MESOZOOPLANKTON IN THE AEGEAN SEA (E.MEDITERRANEAN SEA): DIFFERENCES AMONG DECADES

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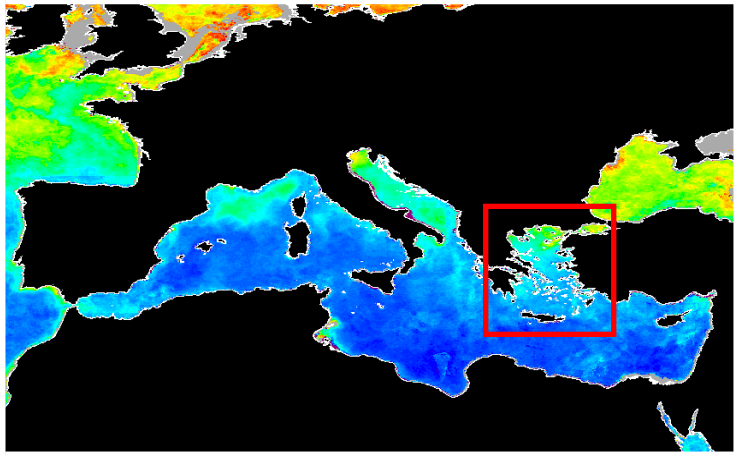
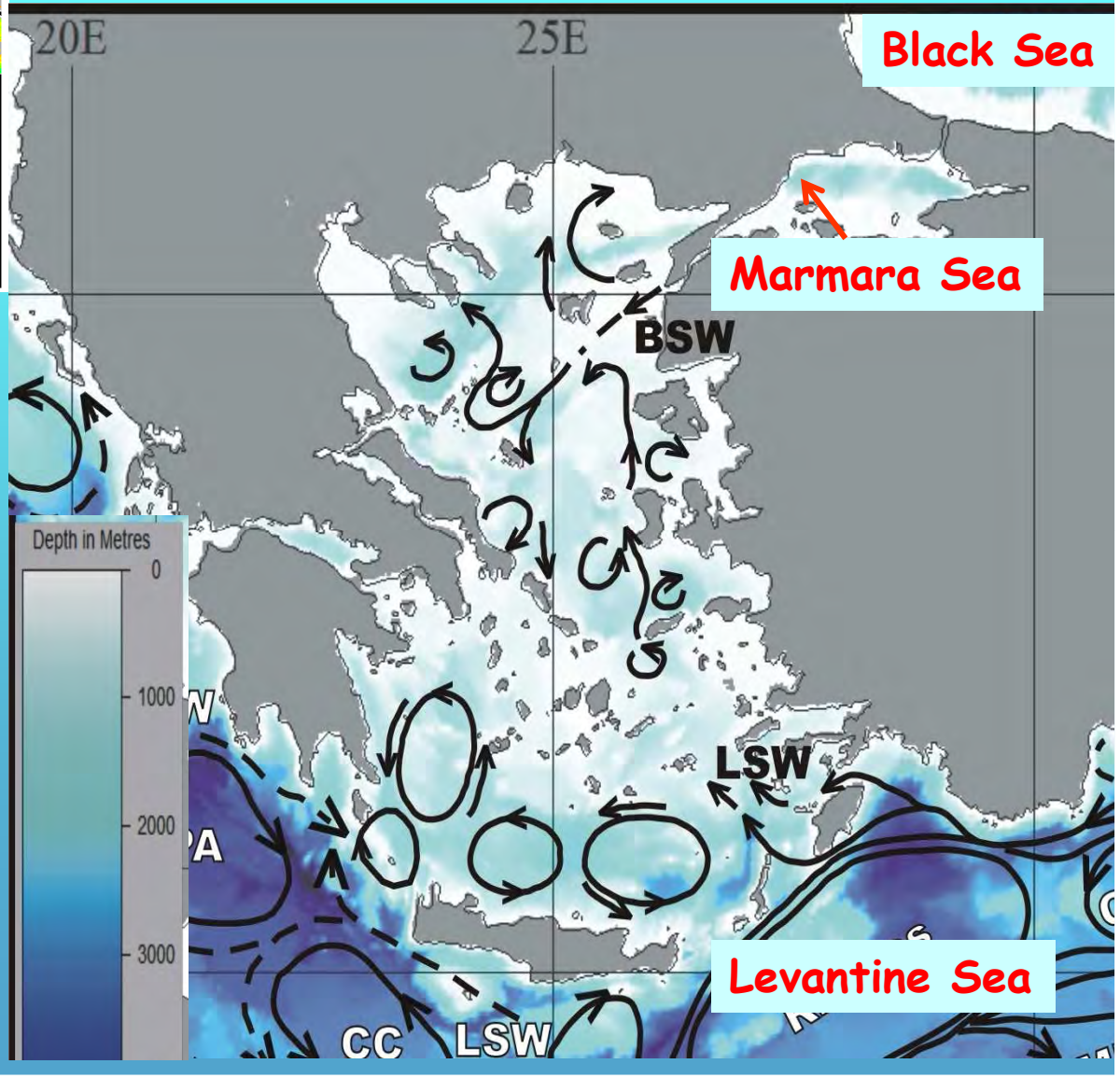
Aegean Sea



Bathymetry, hydrology and circulation

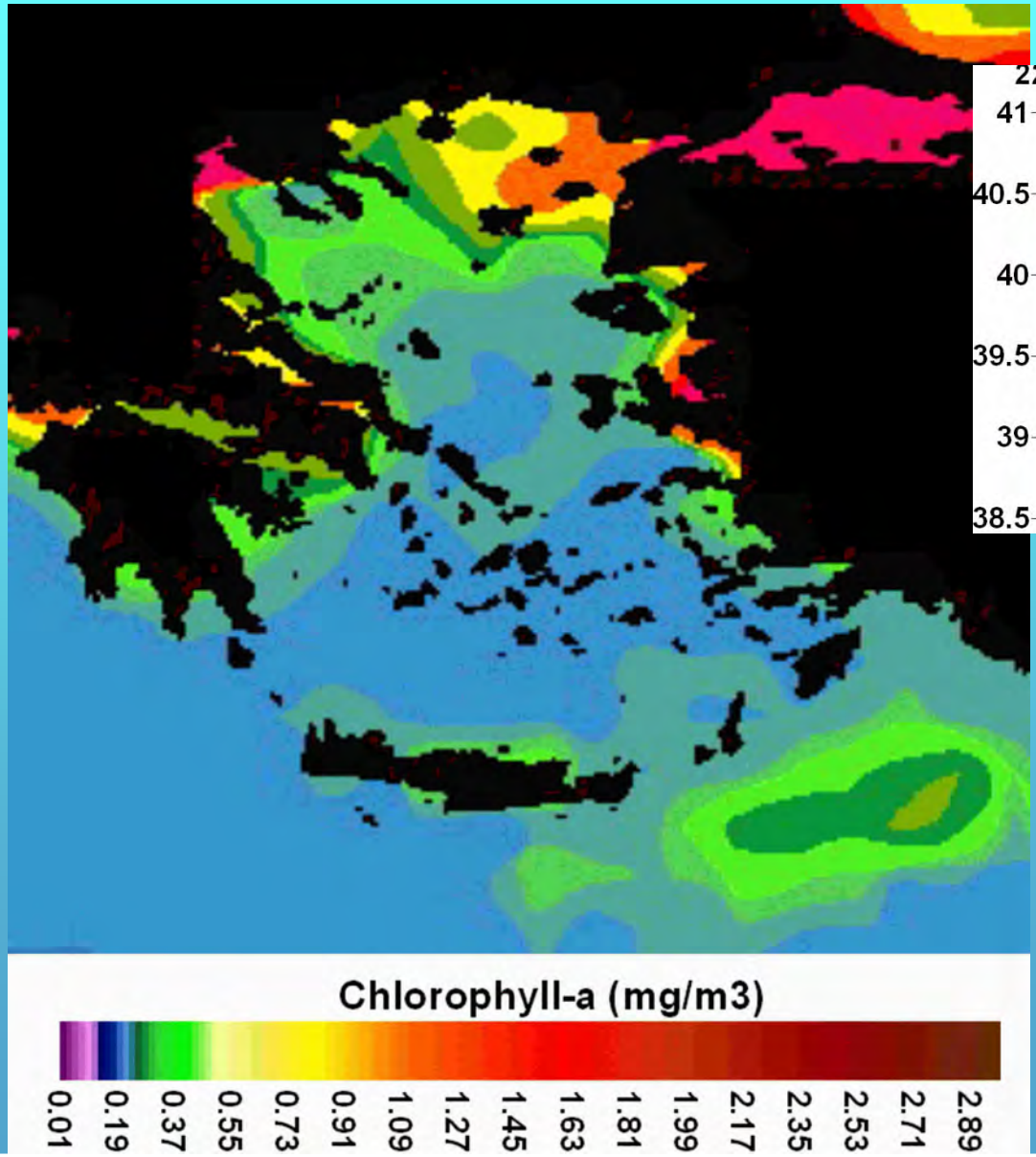


NE: Entrance of modified Black Sea water- with low S- high nutrients

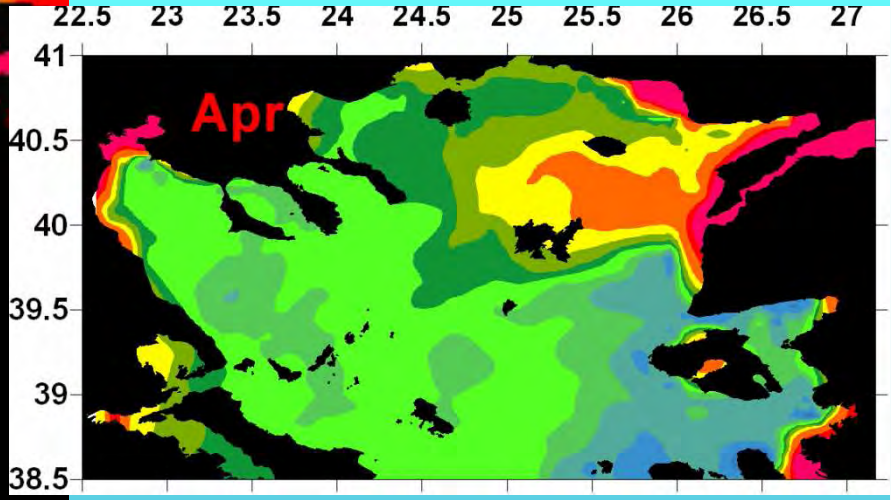
SE: Entrance of Levantine Sea water with high S-low nutrients

Chlorophyll distribution (Satellite)

March 2007



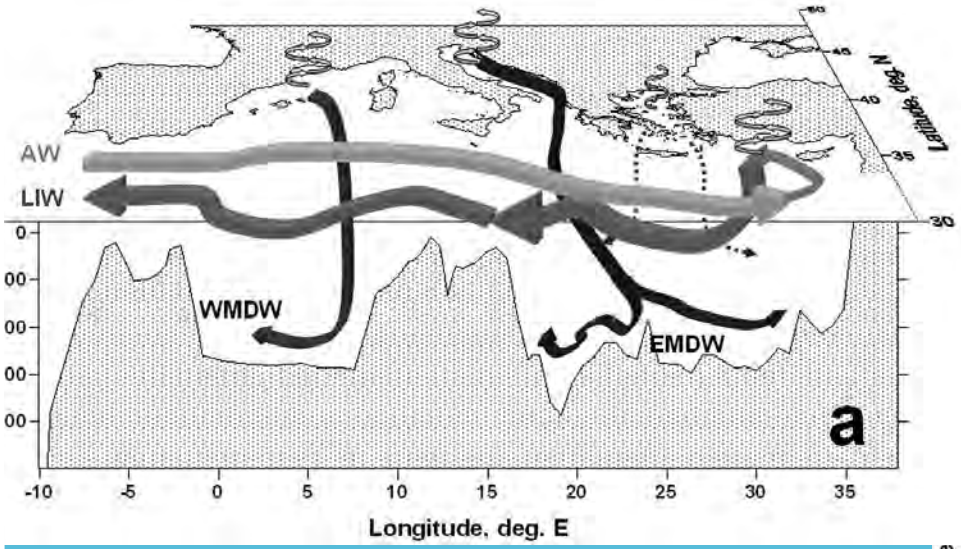
April 2003

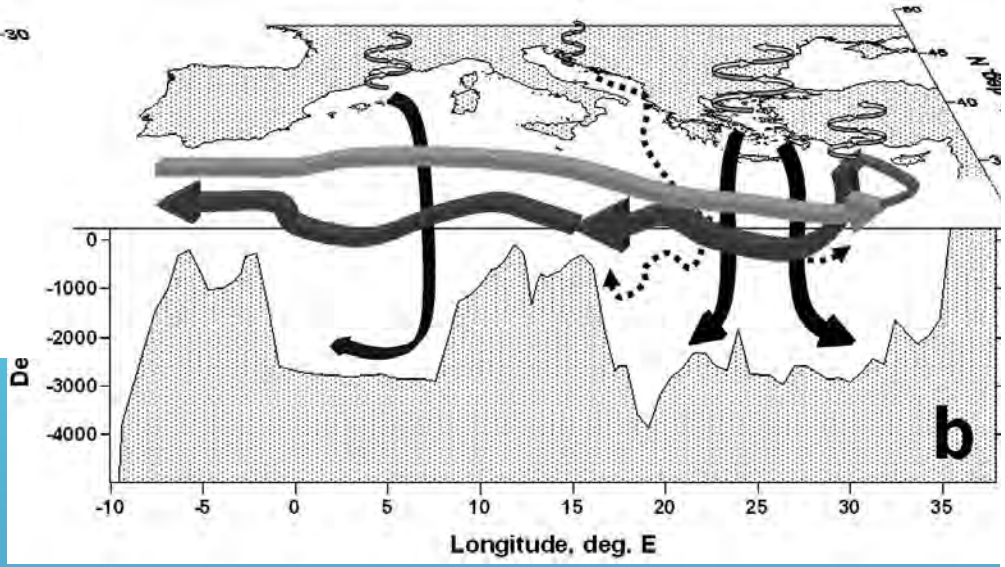


1991-1993 Eastern Mediterranean Transient

Shift of the source of E. Mediterranean Deep water from the Adriatic to the Aegean: increase of salinity (decrease of precipitation), intense deep water formation in S.Aegean, outflow in the EMedit

Pre-EMT (a) and Post-EMT (b) thermohaline circulation patterns

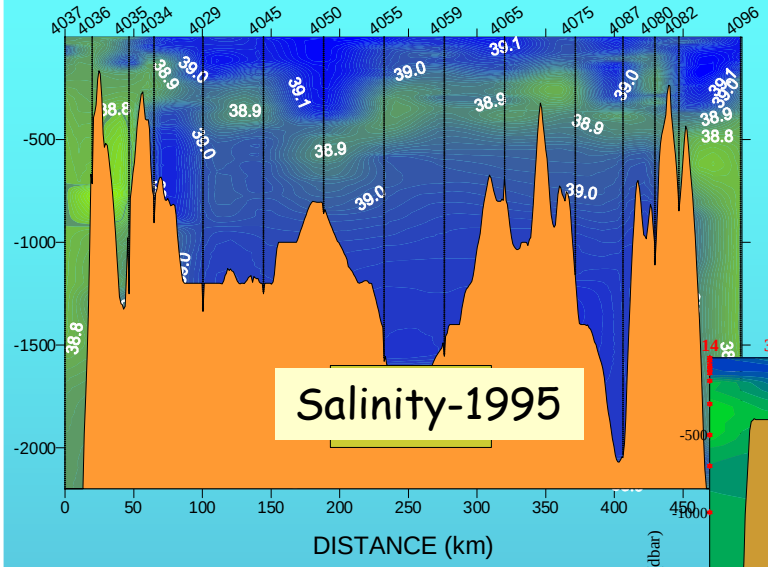




Tsimplis et al., 2006

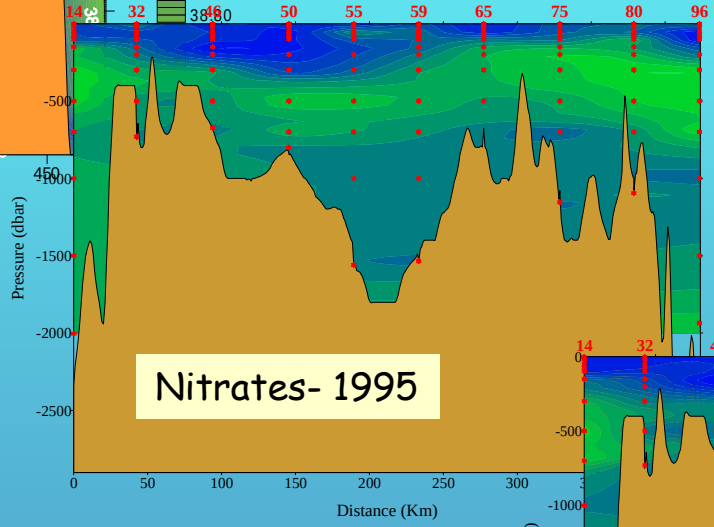
Uplifting of the old-EMDW (Adriatic) by several thousand meters.

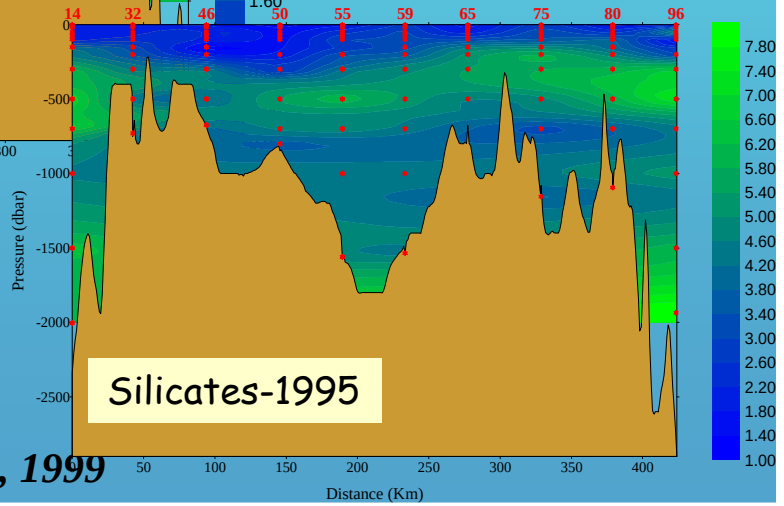
Consequences : Intrusion of the old deep Mediterranean waters –rich in nutrients-into the South Aegean (1992-2008), formation of a distinct layer 200-600m.

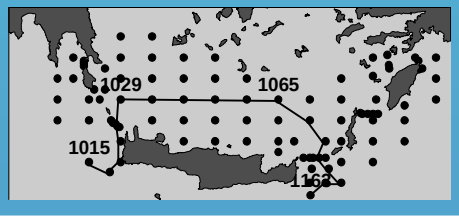


Increased availability of nutrients in the euphotic layer following winter mixing

Theocharis et al., 1999







Souvermezoglou et al., 1999

Aim

Comparison of the mesozooplankton total abundance and dominant species among the decades:

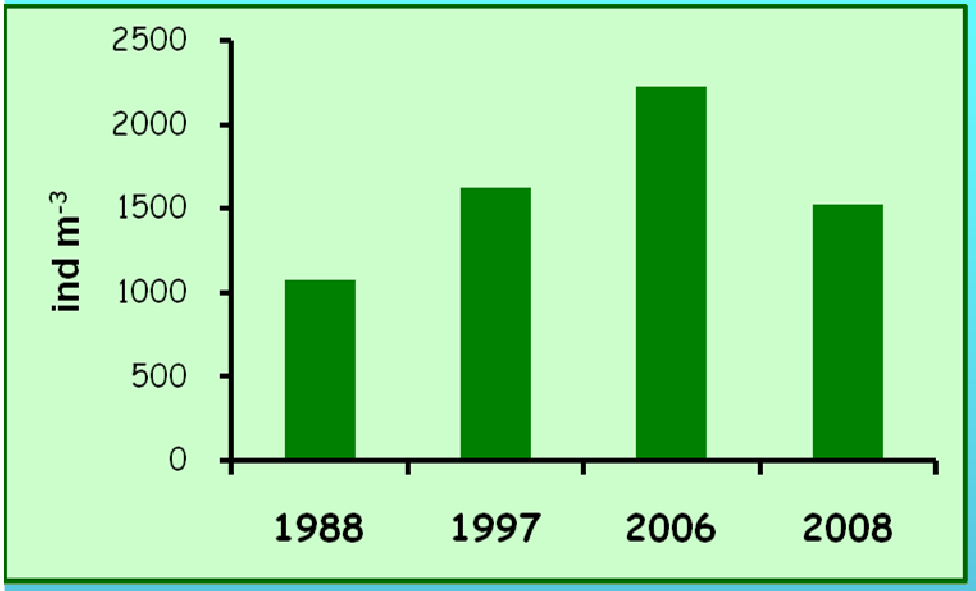
mid 1960's,
late 1980's,
late 1990's
late 2000's

Work performed within the EU project SESAME
(Southern European Seas: Assessing and Modelling Ecosystem changes)

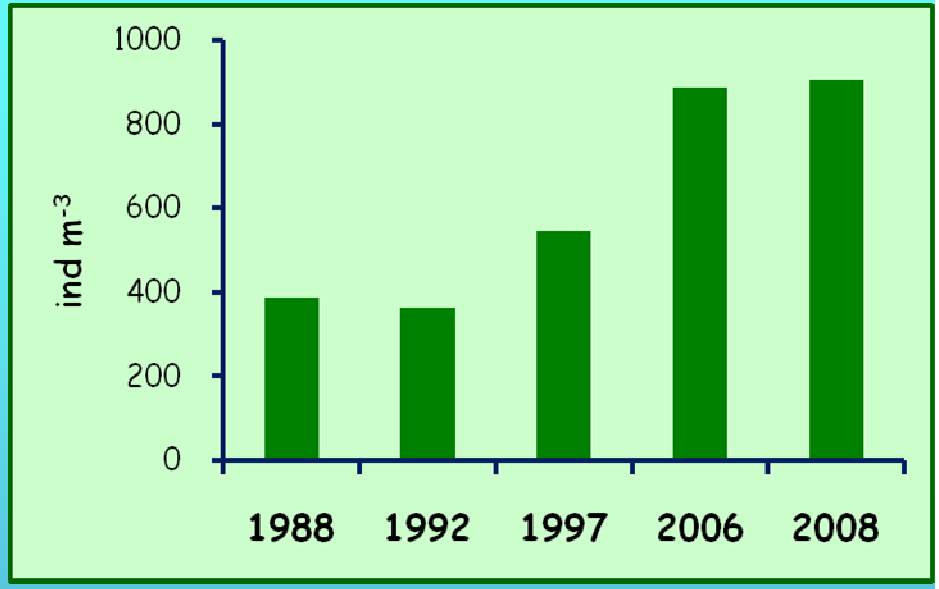
I. Changes in Mesozooplankton total abundance

Early spring

North Aegean Sea



South Aegean Sea



Causes

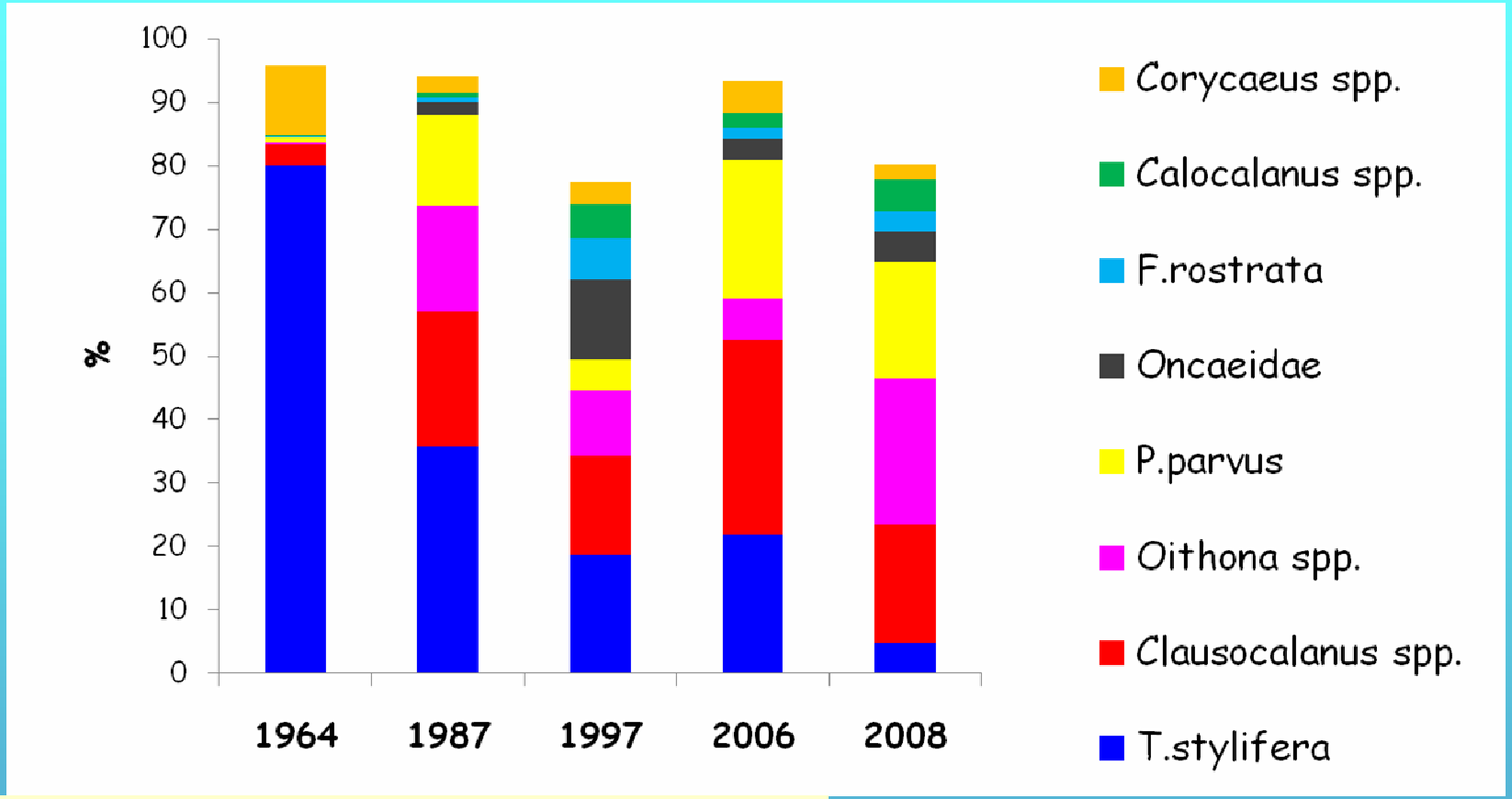
1. Increase of nutrients concentration in the inflowing modified Black sea water
2. Deep vertical mixing (deep water formation) in the troughs of N.Aegean

Cause

Intrusion of the old deep Mediterranean water during and after the Eastern Mediterranean Transient

II. Changes in the species dominance and rank order

North Aegean August-September



Increase

Clausocalanus spp. (C.furcatus): from 6th to 1st or 2nd

Oithona spp. rare-3rd-1st

Paracalanus parvus

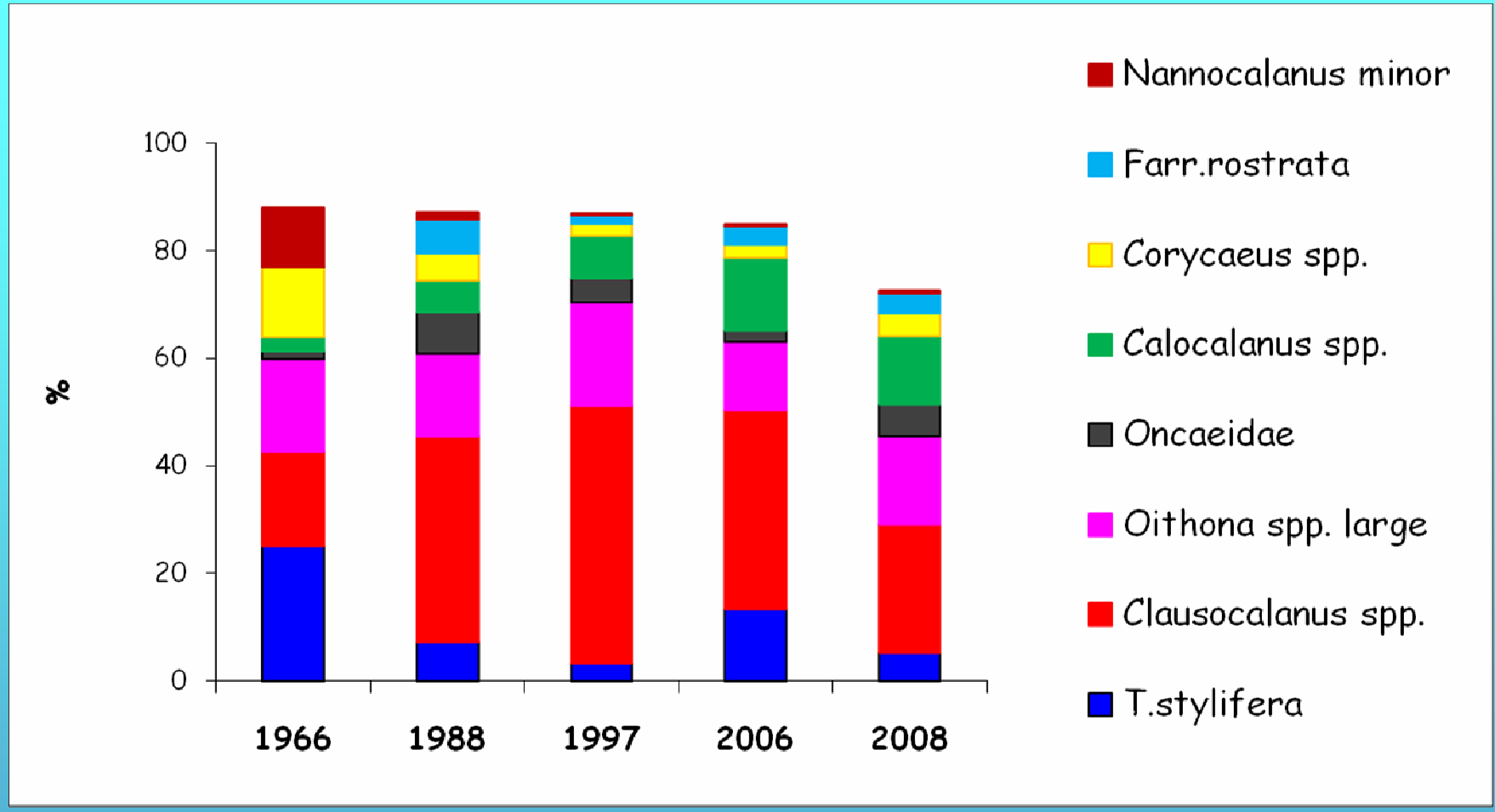
Calocalanus spp.

Decrease

T.stylifera

Corycaeus spp.

South Aegean August-September



Increase

Clausocalanus spp. (C.furcatus): from 2nd to 1st

Calocalanus spp.

Decrease

T.stylifera: from 1st to 4-5th

Corycaeus spp.,

N.minor

SIMILAR CHANGES IN SPRING

Decrease

Temora stylifera,

Nannocalanus minor

C.helgolandicus

Corycaeus spp.,

Warm temperate

Increase

Clausocalanus furcatus,

Oithona spp. (O.plumifera, setigera, atlantica)

Oncaeidae (O.media, O.mediterranea)

Calocalanus spp,

Farranula rostrata

Ctenocalanus vanus

Warm temperate to subtropical

Probably related to temperature increase

Tropicalization of the Mediterranean Sea