



MARES 2020

**ROUNDTABLE SESSION**

PERSEUS - Black Sea experiment (BSEX)

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## Two objectives

- 1) Exchanging information on BSEX cruises
- 2) Discussing review paper for BSEX





## Subtask 1.3.7 BSEX: Black Sea Experiment

Responsible: METU (Baris Salihoglu, [baris@ims.metu.edu.tr](mailto:baris@ims.metu.edu.tr))

Participants: GeoEcoMar, SIO-RAS, IO-BAS, IBSS, UoP, NIB, CSIC

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# SUMMARY OF THE SUB TASK

**Deep Trends:** Past and future trends in the Black Sea related to climate will be studied, based on recent sedimentological, eco-bio stratigraphy, water and sediment **dynamics (GeoEcoMar).**

**D1, D6? More details required from GeoEcoMar**

**Atmosphere:** Influence of atmospheric nutrient deposition in southern Black Sea, DIN, DIP, DOC, DON, and DOP, as well as selected anthropogenic trace metals, will be determined for at least a 1-year period. **(METU, ECPL-UoC, IO-BAS). D5, D8**

**Gelatinous:** New data on gelatinous plankton to be compared with the recent history of these species **(METU, SIO-RAS, IO-BAS, IBSS). D1?, D2, D4**

**Adaptations:** Adaptations of copepods, molluscs and fishes to changes in oxygen concentration, salinity and food supply in the Black Sea **(IBSS). D1,D3,D4**

**Distribution-**Effect of Bosphorus inflow on the distribution of O<sub>2</sub> and on the SW Black Sea ecosystem **(METU). D2,D5,D7**

**LTL-LTL relationships** (e.g., plankton fractional change), PP versus nutritional conditions and food supply of heterotrophic animals (zooplankton and fishes) **(IO-BAS and METU). D4**

**MODEL-**Shelf-deep sea exchange processes will be studied in the NW Black Sea sector **(UoP, MHI). D7. More details required from UoP.**

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# SUMMARY OF UMBRELLA WORKSHOP, BARCELONA

Priority of the issues needed

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# FOLLOW UP IN MOSCOW, June 2013

## Experiments under 3 categories:

1) **Eutrophication:** Joint cruises (during June-August) to study the level of eutrophication and distribution of phytoplankton, zooplankton and impact of gelatinous zooplankton. With respect to decreased concentrations of certain micronutrients (such as silica and phosphorus), changes in the phytoplankton composition also can be addressed with joint cruises. Inputs for D2, D5, D7. Effort will be led by **METU (Baris Salihoglu)**, contributing institutes will be METU, SIO-RAS, IO-BAS, IBSS.

2) **Invasive ctenophores:** Updated temporal levels in the concentration of invasive ctenophores and their impact on native zooplankton and especially on fish. Experimental study of invasive ctenophores effect on low trophic web-microzooplanton, phytoplankton and nutrients contents will be also investigated. Inputs for D2, D4. Effort will be led by **SIO-RAS (Tamara Shiganova)**, contributing institutes will be METU, IO-BAS, IBSS.

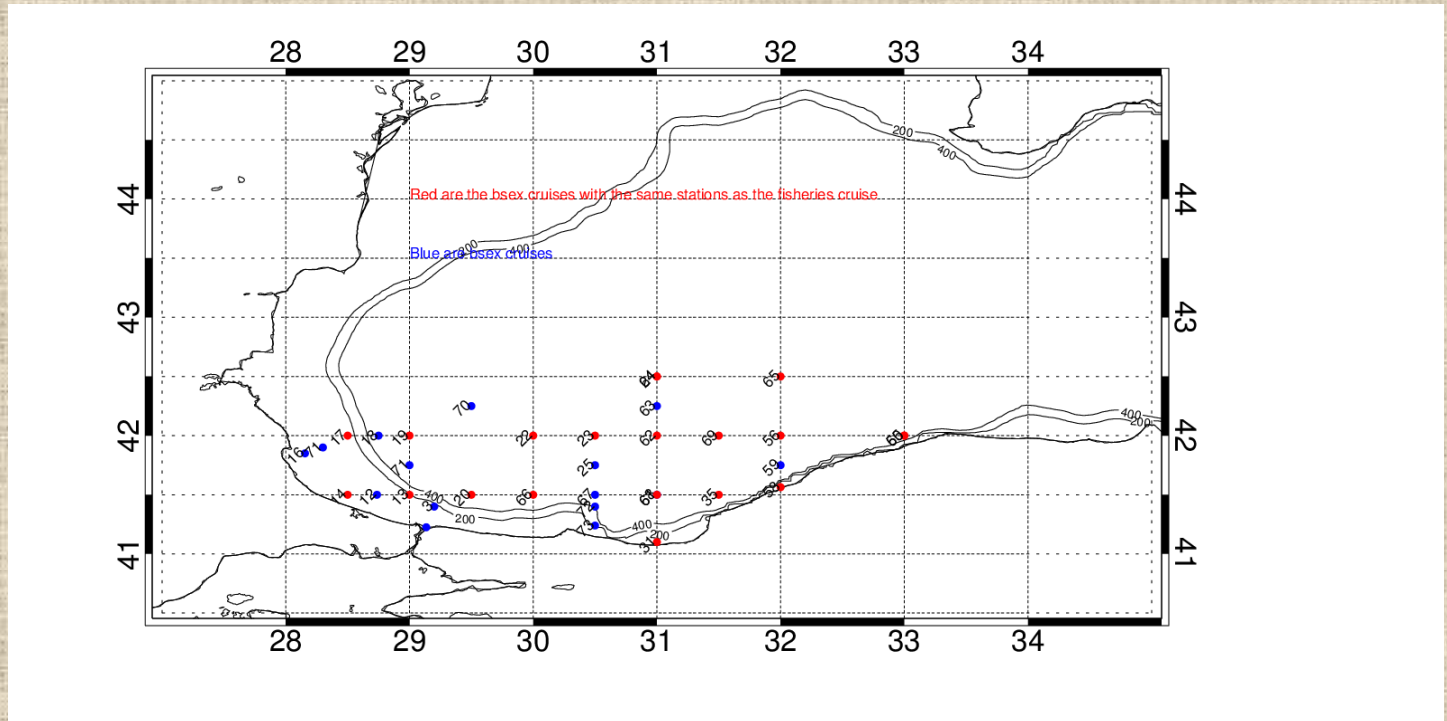
3) **Anchovy Spawning areas:** Experiments to define where most abundant fish, anchovy, spawn. Clarification of modern spawning areas by sampling eggs and larvae of anchovy during the peak spawning seasons (preferably in July, August). Inputs for D3, D4. Effort will be led by METU and SIO-RAS (**Ali Cemal Gucu, Tamara Shigonova**), contributing institutes will be IO-BAS and IBSS.





# FOLLOW UP IN MOSCOW, June 2013

## Turkish planned cruise with usual parameters



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# FOLLOW UP IN MOSCOW, June 2013

## SIO-RAS planned cruise measurements:

### *Gelendzhik (NE Black Sea, Gelendzhik Bay and adjacent shelf)*

*a) Work on existing data:* Data on salinity, temperature, pH, dissolved oxygen, nutrients, phytoplankton, and zooplankton collected in 2000-2012 will be analysed.

*New data acquisition:* Sampling period – spring-summer-autumn (six cruises during this period). Six stations along the transect from Gelendzhik Bay across the shelf to the continental slope will be sampled every cruise.

*Parameters* to be studied for (a) and (b): Salinity, temperature, pH, alkalinity, dissolved oxygen, nutrient species (phosphate, total phosphorus, silicate, nitrite, nitrate and ammonium), chlorophyll-a, bacterioplankton (new data only), phytoplankton, and zooplankton (including fish eggs and larva).

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# FOLLOW UP IN MOSCOW, June 2013

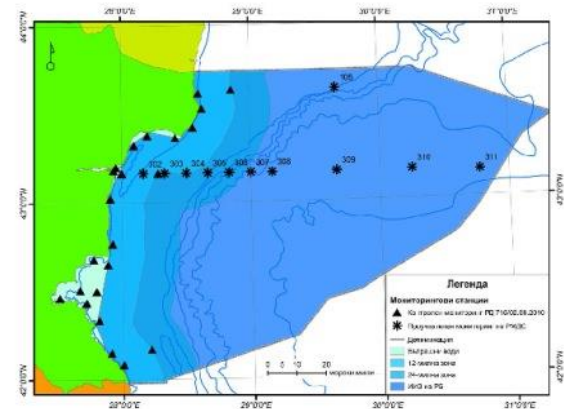
## IO-BAS planned cruise measurements:

- a) Work on existing data:* Data on salinity, temperature, pH, dissolved oxygen, nutrients, phytoplankton, and zooplankton collected in 2000-2012 will be analysed.
- b) New data acquisition:* Sampling period – summer-autumn (four cruises during this period). 5 stations along the Galata transect from Varna Bay across the shelf to the open sea will be sampled every cruise – Fig.3.
- c) Parameters* to be studied for (a) and (b): Salinity, temperature, pH, alkalinity, dissolved oxygen, nutrients (phosphate, total phosphorus, silicate, nitrite, nitrate and ammonium), chlorophyll-a, phytoplankton, and zooplankton (mesozooplankton, macrozooplankton, fish eggs and larva).

Also

- d) Diet composition of small pelagic fishes to test some relevant MSFD indicators
- e) Joint mesocosm experiments for filling gaps on regional variability.

Приложение 5. Карта на пунктовете за мониторинг през 2012





# FOLLOW UP IN MOSCOW, June 2013

## IBSS planned cruise measurements:

Time: end of July- beginning of August

Aim – to study distribution and impact of gelatinous zooplankton on species composition of zooplankton community.

Tasks:

to collect the samples to determine abundance of gelatinous macrozooplankton and mesozooplankton in different areas of the Black Sea

To collect gelatinous macrozooplankton to quantify their food composition

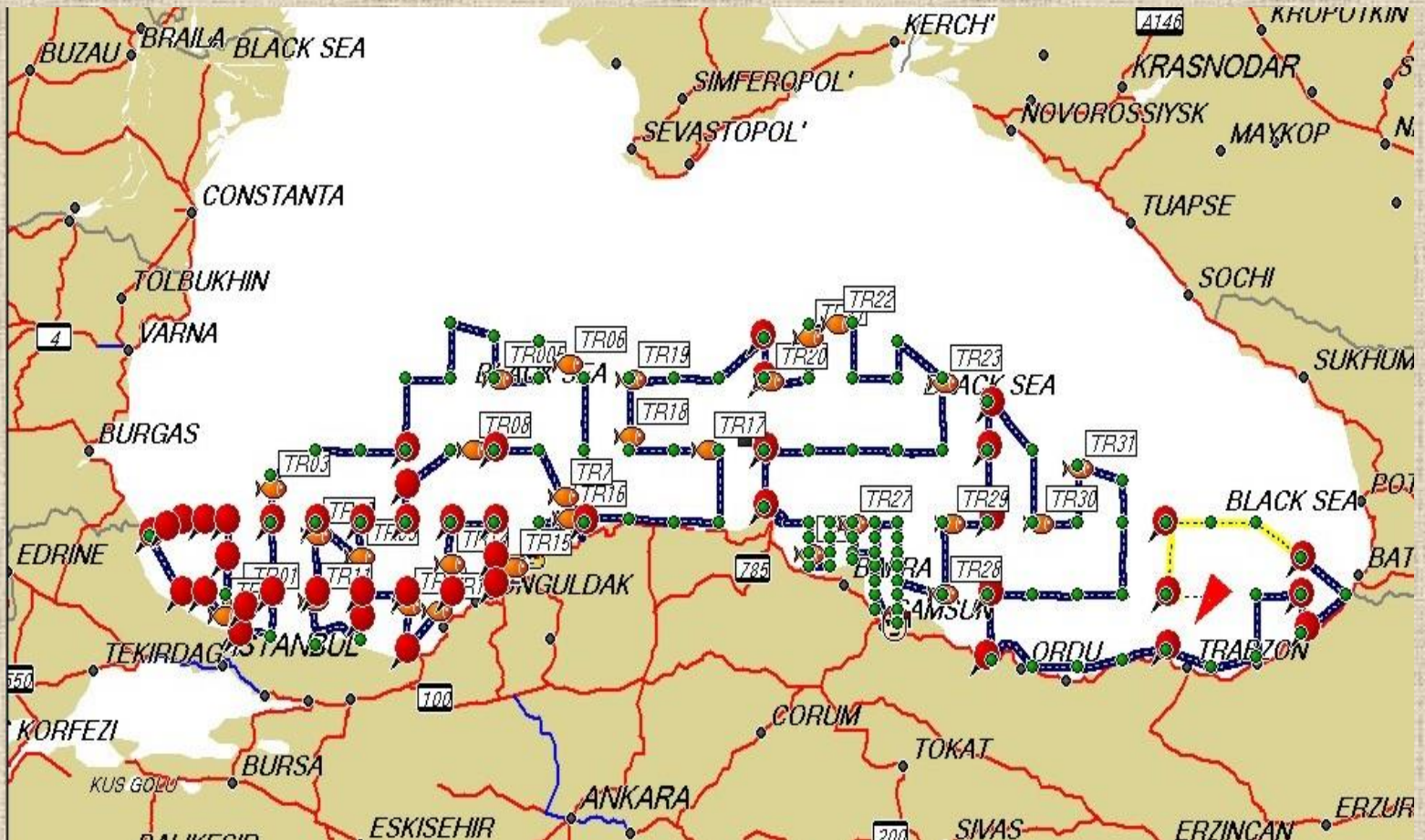
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# Turkish BSEX, July 2013

Fig. Red dots: BSEX stations (fish symbol where trawling made)



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# Turkish BSEX, July 2013

## Parameters collected

Eutrophication O<sub>2</sub>, nutrients, pH, chl, PAR, TOC, TN

Bacterial biomass/production

PP

Phytoplankton

Mesozooplankton

Gelatinous organisms

Eggs and larvae

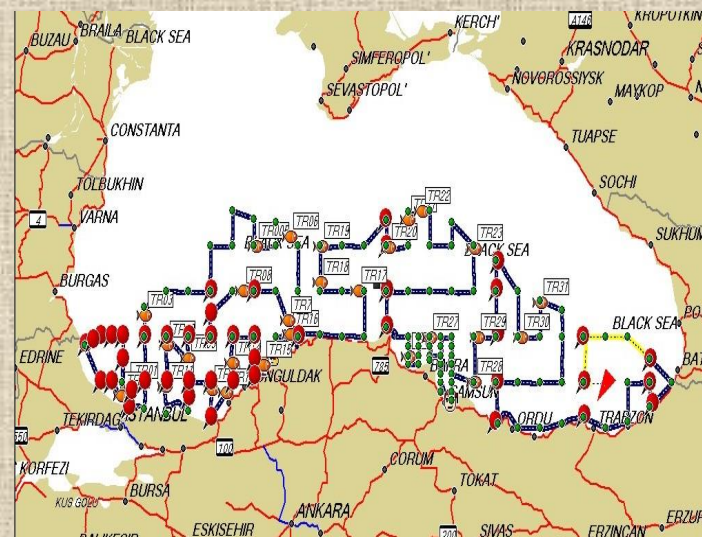
Fish acoustics

Food web PP vs fish biomass

Atm deposition

Contaminants , contaminants in fish (heavy metal)

Box corer/corer sample





## Two objectives

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Thank you for your attention





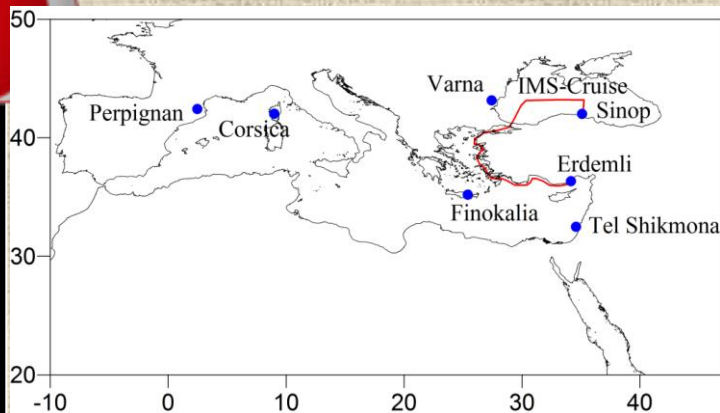
## Potential pathways to carryout similar experiments:

- Joint cruises (which seasons?) to study the level of eutrophication and distribution and impact of gelatinous zooplankton by METU, SIO-RAS, IO-BAS, IBSS, ? also anchovy spawning areas can be studied during the same cruises.
- Updated temporal levels in the concentration of invasive ctenophores and their impact on native zooplankton and especially on fish eggs and larvae.
- Clarification of modern spawning areas by sampling eggs and larvae of anchovy during the peak spawning season (preferably in July).
- In the BS, still it is not clear where the most abundant fish, anchovy, spawn; in the NWS as suggested by Ivanov&Beverton, or in the southern BS as suggested by Niermann et al, or everywhere? This requires another joint cruise undertaken at the same time by many institutes.
- With respect to decreased concentrations of certain micronutrients (such as silica and phosphorus), changes in the phytoplankton composition also can be addressed with joint cruises.

All these tasks could be realised with a large scale joint sampling program contributed by all partners.

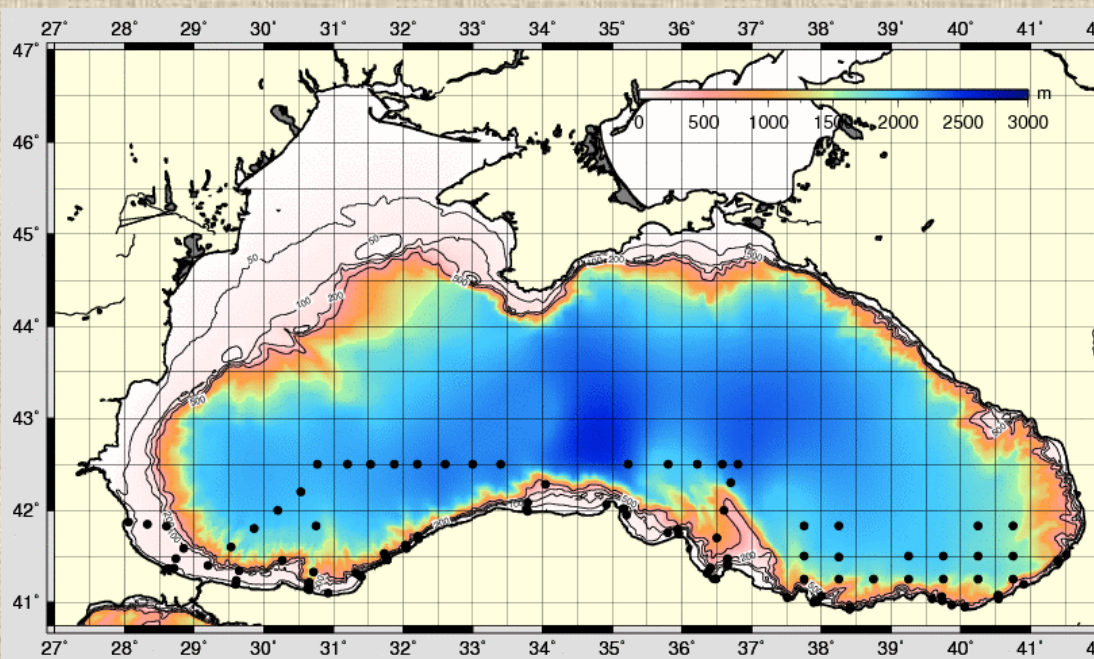


## Tentative plan on IMS-METU planned cruise measurements:



Measurement atmospheric nutrient deposition in southern Black Sea, DIN, DIP, DOC, DON, and DOP, as well as selected anthropogenic trace metals. **METU, ECPL-UoC, IO-BAS. D5 and D1**

One main (joint) cruise in 2013 (June-July tbd)



- Eutrophication O<sub>2</sub>, nutrients, pH, chl, PAR
- Biodiversity phyto fractional change
- Bacterial biomass/production, PP
- Phyto-species level
- Zooplankton-higher taxons, group level/jellyfish (IU)
- Fish acoustics/zooplankton, jellyfish (biomass, species level)
- Food web PP vs fish biomass
- Contaminants, contaminants in fish (heavy metal)
- Box corer/corer sample
- Eggs/Larvae + Noctiluca
- Atm deposition
- TOC, TN
- Gelatinous
- Eggs and larvae

