

Report of the thirty-first session of GESAMP

New York, 13-17 August 2001

**IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP
Joint Group of Experts on the Scientific Aspects
of Marine Environmental Protection (GESAMP)**

GESAMP Reports and Studies No. 72

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Joint Group of Experts on the Scientific Aspects
of Marine Environmental Protection
(GESAMP)**

**REPORT OF THE THIRTY-FIRST SESSION
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**UNITED NATIONS
New York, 2002**

Notes

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ISSN 1020-4873

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For bibliographic purposes this document should be cited as:

GESAMP (IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). 2002. Report of the Thirty-first Session, New York, 13-17 August 2001. Rep. Stud. GESAMP No. 72, 56 pp.

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EXECUTIVE SUMMARY

1 Introduction: The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) held its Thirty-first Session at the United Nations Headquarters in New York from 13 to 17 August 2001. GESAMP was established in 1969 by a number of United Nations Organizations as a Joint Group to encourage independent, interdisciplinary consideration of marine pollution and environmental protection problems with a view to avoiding duplication of efforts within the United Nations system. The main topics considered at this session are described below.

2 Evaluation of GESAMP: In May 2000, the eight Sponsoring Agencies of GESAMP agreed to carry out an independent and in-depth evaluation of the achievements of GESAMP, its impact, scope, working methods and future role. The GESAMP Evaluation Team, established to carry out this evaluation, presented its report to GESAMP, in which it concluded that the United Nations, its Member States and other organisations require an effective, efficient and independent group to provide advice on issues relating to marine environmental protection and management and sustainable development of marine resources and amenities based on sound scientific principles. The Evaluation Team strongly recommended that GESAMP be continued to play that role. However, major changes would be necessary in the structure of GESAMP, its operational procedures and products.

GESAMP gave considerable attention to the detailed recommendations of the Evaluation Team, the initial, positive response thereto of the Sponsoring Agencies and to the plan of these Agencies for a definitive response and a strategy to implement modifications to GESAMP in 2002.

In this context GESAMP also discussed UNEP's proposal on a feasibility study for establishing a regular process for assessing the state of the marine environment. GESAMP gave broad support for this study and as the conduct of marine environmental assessments is one of its main responsibilities, GESAMP anticipated playing a significant role in both the study and any resulting initiatives. GESAMP prepared for this purpose a position paper on global assessments of the state of the marine environment as shown in this report.

3 Evaluation of the Hazards of Harmful Substances Carried by Ships: GESAMP appreciated the ongoing work of its Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships to re-evaluate the 660 bulk liquid substances contained in the International Bulk Chemical (IBC) Code according to the revised GESAMP hazard evaluation procedure. With the valued additional funding by national administrations the accelerated pace of re-evaluation could be maintained and it was anticipated that the Working Group would be able to complete 75 - 80% of these hazard profiles by April 2002.

GESAMP considered in detail the final draft of GESAMP Reports and Studies No.64 entitled: "Revised GESAMP Hazard Evaluation Procedure for Chemical Substances Carried by Ships", as well as the constructive and positive comments received from the external reviewers on this draft report. GESAMP approved Reports and Studies No.64 for publication following a revision by the lead author, reviewers and GESAMP and extended its thanks to the authors and the Working Group for their dedicated efforts since the 26th session of GESAMP in 1996 to complete this publication, which will replace GESAMP Reports and Studies No.35, published in 1989. The new publication would be printed and distributed in January 2002.

4 Environmental Impacts of Coastal Aquaculture: GESAMP considered a proposal by its Working Group on Environmental Impacts of Coastal Aquaculture to work on the issue of implementing the precautionary approach and risk assessment with specific reference to coastal aquaculture development. It was felt that application of the precautionary approach was sometimes used as an argument for the cessation or prevention of aquaculture development, but the corresponding risk criteria had not been specified and offered therefore no basis for informed discussion or rational decision - making. GESAMP agreed to this proposal and developed terms of reference for the Working Group to prepare a review report, including a framework for risk assessment associated with coastal aquaculture development.

5 Aquatic environmental hazard assessment methods for application in seafood safety risk assessment and management: GESAMP reviewed a draft scoping document regarding this issue and acknowledged the importance of developing seafood safety risk assessment methodologies, while noting that some scientific issues related to chemical contaminants should be considered in greater detail. The Group further advised that risk assessment methodologies of microbial contamination could be particularly difficult to develop and recommended the exploration of several issues in this regard. Consequently, GESAMP established a Working Group to further develop the scoping document, which should encompass both chemical and microbial contaminants, for consideration at the next session of GESAMP.

6 Ballast water management: The issue of managing ships' ballast water to minimize the risk of introduction of non-indigenous marine species is gaining momentum in view of the preparation by IMO of a draft ballast water convention for adoption at a diplomatic conference in 2003. GESAMP reviewed a scoping document giving a background on the ballast water issue and the emerging focus on the development of ballast water treatment technologies. Although filtration of ballast water appeared to be the most promising technique, it was noted that increased research could be expected into sterilization techniques employing sophisticated chemicals effective at low ppm levels and that not only the development of GESAMP hazard profiles, but also risk assessment of such chemicals would be a valuable contribution of GESAMP. In light of these considerations GESAMP established an intersessional correspondence group, inter alia, to develop guidance on the bio-effectiveness of separation techniques through filtration of ballast water; to consider the need for applying risk assessment for chemicals considered for ballast water sterilization; and to explore possibilities of future advice by GESAMP on ballast water issues.

1 INTRODUCTION

1.1 The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) held its thirty-first session from 13 to 17 August 2001 at United Nations Headquarters in New York under the Chair of Mr. R. Duce. Mr. M. Huber served as the Vice- Chairperson. On Monday, 13 August, the Members of GESAMP met for informal discussions, while the Intersecretariat held pre-session meetings, together with the Chairperson of GESAMP, Mr. S. Diop, the UNEP Observer, and Mr. K. Bradley, the Chairperson of the GESAMP Evaluation Team.

Opening of the session

1.2 The Chairperson of GESAMP, Mr. R. Duce, called the thirty-first session of GESAMP to order at 9.00 a.m. on 14 August 2001.

1.3 Mrs. Annick de Marffy, the Director of the Division for Ocean Affairs and the Law of the Sea of the Office of Legal Affairs, welcomed the participants to United Nations Headquarters on behalf of the Host Organization, noting that the United Nations was last privileged to host a session of GESAMP, the twenty-fourth, in 1994.

1.4 Mrs. de Marffy extended her congratulations to GESAMP and to its Marine Environment Assessments (MEA) Working Group for producing in 2001 the two excellent studies, A Sea of Troubles and Protecting the Oceans from Land-based Activities: Land-based sources and activities affecting the quality and uses of the marine, coastal and associated freshwater environment. She also presented her compliments to Mr. R. Duce, the Chairperson of GESAMP, and Mr. K. Sekimizu, the Administrative Secretary, for their effective presentations on GESAMP at the second meeting of the United Nations Consultative Process (formerly known as the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea - UNICPOLOS) from 7 to 11 May 2001 in New York.

1.5 Mrs. de Marffy noted that the results of the independent evaluation of GESAMP as well as the related issue of GESAMP's future role in preparing global marine environmental assessments would, among other items on its agenda, warrant serious attention at the current session.

1.6 In conclusion, Mrs. de Marffy expressed her wish for a successful session, one that would pave the way for a more productive, more effective and more visible role for GESAMP as an independent expert advisory body to the UN Sponsoring Agencies and, through them, to Governments in their decision-making processes, as well as to other clientele worldwide.

Adoption of the Agenda

1.7 The agenda for the session as adopted is provided in Annex I to this report. Annexes II and III provide, respectively, the list of documents and the list of participants. References to Annexes IV to VII are provided in the text of the report.

2 REPORT OF THE ADMINISTRATIVE SECRETARY

2.1 Mr. K. Sekimizu, the Administrative Secretary, informed the meeting of the following major developments during the last intersessional period:

.1 Regarding the organization of the evaluation of GESAMP, the independent and in-depth evaluation was proposed by UNEP and, in May 2000, the Sponsoring Agencies agreed with the terms of reference of the evaluation with a view that the evaluation should be completed by the end of 2000. The Administrative Secretary was charged to organize the evaluation and all Sponsoring Agencies, except WHO, provided a budget of \$70,000 in total. The Secretariat encountered difficulty in finding two government-nominated experts for an evaluation team and that had resulted in delay of the evaluation process. Nevertheless, the Evaluation Team was finally established early December 2000. The Evaluation Team met three times and produced its report on 24 July 2001, which was circulated to all GESAMP Members.

.2 In February 2001, the UNEP Governing Council made its Decision 21/13 on the feasibility of establishing a regular process for the assessment of the state of the marine environment. At the Governing Council, IMO, FAO and IOC made a joint statement stating that, in view of the review of GESAMP, it would be premature to commence a new process of a feasibility study dealing with assessment of the state of the marine environment. At a later stage, at the eleventh session the ACC Subcommittee on Oceans and Coastal Areas (SOCA), 3-4 May 2001, WMO and IAEA supported the joint statement.

2.2 The Administrative Secretary also informed the meeting of the following developments in the Sponsoring Agencies:

.1 IMO and its Marine Environmental Protection Committee (MEPC) have prepared a Diplomatic Conference on the Control of Harmful Anti-Fouling Systems for Ships (AFS Conference) to be held from 1 to 5 October 2001, with a view to establishing a new international convention to prohibit the use of TBT in ships' anti-fouling paints.

IMO has recently adopted an amendment to MARPOL Annex I, regulation 13G, to establish an accelerated phase-out scheme for existing single-hull tankers, after intensive discussions in the wake of the Erika marine pollution incident.

IMO has also made progress in dealing with the issue of ships ballast water management in an effort to avoid transfer of harmful marine organisms between regions. MEPC is preparing a draft legal instrument for consideration at a diplomatic conference in 2003 and the GEF/IMO/UNDP project (GLOBALLAST) had made significant progress, including the successful organization of the R&D Symposium and workshop in March 2001 on alternative treatment methods for ballast water and their standards.

.2 The Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem will be held 1-4 October 2001, jointly organized by the Government of Iceland and FAO and co-sponsored by the Government of Norway. The Conference is to be accompanied by a scientific symposium.

.3 Within the framework of cooperation of WMO with the Mediterranean Action Plan of the Barcelona Convention for the Protection of the Mediterranean Sea, a report on the atmospheric input of some persistent organic pollutants (POPs) into the sea was prepared by WMO and published. This is a unique assessment of POPs input to the Mediterranean Sea.

.4 UNESCO-IOC is preparing a Global Conference on Oceans and Coasts at Rio+10 (3-7 December 2001) which will assess the current continuing and new challenges of sustainable development with a view to providing inputs to the World Summit on Sustainable Development, Johannesburg, September 2002.

3 REPORT OF THE CHAIRPERSON

3.1 The Chairperson, Mr. R. Duce, informed the members of the activities of the Chairperson, the Vice-Chairperson, Mr. M. Huber, and the past Chairperson, Mr. P. Wells, during the intersessional period. To keep the membership of GESAMP aware of the many activities taking place during this period, three intersessional reports were sent to the Members. These reports provided updates on the evaluation of GESAMP, the publication of GESAMP Reports and Studies Nos. 70 and 71, and other activities of the officers and working groups during the intersessional period. The Chairperson and the Vice-Chairperson, as well as other GESAMP Members, as indicated below, participated in a number of meetings on behalf of GESAMP during the intersessional period. These included the following:

- Mr. R. Duce participated in all three meetings of the Evaluation Team in London in January, April, and July, 2001.
- Mr. P. Wells participated in the 4th International Coastal Zone Canada Conference, Saint John, NB Canada, with a keynote talk on GESAMP, in September 2000.
- Mr. M. Huber participated in the First Biennial GEF International Waters Conference in Budapest in October 2000.
- Mr. M. Huber participated in the GIWA Steering Committee meeting in Kalmar, Sweden in March 2001.
- Mr. J.-A. Sanchez-Cabeza participated in the GIWA Peer Review Panel Meeting in Kalmar, Sweden in March 2001.
- Mr. R. Duce participated in the second meeting of the Consultative Process at the UN in New York in May 2001.
- Mr. R. Duce participated in the ASLO Workshop on Sequestration of CO₂ by Intentional Fertilization of the Ocean in Washington in May 2001.
- Mr. R. Boelens participated in the Canadian Conference on Ocean Stewardship (GPA/LBA) in Vancouver in June 2001.
- Mr. M. Huber participated in the GESAMP Intersecretariat meeting in London in June 2001.
- Mr. R. Duce participated in the IOC Assembly in Paris in July 2001.

3.2 Several papers concerning GESAMP activities have been submitted by the officers of GESAMP on behalf of GESAMP to the peer-reviewed literature during the intersessional period. These include the following:

- Wells, P.G., R.A. Duce, and M.E. Huber, "Caring for the sea – accomplishments, activities and future of the United Nations GESAMP (the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection)", submitted to *Ocean and Coastal Management* (2001).
- GESAMP and ACOPS, "Priority problems facing the global marine and coastal environment and recommended approaches for their solution", submitted to *Ocean and Coastal Management* (2001).

4 EVALUATION OF GESAMP

4.1 Mr. K. Bradley, the Chairperson of the Evaluation Team, introduced major outcomes of the independent and in-depth evaluation of GESAMP (document GESAMP XXXI/4).

The Evaluation Team was composed of the following Members:

Chair – Mr. Keith Bradley (United Kingdom)
Dr. Julie Hall (New Zealand)
Professor Swami Krishnaswami (India)
Professor Herbert Windom (United States)

4.3 The Chairperson and Vice-Chairperson were also involved in the process of the evaluation and provided information on GESAMP's activities and their views on the future of GESAMP for consideration by the Evaluation Team.

4.4 The Evaluation Team had recommended that:

1. GESAMP be continued
2. Major changes be effected in GESAMP's structure, operational procedures and products
3. A "GESAMP" Office" be created which would perform all the administrative and organizational tasks for GESAMP
4. GESAMP's profile and visibility be increased through an overall promotional and marketing plan, to be updated on an annual basis
5. A closer link with and increased involvement of governments in the GESAMP process be developed, without jeopardizing the independent nature of GESAMP's advice
6. GESAMP be operated more efficiently and effectively, with agreed budgets
7. More work be done intersessionally by correspondence
8. Chair and Vice-Chair become part of GESAMP management, and be given additional responsibilities
9. Modifications be made to the selection and rotation of GESAMP's membership and that of its Working Groups
10. GESAMP's activities be made more transparent
11. GESAMP's products be more user/reader friendly, uniform in image, and produced timely and efficiently

4.5 The Administrative Secretary briefly introduced the outcome of the initial discussions on the above recommendations in the Intersecretariat meeting held on 13 August and pointed out the following:

.1 The Intersecretariat is considering that, taking into account views and opinions to be provided from Members of GESAMP at this session, each Sponsoring Agency would consider the eleven recommendations and would prepare a common response and strategy to implement modifications and improvements to the operation of GESAMP. This exercise would need substantial communications and consultations among Sponsoring Agencies and would necessitate an extraordinary session of the Intersecretariat, which should be convened in the coming winter season after consultations in autumn. A common position at that session of the Sponsoring Agencies on these recommendations should then be reported to the thirty-second session of GESAMP, 6-10 May 2002, the third meeting of the United Nations Consultative Process in 2002 and a subsequent session of the Commission on Sustainable Development (CSD) in 2002.

.2 In the Intersecretariat Meeting on 13 August, the eleven recommendations were considered and initial views exchanged. Although further discussions would be required, the initial response from the Technical Secretaries was generally positive.

.3 Concerning the suggested creation of a "GESAMP" Office, the Sponsoring Agencies considered the establishment of a trust fund and recruitment of a full-time assistant to GESAMP as a non-UN officer who might be recruited from scientific fields or universities and might be located apart from the Sponsoring Agencies or located in one of Sponsoring Agencies. Under this option, which should be further developed in the intersessional period, the current arrangements of the Administrative/Technical Secretaries would be continued.

The Administrative Secretary pointed out that sustainability, reliability, the possibility of donations and inclusion of additional Sponsoring Agencies should be considered for this option.

.4 In view of the further exploration of the possible involvement of Governments, while keeping the independent nature of GESAMP, the following should be further considered:

- Creation of a pool of potential candidates for GESAMP membership to which governments, inter alia, could make nominations. The Intersecretariat would collectively consider the possibility of selecting GESAMP Members from such a pool;

- Creation of a mechanism to allow governments to make proposals to GESAMP, through the Administrative Secretariat, for potential work items for GESAMP; and
- Possibilities of further interaction with government representatives, including participation of government representatives as observers in GESAMP processes, meetings of GESAMP with government representatives to discuss specific aspects, and other appropriate activities.

In the above discussions, the importance of retaining GESAMP's independence was strongly supported by all members of the Intersecretariat.

.5 In order to speed up intersessional work and the review and publication of GESAMP reports, GESAMP's decision-making process should be reviewed.

.6 Mechanisms for selection and appointment of GESAMP Members should be reviewed taking into account the following points:

- Whether a 4-year rotation cycle should be strictly applied for Members in order to appoint new Members and ultimately obtain wider participation in GESAMP's activities;
- The pool of potential candidates should promote the nomination of Members from developing countries and from regions other than Europe or North America;
- The scientific coverage by GESAMP should be reviewed and the possibility of strengthening the social science component should be explored; and
- A collective selection and appointment system by the Sponsoring Agencies/GESAMP Members should be considered.

4.6 The Administrative Secretariat emphasized that the above points merely indicate the starting point of discussions in the intersessional period. The Chairperson of GESAMP would be fully involved in order to seek advice from the GESAMP Members. This advice would be taken into account by the Sponsoring Organisations in the process of developing their common response to the eleven recommendations.

4.7 On Monday, 13 August 2001, prior to the opening of GESAMP itself, GESAMP Members held a thorough, informal discussion of the Evaluation Team's report. There was consensus that the report was fair and balanced and that its eleven recommendations are very helpful for planning GESAMP's future work and operations. Members noted that the report contained some misinterpretations and errors that required further discussion and clarification. Further, the Members felt that more attention could have been devoted to an appraisal of GESAMP's more than 30 years of scientific work, and that the recommended new GESAMP goals required rigorous discussion and review before adoption. Members felt, however, that attention should now be focused on the future of GESAMP. Identification of immediate actions, including consideration of funding mechanisms, would be required to ensure that a revamped and renewed GESAMP continues to play a significant role with the support of the Sponsoring Agencies. It was agreed that GESAMP's role should focus on (1) marine environmental assessment, as much of GESAMP's work relates to the theme of assessing the health of the oceans; and (2) developing advice on ways to improve marine environmental protection. Membership should include a broader range of disciplines, particularly human health and social science, and more balanced geographic representation. This would require a reversal of the present trend of decreasing membership, and the establishment of a minimum number of members, or quorum, should be considered.

4.8 In plenary session, GESAMP continued the discussion of the report of the Evaluation Team, and the Chairperson of the Evaluation Team responded to requests for clarification and additional information. The Group expressed the following views:

- Conducting more work intersessionally would increase the workload not only of Technical Secretaries of GESAMP, but also of GESAMP Members;
- Careful consideration should be given to developing mechanisms that promote better interaction with scientific representatives of governments while maintaining the independence of GESAMP's advice;

- The so-called “business plan” should set out the range of products to be delivered by GESAMP, which include decadal assessments of the health of the oceans, concise reports, such as GESAMP Reports and Studies No. 70, short communications, rapid advice to organisations, and thematic studies;
- GESAMP activities need to include increased attention to regional scales;
- Additional resources are required to implement many of the recommendations of the Evaluation Team; and

- Technical Secretaries should do more to promote awareness of GESAMP within their respective organizations if GESAMP is to succeed in seeking additional support from the Sponsoring Agencies.

5. FEASIBILITY OF ESTABLISHING A REGULAR PROCESS FOR THE ASSESSMENT OF THE STATE OF MARINE ENVIRONMENT (UNEP GOVERNING COUNCIL DECISION 21/13)

5.1 Upon the request by the Administrative Secretary, a UNEP representative, Mr. S. Diop, attended the session as an observer and provided information on the background and the current status of developments relating to the proposed feasibility study on a regular process for the assessment of the state of marine environment (document GESAMP XXXI/5). GESAMP expressed its appreciation to Mr. Diop for his participation.

5.2 Mr. Diop provided a short history of discussions in UNEP, including the UNEP Governing Council Decision 21/13, the objective of the feasibility study, a general plan of discussion towards the next Governing Council in 2003, and information on an informal consultative meeting to be held from 12-14 September 2001 in Reykjavik, Iceland.

5.3 The Administrative Secretary informed the meeting of his participation and discussions in the second meeting of the Consultative Process held from 7-11 May 2001, stating that GESAMP is a good model of coordination and cooperation among UN agencies without entailing excessive cost, and that its independent advice and recommendations have been used in the decision-making process within Sponsoring Agencies, e.g. IMO.

5.4 GESAMP expressed broad support for the proposed feasibility study, and, given that marine environmental assessment is one of the main responsibilities of GESAMP, it anticipated a significant role in both the study and any resulting initiatives.

5.5 GESAMP prepared a position paper presenting its views on global assessments of the state of the marine environment as a contribution to the Reykjavik meeting. This position paper is shown in Annex IV to this report.

5.6 The Administrative Secretary informed the Meeting that the Chairperson of GESAMP, to be accompanied by a representative from the Administrative Secretariat of GESAMP, would attend the Reykjavik meeting to present the above-mentioned paper and other relevant information and to monitor the situation in the consultation process.

6 EVALUATION OF THE HAZARDS OF HARMFUL SUBSTANCES CARRIED BY SHIPS

Report of the thirty-seventh session of the EHS Working Group

6.1 The thirty-seventh session of GESAMP's Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships (EHS) was held at IMO Headquarters, London, from 30 April to 4 May 2001. The ten members of the Working Group, with backgrounds in ecotoxicology, environmental chemistry, occupational safety, mammalian toxicology and behaviour of chemicals in seawater, had been drawn from Japan, the United States and Europe.

6.2 In this introduction of the report of the Working Group (document GESAMP XXX/6), the Chairperson of that Group recalled that in 1998 MEPC had requested GESAMP to re-evaluate the 660 bulk liquid substances contained in the International Bulk Chemical (IBC) Code according to the revised GESAMP hazard evaluation procedure. He informed the Group that 100 hazard profiles had been completed at the thirty-seventh session, that IMO's constituent bodies had been unable to match their request for an accelerated re-evaluation with additional funds, but that additional meetings had been possible through valued donations from the Governments of Japan, Netherlands and the United Kingdom,

and that in order to speed up the process of re-evaluation, the Working Group had and would continue to convene separate sub-groups of mammalian toxicologists, aquatic toxicologists and physical properties experts, each moving at their own pace. It was anticipated that the Working Group at its thirty-eighth session in April 2002 would be able to complete hazard profiles for 75 – 80% of the IBC code substances.

6.3 GESAMP was informed that the criterion of tainting would no longer be actively evaluated in future hazard profiles, despite still being listed as one of the criteria in the revised hazard evaluation procedure. The available data set on tainting potential had been recently reviewed by one of the Working Group members and reliable data were found to be scarce. The ratings had been consolidated on this basis. Given the expense and difficulty of testing, no new data were expected.

6.4 GESAMP approved the hazard profiles of chemicals set out in the report of the Working Group (document GESAMP XXXI/6, annexes 3 and 7). A list of members of the Working Group, its terms of reference and a short overview of its current activities are set out in Annex V to this report.

6.5 The Group noted the great importance IMO continued to attach to GESAMP's work on the hazard profiles, and that in future, advice on hazard profiles for chemical mixtures would need to be developed.

The revised GESAMP hazard evaluation procedure: GESAMP Reports and Studies No. 64

6.6 The Chairperson of the Working Group recalled that in 1995, the Marine Environment Protection Committee (MEPC) of IMO had convened a panel of experts drawn from national administrations, GESAMP members, chemical industry associations and environmental groups. This panel made recommendations on the need to revise and update the GESAMP hazard evaluation procedure, which were subsequently endorsed by GESAMP at its twenty-sixth session in 1996.

6.7 The Working Group proceeded to revise the GESAMP hazard evaluation procedure in the light of advances in environmental science, while considering the needs of IMO in the regulation of large volumes of chemicals transported by sea. Close attention was paid to the UN Globally Harmonized System for the hazard classification of chemicals, then being developed by the OECD/GESAMP was provided with regular progress reports by the Working Group at its sessions from 1997 to 2000 (27th to 30th) which approved various aspects of the emerging revised procedure.

6.8 The Chairperson of the Working Group presented draft 5 of Reports and Studies No. 64 to GESAMP for final approval (document GESAMP XXXI 6/1). The report was accompanied by the comments of an external panel of reviewers from chemical industry associations in Europe (CEFIC, two reviewers), Japan (JCIA) and the United States (ACC, two reviewers), the national administrations of the United Kingdom and the Netherlands, as well as the OECD (document GESAMP XXXI/6/2). These comments were considered in their entirety by GESAMP, and it was felt that they were constructive, positive and that the majority of the changes recommended could be taken on board by the Working Group in finalising Reports and Studies No. 64. The comments and decisions of GESAMP on matters of substance as opposed to editorial or minor issues are listed below:

- GESAMP felt that Reports and Studies No. 64 should emphasize the distinction between the hazard evaluation of substances as carried out by its Working Group and the classification (pollution categorisation) of substances as carried out by IMO.
- GESAMP expressed the view that the introductory sections and the guidance boxes were informative and had achieved the appropriate balance of detail for the intended user groups of the publication.
- GESAMP reconfirmed Column A1 on Bioaccumulation in its present form, consisting of two numerical scales (log K_{ow} and BCF) which are in line with the GHS. It was felt that this would allow IMO to choose an appropriate regulatory 'cut-off' value for 'significant bioaccumulation' compatible with its needs and bearing the GHS in mind. The Working Group was requested to clarify the relationship of column A1 with the GHS in Reports and Studies No. 64. Other detailed suggestions from members of the external review panel on Column A1 could regrettably not be taken into account.

- The definitions of bioaccumulation (the uptake of substances from food items, sediment contact and the water phase by an organism) and bioconcentration (uptake through the water phase only) were considered and approved by GESAMP. The Working Group was requested to clarify in Reports and Studies No. 64 that while it was desirable to have data on bioaccumulation, in practice only the measurement of bioconcentration was technically feasible for regulatory purposes.
- GESAMP reviewed Column B2 on chronic aquatic toxicity, which was developed with broad support from the review panel in 1995. Data would only be required on a case-by-case basis to assist with the evaluation of several types of ‘difficult’ substances and Reports and Studies No. 64 recommends this criterion to assist in the weight of evidence approach. The response on the part of the external reviewers from administrations and industry was generally neutral to positive. However, OECD considered that this sub-column was not compatible with the GHS, which uses surrogate data in place of chronic toxicity data to release chemicals from further (aquatic toxicity) classification. GESAMP supported the retention of this criterion as described in Reports and Studies No. 64. It felt that the discretionary request and use of data was appropriate in the light of possible chronic exposures in heavily used sea-lanes. It was informed by the Chairperson of the EHS Working Group that OECD had previously expressed the intention of reviewing chronic toxicity in the future and that IMO was currently considering a similar ‘surrogate’ mechanism as that contained in the GHS. Additionally, GESAMP requested the Working Group to specify the exposure periods appropriate to such chronic aquatic tests, as well as a list of suitable endpoints for the benefit of the reader of GESAMP Reports and Studies No. 64.
- GESAMP recommended that the evaluation of mixtures should receive further consideration and the Working Group was therefore requested to consolidate the existing text, as well as to add more detail on existing procedures, e.g., the (additive) use of the hazard profiles of individual components in the evaluation of mixtures, and the ‘hydrocarbon families addition method’ as used by IMO. Given that separate methods need to be developed for many of the hazard profile columns and sub-columns, this may be a suitable topic for further consideration by IMO and GESAMP.
- With regard to human health criteria, in the revised GESAMP hazard profile under Columns D1 to D3, GESAMP requested the Working Group to bring definitions and terminology as closely into line with the GHS as possible. It was noted that acute toxicity to mammals through the oral, dermal and inhalation routes were already in harmony with the GHS but on the basis of additional comments received from OECD it was agreed that this would be checked again by the Working Group. Column D2 on eye irritation and corrosion was structured in the same way as all the other columns, i.e. zero indicating no hazard and higher rating numbers indicating increasing hazard. It was felt that the conversion tables in Reports and Studies No. 64 solve this problem by allowing easy conversion to the GHS classification, whose scale runs in the opposite direction. While the GESAMP ratings in these columns differ in some descriptive elements, it was felt that this provided extra detail, without leading to disharmony. It was agreed that Column D3 concerning chronic health endpoints should be looked at again by the Working Group, although the classification tier referred to as Target Organ Systemic Toxicity (TOST) in the GHS appeared to be more a matter for IMO to consider.
- The use of a “weight of evidence” approach in deciding the rating in a given column, rather than the use of the lowest (worst case) value, was positively commented on by several members of the external review panel. GESAMP therefore requested the Working Group to expand on the description of its working methods in Reports and Studies No. 64, either by reference to procedures described in the literature, or by a discussion e.g., of procedures for ignoring outlying data, the appropriate use of the 95 percentile, etc.
- GESAMP reasserted its preference for aquatic toxicity data using marine organisms for the evaluation of hazards of substances carried by ships, while accepting that for many such substances, marine and freshwater data would be directly inter-changeable. There is good scientific evidence to show that freshwater tests tended to provide worst-case data for reactive substances, some metals, etc. In the context of the ‘weight of evidence’ approach described above,

further clarification on the use of marine data was requested from the Working Group in Reports and Studies No. 64.

- GESAMP requested the Working Group to discuss the importance of Quality Assurance in carrying out regulatory testing at the appropriate place in Reports and Studies No. 64.
- The IMO Technical Secretary agreed to request the legal department of IMO to consider the aspect of liability arising from the incorrect use of the revised GESAMP hazard profiles, while maintaining as broad a user group as possible. The result should be reflected as a disclaimer in the publication.
- One of the external reviewers requested that more attention be paid to Annex III issues (packaged goods) as opposed to Annex II (bulk liquids) under the MARPOL 73/78 Convention. However, this was felt to be an issue that could not be covered in Reports and Studies No. 64, as Annex III was a matter still to be considered by IMO and the GHS Sub-committee.

6.9 GESAMP extended its thanks to the Working Group for its dedicated efforts over many years in developing the revised hazard evaluation procedure, particularly in the light of the concurrent pressure to re-evaluate the more than 600 substances in the IBC code. GESAMP approved Reports and Studies No. 64 for publication following revisions by the Chairperson, reviewers and GESAMP. The Executive Summary of the report on the Revised GESAMP Hazard Evaluation Procedure for Chemical Substances Carried by Ships (GESAMP Reports and Studies No. 64) is contained in Annex VI to this report.

7 MARINE ENVIRONMENTAL ASSESSMENTS

7.1 Mr. M. Huber, the Acting Chairperson of the Working Group on Marine Environmental Assessments, introduced document GESAMP XXXI/7. The document described the history of the Working Group and its intersessional activities and is reproduced as Annex VII to this report.

7.2 The future of the Working Group was discussed. GESAMP appointed Mr. M. Huber as Chairperson of the Working Group. New membership would be considered intersessionally in the event that the Working Group undertook new tasks. GESAMP expressed concern that the intentions of the lead agency, UNEP, for future activities of the Working Group were uncertain and agreed that the Administrative Secretary would contact the UNEP Technical Secretary for clarification. Nevertheless, GESAMP expressed the view that the MEA Working Group is of central importance to GESAMP's ability to fulfill its terms of reference in relation to undertaking regular assessments of the state of marine environment.

7.3 GESAMP Reports and Studies Nos. 70 and 71 had been finalised and published as directed by GESAMP XXX. GESAMP expressed disappointment that release of the reports had not been adequately publicised and that commercial publication of the reports had not been arranged. It also expressed concern that an inadequate number of the two reports had been published. There was high demand for the reports but no copies were available for distribution. GESAMP requested that UNEP as the lead agency of the Working Group arrange for the publication of an additional 2000 copies of Reports and Studies No. 70 and 2500 copies of Reports and Studies No. 71 at a minimum.

7.4 Efforts were underway to have the reports translated into French, Spanish, and Japanese. GESAMP considered it desirable that the reports, particularly Reports and Studies No. 70, be translated into additional languages. The IMO Technical Secretary would have the translations posted on the GESAMP web site as they become available. The Chairperson of the Working Group agreed to continue efforts to publicise the reports and disseminate their conclusions and recommendations, possibly including publication of parts of Reports and Studies No. 71 in appropriate journals.

7.5 GESAMP noted the omission of the former Chairperson of GESAMP, Mr. P. Wells, from the "About this Publication" sections of Reports and Studies Nos. 70 and 71. It was agreed that this oversight would be corrected in the electronic versions of the reports as posted on the sponsoring agencies' web sites, as well as in any future published versions of the reports.

7.6 The possibility of amending the bibliographic citations of the two reports to recognise ACOPS as a co-author was discussed. It was noted that this is impracticable because the reports had already been published and assigned an ISBN number under the sole authorship of GESAMP, and the authorship cannot be amended without separate publication. It was agreed that to better reflect ACOPS' co-sponsorship the cover page of the web version of Reports and Studies No. 70 would be revised as follows:

- The logos and names of the UN Sponsoring Agencies, together with the horizontal line immediately above the logos, will be moved slightly higher on the page;
- A short horizontal line will be added immediately below the names of the sponsoring agencies;
- Below this line will be added “Co-sponsoring organisation”, followed by the ACOPS logo, beneath which will appear “Advisory Committee on Protection of the Sea (London); and
- This will be followed by the existing short horizontal line and text “In cooperation with”. ACOPS will be deleted from the list of cooperating organisations.

The same modifications will be made to the covers of Reports and Studies Nos. 70 and 71 in the event that additional copies of one or both of these are published, at which time co-authorship of the reports by ACOPS will be reconsidered.

8 ENVIRONMENTAL IMPACTS OF COASTAL AQUACULTURE

8.1 The FAO Technical Secretary informed the Group that the document “Planning and Management for Sustainable Aquaculture Development”, approved for publication during the thirtieth session of GESAMP, after appropriate revision, will shortly be sent to print as Reports and Studies No. 68.

8.2 He then referred to document GESAMP XXXI/8, Future Work by GESAMP Working Group 31, which was introduced by the Chairperson of the Working Group, Mr. J. Hambrey. Mr. Hambrey proposed that the Working Group should deal with the issue of implementation of the precautionary approach and risk assessment with specific reference to coastal aquaculture development.

8.3 Coastal aquaculture exhibits a wide range of actual and potential environmental and social impacts. The application of the precautionary approach is sometimes used as an argument for the cessation or prevention of aquaculture development, but the corresponding risk criteria are not specified, and there is therefore no basis for informed discussion or rational decision-making.

8.4 The Working Group was requested to examine assessment and communication, with particular emphasis on the treatment of uncertainty, as it relates to coastal development, using coastal aquaculture as a case study. The outputs of the study would comprise a review report, and a set of guidelines for risk assessment of coastal aquaculture showing how these guidelines were derived. These would be targeted primarily at those undertaking environmental assessments and cost benefit analyses of coastal aquaculture development. They would seek to promote harmonisation and consistency in the treatment of risk and uncertainty, and improved communication.

8.5 GESAMP agreed to this proposal and specifically charged the Working Group with the following tasks:

- Review recent studies and guidelines on environmental and economic risk assessment and explore their application to coastal aquaculture;
- Explore the nature of the risks and uncertainties associated with coastal aquaculture development, and the feasibility of developing a more rigorous framework for risk assessment and communication that would address:
 - i. The classification of risks (e.g. production risk; product risk; management risk; environmental risk; human health risk);
 - ii. The nature or character of the risks (e.g. duration; extent);
 - iii. The social and environmental risks associated with alternatives, including no development;

- iv. The evaluation and communication of the of risks; and
 - v. The uncertainties associated with both the nature of the risks and their estimation.
- Explore ways in which such a framework might be used to facilitate improved exchange of views and perceptions of the nature of risk on the part of different stakeholders; and
 - Using the framework: develop broad risk profiles of different types of coastal aquaculture; and develop guidelines on the use of the framework for more detailed and localised assessment of coastal aquaculture development and its alternatives, and on how it might be incorporated in environmental assessment and coastal management systems, including more localised and participatory coastal management systems.

9 ESTIMATES OF OIL ENTERING THE MARINE ENVIRONMENT FROM SEA-BASED ACTIVITIES

9.1 The IMO Technical Secretary introduced the work of the Working Group on Estimates of Oil Entering the Marine Environment from Sea-Based Activities (document GESAMP XXXI/9). He stated that the work of this Group was almost completed and ready for external review and that he anticipated the completion of the study in the intersessional period. Publication of this report was eagerly anticipated by IMO and would be relevant for the Intergovernmental Review meeting of UNEP-GPA/LBA (November 2001) and for the Rio+10 conference (September 2002).

9.2 The Chairperson of the Working Group, Mr. P. Wells, presented a short progress report as follows:

- The Working Group met for the fourth time in London from 26 February to 2 March 2001. All Members of the Working Group attended. The Working Group reviewed and revised the third draft report, incorporating new information and, in the case of operational discharges from ships, new approaches for making the estimates. New sections were added to the report, including on war-related sources, recreational craft, and the glossary.
- Estimated average annual inputs of oil, in tonnes per year, from ships and other sea-based activities into the sea were presented and discussed.
- The fourth draft report and the estimates of inputs are undergoing careful final checking and review by the Working Group prior to the draft report being considered completed and ready for external review. This process is very time consuming, given the complex nature of the task i.e. the methods for making the estimates, especially the calculations for operational ship inputs, and the reliability of the published data on the various sources of oil. The report of the Working Group is planned for completion in the Fall 2001 and for review during Winter 2002.

9.3 GESAMP provided useful comments on the draft report and the estimates contained therein.

9.4 GESAMP agreed that the report could be completed for publishing in the intersessional period subject to the following conditions:

- The draft report together with a compilation of suggestions and comments received from external reviewers should be distributed to GESAMP;

- Comments of GESAMP should be incorporated and the revised draft should be re-distributed to GESAMP; and
- If issues of serious contention were to remain, the revised draft report should be submitted to GESAMP XXXII with a view to its approval.

10. ENDOCRINE DISRUPTING SUBSTANCES IN THE AQUATIC ENVIRONMENT: IMPACTS ON AQUATIC LIFE AND HUMAN HEALTH

10.1 At its twenty-seventh session, GESAMP agreed to establish a Working Group on Endocrine Disruptors with co-sponsorship from FAO, IMO, WHO and UNEP. GESAMP Members and Members of the Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships had maintained a watching brief on developments through the scientific literature during this period. The Working Group was never activated, on the one hand due to a continuing lower priority than other issues and on the other due to the fact that this issue itself is still developing rapidly. A short working paper was presented by the nominal Chairperson of the Working Group, which confirmed that there were still many questions to be answered before an in-depth GESAMP review on this topic would be justified (document GESAMP XXXI/10). He reported that he had contacted the European Inland Fisheries Advisory Commission (EIFAC) but that there was little sign of progress towards a joint working group as originally agreed by the 29th session of GESAMP.

10.2 GESAMP recommended that this Working Group be disbanded and that the topic be returned to the regular GESAMP agenda item “Matters of particular concern regarding the degradation of the marine environment” as new substantive information becomes available.

11. SCOPING ACTIVITIES

11.1 Intentional fertilization of the coastal and pelagic oceans

.1 At GESAMP XXX, the Technical Secretary of UNESCO-IOC informed GESAMP that IOC would help support a joint GESAMP/SCOR (ICSU Scientific Committee on Oceanic Research) scoping activity to evaluate whether a joint Working Group on the issue of fertilization of coastal and pelagic waters by iron and nitrogen to reduce atmospheric carbon dioxide was desirable. An objective evaluation of this issue with the support of both UN agencies and ICSU bodies would be an appropriate way to proceed.

.2 GESAMP and IOC contacted SCOR about this subject, and after evaluation it was determined that the American Society of Limnology and Oceanography (ASLO) was already well along in the organization of a workshop to address this very issue. The Chairperson of GESAMP, Mr. Duce, who is also President of SCOR, was invited to this workshop to represent both GESAMP and SCOR and to evaluate whether this activity satisfied the concerns of GESAMP about this issue.

.3 The ASLO Workshop, held in Washington, DC on 25 April 2001, included a number of individuals from several nations and from the academic, government, and private sector. Extensive

discussions were held about the scientific and policy uncertainties surrounding the use of ocean fertilization to transfer atmospheric carbon dioxide to the oceans. On the basis of available scientific information, the workshop found that “we cannot dismiss ocean fertilization with iron as a mitigation option. However, computer models predict that it would at the very best reduce the expected increase of atmospheric CO₂ by a small percentage. Achieving this degree of sequestration would entail major alterations of the ecosystem, such as changes in food web structure and biogeochemical cycles. These changes would have unknown consequences, some of which will be inherently unpredictable. Three recommendations came from this meeting and were as follows:

- “ASLO and other partners should initiate plans to convene an internationally sponsored symposium to address the role of marine primary productivity in climate change, including natural events and intentional fertilization of the ocean. The symposium should bring together appropriate scientific and policy experts to summarize the scientific and legal uncertainties behind ocean fertilization.”
- “Realizing that the global ocean common requires special governance, and that both private and public resources will be used for carrying out the necessary scientific and policy research, a partnership must be created among academic scientists, industry, and government. In addition to accepted standards for any public-private partnership such as transparency, public access to data, and peer review, this partnership must include: shared commitment to advance the understanding of carbon cycle science; governmental responsibility, for example an environmental assessment requirement and the notification of potentially affected citizens; mechanisms for addressing liability for foreseen and unforeseen circumstances.”
- “Review and oversight of intentional fertilization should occur through an international mechanism. To initiate its development, the results of this workshop should be disseminated to the secretaries of the appropriate international, intergovernmental and government organizations for their consideration and action.”

.4 After review, GESAMP decided that the issue of intentional ocean fertilization was being adequately addressed by this planned activity, and that at the present time there was no requirement for GESAMP to form a working group on this topic. It was agreed, however, that GESAMP would keep a close watch on this issue.

11.2 The GESAMP definition of “pollution”

.1 Under the agenda item an information paper prepared by the member, J.M. Bowers and R.E.V. Boelens was first presented (document GESAMP XXXI/12). This paper essentially constituted a briefing on perceived deficiencies in the existing GESAMP definition of “Pollution” agreed in 1969. These pertain to lack of inclusivity (specific limitation to substances and energy), lack of precaution, the correspondence between pollution and “the introduction [of substances and energy]” and some grammatical deficiencies. The paper suggested that there is a need for GESAMP to reconsider the formulation of the definition and also to consider a companion definition of “contamination”.

.2 Following some discussions, particularly focusing on views regarding which of the perceived deficiencies were of greatest importance to address, it was agreed that there was adequate justification for reconsideration of the definition. GESAMP agreed to the following procedure:

- The consideration of various options for the revision of the definition of “pollution” and for the definition of “contamination” by a correspondence group comprising a few members of GESAMP that would work through electronic means.
- The circulation of a short list of options among the entire GESAMP membership for preliminary discussion and reaction leading to the submission to GESAMP XXXII of a paper containing a firm proposal for amendments to the GESAMP Definition.

The initial correspondence group would comprise: Mr. M. Bewers and Mr. R. Boelens.

12 MATTERS OF PARTICULAR CONCERN REGARDING THE DEGRADATION OF THE MARINE ENVIRONMENT

12.1 New perspectives on coral reef degradation

.1 The observation was made that the field of “integrated coastal management” may be facing a critical juncture since many programmes in different parts of the world have largely failed. A major reason for this is that such programmes have not necessarily led to economic benefit to populations in the affected areas. In some known cases, even relatively successful management programmes have not resulted in the generation of wealth locally. In other cases, this wealth has been repatriated out of the country concerned. For as long as people do not realize significant economic benefits from any coastal management programme, there remains the danger of continued resource degradation and even localized extinctions of species. GESAMP recognizes this as a very complex issue, but also highly relevant and within its remit (document GESAMP XXXI/12.1).

.2 In terms of future action, a correspondence group to further develop the topic was established for the coming intersessional period. It is composed of H. Yap, R. Bowen, M. Huber, J. Hambrey, R. Boelens and F. Briand, and will welcome input from all members of GESAMP. The observer from UNEP also kindly offered to provide material on its recently established coral reef unit.

13 FUTURE WORK PROGRAMME

13.1 Scoping activities

.1 Aquatic environmental hazard assessment methods for application in seafood safety risk assessment and management

The FAO Technical Secretary of GESAMP recalled discussions held during GESAMP XXX, recognizing the need to review aquatic environmental assessment methodologies for the general purpose of seafood safety risk assessment and monitoring.

He informed the Group that the FAO Committee on Fisheries (COFI) at its 24th session (26 February-2 March, 2001) had stressed the need for further training and assistance in fish quality assurance, seafood safety measures, risk analysis and the application of relevant WTO agreements, and requested FAO and WHO to assist developing exporting countries in finding low cost solutions in monitoring the effects of environmental pollution on fish and seafood safety.

As agreed by the 30th session of GESAMP, a draft scoping document had been prepared (document GESAMP XXXI/11.2) and was introduced by Mr. T. Bowmer. GESAMP was informed that the document “Aquatic Environmental Hazard Assessment Methods for Application in Seafood Safety Risk Assessment and Management” was limited since it did not consider exposure to microbial

contaminants through seafood. The importance of the issue of seafood safety risk assessment methodologies was acknowledged by the group, while noting that some scientific issues related to chemical contaminants need to be considered in much greater detail in order to assess the feasibility of the tasks to be undertaken. These included:

- Careful consideration of the feasibility of predicting the uptake of metals with complex speciation patterns;
- Consideration of the discrimination power of models versus the required accuracy of model predictions in a risk assessment framework;
- Attention should be paid to the fate of organic chemicals in the aquatic environments and the difficulties of predicting their bioavailability; and
- The question of effect thresholds and dose effect relationships needs consideration as does the 'basket of products' approach to limiting human exposures for specific substances.

The group also recommended that sections of GESAMP Reports and Studies Nos. 43 and 19 on the application of radionuclide risk assessment techniques to other areas would be a useful starting point. Detailed comments on the draft scoping document were received from FAO just prior to the 31st session and while not tabled for discussion will be taken into account in future scoping activities.

GESAMP advised that risk assessment methodologies of microbial contamination could be particularly difficult to develop and recommended that the following issues be explored in detail:

- The exposure of critical human population groups to specific pathogens;
- The geographical variability of patterns of consumption and thereby exposure;
- The variability of patterns of infection, that one or all of a batch of seafood items may be contaminated; and
- The difficulty of predicting sediment microbial contamination from sewage and other organic input data.

The Group agreed that the scoping document should be further developed to encompass both chemical and microbial contaminants and the terms of reference be refined and submitted to thirty-second session of GESAMP. The FAO Technical Secretary will further pursue this matter, in cooperation with interested organizations and GESAMP members. The Group therefore agreed to establish a Working Group to further the scoping effort and noted that it was intended to appoint two co-chairpersons, experts in ecotoxicology and in seafood related consumer protection to lead this work. Support for the Working Group was assured from FAO, WHO, and possibly UNESCO-IOC. The possibility of expanding this Working Group to become a joint GESAMP/ICES exercise was mentioned.

The terms of reference for Working Group should be developed along the following lines:

- Assess the feasibility of the development/adaptation and use of practical and cost-effective aquatic ecotoxicological and microbiological hazard/risk assessment methods for application in seafood safety risk assessment and management measures
- The immediate objective of the working group would be to look into the feasibility of methods for predicting:
 - the uptake of contaminants such as organochlorines and metals into seafood
 - the presence of microbial contaminants in seafood
 - human exposure
 - seafood species specific issues

- Given the complexity of the issues at hand, an appropriate phasing and prioritisation of the above activities should be considered.

.2 Ballast water management

It was recalled that the Technical Secretary of IMO had informed GESAMP XXX of the need for evaluating methodologies for ballast water management control to minimize the risks of alien species transfer, including the elaboration of guidance for setting criteria and standards reflecting the efficacy of such ballast water control measures and that the Group had agreed that Mr. R. Boelens would prepare a feasibility study or scoping document for consideration at this session (document GESAMP XXX/11).

The IMO Technical Secretary informed the Group that a draft Convention for the Control and Management of Ships' Ballast Water and Sediments was being prepared by MEPC, with a view to its consideration and adoption at a diplomatic conference in 2003. A key element of this convention would be the establishment of a single treatment standard for on-board ballast water treatment, suitable for type-approval, which should be based on biological performance and which would become stricter over time in light of technological developments. Such a standard would have to be agreed by October 2002.

GESAMP considered a scoping document on this issue prepared by Mr. R. Boelens (document GESAMP XXXI/11). This document gave a background on the ballast water issue, described issues related to the current application of mid-ocean ballast water exchange by many vessels, (which was regarded as an acceptable management option on an interim basis) and the emerging focus on the development of ballast water treatment technologies. It was noted that an optimum ballast treatment technique must be:

- safe (for the ship and the crew);
- environmentally acceptable (have less impact than the problem it solves);
- practical (compatible with ship design and operation);
- cost-effective (economical); and
- biologically effective (against target species in ballast water).

The document contained a synopsis of the treatment technologies currently being considered and their possible implications, reported on the development of ballast water quality standards at the IMO/UNDP/GEF GloBallast Workshop and Symposium held in March 2001 and, subsequently, at the 46th session of MEPC in April 2001. It concluded that it was important that the process of developing an international control regime for ballast water be subject to close scientific scrutiny to ensure that the standards and technologies applied are likely to yield tangible benefits, devoid of serious side effects. Although GESAMP was well aware of the problems caused by the transfer of marine species, to date it has not examined possible solutions to these problems in any detail. In this context it was important to remember that ballast water was not the only maritime vector of potentially invasive species; the hulls of vessels must also be considered, particularly with the advent of a global prohibition on the use of TBT-based antifouling paints. The Group thanked Mr. Boelens for his comprehensive document.

Filtration of ballast water appeared to be the most promising techniques at this stage and could be employed to remove first larger organisms (>100 micrometer) and progressively, smaller organisms (<100 micrometer).

It was noted that increased research can be expected into sterilization techniques employing sophisticated chemicals effective at low ppm levels and that not only the development of GESAMP hazard profiles, but also risk assessment of such chemicals would be a valuable contribution by GESAMP to the debate. It was suggested that a reliable baseline of organisms should be established for each major ballast water uptake area near ports and in estuaries. Other suggestions included the preparation of an ecological survey of potentially invasive species, of an ecosystem approach to analyse the most likely pathways for transport of target organisms and of guidance for monitoring activities being undertaken in

the six demonstration sites under the IMO/UNDP/GEF GloBallast Programme (Brazil, China, India, Iran, Ukraine and South Africa).

The Group acknowledged that the issue of introduction of non-indigenous marine species would receive increasing attention and agreed, as a first step, to establish an intersessional Correspondence Group under the lead of Mr. R. Boelens, with the following terms of reference:

- develop guidance on the bio-effectiveness of separation techniques through filtration of ballast water in light of the current ballast water treatment standards being considered in MEPC;
- prepare advice on the bio-effects of discharges from separation systems and the need for alternative disposal/ reception arrangements for filtration residues;
- make the case for the need to apply risk assessment for chemicals being considered for on-board sterilization techniques of ballast water; and
- explore possibilities of future advice by GESAMP on scientific aspects associated with transfer of non-indigenous marine species through ballast water and hull transfer.

The Correspondence Group would prepare a paper for consideration and approval at GESAMP XXXII and subsequent submission to MEPC in October 2002.

It was suggested that this Correspondence Group should liaise with the IMO/UNDP/GEF GloBallast Programme Co-ordination Unit and invite scientists involved in that programme to take part in the correspondence group.

The Group noted IMO's intention to arrange a presentation of the activities of the IMO/UNDP/GEF Globallast Programme at the thirty-second session of GESAMP.

13.2 Intersessional work

Taking into account the above considerations, GESAMP noted the intersessional work planned as follows:

.1 Evaluation of the hazards of harmful substances carried by ships (Working Group 1)

Lead Agency: IMO
Co-sponsors: UNEP, FAO, WHO
Chairperson: T. Bowmer
Members: T. Hofer, D. James, M. Marchand, S. Micallef, M. Morrisette, F. Pedersen, T. Syversen, M. Wakabayashi, J. Crayford, N. Soutar

A meeting of the mammalian toxicologists financed by the Netherlands took place 6-10 August 2001. The aquatic toxicologists will meet in November 2001 (financed by the Japanese Ministry of the Environment). The 38th Session of the Working Group will be held from 22 to 26 April 2002.

.2 Marine environmental assessments (Working Group 26)

Lead Agency: UNEP

Co-sponsors: IMO, FAO, UNESCO-IOC, WHO, IAEA, UN, WMO
Chair: M. Huber
Members: L. Awosika, M. Bewers, R. Boelens
R. Duce, L. Jeftic, R. Engler, M. Huber, H. Yap

Efforts will be made to publicize the availability of GESAMP Reports and Studies Nos. 70 and 71 and disseminate their conclusions and recommendations. The Working Group would be prepared to undertake additional tasks under its Terms of Reference as requested and supported by the Sponsoring Agencies, at which time revised membership would be considered

.3 Environmental impacts of coastal aquaculture
(Working Group 31)

Lead Agency: FAO
Co-sponsors: UNEP, UNESCO/IOC, WHO
Chair: J. Hambrey
Members:

Work of the Group will continue during the forthcoming intersessional period and will include a review of the implementation of the precautionary approach and risk assessment with specific reference to coastal aquaculture developments.

.4 Estimates of oil entering the marine environment from sea-based activities
(Working Group 32)

Lead Agency: IMO
Co-sponsor: UNESCO-IOC
Chair: P. Wells
Members: J. Campbell, P. Johnston, J. Koefoed, F. Molloy,
D. Etkin, T. Wilkins

Work of the group will continue by correspondence/e-mail.

The next draft is being prepared for distribution for the Working Group and reviewers by the Fall of 2001. The report will be reviewed externally during Winter 2002 and will be tabled for approval at GESAMP XXXII in May 2002.

.5 Aquatic environmental hazard assessment methods for application in seafood safety risk assessment and management
(Working Group 33)

Lead Agency: FAO
Co-sponsor: WHO, UNESCO-IOC ^{1/}
Chair: to be determined
Members: to be determined

The Working Group 31 will report to the 32nd session of GESAMP

.6 Ballast Water Management
(Correspondence Group)

^{1/} Pending confirmation

Lead Agency: IMO
Chair: R. Boelens
Members: To be determined

The Correspondence Group would prepare a paper for consideration and approval at GESAMP XXXII and subsequent submission to the MEPC in 2002. The terms of the reference for the correspondence group are found in paragraph 13.1.2 of this report.

14 OTHER MATTERS

14.1 Analysis of Citations of GESAMP Reports and Studies:

The Group was informed about a detailed analysis of the frequency of citation of GESAMP Reports and Studies and related publications in the natural and social sciences literature, which was being conducted upon request of a GESAMP Member (document GESAMP XXXI/14.1). The citation analysis, using Web of Science citation index, showed that 486 papers published since 1989 cite GESAMP documents, while another 358 papers cite journal articles and books based on GESAMP reports. The group welcomed the analysis and appreciated the efforts aimed at improving the visibility of GESAMP. A number of concrete recommendations were made to improve the citation searching procedures essentially for old GESAMP reports. Members of GESAMP were invited to provide further comments and proposals on the draft of the citation analysis which will be completed in Fall 2001.

14.2 A Paper on GESAMP

A paper entitled “Caring for the sea – accomplishments, activities and future of the United Nations GESAMP” and prepared by present and former GESAMP Chairmen and by the Vice-Chairperson was presented to the Group (document GESAMP XXXI/14.2). The paper was first presented at the 4th International Coastal Zone Canada Conference in September 2000 and was submitted for publication to the journal “Ocean and Coastal Management”. The paper represents a continued effort to publicize the work of GESAMP. The GESAMP, the Technical Secretaries and all other interested persons were requested to submit any further comments to the authors for consideration, prior to publication of the paper. The final paper will be available on the GESAMP web site (<http://www.gesamp.imo.org>).

15 DATE AND PLACE OF THE NEXT SESSION

15.1 GESAMP accepted the offer of the International Maritime Organization to host the thirty-second session of GESAMP at IMO Headquarters in London from 6 to 10 May 2002.

16 ELECTION OF THE CHAIRPERSON AND THE VICE-CHAIRPERSON

16.1 GESAMP unanimously re-elected Mr. R. Duce as Chairperson and Mr. M. Huber as Vice-Chairperson for the next intersessional period and the thirty-second session of GESAMP.

16.2 GESAMP also expressed its gratitude to Mr. K. Bradley, the Chairperson of the GESAMP Evaluation Team, and through him, to the Members of the Evaluation Team, for their superb effort in producing the evaluation report.

17 REPORT OF GESAMP XXXI

17.1 The report of the thirty-first session of GESAMP was considered and adopted by the Group on the last day of the session.

17.2 The thirty-first session of GESAMP was closed by the Vice-Chairperson at 4:00 p.m. on 17 August 2001.

ANNEX I

AGENDA

1. Adoption of the agenda
2. Report of the Administrative Secretary
3. Report of the Chairperson
4. Evaluation of GESAMP
5. Feasibility of establishing a regular process for the assessment of the state of the marine environment (UNEP Governing Council Decision 21/13)
6. Evaluation of the hazards of harmful substances carried by ships
7. Marine environmental assessments
8. Environmental impacts of coastal aquaculture
9. Estimates of oil entering the marine environment from sea-based activities
10. Endocrine disrupting substances in the aquatic environment: Impacts on aquatic life and human health
11. Scoping activities
 - 11.1 Intentional fertilization of the coastal and pelagic oceans
 - 11.2 The GESAMP definition of 'Pollution'
12. Matters of particular concern regarding the degradation of the marine environment
 - 12.1 New perspectives on coral reef degradation
13. Future work programme
 - 13.1 Scoping activities
 - 13.2 Intersessional work
14. Other matters
 - 14.1 Analysis of citations of GESAMP Reports and Studies
 - 14.2 A paper on GESAMP
15. Date and place of next session
16. Election of the Chairperson and the Vice-Chairperson
17. Report of GESAMP XXXI

ANNEX II

LIST OF DOCUMENTS

Agenda Item	Document	Submitted by	Title
1	GESAMP XXXI/1	Admin Sec.	Provisional agenda
4	GESAMP XXXI/4	IMO	Report of the GESAMP Evaluation Team
5	GESAMP XXXI/5	IMO	Feasibility of Establishing a Regular Process for the Assessment of the State of the Marine Environment (UNEP Governing Council Decision 21/13): Communication between UNEP and the Administrative Secretary regarding this UNEP initiative
6	GESAMP XXXI/6	IMO	Evaluation of the Hazards of Harmful Substances Carried by Ships: Report of the 37 th Session of the EHS Working Group
	GESAMP XXXI/6.1	IMO	Draft Reports and Studies No.64: The Revised GESAMP Hazard Evaluation Procedure for Chemical Substances Carried by Ships
	GESAMP XXXI/6.2	IMO	Peer Reviewers' comments on Report GESAMP XXXI/6/1
7	GESAMP XXXI/7	M. Huber	MEA Working Group Report
8	GESAMP XXXI/8	FAO	Future work by GESAMP Working Group 31: Implementing the precautionary approach and risk assessment with specific reference to coastal aquaculture development
9	GESAMP XXXI/9	IMO	Estimates of Oil Entering the Marine Environment from Sea-Based Activities
10	GESAMP XXXI/10	Tim Bowmer	Endocrine Disrupting Substances in the Aquatic Environment: Impacts on Aquatic Life and Human Health: Working paper by the Chairman of Working Group 27; and Excerpt from Status report of EIFAC Sub-Commission III on this issue
11	GESAMP XXXI/12	J.M. Bewers and R.G.V. Boelens	On the GESAMP definition of 'Pollution'
12	GESAMP XXXI/12.1	H. T. Yap	New Perspectives on Coral Reef Degradation
13	GESAMP XXXI/11.2	Tim Bowmer and Chris Karman	Aquatic Environmental Hazard Assessment Methods for Application in Seafood Safety Risk Assessment and Management
	GESAMP XXXI/11	R.G.V. Boelens	Management and Treatment of Ballast Water to Reduce Risks of Alien Species Transfer

Agenda Item	Document	Submitted by	Title
14	GESAMP XXXI/14.1	IMO	Frequency of Citation of GESAMP Reports and Studies and of Related Publications in the Science and Social Science Literature
	GESAMP XXXI/14.2	IMO	Paper on GESAMP submitted for publication

**ANNEX III
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ANNEX IV

GLOBAL ASSESSMENT OF THE STATE OF THE MARINE ENVIRONMENT POSITION PAPER BY GESAMP

1 Background

1.1 The UNEP Governing Council Resolution 21/13 on the Global Assessment of the State of the Marine Environment, amongst other matters:

- identifies “ineffective communication between scientists and government policy makers and the public alike” as one of the reasons for the lack of commitment and the inability of the international community to address and solve the environmental problems of the seas in a comprehensive way; and
- requests the Executive Director to explore the feasibility of establishing a regular process for the assessment of the state of the marine environment, with active involvement by governments and regional agreements, building on ongoing assessment programmes.

1.2 At its XXXIst Session held in New York from 13 to 17 August 2001, GESAMP, responding to an invitation from the Administrative Secretary, welcomed the opportunity to discuss the important issues raised by Resolution 21/13 and to comment, as follows.

2 GESAMP contributions to marine environmental assessment

2.1 GESAMP, with the support and services provided by its eight sponsoring agencies, and well-established links to other international organisations and scientific bodies, has a long and distinguished history of contributions to the science of marine environmental protection.

2.2 The status of GESAMP as ‘a source of agreed, independent scientific advice’ has been acknowledged by the Commission on Sustainable Development at its Fourth Session in 1996 (Decision 4/15 (c)).

2.3 The preparation of environmental assessments is central to the GESAMP mission. According to the ‘Updated Memorandum of GESAMP’ (1994), the Group’s mandate is:

- (i) to provide advice relating to the scientific aspects of marine environmental protection; and
- (ii) to prepare periodic reviews and assessments of the state of the marine environment and to identify problems and areas requiring special attention.

Decadal Assessments

2.4 GESAMP has produced three ‘decadal’ assessments (GESAMP, 1982, 1990 and 2001¹) comprising comprehensive and rigorous analyses of trends and conditions in the marine environment. The most recent of these reports – *Protecting the Oceans from Land-based Activities* (GESAMP 2001a) was initiated by UNEP as a contribution to the first Inter-governmental Review Meeting on the implementation of the GPA/LBA planned for November 2001.

¹ See full references of these publications at the end of this document.

Concise Reports for General Readership

2.5 At its XXVIIth session in Nairobi (GESAMP 1997), GESAMP recognised the value of more regular assessments of marine ecosystems and agreed to produce short, non-technical updates on marine environmental conditions at approximately two-year intervals, including ‘highlights of major current and emerging issues’. The first of these reports was released in 2001 under the title *A Sea of Troubles* (GESAMP 2001b). Given the enthusiastic response to this report it seems that it has filled an important niche in the literature and that a continuation of this approach is warranted.

Short Communications

2.6 At its XXVIIIth session in Geneva (1998), GESAMP acknowledged the need for short statements highlighting issues of particular interest or concern that had emerged during the previous year. These statements are not assessments but are intended to highlight new developments relating to protection of the marine environment. Examples are new practices that threaten significant damage to marine ecosystems or human health and new scientific techniques that warrant wider application in environmental management. The first of these reports – *Oceans at Risk* – was released in 1998 (GESAMP 1998).

Thematic Studies

2.7 GESAMP has produced more than 40 reports relating to various marine environmental features, processes and conditions. These detailed reports are prepared by specially convened working groups and many have provided valuable inputs to subsequent environmental assessments. For example, the report *Atmospheric Input of Trace Species to the World Ocean* (GESAMP 1989) provided critical insights into the atmospheric contribution to contamination of the marine environment.

2.8 This set of publications represents an evolution, over more than three decades, in GESAMP’s understanding of how information on marine environmental conditions should be presented to meet the varied needs of its diverse audience.

3 The assessment process

3.1 From its more than 30 years experience in this field, GESAMP concludes that marine environmental assessment is one of the most complex and demanding activities in marine science. Although understanding of certain key aspects of the design and conduct of assessments is steadily improving, knowledge of necessary techniques is still evolving. There is still plenty of scope for debate on the precise aims of assessments and on criteria of marine environmental quality.

3.2 GESAMP believes that an effective assessment process depends on the attention given to *design* (e.g. scope, structure, quality criteria etc.) during the preparatory phase. In this context, wide-ranging consultations with international bodies, governments, NGOs, sectoral interests and the public would be extremely useful; they will help to ensure the assessment achieves its objectives and meets the needs of its users. The *conduct* of an assessment is essentially a scientific exercise. Ideally, the final stage of the process would involve a detailed inter-governmental *review* of the scientific findings, analysing policy implications and identifying measures necessary to redress degradation.

4 Lessons learned from GESAMP’s experience with MEA

4.1 GESAMP maintains a Marine Environmental Assessment (MEA) Working Group to keep under review the changing environmental conditions in coastal and open-ocean ecosystems and to prepare both comprehensive and thematic reports for consideration by inter-governmental agencies, their member governments, policy-makers, environmental managers and the scientific community in general. The Working Group identifies deficiencies in information available for assessment purposes as well as shortcomings in current arrangements for monitoring, data collation, data interpretation and reporting that hamper or weaken assessments at the regional and global levels.

4.2 The MEA Working Group has concluded that there are currently a number of technical, financial and policy barriers that, until they are resolved, preclude any substantive improvement in the quality, relevance and reliability of comprehensive global reports. Indeed, major improvements in the planning and management of assessments should be sought before any new comprehensive global assessments are initiated.

4.3 Amongst the **technical barriers** to improved assessments are:

- A serious and worldwide shortage of reliable and comparable data on key indicators of environmental quality, including risks to marine life and human health;
- A lack of long-term datasets essential to the identification and analysis of temporal trends;
- Excessive time between data collection and publication of monitoring reports;
- Inadequate, or inadequate application of, standards, criteria and reference values for the interpretation of chemical and biological data; and
- Limited, or inaccessible, statistics on the changing patterns of human activities that influence environmental conditions, particularly in coastal areas (e.g. industry, recreation, use of habitats and resources).

4.4 Taking account of its broadly-based experience and expertise in the marine sciences, GESAMP is well placed to investigate the underlying causes of these deficiencies and to recommend possible solutions.

4.5 On the other hand, GESAMP recognises that there are, in addition, certain **financial and policy-related barriers** to assessments and that, whereas the Group can draw these to the attention of governments and agencies, it can do little to resolve them directly. For example, policies relating to marine environmental protection and associated scientific requirements too often fail to place sufficient emphasis on monitoring, so that monitoring is vastly under-resourced. There is, indeed, a tendency to tightly control routine activities such as monitoring and a reluctance to initiate and fund activities that demand continuity i.e. long-term investment. This seriously compromises abilities to detect and assess trends in environmental quality.

4.6 Assessment is seldom incorporated into national marine science programmes as an ongoing activity. The periodic nature of assessments undertaken to date whereby personnel, services and facilities are seconded for fixed periods, hampers the development of expertise and capacity for future assessments and reduces the overall efficiency of the process.

4.7 Global assessments depend almost entirely on reports of national and regional assessment programmes. However, as noted in GESAMP's recent study *Protecting the Oceans from Land-based Activities* (GESAMP 2001a), too many regional (and presumably national) assessments lack sufficient data for purposes of a global review. Accordingly, a fundamental prerequisite to improved global assessments is to achieve a substantial overall improvement in the quality, comparability and regularity of assessments prepared at the national and regional levels.

4.8 Perhaps the most serious limitation of past assessments is the time taken to complete them. For assessments to be useful for policy review and formulation they must be as up-to-date as possible. In some past assessments much of the data were 5 to 10 years old and did not reflect conditions at the time of publication. Even in the case of the year 2000 assessment carried out for the North-East Atlantic (i.e. OSPAR) region, where there is a long-established monitoring and assessment programme, most of the data represented conditions prior to 1997. Accordingly, there is an urgent need to expedite the entire process from data collection, compilation and interpretation to regional and global assessment. This will require a thorough examination of each stage in the process, the identification of impediments and the co-operation of governments, agencies and scientific institutions in developing a more co-ordinated and efficient system.

4.9 Experience shows that, when properly designed, assessments can be conducted most efficiently by small, dedicated, multi-disciplinary teams of scientists working intensively and in close collaboration. While it is important that draft reports be subject to peer review by qualified scientists, it is also the case that unless such reviews are rigorously planned and controlled they can significantly prolong the assessment process. There are strong arguments for a process whereby the scientific perspective on marine environmental quality is followed by a governmental assessment, responding to the scientific conclusions and analysing the policy implications. This is clearly a matter that warrants serious deliberation and dialogue amongst all contributors to the planning and conduct of marine environmental assessments.

5 Concluding remarks

5.1 In summary, GESAMP is the source of the most comprehensive and authoritative global assessments of the state of the marine environment currently available to the international community. Based on its record and long experience in this field, GESAMP believes it can continue to make a substantive, continuous and cost-effective contribution to marine environmental assessments.

5.2 The Group strongly supports all efforts to improve ‘communication between scientists and government policy makers and the public alike’, especially insofar as it may lead to improvement in the currency, relevance and utility of marine environmental assessments. GESAMP is convinced that the assessment process would benefit from the involvement of governments and other stakeholders in the design of assessment methodologies and the review of assessment reports.

5.3 Finally, GESAMP is committed to continually improving the MEA process and working with other organisations that have similar interests and responsibilities.

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ANNEX V

EVALUATION OF THE HAZARDS OF HARMFUL SUBSTANCES CARRIED BY SHIPS

1. Review of current activities

The GESAMP-EHS Working Group held its thirty-seventh session at IMO Headquarters, London, from 30 April to 4 May 2001 under the chairmanship of Mr. Tim Bowmer. At that session the Working Group continued the re-evaluation of the products listed in IMO's International Bulk Chemical Code (IBC) Code, on the basis of its new hazard evaluation procedures, as well as of new substances proposed for carriage in bulk. In all 100 products listed in the IBC Code were evaluated at this session. The Group also held a final review of the draft *Revised GESAMP Hazard Evaluation Procedure for Chemical Substances Carried by Ships* (GESAMP Reports and Studies No.64, see in section 6 of this report)

A meeting of the EHS subgroup of mammalian toxicologists was held from 6 - 10 August 2001 with financial support by the Government of the Netherlands. A meeting of the EHS subgroup of aquatic toxicologists will be held in November 2001 with financial support from the Government of Japan.

The thirty-eighth session of the Working Group will be held from 22 to 26 April 2002.

2. Terms of reference of the Working Group

To examine and evaluate available data and to provide such other advice as may be requested, particularly by IMO, for evaluating the environmental hazards posed by harmful substances carried by ships, in accordance with the rationale approved by GESAMP for these purposes.

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ANNEX VI

EXECUTIVE SUMMARY: REPORT ON THE REVISED GESAMP HAZARD EVALUATION PROCEDURE FOR CHEMICAL SUBSTANCES CARRIED BY SHIPS (GESAMP Reports and Studies No.64))

1 The revised GESAMP Hazard Evaluation Procedure for Chemical Substances Carried by Ships provides a set of criteria for evaluating the hazards of chemical substances entering the marine environment through operational discharges or accidental spillage from ships. Hazards to both man and the marine environment are considered and the information is put together in the form of a 'hazard profile'. The hazard profiles of substances carried by ships that have been reviewed by GESAMP's Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships (EHS) are published at regular intervals and are available from IMO in the form of a "composite list".

2 The revised GESAMP Hazard Evaluation Procedure is intended to provide its users with information on the manner in which GESAMP evaluates the environmental and human hazards of chemical substances carried by ships at sea. It is also intended to provide guidance on how to prepare data in support of requests for evaluating substances for submission to both GESAMP and IMO under the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol relating thereto (MARPOL 73/78).

3 Through its Marine Environment Protection Committee (MEPC)¹, IMO is responsible for assigning substances to an appropriate pollution category. This pollution categorisation system, together with appropriate ship design and operational requirements, is part of the mechanism for the prevention of pollution at sea.

4 Much has changed since 1973 when, at the request of IMO, GESAMP first introduced principles for evaluating chemical hazards, based on the intrinsic properties of a chemical substance, in support of the original MARPOL Convention of 1973. The most important change is one of attitude - the public increasingly expects the seas to be kept clean, both for recreational purposes and for the provision of healthy, uncontaminated food. As part of our common heritage, the sea should be used according to the principles of sustainable development.

5 Environmental science has evolved immensely in the last thirty years. GESAMP itself has done much to highlight sources of marine pollution and to assess their relative importance. The routes and processes of chemical exposure and subsequent toxic effects to aquatic organisms are now better understood and can be predicted from molecular structure, sometimes with remarkable accuracy. Knowledge of the effects of exposure to chemicals on human health has also advanced greatly in this time. A large testing industry has grown up to provide experimental and other data on a wide range of both environmental and human health criteria.

6 Despite such advances, many substances, e.g., those that are poorly soluble, still remain very difficult to test and evaluate; the most problematic are mixtures, particularly those that have been poorly characterised by their manufacturers. In some cases, their identity may be hardly known at all.

7 It is generally accepted that the volume of operational discharges from ships should be reduced as much as practicable. As a result of advances in ship design and construction, and the application of 'efficient tank stripping' devices, such reductions are now possible. Experience with port and harbour reception facilities for tank washings in the world's major ports has shown that bringing all tank washings on shore is at present not a viable option. As a result, only highly toxic substances are brought on shore.

¹ The Environmental Safety and Pollution Hazards Working Group (ESPH) of the Bulk Liquids and Gasses Sub-Committee (BLG) of MEPC carry out this process.

Transferring the problem to land where, in many parts of the world, treatment facilities are non-existent or are unable to cope in many instances, is also undesirable. Therefore, it is still considered necessary to discharge in a controlled manner tank washings from ships at sea.

8 In the light of such developments, GESAMP has revised its hazard evaluation procedure to focus not only on the aquatic toxicity and bioaccumulation of substances as criteria but also to include 'ready biodegradability' and physical behaviour in water for the first time in their own right. The human health criteria have been greatly expanded in order to meet the increased attention for occupational health and safety on board ships. Acute and also chronic effects are treated in more detail than previously.

9 The enormous volumes transported by ship, where a single tank may hold up to as much as 3,300 tonnes and bulk chemical carriers range in dead-weight from a few hundred to well over 40,000 tonnes, warrant special measures for the protection of the sea. GESAMP felt that risk assessment of chemical substances for marine transport, as opposed to hazard evaluation, would be unnecessarily complex, and would require considerably more environmental data on chemical substances to achieve, for little additional benefit. However, it was considered necessary to place emphasis upon some additional hazard criteria due to the larger volumes involved and their specific hazards to the marine environment.

10 The Revised GESAMP Hazard Evaluation Procedure was therefore developed in close consultation with OECD, during its preparation of the UN Globally Harmonised System for the classification and labelling of chemicals (GHS). It has achieved a high degree of harmonisation with the UN GHS. However, as indicated above, it has been necessary to add limited, additional hazard criteria specific to the transport mode in question.

11 The Revised GESAMP Hazard Evaluation Procedure replaces the original system published in 1982 as GESAMP Reports & Studies No.17 and later revised in 1989 as GESAMP Report and Studies No.35. The basic elements of the Revised GESAMP Hazard Evaluation Procedure were first published in draft form in the 1998 report of the thirty-fourth session of the GESAMP EHS Working Group. Implementation commenced in 1999 with the re-evaluation of the bulk liquid substances contained in the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code), as part of IMO's revision of Annex II to the MARPOL 73/78 Convention. Completion of this evaluation is expected in 2003.

12 In the Revised GESAMP Hazard Evaluation Procedure, the function of each environmental or human health criterion is separately defined and described in a short introductory section; the scale on which it is measured as well as the ranking used are given under the heading 'ratings'. This is followed by a set of supporting principles given under the heading 'implementation' in order to assist with evaluating and interpreting the scientific data. Finally, brief guidance is given on approved, internationally available, experimental and extrapolation methods for generating the necessary data.

13 The familiar GESAMP hazard profile has been retained. This is an expanded alphanumeric fingerprint of each substance that can be read at a glance. The numerical scales start from 0 (practically non-hazardous) while higher numbers reflect increasing hazard. It is hoped that in this way, information on substances evaluated by GESAMP will be made available to the widest possible audience in an easily understandable form.

14 Some aspects, such as the evaluation of mixtures, poorly soluble substances, biodegradation rates in the marine environment, occupational exposure on board ships and changes to test procedures designed to reduce the use of test animals are being kept under review.

15 It is hoped that the Revised GESAMP Hazard Evaluation Procedure will play a useful part in protecting the marine environment and those who depend upon the sea for their livelihood. However, it should be borne in mind that the key to protecting man and the environment from hazardous chemicals carried by ships at sea depends on the will of national administrations and multinational corporations to agree upon and implement international regulations.

ANNEX VII

INTERSESSIONAL ACTIVITIES OF THE WORKING GROUP ON MARINE ENVIRONMENTAL ASSESSMENTS

REPORT OF THE ACTING CHAIRPERSON

1 Background

The Working Group (WG 26) was formally established at the twenty-sixth session of GESAMP (Paris, 25-29 March 1996) at the request of UNEP. All eight agencies sponsoring GESAMP agreed to co-sponsor the Working Group, with UNEP assuming the role of the lead agency. The terms of reference for the Working Group were adopted at the twenty-seventh session of GESAMP (Nairobi, 14-18 April 1997). The Terms of Reference are contained in Appendix 1.

Commencing work in the intersessional period between GESAMP XXVIIth and , XXVIIIth the Working Group prepared GESAMP Reports and Studies Nos. 70 and 71. Drafts of these reports were presented at the twenty-eighth session of GESAMP (Geneva, 20-24 April 1998) and the twenty-ninth session of GESAMP (London, 23-26 August 1999), and work continued during the following intersessional periods. At the twenty-ninth session GESAMP welcomed the Advisory Committee on Protection of the Sea (ACOPS) as an additional co-sponsor of the Working Group. Penultimate drafts of GESAMP Reports and Studies Nos.70 and 71 were adopted by the thirtieth session of GESAMP (Monaco, 22-26 May 2000) on the understanding that comments and suggestions made at the thirtieth session would be taken into account by the Working Group in finalizing the reports.

2 Finalization of GESAMP Reports and Studies Nos.70 and 71

The Editorial Board met at the IAEA laboratory in Monaco on 27 May 2000 to consider the comments and suggestions of GESAMP XXX and agree on steps to be taken to finalise the reports. The Board then worked intersessionally by correspondence to finalise the reports. Following receipt of all documents from the other members of the Editorial Board, the Chair (S. Keckes) and Technical Secretary (O. Vidal) of the Working Group assembled the reports and delivered them to the writer/editor for final editing. The Technical Secretary delivered the final drafts to GRID-Arendal for final figure preparation, layout, and publication.

3 Publication of GESAMP Reports and Studies Nos.70 and 71

UNEP supervised final publication and distribution of GESAMP Reports and Studies Nos.70 and 71, which were published on 15 January 2001. Publicity for the release of the report apparently consists of postings on several of the sponsoring agencies' web sites.

Due to an oversight, the role of ACOPS as co-sponsor of the reports is not acknowledged in the printed version. The WORKING GROUP agreed that the correct literature citations for the two reports should be as follows:

GESAMP (IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP/ Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection) and ACOPS. 2001.A Sea of Troubles. Rep. Stud. GESAMP No. 70, 35 pp.

GESAMP (IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP/ Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection) and ACOPS. 2001. Protecting the oceans from land-based activities - Land-based sources and activities affecting the quality and uses of the marine, coastal and associated freshwater environment. Rep. Stud. GESAMP No. 71, 162 pp.

Citing financial constraints, UNEP decided to terminate negotiations for commercial publication of GESAMP Reports and Studies Nos. 70 and 71 as endorsed by GESAMP and the Sponsoring Agencies. The Chair of GESAMP has since been working to negotiate for the publication of the reports by a commercial publisher. Some 4500 copies of GESAMP Reports and Studies No. 70, and 4000 of GESAMP Reports and Studies No. 71 were published by UNEP. This is less than the number of copies required by the Sponsoring Agencies in order to fulfill their distribution requirements, and it appears that the reports are now out of print. The Canadian government has agreed to support translation of the reports into French and Spanish for presentation at the First Intergovernmental Review Meeting on Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, but no funds are presently available to publish these versions for distribution beyond that meeting.

The section "Problems and Solutions" of GESAMP Reports and Studies No. 70 was submitted under the joint authorship for GESAMP and ACOPS for publication in Ocean & Coastal Management in February 2001 and is in review.

4 Other Activities

The twenty-ninth session of GESAMP endorsed the development of co-operative arrangements between the Working Group and the Global International Waters Assessment (GIWA) and appointed the Chairperson of the Working Group (S. Keckes) as the *ex officio* representative of GESAMP on the Steering Group of GIWA. The Chairperson participated in two meetings of the GIWA Steering Group (Kalmar, 27-28 September 1999 and 12-14 March 2000), and in a meeting of GIWA's Task Team for the development of GIWA's methodology (Plymouth, 11-13 January 2000). The thirtieth session of GESAMP appointed the Vice-Chairperson of GESAMP (M. Huber) as its *ex officio* representative on the GIWA Steering Group. The Vice-Chair attended a meeting of the GIWA Steering Group in Kalmar, 3 March 2001. Several members of the Working Group and of GESAMP have been involved in GIWA activities during the most recent intersessional period.

The Working Group discussed by correspondence the implications of UNEP Governing Council decision 21/13 on the possible establishment of a regular process for the Global Assessment of the State of the Marine Environment for GESAMP and the Working Group. The Working Group considers that its Terms of Reference as well as its expertise and experience in global assessments of the marine environment are highly relevant to such a process, and that the Working Group is the logical mechanism for GESAMP's possible participation.

5 Departure of Chair and Technical Secretary

The Chairperson of the Working Group stepped down in December 2000, having completed the task of seeing GESAMP Reports and Studies Nos. 70 and 71 through to publication. The Working Group understands that the Technical Secretary has been reassigned to other duties, but had not been informed of this, nor of his replacement. The Working Group expresses its sincere gratitude to both the Chair and the Technical Secretary for their hard work, dedication, and leadership in guiding and supporting its work over the past several years, and most importantly for their friendship and comradery.

ANNEX VII

APPENDIX

TERMS OF REFERENCE

(paragraph 6.9.1 of the Report of GESAMP XXVII – Nairobi, 14-18 April 1997)

1. To undertake:
 - (a) short, general *biennial assessments*, including highlights of major current and emerging issues;
 - (b) assessment of land-based sources and activities affecting the quality and uses of the marine, coastal and associated freshwater environment [LBA report]; and
 - (c) periodic comprehensive assessments of the condition of the marine environment (SOME reports), with emphasis on the effects of, and threats posed by, anthropogenic activities.
2. To develop scientific approaches:
 - (a) for improving the reliability, comprehensiveness and utility of assessments; and
 - (b) to meet expectations of the international community for a more balanced geographic coverage of assessments, including, inter alia:
 - * new concerns and perspectives;
 - * improved insight regarding trends; and
 - * the social and economic consequences of impacts on the marine environment, its resources and amenities; and vice versa.
3. To identify actions, including adoption of new scientific and innovative approaches for sustainable protection and development of the marine environment, its resources and amenities within the context of existing and planned international and regional agreements.
4. To promote and keep under review the conduct of regional assessments, and to provide scientific and technical guidance to facilitate improved global assessments.
5. To identify, recommend and apply better indices of environmental conditions to assess environmental changes and trends.

List of GESAMP Reports and Studies

The following reports and studies have been published so far. They are available from any of the organizations sponsoring GESAMP.

1. Report of the seventh session, London, 24-30 April 1975. (1975). Rep. Stud.GESAMP, (1):pag.var. Available also in French, Spanish and Russian
2. Review of harmful substances. (1976). Rep.Stud.GESAMP, (2):80 p.
3. Scientific criteria for the selection of sites for dumping of wastes into the sea. (1975). Rep.Stud. GESAMP, (3):21 p. Available also in French, Spanish and Russian
4. Report of the eighth session, Rome, 21-27 April 1976. (1976). Rep. Stud.GESAMP, (4):pag.var. Available also in French and Russian
5. Principles for developing coastal water quality criteria. (1976). Rep.Stud.GESAMP, (5):23 p.
6. Impact of oil on the marine environment. (1977). Rep.Stud.GESAMP, (6):250 p.
7. Scientific aspects of pollution arising from the exploration and exploitation of the sea-bed. (1977). Rep.Stud.GESAMP, (7):37 p.
8. Report of the ninth session, New York, 7-11 March 1977. (1977). Rep. Stud.GESAMP, (8):33 p. Available also in French and Russian
9. Report of the tenth session, Paris, 29 May - 2 June 1978. (1978). Rep. Stud.GESAMP, (9):pag.var. Available also in French, Spanish and Russian
10. Report of the eleventh session, Dubrovnik, 25-29 February 1980. (1980). Rep.Stud.GESAMP, (10):pag.var. Available also in French and Spanish
11. Marine Pollution implications of coastal area development. (1980). Rep. Stud.GESAMP, (11):114 p.
12. Monitoring biological variables related to marine pollution. (1980). Rep. Stud.GESAMP, (12):22 p. Available also in Russian
13. Interchange of pollutants between the atmosphere and the oceans. (1980). Rep.Stud.GESAMP, (13):55 p.
14. Report of the twelfth session, Geneva, 22-29 October 1981. (1981). Rep.Stud.GESAMP, (14):pag.var. Available also in French, Spanish and Russian.

15. The review of the health of the oceans. (1982). Rep.Stud.GESAMP, (15):108 p
16. Scientific criteria for the selection of waste disposal sites at sea. (1982). Rep.Stud.GESAMP, (16):60 p.
17. The evaluation of the hazards of harmful substances carried by ships. (1982). Rep.Stud.GESAMP, (17):pag.var.
18. Report of the thirteenth session, Geneva, 28 February - 4 March 1983. (1983). Rep.Stud.GESAMP, (18):50 p. Available also in French, Spanish and Russian
19. An oceanographic model for the dispersion of wastes disposed of in the deep sea. (1983). Rep.Stud. GESAMP, (19):182 p.
20. Marine pollution implications of ocean energy development. (1984). Rep. Stud.GESAMP, (20):44 p.
21. Report of the fourteenth session, Vienna, 26-30 March 1984. (1984). Rep.Stud.GESAMP, (21):42 p. Available also in French, Spanish and Russian
22. Review of potentially harmful substances. Cadmium, lead and tin. (1985). Rep.Stud.GESAMP, (22):114 p.
23. Interchange of pollutants between the atmosphere and the oceans (part II). (1985). Rep.Stud. GESAMP, (23):55 p.
24. Thermal discharges in the marine environment. (1984). Rep.Stud. GESAMP, (24):44 p.
25. Report of the fifteenth session, New York, 25-29 March 1985. (1985). Rep.Stud.GESAMP, (25):49 p. Available also in French, Spanish and Russian
26. Atmospheric transport of contaminants into the Mediterranean region. (1985). Rep.Stud.GESAMP, (26):53 p.
27. Report of the sixteenth session, London, 17-21 March 1986. (1986). Rep. Stud.GESAMP, (27):74 p. Available also in French, Spanish and Russian
28. Review of potentially harmful substances. Arsenic, mercury and selenium. (1986). Rep.Stud. GESAMP, (28):172 p.
29. Review of potentially harmful substances. Organosilicon compounds (silanes and siloxanes). (1986). Published as UNEP Reg.Seas Rep.Stud., (78):24 p.

30. Environmental capacity. An approach to marine pollution prevention. (1986). Rep.Stud.GESAMP, (30):49 p.
31. Report of the seventeenth session, Rome, 30 March - 3 April 1987. (1987). Rep.Stud.GESAMP, (31):36 p. Available also in French, Spanish and Russian
32. Land-sea boundary flux of contaminants: contributions from rivers. (1987). Rep.Stud.GESAMP, (32):172 p.
33. Report on the eighteenth session, Paris, 11-15 April 1988. (1988). Rep. Stud.GESAMP, (33):56 p. Available also in French, Spanish and Russian
34. Review of potentially harmful substances. Nutrients. (1990). Rep.Stud. GESAMP, (34):40 p.
35. The evaluation of the hazards of harmful substances carried by ships: Revision of GESAMP Reports and Studies No. 17. (1989). Rep.Stud. GESAMP, (35):pag.var.
36. Pollutant modification of atmospheric and oceanic processes and climate: some aspects of the problem. (1989). Rep.Stud.GESAMP, (36):35 p.
37. Report of the nineteenth session, Athens, 8-12 May 1989. (1989). Rep. Stud.GESAMP, (37):47 p. Available also in French, Spanish and Russian
38. Atmospheric input of trace species to the world ocean. (1989). Rep.Stud. GESAMP, (38):111 p.
39. The state of the marine environment. (1990). Rep.Stud.GESAMP, (39):111 p. Available also in Spanish as Inf.Estud.Progr.Mar.Reg.PNUMA, (115):87 p.
40. Long-term consequences of low-level marine contamination: An analytical approach. (1989). Rep. Stud.GESAMP, (40):14 p.
41. Report of the twentieth session, Geneva, 7-11 May 1990. (1990). Rep. Stud.GESAMP, (41):32 p. Available also in French, Spanish and Russian
42. Review of potentially harmful substances. Choosing priority organochlorines for marine hazard assessment. (1990). Rep.Stud. GESAMP, (42):10 p.
43. Coastal modelling. (1991). Rep.Stud.GESAMP, (43):187 p.
44. Report of the twenty-first session, London, 18-22 February 1991. (1991). Rep.Stud.GESAMP, (44):53 p. Available also in French, Spanish and Russia

45. Global strategies for marine environmental protection. (1991). Rep.Stud. GESAMP, (45):34 p.
46. Review of potentially harmful substances. Carcinogens: their significance as marine pollutants. (1991). Rep.Stud.GESAMP, (46):56 p.
47. Reducing environmental impacts of coastal aquaculture. (1991). Rep. Stud.GESAMP, (47):35 p.
48. Global changes and the air-sea exchange of chemicals. (1991). Rep. Stud.GESAMP, (48):69 p.
49. Report of the twenty-second session, Vienna, 9-13 February 1992. (1992). Rep.Stud.GESAMP, (49):56 p. Available also in French, Spanish and Russian
50. Impact of oil, individual hydrocarbons and related chemicals on the marine environment, including used lubricant oils, oil spill control agents and chemicals used offshore. (1993). Rep.Stud.GESAMP, (50):178 p.
51. Report of the twenty-third session, London, 19-23 April 1993. (1993). Rep.Stud.GESAMP, (51):41 p. Available also in French, Spanish and Russian
52. Anthropogenic influences on sediment discharge to the coastal zone and environmental consequences. (1994). Rep.Stud.GESAMP, (52):67 p.
53. Report of the twenty-fourth session, New York, 21-25 March 1994. (1994). Rep.Stud.GESAMP, (53):56 p. Available also in French, Spanish and Russian
54. Guidelines for marine environmental assessment. (1994). Rep.Stud. GESAMP, (54):28 p.
55. Biological indicators and their use in the measurement of the condition of the marine environment. (1995). Rep.Stud.GESAMP, (55):56 p. Available also in Russian
56. Report of the twenty-fifth session, Rome, 24-28 April 1995. (1995). Rep. Stud.GESAMP, (56):54 p. Available also in French, Spanish and Russian
57. Monitoring of ecological effects of coastal aquaculture wastes. (1996). Rep.Stud.GESAMP, (57):45 p.
58. The invasion of the ctenophore *Mnemiopsis leidyi* in the Black Sea. (1997). Rep.Stud.GESAMP, (58):84 p.
59. The sea-surface microlayer and its role in global change. (1995). Rep.Stud. GESAMP, (59):76 p

60. Report of the twenty-sixth session, Paris, 25-29 March 1996. (1996). Rep.Stud.GESAMP, (60):29 p. Available also in French, Spanish and Russian
61. The contributions of science to integrated coastal management. (1996). Rep.Stud.GESAMP, (61):66 p.
62. Marine biodiversity: patterns, threats and development of a strategy for conservation. (1997). Rep.Stud.GESAMP, (62):24 p.
63. Report of the twenty-seventh session, Nairobi, 14-18 April 1997. (1997). Rep.Stud.GESAMP, (63):45 p. Available also in French, Spanish and Russian
64. The revised GESAMP hazard evaluation procedure for chemical substances carried by ships. (in preparation). Rep.Stud.GESAMP, (64)
65. Towards safe and effective use of chemicals in coastal aquaculture. (1997). Rep.Stud.GESAMP, (65):40 p.
66. Report of the twenty-eighth session, Geneva, 20-24 April 1998. (1998). Rep.Stud.GESAMP, (66):44 p.
67. Report of the twenty-ninth session, London, 23-26 August 1999. (1999). Rep.Stud.GESAMP, (67):44 p.
68. Planning and management for sustainable coastal aquaculture development. (2001). Rep.Stud.GESAMP, (68):90 p.
69. Report of the thirtieth session, Monaco, 22-26 May 2000. (2000). Rep.Stud.GESAMP, (69):52 p.
70. A sea of troubles. (2001). Rep.Stud.GESAMP, (70):35 p.
71. Protecting the oceans from land-based activities - Land-based sources and activities affecting the quality and uses of the marine, coastal and associated freshwater environment.(2001). Rep.Stud.GESAMP, (71):162p.
72. Report of the thirty-first session, New York, 13-17 August 2001. (2001). Rep.Stud.GESAMP, (72):41 p.