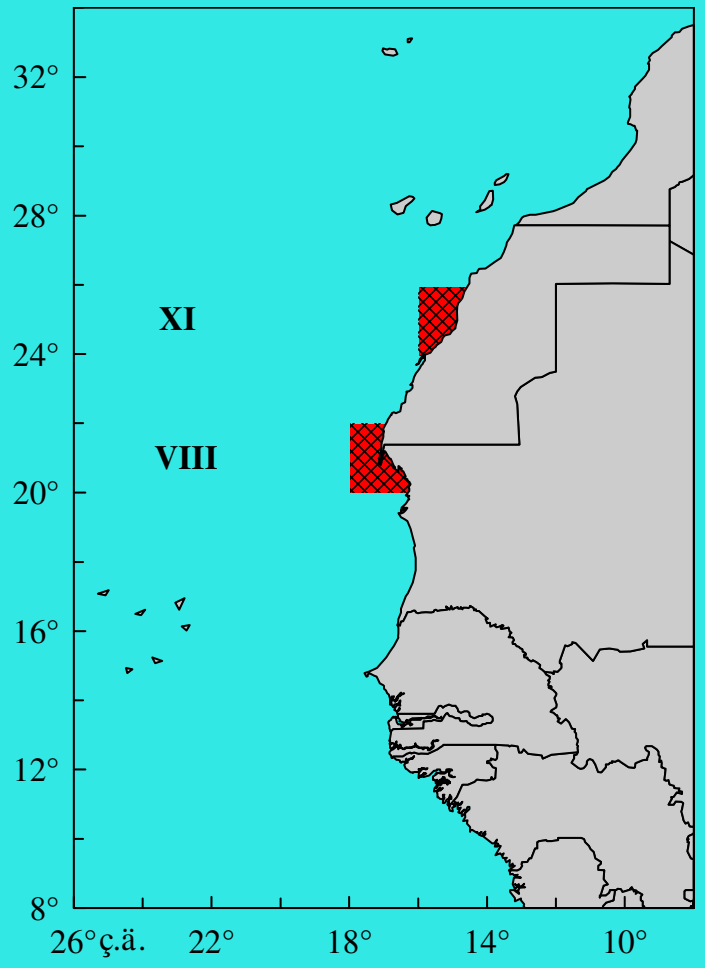




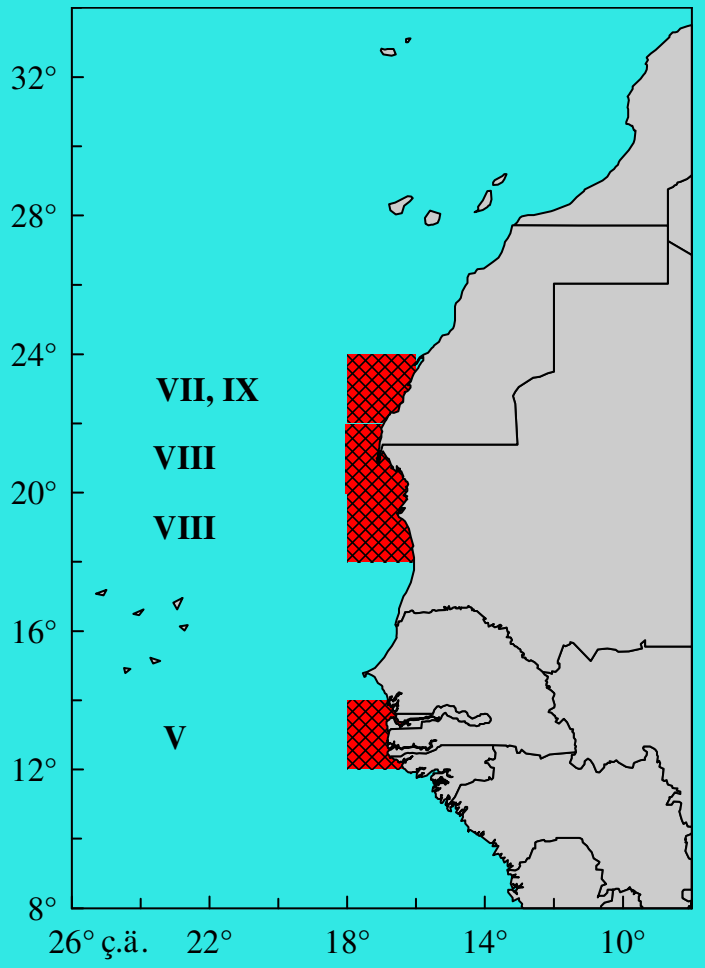


VPA method and multiple regression model-based approximation of the interannual variations in the recruitment abundance of four fish species from the Central Eastern Atlantic

Европейская ставрида

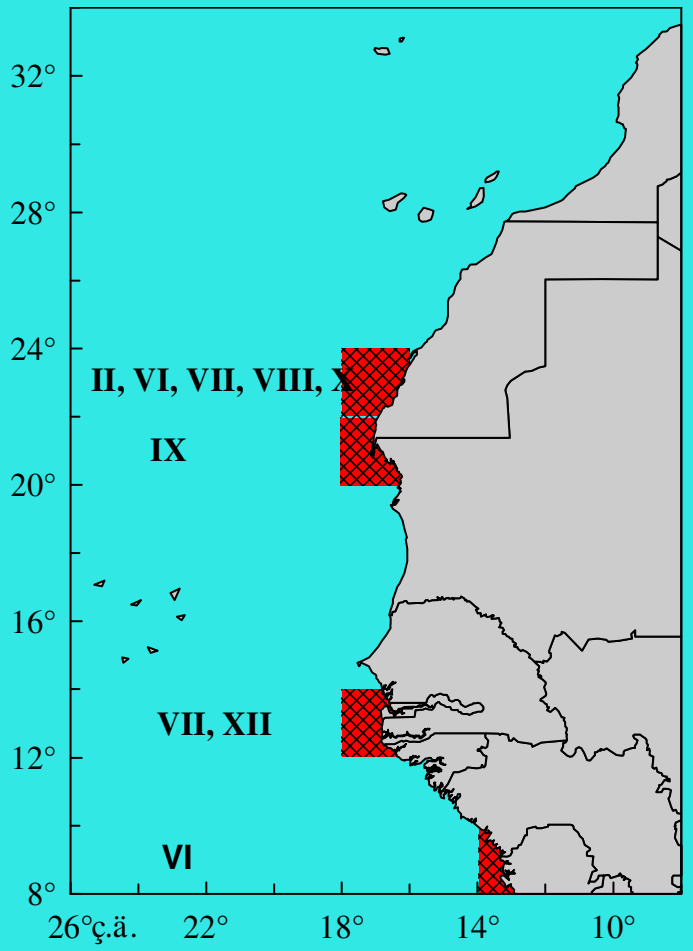


Западноафриканская ставрида

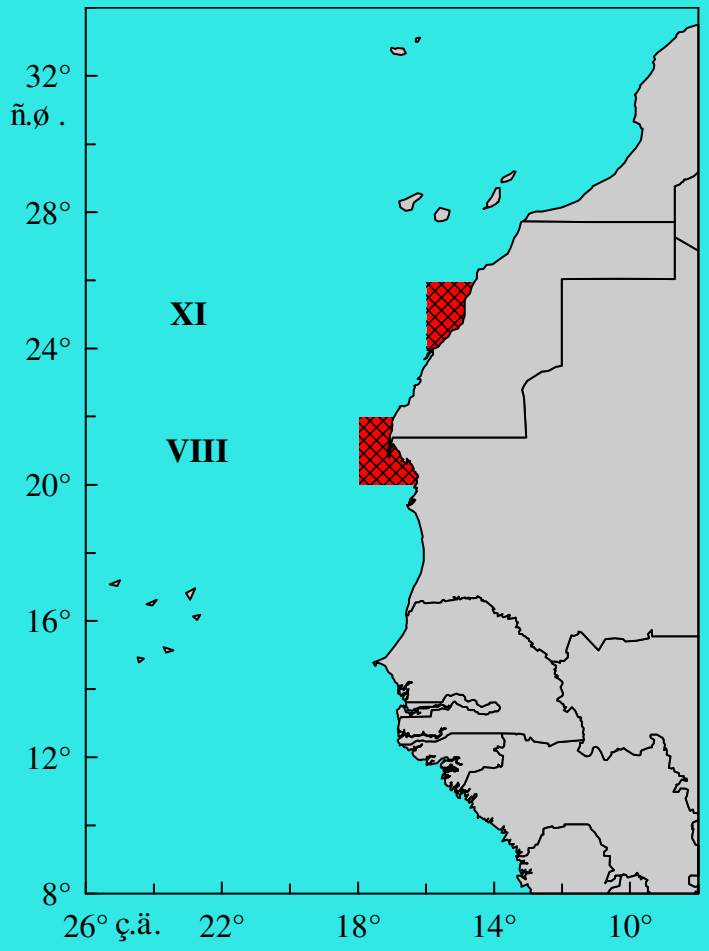


Distribution of grounds where significant correlation upwelling index and European horse mackerel and West African horse mackerel recruitment abundance occur
(Roman numerals indicate months in which the mentioned correlation can be traced)

Круглая сардинелла



Европейская сардина



Distribution of grounds where significant correlation upwelling index and round sardinella and European pilchard recruitment abundance occur (Roman numerals indicate months in which the mentioned correlation can be traced)


UME DU MAROC
INRH
ASABLANCA
FEDERATION DE R
ATLANT NIR
KALININGRAD
Coopération de Recherche
Halieutique
1992–1998
Offert Par l'INRH en Hommage
x Chercheurs et à l'Equipage du N/O ATLANT NI
Casablanca 13 Aout 1998