



EUR-OCEANS User's Needs Survey

Conducted by the EUR-OCEANS Knowledge Transfer Unit

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1 Executive Summary

The importance of transferring scientific results from science to user communities continues to grow in strategic importance and is now built into the majority of EU funded projects. As a growing precedent is placed upon showing the relevance of science to society and the public, it is important to gain a better understanding the effectiveness of current knowledge transfer practices and what can be improved. This survey aimed to develop our understanding of both the individual needs of specific socio-economic users as well as gaining better understanding of those methods which are thought to be most effective and which could be improved. It is also vital to find out if any key barriers remain across communities that may be hindering successful knowledge transfer.

This survey has provided insight into both the methods preferred by users for knowledge transfer and the areas which need improvement. The use of the internet is wide spread in the user and science communities, and although effective in some instances this survey clearly showed that a coordinated approach from the European marine science community would be beneficial to users. There were also many users who still valued personal interactions with scientists, highlighting the importance of cross community conferences and symposium where the user and scientific communities can meet and discuss issues. Continued and sustained interaction and openness between scientists and users communities is vital to improve the transfer of scientific findings. Maintaining openness and transparency will help develop trust between the two communities leading to more effective working relationships.

This survey has provided valuable information that will not only help the EUR-OCEANS KTU to tailor products to meet the specific needs of its socio-economic users but also provides some insight into areas that could be improved across the marine science community to ensure that transfer of knowledge grows in continues to grow and prove effective.

2 Introduction

This report presents the findings of a User's Needs Survey carried out by the EUR-OCEANS Knowledge Transfer Unit (KTU) team. The report is based on the results of the questionnaire survey distributed in January 2007 to socio-economic users with a potential interest in the science generated by the EUR-OCEANS community. The survey will support the development and effectiveness of knowledge transfer from the EUR-OCEANS community to global user groups through an increased understanding of their specific information needs and their preferred methods for delivering of information. The survey will also help to improve understanding of the barriers to transferring knowledge between the marine science and socio-economic user communities.

3 Background information

3.1 Socio-economic Users

For the purposes of this survey socio-economic users are defined as those organisations which may be interested in the outputs and scientific results of the EUR-OCEANS community. The following groups were targeted in this survey:

- Assessment bodies, their scientists and policymakers, e.g. Intergovernmental Panel of Climate Change (IPCC)
- European Environment Agency (EEA)
- Intergovernmental organisations, e.g. International Council for the Exploration of the Sea (ICES)
- International Conventions e.g. Convention on the Conservation of Antarctic Marine Living Resources (CCMLAR)
- Non-governmental Organisations
- Data Providers/Information managers
- National governance e.g. fisheries assessment and climate change agencies, environment agencies
- Corporate User groups, Fishermen's Associations, Consultancies
- relevant European Commission directorates e.g. Fisheries Directorate General
- Private or Commercial Business

3.2 EUR-OCEANS and Knowledge Transfer

The EUR-OCEANS Network was conceived as a means of developing lasting integration of European research organisations that focus on global change and pelagic marine ecosystems and the relevant scientific disciplines. As such, the Network has gathered the leading European scientists in these fields. The aim of the EUR-OCEANS Knowledge Transfer Unit (KTU) is to communicate the science of the EUR-OCEANS partnership to

target groups, and to promote its use in the wider management, policy and user communities.

The term knowledge transfer is interpreted as **the process which facilitates the dissemination of research-based knowledge, expertise and skills between the network and global users**. Effective knowledge transfer requires communication between EUR-OCEANS researchers and global users (e.g. policy makers, advisory bodies, research managers, conservation groups or management bodies), and results in the production, dissemination and use of existing or new research-based knowledge in decision-making and enterprise.

Over the past year, the EUR-OCEANS KTU has developed several tools to help transfer the science generated from the Network, these include a dedicated website, an interactive 'contacts' database and the EUR-OCEANS Fact Sheet series. Fact Sheets are concise, double side, A4 documents, which focus on highlighting key messages and provide targeted and timely information. The Fact Sheets not only highlight current research activities and thinking but also suggest actionable solutions and ways of moving forward.

4 Survey design and administration

4.1 Questionnaire Design

The questionnaire was composed and administered by the EUR-OCEANS KTU team. The questionnaire included a series of closed and open questions, the overall length was kept short to maximise response rate. The use of both open and closed questions has several benefits. Closed questions have a forced choice-format; are easy and quick to fill in, record, code and help to minimise discrimination e.g. language barriers. Open format questions allow for deeper exploration of themes and can be used to allow respondents to increase the range of their responses i.e. through the addition of an 'other' category.

The questionnaire was written in English and then translated into four other European languages - French, German, Greek and Spanish. These languages were chosen because there were a substantial number of contacts from each of these countries, many of whom were from small local organisations. It was hoped that response rates would be higher and answers more detailed if questions were asked in a respondents' first language. Respondents were sent a hardcopy of the survey but were also given the option of filling in the survey online (in English only) from a link provided on the EUR-OCEANS KTU webpage (http://web.pml.ac.uk/euroceans/Userneeds_survey.asp).

4.2 Administration

The survey was sent to a sample of 190 organisations identified from the EUR-OCEANS Knowledge Transfer Contacts database (Deliverable 43). As well as exploring user's information needs the survey will help to further develop the contacts database through the addition or loss of contacts as requested by respondents.

A pack containing a covering letter (appendix 1), the questionnaire (appendix 2) and examples of the all EUR-OCEANS Fact Sheets (appendix 4) was sent out on the 12th January. Five weeks later a follow up email was sent out to those organisations that had not yet responded. Responses continue to come in occasionally but at the time of writing the response rate was 15%. This is consistent with the average response rate to postal questionnaires. Responses were received from a broad range of the user groups surveyed, offering a good representation of views across the user community.

5 Survey Results

The survey results have been analysed according to the questionnaire structure.

5.1 About the Organisations

Qu1. Which of the following best describes your organisation?

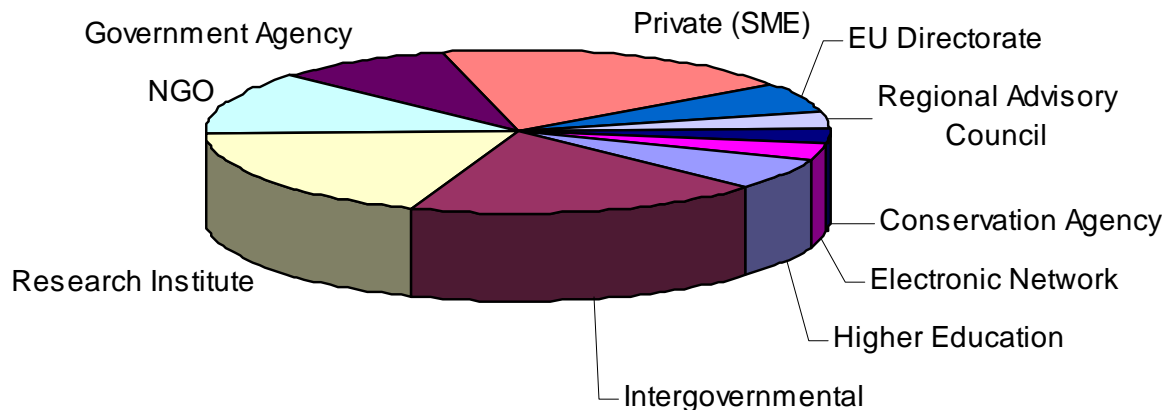


Figure 1. Pie chart to show the range of organisation types that responded to the survey

The responses from Qu1. were used to categorise the respondents into organisational types. The highest number of responses was received from members of the research, private and intergovernmental sectors.

Qu2. What is your organisation’s main area of work?

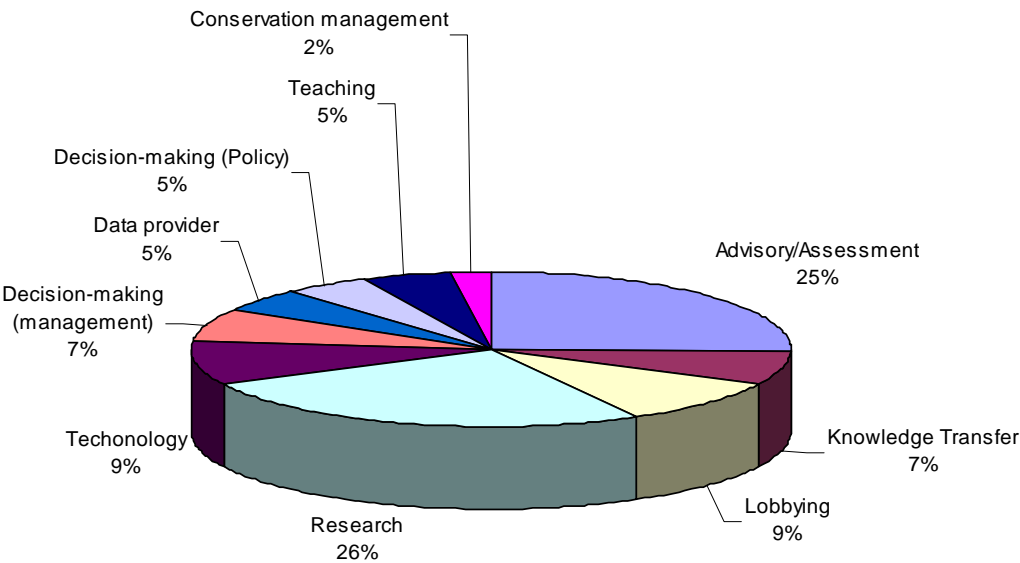


Figure 2. shows the main areas of work undertaken by respondents organisations.

The two main areas of work undertaken by the respondents were advisory/assessment and research followed by lobbying and decision-making (at a management level). The proportions represented here may be slightly skewed as the number of respondents was not equal across organisation types.

5.2 Provision and Use of Scientific Information

Qu3. Which of the following methods do you use to provide scientific information to your customers or target audience?

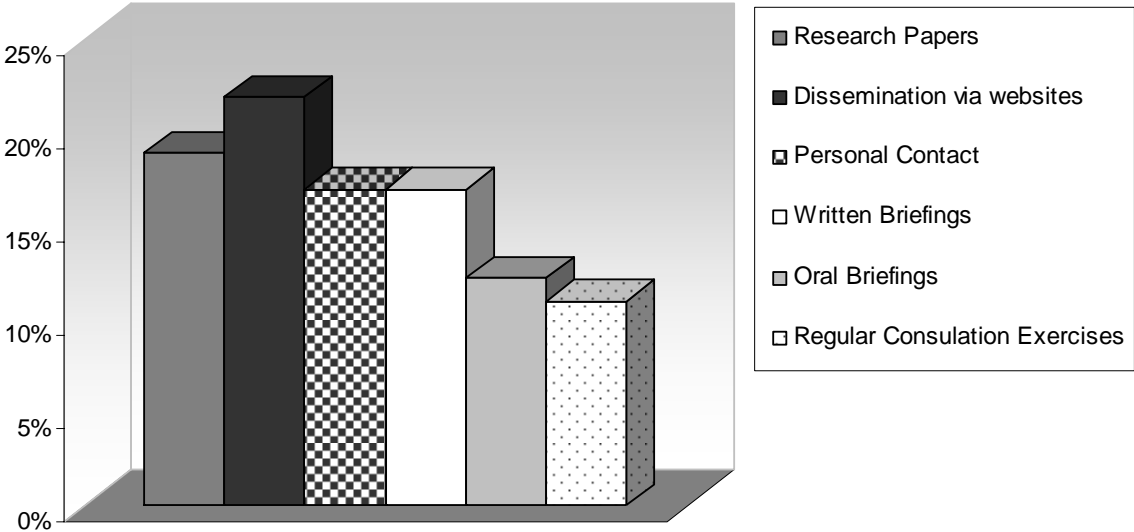


Figure 3. chart to show the methods used by respondents to provide scientific information to their customers or target audience.

The results indicate that the majority of respondents use websites to disseminate information to their own user groups and target audience. This is to be expected since most organisations/projects now run their own websites and posting information is easy and efficient. Other popular, yet more traditional, methods of dissemination included the production of research papers, personal contact and written briefings. Regular consultation exercises were the least used method. Additional methods suggested by some respondents included the use of Newsletters, presentations, email and training seminars.

Qu4. How do you obtain the scientific information needed to support your activities?

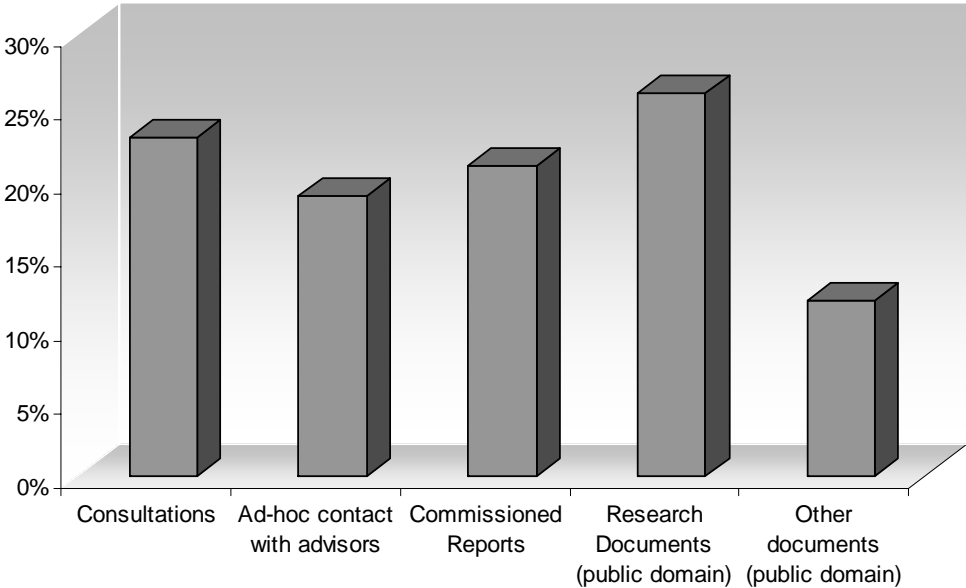


Figure 4. Bar chart to show the methods used by respondents to obtain scientific information

The results indicate that respondents use a good range of methods to obtain scientific information and do not rely on just one or two methods. This is a good indication of users' willingness to utilise a range of methods to access scientific information and therefore the importance of employing a range of knowledge transfer tools. Additional methods used by respondents included: expert groups, field researchers and scientific committees.

Qu5. For which of the following activities does your organisation use scientific information?

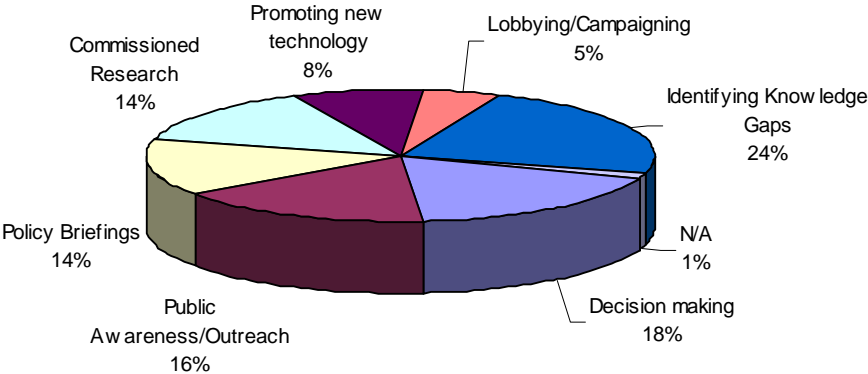


Figure 5. Pie chart to show the range of activities for which respondents use scientific information

The results indicate that scientific information is used to support a wide range of activities. In total 78% of respondents stated they engaged in identifying knowledge gaps, suggesting this is a key activity for many organisations. The wide range of activities supported by scientific information emphasises the demand and need for effective, ongoing knowledge transfer across communities.

Qu6. During the past 3 years, how often have you used scientific information to support your work or the work of your organisation?

All respondents stated that over the past 3 years they had used scientific information in support of their work every week or at least once a month. This again emphasises the value of scientific information to the user community and the importance of ensuring that information is made readily and easily accessible.

Qu7. Please select the methods that you, or your organisation, use most regularly to access the scientific information needed to support your work.

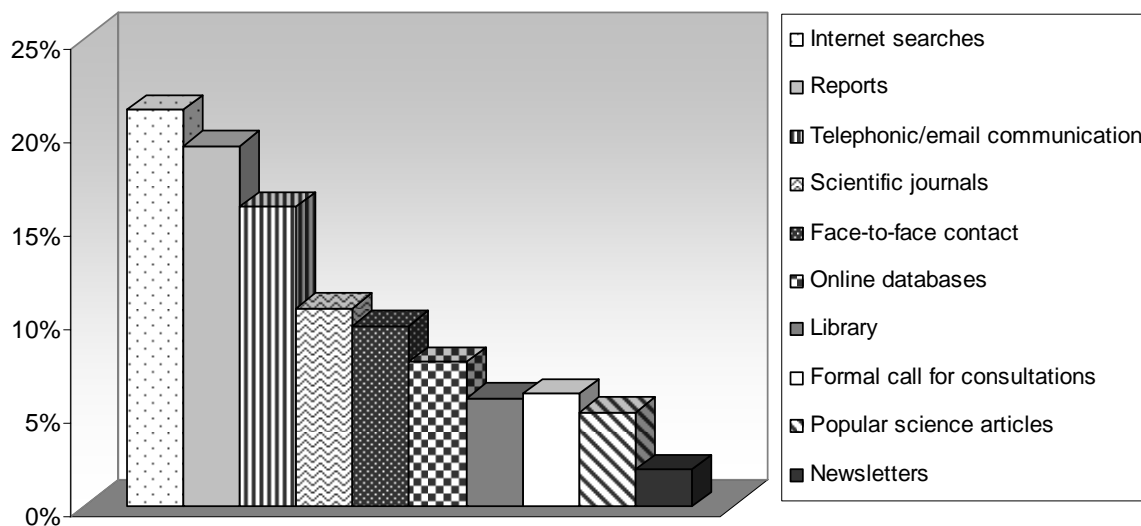


Figure 7a. Bar chart displaying the methods used most regularly by the respondents to access scientific information

In figure 7a. responses have been ranked to ease interpretation. The results indicate those methods which are used most commonly, not surprisingly the internet rates highest, closely followed by written reports. The use of telephonic and email communication were also popular. The results for use of scientific journals maybe slightly skewed owing to a high percentage of the respondents being from Research Institutes. Popular science articles were one of the least regularly used methods, perhaps indicating socio-economic users' require more in-depth and targeted scientific information than provided by the more simple overviews aimed at the general public.

In order to see if the methods used varied depending on the type of user, the results were further broken down across organisation groups as shown in figure 7b. Again it is important

to bear in mind that some organisation groups had fewer respondents and as a result show a narrower range of methods. The results show that the internet is popular almost across the board as was the use of telephone/email and reports. However, with the results broken down in this way it can be seen that the internet is not actually the most regularly used method within each group. In several groups (private, NGOs and Government Agencies) both telephone/email and reports were more regularly used. NGOs employed the widest variety of techniques, perhaps because of the range of customers and target audiences with whom they engage; from school groups and the general public to high-level decision makers, and therefore need to tap into a broad range of methods to achieve their goals.

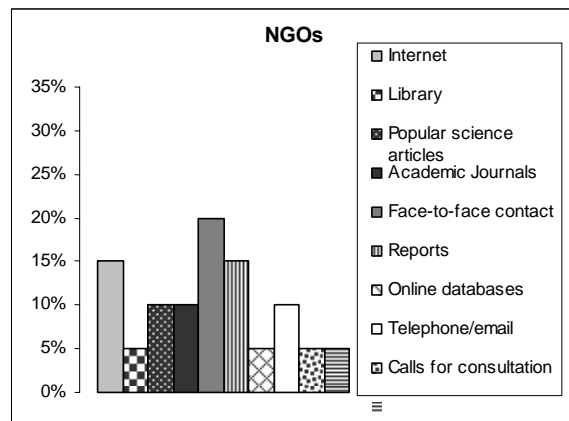
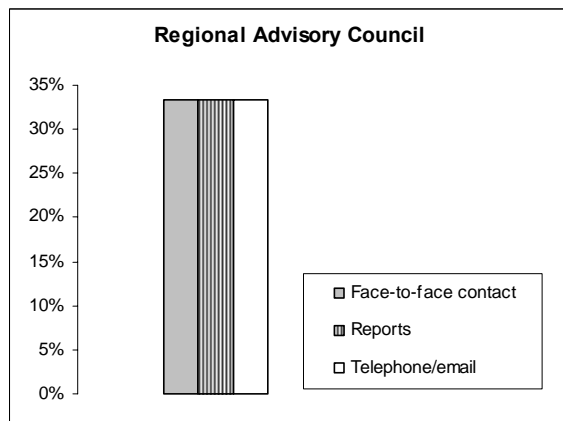
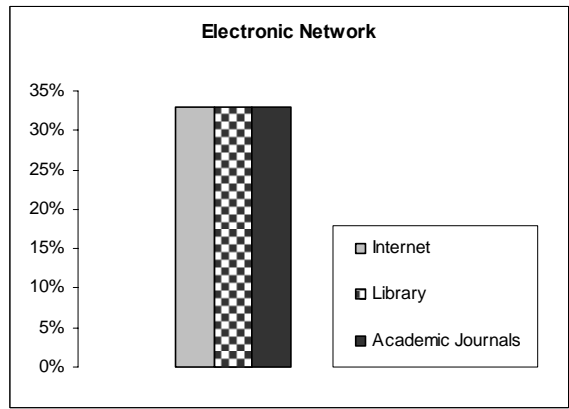
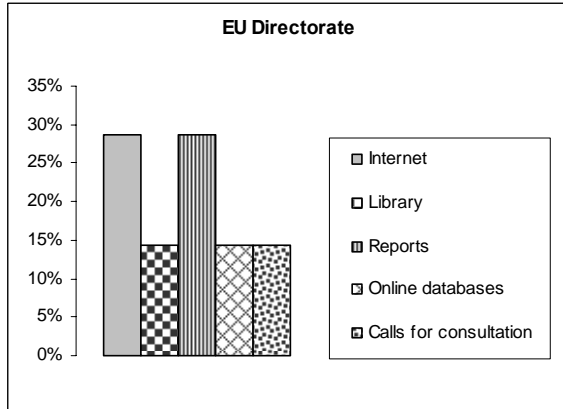
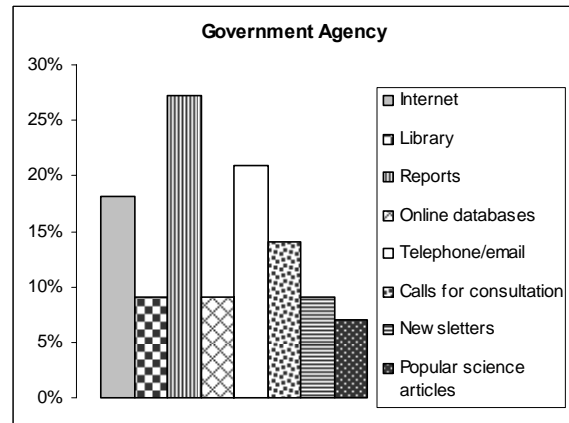
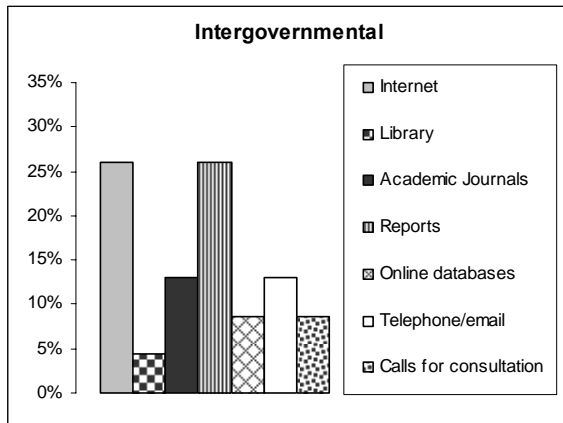
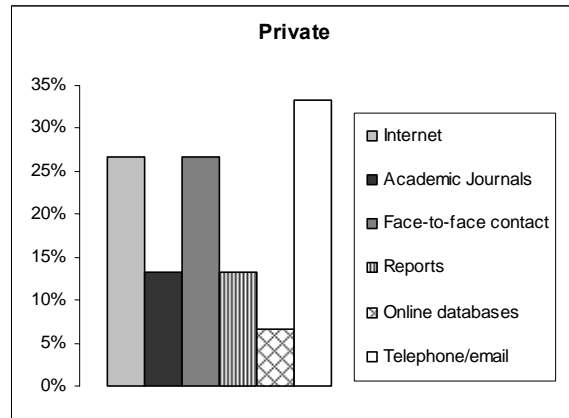
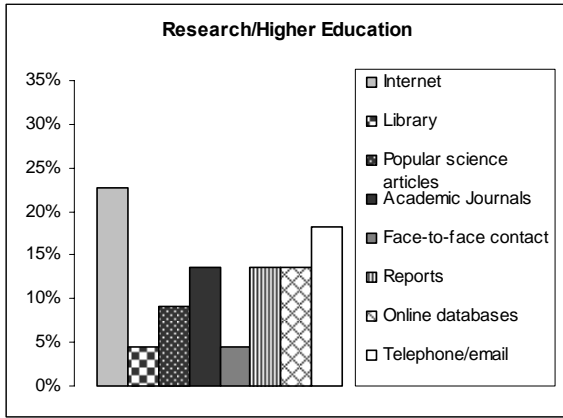


Figure 7b. Bar chart to show the methods used most regularly to access scientific information grouped by organisational type.

Qu8. How do you prefer to receive documents from the scientific/research community?

This question relates to the respondents preferred method for the delivery of scientific information. This ranking is a representation of overall opinion. The preferences expressed by each individual respondent will be noted and future correspondence, in particular delivery of Fact Sheets, will be delivered according to their stated preference.

The 4 choices provided were ranked as follows:

1. Download from websites
2. Email attachment
3. Personal interaction
4. Hardcopy sent to office

Qu9. Based on your experience, how effective do you find the following methods/media for transferring information from the scientific to the user community

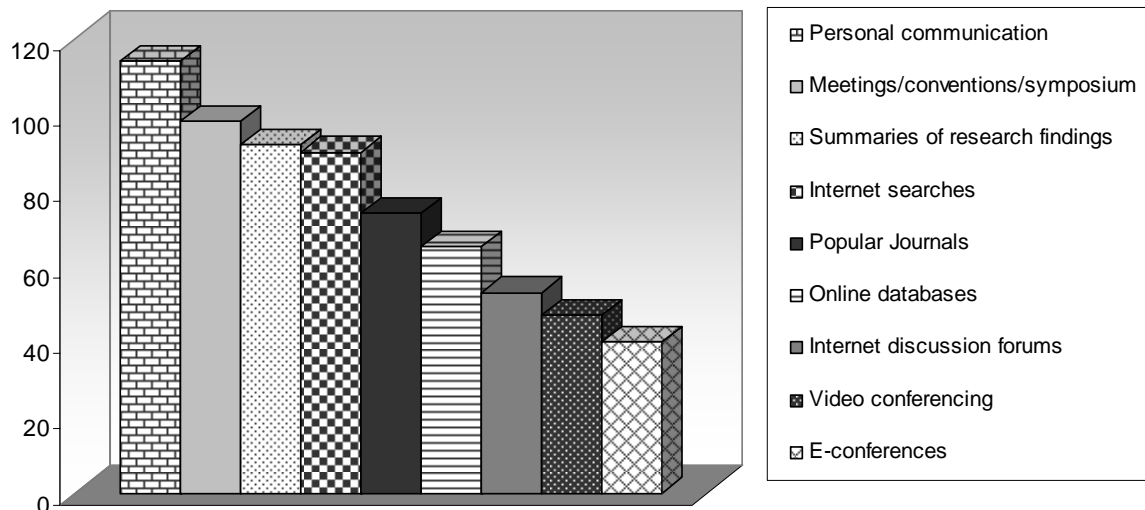


Figure 9. Bar chart to show the most effective methods for transferring scientific information as ranked by respondents

This question was designed to explore the respondent's experience of using the methods commonly employed to transfer scientific information. The results were scored and then ranked to aid analysis. Personal communication ranked the most effective followed by meetings/conventions/symposium, indicating that all forms of personal interaction are rated highly with users. Surprisingly, the use of internet searches ranked as only the fourth most effective, conflicting with the results of Qu8. where websites and the use of the internet for downloads were generally the preferred media for transferring knowledge. This issue is discussed at greater length in the [summary](#). Internet discussion forums, video conferencing and e-conferences were ranked as the least effective methods. A number of reasons may explain this; respondents may not have much experience with these methods, technology may need development to improve efficacy or perhaps people simply still prefer to meet and work in a face-to-face environment. The fact that personal communication ranked the highest suggests this may be the case.

10. Are there any specific periods of the year when you require scientific knowledge to your activities?

The majority of respondents answered 'not particularly' or 'all year' to this question. Any specific times expressed by respondents have been recorded where appropriate so that the EUR-OCEANS KTU can work towards providing information in a timely manner. For example an EU Directorate expressed a need for information during the first quarter to coincide with the preparation of their work programme.

5.3 Barriers to Knowledge Transfer

11. In your opinion, what do you think is/are the main barrier(s) to the successful transfer of knowledge from the marine science to user communities?

12. In your opinion, what steps could be taken to improve the transfer of knowledge from researchers to users?

This section includes the open questions, the responses were extracted and thematically code. The original coded tables can be found in appendix 3. After initial coding the text was extracted and placed in separate thematic tables (Table 1. Main barriers to knowledge transfer and Table 2. Steps to improving knowledge transfer from the marine science community) with responses separated into organisation types.

5.3.1 Main Barriers to knowledge transfer

Six clear themes emerged when respondents were asked their opinions on the main barriers to knowledge transfer from the marine science to user community (Table 1):

5.3.1.1 Communication of science

This topic received the most comments with nearly all respondents citing it as a main barrier to successful knowledge transfer. Many comments related to the use of language and the need for simplicity in explaining scientific findings, the following quote from an inter-governmental organisation sums up the opinions of many:

"Finding a common language plus putting complicated findings in simple words"

The NGOs point to the difficulties in providing good general summaries which also directly meet the needs of individual users.

"Each user has a slightly different information need, which makes it difficult to target publications to these needs. There is often not a lot of good summary information that is easily available and unbiased"

The importance of using clear and simple language to communicate scientific findings is well known, the results from this survey suggest that there is still significant improvement to be made in this area.

5.3.1.2 Cross Community Communication

Several respondents highlighted the issue of communication across different sectors. The main problems cited being a lack of understanding of each others needs, limited structures to support knowledge transfer and in some cases a lack of willingness to participate in KT. The following statement from an intergovernmental organisation sums up the situation:

“Difference in interests can make the communication with scientists difficult because the scientists interest is narrow and deep, the user interest is broader and perhaps more superficial”

As does this quote from a private/commercial organisation:

“Lack of clear collaborative structures between science and industry”

At present, knowledge transfer is carried out in a somewhat ad-hoc basis from the European marine science community. The responses suggest there is a clear need for defined structures through which to transfer scientific knowledge.

5.3.1.3 Resources and Accessibility

Comments under this theme point to the need for increased support to carry out knowledge transfer, as a respondent from an intergovernmental organisation stated; what’s needed is:

“Time to communicate”. Together with the difficulty of finding the necessary resources for successful knowledge transfer, the problem of access to scientific information was identified. Other problems cited include; out-of-date information and access to scientific journals. A respondent from a government agency suggested:

“The spread of initiatives, “one stop shop” concept should be implemented for the Marine sectors in Europe. The several existing initiatives are hidden in the rest”.

5.3.1.4 Transparency

Several respondents highlighted the issue of transparency in the science community, with vested interests and the need to demonstrate that scientific outcomes actually have an identifiable impact on human activity being cited.

5.3.1.5 Lack of interest

This last barrier to knowledge transfer was identified by a respondent from an electronic network, who stated:

“The sea and pelagic ecosystems are not considered a priority environmental issue by most individuals, even the generally aware ones - unlike issues of climate change, waste and energy matters”

This barrier points to the on going issue of bringing ocean issues to the forefront of the environmental and scientific debate, as well as the public’s consciousness. Although this situation has improved in recent years, as the respondent notes it is still given a lower priority than other issues.

Table 1. Thematic table examining the main barriers to knowledge transfer

Organisation type	Communication of Science	Cross Community Communication	Resources and Accessibility	Transparency	Lack of interest
NGO	<p>Each user has a slightly different information need, which makes it difficult to target publications to these needs. There is often not a lot of good summary information that is easily available and unbiased</p> <p>Scientific research must be put in a concise and simple format for everyday use.</p> <p>Final objective and understanding outputs</p>	Communication gaps	<p>It is sometimes difficult for users to winnow through the information available from a Google search to find the most useful information</p> <p>Accessibility to databases, science journals etc</p>		
EU Directorate	<p>Lack of clear language</p> <p>Language, Vocabulary</p>				
Inter-governmental	<p>Volume of knowledge is large and in some cases very technical and thus difficult to process</p> <p>Finding a common language plus putting complicated findings in simple words</p>	<p>Difference in interests can make the communication with scientists difficult because the scientists interest is narrow and deep, the user interest is broader and perhaps more superficial</p> <p>Not enough communication on knowledge transfer, which causes a brake in the transfer of knowledge</p>	<p>Time to communicate</p> <p>Limitation of resources (scientists for communication)</p> <p>Few up to date overviews exist and are difficult to find</p>		
Private	Scientists have a lack of technical knowledge	Lack of clear collaborative structures between science and industry.		Lack of transparency concerning responsibilities	

		<p>Lack of understanding of industry/each others working practices</p> <p>Diversity of marine science community</p>			
Research	Everything has to be explained very simple	<p>lack of effort from scientists, when scientists are willing it works</p> <p>...very poor communication between these two (user and science) communities.</p>		More easier and evident demonstration of main scientific outcomes having clear impact/influence on overall human activity.	Not enough interest from central and local authorities to environmental issues/problems and funding needs for their improvement/solution
Government Agency	language		The spread of initiatives, "one stop shop" concept should be implemented for the Marine sectors in Europe. The several existing initiatives are hidden in the rest.	strong vested interests	
Electronic network					The sea and pelagic ecosystems are not considered a priority environmental issue by most individuals, even the generally aware ones - unlike issues of climate change, waste and energy matters
Regional Advisory Council			At the moment we do not have funds to hire scientists. Requests for research go through the Commission, yet we do get support from ICES		

5.3.2 Steps towards improving knowledge transfer

5.3.2.1 Dissemination of results

The most popular suggestion to improve the dissemination of results was a more structured use of the internet. One respondent suggested:

“A website that hosts updated summaries of research findings + relevant literature and where requests for new reviews can be made could be very useful”.

The responses suggest that despite being a valuable tool at present, the internet is under-utilised by the marine science community. Research outputs need to be co-ordinated to improve access and use. Other proposals to improve dissemination of results included; further efforts to simplify language, cheaper/free access to academic journals and more opportunities to meet scientists' face-to-face at seminars, meetings and workshops. This further corroborates previous findings where personal interactions were rated as one of the most effective methods for knowledge transfer.

5.3.2.2 Formalised Knowledge Transfer

Several respondents pointed to the importance of formal knowledge transfer procedures being put in place so as to incorporate it more strongly into the psyche of the science community. A respondent from the research community suggests:

“If transfer of knowledge was taught at University it may perhaps be improved. Need to educate young scientists or to appoint people for transfer of knowledge specifically”

5.3.2.3 Championing Issues

Although improvements have been made in recent years, marine issues are still not given as much precedent as some other issues (e.g. energy, waste and global change) both in terms of funding and public interest. Several respondents point to the importance of promotion and greater acknowledgement of marine issues, one respondent from the research community suggested:

“Broad and strong advertisement, public relation”

5.3.2.4 Closer links between communities

The importance of closer links between the user and science community was stressed by many respondents, all pointing to the importance of better communication to improve understanding each other's specific needs. A government agency respondent stated:

“Closer links between users and researches so that research questions can be developed which target the user's specific needs”

A respondent from an EU directorate highlighted the need for:

“involvement in projects from the beginning”.

Table 2. Steps to improving knowledge transfer

Type of Organisation	Dissemination of results	Formalised KT	Championing Issues	Closer links between communities
NGO	<p>Free scientific journals, papers, identification manuals for marine species, general information</p> <p>Much more dissemination, simple vocabulary, more meeting and discussion spaces</p> <p>It would be helpful if users had central Web-based sources to which they could go to obtain summary information about many different ocean science topics, which links to more detailed information. A series of perhaps 500-1000 fact sheets of one to two pages. The Wikipedia concept may apply here, but I do not yet trust the content because it is not clear how much any given article has been fact checked. The new aggregation technologies could be used to tailor information to different users.</p>			
EU Directorate	Simple language			<p>constant, improved/frequent dialogue</p> <p>implications (for user groups) and involvement in projects from the beginning</p>
Intergovernmental	A website that hosts updated summaries of research findings + relevant literature and where requests for new reviews can be made could be very useful.	<p>Formalised procedures such as in place at ICES, regular meetings, written requests for scientific advice, Advisory Committees</p> <p>Using professional mediation to overcome/support the above mentioned issues</p>	More publicity	<p>Meetings</p> <p>more communication could highly increase the transfer of knowledge from researchers to users</p>
Private	A search motor with a few clear search words exclusively for Research and Development			Better transfer of technology and knowledge to the

	Joint seminars and public discussion forums			marine science community
Research	More active distribution of research results as reports, review, synthesis via governmental bodies, local authorities and NGOs	If transfer of knowledge was taught at University it may perhaps be improved. Need to educate young scientists or to appoint people for transfer of knowledge specifically	Broad and strong advertisement, public relation.	Increase the participation of scientists to solve real problems affecting the users
Government Agency	identify specific consequences of possible future development for people in general It should be mandatory to provide the results of the public funded projects and make them available on a specific website. At least the EC funded projects.			Closer links between users and researches so that research questions can be developed which target the users specific needs
Regional Advisory Council	direct access to researchers, access to electronic journals (for lower subscription rate)			
Electronic network			Convincing individuals that the condition of pelagic ecosystems etc is an issue of concern to them because it affects or may affect their everyday life e.g. issues of bioaccumulation in fish.	

6 Fact Sheet topics

Respondents were asked to suggest topics for future Fact Sheets that were of particular relevant to them. The following topics were suggested:

Topics	Comments
<ul style="list-style-type: none"> ▪ Vulnerable and essential habitats ▪ Ecosystem based fisheries ▪ Biodiversity ▪ Fisheries management 	2 (plus additional supplements) Fact Sheets on Ecosystem based fisheries have already been produced and further supplements are expected
<ul style="list-style-type: none"> ▪ Ocean Acidification ▪ Global Thermohaline Circulation and implications for society ▪ Arctic Ice and effects of thinning and decreased extent 	Ocean Acidification Fact Sheet completed during writing of this report, see appendix 4
<ul style="list-style-type: none"> ▪ Geographical distribution of sensitive habitats ▪ Characterisation of distinct ecosystems 	
<ul style="list-style-type: none"> ▪ Impact of climate change on marine resource ▪ Ecosystem approach to marine resources, resources (concrete examples) 	
<ul style="list-style-type: none"> ▪ Issues relevant to educators that may be taught to students 	Will be put in contact with EUR-OCEANS Public Outreach team
<ul style="list-style-type: none"> ▪ New technology ▪ Sensor web enablement 	
<ul style="list-style-type: none"> ▪ Smart sensors/ Calibration of sensors ▪ Standardisation of interfaces 	
<ul style="list-style-type: none"> ▪ Coastal erosion ▪ Sea level rise ▪ Eutrophication ▪ Biodiversity and living resources 	
<ul style="list-style-type: none"> ▪ Marine environmental assessment methods ▪ Using satellite products to describe conditions in the ocean - their accuracy and state of the art in spatial aggregation ▪ Use of operational oceanography products 	
<ul style="list-style-type: none"> ▪ Anything linked to Cetaceans 	
<ul style="list-style-type: none"> ▪ Acidification of oceans ▪ Sea level rise 	
<ul style="list-style-type: none"> ▪ Marine Technology ▪ Deep sea research in general 	
<ul style="list-style-type: none"> ▪ Marine Protected Areas ▪ Risk Assessment ▪ Habitat Restoration 	
<ul style="list-style-type: none"> ▪ Methods of fishery management. Examples from other countries (SE Asia, US) ▪ New developments in fisheries management. 	

Topics relevant to the EUR-OCEANS community

The Knowledge Transfer Unit will investigate which of the suggested topics meet with the scientific expertise in the EUR-OCEANS community and endeavour to produce Fact Sheets on those topics where possible.

7 Summary

This survey of user's needs has been effective in improving understanding of the methods/media that can, and currently are used in knowledge transfer, the regularity with which they are used and their perceived effectiveness. One of the main barriers to knowledge transfer identified was that of communication, particularly in terms of the language used by scientists and how results are presented. The importance placed on the use of the internet is interesting in terms of knowledge transfer. There is a potential for information providers to assume that once a piece of information is posted on the web it is accessible, that it has been 'transferred', but is this enough? As the results from this survey indicate, the internet is used most commonly by organisations to transfer their own information (Qu3.), and was also rated as the method used most regularly to access information (Qu7). In QU 8 the majority of respondents stated that downloads from the web was the preferred mode for delivery of information. However, in Qu9. when the effectiveness of internet searches was rated, it ranked only fourth in the list. This suggests that even though the internet is a highly effective method for delivering specific documents, i.e. downloads, trawling through the internet (via searches) is not always successful. As seen by the respondent's recommendations for improving knowledge transfer, the internet is seen as an excellent tool but requires better co-ordination to be used effectively for knowledge transfer. A structured, centrally co-ordinated approach to knowledge transfer from the marine science community via the web is suggested. One government agency respondent suggested:

"The spread of initiatives, "one stop shop" concept should be implemented for the Marine sectors in Europe. The several existing initiatives are hidden in the rest"

Scientists and users need to work together to improve understanding of each others specific needs and constraints so that solutions can be found. The ongoing issue of limited resources continues to hinder this process, with time to engage in effective knowledge transfer a constant restraint. It is also important to work on improving transparency in order to build the confidence of users in the scientific community. The results of the survey indicate that both scientists and users are keen to improve the situation and advance knowledge transfer but improved dialogue and understanding is needed across all sectors.

This survey has had two key benefits, firstly by providing useful information about the specific needs of user's relevant to the EUR-OCEANS community, thereby allowing future products to be tailored to meet their needs. Secondly, the results provide a good overview of the general feeling from the user community to current levels of knowledge transfer from the European marine science community. Below is a list of recommendations for the wider community that may help to improve the current the effectiveness of knowledge transfer.

8 General Recommendations

- Formal procedures for knowledge transfer from marine science community, e.g. mandatory for results to be made publicly available.
- Incorporate knowledge transfer into education, for example as part of University science degrees. This would develop of culture of knowledge transfer amongst the next generation of marine scientists.
- The internet is an important tool but in order to maximise its potential a co-ordinated approach should be adopted. A central database/website that houses all reports and findings from EU funded marine science projects – the ‘one-stop’ shop approach or search motors exclusively for research and development could be useful to many users.
- Continued championing of marine and ocean related issues to ensure they are at the forefront of both users and the publics mind.

9 Future Actions for EUR-OCEANS KTU

Based on the results of this survey, the following actions will be taken by the KTU to improve on current knowledge transfer activities:

- Distribution lists will be created to facilitate the electronic distribution of Fact Sheets electronically.
- Continued and increased attendance at conferences/meetings etc to enhance personal contact.
- All publications to be written in a clear and concise manner with very limited use of scientific jargon.
- Ensure downloadable products are easily and clearly available on KTU web pages
- Where possible develop Fact Sheets based on the topics recommended by users during the survey.

10 Appendix 1. Cover letter

EUR-OCEANS Knowledge Transfer Unit
Plymouth Marine Laboratory
Prospect Place
Plymouth, PL1 3DH
United Kingdom

Dear Sir/Madame,

I am writing to you on behalf of the EUR-OCEANS Knowledge Transfer Unit. EUR-OCEANS (European Network of Excellence for Ocean Ecosystems Analysis) is a network of excellence co-funded by the Sixth Framework Programme for Research and Technological Development of the European Communities. The Network gathers more than 60 research institutes and universities from 25 countries. Its activities started in January 2005, running for 4 years until December 2008.

The EUR-OCEANS Network was conceived as a means of developing lasting integration of European research organisations that focus on global change and pelagic marine ecosystems and the relevant scientific disciplines. As such, the Network has gathered the leading European scientists in these fields. The aim of the EUR-OCEANS Knowledge Transfer Unit (KTU) is to communicate the science of the EUR-OCEANS partnership to target groups and promote its use in the wider management, policy and user communities.

Over the past year, the EUR-OCEANS KTU has developed several tools to help promote the science generated from the Network, these include a dedicated website, a interactive 'contacts' database and the EUR-OCEANS Fact Sheet series. The Fact Sheet series are concise, double side, A4 documents, which focus on highlighting key messages and provide targeted and timely information. The Fact Sheets not only highlight current research activities and thinking but also suggest actionable solutions and ways of moving forward. Please find enclosed examples of Fact Sheets for your information.

In order to continue to develop and tailor our products to meet user's individual information requirements we have devised a survey to analyse your (the user's) specific needs. We want to know what type of information you require, in which formats you prefer to receive it, how you like it to be delivered and what specific topics you are interested in. The survey has been designed to answer these questions.

We would be grateful if you (or an appropriate colleague) could complete this short survey, which should take just a few minutes, bearing in mind that the more accurate and complete information you provide the better we can meet your needs. A paper copy of the survey is included along with a self-addressed envelope, however if you would prefer the survey is available online at http://web.pml.ac.uk/euroceans/Userneeds_survey.asp (English language only)

The EUR-OCEANS Knowledge Transfer Unit is hosted by the GLOBEC International Project Office at Plymouth Marine Laboratory, UK. For further information about the work of the Unit please see www.eur-oceans.org/KTU. For details about how the survey results will be used or to have your name removed from our mailing list please contact Jessica Heard (EUR-OCEANS Project Officer), jessh@pml.ac.uk

Best regards

Manuel Barange (Knowledge Transfer Unit Co-ordinator) and Jessica Heard (EUR-OCEANS Project Officer)

11 Appendix 2. Questionnaire

Welcome to EUR-OCEANS User's Needs Survey

The data from this survey will be used to develop our understanding of your specific scientific information needs; this will in turn help us to tailor products to meet those needs.

For the purposes of this survey, the 'user community' is defined as those who may require scientific information to support of their general activities, either regularly or on an ad hoc basis, for example: policy makers, advisory and management bodies, research managers, conservation groups, private business, education providers, scientists etc

Please answer each question as instructed, an electronic version (in English) is available at http://web.pml.ac.uk/euroceans/Userneeds_survey.asp if you would prefer.

Section 1: About your Organisation

Organisation name: _____

Position/Job title: _____

Department: _____

1. Which of the following best describes your organisation? *(Select all that apply)*

- | | |
|---|---|
| <input type="checkbox"/> Higher Education Institution | <input type="checkbox"/> Private or Commercial Business |
| <input type="checkbox"/> Intergovernmental Body | <input type="checkbox"/> Conservation Agency |
| <input type="checkbox"/> Research Institute | <input type="checkbox"/> Private Consultant |
| <input type="checkbox"/> Independent/Charitable Trust/NGO | <input type="checkbox"/> Local Authority |
| <input type="checkbox"/> Government Agency | <input type="checkbox"/> Aquaria |
| | <input type="checkbox"/> EU Directorate |

Other, please specify: _____

2. What is your organisation's main area of work? *(Please select one)*

- | | |
|--|---|
| <input type="checkbox"/> Advisory/Assessment | <input type="checkbox"/> Technology Development |
| <input type="checkbox"/> Knowledge Transfer | <input type="checkbox"/> Data provider |
| <input type="checkbox"/> Lobbying | <input type="checkbox"/> Decision-making (policy) |
| <input type="checkbox"/> Research | <input type="checkbox"/> Decision-making (management) |

Other, please specify: _____

Section 2: Provision and Use of Scientific Information

3. Which of the following methods do you use to provide scientific information to your customers or target audience? *(Select all that apply)*

- | | |
|---|--|
| <input type="checkbox"/> Research papers | <input type="checkbox"/> Personal contact |
| <input type="checkbox"/> Written policy briefings | <input type="checkbox"/> Dissemination via a website |
| <input type="checkbox"/> Oral policy briefings | <input type="checkbox"/> Not applicable |
| <input type="checkbox"/> Regular consultation exercises | |

Other, please specify: _____

4. How do you obtain the scientific information needed to support your activities? *(Select all that apply)*

- | | |
|--|--|
| <input type="checkbox"/> Regular consultations | <input type="checkbox"/> Research documents in the public domain |
| <input type="checkbox"/> Ad-hoc contacts with advisors | <input type="checkbox"/> Other documents in the public domain |
| <input type="checkbox"/> Commissioned reports | <input type="checkbox"/> Not applicable |

Any other methods? Please specify: _____

5. For which of the following activities does your Organisation use scientific information? *(Please select all that apply)*

- | | |
|--|---|
| <input type="checkbox"/> Decision-making | <input type="checkbox"/> Promote new technology |
| <input type="checkbox"/> Public awareness/Outreach | <input type="checkbox"/> Lobbying and Campaigning |
| <input type="checkbox"/> Policy briefings | <input type="checkbox"/> Identifying knowledge gaps |
| <input type="checkbox"/> Commissioned research | <input type="checkbox"/> Not applicable |

Other, please specify: _____

6. During the past 3 years, how often have you used scientific information to support your work or the work of your organisation?

- Every week Once a month Once a year Once Never

7. Please select the 3 methods that you, or your organisation, use most regularly to access the scientific information needed to support your work. *(Please, select 3 only)*

- | | |
|--|--|
| <input type="checkbox"/> Internet searches | <input type="checkbox"/> Reports |
| <input type="checkbox"/> Library | <input type="checkbox"/> Online databases |
| <input type="checkbox"/> Personal telephonic/email communication | <input type="checkbox"/> Formal call for consultations |
| <input type="checkbox"/> Academic journals | <input type="checkbox"/> Newsletters |
| <input type="checkbox"/> Informal face-to-face contact | <input type="checkbox"/> Popular science articles |

8. How do you prefer to receive documents from the scientific/research community?
(Please rank the following, with 1-most favoured, 4-least favoured)

- | | | | |
|--------------------------|------------------------|--------------------------|---|
| <input type="checkbox"/> | Download from websites | <input type="checkbox"/> | Personal interaction (e.g. at meetings) |
| <input type="checkbox"/> | via email attachment | <input type="checkbox"/> | Hardcopy sent to office |

9. Based on your experience, how effective do you find the following methods/media for transferring information from the scientific to the user community?

Internet searches (e.g. Google):

- Highly Effective Quite Effective Not Effective Never used this method

Internet discussion forums:

- Highly Effective Quite Effective Not Effective Never used this method

Popular journals (e.g. *New Scientist*), **Newsletters:**

- Highly Effective Quite Effective Not Effective Never used this method

International meetings/conventions/symposia:

- Highly Effective Quite Effective Not Effective Never used this method

Personal communication (email or telephonic):

- Highly Effective Quite Effective Not Effective Never used this method

Summaries of research findings (max 2 pages):

- Highly Effective Quite Effective Not Effective Never used this method

Video conferencing (Communicating in real time with two or more people at different locations via video):

- Highly Effective Quite Effective Not Effective Never used this method

Online databases (e.g. [COPEPOD - the global plankton database](#))

- Highly Effective Quite Effective Not Effective Never used this method

E-Conferences: (a moderated discussion conducted via the Internet using email and/or a website)

- Highly Effective Quite Effective Not Effective Never used this method

10. Are there any specific periods of the year when you require scientific knowledge to your activities? (Please specify)

Section 3: Barriers to Knowledge Transfer

11. In your opinion, what do you think is/are the main barrier(s) to the successful transfer of knowledge from the marine science to user communities?

12. In your opinion, what steps could be taken to improve the transfer of knowledge from researchers to users?

13. Would you be interested in receiving information on any of the following topics from the EUR-OCEANS Knowledge Transfer Unit (e.g. as a Fact Sheet)?

- Ecosystem research Pollution
- Climate change Global models
- Biogeochemistry Ecosystem Approach to Marine Resources
- I would like to receive details of **all** future EUR-OCEANS Knowledge Transfer products
- I do **not** want to receive any further information from EUR-OCEANS Knowledge Transfer Unit

If so, in which format?

- Hardcopies Electronically Both

14. Would you like to suggest any specific scientific topics for the Fact Sheet series that are relevant to your needs?

1. _____
2. _____
3. _____
4. _____
5. _____

For further information about the EUR-OCEANS Fact Sheets series please see the Fact Sheet pages at www.eur-oceans.org/KTU

Thank you for completing our survey

If you would like to receive further information from the EUR-OCEANS KTU either in the form of Fact Sheets and other general activities or about the survey results and how they will be used, please contact Jessica Heard, jessh@pml.ac.uk

Contact Details

If you would like to continue to receive information from EUR-OCEANS KTU (as indicated by you in the survey), please provide your contact details below.

NAME:	
Address:	
City:	
State/Province:	
Zip/Postcode:	
Country:	
Telephone:	
Email:	
Fax:	
URL:	

Please note that all further correspondences and products (e.g. Fact Sheets) from the KTU will be in English.

12 Appendix 3. Raw data tables

Raw data extracted from survey responses and thematically coded for questions 11, 12 and 13

Coding categories:

Accessing information

Communication

Resources

Transparency

Lack of interest

Presentation science information

Dissemination of results

Formalised KT

Championing Issues

Closer links between communities

Group	Organisations	Timing	Main Barriers	Steps to improvement	Topics
NGO	OCEANA		Accessibility to databases, science journals etc	Free scientific journals, papers, identification manuals for marine species, general information	<ul style="list-style-type: none"> Vulnerable and essential habitats Ecosystem based fisheries Biodiversity Fisheries management
NGO	The Ocean Foundation	All year.	Communication gaps. Scientific research must be put in a concise and simple format for everyday use.	Much more dissemination, simple vocabulary, more meeting and discussion spaces.	
NGO	Scientific Committee on Oceanic Research (for ICSU)		It is sometimes difficult for users to winnow through the information available from a Google search to find the most useful information. Each user has a slightly different information need, which makes it difficult to target publications to these needs. There is often not a lot of good summary information that is	It would be helpful if users had central Web-based sources to which they could go to obtain summary information about many different ocean science topics, which links to more detailed information. A series of perhaps 500-1000 fact sheets of one to two pages. The Wikipedia concept may apply here, but I do not yet trust the content because it is	<ul style="list-style-type: none"> Ocean Acidification Global Thermohaline Circulation and implications for society Arctic Ice and effects of thinning and decreased extent

			easily available and unbiased. News media often seek sensational stories. Or, in seeking to balance their stories, they give equal space to results of (for example) the IPCC process and the rare critic who disagrees with the IPCC process and/or findings.	not clear how much any given article has been fact checked. The new aggregation technologies could be used to tailor information to different users.	
EU Directorate	European Commission	No particular period	Lack of clear language	constant, improved dialogue	<ul style="list-style-type: none"> Geographical distribution of sensitive habitats Characterisation of distinct ecosystems
EU Directorate	DG Fish	First quarter (work programme preparation)	Language, Vocabulary, Final objective and understanding outputs	Simple language, frequent dialogue, implications (for user groups) and involvement in projects from the beginning	<ul style="list-style-type: none"> Impact of climate change on marine resource Ecosystem approach to marine resources, resources (concrete examples)
Electronic network	MEDIES (Med Education Initiative for Environment and Sustainability)	Year round	The sea and pelagic ecosystems are not considered a priority environmental issue by most individuals, even the generally aware ones - unlike issues of climate change, waste and energy matters	Convincing individuals that the condition of pelagic ecosystems etc is an issue of concern to them because it affects or may affect their everyday life e.g. issues of bioaccumulation in fish.	<ul style="list-style-type: none"> Issues relevant to educators that may be taught to students
Private	Aquatec Group				
Private	Pelagic Freezer-Trawler Association		Difficult to see how certain scientific results are. In order to assess results you need to know what the research request was and who requested it.		
Private	SiS GmbH		Diversity of marine science community Lack of transparency concerning responsibilities Lack of knowledge about industry Scientists have a lack of technical	Better transfer of technology and knowledge to the marine science community	<ul style="list-style-type: none"> New technology Sensor web enablement

			knowledge		
Private	Swedish Shipowners Association	No	Difficult to find the right info	A search motor with a few clear search words exclusively for Research and Development	
Private	SiS Sensoren Instrument System Ltd		Lack of clear collaborative structures between science and industry. Lack of understanding of each others working practices	Joint seminars and public discussion forums	<ul style="list-style-type: none"> Smart sensors Calibration of sensors Standardisation of interfaces
Research	University of Geneva		I think that that there is a very poor communication between these two communities.	Increase the participation of scientists to solve real problems affecting the users.	
Research	IMBER	For: outreach activities, preparation for conferences, report writing. So basically all year round	lack of effort from scientists, when scientists are willing it works	If transfer of knowledge was taught at University it may perhaps be improved. Need to educate young scientists or to appoint people for transfer of knowledge specifically	
Research	Istituto per l'Ambiente Marino Costiero, IAMC-CNR	Not really, just not during vacation.	More easier and evident demonstration of main scientific outcomes having clear impact/influence on overall human activity.	Broad and strong advertisement, public relation.	
Research	Akvaplan-niva AS				
Research	National Institute for Marine Research & Development "Grigore Antipa"	All year round	Not enough interest from central and local authorities to environmental issues/problems and funding needs for their improvement/solution	More active distribution of research results as reports, review, synthesis via governmental bodies, local authorities and NGOs	<ul style="list-style-type: none"> Coastal erosion Sea level rise Eutrophication Biodiversity and living resources
Research	Institute of Marine Research, Bergen		Everything has to be explained very simple		
Intergovernmental	ICES	Year round	Limitation of resources (scientists for communication)	Formalised procedures such as in place at ICES, regular meetings, written requests for scientific advice, Advisory Committees	
Intergovernmental	Institute of Marine		Time to communicate	Meetings	

mental	Research				
Intergovernmental	European Environment Agency	No	Volume of knowledge is large and in some cases very technical and thus difficult to process. Few up to date overviews exist and are difficult to find. Difference in interests can make the communication with scientists difficult because the scientists interest is narrow and deep, the user interest is broader and perhaps more superficial.	A website that hosts updated summaries of research findings + relevant literature and where requests for new reviews can be made could be very useful.	<ul style="list-style-type: none"> Marine environmental assessment methods Using satellite products to describe conditions in the ocean - their accuracy and state of the art in spatial aggregation Use of operational oceanography products
Intergovernmental	ICES	Providing fisheries advice in spring and fall to the EC	Finding a common language plus putting complicated findings in simple words	Using professional mediation to overcome/support the above mentioned issues	
Intergovernmental	Department of Communications Marine and Natural Resources				
Intergovernmental	ACCOBAMS	No, there aren't. Indeed, we organise a scientific Committee every year that we have to prepare early, so our with scientific information is quite regular and is prepared at a steady rate	Not enough communication on knowledge transfer, which causes a brake in the transfer of knowledge	More publicity and more communication could highly increase the transfer of knowledge from researchers to users.	<ul style="list-style-type: none"> Anything linked to Cetaceans
Government Agency	Umweltbundesamt		language; strong vested interests;	identify specific consequences of possible future development for people in general	<ul style="list-style-type: none"> Acidification of oceans Sea level rise
Government Agency	Foundation for Science and Technology, Portugal	Depends on the period of the launch of programs or policies	The spread of initiatives, "one stop shop" concept should be implemented for the Marine sectors in Europe. The several existing initiatives are hidden in the rest.	It should be mandatory to provide the results of the public funded projects and make them available on a specific website. At least the EC funded projects.	<ul style="list-style-type: none"> Marine Technology Deep sea research in general
Government	Ministry of	Before September to help in		Closer links between users and	<ul style="list-style-type: none"> MPAs

Agency	Ecology	the organisation of next years programme		researches so that research questions can be developed which target the users specific needs	<ul style="list-style-type: none"> ▪ Risk Assessment ▪ Habitat Restoration
Advisory council	Pelagic RAC	After ACFM advice on fish stocks/management is release - we organise meetings to discuss this and need scientists to illustrate outcomes	At the moment we do not have funds to hire scientists. Requests for research go through the Commission, yet we do get support from ICES	direct access to researchers, access to electronic journals (for lower subscription rate)	<ul style="list-style-type: none"> ▪ Methods of fishery management. Examples from other countries (SE Asia, US). ▪ New developments in fisheries management.

13 Appendix 4. Fact Sheets

Below is a table list all EUR-OCEANS Fact Sheets produced to date by the KTU. Examples of several Fact Sheets are also included. All other Fact Sheets are available to download from the KTU web pages (www.eur-oceans.eu/KTU).

FS Number	Title
1	EUR-OCEANS: A European response to climate change and its impact on the oceans
2	Ecosystem approach to marine resources: moving from 'fisheries oceanography' towards 'ecosystem oceanography'
3	How can science contribute to an ecosystem approach to the South African hake fishery?
3a	How can science contribute to an ecosystem approach to the South African West coast lobster fishery?
3b	How can science contribute to an ecosystem approach to the South African small pelagic fisheries?
4	Monitoring changes in North Atlantic plankton communities
5	Deep Ocean Observatories: taking the pulse of the ocean
6	Green Ocean Modelling: a tool to understand the interactions between marine ecosystems and climate
7	Ocean Acidification – the other half of the CO ₂ problem