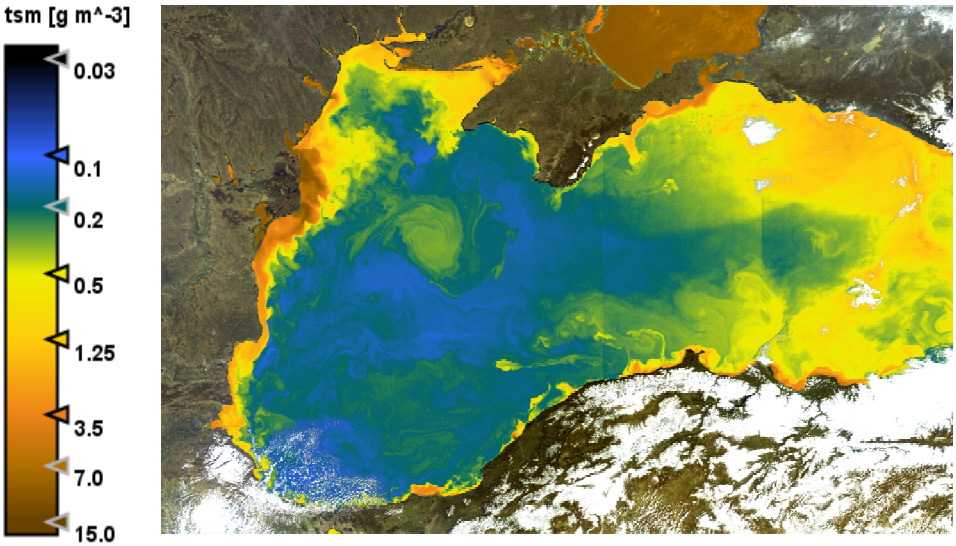
Newsletter Issue I – July 2010



16.-17.11.2010
User Consultation Meeting
Frascati, Italy

CoastColour Project will hold the Second User Consultation Meeting in Frascati, Italy on 16-17 November, 2010. All users and potential users are invited to the meeting to share with the CoastColour Project their experiences and expectations regarding the use of coastal ocean-colour data. For further details, please contact office@coastcolour.org

The importance of the coastal zone

Over the past years the ecology and quality of coastal waters has been the concern not only of science but also of administration and environmental policies. The demands on the coastal zone are growing, and the impact from various human activities such as fisheries, various maritime industries, shipping, mining, tourism, aquaculture and wind farming, together with issues related to climate change, require a careful management to ensure sustainable use and preservation of its natural resources. The water framework directive (WFD) and the European Community Flora Fauna Habitat Directive (FFH) have set important milestones in environmental policies and stewardship. Similar directives and Acts of other countries world wide set common goals.

However, management of the environment always requires a scientific analysis of the system and continuous monitoring. Responding to this need, ESA designed the MERIS instrument specifically to provide ocean-colour measurements most suitable for coastal zone management and research. During the 8.5 years of its operation in space, MERIS has delivered a unique global dataset of coastal zones at 300m spatial resolution, which deserves dedicated processing with internationally agreed algorithms, and provision of products targeted to specific user needs, which are properly documented and easily accessible. Beyond this immediate goal this dataset will become an important tool in the study of the coastal zone in the context in climate change, its importance in the global carbon cycle, the generation of climatically-active gases and its sensitivity and response to changes in temperature, sea level and water mass distribution.

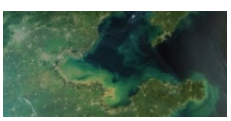
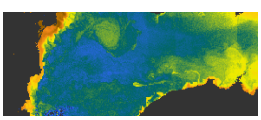
The challenge of optical coastal water remote sensing

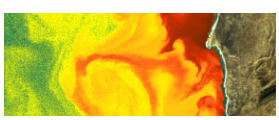
Although the first ocean colour satellite sensor, the Coastal Zone Color Scanner (CZCS), was dedicated to the coastal zone, the available technology in the 1970's was not sufficient to solve the problems of remote sensing of optically complex coastal waters, so the CZCS was mainly used for open-ocean conditions.

Today we have a much better understanding of the optical processes and with improved computational capabilities we can utilize mathematical procedures that could not have been applied years ago. However, optical remote sensing of coastal waters is still a challenge due to various reasons.

Coastal waters comprise a variety of classes with respect to their water constituents and optical properties. It ranges from clear waters to complex waters with various dissolved and particulate substances, which determine the optical properties of the water. The reflection by the sea bottom, strong stratification as well as floating material further contribute to the complexity. Another challenge is posed by the correction of the influence of the atmosphere, which in some cases is by far the most critical step in coastal water remote sensing.

The CoastColour project will address these problems by comparison and combination of a quasi analytical method with non-linear, multiple parameter inversion techniques. An atmospheric correction will be applied which is based on a reconstruction of the water leaving radiance reflectance from the full top of the atmosphere spectrum together with a correction for the effects of adjacent pixels. A fuzzy logic classification scheme will guide the spectrum to the most adapted algorithm, and procedures will be included to determine out of scope conditions of algorithms and the uncertainty of each product on a pixel by pixel basis.

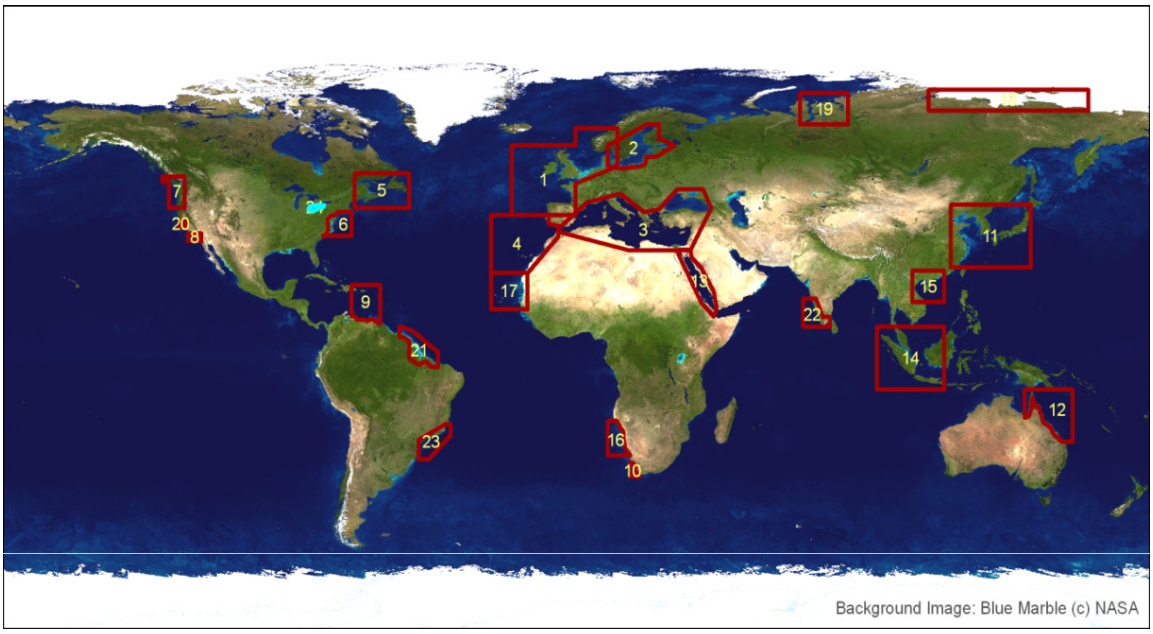



Project Overview

The CoastColour project aims to increase global user uptake of advanced products from ESA's MERIS mission by developing, demonstrating and validating the latest techniques for monitoring water constituents in coastal zones around the world. In particular, the project will be developed according to the needs of the user community, including scientists studying bio-geochemical and physical processes in coastal waters, and companies and government agencies who specialise in providing water quality information to various users such as the the aquaculture industry, local authorities responsible for maintaining water quality and others.

At the high level the work programme is organised around five main lines of activities:

Activity 1:	Algorithm definition and development
Activity 2:	Production
Activity 3:	Validation
Activity 4:	Round Robin
Activity 5:	Communication and interaction with international groups

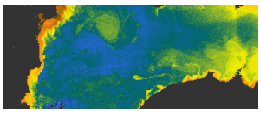


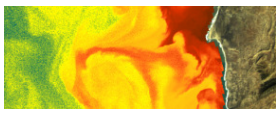
Users and Sites

Following a call for participation as a champion user in CoastColour, and after bringing CoastColour to the attention of the user community at a number of international conferences, a consolidated list of 24 globally distributed sites was selected, over which the CoastColour data set will be generated. These sites represent a large variety of coastal water types and atmospheres.

A total of 34 user organisations will provide local knowledge of the sites, in-situ data for algorithm development and validation, and will participate in the User Consultation Meetings.

The next User Consultation Meeting will be 16. – 17. November 2010 in ESRIN, Frascati, Italy. The meeting is open to all interested parties. For further information and registration please send an Email to office@coastcolour.org

Products

CoastColour will process all available MERIS Full Resolution (300m) data of the champion user sites (and possibly more). The CoastColour products will include a set of basic quantities which will be generated over all sites:

- Top Of Atmosphere radiances
- Remote sensing reflectances
- Classification of waters as being Case 1 or Case 2
- Inherent optical properties
- Concentrations of Chlorophyll-a, Suspended Matter and Coloured Dissolved Organic Matter (CDOM)
- Water clarity (euphotic zone depth, Secchi disk depth)
- Turbidity
- Photosynthetically Active Radiation (PAR)
- Aerosol optical depth
- Chlorophyll-a fluorescence line height
- Uncertainties in each product, at each pixel

An attempt will be made to generate additional experimental, site-specific products, including:

- Primary production
- Phytoplankton carbon biomass
- Phytoplankton functional types, abundance and particle size distribution
- Distribution and abundance of cyano-bacterial blooms
- New products derived from MERIS fluorescence band; algal bloom monitoring using fluorescence band

These CoastColour products together with the standard MERIS L1b and L2 products, over all CoastColour sites from 2005 – 2010 will be made available online.

Team

Scientific/Industrial Team

An international team has been constituted under the leadership of Dr. **Carsten Brockmann** from Brockmann Consult (Germany): Dr. **Shubha Sathyendranath,** Prof. **Trevor Platt** FRS and **Steve Groom** from the Plymouth Marine Laboratory (PML, UK); Dr. **Roland Doerffer** and his colleagues from the Institute of Coastal Research of the GKSS Research Centre (Germany); Dr. **Kevin Ruddick**, Management Unit of the North Sea Mathematical Models (MUMM, Belgium); Prof. **Richard Santer** from the University of the Littoral Opal Coast (LISE, France); Prof. **Vanda Brotas** University Lisbon (CO, Portugal).

Group of consultants

This core team is supported by a group of consultants who provide specific expertise. The group of consultants comprises Prof. **Yu-Hwan Ahn** (KORI), Dr. **Jim Gower** (DFO), Dr. **Mark Dowell** (JRC), Dr. **Stewart Bernard** (CSIR), Dr. **Zhongping Lee** (Mississippi State U.), Dr. **Bryan Franz** (NASA) and Dr. **Thomas Schroeder**/Dr. **Arnold Dekker** (CSIRO).

Science Team

Finally the work of the CoastColour team will be supervised and guided by the Science Team. It is composed of Dr. **Mark Dowell** (JRC), Dr. **Gene Feldman** (NASA), Dr. **Paul Di Giacomo** (NOAA), Prof. **Jürgen Fischer** (FUB), Dr. **Hubert Loisel** (Lille), Dr. **Kai Sorensen** (NIVA), Dr. **Prakesh Chauhan** (ISRO), Prof. **Trevor Platt** (PML), Dr. **Steef Peters** (IVM).

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