


icta Institut de Ciència i Tecnologia Ambientals-UAB

icrea

Canvis ràpids del clima en el passat a l'àrea mediterrània

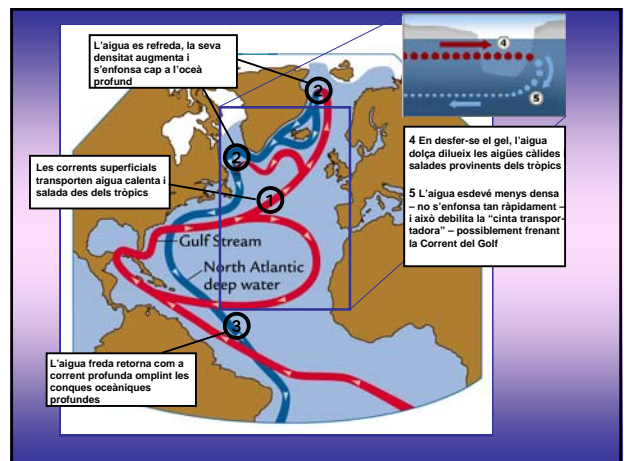
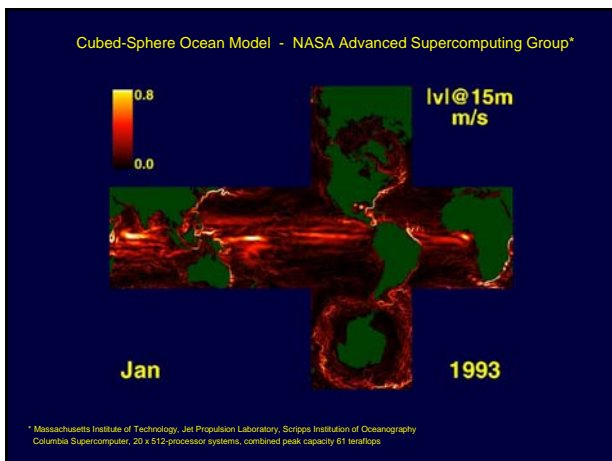
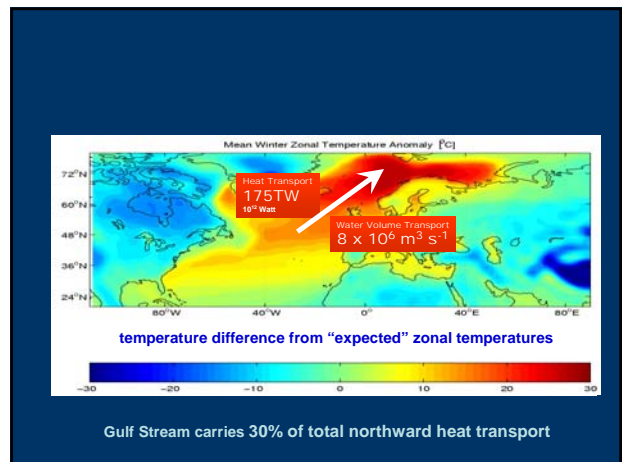
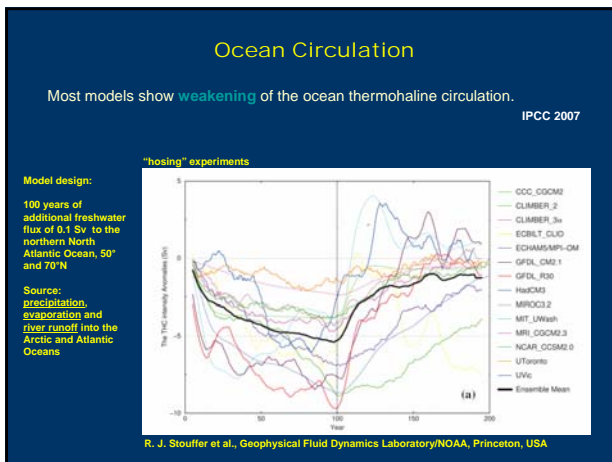
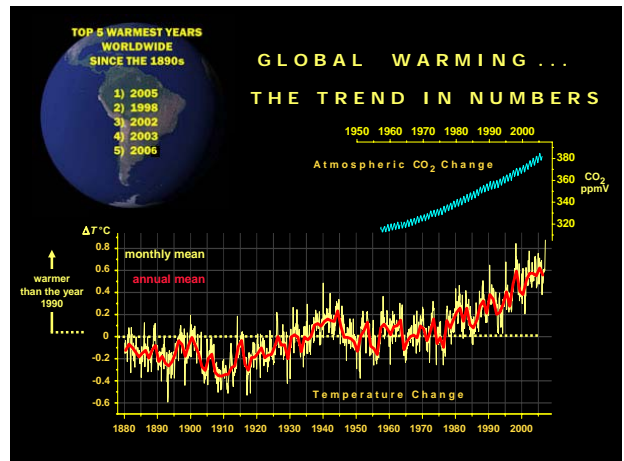
Rainer Zahn

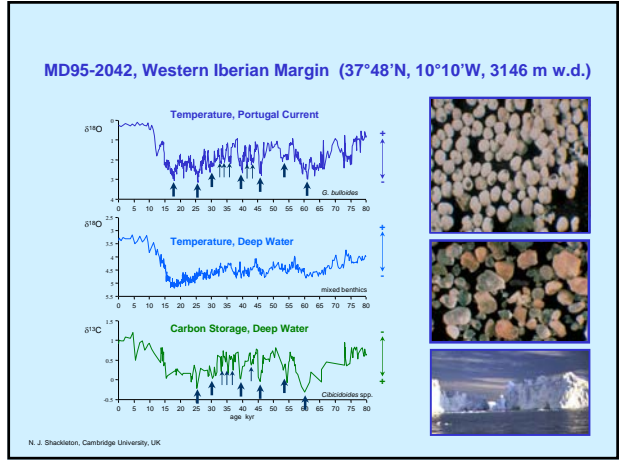
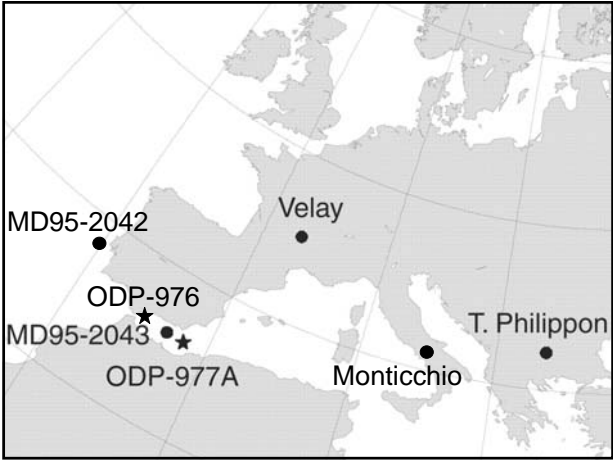
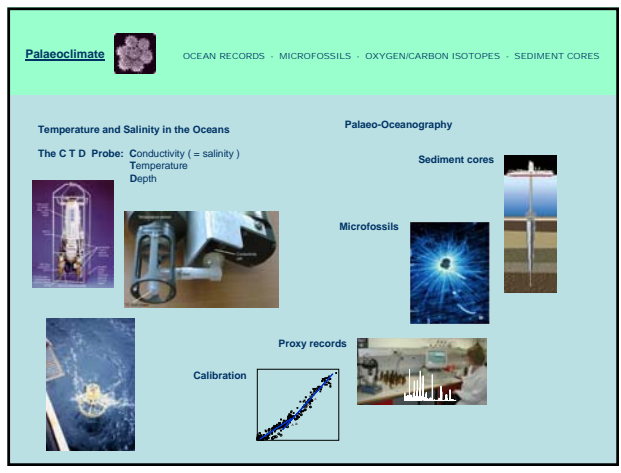
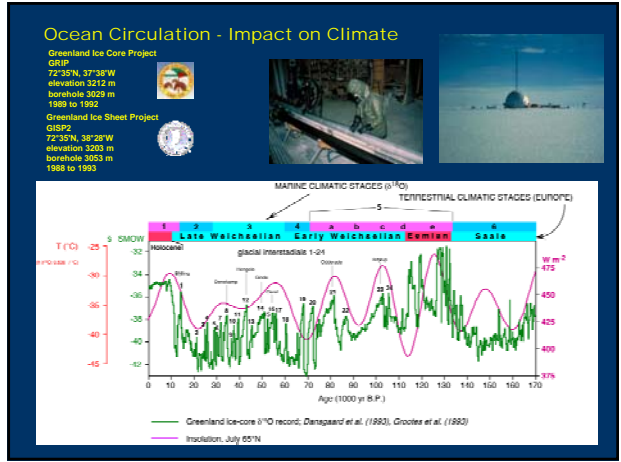
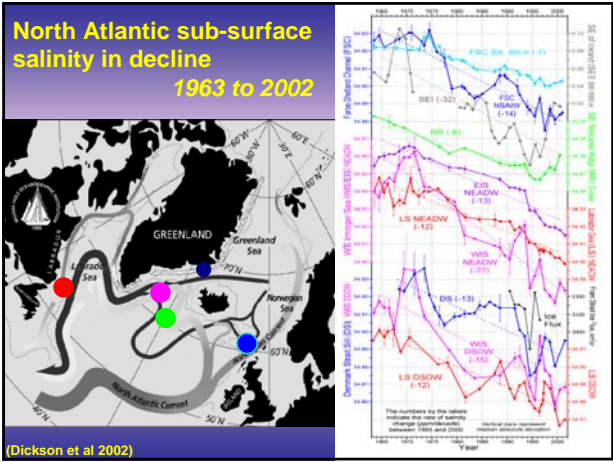
Flood event in Barcelona, 1862

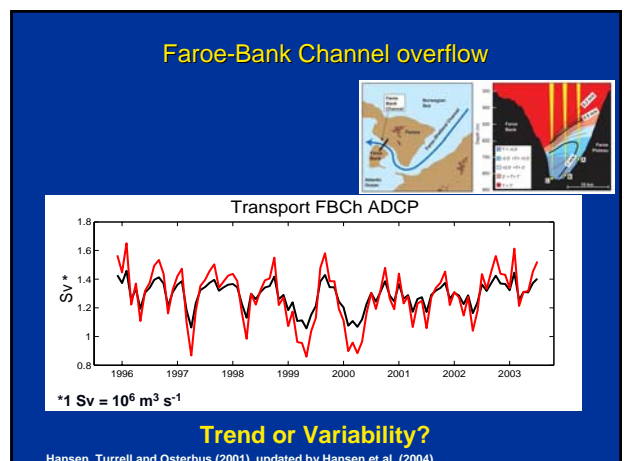
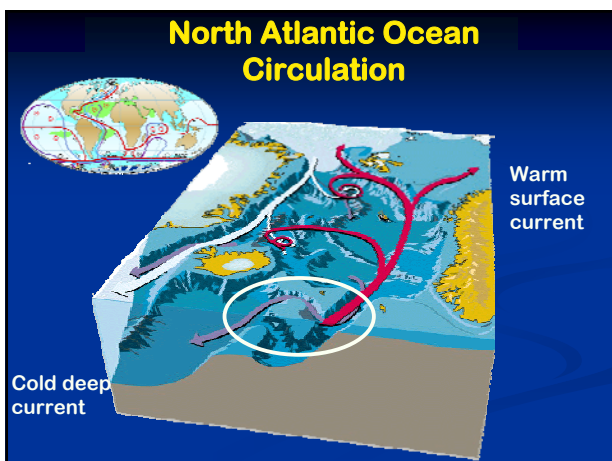
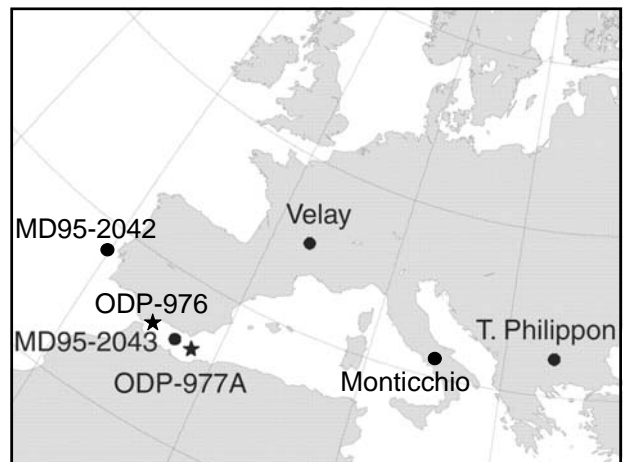
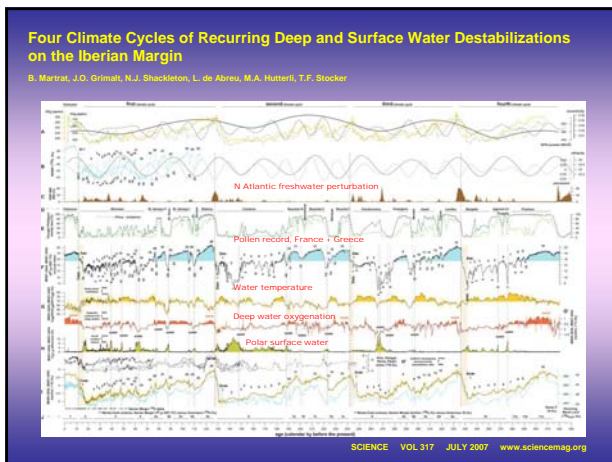
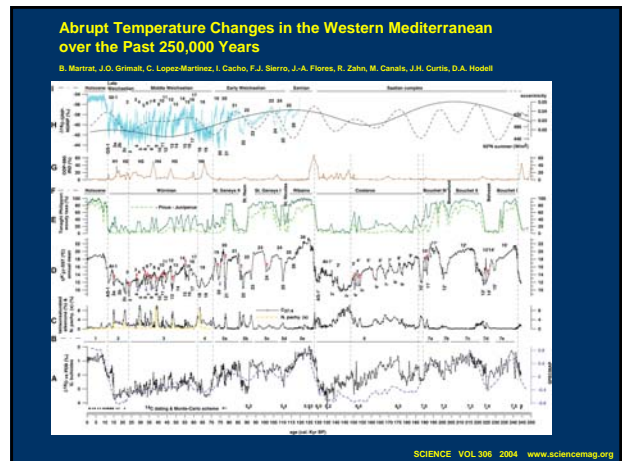
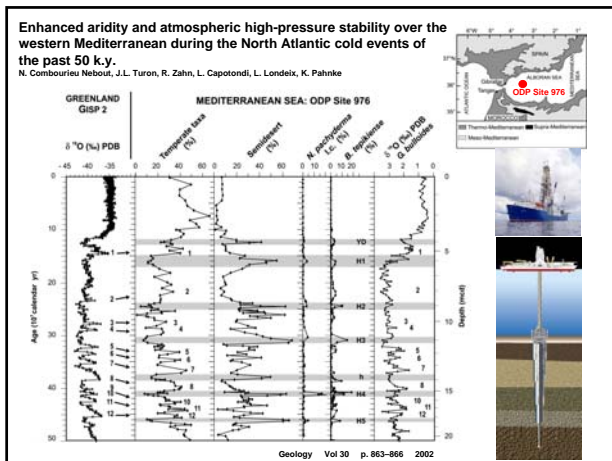


Spanish historical archives exhibit great potential for inferences into climate variability at different timescales and for different territories.

J. Luterbacher et al., 2006, *Mediterranean climate variability over the last centuries: a review.*







Atlantic Climates

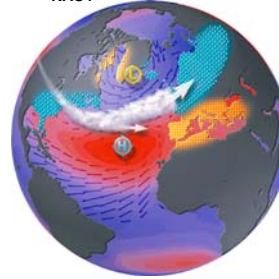
- North Atlantic Oscillation
- Tropical Atlantic Variability
- Meridional Overturning Circulation
- Interactions with each other



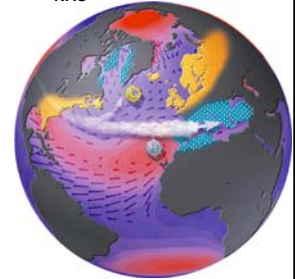
The North Atlantic Oscillation

Atmospheric pressure gradient between Lisbon and Iceland

NAO+



NAO-



is this the future?

Agulhas Current and Indian-Atlantic Salt Leakage



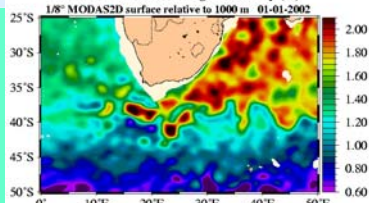
Agulhas Current and Retroflection
volume transport $70 \times 10^6 \text{ m}^3 \text{ s}^{-1}$
 $T > 21^\circ\text{C}$, $S > 35.5$

Agulhas Rings
100 - 400 km in diameter
800 - 2000 m deep

5 - 7 rings per year
water volume $15 \times 10^6 \text{ m}^3 \text{ s}^{-1}$
S Atlantic salt anomaly +0.2

Altimeter Of: Steric Height Anomaly (m)

1/8° MODAS2D surface relative to 1000 m 01-01-2002



"The influence of the Agulhas system of currents and eddies around southern Africa extends far beyond that region. Hence the especial need for a better understanding of the complex phenomena involved."
A.L. Gordon

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J. Anzorge, IICET

Implications

- Climate varies on short and long timescales
- Climate in Iberia is influenced by the North Atlantic THC
- There is significant interannual to multidecadal variability in the Atlantic meridional overturning circulation (observations, models)
- Mediterranean Europe in the past experienced recurrent phases of abrupt changes in climate in association with perturbations of the N Atlantic THC
- Some of the changes involved climate developments not much different from modern and predicted future trends (e.g., increasing desertification)
- Palaeo-scenarios are not perfect analogues for ocean and climate changes in a warming world; but they suggest that the impacts of a N Atlantic MOC change will be hemispheric in extent