78

REPORTS AND STUDIES

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

REPORT OF THE THIRTY-FIFTH SESSION OF GESAMP
Accra, 13-16 May 2008

78

REPORTS AND STUDIES

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

IMO FAO UNESCO-IOC WMO UNIDO IAEA UN UNEP

REPORT OF THE THIRTY-FIFTH SESSION

Accra, 13-16 May 2008

THE INTERIM GUINEA CURRENT COMMISSION, EXECUTIVE SECRETARIAT
Accra, 2008

1. GESAMP is an advisory body consisting of specialized experts nominated by the Sponsoring Agencies (IMO, FAO, UNESCO-IOC, UNIDO, WMO, IAEA, UN, UNEP). Its principal task is to provide scientific advice concerning the prevention, reduction and control of the degradation of the marine environment to the Sponsoring Agencies.

2. This study is available in English only from any of the Sponsoring Agencies.

3. The report contains views expressed or endorsed by members of GESAMP who act in their individual capacities; their views may not necessarily correspond with those of the Sponsoring Agencies.

4. Permission may be granted by any of the Sponsoring Agencies for the report to be wholly or partially reproduced in publication by any individual who is not a staff member of a Sponsoring Agency of GESAMP, provided that the source of the extract and the condition mentioned in 3 above are indicated.

5. Information about GESAMP and its reports and studies can be found at: www.gesamp.org

ISSN 1020-4873

For bibliographic purposes this document should be cited as:

GESAMP (IMO/FAO/UNESCO-IOC/UNIDO/WMO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection). 2008. Report of the thirty-fifth session of GESAMP, Accra, 13-16 May 2008. Reports and Studies, GESAMP No. (78), 73 pp.

1. CONTENTS

EXECUTIVE SUMMARY

1. Introduction

2. The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) held its thirty-fifth session at the Interim Guinea Current Commission (IGCC), in Accra, hosted by the United Nations Industrial Development Organization (UNIDO), from 13 to 16 May 2008. GESAMP was established in 1969 by a number of United Nations Organizations as a Joint Group to encourage the 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. The revitalization of GESAMP

In October 2007, the Executive Committee of GESAMP decided to accept the offer of the International Maritime Organization (IMO) to host the GESAMP Office as a co-sponsoring arrangement between the Sponsoring Organizations of GESAMP. During the intersessional period, the successful cooperation with the Swedish International Development Cooperation Agency has continued, with the main aim of increasing the participation of developing country experts in the activities of GESAMP.

3. Evaluation of the hazards of harmful substances carried by ships (WG 1)

This WG evaluates, at the request of IMO, the hazards to the environment and human health of bulk liquid chemicals carried by ships. Since GESAMP convened in 2007, WG 1 has met once, from 22 to 25 April 2008, and continued its work of revising the hazard profiles contained in the IMO International Bulk Chemicals Code (IBC Code). As agreed by the Marine Environmental Protection Committee (MEPC) of IMO in 2007, a funding mechanism to support the costs of WG 1 will be introduced, with a fixed fee being charged for each submission to the WG.

4. Review of applications for "active substances" to be used in ballast water management systems (WG 34)

Working Group 34 met at two occasions in the Intersessional period. During the 36th session, GESAMP focused its discussions to the direction that its peer review of the reports of the Working Group sessions might take. In particular, risk assessment and human health aspects were discussed, as well as possibilities to optimize the review procedure within the very strict timelines. Finally, in order to facilitate the future work of the WG, GESAMP recommended that the Group initiate a stocktaking exercise, based on the experiences of the Group with the applications so far.

5. Deep-water fisheries-habitat and ecosystem (WG 35)

During the intersessional period, more focused terms of reference were agreed by the Working Group and approved by GESAMP. The Working group plans to hold its first meeting either at the end of 2008 or early in 2009.

6. Development of an ecosystem approach to offshore mariculture (WG 36)

Since the 34th session of GESAMP, the WG has held its first meeting at the Lamont-Doherty Earth Observatory of Columbia University, in New York, USA. So far, the WG has compiled information to assess and present potential ecosystem effects of off-shore mariculture. They have also outlined an ecosystem based approach for Environmental Impact assessment protocols for off-shore mariculture, proposing initial monitoring programmes, as well as planning for mitigation and management. The Working Group estimates to produce its report during 2009.

7. Mercury and its compounds in the marine environment (WG 37)

The Working group has held two meetings, October 2007 in Glasgow, and January 2008 in Bangkok. Due to budgetary considerations within the lead agency (UNIDO), the third meeting, planned to be held back-to-back with the 36th session of GESAMP, was postponed. The final report of WG 37 will focus on the following aspects: sources, transport, fate, pathways, toxicity, monitoring and evaluation, and special considerations.

8. Atmospheric input of chemicals to the ocean (WG 38)

Since the 34th session of GESAMP in 2007, WG 38 has been established and will hold its first meeting in December 2008. The meeting will evaluate the current understanding of the input of atmospheric iron and nitrogen species to the ocean. Further, it will discuss the development of an in-depth review of

atmospheric input of phosphorus, as well as possible modalities of cooperation with other relevant programmes.

9. Global trends in pollution of coastal ecosystems: retrospective ecosystem assessment (WG 39)

The Technical Secretary of IAEA presented a proposal for a new Working Group, which was approved in principle by GESAMP. The revised Terms of Reference will be submitted for final approval by GESAMP intersessionally. The Working Group will revise existing methodologies and data, based on suitable dating methods, pollution indicators, analytical techniques and trend analysis methodologies.

10. Contributions to the Assessment of Assessments under the "UNGA Regular Process"

Since its 34th session, GESAMP has continued to provide scientific support to the lead agencies of the Assessment of Assessments (AoA) phase for the UNGA Regular Process. Following a request from the AoA Secretariat, GESAMP formed a Task Team, which, in March 2008 submitted a review of the assessment landscape regarding marine pollution of the open ocean, including atmospheric inputs and shipping. Furthermore, GESAMP has been represented as an observer at all meetings of the Group of Experts for the AoA and will be hosting the fourth meeting, 4 to 6 November 2008, at IMO in London.

11. Special session on marine environmental protection and science in the West and Central African context

As part of the meeting, a special session in the marine environment in West and Central Africa was arranged. The aim was to draw attention to issues of relevance for the region that might fall within the remit of GESAMP and its Sponsoring Organizations, and more specifically to highlight lessons from the region, mainly the Guinea Current Large Marine Ecosystem (GCLME), and how these may translate to the global scale. Professor Sikirou K. Adam, Benin, gave a presentation on the topic *The African marine areas and issues of concern from the GCLME perspective.* The second presentation, by Professor Babajide I. Alo, Nigeria, was titled *Strategies for addressing marine environmental issues in Africa through regional cooperation.* Summaries of the two presentations are found as annexes to this report.

12. Deliberate nutrient additions to the Ocean to promote primary production

In March 2008, GESAMP and the Scientific Committee on Oceanic Research issued a joint statement regarding proposals to fertilize parts of the oceans with iron in order to stimulate phytoplankton growth. GESAMP agreed to carry on the discussion intersessionally by correspondence with the aim of developing an internal scoping document.

13. Identification of new and emerging issues regarding the degradation of the marine environment

GESAMP discussed a list of topics with significant potential impact on marine ecosystems. Although GESAMP neither could nor should investigate all of these, it will be important to identify the areas where there is a role for GESAMP to carry out independent assessments. During the session, the group discussed eight items in detail, and decided to invite the proponents of each issue to prepare a scoping paper, for possible inclusion in the agenda of the next session.

14. Scoping activities

Three requests for advice had been submitted to GESAMP, two from OSPAR Commission Secretariat and one from IMO. GESAMP agreed to respond positively to all three requests.

RÉSUMÉ ANALYTIQUE

1. Introduction

Le Groupe mixte d'experts chargé d'étudier les aspects scientifiques de la protection de l'environnement marin (GESAMP) a tenu à Accra (Ghana) du 13 au 16 mai 2008, au siège de la Commission intérimaire du courant de Guinée, sa trente-cinquième session organisée par l'Organisation des Nations Unies pour le développement industriel (ONUDI). Créé en 1969 par plusieurs organismes des Nations Unies, le GESAMP est un groupe mixte chargé de promouvoir l'examen indépendant et interdisciplinaire des problèmes de pollution marine et de protection de l'environnement dans le but d'éviter les doubles emplois au sein du système des Nations Unies. Les principaux points abordés lors de cette session sont présentés ci-après.

2. La revitalisation du GESAMP

En octobre 2007, le Comité exécutif du GESAMP a décidé d'accepter l'offre de l'Organisation maritime internationale (OMI) d'accueillir le bureau du GESAMP en vertu d'un accord entre les organisations parrainantes du GESAMP. Pendant l'intersession, la coopération avec l'Agence suédoise de coopération internationale au développement a été poursuivie avec succès, l'objectif principal étant d'accroître la participation d'experts des pays en développement aux activités du GESAMP.

3. Évaluation des risques liés aux substances nocives transportées par les navires (GT 1)

Ce groupe de travail évalue, à la demande de l'OMI, les risques pour l'environnement et la santé humaine des produits chimiques liquides transportés en vrac par les navires. Depuis la session du GESAMP tenue en 2007, le Groupe de travail 1 s'est réuni une fois, du 22 au 25 avril 2008, et a poursuivi ses travaux de révision du Recueil international de règles sur les transporteurs de produits chimiques (Recueil IBC). Comme convenu par le Comité pour la protection de l'environnement maritime de l'OMI en 2007, un mécanisme de financement destiné à prendre en charge les coûts du Groupe de travail 1 sera mis en place, une somme fixe étant perçue au titre de chaque demande faite au Groupe de travail.

4. Examen des demandes concernant les "substances actives" à utiliser dans les systèmes de gestion des eaux de ballast (GT 34)

Le Groupe de travail 34 s'est réuni à deux reprises pendant l'intersession. Au cours de la trente-sixième session, le GESAMP a axé les discussions sur la direction que l'examen par les pairs des rapports issus des sessions du Groupe de travail pourrait prendre. Les aspects évaluation des risques et santé humaine ont été examinés en particulier, ainsi que les possibilités d'optimiser la procédure d'examen dans les délais très serrés. Enfin, pour faciliter les travaux futurs du Groupe de travail, le GESAMP a recommandé au Groupe de faire le point sur la question, en se fondant sur son expérience des applications à ce jour.

5. Pêche-habitat en eau profonde et écosystème (GT 35)

Pendant l'intersession, le Groupe de travail s'est entendu sur un mandat plus ciblé, qui a été approuvé par le GESAMP. Il prévoit de tenir sa première réunion, fin 2008 ou début 2009.

6. Élaboration d'une approche éco systémique de la mariculture au large des côtes (GT 36)

Depuis la trente-quatrième session du GESAMP, le Groupe de travail a tenu sa première réunion à l'Observatoire L'amont-Doherty de l'Université Columbia, à New York (États-Unis d'Amérique). Jusqu'à présent, il a rassemblé des informations pour évaluer la mariculture au large des côtes et en présenter les effets potentiels sur l'écosystème. Il a également esquissé une approche basée sur les écosystèmes pour les protocoles d'évaluation de l'impact environnemental de la mariculture au large des côtes, en proposant de premiers programmes de surveillance, et en prévoyant des mesures de limitation et d'encadrement. Le Groupe de travail compte rendre son rapport en 2009.

7. Le mercure et ses composés dans l'environnement marin (GT 37)

Le Groupe de travail a tenu deux réunions, en octobre 2007 à Glasgow et en janvier 2008 à Bangkok. Pour des raisons budgétaires propres à l'organisation chef de file (ONUDI), la troisième réunion, qui devait se tenir immédiatement après la

trente-sixième session du GESAMP, a été reportée. Le rapport final du Groupe de travail 37 portera essentiellement sur les aspects suivants: sources, transport, sort des substances, trajet, toxicité, suivi et évaluation, considérations particulières.

8. Apports atmosphériques de produits chimiques dans l'océan (GT 38)

Depuis la trente-quatrième session du GESAMP tenue en 2007, le Groupe de travail 38 a été mis sur pied et il tiendra sa première réunion en décembre 2008. Il évaluera à cette occasion la compréhension actuelle des apports atmosphériques en fer et en produits azotés dans l'océan. Il étudiera en outre la mise au point d'une étude approfondi des apports atmosphériques en phosphore, ainsi que les éventuelles modalités de coopération avec d'autres programmes.

9. Évolution mondiale de la pollution des écosystèmes côtiers: évaluation rétrospective des écosystèmes (GT 39)

Le Secrétaire technique de l'AIEA a présenté une proposition concernant la création d'un nouveau groupe de travail, dont le principe a été approuvé par le GESAMP. Le mandat révisé sera soumis au GESAMP pour approbation finale pendant l'intersession. Le Groupe de travail révisera les méthodes et données actuelles, en se fondant sur des méthodes de datation, des indicateurs de pollution, des techniques analytiques et des méthodes d'analyse des tendances appropriés.

10. Contributions à l'évaluation des évaluations dans le cadre du "Mécanisme des Nations Unies"

Depuis sa trente-quatrième session, le GESAMP a continué à fournir un appui scientifique aux organisations chefs de file de la phase d'évaluation des évaluations du "Mécanisme des Nations Unies". Donnant suite à une demande du secrétariat de l'évaluation des évaluations, le GESAMP a formé une équipe spéciale qui, en mars 2008, a présenté une révision du contexte de l'évaluation concernant la pollution des océans, y compris les apports atmosphériques et le transport maritime. En outre, le GESAMP a été représenté en qualité d'observateur à toutes les réunions du Groupe d'experts de l'évaluation des évaluations et accueillera la quatrième réunion, du 4 au 6 novembre 2008, au siège de l'OMI à Londres.

11. Séance extraordinaire consacrée à la protection et à la science du milieu marin en Afrique de l'Ouest et en Afrique centrale

Dans le cadre de la réunion, une séance extraordinaire sur le milieu marin en Afrique de l'Ouest et en Afrique centrale a été organisée. Il s'agissait d'appeler l'attention sur des questions importantes pour la région, qui pourraient relever de la compétence du GESAMP et de ses organisations parrainantes, et plus précisément de mettre en relief les enseignements à tirer de l'expérience de la région, en ce qui concerne surtout le Grand écosystème marin du golfe de Guinée, et de déterminer comment ces enseignements pourraient être exploités à l'échelle mondiale. M. Sikirou K. Adam (Bénin), a fait un exposé sur le thème "Les zones marines africaines et les causes de préoccupation dans l'optique du Grand écosystème marin du golfe de Guinée". La seconde présentation, faite par M. Babajide I. Alo (Nigéria) s'intitulait "Stratégies pour aborder les questions concernant le milieu marin en Afrique grâce à la coopération régionale". Les résumés des deux exposés se trouvent en annexe au présent rapport.

12. Additions délibérée d'éléments nutritifs dans l'océan pour favoriser la production primaire

En mars 2008, le GESAMP et le Comité scientifique pour les recherches océaniques ont publié une déclaration commune concernant des propositions tendant à fertiliser au fer certaines parties des océans afin de stimuler la croissance du phytoplancton. Le GESAMP a accepté d'en poursuivre l'examen par correspondance pendant l'intersession, dans le but d'élaborer un document de cadrage à usage interne.

13. Identification de problèmes nouveaux relatifs à la dégradation du milieu marin

Le GESAMP a examiné une liste de sujets pouvant avoir un impact important sur les écosystèmes marins. Bien que le GESAMP n'ait été ni en mesure ni dans l'obligation d'étudier tous les sujets, il importera de définir les domaines dans lesquels le GESAMP a un rôle à jouer dans la réalisation d'évaluations indépendantes. Au cours de la session, le groupe a examiné dans le détail huit sujets et décidé d'inviter ceux qui les avaient proposés à établir un document de cadrage, qui pourrait figurer à l'ordre du jour de la prochaine session.

14. Activités de cadrage:

Trois demandes d'avis ont été présentées au GESAMP: deux émanaient du secrétariat de la Commission OSPAR et une de l'OMI. Le GESAMP a décidé de répondre favorablement aux trois demandes.

RESUMEN DISPOSITIVO

1. Introducción

El Grupo Mixto de Expertos sobre los Aspectos Científicos de la Protección del Medio Marino (GESAMP) celebró su 35º período de sesiones del 13 al 16 de mayo de 2008 en la oficina de la Comisión Provisional sobre la Corriente de Guinea, con sede en Accra (Ghana), con el auspicio de la Organización de las Naciones Unidas para el Desarrollo Industrial (ONUDI). Varias organizaciones de las Naciones Unidas establecieron en 1969 el GESAMP como grupo conjunto destinado a promover el examen independiente e interdisciplinario de los problemas relacionados con la contaminación del mar y la protección del medio marino a fin de evitar la duplicación de actividades dentro del sistema de las Naciones Unidas. A continuación se detallan los temas principales examinados durante el período de sesiones.

2. La revitalización del GESAMP

En octubre de 2007 el Comité Ejecutivo del GESAMP decidió aceptar el ofrecimiento de la Organización Marítima Internacional (OMI) de acoger en sus locales a la Oficina del GESAMP como parte del acuerdo de copatrocino concertado entre las organizaciones patrocinadoras del Grupo. En el lapso entre períodos de sesiones continuó la fructífera cooperación establecida con la Agencia Sueca de Cooperación Internacional para el Desarrollo (ASCDI), con el objetivo primordial de aumentar la participación de expertos de los países en desarrollo en las actividades del GESAMP.

3. Evaluación de los peligros de las sustancias perjudiciales transportadas por buques (Grupo de trabajo 1)

Este Grupo de trabajo evalúa, a petición de la OMI, los peligros que para el medio ambiente y la salud humana entraña el transporte en buques de productos químicos líquidos a granel. Después del período de sesiones del GESAMP en 2007, el Grupo de trabajo 1 se ha reunido una sola vez, del 22 al 25 de abril de 2008, y prosiguió su labor de revisión de los perfiles de peligros recogidos en el Código Internacional sobre Productos Químicos a Granel (Código IBC). Como se acordó en 2007 con el Comité de Protección del Medio Marino (CPMM) de la OMI, se establecerá un mecanismo de financiación para ayudar a financiar los gastos del Grupo de trabajo 1 mediante el cobro de una cuota fija por cada informe de estudio presentado.

4. Examen de solicitudes relativas a "sustancias activas" utilizadas en los sistemas de gestión del agua de lastre (Grupo de trabajo 34)

El Grupo de trabajo 34 se reunió en dos ocasiones en el lapso entre períodos de sesiones. En su 36º período de sesiones, el GESAMP centró sus debates en la orientación que debería tener su examen por homólogos de los informes sobre las reuniones del Grupo de trabajo. En particular, se analizaron aspectos relativos a la evaluación de riesgos y a la salud humana, así como las posibilidades de optimizar el procedimiento de examen dentro de los estrictos plazos previstos. Por último, a fin de facilitar la labor futura del Grupo de trabajo, el GESAMP recomendó que el Grupo realizara un balance de su labor sobre la base de la experiencia adquirida hasta ahora con las solicitudes.

5. La pesca y los hábitats y ecosistemas de aguas profundas (Grupo de trabajo 35)

En el lapso entre períodos de sesiones el Grupo de trabajo acordó un mandato con objetivos más precisos, el cual fue aprobado por el GESAMP. El Grupo de trabajo prevé celebrar su primera reunión a finales de 2008 o a principios de 2009.

6. Elaboración de un enfoque ecosistémico de la maricultura costa afuera (Grupo de trabajo 36)

Después del 34º período de sesiones del GESAMP, el Grupo de trabajo celebró su primera reunión en el Observatorio Terrestre Lamont-Doherty de la Universidad de Columbia, en Nueva York (Estados Unidos). Hasta el momento, el Grupo de trabajo ha reunido información para estudiar y determinar los posibles efectos de la maricultura costa afuera en el ecosistema. El Grupo también ha esbozado un enfoque ecosistémico de los protocolos de evaluación del impacto ambiental de la maricultura costa afuera, y ha propuesto programas de vigilancia iniciales y planes para la gestión y mitigación del impacto. El Grupo de trabajo prevé presentar su informe en 2009.

7. El mercurio y sus compuestos en el medio marino (Grupo de trabajo 37)

El Grupo de trabajo ha celebrado dos reuniones: en Glasgow en octubre de 2007 y otra en Bangkok en enero de 2008. La tercera reunión, prevista inmediatamente después del 36º período de

sesiones del GESAMP, se pospuso por consideraciones de orden presupuestario en el organismo principal (ONUDI). El informe final del Grupo de trabajo 37 se centrará en los aspectos siguientes: fuentes, transporte, destino, vías, toxicidad, vigilancia y evaluación, y consideraciones especiales.

8. Aportación atmosférica de sustancias químicas a los océanos (Grupo de trabajo 38)

Después de la celebración del 34º período de sesiones del GESAMP en 2007, se estableció el Grupo de trabajo 38, el cual celebrará su primera reunión en diciembre de 2008. En ella se analizarán los conocimientos que se tienen hasta ahora sobre la aportación atmosférica de hierro y componentes nitrogenados a los océanos. Además, se estudiará la realización de un examen a fondo de la aportación atmosférica de fósforo, así como de las posibles modalidades de cooperación con otros programas pertinentes.

9. Tendencias mundiales de la contaminación de los ecosistemas costeros: evaluación retrospectiva de los ecosistemas (Grupo de trabajo 39)

La Secretaría Técnica del OIEA presentó una propuesta relativa al establecimiento de un nuevo Grupo de trabajo, la cual fue aprobada en principio por el GESAMP. El mandato revisado del Grupo de trabajo se presentará al GESAMP en el lapso entre períodos de sesiones para su aprobación definitiva. El Grupo de trabajo revisará las metodologías y datos existentes sobre la base de métodos de datación adecuados, indicadores de contaminación, técnicas analíticas y metodologías de análisis de tendencias.

10. Contribución a la Evaluación de Evaluaciones en el marco del "procedimiento ordinario" de las Naciones Unidas

Desde la celebración de su 34º período de sesiones, el GESAMP ha seguido prestando apoyo científico a los organismos principales encargados de la fase inicial de "Evaluación de Evaluaciones" del procedimiento ordinario establecido por la Asamblea General de las Naciones Unidas. En respuesta a una solicitud de la secretaría para la "Evaluación de Evaluaciones", el GESAMP estableció un grupo de tareas que en marzo de 2008 presentó un análisis del panorama de las evaluaciones relacionadas con la contaminación marina en el mar abierto, incluidas las aportaciones atmosféricas y la navegación. Además, el GESAMP ha estado representado en calidad de observador en todas las reuniones del Grupo de Expertos sobre la Evaluación de Evaluaciones y organizará la cuarta reunión, que se celebrará del 4 al 6 de noviembre de 2008 en la sede de la OMI en Londres.

11. Sesión especial sobre la protección y ciencias del medio marino en el contexto de África occidental y central

Como parte de la reunión, se celebró una sesión especial sobre el medio marino en África occidental y central. Su objetivo fue poner de relieve cuestiones de importancia para la región que pudieran estar comprendidas en el ámbito de actividad del GESAMP y sus organizaciones patrocinadoras y, más concretamente, y destacar las experiencias adquiridas en la región, sobre todo con el proyecto relativo al gran ecosistema marino del Golfo de Guinea, y la manera en que éstas podrían aplicarse a nivel mundial. El Profesor Sikirou K. Adam (Benin) presentó una ponencia sobre las zonas marinas africanas y las cuestiones que suscitan preocupación desde la perspectiva del proyecto. La segunda ponencia, a cargo del Profesor Babajide I. Alo (Nigeria), versó sobre las estrategias dirigidas a resolver problemas relativos al medio marino en África mediante la cooperación regional. En los anexos del presente informe figuran resúmenes de ambas ponencias.

12. Adiciones deliberadas de nutrientes a los océanos para estimular la producción primaria

En marzo de 2008 el GESAMP y el Comité Científico de Investigaciones Oceánicas emitieron una declaración conjunta respecto de las propuestas de fertilización de algunas partes de los océanos con hierro con el propósito de estimular el crecimiento de fitoplancton. El GESAMP convino en proseguir el examen de la cuestión por correspondencia en el lapso entre períodos de sesiones con el objetivo de elaborar un documento de discusión interno.

13. Determinación de problemas nuevos e incipientes relativos a la degradación del medio marino

El GESAMP examinó una lista de temas que podrían tener importantes repercusiones en los ecosistemas marinos. Aunque el GESAMP no podría ni debería investigar todos esos temas, será importante definir las esferas en las que el GESAMP puede cumplir una función realizando evaluaciones independientes. Durante el período de sesiones, el

Grupo examinó ocho temas pormenorizados y decidió invitar a los proponentes de cada tema a que prepararan un documento de discusión con miras a la posible inclusión de los temas en el programa del siguiente período de sesiones.

14. Actividades relativas a estudios de evaluación

El GESAMP había recibido tres solicitudes de asesoramiento, dos de la secretaría de la Comisión OSPAR y una de la OMI. El GESAMP convino en responder favorablemente a las tres solicitudes.

РАБОЧЕЕ РЕЗЮМЕ ДОКЛАДА

1. Введение

Объединенная группа экспертов по научным аспектам охраны морской среды (ГЕСАМП) провела свою тридцать пятую сессию, принимающей стороной которой выступила Организация Объединенных Наций по промышленному развитию (ЮНИДО), в штаб-квартире Временной комиссии по Гвинейскому течению (ВКГТ) 13-16 мая 2008 года. ГЕСАМП была создана в 1969 году рядом организаций системы Организации Объединенных Наций в качестве объединенной группы с целью стимулировать независимое междисциплинарное рассмотрение вопросов загрязнения морской среды и природоохранных проблем, с тем чтобы предотвратить дублирование усилий в рамках системы Организация Объединенных Наций. Ниже приводятся основные темы, рассмотренные на этой сессии.

2. Активизация деятельности ГЕСАМП

В октябре 2007 года Исполнительный комитет ГЕСАМП принял решение принять предложение Международной морской организации (ИМО) принять у себя Управление ГЕСАМП в рамках договоренности о совместном участии между организациями – спонсорами ГЕСАМП. В межсессионный период продолжалось успешное сотрудничество с Шведским агентством по международному сотрудничеству в целях развития, главным образом в целях расширения участия экспертов из развивающихся стран в деятельности ГЕСАМП.

3. Оценка рисков вредных веществ, перевозимых на судах (РГ 1)

Эта РГ по просьбе ИМО оценивает риски, связанные с перевозкой на судах наливных грузов жидких химических веществ, для окружающей среды и здоровья человека. После того как РГ 1 была создана ГЕСАМП в 2007 году, Группа провела одно совещание 22-25 апреля 2008 года и продолжила свою работу по пересмотру профилей рисков, содержащихся в Международном кодексе ИМО, касающемся перевозки наливных грузов, содержащих химические вещества. Согласно принятому в 2007 году решению Комитета по защите морской среды ИМО, будет создан механизм финансирования в целях содействия покрытию расходов РГ 1, предусматривающий взимание установленного сбора за каждый запрос, направляемый РГ.

4. Обзор видов применения "активных веществ", предназначенных для использования в системах управления водяным баластом (РГ 34)

В межсессионный период Рабочая группа 34 провела два совещания. В ходе тридцать шестой сессии обсуждения в рамках ГЕСАМП касались главным образом возможных направлений коллегиального обзора докладов сессий Рабочей группы. В частности, обсуждались аспекты, связанные с оценкой рисков и здоровьем человека, а также возможные пути оптимизации процедуры обзора в весьма жестких временных рамках. С целью облегчить будущую работу РГ ГЕСАМП в конечном итоге рекомендовала предпринять усилия по оценке на основе накопленного Группой опыта в области применения таких веществ.

5. Среда обитания и экосистемные аспекты, связанные с глубоководным рыбопромыслом (РГ 35)

В межсессионный период Рабочая группа согласовала более целенаправленный круг ведения, одобренный ГЕСАМП. Рабочая группа планирует провести свое первое совещание либо в конце 2008 года, либо в начале 2009 года.

6. Выработка экосистемного подхода к марикультуре в прибрежных районах (РГ 36):

После тридцать четвертой сессии ГЕСАМП РГ провела свое первое совещание в центре Наблюдения Земли им. Ламон-Доэрти Колумбийского университета в Нью-Йорке, США. На настоящий момент РГ собрала информацию для оценки и представления заключений относительно потенциальных экосистемных последствий марикультуры в прибрежных районах. Сформулирован также экосистемный подход в отношении протоколов по оценке экологических последствий марикультуры в прибрежных районах, предложены первоначальные программы мониторинга, а также осуществляются мероприятия по планированию в интересах смягчения последствий и обеспечения рациональной деятельности. Рабочая группа рассчитывает представить свой доклад в 2009 году.

7. Ртуть и ртутные соединения в морской среде (РГ 37)

Рабочая группа провела два совещания: в октябре 2007 года в Глазго и в январе 2008 года в Бангкоке. С учетом бюджетных соображений головного учреждения (ЮНИДО) третье совещание, которое планировалось провести в рамках тридцать шестой сессии ГЕСАМП, было отложено. В окончательном докладе РГ 37 внимание будет сосредоточено на следующих аспектах: источники, перенос, поведение, пути распространения, токсичность, мониторинг и оценка, а также особые соображения.

8. Осаждение химических веществ из атмосферы в океан (РГ 38)

После тридцать четвертой сессии ГЕСАМП, проведенной в 2007 году, была создана РГ 38, которая проведет свое первое совещание в декабре 2008 года. На совещании будет подготовлена оценка нынешнего понимания процесса осаждения железо- и азотосодержащих соединений из атмосферы в океанах. Кроме того, будут обсуждены вопрос о проведении подробного обзора осаждения фосфора из атмосферы, а также возможные механизмы сотрудничества с другими соответствующими программами.

9. Глобальные тенденции загрязнения прибрежных экосистем: ретроспективная экосистемная оценка (РГ 39)

Технический секретарь МАГАТЭ представил предложение относительно создания новой рабочей группы, которое в принципе было одобрено ГЕСАМП. В межсессионный период на окончательное утверждение ГЕСАМП будет представлен пересмотренный круг ведения. Рабочая группа проанализирует существующие методологии и данные, основанные на соответствующих методах определения возраста, показателях загрязнения, аналитических методах и методологиях анализа тенденций.

10. Вклад в оценку оценок в рамках "регулярного процесса глобального освещения и оценки ООН состояния морской среды"

После тридцать четвертой сессии ГЕСАМП продолжила оказание научной поддержки ведущим учреждениям, задействованным на этапе оценки оценок (ОО) по регулярному процессу глобального освещения и оценки ООН состояния морской среды. По просьбе секретариата ОО ГЕСАМП образовала целевую группу, которая представила в марте 2008 года обзор системы оценок загрязнения морской среды в открытом океане, включая осаждение веществ из атмосферы и в процессе морских перевозок. Кроме того, ГЕСАМП была представлена в качестве наблюдателя на всех совещаниях Группы экспертов по ОО и 4-6 ноября 2008 года будет выполнять функции принимающей стороны четвертого совещания в штаб-квартире ИМО в Лондоне.

11. Специальное заседание по вопросам охраны морской среды и науки в Западной и Центральной Африке

В рамках соответствующего совещания было организовано специальное заседание по вопросам морской среды в Западной и Центральной Африке. Задача заключалась в том, чтобы привлечь внимание к актуальным для региона вопросам, которые могут входить в сферу компетенции ГЕСАМП и ее организаций-спонсоров, а также, в частности, осветить опыт, накопленный в этом регионе, главным образом в рамках крупной морской экосистемы Гвинейского течения (КМЭГТ), а также возможности их использования в мировых масштабах. Профессор Сикиру К. Адам, Бенин, представил доклад на тему "Морские районы и вызывающие озабоченность вопросы в Африке с точки зрения КМЭГТ". Второй доклад, который представил профессор Бабайджиде И. Ало, Нигерия, был озаглавлен "Стратегии решения вопросов, касающихся морской среды в Африке, в рамках регионального сотрудничества". Резюме этих двух докладов содержится в предложениях к настоящему докладу.

12. Намеренное внесение питательных веществ в океан с целью содействовать созданию первого звена в пищевой цепи

В марте 2008 года ГЕСАМП и Научный комитет по океанографическим исследованиям выпустили совместное заявление, касающееся предложений о внесении железосодержащих удобрений в различных районах океана с целью стимулировать рост фитопланктона. ГЕСАМП приняла решение провести в межсессионный период обсуждение этого вопроса на основе переписки в целях подготовки внутреннего аналитического документа.

13. Выявление новых и возникающих проблем в отношении деградации морской среды

ГЕСАМП рассмотрела перечень тем, которые могут иметь существенные последствия для морских экосистем. Хотя ГЕСАМП не может и не должна изучать все из них, важно будет определить те области, в которых ГЕСАМП призвана играть определенную роль при проведении независимых оценок. В ходе сессии Группа подробно обсудила восемь вопросов и приняла решение предложить сторонам, поставившим каждый из этих вопросов, подготовить аналитические документы с целью возможного включения в повестку дня следующей сессии.

14. Аналитические мероприятия

ГЕСАМП получила три запроса на подготовку рекомендаци, два из которых поступили от Секретариата Комиссии ОСПАР и один – от ИМО. ГЕСАМП приняла решение дать положительный ответ на все три запроса.

1. INTRODUCTION

1.1 The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) held its 35th session from 13 to 16 May 2008 at the Interim Guinea Current Commission in Accra, hosted by UNIDO. The session was held under the Chairmanship of Mr. Mike Huber, while Mr. Tim Bowmer served as the Vice-Chairman. On Monday, 12 May, the Members of GESAMP met for informal discussions, while the Executive Committee held meetings on 12 and 16 May 2008.

Opening of the session

1.2 The Chairman of GESAMP, Mr. Mike Huber, called the 35th session of GESAMP to order at 09.00 a.m. on 13 May 2008.

1.3 Mr. Pablo Huidobro, Technical Secretary of UNIDO, welcomed the participants to the Interim Guinea Current Commission (IGCC). He explained that UNIDO is a newcomer among the Sponsoring Organizations and that this was their first opportunity to host a GESAMP session. He emphasized that UNIDO looks forward to participating in the GESAMP framework in the most productive way.

1.4 Mr. Huidobro stated that GESAMP had made great contributions in the past, and that he sees an excellent future ahead, and concluded by expressing his wish for a successful session.

Adoption of the Agenda

1.5 The agenda for this session, as adopted, is provided in Annex I to this report. Annexes II and III provide, respectively, the list of participants and the list of documents submitted to the Group.

2. REPORT OF THE CHAIRMAN OF GESAMP

2.1 The intersessional period between GESAMP sessions 34 and 35 saw a significant increase in activities. The following is a summary of developments during the intersessional period and of the activities of the Chairman, Vice-Chairman (Mr. Tim Bowmer), the GESAMP Officer (Mr. Fredrik Haag), and other representatives of GESAMP.

2.2 There were several major developments regarding GESAMP during the intersessional period:

1. Three new reports were published in the *Reports and Studies* series:
   - No. 75: Estimates of oil entering the marine environment from sea-based activities (IMO, 2007);
   - No. 76: Assessment and communication of environmental risks in coastal aquaculture (FAO, 2008) was approved intersessionally in late 2007; and
   - No. 77: Report of the 34th session of GESAMP (UNESCO-IOC, 2007).
2. Two reports of Working Group 34 (Ballast Water Working Group) were reviewed and approved intersessionally;
3. The first report in the new, electronic series *Reports to GESAMP* was published in 2007: "Science and Regional Organizations: How can GESAMP help with current needs and future challenges?"
4. Terms of Reference for Working Groups 35 (Deep-water Fisheries), 37 (Mercury and its Compounds), and 38 (Atmospheric Input of Chemicals to the Ocean) were reviewed and approved intersessionally;
5. On 4 March 2008, GESAMP, together with the Scientific Commission on Oceanic Research (SCOR), produced a statement on the deliberate addition of nutrients to the ocean (attached as Annex X to this report).

2.3 The GESAMP Officer attended the first meeting of Working Group 37 (Mercury and its Compounds), 28-29 October 2007, Glasgow, and the Chairman attended the second meeting, 28-29 January 2008, Bangkok.

The Regular Process for Global Reporting and Assessment of the Marine Environment including Socio-economic Activities (UNGA 60/30 Regular Process)

2.4 Since the last session, GESAMP has continued to be involved in the UNGA Regular Process, specifically its initial phase, the Assessment of Assessments (AoA). In response to a request from the lead agencies of the AoA (UNESCO-IOC and UNEP), GESAMP established a Task Team under the Chairmanship of Mr Rick Boelens, to review the current assessment landscape concerning pollution of the open ocean.

2.5 The GESAMP Task Team convened on two occasions:

1. 15-17 November 2007, at IMO Headquarters, London; and
2. 24-28 February 2008, in Mescalero, New Mexico, United States.

The Task Team produced a report on their findings as well as a brief summary document to the Group of Experts for the AoA.

2.6 In addition, GESAMP participated in meetings of the Group of Experts for the AoA as follows:

1. Mr. Mike Huber attended the 1st (28-30 March 2007, UNESCO, Paris), 2nd (8-10 November 2007, UNESCO, Paris), and 3rd (15-17 April 2008, European Environment Agency, Copenhagen) meetings of the Group of Experts for the AoA, in the capacity of a Member of the Group of Experts;
2. The Vice-Chairman and the GESAMP Officer attended the 2nd and 3rd meetings of the Group of Experts for the AoA as representatives of GESAMP;
3. The Chairman of the Task Team on pollution in the open ocean, Mr. Rick Boelens, attended the 3rd meeting of the Group of Experts.

Projects, networking and representation at meetings and international forums

2.7 In accordance with its Strategic Vision, which calls for proactive engagement with other organisations and activities, GESAMP also participated in the following activities, meetings, and other forums during the intersessional period:

2.8 GESAMP has participated in the preparatory activities of the proposed GEF-funded project *Transboundary Waters Assessment Programme*, led by UNEP. GESAMP was represented at the following two meetings:

1. The Chairman attended the first preparatory meeting, 18-19 September 2007, in Bonn; and
2. The GESAMP Officer attended the second preparatory meeting, 26-28 March 2008, in Paris.

2.9 GESAMP was also represented at the following meetings and other forums during the intersessional period:

1. The GESAMP Officer attended the 9th Consultative meeting on LMEs, 10-11 July 2007, in Paris;
2. The Technical Secretary of IMO, Mr. René Coenen, represented GESAMP at the UN-Oceans meeting, 21-22 May 2007, in Paris; and
3. Mr. Jose Matheickal, IMO, delivered a statement describing GESAMP at the Fourth GEF International Waters Conference, 29 July-3 August 2007, Cape Town.

2.10 As part of the internal component of the fund-raising strategy, the Vice-Chairman and the GESAMP Officer visited two of the Sponsoring Organizations to present the status and future prospects of GESAMP activities, and to discuss details of the cooperation:

1. IAEA-MEL, Monaco, 5-6 December 2007;
2. UN-DOALOS, New York, 22 February 2008.

2.11 The Chairman and the GESAMP Officer visited the Marine Programme of the World Conservation Union (IUCN) in Gland, Switzerland, 20 September 2007 to discuss possible opportunities for cooperation.

2.12 Responding to an invitation from the Swedish Maritime Administration, the GESAMP Officer gave a lecture on GESAMP at the Advanced International Training Programme: “Marine Management — Good Governance in Practice”, 13 November 2007, in Malmö, Sweden.

2.13 The GESAMP Officer met with the OSPAR Secretariat on 23 January 2008 to explore opportunities for cooperation and collaboration.

2.14 The Chairman expressed his thanks to the Administrative Secretary and Technical Secretaries for their support during the intersessional period, to Sida for its continuing support and cooperation with GESAMP, to the GESAMP Officer for his unfailing assistance and hard work, and to the GESAMP Members for their active and valuable participation in GESAMP activities during the intersessional period.

3. REPORT OF THE ADMINISTRATIVE SECRETARY OF GESAMP

Activities and achievements of the Sponsoring Organizations of GESAMP since 2007

3.1 Mr. Miguel Palomares, the Administrative Secretary of GESAMP, introduced an overview of the activities and achievements of the Sponsoring Organizations, as reported, with the aim of providing a context of their involvement and interest in the activities GESAMP undertakes. Some of these achievements are reported in Annex IV to this report.

3.2 Since the 34th session of GESAMP, two issues have been the main focus of the Executive Committee of GESAMP; a decision on the location of the GESAMP Office; and a conclusion of the Memorandum of Understanding on GESAMP. Both are very relevant to the long-term viability of GESAMP. The Executive Committee has convened by telephone conference on three occasions in the intersessional period (20 July 2007, 1 October 2007 and 6 May 2008).

Establishment of the GESAMP Office

3.3 On 1 October 2007, the Executive Committee decided to accept IMO's offer to host the GESAMP Office, as a co-sponsoring arrangement between the current sponsors of GESAMP. The Office is expected to gradually expand into a fully-fledged unit, and is presently manned by one GESAMP Officer (seconded by the Swedish Government). A possible extension of this secondment arrangement for 2009, or longer, is currently under discussion. The IMO Council will be requested in 2009 to agree to the establishment of a new GESAMP Officer post, to be fully funded under the IMO regular budget, starting from the beginning of 2010. In addition, IMO provides the time of the Administrative Secretary and Technical Secretary (extended support to the Office, in addition to the normal duties of the Technical Secretary) as an in-kind contribution. Furthermore, IMO provides office space and equipment, storage, etc. as well as secretarial support.

Modus operandi of GESAMP

3.4 During the year, work has continued on updating the Memorandum of Understanding on GESAMP, following extensive input from the Sponsoring Organizations and their legal departments. The updated, consolidated text is at present being cleared by the legal divisions of the Sponsoring Organizations, with the intention of having an agreement signed by the Executive Heads of the Sponsoring Organizations, as soon as practicable, thus putting GESAMP on a solid footing for the future.

3.5 GESAMP took note of these developments.

3.6 The Administrative Secretary conveyed the gratitude of the Sponsoring Organizations to Sida, the Swedish Maritime Administration and the Swedish Government for the substantive support that they had given since the end of 2005, without which the revitalization of GESAMP would not have been possible. GESAMP also expressed its appreciation for their willingness to continue providing support, at least for the near future.

4. GESAMP POOL OF EXPERTS AND WEBSITE

4.1 With respect to the IMO-IAEA agreement to work jointly on certain technical activities aimed at revitalizing GESAMP, Mr. Scott Fowler, the IAEA Consultant coordinating these aspects, updated the group on progress on two major tasks undertaken by IAEA-MEL, i.e. creating a new GESAMP website and the development and operation of the GESAMP Pool of Experts. Since GESAMP 34 in May 2007 considerable progress has been made in improving, testing and refining both products with an aim of finalizing these activities by the end of 2008. There is now a functioning interactive website (www.gesamp.org) that is being used by the GESAMP Office, GESAMP Members and Working Groups for communication and sharing information. Following suggestions from GESAMP, a new subsection for posting "Forthcoming Publications", a function for self-nomination into the Pool of Experts, and a Members' file sharing area have been added to the menus. Recently, a local media company was contracted to finalize the website design and give it professional quality. It will also include a share-point software package for facilitating project management and interactive communication within the Working Groups and should be finalized by end June 2008. Once this is finished, the addition of any new features will have an additional cost. In conjunction with refining the website, several other products designed to enhance the corporate image of GESAMP were also developed which include a logo, letterhead, a promotional leaflet, poster, PowerPoint presentation, and layouts and general style guidelines for reports.

4.2 IAEA has continued to develop and enhance the expert database for GESAMP's Pool of Experts. There are now some 140 expert nominations in the Pool which are in the process of being validated. Unfortunately, the registration forms of many nominated experts remain incomplete; therefore, during the ongoing validation process, those persons are being contacted by e-mail and encouraged to furnish all the missing information. Although it was hoped that the self-nomination mechanism would help increase the Pool size and enable a broader segment of the international scientific community to participate in GESAMP activities, to date only a very few candidates have entered the Pool through self-nomination. The Consultant stressed the need to obtain more names of potential experts in order to broaden the Pool in terms of expertise and geographical representation and reach the critical mass necessary (approximately 500) to be of optimum use. He therefore requested the Technical Secretaries of the Sponsoring Organizations, GESAMP Members and Working Group Chairpersons to furnish expert nominations into the Pool and explained how this could be done on the existing website. At present the IAEA Consultant is serving as the Web Editor for validating the nominations in the Pool and is also making an effort to obtain expert databases relevant for the Pool from other United Nations agencies, regional organizations, NGOs, etc. Furthermore by serving as Web Editor for the evaluation and validation process for Pool experts, the IAEA consultant can assist the GESAMP Officer, Working Group Chairs and others in making initial selections of experts for involvement in future GESAMP activities. In the coming months priority will be given to both expanding the Pool and validating the nominees. In addition, comments and suggestions from a variety of users will be taken into consideration and, whenever necessary and possible, refinements and modifications to the website will be made. The IAEA Technical Secretary also noted that this project will terminate in February 2009 and that a mechanism must be established to ensure that maintenance of the new website and the evaluation and validation of the Pool experts in the database are continued in a timely manner.

4.3 GESAMP appreciated the efforts of IAEA and IMO in creating and developing the website and expert pool database, which are two important tools that will be used to enhance the efficiency of GESAMP's work programme. GESAMP sought clarification on various aspects about registering potential experts in the Pool and made several suggestions for refining certain functions of the website that might facilitate its use by GESAMP Members and the Executive Committee. In particular it was suggested that an area on the website be dedicated to listing "Emerging Issues" of critical importance to the marine environment, given that assessing such issues is one of GESAMP's primary tasks. The Group also agreed that owing to the fundamental need of the website for facilitating an efficient interaction between the GESAMP Office, the Working Groups and GESAMP Members, every effort should be made to ensure continued maintenance of the website and upkeep and evaluation of the expert database after the current arrangement between IMO and IAEA terminates.

5. GESAMP ACTIVITIES

5.1 Evaluation of the hazards of harmful substances carried by ships (WG 1)

Introduction and history

5.1.1 The GESAMP Working Group on the Evaluation of Hazards of Substances carried by Ships (EHS Working Group, or WG 1) evaluates, at the request of IMO, the hazards to the environment and human health of bulk liquid chemicals carried by ships. IMO regulates the ship type and safety considerations required for transporting chemicals by sea as well as the discharge of tank slops at sea or more frequently to port reception facilities. Bulk liquid chemicals listed in the International Bulk Chemicals (IBC) Code are those which are pumped into or discharged from fixed tanks onboard a ship. There are approximately 1,200 chemical tankers active in international trade. A ship may carry from one to thirty or more different chemical cargoes on any given voyage.

5.1.2 The revised MARPOL Annex II and the revised pollution category, ship type and carriage conditions associated with each chemical, entered into force on 1 January 2007. The GESAMP hazard profile provides the basis for the pollution categorization of over 850 bulk liquid substances. The working methods of WG 1 are contained in GESAMP Reports and Studies No. 64, entitled *The Revised GESAMP Hazard Evaluation Procedure for Chemical Substances Carried by Ships.*

5.1.3 Since GESAMP 34 convened in 2007, the WG 1 met once from 22 to 25 April 2008 for its 45th session.

5.1.4 GESAMP noted the following progress since GESAMP 34:

- WG 1 evaluated an additional ten bulk chemicals for maritime transport according to their environmental, human health and physical-chemical criteria.
- From the chemicals industry, new information has also been provided in relation to 14 previously evaluated substances with a view to reappraising specific elements of their GESAMP profiles in the light of new hazard data.
- In correspondence with the chemicals industry, consideration has been given by the group to the relationship between skin and respiratory sensitization since under the IBC Code, a skin sensitizer is classified also as a respiratory sensitizer unless specific evidence is available to show that this is not the case. Assignment as a respiratory sensitizer automatically triggers additional carriage requirements for shipment and there is concern from industry that this could sometimes be applied unnecessarily.
- A routine exercise to review of data and ratings for repro-toxicity properties of the dialkylphthalates group has been undertaken in order to consolidate information for this group of chemicals.
- An appraisal of renewable diesel oil was undertaken at the request of the Marine Environmental Protection Committee (MEPC) of IMO in order to compare this product to mineral-based diesel oil so as to advise upon its origin, production process, chemical identity, and hazard properties, in order to assist IMO with its transport classification. Mineral oil based products are shipped under MARPOL Annex I, while other chemicals are governed by Annex II (Noxious Liquid Substances in Bulk). In the case of Renewable diesel oil, which is produced from raw materials falling under Annex II, clarification of the most appropriate regulation was sought based on a review of a comprehensive dataset that had been assembled by industry.
- The MEPC agreed in 2007 that tank cleaning additives (some 350 products) need to be submitted for re-evaluation in accordance with the revised MARPOL Annex II guidelines. Cleaning additives are used in small quantities on board ships, added to the tank wash-water to remove residues from cargo tanks after unloading. All new cleaning additives are being re-evaluated by IMO on the basis of their revised GESAMP hazard profiles and while a majority of components already have a revised GESAMP hazard profile, MEPC agreed to refer any components without such a profile to WG 1 for review.
- To promote the revised GESAMP hazard evaluation procedure, consideration has been given to preparing a scientific paper in order to communicate the more novel aspects of the approach which have been developed during the revision process. Work on the scope and content of this publication is now ongoing.
- At its meeting last year, the MEPC agreed upon the introduction of a funding mechanism to support the costs of GESAMP/EHS substance evaluations which involves a fixed fee being charged to those submitting products for evaluation. The fee will be charged each time the substance needs to be presented to

a WG 1 meeting thereby encouraging fully comprehensive datasets to be put forward from the outset.

5.1.5 The activities of WG 1 have continued to provide a level playing field for the chemical and shipping industry whereby the hazards of substances are scientifically and fairly evaluated outside of political or commercial influence. The work of WG 1 is unique, as it is the only international peer-review body that evaluates the hazards of commodity chemicals by means of an independent scientific assessment. This allows scientific evaluation to be carried out independently from the procedures to classify substances for marine transportation.

Discussion

5.1.6 In discussion, the following issues were raised and clarifications given:

1. In contrast with the reports of other GESAMP Working Groups, the reports of WG 1 were not reviewed by GESAMP, but submitted directly to the appropriate Working Group of the MEPC. GESAMP only becomes involved when changes are proposed to the hazard evaluation procedure;
2. Aside from new chemicals being submitted for evaluation, the chemical industry frequently submits new data, when these become available, leading to a review of an existing hazard profile; and
3. Following a discussion initiated during the 33rd session of GESAMP, and after approval by MEPC in 2007, a system of fixed fees to be charged to the industry would be introduced to support the GESAMP/EHS substance evaluation. The use of fees would not compromise GESAMP's independence, as the administration of the fees and their use for the evaluation was handled by IMO under its financial rules and regulations. A comparable fees system already exists to fund the activities of GESAMP WG 34, as described in paragraph 5.2.11 below.

5.2 Review of applications for "active substances" to be used in ballast water management systems (WG 34)

Background and introduction

5.2.1 The International Convention for the Control and Management of Ships' Ballast Water and Sediments, (BWM Convention) was adopted at IMO on 13 February 2004, in response to the increasing concern of the international community with regard to the transfer of invasive species in ships' ballast water. The Convention has yet to enter into force.

5.2.2 The GESAMP — "Ballast Water Working Group on Active Substances", GESAMP — BWWG, or WG 34, was established in November 2005 to review any proposals submitted to IMO in preparation for the BWM Convention for approval of Ballast Water Management systems (further referred to as treatment systems) that make use of "active substances". WG 34 reports to IMO on whether such proposals present unreasonable risk to the environment, human health, property or resources in accordance with the criteria specified in the *Procedure for approval of ballast water management systems that make use of Active Substances* (G9) adopted by IMO under resolution MEPC.126(53). WG 34 does not evaluate the operation or design of the systems, or their effectiveness, only their potential for environmental and human health risks. In contrast with the hazard-based approach applied by WG 1, the evaluation by WG 34 follows a risk-based approach.

"Active substances"

5.2.3 "Active substances" are defined by the Convention as "substances or organisms, including a virus or a fungus, that have a general or specific action on or against harmful aquatic organisms and pathogens" and the approval of systems using such substances is described in resolution MEPC.126(53) adopted in 2005.

5.2.4 It is increasingly believed that use of "active substances" will become a condition to comply with the provisions of the Convention, as other methods appear to be less effective. However, the use of "active substances" poses a risk that the ballast water may still be toxic at the time of discharge into the environment and that organisms in the receiving water may suffer unacceptable harm. A cautious approach therefore needs to be taken by developers of such ballast water management systems and thorough (eco)toxicity testing is needed to determine if an "active substance" can be used and under which conditions the potential for harming the receiving environment or human health are sufficiently low to be acceptable.

5.2.5 The Procedure for approval of ballast water management systems that make use of active substances (G9) is aimed at ensuring proper application of the BWM Convention and provides a safeguard for the sustainable use of "active substances".

5.2.6 The approval of systems that make use of "active substances" consists of two-tiers — Basic and Final Approval, and involves the evaluation of the physical and chemical hazards to ensure that a ballast water management system does not pose unreasonable risks for environment, human health, property or resources, as follows:

1. Aquatic toxicology (acute as well as chronic toxicity);
2. Accumulation and degradation in water, sediments and organisms;
3. Bioconcentration and persistence within the living environment and the food web;
4. Mammalian toxicology (short-term as well as long-term hazards);
5. The provision of adequate methods in analytical chemistry to support such investigations;
6. Physical data and physical effects on the ship and the environment;
7. Risks of potential residues in seafood; and
8. Risks for ship and personnel safety on board.

5.2.7 The Terms of Reference for WG 34 are attached in Annex V to this report.

5.2.8 The complex interaction between the manufacturer, the administration submitting the proposal, WG 34, the MEPC Ballast water review group and the MEPC itself is set out in Guideline G9. To assist manufacturers, WG 34 developed a comprehensive **Methodology for information gathering and its conduct of work**, which clarifies the responsibilities of the Administrations in providing data to IMO and the procedures used for evaluating the proposals. The MEPC agreed that the WG 34 Methodology is a living document, which may be further refined taking into account the best practices and lessons learned during the evaluation process. The current text of the Methodology is contained in document MEPC 57/2/10 and can be obtained from the IMO website.

The achievements of the first two years

5.2.9 Following consideration of the reports of the first three meetings of WG 34, held in 2006 and 2007, the MEPC decided to give Basic Approval to six ballast water management systems that make use of active substances. At MEPC 56 in July 2007, the MEPC agreed to give Final Approval to a proposal by Norway regarding a ballast water management system that had previously received Basic Approval based on a submission by Sweden. Since July 2007, the Group had held another two meetings and reviewed seven additional application dossiers and its reports have been considered by MEPC 57 (31 March to 4 April 2008). Since its establishment, WG 34 rejected two proposals for Basic Approval and two proposals for Final Approval providing, in each of these cases, comprehensive recommendations on further improvement of the respective systems.

5.2.10 From the initial applications received, it can be concluded that most manufacturers include a pre-filtration step in their systems to remove particulate matter prior to treatment. Most manufacturers to date have not chosen to use externally dosed chemical substances as "active substances", but have opted to use well-known technologies to generate active substances in situ on board ships. These include chlorination by electrolysis, ozone generation, UV light with or without titanium electrodes and even drinking water treatment technologies using flocculation. One system using an externally dosed substance has also recently received Final Approval from MEPC 57.

Funding arrangements for WG 34

5.2.11 The activities of WG 34 are funded on a cost-recovery basis whereby all costs are borne by the manufacturers of Ballast Water Management Systems. WG 34 can review a maximum of three applications per session and there are currently sufficient applications to warrant three meetings per year. This funding system makes it possible to contract a consultant to prepare the technical dossiers for each session of the Working Group and also to remunerate the fees and travel and subsistence costs for the six or seven experts involved in its work. More recently, based on lessons learned during the previous meetings, the range of expertise available in the Group has been enhanced expanding the number of members to eight or nine members. A desk study was also commissioned to report on the chemistry and (eco-)toxicological consequences of chlorination in marine waters and its implication for in situ production and application on board ships. This study by Mr. Henk Jenner, will act as a reference for the experts of WG 34 when analysing new applications.

Discussion

5.2.12 In discussion, GESAMP focused on the direction that peer review of the reports of WG 34 might take:

1. GESAMP should pay specific attention to how environmental **risk assessments** are addressed in the BWWG review process, for example the concepts and assumptions used. Such a focused peer

review by GESAMP would give additional assurance to the MEPC that the advice it received was accurate and thorough;

2. The **human health** aspect of ballast water systems used on board (crew aspects) should be given more attention. The involvement of human health experts in the peer review process from, or nominated by WHO was recommended;
3. The Group noted that with the current frequency of three sessions of WG 34 per year, a very strict timing between submission of applications by manufacturers and their review by WG 34 exists and that all peer review activities by GESAMP, including any additional aspects would still have to be conducted within a period of three weeks in order to allow recommendations to be passed on in a timely manner to MEPC. The issue of **peer review** by GESAMP in general is further addressed in Chapter 10 of this report; and
4. GESAMP recommended that the Working Group initiates stocktaking exercise, based on the experiences of the Group with the applications so far. Such an exercise could lead to the development of a standardized procedure for the reviews, which would facilitate the future work of the Group, given the fact that submissions are unlikely to decrease in the near future.

5.3 Deep-sea fisheries, habitat and ecosystem concerns (WG 35)

Introduction

5.3.1 More focused terms of reference were agreed by the Working Group and approved by GESAMP. The new Terms of Reference can be found in Annex V of this report. Informal meetings of the Working Group were held in conjunction with other meetings (FAO workshop on Vulnerable Marine Ecosystems and Destructive Fishing in June and the Expert Consultation on International Guidelines for the Management of Deep-Sea Fisheries in the High Seas in September).

5.3.2 Given his heavy commitments, the Chairman of the Working Group, Mr. John Gordon asked to be relieved of his duties and Mr. Pascal Lorance from IFREMER in France was chosen as the new Chairman. The Working Group plans to work mostly by correspondence in 2008, but could meet informally in conjunction with the second session of the FAO Technical Consultation on the International Guidelines for the Management of Deep-Sea Fisheries in the High Seas during the last week of August 2008.

5.3.3 The Working Group plans to hold a meeting either at the end of 2008 or early in 2009.

5.3.4 In its discussions, GESAMP raised the following questions, which were communicated to the Lead Agency:

1. In addition to an expected shift of effort to secondary species as primary species stocks are depleted, is there an intention to address the issue of secondary species from the perspective of a management tool — i.e. the fact that effort might be diverted to secondary species to reduce pressure on primary stocks?
2. If so, is the intention to identify those secondary species that are of most potential interest as target species in the future?
3. Is FAO content that the destructive fishing practices in deep-sea fisheries are being adequately addressed by other organizations/initiatives?

5.3.5 Due to the fact that neither the Technical Secretary nor the Chairman of the Working Group were able to attend the session, it was not possible to receive clarification on the above issues during the session.

5.4 Ecosystem Approach to Mariculture (EAMAR) with emphasis on Offshore Farming (WG 36)

Scoping meetings

5.4.1 This Working Group has had two small scoping/preparatory meetings with the participation of the Chairman (Mr. John Marra, USA), Ms. Soto (FIMA officer) and two other experts for the first meeting (Mr. Bennetti, Brazil; and Mr. Pontecorvo, USA). The first meeting took place in New York, at Lamont-Doherty Earth Observatory of Columbia University, and was hosted by Mr. Marra.

New York meeting; April 9-10 2007, Lamont Doherty Earth Observatory of Columbia University

5.4.2 The objectives of the scoping meeting were to:

1. Achieve a common understanding of major objectives and procedures among the Chairman (Mr. Marra) and FAO secretariat (Ms. Soto);

2. Discuss potential relevant issues to be considered within the framework of the Working Group;
3. Propose and agree on other members of the Working Group;
4. Decide on the agenda and venue of the first Working Group meeting; and
5. Prepare for the 34th session of GESAMP, in Paris.

Major outcomes of the first meeting

5.4.3 The scoping meeting focused on clarifying the Terms of Reference of the Working Group and defining and agreeing on a definition for an ecosystem approach to offshore aquaculture. The Group agreed on advancing definitions for coastal aquaculture (discussed by GESAMP Reports and Studies No. 68), offshore aquaculture and open ocean aquaculture, deciding that the later two types will be the focus of the Working Group.

5.4.4 Additionally, the scientific issues which were thought to be very relevant within EAMAR were:

1. Nutrient inputs and outputs;
2. Ocean productivity enhancement;
3. Culture species trophic levels (e.g. which species are likely to be farmed);
4. Escapes of farmed organisms;
5. Polyculture;
6. Interactions with biodiversity;
7. Economic aspects and environmental costs (e.g. production efficiency versus environmental deterioration);
8. Future demands for marine protein (or for high value fish);
9. Conflicts among users of the open seas, and
10. Limits to offshore-open ocean aquaculture.

5.4.5 It was decided that the 1st working group meeting would take place in September 2007, and that there would be a previous one-day meeting of the Chairman and the FAO Secretary in Italy in July.

Perugia meeting; 5 and 6 July 2007, International Union of Geodesy and Geophysics (IUGG) venue

5.4.6 Using the opportunity of a conference in Italy[1] for the Chairman of the Working Group, Mr. John Marra, it was decided to hold the one-day July meeting in Perugia with the FAO Secretary, Ms. Soto.

5.4.7 The objectives of the Perugia meeting were:

1. To review once more its Terms of Reference, considering the past GESAMP main meeting in Paris and the recommendations received by members regarding this new Working Group and;
2. To define the agenda and objectives for the first formal meeting of the Working Group planned for September in Greece.

5.4.8 This was a successful meeting as there was the opportunity to confirm the participants in the Working Group meeting to be held in Heraklion, Greece, in September 2007. The Terms of Reference and workplan for the Working Group were revised and agreed according to recommendations by the GESAMP Executive Committee and to more recent events and information relevant for the September meeting.

Working Group meeting; 24-27 September 2007, Heraklion, Greece

5.4.9 The formal Working Group meeting took place in Heraklion, Greece hosted by Mr. Ioannis Karakassis in the University of Crete.

5.4.10 The first meeting of the GESAMP Working Group 36 was very successful, with the participation of nine recognized, world experts on different subjects, from open-ocean rearing technologies, ocean productivity, environmental impacts, escapes, and economic and social issues, etc.

5.4.11 The Working Group discussed the proposed definitions for Offshore Aquaculture, and agreed on more specific definitions based on exposure, water depth, and current velocity. The definition of offshore aquaculture is still a complex issue, since coastal aquaculture**,** already addressed in GESAMP Reports and Studies No. 68, does not provide a specific definition of what can be considered coastal aquaculture. On the other hand, there could be sites close to the coast (visible) but with very dynamic oceanographic conditions such that there are no impacts on the sediments and a high dilution rate. Other sites could be very far from the coast (more than 1 km) but still on the continental shelf with higher impacts on sediments. Therefore, it was decided to include concepts of offshore and open-seas aquaculture. These definitions are still being worked out by the Chairman in collaboration with the members of the Working Group and will be provided in the Meeting Report to be ready before the end of 2008.

[1] The International Union of Geodesy and Geophysics (IUGG) held in Perugia http://www.iugg2007perugia.it/.

Major outcomes of the Working Group 36 Activities

5.4.12 The following items represent the major outcome of the WG 36 activities:

1. The terms of reference of the Working Group have been largely achieved. The Group has compiled information to assess present and potential ecosystem effects of offshore mariculture and identified unresolved or unknown effects, attempting as well to identify priority needs for more research. The Group also outlined an ecosystem approach for Environmental Impact Assessment protocols for offshore mariculture, proposing initial monitoring programmes with an ecosystem perspective, and some planning for mitigation and management;
2. Although the Group addressed some of the legal issues and international mandates related to environmental requirements for the leasing process to offshore aquaculture in relation to ecosystem issues, the Group does not feel capable of addressing this in full within the terms of reference of the Working Group;
3. WG 36 agreed on relevant definitions for offshore farming;
4. WG 36 outlined the major issues regarding offshore and open-seas aquaculture (diseases and parasites, nutrient enrichment and fate, feeds, technology challenges, escapes, effects of climate change, and socio-economic issues);
5. WG 36 identified major gaps in our understanding and needs for future research under each of the above topics and emphasized the need to strengthen and deepen on the issues of nutrient fate from offshore farms with potential negative or positive effects, diseases, escapes and social issues, although recognizing that the Group may not have enough expertise on the latter;
6. WG 36 prepared a summary report of the Heraklion meeting and distributed this to the members for comment and correction. This will later contribute to the final GESAMP report of the Working Group.

Future activities

5.4.13 Future activities of the Working Group initially expected to follow the plan outlined in the Terms of Reference of this Working Group, however, due to a lack of funding it will not be possible to proceed as planned. Due to reduced regular programme budget, FAO cannot allocate further funds to this activity during the present biennium. Therefore, the Chairman and the FAO Secretariat have been forced to cancel the second meeting and the Working Group will thus continue its work mainly by correspondence, in order to finalize the Working Group report.

5.4.14 The extended report of the Working Group will be done on the basis of the Heraklion meeting report with expanded information, white papers, figures and tables. This activity will be lead by the Chairman of the Working Group with the assistance of the FAO Secretariat and other Working Group members. The final Working Group report (first draft) is expected to be completed by December 2008 and submitted to GESAMP for consideration for approval. The report is expected to be published in 2009.

5.4.15 GESAMP was pleased to note that, despite the financial constraints, the Working Group is on track to complete its report in 2009.

5.5 Mercury and its Compounds in the Marine Environment (WG 37)

5.5.1 During the GESAMP Executive Committee meeting held in London, February 2006 it was agreed to propose the establishment of a new Working Group to address issues relating to management of methyl mercury. The issue of the designation of methyl mercury as a Persistent Organic Pollutant (POP) (based on its residence time and dissemination in the marine environment) as a candidate for inclusion in the Stockholm Convention has been generating debate in the international scientific community. Scientific work to support the designation of methyl mercury as a POP and the threat it poses to the marine environment is still inconclusive. During the 34th session of GESAMP in Paris (2007), the draft Terms of Reference for the UNIDO/GESAMP WG was presented. GESAMP made comments and requested for the aspect dealing with methyl mercury designation as a POP from the Terms of Reference of the WG. This has necessitated the re-focus of this WG to the scientific issues of mercury and its compounds and their threats to the marine environment. The revised Terms of Reference for the work group was approved by GESAMP 35 and are presented in this report as Annex V.

5.5.2 At the first meeting held in Glasgow in October 2007 the Working Group recognized specific areas relative to the marine environment and a chapter of the final report will be dedicated to each

area of concern. The criteria for the report on mercury and its compounds were identified as:

- Sources
- Transport
- Fate
- Pathways
- Toxicity
- Monitoring and Evaluation
- Special considerations

Each criteria champion will attempt to assimilate and evaluate current knowledge on mercury and in particular methyl mercury in the marine environment. This will also identify gaps in existing knowledge

Discussion

5.5.3 UNIDO informed the meeting that because of the budgetary structure of the Organization (Biennium), at the time of the meeting it was not possible to commit the funding for sponsorship as outlined in the TOR. This situation seriously affected the planned activities for WG 37, as the 3rd meeting, originally scheduled for May 2008 in Accra had to be cancelled. The UNIDO representative indicated that every effort would be made to continue the sponsorship, and that a final resolution would be forthcoming in the next few months. In light of this situation, the Chairperson for WG 37 expressed her concerns for the continuation of the WG.

5.5.4 GESAMP 35 commended the work done by WG 37 and recommended that every effort should be made for the continuation of the work done in the preparation of the report. Support was also voiced by the IAEA Technical Secretary, who committed the IAEA willingness to co-sponsor the WG in the manner of one (1) expert, and the offer to host the next meeting of the WG in Monaco.

5.5.5 The UNIDO Technical Secretary suggested that the WG should establish a close link with the UNEP Global Mercury Partnership. The UNEP initiative has a comprehensive workplan for all aspects of mercury and its impact on the environment. But it is seen as lacking in the issue of mercury in the marine environment. UNIDO further offered to act as initial contact for the WG with UNEP Chemicals, in Geneva, to explore the possibility of co-sponsorship by UNEP for WG 37.

5.6 Atmospheric input of chemicals to the ocean (WG 38)

5.6.1 The Technical Secretary of WMO reported on the activities of the group in the inter-session GESAMP period and on the background of WG 38.

Background

5.6.2 Recognition continues to grow concerning the impact of the atmospheric input of both natural and anthropogenic substances on ocean chemistry, biology, and biogeochemistry as well as climate. The atmospheric input of chemicals to the ocean is closely related to a number of important global change issues. The atmospheric input of anthropogenic nitrogen to the nitrogen-limited regions of the ocean may lead to the increased oceanic production and emission of N_2O that could offset as much as 2/3 of the decrease in radiative forcing from the increased drawdown of CO_2 that results from the low level fertilization of the ocean by anthropogenic nitrogen.

5.6.3 Furthermore, the transport of mineral dust and iron affects the large areas of the global ocean where iron is the limiting nutrient. There is also a close connection with climate here, as a windier and dryer climate would result in increased quantities of iron entering the ocean, with its consequent impact on marine productivity and thus both CO_2 drawdown and dimethyl sulfide release, both of which in turn would provide a climate feedback.

5.6.4 The fates of nitrogen and iron are potentially related to climate and climate change. Although the atmospheric input of nitrogen and iron are currently topics of greatest concern, the input of other substances, such as phosphorus, lead, cadmium, POPs, and sulphur dioxide may also be of concern.

5.6.5 The development of atmospheric models and measurement programs to simulate the long-range transport and deposition of chemicals to the Earth's surface has expanded significantly in the last twenty years. There is now an excellent opportunity for the inclusion of atmospheric transport and deposition studies to the ocean in new and developing atmospheric research and monitoring programs. Until now there has been little involvement of the marine community in either of these efforts, although clearly both would be of significant interest and value to the ocean sciences.

Activities and plans

5.6.6 Since GESAMP 34, WG 38 has been established, with Professors Robert Duce and Peter Liss as Co-Chairs and with 13 members. WMO is a lead agency and IMO and Sida are currently sponsoring organizations. The Terms of Reference, as approved by GESAMP, are found in Annex V.

5.6.7 WG 38 has been established to enhance the interaction of the marine community with these developing atmospheric programs in order to assess

needs for the development of new model and measurement products for improving our understanding of the impacts of the atmospheric deposition of nitrogen, phosphorus and dust (iron) to the ocean.

5.6.8 WG 38 is already linked with two WMO activities: with the WMO Sand and Dust Storm Warning System (SDS-WAS) and with the ongoing WMO assessment "Precipitation Chemistry Data Synthesis and Community Product". Professor Duce presented GESAMP plans to both projects — in November 2007 in Barcelona and January, 2008 in Las Vegas, respectively. In addition, the international research program SOLAS (Surface Ocean/Lower Atmosphere Study) of the International Geosphere/ Biosphere Program (IGBP) is addressing a number of the scientific questions that are very relevant to the Terms of Reference of Working Group 38. Working Group 38 will have representatives from SOLAS in its membership.

5.6.9 The first WG 38 meeting is planned for December 2008. The meeting will:

1. Evaluate current understanding of the input to the ocean of atmospheric iron (dust) and nitrogen species;
2. Discuss the development of an in-depth review of phosphorus from the atmosphere to the ocean and the terrestrial environment. There should also be discussions about whether there are any additional substances that might be of sufficient importance to be considered for a later similar type of review; and
3. Discuss modalities of cooperation with the WMO and other relevant programmes, in particular the WMO Sand and Dust Storm Warning and Assessment System relative to the forecasting of dust inputs from the atmosphere to the ocean.

Discussion

5.6.10 GESAMP suggested that the WG 38 obtains relevant reports and other materials from SCOR concerning the scientific discussions of ocean fertilization, since WG 38 will consider natural fertilization effects through the natural atmospheric input of nutrients.

5.6.11 GESAMP queried whether substances other than nitrogen, phosphorus and iron will be considered in relation to the title of the WG, The Technical Secretary of WMO explained that a door was left open to those chemicals, although in the planed period it is more realistic to expect that the effort will be concentrated on nitrogen, phosphorus and iron. It was concluded that the current WG 38 title is generic and can remain.

5.6.12 A suggestion was made that more members from developing countries should be included. Also, engagement of an intern from developing world is proposed, having in mind that there is enough funding support from Sida for such support.

5.7 Proposal of a new working group "Global trends in pollution of coastal ecosystems: retrospective ecosystem assessment"

5.7.1 The Technical Secretary of IAEA presented a proposal for a new working group "Global trends in pollution of coastal ecosystems: retrospective ecosystem assessment". A draft proposal had been presented to GESAMP 34 for comments, which were taken into account in the new document. The main objective of the Working Group is to contribute to reduced coastal ecosystem stress globally by providing stakeholders, scientists and society in general an objective and global assessment of pollution trends during the last century in sensitive coastal ecosystems, through retrospective ecosystem analysis, by using dated environmental archives and time-series data where available.

5.7.2 The main tasks to be carried out by the Working Group are (i) establish links with other organizations, (ii) revise existing methodologies on suitable environmental archives, dating methods, pollution indicators, analytical techniques and trend analysis, (iii) revise existing data, including data quality, on a regional basis and (iv) disseminate the Working Group activities. The main outputs of the Working Group will be reports on the proposed methodology and a synthesis on existing data. No new data are expected to be produced although the results of the work might trigger new data acquisition in the future. The Working Group might like to consider the organization of regional meetings and a Conference, for which new funding will need to be obtained.

5.7.3 IAEA is under negotiation with some GESAMP co-sponsors to obtain support for the Working Group, which is a prerequisite for approval. IMO, UNEP and UNIDO positively valued the concept and expressed their interest to possibly co-sponsor this Working Group. Subsequently, the Technical Secretary of IAEA asked GESAMP 35 to approve, in principle, the Terms of Reference.

5.7.4 GESAMP 35 expressed agreement on the relevance of this tool for coastal zone managers, and

provided comments that will be considered and, if deemed appropriate, incorporated in the final Terms of Reference. This included (i) to describe the context of the problems that will be solved, (ii) to delimitate the tasks to be accomplished by the Working Group and the leading Agency, (iii) to seek for support for any organizations dealing with coastal ecosystem management, including LMEs, and engage them in the process, (iv) to link the Working Group within the framework of other initiatives such as TWAP and (v) produce a Working Group budget.

5.7.5 The proposal of the new Working Group was approved by GESAMP 35 in principle, and the revised Terms of Reference will be submitted for final approval to GESAMP 35 intersessionally.

6. CONTRIBUTION TO THE ASSESSMENT OF ASSESSMENTS UNDER THE "UNGA 60/30 REGULAR PROCESS"

6.1 The UNEP technical secretary provided a summary presentation of the status and latest development of the Assessment of Assessments related to the United Nations Regular Process. Modalities of undertaking the start-up phase — the so-called Assessment of Assessments (AoA) under the **UNGA resolution 60/30** — were recalled, including:

1. An Ad Hoc Steering Group (AHSG) to oversee the execution of the AoA. The AHSG is composed of Member State representatives (appointed by UNGA President) and of United Nations agencies;
2. UNEP and IOC/UNESCO, to co-lead and facilitate the process;
3. A Group of Experts (GoE) to carry out the AoA and produce a peer reviewed report, including a Summary for Decision Makers (SDM).

6.2 The outline of the AoA report was presented, notably the four parts of the report that should be sent out for review, at the latest by the end of July 2008:

1. Part 0: Introduction;
2. Part I: Summary of findings from the review of regional assessments (in 21 selected regions) and supra-regional issues/thematic assessments;
3. Part II: Evaluation of assessments, drawing on reviewed assessments in Part I, including the best practices being defined looking at the following criteria:
   - Scientific credibility
   - Policy relevance
   - Communication
   - Legitimacy
   - Usefulness
4. Part III: Framework and options for the Regular Process, including:
   - Institutional arrangements
     - Scaling up and down
     - Capacity-building requirements
     - Cost estimate of the process
     - Investment/Benefit in relation to current expenditures for marine sectors.

6.3 One of the supporting tools of the AoA was presented, namely the interactive online database which is a survey report developed by UNEP-WCMC and peer reviewed by GESAMP during a workshop, held at IMO, in London in 2006.

6.4 The GESAMP contribution to the AoA was introduced, namely the draft report on "The review of assessment and studies related to pollution in the open ocean" as developed by a GESAMP Task Team and following the request from the AoA secretariat. This report is focused on marine pollution in the open ocean, including ship-based pollution and atmospheric inputs. It includes an analysis of current assessments, reviews, syntheses and studies, as available. The analysis addresses in particular, coverage and gaps (geographically and thematically) and the overall relevance to a Regular Process. For this review, the GESAMP task team has sub-divided the global ocean into the major ocean basins (Pacific, Atlantic, and Indian oceans) and further into the northern and southern hemispheric portions of those basins.

6.5 Finally, the timeline for the AoA was presented and discussed, including the most critical benchmarks and deadlines that will need to be strictly adhered to for the delivery of the final report before the end of 2009. The Technical Secretary of UNEP also thanked IMO and GESAMP, on behalf of the AoA secretariat, to agree to host the next Group of Experts meeting, 4-6 November 2008, at IMO Headquarters in London. For further details, the meeting was encouraged to visit the website of the AoA: www.unga-regular-process.org.

6.6 Following consultation with the UNGA Resolution 60/30 regular process lead agencies, GESAMP decided to recommend that the AoA Task Team prepare their final report for publication in the Reports and Studies series subject to its approval of the final draft. This would require:

1. External peer review of the report and nomination of appropriate reviewers to a panel. Experts should be identified to consider specific areas needing attention and should be asked to provide solutions rather than just comments;
2. The timeline would need to support any adjustment of the executive summary of the report abstracted by UNEP and IOC

as part of the AoA supra-regional issues section.

6.7 A number of points were raised regarding potential improvements of the Task Team report:

1. More thorough referencing, in accordance with the style and format used in the Reports and Studies series;
2. Executive summary — some statements need checking and confirmation;
3. The aims and objectives need to be stated, possibly in a foreword which describes the context in which the report was produced; and
4. Some areas need expanding or excluding:
   - Small-scale distillation in relation to POP's;
   - Marine radioactivity, including deep-sea dumping sites for radioactive material and accidental losses of vessels and other military equipment;
   - IAEA will provide information on atmospheric inputs; and
   - Speciation of metals or ionizing substances might need consideration.

6.8 UNEP indicated that it is important to include the publication of this report in the workplan of GESAMP, as it will be summarized in the supra-regional issues of the AoA under "Open ocean pollution including atmospheric input" and noted that UNEP intends to provide assistance with the publication. IMO indicated that Sida funds can also be used to assist publication.

7. SPECIAL SESSION ON MARINE ENVIRONMENTAL PROTECTION AND SCIENCE IN THE WEST AND CENTRAL AFRICAN CONTEXT

7.1 As part of the meeting, a special session on the marine environment in West Africa was arranged. The session was intended to draw attention to issues of relevance for the region that might fall within the remit of GESAMP and its Sponsoring Organizations. A more specific objective of this session was to highlight regional lessons on marine environmental assessments and how these translate to the global scales, using the West African Region, and in particular the Guinea Current Large Marine Ecosystem (GCLME), as an example. The session was moderated by Mr. Jacques Abe (IGCC Executive Secretariat).

7.2 The West African Region stretches from Mauritania to the Western part of South Africa on the eastern coast of the Atlantic. This area is composed of the Benguela current, Gulf of Guinea current and the Canary current Large Marine Ecosystems (LMEs). These three main LMEs are included within the UNEP West and Central Africa Regional Seas Programme. With a population of more than 300 million, a large proportion of which live in the coastal areas, these regions face problems of fisheries depletion, water pollution, public health and sanitation, loss of habitat and biodiversity, land-use and planning and coastal erosion.

7.3 Professor Sikirou K. Adam, Centre for Environment and Development in Africa (CEDA), Benin, gave a presentation on the topic of *The African Marine areas and issues of concern from the GCLME Perspectives*. The presentation introduced the Gulf of Guinea region from the perspective of the physical environment as well as the administrative and socio-economic characteristics, and the value of its functions, products and attributes. It further highlighted the processes leading up to the formation of the Gulf of Guinea LME (GOG-LME), which was followed by the Guinea Current LME project.

7.4 The second presentation was given by Professor Babajide I. Alo, Department of Chemistry, University of Lagos, Lagos, Nigeria, addressing the issue of *Strategies for addressing marine environmental issues in Africa through regional cooperation.* The presentation focused on the options and strategies for regional cooperation on marine environmental management, and the lessons learned so far in the region.

7.5 A discussion followed, highlighting a number of issues, such as:

1. The use of accumulated scientific knowledge beyond the lifetime of the project;
2. The transfer of knowledge within the region and the sharing of data;
3. The need for capacity-building;
4. The “short-sightedness” of decision makers and the difficulty for scientists to bring attention to relevant long-term issues;
5. The difficulties in going from data collection to required action to address problems in the marine environment. Problems have been identified, now action is needed. Enforcement is a problem, and each country needs to incorporate regional agreements into its own domestic enforcement structures;
6. Although reductions in contaminants and degradation cannot be detected yet, there is a strong sense that the region is heading in the right direction. In relation to this, the need for indicators or benchmarking to be able to measure progress and improvements in environmental quality, was discussed;
7. Difficulties in translating scientific findings into management- and decision-supporting tools; and
8. Finally, the issue of bilateral fishing agreements was discussed. For example in relation to the EU, better regional cooperation would give a stronger basis for negotiations. It also gives a possibility to address the issue of transboundary stocks.

7.6 GESAMP expressed its deep appreciation to the invited speakers, who drew attention to a number of issues of great relevance to GESAMP as well as the Sponsoring Organizations.

7.7 Summaries of the two presentations can be found in Annexes VIII and IX.

8. DELIBERATE NUTRIENT ADDITIONS TO THE OCEAN TO PROMOTE PRIMARY PRODUCTION

8.1 In March 2008, GESAMP and the International Council for Science, Scientific Committee on Ocean Research (SCOR) issued a joint statement regarding proposals to fertilize parts of the oceans with iron to stimulate phytoplankton growth with the aim of drawing down CO_2 from the atmosphere (see Annex X). GESAMP and SCOR expressed their concern regarding the scientific basis of such proposals.

8.2 Prior to being issued, this GESAMP intersessional statement was approved by the Members and GESAMP's Sponsoring Organizations were given opportunity, albeit brief, of adding their comments; later information indicated that at least one agency had not seen this request in time to respond. GESAMP felt that the matter had some urgency and that combining forces with SCOR gave the statement additional weight. GESAMP at its 35th session considered whether further action was needed in addition to the joint statement. It was noted that such iron fertilization experiments were being driven by commercial attempts to market carbon credits in this way.

8.3 GESAMP was informed that under the terms of the London Convention (LC) and its Protocol, such a use of iron was regarded as "placement of matter for a purpose other than the mere disposal thereof" which was excluded from the definition of "dumping" under these agreements. Although, as a consequence, placement activities fell outside the remit of these agreements, LC Contracting Parties, being concerned about the issue of ocean fertilization, had agreed in 2007 to study it further from the scientific and legal perspectives with a view to regulating it. One Member of GESAMP questioned that as the iron is only partly utilized — could it not then be considered as dumping? It was noted that it would be useful to identify if other regulatory mechanisms of relevance existed.

8.4 Ocean variability, seasonality, upwelling, unpredictability in the occurrence of phytoplankton species and their iron utilizing capacity, all add to the difficulty of scientific studies on the impact of iron fertilization.

8.5 GESAMP discussed issues of scale, considering that even though ocean absorption capacity is theoretically massive — reliability of such techniques is not and the efficacy of CO_2 drawdown is dubious so far. Members considered that to achieve significant drawdown of CO_2, potentially massive interventions would be required with the risk of potentially massive consequences for the environment. It was considered by one member that ocean conditions are so variable that a case by case evaluation of iron fertilization experiments would be necessary, as every location is different. The Technical Secretary of IAEA and several members pointed out that in dealing with such large uncertainties, the precautionary principle should apply.

8.6 GESAMP agreed to carry on the discussion intersessionally by correspondence with the aim of developing an internal scoping document to present to GESAMP and agreed to liaise with the sponsoring agencies, in particular, UNESCO-IOC, IMO, and WMO. Mr. Robert Duce will be invited to lead this discussion.

9. IDENTIFICATION OF NEW AND EMERGING ISSUES

Effects of hypoxia or anoxia on endocrine systems and fish reproduction

9.1 Mr. Rudolf Wu, GESAMP Member, forwarded the following suggestion to GESAMP.

> *"Hypoxia or anoxia affecting thousands of km^2 has been commonly reported for waters around the world. … The eminence of the problem is clearly exemplified by the global increase in number of "dead zones" from 150 in 2004 to 200 in 2006 (UNEP 2006). Although hypoxia is an old problem, there is new laboratory and field evidence to show that hypoxia can act to disrupt endocrine systems and may impair fish reproduction, leading to a male-biased F1 population. Recent studies have further shown that hypoxia can act as a teratogen, delaying hatching and causing malformation of fish embryos. In the light of these new scientific findings and given the fact that (a) hypoxia occurs over very large areas globally, and (b) the problem is likely to be further exacerbated in the coming years because of global warming, hypoxia is likely to have a major impact on the marine environment in the years to come."*

9.2 In introducing the issue, the Chairman noted that it was the apparent subtle toxic effects on reproduction due directly or indirectly to hypoxia that was the potential new and emerging issue here and not the increase in occurrence of hypoxia as such. He further noted that the potential impact may be longer than the hypoxia event itself if reproduction is involved. Not having further information to hand to expand on the discussion, GESAMP decided to ask Mr. Wu to provide a short scoping paper on the topic for consideration at its next session.

Environmental side effects of bottom-trawling

9.3 Some members felt that fish stocks continue to decline due to bottom-trawling despite management measures, as essential environmental aspects may not have been taken into account sufficiently, especially environmental side effects. This issue was felt to be important considering in particular the effects on benthic communities and alternative fisheries methodologies. FAO's gear-type fact-sheet for bottom trawls[2] states that *"they interact physically with the bottom sediment, which might result in removal or damage of sedentary living organisms (including seaweed and corals) and in the case of uneven bottom surface displacement of stones or other larger objects. On flat sandy/muddy bottom the sediments might be whirled up into the water masses and suspended. The short and long-term impact on the bottom environment is poorly documented despite some scientific experiments. More research on possible impact of bottom-trawling is urgently needed to evaluate the effect on the environment.*"

9.4 GESAMP noted that, although it may not be considered a new and emerging issue, bottom-trawling is associated with damage to benthic habitats and potential loss of ecosystem function and that information may still be lacking. For further information, FAO recently published the following related technical papers:[3]

Valdemarsen, J.W., Jørgensen, T., Engås, A., 2007. Options to mitigate bottom habitat impact of dragged gears. Rome, FAO. FAO Fisheries Technical Paper. No. 506. 29p.
ftp://ftp.fao.org/docrep/fao/010/a1466e/a1466e01.pdf

Løkkeborg, S., 2005. Impacts of trawling and scallop dredging on benthic habitats and communities. Rome, FAO. FAO Fisheries Technical Paper. No. 472. 58p
http://www.fao.org/docrep/008/y7135e/y7135e00.htm

Suuronen, P., 2005. Mortality of fish escaping trawl gears. Rome, FAO. FAO Fisheries Technical Paper. No. 478. 72p.
http://www.fao.org/docrep/008/y6981e/y6981e00.HTM
ftp://ftp.fao.org/docrep/fao/008/y6981e/y6981e00.pdf

Impacts of new chemicals such as pharmaceuticals and synthetic nanoparticles

9.5 As at GESAMPs 34th session, the issue of new pollutants was again raised, members expressing their concerns regarding pharmaceuticals from sewage sludge, e.g. non-steroidal anti-inflammatories, noting that pharmaceutical metabolites may be Persistent, Bioaccumulative and Toxic (PBT). One member referred to programmes looking at contaminants which may not yet be internationally recognized as problematic but which include pharmaceuticals and aquaculture chemicals as well

[2] Gear-type fact-sheet for bottom trawls: http://www.fao.org/fishery/geartype/205.

[3] Issues associated with environmental impacts of fishing are briefly addressed in http://www.fao.org/fishery/topic/12273/en.

as life-style chemicals such as siloxanes and perfluorooctanoic Acids (PFOA's). It was also noted that synthetic nanoparticles can accumulate in organisms. It was noted that the Stockholm Convention makes provision for the risk assessments of POPs, and has highlighted some of the chemicals of greatest concern for strict regulation and that furthermore their work programme was complemented by the identification of PBT (persistent, bioaccumulative and toxic) chemicals in Europe and North America which may subsequently be nominated for inclusion under the Stockholm Convention. It was suggested that the early identification of potential POP's based on their properties might need further consideration. Mr. Peter Kershaw and Ms. Helen Keenan volunteered to write a scoping document for GESAMPs next session.

The prophylactic use of antibiotics and lice biocides in salmon farming

9.6 Regarding the recent rise in disease outbreaks among farmed salmon in Chile, one member noted the dramatic increase in the prophylactic use of antibiotics and salmon lice biocides to mitigate fish health problems. The Vice-Chairman pointed out that GESAMP had produced a report on the use of chemicals in coastal aquaculture published in 1997 (Reports and Studies No. 65). One member asked if there was any procedure in place for the tracking of such chemicals.

Environmental Quality Standards (EQS)

9.7 Environmental Quality Standards (EQS) for sediment and water can vary from country to country and even though there may be many missing values and metal speciation is often not taken into account, they are nevertheless invaluable in the interpretation of monitoring data. EQS are not available for many parts of the world. GESAMP considered that global EQS might be very useful in many parts of the world, including developing countries. It was discussed as to whether GESAMP could practically issue such EQS and what the logistics of this might be. The Technical Secretary of IAEA expressed interest in the issue, emphasizing that it is clearly related to the work of the IAEA Marine Environmental Laboratories. He further noted that water EQS may be immediately feasible, but that sediment may be much more difficult. Mr. Babajide Alo reported that in many regions, particularly the Gulf of Guinea and the Benguela LME, deep sea oil exploration is increasing dramatically and that EQS would be very useful in such situations. The Chairperson of WG 37 reported that a complete list of all EQS for mercury had been accumulated by her working group and that furthermore, in compiling this most of the sources of EQS came to light. GESAMP agreed to place this information on its website and to try and build on this in the future through the provision of a scoping document for its next meeting.

Micro-plastics in the marine environment

9.8 Large amounts of plastics enter the marine environment and physically degrade into smaller and smaller fragments; such particles are becoming ubiquitous from about 20µm and smaller. The Chairman pointed out that the issue here was not marine litter as such but micro-plastic breakdown products. They have been found in the UK Continuous Plankton Records in increasing quantities over the past four decades. They can become absorbed by marine organisms and can transfer across the gut and may have toxic impacts. They are also reported to be a carrier of hydrophobic chemicals such as Polychlorinated biphenyls (PCBs) and may deliver them into organisms. Some members were reluctant to comment until it was clear as to which other groups may be looking into this issue. Mr. Peter Kershaw offered to investigate the matter further and provide a scoping paper including an overview of the activities of other organizations.

Carbon Capture and Storage (CCS)

9.9 Regarding Carbon Capture and Storage, in particular undersea gas/oilfield storage GESAMP took note of a recent GEF Scientific and Technical Advisory Panel (STAP) report on this issue and agreed to keep a watching brief on developments.

Ecosystem impacts of changing ice conditions in the Arctic

9.10 Summer ice conditions in the Arctic are impacting the ecosystem rapidly: one member considered that an independent scientific view of the effects of retreating sea ice could augment existing programmes, e.g. the Protection of the Arctic Marine Environment Working Group (PAME). It was stressed by the agencies that duplication should be avoided and GESAMP agreed to keep a watching brief.

9.11 GESAMP agreed to develop, in the intersessional period, a mechanism to better channel its work and discussions on emerging issues, in order to avoid duplication, to benefit from the work already being done by individual Sponsoring Organizations and to provide a better synthesis of issues.

10. INTERSESSIONAL PROCEDURES

10.1 There are three types of document which may need attention from the members in the intersessional period:

1. Short documents such as Terms of Reference;
2. Reports such as those of WG 34 with short deadlines, scoping documents; and
3. Reports and Studies which require external peer review prior to approval by GESAMP.

10.2 GESAMP members need to respond quickly and effectively to requests for comments on documents; to facilitate this, the members considered the following aspects:

1. The agencies can best distribute documents for comment through the GESAMP Office. The secretariat originally issuing the document should direct members as to where they can best focus their efforts, e.g. general comments, specific chapters, other specific or thematic aspects;
2. The members appreciate feedback as to how their comments have been responded to, preferably in the form of a comment and response sheet. The members felt that the imminent availability of a virtual office on the GESAMP website would facilitate comments;
3. A timetable for intersessional assignments will be produced and updated at regular intervals, to alert GESAMP members so that they can plan their work ahead; to this end, an agenda can be placed on the virtual office. The Members agreed to hold regular teleconferences, hosted by the GESAMP Office, three times a year and that final approval of Reports and Studies should be confirmed at such scheduled teleconferences;
4. Requests for formal approval of documents and reports should always be accompanied by an electronic form to be returned together with any comments. The GESAMP Officer will develop and distribute a standardized review form. The members should make clear in the case of approval not being granted as to what actions need to be taken to redress this.

11. SCOPING ACTIVITIES

Request from OSPAR to review a Draft Code of conduct for responsible marine research

11.1 The Chairman in his introduction noted that unique, vulnerable and often spatially limited features such as black smoker hydrothermal vents and cold water coral reefs may need additional protection from over-sampling. GESAMP endorsed the "*OSPAR code of conduct for responsible marine research in the deep-seas and the high seas of the OSPAR maritime area*" and depending on the way it was implemented noted that it may help to protect vulnerable habitats from undue research interference. The Chairman of GESAMP will respond with a letter to OSPAR conveying this information.

Request from OSPAR to nominate experts for the peer review of OSPAR quality status report 2010

11.2 The members agreed that in accordance with the working practices of GESAMP the formation of a Task Team would be the most appropriate mechanism to offer in response to OSPARs request, i.e. a unified, independent peer review, using GESAMP experts with knowledge within and from outside the region, acting in their individual capacity. The product would be an independent peer review report by GESAMP of the main QSR report. GESAMP can offer to publish the peer review as a companion document in its Reports and Studies series.

11.3 GESAMP will respond to the OSPAR secretariat before 20 June.

Request from IMO regarding wash-water discharge criteria from exhaust gas cleaning systems

11.4 GESAMP agreed to comment on, and provide practical suggestions on, the appropriateness of the guidelines for wash-water discharge criteria from exhaust gas cleaning systems. One member noted that oxygen depletion might be a useful addition to the monitoring criteria.

Further contextual technical information will be provided by IMO.

11.5 GESAMP will reply to IMO by the end of July 2008 (at latest 9 weeks before MEPC 58, 6 to 10 October) and will therefore need to conclude a draft of its response by the end of June. GESAMP will also provide IMO with an overview of the cost (if any) of the exercise in person days/months, as well as an indication of the time needed.

12. FUTURE WORK PROGRAMME

Intersessional work

12.1 Evaluation of the hazards of harmful substances carried by ships

(Working Group 1)

Lead Agency: IMO
Co-sponsors: none
Chairperson: C. T. Bowmer
Members: T. Höfer, D. James, S. le Floch, M. Morrissette, H. Saito, N. Soutar (consultant)

The 46th session will be held at IMO in London from 20 to 24 April 2009.

12.2 Review of proposals for approval of ballast water management systems that make use of "active substances"

(Working Group 34)

Lead Agency: IMO
Co-sponsors: none
Co-chairpersons: J. Linders/F. Pedersen
Members: B. Behrends, T. Borges, J. Crayford (consultant), E. Dragsund, S. Hanayama, A. Kronborg, E. Lemieux, D. Tongue

The 5th session of the Working Group was held from 14 to 18 January 2008 in London. The 6th session will be held from 19 to 23 May 2008, and the 7th session is planned from 30 June to 4 July 2008, while tentative dates for the 8th session are 16 to 20 February 2009.

12.3 Development of activities in relation to deep-water fisheries, fisheries habitat and related ecosystem concerns

(Working Group 35)

Lead Agency: FAO
Co-sponsors: UNIDO
Chairperson: P. Lorance
Members: to be determined

The Working Group plans to work mostly by correspondence in 2008, but could meet in the margins of the second session of the FAO Technical Consultation on the International Guidelines for the Management of Deep-Sea Fisheries in the High Seas during the last week in August 2008.

12.4 Development of an ecosystem approach to mariculture with emphasis on offshore farming

(Working Group 36)

Lead Agency: FAO
Co-sponsors: UNIDO
Chairperson: J. Marra
Members: D. Benetti, I. Karakassis, M. P. Kuton, P. Pitta, N. Sims, Y. Olsen, Q. Tang, C. Wurmann

The extended report of the Working Group 36 will be prepared on the basis of the report of the meeting held from 24 to 27 September 2007 with expanded information, white papers, figures and tables. This activity will be led by the Chairman of the Working Group with assistance from the FAO Secretariat and other Working Group members. The final report is expected to be completed by December 2008 and circulated within GESAMP. If approved by GESAMP, the report of the Working Group could be published in 2009.

12.5 Expanded scientific review of mercury and its compound and threats to the marine environment

(Working Group 37)

Lead Agency: UNIDO
Co-sponsors: IAEA
Chairperson: H. Keenan
Members: B. Alo, J. Davee, T. Hennessey, J. Guimaraes, M. Horvat, J. Hurley, J. Leaner, R. Mason, J. Oh, A. Songsasen, T. Tamiyasu

The Working Group has held two meetings and following the revised dates of the 3rd and 4th meetings have still to be confirmed.

12.6 Atmospheric input of chemicals to the ocean

(Working Group 38)

Lead Agency: WMO
Co-sponsors: IMO, other funding possibilities will be considered
Co-Chairpersons: R. Duce, P. Liss

Members: A. Baker, F. Dentener, K. Hunter, M. Kanakidou, N. Kubilay, N. Mahowald, J. Prospero, M. Sarin, I. Tegen, M. Uematsu

The 1st meeting of the Working Group will be held in the end of 2008, at a venue yet to be decided. At the 1st meeting the following would be accomplished to evaluate current understanding of the input to the ocean of atmospheric iron (dust) and nitrogen species, to discuss the aspects of phosphorus input from the atmosphere, and to evaluate how the Working Group can effectively cooperate with the WMO dust storm and precipitation chemistry programmes.

12.7 Global trends in pollution of coastal ecosystems: retrospective ecosystem assessment

(Working Group 39)

Lead Agency: IAEA
Co-sponsors: to be determined
Chairperson: to be determined

In collaboration with Mr. Sandor Mulsow, a proposal was presented and approved in principle by GESAMP. IAEA requested co-sponsorship by other United Nations and international organizations. Final approval will depend on co-sponsoring by at least one other Agency, and, therefore, support by other organizations is actively being pursued.

12.8 GESAMP Task Team for the Assessment of Assessments (UNGA 60/30 Regular Process)

Chairperson: R. Boelens
Members: A. Baker, D.C.E. Bakker, C. T. Bowmer, R. Duce, D. Schmidt Etkin, N. Perera

The GESAMP Task Team will continue to support the Assessment of Assessments, and revise its report for publication in the Reports and Studies series.

12.9 Other activities

The following items will also be addressed intersessionally:

1. Review of a Draft Code of conduct for responsible marine research in deep-seas and the high seas of the OSPAR maritime area (see section 11.1 above);
2. Request from OSPAR to nominate experts for the peer review of the OSPAR quality status report 2010 (see section 11.2 above); and
3. Request from IMO regarding wash-water discharge criteria from exhaust gas cleaning systems (see section 11.4 above).

12.10 Scoping papers for GESAMP 36

Topic: Discussions on deliberate nutrient additions to the ocean to promote primary production (see section 8 above)
Lead Member: R. Duce
Topic: Effects of hypoxia or anoxia on endocrine systems and fish reproduction (see section 9.1 above)
Lead Member: R. Wu
Topic: Impacts of new chemicals such as pharmaceuticals and synthetic nanoparticles (see section 9.5 above)
Lead Members: P. Kershaw and H. Keenan
Topic: Environmental Quality Standards (see section 9.7 above)
Lead Member: H. Keenan
Topic: Micro-plastics in the marine environment (see section 9.8 above)
Lead Member: P. Kershaw

Support arrangements

The Technical Secretary of IMO reiterated his advice to GESAMP that, pursuant to the current Agreement between the Swedish Government and IMO, support would be available for 2008 to cover the travel and subsistence costs of experts from developing countries involved in the activities of all Working Groups listed above. Subject to extension of this agreement this support would also be available for 2009. This support would complement the support provided by the Sponsoring Organizations of GESAMP.

13. ANY OTHER BUSINESS

13.1 No other business was brought to the attention of GESAMP.

14. DATE AND PLACE OF GESAMP 36

14.1 The Administrative Secretary of GESAMP explained that because the scheduling of meetings at IMO, in particular, is yet to be finalized, he would communicate, by the beginning of June, proposals for meeting dates for GESAMP 36 in 2009.

14.2 The Group was also informed that GESAMP sessions are usually hosted in turn by the sponsoring organizations. In this regard and in order to facilitate easy planning and to promote stability for GESAMP meetings, the Administrative Secretary will send a written request to WMO about GESAMP 36 in 2009 and UNEP for GESAMP 37 in 2010. This proposal was supported by the representative of WMO for the purpose of initiating discussions and preparations for GESAMP 36.

14.3 The Chairman thanked the Administrative Secretary for this valuable planning initiative and it was agreed that information about the date and place of the next GESAMP meeting would be provided by end of May early June 2008.

Following the communication from the Administrative Secretary, GESAMP accepted the offer of WMO to host the 36th session of GESAMP at the WMO headquarters in Geneva, from 28 April to 1 May 2009.

15. ELECTION OF CHAIRPERSONS

15.1 Upon the proposal by the Administrative Secretary on behalf of the Executive Committee, the Group elected by acclamation Mr. Tim Bowmer as Chairman. Departing from past practice, GESAMP also agreed to the nominations of two Co-Vice-Chairmen and elected by acclamation Mr. Lawrence F. Awosika and Mr. Sandor Mulsow. It was recognized that in view of the increasing workload of GESAMP, a welcome development, the Chairman needed more and more assistance to lessen his burden, which justified the proposal for two Vice-Chairmen.

15.2 The Chairman congratulated the incoming new Chairman and two Vice-Chairmen and highlighted that while the workload of GESAMP may be at times very heavy, it was also a rewarding burden.

15.3 The meeting expressed their sincere thanks to Mr. Mike Huber, the outgoing Chairman for his dedication and long time support to GESAMP, including at critical junctures, particularly in relation to the Regular Process and the Assessment of Assessments.

16. CONSIDERATION AND ADOPTION OF THE REPORT OF GESAMP 35 AND CLOSURE

16.1 The report of the thirty-fifth session of GESAMP was considered and approved in principle by the Group on the last day of the session.

16.2 The outgoing Chairman of GESAMP, Mr. Mike Huber, closed the 35th session of GESAMP on 16 May 2008 at 12:00 p.m.

ANNEX I: AGENDA

Opening

1 Adoption of the agenda
2 Report of the Chairperson of GESAMP
3 Report of the Administrative Secretary of GESAMP
4 GESAMP Pool of experts and Website and the GESAMP Office
5 Planning of GESAMP activities:
5.1 Evaluation of the hazards of harmful substances carried by ships (WG 1: IMO leading);
5.2 Review of applications for "active substances" to be used in ballast water management systems (WG 34: IMO leading);
5.3 Development of activities in relation to deep-water fisheries, fisheries habitat and related ecosystem concerns (WG 35: FAO leading);
5.4 Development of an ecosystem approach to mariculture (WG 36: FAO leading);
5.5 Expanded scientific review of mercury and its compounds and threats to the marine environment (WG 37:UNIDO leading);
5.6 Atmospheric input of pollutants to the oceans (WG 38: WMO leading);
5.7 Establishment of trends in global pollution in coastal environments (IAEA leading);
5.8 Any other proposals for new Working Groups
6 Contributions to the Assessment of Assessments under the "UN Regular Process"
7 Side-event on topic of regional relevance (to be announced)
8 Deliberate nutrient additions to the ocean to promote primary production. Discussion on GESAMP's position and the recent joint statement with SCOR
9 Identification of new and emerging issues regarding the degradation of the marine environment of relevance to governments and sponsoring organizations
10 Intersessional procedures
11 Scoping activities
12 Future work programme
13 Any other business
14 Date and place of GESAMP 36
15 Election of chairpersons
16 Consideration and adoption of the report of GESAMP 35

Closure

ANNEX II: LIST OF DOCUMENTS FOR GESAMP 35

GESAMP 35/1	Admin. Secretary	Provisional Agenda
GESAMP 35/1/1	Admin. Secretary	Annotations to the Provisional Agenda
GESAMP 35/4	IAEA	Report on the website and pool of experts development
GESAMP 35/5	IMO	Report of the GESAMP Working Group on the Environmental Hazards of Substances Carried by Ships (WG 1)
GESAMP 35/5/1	IMO	Report of the GESAMP Working Group on the Review of proposals for approval of ballast water management systems that make use of active substances (WG 34)
GESAMP 35/5/2	FAO	Report of the Working Group on Developments in relation to deep-water fisheries, fisheries habitat and related ecosystem concerns (WG 35)
GESAMP 35/5/3	FAO	Report of the Working Group on Ecosystem Approach to Mariculture (EAMAR) with emphasis on Offshore Farming (WG 36)
GESAMP 35/5/4	WMO	Report of the Working Group on Atmospheric input of chemicals to the ocean (WG 38)
GESAMP 35/5/5		Report of the Working Group on Planning of GESAMP activities: Expanded scientific review of mercury and its compounds (WG 37)
GESAMP 35/8	The Vice-Chairman	Discussion paper: Deliberate nutrient additions to the ocean. Annex: GESAMP/SCOR statement
GESAMP 35/8/1	IMO	Activities under the London Convention and Protocol on ocean fertilization
GESAMP 35/9	The Chairman	Intersessional procedures
GESAMP 35/11	OSPAR	Draft Code of Conduct for Responsible Marine Research in the Deep Seas and High Seas of the OSPAR Maritime Area
GESAMP 35/11/1	OSPAR	Peer Review of OSPAR Quality Status Report 2010
GESAMP 35/11/2	IMO	Request to GESAMP regarding washwater discharge criteria from exhaust gas cleaning systems
GESAMP 35/INF.1	Secretariat	Draft List of Participants
GESAMP 35/INF.2	Secretariat	Proposed timetable
GESAMP 35/INF.3	Admin. Secretary	Report of the Administrative Secretary of GESAMP. Activities and achievements of sponsoring organizations of GESAMP since the 34th Session
GESAMP 35/INF.4	GESAMP Task Team	A review of assessments and studies related to pollution in the open ocean. Report of the GESAMP Task Team for the Assessment of Assessments under the UNGA 60/30 Regular Process.
GESAMP 35/INF.5	Secretariat	Programme for the special session on marine environmental protection and science in the African context
GESAMP 35/INF.6	Secretariat	Draft list of Documents

ANNEX III: LIST OF PARTICIPANTS FOR GESAMP 35

A. MEMBERS

Lawrence F. AWOSIKA*
Nigerian Institute for Oceanography and Marine Research (NIOMR)
P.M.B. 12729
Lagos
Nigeria
Tel./Fax: +234 1 2619517 - office
Tel./Fax: +234 1 619247 - home
e-mail: larryawosika@yahoo.com

Tim BOWMER
TNO Chemistry
Postbus 360
NL-3700-AJ Zeist
The Netherlands
Tel.: +31 30 6944645
Fax: +31 30 6944099
e-mail: tim.bowmer@tno.nl

Robert DUCE*
Texas A & M University
Department of Oceanography
TAMU - 3146
College Station, Texas 77843-3146
USA
Tel.: +1 979 229 3821
Fax: +1 979 690 6926
e-mail: rduce@ocean.tamu.edu

Michael HUBER
Global Coastal Strategies
P.O. Box 606
Wynnum,
Brisbane, Queensland 4178
Australia
Tel.: +61 7 3893 4511
Fax: +61 7 3893 4522
e-mail: mhuber@bigpond.net.au

Peter KERSHAW
Cefas Lowestoft Laboratory
Pakefield Road
Lowestoft
Suffolk NR33 0HT
United Kingdom
Tel: +44 1502 562244
Fax +44 1502 513865
e-mail: peter.kershaw@cefas.co.uk

Pascal LORANCE*
French Research Institute for the Sustainable exploitation of the Sea (IFREMER)
Department of Fishery Sciences and Technologies
Centre de Brest
BP 70
29280 PLOUZANE
France
Tel.: +33 2 98 22 46 49
e-mail: pascal.lorance@ifremer.fr

John MARRA*
Lamont-Doherty Earth Observatory of Columbia University
61 RT 9W, Palisades
NY 10964-8000
USA
Tel.: +1 845 365-8891
Fax: +1 845 365-8150
e-mail: Marra@ldeo.columbia.edu

Carlos ALONSO HERNÁNDEZ*
Centro de Estudios Ambientales de Cienfuegos (CEAC)
Ctra. a Castillo Jagua
Apdo. No. 5
59350 Ciudad Nuclear Cienfuegos
Cuba
Tel.: +53 43 965146
Fax: +53 43 29732
e-mail: carlos@ceac.cu

Sandor MULSOW
Instituto de Geociencias
Universidad Austral de Chile
Campus Isla Teja
Valdivia
Chile
Tel.: +56 63 22 1208
Fax: +56 63 29 35 63
e-mail: sandormulsow@uach.cl

Helen KEENAN
DLCS, Dept of Civil Engineering
University of Strathclyde
John Anderson Building
Glasgow G4 ONG UK
Tel.: +44 0141 548 3133
Fax: +44 0141 553 2066
e-mail: h.e.keenan@strath.ac.uk

George WIAFE
Department of Oceanography and Fisheries
University of Ghana
P.O. Box LG 99
Legon
Ghana
Tel.: +233 (0)244 657475
Fax: +233 21 502701
e-mail: wiafeg@ug.edu.gh

Rudolph WU*
Biology and Chemistry Department, City University of Hong Kong
Tat Chee Ave.
Hong Kong
Tel.: +852 2788 7401
Fax: +852 2788 7406
e-mail: bhrswu@cityu.edu.hk

Antonio HOGUANE
Eduardo Mondlane University
School of Marine and Coastal Sciences
P.O. Box 128
Quelimane
Mozambique
Tel.: +258 82 3152860
Fax: +258 24 216626
e-mail: hoguane@yahoo.com.br

* Unable to attend the session, available by telephone on request

B. SECRETARIAT

International Maritime Organization (IMO)

Miguel PALOMARES
Administrative Secretary of GESAMP
4 Albert Embankment
London SE1 7SR
United Kingdom
Tel.: +44 207 587 3218
Fax: +44 207 587 3210
e-mail: mpalomar@imo.org

René COENEN
IMO Technical Secretary of GESAMP
4 Albert Embankment
London SE1 7SR
United Kingdom
Tel.: +44 207 587 3239
Fax: +44 207 587 3210
e-mail: rcoenen@imo.org

Fredrik HAAG
GESAMP Officer
4 Albert Embankment
London SE1 7SR
United Kingdom
Tel.: +44 207 587 4139
Fax: +44 207 587 3210
e-mail: fhaag@imo.org

Food and Agriculture Organization of the United Nations (FAO)

Unable to attend the session

United Nations Educational, Scientific and Cultural Organization - Intergovernmental Oceanographic Commission (UNESCO-IOC)

Unable to attend session

World Meteorological Organization (WMO)

Slobodan NICKOVIC
WMO Technical Secretary of GESAMP
World Meteorological Organization
7bis, Avenue de la Paix
BP 2300, 1211 Geneva 2
Switzerland
Tel.: +41 22 7308095
Fax: +41 22 7308049
e-mail: snickovic@wmo.int

International Atomic Energy Agency (IAEA)

Joan-Albert SANCHEZ-CABEZA
IAEA Technical Secretary of GESAMP
IAEA Marine Environment Laboratory
4 Quai Antoine 1er, BP800
MC 98000
Monaco
Tel.: +377 9797 7233
Fax: +377 9797 7273
e-mail: j.a.sanchez@iaea.org

Scott FOWLER
IAEA Marine Environment Laboratory
4 Quai Antoine 1er, BP800
MC 98000
Monaco
Tel.: +377 97 9772 51
Fax: +377 97 9772 73
e-mail: s.fowler@iaea.org

United Nations Environment Programme (UNEP)

Salif DIOP
UNEP Technical Secretary of GESAMP
Ecosystems Section and Water Unit
Division of Early Warning and Assessment (DEWA)
UNEP
P.O. Box 30552
Nairobi
00100 Kenya
Tel.: +254-20-7622015
Fax: +254-20-7622798
e-mail: salif.diop@unep.org

United Nations Industrial Development Organization (UNIDO)

Pablo HUIDOBRO
UNIDO Technical Secretary of GESAMP
UNIDO
Vienna International Centre
PTC/EMB/WMU
P.O. Box 300
Vienna
Austria A-1400
Tel.: +43 1 26026 3068
Fax: +43 1 26026 6855
e-mail: P.Huidobro@unido.org

United Nations (UN)

Alice HICUBURUNDI
UN Technical Secretary of GESAMP
Division for Ocean Affairs and the Law of the Sea/Office of Legal Affairs
2 UN Plaza, Room DC2-0424
New York, NY 10017
United States
Tel.: +1-212-963-5915
Fax: +1 212-963-5847
e-mail: hicuburundi@un.org

C. OBSERVERS

Jacques ABE
Interim Guinea Current Commission
1 Akosombo Street
Airport Residential Area
Accra
Ghana
e-mail: j.abe@gclme.org

Kolawole Sikirou ADAM
Centre for Environment and Development in Africa (CEDA)
(CEDA)
Benin
e-mail: adam_ceda@yahoo.fr

Babajide ALO
Department of Chemistry
University of Lagos
Akoka, Lagos
Nigeria
e-mail: profjidealo@yahoo.com

Adnan AWAD
International Ocean Institute - Southern Africa
University of the Western Cape
Private Bag X17
Bellville 7535
e-mail: aawad@uwc.ac.za

Andrew HUDSON
UNDP/GEF, International Waters FF-1084, 1 UN Plaza
New York, NY
USA
e-mail: andrew.hudson@undp.org

Alhaji JALLOW
Fishery Committee for the Eastern Central Atlantic (CECAF)
FAO Building
#2 Gamel Abdul Nasser Road
P.O. Box GP 1628
Accra
Ghana
e-mail: Alhaji.Jallow@fao.org

Anthony Yaw KARIKARI
CSIR Water Research Institute
Box M.32
Accra
Ghana.
e-mail: anthony_karikari@yahoo.co.uk

Per LUNDQVIST
Swedish Maritime Administration
International Co-operation Division
SE-601 78 Norrköping
Sweden
e-mail: per.lundqvist@sjofartsverket.se

ANNEX IV: ACTIVITIES AND ACHIEVEMENTS OF SPONSORING ORGANIZATIONS OF GESAMP SINCE THE 34TH SESSION

UNEP

The Regional Seas Programme: The UNEP Regional Seas Programme (RSP) continues to provide a comprehensive institutional framework for regional and global cooperation on issues pertaining to the coasts, oceans and seas and to engage governments in efforts to protect the coastal and marine environment. Currently, the global RSP covers eighteen regions, supported either through a regional convention or a regional action plan. In addition to supporting the implementation of the work programmes of the individual RSPs, UNEP/RSP continues to support the implementation of the six global Regional Seas Strategic Directions for 2004-2007 (endorsed at the 6th Global Meeting of the Regional Seas Conventions and Action Plans, Istanbul, Turkey, December 2004) leading to a strengthened programme and a global alliance of Regional Seas Conventions and Action Plans (RSCAPs). See also http://www.unep.org/regionalseas/About/Strategy/default.asp.

Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (the GPA): The second session of the Intergovernmental Review Meeting of the GPA (IGR-2), held in Beijing from 16-20 October 2006, considered progress in the implementation of the GPA and identified options for strengthening its implementation. IGR-2 endorsed a new approach for the GPA focused on mainstreaming, financing, and legislative and institutional strengthening. In 2007, the UNEP/GPA Coordination Office (UNEP/GPA) began to implement this mandate with a primary focus on ensuring that further efforts by national authorities to address land-based sources of marine pollution are well integrated into relevant national development processes, including processes supported by the international community such as the Bali Strategic Plan on Technology Support and Capacity Building.

The GPA has been embedded in the GEF-4 International Waters Strategy. GEF-4 IW will support, among others, interventions aimed at reducing nutrient over enrichment of coastal zones leading to eutrophication and the formation of "dead zones" in ways that are consistent with the GPA. This specific recognition of the GPA in GEF-4 is a result of the active involvement of UNEP/GPA, at the invitation of GEF, in the Technical Advisory Group for International Waters. This important step builds on many years of UNEP/GPA engagement in the GEF supported Large Marine Ecosystem projects and contaminant-based programmes, in many regions including the Black Sea, the Guinea Current, and the East Asian Seas.

UNEP World Conservation Monitoring Centre (WCMC) & UNEP Coral Reef Unit (CRU):

A. Marine environment and marine resources

DEV.TV, in collaboration with UNEP, is producing a television documentary for broadcast in 2008 to raise the awareness about the potential impacts of ocean acidification on key marine environments and ecosystems, i.e. polar plankton communities, tropical reefs and cold-water corals.

B. Marine biodiversity

UNEP presented an "Overview of International Governance and Scientific Issues Regarding the High Seas and Deep-water Ecosystems and Biodiversity" at the 9th Global meeting of Regional Seas Conventions and Action Plans (Jeddah, Kingdom of Saudi Arabia, 29-31 October 2007). The meeting agreed that the conservation of the high seas and deep-water ecosystems and biodiversity needs global cooperation regarding both relevant international governance and scientific issues (Jeddah Declaration). Furthermore, the meeting agreed to intensify regional activities in support of the WSSD Plan of Implementation and the Jakarta Mandate of the Convention on Biological Diversity, notably by identifying critical issues of marine biodiversity, protecting its major components, and promoting its sustainable use; more specifically, focusing on, inter alia, addressing the protection of:

1. Marine biodiversity beyond areas of national jurisdiction; and
2. Deep-sea biodiversity at the regional scale (Global Strategic Directions for the Regional Seas Programmes 2008-2012).

UNEP and UNEP-WCMC, in collaboration with the European deep-sea research project HERMES (Hotspot Ecosystem Research on the Margins of European Seas), published in January 2008 a report "*Deep-sea biodiversity and ecosystems - A scoping report on their socio-economy, management and governance*". This report provides information and guidance on where to find vulnerable deep-water and

high sea ecosystems; the ecological, social and economic goods and services they provide; and how they are affected or threatened by existing or emerging activities and climate change. For the first time, modern assessment methodologies and valuation concepts, used inter alia in the Millennium Ecosystem Assessment, were applied to data and information on vulnerable deep-water and high sea ecosystems. The report highlights gaps in the understanding of deep-sea ecosystems and processes, points out shortcomings of current socio-economic valuation approaches, and identifies areas for further research.

C. Marine science

UNEP-WCMC has initiated collaboration with the Ocean Biogeographic Information System (OBIS), established by the Census of Marine Life (CoML) programme. The objective of this collaboration is to exchange and share geo-referenced data on marine biodiversity (e.g. on vulnerable deep-water ecosystems such as cold-water coral reefs, or data coming forward under the various CoML programmes) with a view to improving the Internet-based access (www.iobis.org) to this information for all stakeholders.

Secretariat of the Convention on Migratory Species and the Joint CMS/ASCOBANS Secretariat: The Convention on the Conservation of Migratory Species of Wild Animals (CMS) aims to conserve terrestrial, marine and avian migratory species throughout their range. It is an intergovernmental treaty, concluded under the aegis of UNEP, concerned with the conservation of wildlife and habitats on a global scale. Since the Convention's entry into force, its membership has grown steadily to include 108 Parties (as of 1 March 2008) from Africa, Central and South America, Asia, Europe and Oceania. Given the nature of migratory species, the Convention covers marine habitats worldwide. One of the main operational instruments of the Convention is the establishment of intergovernmental Agreements concerning the conservation of individual species or groups of related species.

FAO

CONTEXT

The Code of Conduct for Responsible Fisheries (FAO, 1995[4]), adopted in 1995 as the global intergovernmental framework for sustainable fisheries is based on major international agreements (UNCLOS, UNCED, CBD). The Code of Conduct for Responsible Fisheries (CCRF) calls for effective conservation of living aquatic resources with due respect to the ecosystem and biodiversity, and for responsible management and development of the fisheries exploiting them. Its implementation is a top priority of FAO.

The FAO Fisheries and Aquaculture Department is promoting the implementation of the CCRF through numerous regular programme and field project activities. FAO disseminates technical, scientific as well as policy and governance guidelines in support of implementation of fisheries conservation and management measures for responsible use and development of living aquatic resources in marine and freshwater environments. The Organization provides a leading forum for intergovernmental consultations, consensus-building and standards-setting on global fisheries issues. The FAO Committee on Fisheries (COFI), and its Sub-Committees on Fish Trade and on Aquaculture, have a membership of more than 100 countries and numerous international intergovernmental and non-governmental organizations.

Illegal, Unreported and Unregulated Fishing: FAO continued to facilitate the implementation of the IPOA-IUU (the 2001 *FAO International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing*). Technical assistance was provided to nine developing countries[5] to elaborate national plans. They are important as they provide a coherent and consistent approach to devising and implementing policies to combat IUU fishing, including the implementation of any regional obligations that might have been assumed as a result of RFMO membership. FAO undertook two workshops (for countries in the Indian Ocean in cooperation with the Indian Ocean Commission (IOC) and the Indian Ocean Tuna Commission (IOTC) and in the Mediterranean with the General Fisheries Commission for the Mediterranean (GFCM)) to support the implementation of the 2005 FAO Model Scheme on Port State Measures to Combat Illegal, Unreported and Unregulated Fishing.

Management of Fishing Capacity: As regards the 1999 FAO International Plan of Action for the Management of Fishing Capacity, FAO finalized technical guidelines on managing fishing capacity. They address the fundamentals for addressing fishing capacity, from developing national plans to on-the-

[4] FAO, 1995. Code of Conduct for Responsible Fisheries. Rome, FAO. 41 p. http://www.fao.org/DOCREP/005/v9878e/v9878e00.htm.

[5] Assistance was provided to members in Africa (Benin, Cameroon, Mauritania, Seychelles and Zambia) and the Pacific Islands (Niue, Palau and Samoa).

ground management strategies and transitional considerations. FAO participated in the FAO/Asia-Pacific Fishery Commission (APFIC) Regional Consultative Workshop, Managing fishing capacity and IUU fishing in the Asian region; published Fishing capacity management and IUU fishing in Asia; and made contributions regarding the capacity implications of the WTO subsidies discussions.

Improving Information on Status and Trends of Capture Fisheries: The implementation of the FAO 2003 Strategy for Improving Information on Status and Trends of Capture Fisheries is supported under FAO's FishCode Programme (FishCode-STF) with a project that gives particular attention to capacity-building in developing countries and regional cooperation and is presently working in 39 countries. The project follows a regional approach and activities on determining requirements for the improvement of fisheries monitoring systems and regional/national capacity-building in Central America, the South Pacific and China are being implemented. In 2007 activities were extended to West Africa in collaboration with Fishery Committee for the Eastern Central Atlantic.

Deep-sea fisheries in the high seas: The FAO Committee on Fisheries (COFI) first discussed deep-sea fisheries at its 25th session in 2003 and supported the proposal for an international conference on the topic. The management of deep-sea fisheries in the high seas has also been a major source of concern at United Nations General Assembly (UNGA) meetings over the past few years. A recent UNGA Resolution (61/105) called on, "States to take action immediately, individually and through regional fisheries management organizations and arrangements, and consistent with the precautionary approach and ecosystem approaches, to sustainably manage fish stocks and protect vulnerable marine ecosystem ...". Pursuant of this resolution, COFI at its 27th Session in March 2007 further called upon FAO to develop International Guidelines for the Management of Deep-Sea Fisheries in the High Seas.

In 2007 FAO has been developing international guidelines for management of deep-sea fisheries in the high seas through the organization of a series of meetings and the preparation of related documentation:

1. Expert Consultation on Deep-sea Fisheries in the High Seas (Bangkok, Thailand 21-23 November 2006) to provide background documentation, identify issues and discuss main options for management;
2. Workshop on Vulnerable Ecosystems and Destructive Fishing in Deep-sea Fisheries in the High Seas (Rome, Italy, June 2007) to discuss and clarify the issue of vulnerability, destructive fishing and adverse impacts;
3. Expert Consultation on International Guidelines for the Management of Deep-sea Fisheries in the High Seas (Bangkok, Thailand September 2007) to discuss, revise and adopt an initial draft of the international guidelines;
4. Complementary Workshop on Knowledge and Data on Deep-sea Fisheries in the High Seas (Rome, Italy November 2007) to improve the guidelines in relation to data issues and to review the World Wide Review of Deep-sea Fisheries (currently being revised); and
5. Technical Consultation on International Guidelines for the Management of Deep-sea Fisheries in the High Seas held in February 2008 with the aim of revising and completing such international guidelines or similar instrument.

Marine biodiversity: The responsible use of marine biodiversity in fisheries and aquaculture was a central theme of the 11th Session of the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA). The CGRFA has now included aquatic genetic resources in its multi-year programme of work and has promoted an ecosystem approach to address the issue. The finalization of the review of status of trends of aquatic genetic resources in marine capture fisheries, the deep sea and aquaculture will provide information in order to identify key policy issues, priorities and implications for the international development community, and specifically for FAO and the CGRFA. FAO is producing guidelines on Genetic Resource Management in Aquaculture as part of Technical Guidelines for Responsible Fisheries series.

Ecosystem approach to fisheries: FAO published "Models for an ecosystem approach to fisheries", by Plagányi, É.E., see FAO Fisheries Technical Paper. No. 477 (http://www.fao.org/docrep/010/a1149e/a1149e00.htm) and held a workshop on the development of a toolbox for the implementation of an ecosystem approach to fisheries.

Sustainable aquaculture: To improve the management of environmental aspects and to enhance the socio-economic impacts of aquaculture, FAO initiated in 2006 an effort towards the development and application of the ecosystem approach to aquaculture production. An expert

workshop held in May 2007 in Mallorca, Spain on "Building an Ecosystem Approach to Aquaculture: initial steps for guidelines." The expert meeting coined the following definition: *"An Ecosystem Approach for Aquaculture (EAA) is a strategy for the integration of the activity within the wider ecosystem in such a way that it promotes sustainable development, equity, and resilience of interlinked social and ecological systems".* This definition essentially recaps the ecosystem-based management proposed by the Convention on Biological Diversity and also follows recommendations of the CCRF. FAO's aquaculture unit FIMA is currently preparing a comprehensive publication about EAA, principles, and scales and is also working on the development of guidelines.

A Technical Workshop on the Practice of Harvesting Wild Fish/Fishery Resources for Aquaculture Production was held in Hanoi, Viet Nam from 8 to 12 October 2007.

FAO organized a High-Level Special Event on The Role of Aquaculture in Sustainable Development Rome, Italy on 19 November 2007.

Marine Protected Areas: Marine Protected Areas as a Tool for Fisheries Management. FAO has launched a website to increase knowledge on the contribution of Marine Protected Areas (MPAs) to fisheries management. This website has been developed under a project aimed at supporting the Plan of Implementation of the World Summit on Sustainable Development (WSSD). One section of the site presents an overview of the technical guidelines currently being developed by FAO on the design, implementation and testing of MPAs as a fisheries management tool. The MPA website can be found at: http://www.fao.org/fishery/mpas.

IAEA

Supporting Regional Seas Research: Under the ROPME (Regional Organization for the Protection of the Marine Environment) project, oil pollution, persistent organic pollutants (POPs) and trace metals were investigated in biota and sediments from seven countries surrounding the Gulf (Bahrain, Iran (Islamic Republic of), Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates). These were the same pollutants as analysed for the sediment samples taken from the Black Sea. Three training programmes were carried out for the ROPME and two for the MED POL (Programme for the Assessment and Control of Pollution in the Mediterranean region). Proficiency tests of organic pollutants and trace metals in the sediment and biota reference materials were carried out for marine labs in the Yellow Sea region. Five labs each from China and Korea participated in each proficiency test organized by the Marine Laboratory in Monaco.

Use of Nuclear Techniques to Address Management Problems of Coastal Zones in the Caribbean Region (RLA/7/012): A regional technical cooperation project with 12 Member States of the Wider Caribbean in collaboration with UNEP Caribbean Environment Programme Regional Coordinating Unit (CAR-RCU), France, Italy and Spain on this topic support the development and improvement of capabilities to reduce the degradation, due to anthropogenic and natural impacts, of the coastal ecosystems of the wider Caribbean region. To date a "Guide for sampling, preparation and analysis of sediment cores for the historical reconstruction of contamination in the coast zones of the Caribbean" has been produced. This includes standardized procedures for sampling of surface sediments and profiles as well as prescribed laboratory methods developed in the region for their analyses. While methods for field investigations are developed to enable baseline and retrospective reconstruction of pollution levels, efforts continue to enhance the capabilities in the laboratories for sustainable investigation, monitoring and management of the Caribbean Sea. Synergies with related regional projects and activities are achieved through an MoU between the IAEA and UNEP CAR-RCU, and linkages with regional authorities and expert groups on environment. Results will enable informed decisions on use and management of the Caribbean environment.

The Impact of Climate Change on Marine Biodiversity: A new facility to study effects of ocean acidification on the early life stages of commercial fish and polar molluscs was established in the Laboratory in Monaco. This new IAEA initiative responded to recommendations from the Intergovernmental Panel on Climate Change (IPCC) for more knowledge of climate-change impacts on marine biodiversity under ongoing ocean acidification. Radiotracers are used in this experimental facility to examine the metabolism of essential elements and contaminants in this marine biota under different future climate scenarios for ocean acidity as predicted by models.

Speciation of pollutants: For understanding the behaviour of pollutants in any given environment, the determination of the physical and chemical state of an element (speciation) is key for understanding the transfer through the food web. In October 2007, the Monaco laboratory co-hosted a radionuclide speciation workshop in Jackson Hole (USA) where the latest developments in this discipline were revised

and discussed. The rapid development of new technologies enables scientists to obtain more reliable and precise data on the way radionuclides disperse in the environment following a contamination event.

Coordinated Research Project on El Niño (ENSO) phenomenon: Enhanced knowledge of recent climate change helps humankind to better adapt to future socio-economic impacts. The El Niño phenomenon that dominates climate variations in the Pacific Ocean can have effects as diverse as impacts on fish yields in coastal Peru, maize growth in Africa, rainfall in Florida and the extent of polar sea ice. Corals have the ability to act as historical archives of isotopic records of El Niño climate change in the annual bands of their skeleton, as do marine sediments in their successive sedimentation layers. By using Pb-210 and radiocarbon both growth bands in corals from the central Pacific (Palmyra atoll) and laminated sediments from coastal Peru are dated to unveil the evolution of climate in the Pacific Ocean. Work is in progress.

New Coordinated Research Project "Applications of Radiotracer and Radioassay Technologies to Seafood Safety Assessment": This project was initiated with the IAEA/FAO joint programme, and includes scientists from six developing countries and representatives from WHO and Codex Alimentarius. Its major objective is to promote international trade for seafood, particularly from developing countries, through better knowledge of background contaminant levels and bioaccumulation processes that are relevant for aquaculture farms. The research is focused on the biotoxins paralytic shellfish poison (PSP) and ciguatoxin but also on cadmium in seafood such as scallops, oysters and squid where there is inadequate information to establish international standards for trade purposes. The results of this research project are foreseen to be implemented via Codex Alimentarius.

IMO

CO2 sequestration guidelines adopted under the London Protocol: Further to the 2006 amendments to Annex 1 to the London Protocol to regulate CO_2 sequestration in sub-seabed geological formations, the Meeting of Contracting Parties adopted, in 2007, "Specific Guidelines for Assessment of Carbon Dioxide Streams for Disposal into Sub-seabed Geological Formations" to accompany these amendments. The Guidelines were regarded as a "living document" and would be kept under review and updated in five years' time, or earlier, as warranted in light of new developments. Visit for further information http://www.londonconvention.org.

The activities under the London Convention and Protocol on ocean fertilization for sequestration purposes are reported in a separate document (GESAMP 35/8/1).

Preparation for imminent entry into force of the Anti-Fouling Systems Convention: For the last 20 years scientific studies have shown that certain anti-fouling systems used on ships, specifically TBT based anti-fouling paints, pose a substantial risk of toxicity and may have significant chronic impacts at the species, habitat and ecosystem levels. Human health may also be at risk as a result of the consumption of affected seafood. IMO responded to this serious marine environmental issue by adopting the Anti-Fouling Systems (AFS) Convention in October 2001, which will enter into force on 17 September 2008.

The Scientific Groups under the London Convention and Protocol took the initiative in 2006 to collate best management practices of removal of TBT paints from ships, and other marine structures, to prepare for this entry into force. As a consequence in this new regime, ships would, either have to replace, or overcoat, their existing organotin-based anti-fouling systems in the near future. In view of the urgency of informing the IMO Marine Environment Protection Committee (MEPC) and the maritime industry as soon as possible of available information on environmentally-conscious removal methods of anti-fouling systems from ships, interim advice was distributed to MEPC 57 in March 2008, while the completed advice will be made available in the summer of 2008.

International agreement concluded on wreck removal: The new IMO Wreck Removal Convention was adopted in Nairobi, Kenya, on 18 May 2007. The Convention will provide the legal basis for States to remove, or have removed, shipwrecks that may have the potential to affect adversely the safety of lives, goods and property at sea, as well as the marine environment. The Convention will fill a gap in the existing international legal framework by addressing three problems: *first*, and depending on its location, a wreck may constitute a hazard to navigation, potentially endangering other vessels and their crews; *second*, and of equal concern, depending on the nature of the cargo, is the potential for a wreck to cause substantial damage to the marine and coastal environments; and *third*, in an age where goods and services are becoming increasingly expensive, is the issue of the costs involved in the marking and removal

of hazardous wrecks. The Convention attempts to resolve all of these and other related issues.

The Mediterranean Sea area becomes a "Special Area" under MARPOL Annex V (Garbage): MEPC 57 adopted a resolution declaring that, on 1 May 2009, the "Special Area" regulations under MARPOL Annex V (Regulations for the Prevention of Pollution by Garbage from Ships) shall take effect in the Mediterranean Sea area. This is the result of a report by Cyprus to the Committee, on behalf of Albania, Algeria, Croatia, Cyprus, Egypt, France, Greece, Italy, Lebanon, Malta, Monaco, Montenegro, Morocco, Slovenia, Spain, Syria and Tunisia, notifying that adequate reception facilities for garbage are now provided in all relevant ports within the Mediterranean Sea area. Consequently, for all ships, as from 1 May 2009, disposal into the Mediterranean Sea of the following is prohibited: all plastics, including but not limited to synthetic ropes, synthetic fishing nets and plastic garbage bags; and all other garbage, including paper products, rags, glass, metal, bottles, crockery, dunnage, lining and packing materials.

Revision completed of MARPOL Annex VI (Air pollution): The 1997 Protocol to the MARPOL Convention, enacting Annex VI — Regulations for the Prevention of Air Pollution from Ships, which entered into force on 19 May 2005, has undergone a substantial revision with the view to significantly tighten the emission limits of atmospheric pollutants in the shortest possible time. This Annex applies to ships and drilling rigs and (1) prohibits deliberate emissions of ozone depleting substances and installation of new systems containing such substances, (2) sets emission limits on nitrogen-oxides for ships' engines, and (3) regulates the sulphur content in marine fuel oil, as well as shipboard incineration. MEPC 57 reached agreement on all major issues and approved the amendments with a view to formal adoption at MEPC 58. The outcome is a significant and remarkable achievement since many of the issues were highly controversial with a very diverse set of opinions on what options and specific limitations were appropriate in light of the relevant risks to human health and the environment. The measures will significantly and quickly reduce air pollution from ships, offering benefits for the environment and human health.

Work expedited on control and reduction of greenhouse gas emissions from ships: IMO is giving increased attention to reduce greenhouse gas (GHG) emissions emanating from shipping operations. In April 2008, MEPC endorsed a proposal to expedite the Organization's current workplan on GHG emissions, in particular with regard to developing the CO_2 Emission Indexing Scheme and the CO_2 Emission baseline(s). MEPC also agreed on a set of principles for a coherent and comprehensive future IMO regulatory framework on GHG emissions from ships and prepared practical next steps to develop both short-term and longer-term technical, operational and market-based measures to control such emissions. An intersessional Working Group to be convened in June 2008 will prepare a full set of recommended measures for further review at MEPC 58 in October 2008. The IMO measures should act in concert with the wider international efforts being made in the UNFCCC context — seeking the development and adoption of a global agreement by December 2009 and the coming into force of that new regime by 2012.

Implementation of the Ballast Water Management Convention: Work continued in preparation for the entry into force of the 2004 Ballast Water Management Convention aimed to prevent, minimize and ultimately eliminate the transfer of harmful aquatic organisms and pathogens through the control and management of ships' Ballast Water and Sediments. Thirteen sets of guidelines required under the Convention have been adopted and 10 ballast water management systems that make use of Active Substances have been given either Basic or Final Approval, paving the way for the Convention to enter into force. See also document GESAMP 35/5/1.

OPRC-HNS Protocol 2000 in force: The IMO Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, adopted in 2000, entered into force on 14 June 2007. It provides a global framework for international cooperation in combating major incidents or threats of marine pollution from ships carrying hazardous and noxious substances (HNS), such as chemicals. Parties to the Protocol have to take measures for dealing with pollution incidents, either nationally or in cooperation with other countries. Ships have to carry a shipboard pollution emergency plan to deal specifically with incidents involving HNS, which are defined as any substance other than oil which, if introduced into the marine environment is likely to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.

Two oil pollution Manuals in preparation: Work continued on the following two manuals aimed at their approval by MEPC 58 in October 2008:

1. The Manual on oil spill risk evaluation and assessment of response preparedness; and
2. The IMO/UNEP Manual on the Assessment and Restoration of Environmental Damage following Marine Oil Spills.

Further information on the above-mentioned topics may be obtained through the IMO website: http://www.imo.org.

IOC/UNESCO

Ocean Carbon Programme: The International Ocean Carbon Coordination Project (IOCCP), co-sponsored by SCOR, continued its work to promote the development of a global network of ocean carbon observations for research. In February, IOC, SCOR, the IAEA-MEL, and IGBP initiated plans for the 2nd "Ocean in a High CO_2 World" conference, to be held in Monaco in October 2008, to assess what is known about ocean acidification. In April, the IOCCP, SOLAS (Surface Ocean Lower Atmosphere Study), IMBER, and the Global Carbon Project co-sponsored the Surface Ocean CO_2 Variability and Vulnerability Workshop, which brought together over 100 scientists from 20 countries to review the current knowledge base and enhance international cooperation to resolve the magnitude, variability and processes governing ocean sources and sinks of carbon. A special issue of the journal Deep-Sea Research-II is in final preparation. As a follow-up activity, the Surface Ocean CO_2 Atlas (SOCAT) project was initiated to develop a common format global database and gridded data product of publicly available surface CO_2 data, building on an initial database composed of more than 1250 cruises from 1972-2007 with approximately 4.5 million measurements of carbon parameters. In November, IOCCP, CLIVAR, SOLAS, and IMBER established the Global Ocean Ship-based Hydrographic Investigations Panel (GO-SHIP) to develop an integrated strategy for post-CLIVAR hydrography. In December, final editing was completed on the PICES-IOCCP "Guide to Best Practices for Ocean CO_2 Measurements", which was published in early 2008. More info at www.ioccp.org.

Harmful Algal Blooms: The IOC HAB Programme has two main foci; (i) to facilitate and focus international research toward improved operational capabilities for modelling and forecasting harmful algal events and thereby protecting resources, human health, markets and the environment in which harmful algal event occur, and (ii) to provide opportunities for self driven capacity development in developing member states facing problems caused by harmful microalgae to their fisheries, aquaculture, tourism, human health, etc.

The IOC-SCOR Global Ecology and Oceanography of Harmful Algal Blooms Programme, GEOHAB, is established to focus and stimulate international cooperative research. It also implements a series of Core Research projects addressing harmful algae in eutrophic, stratified, upwelling and fjords and coastal embayment systems. It is central to the overall objectives of GEOHAB to deliver understanding and results that will enable improved observation and forecasting systems. The GEOHAB SSC is working with the GSSC in this respect. More info at www.geohab.info.

At the regional level the Programme has established networks which serve both as platform for implementation of IOC activities as well as for activities implemented among members of the network. The networks formulate biannual workplans that are submitted to IPHAB. The networks are "Harmful Algae in North Africa, HANA", "Harmful Algae in the Caribbean, ANCA", "Harmful algae in South America, FANSA", and WESTPAB/HAB. These networks strengthen regional knowledge sharing and gives a strong rooting of the IOC HAB Programme in the regions. At the global level the Programme provides a network via the publication to more than 2,000 subscribers of the IOC newsletter "Harmful Algae News".

The ICES-IOC Working Group on Harmful Algal Blooms Dynamics acts as a scientific forum for formulating new programme elements and ideas as well as a review group for the data compiled in the IOC-ICES-PICES Harmful Algal Information System. The ICES-IOC-SCOR Working Group on GEOHAB Implementation in the Baltic is established to develop and implement a cooperative GEOHAB Research project in the Baltic. The ICES-IOC-IMO Working Group on Ballast of Ships and other Vectors is providing scientific input to the process in IMO revolving around development of guidelines for implementation of the IMO Ballast Water Convention.

Deep-Sea Marine Biodiversity: Following the recent international debate on issues related to the conservation and sustainable use of marine biodiversity beyond areas of national jurisdiction (which led to the establishment of an Ad Hoc Working Group by the United Nations Assembly in 2004), an International Workshop on Biogeographic

Classification Systems in Open Ocean and Deep Seabed Areas Beyond National Jurisdiction was convened in Mexico from 22 to 24 January 2007 at the Universidad Nacional Autónoma de Mexico (UNAM), Mexico City. The workshop was coordinated by the Institute of Marine Sciences and Limnology (ICML) of UNAM, the National Commission for the Study and Utilization of Biodiversity (CONABIO), the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and IUCN. The workshop was funded by Australia, Canada, Mexico and the J. M. Kaplan Fund under the co-sponsorship of IOC/UNESCO.

This workshop represented a major step in consolidating efforts at developing a comprehensive biogeographic classification of open-ocean and deep seabed areas beyond national jurisdictions. The workshop built on existing relevant global and regional collaborative research programmes; the experience of coastal States and regional management bodies in developing representative classification systems; and the latest information made available from science experts. The main output of the Mexico Workshop is a State of the Art Report on Global Open Oceans and Deep Sea-habitats (GOODS) bioregionalisation. The GOODS Report has been peer reviewed and has been submitted to the Conference of the Parties of the CBD. GOODS achievements have also been presented to the second meeting of the Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction that was held from 28 April-2 May 2008. The final GOODS report will be published by IOC/UNESCO in June 2008. Follow-up activities are now planned by the Mexico workshop organizers.

WMO

Precipitation Chemistry Programme: The WMO Precipitation Chemistry Programme continues to provide a framework for assessing impacts of the precipitation chemistry deposition at a global level. Precipitation chemistry remains a major environmental issue in several parts of the world due to acid deposition, eutrophication, trace metal deposition, biogeochemical cycling, and global climate change. In more recent years, concerns have expanded from wet deposition alone to include such considerations as the ocean-air exchange. The WMO Global Atmospheric Watch (GAW) program has recently issued a comprehensive set of guidelines for precipitation chemistry measurements. The Precipitation Chemistry Programme integrates measurements of several regional networks (EMEP (Europe), DEBITS (Africa), EANET (East Asia), CAPMoN (Canada), NADP (USA). Although most of the measurements are made over ground sites, by integrating measurements and atmospheric chemistry models, gaps in assessing air-sea exchange are partly filled. To date, the Precipitation Chemistry Programme has focused largely on major ions. Trace metals and organics (including pesticides, PCBs, and PAHs) are currently not of a major WMO concern because of limited financial circumstances.

Establishing links between GESAMP and WMO Precipitation Chemistry Programme: The Second WMO Expert Meeting on Precipitation Chemistry (PC) Data Synthesis and Community Product, held in Las Vegas, 30-31 January 2008 considered progress in integrating chemistry observation and model data, in order to provide a global assessment on chemicals deposition from the atmosphere. Professor Robert Duce was invited to represent GESAMP and to report on GESAMP activities and plans. It was stressed that GESAMP can play a significant role in the development of a regular process for assessing the health of the oceans, much like the IPCC deals with climate change. Additional oceanic measurement sites for atmospheric concentrations and deposition of chemicals are necessary to quantify the inputs to the ocean more accurately. A report was presented on the formation of a WMO-supported GESAMP working group on the input of chemicals from the atmosphere to the ocean, which will focus on phosphorus inputs and which will contribute to N/P/Fe assessment. The WMO Scientific Advisory Group for Precipitation Chemistry should consider asking GESAMP to contribute to the WMO PC global assessment, including a discussion regarding the importance of N and P loadings to ocean biodiversity.

Establishing links between GESAMP and WMO Sand and Dust Storm Warning and Assessment System (SDS-WAS): The WMO Sand and Dust Storm Warning and Assessment System (SDS-WAS) was initiated in 2006 in response to the desire of more than 40 WMO Members to improve capabilities for more reliable sand and dust storm forecasts and analysis products. Approximately fourteen research and/or operational centres around the world provide sand and dust research forecasts. Some models couple dust to solar radiation, to clouds/precipitation thus providing a feedback to weather. In some models, iron component has been developed to simulate Fe atmospheric transport and deposition of its soluble fraction to the ocean. SDS-WAS will integrate research communities (modelling/prediction/analysis, observations and effects) and communities of practice (e.g. weather

forecasters, medical researchers, aviation safety, and marine productivity). During the WMO/GEO Expert Meeting on a WMO Sand and Dust Storm Warning and Assessment System, organized in Barcelona from 7 to 9 November 2007, Professor Duce reported on GESAMP activities and plans. It was emphasized that GESAMP in cooperation with SDS-WAS will evaluate the needs of the marine community and assist in articulating them in the development of these WMO efforts. Professor Duce provided information to the participants on the importance of the input of dust (including Fe and P) to the ocean, dust being a probable most significant nutrient in the ocean primary productivity process.

Task Force on Hemispheric Transport of Air Pollution (HTAP): HTAP is acting within the framework of the United Nations Convention on Long-range Transboundary Air Pollution, in support of the 1999 Gothenburg Protocol. WMO contributes to the ongoing work on the assessment of the hemispheric transport of air pollution that will also address linkages between long-range transport and climate change. The assessment will be based largely on integrating observation data and modelling tools. There is a strong need to improve comparability of model results with measurements, with 25 models being included in the assessment. The final HTAP report is due in mid-2009. One of the HTAP assessment components is the air-sea exchange of pollution since the ocean plays an important role as a source of aerosol (e.g. sea salt) and sink for pollution.

International Aerosol Precipitation Science Assessment Group (IAPSAG): In 2003, the World Meteorological Organization (WMO) and the International Union for Geodesy and Geophysics (IUGG) agreed to conduct jointly a scientific review of the current state of knowledge on the impacts of aerosol pollution on precipitation, and established the International Aerosol precipitation Science Assessment Group (IAPSAG). In the Assessment, the ocean is considered as an important contributor to the aerosol-precipitation interactions. Namely, over the oceans, organic sulphur from the ocean and methane sulfonic acid provides a source of cloud condensation nuclei (CCN). The sea-salt aerosol also behaves as CCN. On the other hand, wet deposition represents an efficient mechanism to wash out by precipitation chemicals into the ocean. The work on this assessment is finalized and will be published as a monograph in July 2008.

UN

Division for Ocean Affairs and the Law of the Sea: The Division for Ocean Affairs and the Law of the Sea (DOALOS), Office of Legal Affairs, United Nations, acts as the Secretariat of the 1982 United Nations Convention on the Law of the Sea (UNCLOS). UNCLOS, the "Constitution for the oceans" sets out the legal framework within which all activities in the oceans and seas must be carried out.

Part XII of UNCLOS, in particular contains provisions on the protection and preservation of the marine environment. In this regard, the Convention lays down, the fundamental obligation of all States to protect and preserve the marine environment. It further urges all States to cooperate on a global and regional basis in formulating rules and standards. In order to promote such cooperation and enactment of rules and standards, DOALOS cooperates with all relevant international organizations, in particular the United Nations specialized agencies and programmes, regional organizations, coordinating and inter-agency mechanisms, such as UN-Oceans and GESAMP, as well as non-governmental organizations. In addition, Part XIII on marine scientific research and Part XIV on development and transfer of marine technology also play a role in promoting the sustainable management and uses of the oceans and seas. The need has been identified in this regard, to ensure access for decision makers to advice and information on marine science and technology, the appropriate transfer of technology and support for the production and diffusion of factual information and knowledge for end-users.

DOALOS' mandate includes core and substantive servicing functions. Core functions consist of: (a) the provision of advice and assistance on the implementation of UNCLOS and the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks ("Fish Stocks Agreement"); (b) monitoring and research activities and maintaining a comprehensive information system; activities relating to the deposit of charts and coordinates; and (c) provision of training and technical assistance. DOALOS provides substantive servicing, inter alia, to the Meeting of States Parties to UNCLOS, the informal consultations of States Parties to the Fish Stocks Agreement, the United Nations Informal Open-ended Informal Consultative Process on Oceans and the Law of the Sea (the "Consultative Process") and the Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction (the "Ad hoc Open-ended Informal Working Group"), when it is convened by the General Assembly. It also services the meetings of

the Commission on the Limits of Continental Shelf (CLCS).

A few examples of DOALOS relevant activities to GESAMP occurring in 2007-2008 are provided below.

Capacity-building: Apart from the regular DOALOS/UNITAR briefings to delegations in New York, recent activities of relevance to GESAMP include:

1. Development and delivery of a training course on the "Development, implementation and management of marine protected areas";
2. Development of a training course on "Ecosystem approaches to ocean management";
3. Final stage preparations for the delivery of a training package on "Nutrient pollutants from agriculture in the Black Sea region".

Monitoring and reporting functions: The General Assembly has explicitly confirmed its role as the global forum institution having the competence to undertake an annual review and evaluation of the implementation of the Convention and other developments relating to ocean affairs and the law of the sea in resolution 49/28 adopted in December 1994, following the entry into force of UNCLOS. Pursuant to that and other General Assembly resolutions, the Secretary-General provides a comprehensive overview of all developments pertaining to oceans and the law of the sea, in particular the implementation of UNCLOS, including activities of the institutions established by the Convention. The reports of the Secretary-General, which constitute the basis for the consideration and review of developments by the General Assembly, also serve as reports on the work of the Organization, and of the United Nations system as a whole (including GESAMP), in the field of ocean affairs.

The annual reports of the Secretary-General on the law of the sea have been complemented periodically by special reports on specific topics of current interest, e.g., marine environment, marine scientific research, needs of States, progress made in the implementation of the comprehensive legal regime embodied in the Convention, etc. An example of a recent special report is the report that was prepared for the 2008 meeting of the Ad hoc Open-ended Informal Working Group.

In 2008, the following reports of the Secretary-General will be submitted to the sixty-third session of the General Assembly: (a) the annual comprehensive report on oceans and the law of the sea to be submitted to the 63rd session of the Assembly and before that to the ninth meeting of the Consultative Process; (b) the report on sustainable fisheries issues; and (c) a special report containing a study on the implementation of UNCLOS relating to the sustainable development of marine resources and uses. The Assembly will also have before it at its sixty-third session the joint statement of the Co-Chairpersons of the Ad Hoc Open-ended Informal Working Group and the report on the work of the Consultative Process.

All the above-mentioned reports and additional information are already or will be made available on the DOALOS website at: http://www.un.org/Depts/los/index.htm.

Substantive servicing functions:

1. **Informal consultations of States Parties to the Fish Stocks Agreement.** The States Parties meet annually in order to consider, inter alia, the implementation of the Agreement at global, regional and subregional levels. They met in March this year and in 2009, they will be preparing for the resumed Review Conference in 2010;
2. **Seventeenth Meeting of States Parties.** The Meetings have dealt primarily with elections of the members of the International Tribunal for the Law of the Sea and of the members of the Commission on the Limits of the Continental Shelf as well as with budgetary and administrative matters of the Tribunal. For the last few years a debate has been ongoing and divergent views emerged with regard to the mandate of the Meeting of States Parties to discuss matters of a substantive nature relating to the implementation of the Convention;
3. **Eighth meeting of the Consultative Process.** The Consultative Process was established in 1999 to facilitate the annual review by the General Assembly, in an effective and constructive manner, of developments in ocean affairs and the law of the sea by considering the Secretary-General's annual report on oceans and the law of the sea and by suggesting particular issues to be considered by it (resolution 54/33). The eighth meeting of the Consultative Process in 2007 focused its discussion on "Marine genetic

resources". In its resolution 61/215 of 22 December 2007, the General Assembly recognized the abundance and diversity of marine genetic resources and their value in terms of benefits, goods and services they can provide as well as the importance of research on marine genetic resources for the purpose of enhancing the scientific understanding, potential use and application, and enhanced management of marine ecosystems. The topic of focus for the ninth meeting of the Consultative Process will be: "maritime security and safety";

4. **Second meeting of the Ad hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction.** The meeting examined the following issues: (a) the environmental impacts of anthropogenic activities on marine biological diversity beyond areas of national jurisdiction; (b) coordination and cooperation among States as well as relevant intergovernmental organizations and bodies for the conservation and management of marine biological diversity beyond areas of national jurisdiction; (c) the role of area-based management tools; (d) genetic resources beyond areas of national jurisdiction and; (e) whether there is a governance or regulatory gap, and if so, how it should be addressed.

It should be noted that in the "Joint Statement of the Co-Chairpersons" on the meeting of the Working Group, the need for regular scientific assessments of the state of the oceans on a global scale to support decision-making was underlined. It was suggested by some delegations that the role of GESAMP could be enhanced to carry out for example, targeted research for policymakers.

ANNEX V: TERMS OF REFERENCE FOR CURRENT GESAMP WORKING GROUPS

The Terms of Reference for each of the currently active Working Groups are reproduced below, with the information on administrative arrangements, background and context, etc.

Working Group 1: GESAMP Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships (EHS)

Terms of Reference approved by GESAMP at its 6th session (1974) and amended at its 8th session (1976)

The terms of reference of the GESAMP EHS Working Group, as given by GESAMP at its 6th session in Geneva (1974) and amended at its 8th session in Rome (1976) are:

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

At that time, the rationale for hazard evaluation specified for the Working Group was laid down in GESAMP IV/19/ Supp.1; this was replaced in 1982 by GESAMP Reports and Studies No. 17, which was in turn superseded by Reports and Studies No. 35 in 1989. As approved by GESAMP at its 28th session in 1998, the procedure described in Reports and Studies No. 64 (2001), replaces all previous versions. The terms of reference remain the same.

Working Group 34: Review of Proposals for Approval of Ballast Water Management Systems that make use of Active Substances

Terms of Reference approved intersessionally by GESAMP, November 2005

1 Consideration of development of necessary methodologies and information requirements in accordance with G9* for consideration by MEPC 56.

2 For Basic Approval, the Group should review the comprehensive proposal submitted by the Member of the Organization along with any additional data submitted as well as other relevant information available to the Group and report to the Organization. In particular, the Group should undertake:

1. Scientific evaluation of the data-set in the proposal for approval (see paragraphs 4.2, 6.1, 8.1.2.3, 8.1.2.4 of G9);
2. Scientific evaluation of the assessment report contained in the proposal for approval (see paragraph 4.3.1 of G9);
3. Scientific evaluation of the risks to the ship and personnel to include consideration of the storage, handling and application of the active substance (see paragraph 6.3 of G9);
4. Scientific evaluation of any further information submitted (see paragraph 8.1.2.6 of G9);
5. Scientific review of the risk characterization and analysis contained in the proposal for approval (see paragraph 5.3 of G9);
6. Scientific recommendations on whether the proposal has demonstrated a potential for unreasonable risk to the environment, human health, property or resources (see paragraph 8.1.2.8 of G9); and
7. Preparation of a Report addressing the above-mentioned aspects for consideration by MEPC (see paragraph8.1.2.10 of G9).

3 For Final Approval, the Group should review the discharge testing (field) data and confirm that the residual toxicity of the discharge conforms to the evaluation undertaken for Basic Approval and that the previous evaluation of the risks to the ship and personnel including consideration of the storage, handling and application of the active substance remains valid. The evaluation will be reported to MEPC (see paragraph 8.2 of G9).

4 The Group shall keep confidential all data, the disclosure of which would undermine protection of the commercial interests of the applicant, including intellectual property.

* G9 stands equivalent for MEPC 53/2/1 annex, as amended: Procedure for approval of ballast water management systems that make use of Active Substances (G9).

Working Group on 35: Deep-water Fisheries

Terms of Reference approved intersessionally by GESAMP, January 2008

A strategic evaluation of future developments in deep-water fisheries with emphasis on secondary species currently forming part of the bycatch.

The background to this ToR is as follows:

(a) The number of targeted deep-water species is relatively small and, although there are many gaps, knowledge of their biology and ecology is increasing and the spatial distribution and status of the stocks are, in most cases, being reported;

(b) Most deep-water fisheries have a significant bycatch which is either landed or discarded. Whether a species is landed ultimately depends on market preferences but it may also be related to the small quantities caught because the fishing gear is designed for the capture of the main target species. Future gear developments or a move of a fishery into new area or habitat may result in some of the species that are presently secondary bycatch species becoming target species;

(c) As stocks of the present target species decline it is likely that more attention will be focused on these secondary species. In most cases there has been no systematic collection of data. To avoid the problems of the past now is the time to carry out a strategic evaluation of the secondary deep-water species. Examples of such species include alfonsinos (*Beryx* spp.), roughhead grenadier (*Macrourus berglax*), cardinal fish (*Epigonus* spp.) wreckfish (*Polyprion* spp.) and armourhead (*Pseudopentaceros* spp.);

(d) Working Group 35 should carry out a global review on the available information on a representative selection of secondary deep-water species. This would include: (a) information on spatial distribution (are new areas likely to be exploited?), (b) relative abundance, (c) biological parameters, (d) catch trends, (e) environmental impacts, (f) marketability, and (g) existing and future management structures (coastal state and RFMOs). The output of this activity would be a report that describes the status of such fish and enable some prediction of future trends in deep-water fisheries.

Working Group 36: Ecosystem Approaches to Mariculture (EAMAR) with emphasis on Offshore Farming

Terms of Reference approved by GESAMP intersessionally, September 2008

Tasks

Among its tasks this Working Group will initially address the following tasks which are outlines on a proposed priority order:

(i) Compile information to assess present and potential ecosystem effects of offshore mariculture and identify unresolved or unknown ecosystem effects, i.e. the priority needs for more research;

(ii) Propose a roadmap for an ecosystem approach framework for Environmental Impact Assessment protocols for offshore mariculture, including monitoring programmes with an ecosystem perspective, plans for mitigation and management; and

(iii) Propose a road map for the identification of legal issues and international mandates related to environmental requirements for the leasing process to offshore aquaculture as they apply to ecological issues.

Outputs

A report will be written and published, and which will review the issues surrounding an EAMAR, and which includes a set of guidelines based upon this review.

Working Group 37: Mercury and Its Compounds

Terms of Reference approved by GESAMP at the 35th session, May 2008

The Terms of Reference for GESAMP Working Group 37 are to undertake a scientific review of mercury and its compounds. Topics to be included in the review are:

- Sources
- Transport
- Fate
- Pathways of Bioaccumulation and Biomagnification
- Toxicity
- Monitoring and Evaluation
- Special Considerations

Working Group 38: Atmospheric Input of Chemicals to the Ocean

Terms of Reference approved intersessionally by GESAMP, February 2008

The Terms of Reference of Working Group 38 are as follows:

Assess the need for the development of new model and measurement products for improving our understanding of the impacts of the atmospheric deposition of nitrogen species and dust (iron) to the ocean;

- Review the present information on the atmospheric deposition of phosphorus species to both the marine and terrestrial environments, considering both natural and anthropogenic sources, and evaluate the impact of atmospheric phosphorus deposition on marine and terrestrial ecosystems. Consider whether such a review of any other substance would be useful.
- Work with the WMO Sand and Dust Storm Warning and Assessment System and with the WMO Precipitation Chemistry Data Synthesis and Community Project to evaluate the needs of the marine community and assist in clearly articulating them in the development of these WMO efforts
- To address these issues, individuals with the following expertise are required as members of the working group: atmospheric chemistry, marine biogeochemistry, air/sea chemical exchange, atmospheric dust and iron, nitrogen, and phosphorus measurement and modelling, general atmospheric transport modelling, precipitation chemistry measurement and modelling.

ANNEX VI: GESAMP TASK TEAM FOR THE ASSESSMENT OF ASSESSMENTS OF THE UNGA 60/30 REGULAR PROCESS

Approved intersessionally by GESAMP, November 2007

Introduction and background

1 In November 2005, UNGA Resolution A/60/30 launched the start-up phase, or the Assessment of Assessments (AoA), of the United Nations Regular Process for the global reporting and assessment of the state of the marine environment, including socio-economic aspects. Later, in December 2006, the 61st session of the United Nations General Assembly urged the Ad Hoc Steering Group to complete the AoA within two years. UNEP and IOC of UNESCO were appointed to jointly lead the Assessment of Assessments.

2 In March 2007, the Group of Experts (GoE) for the AoA was convened for its first meeting, having been selected and approved by the Ad Hoc Steering Group. During this meeting, an overall working approach for the AoA was discussed and developed (see Box 1). The GoE also developed an annotated outline of the AoA, a workplan and timetable, as well as templates that will be used in the analysis of the individual marine assessments.

3 The AoA constitutes a thorough review of the assessment landscape for oceans and coasts, evaluating the current assessments on the regional and global level, in an attempt to distil best practices and suggest a framework for the United Nations Regular Process. For this purpose, the world has been divided into 21 regions that are individually addressed by the GoE. In addition, a number of supra-regional issues have been identified (fisheries, shipping, etc.).

4 In September 2007, GESAMP received a request from the lead agencies to contribute to the AoA, by conducting *a specific review of existing global and regional marine assessments related to marine pollution, including ship-based pollution and atmospheric inputs to the ocean.* GESAMP has responded positively to this request, and has set up a Task Team to address this issue.

5 GESAMP's contribution has been discussed by the Group, the lead agencies and the Group of Experts of the AoA, as well as the GESAMP Task Team. This has led to the formulation of the following terms of reference:

Terms of reference

6 On behalf of GESAMP, the Task Team will provide input to Phase 1 and 2 of the AoA process as requested by the lead agencies, as follows:

1. Focus on marine pollution, including ship-based pollution and atmospheric inputs, in the open ocean (as defined in paragraph 7 of the report of the 1st meeting of the GESAMP Task Team);
2. Include an analysis of current assessments, reviews, syntheses and studies, as available. The analysis will address, in particular, coverage and gaps (geographically and thematically) and overall relevance to a Regular Process.
3. Adhere to the extent possible to the methodological guidelines and timeline establish by the GoE;
4. In completing its analysis of the assessment landscape, the Team will attempt to summarise its findings on an ocean basin basis (see in paragraph 7 of the report of the 1st meeting of the GESAMP Task Team), taking into account the criteria listed in Annex II and III of the Report of the First Meeting of the Group of Experts.

ANNEX VII: TEMPLATE FOR TERMS OF REFERENCE FOR GESAMP WORKING GROUPS

BACKGROUND AND CONTEXT

- **The subject:** Brief general background on subject of the study?
- **The issue/problem**: Why is the subject of concern or interest to the international community from the perspective of marine environmental protection?
- **The need**: why is a GESAMP study needed? (E.g., synthesis of scattered information, assessment of environmental status/impacts, development of new methodologies, establishment of standards or guidelines, identify requirements for research, monitoring, management, and/or policy development.)

TERMS OF REFERENCE

- Specific, concrete, point-by-point tasks to be carried out by the WG, and/or specific information to be included in the report.
- Defined scope: what will and won't be done?
- Not open-ended: focus on a specific product to be produced (usually a report).
- If additional tasks are envisioned they may be identified as future work for the WG, but TOR should focus on specific task being proposed.
- Identify expertise required for the WG

WORKPLAN

- Work methods (usually meetings and intersessional work/correspondence
- Provisional timeline, including:
  - Meeting dates
  - Milestones (drafts, reviews, revisions, etc.)
  - Deliverables and delivery date (usually publication of a report)
- Provisions for peer review
- Provisions for publication, dissemination and outreach (PR)

ADMINISTRATIVE ARRANGEMENTS

- Sponsors
- Budget and funding
- WG Chairperson(s) and members if available at time of proposal
- Technical secretary for the WG

ANNEX VIII: SPECIAL SESSION ON MARINE ENVIRONMENTAL PROTECTION AND SCIENCE IN THE WEST AND CENTRAL AFRICAN CONTEXT

"The African Marine Areas and Issues of Concern from the GCLME Perspectives"

Presentation by Professor Kolawole S. Adam, CEDA, Benin

SUMMARY

The GCLME Region includes the Exclusive Economic Zones (EEZ) of sixteen countries: Angola, Benin, Cameroon, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Gabon, Ghana, Equatorial Guinea, Guinea, Guinea-Bissau, Liberia, Nigeria, Sao Tome and Principe, Sierra Leone and Togo (See Figure 1). The coastal habitats in the GCLME include nearshore waters, salt marshes, mangrove swamps, estuaries, lagoons as well as other brackish bodies of water. The total length of its coastline is nearly 7,600 km, including the coastline of the island State of Sao Tome and Principe and the insular regions of Equatorial Guinea. Angola has the longest coastline of approximately 1,650 km and is ranked among the most productive coastal and offshore waters in the world with rich fishery resources, oil and gas reserves, precious minerals, a high potential for tourism and an important reservoir of marine biological diversity of global significance. Approximately 40 per cent of the region's 300 million people live in coastal areas, many of whom are dependent on the lagoons, estuaries, creeks and inshore waters surrounding them for their livelihood and food security.

1. Description of the GCLME Region

1.1 Physical and Biological Aspects

In the Atlantic basin, the current systems are dominated by the effect of the two gyral currents of the north and south hemispheres. In each hemisphere a cold current flows towards the equator along the eastern oceanic margin — southward-flowing Canary Current in the north and northward-flowing Benguela Current in the south.

The geomorphologic units are coastal plains edged towards the continent by cliff of variable significance, and towards the sea by the continental shelf include bathymetric undulations of sand ridges, canyons, gullies, dead Holocene coral banks, pockets of hard ground and rocky bottoms. The shore is far from being morphologically simple. It is a contact area between many *sandy beach ridges (both old and young), clay-sandy glacis, and coastal lagoons or marshes* which separate these from Ogolian glacis. Morphological evolution has been mainly conditioned by sea-level fluctuations, and secondly, by local tectonic movements.

Mangrove swamps are one of the most biologically significant coastal ecosystems in the GCLME. Mangroves, typically *Rhizophara sp, Conocarpus sp, Avicennia sp, Mitragyna inermis, Laguncularia sp*, occur almost everywhere along the coasts in the GCLME and are dominant in certain places, such as the Niger Delta of Nigeria which has Africa's largest and the world's third largest mangrove forests.

1.2 Values of the GCLME Area

The coastline of the region is generally low-lying and interspersed with marshes, lagoons and mangrove swamps. A number of estuaries interrupt the barrier beaches that separate mangrove swamps from the sea. Among these are (i) Wetlands habitats, where mangrove forests are the most apparent features (close to 25,000 km2 from Guinea-Bissau to Angola), (ii) Coastal lagoons, which are found mainly in the Gulf of Guinea from Côte d'Ivoire to east of Nigeria, are associated with freshwater rivers, deltas, and estuaries and include a wide range of tidal swamps and seasonal marshland, (iii) Sea-grass beds

which are not very well developed in the region, and (iv) Sandy beaches, particularly along the Angolan coast. They are considered important nesting ecosystems, particularly for sea turtles. Their exposure to strong currents and swells make them extremely dangerous, however. These areas are often subject to marine debris and detritus accumulation.

The GCLME Region is ranked among the most productive coastal and offshore waters in the world with rich fishery resources, oil and gas reserves, precious minerals, a high potential for tourism and an important reservoir of marine biological diversity of global significance. Approximately 40 per cent of the region's 300 million people live in coastal areas, many of whom are dependent on the lagoons, estuaries, creeks and inshore waters surrounding them for their livelihood and food security.

These marine and coastal areas, including their upstream freshwater regions, are at present affected by a number of anthropogenic activities: over-exploitation of fishery resources; impacts from the land-based settlements' activities; industrial, agricultural and urban effluents and domestic sewage and other mining activities such as oil and gas exploration (in particular, off the coasts of Angola, Cameroon, Gabon and Nigeria), resulting in the deterioration of water quality in the GCLME.

2. Threats to GCLME Region

It is recognized that the coastal and the marine ecosystem of the GCLME region is affected by four major problems: (i) the decline of fish stocks and unsustainable harvesting of living resources, (ii) an uncertainty regarding ecosystem status, integrity and yields in a highly variable environment including effects of global climate change, (iii) the deterioration in water quality (chronic and catastrophic) from land and sea-based activities, eutrophication and harmful algal blooms, and (iv) the habitat destruction and alteration including inter alia modifications of sea floor and coastal zone, and, coastline erosion.

3. Opportunities

3.1 Government Policies

Several opportunities exist for the management and conservation of the GCLME area. These stem from the government sectoral policies (Fisheries Law, Environmental Policy, Wildlife and Forestry Policy, Medium-Term Development policy, Water Resources Commission and the Land Policy).

3.2 Traditional Management Practices

Traditional management practises and available scientific knowledge that have encouraged both utilization and conservation of coastal and marine environment. A strong traditional base for protection of coastal areas through indigenous management systems exists in the GCLME countries. Traditional management practices, which underscore socio-cultural values, are accepted as means of regulating the utilization of coastal and marine resources.

3.3 Socio-economic Demands

The socio-economic demand for coastal and marine resources and products is in itself an opportunity. With increasing scarcity of the wetlands resources, there will be pressure from users to ensure their sustainable exploitation.

3.4 Scientific Knowledge

There exists a significant body of scientific information on costal and marine environment in several parts of the GCLME Region. There also exist in GCLME countries a substantial number of experts in coastal and marine ecology and coastal zone management.

4. The GCLME Project

From the four major transboundary environmental problems/issues identified in the Region (decline in GCLME fish stock and unsustainable harvesting of living resources), uncertainty regarding ecosystem status, integrity and yields in a highly variable environment including effects of global climate change, deterioration in water quality (chronic and catastrophic) from land and sea based activities, eutrophication and harmful algal blooms, and Habitats destruction and alteration including inter alia modification of seabed and coastal zone, degradation of coastscapes, coastline erosion, the GCLME is a hope for sustainable environmental development.

4.1 Objectives

The four overall development goals of this project are to (i) Recover depleted fish stocks, (ii) Restore degraded habitat, (iii) Reduce land and ship-based pollution, and (iv) Create an ecosystem-wide assessment and management framework for sustainable use of living and non-living resources in the GCLME. Priority action areas rely heavily on regional capacity-building. Sustainability will derive

from this improved capacity, strengthening of national and regional institutions and improvement in policy/legislative frameworks.

4.2 Major components

The major components of the GCLME Project are (i) to Finalize SAP and develop sustainable financing mechanisms for its implementation, (ii) to recover and sustain depleted fisheries and living marine resources including mariculture, (iii) to plan for biodiversity conservation, restoration of degraded habitats and developing strategies for reducing coastal erosion, to reduce land and sea based pollution and improve water quality, and reach a regional Coordination and Institution Sustainability.

5. First Results

Training Workshops leading to many publications

On different domains of coastal area issues (ICAM, Fishery, Pollution, Mangroves, Coastal Geomorphology, GIS, Socio-economics, Communication through NGOs involvement …).

5.1 Coastal Profiles

They constitute National Coastal Areas Environmental Assessments leading to primary unstructured national projects.

5.2 Demonstration Projects

Four Regional and six National.

5.3 National Programme for Action (NPA)

A NPA for the protection of the marine environment from Land Based Activities is a dynamic short, medium and long-term agenda for marine protection. It requires, through strategic planning, the implementation of concrete, targeted and cost-related projects as well as a periodic evaluation to improve performance.

6. Initiative responses: Major expected results

Several West African subregional initiatives related to Coastal areas exist, as the Large Marine Ecosystem of Gulf of Guinea Programme, funded by Global Environment Facility and administered through UNIDO, which aims at assisting several West African States to manage their coastal resources sustainably. Other initiatives, such as the West and Central African Regional Seas Programme (WACAF) of UNEP, have also helped establish subregional collaboration.

To conclude, we can say that the GCLME Project is a new hope for the region, in terms of the capacity, to address the problems, with the absence of institutions to deal with these problems and the lack of legal and policy frameworks that would ensure that whatever measures that are taken are sustainable and of long term in nature. These are the three principal problems that are common to all the sixteen countries. What we are doing is to address the problems of inadequate capacity through regional workshops, training seminars and symposiums. We try to look at the countries, the existence and the lack of legal policy frameworks that would guide comportment of people who impact on the environment.

ANNEX IX: SPECIAL SESSION ON MARINE ENVIRONMENTAL PROTECTION AND SCIENCE IN THE WEST AND CENTRAL AFRICAN CONTEXT

"Strategies for addressing marine environmental issues in Africa through regional cooperation"

Presentation by Professor Babajide Alo, Director, Linkage Centre for Environmental Human Resources Development, Department of Chemistry, University of Lagos, Akoka, Lagos

1. Preamble

In the Africa region, just as is common elsewhere in the world, a legacy of over-fishing, destruction of coastal habitats, and accelerated land-based pollution loadings has continuously reduced biomass and diversity of the costal oceans to the point that ecosystems are being degraded, national economic benefits from marine systems are falling and poor communities depending on the resources for their livelihoods and protein supply are being threatened. To exacerbate the scourge of these problems in the Region, very limited coastal area and marine data and information for planning interventions have been available. Even more so, very scanty transboundary and integrated regional information upon which management actions and political decisions can be based has been available. Also very limited regional cooperation in ocean management has been known. The litany of challenges above occurs in the face of some various limited sectoral and individual national monitoring and assessment efforts. The individual national efforts were also invariably not designed to assess long-term trends and/or potential threats of cumulative impacts of human activities. Hence, even though marine environmental challenges are transboundary in nature, regional level negotiations and interventions have not been commonplace.

The countries in the subregion have however come to fully recognize the commonality in the environmental and socio-economic challenges facing their common marine, coastal and freshwater resources and have come to reality with, and accepted the need for joint stewardship in managing the commonly shared resources of the coastal and marine areas of the Region in order to ensure its future sustainability.

2. Sustainable Integrated Management of a Changing Marine Ecosystem

The colonial and political past have left a history of fragmented management of the African marine environment including an absence of co-coordinated planning and integration, poor legal frameworks and a lack of enforcement and implementation of existing regulatory instruments, insufficient public involvement, unbalanced regional capacity development and inadequate financial mechanisms of support.

These human factors are superimposed on a complex ecosystem which transcends national/country boundaries with a highly variable environment and have manifested themselves in declines of fish stocks and some unsustainable practices of harvesting of living resources, uncertainty regarding ecosystem status and yields, increasing pollution, habitat destruction and alteration, loss of biotic integrity and threats to biodiversity, harmful algal blooms, and inadequate capacity to monitor and assess ecosystems. All of these have significant transboundary implications.

The real challenge in the Region therefore is develop systems and structures to address the major environmental issues and halt this changing state of the African marine environment from the BCLME to the GCLME to the CCLME and even on the east coast, the Somali Current LME. The ultimate, wherever possible, is to reverse the process through cooperative regional action to manage the ecosystem on an integrated and sustainable basis. These regional transboundary environmental problems have implications, which can be mitigated through cooperative regional actions to manage the complex ecosystem on an integrated and sustainable basis.

2.1 Major environmental issues

The major environmental problems facing the marine environment of the Africa Region including the Gulf of Guinea concern:

- Loss of fishery resources
- Highly variable ecosystems
- Declining water quality
- Poor public health and sanitation
- Habitat degradation and coastal erosion

- Loss of marine biodiversity and Eutrophication
- Limited institutional, infrastructural and human capacity

Related to these primary problems are other socio-economic and cultural issues such as loss of access to abundant fish harvests, which notably reduced per capita incomes in the region together with high health management costs.

2.2 The challenge

The loss of fishery resources and decline in fish stocks is exemplified by over-exploitation of the commercial fish stocks and some unsustainable harvesting of the living resources of the marine ecosystems of the Region and this continues to be a cause of concern. Maritime boundaries do not coincide with ecosystem boundaries, and several of the region's important harvested resources are shared between countries or at times move across national borders. Over-harvesting of a species in one country can therefore lead to depletion of that species in another as well as changes to the ecosystem as a whole. Moreover, many of the resources management difficulties are common to all the countries and are transboundary in nature and require collective and cooperative action by member states to address them fruitfully.

The environment associated with the LMEs of the Region is highly variable, and so the status and yield of the ecosystem as a whole are difficult to predict. Although the ecosystems are naturally adapted to a highly variable environment, sustained events such as for example the Benguela Ninos, widespread hypoxia events, intrusions and changes in winds can have an impact on the whole system, compounding the negative effects of fishing, while poor predictive ability limits the capacity to manage effectively system-wide.

Deterioration in water quality from land and sea-based activities poses a threat to the ecosystems of the African marine areas at both local and regional levels. Although most impacts of chronic deterioration in water quality are localized national issues, they are common to all counties, and generally increases as coastal populations increase and generally also require collective, transboundary action as best options to address them. Apart from the health impacts of such scenarios, chronic pollution can favour less desirable species and result in the species migration across national boundaries. Common human-induced catastrophic events such as major oil spills and large-scale system-wide anoxic events can have widespread transboundary consequences, requiring cooperative management and sharing of knowledge, equipment and technology.

A large majority of residents live in unsatisfactory unsanitary conditions with limited access to basic infrastructural facilities/services. Inadequate facilities for human and other waste disposal are crucial issues and constitute a major health hazard. The infrastructural needs of the coastal urban centres of the Region are enormous as a result of high population growth. Poverty itself is a contributory factor to the present state of degradation since it is a strong impediment to adopting new practices or behaviour less damaging to the environment. In the more developed countries of the region such as Angola, Nigeria, Ghana, Côte d'Ivoire and Cameroon, industrial expansion in the coastal cities (hotspots) has also resulted in degradation of the coastal marine environment. Hazardous waste disposal, water pollution from untreated industrial effluents and air pollution from gaseous and particulate emissions constitute the primary aspects of the pollution from the industries.

Habitat destruction and alteration, coastal erosion and degradation including modification of the sea bed and coastal zone in the Region are taking place at an increased pace. Although most impacts appear localized, loss of ecosystem integrity arising from changes in community composition and habitat alterations attributable to fishing and mining can cause migration of biota and system-wide ecosystem change. Uncertainties exist about the transboundary and regional cumulative impacts on the benthos resulting from sea bed mining and associated sediment disturbance and movement.

Increased loss of biotic integrity, such as changes in community composition, species and marine diversity, and the introduction of alien species threaten the biodiversity of the marine areas as a whole. Past over-exploitation of targeted species has further altered the ecosystem, causing impacts at all levels, including top predators, and reducing the genetic diversity. Endemic species of the coastal zone such as the mangroves are being overtaken by invasive alien/exotic species. Alien species of phytoplankton have been introduced into the region as a result of ballast water from ships, potentially destabilizing the foodweb.

During the past decade, there has been increased incidence in the occurrence of blooms of harmful algae in the coastal waters in many parts of the world as a result of high loading by nutrients and contaminants as well as the invasion by alien species.

Harmful Algal Blooms (HABs) occur in all the coastal waters.

Generally the above challenges are exacerbated by lack of effective legal regimes, insufficient and limited institutional, infrastructural and human capacity at all levels to accurately assess the status of the LMEs as a whole, and to jointly engage and assess the shared resources and other transboundary elements/components and the variability thereof. All the countries face similar problems in terms of assessment of the impacts, and monitoring the effects and management of the problems caused to fisheries and the quality of seafood. Moreover there is unequal distribution of this capacity (when available) between countries. Hence collective regional and transboundary action has always been required to cooperatively address these problems.

3. Regional/International Cooperative Efforts for Joint Management of the Marine Environment in West and Central Africa

The Abidjan Convention for Co-operation in the Protection, Management and Development of the Marine and Coastal Environment of the West and Central African Region was born out of the need to undertake regional and common approaches to the prevention, reduction and combating of pollution in the marine environment, the coastal areas and related inland waters of Western Africa and has provided the vehicle of a framework binding instrument for this purpose. The States bordering LMEs in Africa just as with other LMEs are engaged in a great many regional initiatives and cooperation activities ranging from generally conceived political organizations (e.g. ECOWAS in the GCLME, SADCC for the BCLME States) to highly specialized sectoral ones. In the areas of marine management and protection, most of the countries of the region have ratified several international Conventions such as the International Convention on Civil Liability for Oil Pollution, Convention for Cooperation in the Protection and Development of the Marine and Coastal Environment of the WACAF Region and the IMO's MARPOL 73/78 (see Alo, 2001). Others, including the Convention on Wetlands of International Importance, especially as Water Fowl Habitats, are under consideration.

Since 1984, several countries in the Region have actively participated in the UNEP/WACAF II and III projects on monitoring of pollution and coastal erosion respectively in the marine environment. A continuing priority is the DUMP WATCH program for tracing and reporting attempted export to the region of toxic wastes and other hazardous products. Presented below are summaries of the major Ongoing or past International Cooperation Projects for Marine Environmental Issues in the Africa Region and Linkages with the recent GCLME Project.

In most regional cooperation projects in the region, there has been no framework of coordination. Hence the undue effects of project duplication and lack of synergies have been glaring prior to the LME Projects — the BCLME, the GCLME and the upcoming CCLME. The GCLME is providing an opportunity to develop synergies and collaboration mechanisms with all these initiatives.

4. The GCLME Case — a GEF LME Project

The Guinea Current region was one of the first regions where the LME concept was first applied for coastal and marine environmental management. The Global Environment Facility (GEF) first funded a pilot phase GOG-LME project titled, "Water Pollution Control and Biodiversity Conservation in the Gulf of Guinea Large Marine Ecosystem" was implemented between 1995-1999, with the development objective of "the restoration and sustenance of the health of the Guinea Current LME and its natural resources, particularly as it concerns the conservation of its biological diversity and the control of water pollution".

The GOG-LME project, an initiative of five (later six with the participation of Togo) countries in the region [namely Benin, Cameroon, Côte d'Ivoire, Ghana, Nigeria and Togo] was implemented with the technical assistance of UNIDO, UNDP, UNEP and the US-NOAA (under the United States Department of Commerce) and the collaboration of a host of national, regional and international organizations. The GOG-LME project represented a regional effort to assess, monitor, restore and enhance the ecosystems capacity and productivity in order to sustain the socio-economic opportunities for the countries in the coming decades.

The following specific strategic objectives were established for the project:

- Strengthening regional institutional capacities to prevent and remedy pollution of the Gulf of Guinea LME and associated degradation of critical habitats;
- Developing an integrated information management and decision-making system for ecosystem management;
- Establishing a comprehensive programme for monitoring and assessing the living marine

resources, health, and productivity of the Gulf of Guinea LME;
- Preventing and controlling land-based sources of industrial and urban pollution;
- Developing national and regional strategies and policies for the long-term management and protection of the Gulf of Guinea LME.

The outstanding accomplishments and achievements under the pilot phase Gulf of Guinea GOG LME Project (1995-1999), as verified in Tri-Partite Review Reports and the Final In-Depth Evaluation, was ample proof of the catalytic and defining roles that regional cooperation projects can play in the Region.

4.1 Moving from the GOGLME to the GCLME

Following from all the achievements of the pilot phase GOG-LME project as listed above, the Committee of Ministers responsible for the project during their First Meeting in Accra, on 10 July 1998 called for initiation of an expanded project to include all 16 countries situated within the natural limits of the Guinea Current Large Marine Ecosystem. Pursuant to this Accra Ministerial Declaration by the Environment Ministers of the Pilot phase countries which endorsed a regional approach to the environmentally sustainable development of the coastal and marine environment of the West and Central Africa; a GEF PDF-B Project was initiated in 2001 with the support of GEF, UNDP, UNEP US-NOAA and UNIDO with latter as implementing organization.

A supplementary PDF B was approved by GEF in November 2002.

4.2 The Interim Guinea Current Commission

Pursuant to the Decision II of the Brazzaville Declaration (26 May 2006) of the African Ministerial Conference on Environment which calls on African Governments to support the LME Projects in Africa as tools for revitalization and successful implementation of the Abidjan Convention (1981); and the Abuja Ministerial Declaration of 22 September 2006 (involving Ministers from the 16-cooperating countries bordering the GCLME) called for institutionalization of regional cooperation by the sixteen countries bordering the GCLME, and creation of a technical Secretariat to serve an organization that shall be entitled the Interim Guinea Current Commission (IGCC), and later the GCC even after the GEF catalytic support. It is planned to be established as an international body consistent with the terms of the United Nations Convention on the Law of the Sea.

5. Conclusions

It has become obvious that if the spiralling degradation of the coastal and marine ecosystems is to be reversed in order that these ecosystems continue to sustainably provide livelihoods benefits to coastal communities as well as foreign exchange for governments, drastic reforms in the marine resources management paradigms of the Region are necessary. The success of the GEF GCLME Project in the West and Central Africa region is beginning to amply demonstrate that countries in the Africa Region can work together and jointly assess and manage the national and the shared transboundary marine resources of each nation. Also, regional cooperation in management of the marine areas can be well facilitated by successfully adopting the LME ecosystem-based approach for addressing the inevitable challenges arising from or due to the continued decline of the status of the African marine environment. The growing interest of member States to a joint partnership and joint management for restoring biomass and ecosystem integrity and diversity is manifested in the smooth commitments of Governments to transforming the GCLME Project to a full-fledged Guinea Current Commission after the GEF catalytic action similar to the IBCC for the Benguela LME. These are obviously targeted at strengthening regional cooperation. The GCC with a supporting Secretariat is planned to provide the regional organization for cooperative management. It is hoped that through these regional cooperation mechanisms, the continuing damage to the marine environment will be reversed as well as the livelihoods and security of dependant poor communities.

6. References

Adam Sikirou K., (1998) – "Towards Integrated Coastal Zone Management in the Gulf of Guinea (A Framework Document)", Published by Les Edition du Flamboyant Cotonou, Benin. Pub: GEF/UNIDO/UNDP/UNEP/US-NOAA/NEPAD 175pp.

Alo, B. I., Ibe, C, Csizer, Z., Yumkella, K. K., Ukwe, C. N. and Eisa, M. (2001) Environmentally Sustainable Development in the West and Central African Region, Pub. RIDC, UNIDO 203pp.

Alo, B. I. 2001, Oil Transportation and the Effects on the Marine Environment 25pp. Technical paper presented at the N.M.A. International Seminar on Marine Capacity-Building and Resource Development, Lagos, Nigeria, April, 2001.

GCLME Project (2006) Transboundary Diagnostic Analysis Eds. Ibe, C, Alo, B. I., Ajao, E., and Ukwe, C.

GCLME Project (2007) Strategic Action Plan document for the GCLME.

Hatziolos M., Lundin, C. G. and Alm, A. (1996) Africa: A Framework for Integrated Coastal Zone Management, Environment Department, The World Bank, Washington D.C., USA 150pp.

Ibe Chidi et. al, (1998) - "Integrated Environmental and Living Resources Management in the Gulf of Guinea", (The Large Marine Ecosystem Approach), Proceeding of the First Regional Symposium on the Gulf of Guinea Large Marine Ecosystem, Published by UNDP/UNIDO/GEF, Ghana p. 8-13.

Ibe A. Chidi and Zabi S. G. (1998) – "Overview of Environmental Problems in the Gulf of Guinea", State of the Coastal and Marine Environment of the Gulf of Guinea, Pub. Center for Environmental and Development in Africa, Cotonou, Benin, p. 3-7.

I.M.O. 1989, Strategy for the Protection of the Marine Environment, IMO, London, 112pp.

UNIDO (2000), Water Pollution Control and Biodiversity Conservation in the Gulf of Guinea Large Marine Ecosystem (LME), Unpublished GOG-LME Project Final Evaluation Report.

UNITAR (2000), Preparing a National Profile to Assess the National Infrastructure for Management of Chemicals. (A Guidance Document), Inter-Organisation Programme for the Sound Management of Chemicals.

ANNEX X: GESAMP/SCOR STATEMENT ON DELIBERATE NUTRIENT ADDITION TO THE OCEANS

International Council for Science
Scientific Committee on Oceanic Research

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

PRESS RELEASE

4 March 2008

Position of SCOR[1] and GESAMP[2] on Deliberate Nutrient Additions to the Ocean

[1] SCOR is an international nongovernmental organization created in 1957 by the International Council for Science to promote international cooperation in all areas of ocean science (see www.scor-int.org).

[2] GESAMP is an independent group of experts, formed in 1969, that advises the United Nations (UN) system on the scientific aspects of marine environmental protection. It is sponsored by eight UN organizations with responsibilities for the marine environment and provides a mechanism for coordination and collaboration among them (see www.gesamp.org).

Deliberate fertilization of the ocean, until recently a subject of mostly scientific interest, has caught the attention of the commercial sector because of its potential to sequester carbon and to increase the production of living marine resources. To be effective for either of these purposes, eventual fertilization would add iron or nitrogen to large areas of the world's ocean. Proposals to realize the potential of ocean fertilization on such scales suffer a major weakness: one does not know how the oceanic ecosystem will respond. Current understanding of how the ocean operates is increasing rapidly, but is still not sufficient to predict the effects of large-scale nutrient manipulations.

Field experiments, carried out in various parts of the world ocean to study the role of iron in ocean ecosystems, have not been able to demonstrate a significant net increase in carbon export to the deep ocean on short or long time scales. These experiments have also raised important and, as yet, unanswered questions about changes in community structure. Ocean fertilization on any significant scale will (by design) impact the species succession and the ecosystem structure and function in the affected areas. Furthermore, the impacts of fertilization are unlikely to be confined to the specific region that receives the fertilizer. Ocean currents mix and move water continuously and so can transport nutrients, the resulting biomass, and decomposition products beyond the target areas, with unknown consequences. Inadvertent anthropogenic additions of nutrients to the coastal ocean are presently causing significant problems such as hypoxia, anoxia and harmful algal blooms. At the present, the long-term consequences of ecosystem alterations from nutrient additions are unforeseeable and may be harmful. The effects of deliberate large-scale nutrient addition may therefore range from the desired and positive to the unintended and negative.

The Scientific Committee on Oceanic Research (SCOR) of the International Council for Science and the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) of the United Nations agree that any deliberate large-scale addition of nutrients to the ocean must be conducted in such a way that the outcomes of these experiments are statistically quantified and independently verified with respect to but not limited to:

- Changes in new primary production and total community respiration rates at the fertilization site and "downstream" of the site;
- Assimilative capacity of selected ocean regions;
- Changes in the drawdown of carbon dioxide from the overlying atmosphere, and carbon dioxide and essential macro-nutrients (P, N, and Si) from the surface waters;
- Changes in the production of carbon dioxide and other gases relevant to climate change (e.g., nitrous oxide, methane, and dimethyl sulfide) in surface and mesopelagic waters;
- Changes in denitrification rates within the oxygen minimum zone;
- Changes in the production of toxins that might be detrimental to other organisms, for example, by harmful algal blooms;

- Changes in the export of carbon to a depth where sequestration for at least 100 years is likely;
- Changes in pH and oxygen concentrations in the water column;
- Changes in biomass, composition, and biodiversity of phytoplankton, bacteria, and zooplankton, and recruitment of fish and shellfish; and
- Changes in food web structure.

To be scientifically credible the design and implementation of large-scale nutrient addition experiments must be transparent and the results must be clearly stated and made available to the scientific community and the general public. Transparency is essential, because any appearance of lack of independence from vested interests lowers the credibility of the results among ocean scientists, environmental organizations, policymakers, and potential investors in carbon credits. Carbon credits for fertilization should not be allowed unless and until reliable methods have been developed to estimate and verify the amount of carbon actually sequestered, and side effects have been properly understood and taken into account. We commend efforts by some commercial ventures to create codes of conduct and obtain outside reviews. It is essential that each stage of these experiments is reviewed by well-qualified experts free of vested interests. The goal of any new experiment on the effects of nutrient addition should be to increase our understanding of ocean processes at adequate spatial and temporal resolution; experiments should build on the lessons and the insights of previous experiments.

For further information please contact:

SCOR's interests in this topic: Prof. Bjorn Sundby, SCOR President. McGill University (Canada) — Can be reached at +1 514 398-4883.
General Questions about the Scientific Committee on Oceanic Research (SCOR) and

General Questions about the Joint Group of Experts on the Scientific Aspects of Marine Environment Protection (GESAMP) and GESAMP's interests in this topic: Dr. Michael E. Huber, Chairman of GESAMP (Australia) — Can be reached at +61 7 3244 7336.

Questions about the effects of iron in ocean ecosystems: Dr. Ken Buesseler, Senior Scientist, Woods Hole Oceanographic Institution (USA, but on sabbatical in New Zealand) — Can be reached at +64 2 1056 0521 between 9 a.m. and 5 p.m. (New Zealand time).

Questions about iron chemistry in the ocean: Prof. Tim Jickels, School of Environmental Sciences, University of East Anglia (United Kingdom) — Can be reached at +44 1603 593117.

General questions about GESAMP: Fredrik Haag, GESAMP Officer, International Maritime Organization (United Kingdom) — Can be reached at +44 20 7463 4139, or through gesamp@gesamp.org.

This statement contains views expressed or endorsed by members of SCOR and GESAMP who act in their individual capacities; their views may not correspond with those of their sponsoring organizations or Governments.

ANNEX XI: GESAMP REPORTS AND STUDIES

The following reports and studies have been published so far.
They are available from the GESAMP website, www.gesamp.org

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. 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 Russian

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. (2002). Rep.Stud.GESAMP, (64):121 p.

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. (2002). Rep.Stud.GESAMP, (72):41 p.

73. Report of the thirty-second session, London, 6-10 May 2002. (in preparation). Rep.Stud.GESAMP, (73)

74. Report of the thirty-third session, Rome, 5-9 May 2003 (2003). Rep.Stud.GESAMP, (74):36 p.

75. Estimations of oil entering the marine environment from sea-based activities (2007), Rep.Stud.GESAMP, (75):96 p.

76. Assessment and communication of risks in coastal aquaculture (2008). Rep.Stud.GESAMP, (76):198 p.

77. Report of the thirty-fourth session, Paris, 8-11 May 2007 (2008), Rep.Stud.GESAMP, (77):83 p.

78. Report of the thirty-fifth session, Accra, 13-16 May 2008 (2008), Rep.Stud.GESAMP, (78):XX p.

Science for Sustainable Oceans

ISSN 1020–4873

IMO FAO UNESCO IOC WMO UNIDO IAEA UN UNEP