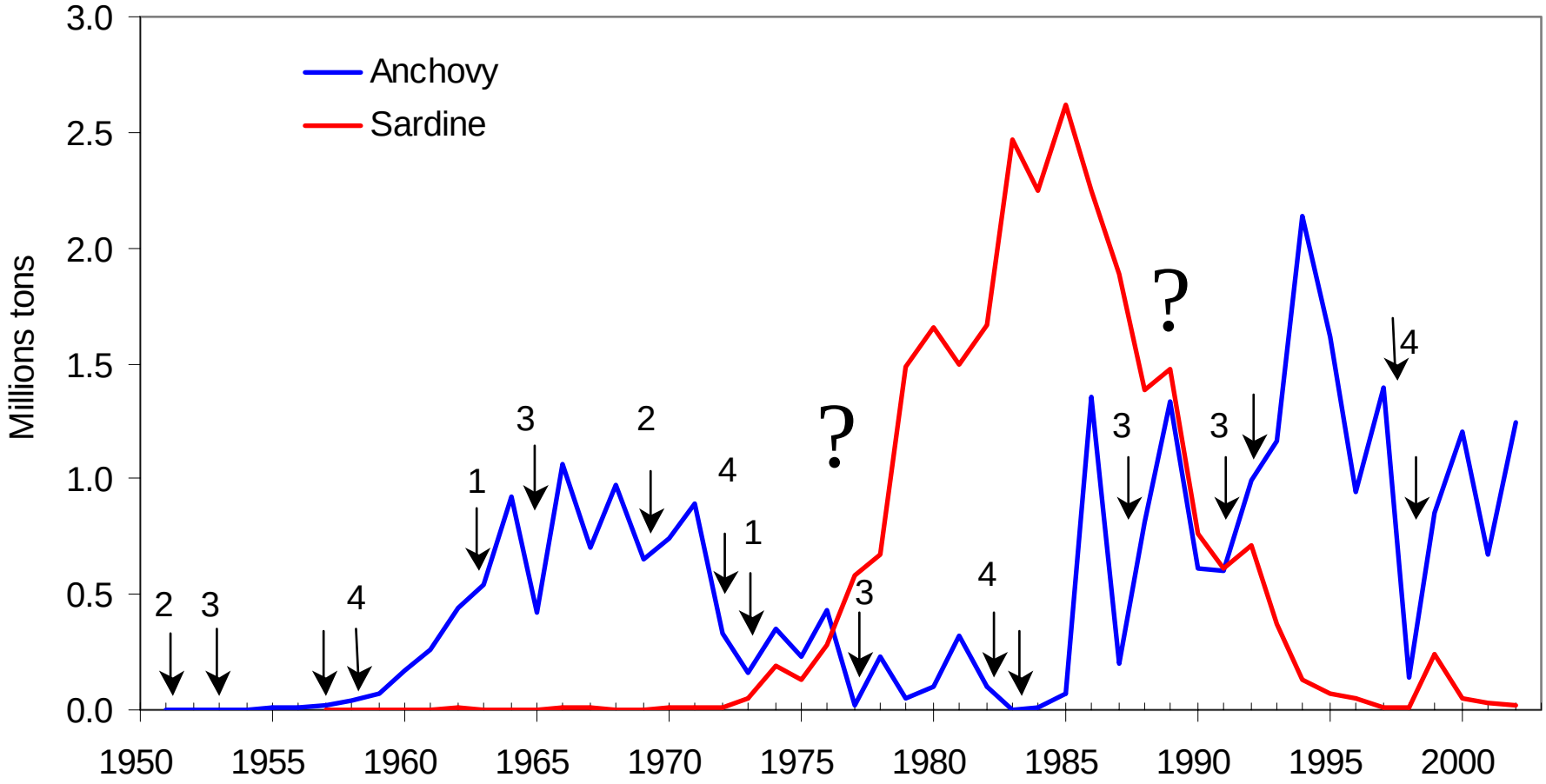
PICES Thirteenth Annual Meeting
Hawaii, U.S.A., October 14-24, 2004

Low Frequency Environmental Fluctuations and Main Chilean Pelagic Fisheries

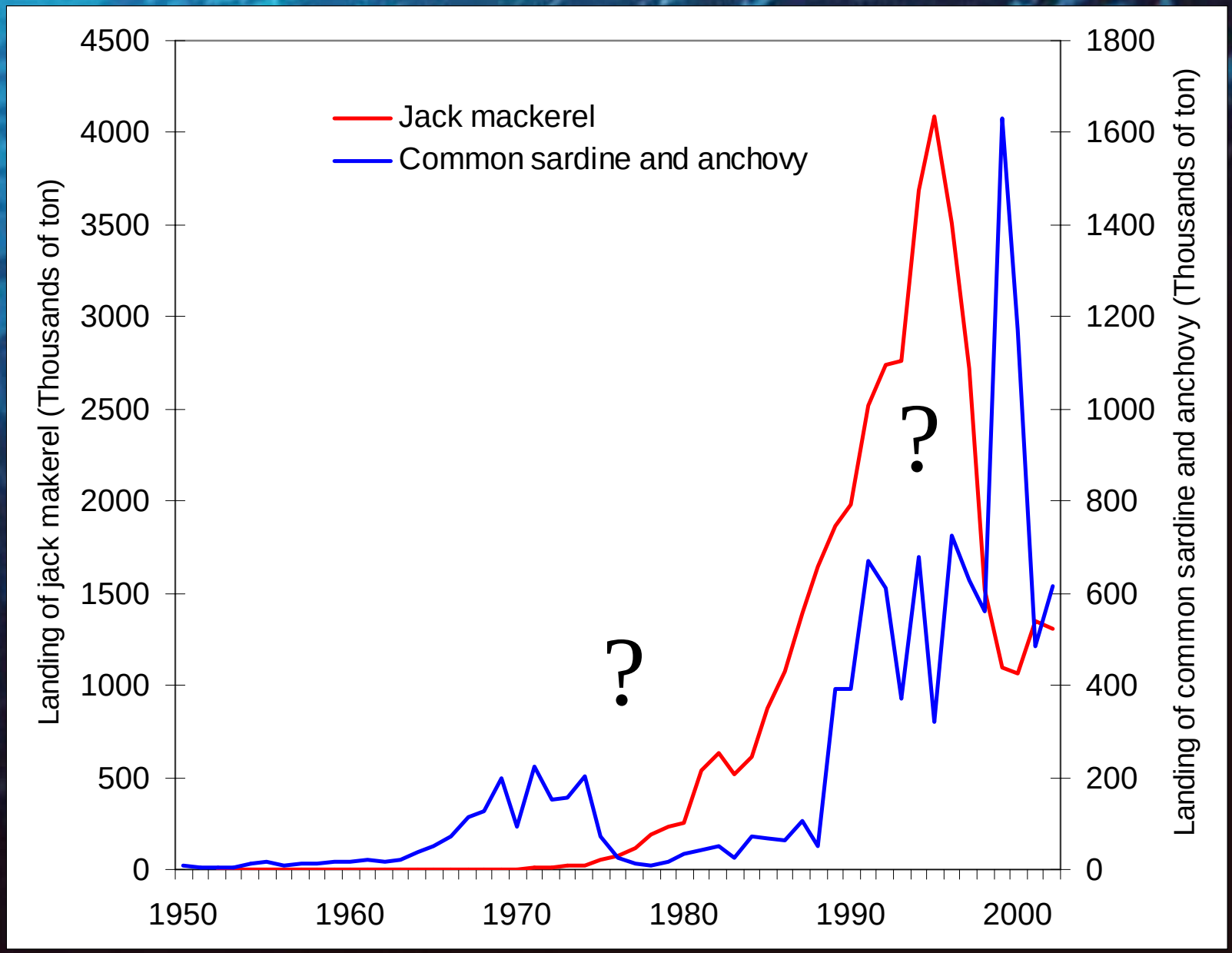
E. Yáñez[1], *C. Silva*[1], *A. Montecinos*[2], *and F. Gómez*[1]

[1]Pontificia Universidad Católica de Valparaíso (PUCV)

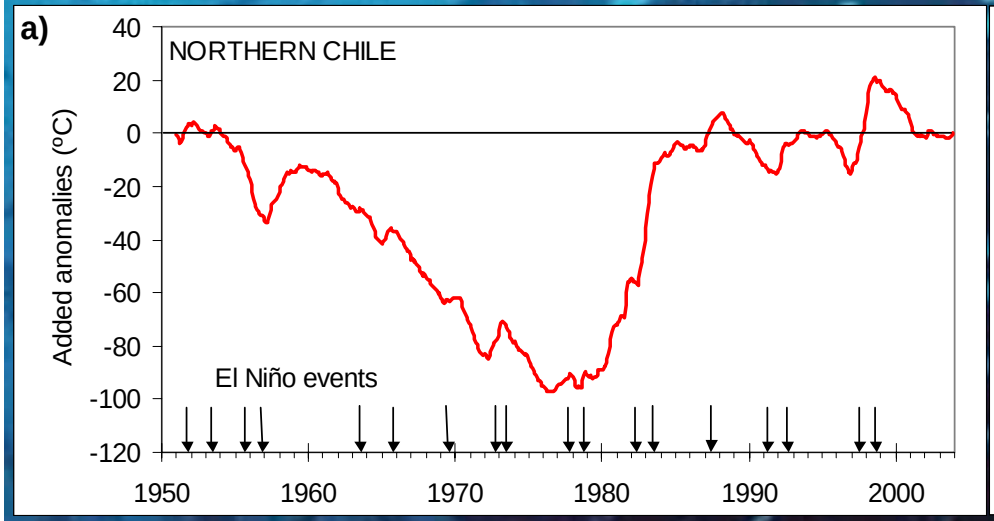
[2]Universidad de Concepción (UDEC)

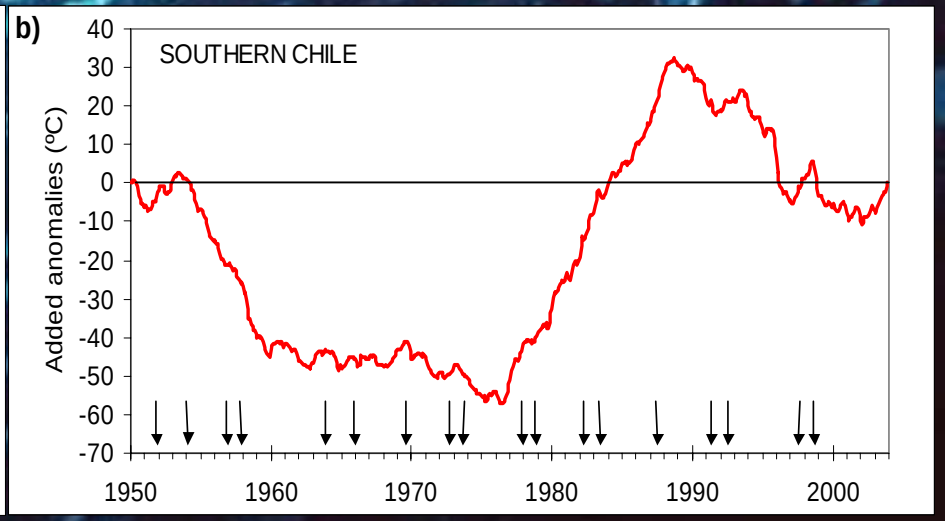


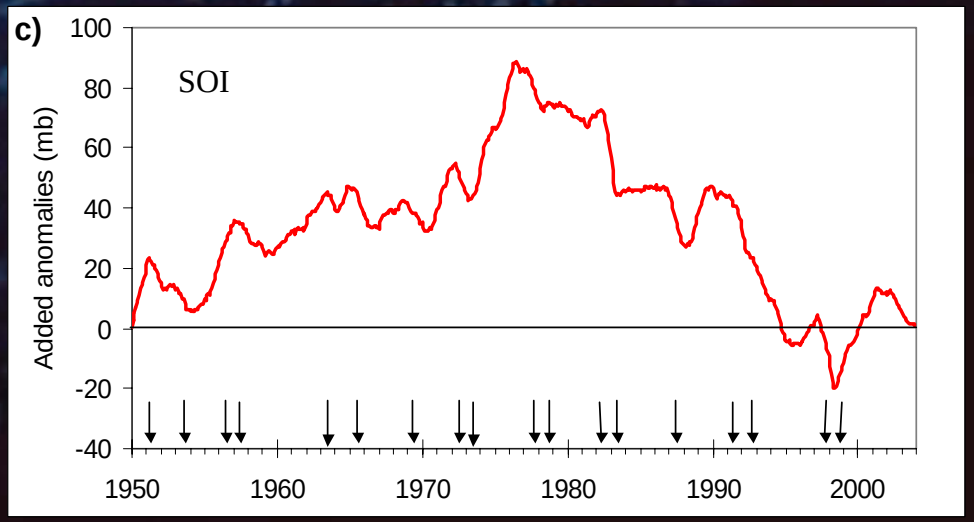
Anchovy and sardine landings in northern Chile
Arrows indicate El Niño events and the intensity



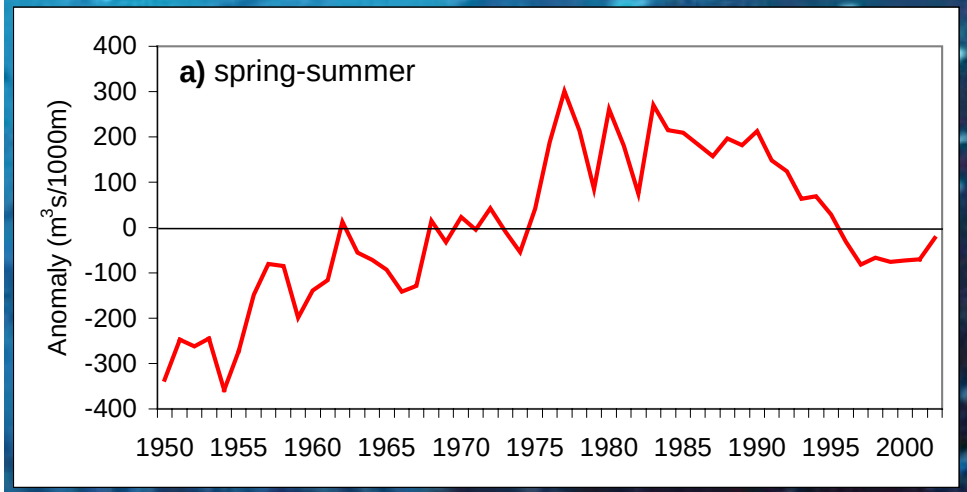
Landings of pelagics exploited in southern Chile

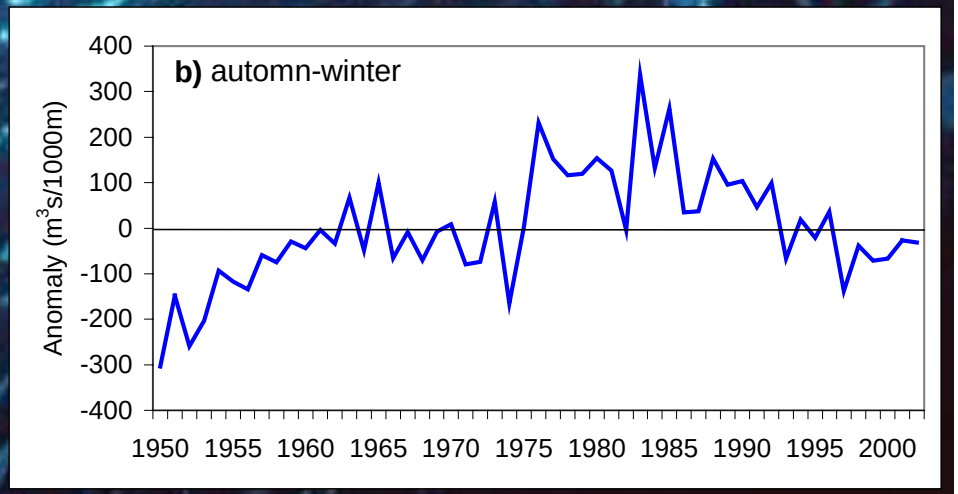


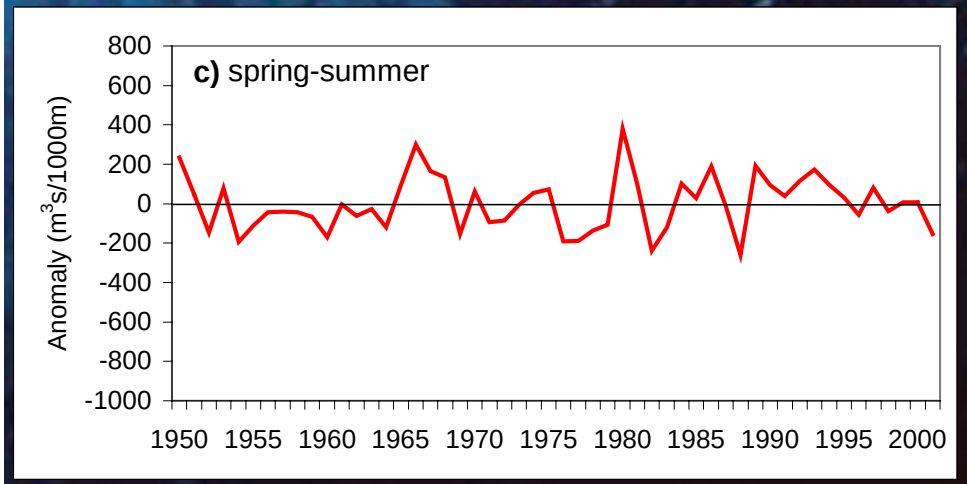


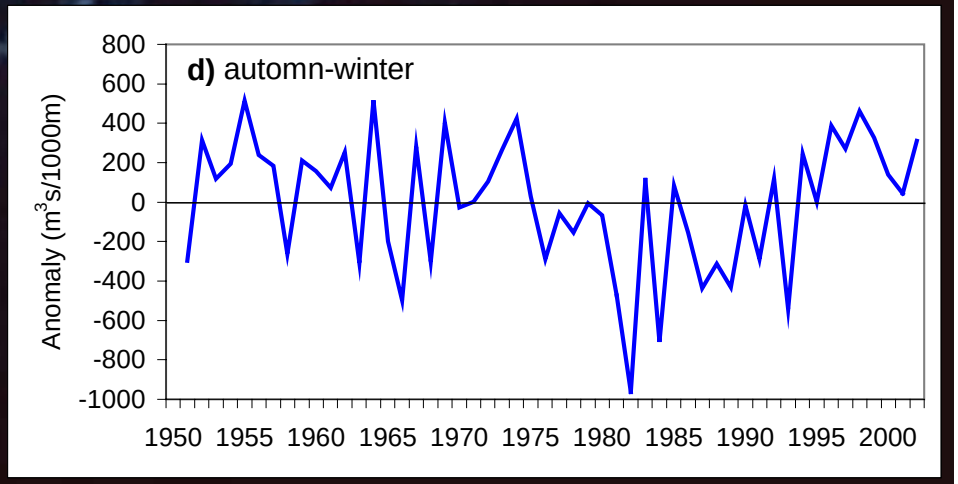


Integrated anomalies of a) SST in northern Chile, b) SST in southern Chile and c) SOI



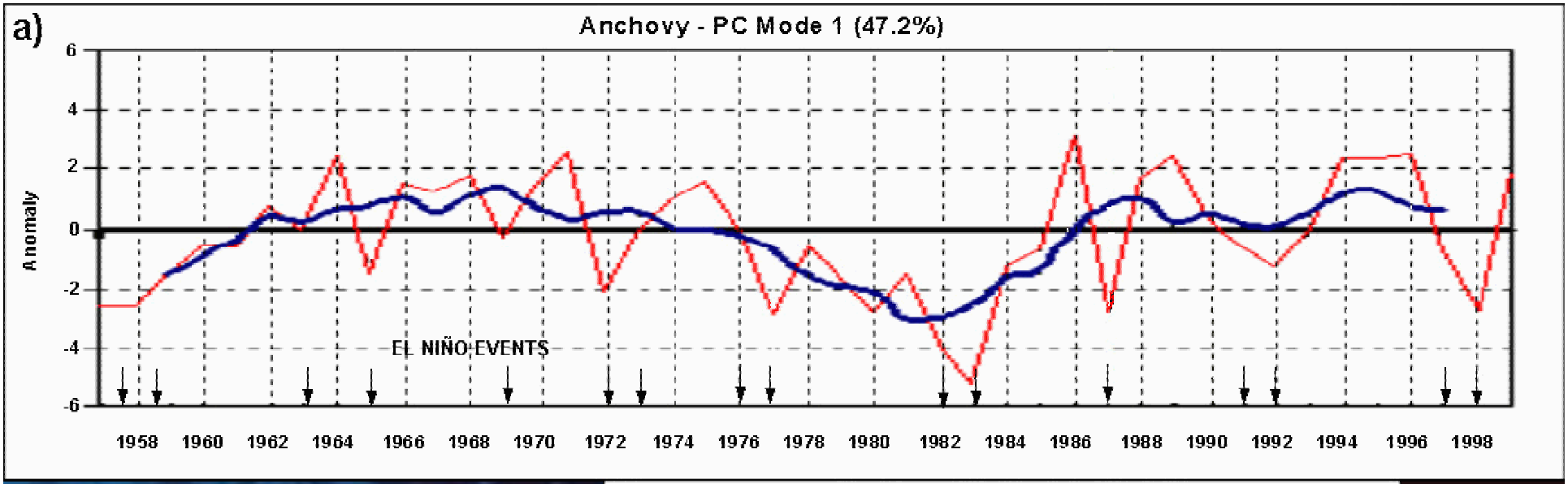


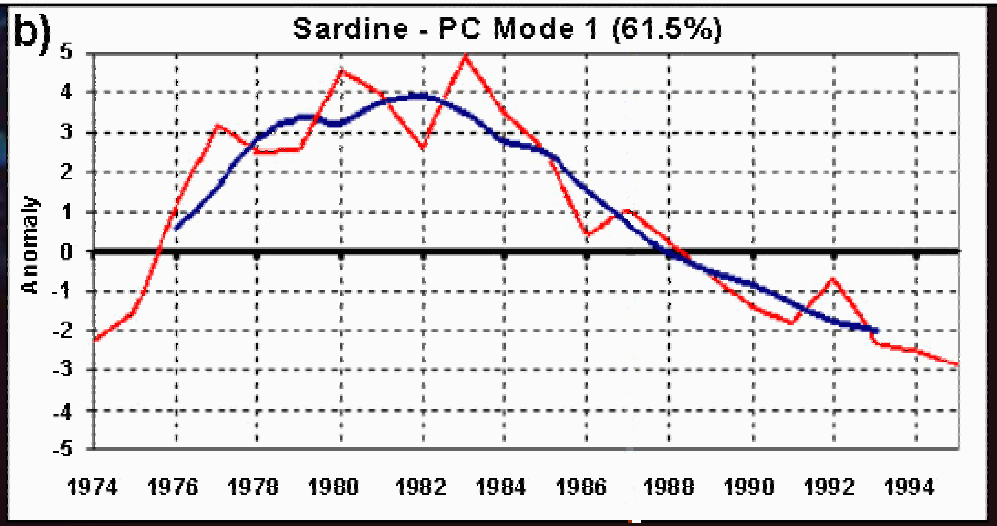




Upwelling Index annual anomalies in northern (a, b), and southern (c, d) Chile

Red lines: spring-summer Blue lines: autumn-winter

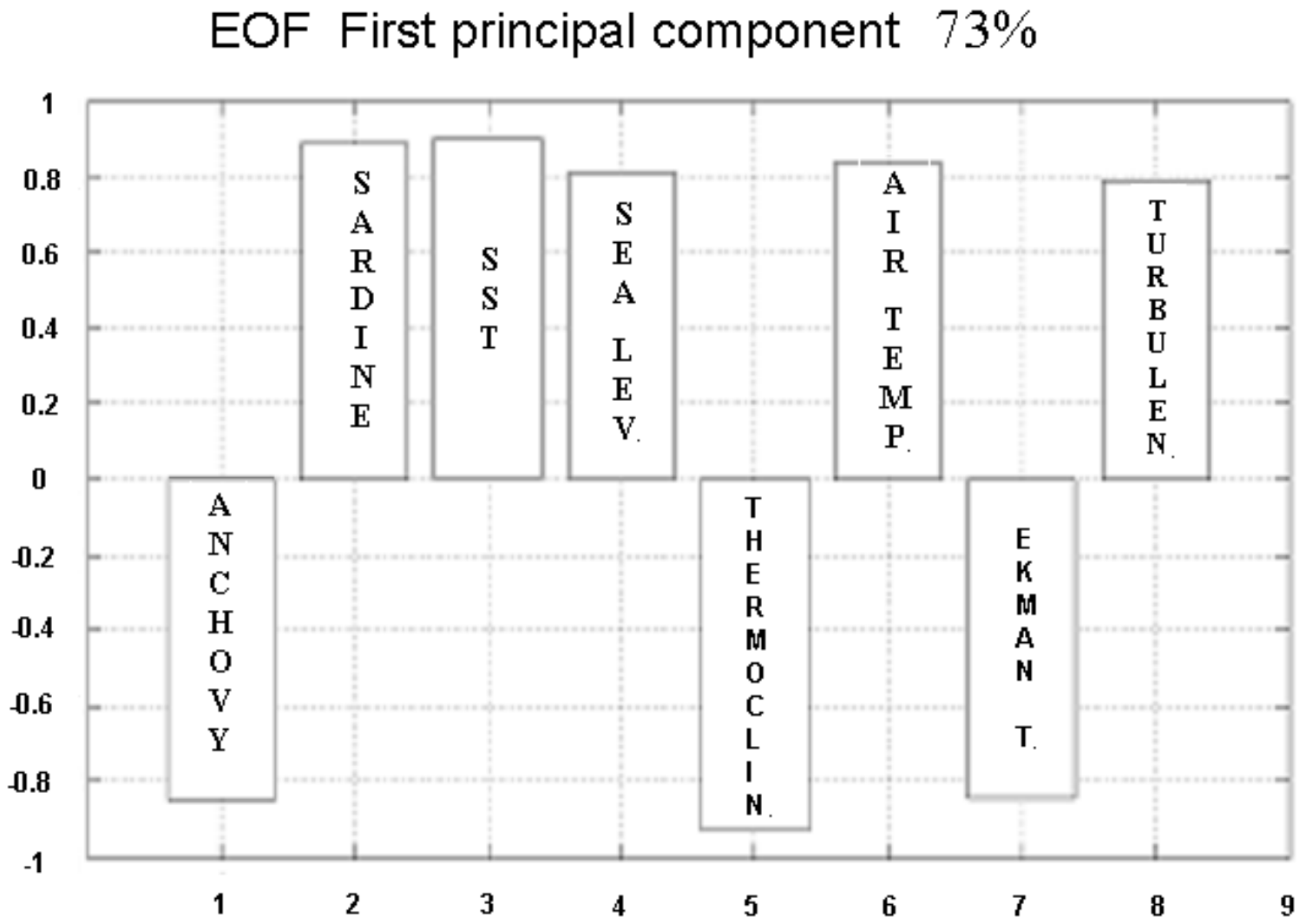




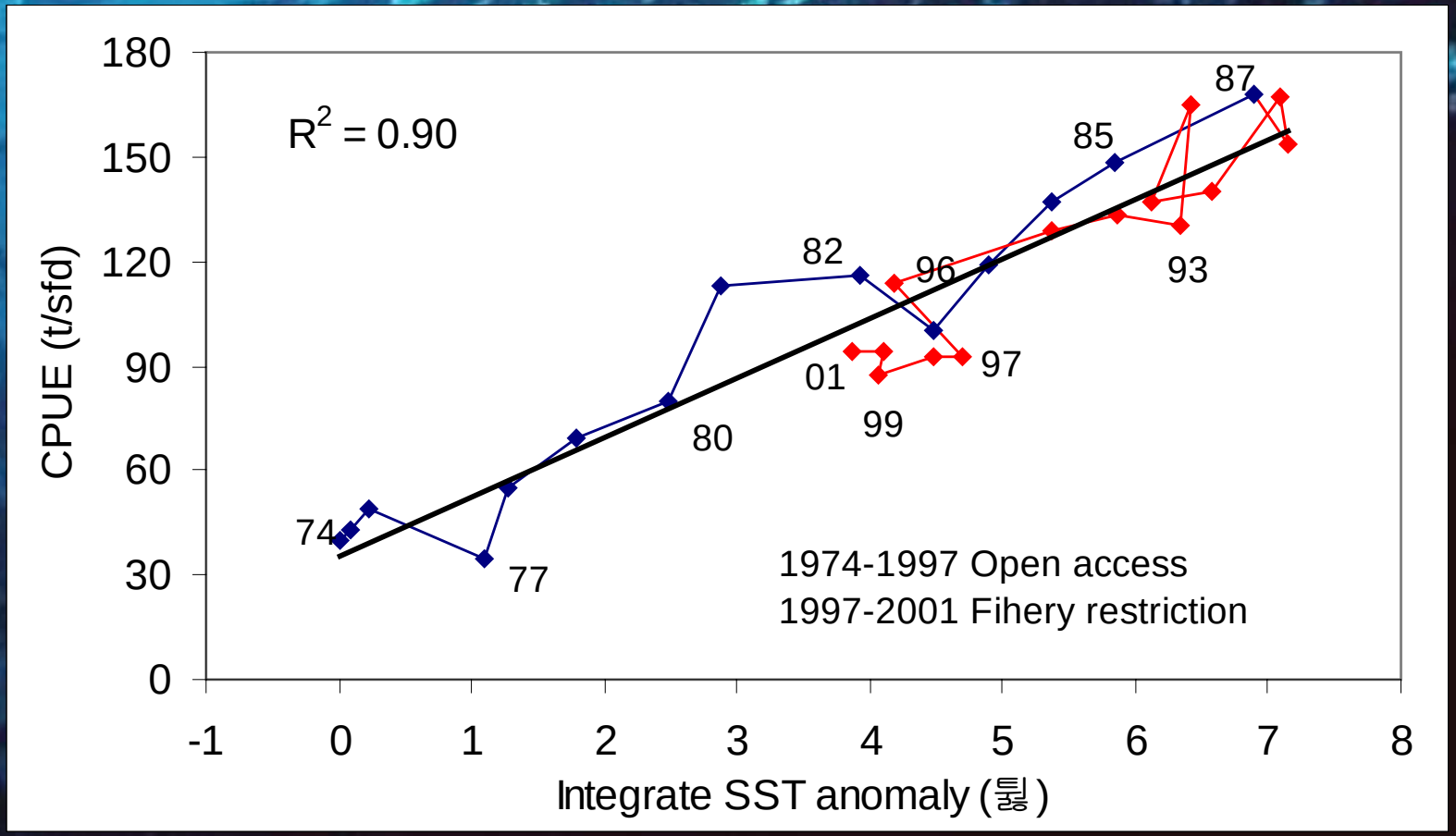
EOF time series analysis of:

a) catch, fishing effort, SOI and SST for anchovy

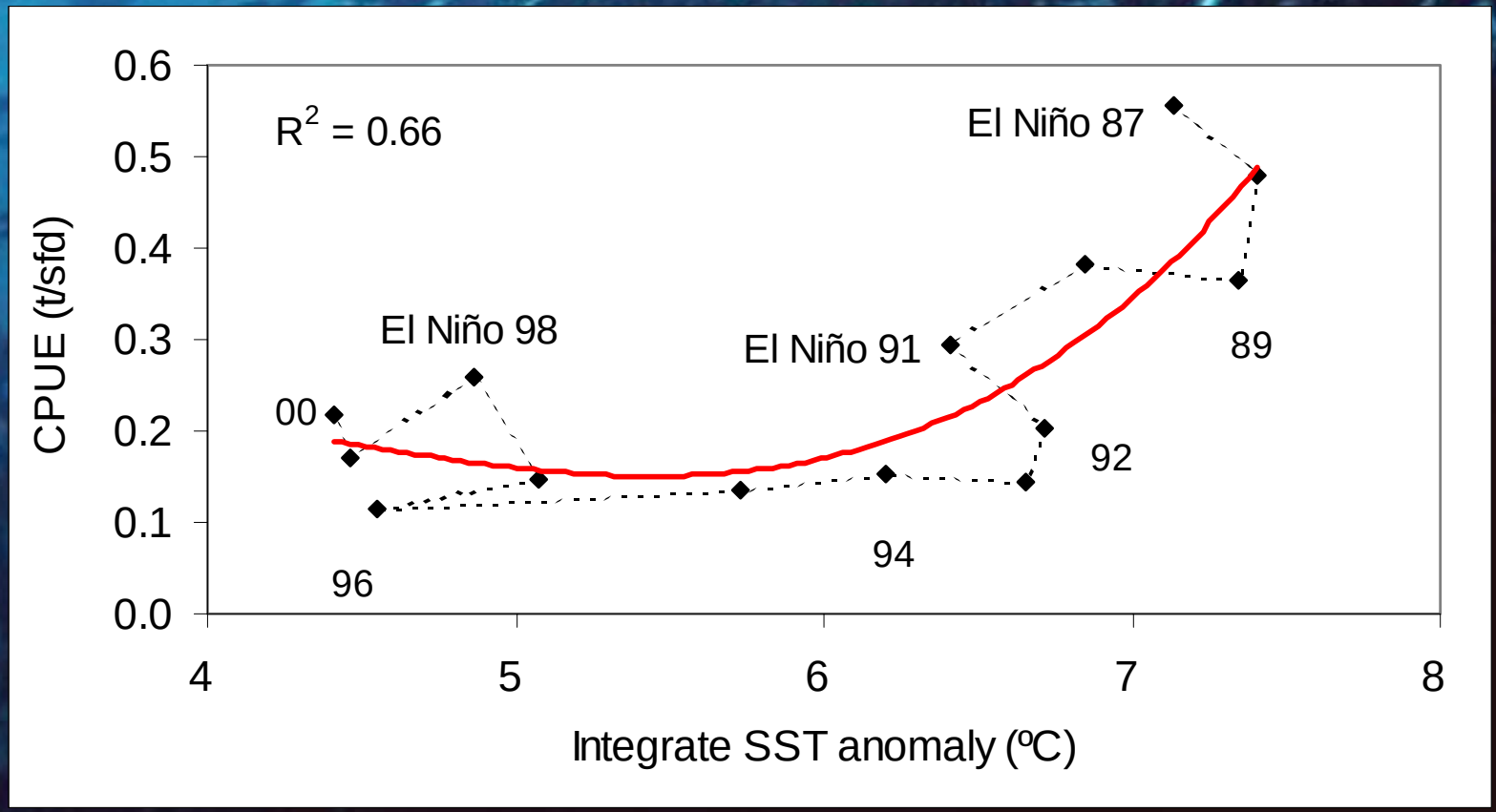
b) recruitment, biomass, SST and UI for sardine



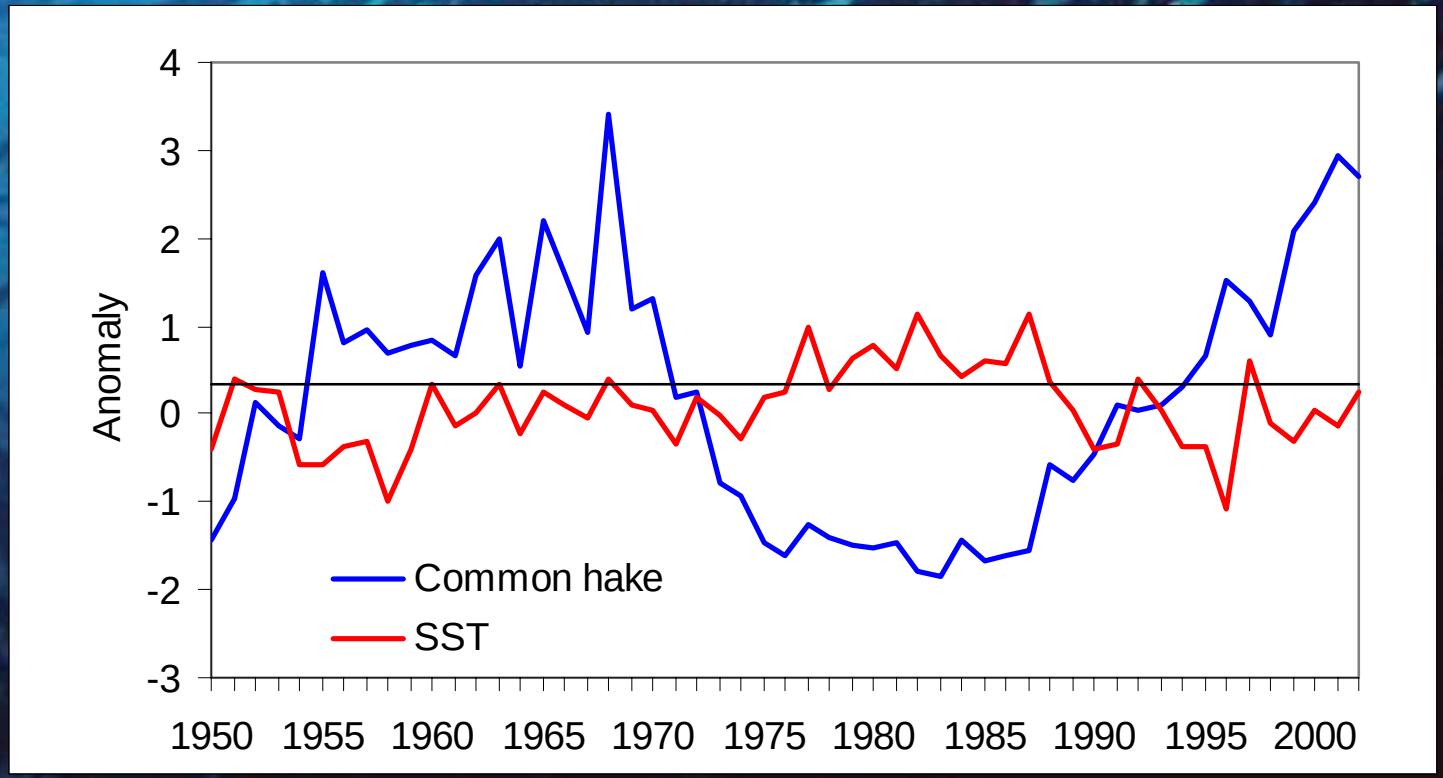
Correlation between EOF first component and different time series (1960-1998)



Relationship between jack mackerel CPUE and integrated SST anomaly in southern Chile (1974-2001)



Relationship between swordfish CPUE and integrated SST anomaly in southern Chile (1987-2000)



Common hake landing and SST anomalies in southern Chile (1950-2002)

CONCLUSIONS

Climate fluctuations associated with El Niño events affect pelagic fishes, joint to the effects of fishing effort. However, there are long-term fluctuations that affect the fishing activity.

The 1976 regime shift was unfavorable to anchovy, but was positive for the sardine fishery in northern Chile. In southern Chile jack mackerel landings increased after this regime shift (with 4 millions tons in 1994), associated to a remarkable fishing effort. However, sardine and jack mackerel CPUE declined after 1987. At the same time a recovery of anchovy landings was observed.

CONCLUSIONS

The 1976 regime shift was observed in the SOI. But the new shift observed in coastal environmental variables and landings after 1987, it wasn't observed in this index.

Finally, it is necessary to produce complementary research, considering the trilogy compose by fisheries, ecosystems and environment, to better understanding the involved mechanisms.

THANKS