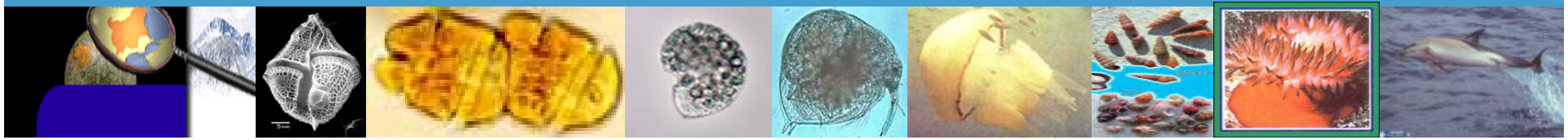
I F R

V A R N A

16-17.04.2014, Varna, Bulgaria

INSTITUTE OF FISH RESOURCES-VARNA, BULGARIA



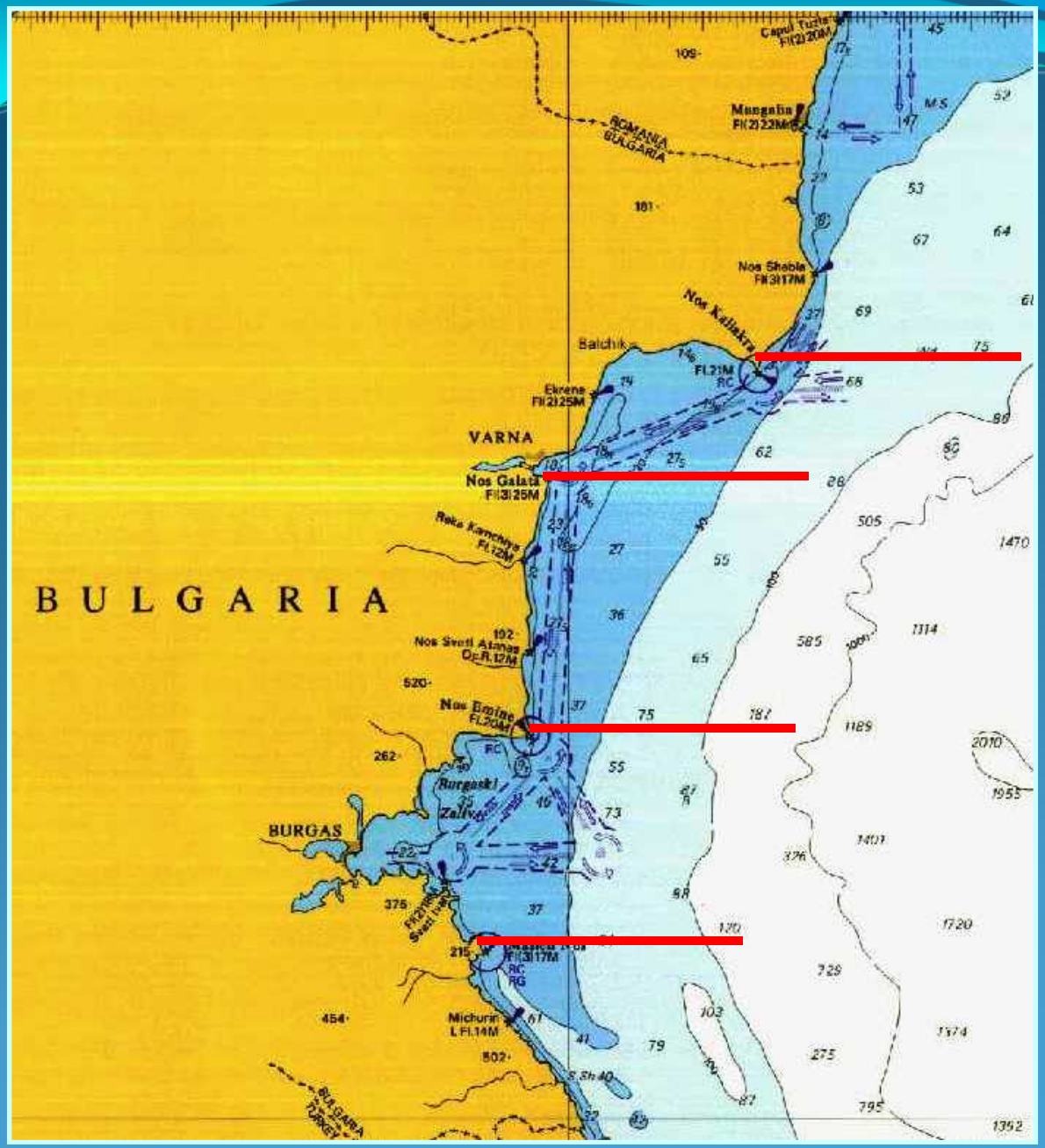
Investigations focus *since 1954*

- Biodiversity
- Ecosystem changes triggered by anthropogenic and climatic factors
- The Danube River impact on nutrients level and living organisms
- Potentially toxic phytoplankton species
- Invasive zooplankton distribution
- Biology and ecology of coastal lakes
- Commercial fish stock dynamics and trophic base
- Monitoring of lipid's dynamics of commercial fish species
- Anadromous fish research in the Danube River
- Genetic-biochemical methods for identification of fish species (sea and fresh water species) and hybrids

Datasets: SEADATA NET, UP-grade Black Sea Scene, Black Sea Scene (with DQC-CMS)

- Abiotic datasets – T, Salinity, O2 content, N - and P-species (17 hydrological and hydro-chemical parameters)
- Biotic datasets – Bacteria, Phytoplankton, Zooplankton (Meso-and Macrozooplankton), Benthos, Ichthyoplankton
- Ichthyologic datasets – Fish stock and recruitment of small pelagic fishes: Continuous data for : *Merlangus merlangus; Trachurus mediterraneus ponticus, Sprattus sprattus, Engraulis encrasicolus.*
- Cetaceans – stranded animals and distribution in the sea


SeaDataNet EDMED data sets originating from Institute of Fishery Resources (IFR) - Mozilla Firefox
bodc.ac.uk
https://www.bodc.ac.uk/data/information_and_inventories/edmed/results/191/originated/
Pan-European infrastructure for Ocean & Marine Data M
SeaDataNet
uropean Directory of Marine Environmental Data (EDMED)
ata sets originating from Institute of Fishery Resources (IFR)
| New query | Found 4
Host
Data set name
Abiotic Parameters Data Set for the Bulgarian coast
Biotic Parameters Dataset for the Bulgarian coast
Ichthyological Data set for the Bulgarian coast
Western Black Sea cetaceans dataset
| New query | Found 4
The EDMED search service is provided by the British Oceanographic Data Centre



TRANSECTS

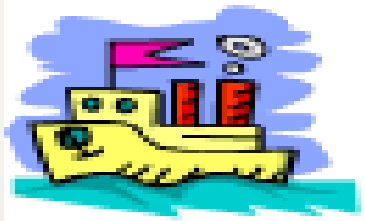
(1954-2013)

Cape Kaliakra

- Capa Galata
- Cape Emine
- Cape Maslen nos

Stations: 1, 3, 10, 20, 30 miles offshore.

MAP of most regular sampling on a seasonal and monthly basis.

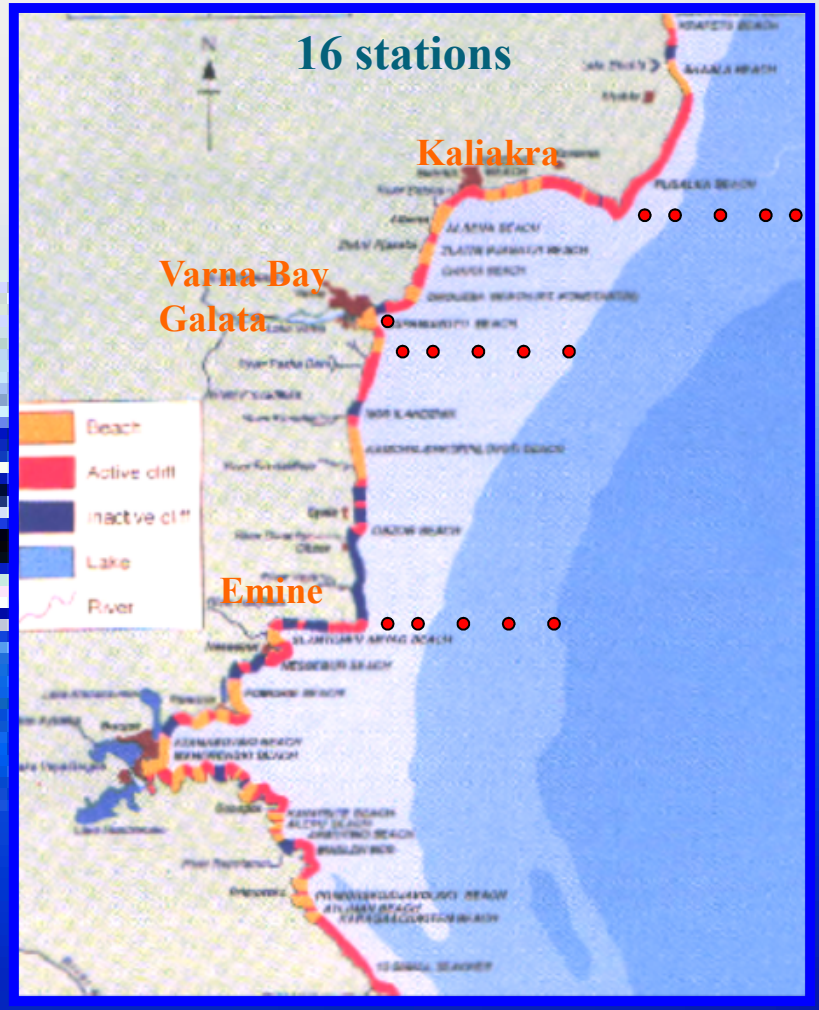


Cape Kaliakra

Cape Galata

Varna Bay

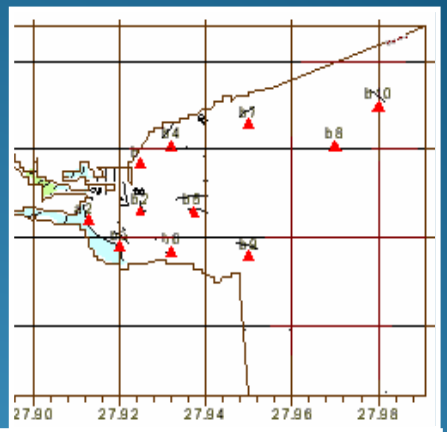
Bourgas Bay

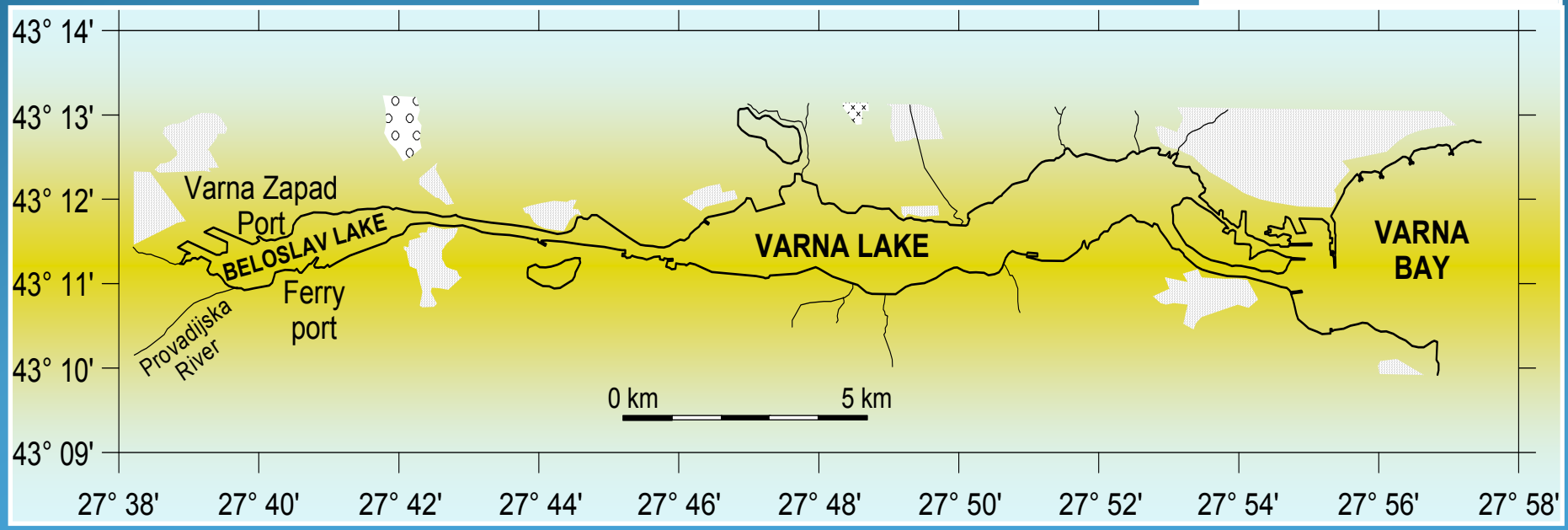


Note: benthic communities were studied on a different basis – seasonal observations started in the 1980s, however there was more intensive sampling in particular periods, e.g. 1020 samples only in 1986.

The Bay of Varna (since 1954)

- The Bay of Varna – 10 stations;
- Varna Lake – 4 stations;
- Beloslav Lake – 2 stations.



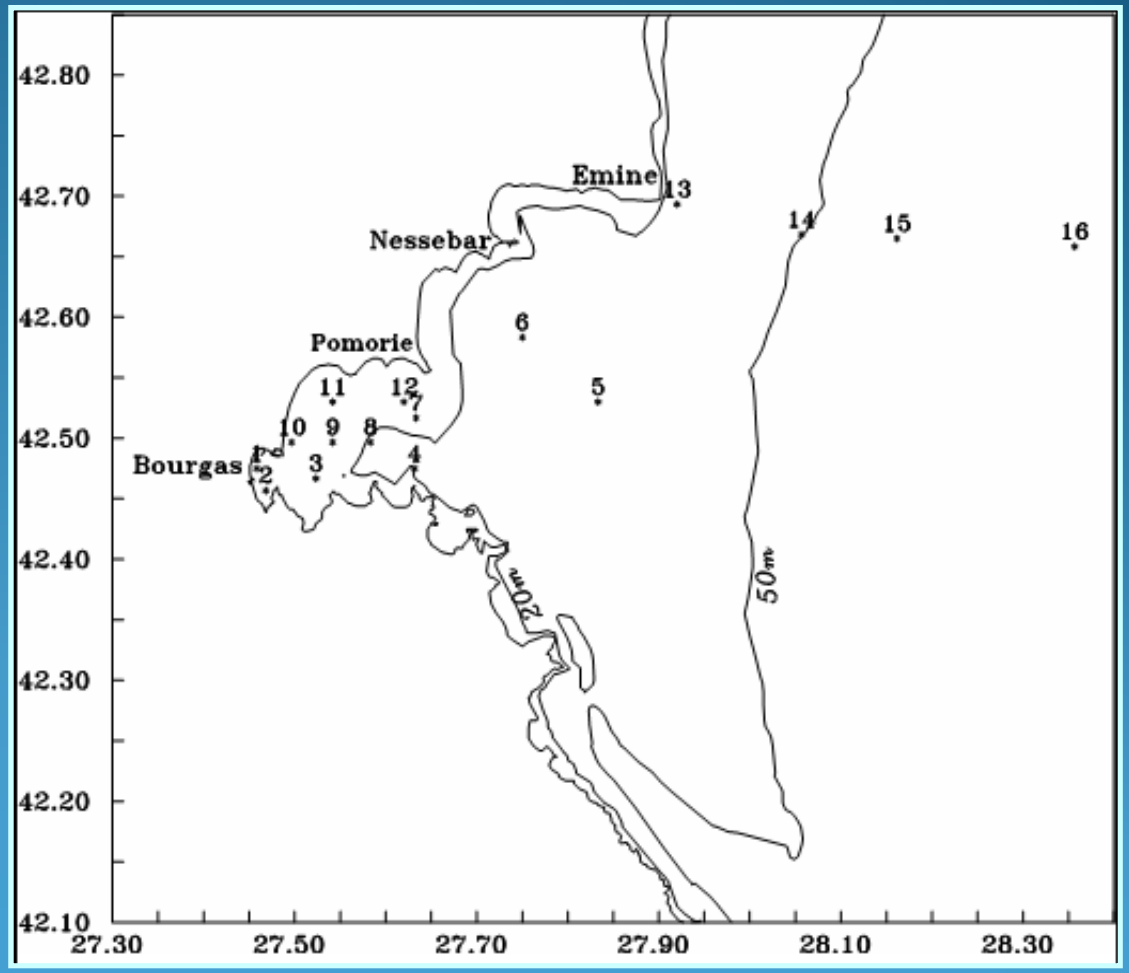


The Bay of Bourgas

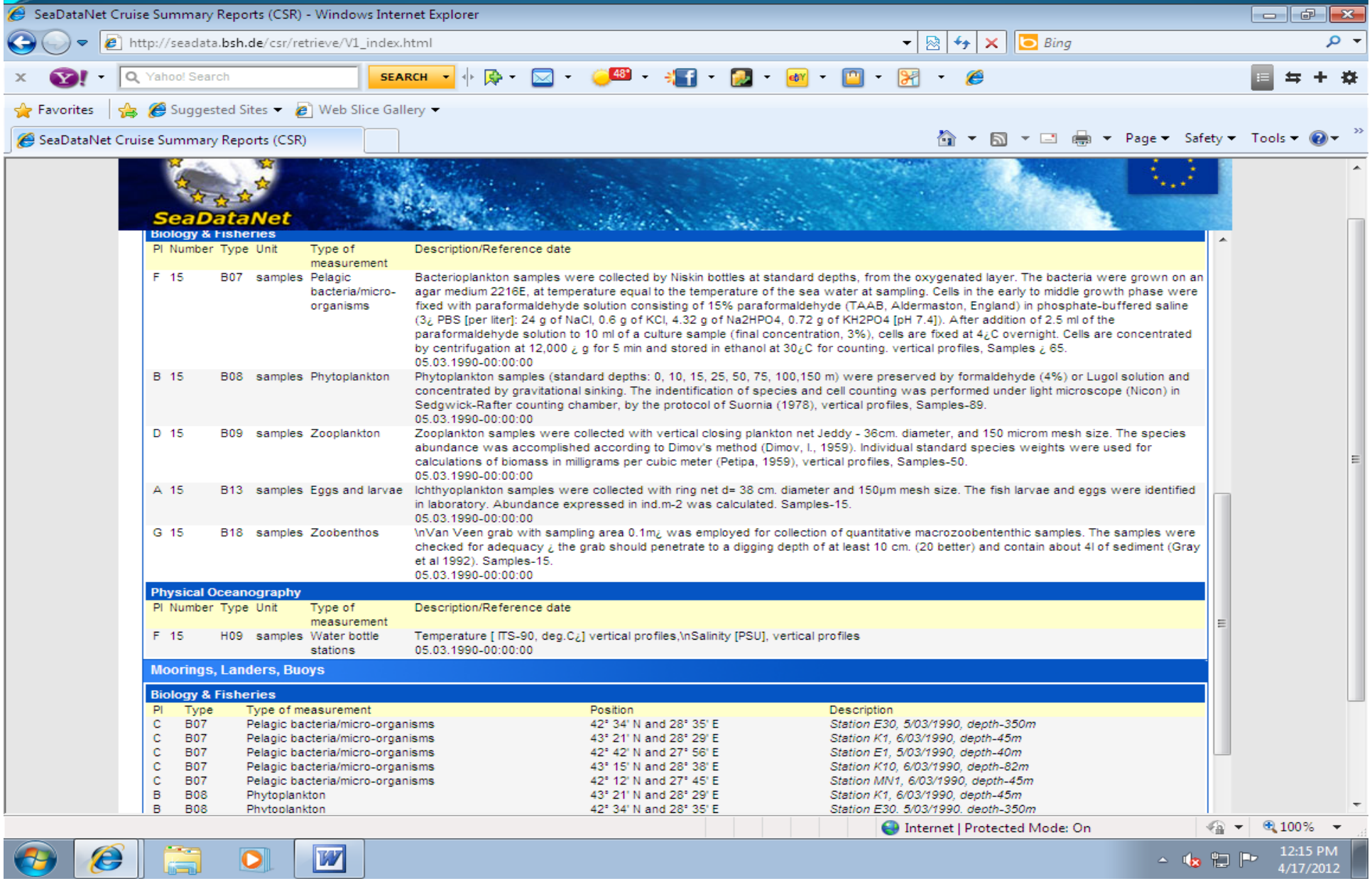
The Bay of Bourgas –

12 stations (1990-2000, 2009-2010)

Lakes Mandra, Vaia, Pomorie (70s and 80s)



Directory of scientific cruises (CSR)



Biology & Fisheries

Pl	Number	Type	Unit	Type of measurement	Description/Reference date
F	15	B07	samples	Pelagic bacteria/micro-organisms	Bacterioplankton samples were collected by Niskin bottles at standard depths, from the oxygenated layer. The bacteria were grown on an agar medium 2216E, at temperature equal to the temperature of the sea water at sampling. Cells in the early to middle growth phase were fixed with paraformaldehyde solution consisting of 15% paraformaldehyde (TAAB, Aldermaston, England) in phosphate-buffered saline (3¿ PBS [per liter]: 24 g of NaCl, 0.6 g of KCl, 4.32 g of Na2HPO4, 0.72 g of KH2PO4 [pH 7.4]). After addition of 2.5 ml of the paraformaldehyde solution to 10 ml of a culture sample (final concentration, 3%), cells are fixed at 4¿C overnight. Cells are concentrated by centrifugation at 12,000 ¿ g for 5 min and stored in ethanol at 30¿C for counting. vertical profiles, Samples ¿ 65. 05.03.1990-00:00:00
B	15	B08	samples	Phytoplankton	Phytoplankton samples (standard depths: 0, 10, 15, 25, 50, 75, 100,150 m) were preserved by formaldehyde (4%) or Lugol solution and concentrated by gravitational sinking. The indentification of species and cell counting was performed under light microscope (Nicon) in Sedgwick-Rafter counting chamber, by the protocol of Suornia (1978), vertical profiles, Samples-89. 05.03.1990-00:00:00
D	15	B09	samples	Zooplankton	Zooplankton samples were collected with vertical closing plankton net Jeddy - 36cm. diameter, and 150 microm mesh size. The species abundance was accomplished according to Dimov's method (Dimov, I., 1959). Individual standard species weights were used for calculations of biomass in milligrams per cubic meter (Petipa, 1959), vertical profiles, Samples-50. 05.03.1990-00:00:00
A	15	B13	samples	Eggs and larvae	Ichthyoplankton samples were collected with ring net d= 38 cm. diameter and 150µm mesh size. The fish larvae and eggs were identified in laboratory. Abundance expressed in ind.m-2 was calculated. Samples-15. 05.03.1990-00:00:00
G	15	B18	samples	Zoobenthos	\nVan Veen grab with sampling area 0.1m¿ was employed for collection of quantitative macrozoobententhic samples. The samples were checked for adequacy ¿ the grab should penetrate to a digging depth of at least 10 cm. (20 better) and contain about 4l of sediment (Gray et al 1992). Samples-15. 05.03.1990-00:00:00

Physical Oceanography

Pl	Number	Type	Unit	Type of measurement	Description/Reference date
F	15	H09	samples	Water bottle stations	Temperature [ITS-90, deg.C¿] vertical profiles,\nSalinity [PSU], vertical profiles 05.03.1990-00:00:00

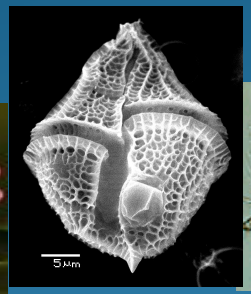
Moorings, Landers, Buoys

Biology & Fisheries

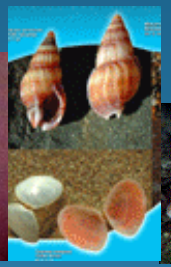
Pl	Type	Type of measurement	Position	Description
C	B07	Pelagic bacteria/micro-organisms	42° 34' N and 28° 35' E	*Station E30, 5/03/1990, depth-350m*
C	B07	Pelagic bacteria/micro-organisms	43° 21' N and 28° 29' E	*Station K1, 6/03/1990, depth-45m*
C	B07	Pelagic bacteria/micro-organisms	42° 42' N and 27° 56' E	*Station E1, 5/03/1990, depth-40m*
C	B07	Pelagic bacteria/micro-organisms	43° 15' N and 28° 38' E	*Station K10, 6/03/1990, depth-82m*
C	B07	Pelagic bacteria/micro-organisms	42° 12' N and 27° 45' E	*Station MN1, 6/03/1990, depth-45m*
B	B08	Phytoplankton	43° 21' N and 28° 29' E	*Station K1, 6/03/1990, depth-45m*
B	B08	Phytoplankton	42° 34' N and 28° 35' E	*Station E30, 5/03/1990, depth-350m*

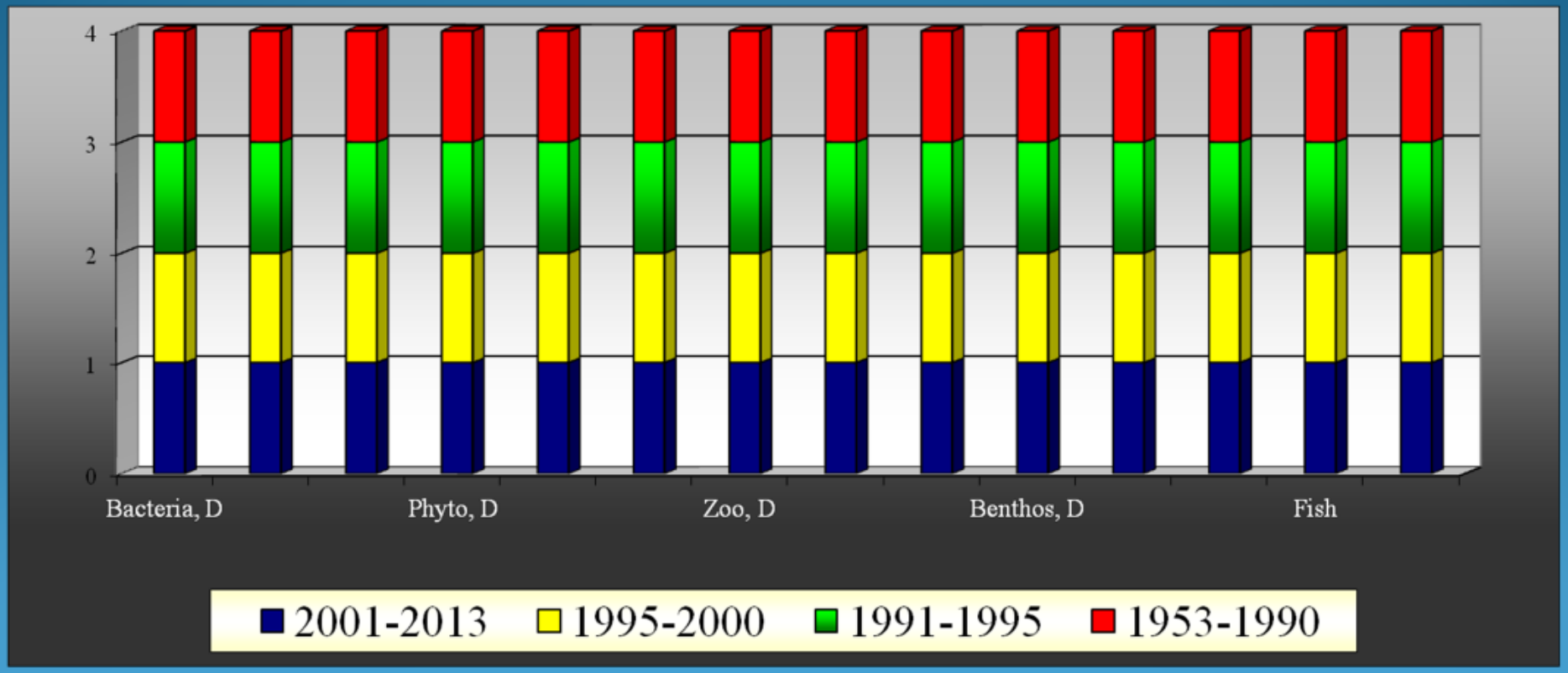
Biotic Parameters







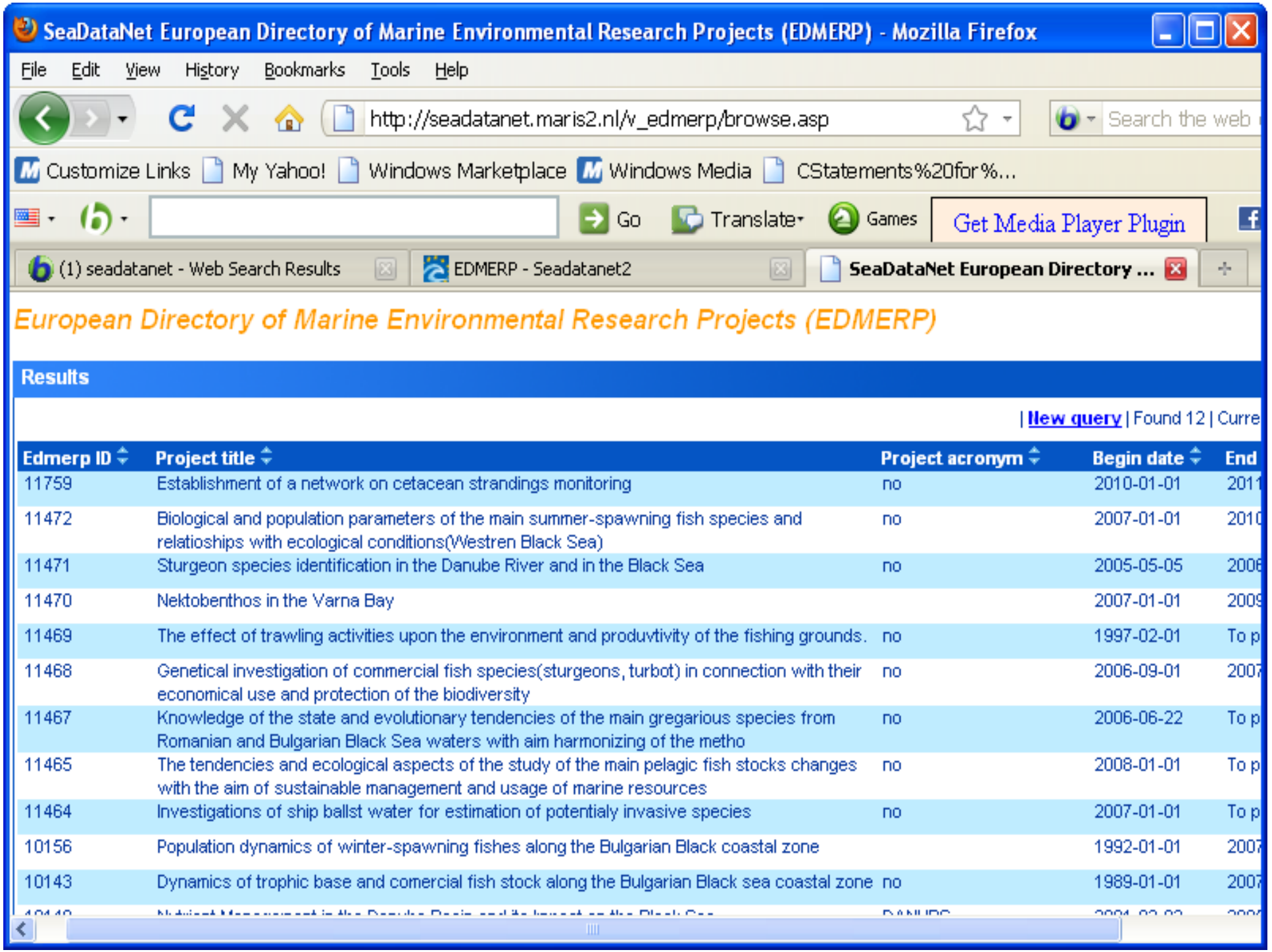




Bacterioplankton – since 1972. Fish – since 1932.

Recent projects:

- **Biological and population parameters of the economically important aquatic resources in the Bulgarian Black region (funded by the AA, 2014-2018).**
- **Investigations on the impact of *Rapana venosa* on the *Mytilus galloprovincialis* and bottom ceonosis along the Bulgarian coast of the Black Sea (funded by NAFA/2012)**
- **Contemporary state of the biodiversity along the Bulgarian Black Sea coast (funded by the AA, 2010-2012)**
- **Pelagic and bottom communities along the Bulgarian Black Sea cost funded by the AA, 2014-2018).**



European Directory of Marine Environmental Research Projects (EDMERP)

Results

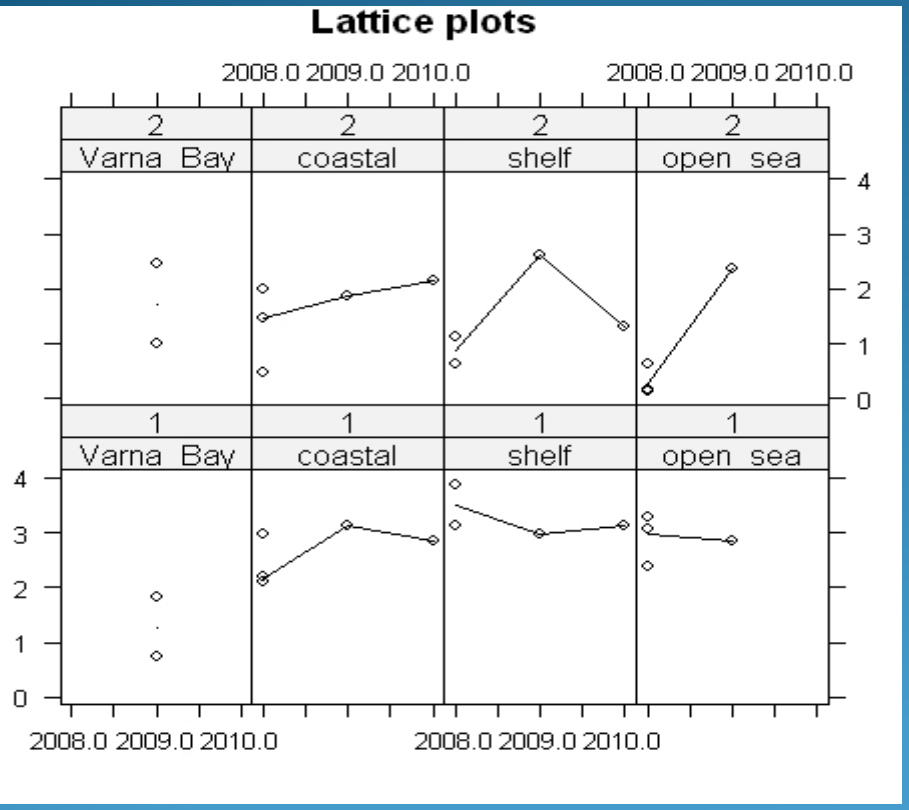
| New query | Found 12 | Curre

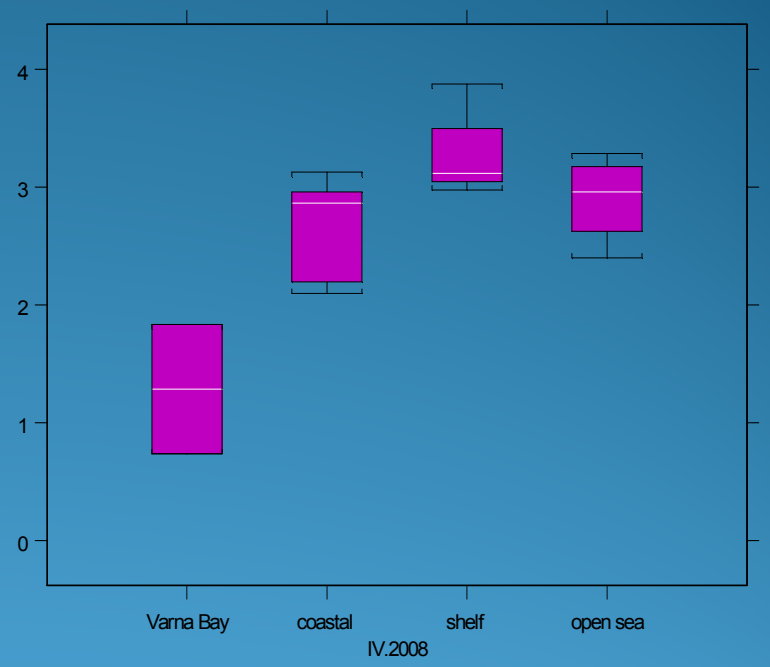
Edmerp ID	Project title	Project acronym	Begin date	End
11759	Establishment of a network on cetacean strandings monitoring	no	2010-01-01	2011
11472	Biological and population parameters of the main summer-spawning fish species and relatioships with ecological conditions(Westren Black Sea)	no	2007-01-01	2010
11471	Sturgeon species identification in the Danube River and in the Black Sea	no	2005-05-05	2006
11470	Nektobenthos in the Varna Bay		2007-01-01	2009
11469	The effect of trawling activities upon the environment and produvtivity of the fishing grounds.	no	1997-02-01	To p
11468	Genetical investigation of commercial fish species(sturgeons, turbot) in connection with their economical use and protection of the biodiversity	no	2006-09-01	2007
11467	Knowledge of the state and evolutionary tendencies of the main gregarious species from Romanian and Bulgarian Black Sea waters with aim harmonizing of the metho	no	2006-06-22	To p
11465	The tendencies and ecological aspects of the study of the main pelagic fish stocks changes with the aim of sustainable management and usage of marine resources	no	2008-01-01	To p
11464	Investigations of ship ballst water for estimation of potentialy invasive species	no	2007-01-01	To p
10156	Population dynamics of winter-spawning fishes along the Bulgarian Black coastal zone		1992-01-01	2007
10143	Dynamics of trophic base and comercial fish stock along the Bulgarian Black sea coastal zone	no	1989-01-01	2007

Descriptor 1: Biological diversity (species and habitats maintained) (fish and marine mammals, pelagic and benthos habitats)

- Species composition of fish populations along the Bulgarian Black Sea coast (*Mugilidae, Gobies, Clupeidae*), distributional patterns and populations condition for small pelagics
- Species composition and distribution of Cetaceans (data not available for free usage)
- Species composition, population biomass and abundance, Shannon index estimations for plankton and benthos species in the investigated localities
- Statistics of catches of aquatic resources

Zooplankton examples: Index of species diversity (Shennon index)

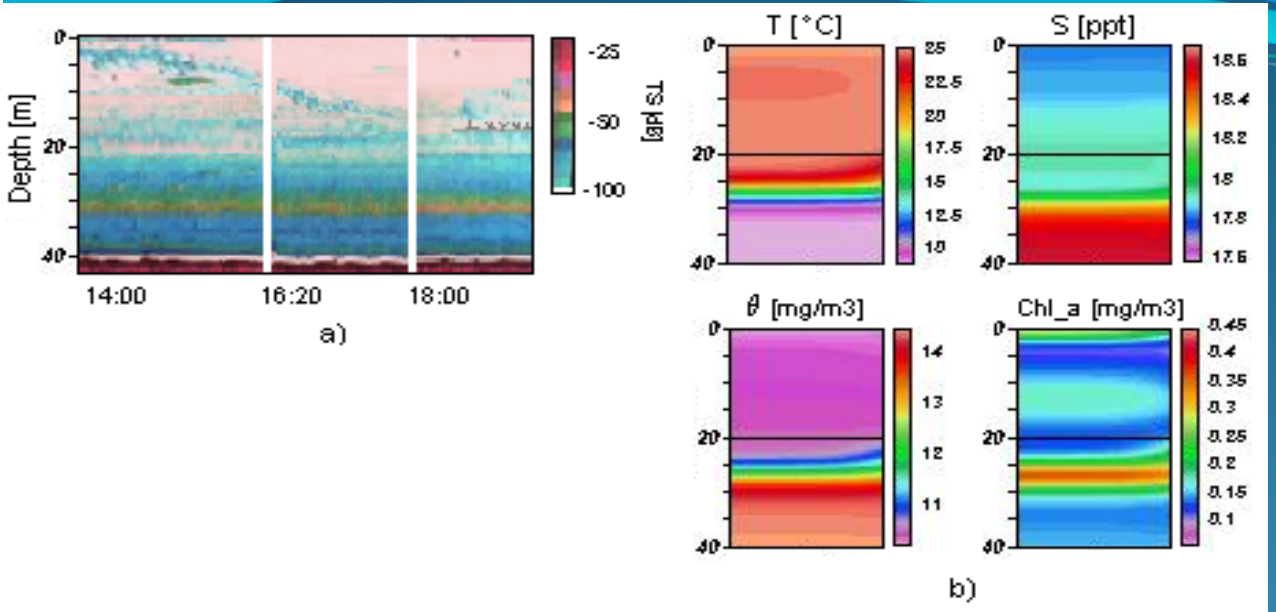


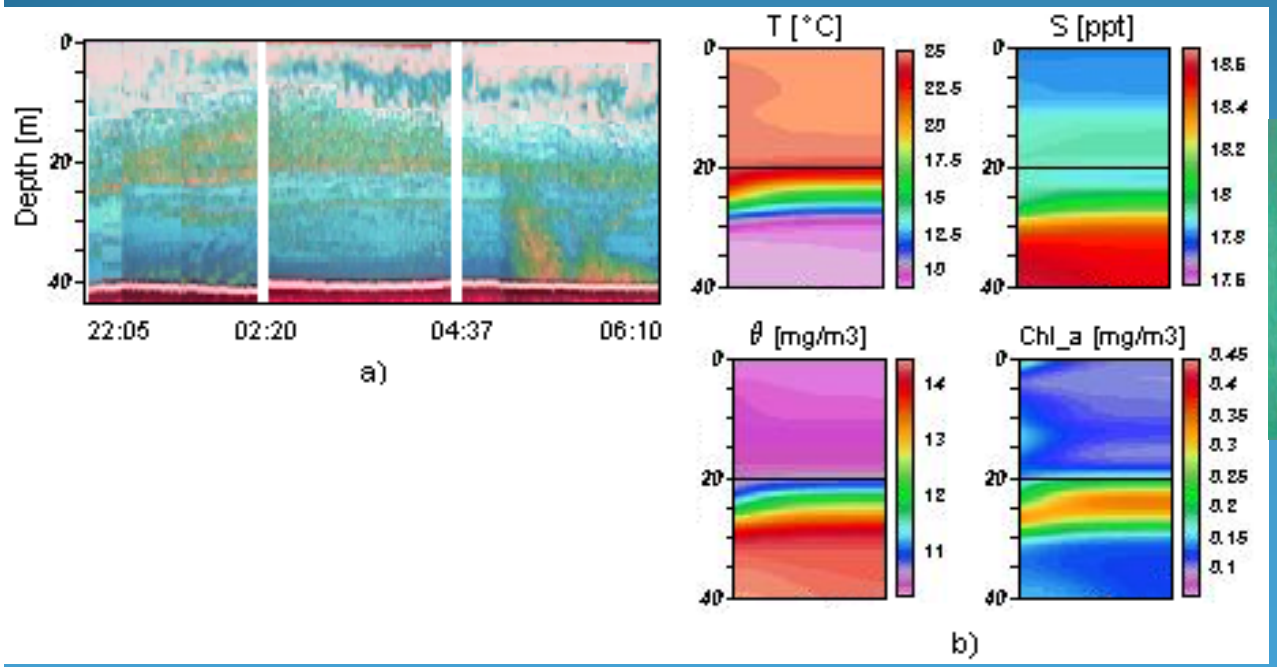


Shennon index changes 1) abundance H(A) и 2) biomass H(B) in Varna Bay , coastal waters, shelf and open sea

Shennon index in:
Varna Bay, coastal region, shelf and open sea

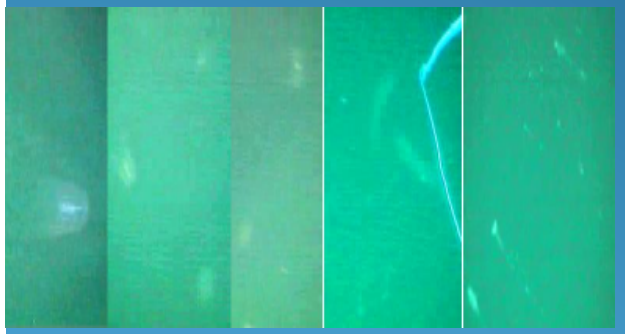
Distributional patterns: Acoustic & Video recording (2003-2006); plankton community and fish





Acoustic data were collected using a Simrad EQ33 echosounder operating at 50kHz and 200 kHz.

The video observation was carried out with a digital colour videocamera CCD "Panasonic" (380 TV lines, 582(H)x492(V) pixels).



Video recordings of ctenophores, fish and marine snow.

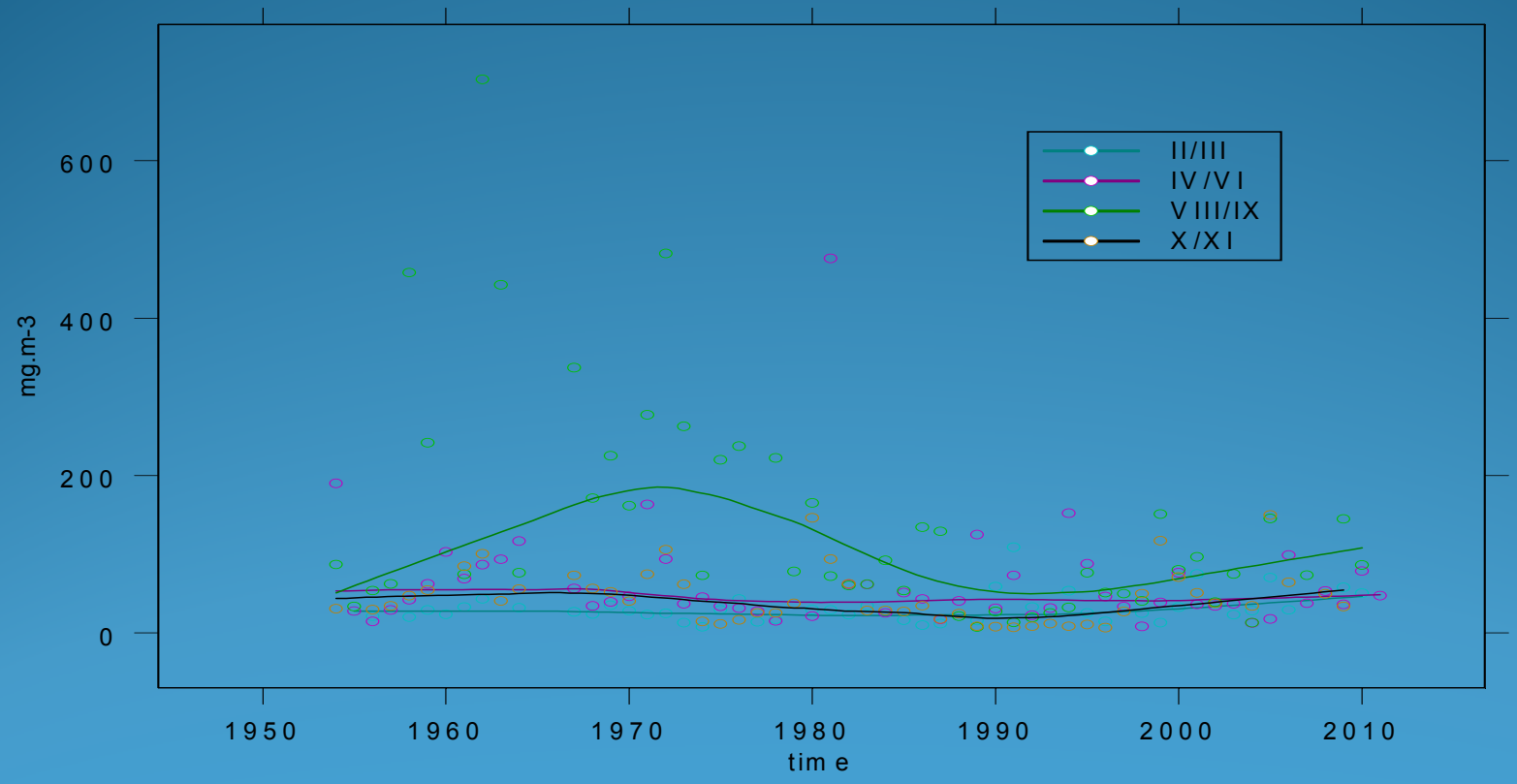
Descriptor 3: Population of commercial fish/shellfish (within safe biological limits - healthy stocks)

- Level of pressure : Fishing fleet capacity /fishing effort; Fish stock biomass trends; Fish catches/ biomass, total landings; Fishing mortality
- Reproductive capacity: Spawning Stock Biomass, Biomass indexes
- Population age and size distribution: Length and age structure, mean maximum length , growth, Biochemical and genetic analyses

Descriptor 4: Elements of marine food webs (all elements at normal abundance and diversity)

- Abundance and distribution of key groups and species - abundance trends of key groups
- Performance of key predators - Consumption rate of mesozooplankton by gelatinous species (data for 2002-2010)
- Diet composition – small pelagics and gelatinous zooplankton
- Body size of selected groups – fish and gelatinous zooplankton

Seasonal changes in mesozooplankton biomass ($mg.m^{-3}$) during 1954 - 2010.



Descriptor 6: Sea floor integrity (species, habitats and structures and functions are not adversely affected)

- Species composition, biomass and abundance in sand, silt and clay sediments (soft bottom sediments),
- Condition of benthic communities
- Abundance of bio-engineering species
- Sensitive species (AMBI)
- Biomass size spectrum
- Density and richness indexes
- *Rapana venosa* distribution, biomass and abundance
- *Mytilus galloprovincialis* distribution, biomass and abundance
- *Chamelea gallina* distribution, biomass and abundance

Thank you for your attention!