The Abdus Salam
International Centre for Theoretical Physics

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**Workshop and Conference on Biogeochemical Impacts of Climate and
Land-Use Changes on Marine Ecosystems**

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Modelling the circulation dynamics of the Turkish Strait System

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Turkey*

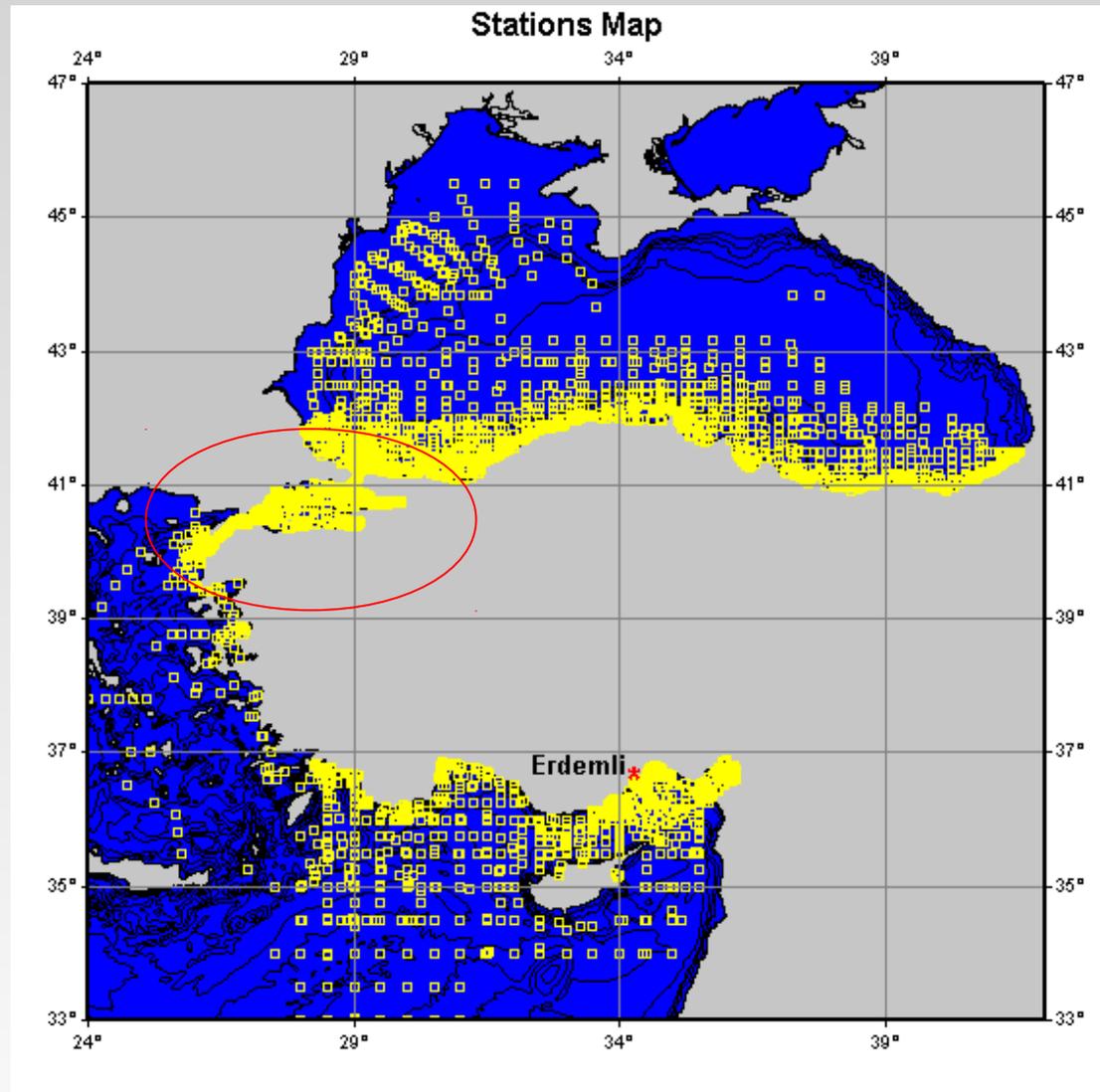# Modelling the circulation dynamics of the Turkish Strait System

ÖZGÜR GÜRSES

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1985-2009

METU-IMS STATION COVERAGE

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Why study the Turkish Strait System?

- Very distinct adjacent basins :Mediterranean and the Black Sea
    - Completely different water masses
    - Migration route for important species
    - Effects on spawning strategies

- Marmara Sea - a buffer zone

- Economic & strategic importance

- Major oil transport route
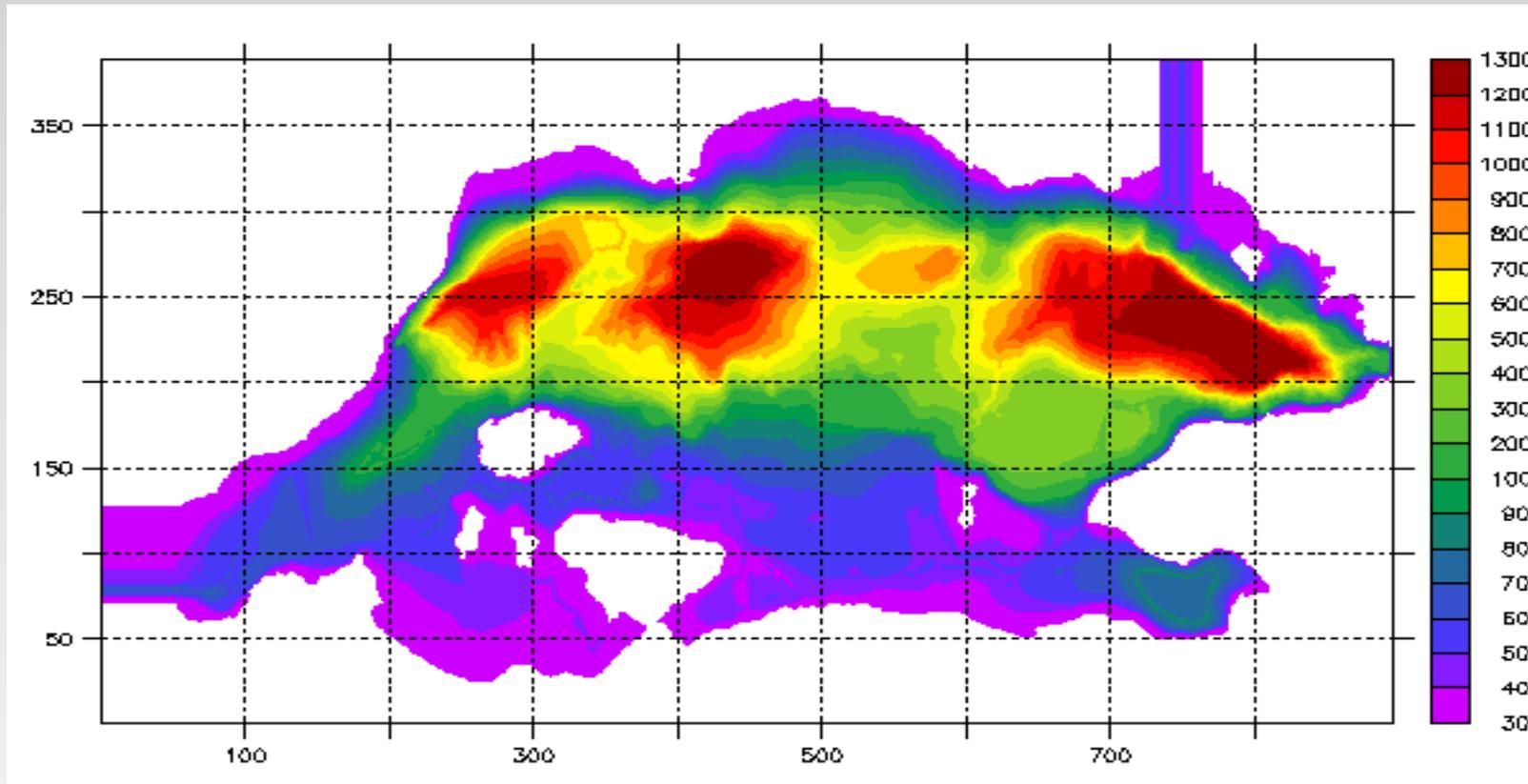
TURKISH STRAITS SYSTEM
the Dardanelles, the Marmara Sea and the Bosphorus
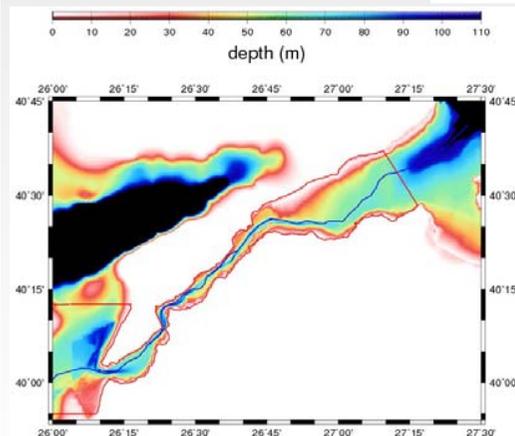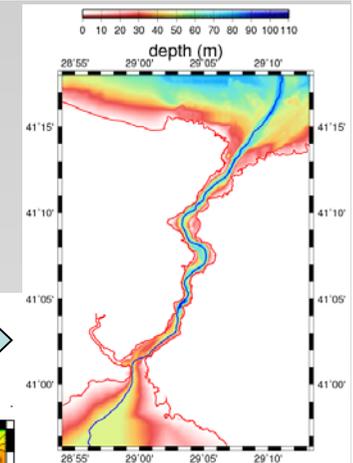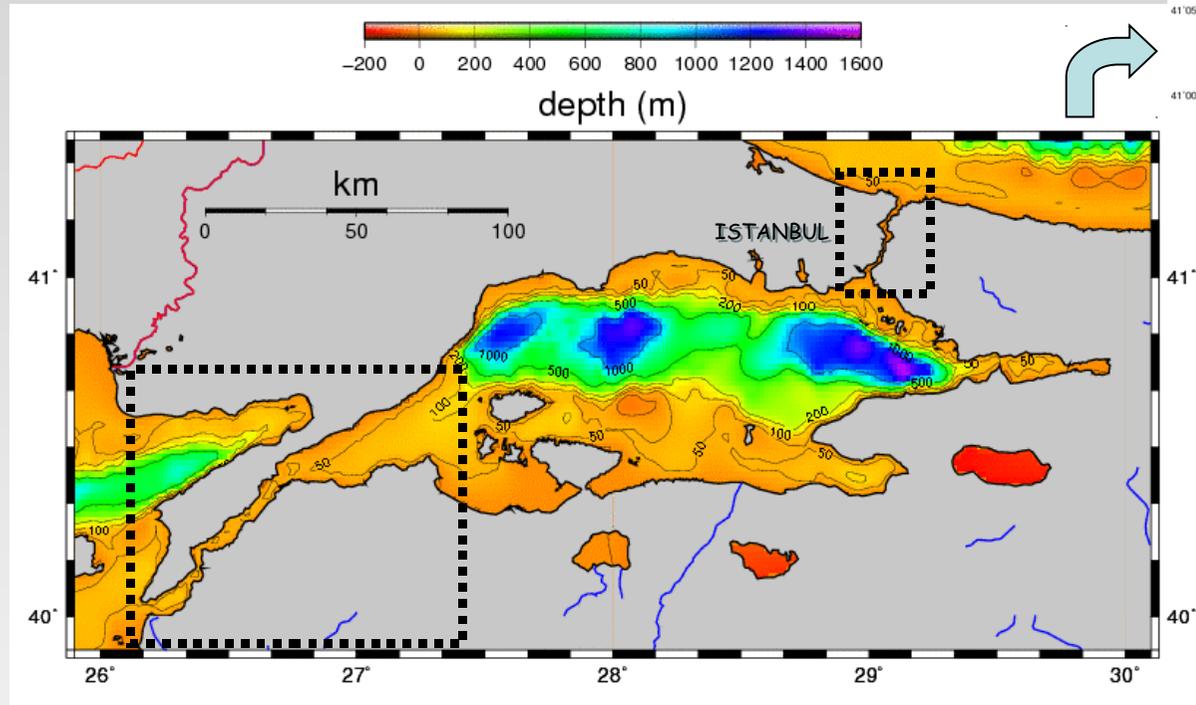
Deep troughs adjoining wide shelf areas, interconnected by straits and canyons

Bathymetry at 20 m resolution (Gökaşan, 2004)

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Model domain with bathymetry

- 897 x 389 x 40 (20), h_{min} = 30m

- Smoothed using gridpak

- Idealized straits as open boundaries for T, S, and flow

Forcing, Initial and Boundary Conditions:

- No atmospheric forcing for test runs
- Uniform vertical summer T and S initial profile for the whole domain (obtained from a SESAME-IP* cruise)
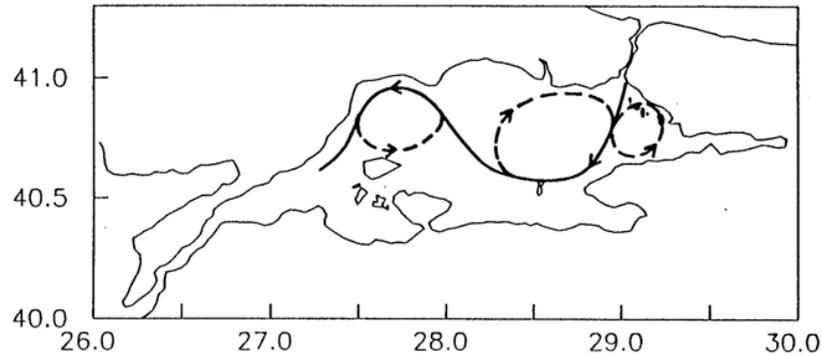- Closed lateral B.C.s except for the straits
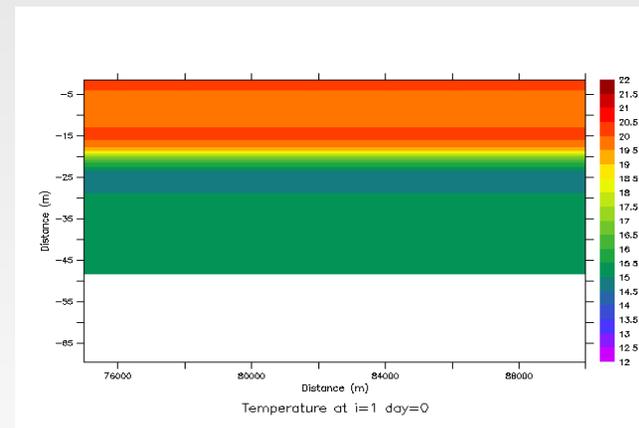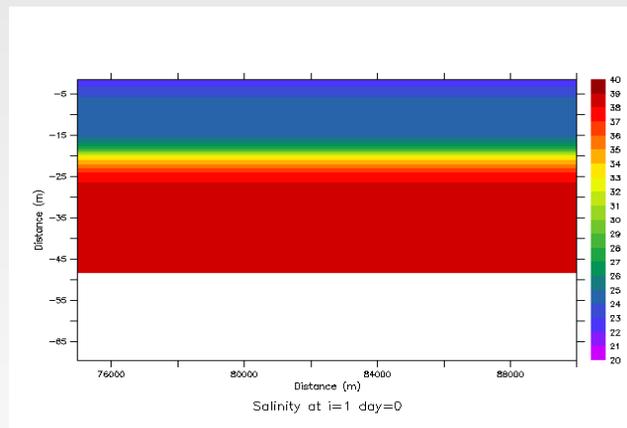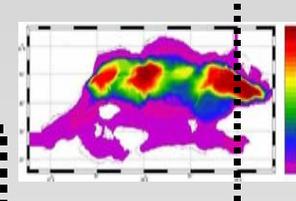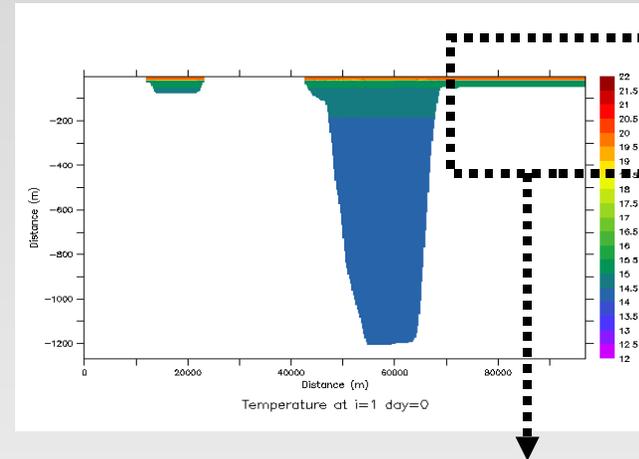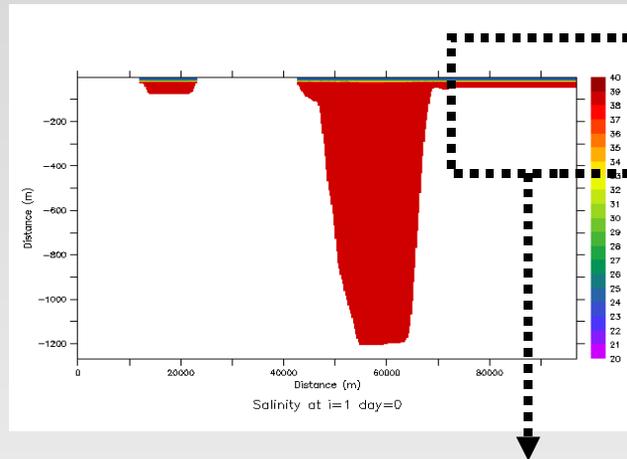
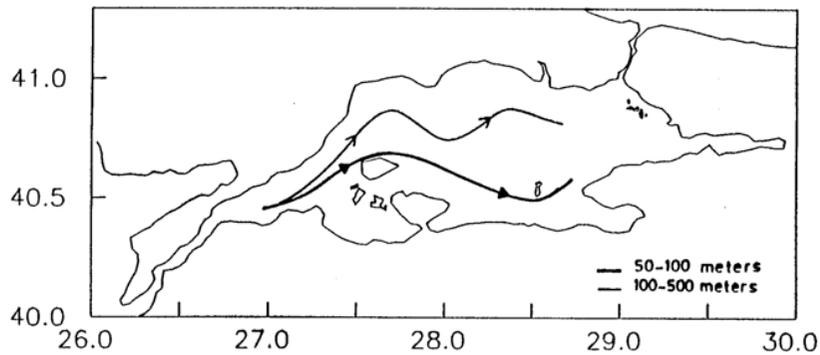*Temperature and salinity profiles along 29°E at the initialization*

* Southern European Seas : Assessing and Modelling Ecosystem changes (EC-FP6 project)

Preliminary Results
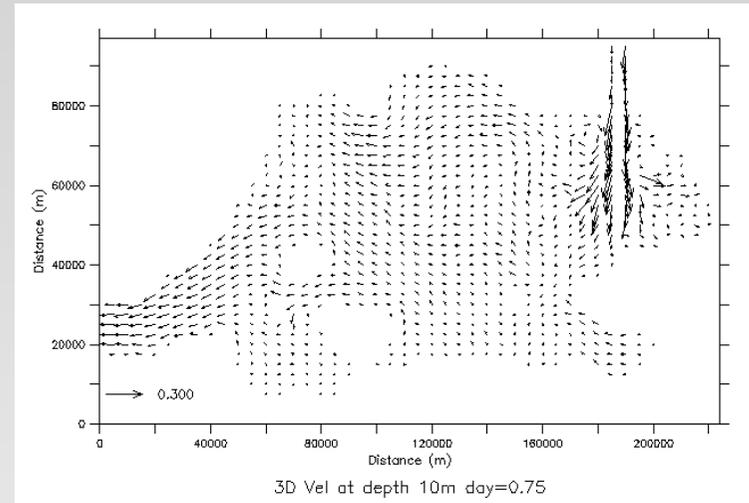
Observed surface circulation
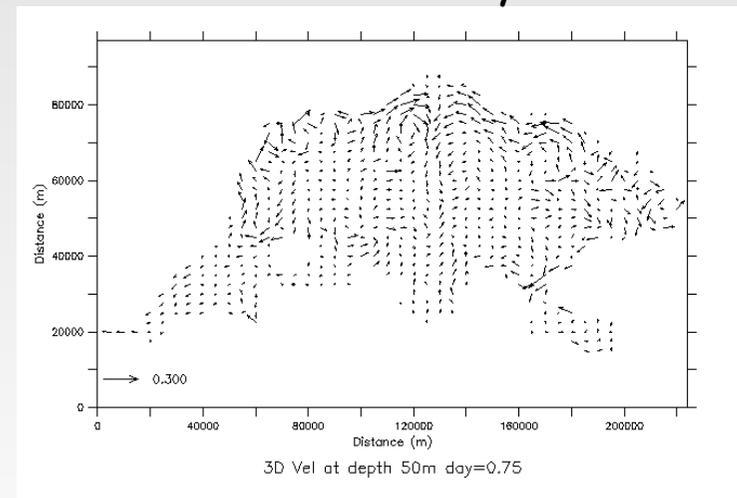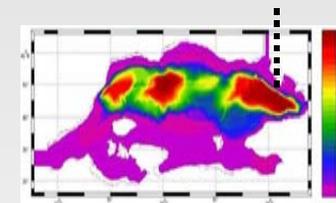
10 m velocity

Observed deep circulation

50 m velocity

Besiktepe et. al. ,1994

A snapshot from the model (day 1)

Unluata et. al. ,1991
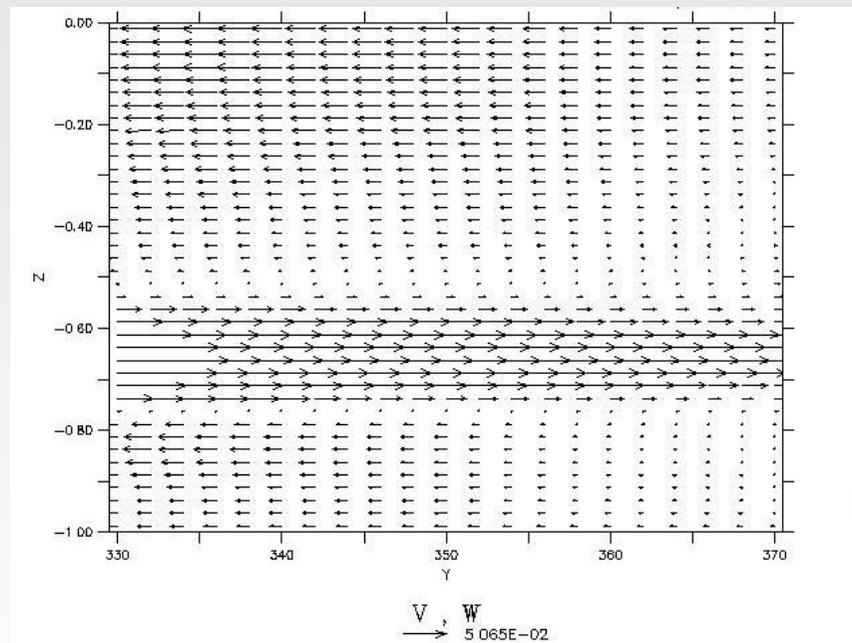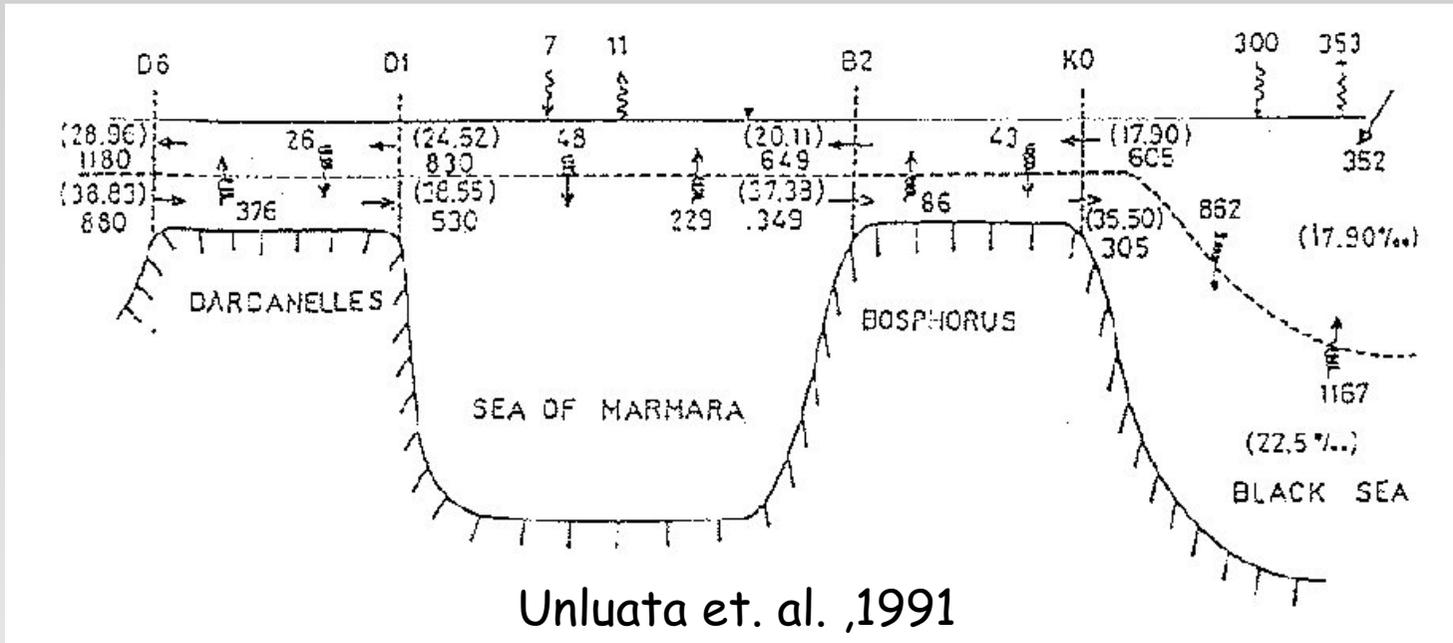
A snapshot from the model (day 1)

Thank You!

"...there are known knowns. These are things we know that we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns. These are things we don't know we don't know."

Donald Rumsfeld