

Wadden Sea Newsletter 2003 - No. 2

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Preface

Dear Reader,

The celebration of the 25th Anniversary of the Wadden Sea Cooperation on 22 October 2003 was an excellent opportunity to get an outside look at the cooperation. Peter Bridgewater, the Ramsar secretary, did this in an admirable way in his keynote address which we included in this newsletter. Another highlight of the celebration was the launch of the International Wadden Sea School, a trilateral project to initiate and support the exchange of school classes in the Wadden Sea region.

Under the section monitoring and research, you will find recent results of harbour seal counts and breeding bird monitoring, as well as information on a new fish species in the Wadden Sea. Research projects are indispensable to complement ongoing monitoring programs by working on specific questions, explaining the causes of the observed changes or giving recommendations to optimize

the monitoring. In two articles, short presentations of research projects in Lower Saxony and Denmark are given. An overview of further projects relevant for the TMAP, the Wadden Sea monitoring program, can be found on the Secretariat's homepage. The newsletter concludes, as always, with a list of new publications and a calendar of events.

Do you have any comments, amendments or critics? What do you think about an e-mail version of the Wadden Sea Newsletter? We are keen to get your opinion. Please send an e-mail to: marencic@waddensea-secretariat.org

Harald Marencic
Common Wadden Sea Secretariat

25th Anniversary



From left to right:
Minister Hans-Heinrich Sander, (Lower Saxony), State Secretary Peter Knitsch, (Schleswig-Holstein), Parliamentary State Secretary Simone Probst (Germany), Minister Cees Veerman, (The Netherlands), Director General Mr. Jens Peter Simonsen (Denmark) and Peter Bridgewater, Secretary General of the Ramsar Convention at the 25th Anniversary a „Schloss Gödens“. (Photo: Masch).

On invitation of the Dutch Minister of Agriculture, Nature and Food Quality, Mr. Cees Veerman, over 120 guests celebrated the 25th Anniversary of the Trilateral Cooperation on the Protection of the Wadden Sea on 22 October 2003 at the picturesque and over 350-year old „Schloss Gödens“.

Minister Veerman welcomed the Parliamentary State Secretary Ms. Simone Probst (Federal Ministry of Environment, Nature Protection and Nuclear Safety, Germany) Director General Mr. Jens Peter Simonsen (Ministry of Environment, Denmark), and the Lower Saxon Minister of the Environment Hans-Heinrich Sander, as well as guests from science, policy and non-governmental organizations involved in the Wadden Sea cooperation.

The aim of the Wadden Sea Cooperation was primarily the protection of nature, Minister Veerman said, but cultural and landscape aspects were also

incorporated in its work. A sustainable development of the area, he underlined, requires to integrate aspects of resource uses and nature protection especially with regard to a future increased sea level rise. All speakers stressed the importance of creating sufficient support for policy and mangement at grass roots level.

Beside the official statements, there were also several opportunities in forum discussions and personal talks to look back on what had been achieved and to new challenges for the future cooperation.

The keynote address was held by Peter Bridgewater, Secretary General of the Ramsar Convention, who praised the excellent spirit of the cooperation but also addressed challenges to be met to accomplish a sustainable development of the Wadden Sea region. He particularly stressed the importance of linking culture with nature in the protection of the Wadden Sea.

Keynote address to the 25th Anniversary of the Trilateral Wadden Sea Cooperation

Peter Bridgewater
Secretary General, Ramsar
Convention

Minister Veerman, Director General of the Ministry of the Environment Simonsen, Secretary of State Probst, Distinguished Guests, Ladies and Gentlemen,

It was with great pleasure I accepted your kind invitation to address you today, on the occasion of your 25th (or jubilee) anniversary of the Trilateral Wadden Sea Cooperation.

The Wadden Sea is truly significant globally – for nowhere else in the world can such a large unbroken stretch of tidal flats be found. So knowing that since 1978, your responsible ministries of The Netherlands, Denmark and Germany have been working together on the conservation and wise management of the Wadden Sea is of importance to the global community – not least to that part



Peter Bridgewater with Jens Enemark, Secretary of the Common Wadden Sea Secretariat, and Jan Kuiper, EcoMare, Texel (from left) (Photo: Marencic)

involved in the Convention on Wetlands. And it is a landmark of trans-border cooperation to ensure an area of great importance to the world is able to be managed within a set of coherent policies derived from the three governments acting together – building on your discussions in Esbjerg twelve years ago.

Why, then is this area so important – one could dismiss it as a few low-lying sandy islands in a vast sea of accreting mud, with an agrarian hinterland – surely nothing like the exciting verdant splendour of Tropical Forests? So why the fuss?

The importance of the Wadden Sea for biological diversity stems from the high growth rate of algae and sea grasses. Shallow, nutrient rich waters are the driving force for this high productivity. Additionally, the Wadden Sea has a multitude of transitional zones to terrestrial, marine, and freshwater environments, which is the basis for remarkable species richness. Yet in global terms, areas like the Wadden Sea are often forgotten in the rush to “preserve” so called hot-spots, chiefly in tropical systems. But the diversity of species, and the intricate landscape texture of ecosystems in the salt marshes and the tidal flats, makes a special contribution to the ecosystem services needed and desired by human populations – populations in the immediate vicinity, yes, but much, much, more widely as well.

For some 50 migratory bird species the Wadden Sea is a vital “Freeway stop”, to recharge their food resources, as well as providing a place to rest, on their migratory journeys. Every year an average of 10 to 12 million birds pass through this area on their migration routes. And for more than 30 species of birds, the Wadden Sea is an indispensable breeding area. Among these are many

rare and threatened species – and Minister, Director General of the Ministry of Environment and Secretary of State, I have to bring to your attention some very recent work performed by the International Wader Study Group, which is sounding a clear warning over the future of some of these species. Quoting from their report they say;

The task of ensuring the favourable conservation status of waders is inseparable from that of ensuring the conservation and wise use of their wetland and other habitats. Regrettably however, the loss and degradation of wetlands and other habitats continues apace all around the world. This is the underlying cause of the poor conservation status of so many species. Loss and degradation of habitat has many causes. It also has many consequences for waders including those of an ecological, reproductive and genetic nature. The consequences of the intensification of agriculture remain major adverse factors affecting the status of waders not only in western Europe, with its long-established agricultural landscapes, but also in other regions such as eastern Europe and central Asia where natural steppe landscapes have now been replaced by arable and other agricultural forms of cultivation.

I think these conclusions offer new reasons why it is so critical your work under this trilateral cooperation must continue and develop. I can only, from the perspective of the Ramsar Convention, urge you to remain vigilant on these issues, and increase the degree to which your national boundaries become blurred in the management strategies pursued in the Wadden Sea.

Of course, the biological richness of the region is well known and documented – it is a classic transition zone, and these zones typically have a high biological diversity. But, as your trilateral cooperation has already identified, the region also has special landscape elements, especially bio-cultural elements, which characterize it. From the perspective of that most basic of cultural attribute, language, we see the region has the three languages of German, Danish and Dutch. Looking closer, though, we see other richness – disregarding borders the region has its own language of Frisian, which itself has dialects.

It is still more complicated than that, however, since, in fact, five linguistic varieties are spoken in North Frisia: the standard languages of German and Danish and the non-standard languages of Frisian, Low German and Jutish (a Danish dialect). For all of the middle ages Frisian was the only language spoken in Friesland, and it was the language of the people and of the government. Of course, in the beginning of this century we have a

kaleidoscope of languages and dialects, reflecting history in part, as well as a new desire to rekindle cultural bonds, including with the landscape. This simply emphasises the need always to ensure people are put at the heart of nature, for environmental problems are typically people problems!

The Ramsar Convention at its last COP adopted guiding principles on cultural values of wetlands to help in their management and conservation, so it is very welcome that this trilateral agreement is also taking notice of this issue. It is my personal conviction that unless we balance our knowledge of the cultural and biological diversity of landscapes and seascapes we will not be able to manage or use them wisely.

Let me now turn another event of global conservation significance just completed in South Africa – the World Parks Congress. Convened every 10 years by the World Conservation Union (IUCN) this is a large gathering of professionals concerned with protected area management. This event however, concerned itself with changing the protected areas paradigm – and in no more significant way than a component which dealt with the issue of linkages in landscape and seascape, including trans-border cooperation. Again we see the Wadden Sea already demonstrating clearly the way ahead.

Historically your three countries have been world leaders in promoting the need to establish and manage protected areas in a wider context. This afternoon, I should like to take the opportunity to speak about 10 areas for action agreed by the World Parks Congress– all of which are relevant in the context of the Wadden Sea.

One conclusion was a clear view that parks cannot exist as unique islands, but must be seen as places in a matrix. A second conclusion was that protected areas both need, and can provide for, ecological, cultural and social resilience. Protected areas are indeed the “resilience parachutes” of the world, concentrates of biological and cultural diversity

The ten target areas for action are essential steps towards achieving more sustainable protected areas – while solving other pressing social and environmental issues. In brief the issues are:

- Alleviating Poverty
- Coping with Global change
- Getting better Governance
- Promoting the bio-cultural aspects of landscape
- Linking Marine systems to each other and to terrestrial systems
- Putting linkages at the heart of the Conven-

tion on Biological Diversity's Ecosystem Approach

- Initiating new Institutions for managing linkages
- Finding new funding to support linkages
- Reinvigorating Research which takes account of linkages, and
- Ensuring engagement of the Private sector

You will be pleased to see that your trilateral agreement has been engaged already in many of these actions in the Wadden Sea – I believe this an excellent example for other areas in the world to follow. And the timing of this 25th celebration allows me take the opportunity to table this plan – and taking account of my earlier remarks on language, I table it in Danish, Dutch, German, and English – but alas not Frisian!

But may I end my remarks by returning to my stable, as it were – the Ramsar Convention. The Wadden Sea includes 8 Ramsar sites covering over 1,000,000 hectares, which makes it special for us.

This occasion, as we look back on 25 years of achievement here in the Wadden Sea, and look forward to 25 more such years, seems the perfect moment to sketch out a vision of the future for the Ramsar Convention. Twenty five years ago, Ramsar was the obvious convention to be engaged in the Wadden Sea – but back then primarily because of its key role in protecting sites for migratory waterfowl. Since that time we have built on that role, but now fulfil that role in partnership with the Convention on Migratory Species and its regional agreements, which I have to acknowledge are well looked after in Bonn!

And we have grown in other directions. As you

Peter Bridgewater
presenting Minister
Veerman, Parliamentary
State Secretary Probst and
Director General Simonsen
with a copy of the Ramsar
Wetlands book.
(Photo: Marencic)



know, the Ramsar Convention is a global treaty for the conservation of wetlands: shallow open waters and any land regularly or intermittently covered or saturated by water. Of course, as we are in Europe, there are regional agreements to be taken account of – The EC Bird Directive 1979 aims at the protection of all species of naturally occurring birds in the territory of the member states through “special protection areas” (SPAs). And so the Wadden Sea Ramsar sites have also been designated as SPAs. Additionally, the EC Habitat Directive 1992 aims at the conservation of habitats of wild flora and fauna in the member states. NATURA 2000 – a coherent ecological network – has been established under this Directive, and, major parts of the Wadden Sea are included in this network.

Right now the world is poised to cope with the issue of ensuring enough freshwater for all – which also means ensuring enough water for wetlands and other ecosystems. I am convinced the Ramsar Convention can become a water convention – for we are already a Convention which deals with protection, production and natural purification of freshwater – as well as the near-shore marine environments.

The Convention has increasingly recognized that wetlands not only play a vital role in the hydrological cycle, but that to secure their conservation and wise use it is essential that they are managed in the wider context of basin-scale and water resource management. And wetlands typically perform many functions which could be described as purification of water, so much so that artificial wetlands are now being created for just this purpose. The challenge is to find ways of securing appropriate allocation of water to wetlands in the face of increasing water demand and diminishing water supply through over-abstraction and the effects of prolonged and increasing droughts and desertification in many parts of the world.

Arising from the last Ramsar COP, held in Valencia, Spain a year ago, and at which each of your Governments played key and highly effective roles, Resolution VIII.1 strongly urged all Contracting Parties to bring water allocation Guidelines to the attention of their national authorities responsible for water resource management. In addition, Contracting Parties at COP8 adopted several other Resolutions of direct relevance to the linkage between wetlands and water management, notably on:

- The Report of the World Commission on Dams (WCD) and its relevance to the Ramsar Convention;

- Agriculture, wetlands and water resource management;
- The impact of natural disasters, particularly drought, on wetland ecosystems; and
- Guidelines for rendering the use of groundwater compatible with the conservation of wetlands.

In recognition of the major importance to address issues of water management through the Convention on Wetlands, COP8 also requested its Scientific and Technical Review Panel to develop further guidance for Contracting Parties on:

- groundwater management,
- environmental flows,
- river basin management case studies, and
- the relationship between agricultural good practice and sustainable management of wetlands.

That work is now in full swing and when COP9 meets next in Kampala, Uganda, in 2005 Contracting Parties will have before them new guidance on these issues. It is, of course, more than appropriate that this will be the first Conference of the Parties meeting to be held in Africa – the continent where these issues press more urgently than most.

Minister, Director General of the Ministry of Environment and Secretary of State, you must, as do I, hear frequently about the need for a new focus, a new institutional framework, a paradigm shift, to deal with the water issue – and yet it seems we already have the pieces there, in place, to deal with this most critical of issues.

And so, as you contemplate the next 25 years of this trilateral agreement you have so successfully nurtured, I urge you to see how it can be an exemplar for the global community, as they seek to understand and manage the environmental complexities of the water issue.

And of course, I urge you especially to see how this leadership here can be transferred to the Ramsar Convention, as it seeks to promote better knowledge, wiser use, and ultimately better balanced management and conservation of the earth's water resources and the ecosystems which depend on them, and on which they depend.

I am sure I can say, in conclusion, *It sil heve!* Dank u wel! Tak! Danke! Tankje wol! And Thank you!

Peter Bridgewater

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International Wadden Sea School" Inspires Future Generations for Cross-border Protection

Anja Szczesinski,
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On the occasion of the 25th anniversary of the Trilateral Wadden Sea Cooperation, a new project has been launched that takes the idea of a joint protected area into the future generation of decision makers: The International Wadden Sea School - a trilateral learning experience for young people from The Netherlands, Germany and Denmark.

For 25 years, The Netherlands, Germany and Denmark have been working together in protecting and sustainably developing the Wadden Sea region. Politicians, conservationists and other stakeholders have increasingly understood the Wadden Sea as a shared nature area and promoted a cross-border management. Numerous facilities for public information and environmental education inform locals and visitors about the value and vulnerability of the Wadden Sea and provide first-hand experiences in nature. But still, the international dimension of the Wadden Sea and the idea of a joint protected area are generally rather little recognised. This awareness, however, is a vital basis for the successful protection of the Wadden Sea as an entity, today and in the future.

Against this background, the Trilateral Cooperation and Nature NGO's have set up an educational pilot project that addresses the coming generation: The International Wadden Sea School (IWSS). In order to enhance the awareness among young people of the Wadden Sea as a shared natural heritage and to create an understanding for the need to protect and sustainably manage the Wadden Sea region as a whole, the IWSS provides an international learning experience for the decision makers of tomorrow.

Built up as a network of environmental education centres along the coast and on the islands, the IWSS offers middle school classes from the Wadden Sea countries the chance to visit the Wadden Sea area of another country where they

take part in a special educational programme. For example, a Dutch class comes to Hallig Hooge in Germany, Danish classes visit Texel in The Netherlands and German groups travel to Rømø in Denmark. At the individual sites, the participating pupils not only learn about nature in the Wadden Sea, but also get insight into different socio-cultural backgrounds, various approaches to conservation and the sustainable development of the



(Photo: Schutzstation
Wattenmeer)

international Wadden Sea region. Activities that focus on intercultural learning and stimulate international communication complete the courses.

The three columns "network", "exchange forum" and "educational programme" principally constitute the IWSS, with the network of educational facilities in the four Wadden Sea regions Denmark, Schleswig-Holstein, Lower Saxony and The Netherlands being the framework of the project. The variety of centres offers an attractive choice of destinations for class trips and ensures a true international "Wadden experience". The different partners cooperate in establishing and running the IWSS and gain besides an international programme also an increased international exchange of experiences and ideas.

The exchange of school classes within the international Wadden Sea area is the actual purpose of the IWSS. The central tool is a platform that facilitates class trips from any of the Wad-



(Photo: WWF)

den Sea countries to any other country's Wadden Sea region by providing easy access to the individual courses. The various centres set up flat-rate offers including board and lodging, local transport and the IWSS-programme, that can be easily booked from abroad.

The educational basis of the IWSS courses is a common curriculum that the different partners jointly develop. Especially designed for international school classes, this programme focuses above all on trilateral region building and raising the "Wadden awareness". A strong emphasis is put on the experience of nature and wilderness as an essential step towards positive feelings and an increased awareness for the Wadden Sea. Besides activities that aim at awareness raising and/or convey biological and ecological aspects, the curriculum also takes account of various for the protection of the Wadden Sea relevant social, cultural and economical features of the individual sites and regions.

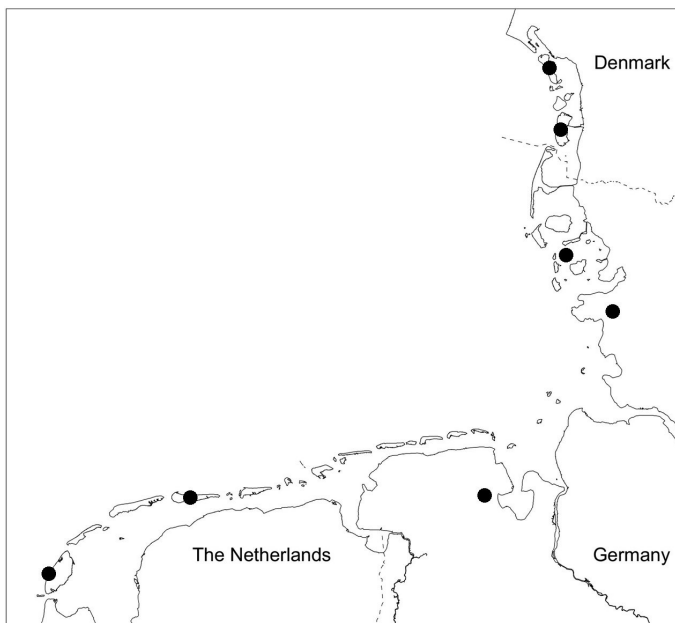
As the IWSS has just started as a pilot project, some aspects of the concept are still visions and many questions concerning the practice have not been answered yet. During the two-year pilot phase, made possible by the ideational contributions of many people and the financial support of the Trilateral Cooperation as well as the Schleswig-Holstein lottery "BINGO!", the present concept will be tested and continuously revised. Furthermore, questions regarding the continuation of the IWSS beyond the pilot phase will be dealt with, i.e. how cooperation and exchange between the partners can be promoted and coordinated most efficiently, whether and where to take up and involve existing programmes like Eco Schools and the BLK-Programme "21" and how to fund the long-term IWSS. At the end of these two years rich in experiments and experience shall stand a sound concept if and how the IWSS can serve as a long-term programme of the Trilateral Cooperation.

Right now, though, the IWSS is in the middle of the start-up phase, preparing and looking forward to the first international class trips next spring.

For more information about the IWSS and offers for class trips in 2004 please contact

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The IWSS-network of environmental education centers is still "under construction". Up to now, 7 facilities take part.



Sustainable Development in the Wadden Sea Region

3rd meeting of the Wadden Sea Forum, Oldenburg, 30–31 October 2003.

Folkert de Jong, Wadden Sea Forum Secretariat, Wilhelmshaven, FRG

"Economic vitality, high quality and diversity of employment, improving education and research to keep young people in the region, good infrastructure, preserving the characteristic Wadden Sea landscape and protection of Wadden Sea ecosystem". These are some of the many issues which the trilateral Wadden Sea Forum regarded as important for sustainable development in the Wadden Sea region.

The Wadden Sea Forum, which held its third meeting in the Chamber of Commerce Oldenburg, Germany, was in favour of maintaining the typical features of the Wadden Sea landscape, i.e. wide views, rural areas, and cultural history. Also the necessity of increasing the social cohesion of the countryside was stressed.

But, to be able to realize the social, ecological and cultural historical ambitions, sustainable economic growth is absolutely necessary.

At the next meeting in April 2004, the Forum will continue the discussion on sustainability aims and will furthermore discuss how such aims can be used by local and regional administrations. Input to this discussion will be given by a study on sustainable development, currently carried out by the Danish consultant COWI. In the study, the situation with regard to the status of sustainable development in the Wadden Sea countries will be evaluated. It concerns not only the national sustainability strategies, but also to what extent sustainability has become part of policies of the private sector or plays a role in the behaviour of consumers.

On the basis of the inventory and the outcome of the discussions in the Wadden Sea Forum and its thematic working groups, proposals will be developed for a Wadden Sea region sustainability strategy.

Offshore windparks and shipping safety

The Forum furthermore discussed the topical issues of the planning of offshore wind parks, shipping safety and sustainable shrimp fisheries.

The Forum agreed that there should be balanced planning of offshore wind parks, both national and trilateral. With regard to shipping safety the meeting agreed to commission a study in which gaps in the existing national contingency systems for shipping casualties will be identified. On the basis of this study the Forum will, at its next meeting in April 2004, discuss the need for additional measures, mainly in the framework of the Wadden Sea PSSA (Particularly Sensitive Sea Areas).

The socio-economic situation in the Wadden Sea region

The Forum has commissioned a number of studies on the social-economic situation of the Wadden Sea region. The analyses of the German and Danish Wadden Sea region can be downloaded from the WSF website www.waddensea-forum.org. First results of an integrated analyses of the national studies were presented at the meeting.

According to the analysis the Wadden Sea region shows a relatively high population growth, although there are large differences within the region. Population growth in the period 1990-2000 has been highest in the German Wadden Sea region: 5% whereas it was 3.6% for the whole of Germany.

A comparison of developments in GDP and employment showed that the Dutch and Danish parts of the region have done well in the past 10 years, but that most of the German Wadden Sea region showed negative figures. A positive exception is the German Kreis Friesland with a relatively high increase in both GDP and employment figures. In a follow-up studies the specific perspectives and opportunities for the region will be investigated.

Sea level rise

A particular challenge for the Wadden Sea region is the expected increase in sea level rise. The results of a trilateral study into the possible impacts of increased sea level rise, carried out in 2001 by the trilateral expert group Coastal Protection and Sea Level Rise (CPSL), were presented to the Forum. The CPSL has elaborated three sea level rise scenarios. The first scenario is the present situation, meaning an average sea level rise of 10 cm/50 years. In the most plausible expectation for the future, which is a sea level rise of 25 cm per 50 years, the group expects that the system as a whole will be able to compensate the changes, but there will be large differences between different parts of the area.

However, if the sea level rise is faster, (50 cm/50 years), the size of the tidal flats could decrease by 15% (720 km²), the tidal basins getting more the character of tidal lagoons.

A sea level rise of 50 cm in 50 years will result in a marked decrease in all waders, owing to an expected increase in flooding time, leaving less time for the birds to feed on the intertidal flats. Duck and geese stocks will also decrease in number because salt marshes will be flooded more frequently, leaving less time for feeding.

For dikes (maintenance and strengthening) the expected increase in costs for the most realistic sea level scenario (25 cm in 50 years) is expected to be in the order of 5 to 15 % for the German Wadden Sea. In the Dutch and the Danish Wadden Sea, the relative increase is estimated to be much higher. This results mainly from the fact that at present dikes are only maintained in these two countries, not strengthened as in Schleswig-Holstein and Lower Saxony. For the high sea level scenario (50 cm in 50 years) the costs to maintain present dike safety in the year 2050 may rise by up to 75 % (Germany) and even more in The Netherlands and Denmark. Another important consequence of an increased sea level is that possibilities for discharging fresh water from the mainland into the sea will become less and that additional sluicing, pumping and/or fresh water storage capacity is needed.

The meeting was informed that the group will continue its work with developing proposals for best environmental practices to cope with the anticipated impacts in a way which guarantees safety but which is compatible with the protection of the ecosystem.

Background information about the Forum, including records of the Forum and TG meetings, on the Wadden Sea Forum website: www.waddensea-forum.org



Interreg III b

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The Harbour Seal Population in the Wadden Sea as Revealed by the Aerial Surveys in 2003

Trilateral Seal Expert Group, TSEG:
Peter J.H. Reijnders, Sophie M.J.M. Brasseur, Kai F. Abt, Ursula Siebert, Michael Stede, Svend Tougaard

Part of the Seal Agreement respectively the trilateral Seal Management Plan is the monitoring of the harbour seal population in the Danish, German (Schleswig-Holstein and Lower Saxony), and Dutch Wadden Sea by an annual series of aerial surveys. This year, the surveys had an extra dimension because of the occurrence of a seal epizootic in 2002. The results of the aerial surveys this year provide some insight into the impact on the seal population due to the mass mortality. For scientific reasons, it has been decided to compare the survey results between years based on the maximum count during the moulting season, which were obtained in all regions at the same time (Reijnders et al. 2003). In 2003, the maximum number of seals counted during the moult period (August) amounted to around 10,800 animals. This figure is composed of 1,160 seals in Denmark, 4,235 in Schleswig-Holstein, 3,050 in Lower Saxony and 2,365 in the Netherlands. It is possible that for some regions the maximum number counted sometime between June and August may differ from the

moult count. The maximum number of pups counted during the whelping period (June) was 2,956: Denmark 270, Schleswig-Holstein 1,407, Lower Saxony 799 and in the Netherlands 480.

It is obvious that the population paid a heavy toll, because 20,975 seals were counted in 2002. Until 2002, the Wadden Sea seal population had been growing at the highest rate so far recorded for this species. That growth was interrupted by a new outbreak of the phocine distemper virus (pdv) disease. According to virologists, this pdv was very similar to the one that caused an outbreak in 1988. In order to assess the impact of the epizootic on the population, the actual counts this year are compared with the expected population counts had no epizootic occurred. If the average annual growth rate, achieved in the pre-epizootic period, (1995-2001) had continued, the expected August count for 2003 would have been approximately 23,000 seals. The population in 2003 is 53% less than it could have been without the disease. Though this is

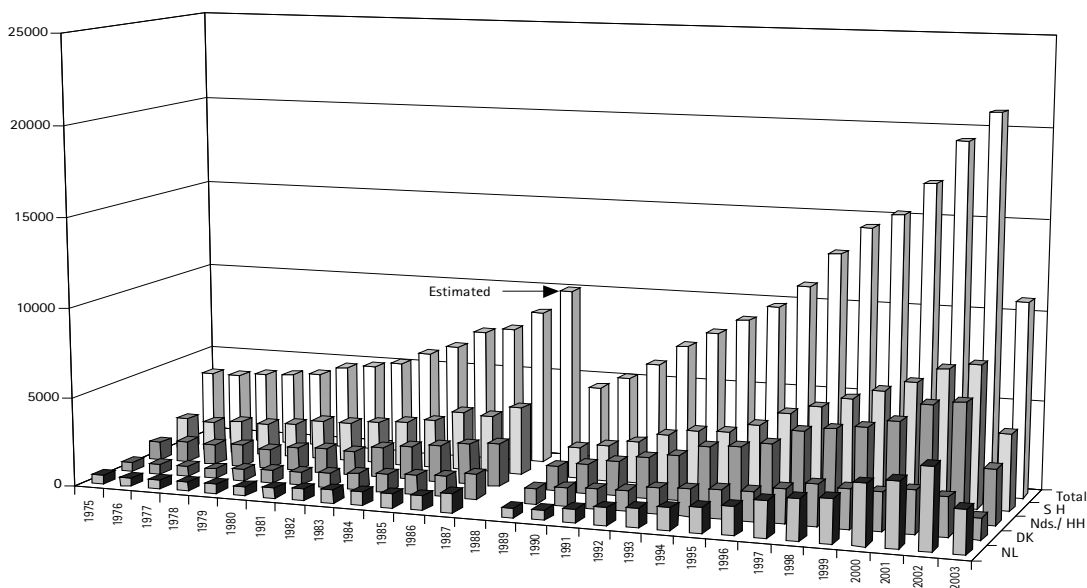


Figure 1:
Number of counted common seals in the Wadden Sea since 1975

an impressive loss in comparison to the impact of the former epizootic in 1988 (number counted in 1989 58% less than expected), the relative mortality this time is evidently lower. This difference can be attributed to the fact that a fraction of the population was composed of animals that survived the 1988-epizootic and was immune to this virus. It cannot be excluded that differences in the epidemiology of this virus had an effect as well.

It would be interesting to assess how many animals died and what percentage has actually been found dead. To do so, the counts in 2002 and 2003 have first to be corrected for animals missed during surveys due to diving e.g. Then, the assumed number of survivors plus the number of pups born in 2003 should equal the population size in 2003. That way it has been calculated that probably around 15,500 animals died in the Wadden Sea. This is subject to the assumption that the counted animals have the same chance to be hit by the epizootic as the animals that did not haul out at the moment the survey was carried out. Given a total number of about 10,660 seals found dead, the ratio between seals found dead and estimated to have died is approximately 70%.

What about the future development of the seal population?

The growth rate over the next couple of years is difficult to predict precisely. This strongly depends on the extent of the perturbation of the age distribution, which is still unknown. A positive observation is the reproductive outcome this year. It is conceivable that successful mating and later implantation might have been hampered, as the epizootic was still in progress during the mating period. The counts indicate that this is not the case. Reproductive success can, e.g., be assessed

by expressing the number of pups counted per total number counted. The average (geometric mean) for the pre-epizootic period (1990-2001) is 22.0%, for 2003 it is 27.3%. It is hypothesized that this percentage is so unusually high because adult males experienced a higher mortality during the epizootic than adult females. Therefore the August count (when males generally dominate the survey results) may have been lower, resulting in an unusually high birth rate. This supposition is supported by the finding in Germany and the Netherlands that males were over-represented in the composition of the animals found dead during the epizootic in 2002. Anyway, it is safe to conclude that the reproductive performance of the adults surviving the epizootic is as good as it was in the pre-epizootic period. The high birth rate in 2003 offers a justified prospect for an unusually high population increase (15-20%) for 2004. That is a good start and allows for a prudent expectation of a quick recovery of the population from the blow in 2002.

Reference

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The Breeding Bird Season in the Wadden Sea in 2002

Joint Monitoring Group of
Breeding Birds in the
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Introduction

The coordinators of the Joint Monitoring Group of Breeding Birds in the Wadden Sea, JMBB, present in the following an overview of some interesting characteristics of the breeding bird season 2002, despite the fact that the data are not completely available at the moment. This paper is directed towards all interested counters, administrators and others, who would like to know early what is going on in the Wadden Sea breeding bird fauna. This does not replace a thorough analysis of the full amount of data throughout the Wadden Sea representing the whole target species set.

Used abbreviations: NL - The Netherlands, LS - Lower Saxony, HH- Hamburg, SH - Schleswig-Holstein, DK - Denmark, bp - breeding pair.

Weather conditions and breeding success

In general, the breeding bird season in 2002 can be characterized as quite normal concerning weather conditions and the number of flooding events. Therefore, we cannot assume that changes in breeding bird numbers or the breeding success in general were strongly influenced by these factors. But, nevertheless, the breeding season 2002 was again affected by some stronger flooding incidents. A larger part of the low lying salt marshes and beaches was flooded at the end of April, and the water level reached a few times more than 0.5 m above mean high water in the second half of June (about 1m on June 28, 2002).

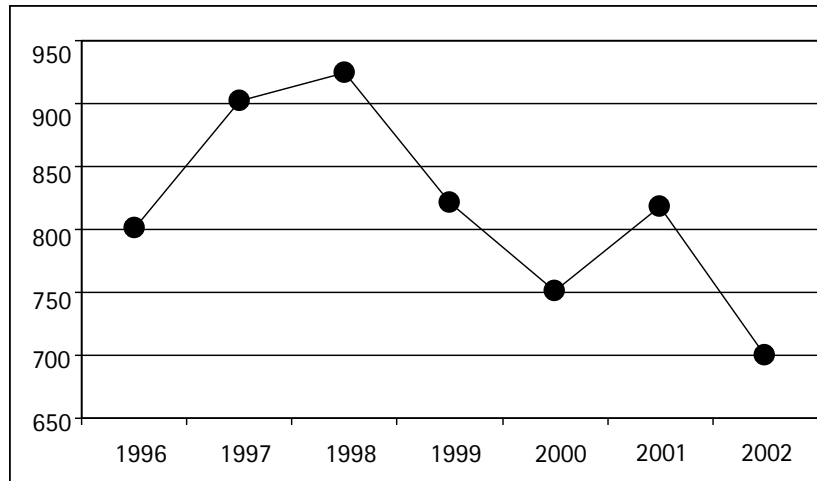
Most of the wader species started breeding early; a good hatching success was recorded, e.g. 50% of the Oystercatcher *Haematopus ostralegus* pairs in the census area Hedwigenkoog (mainland salt marsh SH) were found with hatched chicks (1.25/bp). The fledging period was mostly warmer than normal and a lot of older young of Oystercatcher *Haematopus ostralegus* were al-

ready observed up to the end of June. This was also true especially for the Redshank *Tringa totanus*. In the complete ungrazed mainland salt marsh of Osewoldter Koog/SH more than a third of the pairs counted before was found still warning intensively one week after the flooding of June 28. Possibly, the young survived the short time of high tide in higher vegetation. A very good breeding success for all waders including Kentish Plover *Charadrius alexandrinus* was reported for all inland areas in SH (polders like Beltringharder Koog, Eider estuary). In DK, the breeding success of Kentish Plover on Rømø was poor, probably caused by predation by foxes.

Blackheaded Gull suffered high losses, e.g. 85% in some areas on the Hallig Habel/SH on June 28. Arctic Terns *Sterna paradisaea* on the small Hallig-islands/SH had hardly any breeding success due to flooding the third year in a row. In DK, already on June 13, high sands were flooded by extraordinary high water. Furthermore, sand drift by heavy winds from the east on some beaches and outer sands caused possibly problems at the beginning of June, especially for Little Terns *Sterna albifrons* and Kentish Plovers. In NL, the reproduction of Spoonbill was low due to bad weather and low temperatures.

The small breeding population of Gull-billed Tern *Gelochelidon nilotica* in the German and Danish Wadden Sea area - with the main colony at the mouth of the river Elbe over the last years - is the only one in NW-Europe. These birds are roosting during their post-breeding migration in the northern part of the IJsselmeer (Province of Friesland/NL). On this roosting site, it is possible to identify and count adults and juveniles to estimate the breeding success. Families with juveniles appear in Noord-Holland during the last week of July and in the first week of August, shortly after fledging. In 1988 - 2002, an average of about one young per pair was observed; in 2002 a value of only 0.14 was registered (Vlek 2002).

Fig. 1:
Numbers of Oystercatcher
in census areas on
mainland salt marshes in
Schleswig-Holstein.



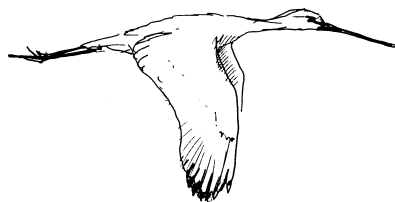
Cormorant, Bittern, Spoonbill, Egrets, Ducks, Raptors and Owls

A second colony of Cormorants *Phalacrocorax carbo* established itself in SH besides Trischen (12 bp on the island Föhr), but, in LS, the stocks decreased successively on the islands Memmert and Lütje Hörn over the last three years and also no further increase appeared in SH.

Relatively high numbers of Bittern *Botaurus stellaris* were registered on the islands in NL and LS this year (a total of 17 on the West Frisian islands).

The population of Spoonbill *Platalea leucorodia* reached a new all-time record with 1,425 bp in the whole NL, respectively 951 bp in the Wadden Sea area. In LS, a further increase up to 73 bp on six islands was stated and 12 bp with at least 21 hatchlings bred now in SH on two islands. A small colony settled on the mainland each in NL and LS.

Spoonbill *Platalea leucorodia* (Drawing: N. Knudsen)



The settlement of white herons continued. In NL, 3 bp of Little Egret *Egretta garzetta* were detected on the islands and 1 bp of Great White Egret *Casmerodius albus* on the mainland. Little Egrets were also observed in the German part of the Wadden Sea again in summer the 2002.

The Barnacle Goose *Branta leucopsis* established larger stocks in some areas in SH (up to 40

bp in the polders Rickelsbüller and Beltringharder Koog). The number of Eiders *Somateria molissima* (males at the beginning of the breeding season) on the island Langli, DK decreased from 145 resp. 196 bp in 2000/ 2001 to 78 bp in 2002. It is not clear up to now, if there is a general negative trend in large parts of the Wadden Sea in consequence of outbreaks of avian cholera in DK or the mass mortality over the last winters in the Wadden Sea (Desholm et al. 2002). A little increase in breeding pairs was registered regarding the Redbreasted Merganser *Mergus serrator* especially in the western part of the Wadden Sea with 6 bp on the island Griend and a first breeding on Terschelling, NL. In DK, 3 bp were documented.

The numbers of Hen Harrier *Circus cyaneus* and Shorteared Owl *Asio flammeus* are more or less stable resp. fluctuating on a low level on the islands in LS. However, in NL, a further decline of the stocks on Terschelling was noticed (from 39 bp in 1996 – Rasmussen et al. 2000 – to 27 bp in 2002) after the obvious decrease of Hen Harrier in 2001 on Ameland (Südbeck et al. 2002).

Waders

In 12 census areas on the mainland salt marshes in SH, the trend of the Oystercatcher has been negative since 1999, with a slight rebound in 2001. Compared with 1998, there is a decrease of 25% up to 2002 (Fig. 1). In the past, the population increased over the whole 20th century.

499 bp of Avocet *Recurvirostra avosetta* has been the lowest registered number in DK in 2002, since the surveys started in 1996; still in 1999, there were nearly twice as many. An inland-colony of Avocets on the LS-part of the Dollard was disturbed by egg-collectors in 2001 and as a result of this no settlement was registered in 2002.

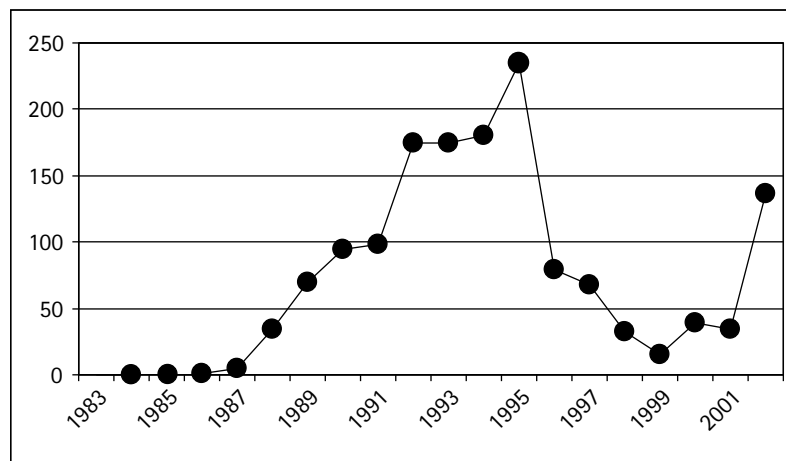


Fig. 2:
Breeding pairs of Kentish
Plover in the
Beltringharder Koog,
Schleswig-Holstein.

Otherwise, in the polder Breebaart/NL, an out-poldered area on the NW side of the Dollard, the Avocet occurred with very high numbers (774 bp).

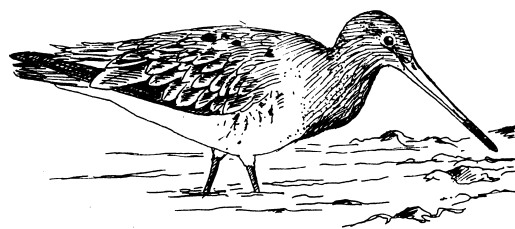
The number of Great Ringed Plover *Charadrius hiaticula* seems furthermore to decrease in large parts of the Wadden Sea. In the census areas in DK, only 28 pairs were recorded. The number has decreased since 1997. In LS, the population on the East Frisian islands dropped from 106 resp. 118 bp in 1998/99 to 81 bp in 2002.

In 2002, in DK, 92 bp of Kentish Plover were counted. After an increase in the 1990s, the population has been more or less stable with around 100 bp since 1999. 84% bred on the island of Rømø in 2002. Caused by "management" of Barnacle Geese *Branta leucopsis* (created by grazing a habitat with very low vegetation at the beginning of the breeding season; Südbeck et al. 2002) the breeding pairs of Kentish Plover slightly increased in the Beltringharder Koog/SH up to 39 resp. 34 bp in 2000/2001. In 2002, the population increased explosively up to 136 (Fig. 2). In the western part of the Wadden Sea (NL + LS), the numbers were again very low resp. more or less stable on a low level.

Probably, one pair of Dunlin *Calidris alpina schinzii* bred again in the LS-part of the Dollard after 2001, the rest-population in SH is probably unchanged with approximately 2 - 3 bp in St. Peter over the last years. In DK, only four of the best localities for Dunlins were recorded in 2002 and 16 bp were found on two of the localities. The numbers must be considered a minimum estimate and the total number of pairs in DK is probably 50-100% higher. The number of 27 bp (2002) has been the lowest recorded since 1998. One breeding pair of Turnstone *Arenaria interpres* was verified in DK again on the island Mandø, where first

breeding had been confirmed in 1994 since the 19th century (Rasmussen et al. 2000).

Within the "meadow-birds" for the Lapwing *Vanellus vanellus*, a decrease of 70% compared to the numbers in 1999/2000 was found in the census areas in DK (158 bp in 2002). Bar-tailed Godwit *Limosa limosa* was recorded with 146 bp on ten localities in DK. After the decreases from the middle of the 1980s to the middle of the 1990s, the number seems to have stabilized now. However, there was a decrease in most of the control areas, but the number had increased in Margrethe Kog from 30 bp in 1996 to 44 in 2002, and in Tøndermarsken from 65 to 90 bp. In LS, the decrease of both species on the mainland as well as on the islands continued.



Bar-tailed Godwit *Limosa limosa* (Drawing: N. Knudsen)

In four regularly controlled areas in DK, five females of Ruff *Philomachus pugnax* indicating breeding attempts were found. This is the highest number since 1998, four more females were seen on three different localities during the breeding season. Despite the increase in 2002, the situation is considered as very critical for this species in the Danish Wadden Sea.

One breeding pair of Black-winged Stilt *Himantopus himantopus* was found in Beltringharder Koog, SH as well as on a North Frisian salt marsh in NL.

Gulls and Terns

The population of Black-headed Gull is still increasing in SH, especially on the Halligen. From 1999 to 2001, there was still a strong increase with 25% up to 35,000 bp, whereas big colonies on the Baltic coast in Germany has shown a steady decrease with 75% since 1983 and also the inland population is decreasing (Bellebaum 2002). In NL, the enormous colony on the island Griend increased further to 33,500 bp. However, in DK, in total only 5,495 bp were breeding in 2002, which has been the lowest number since 1996. There was a reduction in all colonies, also in the largest colony on the island Langli.

The Mediterranean Gull *Larus melanocephalus* reached 79 bp in the Elbe estuary west of Hamburg, that is about doubled compared to 2001. Single pairs were found in different places in all parts of the Wadden Sea now.

The Common Gull *Larus canus* reached 2,422 bp in DK (more than 80% on Langli), the largest number since 1996. On Amrum, the biggest breeding site in SH, a new record with 2,719 bp was found (the same trend near the river Elbe west of Hamburg). The German population on the Baltic coast is declining (Hälterlein et al. 2000).

The same development took place for the Lesser Black-backed Gull *Larus fuscus*. 479 bp were breeding in 2002 in DK, which are nearly twice as many as in 2001. The increase was so high that it would be reasonable to conclude that there must have been immigration from outside. The most important breeding sites are on Langli and Mandø. On Amrum /SH, 11,165 bp were recorded. An analysis of the development in this area by a population model demonstrated also that the strong increases in some years in the past could not be a result of the reproduction in the area but of immigration from abroad (e.g. from NL; Garthe et al. 2000). A few breeding pairs were found on the river Elbe west of Hamburg in 2002.

In total 4,545 bp of Herring Gull *Larus argentatus* were breeding in DK, which was an increase of more than 500 pairs compared to 2001. On Amrum, SH the number was reduced to 1,462 bp. In the 1990s, the numbers shifted between 2,500 and 3,000. Large parts of the dune valleys are now occupied by Lesser Black-backed Gulls and the Herring Gull settled only in the outside margins on the slopes. Single pairs bred - protected against ground predators - on the top of thatched roofs on Sylt the last years.

In the course of the southwest-ward expansion the Great Black-backed Gull *Larus marinus*

bred with 6 bp on the Terschelling and the first time on Griend in NL.

The main colony of Gullbilled Tern *Gelochelidon nilotica* was found with 41 bp again in the salt marsh Neufeld, SH in the mouth of the river Elbe. In DK, only a single bird was seen a couple of times during the breeding season, no breeding pairs were observed for the first time.

Very high numbers, in some cases all-time highs, were detected of Sandwich Terns *Sterna sandvicensis* on the uninhabited islands Hallig Norderoog/SH (5,250 bp), in LS on Minsener Oog, (3,068 bp) and Memmert (477 bp) and Griend/NL (10,966 bp). Lower numbers than normal compared to last years were found on Langli/DK and Trischen, SH. Wangerooge, Juist/LS and Scharhörn/HH were completely abandoned.

There were 63 bp of Common Tern *Sterna hirundo* in DK in 2002, which has been the lowest number since 1996. The number of Arctic Tern in total has been rather stable between 1,000 and 1,200 bp in DK since 1996 (2002: 1,062). The largest colony of Common Tern in SH in the mainland-salt marsh Neufeld in the mouth of the river Elbe holds with 1,368 bp a very high stock. On Griend/NL, a large decrease of both species was reported. Probably the number of Arctic Tern was very low all over the Dutch area.

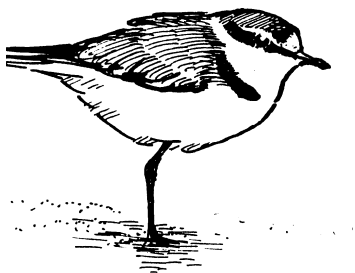
The population of Little Tern seems to be rather stable with little fluctuations in all parts of the Wadden Sea over the last years. But on a smaller scale, consistently a shifting from one area to another is to be noted in periods of about 10 years or even shorter periods. At the moment, e.g., the newest colonies on Hallig Hooge/SH and Wangerooge, LS are definitely increasing, whereas older ones with high stocks in the 1990s like Morsum-Odde on Sylt, SH and Juist/LS are decreasing.

Songbirds

Especially the dune areas on the Wadden Sea islands are important breeding grounds for the Wheatear *Oenanthe oenanthe*. 112 bp were found on Norderney/LS in 2002, on other islands clearly lower numbers and partly dramatic collapses were noticed. On Sylt/SH high densities up to 15 bp/km² were found but the species decreased over the last years. The German inland populations have been decreasing for a longer time (Kieckbusch 2002, Pfeifer 2003). So this species should find more attention in the future.

Conclusion

The Spoonbill has also established itself as breeding species in the northern Wadden Sea/SH over the last years, the Egrets are extending from the south. The Barnacle Goose is established in all parts of the Wadden Sea coming from the north, with larger stocks in SH. Recently not only "meadow-birds" and "beach-birds" but also some coastal waders with increasing populations over long decades, especially the Oystercatcher, begin to show a clear decrease in wider parts of the Wadden Sea. The Avocet-colonies showed small and a large-scale shifting between different areas depending on disturbance and predation. Within the "beach-birds", the Little Tern and Kentish Plover are probably stabilized on a low level and shifting between different more or less suitable areas at the moment. However, the Great Ringed Plover has decrease uninterrupted and dramatically for a few years now. The Gull populations, except for the Herring Gull, are still more or less heavily increasing in most areas. Also the Sandwich Tern seems to be in a good status of conservation. The population of Arctic Tern is still to be seen as stable; for the Common Tern, the situation is not really clear at the moment. Regarding all Gulls and Terns a trend to concentrate more and more in big colonies and – with the exception of the northern river bank of the Elbe mouth – to shift to the islands is visible.



Kentish Plover *Charadrius alexandrinus*
(Drawing: N. Knudsen)



Little Tern *Sterna albifrons*
(Drawing: N. Knudsen)

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Quality Assurance Meetings



(Photo: Lars Maltha Rasmussen)

New Ways to Test and Improve Methods – Quality Assurance Activities in Breeding Bird Monitoring

Jan Blew, Dersau, FRG

Introduction

Bird monitoring has to deal with a large variability of bird numbers in time and space. To cope with this, a strong and accurate harmonization of methods is of utmost importance. The Trilateral Monitoring of Breeding Birds in the Wadden Sea in the frame of the Trilateral Monitoring and Assessment Program (TMAP) is such a large-scale program.

The TMAP attempts to improve the comparability of monitoring methods in the Wadden Sea. Trilateral monitoring guidelines have been prepared for the different parameters which require appropriate quality assurance programs to ensure that the data are suitable for the purpose for which they have been collected and that the level of accuracy is compatible with the objectives of the monitoring program.

Activities to strengthen the data quality of breeding bird numbers in the Wadden Sea has been a major task since the beginning of the trilateral breeding bird monitoring in 1993. But because there were no standardized procedures to test and elaborate field tests on methods at the national and international level innovative steps had to be found. First insights will be published here.

Since 1995, the monitoring of coastal breeding birds in the Danish-German-Dutch Wadden Sea has been carried out using standardized methods (Hälterlein et al. 1995). Within the frame of the TMAP the members of the Joint Monitoring Group of Breeding Birds (JMBB) – between 1993 and 2001 – collected data at a total of seven Quality Assurance Meetings (QAM). Those meetings had – besides expert discussions, workshops, seminars and motivation – the aim to conduct comparative counts on breeding bird census plots. These comparative counts shall help to further improve, calibrate and standardize the counting techniques.

Within the Wadden Sea, quality assurance methods for breeding bird monitoring had not been available so far. Thus, those meetings started out as pioneer work. "Learning by doing" was the motto: the field tests changed from meeting to meeting, different species, habitats and methods were used and data quality were not steady due to changing conditions, participants and objectives. Besides, no scientific method of the tests was available. Consequently, these first analyses should be – in light of their provisional character – viewed with some caution.

Material and Methods

A compilation and evaluation of the available data of seven QAM has been carried out (Blew 2003).

In Hälterlein et al. (1995) six different counting methods are described:

- A: aerial counts aided by aerial photographs – for large colonies,
- B: ground counts of breeding pairs – for colonies which can be viewed/scanned with a spotting scope,
- C: ground counts of individual birds in flight above the colony – for colonies which cannot be viewed/scanned with a spotting scope,
- D: ground counts of nests,
- E: ground counts of territorial/breeding pairs (observing territorial behaviour etc.),
- F: ground counts of all birds present at counting time (excluding non-breeding birds).

During the comparative counts the stochastic and the systematic errors cause variation of results. In other sources the „stochastic error“ is called „sampling error“, the „systematic error“ is called „measurement error“.

The systematic error is the difference between the mean of many counts and the actual number of birds present and is the predictable part of the error (Rappoldt et al. 1985). Sources of systematic errors can be – even within one counting method – the counting circumstances (weather, habitat and conspicuousness of the birds, disturbances etc.), time of day, the optic used, the numbers of birds present, the individual experience of the counter, time and effort taken for counting and others (e.g. Hälterlein 1996). All efforts should be taken to keep the systematic error as low as possible; in general this can be achieved by standardization of methods, a thorough description and a meticulous application of the methods.

To assess the systematic error, the scale and accuracy of the results yielded during QAM can be compared with "control numbers". Control numbers are either results of aerial or nest counts or the results of those experienced counters who are most familiar with the counting plots and in most cases carry out those counts on a regular basis.

But even if all efforts are made to minimize the systematic error, a stochastic error still exists, meaning counters will still count with a certain variation. This stochastic error is the "within-situation-variation" of the data and is described in terms of the "ratio of standard deviation over mean" – RSD, that is the proportion, the standard deviation represents from the mean ($100 \cdot \text{STD} / \text{AVG}$)

(Rappoldt et al. 1985). Unfortunately, the stochastic and the systematic error cannot always be separated in the overall variation of a count.

During seven QAM a total of 25 comparative counts have been available for an analysis. If an analysis is carried out per species, this number increases to a total of 92 species counts.

The assessment of both systematic and stochastic error is carried out separately for counts of colony species and counts of non-colony species. „Colony-species with less than 50 individuals in the counting plot“ also fall under this category.

Results

Colony species – stochastic counting error

For the 18 colony species counts, the magnitude of the individual counting error ("within-situation-variation") lies within the limits of literature values (e.g. Rappoldt et al. 1985). It turned out that there is no clear relation between the size of a colony and the stochastic error (Fig. 1 for an overview, Fig. 2 for the example Sandwich Tern). Of those counts with a rather large variation some cases can be explained: in two cases counters had to walk through the colony and could not spot it from one observation point (rhombus in Fig. 1), in some cases flying birds (after a spontaneous flight) had to be counted (black square in Fig. 1), in one case one outlier considerably raised the RSD of this count (circle in Fig. 1). Clearly, per species, only limited data are available to thoroughly test those parameters.

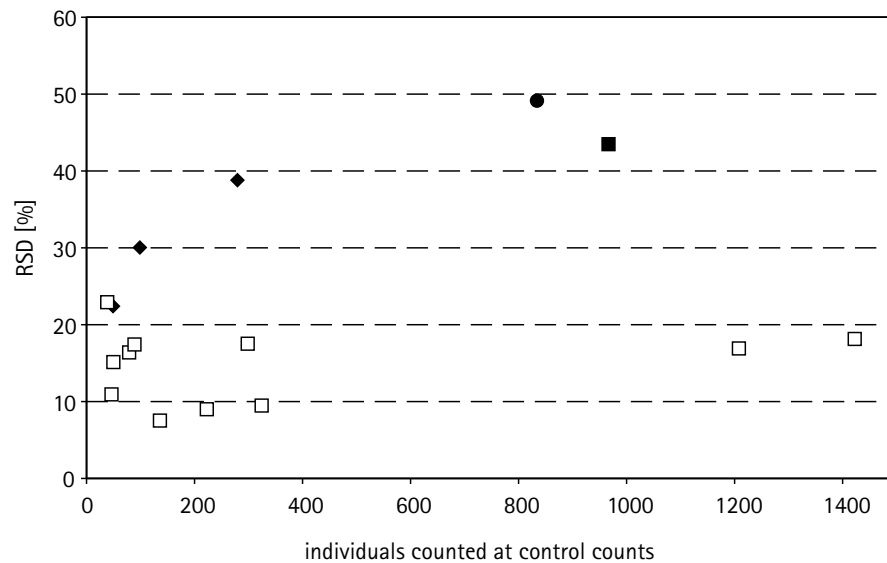
Colony species – potential systematic errors due to different methods

For most areas with large colonies, methods like "nest counts" and "aerial counts" are applied and best suited for yielding comparable results for monitoring purposes. For some QAM, those results are used as "control numbers". In comparison to "control numbers" the QAM results show more cases of under- than overestimation. However, the variation of the count situations, size of the colonies and habitat situation do not suffice to thoroughly analyse the results per species. Repeated counts conducted at different times of the day counts supported the already known fact, that the presence of birds during the day varies either with regard to tide or with regard to time of the day (Fig. 2).

Non-colony species – stochastic counting error

Only for Oystercatcher (*Haematopus ostralegus*), enough counts (15) are available to assess those

Figure 1:
Counts of medium to large colonies: RSD* in relation to colony size; results of 16 species counts (open squares: 11 species counts; black squares: flying birds counted; rhombus: birds counted while walking through colony; circle: high RSD due to one outlier within the count). * RSD = ratio of standard deviation over mean (see "Material and Methods")



parameters. Here, the magnitude of the individual counting error lies within the limits of literature values (Rappoldt et al. 1985), and it is not dependent on the number of birds present; some of the high RSD might be explained by large census plots (black squares in Fig. 3). For other species like Redshank (*Tringa totanus*) (4 counts) or small breeding aggregations of Arctic Tern (*Sterna paradisaea*), the stochastic counting error is rather large, but there are not enough comparable counts at QAM to draw any conclusions.

Non-colony species – potential systematic errors due to different methods

During the QAM most of the counts at areas with non-colony species are conducted by scanning the census plot from a few points from a distance; in most cases, the "control numbers" are derived in the same manner. As with the colony counts, the QAM results of non-colony species are generally lower than the "control numbers". One reason could be that the QAM counts have in general been rather late in the season; six out of seven QAM took place in the beginning of June. Other differences between the QAM and the "control" results can be attributed to bad counting conditions or insufficient counting instructions.

At one QAM, a census plot was counted first for 15 minutes, then for another 15 minutes, and a third count was carried out after a person had walked through the plot. First of all, the results increased when more time was invested in counting. Secondly, they increased again, after a person had walked through the plot.

Discussion and Recommendations

For the monitoring of breeding birds in coastal habitats, a thorough method description exists (Hälterlein et al. 1995) and efforts are taken to internationally (trilaterally) standardize the counts (Blew 2003). Thus, for the coastal breeding birds - compared to other bird groups - reliable and fairly accurate results exist. Still, even here, many different situations exist, from large colonies in remote areas to smaller colonies, from common non-colony species to rare species. If time and effort allow, large and medium colonies are best counted from the air or with nest counts (see below). Due to habitat and location, some large or medium colonies will always be counted from the ground, and for the non-colony species ground counts will be the common method.

Over the first years of QAM, organizers and participants have learned that they are facing many different situations, sometimes lacking comparable data. Frequently, QAM were carried out well after the main counting period, trying to coordinate with the counters availability within the field season. Naturally, the group of participants (experienced counters) changed over time, their individual knowledge with regard to local species and counting plots were different. Consequently, during this first compilation of existing QAM data, it turned out that not for every situation enough data exist and for some analyses there were not sufficient data available. However, the approach was worthwhile and to further investigate and minimize both the systematic and the stochastic error, the QAM should be continued. Using the

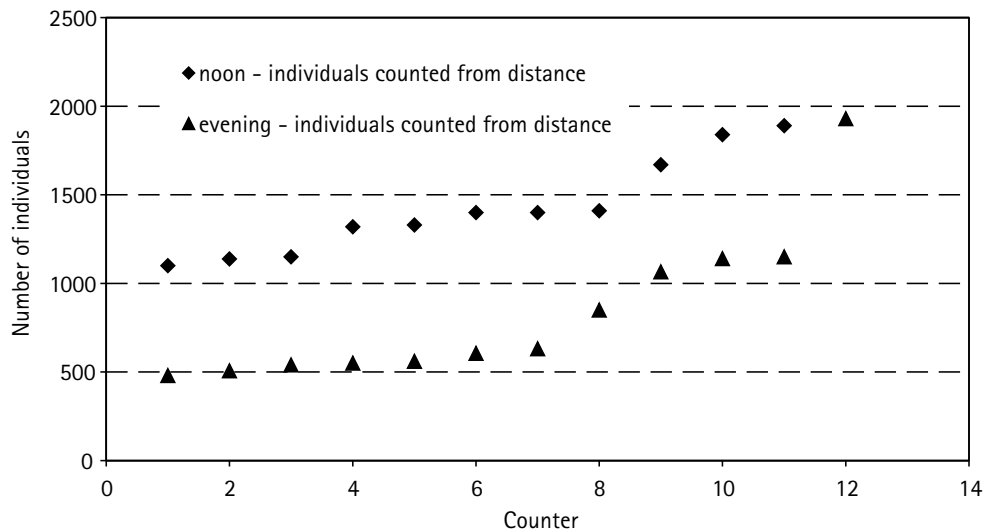


Figure 2:
Sandwich Tern counted
during noon and evening
hours (n = 13).

experiences made during the past QAM, the following recommendations shall help to refine future QAM and shall concentrate on still open questions and species-habitat-situations.

General recommendations for future QAM

Exact instructions

In the standard variation of the results, systematic and stochastic errors cannot be separated. To exclude external influences as much as possible and to minimize the systematic error the counting conditions should be exactly explained for every QAM participant. Those are: clear instructions on how to carry out the count (observation points, time taken for counting, field protocol etc.), clear delineations of counting areas (borders of census plot, birds to be included and not included etc.), count of individuals (Method F) mandatory besides the estimation of pairs (Method E), optic used, repeated counts (if applicable).

Protocol

For each QAM count the counting conditions, the number of participants, the time of day, the status of the tide, the instructions given to the participants and any extra observations should be written into a protocol; protocols should be summarized in a short report.

"Control numbers"

Future QAM should preferably be conducted where "control numbers" exist, and those should be researched as close as possible to the QAM date. The persons who provided those numbers should participate.

For colony species, aerial and nest counts shall be used as "control numbers". For non-colony counts, the results ("counted individuals" and "estimated pairs") of the "experienced counters" most familiar with the plots shall be used. Even better as "control numbers" could be nest counts conducted just before the QAM (for method, necessary precautions and limitations of nest counts see Exo et al. 1996, Wilkens & Exo 1998).

Experienced participants

To facilitate and refine the analysis of the results, it is recommended to involve mainly "experienced counters" or classify the counters according to their own estimate, because the methods instead of the individual counter should be tested.

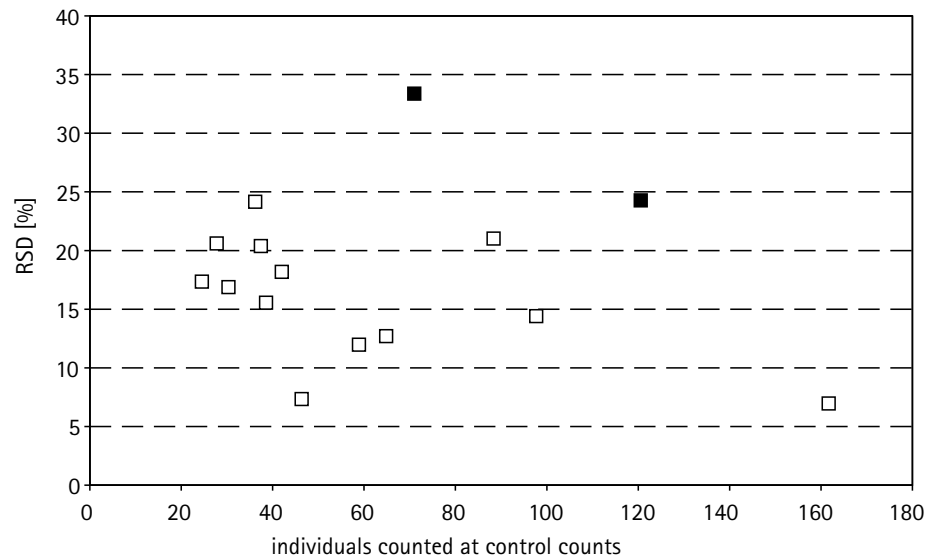
Recommendation for particular situations

Colony species – stochastic counting error

It is recommended, to conduct more QAM counts of medium to large colonies; thus, one should be able to draw more conclusions for additional species. Different methods of counting can be assessed for their particular stochastic counting errors. Of interest are especially those applicable in the standard monitoring. E.g. it would be of interest, whether:

- the counting of birds in flight can be improved if up to three persons synchronously count different parts of a colony;
- the numbers improve / RSD decreases, when persons are better informed about the area,
- the numbers improve / RSD decreases, when persons invest more time into the counts,

Figure 3:
Counts of Oystercatcher
(non-colony species): RSD*
in relation to the number
of individuals at the plot;
 results of 15 counts (black
 squares: results from very
 large census plots).
 * RSD = ratio of standard
 deviation over mean (see
 "Material and Methods").



- the repetition of counts does influence counting results,
- the factor to calculate "breeding pairs" from "counted individuals" is subject to counting conditions or size of the colony.

Colony species – potential systematic errors due to different methods

Large and medium colonies are best counted from the air if the conditions (habitat type, area of the colony) are suitable and certain methods are followed. Since neither aerial nor nest counts are subject of QAM, it is recommended that, for both those methods, the counters invest some time and effort in testing and examining their own results in regular intervals.

For colony ground counts recommendations for future QAM are:

- include more medium size colonies in the counts, from which "nest" or "aerial" counts are available, preferably as close as possible to the QAM date;
- test the factor (to be multiplied with the "counted individuals") applied in the standard methods, using nest counts for the estimation of the breeding pair numbers;
- analyse whether cases of under- or overestimations can be attributed to certain conditions (habitat, visibility, size of colony, species).

Non-colony species – stochastic counting error

In general, the recommendations are the same as those for "Colony species – stochastic counting error" (see above). More QAM are needed to assess counts for species other than Oystercatcher.

In future QAM, it should be tested whether the RSD can be narrowed down by improving the counting instructions (see above).

Non-colony species – potential systematic errors due to different methods

From the discussions during the QAM, it seems that – with regard to counting plots with non-colony species – even the experienced counters do not always have the same opinion of which birds to include into a count. Thus, frequently birds at the border of the counting plots, especially towards the sea (mudflats) are not counted by some and counted by others, leading to high variance in the results. To minimize this systematic error, in particular the definition of the census area as well as which birds to include into the count need to be stated more precisely.

Further recommendations

Here I will briefly mention some topics which came up during the analyses and discussions.

- QAM results for the less numerous or less conspicuous species such as Ringed Plover, Redshank or ducks show large variations. Future QAM could take this topic into account by instructing the participants to pay equal attention to numerous and less numerous species. Extra counting efforts could be initiated such that after counting the numerous species an extra round is carried out for counting less numerous species.
- In many coastal areas and salt marshes the vegetation is growing higher because grazing by cattle or sheep has been decreased or

phased out completely. For most species, but especially for Redshank or duck species, numbers are grossly underestimated if the plot is just spotted from the dyke. In future QAM, one person could walk through the plot while the participants keep counting from outside the plot. Clearly, aspects of protection of birds, nests and juveniles should be obeyed. These data could test, whether walking through the plot increases counting results and whether the RSD increases due to confusion of counted and non-counted birds.

- Clearly, the "number of breeding pairs" is the number of interest for monitoring efforts. Counters are asked to estimate the "number of breeding pairs" using certain rules (Method E in Hälterlein et al. 1995). The question is: does the "estimation of pairs" introduce more variation into the data? So far QAM results show, that the values of "estimated pairs" do not have a higher variation than the values of "counted individuals". Future QAM data should help to further investigate this hypothesis and thus provide both numbers – "estimated pairs" and "counted individuals".

Concluding remarks

The Quality Assurance Meetings present some pioneer work in coastal breeding bird monitoring. Some meetings and experiences were necessary to become aware of the complexity of the task. The first analyses of their results presented here make evident that for the QAM standardized instructions and a thorough protocol should be kept to further improve these quality assessments.

Acknowledgements

Thanks to all organizers and participants of the Quality Assurance Meetings, spending additional free time to make those comparative counts possible and be willing to test their own counting results. Bernd Hälterlein, Lars-Malthe Rasmussen, Martin Schulze-Diekhoff and Ole Thorup did provide some additional data. Thanks to Lieuwe Dijkse, Bernd Hälterlein, Kees Koffijberg, Karsten Laursen, Lars-Malthe Rasmussen, Petra Potel, Bettina Reineking and Peter Südbek for comments on several drafts.

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Dragonets

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Three Callionymid Species (Dragonets) Inhabit the Wadden Sea

Dragonets belong to the most colourful fishes living in the German Bight and North Sea. However, only a few people may have the chance to see some of them: biologists and fishermen using small meshed nets. Whoever else wants to see their colours should look into the books, e.g. Muus & Nielsen (1999). The species are comparatively small, live mostly on the bottom and seem to be not very abundant in our waters. They are also prey of cod and other predatory fish, which are now rare in our waters. May be that is the reason,

latus almost vertical parallel, which is not, i.e. wrongly reflected in Muus & Nielsen (1999). They are therefore easily confused.

The German „Atlas der Fische im schleswig-holsteinischen Wattenmeer“ (Vorberg & Breckling 1999) contains two species: *C. lyra* and *C. maculatus*, but the sketch of the latter one is clearly showing *C. reticulatus*. It may be the first hint that this third species, which has never been reported so far east of Helgoland, lives in the Wadden Sea as well. For *C. maculatus*, which is more frequently caught during other surveys in north-westerly, deeper waters off the Wadden Sea islands, the areas reported by Vorberg & Breckling (1999) seem rather remote, though the sizes mentioned fit the species size distribution.

Thorough checks of callionymid fish specimen, caught during DYFS campaigns in recent years, ap-

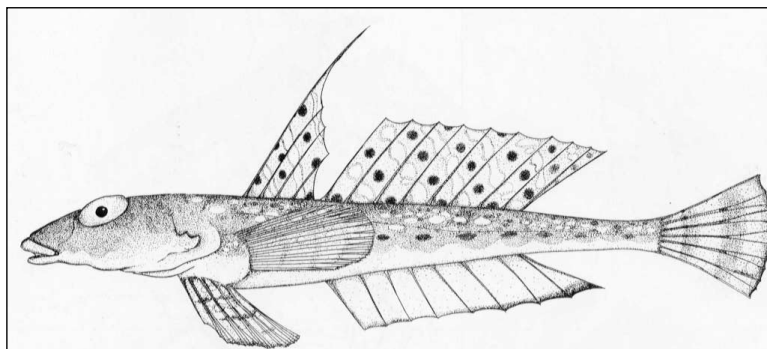
plying morphological different features as well have revealed that *C. reticulatus*, that has never been reported from the German Wadden Sea region, is indeed present there. Besides coloration and morphometric differences the presence (*C. maculatus*) or absence (*C. reticulatus*) of the fourth, though small preopercular spines, pointing forward on the opercula, helped to recognise the third species and gave a true and new regional record. A scientific paper is accepted and will be published soon in the Journal of Applied Ichthyology.

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Figure of *Callionymus maculatus* (which shows *C. reticulatus*) from Vorberg and Breckling (1999).



while they seem to occur more often in the hauls of the demersal young fish survey program (DYFS) of the German Fisheries Research Centre.

Many of the older reference books show only two species, while the recent one mentioned above contains now three for the North Sea out of approx. 130 species inhabiting the oceans: Dragonet (*Callionymus lyra*, max. length 30 cm, living in shallow waters down to 200m on muddy to sandy grounds), Spotted Dragonet (*Callionymus maculatus*, max. length 14 cm, preferring slightly deeper waters down to 300m and sandy bottom) and the Reticulated Dragonet (*Callionymus reticulatus*, max. length 10 cm, preferring clean sandy grounds down to 40m). As only the males show distinct, bright colours and patterns, while the females are smaller and exhibit a less structured and brownish appearance, it is sometimes a problem to distinguish between the species especially between small specimens. Another problem among the males of *C. maculatus* and *C. reticulatus* are their spots on the second dorsal fin. Both have them, though with a different pattern: *C. maculatus* horizontally parallel, *C. reticu-*

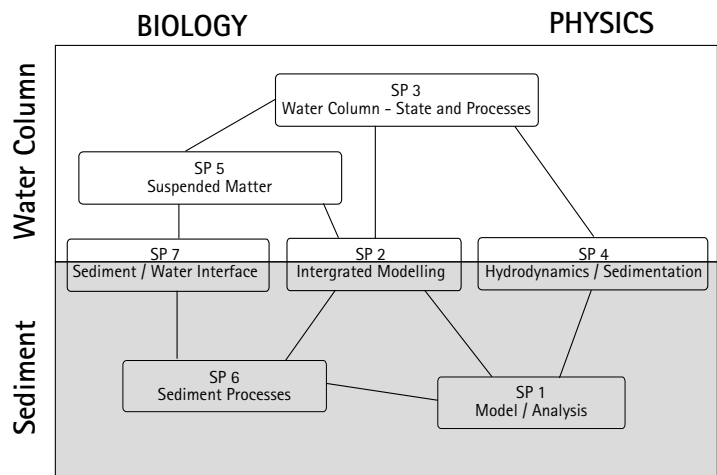
BioGeoChemistry of Tidal Flats

A DFG Research Group

The Research Group on *BioGeoChemistry of Tidal Flats* was installed by the Deutsche Forschungsgemeinschaft (DFG) in April 2001. It is devoted to perform fundamental research in the backbarrier area of the island of Spiekeroog. As outlined in the figure, a total of seven subprojects deals with water column and sedimentary processes as well as modelling. Besides the Institute of Chemistry and Biology of the Marine Environment (ICBM) at the University of Oldenburg - as the leading organization, the Max Planck Institute for Marine Microbiology in Bremen, the Senckenberg Institute and the Research Center Terramare, both in Wilhelmshaven, are involved in the project.

The investigations of the Research Group aim at a fundamental understanding of important biogeochemical processes in tidal flat systems. For this purpose, chemical and biologically mediated transformations on water-column-suspended particles, at the sediment-water interface and in the sediments themselves are investigated. Taking into account the hydrodynamic conditions, the influence of these different processes on material budgets will be determined. The data sets obtained encompass elemental distributions, especially those of manganese and iron as redox-sensitive elements, phospholipids, biomarkers such as hydrocarbons, fatty acids or steroids and inorganic nutrients. Biological data include bacterial numbers and activities both in the water column and in the sediment.

An important tool is the time series station in the Otzumer Balje, the tidal inlet between the islands of Langeoog and Spiekeroog. Here, CTD as well as ADCP systems are and will be installed to obtain high temporal resolution data. This system also allows for taking water samples at different water depths. As it can withstand both adverse wave and ice conditions and is equipped with a shelter, intense winter sampling should provide data that allow to elucidate the importance of wintery import and export processes. Regular monthly sampling both in the drainage area of the deep discharging from land into the Spiekeroog backbarrier area and the tidal channels and flats provides the necessary long-term data whereas high areal and temporal sampling rates emphasize the role of short-term processes.



From the data obtained a mathematical ecosystem model of the biogeochemical processes in the tidal flat sediments and at the sediment-water interface will be developed. On a higher level, a material budget will be established for a selected tidal flat area on the East Frisian North Sea coast (backbarrier tidal flat of Spiekeroog island). The results of experimental sediment transport studies will be described mathematically with a hydrodynamical model. In addition, a tight coupling of methods for analyzing nonlinear dynamic systems with ecological aspects will be used to reveal how spatial, temporal and/or spatio-temporal structures are formed due to nonlinear interactions of chemical and biological transformations, diffusion and advection. This technique will also be employed to determine whether exceeding a critical threshold leads to the spontaneous formation of new structures or dynamics. With this fundamental methodological contribution to the field of integrative modeling, the Research Group takes a significant step forward to the development of a comprehensive mathematical model of tidal flat systems which, beyond the initially selected study area, should also be applicable to other tidal flat areas and similarly complex systems. The work of the Research Group is based on the results of various past ecosystem research projects in the same coastal area, but in the analysis of the material budget and particularly in the integrative modeling it will, due to the innovative methodological concepts applied, break new scientific ground.

Further information: www.icbm.de/watt/eng_index.html

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NAME Project

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Interaction Between Nitrate-Bearing Groundwater and the Marine Ecosystem

Introduction to the NAME Project

High amounts of nutrients leaking from areas with intense agriculture characterize large parts of Europe. It is well-known that periods of eutrophication in our coastal waters cause algae blooms, deterioration of water quality, disappearance of biological niches, and derived declines in species variety and seafood production. Most of the nutrients presumably reach the sea via rivers and streams, but an unknown quantity reaches the sea through the seabed as nitrate-bearing groundwater.

The overall task of the EU-financed project NAME (an acronym for: Nitrate from Aquifers and influences on the carbon cycling in Marine Ecosystems) is to resolve the importance of this nutrient input from nitrate-bearing groundwater. In the project, six institutes from four different European countries participate. The project has a duration from 2002 to the end of 2004 and is financed by the European Commission with a grant of approximate 1.7 M Euro.

Project Objectives

At present it is not possible to state a scientifically reliable explanation of the nitrate flux to the marine ecosystem through the leaking groundwater. There are no quantitative studies of the physical and chemical processes involved in the groundwater leakage through the sea bed. The NAME Project integrates the groundwater system with the marine ecosystem with a view to exclude the unknown interactions between the carbon and the nitrate cycles that arise in a complex coastal

environment that is influenced by groundwater leaking through the sea bed. The information and experience obtained through the NAME Project will later be used to develop the procedures now lacking to secure the future monitoring of leaching nutritive salts that is directly linked to the groundwater leaching from the sea bed.

The Field Site

The site studied through this project is close to Hjerting in Denmark in the northern Wadden Sea. The location is sheltered by Skallingen and has a beach fronting Ho Bay. This site was chosen for the project part because the groundwater at multiple test sites at this location is influenced by nitrate leaching and part because the groundwater reservoir that leaks groundwater directly to the marine ecosystem. This groundwater reservoir consists of Pleistocene sands that are as thick as up to 30 meters. The reservoir floor is fat impermeable Pleistocene age clay.

Participants

The project is a highly multi-disciplinary project combining a broad selection of scientific disciplines. The project is headed by Environment & Resources at the Technical University of Denmark, which is also responsible for the groundwater geochemistry and modelling. Ribe County represents the end-user and is responsible for the hydrogeology. The University of Lausanne carries out the geophysics to clarify the geological structure and the fresh/seawater distribution. The Netherlands Institute of Ecology studies the denitrification in the marine environment and biogeochemical process modelling. The Max Planck Institute for Marine Microbiology studies the biogeochemical processes related to the organic matter degradation in the marine environment. Finally DHI Water & Environment will perform integrated modelling of groundwater reactive transport and marine ecosystems.

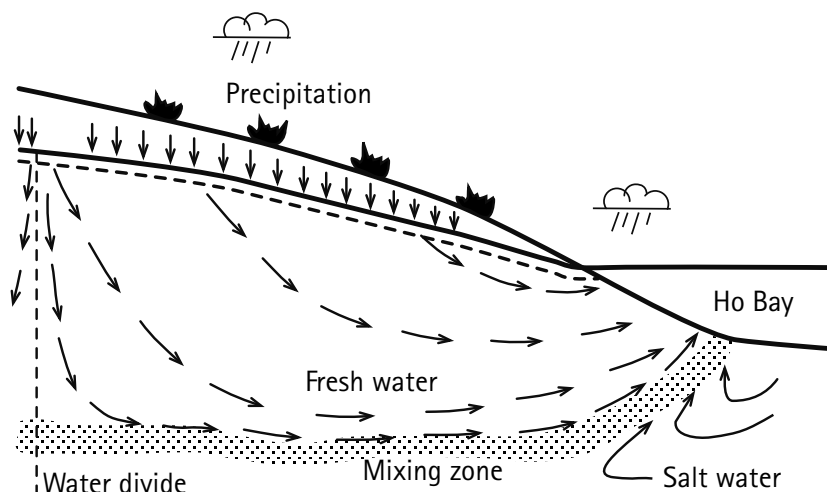
Further information

Project website: www.natur.ribeamt.dk/name
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Figure 1:
Nitrate-bearing groundwater infiltrates from areas with intense agriculture and discharges through the shoreface and seabed.



From Baltimore to Durban – The Wadden Sea in an International context

Jens Enemark, Secretary,
CWSS

Observations from international conferences.

The 5th IUCN World Parks Congress was held in Durban, South Africa, 8–17 September 2003. The World Parks Congress' are held every 10 years and is the major global event for policy makers, managers and scientists of national parks and nature reserves world wide. The theme of the 5th Parks Congress was "Benefits beyond boundaries". It reflected the current world wide shared understanding that protected areas can only be managed effectively within a broader social and economic context. At the World Parks Congress in 1992 in Caracas the world looked somewhat different. The emphasis was much more on the management of the protected areas and on the preservation of pristine nature areas.

Much more emphasis was also laid on the protection and management of coastal areas and oceans in Durban compared to the Caracas meeting where this aspect was only dealt with to a very limited extent. On the initiative of the of the IUCN World Commission of Protected Areas-Marine the whole complex of protection and sustainable management of coastal areas and oceans was a cross cutting theme in the workshops organized in Durban. The driving forces behind this initiative were Charles Ehler, director, International Program Office of the National Oceanic and Atmospheric Administration (NOAA), USA and vice chair of the IUCN Commission and Biliiana Cicin-Sain, director at the Center for the Study of Marine Policy at the University of Delaware, USA.

Starting in Baltimore

A key workshop within the marine theme was the discussion of the principles and guidelines to incorporate marine protected areas (MPAs) into integrated coastal and ocean management. These principles and guidelines had been prepared at a workshop in Baltimore in July 2003, held in advance of the biannual Coastal Zone Management conference. The workshop was held on the initiative of NOAA and the University of Delaware and encompassed presentations of case studies from marine protected areas world wide. I was invited to present the Wadden Sea as an example of a trans-boundary management in relation to protecting and managing a coastal area.

Not surprisingly there were large differences in the conservation and management issues be-

tween areas of the developing and the developed world. Presentations from the developing world included case study presentations from a.o. Mexico, Kenya and the Philippines. Not surprisingly but important to be reminded of is the fact that the management issues in these parts of the world are very much related to securing food for an ever increasing population which produces such goods in an environment in which there is a lack of financial resources, knowledge and good governance, while at the same time conserving ecosystems.

The case studies from the developed world included the Florida Keys, the Great Barrier Reef and the Wadden Sea. In comparison there is hardly any lack of resources, knowledge and governance. The Great Barrier Reef and the Wadden Sea are among the world's largest and best managed ecosystems. For both areas an important issue is how to manage such marine protected areas in a larger context and how to appropriately address the external impacts on the area. The Great Barrier Reef Marine Park Authority has just lately been able to introduce a new government policy on improving the water quality on the Reef by a new watershed management, a policy that has not existed so far.

Ending in Durban

In Durban, the exercise in Baltimore was more or less repeated, but for a larger and much broader audience. The Great Barrier Reef and the Wadden Sea were again given the opportunity to demonstrate their world-wide uniqueness and comprehensive management approach as a model for other areas. On the basis of the input of the Baltimore workshop, three overarching principles associated with a number of guidelines were discussed in Durban:

- strengthening the linkages between the MPAs and the wider coastal and marine area,
- developing governance arrangements to incorporate MPAs into the broader framework of coastal management and,
- fostering implementation of MPAs through enhanced policy and management tools.

The principles were lively discussed by the audience. It was agreed that on the basis of the input in Durban the principles and guidelines should be elaborated further in the framework of the IUCN Commission.



A 50 meter broad public beach in Connecticut – public, if you have a permit (Photo: Enemark).

The discussions in Durban on this issue and other marine themes have clearly demonstrated that there is a need to focus on the state and management of our coastal areas and oceans. Undoubtedly, they are currently the most endangered ecosystems because of in many cases unsustainable impacts and uses. The management of oceans and coastal areas are furthermore complex in terms of the available instruments and competencies. The challenges are great but it is necessary to meet those in time and within the next generation.

And further across the USA

I also participated in the Coastal Zone 03 (CZ 03, pronounced "seeset" by insiders). Since the adoption of the Coastal Zone Management Act in 1972, the world's first coastal zone management act, coastal managers in the most broadest sense from primarily the states but also from abroad meet biannually to exchange information and discuss issues related to coastal management. The CZ is an information market place with many interesting, but also uninteresting, workshops and plenary meetings. This time it was about coastal management through time. An excellent example of coastal and estuary management in the States is the Chesapeake Bay, the largest estuary in North America. Since Baltimore is located at the estuary it was natural to present progress and future plans. The Chesapeake Bay Program is the most advanced and costly estuary program in the USA using more than 50% of the estuary programs in the States. The Chesapeake 2000 Bay program which is an agreement between the federal government and the states in the watershed aims to further protect and restore the Bay and its rivers by address-

ing 5 key areas, e.g. improving water quality and encouraging sound land use. The Chesapeake Bay Program has an excellent website <http://www.chesapeakebay.net>. CZ, an inspiring and motivating event.

I further visited the internationally renowned Coastal Resources Center (CRC), University of Rhode Island in Narragansett, Rhode Island and gave a lecture on the Wadden Sea "program" as it is mostly depicted in the states. The CRC are conducting coastal management projects world wide but primarily in the developing countries and educating new coastal managers. Its inspiring director Stephen Olson informed me that CRC is currently carrying out a comparative study of the management of three large coastal ecosystems that have evolved to be able to successfully address the issues they are facing in their ecosystems, namely the Chesapeake Bay, the Great Barrier Reef and the Wadden Sea. The study will be available in 2004 and is meant to also be an inspiration for coastal managers world wide. An interesting piece of information at the end of an interesting journey.

And I finally understood why the issue of public access to beaches in the states is such a big issue amongst coastal managers. Practically the whole coast is private property up to the mean low water mark. I only found one public beach on a 200 mile travel along the coast, and access was only possible with a specific permit and a huge parking fee.

Jens A. Enemark

Common Wadden Sea Secretariat

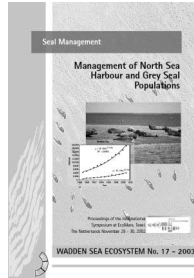
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Seal Management

CWSS 2003. Management of North Sea Harbour Seal Populations. Proceedings of the International Symposium at EcoMare, Texel, The Netherlands, November 29 - 30, 2002. Wadden Sea Ecosystem No. 17. Common Wadden Sea Secretariat, Wilhelmshaven, 63 p.



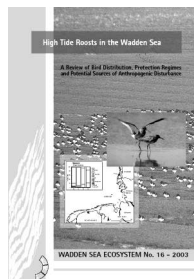
At the International Symposium at EcoMare on Texel, new research developments with regard to management of harbour and grey seal populations were discussed in relationship to the trilateral Seal Management Plan 2002 - 2006, which was adopted at the last Ministerial Wadden Sea Conference in Esbjerg in 2001. The participants addressed management policies for the seal populations as well as the role of research, information, education and seal rehabilitation.

During the preparation of the symposium, the second outbreak of the PDV epizootic among harbour seals occurred. First research results of this outbreak were included in the symposium.

Copies can be ordered at the Common Wadden Sea Secretariat (info@waddensea-secretariat.org, EUR 6 + mailing costs)

Roosting Birds

Koffijberg, K., J. Blew, K. Eskildsen, K. Günther, B. Koks, K. Laursen, L.-M. Rasmussen, P. Potel, P. Südbeck, 2003. High Tide Roosts in the Wadden Sea. A Review of Bird Distribution, Protection Regimes and Potential Sources of Anthropogenic Disturbance. A Report of the Wadden Sea Plan Project 34. Wadden Sea Ecosystem No. 16. Common Wadden Sea Secretariat, Wilhelmshaven, 120 p.

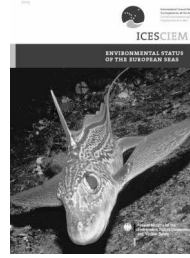


The report is published by the TMAP Joint Monitoring Group of Migratory Birds in the Wadden Sea (JMBB) and addresses the Wadden Sea Plan Project 34 regarding high tide roosts in the Wadden Sea. The aim of the project, which was carried out under the leadership of the Netherlands, was to investigate the status of high tide roosts for migratory waterbirds in the trilateral Wadden Sea in relation to the necessity of undisturbed roosting sites for these species. The report consists of a detailed overview of the distribution of waterbirds during high tide, and an inventory of protection regimes and potential sources of anthropogenic disturbance for each site.

Copies can be ordered at the Common Wadden Sea Secretariat (info@waddensea-secretariat.org, EUR 6 + mailing costs).

Environmental Status of the European Seas

ICES 2003. Environmental Status of the European Sea. A Quality Status Report prepared by ICES for the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. 75 pages.



As a basis for the first joint meeting at the OSPAR and HELCOM Commissions in Bremen in June 2003 and to inform the public, a report on the status of European Seas has been prepared by ICES and the German Federal Environmental Ministry.

In four sections, the authors provide an overview of the individual areas, the status of the seas with regard to, a.o., biodiversity, habitats, fish stocks, seabirds and marine mammals, human impacts on marine biodiversity and a summary of key messages with regard to climate change, fisheries, nutrient enrichment, contaminants, shipping, coastal zone and marine biodiversity.

The report can be downloaded at the ICES Homepage (<http://www.ices.dk>).

Lights at the Horizon

Voss, J. 2003. Lichter am Horizont – Leuchttürme zwischen Tag und Nacht. Edition Maritim, Hamburg, 144 p, EUR 22,90, ISBN 3-89225-482-6.



Lighthouses are part of the culture of the coasts of the world. Beside typical landmarks or steeples they have always served as navigation points in dangerous coastal waters. This function has nowadays become less important and navigation systems like GPS has taken over this role. Several lighthouses have already been switched off. Nevertheless lighthouses have a charisma attracting water-based observers and landlubbers likewise.

Jürgen Voss has gathered more than 100 lighthouse pictures along the coasts of the world shown on a fascinating colour picture during the "blue hour" around twilight. Every lighthouse location is shown on a map together with geographic position, navigational identification and height together with the year of construction and specific aspects of each building. This book will fascinate each of you who belongs on the coast and feels the cultural aspects of its landscape. It is a nice present for friends of coastal waters as well as sailors and skippers. Hopefully this book will highlight the value of lighthouses along our Wadden Sea coast and their strong relationship not only to the shipping society but also for tourist purposes. (Martin Stock)

Calendar of Events

2004

Coastal Futures 2004: Review and Trends

21 - 22 January 2004, London, UK
 CMS, Coastal Management for Sustainability, SOAS, London, UK. Info: bob.earl@coastms.co.uk, fax: +44 (0)1531 890415, www.coastms.co.uk

World Wetland Day

2 February 2004
 Ramsar Website: www.ramsar.org

The Water Framework Directive – in the estuarine and coastal environment

3 March 2004, London UK
 CoastNET Conference. SOAS, London, UK.
 Info: bob.earl@coastms.co.uk, fax: +44 (0)1531 890415, www.coastms.co.uk

8th International Coastal Symposium – ICS

14 - 19 March 2004, Itajaí - SC - Brazil
 Universidade do Vale do Itajaí - UNIVALI. Centro de Ciências Tecnológicas da Terra e do Mar - CTT-Mar. Info: www.cttmar.univali.br/~ics200431

Quantitative Ecosystem Indicators for Fisheries Management

31 March - 3 April 2004, Paris, France
 The International Symposium will deal two major themes. An overview of the vast range of indicators of exploitation and state of ecosystems that are being developed for fisheries management from an ecosystem perspective. The second theme will cover the scientific basic for integrating indicators into an effective EAF. This comprises the evaluation of indicators, the definition of operational frameworks and the communication to stakeholders of inferences based on indicators.

Marine Sandwave & River Dune Dynamics II

1 - 2 April 2004, Enschede, The Netherlands
 International Workshop. University of Twente, Fax: +31 53 489+5377,
 E-mail: marid2004@ctw.utwente.nl,
<http://marid2004.utwente.nl/>

Integrated Coastal Zone Management: Fact or Fiction?

21 - 22 April 2004, Plymouth, UK
 Organised by University of Plymouth.
 Info: www.science.plym.ac.uk/pass.
 Contact Dr Rose Gillon, rgillon@plymouth.ac.uk

BaltCoast 2004 - Managing the Baltic Sea

26 - 28 April 2004, Rostock-Warnemuende, Germany, Info: Contact: T. Dolch, fax: +49 381 5197 211, Email: baltcoast@eucc-d.de, www.eucc-d.de/baltcoast2004/

Coastal Environment 2004

26 - 28 April 2004, Alicante, Spain
 Fifth International Conference on Environmental Problems in Coastal Regions, Info: <http://www.wessex.ac.uk/conferences/2004/coastalenvironment04/>

Reconciling Fisheries with Conservation: The Challenge of Managing Aquatic Ecosystems

2 - 6 May 2004, Vancouver, British Columbia, Canada, Fourth World Fisheries Congress.
<http://www.worldfisheries2004.org>
 The program contains over 40 sessions that address the most pressing issues in fisheries management in both freshwater and marine ecosystems, along with a special forum for interested industry representatives and non-governmental organizations.

European Water Framework Directive and Coastal Waters

13 - 14 May 2004, Leeuwarden, The Netherlands
 The international Wadden Sea conference is organized by the Dutch Wadden Sea Council (Raad voor de Wadden). Subjects covered include the opportunities and threats posed by the WFD for the Wadden Sea as a wetland, the administrative aspects of integrally implementing the WFD and the incorporation of the WFD in existing legal structures. Info: www.raadvoordewadden.nl, Wadden Sea Council, Postbus 392, NL - 8901 BD Leeuwarden, phone: +31(0)58 212 60 15.

24th EARSeL Symposium

25 - 27 May 2004, Dubrovnic, Croatia
 New Strategies for European Remote Sensing.
 Followed by Workshop: Remote Sensing of Land
 Use and Land Cover 28-29 May 2004.
 Info: <http://www.earsel.geosat.hr/>

5th UN International Children's Conference on the Environment

19 to 23 July, 2004, New London, Connecticut,
 USA
 Over 600 young people, ages 10 - 13, will study,
 deliberate, and publish their unique positions on
 Oceans, Rivers and Waterways; Living on the Edge
 of Extinction; Indigenous Healing Ways; and En-
 ergy Policy. Info: <http://www.icc04.org>

7th INTECOL International Wetlands Conference

25 - 30 July 2004, Utrecht, The Netherlands
 This conference will be organized by the Utrecht
 University under the auspices of the International
 Association of Ecology (INTECOL). It encompasses
 32 invited symposia and 36 sessions with con-
 tributed papers on a wide range of topics related
 to wetland ecosystem functioning, conservation
 and management, including coastal wetlands.
 Info: <http://www.bio.uu.nl/intecol>

Littoral 2004

19 - 22 September 2004, Aberdeen, Scotland
 Info: d.r.green@abdn.ac.uk / s.d.king@abdn.ac.uk,
 Website: www.littoral2004.org

Conference on Coastal Engineering ICCE 2004

19 - 24 September 2004, Lissabon, Portugal
 Info: www.icce2004.org

Annual Conference of the Inter- national Wader Study Group

5 - 7 November 2004, Papenburg, Germany
 The International Wader Study Group (IWSG, <http://www.waderstudygroup.org>) is an association of
 amateurs and professionals from all parts of the
 world interested in Charadrii (waders or shore-
 birds). The annual 2004 conference of the IWSG
 will be organised by the Institut für Vogelforschung
 "Vogelwarte Helgoland", Wilhelmshaven. The con-
 ference will start with two workshops on Friday 5
 November on "Coastal salt marshes throughout
 the world: Significance and mechanisms in life

histories of waders" and on methods for analys-
 ing bird populations. The Annual General Meeting
 and talks will take place on Saturday and Sunday,
 6 - 7 November. Info: <http://www.ifv.terramare.de/wsg2004>

Contact address: Gregor Scheiffarth, Institut für
 Vogelforschung "Vogelwarte Helgoland", An der
 Vogelwarte 21, D - 26386 Wilhelmshaven, Ger-
 many,
 phone: +49 4421 96890, fax: +49 4421 968955,
 email: gregor.scheiffarth@ifv.terramare.de

2005

International Conference on Coastal Conservation and Management in the Atlantic and the Mediterranean

17 - 20 April 2005, Vilamoura, Algarve, Portugal
 ICCCM2005 Secretariat, Tel: 351 966055637,
 E-mail: icccm2005_as@aeiou.pt
 Website <http://icccm2005.tripod.com>

First International Marine Protected Areas Congress

23 - 27 October 2005, Geelong, Australia
 The global conference will address the World Com-
 mission on Protected Areas' Marine goal and pri-
 mary themes, and will progress discussion on their
 widespread adoption and implementation consis-
 tent with resolutions relevant to marine protect-
 ed areas arising from the Durban World Parks Con-
 gress. Info: www.impacongress.org

Notes for Contributors

Contents

The Wadden Sea Newsletter is a trilateral periodical to inform scientific, nature management and policy-making institutions in Denmark, Germany and The Netherlands about research projects, their results, management measures and topical news in the Wadden Sea area.

Length and Structure

"Main theme" articles should be about 3 printed pages (about 1500 words with one figure on each page), short contributions of about one page (about 500 word with one figure) and brief notes are also welcome.

The "main theme" articles should include an abstract of 4 - 7 lines in easy English. The body of the article should be organized in sections with headings.

Only a few (2 - 4) recent references should be added to the contributions.

Example: Becker, P.H., S. Thyen & K.R. Schneider, 1998. Monitoring Pollutants in Coastal Bird Eggs. Wadden Sea Ecosystem No. 8, Common Wadden Sea Secretariat, Wilhelmshaven, pp 59 - 101.

Reference in text: (Becker et al. 1998) or (Beukema & Vlas 1979).

Authors are advised to consult this issue of the Newsletter and follow the conventions for section headings, tables, captions, references, addresses, quotation marks and abbreviations. (see also: <http://www.waddensea-secretariat.org>)

Language

The Wadden Sea Newsletter is published in English.

Format

A hard copy of the text, tables and figures and an electronic copy of the manuscript in WORD or RTF format should be submitted, either as a file attached to an e-mail (preferred) or on a diskette.

With the exception of species names (*italics*) the text should not contain any further formats (e.g. bold, underlined, hyphenation, justified setting).

Photos, Figures, Illustrations, Tables

Photos, figures and illustrations with useful captions and legends are welcome and should be included wherever possible.

Photos should be submitted as slide or photo print. Electronic versions of figures, illustrations and tables should be delivered in black and white (resolution 300 dpi at 9 x 13 cm) and as separate files in the program they have been created with, e.g. Excel, Freehand, CorelDraw or as an Adobe Illustrator format (or another format which can be edited).

Please, send your article to the

Common Wadden Sea Secretariat

Virchowstr. 1

D - 26382 Wilhelmshaven

e-mail: marencic@waddensea-secretariat.org

**Deadline for the next
Wadden Sea Newsletter
15 March 2004**