BIO - OPTICAL CHARACTERIZATION OF THE BLACK SEA FOR REMOTE SENSING APPLICATIONS

(SfP Project Number 982678)

APRIL Progress Report - 2010

Progress Report prepared by:
Temel Oguz, Erdemli, Turkey, NPD
Atanas Palazov, Varna, Bulgaria, PPD

PROJECT CO-DIRECTORS:
Michael Lee, Sevastopol, Ukraine
Oleg Kopelevich, Moscow, Russia
Viorel Malciu, Contsanta, Romania

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1. LIST OF ABBREVIATIONS

Acronym	Extended name
EC	European Commission
HPLC	High Performance Liquid Chromatography
IMS	Institute of Marine Sciences of the Middle East Technical University
IO	Institute of Oceanology of Bulgarian Academy of Sciences
JRC	Joint Research Centre
MHI	Marine Hydrophysical Institute
MODIS	Moderate Resolution Imaging Spectrometer
NIMRD	National Institute for Marine Research and Development
NPD	NATO country Partner Director
SeaWiFS	Sea-viewing Wide Field-of -view Sensor
SfP	Science for Peace
SIO	Shirshov Institute of Oceanology
NASA	National Aeronautics and Space Administration
ROSA	Romanian Space Agency
PPD	Partner country Project Director

2. PARTICIPANTS

(a) Project Director (NPD)

SURNAME/First name/Title	Job Title, Institute and Address	Phone, Fax and E-mail
Oguz /Temel/Prof.	Emeritus Prof. Institute of Marine Sciences, Middle East Technical University, 33731 Erdemli, Turkey	oguz@ims.metu.edu.tr

(b) Project Director (PPD)

SURNAME/First name/Title	Job Title, Institute and Address	Phone, Fax and E-mail
Palazov/Atanas/Dr.	Director of Institute of Oceanology P.O. Box 152, Varna 9000, Bulgaria	+359 52 370484 +359 52 370483 palazov@io-bas.bg

(c) Project Co-Director

SURNAME/First name/Title	Job Title, Institute and Address	Phone, Fax and E-mail
Lee/Michael/Dr.	Chief of Marine Optics Department at Marine Hydrophysical Institute Bldg. 2, Kapitanskaya Str., Sevastopol 99011, Ukraine.	+38 0692 540452 +38 0692 554253 lee@alpha.mhi.iuf.net

(d) Project Co-Director

SURNAME/First name/Title	Job Title, Institute and Address	Phone, Fax and E-mail
Kopelevich/Oleg/Dr.	Head of Ocean Optics Laboratory, P.P. Shirshov Institute of Oceanology, 36 Nakhimovsky prospect, Moscow 117997, Russia.	(499) 124 7583 (499) 124 5983 oleg@ocean.ru

(e) Project Co-Director

SURNAME/First name/Title	Job Title, Institute and Address	Phone, Fax and E-mail
Malciu/Viorel	Head Department Oceanography, Marine and Coastal Engineering, National Institute for Marine Research-Development “Grigore Antipa”, Bvd Mamaia, 300 Constanta, Romania	Tel: 000241543288 Fax: 000241831274 Email: incdmct@datanet.ro

(f) Participant / End-user

SURNAME/First name/Title	Job Title, Institute and Address	Phone, Fax and E-mail
Zibordi/Giuseppe/Dr.	Scientific Officier/ Joint Research Centre of the European Commission, I-21020 Ispra, Varese	+39 0332 785902 +39 0332 789177 giuseppe.zibordi@jrc.it

3. BACKGROUND AND OBJECTIVES

The Black Sea receives drainage from almost one-third of the continental Europe (five times its own surface) which includes significant portions of 17 countries, 13 capital cities and some 160 million people. The Black Sea is virtually isolated and hence a vulnerable water basin with 87% of its volume affected by anoxia. Of all the basins of the world ocean, the environmental degradation in the Black Sea is the most severe.

The monitoring of trophic and geochemical status of marine waters can rely on satellite ocean colour data. In fact such a technology allows for the determination at synoptic scale of water quality indicators like: chlorophyll a concentration (and potentially of accessory pigments) used as a proxy for phytoplankton biomass; concentration of total suspended matter and colored dissolved organic matter through its absorption properties.

Current limitation in the operational use of satellite ocean colour data in the Black Sea and in other marginal seas is the lack of regional bio-optical algorithms linking the satellite signal to the specific water quality indicators. In fact operational satellite products generally rely on algorithms developed for global applications which generally are the source of large uncertainties in coastal areas. This urges the development of specific regional bio-optical algorithms on the basis of comprehensive data sets of statistically representative in situ measurements.

The project, within the framework of the environmental security research topic, aims at the implementation of a tool to support remote sensing applications for operational environmental monitoring and climate studies in the Black Sea. Novel aspect of the project will be the comprehensive bio-optical characterization of the western-central ecological regions of the Black Sea (those exhibiting the highest environmental stress and range of variability in bio-optical features) using state of the art measurement methods and instrumentation during seasons exhibiting different trophic regimes. The in situ data collected within the framework of two oceanographic cruises will be the basis for the development of new bio-optical algorithms and models for Black Sea environmental monitoring through Earth observing systems (mostly the MODIS onboard the NASA AQUA polar platform). The sequential objectives defining the project flow are highlighted in Fig. 1

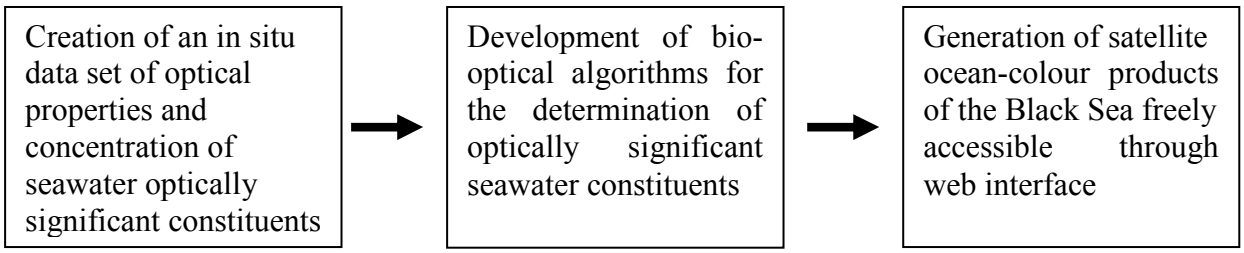

Figure 1: Major sequential objectives characterizing the project flow.

4. PROJECT STRUCTURE AND ACTIVITIES

MILESTONES, DELIVERABLES AND SCHEDULE: SfP-982678 REPORT DATE: 31.03.2010

Milestone/Year		1st Year				2nd Year				3rd Year			
Month №:			Planed				New plan				Done		
		1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12	1-3	4-6	7-9	10-12
	Month	XI-I	II-IV	V-VII	VII-X	XI-I	II-IV	V-VII	VII-X	XI-I	II-IV	V-VII	VII-X
1	**Instrument procurement & assessment of methods**												
1.1	Procurement of field instruments (profiler)												
1.2	Assessment of measurement method												
2	**Field measurements**												
2.1	First bio-optical cruise (within the selected period)												
2.2	Second Bio-optical Cruise												
3	**Data analysis and quality assurance**												
3.1	Analysis and assurance of data from first cruise												
3.2	Analysis and assurance of data from second cruise												
4	**Algorithms development**												
4.1	Development of bio-optical algorithms												
4.2	Cross-comparison of regional and global algorithms												
5	**Results implementation**												
5.1	Implementation of regional bio-optical algorithms												
5.2	Assessment of new products												
5.3	Distribution of new products through web interface												

Deliverables			Availability of equipment	Assessment of measuremen		Data from the first				Data from the second	Bio-optical algorithms	Ocean color products
Reporting			1st Progress	2nd Progress report		3rd Progress report		4th Progress		5th Progress report		Final Report

5. TECHNICAL PROGRESS

5.1. Major Accomplishments

Major accomplishments achieved in the first six months of the project can be summarized as follows:

1. In 09 - 10 November 2009 a kick-off meeting of the project was held in Istanbul with the participation of project representatives from Turkey, Bulgaria, Russia, Romania, Ukraine and Italy. This was considered the project start. During the meeting management of the project, budget, major tasks, methodologies, equipment to be used and scientific cruises were discussed. It was reminded that the money provided in the project proposal for cruises was refused completely by NATO Science for Peace and Security Committee. The need for ship time to fulfil project requirements suggested the following actions:
   - to apply for a Romanian Research Vessel within the context of the current NATO project (through a partnership with the Rumanian Navy) and/or a Romanian Research Vessel funded within the framework of a project hopefully funded by the Romanian Space Agency and the European Space Agency. The former solutions would mostly ensure the capability of sampling in Romanian waters.
   - to apply for the Bulgarian Research Vessel (Akademik) within the framework of the EUROFLEET initiative planned for 2011.
   - to apply for a Turkish Research Vessel (Bilim) within the framework of National research programs during 2011.
2. Choice ,purchase and delivery of the field instrument (free-fall optical profiler)

The purchase and delivery of the equipment required longer than expected. The preliminary selection of possible vendors was performed in the middle of November 2009. The invitations for participation to the competitive bidding were sent on 29 November. After that a first selection phase was completed, and the first ranking vendor was chosen (the PPD was already familiar with the instrument selected). After this the complete documentation was sent to NATO in order to get approval. Currently, we have not yet received official approval from NATO.

3. In January the „Expression of Interest" was prepared and submitted by the project co - directors for applying for fully funded ship time on the Bulgarian research vessel "Akademik" under the frame the EU funded project EUROFLEETS "Towards an alliance of European research fleets". The deadline for submission of full project proposals is 31st May. Currently, the preparation of our project proposal with title" Bio-Optics for Ocean Color Remote Sensing of the Black Sea" is in the final stage and soon will be submitted to the EUROFLEET Committee.

4. The European Space Agency (ESA) and the Romanian Space Agency (ROSA) agreed on the need of bio-optical field measurements in the western Black Sea to support satellite ocean colour activities. The agreement between ESA and ROSA, is leading to the availability to ship time (currently envisaging the use of Romanian research vessel "Mare Nigrum") that will be exploited in collaboration with the NATO SfP project. Currently, the ESA Contract was signed and will enter to force on November 1st 2010.

5 In MHI the new spectral transparency meter is made, for future use in calibration of Volume Scattering Function meter. The instrument will be tested this summer and will be used during the two bio optical cruises planned in the NATO SfP project.

5.2. Milestones for the next six months

- Delivery of free-fall optical profiler.
- Test of free-fall optical profiler.
- Submission of the full project proposal to the EUROFLEET Scientific Review Committee.
- Test of the new MHI spectral transparency meter.
- Training on Optical Profile Measurements and Data handling.

5.3. Involvement of young scientists

Currently the number of scientists less than 40 years old involved in the project activities is as follows:

- 2 from METU-IMS, Turkey:

One post doc (Dr. Heather Cannaby)and Msc Student (Mr. Akif Korkmaz), both are working on Black Sea ecosystem modelling, by using remote sensing data and field optical measurements. They will partly involve to campaigns and data processing issues. Also they will be potential end users of the resulting products of the project.

- 1 from IO – BAS, Bulgaria:

Mrs. Violeta Slabakova, Associate Researcher, has prepared the Web presentation for the Project, and maintains it as the permanent task. Also, she started with her PhD Thesis: "APPLICATIONS OF SATELLITE REMOTE SENSING FOR MONITORING THE MARINE ENVIRONMENT IN THE BULGARIAN BLACK SEA ZONE (working title)". Also she will involve in the oceanographic campaign and data processing.

- 3 from MHI NASU,Ukraine:

Mrs. Elena Korchomkina, Junior Scientist is developing and testing two algorithms: for remote chlorophyll-retrieval in Case 2 waters and for improvement of standard atmospheric correction of remote sensed reflectance. Also, she is ready to present her PhD Thesis: "DETERMINATION OF PHYTOPLANKTON PIGMENTS CONCENTRATIONS IN SEAWATER USING REMOTE SENSING AND CONTACT OPTICAL MEASUREMENTS".
Mrs. Daria Kalinskaya, Junior Scientist is concerned with aerosol optical properties spatial distribution and its analyses.
Mr. Alexander Latushkin, engineer, is studying spectral features of phytoplankton spectral attenuation coefficient and also taking part in design of spectral transparency meter.

- 3 from NIMRD, Romania

Dr. Razvan Mateescu, hydrotechnical engineer, was involved in the oceanographic campaign (Akademik) for ocean colour determination
Dan Vasiliu, chemist, involved in chlorophyll- a determination.
Alina Spanu, geographer, involved in spatial distribution of the physical parameters and data processing.

5.4. Major travel

The travels were related to the Project Kick-off meeting (Istanbul, Turkey 09 -10 November 2009):

- Two person from IMS- Turkey (Prof. Temel Oguz and Dr. Hasan Örek)
- Two person form IO – Bulgaria (Dr. Atanas Palzov and Mrs. Violeta Slabakova)
- One person from MHI-Ukraine (Dr. Michael Lee)

- One person from SIO- Russia (Dr. Oleg Kopelevich)
- One person from NIMRD-Romania (Viorel Malciu)

5.5. Visit by experts/advisors and NATO consultant

As the guest expert from European Space Agency (ESA), Mr. Jean-Paul Huot has been invited to the kick-off meeting in Istanbul for the occasion of Official Launching of the Project.

5.6. Visibility of SfP project

The project is in its early phase. No publication has submitted up to now.
For the purpose of visibility of the project, the Web site: www.natosps.io-bas.bg was dedicated to the Project following the NATO existing recommendations. Besides ongoing and planned activities related to the Project, important document on outcomes, all necessary links to participating institutions, as well as to NATO SfP Programme are available.

5.7. Technical and administrative difficulties

No problems encountered with NATO administration, which provided help and assistance whenever requested.

5.8. Changes in personnel

As far it was no changes in personnel, but we are creating additional possibilities for involvement of new personnel and young researchers in the Project.

5.9 Changes in project plan

A special attention was paid to the selection of an optical free fall profiler. The instrument purchase and delivery took more than expected. The main reason for the delay is the need for supplementary grants for the Project owing to the insufficient available funds for the purchase of the selected equipment.

6. FINANCIAL STATUS

6.1 Annexes 4a: SfP NATO BUDGET TABLES

A) INSTITUTE OF MARINE SCIENCES, ERDEMLY, TURKEY

SfP NATO BUDGET TABLE

Project number: SfP - 982678		Project short title:	SfP - Black Sea Characterization
Report date: 31.03.2010		Duration of the Project [1]:	November 2009 – October 2012
Project Co-Director: *(Temel Oguz, Erdemly, Turkey)*			

	ACTUAL EXPENDITURES	**FORECAST EXPENDITURES**		
Detailed Budget Breakdown *(to be completed in EUR[3])*	*(1)* from start until 31.03.2010	*(2)* for the following six months	*(3)* for the following period until project's end	**Comments on changes, if any, in the financial planning compared to the approved Project Plan**
(a) Equipment				
Subtotal "Equipment"				
(c) Training				
Subtotal "Training "				
(f) Travel		5 000	8 820	
(F1). Kick-off meeting Istanbul, Turkey 09-10 November 2009 - 2 person	680			
Subtotal "Travel"	**680**	**5 000**	**8 820**	
(g) Consumables - Spare parts:	0	2 000	4 000	
Subtotal "Consumables - Spare parts"	**0**	**2 000**	**4 000**	
(h) Other costs and (i) stipends *(specify)*	0	1 500	3 000	
Subtotal "Other costs"	**0**	**1 500**	**3 000**	
TOTAL *(1), (2), (3)* **:**	**680**	**8 500**	**15 820**	
CURRENT COST OUTLOOK *=(1)+(2)+(3)*			***25 000***	

B) INSTITUTE OF OCEANOLOGY-BAS, VARNA, BULGARIA

SfP NATO BUDGET TABLE

Project number: SfP - 982678		Project short title:	SfP - Black Sea Characterization
Report date: 31.03.2010		Duration of the Project [1]:	November 2009 – October 2012
Project Co-Director: *(Atanas Palazov, Varna, Bulgaria)*			

Detailed Budget Breakdown *(to be completed in EUR[3])*	**ACTUAL EXPENDITURES** *(1)* from start until 31.03.2010	**FORECAST EXPENDITURES** *(2)* for the following six months	*(3)* for the following period until project's end	**Comments on changes, if any, in the financial planning compared to the approved Project Plan**
(a) Equipment	0		0	
(A1) MicroPRO-II profiler system		70 493		
Subtotal "Equipment"	**0**	**70 493**	**0**	
(c) Training	0	0	4 500	
Subtotal "Training "	**0**	**0**	**4 500**	
(f) Travel		0	11 127	
(F1). Kick-off meeting Istanbul, Turkay 09-10 November 2009 - 2 person	980			
Subtotal "Travel"	**980**	0	**11 127**	
(g) Consumables - Spare parts:	0	0	5 600	
Subtotal "Consumables - Spare parts"	**0**	**0**	**5 600**	
(h) Other costs and (i) stipends *(specify)*			4400	
(I1)Stipendies for Mrs.Violeta Salabakova	600	600		
Subtotal "Other costs"	**600**	**600**	**4 400**	
TOTAL *(1), (2), (3)* **:**	**1 580**	**71 093**	**25 627**	
CURRENT COST OUTLOOK *=(1)+(2)+(3)*			***98 300***	

C) MARINE HYDROPHYSICAL INSTITUTE, SEVASTOPOL, UKRAINE

SfP NATO BUDGET TABLE

Project number: SfP - 982678		Project short title:	SfP - Black Sea Characterization
Report date: 31.03.2010		Duration of the Project [1] :	November 2009 – October 2012
Project Co-Director: *(Michael Lee, Sevastopol, Ukraine)*			

	ACTUAL EXPENDITURES	**FORECAST EXPENDITURES**		
Detailed Budget Breakdown *(to be completed in EUR[3])*	*(1)* from start until 31.03.2010	*(2)* for the following six months	*(3)* for the following period until project's end	**Comments on changes, if any, in the financial planning compared to the approved Project Plan**
(a) Equipment				
Subtotal "Equipment"				
(c) Training	0	0	4250	
Subtotal "Training "	**0**	**0**	**4250**	
(f) Travel			6703	
Kick-off Project meeting, Istanbul, 09.11.2009	714			
CASRE meeting, Kiev, 12.10.2010		133		
Subtotal "Travel"	**714**	**133**	**6703**	
(g) Consumables - Spare parts:				
Component parts	0	810	1890	
Subtotal "Consumables - Spare parts"	**0**	**810**	**1890**	
(h) Other costs and (i) stipends *(specify)*			**6190**	
(H1)Other costs	0	735		
(I1) Stipends for Mrs. Elena Korchomkina	500	600		
(I2)Stipends for Mrs. Daria Kalinskaya	375	150		
(I3)Stipends for Mr. Alexander Latushkin	250	300		
Subtotal "Other costs"	**1125**	**1785**	**6190**	
TOTAL *(1), (2), (3)* **:**	**1839**	**2728**	**19033**	
CURRENT COST OUTLOOK *=(1)+(2)+(3)*			***23 600***	

D) P.P SHIRSHOV INSTITUTE OF OCEANOLOGY, MOSCOW, RUSSIA

SfP NATO BUDGET TABLE

Project number: SfP - 982678		Project short title:	SfP - Black Sea Characterization
Report date: 31.03.2010		Duration of the Project [1]:	November 2009 – October 2012
Project Co-Director: *(Oleg Kopelevich, Moscow, Russia)*			

Detailed Budget Breakdown *(to be completed in EUR[3])*	**ACTUAL EXPENDITURES** *(1)* from start until 31.03.2010	**FORECAST EXPENDITURES** *(2)* for the following six months	**FORECAST EXPENDITURES** *(3)* for the following period until project's end	**Comments on changes, if any, in the financial planning compared to the approved Project Plan**
(a) Equipment				
Subtotal "Equipment"				
(c) Training				
Subtotal "Training "				
(f) Travel		2000	6600	
(F1) Kick-off meeting Istanbul, Turkey 09-10 November 2009 – 1 person	600			
Subtotal "Travel"	**600**	**2000**	**6600**	
(g) Consumables - Spare parts:	0	0	6000	
Subtotal "Consumables - Spare parts"	**0**	**0**	**6000**	
(h) Other costs and (i) stipends *(specify)*				
(I1) Stipendies for Mr.Vladimir Levchenko (or the other student)	0	500	2000	
Subtotal "Other costs"	**0**	**500**	**2000**	
TOTAL *(1), (2), (3)* **:**	**600**	**2500**	**14600**	
CURRENT COST OUTLOOK *=(1)+(2)+(3)*			***17 700***	

E) NATIONAL INSTITUTE FOR MARINE RESEARCH AND DEVELOPMENT, CONSTANTA, ROMANIA

SfP NATO BUDGET TABLE

Project number: SfP - 982678		Project short title:	SfP- Black Sea Characterization
Report date: 31.03.2010		Duration of the Project [1]:	November 2009 – October 2012
Project Co-Director: *(Viorel Malciu, Contanta, Romania)*			

Detailed Budget Breakdown *(to be completed in EUR[3])*	**ACTUAL EXPENDITURES** *(1)* from start until 31.03.2010	**FORECAST EXPENDITURES** *(2)* for the following six months	**FORECAST EXPENDITURES** *(3)* for the following period until project's end	**Comments on changes, if any, in the financial planning compared to the approved Project Plan**
(a) Equipment				
Subtotal "Equipment"				
(c) Training	0	0	4 250	
Subtotal "Training "	**0**	**0**	**4 250**	
(f) Travel		0	7 053	
(F1) Kick-off meeting Istanbul, Turkey 09-10 November 2009 – 1 person	497			
Subtotal "Travel"	**497**		**7 053**	
(g) Consumables - Spare parts:	1 000	0	1 700	
Subtotal "Consumables - Spare parts"	**1 000**	**0**	**1 700**	
(h) Other costs and (i) stipends *(specify)*			2 700	
(H1)Other costs	700	0		
(I1)Stipends	1 000	0		
Subtotal "Other costs"	**1 700**	**0**	**2 700**	
TOTAL *(1), (2), (3)* **:**	**3 197**		**15 703**	
CURRENT COST OUTLOOK *=(1)+(2)+(3)*			***18 900***	

6.2 Annexes 4b: SfP NATO SUMMARY BUDGET TABLES

SFP NATO BUDGET SUMMARY TABLE

Project number: SfP - 982678 Report date: 31.03.2010 The Project is in the year *(please indicate)*: *1 – 2- 3*	Project short title: SfP - Black Sea Characterization Duration of the Project[1]: November 2009 – October 2012

Breakdown per Project Co-Director *(to be completed in EUR [3])*

Project Co-Director's name, city, country	APPROVED BUDGET: Total year1- 3	CURRENT COST OUTLOOK: Total year1- 3	ACTUAL EXPENDITURES since start until 31.03.2010	FORECAST EXPENDITURES for the following 6 months	FORECAST EXPENDITURES for the following period until project's end	Comments on changes, if any, in financial planning compared to the approved Project Plan
Prof.Temel Oguz,, Erdemli, Turkey	*25 000*	*25 000*	*680*	*8 500*	*15 820*	
Dr. Atanas Palazov, Varna, Bulgaria	*98 300*	*98 300*	*1 580*	*71 093*	*25 627*	
Dr. Michael Lee, Sevastopol, Ukraine	*23 600*	*23 600*	*1 839*	*2 728*	*19 033*	
Dr. Oleg Kopelevich, Moscow, Russia	*17 700*	*17 700*	*600*	*2 500*	*14 600*	
Viorel Malciu, Constanta, Romania	*18 900*	*18 900*	*3 197*		*15 703*	
TOTAL *(must be identical with TOTALs given in 'Breakdown per item')*:	**183 500**	**183 500**	**7 896**	**84 821**	**90 783**	

Breakdown per item *(to be completed in EUR [3])*

Item	APPROVED BUDGET: Total year 3	CURRENT COST OUTLOOK: Total year 3	ACTUAL EXPENDITURES since start until 31.03.2010	FORECAST EXPENDITURES for the following 6 months	FORECAST EXPENDITURES for the following period until project's end	Comments on changes, if any, in financial planning compared to the approved Project Plan
(a) Equipment	*68 000*	*70 493*	*0*	70 493	0	
(b) Computers - Software						
(c) Training	*13 000*	*13 000*	*0*	*0*	*13 000*	
(d) Books - Publications						
(e) Experts - Advisors						
(f) Travel	*52 000*	*50 907*	*3 471*	*7 133*	*40 303*	
(g) Consumables - Spare parts:	*23 000*	*23 000*	*1 000*	*2 810*	*19 190*	
(h) Other costs and (i) stipends	*27 500*	*26 100*	*3 425*	*4 385*	*18 290*	
TOTAL :	**183 500**	**183 500**	**7 896**	**84 821**	**90 783**	

6.3 Annexes 4c: SfP NATO NATIONAL CONTRIBUTION TABLES

B) INSTITUTE OF OCEANOLOGY-BAS, BULGARIA

SFP NATIONAL CONTRIBUTION TABLE

Project number: SfP -982678 Project Co-Director: *(Atanas Palazov,Varna, Bulgaria)* Report date: 31.03.2010	Project short title: SfP - Black Sea Characterization

A. TYPE of EXPENDITURE

Budget breakdown	**Year of expenditure 1st year**	**2nd year**	**3rd year**
(a) Salaries *(Name and qualification of research and support personnel)*			
(A1) Dr Atanas Palazov, director	2 500	2 500	2 500
(A2) Violeta Slabakova, associated researcher	2 000	2 000	2 000
(A3) Mr. Hirsto Stanchev, associated researcher	500	500	500
Subtotal "Salaries"	**5 000**	**5 000**	**5 000**
(b) Overhead Costs *(specify: consumables, energy, local transportation)*			
(B1) Energy	500	500	500
(B2) Consumables	500	500	500
Subtotal "Overhead"	**1 000**	**1 000**	**1 000**
(c) Equipment - Computers			
Subtotal "Equipment"			
(d) Other costs			
(D1) Ship crew	10 000		
Subtotal "Other costs"	**10 000**		
TOTAL :	**16 000**	**6 000**	**6 000**
GRAND TOTAL = (1) + (2) + (3) + (4) + (5)	**28 000**		

B. SPONSORING INSTITUTIONS

Name of sponsoring institution	**Year of expenditure 1st year**	**2nd year**	**3rd year**
TOTAL :	(1)	(2)	(3)
GRAND TOTAL = (1) + (2) + (3) + (4) + (5)			

E) NATIONAL INSTITUTE FOR MARINE RESEARCH AND DEVELOPMENT, CONSTANTA, ROMANIA

SFP NATIONAL CONTRIBUTION TABLE

Project number: SfP -982678 Project Co-Director: *(Viorel Malciu,Constanta, Romania)* Report date: 31.03.2010	Project short title: SfP- Black Sea Characterization

A. TYPE of EXPENDITURE

Budget breakdown	Year of expenditure 1st year	2nd year	3rd year
(a) Salaries *(Name and qualification of research and support personnel)*			
Dr. Viorel Malciu	400	400	300
Dr. Razvan Mateescu	300	300	300
Dan Vasiliu	300	300	300
Subtotal "Salaries"	**1 000**	**1 000**	**900**
(b) Overhead Costs *(specify: consumables, energy, local transportation)*	500	500	500
Subtotal "Overhead"	**500**	**500**	**500**
(c) Equipment - Computers	1 000	700	1 000
Subtotal "Equipment"	**1 000**	**700**	**1 000**
(d) Other costs			
Subtotal "Other costs"			
TOTAL :	**2 500**	**2 200**	**2 400**
GRAND TOTAL = (1) + (2) + (3) + (4) + (5)	**7 100**		

B. SPONSORING INSTITUTIONS

Name of sponsoring institution	Year of expenditure 1st year	2nd year	3rd year
TOTAL :	(1)	(2)	(3)
GRAND TOTAL = (1) + (2) + (3) + (4) + (5)			

7. CRITERIA FOR SUCCESS TABLE

Project number:	SfP -982678	Project short title: SfP - Black Sea Characterization
Report date:	31.03.2010	Duration of the Project [1] : 10.11.2009 - 10. 11. 2012
The Project is in the year [2]: *1 – 2 - 3*		

Criteria for Success as approved with the first Grant Letter on: *12.12.2008*	%	**Criteria for Success: Achievements as at** *10.11.2009. / 31.03 2010*	%
1) Procurement and test of new in situ instrumentation (bio-optical profiler)	20	1) International bidding call for free- fall profiler purchase was realized 2) The first ranking vendor was chosen 3) The complete documentation was sent to NATO for approval	10
2) Execution of the first bio-optical cruise	20	6 months after beginning of the project	0
3)Analysis and quality assurance of the bio-otical data from the first cruise	10	9 months after beginning of the project	0
4)Execution of the second bio-optical cruise	10	18 months after beginning of the project	0
5)Analysis and quality assurance of the bio-optical data from the second cruise	10	21 months after beginning of the project	0
6)Development of regional bio-optical algorithms	10	18 months after beginning of the project	0
7)Implementation of the new bio-optical algorithms in the JRC processing chain for ocean color satellite data	10	3 rd year of the project	0
8)All countries involved in the project continue the bio-optical sampling program in the Black Sea to future improve bio-optical algorithms of available ocean color products	10	Two years after completion of the project	0
TOTAL :	**100%**	**TOTAL [4] :**	**10 %**

SUMMARY REPORT

SfP – Black Sea Characterization

SfP – 982678
Bio - Optical Characterization of the Black Sea for Remote Sensing Applications

Project Co-Directors:
Prof. Temel Oguz, IMS, Erdemli, Turkey (NPD)
Dr. Atanas Palazov, IO, Varna, Bulgaria (PPD)
Dr. Michael Lee, MHI, Sevastopol, Ukraine
Dr. Oleg Kopelevich, SIO, Moscow, Russia
Dr. Viorel Malciu, NIMRD, Constanta, Romania

Approval Date: *12 th December 2008* Effective Date: 10 th November 2009
Duration: 3 years till 10 th November 2009
NATO Budget: 183 500 EUR

Information about the SfP Project through Internet: www.natosps.io-bas.bg

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Abstract of Research

The project, within the framework of the environmental security research topic, aims at the implementation of a tool to support remote sensing applications for operational environmental monitoring and climate studies in the Black Sea. This final objective is expected to be achieved through the implementation of new models and algorithms in a processing chain for ocean colour imagery. The new models and algorithms for the quantification of the concentration of seawater optically significant constituents (mostly chlorophyll a, total suspended matter and yellow substance), will result from the analysis and application of comprehensive in situ bio-optical measurements of optical properties (inherent and apparent) and concentration of seawater optically significant constituents performed during two major oceanographic campaigns.

Major Objectives:

- to create an in situ data set of optical properties (inherent and apparent) and concentration of seawater optically significant constituents for the Black sea.
- to develop a new bio-optical algorithms for the determination of optically significant seawater constituents for Black Sea environmental monitoring through Earth observing systems (mostly the Medium Resolution Imaging Spectrometer (MODIS) onboard the NASA AQUA polar platform).
- to validate a new regional bio-optical algorithm.
- to cross - compare of regional and global bio- optical algorithms
- to generate satellite ocean-colour products of the Black Sea freely accessible thought web interface

Overview of Achievements since the Start of the Project until 31 March of current year

- Organisation of the first kick-off meeting in November 2009, in Istanbul, Turkey.
- International bidding call for free- fall profiler purchase was realized.
- Bidding proposals were received from different vendors and were compared from the technical and price view point. The first ranking vendor was chosen.
- „Expression of Interest" was prepared and submitted for applying for fully funded ship time on the Bulgarian research vessel "Akademik" under the frame the EU funded project EUROFLEETS "Towards an alliance of European research fleets".
- The agreement between ESA and ROSA, is leading to the availability to ship time (currently envisaging the use of Romanian research vessel "Mare Nigrum") that will be exploited in collaboration with the NATO SfP project.
- A new spectral transparency meter is made, for future use in calibration of Volume Scattering Function meter during the both planning bio-optical expeditions
- Project Internet web site was prepared and is now available under Institute of Oceanology, BAS web server: www.natosps.io-bas.bg

Payments through NATO Funds: 7 896 EUR

Milestones for the Next Six Months

- Delivery of free-fall optical profiler.
- Test of free-fall optical profiler.
- Submission of the full project proposal to the EUROFLEET Scientific Review Committee.
- Test of the new spectral transparency meter developed by MHI.
- Training on Optical Profile Measurements and Data handling.

Implementation of Results

The Institute for Environment and Sustainability of the Joint Research Centre is a major civil entity that will make use the outcomes of the scientific activities of this project in its processing chain for satellite ocean colour data in view of generating more accurate remote sensing products for the Black Sea.

Other Collaborating Institutions

- Maritime Hydrographic Directorate, Romania
- Research Center of the Navy, Romania

Abbreviations: *(give full expression for all abbreviations which occur in this summary)*
IMS – Institute of Marine Science
IO- Institute of Oceanology
MHI – Marine Hydrophysical Institute
SIO – Shirshov Institute of Oceanology
NMRD – National Institute for Marine Reaseach and Development
JRC- Joint Research Centre
NASA – National Aeronautics and Space Administration
ROSA – Romanian Space Agency
ESA – European Space Agency