DEEPER THAN LIGHT
Communicating an unknown world

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ABSTRACT

This presentation introduces the communication activities related to the MAR-ECO project, a broad international scientific study which aim is to understand the life of the organisms inhabiting the Mid-Atlantic Ridge of the Northern Atlantic Ocean down to 4000m.
The main cruise of MAR-ECO took place with the Research Vessel G.O. Sars in 2004. During the two legs of the cruise an artist, a photographer and a TV team were working with the scientific staff. This created stunning photos, art, film and other visual presentations that were a fundamental support for the overall outreach activities in the project.

During the cruise this was communicated extensively through press contacts and the web to an international audience. The communication was an integrated part of the scientific work. It started from day one and followed the same steps as the phases in the science plan; from preparation, through field work, and later into preliminary and final results.

Objective/Hypotheses
Science communication is a process that should be strongly linked and integrated into the research process itself. This actually empowers both the scientists and the audience.

Methods
The audience, through media and the web, was invited on a journey to discover deep sea life using state of art technology together with the scientist and fellow explorers, such as the artist, the photographer and the TV-crew. And after the cruise to utilise this material as a platform to communicate further the results of the investigation through TV-documentaries, publication, an educational network, publications, exhibitions and more.

Main conclusions
Cross over triggers the public.
The exploration aspect and to invite the public through the scientific process was vital.
Working strategically over a long time gives results and keeps attention. To be inclusive and involving partners and stakeholders outside the scientific community in the communication process widens the project and gives more power to the effort.

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Background

75% of our planet is water, and our knowledge of the deep sea is limited. It is said that we know more about the surface of the Moon than we know about the deep sea on Earth.

Scientists from 16 nations are now participating in the international research project MAR-ECO exploring the deep sea life in waters around the Mid-Atlantic Ridge from Iceland to the Azores for the period 2001-2010. The project is led by the Norwegian Institute of Marine Research and Bergen Museum/University of Bergen. During the two month cruise in 2004 the research vessel *G.O.Sars* collected biological, visual and acoustic data. All biological samples, various marine organisms such as fishes, cephalopods, and various other midwater and bottom-living animals, are part of the scientific deep sea collections at Bergen Museum. This treasure of samples represents several years of work for the international deep sea scientists in the time to come.

MAR-ECO is one of several projects connected to a large global initiative called the Census of Marine Life (CoML), a global network of researchers in more than 70 nations. They are all engaged in a ten-year initiative to assess and explain the diversity, distribution, and abundance of marine life in the oceans - past, present, and future.

Objectives and methods

Education and outreach is an important task in the MAR-ECO project. In the initial phase a Public Outreach group was established. The ambition has been that the outreach activities should be closely integrated with the scientific work, following the steps in the science plan, from fieldwork, through analysis to results. The communication work started from day one.

Our aim was to communicate, create and stimulate interest and knowledge on deep sea life to an international public, especially children and youth. We wished to create fascination, by appealing to people's feelings, using images, art and stories. Our hypothesis was that this would trigger "a thirst for knowledge" on different levels and in various forms. Alongside the scientific discovery itself, we wanted to tell stories, present images from the deep and present deep sea life from different points of view, through art and other communication forms, thereby creating a feeling of exploration, and to invite everyone that wanted to take part into the outreach process. To create an understanding of the need for a sustainable management of deep sea ecosystems was the overall ambition.

Modern technology has visually opened a previous inaccessible world to all of us. Today, with the help of modern technologies, we can see with our own eyes what exists in the deepest ocean. To help us reach out to our target groups, we had focus on the media, and offered images and footage never seen before. At the same time, we were trying to capture and maintain interest over a longer period by reporting from cruises and processes, by offering updated descriptions of findings, ongoing analysis and interpretations using new initiatives and products.

The **means** to achieve the stated goals were our internal organisation, a focused communication plan, and a diverse set of outreach activities.

Planning and organizing

The initial phase of the project, when we wrote a plan and set up goals was important, since we decided on the main outputs. The **communication plan** described the main strategic **principles** underlying our work. The communication activities should start from day one, following the science plan from planning, through fieldwork and results. A prerequisite was strong scientific participation in the outreach activities.

Our **target groups** were the general public in countries that border the North Atlantic, in Western Europe and North-America.

Our more **specified goals** were to create a variety of specified activities and products, involving many participants, getting high score in media coverage, get many hits on the web site, involve a large number of schools, students, visitors and readers. These are goals we could measure over a period.

We built a tight **organisation** to follow up the outreach effort in the project. This organisation was co-chaired by communication officers of the two institutions that led the MAR-ECO project, the University of Bergen and the Norwegian Institute of Marine Research. The organisation also included a part-time co-ordinator responsible for maintaining regular tasks such as publishing on the web and other ongoing activities that required daily or weekly attention. We had weekly PO meetings, and we also decided to be open and inviting to people contributing to the project out of their own interest and with independent means. The core PO group had no scientists, but comprised science communicators. All had other obligations, for example running departments and related activities.

The scientific PI and Steering Group of the MAR-ECO strongly supported and valued the outreach activity, and emphasised the ambition: Outreach should be one of the two main outputs of the science project, equal in value to the scientific results.

The Census of Marine Life programme was also a motivator for success. The education and outreach activity of the programme is directed from the University of Rhode Island, USA, and the CoML E&O organisation supports the individual CoML projects in their outreach efforts. CoML also helps raising media attention, and also has their own outputs to the media to which the individual science projects contribute.

A platform for communication

The web site
It was important to create a graphic identity and a common platform where we could gather all our information about the project both for internal and external communication. Early on we established a web site with a project logo and chosen graphic design **www.mar-eco.no** . The web site has its own portals carrying background material and news for children and young people, the general public and the scientific community. The project has developed a large amount of images, videos and films which have been very important to communicate together with the more text based information. The web-site formed the principal channel for

the daily reports of the scientists on board the R/V G.O. Sars during summer 2004. This was where the scientists described their activities of the day, their finds and their tentative evaluations. Spectacular images and videos from the deep sea were important elements of the site, which has become an arena for reports from the cruises, analytical efforts and scientific meetings. The site also includes presentations made by students who are linked to the project.

A repertoire of activities

Based partly on this common platform we developed a variety of separate activities that also stimulated synergy.

The project developed a comprehensive program of popularisation via **international media**, through the big international news wires, web sites, TV and radio channels, news paper, magazines etc. Particularly during the summer of 2004 the project was presented in 14 different languages in 32 countries. The project has utilized press releases, press conferences, and direct contact activities, and has also taken part in courses for science journalists. During the later periods of the project the media coverage has continued especially related to the travelling exhibition *Deeper than Light*. We have thus succeeded in maintaining attention to MAR-ECO in different countries with local participants and contributors.

A 60-minute international **TV documentary** was produced by the Norwegian Broadcasting Corporation (NRK) that sent a recording team on the first part of the 2004 research cruise. The documentary was aired in Norway in December 2004 and was very well received. The programme has been nominated for awards and was put on the international TV documentary market. NRK has also made use of the results of the projects in a number of televised nature and science magazines. In addition, the Portuguese national public service broadcasting RTP has also made a TV documentary on the project.

Promotion and information products in the form of newsletters, videos and photo presentations, posters, bookmarks etc. have been produced. The newsletter had an important function in spreading internal information in this international project and gave the scientists material which they could use in presenting the projects to others.

A separate international **school project** run by the EU's Comenius Programme, with the participation of schools in Portugal, France, the UK, Lithuania, Greece, the Czech Republic and Norway. In the course of 2004 and 2005 a number of teaching projects involving participating research groups and school classes in their respective countries have been carried out. A "Net-day" where students could communicate with scientists was organised for participants in the Comenius network. In UK successful projects have been run especially with schools in Scotland.

The participation of the Norwegian **artist Ørnulf Opdahl** in the first part of the 2004 cruise, and of the British **nature photographer David Shale** in the second has been very important. David Shale also joined a UK MAR-ECO cruise in 2007. The artwork produced by these two artists has been used in various popularization efforts, especially in media and various exhibitions about the project in Norway and other countries.
The **coffee table book "Deeper than Light"**was published in 2007 presenting stories and images from the deep sea. The fascinating images and artistic impressions from David Shale and Ørnulf Opdahl are an important part of the book. This is collaboration between MAR-

ECO and four other deep sea projects (DESEO) in the Census of Marine Life. The book is published so far in English, French, German, Spanish and Norwegian. A major **popular science book** is now nearly finalized by the British scientist and author Peter Boyle which summarizes the activities and results of the project and will be published and distributed internationally. The art and the images from the project will also here play an important part.

Various exhibitions on the project have been presented. The first **exhibition** *Secrets of the Deep* shown in the Bergen Museum presents the background to MAR-ECO together with biological samples from earlier North Atlantic expeditions. The expedition in 2004 resulted in various smaller exhibitions in Iceland, the Azores, and several sites in Norway. All this has been developed further into the **international travelling exhibition** *Deeper than Light* designed, developed and produced by the Bergen Museum, University of Bergen. The travelling exhibition confronts science, art and technology and such invites visitors to experience the unknown world and discoveries from the deep sea by presenting deep sea animals, art, images, films, models and interactive audiovisual software. *Deeper than Light* opened in Paris, at UNESCO in March 2006, and has so far travelled from Paris to Porto, Essen, Oslo and Aberdeen. The exhibition will travel to the most important participant countries in Europe and North America, whose national contributions to the project will also be profiled at appropriate exhibition sites. Bergen, Valencia and Washington DC are already confirmed venues.

Events either related to exhibitions, school projects or open public shows form important elements of the communication repertoire. Numerous talks, lectures, concerts, open ship days, research days etc. have been held in various countries throughout the project period.

Including players, generating new activities

We stressed from the start that the communication project should be open to everyone willing to make contributions. This resulted in new activities and projects which we had not planned or foreseen.

- As parts of a PhD work in media studies a doctoral student has been in charge of a project developing a prototype for new computer game based upon the deep sea environment. The PhD thesis is a reflection and analysis of how to use new technology, design and art in scientific popular communication.
- Another project is the contribution of an artist who has made sculptures of marine forms. This work has also been described in a master's degree about science and art.
- "Underwater" is a music project inspired by MAR-ECO. A new CD and concerts have been developed with jazz and lyrics based upon the topic deep sea and science.
- An interactive presentation of MAR-ECO, using both text, images, films, sound and text has been developed by students at the Agder University College This is also available as a DVD for sale.

Not only participators and new communicators have been connected to this project. The different aspects have also helped us in getting support from various partners and sponsors such as Kongsberg Maritime, The Norwegian Foreign Ministry etc.

Results

Did we reach our goals scheduled in our communication plan? Yes, to a great extent, is the answer. Several awards for communication activities indicate this:

- 2004 the Norwegian Research Council prize for Excellence in Science Communication.
- 2007 Institute of Marine Research Award for excellence in Science Communication
- 2006 Wonders
- 2006 EUs Descartes Prize for Excellence in Science Communication (Innovative action)
- 2007 CoML overall price for excellence in science and communication.

Despite overall success, there are some fields in which we would have liked to reach further. This is especially the case for our school efforts. Although we have had extensive school communication we have not managed to develop a continuously active education program and school network. We experienced that this would require more attention and resources than we were capable of.
Secondly, the support from local institutions has varied. In one end there has been lot of inspiration and support from colleagues, leaders and partners. In the other end, others would look upon the project as a competitor in attention and in the competition for internal resources. We did not give these challenges enough attention from the beginning.
Thirdly, keeping the web site updated especially in the latter part of the project has been a real challenge due to both technical reasons and lack of personnel.

New ways and new thinking has been one of our ambitions, and the comprehensive and innovative character of the project is especially evident in the following:

Popularisation as an integrated aspect of the research process
The main underlying strategy has been that popularisation should be integrated and implemented in parallel with the research activity. Direct communication from the research cruise has helped improve understanding of the research process and the patience required in a long-term scientific project. It has also prepared the ground for further dissemination of the results by stimulating greater external interest in the results of the project. Making popularisation a priority task from the very launch of the project has helped to reinforce the appreciation of its importance among scientists and other involved parties, as well as helping to bring participants together. Popularisation has raised the level of interest in the project and has encouraged other people to examine MAR-ECO and consequently to ask questions about it. This in turn has influenced the scientific questions that have been asked by the project itself.

Broadly based popularisation efforts, adopting a repertoire of measures aimed at a number of different target groups. New communication technology on board modern research vessels makes it possible to invite different target groups to follow and play a “virtual” role in field work far out on the high seas.

Popularisation as a pleasant duty to all participants
Right from the very beginning of the conceptual phase of MAR-ECO, the project steering group has emphasised popularisation as a prioritised and valuable task for all scientific participants, and this has been followed up during all the phases of the project. During the

2004 research cruise, two scientists were given the main responsibility every day to pass on impressions and results on the project's web-site. Daily summing-up meetings on board the research vessel helped to bind the participants together and set the focus on the popularisation efforts which have formed a core aspect of the whole work.

Efforts vis-à-vis the international media
Strategic media planning has enabled the project, particularly in connection with the 2004 cruise, to obtain wide coverage in international media: in newspapers, magazines, radio and TV, web-sites, etc. The cruise in 2004 resulted in MAR-ECO coverage in 14 languages, by 20 international news agencies, at least 19 TV stations, more than 200 web articles and at least 70 major newspaper articles. Also later cruises have been reported on widely. Front pages in outlets such papers as El Pais and NRC Handelsblatt, and so far full-page articles in Frankfurter Allgemeine, Die Welt, Sunday Times, the Scotsman etc. and participation in a number of TV and radio programmes is evidence of some level of sustained success, in particular attributable to the cruises and the travelling exhibition.

Interdisciplinary meeting of art and science
Through the participation of different artists the project has endeavoured to create links between science and art. Especially the travelling exhibition *Deeper than Light* has become an arena where these different perspectives fascinated visitors. Communication via the different perspectives of the researcher and the artist stimulate emotions and experiences as much as rational knowledge and dry facts. In some way we can say that the science explains and the art reveals the new knowledge and insight. Bringing art into the research process has also helped to raise consciousness of the fact that creativity, intuition and experimentation, for example, can form important elements of the work of the scientist.

Organisation and the inspiration of the project manager
The chief scientist and project manager for the MAR-ECO project has been a decisive driving force behind the effort to make popularisation a visible part of the work of the project's participants. The Public Outreach group has had responsibility for drawing up strategies and implementing a wide range of measures in collaboration with the researchers. Since the start of the project manager have fronted and profiled the project, with the aim of attracting attention and support. The media coverage has led to yet more requests for popular talks and presentations. The project manager and several profiled participants have given interviews and lectures, and have been important as providers of scientific information to the general public.

Did we manage to empower the public?

Come – explore with us! That was the main message to the public from the beginning. We did not, in the first instance, want to tell complicated stories about e.g. food chains and migration within deep sea environments. We wanted their attention, and we decided to speak to their hearts, emotions, and imagination. The knowledge was considered as a spin-off, if and only if, we managed to attract attention in the first place. This was the way we decided to empower the public, to interest and at the next stage, to develop the urge to find out more about this part of our planet where our knowledge has been so restricted.
The wide range of activities in different phases of the project has contributed to maintaining the attention in different settings and places. Especially the travelling exhibition contributes to this in this latter part of the project period.

Did we manage to empower the scientists?

The outreach team is dependent upon the scientists, and the scientists are dependent upon the outreach team. The dynamics between the two are very important. To have an understanding about the role and function of the two entities is crucial. In our case, the role of the PI was exemplary. The PI understands these dynamics and played an important part as a motivator and facilitator also for the outreach efforts.

The scientists were very active during the cruises, and thus laid the foundation for further outreach. Since then, we have not to the same extent been dependent on their participation. They have primarily focused on the science, but continued communication with the PO group has facilitated popular publishing of scientific findings, once they are ready to be released, in further reports on the website, to the media, in the exhibition and associated events etc. We had created a repertoire of activities that we could act upon. At the same time we had to be aware of the scientific process that has to follow rules and regulations that very often limit the outreach.