



Regional Information Systems and Coastal Databases for ICZM in Germany – are they efficient and informative?

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Abstract

The challenge of an integrated planning approach to ICZM (Integrated Coastal Zone Management) is to fully supply information across all relevant policy and authority levels and across all relevant sectors. In the various management and planning processes information is essential for decision making and stakeholder involvement. In particular the regional level has been identified as an important level to ensure the success of ICZM. Web-based information tools would most likely improve the flow of information in the region. They are freely accessible at any time and are, furthermore, flexible, relatively cheap and can store great quantities of information. Various internet tools such as the Regional Information System ICZM-Oder and Coastal Databases have been developed to support regional and local coastal decision-makers. These tools bundle multidisciplinary ICZM relevant data and information, such as results of scientific projects, policies and strategies as well as spatial data. An increasing interest is shown by users of the regional information system ICZM-Oder and the Coastal Databases. However, they have so far not had any noticeable effects on regional policies and decision making. Although, these tools are promising, there is room for improvement. A more user driven content would increase value and acceptance of these tools. Combining existing tools would be of mutual benefit. The improvement of web-based information tools should also include face-to-face communication. Regional decision-makers can not be reached solely by using indirect information tools. Well focused regional meetings, forums and workshops are necessary too. Finally, the benefits of ICZM need to be communicated to the local and regional decision-makers. If decision-makers and actors in the region are convinced of integrated planning approaches, they are more likely to accept regional information tools and to use them.

1 Background and Objectives

Our coastal regions are under constant pressure. Demographic changes, economic restructuring, increased living standards and leisure time, and global trade patterns cause irreversible and damaging changes to coastal ecosystems. Growing demands for coastal resources are leading to their degradation and loss of the functions they provide. Moreover, this degradation has negative social and economic consequences (European Commission 2001). Finally, due to the effects of climate change, coastal zones will be facing new problems and challenges in the future.

In recent years, the European Union has made great endeavours to improve the sustainable development of our coasts. Therefore, European coasts have already been influenced by a number of policies. Furthermore, the National ICZM Strategy of Germany (BMU 2006) has been putting pressure on regional and local coastal actors to implement integrated planning and management processes. In particular, it is claimed that the regional level is the most important level for the success of ICZM. But, as the National Strategy has shown, there is very little knowledge of ICZM. It must be said that concrete practical instruction in establishing ICZM is not set out in the National Strategy document. To strengthen ICZM in the future the National Strategy recommends establishing information and communication networks as well as general accessible web-based information platforms.

Nowadays, web-based information systems are popular. Almost every organisation, e.g. scientific institutes, authorities, administrations and NGOs (nongovernmental organisations), present themselves with their own information system. Moreover, information portals for specific fields as well as project information systems are common. The main goal of all this is to fulfil demands for public information access, and to save costs. E-government, including online participation, is increasing (Haaren et al. 2005). Information is provided in different forms: as online text (e.g. Wikipedia¹), downloadable documents (e.g. Helcom²), literature databases (e.g. BFN³), photographs (e.g. VLIZ⁴), policies (e.g. European Commission⁵), maps (e.g. MIDA⁶), scientific results (CHARM⁷) etc. Without doubt, all these different information systems are useful and facilitate access to immense information. But with regard to ICZM, there are still several weaknesses. In particular, project web pages are, in the main, not satisfactory. The main shortcomings are poorly presented projects, insufficient presentation of outcomes and a lack of long term access beyond the project period. Information portals of institutions offer a lot of very specific information on their subject and are only partly of concern to ICZM. The same problem can be observed in the case of authorities which only provide information, strategies and policies in their field of responsibility. The following are ICZM information systems in Germany (i) the national ICZM strategy portal (www.ikzm-strategie.de), which gives background information about the national strategy; (ii) the North and Baltic Sea Coastal Information System (NOKIS) (<http://nokis.baw.de>), which offers metadata of information and data; and (iii) the information portal of EUCC - The Coastal Union Germany (<http://www.eucc-d.de>), which collects any kind of national and international information and data concerning ICZM. However, these information systems do not address regional coastal managers with their specific problems.

As requested by the EU and the national ICZM Strategy, the regional level needs to be strengthened in order to support the ICZM process (European Commission 1999, BMU 2006). In this respect modern information technologies can play a key role in ICZM in order to overcome the main deficits (European Commission 1999, Rupprecht Consult 2006). A regional information system functioning as an umbrella and linking all coastal related planning and management tasks in a specific region would be a possibility. Such a regional information system should provide multi-sectoral information for decision-makers, for scientists and the public. Furthermore, a regional information system should impart knowledge about, and raise awareness of specific problems within the region. Because ICZM is not well known or accepted at the local and regional level, benefits of ICZM have to be clearly communicated.

The Regional Information System ICZM-Oder and the Coastal Databases, which are presented here, show a new approach in meeting these challenges. Whether the various linked tools disseminate information efficiently in the region and whether they reach their target groups will be discussed in the following.

2 Information Tools

Regional Information System ICZM-Oder

The Oder estuary region, divided by the border of Germany and Poland, is relatively large. Within the region many authorities, administrations, ministries and stakeholders as well as projects play an active

¹ <http://wikipedia.org/>, (22.07.2007).

² Helsinki Commission, Baltic Marine Environment Protection Commission, http://www.helcom.fi/publications/en_GB/publications/, (22.07.2007).

³ Bundesamt für Naturschutz, <http://www.dnl-online.de/>, (22.07.2007)

⁴ Flanders Marine Institute, <http://www.vliz.be/vmdcdata/photogallery/sea.php>, (22.07.2007)

⁵ http://ec.europa.eu/maritimeaffairs/sectoral_dgenv_en.html, (22.07.2007)

⁶ Marine Irish Digital Atlas, <http://mida.ucc.ie/>, (22.07.2007)

⁷ Characterisation of the Baltic Sea Ecosystem: Dynamics and Function of Coastal Types, http://www2.dmu.dk/1_Viden/2_Miljoe-tilstand/3_vand/4_Charm/charm_main.htm, (22.07.2007)

role pursuing their responsibilities, strategies and positions. Because of mainly sectoral planning processes within the region, there is a great need to improve information and communication in order to strengthen the integrated planning approaches of ICZM. Linking tools which support coordination and harmonisation of activities, and ensure the efficient information flow across hierarchies and stakeholders, would be beneficial.

In the following the web-based “Regional Information System ICZM-Oder” (<http://www.ICZM-oder.de>), established during the German national project “Research for an Integrated Coastal Zone Management in the German Oder estuary region (ICZM-Oder)”, is presented. This system does not claim to be the only solution to the obvious deficits, but it is an attempt to improve the flow of information and access to information.

The Regional Information System ICZM-Oder addresses scientists, authorities, the local population as well as tourists and visitors. Therefore it is designed as a generally accessible regional internet platform. Because of the cross-border character of the Oder estuary region, the regional information system disseminates information in German and Polish, and in English in order to promote the international integration of the project. It offers a wide range of regional information and data, such as scientific documents, project results, statistical data, spatial data, photographs and press reports. Furthermore, the regional information system has an umbrella function linking regional projects, initiatives and activities. Its aim is to tackle three problems:

- concentrating potential information for an integrated planning and management approach
- the subsequent use of project results
- improving the communication and exchange between stakeholders.

So, the Regional Information System ICZM-Oder has always been linked with the information system of the **Regional Agenda 21 “Stettiner Haff”**. The latter describes background and themes of the Regional Agenda 21, delivers information about the regional players, offers central documents and publishes dates and activities (Bock & Schernewski 2005).

A special feature within the regional information system is the visualisation tool “**GIS ICZM-Oder**”. The web-based GIS approach invalidates the criticism that GIS is an elitist technology. The GIS ICZM-Oder allows free access to regional spatial information. This feature is unique, in that, for the first time, multi-disciplinary spatial data are presented across borders, and across land and sea to a large community in Germany. Visualisation and the overlay of different themes increase the understanding and awareness of complex integrated correlations and problems. The GIS ICZM-Oder is linked to the GIS ICZM M-V, which contains data about the coastline of the federal state Mecklenburg-Vorpommern (M-V). The GIS-ICZM M-V acting as an umbrella provides a spatial extension to the federal state Schleswig-Holstein as well as to Denmark and Poland (Schernewski et al. 2007).

The **Meta Information System ODIS** was developed within the project ICZM-Oder, to facilitate information searches. ODIS has a gateway to NOKIS and thus ensures the mutual exchange of data and information. All significant outcomes of the project ICZM-Oder are indexed and can be permanently retrieved by NOKIS and other (international) meta information systems (Schernewski et al. 2007).

With the goal of supporting coastal and environmental education and knowledge the regional information system is additionally linked to the **E-learning Platform “ICZM-D Lernen”**. This internet platform is an independent, freely accessible web-based learning system consisting of online study, information and teaching modules. In particular the modules provides information on specific focus themes on coasts and seas as well as ICZM. Furthermore, the case study modules give rare insight into the practical process of ICZM, show specific national and local conditions and provide lessons learned. There is a module about the Oder estuary region as well as thematic modules including a focus on the project “ICZM-Oder” as case study. While most of the modules are available in German, some are also available in English. They addresses experts, students and interested citizens (Klein 2006).

Since the Regional Information System ICZM-Oder was launched in May 2004, the number of users has steadily increased at a fast rate. After three years, in May 2007, the number of monthly users had reached about 12,000 and more than 250,000 pages had been opened (figure 1). This means an average of 400 users per day, with the number of users still growing.

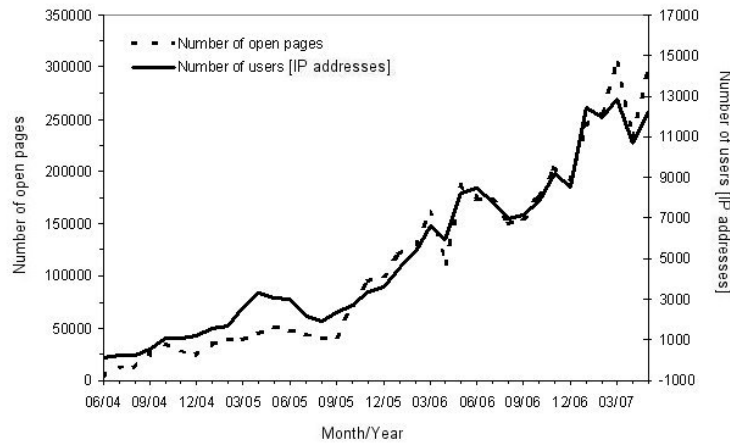


Figure 1: The web-based Regional Information System ICZM-Oder: Number of users and accessed pages between 2004 and 2007 (Schernewski et al. 2007, modified).

Because of the cross-border character of the Oder estuary region the information system has a tri-lingual approach. At the moment it contains about 110 html-pages, which are made up of 56 % German, 22 % Polish and 22 % English pages (Schernewski et al. 2007). Figure 2 illustrates the relative numbers of accessed languages and reflects this ratio. That is to say, Polish and English pages are accessed as often as German pages. As from the beginning of 2007, a trend of increasing interest from the international side can be detected. This probably results from the involvement of the “ICZM-Oder“ project as a case study in several international projects such as ASTRA (Developing Policies & Adaptation Strategies to Climate Change in the Baltic Sea Region) and SPICOSA (Science and Policy Integration for Coastal Systems Assessment).

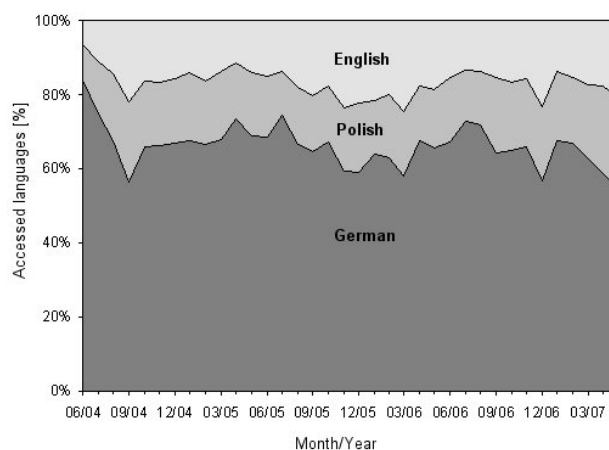


Figure 2: The web-based Regional Information System ICZM-Oder: Relative number of users accessing pages in English, Polish and German between 2004 and 2007 (Schernewski et al. 2007, modified).

The server has also observed from which country users originate. The comparison between German and Poland (figure 3) shows that the number of German and Polish users are increasing at the same rate. The number of pages, which have been opened, reflects the ratio of two-third German pages to on-third Polish within the Regional Information System ICZM-Oder. With this ratio in mind, the high number of Polish users in comparison to German users is remarkable. The number of Polish users is two-thirds of the number of German users. This reflects a great interest in the regional information system from the Polish side.

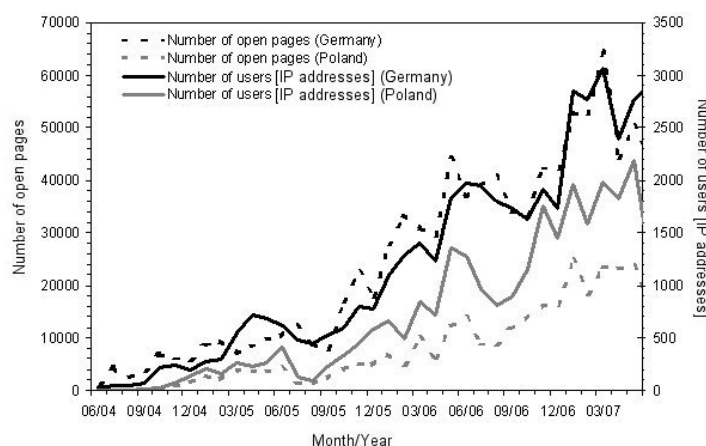


Figure 3: The web-based Regional Information System ICZM-Oder: Number of users and pages accessed by Germany and Poland between 2004 and 2007 (Schernewski et al. 2007, modified).

Due to the fact that 75 % of all users can not be assigned to a specific country because their IP addresses or provider do not allow this, the statistics with regard to the countries contain some uncertainties.

Coastal Databases

The Coastal Databases were developed to promote the information flow in the Oder estuary region. Additionally, they enable linkage between different regional, national and international user communities.

Based on work within the German national project ICZM-Oder several web-based Coastal Databases have been established and extended by the EUCC – The Coastal Union Germany (<http://databases.eucc-d.de/>). The main objective is to provide permanent access to the latest and most comprehensive data and information for everybody, at any time and everywhere. The databases are divided into project, event, education and coastal picture databases. Accordingly, they contain world-wide coastal and marine information about projects and regional case studies, events, conferences and workshops, education and training programs, summer schools and courses as well as coastal pictures. In particular the coastal picture database is a remarkable tool which uses Google Maps to show the spatial location of the photographs.

Unique is that users themselves contribute database content. This can be achieved because of the link between the databases and many organisation and project web pages, and because it is possible to show selected, user-driven database contents on these partner web pages. These databases increase the attractiveness of the partner web pages and animate their users to contribute their own information. This approach ensures the dissemination of information towards a large and varied user community and, furthermore, promotes the strengthening of the databases by the users themselves.

The project and event databases were first established, in April 2005. At the moment descriptions and information about 325 coastal projects and case studies are available. They mainly present activities throughout Europe, but also worldwide. The event database has been informed about 232 conferences

and workshops worldwide. It currently advertises 58 coming events. The training and education database has been online since March 2006. So far it has received information on 56 courses on coast related themes and has information on 25 future and annual courses. The recent database is the picture database, which has been opened since April 2007. It already contains more than 466 coastal pictures whereby the majority (350) originate from the project “ICZM-Oder”.

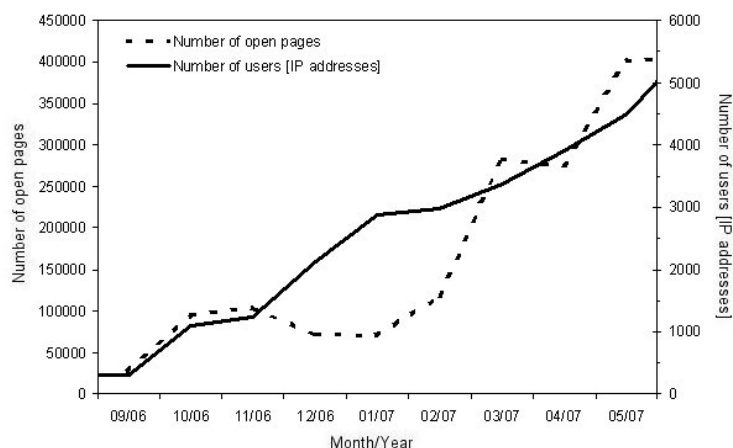


Figure 4: The project database: Number of users and accessed pages in the last 12 months

The event database and the project database are the most frequently accessed and also receive the most input. Figure 4 demonstrates access to the project database in the last 12 months. Unfortunately access has not been completely monitored since its establishment in April 2005. However, figure 4 gives an idea about how the number of users has been increasing in the last 12 months. By May 2007 the monthly number of users was exceeding 5,000 and users opened about 400,000 pages.

3 Discussion

Are these Internet Tools efficient?

Strengths

Nowadays the most efficient way of making information accessible to a wide audience is by using the Internet, whose essential attributes are information, communication and participation. Web-based information tools such as the Regional Information System ICZM-Oder, the GIS ICZM-Oder, the E-Learning Modules and the Coastal Databases have many advantages with regard to information flow in the regional ICZM processes. They:

- provide regional information flexibly, cheaply, fast and interactively,
- store a large amount of data
- are permanently accessible and can deliver information to almost every household,
- allow spatial, temporarily unlimited use of information,
- facilitate preparation and explanation of complex contents and coherences,
- can motivate regional communication.

The tools which are presented here follow different strategies. While the Regional Information System ICZM-Oder addresses the regional coastal community, the other tools are available for both regional and external users. Each of the tools has its own specific advantage with regard to presenting and storing special types of data and information. Combining these tools greatly increases their efficiency. In particular if users enter information, they benefit from dissemination via the partner

web-pages (Coastal Databases). In the case of cross-border regions, multilingual tools can raise awareness of what is going on on the other border and strengthen shared identity. The challenge of the Regional Information System ICZM-Oder is to provide information for experts and laymen in a bilingual region. The umbrella character of this information system strengthens the tool. Links with supplementary information portals and services ensure permanent acceptance and utilisation (Schernewski et al. 2007).

The high number of users demonstrates not only interest in these tools, but also an obvious need for freely, easily accessible information in the field of coastal management. In this respect, these tools seem to be useful carriers for the dissemination of information in the context of ICZM. This could imply that when information is easily accessible, it can be better integrated in planning and management processes as well as being more readily used for education and awareness raising.

Weaknesses

Experience shows, that information disseminated by means of internet tools does not automatically reach target groups (Clark 1997, Burg 1999, Haaren et al. 2005). The existence of online information needs to be advertised by other media. For example, experts can be informed about new internet tools in journals and by means of other media (posters, flyers, mainstream portals). Conventional media (local press, radio, flyer) could be used to target the regional public. All in all, web-based information tools depend on traditional media.

Are the tools well-structured? Data of the increasing number of users (Chapter 2) of these tools demonstrates there is a demand for bundled coastal information. This however does not answer the question whether the information system is optimally structured and whether it is providing content relevant to regional and local decision-maker. An analysis of what users need with respect to content would answer this question. A questionnaire could be developed and a survey carried out with a representative number of people. However, such a time-consuming task cannot be realised within the project ICZM-Oder. Another option would be a user behaviour analysis of detailed server statistics to learn more about the acceptance of structure and content of the Regional Information System ICZM-Oder.

But does the information disseminated by these tools affect regional policies and decision-making? With regard to the Oder estuary region we have the impression this is not the case (Schernewski et al. 2007). However, it is not clear whether this is due to the fact that regional information tools need to be improved or whether it is because regional decision-makers are not aware of ICZM's mission

Proposals

A key point of ICZM is to make local and regional decision-makers and coastal actors aware of the benefits of ICZM. We have learned that, along with indirect and impersonal dissemination of information, such as via internet tools, face-to-face communication is still necessary (Schernewski et al. 2007). A successful communication approach can be seen in the Belgian "Coordination Point", which initiates and coordinates the Belgian ICZM process (Nandelstädt 2007). The Coordination Point facilitates discussion and the involvement of relevant working groups within regional meetings, forums and workshops. A regional contact person, promoting the benefits of ICZM, would help to facilitate continuous communication and increase sensitisation for ICZM in the Oder estuary region. Whether existing structures (regional manager, regional office) could be used for this task should be looked into.

Are these Internet Tools informative?

Strengths

The tools provide a large amount of data and information permanently. However, there is a danger of information overload which affects the ability of people to handle information. Therefore, coordinated information tools which provide pre-selected, consolidated information with specific content are essential (European Commission 1999). The Regional Information System ICZM-Oder bundles such

a large variety of pre-selected, structured and downloadable data and information in the multi-disciplinary field of ICZM. Furthermore, information overload can be avoided by ensuring that the contents meet the requirements of users. Finally, supplementary internet portals could be linked.

Weaknesses

As shown above, the tools do not really affect regional coastal actors. But this does not mean that new information tools and services need to be developed. The existing tools should be improved until they meet the needs of regional decision-makers thereby providing tools which are valuable and accepted. Sustainable planning within the region would be thus greatly supported.

Proposals

What should be changed and added with regard to existing data and information? First of all, target groups need to be clearly distinguished. If the regional information system is to affect regional decision-makers, they should be the main target group. Furthermore, information and data for scientists should also be included, because of the very necessary ongoing scientific research within the region. Regional residents must also be informed and educated about the problems in their region.

The existing structure of the regional information system could be restructured in order to detect specific data and information more easily. To avoid long searches for information, all existing information should be cross-linked, so that several pathways to the information are possible. Moreover, the different types of information within the different tools should be cross-linked thematically. Combining different tools would mean presenting and visualising data and information in the most suitable manner.

In order to make the Regional Information System IKZM-Oder a tool which supports coastal managers in their daily work, additional content could be helpful. Table 1 shows suggestions for information which could support regional decision-makers, as well as scientist and the regional population.

Table 1: Proposal of additional information to improve the Regional Information System ICZM-Oder

Additional information / tools	For Regional coastal decision-makers	For ScientistS	For the Regional public
Presentation of responsible authorities and contact persons within the region	x	x	
Links to authorities and administrations with relevance to the region who offer complementary data and information	x	x	x
Database with relevant directives and laws	x	x	
Links to other regional projects with relevance to ICZM	x	x	
Compilation of "best practice" in form of projects or "lesson learned"	x	x	
Indicators	x	x	
Instruction/ manual of ICZM	x		
Decision support systems	x		
Information about benefits of ICZM for the region	x		x
Demonstration tools of ICZM	x		x
Integration of Coastal Picture database	x	x	x
Integration of relevant e-learning modules	x		x

Limits

A precondition for using the Internet for dissemination and communication specific issues is the question of the target group's access to the Internet. Experts and decision-makers usually have access to the Internet in their professional environment. However, in order to involve the general public in integrated planning processes, Internet access in private households is necessary. Although, the Internet has developed into a media which is very present in daily life, not everybody has access to it.

The present "(N)onliner Atlas 2007" has investigated use and disuse of the Internet, its structures and regional distribution in Germany. Within the postal code region 17, which includes the Oder estuary region, 47 % of the population have Internet access, 8 % are planning access in the next 12 months, and 45 % are off liners. It is remarkable that Germany wide there is hardly any difference between rural and urban regions' access. All most all pupils access the Internet. In comparison with the age distribution of the whole of Germany (figure 5), it seems that in the Oder estuary region about 60 % of the population between 20 and 50 years has access. In general, three-quarters of employed people have Internet access, whereas in the non-employed group it is less than half. Excluding pupils, the rate of Internet access rises with education levels within the population (TNS Infratest & Initiative D21 2007).

This data shows clearly that whether information reaches target groups depends on the Internet access rate of the population and their social profile. So far, information access via Internet tools is limited to people with Internet access and with higher educational backgrounds.

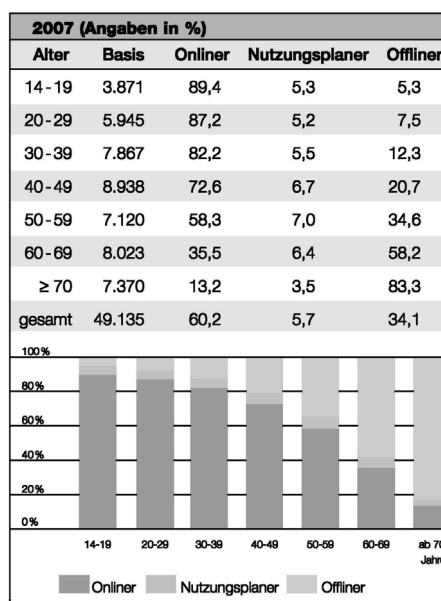


Figure 5: Internet access [%] in Germany 2007 divided by age groups (TNS Infratest & Initiative D21 2007)

4 Conclusion

The Regional Information System ICZM-Oder and the Coastal Databases are flexible, relatively cheap to establish and maintain and easy to update. They can bundle a large amount of information and data and they are easy to access and use. Their acceptance is increasing. Independent organisations, such as EUCC - The Coastal Union, whose mission is to promote ICZM, can ensure permanence of these internet tools and enable subsequent access of project results. In this respect the information tools presented here are efficient.

Information disseminated by these internet tools can reach regional as well as external user groups. This implies that most of the target groups are reached. However, there are still household without

Internet access even among those people with higher education. This means that although internet tools are useful, they do not reach every individual of the target group.

As stated above the need for efficient informative internet tools does not mean new tools or media need to be developed. The internet tools which are presented here have a lot to offer. However, acceptance by policy-makers, scientists and the local public needs to be increased and combining tools would improve the impact on the target groups. User-driven tools such as the Coastal Databases have the ability to strengthen web sites and portals. For the future, the Regional Information System ICZM-Oder needs to be improved to ensure that it becomes more accepted and valuable for regional decision-makers. Specific user needs with respect to content need to be clarified. Furthermore, the benefits of the information tools need to be communicated to all players to ensure that their knowledge enters integrated planning processes. Improvements should include increasing face-to-face communication besides advertising the tools using traditional media.

When all is said and done, the key point which remains is to persuade local and regional coastal managers of benefits of ICZM.

References

- BMU - Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (2006): Nationale Strategie für ein integriertes Küstenzonenmanagement, (<http://www.ICZM-strategie.de>, 22.07.2007).
- Bock, S. & G. Schernewski (2005): Das Regionale Informationssystem zur Odermündungsregion. In: B. Glaeser, A. Sekścińska and N. Löser (eds.): Integrated Coastal Zone Management at the Szczecin Lagoon: Exchange of experiences in the region, Coastline Reports 6, Warnemünde, S. 169-174, (http://www.eucc-d.de/plugins/coastline_reports/coastline_reports6.php, 22.07.2007).
- Burg, A. (1999): Internet und Planungspartizipation. Einsatz telekooperativer Verfahren in der Öffentlichkeitsarbeit bei der Aufstellung städtebaulicher Pläne am Beispiel von Deutschland, Großbritannien und Schweden, Univ. Dissertation Kaiserslautern, Shaker, Aachen.
- Clark, J.R. (1997): Coastal zone management for the new century, *Ocean & Coastal Management*, Vol. 37, No. 2, pp. 191-216, Elsevier Science Ltd., Ireland.
- EEA - European Environment Agency (2006): The changing faces of Europe's coastal areas, EEA Report No 6/2006, European Environment Agency, Copenhagen.
- European Commission (2001): EU focus on coastal zones, European Commission, Directorate-General Environment, Nuclear Safety and Civil Protection, Luxembourg.
- European Commission (1999): Lessons from the European Commission's Demonstration Programme on Integrated Coastal Zone Management (ICZM), Directorates-General: Environment, Nuclear Safety and Civil Protection; Fisheries: Regional Policies and Cohesion, European Commission, Luxembourg.
- Haaren, C. von, Oppermann, K.-I. Friese, R. Hachmann, J. Meiforth, A. Neumann, S. Tiedtke, B. Warren-Kretschmar & F.-E. Wolter (2005): Interaktiver Landschaftsplan Königslutter am Elm. Ergebnisse aus dem E+E-Vorhaben Interaktiver Landschaftsplan Königslutter am Elm des Bundesamtes für Naturschutz, Schriftenreihe: Naturschutz und Biologische Vielfalt, Heft 24, Bundesamtes für Naturschutz, Bonn - Bad Godesberg.
- IKZM-D Lernen: Lernmodul: EDV-gestützte Hilfsmittel und Werkzeuge zur Unterstützung des Integrierten Küstenzonenmanagements (IKZM), (<http://www.ikzm-d.de/>, 22.07.2007).
- Klein, J.S. (2006): Evaluierung und Konzeption eines Internetauftritts im Bereich der Küsten- und Meeresbildung, IKZM-Oder Berichte 27, (http://ikzm-oder.de/ergebnisse_ikzm-oder_berichte.php, 22.07.2007).
- Nandelstädt, T. (2007): Lessons learned of ICZM practices for Germany, In: Schernewski, G., B. Glaeser, R. Scheibe, A. Sekścińska & R. Thamm (eds.): Coastal development: The Oder estuary and beyond, Coastline Reports No. 8.
- Rupprecht Consult (2006): Evaluation of Integrated Coastal Zone Management (ICZM) in Europe: final report. Rupprecht Consult/International Ocean Institute: Köln, Germany.
- Schernewski, G., S. Bock, H. Janßen, N. Löser & A. Hmielorz (2007): Regional Climate Change and coasts: A case study on perception, information, dissemination and education, In: W. Leal Filho, F. Manke & P.

- Schmidt-Thomé (eds.) (2007): Information, Communication and Education on Climate Change - European Perspectives, Umweltbildung, Umweltkommunikation und Nachhaltigkeit, Vol. 26, Peter Lang GmbH, Frankfurt am Main.
- Schernewski, G., H. Janßen & N. Löser (eds.) (2007): Forschung in der Odermündungsregion: Ergebnisse 2004-2007, IKZM-Oder Berichte 30, (http://ikzm-oder.de/ergebnisse_ikzm-oder_berichte.php, 22.07.2007).
- Schernewski, G. & N. Löser (eds.) (2006): Forschung in der Odermündungsregion: Ergebnisse und Perspektiven 2006, IKZM-Oder Berichte 22, (http://ikzm-oder.de/ergebnisse_ikzm-oder_berichte.php, 22.07.2007).
- TNS Infratest & Initiative D21 (2007): (N)onliner Atlas 2007, Eine Topographie des digitalen Grabens durch Deutschland, TNS Infratest Holding GmbH & Co. KG & Initiative D21 e.V.

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