Research and monitoring in support of MSFD indicators in the southwestern Black sea

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Descriptor 1: Biological diversity is maintained

Benthic habitats studied by LME-IBER-BAS

Predominant types of MSFD bottom habitats, habitat types in Annex I of the Habitats Directive and National habitat subtypes (biotopes)

MSFD habitats classification	Habitats Directive Annex I Habitat types	National habitat subtypes (biotopes) in the Bulgarian Black Sea waters
Shallow sublittoral rock and biogenic reef ,	1170 Reefs	Infralittoral rocky bottom with perrennial algae from genus *Cystoseira* Lower infralittoral with association of the scyophylic algae *Phyllophora crispa* Infralittoral rocky bottom with seasonal red and green algae
Shallow sublittoral sands	1110 Sandbanks which are slightly covered by sea water all the time	Underwater seagrass meadows Sands and muddy sands with *Chamelea gallina*

Species level- *s*pecies distribution, distributional range, distributional pattern, area covered.

Habitat level- Habitat distribution, Habitat extent- based on precise habitat mapping.

Habitat condition- based on internationally approved indices(see descr. 6).

Ecosystem level- still need integration studies

Descriptor 3: Commercial fish

- Collection of biological and fisheries data from the southwest Black Sea

- Development of analytical population dynamics models

- Perform regular stock assessment within the STECF Black Sea EWG

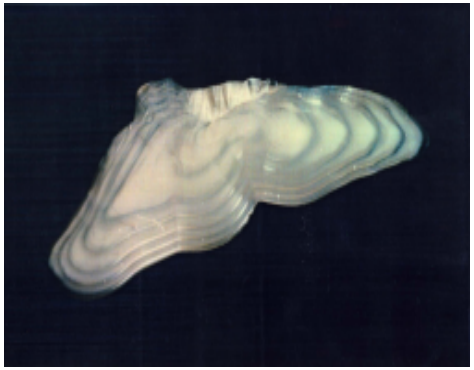
- Estimate reference points and MSY indicators for fish stocks in the Black Sea

Integrated Fish Stock Assessment

Wegth-at-age

Total international catch

Survey data

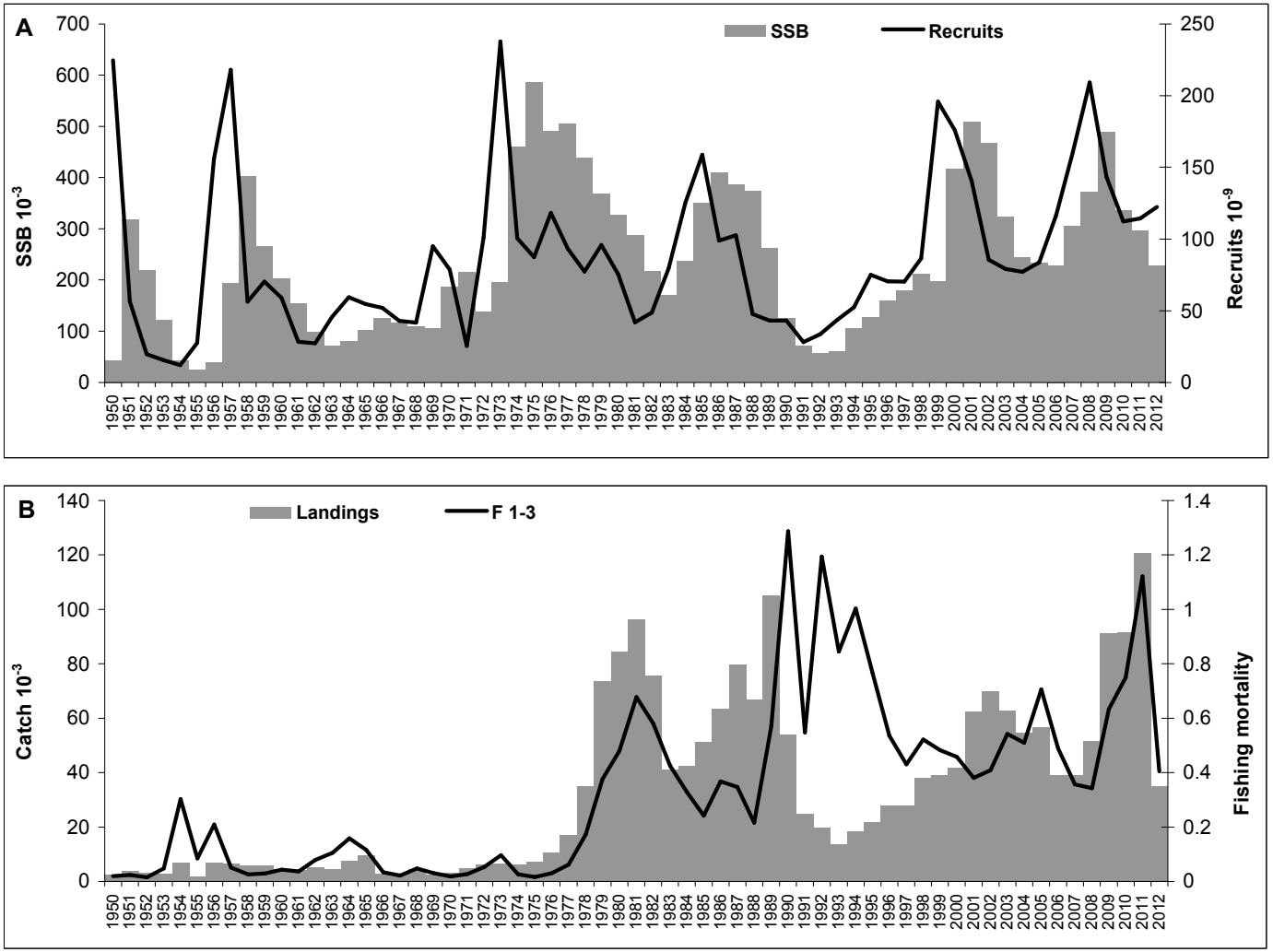


Age composition data

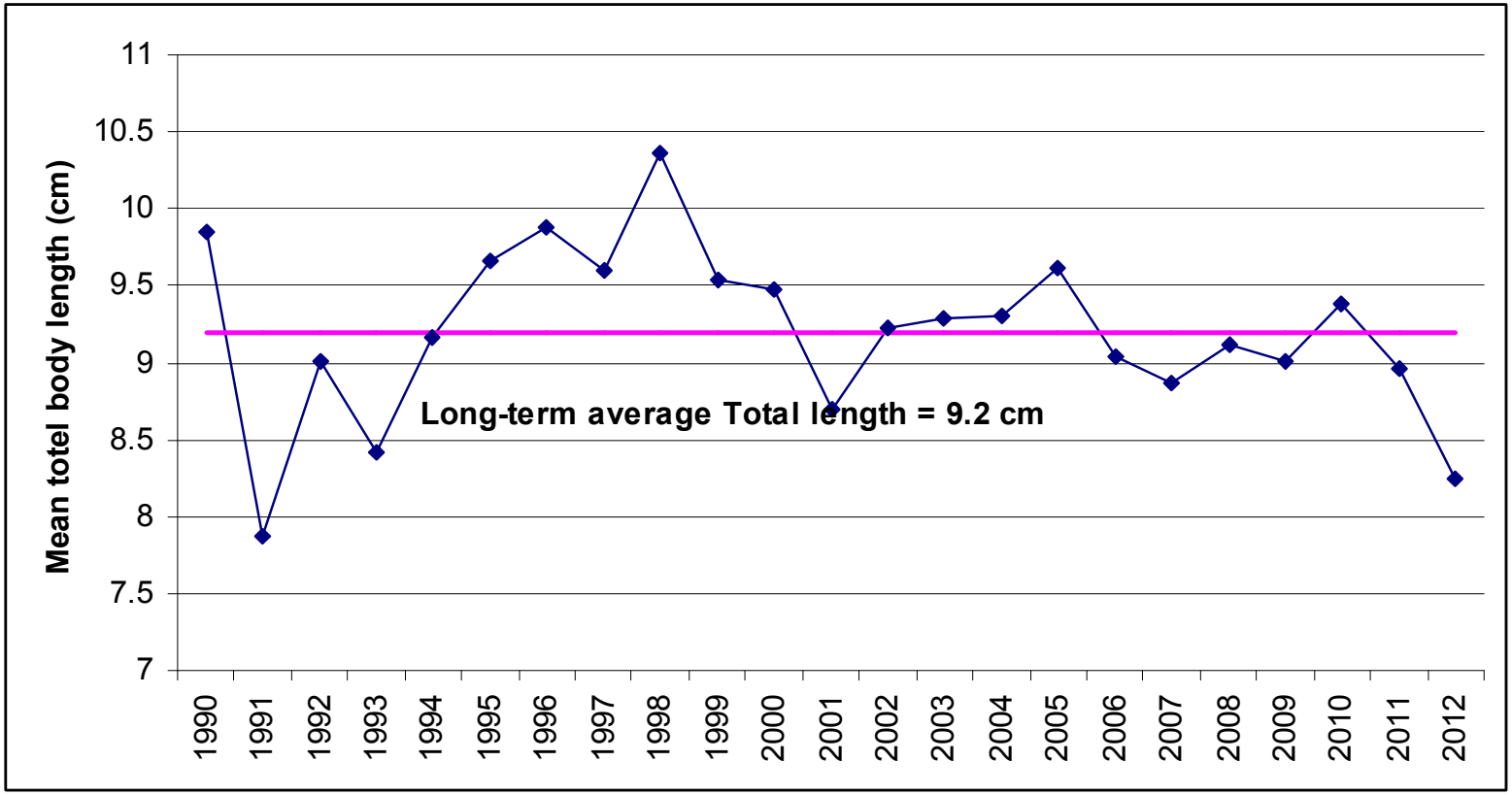
Current and past spawning stock size

Fishing Mortality

Recruitment



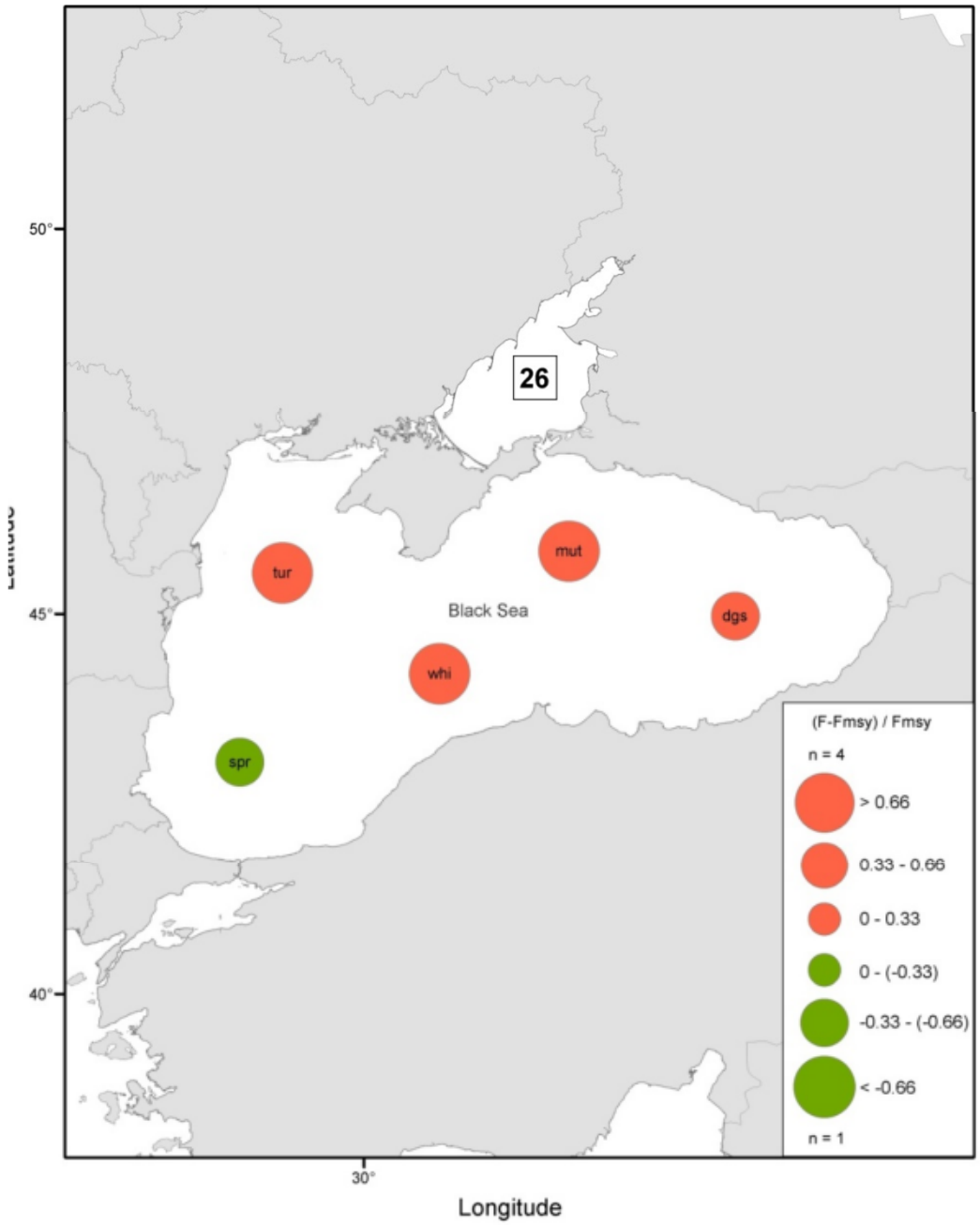
Stock assessment of sprat in the Black Sea



Mean length of sprat in the catches. Long-term average (over 1990-2012) is shown as a purple line

Black Sea stocks with data categories assigned and D3.1 assessment from the 2012 stock assessments

#	Common name	Scientific name	Data category	Stock assessment	F 2010	F 2011	F 2012	Fmsy	(F-Fmsy)/Fmsy
1	Sprat	*Sprattus sprattus*	1	STECF EWG	0.75	1.12	0.40	0.64	-0.37
2	Anchovy	*Engraulis encrasicolus*	2	STECF EWG					
3	Mediterranean Horse mackerel	*Trachurus mediterraneus*	2	STECF EWG					
4	Turbot	*Psetta maxima*	1	STECF EWG	0.79	0.73	0.85	0.27	2.17
5	Whiting	*Merlangius merlangus*	2	STECF EWG			0.96	0.40	1.40
6	Red mullet	*Mullus barbatus*	1	STECF EWG	0.79	0.81	0.91	0.46	0.97
7	Picked dogfish	*Squalus acanthias*	2	STECF EWG			0.24	0.18	0.33



Status of the current fishing mortality (F) in relation to the target reference mortality (Fmsy) for of 5 Black Sea stocks.

Descriptor 4: Food webs

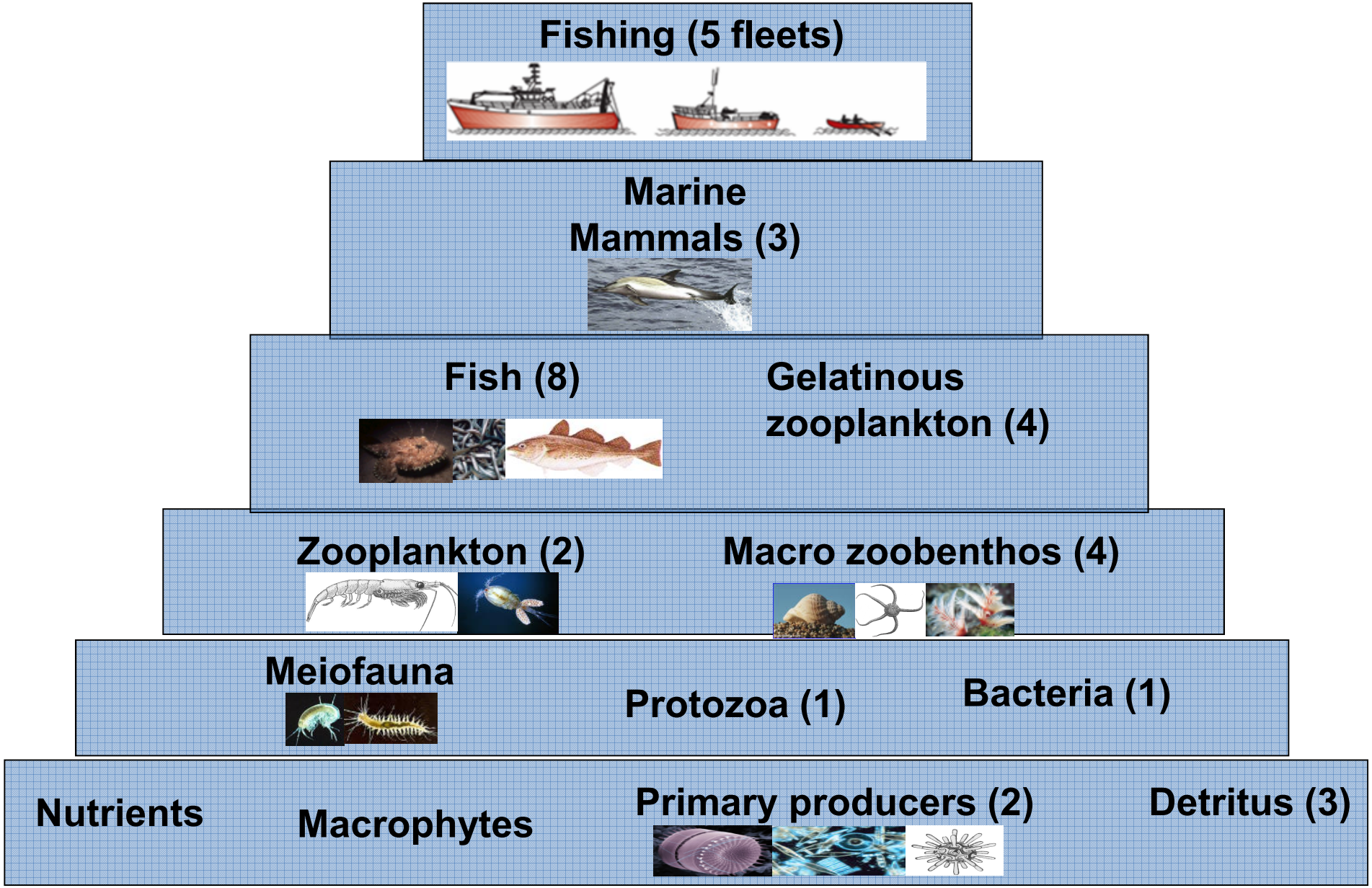
- Collection of biological, fisheries & dietary data from the southwest Black Sea

- Development of food web models (Ecopath, Ecosim, Ecospace)

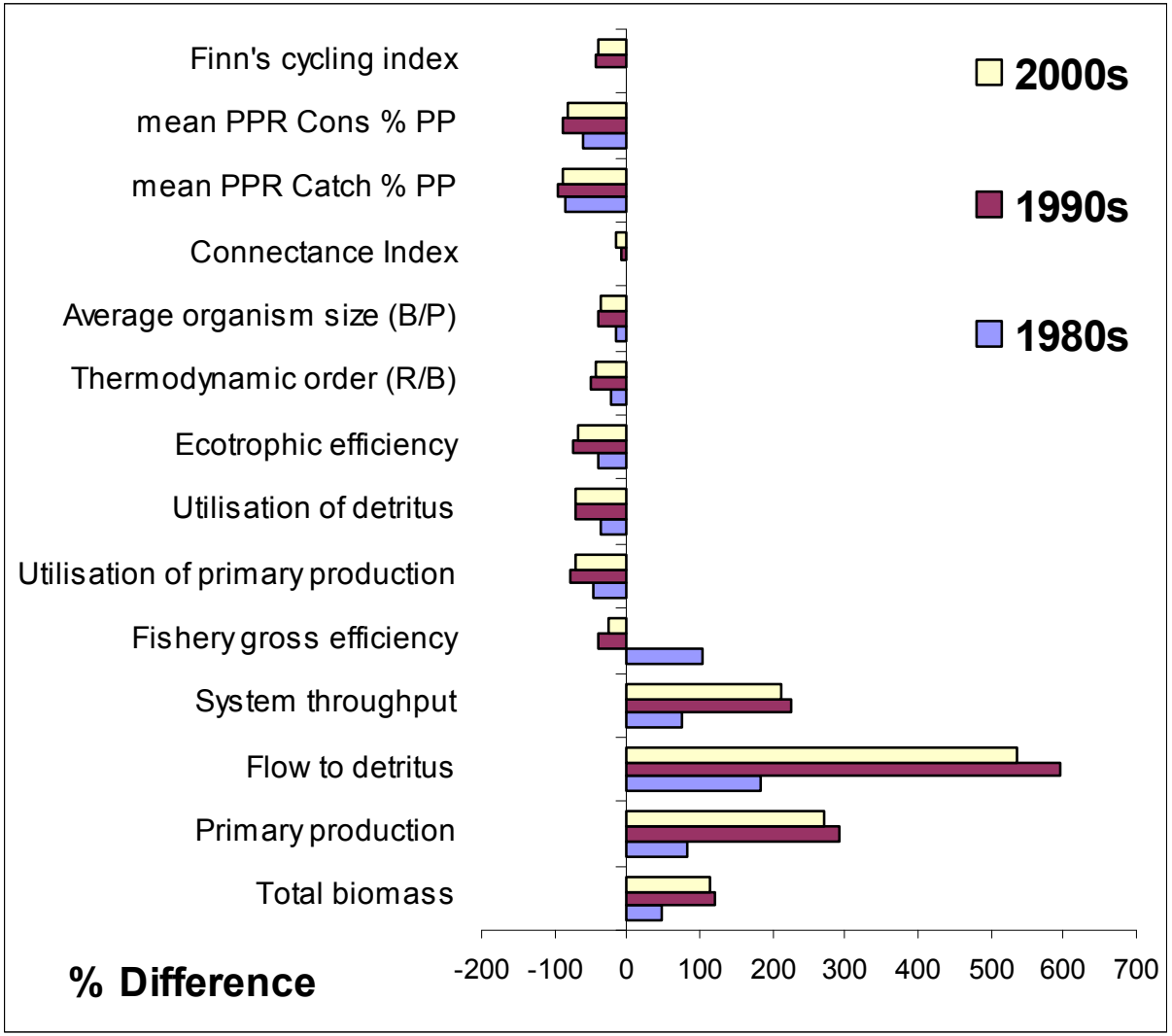
- Develop multivariate indicators for integrated ecosystem assessment

- Development and assessment of trophic indicators

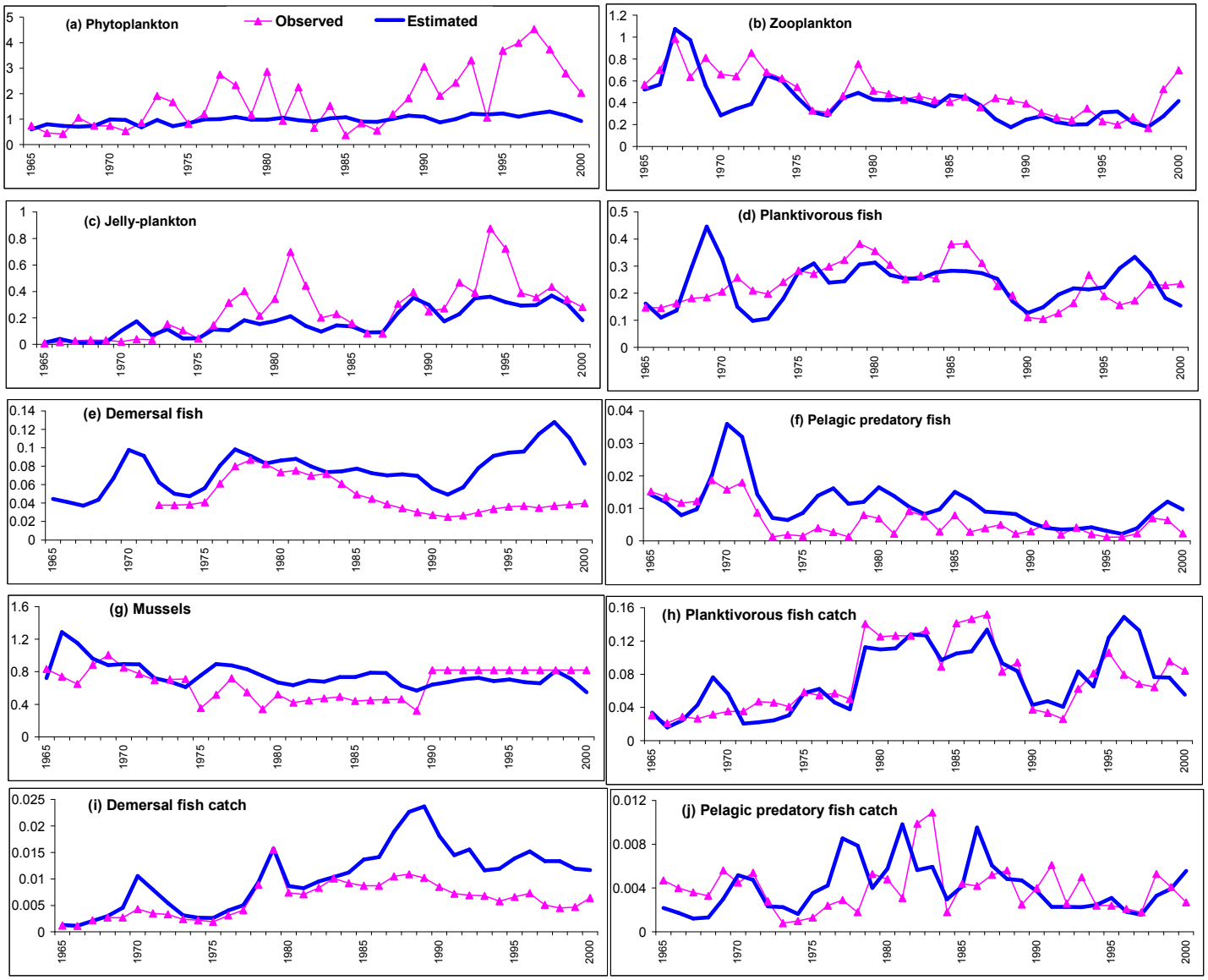
Coupled Black Sea Ecopath model



Indicators of ecosystem 'health': % Difference between 1960s 'pristine' state and later decades



Time dynamic model estimates (blue lines) of the main trophic groups in the Ecosim model 1965-2000



Descriptor 6: Sea-floor integrity

Condition of benthic community

- species diversity (abundance or biomass), tolerant or sensitive taxa, presence of sensitive and/or tolerant species

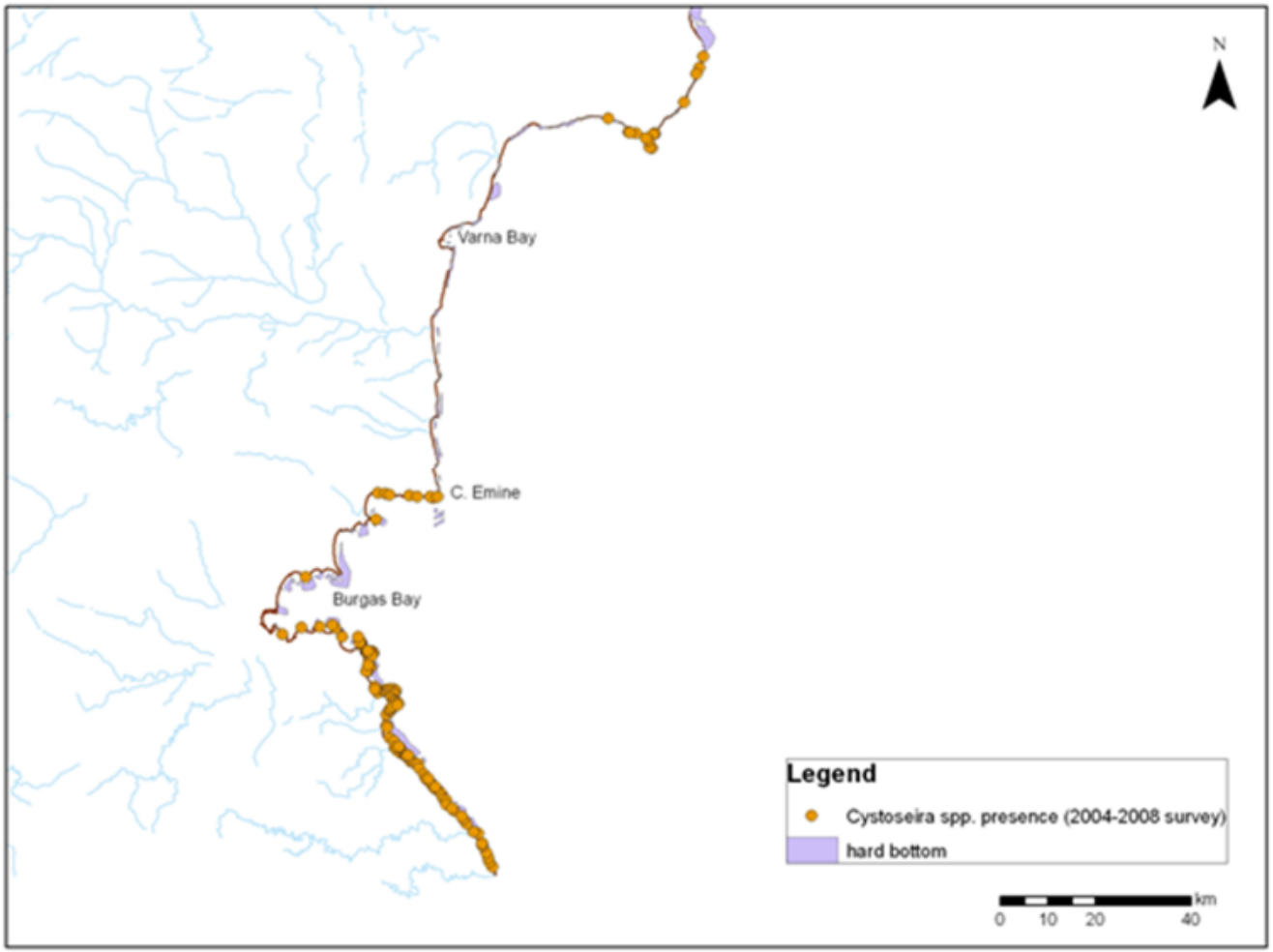
- overall area of priority habitats and depth structure of communities

- multi-metric indexes- based on species diversity and richness, proportion of different funcitonal groups, and opportunistic to sensitive species :

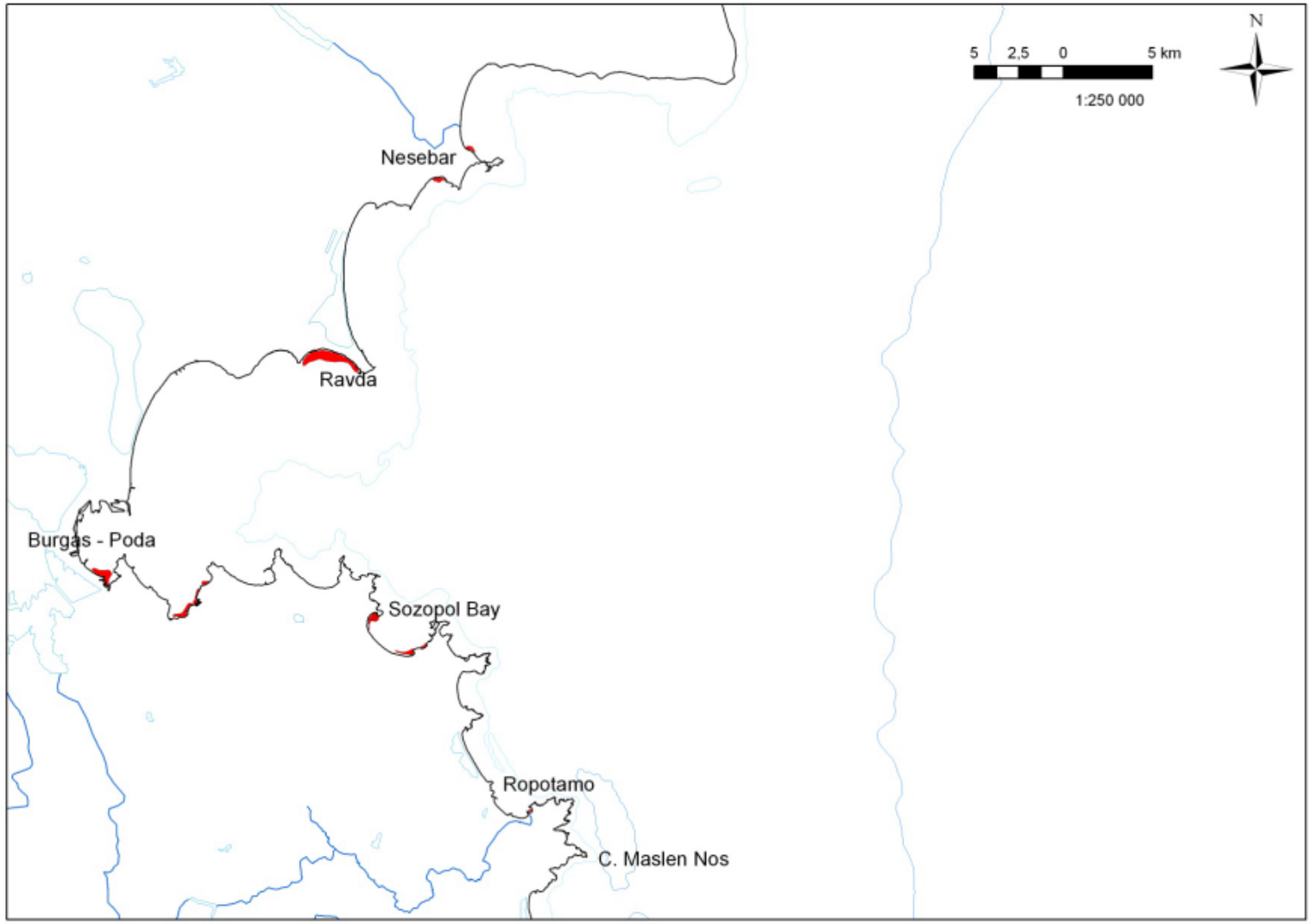
for macrozoobenthos BENTIX, AMBI, M-AMBI…

- for phytobenthos: EEI-C, Carlit

Distribution of Cystoseira spp. infralittoral habitats along the Bulgarian Black Sea coast. Area between C. Emine and Varna Bay not surveyed. Data included in Coconet WP2 database



Distribution of habitat 1110, subtype Underwater seagrass meadows in Burgas Bay, SW Black Sea



Thank you!