

## AN EVALUATION OF THE SEA AND COAST PROGRAMME II Durban, 4-7 July 2005

### Preamble

SANCOR's Sea and Coast Programme (SCP) was established in 1995 as a partnership between the Foundation for Research and Development (FRD, now the National Research Foundation, NRF) and the Department of Environmental Affairs and Tourism (DEA&T). The authors of this document were asked by the Chair of the South African Network for Coastal and Oceanic Research (SANCOR) Steering Committee to assess the achievements of The Sea and the Coast Programme Phase II (SCP II, 2001-2005). The assessment was based on the annual individual project reports (2001-2003), the executive summaries of the annual reports from National Science Foundation (NRF) to the Department of Environmental Affairs and Tourism (DEA&T) (also 2001- 2003) and the evaluation of the Sea and Coast phase I programme (SCP I) conducted in 2000. The Terms of Reference were set by the SANCOR Steering Committee as follows:

1. Evaluate the performance of the program in relation to its objectives and vision.
2. Appraise the development/history and focus of the programme in terms of the original objectives and the provision made for needs and opportunities as they emerged.
3. Evaluate the efficiency and effectiveness of the structure, management, administration, monitoring and marketing of the programme with specific reference to the roles of the respective stakeholders and the MSET research community.
4. Were the stakeholders mandates met i.e. Marine and Coastal Management and the National Research Foundation?
5. Was the Sea and Coast II Programme successful in being driven by a "bottom-up" mechanism rather than a "top-down" one?
6. Has the Programme through its four thrusts effectively fully encompassed both applied and fundamental research and has the various projects and outputs within this programme been characterised as adopting a problem-solving approach?
7. Make recommendations regarding the future focus and scope of the MSET research programme.
8. General comments.

The evaluation process was conducted over four days, coinciding with the 12<sup>th</sup> Southern African Marine Sciences Symposium (SAMSS 2005) in Durban. Given the limited time available and late arrival of supporting documentation the evaluation was not an in-depth assessment of the projects within the programme, and rather focused on providing a general assessment and some suggestions for the planning of phase III of the SCP. Suggestions to improve and facilitate future assessment procedures are also provided.

### General assessment

The evaluation panel commends the South African marine science community for their continued support to the SCP over the last decade. This support demonstrates the desire of the marine science community to work together, across Institutions and research interests, to maximise its human and financial resources. The financial support of the NRF and DEA&T also reflects the realisation that the programme contributes significantly to the generation of national synergy in marine scientific research.

In summary, the panel found that the research was of good quality, although the projects are largely descriptive and do not necessarily incorporate cutting-edge science. The number of important publications is impressive, although it would be more informative for the evaluators to distinguish between the publications coming directly from the project and those coming from the research teams in general. To some extent research findings are transferred to the relevant groups that could benefit from them (industry, management bodies, general public), although this transfer is uneven across the different scientific thrusts, as reflected in other sections of this report. In summary, and taking into account the level of funding invested, the Sea and Coast programme provides excellent value for money.

One of the most evident successes of the SCP II has been the training of students from previously disadvantaged backgrounds. In recent years this student group has contributed about half of the total number of MSc and PhD students. The transformation of the marine science community, particularly at the level of young scientists, has been evident to the panel through the past few SAMSS symposia. In this sense the SCP has achieved SANCOR's original intention to address South Africa's Reconstruction and Development Programme (RDP). However, there are concerns over the ability to recruit new students into the field given the limited long-term opportunities available to them. The panel suggests a strengthening of the post-doctoral research programme, in order to retain graduates and bring new scientific impetus into the community. In this context the panel notes that, in the 2002 SCP report from NRF to DEA&T, SANCOR was asked to initiate long-term plans for corrective action to retain young scientists. The development of a post-doctoral programme would contribute to this goal. In addition, increasing the exposure of young scientists to international conferences and research teams is an essential principle in ensuring long-term commitment of young graduates.

However, the evaluators detected a progressive loss of scientific leadership and vision over the two phases of the programme. The SCP is managed by the Conservation and Management of Ecosystems and Biodiversity Focus Area of the NRF (incidentally, no representative of this body was available during the evaluation process). A Joint Venture Advisory Committee (JVAC), consisting of representatives of the investors, chairpersons of the different NRF advisory panels and the chairperson of the SANCOR steering committee, considers progress and funding needs of the programme. In the past each thrust had an appointed Chair that provided some cohesion and coordination. However, the role of the thrust chairs seems to have been lost over the second phase of the programme and, in the absence of a scientific steering committee, it is unclear who actually provides scientific leadership and coherence. The panel recommends that this issue be addressed urgently before launching the third phase of the Sea and Coast programme.

One of the immediate consequences of the loss of scientific leadership is the fact that the SCP II is not a coordinated, goal-oriented research programme but a collection of independent research projects, selected on the basis of a number of criteria. Furthermore, there are two very different types of projects funded under the programme. On the one hand there are projects that tackle specific research questions and generally support small teams with very limited funding, and on the other hand big projects that use the SCP funding to support a large collection of students in large University departments under broad and diverse research agendas. The latter absorbs the bulk of the funding. This division is probably the result of funding shortages in the past that has forced the community to fit its activities in a structure that is functional but increasingly dispersed.

The panel appreciated the original vision in the SCP I in support of inter-disciplinary research across the natural, social and economic sciences, incorporating local knowledge and promoting the involvement of marginalised communities in the research. However, this vision remains largely unrealised, as noted in the review of the SCP I. With some exceptions, the incorporation of social and economic science appears has been done as an add-on to natural science-driven projects or for cosmetic reasons. To achieve the same inter-disciplinarity that marine research across the natural sciences enjoys, a serious attempt to engage social and economic scientists needs to be implemented. The same challenge has been addressed internationally through, for example, the creation of scientific seminar series that address specific inter-disciplinary topics, with a view to promote new and innovative research.

It is noted that the international collaborations of SCP are limited to links developed by individual scientists. While keeping to the research needs of the country lessons could be learned from similar funding initiatives in other parts of the world. The crucial role of international collaboration in the development of scientific research needs to be fully understood by the SCP investors.

As a final comment we would like to state that we found it difficult to review the programme in such a short time. The documents were sent to the referees shortly before the conference, and much of the information was not available in a clear and summarised form. The reports of the projects often provide a summary of the activities of whole working groups or research teams and it was impossible to distinguish between activities strictly under The Sea and the Coast Programme and those from other independently-funded sources. We therefore recommend putting more emphasis on the review process. A programme of SCP size and value should be

reviewed in a separate workshop where reporting by grant-holders is based on the same terms of reference that are given to the evaluators.

### Funding issues 2001-2003

An assessment of the funding allocations over the first three years of SCP II reveals that most of the budget has been used to fund the running expenses of the research and student bursaries (Figure 1). Very little funding has been invested in post-doctoral scholarships, while equipment, staff development and research assistance have enjoyed virtually no funding. The panel is concerned that this funding structure is inadequate to develop and implement new scientific approaches and ideas, which require, for example, new equipment. Funding for staff development needs, including significant support for a post-doctoral programme, is also necessary to retain graduates and to bring in international scientists capable of strengthening and invigorating the research. The panel notes that the funding for 2003 has increased substantially from previous years (Figure 1). However, the additional resources are exclusively reflected in running expenses for projects in the thrusts Biodiversity and Sustainable Marine and Coastal Resources. The reasons for this change are unclear to the panel.

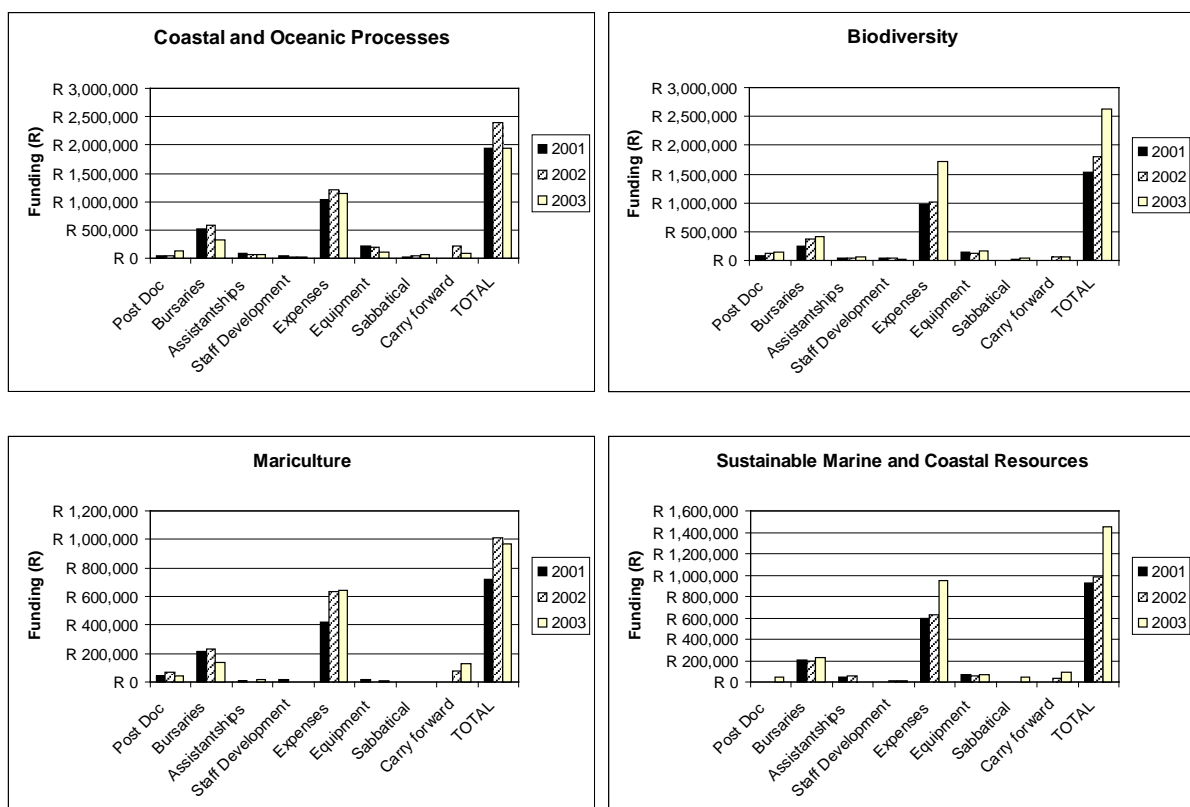


Figure 1. Funding allocations for the four thrusts of the SCP II over the period 2001-2003.

### Student bursaries (2001-2003)

The SCP II has been supporting around 140 BTech/Hons, MSc and PhD students per year over the last four years (Figure 2). There is a healthy ratio between students completing their degrees and new students, reflecting the excellent role of the programme in educating a new generation of marine scientists. However, without adequate matching information we were unable to assess the level of post-graduate degree completions. Approximately half of the students were from formerly disadvantaged backgrounds and half were women, achieving the SCP targets in this regard. Over 80% of these students were South African, while a large proportion of the rest belong to SADC countries.

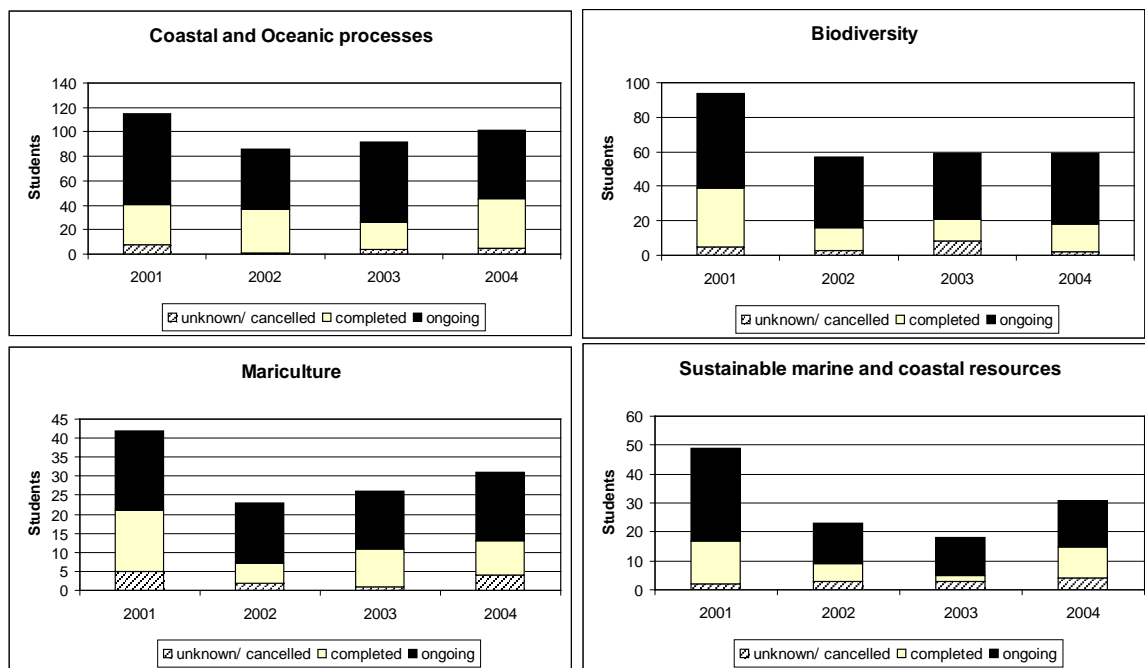


Figure 2. Number of BTech/ Hon, MSc and PhD bursaries supported through the SCP II (2001-2004), per thrust. Ongoing reflects new entrants and existing studentships for a given year.

### Addressing Terms of Reference

The following sections address specifically the eight ToR posed by the SANCOR Steering Committee to the evaluation panel.

1. Relate the performance of the programme to its needs, i.e. to what extent were the original objectives and the overall vision addressed? Furthermore were the challenges identified by the review of Sea and Coast I Programme and those identified by when drafting the Sea and Coast II Programme met?

The aim of the Sea and Coast II was to "provide information, advice and training in support of optimal and sustainable use and development of our sea, coast and estuaries". At the JVAC meeting of November 2001 it was concluded that the Sea and Coast II programme lacked research coordination and cohesiveness, and a number of workshops were held to improve its focus and structure. Seven thrusts were reduced to four thrusts with the Biodiversity and Mariculture thrusts remaining intact. The Coastal and Oceanic Processes thrust resulted from a merger of two original thrusts: Coastal Processes and Ocean Dynamics, and the Sustainable Marine & Coastal Resources thrust resulted from the merger of the Resources for the Future, Innovative Technology and Tourism and Development thrusts. The workshops defined new scopes and outcomes for the thrusts, and these were used in this evaluation to update the original material in the April 2000 description of the Sea & Coast II Programme.

The outputs of all the thrusts have resulted in some excellent scientific publications, but this contribution has been uneven across the thrusts. However, it is difficult to separate the overall production of the research teams from the specific achievements of the projects themselves. In the majority of project outputs are not pulled through to management and policy level, probably because they address narrow questions at the expense of the broader knowledge needed to modify or develop management applications. The reputation that South Africa has in terms of inter-institutional and inter-disciplinary research in coastal and oceanic waters is evident in the proposals, although efforts to incorporate social and economic research have been largely unsuccessful. The

most evident result of the Sea and Coast II programme is the contribution it has made in terms of student capacity building, with considerable efforts to re-dress imbalances in the past in terms of race and gender in the student body.

## **2. Appraise the development/history and focus of the programme in terms of the original objectives and the provision made for needs and opportunities as they emerged.**

The Coastal and Oceanic Processes thrust resulted from a merger of two original thrusts: Coastal Processes and Ocean Dynamics. The scope of these two original thrusts was defined in April/ May 2002 workshops to include nine topics. From an examination of projects pertaining to the various topics it can be concluded that The Sea and Coast II, particularly in 2001 and 2002, has placed a large effort on near-shore research. This includes not only the large number of projects on estuarine dynamics, but also a number of efforts on the dynamics of sandy beaches, intertidal and surf beach communities. In this regard Sea and Coast II has particularly addressed the biological research needs of coastal zone management, but not so much other management needs identified in the initial planning reports. Some of the research areas identified in the 2002 planning workshop as needing implementation, like oceanography of seamounts and continental slopes and deep water resources or fisheries investigations in neglected areas, have subsequently not been addressed.

Although there was a name change from Ecology, Systematics & Conservation in 2001/02 to the Biodiversity thrust in 2003 the scope stayed roughly the same but some projects were shifted to the Sustainable Marine & Coastal Resources thrust. During the period 2001-2003, the biodiversity thrust has been successful with regard to systematic research and production of inventories and guides, e.g. seaweeds, teleosts, chondrichthyans, corals and some other invertebrates. With respect to other aspects of the scope of the thrust, the importance of spatial data was noted at the 2002 workshop and some effort has been made to improve this, as evidenced from several GIS based presentations at SAMSS 2005, although the full power of geo-spatial analysis does not appear to be utilised. There has been an increase in genetic research as evidenced by some student papers at the SAMSS. There appeared to be little work on minimising deleterious effects of human activities on biodiversity or effectiveness of MPAs for biodiversity conservation, although possible fishery effects are being examined for some small reserves. Overall, the biodiversity thrust projects appear to focus at the species rather than ecosystem level. Dynamic concepts like functional diversity and ecological services, which is where much international biodiversity research is now focussed, are absent from projects.

One of the major goals of the Mariculture thrust has been to strengthen the industry by providing and assisting them with high quality applied research. Two structural areas that need different approaches can be identified: small-scale mariculture to improve livelihoods of coastal communities and industrial mariculture which is export-orientated and mobilises large investment. The research needs of both target groups have been addressed in the implementation of the thrust and the evaluators noted that the industry has contributed substantially to some of the projects. The aims and goals of the Mariculture thrust were refocused in the second period of the programme to the development of more productive technologies, search for new species, and the relevance of aquaculture for the environment. The initial strong focus of the programme on the impact of mariculture on coastal communities has been scaled back.

The Sustainable Marine and Coastal Resources thrust resulted from a combination of three earlier thrusts. Surprisingly, this thrust did not benefit from a mid-term planning workshop as did the other thrusts. As a result, this thrust was difficult to evaluate against objectives. In broad terms, the projects were mainly applied in nature, but there seemed to be lack of guidance on how researchers should structure their research to meet the original objectives. Most projects pertained to resources and there were extremely few addressing technological innovation or tourism. Resource projects covered scope topics on resource assessment, recreational fisheries, with some limited fishery economics. From the documentation, several of the original scope topics did not appear to have been addressed.

**3. Evaluate the efficiency and effectiveness of the structure, management, administration, monitoring and marketing of the programme with specific reference to the roles of the respective stakeholders and the MSET research community.**

The Joint Venture Advisory Committee (JVAC) was appointed to ensure that the sponsoring bodies had a direct hand in the management of the Sea and Coast programme. From the annual reports it can be deduced that the structure was reasonably efficient. However, while the JVAC may have been adequate to ensure administrative management, there is a perceived lack of scientific leadership and vision in the programme as a whole. As such, the evaluation team feels that the programme lacks overall strategy and its implementation is not properly managed in scientific terms (for example, it appears that the thrust chairs no longer exist).

Overall, the evaluation team feels that the documentation provided does not allow a thorough assessment of these aspects of the Sea and Coast II programme.

**4. Were the stakeholders mandates met i.e. Marine and Coastal Management and the National Research Foundation?**

The Sea and Coast II programme aims to provide information, advice and training in support of optimal and sustainable use and development of our sea, coasts and estuaries. In concept it matches well with the mandates of the investors (stakeholders is not the correct term, as other non-sponsoring bodies would also be stakeholders). However, without interviews with the investors we cannot comment on whether the mandates have been met from the data we have.

**5. Was the Sea and Coast II Programme successful in being driven by a “bottom-up” mechanism rather than a “top-down” one?**

The review panel noted that at a meeting of the JVAC in November 2001 the NRF indicated a general lack of research coordination and cohesiveness within and between thrusts of the Sea and Coast II programme. As a result SANCOR was asked to hold thrust workshops to this end. Workshops were held in April 2002 (Biodiversity, Ocean Dynamics) and May 2002 (Marine Aquaculture, Coastal Processes). No workshop was called for the Innovative technology, Tourism and Development and Resources for the Future thrusts. These were later grouped into the Sustainable Marine and Coastal Resources thrust. A total of 39 scientists took part in the workshops, which could be perceived as an effort to provide a mechanism for “bottom-up” input. However, the majority of the workshop participants were grant holders of the Sea and Coast II programme. While this would have provided ample opportunities for research coordination and effort maximisation, it could not have provided for sufficient consultation on the broader views of the community. In a way, the workshops could be interpreted as incestuous. As with turkeys voting for Christmas, it would have been unexpected if the current grant holders were to recommend a substantial reorientation of the programme or of its implementation efforts. The investors and stakeholders should ensure that future consultations are open to the broader research community, and possible involving regional /international experts. Likewise, the lack of consultation in the area of Sustainable Marine and Coastal Resources was surprising.

It should also be noted that the Sea & Coast programme does not fund all marine research in South Africa and an inventory of all such marine research is clearly needed so the real gaps can be identified. It is suggested that SANCOR/NRF/MCM seriously address this, for example, in relation to new DEA&T biodiversity initiatives as indicated during SAMSS.

**6. Has the Programme through its thrusts effectively fully encompassed both applied and fundamental research and have the various projects and outputs within this programme been characterised as adopting a *problem-solving* approach.**

The reports provided offer little guidance to evaluate the contributions of the projects to applied and fundamental research. While the latter could be assessed on the basis of research publications in the international literature (if we had a complete list of publications related to the projects), the former requires effective pull-through to policy and management. Unless this aspect is specifically reported in the annual reports it is very difficult to evaluate.

There were relatively few direct applications of the research indicated, though this varied between thrusts (Mariculture and Sustainable Marine and Coastal Resources thrusts have more evident direct applications). We caution that our conclusion may be a reflection of the lack of effort in reporting research applications rather than lack of application of research *per se*.

In general terms, the programme has followed a clear problem-solving approach in as much as proponents need to identify a problem in their research proposals. However, the project reports do not necessarily comment on whether the identified problem has been solved. Overall, the emphasis on short-term applications has clearly limited the development of fundamental research.

## **7. Make recommendations regarding the future focus and scope of the MSET research programme.**

The most obvious recommendation would be towards addressing the science topics mentioned above that were identified in the 2002 workshops and that were not implemented. The identification of more detailed science gaps would require a more in depth evaluation procedure encompassing all current marine research in South Africa.

With regard to the specific thrusts, the Coastal and Oceanic Processes thrust still fails to address deep-water resources and oceanography of the continental slope and this could be particularly relevant in view of possible extension of the SA Exclusive Economic Zone. Further, as estuaries are so accessible to surrounding communities, the social and economic component of such research should be fostered. In the biodiversity thrust concerted effort should be made to work at the functional diversity level and consider ecological benefits of biodiversity as well as threats to this. This would be in accordance with current international trends. It is recommended that techniques developed by the thrust are assessed by socio-economists with regard to development of small-scale mariculture. The Sustainable Marine and Coastal Resources thrust also needs a sharper focus on the socio-economic benefits of marine resource use. We strongly recommend continued support for quantitative research to underpin the sustainable use of South African marine and coastal resources. Also, although long-term monitoring of marine resources and their use is not within the scope of short term Sea & Coast projects, there is evidence that some researchers are making concerted efforts to collect long-term data sets and we recommend that this be encouraged.

The Sea and Coast Programme requires a clear research strategy that will focus on themes that are of national importance whilst being cognisant of the global context of marine science. In this regard we would recommend that international collaboration be strengthened at all SCP levels.

## **8. General comments**

- Most of the scientists that were supported in 2001 were still supported in 2004 indicating good continuity in funding policy. However, this could also be interpreted as indicating few opportunities for new entrants.
- There appears to be a miss-balance between the different fractions of the thrust budgets. While 16 % of the 2003 budget was spent on MSc and PhD bursaries, 67% was spent on "running expenses" and only 5% for equipment. The number of post-doctoral grants (currently 5%) and money for staff development (currently 1%) should be increased to create a sustainable research environment. Students who have graduated in a certain field will only remain in this research area if they see a professional future. In summary, student bursaries provide for cheap labour, but do not solve the problem of building up capacity at all levels as required in the original aims of the programme.
- It is seen very positively that some projects attract foreign PhD students as this indicates the high quality of the research performed in the programme. There has also been an improvement in the number of black students within the projects, but this seems to drop at PhD level.
- Based on the 2003 data, two thirds of grants went to professors and one third to PhDs, indicative that there are probably few new entrants to the funding system (or there has been a proliferation of professors!).

- The funding of projects has been very diverse with orders of magnitude differences between projects. The evaluators got the impression that most of the bigger team projects are using, or have to use, top-up funding from other sources to run their research. This is also reflected in their extensive lists of publications that contain not only publications based on the project but also those from the whole research team and other funding. We recommend that reporting on true costing of the projects be done to get a clearer picture of the actual costs related to salaries of staff, use of facilities, ships time, agency contributions etc. As such, projects of the Sea & Coast programme look overly cost effective.
- The complication of comparing large team projects with single researcher projects is a vexing one. At the same time there appears to be little cognisance of the value of project leaders leveraging funds from other sources which enable large team projects to actually function and add value to the Sea and Coast programme.
- Many of the projects have social and economic research opportunities but these have not been realised. Social scientists need to be involved in project design and planning from the beginning to ensure project success. This will increase the acceptance of the outputs in the user communities and facilitate the transfer of knowledge from science to target groups as was requested in the aims of the SCP I.
- The panel found that the evaluation process was poorly thought through and badly managed. It is suggested that future evaluations:
  - Be conducted over a longer time period, possibly preceding future SAMSS meetings. It must be stressed that the three days allocated to this review were insufficient, particularly given the limited support provided.
  - Include interviews with representatives of the partnership (SANCOR, NRF and MCM) to capture their views regarding programme management issues.
  - Include interviews with the grant holders to present their projects and gather information additional to the written reports.
  - The project reports do not necessarily cover all the items that the evaluation panel was asked to respond to. We suggest that the grant holders should be provided with the same ToRs as the evaluation team to be able to structure their reports along these guidelines.
  - Receive better support from the NRF, both to clarify issues and to provide summaries of the hundreds of pages of information regarding Sea and Coast.

Finally, the evaluation panel would like to express its gratitude to SANCOR for the honour and confidence placed on us. The four days of the evaluation were filled with fruitful discussions on the structure and outputs of the SCP II. We hope that our comments and recommendations, though maybe sometimes very direct and brief, will help develop the third phase of the Sea and Coast programme, a valuable asset to marine science in Southern Africa.

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8 July 2005