

**SP-549**  
May 2004

Proceedings of  
**MERIS User Workshop**

10 – 13 November 2003  
ESA-ESRIN, Frascati, Italy

***European Space Agency***  
***Agence spatiale européenne***

## Scientific Committee

J. Aiken	Plymouth Marine Laboratory, United Kingdom
F. Baret	INRA Bioclimatologie, Site agroparc, France
P. Curran	University of Southampton, United Kingdom
R. Doerffer	GKSS Institute for Coastal Research, Germany
J. Fischer	Institut für Weltraumwissenschaften, Germany
J. Gower	Institute of Ocean Sciences, Canada
M. Hallikainen	Helsinki University of Technology, Finland
A. Morel	LPCM, France
J. Moreno	University of Valencia, Spain
J.P. Muller	University College London, United Kingdom
R. Myneni	Boston University, United States
L. Petterson	Nansen Environmental and Remote Sensing Center, Norway
F. Prata	CSIRO Atmospheric Research, Australia
J. Privette	NASA, United States
K. Ruddick	MUMM, Belgium
R. Santer	Universite du Littoral Cote d'Opale, France
M. Verstraete	Space Applications Institute, Italy
G. Zibordi	Space Applications Institute, Italy

## Local Organising Committee

P. Regner (ESA/ESRIN), V. Arpaia (SERCO)

*Publication* Proceedings of MERIS User Workshop, 10 – 13 November 2003,  
ESA/ESRIN, Frascati, Italy, (ESA SP-549, May 2004)

*Compiled by:* H. Lacoste

*Published and distributed by:* ESA Publications Division  
ESTEC  
Postbus 299  
2200 AG Noordwijk  
The Netherlands

*Printed in:* The Netherlands

*Price:* € 40

*ISBN No:* 92-9092-860-3

*ISSN No:* 1609-042X

*Copyright:* © 2004 European Space Agency

## Foreword

The MERIS Users Workshop took place at ESRIN from 10<sup>th</sup> to 13<sup>th</sup> November 2003. It was the first user-oriented event of this type organised by ESA (after a number of dedicated MERIS calibration and validation workshops) which brought together ESA Principal Investigators and co-investigators, scientists and students using MERIS data – across the fields of ocean colour, land applications and atmospheric science.

The workshop provided the 180 participants (16 countries were represented) with an opportunity to learn more about the most recent processing algorithms and the quality of the derived products and to gain understanding of the Envisat user services and MERIS data distribution activities and constraints.

In addition, the workshop provided a unique forum for investigators to present their latest results from on-going AO research projects, discuss various aspects of MERIS data analysis and interpretation, and assess the usefulness of available data analysis tools.

The workshop was organised in the form of thematic plenary sessions allowing 20 minutes for presentations and 5 minutes for discussion. A chaired poster session was also organised in which participants could briefly summarize in a 3 minutes presentation the main contents of their poster. 76 presentations (47 orals and 29 posters) were given during the workshop ranging from pure research including calibration and validation, to demonstration of applications and development of services. The workshop included a working session for open source developers on the BEAM (Meris & AATSR) user toolbox.

Each workshop session was followed by a round table in which attendees were able to express their views on MERIS products, user services and data distribution and take part in discussions on specific issues raised during the presentations.

On the last day of the workshop, three parallel thematic working sessions on ocean, land, and atmosphere were organized, to discuss relevant issues of the MERIS data exploitation pertaining to the session topics and to draft recommendations for the development of new algorithms and products in future. These sessions were chaired by members from the Scientific Committee and facilitated by a secretary responsible for ensuring all issues raised were recorded.

The main issues addressed during the discussions were: 1) strong need for the continuity of the MERIS mission, 2) high demand for provision of a range of level 3 products, 3) continuation of the Cal/Val activities throughout the Envisat mission for continuous improvement of the standard ESA MERIS products. As a measure of the success, the User Workshop at ESRIN showed a rapid increase of the use of MERIS data by the scientific community.

The enclosed proceedings contain the results presented at the workshop in the form of full-length papers and the recommendations brought up during the round table and the thematic splinter sessions. The submitted papers confirm the outstanding capabilities of the MERIS measurements for scientific research and applications development in the field of ocean colour, land applications and atmospheric science and summarise how they compare with other optical sensor data. A web site was prepared for the workshop and submitted papers are available on-line at URL:  
<http://envisat.esa.int/workshops/meris03/>

I would like to take this opportunity to thank all attendees for their effort in attending, presenting and contributing to the workshop. I should also thank the organising committee, the scientific committee, the session chairmen and secretaries, the ESRIN local administration, the SERCO support team and ESA staff who contributed to the success of this event. I look forward to seeing all of you at the ENVISAT Symposium in Salzburg (A) from 6<sup>th</sup> to 10<sup>th</sup> September 2004.

Dr. Peter Regner  
(ESA/ESRIN Workshop Local Organiser)

# Contents

## **Session 1: Status of Envisat, Data Distribution, Calibration, Processing and Validation**

*Chairs: P. Lecomte & P. Goryl*

Scope of Water Products – The Quality and Science Flags

*C. Brockmann*

## **Session 2: Atmospheric Products Validation**

*Chairs: R. Santer & J. Fischer*

Cross-Validation of MERIS and ASAR-InSAR Water Vapor Observations

*J. Muñoz Sabater, R.F. Hanssen & D. Moisseev*

Validation of MERIS Near IR Water Vapour Retrievals Using MWR and GPS Measurements

*Z. Li, J.-P. Muller, P. Cross, P. Albert, T. Hewison, R. Watson, J. Fisher & R. Bennartz*

Inter-Comparison of MERIS, MODIS and MISR Cloud Top Heights

*C. Naud, B. Baum, R. Bennartz, J. Fischer, R. Frey, P. Menzel, J.-P. Muller, R. Preusker & H. Zhang*

MERIS Cloud Masks: Exploration and Visualisation of MERIS Spectra

*D. Cornford & A. Lyaskovskiy*

## **Session 3: MERIS Water Products Validation**

*Chairs: A. Morel & J.-P. Huot*

An Evaluation of the Accuracy of MERIS Radiometric and Geophysical Products for a Northern Adriatic Sea Coastal Site

*G. Zibordi, F. Mélin, J.-F. Berthon, D. van der Linde & B. Bulgarelli*

Validation of MERIS Ocean Color Algorithms in the Mediterranean Sea

*S. Marullo, F. D'Ortenzio, M. Ribera D'Alcalà, M. Ragni, R. Santoleri, V. Vellucci & C. Luttazzi*

Suspended Particulate Matter (SPM) Mapping from MERIS Imagery

Calibration of a Regional Algorithm for the Belgian Coastal Waters

*B. Nechad, V. De Cauwer, Y. Park & K. Ruddick*

MERIS Validation Activities at Lake Constance in 2003

*P. Gege & S. Plattner*

## **Session 4: MERIS Land Products Validation**

*Chairs: J. Moreno & M. Rast*

MERIS Land Products Validation

*D. Ramon, R. Santer, E. Dilligeard, D. Jolivet & J. Vidot*

MERIS Global Vegetation Index: Evaluation and Performance

*N. Gobron, F. Mélin, B. Pinty, M. Taberner & M.M. Verstraete*

## **Session 5: Coastal and Inland Waters**

*Chairs: R. Doerffer & K. Ruddick*

Algae Bloom Detection in the Baltic Sea with MERIS Data

*H. Krawczyk, K. Ebert & A. Neumann*

CHL Maps of the Dutch Coastal Zone: A Case Study within the REVAMP Project

*S.W.M. Peters, H. van der Woerd & B. Pasterkamp*

Validation of Chlorophyll Fluorescence Derived from MERIS on the West Coast of Canada

*J. Gower & S. King*

Operational Coastal Water Quality Monitoring: Are Space Borne Products an Alternative to In-Situ Measurements - Where are we Now?

*C. Brockmann, S. Dury, G. Hesselmanns, H. Hakvoort, R. Duin, M. Slater, R. Jordans & K. Stelzer*

Mapping of Photosynthetic Pigments in Spanish Reservoirs

*R. Peña-Martinez, J.-A. Dominguez-Gómez, C. de Hoyos & A. Ruiz-Verdú*

Water Quality Monitoring of Lake Garda Using Multi-Temporal MERIS Data

*N. Strömbeck, G. Candiani, C. Giardino & E. Zilioli*

Aerosol Retrieval and Atmospheric Correction for MERIS Data over Lakes

*D. Floricioiu & H. Rott*

## **Session 6: Land Cover Monitoring**

*Chairs: F. Baret & M. Verstraete*

Monitoring Landcover Changes of the Niger Inland Delta (Mali) by Means of Envisat MERIS Data

*R. Seiler & E. Csaplovics*

Deriving Landcover Information over Siberia Using MERIS and MODIS Data

*L. Skinner & A. Luckman*

Use of MERIS Data for Land Cover Mapping in the Netherlands

*J.G.P.W. Clevers, H.M. Bartholomeus, C.A. Múcher & A.J.W. de Wit*

Monitoring Snow Cover in Alpine Regions through the Integration of MERIS and AATSR Envisat Satellite Observations

*M.L. Tampellini, P.A. Brivio, P. Carrara, D. Fantoni, S. Gnocchi, G. Ober, M. Pepe, A. Rampini, R. Ratti, F. Rota Nodari & T. Strozzi*

## **Session 7: Vegetation Monitoring**

*Chairs: J. Privette & J. Curran*

MTCI: The MERIS Terrestrial Chlorophyll Index  
*J. Dash & P.J. Curran*

## **Session 8: New Methods**

*Chairs: P. Curran & J. Gower*

A Method for Atmospheric Correction Based on Spectral and Spatial Variability  
*D. Béal, F. Baret & X.F. Gu*

Atmospheric Correction of MERIS Imagery above Case-2 Waters  
*T. Schroeder & J. Fischer*

A Technique for Aerosol Retrieval over Land from MERIS Data  
*L. Guanter, J.M. Martí, L. Alonso & J.F. Moreno*

Use of the 709 NM Band of MERIS to Detect Intense Plankton Blooms and Other Conditions in Coastal Waters  
*J. Gower, S. King, W. Yan, G. Borstad & L. Brown*

## **Poster and Demo Session**

*Chairs: M. Rast & G. Zibordi*

Integrated Watershed Modeling  
*P. Bagulho Galvão, R. Neves, A. Silva, P. Chambel Leitão & F. Braunchweig*

Deriving Albedo from Coupled MERIS and MODIS Surface Products  
*F. Gao, C. Schaaf, Y. Jin, W. Lucht, & A. Strahler*

Aerosol Retrieval from MERIS and Ground-Based Radiometers in the German Bight, Turbid Coastal Waters  
*I. Behnert, R. Doerffer, G. Becu, P.-Y. Deschamps & N. Fomferra*

HiProGen – A System to Generate High Level Products  
*T. Lankester, C. Loial, S. Hubbard, K. Andersson & G. Pittella*

MERIS Imagery over Belgian Coastal Waters: Mapping of Suspended Particulate Matter and Chlorophyll-A  
*K. Ruddick, Y. Park & B. Nechad*

Development of an Integrated System for Coastal Waters  
*P. Pina, F. Martins, P. Chambel Leitão, F. Braunchweig & R. Neves*

Determination of Fine Particulate Matter from MERIS and SeaWiFS Aerosol Data  
*D. Ramon, R. Santer & J. Vidot*

Implementation of New Technologies to Monitor Phytoplankton Blooms in the South of Chile  
*C. Rodríguez-Benito, C. Haag & A. Alvial*

MERIS IPWV Validation: A Multisensor Experimental Campaign in the Central Italy

*P. Ciotti, E. Di Giampaolo, P. Basili, S. Bonafoni, V. Mattioli, R. Biondi, E. Fionda, F. Consalvi, A. Memmo, D. Cimini, R. Pacione & F. Vespe*

Application Development for the Utilisation of ENVISAT Data

*G. Csornai, Zs. Suba, Cs. Wirnhardt, G. Nádor, L. Tikász, I. László, Á. Csekő & L. Martinovich*

Synergy of MERIS/ASAR for Observing Marine Film Slicks and Small Scale Processes

*J. da Silva, S. Correia, S.A. Ermakov, I.A. Sergievskaya & L.S. Robinson*

MERIS O2 Calibration using SCIAMACHY Measurements

*S. Casadio & P. Colagrande*

Demonstration of the BEAM Software – A Tutorial for making Best Use of VISAT

*C. Brockmann*

**MERIS Workshop – User Observations and Recommendations**

*P. Regner*

**List of Participants**

**Abstract Book**