



Global  
Environment  
Facility



# **Results of the monitoring activities for the last 15 years**

## **-increase of institutional capacity of the countries for monitoring**

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15 Years of UNDP/GEF in the Black Sea Region,  
Final Seminar,  
14-15 February 2008, Istanbul



- The Contracting Parties shall establish . . . . . joint monitoring programs covering all sources of pollution and shall establish a pollution monitoring system for the Black Sea including. . . programs. . for observing, measuring, evaluating and analyzing the risks or effects of pollution of the marine environment of the Black Sea

- Bucharest Convention art. XV – 4
- BSSAP Article 54: Black Sea Monitoring System & Quality Assurance System

## ■ BSEP – 1993.

- - monitoring and managing the Black Sea ecosystem
- - developing a Black Sea Strategic Action Plan
- - developing an Urgent Investment Portfolio

- **Monitoring**

- **CAPACITY BUILDING**

- **laboratory equipment**

- **technical assistance, training**

- **QA/QC**





# Technical assistance

- Two Tacis projects assisting the Odessa Activity Centre with:
  - supplementary laboratory equipment
  - training
  - long term consultant
  - first attempt for developing EQS and EQO
  - QA/QC
  - First attempt of introducing biomarkers

## ■ Two Phare projects for:

- laboratory equipment
- in house training for equipment and QA/QC
- biomarkers
- QA/QC procedures



# ACHIEVEMENTS

- National monitoring programs
- Assessment of land based sources
- T D A
- Biomarkers
- Mussel watch
- First approach to bathing water quality monitoring
- Manual for Recreational Water and Beach Quality Monitoring – in cooperation with WHO
- Black Sea Environmental Series Vol.10: **Black Sea Pollution Assessment**

The most important disturbing factor for the Black Sea ecosystem is the eutrophication

Measures need to be taken in order to reduce the effects

- April 2000 PDF-B for BSERP finalized
- June 2000 first stocktaking meeting
- Project Document developed and approved
- October 2000 Black Sea Permanent Secretariat established

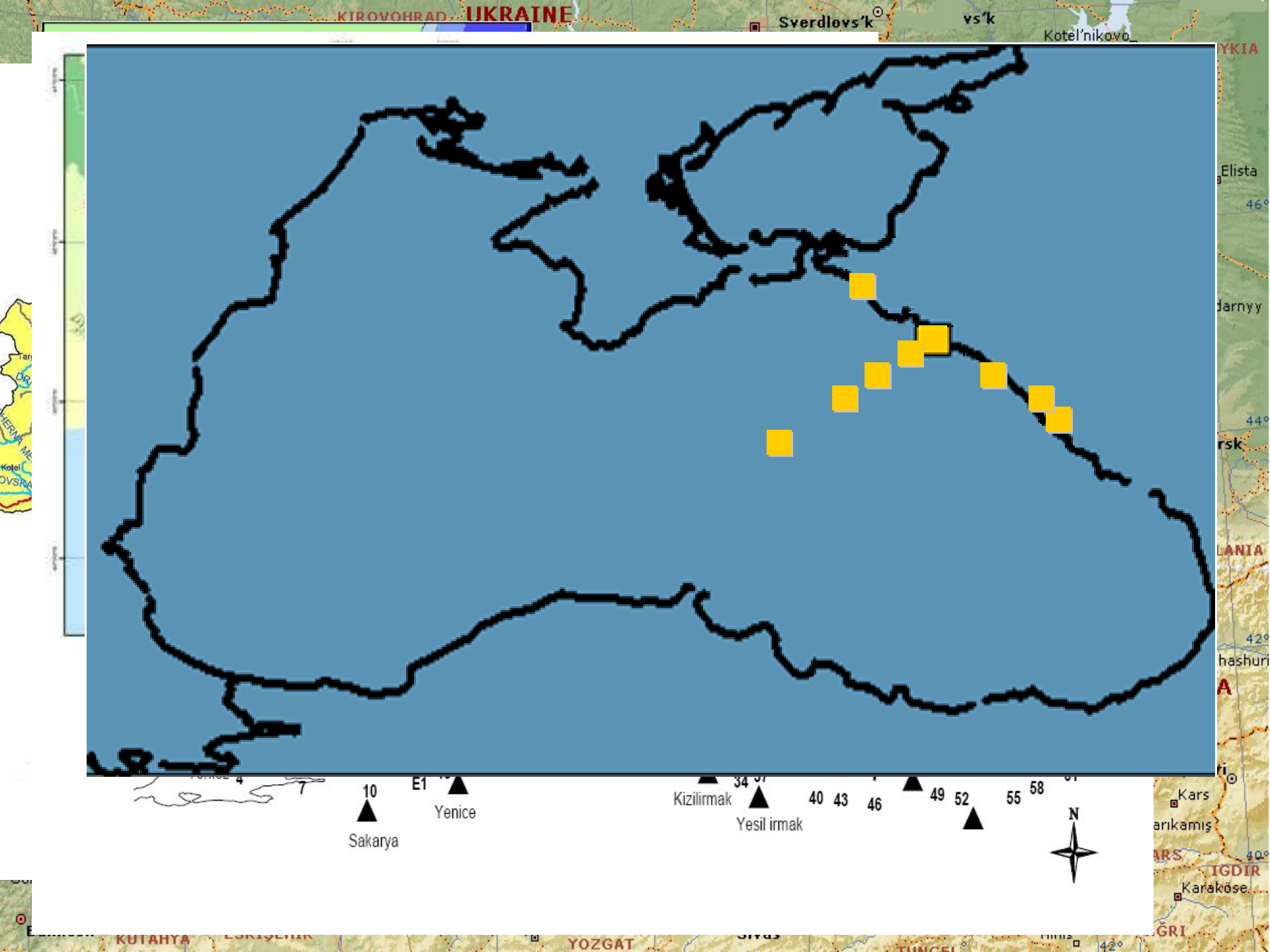
- Black Sea Ecosystem Recovery Project approved by GEF Council and financed

***(Control of eutrophication,  
hazardous substances and related  
measures for rehabilitating the  
Black Sea ecosystem)***

- 2001 AG-PMA discussed BSIMAP
  - to provide data for the state of the environment reporting
  - impact assessments of major pollutant sources
  - transboundary diagnostic analysis as part of Black Sea-SAP
- BSIMAP based on national monitoring programs

- In 2001 the AG PMA agreed to divide the Black Sea into seven zones of responsibilities

- Bulgaria (territorial waters)
- Georgia (territorial waters)
- Romania (territorial waters)
- Russian Federation (territorial waters)
- Turkey (territorial waters)
- Ukraine (territorial waters)
- Open Sea



- 2002 BSIMAP approved by the Commission in a first format
- 2006 BSIMAP updated
- 2006-2010 BSIMAP approved by the Commission
  
- The Black Sea states agreed to:
  - Utilize common sampling, storage, analytical techniques, assessment methodologies and reporting formats
  - Include agreed QA/QC procedures
  - Undertake intercalibration and intercomparison exercises



## ■ BSIMAP monitoring frequency

- For most parameters (nutrients, petroleum hydrocarbons, salinity, oxygen balance parameters, suspended solids and other physico-chemical parameters) - 4 times per year
- For trace metals - once per year
- Starting with 2001 countries report annually the monitoring data

# BIOTA

		Frequency
Chlorophyll a	m	4
Phytoplankton	m	4
Mesozooplankton	m	4
Biomass of Noctiluca	m	4
Macrophytobenthos	m	1
Macrozoobenthos	m	1
Fish landings (annually)	m	Annual average
Fish landings (monthly)		Annual average

	Country	Monitoring stations	Length of the coast (km)	Average distance between stations (km)	
	Bulgaria	5	300	60	
	Georgia	5	310 1	62	
	Romania	32	225	11	
	Russian Federation	4	475	95	
	Turkey	66	1400	21	
	Ukraine	14	628	116	

## ■ **Two Pilot Monitoring Exercises.**

1. Identification of the specific biological, chemical and physical indicators for the Black Sea (countries)
2. Investigation of the regional capacity to undertake monitoring of the selected indicators
3. Recommendation for training and equipment needs in each country
4. Initiation of training for specific indicators and QA/QC

# ■ **First Pilot Monitoring Exercise**

2 0 0 3 - 2 0 0 4

Network of station selected by each involved national laboratory

- The stations must:
  - be focused on eutrophication
  - have a previous history of monitoring at the location with historical data

Romania – October, November,  
December 2003

■ Indicators to be monitorised:

- Nutrients ( $\text{NO}_3$ ,  $\text{NO}_2$ ,  $\text{NH}_4$ , TN,  $\text{PO}_4$ , TP,  $\text{SiO}_4$ )
- Oxygen (% , mg/l)
- Secchi depth
- Chlorophyll- a
- Phytoplankton (Biomass, Key Groups)
- Zooplankton (Biomass, Key Groups)
- Macrozoobenthos (Density, Biomass, Key Groups)

# **Second Pilot Monitoring Exercise**

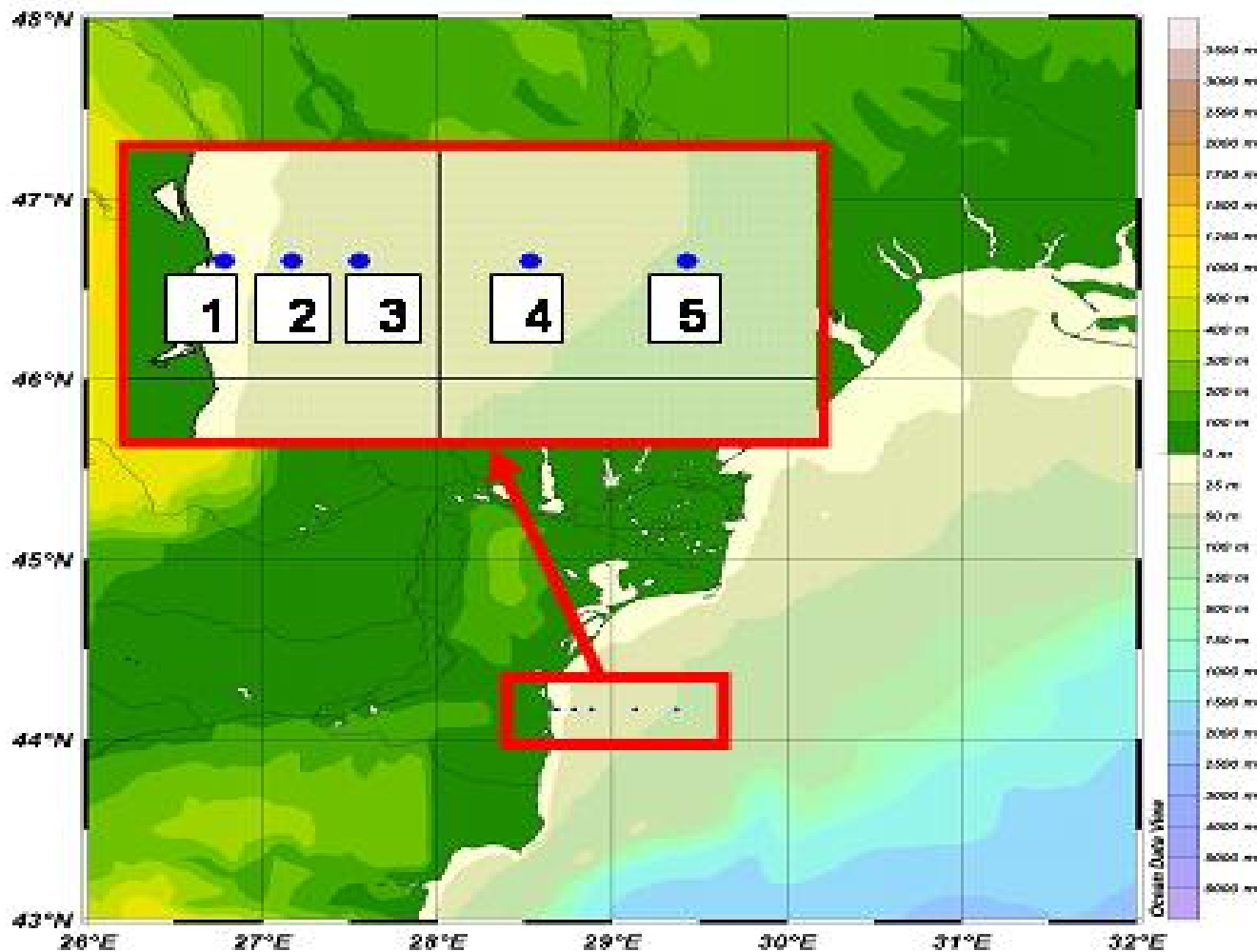
- June 2006 and March 2007
- Sampling stations representative for national state of ecosystem
- 2005 and 2006, training workshops on nutrients, zoobenthos, phytoplankton and zooplankton sampling/analysis were organised in different labs. (Constanta, Varna, Odessa)
- Black Sea Commission Manuals for Phytoplankton, Zooplankton, Zoobenthos, Nutrients and Pigments developed

# Georgia

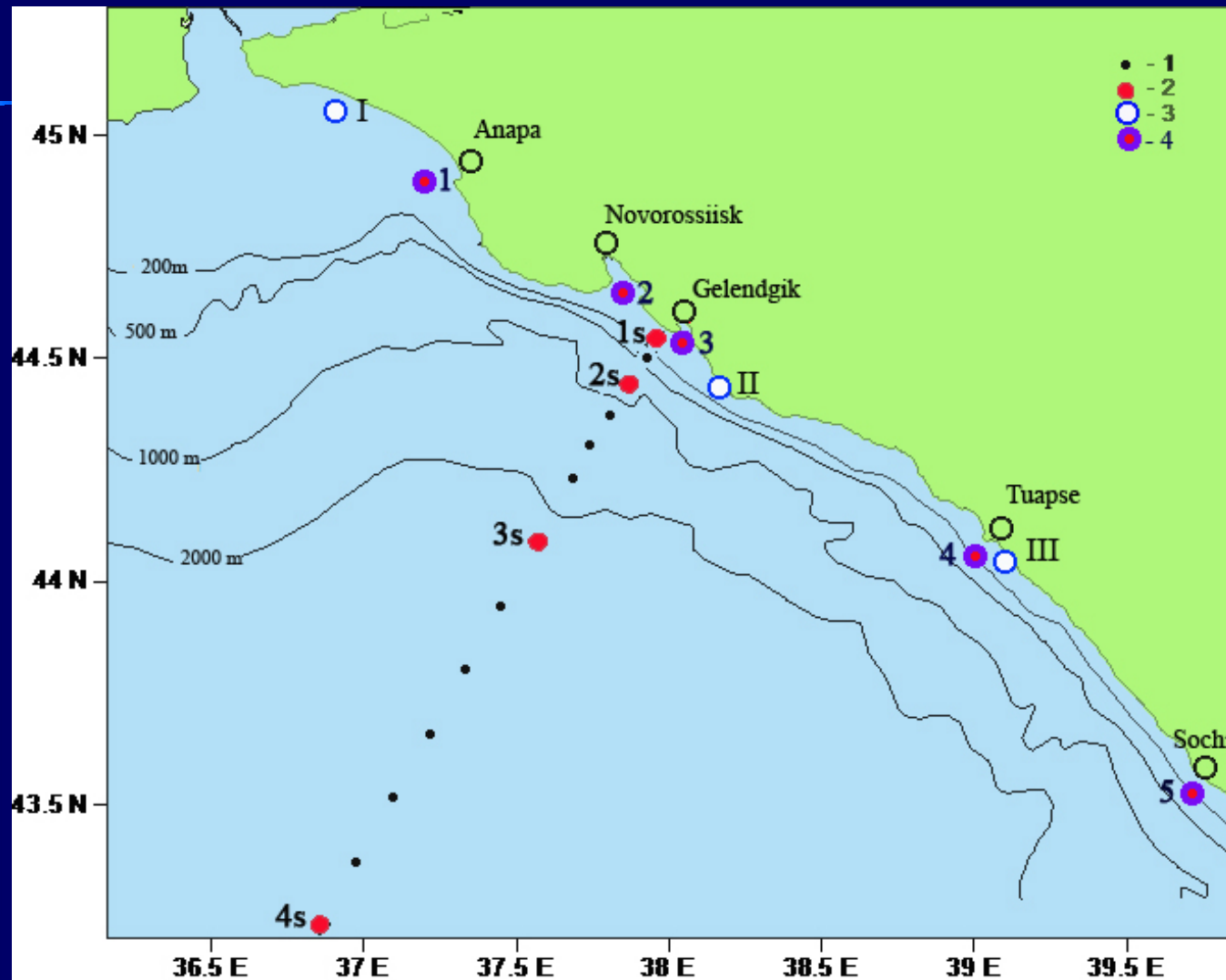




# Romania



# Russian Federation



## ■ Indicators to be monitorised:

### ***Chemical***

- Nutrients (NO<sub>3</sub>, NO<sub>2</sub>, NH<sub>4</sub>, TN, PO<sub>4</sub>, TP, SiO<sub>4</sub>)
- Oxygen (% , mg/l)
- Secchi depth
- Chlorophyll- a
- TSS
- Sediment trace metals, oil and oil products, chlorinated pesticides

## **Biological**

- Phytoplankton (Biomass, Key Groups)
- Zooplankton (Biomass, Key Groups)
- Macrozoobenthos (Density, Biomass, Key Groups)

- QA/QC assured by sediment replicate samples sent to Monaco Marine Environmental Studies Laboratory (IAEA), for comparative purposes
- National laboratories involved in monitoring participate in intercomparison and intercalibration exercises QUASIMEME and MESL

- Most national laboratories involved in BSIMAP are accredited
  - Romania ISO 17025 / 2005

# **BSIS**

## **The Black Sea Information System**

- **Countries use local applications for each advisory group to enter data, send or upload to the Commission's server through secure internet channels**
- **Commission's staff checks and imports the data into the central database**
- **Output data from the central database available to BSIS users through local network and/or in the web through a WEB application**

# V T O P I S

(Vessel Traffic Oil Pollution Information System)

- To improve the protection of marine environment and vulnerable coastal resources
- To enhance the capabilities for monitoring and control of marine environment, including emergency situation at sea
- To contribute to the effective implementation of Black Sea Contingency Plan
  - *Database*
  - *Information flow*
  - *Hardware and basic software*
  - *Oil spill modeling*
  - *"User guide" for implementing and training*



# Kamchiya River Project

- To support efforts for the protection and rehabilitation of marine environment
- To model nutrient export from within the Kamchiya River Basin to the Black Sea
- Technologies for reduction of nutrient loads

# What is left in the region

- BSIMAP
  - Involved national laboratories
  - Good connection between scientists
  - Laboratory equipment
  - QA/QC procedures
  - Standardised regional methods manuals for Phytoplankton, Zooplankton, Zoobenthos, Nutrients and Pigments
- BSIS
- IT hardware and software
- TDA
- BS-SAP