

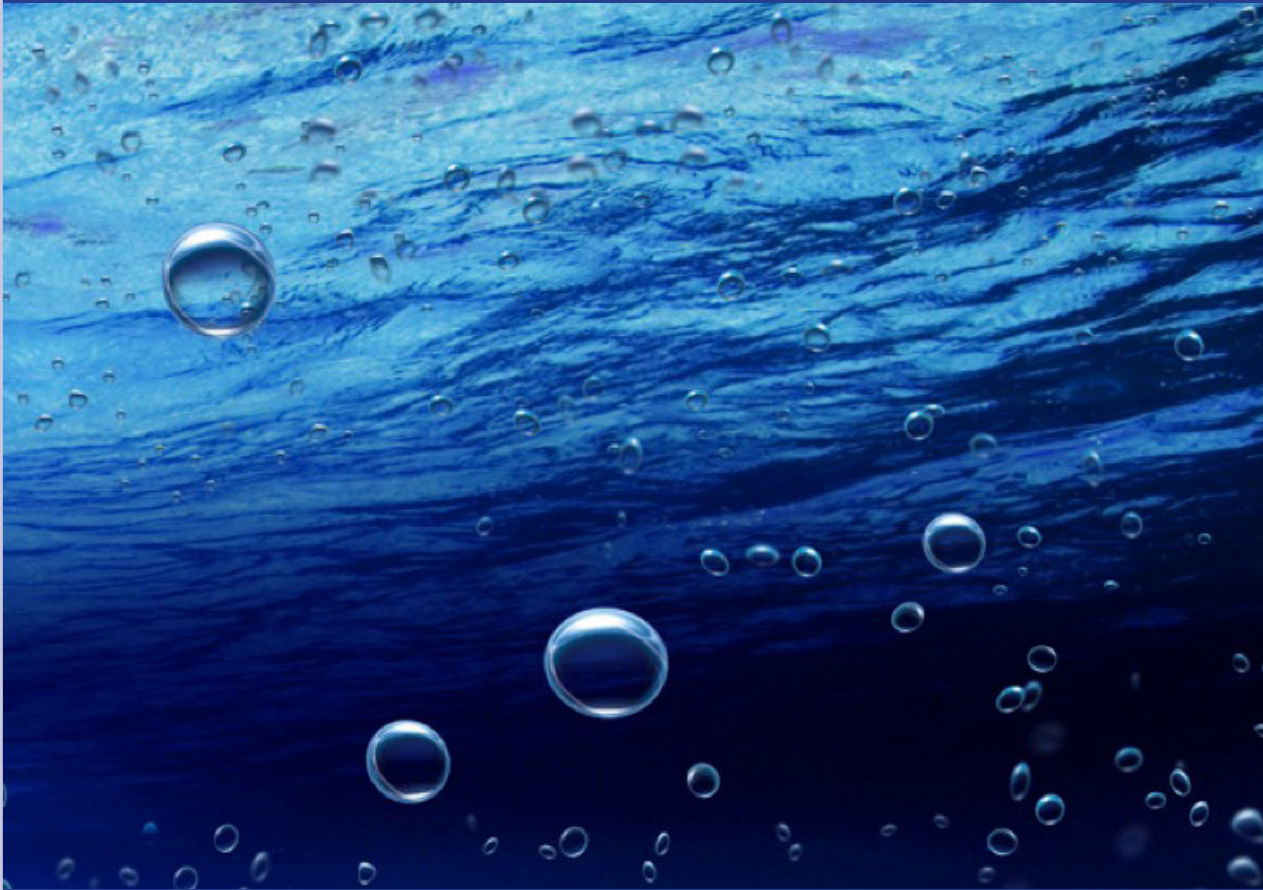


GESAMP

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

REPORT OF THE FORTY-FIRST SESSION OF GESAMP

Malmö, Sweden, 1 to 4 September 2014



IMO



FAO



UNESCO



IOC



WMO



UNIDO



IAEA



UN



UNEP



UNDP



IMO FAO UNESCO-IOC WMO UNIDO IAEA UN UNEP UNDP

**REPORT OF THE FORTY-FIRST
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Notes:

GESAMP is an advisory body consisting of specialized experts nominated by the Sponsoring Agencies (IMO, FAO, UNESCO-IOC, UNIDO, WMO, IAEA, UN, UNEP, UNDP). 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.

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EXECUTIVE SUMMARY

0.1 Introduction: The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) held its 41st session hosted by the International Maritime Organization (IMO), at the World Maritime University (WMU) in Malmö, Sweden, from 1 to 4 September, 2014. 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. GESAMP continues to function largely through its working groups which can be sponsored directly by the UN agencies in answer to their scientific needs, or in collaboration with partners. Alternatively, attention for topical and urgent issues is raised through GESAMP's New and Emerging Issues programme with mixed or outside funding; the most recent example being the micro-plastics working group. In either case, sustained and predictable funding is required and securing this remains a concern for GESAMP and its Executive Committee.

0.2 Evaluation of the hazards of harmful substances carried by ships (WG 1): This working group (WG) evaluates, at the request of IMO, the hazards to the environment and human health of bulk liquid chemicals carried by ships, with around 900 hazard profiles currently on record. The hazard profile contains a unique fingerprint of each substance, providing information on 13 separate human health, environmental, and physico-chemical hazard criteria. WG 1 met once since GESAMP 40, evaluating 11 new substances to assign full GESAMP Hazard Profiles. Furthermore, six additional substances were re-evaluated. In addition, there is an ongoing review and consolidation of information held in the WG's database that has resulted in a series of updates and amendments to some existing profiles. This review exercise, currently being undertaken by the GESAMP Secretariat, with any new information then submitted to the WG for appropriate assessment, will continue until all the historical files have been duly reviewed and the hazard profiles verified and/or amended. GESAMP agreed that there is a need to improve the visibility of this WG, as well as several of the other GESAMP WGs, and decided the 'GESAMP Composite List' would be made available on the GESAMP website.

0.3 Review of applications for 'active substances' to be used in ballast water management systems (WG 34): WG 34 met four times since GESAMP 40, evaluating 10 ballast water treatment systems and reporting its recommendations to IMO's Marine Environment Protection Committee (MEPC). Five of these systems received a recommendation for Basic Approval and five received a recommendation for Final Approval. Also, the sixth stocktaking workshop was held to review the methodology for evaluation of applications received from industry. In the coming period, WG 34 will continue its preparation of the GESAMP approved Methodology for publication in the GESAMP Reports & Studies series.

0.4 Metals (formerly mercury) Working Group (WG 37): There has been no activity under this WG 37 since the preliminary report of the WG to UNEP, entitled *Mercury in the Aquatic Environment: Sources, Releases, Transport and Monitoring*, was completed in 2011. It was agreed to continue the efforts to finalise the pending report.

0.5 Atmospheric input of chemicals to the ocean (WG 38): Since its inception, the WG has published five scientific papers in peer-reviewed journals. During a workshop in February 2013, the WG initiated the development of nine additional scientific papers. Since then, one of these has been published, and one has been submitted for publication. The remaining seven papers are at various stages of preparation. It was decided that WG 38 would primarily devote the next year to completing all of the current scientific papers, but also develop possible new activities for the future. Furthermore, GESAMP noted that WG 38 organized a special session during the European Geosciences Union meeting, held in Vienna, Austria in April, 2014, which included a total of 20 papers, 13 of them were presented by members of WG 38.

0.6 Establishment of trends in global pollution in coastal environments (WG 39): The purpose of this WG is to contribute to the reduction of stress in the coastal ecosystem by providing stakeholders, scientists and society with an objective and global assessment of pollution trends during the last century in sensitive coastal ecosystems. The WG has continued its work on the literature survey and compilation of a bibliographic records database. In addition, a pilot web platform has been developed, with the aim to host and manage the information contained in the database. The second meeting of WG 39 was held at the IAEA Environment Laboratories in Monaco in May, 2014. GESAMP noted the need to complete the digitization of core profile figures from the papers in the data base. It was agreed that the Lead Agencies will look for appropriate funding with the aim to implement the pending WG 39 activities during the intersessional period. However, the timeline for completion of the work will depend on the availability of funds.

0.7 Global assessment of (micro)-plastics (WG 40): GESAMP 38 established this WG on inputs, levels, distribution and fate of micro-plastics in the ocean, and potentially the role of micro-plastics as a pathway for persistent, bio-accumulating and toxic substances entering marine food-webs. Since GESAMP 40, the WG has held its third and final WG meeting, from 8 to 10 July 2014, and the final report of the WG is nearing finalization. It was also noted that the WG had continued to foster links to other initiatives, including the GEF Transboundary Water Assessment full-sized project, the work of the International Whaling Commission, as well as the Global Partnership on Marine Litter. GESAMP noted the excellent progress made, as well as the recent discussions at the first session of the United Nations Environment Assembly (UNEA), held from 23 to 27 June 2014, which suggested further work, building on the outcomes of the WG. The Group discussed possible options to either extend the

current terms of reference of WG 40, or establish a new WG. It was agreed that, if possible, it would be beneficial to build on the current experience and membership rather than establish a completely new WG. Therefore, GESAMP proposed to amend the TOR of WG 40 to respond to the request by the UNEA.

0.8 Contribution to the United Nations 'Regular Process' (UNRP): GESAMP noted the progress with the preparation of the first World Ocean Assessment (WOA), and reiterated its commitment to support the Regular Process, and expressed its availability to assist those of its Sponsoring Organizations that so require with support in the peer review process.

0.9 Transboundary Waters Assessment Programme (TWAP): GESAMP has been involved in the GEF-sponsored Transboundary Waters Assessment Programme (TWAP) since its inception. In the intersessional period, the GESAMP Task Team set up to produce a revised assessment of 'Pollution of the Open Oceans' had completed its report, which had undergone internal and external peer review, and now awaits final editing. GESAMP also noted that further contributions to the TWAP, organized through the Chairman, have included producing an assessment of floating litter in the ocean and Large Marine Ecosystems, a review of contaminants associated with plastic resin beads, and designing a methodology for clustering groups of LMEs according to the degree of environmental degradation.

0.10 Side event on "Maritime activities and noise: sources and impacts", 3 September 2014: GESAMP and IMO organized a special side event, hosted by WMU. The session was attended by approximately 50 people, with five panelists giving presentations on various aspects of noise in the marine environment. GESAMP agreed that the issue is of interest and relevance to its mandate, and also noted the progress made in various international fora. It was agreed that GESAMP will keep a 'watching brief' and observe future developments.

0.11 Identification of new and emerging issues regarding the degradation of the marine environment: Several possible issues were discussed. On

the issue of seabed mining and effluent discharge, GESAMP noted that most available examples lie in internal waters and therefore fall under national jurisdiction. It was also recognized that the International Seabed Authority (ISA) is the competent authority with an international mandate to regulate mining in the seabed and ocean floor and subsoil thereof beyond the limits of national jurisdiction (the Area) as established under Part XI of UNCLOS. Regarding Effects of changing N/P ratio in the atmospheric deposition to the ocean, GESAMP agreed to develop a scoping paper in the intersessional period. Finally, on the topic of Ecosystem services valuation, GESAMP agreed to continue the discussion intersessionally, in order to prepare a short document to define the potential role of GESAMP in reviewing/harmonizing methodologies for ecosystem services valuation. The document will then be shared with the Sponsoring Organizations.

0.12 Scoping issues: GESAMP agreed to renew its discussion with CIESM on the issue of bio-magnification in top predators and its ecological and social implications, including the possibility to organize a GESAMP workshop on bio-magnification, subject to interest from the Sponsoring Organizations. GESAMP considered a proposal for the establishment of a WG on the relevance of the production of disinfection by-products (DBP) against other inputs of DBPs in the aquatic environment. It was noted that at this point in time, the necessary commitment and financial resources to further take-up the WG objectives were lacking. GESAMP discussed the issue of Environmental Quality Standards (EQS) and noted the need to review the section and links on the GESAMP website. Finally, GESAMP took note of the progress made by the correspondence group on the Discharge of Mine Tailings and Coastal Run-Off in the Marine Environment. GESAMP agreed that the correspondence group would finalize the scoping paper as soon as possible for GESAMP to consider intersessionally. The scoping paper would then be transmitted to the LC/LP correspondence group by the Secretariat, with a view to planning a workshop in the intersessional period.

ملخص تحليلي

في موناكو ، في شهر أيار/ (IAEA) في المختبرات البيئية التابعة للوكالة الدولية للطاقة الذرية مايو ٢٠١٤ . وأخذ فريق الخبراء المشترك علماً بالحاجة إلى استكمال تحويل المستندات الورقية الأساسية إلى ملفات رقمية في قاعدة البيانات . وتقرر أن تنظر الوكالات التي تقوم بدور رائد في هذا الميدان في تأمين التمويل بغية تنفيذ أنشطة فريق العمل العالقة خلال الفترة بين الدورات . بيد أن الفترة الزمنية لإنجاز العمل تتوقف على مدى توافر التمويل

تقييم اللدائن الدقيقة) على الصعيد العالمي (فريق العمل ٤٠) : في دورته ٧٠، الثامنة والثلاثين ، شكّل فريق الخبراء المشترك المعني بالنواحي العلمية للتلوث البحري فريق العمل هذا المعني باللدائن الدقيقة في المحيطات ومستوياتها وتوزيعها (GESAMP) ومصيرها . والدور المترتب على ذلك لهذه اللدائن بوصفها سبيلاً للمواد السامة ذات التأثير المستمر والتراكم الجيوي التي تتسلل إلى الدورة الغذائية للأحياء البحرية . ومنذ الدورة الأربعين لفريق الخبراء المشترك ، عقد فريق العمل اجتماعه الثالث والأخير في الفترة من ٨ إلى ١٠ تموز/يوليو ٢٠١٤ ، وشارف على وضع تقريره الختامي في صيغته النهائية . وجرى الإشارة أيضاً إلى أن فريق العمل واصل تعزيز الروابط بمبادرات أخرى ، بما فيها المشروع المتكامل الحجم والعمل الذي تقوم (GEF) لتقييم المياه العابرة للحدود الذي يضطلع به مرفق البيئة العالمية به الهيئة الدولية لتنظيم صيد الجيتان ، فضلاً عن الشراكة العالمية لمعالجة مشكلة القمامة البحرية . وأخذ فريق الخبراء المشترك علماً بالتقدم الممتاز الذي أحرز ، فضلاً عن المناقشات التي عُقدت في (UNEA) التي جرت مؤخراً ، في الدورة الأولى لجمعية الأمم المتحدة للبيئة الفترة من ٢٣ إلى ٢٧ حزيران/يونيو ٢٠١٤ ، والتي جرى خلالها تقديم اقتراحات بشأن الأعمال التي يتعين القيام بها في المستقبل تأسيساً على حصيلة الأعمال التي اضطلع بها فريق العمل ٤٠ . وناقش فريق الخبراء المشترك الخيارين المتاحين ، وهما إما تمديد العمل بالاختصاصات الحالية لفريق العمل ٤٠ أو تشكيل فريق عمل جديد . واستقر الرأي على أنه من المفيد ، إذا كان ذلك مستطاعاً ، التأسيس على الخبرات الراهنة والأعضاء الراهنين بدلاً من تشكيل فريق عمل جديد تماماً . وبناءً على ذلك ، اقترح فريق الخبراء المشترك تعديل اختصاصات فريق العمل ٤٠ بحيث تلبّي ما طلبته جمعية الأمم المتحدة للبيئة

الإسهام في "العملية المنتظمة" للإبلاغ عن حالة البيئة البحرية وتقييمها على الصعيد العالمي ، بما في ذلك الجوانب الاجتماعية والاقتصادية ، التابعة للأمم المتحدة أخذ فريق الخبراء المشترك علماً بالتقدم الذي أحرز للإعداد لأول تقييم عالمي (UNRP) للمحيطات ، وأعاد التأكيد على التزامه بدعم "العملية المنتظمة" ، وأبدى استعداداً لمساعدة الهيئات الداعمة لهذه العملية التي تحتاج هذا الدعم في إطار عملية الاستعراض من قبل الأقران .

يشارك فريق الخبراء المشترك (TWAP) برنامج تقييم المياه العابرة للحدود ٩٠، في برنامج تقييم المياه العابرة للحدود ، المعني بالنواحي العلمية للتلوث البحري الذي يدمجه مرفق الأمم المتحدة للبيئة ، منذ إنشاء هذا البرنامج . وفي الفترة بين الدورات ، أنجز فريق المهتمات الذي شكّله فريق الخبراء المشترك لإجراء تقييم منقّح لـ "التلوث في عرض البحر" تقريره ، الذي خضع لعملية استعراض داخلية وخارجية من قبل الأقران ، وابتدأ الآن الصياغة النهائية . وأخذ فريق الخبراء المشترك علماً أيضاً بأن المساهمات الأخرى في برنامج تقييم المياه العابرة للحدود ، التي عمل الرئيس على تنظيمها ، اشتملت على إعداد تقييم للقمامة التي تطوف في المحيطات والنظم الإيكولوجية الكبيرة ، واستعراض الملوثات المرتبطة بحييات الارتفاع اللدائي ، وتصميم منهجية لتجميع النظم الإيكولوجية الكبيرة وفقاً لتدرُّك البيئي الذي تعاني منه

نشاط جانبي بشأن "الأنشطة البحرية والضجيج : المصادر والتأثيرات" ، ٣ ١٠٠، **أيلول/سبتمبر ٢٠١٤** : نظّم فريق الخبراء المشترك المعني بالنواحي العلمية للتلوث البحري والمنظمة البحرية الدولية نشاطاً جانبياً خاصاً ، استضافته الجامعة البحرية العالمية (GESAMP) ، حضره حوالي ٥٠ شخصاً وتكلّم خلاله خمسة محاضرين تناولوا الجوانب المختلفة للضجيج في البيئة البحرية . ورأى فريق الخبراء المشترك أن هذه المسألة جديرة بالاهتمام وذات صلة وثيقة باختصاصاته ، وأخذ علماً أيضاً بالتقدم الذي أحرز بهذا الصدد في مختلف المنتديات الدولية . وتقرر أن يبقى الفريق هذه المسألة قيد نظره ويراقب ما يستجد بشأنها من تطورات

تحديد مشاكل جديدة ومستجدة في ما يخص تدرُّك البيئة البحرية : نوقشت ١١٠، عدة مشاكل محتملة . ففي ما يتعلق بمشكلة التعدين في قاع البحر وتصريف النفايات السائلة ، أخذ فريق الخبراء المشترك علماً بأن غالبية الأمثلة المتوافرة على هذه المشكلة هي في المياه الداخلية وتقع بالتالي ضمن اختصاص السلطات القضائية الوطنية . وجرى التسليم أيضاً بأن هي السلطة المختصة والمكلفة على الصعيد الدولي بتنظيم (ISA) السلطة الدولية لقاع البحار التعدين في قاع البحار والمحيطات وباطن أرضها خارج حدود السيادة الوطنية ، على النحو وفي ما يتعلق (UNCLOS) من اتفاقية الأمم المتحدة لقانون المحيطات XI الذي يحدده الجزء في الترسبات الجوية للمواد الكيميائية في المحيطات ، وافق فريق N/P بتأثيرات تغيّر نسبة الخبراء المشترك على إعداد دراسة استقصائية خلال الفترة بين الدورات . وختاماً ، في ما يخص مسألة تقييم خدمات النظم البيئية ، وافق فريق الخبراء المشترك على مواصلة مناقشتها خلال الفترة بين الدورات بغية إعداد وثيقة لتحديد الدور الممكن لهذا الفريق في منهجيات مراجعة/ موازنة تقييم خدمات النظم البيئية . وسيتم بعد ذلك إطلاع الهيئات الداعمة على هذه الوثيقة

مقدمة : عقد فريق الخبراء المشترك المعني بالنواحي العلمية للتلوث البحري ١٠٠، في (IMO) دورته الواحدة والأربعين ، التي استضافتها المنظمة البحرية الدولية (GESAMP) السويد ، في الفترة من ١ إلى ٤ أيلول/ ، Malmö في مقر الجامعة البحرية العالمية (سبتمبر ٢٠١٤) . وكان فريق الخبراء المشترك قد تأسس في عام ١٩٦٩ من قبل عدد من منظمات الأمم المتحدة كفريق مشترك للتشجيع على القيام بدراسات مستقلة متعددة الاختصاصات لمشاكل التلوث البحري والبيئة البحرية ، وذلك بغية تفضي إزدواجية الجهود ضمن منظومة الأمر المتحدة . ويرد أدناه وصف للموضوعات الرئيسية التي بُحِثت في هذه الدورة . ويواصل فريق الخبراء المشترك القيام بوظائفه وبصفة رئيسية عبر أفرقة العمل التابعة له التي يمكنها أن تعمل برعاية مباشرة من الوكالات التابعة للأمم المتحدة تلبيةً لاحتياجاتها العلمية ، أو بالتعاون مع شركاء آخرين . وعلى نحو يبدل ، يوسع فريق الخبراء المشترك أن يولى الاهتمام للمسائل المواضيعية والملمّحة من خلال برنامج المسائل الجديدة والمستجدة الذي يضطلع به بتمويل مختلط أو خارجي ؛ ومن الأمثلة الأخرى على ذلك فريق العمل المعني باللدائن الدقيقة . وفي الحالتين ، يظل التمويل المستدام والمتوقّع أمراً ضرورياً ، وتظل مسألة ضمان هذا التمويل من الشواغل الرئيسية لفريق الخبراء المشترك ولجنته التنفيذية

تقييم مخاطر المواد الضارة التي تنقلها السفن (فريق العمل ١) : يقيم فريق ٢٠، العمل هذا ، بناءً على طلب المنظمة البحرية الدولية ، المخاطر التي تتعرض لها البيئة وصحة الإنسان من المواد الكيميائية السائلة السائبة التي تنقلها السفن . وقد تمّ حتى الآن تسجيل خلاصات مخاطر لقرابة ٩٠٠ مادة من هذه المواد . وتنص خلاصة المخاطر على السمات الفريدة لكل مادة ، وتتضمّن معلومات عن ١٣ معياراً من معايير المخاطر التي تهدد صحة الإنسان والبيئة وكذلك تلك التي تؤثر في العوامل الفيزيائية والكيميائية . وقد عقد فريق العمل ١ اجتماعاً واحداً منذ الدورة الأربعين لفريق الخبراء المشترك ، وقيم ١١ مادة جديدة بغرض تحديد خلاصات المخاطر الكاملة التي تعود إليها في سياق اختصاصات فريق الخبراء المشترك المعني بالنواحي وأعاد كذلك تقييم ٦ مواد أخرى . وبالإضافة إلى ذلك ، (GESAMP) العلمية للتلوث البحري هناك مراجعة وتجميع بشكل متواصل للمعلومات الموجودة في قاعدة البيانات التابعة لفريق العمل هذا ، مما أدى إلى سلسلة من التحديثات لبعض خلاصات المخاطر وإدخال تعديلات عليها . وهذه المراجعة ، التي تقوم بها حالياً أمانة فريق الخبراء المشترك ، على أن يتم بعد ذلك إطلاع فريق العمل ١ عليها لتقييمها على النحو اللائق ، ستتواصل إلى أن يتيسّر القيام على نحو وافي بمراجعة جميع الملفات القديمة والتحقق من خلاصات المخاطر وأو إدخال تعديلات عليها . ورأى فريق الخبراء المشترك أن الحاجة تستدعي إبراز المهام التي يضطلع بها فريق العمل ١ ، فضلاً عن تلك التي تضطلع بها أفرقة العمل الأخرى التابعة له ، وقرر أن يتيح (GESAMP) "قائمة مكونات فريق الخبراء المشترك المعني بالنواحي العلمية للتلوث البحري على موقعه الإلكتروني

النظر في الطلبات التي تتناول "المواد النشطة" التي ستستخدم في نظّم معالجة مياه الصابورة (فريق العمل ٢٤) : عقد فريق العمل ٢٤ أربعة اجتماعات منذ الدورة الأربعين لفريق الخبراء المشترك ، وقيم ١٠ نظّم لمعالجة مياه الصابورة ، ورفع توصياته إلى التابعة للمنظمة البحرية الدولية . وقد أوصى بمنح الموافقة (MEPC) لجنة حماية البيئة البحرية الأولية لخمس منها ومنح الموافقة النهائية للنظّم الخمسة الأخرى . وعُقدت أيضاً حلقة العمل التقييمية السادسة لمراجعة منهجية تقييم الطلبات التي ترد من قطاع النقل البحري ، وفي الفترة المقبلة ، سيواصل هذا الفريق العمل على إعداد المنهجية التي سيقوم بها فريق الخبراء المشترك . بغية نشرها في سلسلة الدراسات والتقارير التي تصدر عنه

فريق العمل المعني بالفلزات (بالزئبق سابقاً) (فريق العمل ٢٧) : لم يقر ٤٠، فريق العمل ٢٧ بأي نشاط منذ أن أكمل تقريره الأولي ، المعنون الزئبق في البيئة المائية : في (UNEP) المصادر والإطلاق والنقل والرصد ، الذي رفعه إلى برنامج الأمم المتحدة للبيئة عام ٢٠١١ . وجرى الاتفاق على أن يواصل فريق العمل بذل جهوده لوضع هذا التقرير في صيغته النهائية .

لترسبات الجوية للمواد الكيميائية في المحيطات (فريق العمل ٢٨) : نشر ٥٠، فريق العمل ٢٨ منذ تشكيله خمس دراسات علمية في مجلات علمية متخصصة . وخلال حلقة عمل عُقدت في شهر شباط/فبراير ٢٠١٣ ، باشر بإعداد تسع دراسات علمية إضافية . ومنذ ذلك التاريخ ، نُشرت إحدى هذه الدراسات وجرى تقديم دراسة أخرى للنشر . وبلغ إعداد الدراسات السبع المتبقية مراحل متعددة . وتقرر أن يكرّس فريق العمل ٢٨ السنة القادمة بشكل رئيسي لإكمال جميع الدراسات العلمية المتبقية ، وأن ينظر في القيام بأنشطة جديدة في المستقبل . وعلاوة على ذلك ، أخذ فريق الخبراء المشترك علماً بأن فريق العمل ٢٨ نظّم دورة خاصة ، خلال اجتماع الاتحاد الأوروبي لعلوم الأرض ، عُقدت في فيينا ، النمسا ، في شهر نيسان/أبريل ٢٠١٤ . وتناول ما مجموعه ٢٠ دراسة علمية ، قدّم أعضاء في فريق العمل هذا ١٣ دراسة منها

تحديد أنماط التلوث على الصعيد العالمي في البيئات الساحلية (فريق العمل ٢٩) : الغرض من فريق العمل هذا الإسهام في الحد من الضغط الذي تتعرض له النظم البيئية الساحلية ، وذلك بتزويد الجهات المعنية والعلماء والمجتمع بتقييم موضوعي وعالمي لأنماط التلوث في النظم البيئية الساحلية الحساسة خلال القرن الماضي . وقد واصل الفريق أعماله التي تشمل إجراء مسح لما تمّ من بحوث وإعداد قاعدة بيانات خاصة بالمراجع . وبالإضافة إلى ذلك ، جرى إعداد موقع إلكتروني تجريبي متاح عليه المعلومات التي تتضمنها قاعدة البيانات مما يسمح بالتالي بمعالجة هذه البيانات . وعقد فريق العمل ٢٩ اجتماعه الثاني

١٢٠٠ **مسائل استقصائية :** وافق فريق الخبراء المشترك المعني بالنواحي العلمية على معاودة المناقشات مع اللجنة الدولية للاستكشاف العلمي (GESAMP) للتلوث البحري بشأن مسألة التضخيم الحيوي لدى كبريات الكائنات المفترسة (CIESM) للبحر الأبيض المتوسط وتأثيراته الإيكولوجية والاجتماعية ، بما في ذلك إمكانية قيام فريق الخبراء المشترك بتنظيم حلقة عمل تناول التضخيم الحيوي ، في حال أبدت الهيئات الداعمة اهتمامها بذلك . ونظر فريق الخبراء المشترك في اقتراح يدعو إلى تشكيل فريق عمل يُعنى بالصلة بين تكوّن المركبات الناجمة عن عملية التطهير والتأثيرات الأخرى لهذه المركبات في البيئة البحرية . ولوحظ عدم توافر الالتزام والموارد المالية الضرورية ليصبح ذلك ضمن أهداف فريق العمل في الوقت

ولاحظ الحاجة إلى (EQS) الراهن . وناقش فريق الخبراء المشترك مسألة معايير الجودة البيئية مراجعة الجزء المتعلق بها من موقعه الإلكتروني وكذلك الوصلات . وفي الختام ، أخذ فريق الخبراء المشترك علماً بالتقدم الذي أحرزه فريق العمل بالمراسلة المعني بتصريف مخلفات التعدين والمياه الساحلية التي تتسرب إلى البيئة البحرية . واتفق على أن ينكب فريق العمل بالمراسلة على إعداد الصيغة النهائية للدراسة الاستقصائية في أقرب وقت مستطاع لكي ينظر فيها فريق الخبراء المشترك في الفترة بين الدورات . ثم تقوم الأمانة بإحالة هذه الدراسة إلى فريق العمل بالمراسلة المعني باتفاقية/بروتوكول لندن بغية التخطيط لعقد حلقة عمل خلال الفترة بين الدورات .

执行概要

0.1 引言: 海洋环境保护科学问题联合专家组于2014年9月1至4日, 在国际海事组织的赞助下, 于瑞典马尔默, 世界海事大学举行了其第41届会议。该专家组是1969年由一些联合国的组织, 为鼓励对海洋污染和环境保护问题的独立的、多学科的审议, 以期避免联合国系统内的重复劳动而建立的一个联合小组。在本届会议上所讨论的主要题目详述如下。该组的运作仍继续主要通过其可由联合国机构, 或与其伙伴, 为答复具体的科学需求而共同赞助的各工作组进行。或者, 通过该组具有混合或外部资金的新和新兴问题计划提起对主题性或紧迫性问题的关注; 最近的范例是微塑料工作组。在两种情况下, 均需要有可持续并可预期的资金, 对此的保证仍是该组及其执行委员会所关注的问题。

0.2 船载危险有害物质评估(工作组1): 此工作组在国际海事组织的要求下, 评估船载散装液体化学品对环境和人类健康的危险, 记录中现共有约900危险档案。危险档案含有各物质的独特指纹, 就13种不同的人的健康、环境和物理-化学危险标准提供信息。工作组自第40届会议以来开过一次会, 对11种新物质做了评估以确定完整的联合专家组危险档案。另外, 对六种附加物质重新做了评估。及, 对该工作组数据库中持有的信息不断进行审核和整理, 这导致了一系列的对一些现有档案的更新和修正。就提交给该工作组做适当评估的任何新信息而言, 此项目前正由该专家组秘书处进行审核工作将继续进行, 直至全部历史档案均得到适当审核, 及危险档案得到验证和(或)修正为止。该专家组同意, 有必要提高该工作组以及其他数个该专家组的工作组的可见性, 并决定, 将在该专家组的网站上提供“联合专家组的构成清单”。

0.3 压载水管理系统中所用“活性物质”申请审核(工作组34): 工作组34自第40届联合专家组会议以来开了四次会, 对10项压载水处理系统做了评估并向国际海事组织的海洋环境保护委员会(环保会)报告了其建议。这些系统中的五个, 获得了基本认可推荐, 及五个获得了最终认可推荐。另外, 举行了第六次盘点讲习班, 对评估收自业界的申请的方法进行审核。在即将到来的时期, 工作组34将继续准备该联合专家组所批准的方法, 供在联合专家组报告和研究系列中公布。

0.4 金属(原汞)工作组(工作组37): 自该工作组于2011年完成了致联合国环境署的题为水环境中的汞: 来源、释放、运输和监测的初步报告后, 在此工作组37之下没有任何活动。业已同意, 继续努力最终完成该未决报告。

0.5 大气至海洋的化学品输入(工作组38): 该工作组, 自成立以来, 已在同行审议杂志中发表了五份科学论文。在2013年的一次讲习班上, 该工作组启动了九份科学论文的撰写。从该时起, 已有一份得到发表, 另一份已提交供发表。业已决定, 工作组38在下一年度将主要致力于完成所有目前的科学论文, 并还要开发未来的可能的新的活动。另外, 联合专家组注意到, 该工作组38在2014年4月于奥地利维也纳举行的欧洲地球科学联盟会议期间组织了一次特别会议, 其中包括有共计20份论文, 其中13份是该工作组38的成员提交的。

0.6 确定全球沿海环境中的污染趋势(工作组39): 该工作组的目的是通过向利益攸关方、科学家和社会提供一个客观和全球性的沿海敏感生态系统在过去的世纪中的污染趋势评估, 对减少沿海生态系统的压力做出贡献。该工作组继续其在文献检验和编撰文献记录数据库上的工作。另外, 业已开发了一

个试点网上平台, 其目的是持有并管理数据库中所含信息。工作组39的第二次会议是2014年5月在摩纳哥的国际原子能机构环境实验室举行的。联合专家组注意到完成将纸张中的核心剖面数据数字化的必要性。业已同意, 牵头机构将寻求适当的资金以在会间期间实施未决的工作组39的活动。但是, 完成该项工作的时间线将有赖于可用的资金。

0.7 (微)-塑料全球评估(工作组40): 联合专家组38成立了该关于海洋中微-塑料的注入、水平、分布和归宿, 及微塑料作为持久性、生物聚集和有毒物质进入海洋食物网的潜在作用的工作组。自联合专家组40以来, 该工作组已于2014年7月8至10日, 举行了其第三次和最后一次工作组会议, 该工作组的最后报告几近完成。还注意到, 该工作组继续培养着与其他动议的联系, 包括全球环境基金跨境水域评估方案的实比项目, 国际鲸鱼委员会的工作, 以及最近在2014年6月23至27日举行的第一届联合国环境大会上的讨论, 该讨论在该工作组的成果的基础上, 建议出未来的工作。该组讨论了可能的选择, 或者延展当前的工作组40的权限范围, 或者成立一个新的工作组。业已同意, 如可能, 依赖目前的经验和成员将比成立一个全新的工作组更有益。因此, 联合专家组建议修正工作组40的权限范围以响应联合国环境大会的要求。

0.8 对联合国“经常程序”的贡献: 联合专家组注意到筹备首次海洋评估的程序, 并重申其支持经常程序的承诺, 及表示能够协助其有需要的赞助组织在同行审议过程中提供支持。

0.9 跨境水域评估方案(TWAP): 联合专家组在全球环境基金的跨境水域评估方案启动时就已参与。在会间期间, 联合专家组为制定经修订的“开放大洋污染”评估成立的特设组已完成其报告, 该报告业经内部和外部的同行审议, 现正等待最后编辑。联合专家组还注意到, 通过主席而组织的对跨境水域评估方案的进一步贡献, 已包括了制定一项对大洋中和大海洋生态系统中漂浮垃圾的评估, 对有关塑料树脂珠的污染物的审核, 及按照环境恶化的程度为大海洋生态系统的类聚组别设计一个方法。

0.10 2014年9月3日关于“海事活动和噪音: 来源和影响”的会外活动: 联合专家组和国际海事组织组织了一个由世界海事大学主办的特殊会外活动。该活动有约50人参加, 有五名研讨专家对海洋环境中的噪音的各个不同方面做了演讲。联合专家组同意, 该问题是其授权所关注并与之有关的, 并还注意到在各个国际论坛上的进展。业已同意, 联合专家组将保持“观察情况报告”并关注未来进展。

0.11 确定有关海洋环境恶化的新和新兴问题: 数个可能的问题得到了讨论。关于海床采矿和排出物排放, 联合专家组注意到, 大多数可用的范例位于内水中并因此在国家管辖之下。另外还认识到, 国际海床当局(ISA)是按照联合国海洋法公约第XI部分成立的, 具有国际授权, 管理国家管辖界限之外的海床和洋底及其底土采矿的主管当局。关于大气对海洋沉降的N/P比率变化的影响, 联合专家组同意在会间期间拟定范围界定文件。最后, 关于生态系统服务估值的议题, 联合专家组同意在会间继续讨论, 以便准备出一份短文, 界定出联合专家组在审核/协调生态系统服务估值方法中的潜在作用。该文件将之后由各赞助组织分享。

0.12 范围界定问题: 联合专家组同意与地中海科学探测委员会(CIESM)就顶层捕食者的生物放大问题

及其生态和社会影响重开讨论,包括组织一个关于生物放大的联合专家组讲习班的可能性,但有赖于赞助组织的兴趣。联合专家组审议了一个就消毒副产品的产生对其他消毒副产品的的水环境中注入的关联成立一个工作组的建议。业已注意到,在目前的时间点上,缺乏进一步采纳工作组目标的必要承诺和财务资源。联合专家组讨论了环境质量标准的问题并注意到审议联合

专家组网站上的节段和链接的必要性。最后,联合专家组注意到关于海洋环境中尾矿排放和沿岸流入物的通讯组所取得进展。联合专家组同意,该通讯组将尽快完成范围界定文件,供联合专家组在会间审议。该范围界定文件将之后由秘书处送交伦敦公约/伦敦议定书通讯组,以期在会间期间规划出一个讲习班。

RÉSUMÉ DU RAPPORT

0.1 **Introduction** : le Groupe mixte d'experts chargé d'étudier les aspects scientifiques de la protection de l'environnement marin (GESAMP) a tenu sa quarante et unième session, organisée par l'Organisation maritime internationale (OMI), du 1er au 4 septembre 2014 à Malmö (Suède). Créé en 1969 par plusieurs organismes des Nations Unies, le GESAMP est un groupe mixte chargé de promouvoir l'examen indépendant et pluridisciplinaire 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 thèmes abordés lors de cette session sont présentés ci après. Le GESAMP continue d'agir en grande partie par l'intermédiaire de ses groupes de travail, qui peuvent être directement financés par des organismes des Nations Unies en vue de répondre à des besoins scientifiques, ou en collaboration avec des partenaires. En revanche, les questions d'actualité et de nature urgente sont traitées dans le cadre du Programme du GESAMP sur les nouveaux enjeux qui bénéficie de financements mixtes ou extérieurs, l'exemple le plus récent étant le Groupe de travail sur les microplastiques. Dans un cas comme dans l'autre, le financement doit être continu et prévisible, ce qui reste une source de préoccupation pour le GESAMP et son Comité exécutif.

0.2 **Évaluation des risques que présentent les substances nuisibles transportées par mer (Groupe de travail 1)** : à la demande de l'OMI, ce groupe de travail évalue les risques que présente le transport par mer de produits chimiques liquides en vrac pour l'environnement et la santé de l'homme. Quelque 900 profils de risques sont actuellement enregistrés. Un profil de risques contient une empreinte unique de chaque substance et fournit des renseignements sur 13 critères différents des risques qu'elle présente pour la santé de l'homme et l'environnement ou sur le plan physico chimique. Depuis la quarantième session du GESAMP, le Groupe de travail 1 s'est réuni une fois pour évaluer 11 nouvelles substances en vue de leur assigner des profils de risques complets. Il a également réévalué six autres substances. Par ailleurs, des travaux sont en cours pour passer en revue et regrouper les renseignements figurant dans la base de données du Groupe de travail, ce qui a donné lieu à une série de mises à jour et à la modification de certains profils existants. Ce processus de révision actuellement mené par le Secrétariat du GESAMP, lequel communique les nouveaux renseignements au Groupe de travail aux fins d'évaluation, se poursuivra jusqu'à ce que toutes les données historiques aient été correctement passées en revue et que les profils de risques aient été vérifiés et/ou modifiés. Le GESAMP a estimé qu'il fallait accroître la visibilité du Groupe de travail, ainsi que celle de plusieurs autres groupes, et il a décidé de mettre à disposition la liste composite sur son site Web.

0.3 **Examen des demandes d'approbation des systèmes de gestion des eaux de ballast utilisant des substances actives (Groupe de travail 34)** : le Groupe de travail 34 s'est réuni à quatre reprises depuis la quarantième session du GESAMP. Il a évalué

10 systèmes de traitement des eaux de ballast et a transmis ses recommandations au Comité de la protection du milieu marin (MEPC) de l'OMI. Cinq de ces systèmes ont fait l'objet d'une recommandation pour approbation initiale et cinq d'une recommandation pour approbation définitive. Par ailleurs, le sixième atelier consacré au bilan des activités du GESAMP BWWG a été organisé afin d'examiner la méthode d'évaluation des propositions soumises par le secteur. Au cours de la période à venir, le Groupe de travail continuera de mettre au point la méthode approuvée en vue de sa publication dans la série Rapports et études du GESAMP.

0.4 **Groupe de travail sur les métaux (anciennement Groupe de travail sur le mercure) (Groupe de travail 37)** : le Groupe de travail 37 n'a mené aucune activité depuis qu'il a achevé son rapport préliminaire au PNUE, consacré au mercure en milieu aquatique : sources, rejets, transport et contrôle, en 2011. Le GESAMP a décidé qu'il fallait s'efforcer de finaliser le rapport en attente.

0.5 **Dépôts atmosphériques de produits chimiques dans l'océan (Groupe de travail 38)** : depuis sa création, le Groupe de travail 38 a publié cinq documents scientifiques dans des revues à comité de lecture. Au cours d'un atelier organisé en février 2013, il a commencé à travailler sur neuf autres documents scientifiques. Depuis lors, un document a été publié et un autre a été soumis aux fins de sa publication. Les sept documents restants en sont à différents stades d'élaboration. Il a été décidé que le Groupe de travail consacrerait ses travaux de l'année suivante à achever tous les documents scientifiques en cours, mais aussi à développer d'éventuelles nouvelles activités pour l'avenir. Le GESAMP a noté en outre que le Groupe de travail avait tenu une session spéciale au cours de la réunion de l'Union européenne des géosciences, organisée à Vienne (Autriche) en avril 2014, pendant laquelle 20 documents au total avaient été soumis, dont 13 par des membres du Groupe.

0.6 **Tendances mondiales en matière de pollution des écosystèmes côtiers (Groupe de travail 39)** : ce groupe de travail a pour objectif de contribuer à réduire les atteintes aux écosystèmes côtiers en offrant aux parties prenantes, aux scientifiques et à la société une évaluation objective, au niveau mondial, des tendances en matière de pollution enregistrées au cours du siècle dernier dans les écosystèmes côtiers vulnérables. Le Groupe de travail 39 a poursuivi ses travaux de documentation et de compilation d'une base de données de notices bibliographiques. Il a également mis au point une plate forme Internet pilote afin de stocker et de gérer les renseignements contenus dans cette base de données. La deuxième réunion du Groupe de travail s'est tenue au Laboratoire d'étude du milieu marin de l'AIEA, à Monaco, en mai 2014. Le GESAMP a noté qu'il fallait finir de numériser les chiffres des profils clés issus des documents dans la base de données. Il a été décidé que les organismes chefs de file recherchaient des financements appropriés afin de pouvoir mettre en œuvre les activités du Groupe de travail en suspens pendant l'intersession, la date d'achèvement

des travaux dépendant toutefois de la disponibilité de fonds.

0.7 Évaluation mondiale des microplastiques (Groupe de travail 40) : le GESAMP a constitué un groupe de travail chargé d'étudier les dépôts, les niveaux, la répartition et le devenir des microplastiques dans l'océan et, éventuellement, le rôle des microplastiques comme voies d'entrée des toxiques bioaccumulables persistants dans les réseaux alimentaires marins. Depuis la quarantième session du GESAMP, ce groupe de travail a tenu sa troisième et dernière réunion, du 8 au 10 juillet 2014, et son rapport définitif est presque achevé. Il a été noté que le Groupe de travail 40 avait continué de promouvoir les liens avec d'autres initiatives, y compris le projet de grande envergure mené par le FEM en ce qui concerne l'évaluation des eaux transfrontalières, les travaux de la Commission baleinière internationale et le Partenariat mondial sur les déchets marins. Il a été noté également que de remarquables progrès avaient été accomplis à cet égard et que, lors la première session de l'Assemblée des Nations Unies pour l'environnement, tenue du 23 au 27 juin 2014, il avait été proposé d'effectuer d'autres travaux en se fondant sur les résultats des travaux du Groupe de travail. Le GESAMP a étudié les options possibles pour soit élargir le mandat actuel du Groupe de travail 40, soit constituer un nouveau groupe de travail. Il a été jugé judicieux de s'appuyer sur l'expérience et les membres actuels du Groupe, dans la mesure du possible, plutôt que de constituer un nouveau groupe de travail. Le GESAMP a donc proposé de modifier le mandat du Groupe de travail 40 pour répondre à la demande de l'Assemblée des Nations Unies pour l'environnement.

0.8 Contribution au Mécanisme périodique de l'ONU : le GESAMP a noté les progrès qui avaient été réalisés dans la préparation de la première évaluation mondiale des océans, a rappelé son engagement en faveur du Mécanisme périodique et s'est déclaré prêt à aider les organismes participants qui avaient besoin d'une assistance eu égard à l'examen par des pairs.

0.9 Programme d'évaluation des eaux transfrontalières : le GESAMP participe au Programme d'évaluation des eaux transfrontalières mené sous l'égide du FEM depuis sa création. Pendant l'intersession, le Groupe d'étude du GESAMP qui avait été constitué pour établir une évaluation révisée de la pollution en haute mer a achevé son rapport, lequel a fait l'objet d'un examen par des pairs internes et externes et est désormais en attente de mise au point définitive. Le GESAMP a également noté que d'autres contributions avaient été apportées au Programme, par l'intermédiaire du Président, par exemple l'évaluation des débris flottants en haute mer et dans les grands écosystèmes marins, l'examen des contaminants associés aux grains de résine plastique et la mise au point d'une méthode de regroupement des grands écosystèmes marins en fonction du degré de dégradation de l'environnement.

0.10 Manifestation parallèle consacrée aux sources et effets du bruit causé par les activités maritimes (3 septembre 2014) : le GESAMP et l'OMI ont organisé une manifestation parallèle spéciale, qui a été accueillie par l'UMM. Y ont participé quelque 50 personnes, dont cinq intervenants qui ont présen-

té des exposés sur divers aspects du bruit dans le milieu marin. Le GESAMP a estimé que cette question intéressait ses travaux et entrainait dans le cadre de son mandat et il a pris note des progrès qui avaient été faits au sein de diverses instances internationales. Il a décidé de suivre attentivement la question et les faits nouveaux à cet égard.

0.11 Identification des nouveaux enjeux en matière de dégradation du milieu marin : plusieurs enjeux possibles ont été examinés. S'agissant de l'exploitation minière des fonds marins et des rejets d'effluents, le GESAMP a noté que les exemples les plus récents concernaient des eaux intérieures et relevaient donc de la juridiction nationale. Il a aussi reconnu que l'Autorité internationale des fonds marins était l'autorité compétente, disposant d'un mandat international pour réglementer l'exploitation minière du fond des mers et des océans ainsi que du sous sol adjacent au delà des limites de la juridiction nationale (la Zone), conformément aux dispositions de la partie XI de la Convention des Nations Unies sur le droit de la mer. En ce qui concerne les conséquences d'un changement du rapport N/P des dépôts atmosphériques dans les océans, le GESAMP a décidé d'élaborer un document décrivant la portée des travaux pendant l'intersession. Enfin, pour ce qui est de l'évaluation des services écosystémiques, il a décidé de poursuivre les débats pendant l'intersession afin de rédiger un bref document décrivant le rôle qu'il pourrait jouer dans l'examen/harmonisation des méthodes d'évaluation des services écosystémiques, qui serait ensuite diffusé aux organismes participants.

0.12 Questions concernant la portée des travaux : le GESAMP a décidé de reprendre les débats avec la Commission internationale pour l'exploration scientifique de la mer Méditerranée sur la question de la bioamplification chez les prédateurs en bout de chaîne et ses incidences écologiques et sociales, y compris la possibilité d'organiser un atelier du GESAMP consacré à la bioamplification, sous réserve de l'intérêt des organismes participants. Le GESAMP a examiné une proposition visant à constituer un groupe de travail qui serait chargé d'étudier la pertinence de la production de sous produits de la désinfection (SPD) par rapport à d'autres apports de SPD dans le milieu aquatique. Il a été noté que, à ce stade, l'engagement et les ressources financières nécessaires pour examiner plus avant les objectifs du groupe de travail faisaient défaut. Le GESAMP a étudié la question des normes de qualité de l'environnement et a noté qu'il fallait revoir la section et les liens pertinents sur son site Web. Enfin, il a noté les progrès réalisés par le Groupe de travail par correspondance sur le rejet de résidus provenant de l'exploitation des mines et d'eaux de ruissellement dans le milieu marin. Il a décidé que ce dernier devrait établir dès que possible la version définitive du document décrivant la portée des travaux, aux fins d'examen pendant l'intersession. Le Secrétariat transmettrait ensuite ce document au Groupe de travail par correspondance LC/LP afin de planifier un atelier pendant l'intersession.

КРАТКОЕ РЕЗЮМЕ

0.1 **Введение:** Объединенная группа экспертов по научным аспектам защиты морской среды (ГЕСАМП) провела свою 41-ю сессию, организованную Международной морской организацией (ИМО), во Всемирном морском университете (ВМУ) в Мальмё, Швеция, с 1 по 4 сентября 2014 года. ГЕСАМП была образована в 1969 году рядом учреждений системы Организации Объединенных Наций в качестве объединенной группы для содействия независимому междисциплинарному изучению проблем, связанных с загрязнением моря и защитой окружающей среды, с целью предотвращения дублирования усилий, предпринимаемых в рамках системы Организации Объединенных Наций. Основные вопросы, рассмотренные на указанной сессии, приведены ниже. ГЕСАМП продолжает функционировать в значительной мере через свои рабочие группы, которые могут напрямую финансироваться учреждениями ООН в соответствии с их научными потребностями, либо в сотрудничестве с партнерами. Кроме того, внимание к актуальным и наиболее острым вопросам позволяет привлечь Программу ГЕСАМП по новым и возникающим проблемам, реализуемая на основе смешанного или внешнего финансирования, самым недавним примером чего является создание рабочей группы по микропластикам. И в том и в другом случае требуется устойчивое и предсказуемое финансирование, и его обеспечение остается одной из сложных задач, стоящих перед ГЕСАМП и ее Исполнительным комитетом.

0.2 **Оценка рисков, связанных с перевозкой вредных веществ на судах (РГ 1):** По просьбе ИМО данная рабочая группа (РГ) осуществляет оценку опасности, которую представляют жидкие химические грузы, перевозимые на судах наливом, для окружающей среды и здоровья человека; причем к настоящему времени разработано 900 профилей опасности. Профиль опасности представляет собой уникальный идентификатор каждого вещества, содержащий информацию по 13 различным критериям опасности, касающимся здоровья человека, окружающей среды и физико-химических свойств. Со времени 40-й сессии ГЕСАМП РГ 1 провела одно заседание, на котором были рассмотрены 11 новых веществ с точки зрения необходимости разработки для них полных профилей опасности ГЕСАМП. Кроме того, была произведена переоценка еще шести веществ. Вместе с тем в настоящее время осуществляется обзор и упорядочение информации, содержащейся в базе данных РГ, в результате чего в некоторые из существующих профилей был внесен ряд уточнений и поправок. Данный обзор, выполняемый в настоящее время Секретариатом ГЕСАМП, который передает любую новую информацию РГ для соответствующей оценки, будет продолжаться до тех пор, пока все ранее составленные файлы не будут надлежащим образом рассмотрены, а профили опасности не будут подтверждены и/или уточнены. ГЕСАМП постановила, что существует необходимость принять меры к распространению информации о работе этой и ряда других РГ ГЕСАМП, и приняла решение о том, что «Сводный перечень ГЕСАМП» будет размещен на веб-сайте ГЕСАМП.

0.3 **Рассмотрение заявок на одобрение «активных веществ», предназначенных для использования в системах управления балластными водами (РГ 34):** Со времени 40-й сессии ГЕСАМП РГ 34 провела четыре заседания, в ходе которых были оценены 10 систем обработки балластных вод, и направила свои рекомендации Комитету по защите морской среды (КЗМС) ИМО. Пять из этих систем получили рекомендацию о предоставлении основного одобрения, а остальные пять – окончательного одобрения. Кроме того, состоялся шестой обзорный семинар, цель которого заключалась в анализе методологии оценки заявок, получаемых от предприятий отрасли. В предстоящий период РГ 34 продолжит подготовку одобренной ГЕСАМП методологии к публикации в серии докладов и исследований ГЕСАМП.

0.4 **Рабочая группа по металлам (ранее именуемая Рабочей группой по ртути) (РГ 37):** В рамках РГ 37 деятельность не велась, поскольку предварительный доклад РГ, подготовленный для ЮНЕП и озаглавленный Ртуть в водной среде: источники, выбросы, перенос и мониторинг, был завершен в 2011 году. Было решено продолжить работу по подготовке окончательной редакции доклада.

0.5 **Поступление химических веществ в океан из атмосферы (РГ 38):** С момента своего создания РГ опубликовала пять научных работ в рецензируемых журналах. В ходе семинара в феврале 2013 года РГ инициировала подготовку еще девяти научных статей. Впоследствии одна из них была опубликована, а еще одна представлена к публикации. Остальные семь статей находятся на разных стадиях подготовки. Было решено, что РГ 38 посвятит следующий год главным образом завершению всех находящихся в работе научных статей, а также наметит возможные новые направления деятельности на будущее. Кроме того, ГЕСАМП отметила, что РГ 38 организовала специальное заседание в ходе сессии Европейского союза наук о земле, состоявшейся в апреле 2014 года в Вене, Австрия; на заседании в общей сложности было представлено 20 научных работ, причем 13 из них – членами РГ 38.

0.6 **Определение глобальных тенденций загрязнения окружающей среды в прибрежных районах (РГ 39):** Цель данной РГ состоит в содействии уменьшению нагрузки на прибрежные экосистемы путем предоставления заинтересованным сторонам, ученым и обществу в целом объективной оценки глобальных тенденций загрязнения уязвимых прибрежных экосистем за последнее столетие. РГ продолжает свою работу по обзору публикаций и составлению базы библиографических данных. Кроме того, была разработана пилотная версия веб-платформы для хранения содержащейся в базе данных информации и управления ею. Второе совещание РГ 39 было проведено в Лабораториях окружающей среды МАГАТЭ в Монако в мае 2014 года. ГЕСАМП отметила необходимость в завершении оцифровки данных основных профилей, которые содержатся в документах, вошедших в базу данных. Было решено, что ведущие учреждения займутся поиском соответствующего финансиру-

вания для выполнения предстоящих работ РГ 39 в межсессионный период. Однако сроки завершения работ будут зависеть от наличия средств.

0.7 Глобальная оценка (микро)пластиков (РГ 40): 38-я сессия ГЕСАМП создала данную РГ для изучения путей поступления, объемов, распространения и поведения микропластиков в океане, а также, возможно, роли микропластиков в качестве канала, по которому стойкие, биологически накапливающиеся и токсичные вещества могут попадать в морские пищевые цепи. Со времени 40-й сессии ГЕСАМП РГ провела свое третье и последнее заседание в период с 8 по 10 июля 2014 года, и работа над итоговым докладом РГ близится к завершению. Было также отмечено, что РГ продолжала налаживать связи с другими инициативами, включая крупномасштабный проект ГЭФ по оценке трансграничных вод, Международную китобойную комиссию, а также Глобальное партнерство по морскому мусору. ГЕСАМП отметила превосходные результаты проделанной работы, а также недавние обсуждения на состоявшейся с 23 по 27 июня 2014 года первой сессии Ассамблеи Организации Объединенных Наций по окружающей среде (АООНОС), в ходе которой было предложено продолжить работу в развитие итогов деятельности РГ. Группа обсудила возможность продления срока полномочий РГ 40 либо создания новой РГ. Было решено, что, если это возможно, было бы целесообразно воспользоваться существующим опытом и членским составом, а не создавать совершенно новую РГ. Вследствие этого ГЕСАМП предложила продлить полномочия РГ 40 в ответ на просьбу АООНОС.

0.8 Вклад в «Регулярный процесс» Организации Объединенных Наций (РП ООН): ГЕСАМП отметила прогресс в подготовке Первой оценки состояния Мирового океана (WOA), подтвердила свою приверженность поддержке Регулярного процесса и выразила готовность оказать помощь в организации процесса экспертной оценки тем организациям-спонсорам, которым она требуется.

0.9 Программа оценки трансграничных вод (ТВАР): ГЕСАМП принимает участие в финансируемой ГЭФ Программе оценки трансграничных вод (ТВАР) с момента ее создания. В межсессионный период целевая группа ГЕСАМП, созданная для подготовки пересмотренной оценки загрязнения окружающей среды в открытом океане, завершила свой доклад, который прошел внутреннюю и внешнюю экспертизу, и в настоящее время ожидает подготовки окончательной редакции. ГЕСАМП также отметила, что под руководством Председателя в программу ТВАР был внесен дополнительный вклад, выразившийся в проведении оценки плавучего мусора в океане и крупных морских экосистемах и обзора загрязнителей, связанных с гранулированными пластичными полимерами, а также в разработке методологии объединения КМЭ в группы в соответствии со степенью ухудшения состояния окружающей среды.

0.10 Параллельное мероприятие «Морская деятельность и шум: источники и воздействия», 3 сентября 2014 года: ГЕСАМП и ИМО организовали специальное параллельное мероприятие, принимающей стороной которого выступил ВМУ. На заседании присутствовало около 50 человек, пять докладчиков провели презентации по различным

аспектам шума в морской среде. ГЕСАМП постановила, что данный вопрос представляет интерес и входит в сферу ее полномочий, а также отметила прогресс, достигнутый в этой области на различных международных форумах. Было решено, что ГЕСАМП возьмет этот вопрос под контроль и будет наблюдать за дальнейшим развитием событий.

0.11 Выявление новых и возникающих проблем, касающихся ухудшения состояния морской среды: Был обсужден ряд возможных проблем. По вопросу разработки ресурсов морского дна и сброса сточных вод ГЕСАМП отметила, что в наиболее явной форме эти проблемы наблюдаются во внутренних водах и поэтому относятся к сфере национальной юрисдикции. Было также признано, что Международный орган по морскому дну (МОМД) является компетентной организацией с международным мандатом в области регулирования разработки ресурсов дна морей и океанов и его недр за пределами национальной юрисдикции (Район) согласно Части XI ЮНКЛОС. В межсессионный период ГЕСАМП решила разработать документ, определяющий масштабы такой проблемы, как влияние изменения отношения азота к фосфору в атмосферных осадениях в океане. В заключение, по вопросу об оценке экосистемных услуг ГЕСАМП решила продолжить обсуждение в межсессионный период с целью подготовки краткого документа о потенциальной роли ГЕСАМП в рассмотрении/гармонизации методологий оценки экосистемных услуг. Впоследствии документ будет разослан организациям-спонсорам.

0.12 Вопросы, находящиеся в стадии предварительной проработки: ГЕСАМП согласилась возобновить обсуждения с МКНИСМ по вопросу биомагнификации у высших хищников и ее экологических и социальных последствий, включая возможность организации семинара ГЕСАМП по биомагнификации при условии заинтересованности организаций-спонсоров. ГЕСАМП рассмотрела предложение о создании РГ по оценке значимости образования побочных продуктов дезинфекции (ППД) в сравнении с другими каналами поступления ППД в водную среду. Было отмечено, что в настоящее время уровень заинтересованности и объем финансовых ресурсов, необходимые для дальнейших работ по выполнению задач РГ, являются недостаточными. ГЕСАМП обсудила вопрос о стандартах качества окружающей среды (EQS) и отметила необходимость обновления соответствующего раздела и ссылок на веб-сайте ГЕСАМП. В заключение, ГЕСАМП приняла к сведению прогресс, достигнутый корреспондентской группой по сбросу шахтных отходов и береговых стоков в морскую среду. ГЕСАМП постановила, что корреспондентская группа должна как можно скорее завершить доклад по оценке объемов предстоящих работ для его рассмотрения ГЕСАМП в межсессионный период. Данный доклад затем будет передан Секретариатом корреспондентской группе ЛК/ЛП с целью планирования проведения рабочего совещания в межсессионный период.

RESUMEN EJECUTIVO

0.1 **Introducción:** El Grupo mixto de expertos sobre los aspectos científicos de la protección del medio marino (GESAMP) celebró su 41ª reunión, organizada por la Organización Marítima Internacional (OMI), en la Universidad Marítima Mundial (UMM), en Malmö (Suecia), del 1 al 4 de septiembre de 2014. Varias organizaciones de las Naciones Unidas establecieron el GESAMP en 1969 como grupo mixto para alentar el examen independiente e interdisciplinario de los problemas de la contaminación marina y la protección del medio ambiente, con miras a evitar la duplicación de esfuerzos en el sistema de las Naciones Unidas. Los principales temas examinados en esta reunión se describen a continuación. El GESAMP sigue funcionando principalmente por conducto de sus grupos de trabajo, que los organismos de las Naciones Unidas pueden patrocinar directamente en respuesta a sus necesidades científicas, o en colaboración con socios. También puede plantearse el examen de cuestiones temáticas y urgentes por conducto del Programa de cuestiones nuevas e incipientes del GESAMP con financiación mixta o externa. El ejemplo más reciente es el del Grupo de trabajo sobre microplásticos. En todo caso, se requiere una financiación sostenida y previsible, lo cual sigue siendo una preocupación del GESAMP y de su Comité Ejecutivo.

0.2 **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 para el medio ambiente y la salud humana de los productos químicos líquidos a granel transportados por buques, y actualmente se dispone de unos 900 perfiles de riesgo. Dichos perfiles contienen una huella singular de cada sustancia, que suministra información sobre 13 criterios distintos de peligro ambiental, fisicoquímico y sobre la salud humana. El Grupo de trabajo 1 se ha reunido en una ocasión desde el GESAMP 40, y ha evaluado 11 nuevas sustancias para asignarles un perfil de riesgo completo. Además, volvieron a evaluarse otras seis sustancias y se está llevando a cabo un examen y una refundición de la información recogida en la base de datos del Grupo de trabajo, lo que ha dado lugar a una serie de actualizaciones y enmiendas de algunos de los perfiles existentes. Este ejercicio de examen, que actualmente lleva a cabo la Secretaría del GESAMP, junto con toda nueva información presentada al Grupo de trabajo para un examen adecuado, continuará hasta que se hayan examinado debidamente todos los archivos históricos y se hayan verificado y/o enmendado los perfiles de riesgo. El GESAMP acordó que era necesario mejorar la visibilidad de este grupo de trabajo, así como la de otros grupos de trabajo del GESAMP, y decidió que la lista refundida del GESAMP se publicaría en el sitio del GESAMP en la Red.

0.3 **Examen de solicitudes de aprobación de "sustancias activas" para su utilización en los sistemas de gestión del agua de lastre (Grupo de trabajo 34):** El Grupo de trabajo 34 se reunió cuatro veces desde el GESAMP 40, evaluó 10 sistemas de gestión del agua de lastre y presentó sus recomendaciones al Comité de protección del medio marino (MEPC) de

la OMI. Cinco de esos sistemas fueron objeto de una recomendación de aprobación inicial y otros cinco de una recomendación de aprobación definitiva. Además, se celebró el sexto taller anual de evaluación en el que se examinó la metodología de evaluación de las solicitudes recibidas del sector. Próximamente, el Grupo de trabajo 34 continuará preparando la metodología aprobada del GESAMP para la publicación en la serie *GESAMP Reports and Studies*.

0.4 **Grupo de trabajo sobre metales (anteriormente mercurio) (Grupo de trabajo 37):** No ha habido ninguna actividad con respecto a este grupo desde que se finalizó el informe preliminar del Grupo de trabajo 37 para el PNUMA, titulado "Mercurio en el Medio Marino: Fuentes, Descargas, Transporte y Vigilancia", en 2011. Se acordó que el Grupo continuaría su labor para finalizar el informe pendiente.

0.5 **Aportación atmosférica de sustancias químicas a los océanos (Grupo de trabajo 38):** Desde su creación, el Grupo de trabajo ha publicado cinco artículos científicos en revistas revisadas por pares. Durante un cursillo celebrado en febrero de 2013 el Grupo de trabajo inició la elaboración de otros nueve artículos científicos. Desde entonces uno de ellos se ha publicado y otro se ha presentado para su publicación. Los siete artículos restantes se encuentran en distintas fases de preparación. Se decidió que el Grupo de trabajo 38 dedicaría principalmente el próximo año a completar todos los artículos científicos actuales, pero también a elaborar posibles actividades nuevas para el futuro. Además, el GESAMP tomó nota de que el Grupo de trabajo 38 había organizado una reunión especial durante la reunión de la Unión Europea de Geociencias, celebrada en Viena (Austria) en abril de 2014, en la que el Grupo de trabajo 38 había presentado 13 de los 20 artículos examinados.

0.6 **Determinación de tendencias en la contaminación del medio ambiente costero a nivel mundial (Grupo de trabajo 39):** La finalidad de este grupo de trabajo es contribuir a mitigar las presiones sobre el ecosistema costero suministrando a los interesados, los científicos y la sociedad una evaluación objetiva a nivel mundial de las tendencias en materia de contaminación en el último siglo en los ecosistemas costeros sensibles. El Grupo de trabajo ha continuado su trabajo de estudio de la documentación y compilación de una base de datos de registros bibliográficos. Además, se ha desarrollado una plataforma web piloto con el objetivo de albergar y gestionar la información contenida en la base de datos. La segunda reunión del Grupo de trabajo 39 se celebró en el Laboratorio para el Medio Ambiente Marino del OIEA en Mónaco, en mayo de 2014. El GESAMP tomó nota de que era necesario llevar a cabo la digitalización de las figuras de perfil básico de los artículos en la base de datos. Se acordó que los organismos dirigentes recabarían la financiación adecuada para implantar las actividades pendientes del Grupo de trabajo 39 durante el lapso interperiodos. No obstante, el plazo para finalizar la labor dependería de la disponibilidad de fondos.

0.7 Evaluación mundial de los microplásticos (Grupo de trabajo 40): En el GESAMP 38 se constituyó este nuevo Grupo de trabajo sobre deposiciones, niveles, distribución y destino de los microplásticos en el océano, y el posible papel de éstos como vector en el transporte de sustancias tóxicas, persistentes y bioacumulables que ingresan en las redes alimentarias marinas. Después del GESAMP 40 el Grupo de trabajo celebró su tercera y última reunión, del 8 al 10 de julio de 2014, cuyo informe definitivo está a punto de finalizarse. También se tomó nota de que el Grupo de trabajo había seguido estableciendo vínculos con otras iniciativas, como el proyecto completo del FMAM sobre la evaluación de las aguas transfronterizas, la labor de la Comisión Ballenera Internacional, así como la Alianza Mundial sobre la Basura Marina. El GESAMP tomó nota del excelente progreso realizado, así como de las recientes deliberaciones en el 1º periodo de sesiones de la Asamblea de las Naciones Unidas sobre el Medio Ambiente, celebrado del 23 al 27 de junio de 2014, en el que propuso seguir adelante con la labor basándose en los resultados del Grupo de trabajo. El Grupo examinó varias opciones posibles para ampliar el mandato actual del Grupo de trabajo 40 o constituir un nuevo grupo de trabajo. Se acordó que, de ser posible, convendría basarse en la experiencia y los miembros actuales en vez de constituir un grupo de trabajo completamente nuevo. Por consiguiente, el GESAMP propuso que se enmendara el mandato del Grupo de trabajo 40 a fin de atender a la petición de la Asamblea de las Naciones Unidas sobre el Medio Ambiente.

0.8 Contribución al “proceso ordinario” de las Naciones Unidas: El GESAMP tomó nota del progreso realizado con respecto a la preparación de la primera Evaluación Mundial de los Océanos y reiteró su compromiso para apoyar el proceso ordinario y se declaró dispuesto a ayudar a las organizaciones patrocinadoras que necesiten apoyo en el proceso de revisión por pares.

0.9 Programa de evaluación de las aguas transfronterizas: el GESAMP ha participado en el programa de evaluación de las aguas transfronterizas, patrocinado por el FMAM, desde su creación. Durante el lapso interperiodos el equipo de tareas del GESAMP creado para producir una evaluación revisada de “contaminación en el mar abierto” finalizó su informe, que fue objeto de una revisión por pares interna y externa y se encuentra actualmente en espera de una edición final. El GESAMP también tomó nota de las contribuciones adicionales al Programa, organizadas por conducto del Presidente, entre las que se incluyen la producción de una evaluación de la basura flotante en el mar y en los grandes ecosistemas marinos, un examen de los contaminantes vinculados a las bolitas de resina de plástico y el diseño de una metodología para grupos de grandes ecosistemas marinos en función del grado de degradación ambiental.

0.10 Evento paralelo sobre “actividades marítimas y ruido: fuentes y efectos”, 3 de septiembre de 2014: el GESAMP y la OMI organizaron un evento paralelo especial auspiciado por la UMM. Aproximadamente 50 personas asistieron a esta reunión, en la que cinco miembros del panel presentaron ponencias sobre varios aspectos del ruido en el medio marino. El GESAMP acordó que se trataba de una cuestión importante y de interés para su mandato, y

también tomó nota del progreso realizado en varios foros internacionales. Se acordó que el GESAMP seguiría de cerca la labor a este respecto y observaría las novedades que surgieran.

0.11 Identificación de aspectos nuevos respecto de la degradación del medio marino: se examinaron varias cuestiones. Por lo que respecta a la explotación minera de los fondos marinos y la descarga de efluentes, el GESAMP tomó nota de que en la mayoría de los casos disponibles se trataba de aguas internas y por lo tanto bajo la jurisdicción nacional. También se reconoció que la Autoridad Internacional de los Fondos Marinos es la autoridad competente, con un mandato internacional para regular la explotación minera de los fondos marinos y oceánicos y su subsuelo fuera de los límites de la jurisdicción nacional (la zona), de conformidad con lo dispuesto en la parte XI de la CONVEMAR. En cuanto a los efectos de cambiar la proporción de N/P en la deposición atmosférica en el mar, el GESAMP acordó elaborar un estudio preliminar durante el lapso interperiodos. Por último, respecto de la valoración de los servicios de los ecosistemas, el GESAMP acordó seguir deliberando durante el lapso interperiodos a fin de elaborar un documento breve para definir la posible función del GESAMP en el examen/armonización de las metodologías para la valoración de los servicios de los ecosistemas. Este documento se distribuirá a las organizaciones patrocinadoras.

0.12 Asuntos en fase preliminar: el GESAMP acordó reanudar sus deliberaciones con la CIESM sobre la cuestión de la biomagnificación en los depredadores que se encuentran en lo más alto de la cadena alimentaria y sus repercusiones ecológicas y sociales, incluida la posibilidad de organizar un cursillo del GESAMP sobre la biomagnificación, a reserva de que las organizaciones patrocinadoras estén interesadas. El GESAMP examinó una propuesta para constituir un grupo de trabajo sobre la pertinencia de la producción de los subproductos de la desinfección en relación con la presencia de otros subproductos de la desinfección en el medio acuático. Se tomó nota de que en ese momento no se disponía del compromiso y los recursos financieros necesarios para seguir adelante con los objetivos del Grupo de trabajo. El GESAMP deliberó sobre la cuestión de las normas de calidad ambiental (EQS) y tomó nota de que era necesario examinar la sección y los vínculos sobre esta cuestión en el sitio del GESAMP en la Red. Por último, el GESAMP tomó nota del progreso realizado por el Grupo de trabajo por correspondencia sobre la descarga de desechos de minería y la escorrentía costera en el medio marino. El GESAMP acordó que el Grupo de trabajo por correspondencia terminaría el estudio preliminar lo antes posible a fin de que el GESAMP lo examinara durante el lapso interperiodos. Posteriormente, la Secretaría remitiría el estudio preliminar al Grupo de trabajo por correspondencia LC/LP, con miras a programar un cursillo durante el lapso interperiodos.

1 INTRODUCTION

1.1 The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) held its 41st session from 1 to 4 September 2014 in Malmö, Sweden, hosted by the International Maritime Organization (IMO) at the World Maritime University (WMU). The session was held under the Chairmanship of Dr. Peter Kershaw, with Dr. Manmohan Sarin as Vice-Chairman. The session was preceded by the GESAMP Executive Committee (ExCom) meeting and

GESAMP Members' informal meeting both held on 1 September 2014.

Adoption of the agenda

1.2 The meeting approved the provisional agenda. The agenda for the 41st session is attached as Annex I to this report. The list of documents submitted to this session is shown in Annex II to this report and the list of participants in Annex III.

2 REPORT OF THE CHAIRMAN OF GESAMP

2.1 The Chairman expressed his thanks to IMO and WMU, the host of the 41st session of GESAMP, for their hospitality, and in particular Ms. Mia Hedin for the organization of the session.

2.2 The Chairman reported that GESAMP had been very active in the period since the 40th Session in September 2013 in spite of continuing difficulties in securing funding to cover support for the GESAMP Office, and pursued some of the emerging issues already identified.

2.3 The main focus has been on the planned activities of the Working Groups. Continuing support from the UN Sponsoring Organizations, supplemented with funding from other sources, is essential to allow this core work to continue and deliver high quality outputs that are appreciated by the target audience and a much wider user-group. The support from the UN Sponsoring Organizations is greatly appreciated and GESAMP urges that this level of support should be maintained and, if at all possible, increased. The independence, credibility and cost-effectiveness of the GESAMP model are well recognized.

Correspondence groups

2.4 In recent years inter-sessional correspondence groups have addressed several important issues, to help evaluate whether some of these are areas GESAMP may wish to develop further. These include: i) the effects of hypoxia, including possible endocrine effects; ii) bio-magnification of contaminants and potential effects on ecosystem and human health; iii) the potential impact of disinfection by-products (DBP) in the marine environment; and (iv) the impacts of mine tailings in the marine environment. Of these, a proposal for a new working group on DBP was developed and circulated to ExCom in the inter-sessional period, to ascertain the level of interest in supporting this initiative. There has also been some discussion to re-consider the option of holding a scoping workshop on bio-magnification in Monaco, and inviting FAO, WHO and other organizations to participate. Both issues are further discussed under item 7.

GESAMP Office

2.5 Ad hoc requests for GESAMP advice or support have been steadily increasing in recent years, and this trend has continued since the 40th Session. Requests range widely in topic area, the age of the enquirer, the degree of sophistication of the query and the level of effort required to deal with them. They range from enquiries from children conducting school projects to detailed questions about the bulk transport of chemicals, BWMS and the effectiveness of marine litter retrieval devices. It is encouraging to see that GESAMP is seen as a source of reliable information and advice, but each enquiry takes time to respond to and this puts an additional load on the GESAMP Office and the GESAMP Chairman.

2.6 Efforts to secure a GESAMP Officer have continued but have not yet been successful. It is beyond doubt that a full-time Officer would be very helpful to: assist in the running of the Office; help to organize workshops and meetings; deal with routine enquiries; maintain and update the website; and improve communications with ExCom, the Pool of Experts (PoE), GESAMP Members and third parties. Several enquiries have been received from early-stage professionals wishing to work in the GESAMP Office. This is encouraging but cannot be taken further without a dependable funding source, either from the Sponsoring Organizations or other sources.

2.7 GESAMP risks losing the momentum of setting up the PoE because of a lack of resources to maintain the website and the PoE application process. Several queries have been received from PoE members about their continuing involvement, and there have been several offers from well-qualified scientists to take part. But it is difficult to respond adequately in the present circumstances.

GESAMP and the wider international community

2.8 The Chairman represented GESAMP at the Annual Science Conference of the North Pacific Marine Science Association (PICES) for the fifth successive

year. The 2013 Conference took place in Nanaimo, Vancouver Island Canada. The main contributions were made through the Marine Environmental Quality Committee (MEQ), covering issues such as marine litter and marine radioactivity after Fukushima. MEQ have set up a Study Group on emerging issues, which complements GESAMP's Emerging Issues programme. The Chairman is one of the conveners of a special session on marine litter planned for the 2014 meeting in Korea.

2.9 The Chairman represented GESAMP at the inaugural meeting of the Ocean Acidification International Reference User Group (RUG), held at the Oceanographic Museum in Monaco. For further information see <http://www.iaea.org/ocean-acidification/page.php?page=2198>. The RUG is chaired by Dan Laffoley of the IUCN, and is supported by Prince Albert of Monaco. The IAEA Environment Laboratories hosts the Ocean Acidification International Coordination Centre.

2.10 The Chairman was invited to give two presentations at the UNEP Global Land Ocean Conference in Jamaica (GLOC-2) on the themes of marine litter and indicators.

2.11 The Chairman has been advising UNEP DEWA on the design and implementation of the Global Partnership on Marine Litter (GPML), and potential further work GESAMP might be asked to undertake in the area on marine plastics and microplastics.

2.12 GESAMP continues to be recognized as a source of reliable and impartial science assessment and advice. This accolade can only be maintained if

there is sufficient support and financial backing to provide a vibrant programme, providing a cost-effective service for the Agencies and responding to requests from external bodies to contribute GESAMP experience and expertise. GESAMP noted that there appear to be two components to ensuring GESAMP can thrive: i) for the Agencies to commit to supporting GESAMP both in terms of sponsoring Members to attend the annual Session and offering financial support for working group and other ad hoc activities; and ii) to pursue partnerships between UN entities and external funding bodies such as industry, Foundations, intergovernmental bodies, national governments and NGOs.

Action taken by GESAMP

2.13 In the ensuing discussion, GESAMP agreed that there is a need to communicate its activities and achievements better, both to the wider community and those with a more immediate interest in its mandate. This could include emailing GESAMP reports and documents to the Pool of Experts, as well as to all members of GESAMP Working Groups. It was requested that information from the GESAMP Office should be forwarded by the Working Group Chairs to their respective WG members, and that the GESAMP Office would provide all WG Chairs and the ExCom with the template Powerpoint presentation on GESAMP, as well as any other information that may be used for outreach purposes.

2.14 It was further agreed that the Chairman and WG Chairmen would assist the GESAMP Office in the review of the Pool of Experts.

3 REPORT OF THE ADMINISTRATIVE SECRETARY OF GESAMP

Outcome of the meeting of the Executive Committee of GESAMP (ExCom)

3.1 GESAMP noted that ExCom met on Monday, 1 September 2014. The main points of discussion are shown in paragraphs 3.2 to 3.5 below.

Funding

3.2 ExCom discussed the financial and in-kind support, which the nine UN Sponsoring Organizations of GESAMP committed to support the activities of GESAMP in 2014-2015. ExCom noted that the Sponsoring Organizations present intended to continue their support to the level of the previous years.

Governance

3.3 ExCom noted that the issue of institutional arrangements had been discussed at several previous ExCom meetings, and that GESAMP currently operates under an MOU, which was most recently updated in 1994. In light of the fact that not all Sponsoring Organizations were in attendance, it was agreed to

postpone any further discussions on revisions or updating of the MOU, and the ExCom agreed to continue operating under the current arrangements.

Activities and achievements of the Sponsoring Organizations of GESAMP since 2013

3.4 GESAMP considered the Administrative Secretary's report (GESAMP 41/3). The Administrative Secretary also presented an overview of the activities and achievements of the Sponsoring Organizations of GESAMP. The highlights of these achievements are reported in detail in Annex IV to this report.

3.5 The Administrative Secretary informed the meeting of the latest developments in the GESAMP Office, which was established at IMO as a co-sponsoring arrangement between the current Sponsoring Organizations. GESAMP noted the ongoing efforts to increase the staff compliment, including through the advertising of a position as an Associate Professional Officer assigned to the GESAMP Office. The main activities of the GESAMP Office were reported and GESAMP took note of these developments.

4 PLANNING OF GESAMP ACTIVITIES

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

4.1.1 A report of the activities of WG 1 was given by Dr. Thomas Höfer, Chairman of the Working Group (WG).

4.1.2 GESAMP noted that since its last session, Working Group 1 has met once (EHS 51). The meeting was held at the Centre of Documentation, Research and Experimentation on Accidental Water Pollution (Cedre), Brest, France, in an attempt to embed into the standardized routine work of the Working Group 1 ongoing scientific research related to this work and practical use of the GESAMP hazard evaluations.

4.1.3 After the retirement of Dr. Tim Bowmer who chaired the Group during the past 16 years, the Working Group met under the chairmanship of Dr. Thomas Höfer. The group recalled how Dr. Bowmer had guided it through a wide range of challenging tasks that had resulted in a considerable number of achievements under his leadership, notably the revision of the GESAMP Hazard Evaluation Procedure, which had been finalized and published as GESAMP Reports & Studies No.64 in 2002. During his tenure, more than 850 chemicals had been re-evaluated according to this established procedure within a relatively short period of several years, covering more than a million data points. The group expressed its gratitude for his untiring efforts and dedication to the work of the group over nearly 20 years.

4.1.4 As part of the routine work of the Group, 11 new substances were reviewed in order to assign full GESAMP Hazard Profiles. Based on correspondence with industry, 6 additional substances were re-evaluated. In addition to the evaluation of new substances, there is an ongoing review and consolidation of information held in the GESAMP/EHS database that has resulted in a series of updates and amendments to some existing profiles. This review exercise, currently being undertaken by the GESAMP Secretariat, with any new information then submitted to GESAMP/EHS for appropriate assessment, will continue until all the historical files have been duly reviewed and the hazard profiles verified and/or amended.

4.1.5 GESAMP 40 noted that the Working Group drafted a first version for a 2nd edition of Reports and Studies No.64. The draft had been approved at the 40th session (GESAMP 40/5/4). Before the 51st session of the Working Group this first draft had been circulated to the members for final proof reading. Based on minor corrections and editorial amendments, after the meeting the secretariat prepared this final version for printing. The 2nd edition of Reports and Studies No.64 should be published via IMO Publishing Service in 2014.

4.1.6 During some years, the WG encountered difficulties in recruiting senior scientists to effectively sustain the expertise levels within the Group. Attempts to involve experts from developing countries resulted in varying degrees of success. Two candidates for membership joined this session. These could consolidate the expertise in aquatic toxicology and in mammalian toxicology.

For the upcoming meetings, efforts will be made to attract further suitable candidates in all three main areas of competence: (1) aquatic toxicology (including bioaccumulation and biodegradation), (2) mammalian toxicology, and (3) behaviour of chemicals in the sea.

4.1.7 To enhance the visibility of the WG 1 in communities being involved in marine science and marine environmental protection, the output of the WG (the yearly reports and the GESAMP Composite List), the potential utility of the GESAMP hazard profiles, and the competence of its membership should be better presented on internet via www.gesamp.org. This could also support recruitment efforts.

Action taken by GESAMP

4.1.8 GESAMP agreed that there is a need to improve the visibility of this WG, as well as several of the other GESAMP WGs. It was therefore decided the 'GESAMP Composite List' would be made available on the GESAMP website. It was also decided that all WG Chairs would review the contents of the pages for their respective WGs on the GESAMP website, and submit proposed revisions to the GESAMP Office.

4.2 Review of applications for 'active substances' to be used in Ballast Water Management systems (WG 34)

4.2.1 A report of the activities of WG 34 was given by Dr. Jan Linders, Chairman of the Working Group.

4.2.2 It was noted that 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. To date, 10 August 2014, 40 countries have ratified the BWM Convention, and the required minimum number is 30. These countries represent 30.25% of the required 35% of the world's tonnage. Therefore, the second criterion has not yet been met. Nevertheless, there is good hope that the Convention will enter into force soon.

4.2.3 Within this framework, an approval procedure has been set up for those ballast water management systems which make use of an Active Substance or Preparation to comply with the Convention. The procedure consists of a two-step approach for granting Basic Approval and Final Approval. The approval is granted by the Marine Environment Protection Committee (MEPC) based on the advice provided by WG 34. There is a third step, the Type of Approval, but that is outside the remit of WG 34.

4.2.4 The more general outline, scope and aim of the BWM Convention was addressed in the report to GESAMP 35 (see document GESAMP 35/5/1).

4.2.5 The report of the WG Chairman focused on the main activities of WG 34, which consists of the evaluation of several Ballast Water Management Systems

(hereafter BWMS) and the further development of the Methodology of the Group, which has been accepted as a 'living' document.

'Active Substances'

4.2.6 '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.169(57) adopted in 2008. However, not only 'Active Substances' are evaluated by WG 34. Also all other substances considered relevant are taken into account in the evaluation report. The Procedure for approval of ballast water management systems that make use of Active Substances (G9) contained in resolution MEPC.169(57) under the BWM Convention distinguishes also 'Relevant Chemicals' and 'Other Chemicals'.

4.2.7 Therefore, WG 34's task is to evaluate the risks for the crew, the ships' safety, the risk for the public at large and the environmental safety of the BWMS. It is furthermore the intention of WG 34 to perform these evaluations in a consistent and transparent manner, which helps Administrations to prepare a concise dossier, containing all the necessary data. The Methodology, as developed by WG 34 in the course of its work process, serves as guidance in the evaluation.

4.2.8 WG 34 convened four times since GESAMP 40 to evaluate proposed BWMS, and also held a stocktaking workshop to discuss items related to the Methodology in the same week as the 29th meeting of WG 34. The sixth stocktaking workshop was held shortly before GESAMP 41 and therefore will not be reported to the meeting as the report is not yet available. Some of the major results were shared with the meeting, mainly on the human exposure assessment and the development of the database of disinfection by-products commonly related to BWMS. During the WG 34 meetings, 10 BWMS were discussed and evaluated, 5 systems applied for Basic Approval (BA) and also 5 systems for Final Approval (FA). All these BWMS received a recommendation for Basic Approval and Final Approval, where appropriate. During its meetings, MEPC endorsed the pending recommendations of WG 34 in all cases and granted the approvals accordingly.

Methodology for information gathering and the conduct of work of WG 34

4.2.9 The evaluation Methodology of WG 34 has been determined to be a living document based on increasing experience in the evaluation of BWMS. During three Stocktaking Workshops (STW) WG 34 further developed the Methodology by adding:

- .1 a hierarchy in the environmental risk assessment with a higher value to the whole effluent testing during the Final Approval process;
- .2 a methodology on the determination of corrosion, as agreed with relevant organizations;

- .3 a preferred method of determination of TRO by using the colorimetric method in favor of the amperometric method; and
- .4 the potential need for additional testing in case the BWM Convention enters into force in the area of CMR screening tests.

4.2.10 GESAMP also noted the outcomes of the 5th STW, which was held from 4 to 6 September 2013, at IMO Headquarters in London. At this workshop, GESAMP was once again represented by its chairman Dr. Peter Kershaw, who attended for one day.

4.2.11 The 6th STW of WG 34 was held back-to-back with its 29th meeting from 9 to 11 July 2014. A full report of this workshop will be sent to GESAMP 42 for discussion. The main results were the update of the human health risk assessment procedure and the inclusion of 25 additional DBPs to the GESAMP-BWWG database. The database now contains physico-chemical data, toxicological data and ecotoxicological data of 41 substances. Two substances have been deleted: potassium bromate and sodium bromate. Only the substance bromate-ion remained from these three. The 6th STW was attended by Dr. Alex Baker, GESAMP Member, on behalf of GESAMP.

4.2.12 Although the deadline for the submission of BWMSs to MEPC 68 has not yet passed, WG 34 have already scheduled two meetings to accommodate future applications: BWWG 30, from 8 to 12 December 2014 and BWWG 31, from 9 to 13 February 2015. It should be noted that the number of meetings depends on the number of submissions. Both meetings will be held at IMO Headquarters in London.

4.2.13 The Chairman of WG 34 expressed his sincere thanks to all the members of GESAMP that took the time to critically review the work of WG 34. The quality of the work has been improved as a result from this peer review process, and the comments made were brought to the attention of the consultants involved in the drafting of the reports.

Action taken by GESAMP

4.2.14 GESAMP noted with satisfaction the intention of the WG 34 to publish the WG methodology in the GESAMP Reports and Studies in the forthcoming inter-sessional period of GESAMP. The publication will contain all relevant scientific approaches to determine the risks associated with BWMS with respect to the exposure of humans, the environment and property. Procedural aspects of the Methodology will not appear in the publication intended.

4.3 Expanded scientific review of mercury and its compounds and threats to the marine environment (WG 37)

4.3.1 There has been no activity of this WG since GESAMP 38, the preliminary report of the WG 37 to UNEP, entitled Mercury in the Aquatic Environment: Sources, Releases, Transport and Monitoring, was completed in 2011. The report has not been formally peer reviewed by GESAMP and it was suggested that UNEP Chemicals be contacted on the status of the report

and to identify potential funding for the report finalisation and publication. This might require the review and inclusion of the latest publications on the subject. The report has enhanced the Mercury agenda of UNEP towards a legally binding treaty and therefore effort should be put to publish it before it becomes outdated.

Action taken by GESAMP

4.3.2 The GESAMP Office will contact UNEP Chemicals to raise the issue point of the pending report and the UNIDO Technical Secretary will discuss the report with the fate and transport partnership area lead at the next session of the Global Mercury Partnership Advisory Group meeting to be held in Bangkok at the end of October 2014. It was also agreed that Dr. Kershaw and Dr. Baker will update the text by incorporating the recent results from the work of the Task Team on Open Ocean Pollution.

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

4.4.1 A report of the activities of Working Group (WG) Working Group (WG) 38 was given by Dr. Robert Duce, Co-chairman of the Working Group. WMO has continued its lead support of GESAMP to WG 38. WG 38. The Group has been very successful and scientifically productive. It has continued to deliver high level assessment and peer-reviewed publications on the atmospheric input of chemicals to the ocean, supported by WMO with additional financial support from a number of international and US-based sources (SCOR). Following the initial terms of reference (presented in GESAMP Reports and Studies No.84), and as a result of several working group meetings, five scientific papers have been published in the peer reviewed scientific literature. These are:

Okin, G., A. R. Baker, I. Tegen, N. M. Mahowald, F. J. Dentener, R. A. Duce, J. N. Galloway, K. Hunter, M. Kanakidou, N. Kubilay, J. M. Prospero, M. Sarin, V. Surapipith, M. Uematsu, T. Zhu, "Impacts of atmospheric nutrient deposition on marine productivity: roles of nitrogen, phosphorus, and iron", *Global Biogeochemical Cycles*, 25, GB2022, doi:10.1029/2010GB003858, (2011).

Hunter, K.A., P. S. Liss, V. Surapipith, F. Dentener, R. A. Duce, M. Kanakidou, N. Kubilay, N. Mahowald, G. Okin, M. Sarin, I. Tegen, M. Uematsu, and T. Zhu, "Impacts of anthropogenic SO_x, NO_x and NH₃ on acidification of coastal waters and shipping lanes", *Geophysical Research Letters*, 38, L13602, doi:10.1029/2011GL047720 (2011).

Kanakidou, M., R. Duce, J. Prospero, A. Baker, C. Benitez-Nelson F. J. Dentener, K.A. Hunter, N. Kubilay, P. S. Liss, N. Mahowald, G. Okin, M. Sarin, K. Tsigaridis, M. Uematsu, L.M. Zamora, and T. Zhu, "Atmospheric fluxes of organic N and P to the ocean", *Global Biogeochemical Cycles*, 26, GB3026, doi:10.1029/2011GB004277, (2012).

Schulz, M., J. M. Prospero, A. R. Baker, F. Dentener, L. Ickes, P. S. Liss, N. M. Mahowald, S. Nickovic, C. Pérez García-Pando, S.

Rodríguez, M. Sarin, I. Tegen, R.A. Duce, "The atmospheric transport and deposition of mineral dust to the ocean - Implications for research needs", *Environmental Science and Technology*, 46, 10,390-10,404 (2012).

Hagens, M., K.A. Hunter, P.S. Liss, and J.L. Middelburg, "Biogeochemical context impacts seawater pH changes resulting from atmospheric sulfur and nitrogen deposition", *Geophysical Research Letters*, 41, doi:10.1002/2013GL058796 (2014).

4.4.2 During and following GESAMP 39, new terms of reference for the continued work of GESAMP WG 38 were approved (see Annex V), to address issues related to the impact of the atmospheric deposition of anthropogenic nitrogen to the ocean.

4.4.3 To address these new terms of reference, a workshop on "The Atmospheric Deposition of Nitrogen and its Impact on Marine Biogeochemistry" was held at the University of East Anglia in Norwich, United Kingdom, from 11 to 14 February 2013. The proceedings of this workshop was described in some detail in the report of GESAMP 40. Nine scientific papers are being and have been developed addressing the new terms of reference. One of these nine papers has been published:

Kim, T.-W., K. Lee, R.A. Duce and P.S. Liss, "Impact of atmospheric nitrogen deposition on phytoplankton productivity in the South China Sea", *Geophys. Res. Lett.*, DOI: 10.1002/2014GL059665 (2014).

4.4.4 An additional paper has been submitted and is currently under revision:

Sharples, J., et al. "Physical controls on riverine delivery of nutrients and carbon to the oceans", submitted to *Nature*.

4.4.5 Seven other papers are in various stages of preparation for submission, with two that should be submitted in September. Some preliminary results from these additional papers were presented to GESAMP 41.

4.4.6 WG 38 organized a session on "Atmospheric inputs to the Ocean" for the 2014 European Geosciences Union meeting, held in Vienna, Austria in April, 2014. This successful session included a total of 20 papers, 13 of them were presented by Members of WG 38.

Action taken by GESAMP

4.4.7 It was decided that WG 38 would primarily devote the next year to completing all of the current scientific papers, but they will also develop possible new activities for the future - scientific issues related to the atmospheric input of chemicals to the ocean and the atmosphere-ocean interactions that WMO, IMO, and other sponsors might be interested in the working group addressing. In particular, this will be discussed with two or more science advisory groups (Precipitation Chemistry, Reactive Gases, and possibly others) of the WMO Global Atmosphere Watch Program. WMO has continued to support WG 38, established a trust fund for GESAMP and invites other organizations to contribute to the trust fund.

4.5 Global trends in pollution of coastal ecosystems (WG 39)

4.5.1 The Chairperson of WG 39, Dr Ana Carolina Ruiz Fernandez, presented the WG's latest progress. The purpose of WG 39 is to contribute to the reduction of stress in the coastal ecosystem by providing stakeholders, scientists and society with an objective and global assessment of pollution trends during the last century in sensitive coastal ecosystems. At the request of IAEA, the WG 39 looks at the establishment of trends in global pollution in coastal environments.

4.5.2 The Working Group (WG) 39 met for the first time back-to-back with the International Symposium on Isotopes in Hydrology, Marine Ecosystems, and Climate Change Studies in Monaco at the beginning of April 2011. Terms of Reference (ToR) were provided and members agreed on the work methodology and distribution of tasks between them. The main activity agreed was to conduct literature surveys on temporal trends of pollution of coastal ecosystems following a list of priority substances, and to classify the information according to the geographical definitions of the Large Marine Ecosystems (LMEs).

4.5.3 A bibliographic database is being developed in MS Excel and is being used by the WG 39 members through a file-sharing website (Dropbox). The compilation is periodically reviewed and backed up, and is available from the WG Chairman.

4.5.4 GESAMP recalled that WG 39 did not meet during the last 2 years. IAEA and UNIDO secured funding for a second meeting of the working group to be held in the first week of September 2013, with the objective to work on Task 2 of the WG 39 ToRs, depending on completion of Task 1. However, not enough progress was achieved and the 2nd meeting of WG 39 was postponed to the first quarter of 2014.

4.5.5 During the 40th session of GESAMP, it was reported that WG 39 continued its work during the intersessional period; a total of 304 scientific papers had been compiled and the bibliographic records had been introduced in the WG 39 database (Dropbox). The information gathered corresponds to 27 of the 64 LMEs; some of the LMEs may have no records because no studies have been performed in that region. In addition, a pilot web platform had been developed with the assistance of UNINMAR at the Institute of Marine Sciences and Limnology, National Autonomous University of Mexico (ICMyL-UNAM) with the aim to host and manage the information contained in the WG 39 database. An example of the current functions and capabilities is shown at <http://132.248.15.44:8080/uninmar/>

4.5.6 It was stressed that in order to keep the construction of the WG 39 web database, it is necessary to continue with the compilation and analysis of scientific literature, including the selection of the figures to be used for the analysis of pollution trends. The bibliographic records will be entered in the web database (based on the MS Excel database) and each figure will be digitalized by ICMYL-UNAM. The institution is willing to provide the use of the web platform and the related further development for free, but funding is needed to support internships and students for further literature

surveys, as well as to support the paper data gathering and data digitalization, effort which depends on the final number of papers and figures to be entered.

4.5.7 The second meeting of WG 39 was held at the IAEA Environment Laboratories in Monaco in May, 2014. A web-based analysis tool to assess pollution trends in the temporal series (100 years), created by UNINMAR-UNAM for the WG39 members, was presented. The routine was carefully explained, step by step, so WG 39 members were able to perform trend analysis in their assigned LMEs.

4.5.8 As a pilot study, the relevant figures of LME 03 (California Current) had been digitized by UNAM, at no cost to the leading organizations. All WG 39 members worked in the quantification of temporal trends from selected papers, pollutants were grouped, statistical tests were performed and a preliminary LME dataset was produced. On this basis, a preliminary report on LME 03 (California Current) was produced. The WG 39 working methodology was revised according to the experience gained by all WG39 members during i) the literature search and review (Task 1) and ii) the pollution trend analysis performed in Session 2 of this meeting.

4.5.9 During the WG meeting, the members delineated and agreed on future work and task assignment. As already included in the inception of WG39, it was clear that support is needed to continue with the WG 39 tasks. After the examination of the pilot study, members agreed that the methodology designed, the existing tools and available data will warrant a high quality and high impact product, and request GESAMP and the leading organizations to approve and fund the forthcoming activities. At the end of the WG meeting, the main results were presented to IAEA-EL Director and IAEA-EL staff, noting the quality and relevance of the work to IAEA.

4.5.10 Members of GESAMP expressed a concern about the use of the NOAA-SQUIRT benchmarks to evaluate potential risk of harmful effects to the coastal resources, due to the possibility of misinterpretation of the PEL values. The WG 39 Chairperson explained that this information will be carefully explained and interpreted in the detailed report for each of the LMEs, and submitted for review by GESAMP before publication.

Action taken by GESAMP

4.5.11 The meeting stressed that, in order to continue with the WG 39 activities, it is necessary to complete the digitization of core profile figures from the papers in the data base. It was agreed that the Lead Agencies will look for appropriate funding with the aim to implement the pending WG 39 activities (e.g. digitization of paper graphs, maps production, 3rd meeting of the WG39 to review the final report) during the intersessional period. However, the timeline for completion of the work will depend on the availability of funds.

4.6 Sources, fate and effects of microplastics in the environment – a global assessment (WG 40)

4.6.1 A report of the activities of WG 40 was provided by Dr. Peter Kershaw, Chairman of WG 40.

4.6.2 The third and final WG meeting took the form of a three-day intensive workshop, from 8 to 10 July 2014, hosted by KIOST in Busan, attended by 13 WG members and two observers, with additional support staff provided by KIOST. A one-day international conference was held immediately before the workshop, which proved to be an excellent way for Working Group members to summarize their inter-sessional activities, as well as be made more aware of some of the litter-related issues in this region of growing economic importance. A final day was spent visiting the modern and very well equipped facilities of the KIOST Busan laboratory, and learn about their latest micro-plastics research. This was followed by an opportunity to visit the 'most polluted beach in Korea', where Working Group members were able to sample for microplastics.

4.6.3 In the inter-sessional period between the second and third workshops, a shared office space in Basecamp™ was used to prepare revised drafts of each section of the report in preparation for the workshop. It was also utilised during the workshop to prepare agreed texts, following intensive discussion. The period up to September 2014 has been spent producing agreed revisions, finalising the main conclusions and key recommendations, and preparing graphics and other content. Google Docs is being utilised to allow several people to work on individual sections, and keep control of the editing process. The draft report will be submitted for review by GESAMP in mid-September before final editing and preparation for publication in mid-November. The report will be launched during the 2nd International Ocean Science Conference in Barcelona, Spain (17-21 November 2014).

4.6.4 A separate document is being prepared to provide a 'Summary for Policy Makers', with similar length and style to the brochure prepared for GLOC-2. This will include a summary of the main findings and conclusions, together with key conclusions and recommendations. The recommendations will include suggestions to improve future assessments, focusing on topics WG 40 recognized as being important but which the WG, as currently constituted, was not able to address. They include an approach for identifying sources and pathways and the need to adequately address plastic particles in the nano-size range.

4.6.5 The intended audience for the Assessment includes:

- UN Agencies
- other sponsoring organizations
- Regional Seas Organizations
- decision-makers in sovereign states
- general public
- scientific community

Future activities of the Working Group

4.6.6 The Working Group, as it is presently constituted, has fulfilled the original Terms of Reference set out by GESAMP. The WG highlighted a number of issues which it considered important but for which it did not necessarily have the expertise to address adequately. In addition, the number of groups and

individuals working on this topic has grown significantly since the Working Group was first conceived, and covers a much wider geographical range. This would appear to provide a natural break for WG 40. Any further work GESAMP may consider necessary could be undertaken either by a new Working Group or a re-constituted WG 40, informed by the recommendations of the WG 40 assessment.

Links with related initiatives

4.6.7 The WG 40 Assessment is relevant to a number of other international initiatives, in which several members of WG 40 have been involved, and to which WG 40 has contributed:

GEF Transboundary Water Assessment full-sized project

4.6.8 GESAMP has contributed to three different aspects of the GEF Transboundary Water Assessment full-sized project (TWA) which include marine microplastics:

- .1 Indicator of floating plastic in the Open Ocean and large marine ecosystems (LME);
- .2 Indicator of POPs in plastic resin pellets in LMEs, linked to the International Pellet Watch; and
- .3 Assessment of pollution in the open ocean – revision of GESAMP R&S 79.

4.6.9 The TWA assessment reports have been completed and await final review and editing.

Global Marine Partnership on Marine Litter/GLOC-2

4.6.10 A brochure on 'Microplastics as an emerging issue' was prepared by two members of WG 40 (Peter Kershaw and Valeria Hidalgo-Ruz) for the 2nd Global Land-Ocean Conference, 2-4 October, 2013 in Jamaica. Peter Kershaw gave a presentation on microplastics and marine debris in general.

Action taken by GESAMP

4.6.11 GESAMP noted the excellent progress made, as well as the recent discussions at the UNEA, which suggested further work, building on the outcomes of the WG. See further under section 11 below. The Group discussed possible options to either extend the current terms of reference of WG 40, or established a new WG. It was agreed that, if possible, it would be beneficial to build on the current experience and membership rather than establish a completely new WG.

5 CONTRIBUTION TO OTHER UN PROCESSES

Regular Process for Global Reporting and Assessment of the State of the Marine Environment including Socio-economic aspects

5.1 GESAMP noted that the process of preparing the first World Ocean Assessment (WOA), was now at the stage of external peer review. However, not all chapters had been finalized, and it was likely that the intended deadline of 31 October 2014 would not be met.

Action taken by GESAMP

5.2 GESAMP reiterated its commitment to support the Regular Process, and expressed its availability to assist those of its Sponsoring Organizations that so require with support in the peer review process.

GEF Transboundary Waters Assessment Programme (TWAP)

5.3 GESAMP has been involved in the GEF-sponsored Transboundary Waters Assessment Programme (TWAP) since its inception. In the inter-session period, the GESAMP Task Team set up to produce a revised assessment of 'Pollution of the Open Oceans' has completed its report. This has undergone peer review by GESAMP, as well as external peer-review, from experts in each of the main topics included, and now awaits final editing. The report focuses on the five-year period since the publication of GESAMP R&S 79 in 2009, which covered similar subject matter.

5.4 Further GESAMP contributions to the TWAP, organized through the Chairman, have included producing an assessment of floating litter in the ocean and Large Marine Ecosystems, a review of contaminants associated with plastic resin beads, and designing a methodology for clustering groups of LMEs according to the degree of environmental degradation.

6 IDENTIFICATION OF NEW AND EMERGING ISSUES REGARDING THE DEGRADATION OF THE MARINE ENVIRONMENT OF RELEVANCE TO GOVERNMENTS AND SPONSORING ORGANIZATIONS

6.1 This GESAMP agenda item is intended to provide an opportunity for Members to bring new topics related to the status of the marine environment to the attention of the Sponsoring Organizations, and to discuss issues arising during the course of the current GESAMP meeting. Four potential new topics were identified and discussed during this session.

Seabed mining

6.2 The first topic raised during the informal meeting of the GESAMP Members on the morning of 1st September (Monday) 2014 relates to "Sea-bed mining and effluent discharge". During the GESAMP session, Dr. Huber gave a presentation describing three seabed mining projects, proposed mining projects for iron sand and phosphorite nodules in New Zealand, and an approved project to mine hydrothermal sulphide deposits in Papua New Guinea. Dr. Huber described the nature of the deposits and the proposed mining methods and technology. Seabed mining is by no means a new activity and has been occurring for decades. It appears, however, to be becoming more widespread geographically, with an increasing range of mineral resources targeted. Advances in technology are making it feasible to mine at increasing depths, and there is active exploration of deep-sea areas such as

the Mid-Atlantic Ridge and polymetallic nodules on the abyssal seabed.

6.3 As an expanding marine activity that clearly has significant potential environmental implications, seabed mining is of interest to GESAMP given its remit for marine environmental protection. GESAMP noted, however, that the examples presented by Dr Huber are under national jurisdiction. GESAMP also recognised that the International Seabed Authority (ISA) is the competent authority with an international mandate to regulate seabed mining in international waters. GESAMP discussed the possibility that the ISA has access to information and expertise that might strengthen GESAMP's capabilities, if not necessarily with respect to seabed mining potentially for other issues such as submarine tailings discharge.

6.4 Thus, impacts need to be considered as technological advances make the likelihood of these projects to become viable and multiply as we have seen from the examples. There is also an established authority within the UN about the issue (International Seabed Authority). This issue can be linked with the release of land-based mining tailings into the sea (see section 7 below). GESAMP's assessment is that it is an issue with potential serious environmental effects but any involvement should be done in coordination with the ISA.

Effects of changing N/P ratio in the atmospheric deposition to the ocean

6.5 The second item raised concerned the rapidly changing N/P ratio in the atmospheric deposition to the ocean surface (much different from the canonical Redfield ratio of nutrients in the marine environment). This change has the potential to favor organisms relying on nitrogen in comparison to organisms relying on phosphorous. In this context, it was noted that in the South China Sea, phosphorous levels have increased as well, moreover the increased input of nutrients to the oceans have led to denitrification in some areas. Therefore the whole issue of changes to the N to P ratio should be studied. GESAMP noted that the study could be broadened to sources other than atmospheric deposition involving other key constituents (example Fe and Si).

Action taken by GESAMP

6.6 GESAMP agreed to develop a scoping paper in the intersessional period (lead authors: Dr. Baker and Dr. Sarin). It was also agreed that to ensure the viability of the scoping paper, it would be important to involve the potentially interested Sponsoring Organizations already in the scoping process, and to ensure that the interests of the potential sponsoring agencies are addressed in the scoping paper.

Marine litter and the outcome of UNEA

6.7 Another topic resulted from resolution number 6 from the United Nations Environmental Assembly (UNEA) in June 2014. The resolution recognizes the important issue of the fate of marine plastics, debris and micro-plastics in the environment and requests the Executive Director of UNEP to prepare a study on this issue which results will be presented at the next session of UNEA in 2016. In the resolution, the current work of GESAMP (WG 40) is recognized and therefore UNEP is proposing to establish a new WG on the issue, which would build from the results of WG 40. Terms of reference for this new WG have been circulated by UNEP during the session and comments provided by

the members. The WG would be opened to other interested parties: FAO, IOC, IAEA and the private sector especially the “non-traditional” partners such as the fashion industry. UNEP and FAO have earmarked some funds to support this new WG. As can be noted in section 11 of this report, GESAMP proposed to amend the TOR of WG 40 to respond to the request by the UNEA.

Ecosystem services valuation

6.8 The fourth topic identified concerned ecosystem services valuation. Different methodologies are presently being used for quantifying environmental damage due to episodic events and pollution sources. Different approaches are adopted to predict the cost of loss of ecosystem services in relation to environmental changes or to anthropogenic activities. Therefore, there is a need to review the existing methodologies. UN agencies are already aware of these issues and some of them have already established working groups dealing with this subject or specific ecosystem services/functions.

Action taken by GESAMP

6.9 It was agreed that a sub-group would prepare a short document to better clearly define the potential role of GESAMP in reviewing/harmonizing methodologies for ecosystem services valuation. The document will be shared with the Sponsoring Organizations, to collect their views/suggestions/interest on these issues. Meanwhile, a proposal will be made on how GESAMP could better approach the problem, including the possibility of joint Working Groups those are already established by different agencies for specific purposes. The UNIDO Technical Secretary reminded the group that the GEF is looking into the issue and economic valuation was the main topic of the last GEF International Waters Conference held in October 2013. The Chairperson proposed to discuss the way forward with Dr. Delfanti on the level of interest and where GESAMP might fit in, noting that this might be a good opportunity to bring some social scientists back into the GESAMP Membership. Dr. Mogo agreed to be part of the discussion.

7 SCOPING ACTIVITIES

Biomagnification of contaminants in marine top predators and its ecological and health implications

7.1 GESAMP noted that no progress had been made on the topic of biomagnification during the intersessional period. However, the Chairman agreed to renew the discussion with CIESM on the possibilities to conduct a joint international workshop.

Relevance of the production of disinfection by-products (DBP) against other inputs of DBPs in the aquatic environment

7.2 This agenda item was once again brought up for discussion in the GESAMP 41 session: DBPs originally brought up in context of ballast water management systems need to be considered to explore major sources of DBPs (including comparative burdens from natural sources of some DBP chemicals). Document GESAMP 41/7 noted that over 700 DBPs have been found in drinking water. As earlier, it was emphasized that processes and mechanisms which can introduce DBPs into the aquatic environment include industrial cooling units; desalination plants; land-based waste water treatment facilities; seawater toilets; and ballast water management systems. In summary, the paper estimated the total tonnes of tribromomethane (as an

example) from BWMS, industrial cooling and desalination which were all found to be about three orders of magnitude or more higher than natural occurrence, suggesting a modest overall risk to marine ecosystems and human societies. Nevertheless, especially at regional or local scale discharges of DBPs may lead to concentrations with some effects. Therefore, a potential project of GESAMP on the emissions of DBP at the regional and local scale should be considered, through possible creation of a GESAMP WG on DBP at regional and local scales.

7.3 Members discussed the tentative and proposed names/chair-person of WG in this area. However, there continues to be a concern regarding the necessary commitment and financial resources to further take-up WG objectives.

Environmental Quality Standards

7.4 GESAMP discussed the issue of Environmental Quality Standards (EQS) and noted the need to review the section and links on the GESAMP website, as these are out of date and defunct. It was agreed that Dr. Huber and Dr. Ruiz Fernandez will review the website section and provide corrections to the GESAMP Office.

Discharge of Mine Tailings and Coastal Run-Off in the Marine Environment

7.5 Dr. M Huber reported on progress of the correspondence group, established at the 40th session of GESAMP, last year. He recalled that the side event at GESAMP 40 had examined three separate issues:

- Industrial submarine tailings disposal (STD), also known as deep-sea tailings placement (DSTP);
- Industrial riverine tailings disposal; and
- Artisanal tailings disposal, which is riverine.

7.6 It was also noted that GESAMP agreed that in this case the scope of GESAMP's attention was limited to riverine and submarine disposal of land-generated mine tailings, and seabed mining was a separate issue and beyond the scope of GESAMP's activities.

7.7 The LC/LP Secretariat commissioned a review of riverine and submarine tailings disposal, which was noted at GESAMP 40. The report was updated since GESAMP 40 and the updated report is available at <http://www.imo.org/OurWork/Environment/LCLP/EmergingIssues/minetailings/Documents/Mine%20Tailings%20Marine%20and%20Riverine%20Disposal%20Final%20for%20Web.pdf>.

7.8 GESAMP was informed that the LC/LP had established a correspondence group on submarine mine tailings disposal, led by Chile, and that the terms of reference included liaison with the GESAMP correspondence group. In addition, Chile has established a National Deep Sea Tailings Placement Initiative, and an international workshop on the topic had been held in January 2014. The issue was discussed at the meeting of the LC/LP Scientific Groups in May 2014, and Peru offered to host a workshop in cooperation with GESAMP.

7.9 Dr. Huber noted that the review of riverine and submarine mine tailings disposal commissioned by the LC/LP Secretariat found that only four industrial-scale mines world-wide still practice riverine disposal, and it is unlikely that this practice will be approved for new mines. Thus, there is no need for GESAMP to further consider industrial riverine discharge. Industrial STD and artisanal riverine disposal are very different activities, with very different economic, social, regulatory and scientific dimensions. Thus, it would not be feasible to consider both topics in a single process. It will be more feasible to address the two issues with a phased approach, and as other international and national initiatives on STD are in progress it would be logical for GESAMP to consider STD in the first phase.

7.10 Dr. Huber reviewed the use of STD around the world and noted it is possible that additional mines employ the practice in addition to those identified in recent reviews. Two mines proposing STD at the time of the review commissioned by the LC/LP Secretariat had received approval for the practice. There are a number of other mines proposing STD, and interest in the practice by the mining industry elsewhere. Thus, the use of STD may increase in the future.

7.11 STD is attractive to the mining industry because it is often a lower-cost option than land disposal, however there are other defensible reasons to consider STD. These include avoidance of acid mine drainage, reducing land-use conflicts, and technical constraints on containing mine tailings on land in many geographies, for example those with steep topography, seismic activity, and/or heavy rainfall events. GESAMP noted there are a number of environmental risks associated with STD, as well as information gaps.

7.12 Dr. Huber presented a variety of topics for possible topics at a workshop on STD, either for evaluation at the workshop itself or for consideration as possible tasks for a subsequent Working Group. There are a number of possible partners, funders, or participants in such a workshop.

Action by GESAMP

7.13 GESAMP agreed that the correspondence group would finalize the scoping paper as soon as possible for GESAMP to consider intersessionally. The scoping paper would then be transmitted to the LC/LP correspondence group by the Secretariat, with a view to planning for a workshop in late 2014 or early 2015. The following Members/experts are expected to participate in the correspondence group: Dr. Mike Huber (lead), Dr. Ana Carolina Ruiz Fernandez, Dr. Emmanuel Ajao, Dr. Thomas Höfer, Dr. David Santillo (United Kingdom), Dr. Patricio Rodriguez (Chile) and Dr. Daniel Franks (Australia).

8 GESAMP SIDE EVENT: MARITIME ACTIVITIES AND NOISE: SOURCES AND IMPACTS

8.1 Over the past century, human activities have increased the levels of sound in the oceans, through shipping, military operations, offshore exploration and other activities, including the use of active acoustic equipment for various purposes. Noise in the marine environment has been shown to have impacts on marine mammals, fish and invertebrates, in particular those who use sound for communication and navigation, causing physical injuries as well as disrupting behaviour. Over at least the last two decades, the issue has been documented in scientific literature, as well as studies commissioned by governments and non-governmental groups. However, there are still significant gaps in the knowledge, in particular in terms of the specific and non-specific impacts of noise, and when it comes to studies over longer time and larger spatial scales. As an example on the regulatory side, IMO has developed “Guidelines for minimizing underwater noise from commercial ships”, which was recently adopted by the Organization’s Marine Environment Protection Committee.

8.2 On Wednesday 3 September, GESAMP and IMO organized a special side event entitled “Maritime activities and noise: Sources and impacts”. The side event was chaired by the Chairman of GESAMP. Approximately 50 people attended the side event. The objective of this session was to showcase the current state of knowledge and identify the gaps in knowledge relating to the sources and impacts of maritime noise.

8.3 The moderator opened the session with a brief introduction to GESAMP for members of the audience who may not have been familiar with its mandate and activities.

Summary of the presentations

Environmental Impacts of Noise in the marine environment: What do we know and where are the gaps? Dr. Christina Muller-Blenkle, Independent Consultant, Berlin, Germany

8.4 *Dr. Muller-Blenkle* described natural and anthropogenic noise in the seas and its origin. It was noted that shipping is one of the largest sources but also sonar, oil rigs, other industry such as offshore wind farms. The bulk of the noise is low frequency, which is important as it can travel the farthest. The physics of underwater sound was also presented, noting that decibel levels in air and water are not the same and the range in the sea is wider. *Dr. Muller-Blenkle* described hearing in different marine mammal groups who use sound for orientation, prey/predator detection, territorial behaviour and various social functions. Marine animals have an enormous range of hearing ability, ranging from 0.01 to 1,000 hz across species from small shrimps to the largest whales. The effects of marine noise on animals range from detection to masking to reaction to injury, and the specific impacts depend on the sound source, receptor hearing ability, and a suite of external and internal factors. It was described that marine

mammals are by far the most investigated group in terms of sound utilization. There has been fair amount of media coverage of marine mammals and sound such as whale strandings possibly tied to military sonar maneuvers. Other impacts can be disruption of natural behaviour, stress and habitat loss. We only have knowledge on hearing ability for about 100 of 32,000 fish species. Some species use sound for both intraspecific and interspecific communication such as defending territory and mating calls. A number of studies have documented effects of noise on fish including reduced numbers near seismic surveys and avoidance of shipping routes. Key knowledge gaps include impacts on other species, invertebrates, effects on early life stages and the effects of low level constant noise.

Mitigating the threat of ship strikes with large cetaceans in Southern Sri Lanka. Ms. Annukka Pekkarinen, Ph.D. student, World Maritime University

8.5 A rich blue whale population occurs south of Sri Lanka; the whales tend to congregate at 1,000 m. depth contour which also corresponds to one of the main shipping lanes between Asia and Europe/Mid-East. There is also a sizeable whale-watching sector in the area. About 20 and 30 whale strandings occurred in 2011 and 2013, respectively. The current WMU-led research project aims to build the scientific data basis needed for taking action to manage shipping in the area. A series of hydrophones have been deployed in the main blue whale occurrence areas, which will be provide data over the coming months. As an example of a management option, an initial traffic separation scheme was proposed in a research paper, in order to help minimize the impacts of shipping noise on the whales. Other examples of projects looking at approaches to minimize impacts of shipping noise on whales were highlighted. Future plans include adding a satellite/acoustic tagging component to the project.

The European Marine Strategy Framework Directive and Underwater Noise. Dr. Frank Thomsen, DHI

8.6 *Dr. Thomsen* introduced the European Marine Strategy Framework Directive (MSFD) as a policy framework that applied to a very large body of water encompassing the EU’s seas and ocean areas. It was adopted in 2008 and transposed into law by member states in 2010. Its aim is for countries to take steps to achieve good environmental status (GES) of marine waters (ecologically diverse, dynamic, clean, healthy and productive). Energy/noise is one of 11 GES descriptors which states that introduction of energy, including noise, is at levels that do not adversely affect the marine environment. MSFD applies an Attribute-Indicator-Environmental Target approach towards delivering this and the other GES. Two key issues at hand are:

- .1 acute exposure to loud, low and mid-frequency impulsive sounds; and
- .2 chronic exposure to continuous low frequency sound.

8.7 Studies have shown behavioural change of several species due to wind farm installation (pile driving) and seismic vessels; some strandings have also been documented. The first indicator for GES11 was defined as distribution in time and place of loud, low and mid frequency impulsive sounds. The indicator is implemented through noise register, assessment of status quo, forecast of future scenarios and possible use in MSP. It was noted that baleen whales have a large overlap with the frequency range for shipping sound, whereas toothed whales have much lower overlap and may hence be at lower risk. Studies suggest that overall ambient sound in the oceans is increasing, by about 3 dB per decade, mainly due to the increase in shipping. This defines the second GES11 indicator which is to measure trends in the ambient noise level within 1/3 octave bands, coupled with modelling. The EU's MSFD represents the first policy explicitly addressing underwater noise.

The BIAS project - a regional attempt to implement a coherent management of underwater sound, Professor Peter Sigray, Swedish Defense Research Agency/Stockholm University

8.8 The Baltic Sea Information on the Acoustic Soundscape (BIAS) project focuses on ship noise in the Baltic Sea. As noted by the previous speaker, there is a need to start to measure underwater noise in the European waters. Professor Sigray stressed that fish behaviour tends to change in response to particle motion, at higher frequencies, less so to pressure changes. Marine mammals and fish have different ranges of hearing frequencies which in turn overlap differently with the frequency range of ship noise. Fish use sound for orientation, communication, predator avoidance, foraging and spawning. Consequently, ship noise can be at levels which can cause masking of communication in vocal fish species, and may also have longer term effects on fish physiology and behaviour. As part of the project, a total of 38 sensors have now been deployed in the Baltic Sea, which are retrieved and redeployed every 3 months. The data will feed into an acoustic-numeric model, and the measured data will help improve the model data. The model incorporates data such as VMS, surface sound speed, wave height, AIS, bathymetry and bottom density. Protocols for quality assessment are also being developed.

IMO's work on underwater noise. Mr. Fredrik Haag and Mr. Edward Kleverlaan, IMO

8.9 GESAMP noted from this presentation that from ships, the main noise issue is chronic sources of sound, not acute. Factors include ship size, loading conditions, method of propulsion, speed and bottom topography. The maritime industry projects a doubling of shipping cargo volume by 2025. Already in 1981, IMO introduced Code of noise levels *on board* ships but did at that point not address underwater threat to marine life. Since 2004, international efforts were accelerated to examine and address effects of ship noise on marine life. In 2014, MEPC approved guidelines for reduction of underwater noise from commercial shipping. The guidelines apply to all commercial ships; provides purposes/definitions, outlines standards and references; describes design considerations; on board machinery;

additional technology options for existing ships; and operational and maintenance considerations. Possible future issues for discussion include noise reduction targets; evaluation contributions from vessels compared to other sources; setting operational guidelines; identifying noisiest ships to understand factors; establishing baseline ambient noise levels; and collection of information on sensitive areas. It was also noted that the World Organization of Dredging Associations (WODA) has developed technical guidance on underwater sound in relation to dredging.

Panel discussion

8.10 In the ensuing discussion, several questions were raised by the audience. Professor Sigray pointed out that standards are now being established to determine ship acoustic signatures. It was further noted that a key aspect to achieve the targets in the IMO guidelines is a focus on the design phase. It was highlighted that, to increase understanding of the noise scale, a 3 dB increase is a doubling in loudness, a 10 dB change is a 10-fold increase (e.g. the scale is logarithmic). A member of the audience asked regarding North Sea dredging, and to what extent the IMO or EU guidelines can be used to mitigate the effect. Dr. Thomsen indicated that we still the effects of dredging still are largely unknown. The available guidance takes a risk-based approach looking at the source, the nature of marine life in the area, etc. It was further noted that the 3-10 dB noise reduction targets in the IMO guidelines, does not include naval vessels, as these are outside the remit of IMO's jurisdiction. However, it was also emphasized that many naval forces are undertaking their own processes of noise risk assessment and mitigation. The panelists were asked if they perceive actions by other industries that generate noise in the ocean. On this topic, Dr. Thomsen noted that under the EU there are two indicators deliberately included to address issues of both ambient noise such as shipping, and more direct noise from inputs such as pile driving. Similarly, seismic air guns already have a long history of management and noise mitigation through EIA and other mechanisms. If anything, the EU directive represents an important entry point for shipping within the marine noise management framework since shipping was largely absent in previous efforts at noise management and regulation.

Action taken by GESAMP

8.11 GESAMP agreed that the issue is interest and relevance to its mandate, and also noted the progress made in various international fora. It was agreed that GESAMP will keep a 'watching brief' and observe future developments.

8.12 GESAMP also noted the benefits of hosting the session, and in particular its side-event, at an institution such as WMU, as it provided an opportunity to reach out to students, faculty and indeed the future leaders, in this case within the maritime industry. GESAMP also extended its gratitude to the students and faculty who contributed greatly to the outcome of the side-event, through enthusiastic interventions and engaging discussions.

9 DATE AND PLACE OF GESAMP 42

9.1 GESAMP noted that the hosting organization and venue for the 42nd session of GESAMP will be confirmed by the ExCom as soon as possible, pending

discussions with those Sponsoring Organizations that were not able to attend this session.

10 FUTURE WORK PROGRAMME

Development on microplastics since GESAMP 40

10.1 In the period preceding GESAMP 41, UNEP developed a proposal taking account of the outcome, concerning plastics and microplastics, of the first UN Environment Assembly (UNEA) in June 2014. The request by UNEP for GESAMP to consider carrying out the work described in the draft TORs was widely welcomed by GESAMP. Two options were considered to take this forward: i) creating a new Working Group; and, ii) including the additional elements in WG 40 by creating new and revised TORs. Following extensive discussion, it was decided that including the proposed work in the existing WG 40 was the most logical and efficient way of proceeding. A draft set of revised Terms of Reference was developed, but these are subject to final agreement, in the inter-session period, with all the Agencies that have expressed an interest in this topic; i.e. UNEP, UNESCO-IOC, FAO, IMO, UNIDO and IAEA. One consequence of maintain WG 40 is that it will provide a platform for other plastics-related work, including items that are unlikely to be completed within the very tight deadlines for producing results in time for the next UNEA meeting, in May 2016. It will also allow existing support arrangements to be continued, subject to the agreement of the sponsoring bodies involved.

Action taken by GESAMP

10.2 Following discussion among the Members, the following draft revised Terms of Reference were proposed for the extension of WG 40 to meet the request from UNEP (1st phase) and for a potential future work programme (2nd phase). Note: these TORs are only provisional and are subject to revision:

Initiate in 1st phase:

1. To assess the main sources and categories of plastics and microplastics entering the ocean

Approach: Identify probable 'hotspots' of land- and sea-based sources for plastic and microplastics, using a combination of targeted modelling, knowledge of actual and potential sources (e.g. coastal tourism, aquaculture, fisheries, riverine inputs, urban inputs), environmental and societal data.. This can help to inform the development of effective measures in other regions.

1st phase:

To contribute to a modelling workshop involving a wider group of modellers to improve current assessment

methodologies. Approach: to include coastal-open ocean scaling, 3D circulation, varying particle properties (e.g. size, density).

1st phase:

2. To assess the occurrence of microplastics in commercial fish and shellfish species

3. To assess local, regional and global scales of accumulation of plastics and accompanying chemicals (additives and absorbed contaminants), including SIDS an regional hotspots. Examples of 'hot spots', from available evidence, include: the Bay of Bengal, Mediterranean Sea, Gulf of Mexico, Japan Sea and other far eastern seas.

Approach: combined modelling and data analysis

Initiate in 1st phase, complete in 2nd phase:

4. To assess the effects of nano-scale plastics on marine organisms

Approach: Encourage the inclusion of expertise on pharmacology (drug delivery using polymers), mammalian toxicology, nano-sciences and nano-engineering in future assessments. Critically review laboratory-based experiments examining the behaviour and potential effects of nano-plastics and assess their relevance to the natural environment. Improve sampling and detection methods for nano-sized plastic particles, particularly in biota.

2nd phase:

5. To assess the risk of physical and chemical effects of ingested microplastics on marine organisms.

Approach: Compare information from laboratory-based experiments of organism-chemical behaviour with field-based observations. Include expertise on animal behaviour and physiology for target species, including important commercial species. Take account of gut retention times and the conditions inside the gut when assessing risk. Include a consideration of particle size and shape when assessing risk of damage.

2nd phase:

6. To assess the significance of plastics and microplastics as a vector for organisms, facilitating the spread of non-indigenous (alien) species.

Approach: Review the published evidence on NIS introductions and potential vectors (e.g. ship hull transfer, ballast water transfer), to estimate the relative importance of plastics and microplastics as a transport vector. Review epidemiological evidence for the occurrence of outbreaks of pathogenic disease associated with NIS. Undertake a targeted risk assessment based on existing data on NIS introductions and disease outbreaks, and utilise existing circulation models to identify key transport routes for pathogenic organisms and the conditions favourable for growth.

10.3 The following draft work plan (for the 1st phase) was also proposed by GESAMP:

- Identification of initial WG participants – November 2014
- Scoping meeting – November 2014, Barcelona – in conjunction with workshop on microplastics preceding the 2nd IOSC
- 1st Workshop – spring 2015
- Modelling workshop – spring 2015
- 2nd Workshop – autumn 2015

- draft 1st report (for UNEA) – February 2016
- final version 1st report - April 2016
- UNEA – May 2016
- Revise 2nd phase work programme - September 2016 (tentative) GESAMP 43

10.4 It is anticipated that the draft work plan will be subject to discussion between the WG 40 Chair and representatives of UNEP, FAO, UNESCO-IOC and IMO, prior to its confirmation. Potential contributors to the WG will be identified through a variety of established contacts with individual and institutions, as well as by making use of existing fora such as the PICES Annual Science Conference and specialist science conferences. The 2014 PICES Conference (October 2014) includes a one-day special session of marine litter and the 2nd International Ocean Research Conference (Barcelona November 2014) includes a one-day workshop on microplastics as well as a Side Event to launch the WG40 1st Assessment. Both will provide an excellent opportunity to meet members of the international natural science, social science and policy communities.

11 GESAMP WORKING GROUPS, CORRESPONDENCE GROUPS AND TASK TEAMS

11.1 The currently active GESAMP Working Groups, correspondence groups and task teams are listed, with their current ToR, in Annex V.

12 ANY OTHER BUSINESS

12.1 No other business was raised.

13 ELECTION OF CHAIRPERSONS

13.1 GESAMP re-elected Dr. Peter Kershaw as Chairman and Dr. Manmohan Sarin as Vice-Chairman, unanimously, for the intersessional period and the 42nd session of GESAMP.

14 CONSIDERATIONS AND ADOPTION OF THE REPORT OF GESAMP 41

14.1 The report of the forty-first session of GESAMP was considered and approved.

15 CLOSURE OF THE SESSION

15.1 The Chairman of GESAMP, Dr. Peter Kershaw, closed the forty-first session of GESAMP on Thursday, 4 September 2014 at 1300 hrs.

ANNEX I – AGENDA

PROVISIONAL AGENDA

41st session of the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) to be held at World Maritime University, Malmö, Sweden, from 1 to 4 September 2014

Monday, 1 September

Informal meeting of the members of GESAMP

Initial meeting of the Executive Committee of GESAMP (ExCom)

Opening of the session

- 1 Adoption of the agenda
- 2 Report of the Chairperson of GESAMP
- 3 Report of the Administrative Secretary of GESAMP
- 4 Planning of GESAMP activities:
 - .1 Evaluation of the hazards of harmful substances carried by ships (WG 1: IMO leading)
 - .2 Review of applications for 'active substances' to be used in ballast water management systems (WG 34: IMO leading)
 - .3 Expanded scientific review of mercury and its compounds and threats to the marine environment (WG 37: UNEP leading)

Tuesday, 2 September

- .4 Atmospheric input of pollutants to the oceans (WG 38: WMO leading)
 - .5 Establishment of trends in global pollution in coastal environments (WG 39: IAEA leading)
 - .6 Sources, fate and effects of microplastics in the environment – a global assessment (WG 40: UNESCO/IOC leading)
- 5 Contributions to other UN processes

Wednesday, 3 September

Morning session

6 Identification of new and emerging issues regarding the degradation of the marine environment of relevance to governments and sponsoring organizations

7 Scoping activities

Afternoon session

8 GESAMP side event: "Maritime activities and noise: Sources and Impacts"

Thursday, 4 September

Morning session

- 9 Date and place of GESAMP 42
- 10 Future work programme
- 11 Any other business
- 12 Election of chairpersons
- 13 Consideration and adoption of the report of GESAMP 41
- 14 Closure of the session

Afternoon session (closed session)

Concluding Meeting of the Executive Committee of GESAMP (ExCom)

ANNEX II – LIST OF DOCUMENTS

GESAMP 41/1	Admin. Secretary	Provisional Agenda
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GESAMP 41/3	Admin. Secretary	Report of the Administrative Secretary of GESAMP
GESAMP 41/4	Chairman of WG1	Planning of GESAMP activities: Evaluation of the hazards of harmful substances carried by ships
GESAMP 41/4/1	Co-Chairmen of Working Group 38	Planning of GESAMP activities: Atmospheric input of pollutants to the oceans Report of the Co-Chairmen of Working Group
GESAMP 41/4/2	Chairman of WG 40	Report of the GESAMP Microplastics Working Group (WG 40) Report of the Chairman of Working Group 40
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ANNEX III— PROVISIONAL LIST OF PARTICIPANTS

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ANNEX IV – ACTIVITIES AND ACHIEVEMENT BY THE SPONSORING ORGANIZATIONS OF GESAMP DURING THE INTERSESSIONAL PERIOD

This annex provides a summary of the Sponsoring Organizations' achievements since GESAMP 40 (April 2013) from IMO, WMO, UNIDO, IAEA, UNDP, UNESCO-IOC and UNEP.

IMO

Implementation of the Ballast Water Management Convention

1 The Ballast Water Management Convention was adopted in February 2004 and aims 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. The Convention will enter into force 12 months after the date on which not less than 30 States, the combined merchant fleet of which constitute not less than 35 per cent of the world's gross tonnage, have ratified it. Currently, a total of 40 states, representing 30.25 per cent of the world merchant fleet tonnage, have ratified.

2 In April 2014, MEPC 66 decided to grant Basic Approval to four and Final Approval to two ballast water management systems that make use of Active Substances, noting that there are already 42 type-approved ballast water management systems available.

3 The Committee, having noted the outcome of the Fifth Stocktaking Workshop on the activity of the GESAMP-Ballast Water Working Group, endorsed a revision of the GESAMP-BWWG Methodology for information gathering and conduct of work. The revised Methodology has been disseminated as BWM.2/Circ.13/Rev.2.

4 The Committee also approved BWM-related guidance, including Guidance on entry or re-entry of ships into exclusive operation within water under the jurisdiction of a single Party (BWM.2/Circ.52). In addition, the Committee requested the Secretariat to explore the possibility of conducting a study on the implementation of the ballast water performance standard described in regulation D-2 of the BWM Convention, with the aim to address a number of industry concerns, including proposals to amend the Guidelines for approval of ballast water management systems (G8).

Ship Recycling

5 Following the adoption of the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, in May 2009, the Marine Environment Protection Committee of IMO worked on the development of six guidelines required under the terms of the Convention to facilitate the global implementation of its requirements in a uniform and effective manner. At its sixty-fourth session,

in October 2012, the MEPC completed its work on all six sets of guidelines and adopted the *2012 Guidelines for the Survey and Certification of Ships under the Hong Kong Convention* and the *2012 Guidelines for the Inspection of Ships under the Hong Kong Convention*.

6 Currently, the *2011 Guidelines for the Development of the Inventory of Hazardous Materials* are under review as regards the development of threshold values, exemptions and bulk listings applicable to the materials to be listed in the Inventories of Hazardous Materials. MEPC 66 re-established the intersessional correspondence group to further this work and to prepare amendments to the Guidelines, as appropriate.

Amendments to MARPOL Annexes I, II, III, IV and V to make the use of the III Code mandatory

7 The Committee adopted resolution MEPC.246 (66) on amendments to MARPOL Annexes I, II, III, IV and V to make the use of the III Code mandatory, which will enter into force on 1 January 2016, the same date of entry into force of the amendments to SOLAS and other mandatory instruments to make the use of the III Code mandatory.

Amendments to MARPOL Annex I (Oil)

8 MEPC 66 adopted, by resolution MEPC.248(66), amendments to MARPOL Annex I, regarding mandatory carriage requirements for oil tankers for a stability instrument. The amendments are expected to enter into force on 1 January 2016. MEPC 66 also approved draft amendments to regulation 43 of MARPOL Annex I to prohibit ships from carrying heavy grade oil on board as ballast for use as fuel outside of the Antarctic area, with a view to adoption at MEPC 67.

Development of a mandatory Polar Code

9 As reported to the last session, the increased interest in the polar regions with the projected growth in shipping traffic therein and the need to further promote the safety of navigation and prevention of pollution from ship operations, IMO has decided to develop a mandatory International Code for ships operating in polar waters (Polar Code). MEPC 66 reviewed the environmental requirements under the proposed draft Polar Code and the draft amendments to MARPOL to make the Polar Code mandatory. A correspondence group was established and the holding of an intersessional working group ahead of MEPC 67 was approved, to finalize the draft MARPOL amendments and the environmental requirements and to report to the next session (MEPC 67) in October 2014, with a view to adoption at MEPC 68 in May 2015.

MEPC circulars related to port reception facilities

10 To guide ship's crew who seek to deliver MARPOL residues/wastes ashore and port reception facilities providers who seek to provide timely, efficient port reception services to ships, the Committee approved MEPC.1/Circ.834 on *Consolidated guidance for port reception facility providers and users*, which consolidates into one all five previous updated and revised circulars related to port reception facilities, and provides communication and reporting procedures as well as the user of standardized forms.

MARPOL Annex VI (Prevention of air pollution from ships)

11 Amendments to MARPOL Annex VI, Regulations for the prevention of air pollution from ships, adding a new chapter 4 to Annex VI on Regulations on energy efficiency for ships to make mandatory the Energy Efficiency Design Index (EEDI), for new ships, and the Ship Energy Efficiency Management Plan (SEEMP) for all ships entered into force on 1 January 2013.

12 MEPC 66 made further significant progress on the item and, in particular, adopted amendments to MARPOL Annex VI concerning the effective date of implementation for the Tier III NO_x emission standards.

13 The Committee also adopted:

- .1 by resolution MEPC.251(66), amendments to MARPOL Annex VI and the NO_x Technical Code 2008, including the effective date of the Tier III NO_x emission standards, and the extension of the application of EEDI to LNG carriers, ro-ro cargo ships (vehicle carriers), ro-ro passenger ships and cruise passenger ships having non-conventional propulsion;
- .2 by resolution MEPC.242(66), 2014 Guidelines in respect of the information to be submitted by an Administration to the Organization covering the certification of an approved method as required under regulation 13.7.1 of MARPOL Annex VI;
- .3 by resolution MEPC.243(66), 2014 Guidelines on the approved method process;
- .4 by resolution MEPC.244(66), 2014 Standard specification for shipboard incinerators; and
- .5 by resolution MEPC.245(66), 2014 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships.

14 The Committee approved, with a view to adoption at MEPC 66, draft amendments to:

- .1 MARPOL Annex VI regarding engines solely fuelled by gaseous fuels; and

- .2 regulation 13.7.1 of MARPOL Annex VI and item 2.2.1 of the supplement to the IAPP Certificate.

15 The Committee also approved amendments to the unified interpretation concerning implementation of MARPOL Annex VI.

16 The Committee endorsed the work plan for the ad hoc working group on facilitation of transfer of technology for ships in order to implement resolution MEPC.229(65) on Promotion of technical co-operation and transfer of technology relating to the improvement of energy efficiency of ships.

17 The Committee also made discussions on further technical and operational measures for enhancing the energy efficiency of international shipping, and established an intersessional correspondence group to consider the development of a data collection system for fuel consumption of ships.

18 The Committee noted the progress of the third IMO GHG Study 2014 and that the final report of the Study is expected to be considered at MEPC 67.

London Convention and Protocol (LC/LP)

Progress to regulate ocean fertilization

19 In 2013, the Contracting Parties adopted resolution LP.4(8), thereby amending the Protocol to include marine geoengineering activities. The amendments, adopted on 18 October 2013 by the Protocol Parties, add a new article 6bis which states that "Contracting Parties shall not allow the placement of matter into the sea from vessels, aircraft, platforms or other man-made structures at sea for marine geoengineering activities listed in Annex 4, unless the listing provides that the activity or the sub-category of an activity may be authorized under a permit".

20 Marine geoengineering is defined as "a deliberate intervention in the marine environment to manipulate natural processes, including to counteract anthropogenic climate change and/or its impacts, and that has the potential to result in deleterious effects, especially where those effects may be widespread, long-lasting or severe". A new Annex 4 on "Marine geoengineering" lists "Ocean fertilization", defined as "any activity undertaken by humans with the principal intention of stimulating primary productivity in the oceans. Ocean fertilization does not include conventional aquaculture, or mariculture, or the creation of artificial reefs." The Annex provides that all ocean fertilization activities other than those referred to above shall not be permitted.

21 An ocean fertilization activity may only be considered for a permit if it is assessed as constituting legitimate scientific research taking into account any specific placement assessment framework. A new Annex 5 adds the Assessment Framework for matter that may be considered for placement under Annex 4. The Assessment framework provides that Contracting Parties should consider any advice on proposals for activities listed from independent international experts or an independent international advisory group of experts.

CO₂ sequestration in sub-seabed geological formations

22 In 2012, the governing bodies adopted the 2012 Specific Guidelines for Assessment of CO₂ Streams for Disposal into Sub-seabed Geological Formations to take into account transboundary migration of CO₂ within such formations. In October 2013, the Guidance on implementation of Article 6.2 on the export of CO₂ streams for storage in sub-seabed geological formations for the purpose of sequestration was adopted.

Sub-sea disposal of mine tailings

23 Since the last session of GESAMP, the governing bodies of the London Convention and Protocol have continued their review of publicly available information on type and extent of “Riverine and sub-sea disposal of tailings and associated wastes from mining operations”, building on the report presented to the governing bodies in 2012. In October 2013, the governing bodies established an intersessional correspondence group, with the mandate to develop an inventory and understanding of the scope of the LC/LP and other international bodies, as well as gather information on best practices, existing guidance and other issues, in relation to this topic. The Group was also instructed to liaise with GESAMP and coordinate its effort in relation to the ongoing scoping process under GESAMP.

IAEA

RML Activities

GESAMP WG 39 meeting in Monaco

24 The second workshop of GESAMP’s Working Group 39 “Global trends in pollution of coastal ecosystems” took place in NAEL in Monaco on 12-16 May 2014. The objective of the Working Group is to contribute to reduce 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 when available. Experts from 7 Member States were convened to the workshop during which UNInMAR-UNAM (Institute of Marine sciences and Limnology, University of Mexico) presented a database “LME (Large Marine Ecosystem) pollutants” and an analysis tool to assess pollution trends in a chosen temporal series. These methodologies were thoroughly studied by WG39 and successfully applied using digitized data of the California Current as a pilot study case that is reported on LME 03. After carrying out a literature survey and reviewing the most relevant papers, future tasks were assigned with revised working methodologies and delineated within WG39.

IAEA’s project for “Marine Monitoring Confidence Building and Data Quality Assurance”

25 In the framework of the IAEA’s Nuclear Safety Action Plan, the IAEA collaborates with Japan to assist in the implementation of the marine monitoring pro-

gramme set in place following the 2011 earthquake, tsunami and resulting Fukushima Daiichi Nuclear Power Station nuclear accident. Activities under this project are a follow-up to the the International Peer Review Mission on Mid- and Long-Term Roadmap towards the Decommissioning of TEPCO’s Fukushima Daiichi Nuclear Power Station Units 1-4, which visited Tokyo and the Fukushima Prefecture in November-December 2013. The project started in 2014 and will run for 3 years.

IAEA’s Regional Technical Cooperation project RCA RAS/07/021 “Marine Benchmark Study on the Possible Impact of the Fukushima Radioactive Releases in the Asia-Pacific Region”

26 This is an IAEA Regional Technical Cooperation Project running in the Asia-Pacific region covered by the “Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology for Asia and the Pacific” (RCA) aiming to assist Member States in the region to build capacity allowing them to assess eventual impacts of the radioactive releases from the Fukushima Daiichi Nuclear Power Station on the marine ecosystems. The 3rd Annual Review Meeting for the Project was hosted by Republic of Korea in Busan in July 2014 and was attended by 30 participants from 20 Member States. The project, running between 2011-2015, was already successful in training scientists and laboratory staff from the region in analytical and assessment techniques and in updating the ASPAMARD regional database with 100 000 data on radioactivity in seawater, sediment and biota.

Participation in marine cruises

27 Following a request received from the Environmental division of the Ministry of Fisheries and Marine Resources of Namibia, IAEA NAEL participated in a scientific cruise on the Ministry’s Research Vessel *Mirabilis* during its May 2014 survey along the Namibian coast. The main aim of the collaboration was to carry out a baseline study of marine radioactivity levels in the Benguela system, to extend the existing database on trace elements and to assist Namibia to set up an environmental programme. The collected seawater, sediment and biota samples will be analysed at the IAEA’s Environment Laboratories in Monaco and at the IAEA’s Collaborating Centre the “Centro Nacional de Aceleradores” in Seville. Namibian scientists will be trained in analytical techniques at the IAEA’s Environment Laboratories in Monaco and will participate in the analysis of samples. In addition a national Technical Cooperation project has been proposed for the cycle 2016-2017 to support Namibia to establish a marine radioactivity monitoring programme.

Analytical quality services

- Production of Certified Reference Materials for radionuclides in Sediment from Bikini Atoll and Pacific Ocean:

Two candidate certified reference sediments (IAEA-412 and IAEA-410) have been distributed to 30 laboratories including 5 labs from the

CELLAR (Collaboration of European Low-Level Underground Laboratories) group. 27 participants sent back data sets. The characterisation of these materials is ongoing;

- Inter-laboratory Comparison Exercises:

Two new sediment samples IAEA-465 (Baltic sea sediment) and IAEA-469 (Ibaraki Pacific Ocean sediment) were obtained and are under treatment to be prepared for future inter-laboratory comparison exercises over the next 3 years; and

- Proficiency Testing:

After finalising 2 PTs in 2012 and 2013, RML has organised in 2014 a third PT exercise with seawater samples spiked with Sr-90, Cs-134, Cs-137 and H-3. 48 participants take part in this proficiency test. The PT activities are carried out in the framework of the IAEA's Regional Technical Cooperation project RCA RAS/07/021 "Marine Benchmark Study on the Possible Impact of the Fukushima Radioactive Releases in the Asia-Pacific Region" and the IAEA's Nuclear Safety Action Plan project for "Marine Monitoring Confidence Building and Data Quality Assurance".

MARIS database

28 In 2014 the IAEA's MARine information System (MARiS), a global database for marine radioactivity measurements accessible on Internet through the IAEA's NUCLEUS portal, entered a phase of upgrade and development. Development areas include updating the dataset, improving the website, and linkage with larger environmental data networks. MARiS is now exploring links to both the Group on Earth Observations (GEO) and their data network GEOSS (Global Earth Observation System of Systems), and the iMarine virtual research environment. Furthermore, with the increasing need to educate the wider general audience on the topic of marine radioactivity and the issues surrounding it, MARiS also re-established links to the UN Atlas of the Oceans, a web portal that provides information relevant to the sustainable development of the Oceans. The UN Atlas of the Oceans is developed and maintained by the FAO and works in close collaboration with UN-Oceans, an inter-agency mechanism to coordinate ocean related activities. In September 2014 RML will host a consultants' meeting to collect advice on the development of the MARiS database. New staff, including a professional and an intern, is assigned to MARiS development.

REL Activities

Activities of the "Ocean Acidification International Coordination Centre (OA-ICC)"

29 The OA-ICC was presented at the annual meeting of the German ocean acidification project BIOACID, Warnemünde, October 2013. The project continued to work in close cooperation with the Ocean Acidification International Reference User Group, OAIRUG (funded by the Prince Albert II Foundation); a group specialized

in communicating ocean acidification to policy makers and other non-scientific audiences. The first meeting of the OAIRUG took place from 2-4 December 2013 in Monaco. The OA-ICC co-produced the fact sheet "20 FACTS on ocean acidification" in multiple languages on time for the release of the IPCC Working Group 1 report in September, and assisted the Global Ocean Acidification Observing Network with the creation of promotional material (leaflet, flyer and folder in preparation for an IAEA co-organized side event in Geneva in January 2014).

30 On 2014 the following products were launched: an online version of the OA-ICC Bibliographic database (including more than 2000 references and allocated keywords; <http://tinyurl.com/oaicc-biblio>), the production of an open access slide set for scientists communicating OA to a wider audience ('Things you should know about ocean acidification'; <http://www.iaea.org/ocean-acidification>), and the completion of the first OA-ICC supported inter-comparison exercise on software used in OA research (article published in Biogeosciences Discussions). The OA-ICC web site and news stream were continuously updated and further developed, e.g. to include resources on ocean acidification listed according to audience and language. The OA-ICC Data compilation was updated in close collaboration with partners (Xiamen Univ. and the German-based data centre Pangaea), and now includes more than 400 data sets. The OA-ICC organized an expert meeting on OA data management in Monaco, 23-24 April 2014. The Coordinated Research Project (CRP) on Ocean Acidification and the Economic Impact of Fisheries and Coastal Societies started in 2013 continues its activities and is having the 2nd Research Coordination Meeting in October 2014 at Environmental Laboratories in Monaco

Establishment of the radio-ligand Receptor Binding Assay (RBA) methodology at REL

31 The RBA technique for HAB toxin detection has been implemented at REL. It is intended to contribute to both experimental work (assessment of vulnerability of edible marine organisms to algal toxins in the context of climate and environmental changes) and training of Member States representatives in support to the Technical Cooperation Programmes (there is currently a shortage of training centres for RBA). The RBA methodology is also being promoted within different international partnerships (e.g. GPNM, IPHAB, GEOHAB). A new Coordinated Research Project (CRP) on the application of the RBA technique for improving coastal management has been developed and the initial meeting of the project initially planned for 2014 will take place in early 2015.

Study of vertical fluxes of carbon in a critical oceanic zone off the coast of Peru and Mauritania

32 Within the partnership with German research institutes (GEOMAR in Kiel and University of Kiel) a cruise was carried out to study and better understand tropical oceans and marine low oxygen zones. This is done within the German Collaborative Research Centre SFB-754 (Sonderforschungsbereich) on "Climate Biogeochemistry Interactions in the Tropical Ocean".

As part of this, REL participated in a sampling mission in June 2014, at the Eastern Boundary Upwelling System off Mauritania on board of the research vessel "METEOR". The participation and contribution of REL focussed on the quantification of carbon removal from the low oxygen upper waters of the region.

Marine Environmental; Studies Laboratory (MESL) Activities

GESAMP Task Team meeting in Monaco

33 The workshop of GESAMP's Task Team on Open Ocean Pollution under the Transboundary Waters Assessment (TWA) project, took place in NAEL Monaco on 25-28 February 2014. The GESAMP Task Team aims at updating a previous review of open ocean pollution (GESAMP 2009) and to complement other assessments by IOC focusing on shelf sea areas. The updated Report is conceived as a thematic, initial assessment focussing on data from the last 5 years and will feed into the GEF/IOC/UNEP Trans-boundary Waters Assessment. M. Angelidis of NAEL/MESL and H.Nies of NAEL/RML, joined the Task Team during the 4-days workshop to discuss recent scientific findings on a range of open ocean pollution topics.

Strengthening data quality assurance of Regional Seas laboratories participating in marine monitoring programmes

34 MESL provided technical support for strengthening the capability of Mediterranean laboratories to accurately analysing contaminants in marine samples, the framework of the MED POL marine pollution monitoring programme (MED POL is the Programme for the Assessment and Control of Pollution in the Mediterranean Region of UNEP/Mediterranean Action Plan). Designated national monitoring laboratories in Mediterranean countries benefit by being able to use the analytical support of MESL in the development in their quality assurance programs for determination of trace elements and organic contaminants in marine environment.

35 In the framework of collaboration with UNEP/MAP-MED POL, MESL developed two new Recommended Methods:

- .1 Determination petroleum hydrocarbons in biological samples; and
- .2 Extraction of organic mercury in marine samples before thermal decomposition amalgamation and atomic absorption spectrophotometry.

36 Also, to improve and simplify the procedures for the analysis of organic contaminants, MESL optimised a multi-residue method for the determination of selected organochlorinated compounds and petroleum hydrocarbons in marine sediment.

37 MESL provided technical support on strengthening data quality assurance in marine pollution monitoring in the Mediterranean region. In collaboration with UNEP/MAP- MED POL, MESL organised two Proficiency Tests with the participation of 29 labora-

tories and two Training Courses for 11 Mediterranean scientists:

- Analytical Performance Study for MEDPOL: Determination of trace elements in marine sediment sample (IAEA-MEL-2013-01 PT/TE)
- Analytical Performance Study for MEDPOL: Determination of chlorinated pesticides, PCBs and petroleum hydrocarbon in biota sample (IAEA-MEL-2013-01 PT/ORG),
- Training workshop on the analysis of Trace Elements in marine samples for laboratory practitioners in MEDPOL countries, 2-13 December 2013
- Training workshop on the analysis of Organic Contaminants in marine samples for laboratory practitioners in MEDPOL countries, 2-13 December 2013

38 MESL and RML continued to provide technical support to the Mussel Watch Programme of the Regional Organisation for the Protection of the Marine Environment of the Gulf (ROPME) by jointly analysing oyster and sediment samples from the coastal zone of the Gulf Member States, for radionuclides. A relevant Report was presented to ROPME on 2013.

Developing tools for assisting MSs to analyse Mercury and Methyl Mercury in marine samples

39 MESL continued the development of recommended analytical methods for determination of Mercury and Methyl Mercury in marine samples. These methods, in combination with the Mercury CRMs which are produced by MESL, are valuable assistance to Member States in order to fulfil their monitoring obligations in the framework of the global Minamata Convention on Mercury, signed on October 2013 in Japan.

IOC of UNESCO

Ocean acidification

40 Efforts of IOC on ocean acidification include advocacy and communication, and promotion of research and oriented actions towards capacity building. The IOC recognizes the importance of improving our understanding of the rates of transfer and pathways in global ocean carbon cycle and the societal impacts associated with increased ocean acidification and therefore initiated and participated in several activities to advance research and sustained observations and to inform policymakers and stakeholders.

41 A few examples showing the promotion of scientific achievements, public outreach and communication include:

- .1 The IOC-UNESCO co-led the preparation of the Ocean Acidification Summary for Policymakers (SPM) which was published in November 2013. This summary (led by IOC, IGBP and SCOR)

- is an international assessment by a group of experts of the latest ocean acidification research presented at the world's largest gathering of experts on ocean acidification ever convened (Third Symposium on the Ocean in a High CO₂ World). The assessment included the latest peer-reviewed publications. The experts concluded that the acidity of the world's ocean may increase by around 170% by the end of the century leading to significant changes in marine ecosystems, loss of biodiversity and economic losses. People who rely on the ocean's ecosystem services – often in developing countries – are especially vulnerable;
- .2 The IOC-UNESCO was the main organizer of a UNFCCC COP19 side event on Ocean Acidification. In cooperation with other UN agencies, NGOs and national ocean acidification programmes this event was used to enhance the awareness towards the threat of Ocean Acidification and how this affects the marine environment. The public launch of the ocean acidification SPM was conducted during this side event. Besides that this side event highlighted initiatives to address the challenges associated with ocean acidification, including the need for greater international observation and coordination. The event attracted, 150 people, covering a broad audience including journalists, parties, NGOs and UN agencies/organizations;
 - .3 In addition the IOC-UNESCO organized a parallel session on the Ocean at 'The World Science Forum', which took place in Rio de Janeiro in November 2013 with the theme 'Science for Global Sustainable Development'. This parallel session was entitled 'Applying Ocean Sciences and Knowledge for Societal Benefit: Demands After Rio+20'. The session highlighted the direct link between climate change, the health of the ocean, and human well-being, as well as the need to apply ocean sciences knowledge for social benefit to reverse the degradation of marine ecosystems, and to minimize climate change impacts and other pressures on coastal communities and ocean ecosystems and resources; and
 - .4 Further the IOC-UNESCO supports the Ocean Acidification International Coordination Centre (OA-ICC), operated by the IAEA Marine Environmental Studies Laboratory in Monaco. The Centre is overseen by an Advisory Board consisting of leading institutions, including the IOC -UNESCO. Successful outreach efforts during the past year in cooperation and collaboration with the OA-ICC were e.g the GEO-X side event promoting GOA-ON and The ocean

acidification side event at the UNFCCC COP19.

42 With respect to the promotion of research and oriented actions towards capacity building, the IOC has developed the following activities in 2013-2014:

- .1 IOC is running since 2012 a project on Ocean Carbon Sources and Sinks, which includes biogeochemical time series, ocean carbon and blue carbon. Related to that, the IOC leads, with support by the IOCCP and OCB, a new initiative the 'International Group for Marine Ecological Time Series' (IGMETS). This new initiative, so far driven by a core group of ten people, elaborates on how to compile and disseminate a comprehensive, integrated interpretation of global biogeochemical ocean changes as seen through time-series. The main outcome document will be a scientific report, accompanied by e.g. a website and further science/policy publications. Integrated selected variables will be used to look at holistic changes, comparing different ocean regions. Impacts of climate change will be explored at a global level and regions that may be at greater risk will be highlighted. The major audience for the envisaged publication will be the scientific community; nevertheless side products aim to guide policy makers and local stakeholders. This is a massive effort, in the hopes that the importance of biogeochemical Time Series sites to detect climate change is acknowledged worldwide; and
- .2 The IOC has launched in 2012, together with NOAA and other organizations, the Global Ocean Acidification Observing Network (GOA-ON), which aspires to provide a central source of information and data exchange for ocean scientists on research activities in this area and to effectively monitor OA in coastal waters and high seas. With regard to that the IOC-UNESCO was part of the organization team of a side event at the GEO-X in January 2014, presenting the Network and promoting its important role in coordination and improving ocean observation to detect the impacts of ocean acidification. Furthermore the IOC-UNESCO hosted and participated in the first meeting of the Executive Council of the GOA-ON in May 2014, where further actions were planned and the GOA-ON plan was finalized.

Blue Carbon

43 The Blue Carbon Initiative is a coordinated, global program focused on mitigating climate change through the conservation and restoration of coastal and marine ecosystem. It engages local, national, and international governments in order to promote policies

that support coastal blue carbon conservation, management and financing. The goal is to develop comprehensive methods for assessing blue carbon stocks and emissions, which will be implemented by projects around the world that demonstrate the feasibility of blue carbon accounting, sustainable management and incentive agreements. Finally the group wants to support scientific research into the role of coastal blue carbon ecosystems for climate change mitigation.

44 The IOC is highly involved in the Blue Carbon Scientific Working Group, which provides the scientific foundation for the Blue Carbon Initiative by synthesizing current and emerging science on blue carbon and by providing a robust scientific basis for coastal carbon conservation, management and assessment. Priority research of the Scientific Working Group functions in close partnership with the Initiative's Policy Working Group. A Field Guide for carbon accounting in mangroves, seagrasses and salt marshes applicable at national and local levels will be published shortly. The guide was subject to significant peer and user review before being published. The future application of the guide and the expansion of countries which are involved will be major tasks for the following two years.

45 Additionally, the IOC organized the meeting of the Working Group in Paris, UNESCO headquarters, in October 2013. The agenda for the meeting concentrated on issues related to remote sensing and mapping of coastal carbon ecosystems.

IOC Joint action with ICES and IMO on Ballast and other Ship Vectors

46 The ICES/IOC/IMO Working Group on Ballast and Other Ship Vectors (WGBOSV) critically reviews and reports on the status of shipping vector research with an emphasis on new developments in ballast water treatment technology, risk assessment, ballast water sampling devices, and selection of ballast water exchange zones. The WG also discusses and evaluates the sampling strategies to ensure that international guidelines are based on accurate scientific information, thereby helping to achieve consensus on difficult and technical issues.

47 In 2014 the WG had a full day joint meeting with the Working Group on Introductions and Transfers of Marine Organisms (WGITMO) and continued to critically review and report on the status of shipping vector research with an emphasis on studies of shipping transport vectors, shipping vector management activities and risk assessment. The Group also evaluate sampling and analysis strategies for type approval and compliance testing of ballast water treatment technologies under consideration at IMO or by other regulators (e.g. U.S. Environmental Protection Agency); evaluate available information on the effects of treated or exchanged ballast water on the aquatic environment and provide input on strategies which could be used to increase confidence surrounding environmental safety of treated ballast water being discharged; and investigate and report on new developments in non-native species issues associated with biofouling (e.g. artificial structures in the marine environment and recreational boating) as well as on new developments in non-native

species issues in the Arctic. Full report at <http://www.ices.dk/community/groups/Pages/WGBOSV.aspx>

Nutrient's coastal Impacts research

48 The 'Global Foundations for Reducing Nutrient Enrichment and Oxygen Depletion from Land-based Pollution in Support of Global Nutrient Cycle' Full Size Project by the Global Environment Facility (GEF) was approved in 2011 and the time frame is 24 months, April 2012 – March 2015. UNEP's Division of Environmental Policy and Implementation (DEPI) is the implementing agency of the Project. The partners are UNEP's Global Programme of Action for the Protection of the Marine Environment from Land Based Activities (GPA) as the main executing agency coordinating the work of IOC-UNESCO, Governments of the Philippines, India, The Netherlands and the USA; PEMSEA; Chilika Development Authority; Global Environment and Technology Foundation; Netherlands Environmental Assessment Agency; Washington State University, Vancouver; University of Utrecht, The Netherlands; The Netherlands Energy Research Centre; Institute for Oceans Management, Anna University Chennai; National Centre for Sustainable Coastal Management, India and University of the Philippines.

49 The project will provide the foundations (including partnerships, information, tools and policy mechanisms) for governments and other stakeholders to initiate comprehensive, effective and sustained programs addressing nutrient over-enrichment and oxygen depletion from land based pollution of coastal waters. The Project includes execution of pilot projects in the Manila Bay watershed, Philippines, and the Chilka Lake, India. The deliverables include:

- .1 Development and application of quantitative modeling approaches to estimate and map sources and contributions of different nutrient sources to coastal nutrient loading and their effects; to indicate when nutrient over-enrichment problem areas are likely to occur; and to estimate the magnitude of expected effects of further nutrient loading on coastal systems under a range of scenarios;
- .2 Development of a "Policy Toolbox", through which the decision-makers will have informed and interactive access, to cost effective, replicable tools and approaches to develop and implement nutrient reduction strategies; and
- .3 A Global Partnership on Nutrient Management, see website <http://www.gpa.unep.org/index.php/global-partnership-on-nutrient-management>

Microplastics

50 Efforts of IOC on microplastics include advocacy and communication as well as promotion of research and scientific assessment. In terms of advocacy the IOC is producing a video to create awareness on the impacts of plastics and microplastics in the ocean, its marine organisms and ecosystems. One

workshop and one side event are being held in parallel to the 2nd International Ocean Research Conference.

51 Regarding the promotion of research and scientific assessment, the IOC is leading the GESAMP WG40: *Sources, fate and effects of micro-plastics in the marine environment – a global assessment*, tasked to conduct a global assessment of the inputs, levels, distribution and fate of micro-plastics in the ocean, and the potential role of micro-plastics as a pathway for persistent, bio-accumulating and toxic substances entering marine food-webs.

Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socio-Economic Aspects – World Ocean Assessment

52 The task of the first cycle of the Regular Process (2010 to 2014) will be to produce the first World Ocean Assessment. To this end, the UN General Assembly has created an Ad Hoc Working Group of the Whole to oversee and guide the Regular Process, and a Group of Experts to carry out the assessments within the framework of the Regular Process. In addition, a much larger pool of experts has been created to assist the Group of Experts in conducting the assessments and to provide effective peer-review to ensure the high quality of the outputs. Since the Working Group meets once a year, a Bureau consisting of fifteen Member States¹, representing the regional groups of the United Nations, was established for the intersessional periods of the Ad Hoc Working Group of the Whole.

53 Following the adoption in 2012 of the Terms of Reference and Methods of Work for the Group of Experts as well as the Outline of the First Global Integrated Marine Assessment (World Ocean Assessment, WOA-I), the Group of Expert supported by the Pool of Experts have engaged in the drafting of the WOA chapters with the aim to deliver these for peer review in the summer of 2014.

54 In line with resolution A/RES/68/70 of 9 December 2013 on Oceans and the law of the sea, inviting IOC and other agencies to provide technical and scientific support to the Regular Process, IOC has continued to engage in the World Ocean Assessment in the following manner:

- .1 In the area of Communication: With initial letters of support and funds in cooperation with UNEP/GRID-Arendal, a communication portal and a dedicated website has been developed for use by the Group of Experts and contributors to the report. Between 2012 and 2014, financial support has been provided by the IOC to an amount of 30,000 USD thanks to contributions from France and Belgium (Govt of Flanders);
- .2 In the area of Assessments: IOC is leading a number of marine assess-

¹ African States: Ghana, Kenya, Tanzania; Asia-Pacific States: China, Republic of Korea, Sri Lanka; Eastern European States: Bulgaria, Estonia, Ukraine; GRULAC: Argentina, Chile, Ecuador; Western European and other States: Greece, Spain, USA (at the date of 26/03/2013)

ment products and databases that are available to the Group of Experts and will be integrated into the World Ocean Assessment. In particular, the contribution of the GEF Transboundary Water Assessment Programme (TWAP) implemented by UNEP and IOC, to prepare an indicator based assessment of the world's Large Marine Ecosystems and Open Ocean areas (see below). This project which will deliver this year its results in the form of technical reports and a web based portal, has been implemented in close coordination with the WOA Group of Experts with a view to make these information available to writers and contributors; and

- .3 In the area of Capacity building: UNEP and IOC have continued to support member states in the organization/facilitation of workshops. Technical and financial support has been provided to member states for the organization of Workshops, held in accordance with the Guidelines for Workshops adopted by the General Assembly in resolution 66/231 of 24 December 2011. These Workshops were hosted by the Governments of Chile, China, Belgium, the United States of America, Mozambique, Australia, Côte d'Ivoire and most recently India.

55 UNEP and IOC are also committed to assist the Group of Experts of the Regular Process (GOERP) in finalising production of the report of the First Global Integrated Marine Assessment with the technical editing of the publication among others. IOC is providing support to DOALOS to hire an editor for the whole WOA report. As the draft chapters become available, a peer review process will take place based on a two track approach:

- UN Member States and relevant technical agencies such as IOC will be invited to provide comments on the draft chapters; and in parallel
- A technical review conducted by experts (from the pool of expert) nominated by the Group of Experts (GOERP),

TWAP

56 The Transboundary Waters Assessment (TWA) Programme Full Size Project by the Global Environment Facility (GEF) was approved in December 2012 and the time frame is 24 months, January 2013 – December 2014. UNEP's Division of Environmental Policy and Implementation (DEPI) is the implementing agency of TWAP FSP. The partners are UNEP's Division of Early Warning and Assessment (DEWA) as the main executing agency coordinating the work of UNESCO-IHP, ILEC, UNEP-DHI and IOC-UNESCO.

57 The project is aimed to produce the first truly global assessment of all transboundary waters within the five recognized categories: transboundary aquifers and SIDS groundwater; transboundary lakes and reser-

voirs; transboundary rivers; Large Marine Ecosystems and the Open Ocean, and at the same time formalize the network of partners to establish a firm institutional basis on which to base future periodic global assessments of transboundary waters.

58 In the context of the IOC led marine components (Open Ocean and LME), GESAMP is a partner responsible for the marine pollution aspect and will deliver the following outputs:

- .1 Updated GESAMP Report No. 79 "Pollution in the open oceans: a review of assessments and related studies";
- .2 Gridded data on plastic density in the marine environment (pieces/km² from towed nets) for the LMEs and Open Ocean data infrastructure, subject to data availability (e.g. latitude/longitude of sampling stations);
- .3 Gridded data on plastic pellet distribution and contaminant (POPs) concentrations for LMEs in the agreed format for the LMEs data infrastructure, subject to data availability (e.g. latitude/longitude of sampling stations);
- .4 Brief reports on outputs ii and iii above, including methodology/approach, data sources, and results; and
- .5 Written contribution to the Pollution chapters of the both LME and Open Ocean assessment reports as well as narratives for inclusion on the web portal.

59 Both LME and Open Ocean draft reports will be ready for peer review by October 2014 before being published in December 2014. The TWAP marine portal should be launched in November 2014.

UNIDO

Collaborative Actions for Sustainable Tourism (COAST) Project

60 In the past five and a half years, UNEP, UNIDO, and UNWTO have actively collaborated to address sustainable tourism development in selected eight coastal states in Sub Saharan Africa (Cameroon, the Gambia, Ghana, Kenya, Mozambique, Nigeria, Senegal, and Tanzania), through a Global Environment Facility (GEF) funded project in the International Waters focal area, entitled, Collaborative Actions for Sustainable Tourism (COAST). This project also included lesson sharing and capacity building collaboration with one African small island state, the Seychelles. The COAST project's goal was to demonstrate and support the adoption of best practices for sustainable tourism to reduce the degradation of marine and coastal environments of transboundary significance. The project was implemented in three main thematic areas: Eco-tourism Practices, Environmental Management Systems and Reef and Marine Recreation Management with demonstration sites in eight of the countries, as well as regional-level activities where all nine COAST countries were brought together in capacity building and awareness raising events.

61 The contributions in this recently concluded project (30 June 2014) in demonstrating practical applications to; improving tourism governance, reducing land based pollution, resource efficiency, promoting micro-enterprises which can sustain local employment and culture, as well as enhanced codes of conduct and sustainable marine recreation planning are all significant. The project dedicated additional efforts during the last year of implementation to capture and document Best Available Practices and Best Available Technologies (BAPs/BATs) arising from the demonstration sites so as to facilitate the replication, upscaling and sustainability of actions at a national and regional level.

62 Eight major transboundary lessons and results emerged from the project: (1) Adopting cleaner management techniques and technologies in the African hospitality industry can help hotels gain a competitive edge and achieve a healthier environment. (2) The goals of poverty reduction and job creation can be achieved through the promotion of community based entrepreneurs involved in activities related to the conservation of natural resources. (3) Local tourism stakeholders can play a leading role in the conservation of biodiversity in coastal tourism areas. (4) Private-community-public partnerships enable the development of new environmental services and economic activities and improve local management of the coastal zone. (5) Planning in coastal areas must be understood as an integrated and dynamic process, requiring the coordination of various activities within the same space (e.g. tourism, fisheries, transport, industry) anticipating both present and future environmental pressures. (6) Drafting and enforcing sustainable management plans at local and national levels are necessary to enhance a coordinated government framework in which the tourism sector is actively contributing to long term sustainability. (7) Codes of conduct and marine zoning are effective and essential tools to ensure better conservation of reef and marine areas within coastal destinations. (8) Heritage, cultural and traditional practices are powerful drivers attracting tourists to coastal areas while providing niche opportunities to expand the benefits of tourism to the poor.

63 At the final Steering Committee and Results sharing event held in June 2014, the project partners and participating nine country focal points from the Ministry of Environment and Ministry of Tourism collectively expressed a clear wish for a second phase of this project to the UN Agencies, given the numerous positive benefits this project was able to attain within each of their respective countries, as well as regionally. More information can be found on <http://coast.iwlearn.org/en>

GoM-LME

64 The project "Integrated Assessment and Management of the Gulf of Mexico Large Marine Ecosystem (GoM-LME)" is aimed at setting the foundations for a LME-wide ecosystem-based management approach to rehabilitate marine and coastal ecosystems, recover depleted fish stocks, and reduce nutrient overloading in the Gulf of Mexico. To date the Transboundary Diagnostic Analysis (TDA) has been completed and widely disseminated; the TDA analyses the various transboundary environmental problems,

major root causes, impacts and consequences in the Gulf. The Strategic Action Plan (SAP) has also been developed and validated by both countries. This completed the current project which will be closed in October 2014.

65 UNIDO has been working with the counterpart to develop a second phase of this project aiming at the implementation of the SAP with the objectives of reducing landbased pollution, managing fisheries and reinforcing the regional coordination mechanisms at the political and academic levels. More on the GoM-LME project can be found at <http://gulfofmexicoproject.org/en/>.

SWITCH MED

66 The SWITCH-Med programme is a European Commission funded project that focuses on sustainable consumption and production (SCP) in nine countries of the South Mediterranean region. The SWITCH-Med Initiative is made up of three interlinked components: Policy, Demonstration and a Networking component. UNIDO is the implementing agency of the Demonstration and Networking components, and is working closely with UNEP-DTIE and the UNEP-MAP - Regional Activity Centre for Cleaner Production (SCP/RAC) as executing partners. The project commenced on 1 February 2014.

67 The UNIDO executed components will support industry, emerging green entrepreneurs, civil society and policy makers through policy development, demonstration activities and networking. The first Steering Committee Meeting was successfully held in June 2014 in Brussels with all the project partners and countries being represented by focal points from the respective Ministry of Industry and Ministry of Environment.

68 MED TEST II will be implemented under the scope of the Demonstration component. The objective of MED TEST II is to stimulate the demand and supply of sustainable production services to industry. The MED TEST II will contribute to achieve national and regional pollution reduction objectives for the Mediterranean Sea set within the EU Horizon 2020 initiative and by the UNEP MEDPOL programme. During 2014 UNIDO completed scoping activities in each country and is conducting the bidding and selection process for service providers in each country. Activities in the countries will commence in early 2015.

Fish stock project in Sudan

69 UNIDO in cooperation with the Norwegian Institute for Marine Research (IMR) continued to provide technical assistance to assess the status of renewable marine resource in the Red Sea State, Republic of the Sudan. In 2013 two surveys (each 30 days at sea) were implemented and some 35 national experts were trained in the design and implementation of surveys as well as in the at sea analyses of results. A follow-up project is being discussed for funding with the Norwegian Embassy in Khartoum.

UNEP's Marine and Coastal Strategy²

70 UNEP's marine strategy cuts across the seven sub-programme areas of the programme of work. These are namely climate change, disasters and conflicts, ecosystem management, environmental governance, chemicals and waste, resource efficiency and sustainable consumption and production, and environment under review. The strategy covers four major areas: the land-ocean connection, ecosystem services, balancing use and conservation and vulnerable people and places. The outcomes are achieved by focusing on UNEP's core competencies of assessment, policy, planning and communications, providing objective science-based information and enhancing users' capacities.

71 Led by the Division of Environmental Policy Implementation (DEPI) a key strength of the marine and coastal ecosystem programme is its ability to facilitate cooperation at global, regional and national levels through the Regional Seas Programme and the Global Programme of action for the protection of marine environment from land-based activities (GPA). UNEP's work focuses on using sound science to apply ecosystem management to address factors causing decline of ecosystem services in marine and coastal areas. The key areas of work include environmental aspects of fisheries, integrated management of marine protected areas, marine biodiversity and ecosystems, and impacts of climate change on the marine environment.

72 UNEP is continuously providing technical support and capacity building on the integrated management of marine and coastal ecosystems within the framework of its marine and coastal strategy. In particular support is given to member states through the platforms of the GPA and the Regional Seas Conventions and Action Plans; e.g. Abidjan Convention, Barcelona Convention, Cartagena Convention, COBSEA, Nairobi Convention, and NOWPAP. Furthermore, there is extensive collaboration with UN Agencies such as UNESCO/IOC, UNDP, IMO, FAO, UN DOALOS, UN DESA and the World Bank, amongst others.

Regional Seas Programme³

73 Based on the decisions of the previous Governing Council, recently upgraded to the United Nations Environmental Assembly of the United Nations (UNEA), UNEP has been coordinating the Regional Seas Programme. At the 14th Global Meeting of the Regional Seas Conventions and Action Plans held in Nairobi, Kenya, 3-5 October 2012, the Executive Secretaries and Coordinators of the participating Regional Seas programmes and UNEP agreed on the Regional Seas Strategic Directions 2013-2016.⁴

74 The Regional Seas Conventions and Action Plans are one of the on-the-ground implementation vehicles that UNEP has to support member states in addressing the growing degradation of the marine and coastal environment around the world. The 18 Conventions and Action Plans encompass 143 countries. UNEP support to the implementation of the Regional

² <http://www.unep.org/depi>

³ www.unep.org/regionalseas

⁴ UNEP GC decision 27/6

Seas strategic Direction 2013-2016⁵ focuses on:

- .1 Enhancing countries' "ownership" over their respective Regional Seas Conventions and Action Plans;
- .2 Effectively applying an ecosystem approach in the management of the marine and coastal environment;
- .3 Contribute to the implementation of the Manila Declaration of the Global Programme of Action for the Protection of the Marine Environment from Land Based Activities (GPA), in particular the partnerships on wastewater management, nutrients and marine litter;
- .4 Strengthen capacities at the national and regional level on marine and coastal governance, in order to enable coordination and coherence with Large Marine Ecosystem projects, Regional Fisheries Management Organizations and River Basin Organizations, as appropriate;
- .5 Support the provision of tools to decouple economic growth from environmental pressures in the marine and coastal environment by promoting resource efficiency and productivity, including assessing the services provided by these key marine and coastal ecosystems;
- .6 Strengthen coordination and build necessary capacities at the national and regional levels to improve global knowledge and trends on the state of the marine environment, contributing to the World Oceans Assessment (Regular Process);
- .7 Strengthen collaboration mechanisms with relevant Multilateral Environmental Agreements (MEAs), UN Agencies and International Financial Institutions (IFIs); and
- .8 Contribute to the implementation of the Mauritius Strategy for the Sustainable Development of Small Island Developing States and the preparatory process for Barbados +20.

75 The implementation of these key areas of work are directly linked to the support that the Regional Seas provide to their member states.

76 UNEP successfully organized the 15th Global Meeting of the Regional Seas Conventions and Action Plans from 30 September to 1 October 2013 in Montego Bay, Jamaica. The meeting focused on partnerships in the implementation of the Regional Seas Strategic Directions 2013-2016 and Ocean Governance.

77 As part of activities to celebrate the 40th anniversary of the Regional Seas Programme UNEP organized the Regional Seas Visioning Workshop, in Geneva, Switzerland 3-4 July 2014. The workshop

⁵ <http://www.unep.org/regionalseas/globalmeetings/15/RegionalSeasStrategicDirections2013-2016REV.pdf>

aimed to identify the future trends and priorities for the Regional Seas Conventions and Action Plans. The workshop was attended by the Regional Seas, UN Agencies and other key partners. The workshop identified the following priorities for the 10+ timeframe:

- .1 Extraction: Living (fisheries) and non-living resources (oil/gas, sea-based mining);
- .2 Pollution;
- .3 Governance; and
- .4 Impacts of a changing climate and ocean acidification.

Ecological Indicators

78 UNEP and partners have recently begun a process to select ecological indicators to assess the state of the marine environment of the Regional Seas Conventions and Action Plans. In this regard a technical workshop on selecting indicators for state of regional seas was held in Geneva, 30 June - 2 July 2014. UNEP proposed to establish a set of indicators, from which the regional seas programmes can draw and decide in order to track down the chronological changes of the status of marine and coastal environment.

79 In this sense, ecosystem-based indicators can provide information to guide both sustainable management of ocean resources as well as the monitoring of the state of the marine environment in consideration of performance against environmental targets and/or limits in a defined geographical area. In order to guide management, indicators should be set within a reference framework and hierarchies of indicators can provide coordinated support. With time current ecosystem-based indicators are likely to embrace ecosystem service indicators and synergies should be considered when considering any relevant strategic development.

6^{Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA)}

80 The GPA focused its efforts primarily on the three pollution source categories of nutrients, wastewater, and marine litter, through establishment and management of global partnerships, in response to the Manila Declaration. The major event for 2013 convened by the GPA was the multi-stakeholder Second Global Conference on Land-Ocean Connections (GLOC-2). The GLOC-2 was successfully held during the period October 2-4, 2013 in Montego Bay, Jamaica. A number of recommendations were made towards the implementation of the Manila Declaration on Furthering the Implementation of the GPA. The Global Partnership on Nutrient Management (GPNM) carried out a global over-view of nutrient management policies, practices and their impacts on water quality, soil health and human wellbeing, in partnership with the International Nitrogen Initiative. This report titled "Our Nutrient World" was finalized and launched at the 27th session of the Governing Council in February 2013. This was one of the most viewed articles of the Independent newspaper (UK) for 3 days, and for the Guardian newspaper (UK) it was one of the most shared and commented

⁶ <http://www.gpa.unep.org/>

news items, with a record of 240 comments and 12767 shares through Facebook. Subsequently several articles were published in scientific journals including Nature.

81 The GPA launched the GPNM Caribbean Platform in May 2013. GPNM in partnership with Global Transdisciplinary Processes for Sustainable Phosphorus Management (Global TraPs) organized the Fifth International Nutrient Management Symposium and the First International Conference of the Global TraPs in Beijing in June.

82 UNEP contributed to the preparation of the “2012 Chilika Lake Ecosystem Health Report Card” which focuses on understanding the biogeochemical process and fluxes of nutrients in the Chilika Lake and estimating the overall water quality status, biodiversity and fisheries of the Chilika Lake along with the coastal water quality in the adjacent Bay of Bengal. The Chief Minister of Odisha, India approved the Report Card which is the first of its kind in Asia. The GPNM partners are facilitating replication of the Ecosystem Health Report Card in several coastal States of India and in the Philippines. In the area of wastewater management, the UNEP Executive Director, in May 2013, announced the formation of a global partnership on wastewater management – known as the Global Wastewater Initiative (GWI). A number of international organizations were formally invited to become Founding members of the GWI. There are currently over 30 member entities. The GWI held its first members meeting on October 4th, 2013 at the GLOC-2 conference and Partnership Forum. During the forum, the GWI International Steering Committee was established and the proposed focal areas of work as well as a work programme were agreed. The elements of this GWI have been developed and joint pilot activities are underway, some partially funded by UNEP.

83 The GPA is coordinating activities under the UN-Water Task Force on Wastewater. The key activity of the Task Force has been development of wastewater targets and indicators, as contribution to the development of a Sustainable Development Goal (SDG) for Water. UNEP, through the work of the Task Force, has contributed to concrete recommendations for SDG targets and indicators for wastewater and water quality, for inclusion in a recommendation made by UN-Water. An Analytical Brief on Wastewater, prepared by this Task Force, is to be published by UN-Water later in 2014.

84 The GPA initiated an economic valuation of the impacts of wastewater, which was completed and is being expanded in 2014. The GPA has also agreed with the World Bank to Co-Chair the Marine Pollution Working Group under the Global Partnership for Oceans, which will support target setting and investments for pollution.

85 Continued development of the Global Partnership on Marine Litter (GPML) was the focus of the GPA in 2013. The GPML launched during the United Nations Conference on Sustainable Development, Rio + 20 in June 2012, is a voluntary open-ended partnership for international agencies, Governments, businesses, academia, local authorities, and civil society.

Besides being supportive of the Global Partnership on Waste Management, the GPML seeks to protect human health and the global environment by the reduction and management of marine litter as its main goal, through several specific objectives. UNEP provides the Secretariat for the GPML in line with the mandate received in the “Manila Declaration on Furthering the Implementation of the GPA”, and leads on the focal area on land-based sources of marine litter. FAO and IMO lead the focal area on sea-based sources of marine litter. In October 2013, the first partnership forum of the GPML was convened. UNEP, IMO and FAO served as the initial steering committee which is being expanded. GPML Focal area work plans have been prepared for land-based sources of marine litter (by UNEP) and for sea-based sources of marine litter (by IMO and FAO). Much support has been provided to various organizations including Regional Seas Conventions and Action Plans.

86 Various activities are underway in collaboration with partners including: An e-book on micro-plastics; A desk study on the baseline of marine litter (in response to Rio+20); A publication on plastic in personal care products; and an international I-phone application in various languages was developed to increase consumer awareness of micro-plastics in personal care products. FAO led activities include: desk review/study of technologies and methodologies used to remove ALDFG from the marine environment; Methods to Estimate the Efficiency and Duration of Ghost Fishing, Estimates of Derelict Gear, Estimates of Megafauna Ghost Fishing Mortality, and Regional Fisheries Management Organization Management Measures”; review and analysis of national and regional legal and policy frameworks for selected countries / regions where recovery and clean-up missions have been successful, incl. Norway, the USA, and e.g. Australia and Korea or others. IMO-led activities include: A dedicated website with information on sea-based sources of marine litter, as a resource for schools, kids and youth; Outreach to Marine Environment Protection Associations (MEPAs) - establishment of a Marine litter observation system in cooperation with the Hellenic MEPA; MARPOL Port Reception Facilities workshops in South East Asia: Technical resources paper/study on reception facilities, additional awareness raising materials; and Translated information in various languages, incl. outreach materials and videos. The GPML has also supported the development of regional, national and municipal marine litter action plans as well as a demo project in Samoa.

87 A major publication on “Valuing Plastics” was also launched during the First UNEA in June 2014. This publication was prepared by Trucost, with support from the Plastic Disclosure Project and UNEP/GPA. Perhaps the most significant development in the area of marine litter was the Resolution of governments during UNEA. Among the many resolutions agreed upon by governments was to particularly focus efforts to address marine plastics. UNEP/GPA is leading the development of the follow up activities.

The Regular Process

88 The current process being referred to as World Oceans Assessment (WOA) with secretariat (UN

DOALOS) and member states is implementing the first integrated assessment cycle 2010-2014. UNEP has since been providing technical and scientific support in the following areas: 1. Communication: initial support to set up of a communications portal for use by the Group of Experts and member states; 2. Assessments: sharing its extensive knowledge gained through the GEO processes and in the development of integrated assessments; 3. Capacity building: support to member states on the Regular Process in the organization/facilitation of regional workshops through the platform of the Regional Seas Conventions and Action Plans; 4. Resource mobilization: engagement with potential donor countries to support the Regular Process.

89 The workshop for the Pacific Region was hosted by the Government of Australia 25-27 February 2013 in Brisbane, Australia, facilitated by the Noumea Convention (SPREP). More than 25 member states from the region were in attendance, the Members of the Group of Experts as well as UNEP and UNDOALOS.

90 The workshop for the South Atlantic Region was hosted by the Government of Ivory Coast 28-30 October 2013 in Grand Bassam, Ivory Coast, facilitated by the Abidjan Convention. 22 member states from West Africa, as well as 3 countries from South America were in attendance. Members of the Group of Experts as well as UNEP, IOC-UNESCO, FAO, IMO and UNDOALOS also attended the workshop.

91 UNEP, by way of providing technical and scientific support, has participated in the following activities related to the WOA:

- .1 Meeting to consider methodologies for conducting state of marine environment assessments and to design a new United Nations Capacity Building Program for developing countries held 14-15 April in Paris at the IOC UNECSO offices. The meeting was attended by representatives from UNEP, UNESCO-IOC, GRID Arendal and the co-chair of the Group of Experts for the Group of Experts for the Regular Process, Mr. Alan Simcock. The meeting discussed a document from GRID/Arendal "Measuring the State of the Oceans: Guidelines for the Conduct of State of Marine Environment (SOME) reporting workshops based on Expert Elicitation ("SOME workshops"). The meeting recommended that methodological approach for assessment should consider the ecosystem services component of the marine environment needs to be more prominent (within ecosystem processes and habitats), including within the socio-economic benefits section; consider using TWAP results to do a comparison analysis with EE assessments; explore the possibility to integrate indicators resulting from TWAP at LME and Open Ocean scale; better define the post workshop steps leading to the preparation of the final assessment product, including peer review and communication processes; frame

the methodology within the Sustainable Development Goals process and human wellbeing dimension and review the methodology with wider group of experts (including with socio-economic expertise); and

- .2 Meeting between the Bureau of the Ad Hoc Working Group of the Whole and the Group of Experts of the Regular Process on 7 May 2014. The meeting discussed progress in the preparation of the World Ocean Assessment, identification of gaps in the areas of expertise in the Pool of Experts, and proposed arrangements for peer review of the World Ocean Assessment.

92 The draft chapters of the WOA are currently being reviewed by the country selected experts from the pool of experts.

93 The UNEP/GEF International Waters unit has continuously assisted partners to mobilize GEF funding for a number of marine related projects. Current projects funded by GEF include the UNEP/GEF Transboundary Waters Assessment Programme (TWAP): Aquifers, Lake/Reservoir Basins, River Basins, Large Marine Ecosystems, and Open Ocean to Catalyze Sound Environmental Management which was endorsed by the GEF CEO in 2012 and began implementation in early 2013; the Integrated Land, Water & Wastewater Management in Caribbean SIDS project (2012-2017); the Mediterranean - Integration of climatic variability and change into national strategies implementing the ICZM Protocol in the Mediterranean (ted in May 2012-December 2015); and the Strategic Partnership for the Mediterranean Large Marine Ecosystem - Regional Component which started in March 2009 will be completed in December 2015.

94 Some concepts are being developed: (1) addressing land-based activities in the Western Indian Ocean – SAP Implementation Phase; (2) the South China Seas SAP implementation which was PIF approved in May 2014 and (3) the Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand, is expected to start execution in early 2015.

95 The UNEP portfolio of marine GEF projects also include some methodology or targeted research projects such as the TWAP mentioned above, the carbon accounting and valuing ecosystem services in Blue Forests project recently CEO endorsed, the Global foundations for reducing nutrient enrichment and oxygen depletion from land-based pollution in support of the Global Nutrient Cycle along with its complementary Targeted Research project for improving understanding of the Global Nitrogen Cycle, and the specific ecosystem management projects in various Large Marine Ecosystems.

The GEF Transboundary Waters Assessment Programme (TWAP)

96 The TWAP full size project (FSP) is applying the methodologies developed during the medium

size project (MSP) to produce the first indicator based global assessment of all five recognized transboundary water systems and to formalize the partnerships on which to base future period global assessments. This two-year project aims to assist the GEF and other international organizations in improved priority setting by providing a baseline and priorities for intervention. The project aims to assist the GEF and other international organizations in improved priority setting for funding by providing a baseline and priorities for intervention. It is anticipated that this baseline will serve to assist international funding agencies in tracking the impacts of their interventions in terms of changes in state of the aquatic environments under consideration.

97 The execution of the TWAP is coordinated by UNEP (Division of Early Warning and Assessment) and involves many partners that are already engaged in assessment efforts. Lead organizations and core partners for the implementation of the TWAP are as follows:

- .1 Transboundary aquifers and SIDS groundwater systems: UNESCO's International Hydrological Programme (IHP) (lead), International Groundwater Resources Assessment Centre (IGRAC), Internationally Shared Aquifer Resources Management (ISARM), World Water Assessment Programme (WWAP), Food and Agriculture Organization of the United Nations (FAO), Swiss Development Cooperation (SDC), and the Worldwide Hydrogeological Mapping and Assessment Programme (WHYMAP);
- .2 Transboundary lake/reservoirs basins: International Lake Environment Committee (ILEC) (lead), UNEP Division of Early Warning and Assessment (DEWA), International Center for Watershed Studies (ICWS), Texas State University, and Research Center for Sustainability and Environment (RSCE), Shiga University;
- .3 Transboundary river basins: UNEP-DHI Centre for Water and Environment (lead), International Union for the Conservation of Nature (IUCN), and Stockholm International Water Institute (SIWI);
- .4 LMEs: Intergovernmental Oceanographic Commission of UNESCO (IOC of UNESCO) (lead), National Oceanic and Atmospheric Administration (NOAA);
- .5 Open ocean: Intergovernmental Oceanographic Commission of UNESCO (IOC of UNESCO) (lead), European Commission- Global Earth Observation System of Systems (GEOSS) interoperability for Weather, Ocean and Water (GEOWOW), UNEP Division of Early Warning and Assessment (DEWA), Global Ocean Observing System (GOOS); and
- .6 Data and information management: UNEP/DEWA/GRID-Geneva (lead), the Government of Switzerland (CH-FOEN) and the University of Geneva (UniGe).

98 The main outputs of the project will be five technical reports as well as a synthesis report which will be prepared during the first quarter of 2015. The TWAP Data Portal will provide access to all indicators by 31 March 2015. Publication of all TWAP published products will be completed by 30 June 2015

UNEP's activities in support of Small Islands Developing States (SIDS)

99 Small Island Developing States (SIDS) continue to face multiple challenges. As highlighted in the Rio+20 outcome document, *The Future We Want*, the international community "note with concern that the outcome of the five-year review of the Mauritius Strategy concluded that small island developing States have made less progress than most other groupings, or even regressed, in economic terms, especially in terms of poverty reduction and debt sustainability." The international community reaffirmed their commitment to take urgent and concrete action to address the vulnerability of small island developing States, including through the sustained implementation of the Barbados Programme of Action (BPOA) and the Mauritius Strategy for Implementation (MSI), and underscore the urgency of finding additional solutions to the major challenges facing small island developing States in a concerted manner so as to support them in sustaining momentum realized in implementing the Barbados Programme of Action and the Mauritius Strategy and achieving sustainable development.

100 As part of UNEP's contribution to the SIDS International Conference, to be held in September 2014 UNEP together with UN DESA embarked on a Foresight Process for Small Island Developing States (SIDS) with the aim to inform the United Nations (UN) community, policymakers and other stakeholders in general about critical environmental related emerging issues and solutions from the perspective of the SIDS that require immediate attention. The report of the process *Emerging issues for Small Island Developing States: Results of the UNEP/UN DESA Foresight Process for SIDS*.

101 The report was launched at the World Environment Day, 5 June in Barbados and is one of UNEP's contributions to the SIDS International Conference, to be held in September 2014 in Apia, Samoa. It identifies with one of the four thematic foci of the SIDS International Conference; "identify new and emerging challenges and opportunities for the sustainable development of SIDS and ways and means to address them, including through the strengthening of collaborative partnerships between SIDS and the international community".

102 In developing the list of emerging issues, UNEP built on the successful "UNEP Foresight Process" model used as an input to the Rio +20 Conference, gathering a panel of experts in a range of environmental, social and economic fields to identify priority areas and discuss their relevance to SIDS and to one another. UNEP and UN DESA developed separate lists of 20 environmental and 15 socio-economic emerging issues respectively, but it is realized that many of the social and economic issues have strong environmental

⁷ www.unep.org/publications

components and vice versa. Building on the issues identified by the Foresight Process for SIDS Global Environment Outlook (GEO) for SIDS provides an outlook on four key areas following a book sprint held in Geneva 14-18 July 2014, focused on the following areas: Green/blue economy; reconnecting with nature; priorities for island communities and nature technological leap frogging. The GEO for SIDS Outlook report will be launched during the SIDS summit in September 2014. In addition, UNEP will make available relevant data flows and knowledge related to key SIDS issues on its new web-based knowledge management platform – ⁸UNEP-Live.

Green Economy for Oceans and SIDS

103 UNEP continues to lead the international debate around the green economy for oceans and SIDS. UNEP assists member states to work with key business sectors linked to the marine environment, that are making a transition towards a green economy in terms of resource efficiency and productivity, including analysing the socio-economic dimensions of such a transformative change. The First Regional Workshop on the Green Economy for Oceans and SIDS took place 15-17 April 2013 in Montego Bay, Jamaica, with the representatives of 22 Caribbean SIDS. Similarly, in the Western Indian Ocean region, a Regional Workshop on the Green Economy for Oceans and SIDS took place 11-13 December 2013 in Victoria, Seychelles, with the representation of 10 countries.

104 Additionally, UNEP is currently working with partners such as GRID Arendal in the development of a TEEB for Oceans and Coasts that will seek to draw attention to the economic benefits of ocean and coastal biodiversity and healthy ecosystems, emphasizing the unrealized benefits of preserved and enhanced whole ecosystem structures, functions and processes to the well-being of humans and nature. In order to achieve this, it will bridge the gaps in knowledge on ocean ecosystem services and functions and support the mainstreaming of biodiversity and ecosystem considerations into both national policymaking and broader societal perspectives. This effort offers a critical and unique opportunity to carefully identify and bring to life the ways in which ecosystem valuation can change the incentives and policies that, to date, have resulted in the steady decline and loss of value of these economic engines for the planet.

⁹UNEP's Contributions to the Post-2015/SDGs Processes

105 The Post 2015 agenda promises a historical opportunity to shift from development in silos to a more integrated approach; a view reinforced by the Rio+20 Outcome, MDG Summit Outcome, and the UN Secretary-General's report 'A life of dignity for all'. Rio+20 committed Member States to develop a set of sustainable development goals (and targets and indicators) that would be balanced, coherent and comprehensive.

⁸ <http://www.unep/live.org/>

⁹ <http://unep.org/post2015/Publications/UNEPPost-2015Note1/tabid/133049/language/en-US/Default.aspx#sthash.srwNdLbm.dpuf>

106 Throughout the entire process, UNEP has been working through the UN system to support the OWG on how to achieve a set of truly integrated Sustainable Development Goals. The first United Nations Environment Assembly (UNEA), held in June, 2014, was an important part of this process, which afforded Ministers and stakeholders an opportunity to collectively review the emerging SDGs framework. We must now continue to articulate what the environmental dimension of sustainable development has to contribute to the agenda and emphasize the importance of the environmental contribution to a prosperous and healthy society.

107 The inclusion of oceans and seas in the post-2015 development agenda has greatly evolved. From only briefly mentioned at the beginning of the Rio+20 process, oceans and seas are now being addressed in a stand-alone SDG on Oceans and Seas and are thus likely to feature prominently in the post-2015 development agenda. Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

108 UNEP has focused on incorporating ecosystem-related targets under the SDGs and developing targets that focus on maximizing the health and productivity of ecosystems, that way we can repair, advance and sustain the foundation upon which sustainable development depends. Encouraging comprehensive policies and sizable investments in scaling-up the ecosystem-based actions that have already worked offers the first step towards achieving the SDGs.

UNDP

109 In 2013-14, 25 GEF-financed regional projects were under implementation representing an investment of USD 129 million in GEF grant funding and USD 475 million in government and other partner financing aimed at achieving global environmental outcomes and multiple development benefits.

110 Given the tremendous socio-economic benefits provided by the earth's freshwater and marine ecosystems, UNDP strives to protect and sustainably manage major freshwater and marine transboundary waters systems. In practice, this strategy is applied in three main areas of work: (i) promoting the sustainable management of oceans; (ii) protecting transboundary surface and groundwaters; and, (iii) promoting climate resilient integrated water resource and coastal management.

111 Over the last 20 years, UNDP has developed, applied and refined a series of three methodologies and approaches - Transboundary Diagnostic Analysis/Strategic Action Programmes (TDA/SAP), Integrated Coastal Management, and building on regional/global legal frameworks - that have proven highly effective not only in advancing water and ocean governance reform, but also at catalysing sizeable quantities of both public and private financial flows towards environmental restoration and protection. SAPs delineate multi-country commitments to regional and national governance reforms and investments towards sustainable utilization of shared aquatic ecosystems. UNDP is currently supporting the implementation of five

Strategic Action Programmes (SAPs), an additional five SAPs were recently completed and adopted – for the Western Indian Ocean; the Caribbean and North Brazil Shelf LME; the Arafura and Timor Seas; and the Sulu-Celebes Sea - and several additional SAPs are under preparation.

112 UNDP's Sustainable Ocean Management Programme assists groups of countries sharing 10 of the world's most important Large Marine Ecosystems (LMEs) in applying integrated, ecosystem-based, climate resilient approaches to sustaining LME ecosystem services. UNDP has been applying the LME approach to regional ocean governance since 1995 and has been involved as a GEF Agency in 13 of the 21 LMES supported by the GEF. Through transboundary diagnostic assessments and support to the development and implementation of LME action programmes, the programme helps to put in place LME governance regimes to transform markets and create sustainable productive use patterns of coastal and ocean resources.

113 In Africa, Ministers from three countries sharing the resources of the Benguela Current LME - Angola, Namibia, and South Africa - signed the Benguela Current Convention, the first LME Convention in the world, on 18 March 2013. They further committed to their intensified efforts to meet the 2015 target to maintain or restore fish stocks to levels that can produce maximum sustainable yields, and to eliminate illegal unreported and unregulated fishing.

114 In Latin America and the Caribbean, a 10-year Strategic Action Programme for the sustainable management of the shared living marine resources of the Caribbean and North Brazil Shelf Large Marine Ecosystems was endorsed in 2013 and provides a comprehensive roadmap through strengthened and consolidated regional cooperation. Six strategies have been defined under the SAP, and short-term (1-5 years) and medium-term (6-10 years) actions have been proposed under each strategy. This is the first time that 20+ countries have agreed on a common approach towards the management and governance of a Large Marine Ecosystem.

115 At the global level, the GloBallast Partnerships Programme continues to play an instrumental role in preparing developing countries for implementation of the International Convention on Ballast Water Management while continuing to play a catalytic role in transforming an entirely new ballast water technology market, now estimated to be worth over USD 45 billion in the next 10 to 15 years. GloBallast won the international maritime award for the best innovative project 2013 instituted by the MarineBiz TV. The IW:LEARN project, now in its third phase, continues to strengthen knowledge sharing and learning, among all GEF-financed international waters projects.

116 In the third area of work, UNDP is promoting climate resilient integrated water resource and coastal management. In Asia and the Pacific, an integrated water resources and wastewater management (IWRM) project in the Pacific Island Countries is nearing completion as national demonstration projects on-the-ground have been completed and are being scaled-up and replicated. National Apex Water Committees are

now functional in 12 countries, and IWRM policies have been endorsed in Nauru, Palau and Niue, Samoa, Tuvalu, Vanuatu, Palau. Similar policies have been drafted in Tonga, Solomon Islands, Fiji and the Marshall Islands Progress was also made to transform PEMSEA into a sustainable intergovernmental organization.

WMO

WMO/IOC/ICSU World Climate Research Programme (WCRP)

Integration of physical, biogeochemical and ecosystem research in the ocean

117 Research on physical oceanography and ocean ecosystems and biogeochemistry, which is of prime priority for GESAMP, are continuously getting more integrated and interlinked. As the result of an extensive community consultation culminating at the Open Science Conference (OSC) entitled "Climate Research in Service to Society" (<http://conference2011.wcrp-climate.org>), Denver, Colorado, USA, October 2011, the WCRP Joint Scientific Committee has identified six Grand Science Challenges (<http://www.wcrp-climate.org/index.php/grand-challenges>), as follows:

- (a) Provision of skilful future climate information on regional scales;
- (b) Regional sea-level rise;
- (c) Cryosphere in a changing climate;
- (d) Clouds and climate sensitivity;
- (e) Changes in water availability; and
- (f) Prediction and attribution of extreme events.

118 These research topics are seen by WCRP as scientific challenges of particularly high societal importance and as areas of research in which it is possible to expect significant progress within five to ten years. The Grand Challenges serve as unifying themes across the four WCRP core projects, i.e. CLIVAR, CliC, GEWEX and SPARC, and the various working groups that develop implementation plans for the Grand Challenges.

119 CLIVAR (<http://www.clivar.org/>) is the main WCRP core project dealing with ocean-related climate research matters, and aims at understanding the dynamics, the interaction, and the predictability of the coupled ocean-atmosphere system, in particular:

- Intraseasonal, seasonal and interannual variability and predictability of monsoon systems
- Decadal variability and predictability of ocean and climate variability
- Marine biophysical interactions and dynamics of upwelling systems
- Sea Level Rise and Regional Impacts
- Trends, nonlinearities and extreme events

- ENSO in a changing climate
- Consistency between planetary heat balance and ocean heat storage

120 Over 130 members of CLIVAR panels and guests gathered in The Hague, 14-19 July 2014 for the first-ever Pan-CLIVAR meeting to discuss the evolving Research Foci plans and strategies for CLIVAR's contributions to ocean observations and climate modeling, and to WCRP's Grand Challenges.

Regional ocean observing systems, field experiments, and process studies – CLIVAR-GSOP

121 WCRP and its Core Projects provide scientific support to regional ocean observations and help to coordinate them. Together with GOOS and GCOS, WCRP sponsors the Ocean Observations Panel for Climate (OOPC) and contributes to development of the Framework for Ocean Observing (FOO). The CLIVAR Atlantic Region Panel, Pacific Region Panel, CLIVAR/IOC-GOOS Indian Ocean Region Panel, CLIVAR/CliC/SCAR Southern Ocean Region Panel, and CLIVAR/GEWEX Monsoons Panel support dedicated observing systems, field experiment and process studies in their respective regions in collaboration with sister programmes, agencies and partners.

122 The utility of ocean measurements is continuously being enhanced through the efforts of the CLIVAR Global Synthesis and Observations Panel (GSOP). GSOP coordinates its contribution to implementation of FOO with OOPC. Such ocean synthesis products are needed to understand heat content and sea-level changes in the context of climate change and variability and to measure changes in the meridional overturning circulation that could lead to rapid climate change. They also form the basis for assimilation of ocean observations into climate prediction systems, and, in particular, those to be used for decadal prediction. Ocean data synthesis, coordinated by WCRP and involving representatives from all the major modelling - including reanalysis - centres around the world, provides key information about the state of the ocean to a wide range of users. Synthesis products increasingly include information about carbon to help understand and monitor the role of the ocean as a carbon sink. New measuring platforms such as underwater gliders and integrated physical and biogeochemical sensors are continuously being tested and refined in WCRP and CLIVAR international field programmes. These autonomous vehicles provide cost-effective observations and are expected to become part of a sustained ocean climate observing system.

Ocean model development – CLIVAR/OMDP

123 The CLIVAR Working Group on Ocean Model Development (WGOMD), now renamed Ocean Model Development Panel (OMDP), met for its twelfth session in Kiel, Germany, in April 2014. WGOMD/OMDP is the leading coordinating body for ocean modelling, and will continue to develop the Coordinated Ocean - ice Reference Experiments (CORE) protocol as a basis for PI driven collaborations between groups, potentially serving as a reference for broader ocean model inter-comparison activity of the AMIP/CMIP class experi-

ments at some future date. The CLIVAR Exchanges 65 (http://www.clivar.org/sites/default/files/documents/exchanges65_0.pdf) published in July 2014 is a special issue on high resolution ocean climate modelling and provides details about recent frontier topics, state of the art research, and recommendations for future research priorities. A special online issue of the Ocean Modelling journal is also in preparation. It will document the state-of-the-science in global ocean-sea ice modelling available through the CORE-II protocol.

Transboundary Water Assessment - TWAP

124 WCRP is a partner in the Transboundary Water Assessment Project, a full size Global Environmental Facility (GEF) initiative aiming at producing the first truly global assessment of all transboundary waters. WCRP's role is to support UNESCO-IOC leading the "Large Marine Ecosystems and the Open Ocean" components by facilitating access to data sets of future projections of various global marine variables that will be merged with socio-economic data to produce indices of stress and vulnerability of human and natural systems. The ultimate goal is to produce a metric- and mapping-based assessment transforming existing scientific data and projections for the open ocean into stakeholder-relevant information for several themes of relevance such as sea-level rise, coral bleaching, and ocean acidification.

Upper Ocean – Lower Atmosphere and fluxes between them - SOLAS

125 WCRP maintains its sponsorship of the fruitful IGBP/SCOR/WCRP/iCACGP Surface Ocean – Lower Atmosphere Study (SOLAS, <http://www.solas-int.org>). Progress in quantitative understanding of surface fluxes is the necessary condition for understanding climate feedback mechanisms and for Earth System Modeling in general. A dedicated Flux Task Team is being established under the WCRP Data Advisory Council to address these issues more comprehensively across the program.

WMO Marine Meteorology and Oceanography Programme (MMOP)

126 WMO MMOP facilitates international cooperation and promotes activities to provide improved met-ocean information and services; through coordinating, and developing standards and procedures for, a fully integrated marine observing, data management and service system. MMOP aims a broad range of societal benefits, including; reducing loss of life and property from natural (and indirectly, human-induced) disasters at sea and in coastal zones; understanding marine environmental factors affecting human health and well-being; providing key met-ocean information to understand, assess, predict, mitigate and adapt to climate variability and change; and improving the management and protection of terrestrial, coastal and marine ecosystems.

127 The overall technical guidance and governance for MMOP is provided by the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), jointly sponsored by WMO and

IOC of UNESCO. At the 4th session of JCOMM (May 2012, Republic of Korea), the objectives and priorities of JCOMM for 2012-2017 were agreed as following:

- (i) To enhance the provision of marine meteorological and oceanographic services in support of the safety of life and property at sea and in coastal areas; contribute to risk management for ocean-based economic, commercial and industrial activities; contribute to the prevention and control of marine pollution, sustainable development of the marine environment, coastal area management and recreational activities, and in support of the safety of coastal habitation and activities; and to coordinate and enhance the provision of the data, information, products and services required to support climate research and the detection and prediction of climate variability;
- (ii) To coordinate the development, enhancement and delivery of climate services related to the marine atmosphere and coastal and deep oceans, based on the core competencies within the Commission in marine meteorology and oceanography, as a contribution by JCOMM to the Global Framework for Climate Services (GFCS);
- (iii) To coordinate the enhancement and long-term maintenance of an integrated global marine meteorological and oceanographic observing and data management system, containing both in situ and remote sensing components and including data communication facilities, in the most cost-effective and efficient way, as part of the Global Ocean Observing System (GOOS) and the World Weather Watch (WWW), and in support of the Global Framework for Climate Services (GFCS), the World Climate Research Programme (WCRP), the Global Climate Observing System (GCOS), and other major WMO and IOC Programmes. This system is contributing to the WMO Information System (WIS) and the IODE Ocean Data Portal, and will be complying with the requirements of the WMO Integrated Global Observing System (WIGOS);
- (iv) To manage the evolution of an effective and efficient programme through the selective incorporation of advances in meteorological and oceanographic science and technology; and to work to ensure that all countries have the capacity to benefit from and contribute to these advances, and to contribute to the work of JCOMM in general; and
- (v) To promote and facilitate the equitable participation of all WMO Members and IOC Member States in all activities of,

and benefit from all products and services provided by, JCOMM.

128 The following paragraphs briefly introduce a subset of WMO/MMOP activities in 2013/2014 and relating plans in near-term, which are directly relevant to understanding and protection of the marine environment:

Regulatory Framework and Guidance for Marine Meteorological Services

129 The WMO is an international standardizing organization that determines international standards for methods, procedures, techniques and practices in meteorology and operational hydrology, according to the working arrangement with the International Standards Organization (ISO). In the areas of marine meteorology, the WMO publication No. 558 (Manual on Marine Meteorology) provides a set of technical regulations to specify obligations of the National Meteorological and Hydrological Services (NMHSs) in the implementation of marine meteorological services, and to facilitate cooperation in respect of the associated international coordination.

130 This Manual is also provide reference to the meteorological component of the Global Maritime Distress and Safety System (GMDSS), the World-Wide Met-Ocean Information and Warning Service (WWMIWS), in support of the Convention for the Safety of Life at Sea (SOLAS), in the collaborative framework of WMO, the International Maritime Organization (IMO) and the International Hydrographic Organization (IHO). The WWMIWS is currently included in the regulatory publications as an IMO resolution 1051(27), which was formally adopted by the 27th IMO Assembly (November 2011). It complements the IMO Resolution A706(17) on the IMO/IHO World-Wide Navigational Warning Service. All those reference documents are available on the JCOMM website (<http://www.jcomm.info/GMDSS>). The global coordination, in support of the national implementation of WWMIWS, is undertaken by JCOMM on behalf of WMO, and through its Expert Team on Maritime Safety Services.

131 A key role of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) in this regard is to respond to technical and regional requirements of WMO Members for improved marine meteorological and oceanographic services. JCOMM is currently undertaking the review of the overall structure and contents of the WMO-No.558, and provide guidance in the review of the Joint IMO-IHO-WMO Manual on Maritime Safety Information (Joint MSI Manual) as part of the joint WMO-IMO-IHO cooperation for the implementation of GMDSS. It is planned that a proposed new structure of the WMO-No.558 will be reviewed by WMO Members (through the WMO governing bodies) by 2016. The essential procedure and practices of the NMHSs, meanwhile, will be carried out in a consistent manner, with a view to be better supported by a revised set of technical regulations for enhanced efficiency and consistency throughout the overall service provision.

Marine Weather Forecaster Competence Standards Framework

132 Pursuant to Recommendation 5 (JCOMM-4) – *Quality Management Implementation for JCOMM*, JCOMM experts has been working to define *competency* requirements for their core job-tasks. A draft of WMO Marine Weather Forecaster (WMF) Competence Standards Framework has been under review by key WMO working groups and expert teams, in order to submit the final consolidated draft to the 17th WMO Congress (May 2015, Geneva), for its review and approval. The proposed competencies, so far identified, include the following:

- .1 Analyze and monitor continuously the weather situation: Observations and forecasts of weather parameters and significant weather phenomena are continuously monitored to determine the need for issuance, cancellation or amendment/update of forecasts and warnings according to documented thresholds and regulations.
- .2 Forecast marine weather phenomena and parameters: Forecasts of meteorological parameters and phenomena are prepared and issued in accordance with documented requirements, priorities and deadlines.
- .3 Warn of hazardous phenomena: Warnings are issued in a timely manner when hazardous conditions are expected to reach documented threshold values and as appropriate, amended according to documented criteria.
- .4 Ensure the quality of meteorological information and services: Marine weather forecasts, warnings and related products are provided within a quality management framework.
- .5 Communicate meteorological information to internal and external users: Marine weather forecasts and warnings are effectively communicated to user communities.
- .6 Regional variations: A clear understanding of the regional variations applicable to adjacent areas of forecast and warning responsibility.

133 It should be noted that the ongoing process has taken into account considerable variation in the legitimate functions of Marine Weather Offices worldwide, therefore, the WMF competencies proposed for adoption for the respective regional/national functions and priorities reflected this variety of functions. The review process continuously conducts a cross-review of other WMO competence frameworks, such as the Aeronautical Meteorology and the Public Weather Service (PWS: under development) to ensure harmonized development and application to the work of NMHSs.

134 As the next step, continuous collaboration is required for WMO, IMO, IHO and other relevant

mechanisms, to define and update a clear set of user requirements for marine meteorological services that would be provided based upon the agreed competence framework.

Transfer of Science to Enhance Operational Services

135 In terms of the dangerous sea state, currently, the majority of meteorological Maritime Safety Information (meteorological MSI) contains the significant wave height only; generally using the Douglas scale. Considering that many accidents have occurred in coastal or open seas due to sea state, where significant wave heights were far below the thresholds fixed for the vessels, the future improvement should address the complex (e.g. crossing seas) or unusual (e.g. steep sea, risk of abnormal or freak waves, breaking wave intensity) sea state.

136 In order to address this issue, the JCOMM Expert Team on Waves and Coastal Hazard Forecasting (ETWCH) has been in process of defining key parameters and related thresholds, to provide more useful information for the safety of vessels and crews in complex and dangerous seas, in association with the ship masters, owners and manufacturers. A white paper on dangerous sea-state forecasting was developed, to define key parameters and related thresholds, to provide more useful information for the safety of vessels and crews in complex and dangerous seas. It describes:

- .1 Key elements to understand complex sea states, and associated terminology in weather and sea bulletins;
- .2 Required development for standardized forecasts of dangerous sea state; and
- .3 Proposed form of dissemination through SafetyNET and NAVTEX.

137 It is expected that the WMO Congress in 2015 will review and approve the proposed procedure, with necessary amendment, described in the white paper. Once the agreed process is applied to the operational services, it is anticipated that the meteorological/oceanographic MSI would include much comprehensive information on the complex (e.g. crossing seas) or unusual (e.g. steep sea, risk of abnormal or freak waves, breaking wave intensity) sea state, for ship masters, owners and manufacturers. The partner Organizations will be advised on the progress following the established procedure accordingly.

Marine Meteorological and Oceanographic Support for Marine Environmental Emergency Responses

138 The Marine Pollution Emergency Response Support System for high seas (MPERSS: <http://www.jcomm.info/MPERSS>), was formally established in 2001 at the 1st session of Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM-1; June 2001, Iceland), after a trial period since January 1994. Its primary objective is to have in place a coordinated, global system for the provision

of meteorological and oceanographic information for marine pollution emergency response operations outside waters under national jurisdiction. The MPERSS is implemented as recommended practise following the guidance within the "Guide to Marine Meteorological Service (WMO-No.471)", by the Area Meteorological and Oceanographic Coordinators (AMOCs) who are identified among the National Meteorological and Hydrological Services (NMHS) with capabilities of marine modelling and service distribution.

139 Following the decision made at the 4th session of JCOMM (May 2012, Republic of Korea), an ad hoc task team of JCOMM has been developing an outline future framework for the global coordination of marine environmental emergency responses, based on the review of currently available technologies for modelling, forecasting and operational support, in view of exploring feasibility of providing enhanced coordination in basin scale. The Team is requested to complete a draft before the WMO Congress in 2015, for further review and revision that should involve partners in the MSI provision and services.

140 A future framework should in particular include ways to ensure usability of information service / products, through continuous interaction with users to review/update requirements. Primarily responding to operational requirements, it will need to be recognized as part of relevant intergovernmental protocols and contingency plans (e.g. the Joint Radiation Emergency Management Plan for the respective parts of procedure), after rigorous trials/test and review.

WMO Commission of Atmospheric Science (CAS)

141 The WMO Commission of Atmospheric Sciences (CAS) at its 16th session in November 2013 indicated six future priorities (CAS-16/Doc. 9) that include in high-impact weather research, modelling and prediction of the water cycle, Integrated Greenhouse Gas Information System (IGIS), aerosol research, research and services for large urban complexes, and evolving technologies.

142 As regards deposition to the oceans, the CAS-16 underlined that several factors determine whether a part of the ocean will receive atmospheric inputs that could alter biogeochemical processes. Three important factors are the reactivity of the material being deposited, the residence time of the chemical in the atmosphere and atmospheric transport patterns relative to the sources. The collaboration between WMO and GESAMP is active and WMO has established a trust fund to manage financial contributions of GESAMP partners for the support of the Working Group involved with input to the oceans (Working Group 38).

WMO Global Atmosphere Watch Programme (GAW)

143 The Global Atmosphere Watch (GAW) Programme of WMO (http://www.wmo.int/pages/prog/arep/gaw/gaw_home_en.html) is a partnership involving the Members of WMO, contributing networks and collaborating organizations and bodies which provides

reliable scientific data and information on the chemical composition of the atmosphere, its natural and anthropogenic change, and helps to improve the understanding of interactions between the atmosphere, the oceans and the biosphere.

144 GAW focal areas are aerosols, greenhouse gases, selected reactive gases, ozone, UV radiation and precipitation chemistry (or atmospheric deposition). GAW works together with GESAMP as well as provides Sand and Dust Storms Warning (SDS-WAS).

145 Several groups within the GAW Programme perform research relevant to the ocean, including research on atmospheric aerosols that can help to estimate the transport of nutrient materials to the ocean, research of the precipitation chemistry that address currently wet deposition, research on reactive gases that address global nitrogen and sulphur cycle and research on greenhouse gases that address global carbon cycle. Collaboration with ocean community is not very well established and further efforts are needed to address the exchange mechanisms between the ocean and the atmosphere.

GAW Precipitation Chemistry observations and analysis

146 Wet deposition is an important process by which precipitation removes anthropogenic and naturally occurring gases and particles from the atmosphere. Quantifying the composition of wet and total deposition regionally and globally, including the oceans, is important to understanding the cause and effect of contemporary environmental issues such as acidification, eutrophication, smog and climate change. To better understand these issues, GAW's Scientific Advisory Group for Precipitation Chemistry (SAG-PC) was formed to assure the harmonization of precipitation chemistry measurements conducted by regional and national programmes, to enable quantification of patterns and trends of the composition of precipitation on global and regional scales, to improve understanding of biogeochemical cycles of major chemical species, and to provide the data for evaluating ecosystem effects of atmospheric deposition.

147 A major recent product of the SAG-PC is a database of quality-assured ion concentration and wet deposition data gathered from regional and national monitoring networks. The database is available for download from the World Data Centre for Precipitation Chemistry (<http://wdcpc.org/>). This database served as a basis for the global assessment of precipitation chemistry, which was published by Vet et al. (2014) and is available online at <http://dx.doi.org/10.1016/j.atmosenv.2013.10.060> and in hardcopy form from the WMO.

GESAMP WG 38: Atmospheric Input of Chemicals to the Ocean

148 WMO continues its support of GESAMP WG 38 (Atmospheric Input of Chemicals to the Ocean). WG 38 is very successful and scientifically productive. During the reporting year WG 38 delivered a high level assessment and worked on 9 peer-reviewed papers

(1 published, 1 submitted to Nature, and 7 to be submitted) on the atmospheric input of nutrients to the ocean. The work of the group was presented in a special session of the European Geosciences Union, held in Vienna, Austria, in April 2014.

149 The Progress Report of the Working Group 38 has been submitted to GESAMP 41 by the Chairman of WG 38.

ANNEX V – CURRENT WORKING GROUPS AND THEIR TERMS OF REFERENCE

WG 1: Evaluation of the hazards of harmful substances carried by ships

Lead Agency: IMO

Co-sponsors: None

Chairperson: T. Höfer (Germany)

Members: S. leFloch (France), T. Höfer (Germany), D. James (U.K.), W. Jiang (China), M. Morrissette (USA), H. Saito (Japan), (two vacancies), K. McDonald (consultant)

Products:

- a) Hazard profiles of new substances & correspondence with the chemicals industry.
- b) Maintenance and update of 900 GESAMP hazard profiles
- c) GESAMP Reports and Studies 64, 2nd edition

Planning: 52nd Session, 13 to 17 April 2015 at IMO in London

Terms of Reference for WG 1

The terms of reference of the GESAMP EHS Working Group, as given by GESAMP at its 6th session in Geneva (1974) (96) and amended at its 8th session in Rome (1976) (97) 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”.

These terms of reference remain unchanged.

WG 34: Review of applications for “Active Substances” to be used in ballast water management systems

Lead Agency: IMO

Co-sponsors: None

Chairperson: J. Linders (Netherlands)

Members: T. Borges (Portugal), A. Dock (Sweden), B. Werschkun (Germany), S. Hanayama (Japan), K. Rhie (Republic of Korea), D. Smith (U.K.), G. Ziegler (USA), E. Pelletier (Canada)

Consultants: Ms. A. Dock (dual function)

Products: Evaluation of the risks to the environment, human health and the ships’ crew from ballast water management systems

Completion of the methodology in R&S following external and GESAMP peer review

Planning: A minimum of four meetings are planned before GESAMP 42 in 2015

Terms of Reference for WG 34

1 Consideration of development of necessary methodologies and information requirements in accordance with the “Procedure for approval of ballast water management systems that make use of Active Substances (G9)” (adopted by resolution MEPC 169(57)) for consideration by MEPC 65.

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 Procedure (G9));
- .2 scientific evaluation of the assessment report contained in the proposal for approval (see paragraph 4.3.1 of Procedure (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 Procedure (G9));
- .4 scientific evaluation of any further information submitted (see paragraph 8.1.2.6 of Procedure (G9));
- .5 scientific review of the risk characterization and analysis contained in the proposal for approval (see paragraph 5.3 of Procedure (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 Procedure (G9)); and
- .7 preparation of a report addressing the above-mentioned aspects for consideration by MEPC (see paragraph 8.1.2.10 of Procedure (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 the MEPC (see paragraph 8.2 of Procedure (G9)).

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

Metals (formerly mercury) Working Group

Lead Agency: UNEP

Co-sponsors: None

Chairperson: None

Members: P. Kershaw, A. Baker

Products: Completion and peer review of GESAMP Reports and Studies No.86 on "Mercury in the Marine Environment".

WG 38: Atmospheric input of chemicals to the oceans

Lead Agency: WMO

Co-sponsors: IMO, US National Science Foundation

Chairpersons: R. Duce (USA), P. Liss (U.K.)

Members: Katy Altieri (United States), Alex Baker (United Kingdom), Doug Capone (United States), Frank Dentener (Italy), Katja Fennel (Canada), Jim Galloway (United States), Tim Jickells (United Kingdom), Maria Kanakidou (Greece), Julie LaRoche (Canada/Germany), Kitack Lee (Korea), Jack Middelburg (Netherlands), Keith Moore (United States), Slobodan Nickovic (Serbia), Greg Okin (United States), Andreas Oeschies (Germany), Joseph Prospero (United States), Manmohan Sarin (India), Sybil Seitzinger (Sweden), Jonathan Sharples (United Kingdom), Parv Suntharalingam (United Kingdom), Mitsuo Uematsu (Japan), Lauren Zamora (United States)

Products: a) Completion of peer reviewed paper in the scientific literature on atmospheric chemical deposition

Planning: New scientific issues to be discussed by the Working Group intersessionally and approved by GESAMP 42.

Terms of Reference for WG 38

1 Update the geographical estimates of anthropogenic nitrogen deposition to the global ocean made in the SCOR-sponsored 2008 paper in Science (Duce, R.A., et al., "Impacts of atmospheric anthropogenic nitrogen on the open ocean", Science, 320, 893-897, 2008), which were based on data from 2005 or earlier. This would utilize newer and more geographically distributed data on anthropogenic atmospheric nitrogen concentrations and deposition over the global ocean as well as improved models of these processes and impacts;

2 Considering issues related to Task 1 above, re-evaluate the impact of atmospheric nitrogen deposition on marine biogeochemistry, including re-estimating the amount of CO₂ that could be drawn down from the atmosphere into the ocean as a result of the increased productivity in the ocean derived from the additional anthropogenic nutrient nitrogen deposited. This would allow an update on the impact of the atmospheric nitrogen deposition on atmospheric radiative properties outlined in the 2008 Science paper;

3 Provide a more reliable estimate of the impact of atmospheric anthropogenic nitrogen deposition on the production of additional nitrous oxide in the ocean and its subsequent emission to the atmosphere. This was one of the greatest uncertainties in the 2008 Science paper;

4 Evaluate the extent to which anthropogenic nitrogen delivered to the coastal zone via rivers, atmospheric deposition, etc. is transported to the open ocean, in which regions this may happen, and what its impact is there. In the 2008 Science paper it was assumed that all nitrogen delivered to the coastal zone was sequestered there and did not reach the open ocean, but this may not be true in all locations; and

5 Make a more detailed estimate of the input and impact of anthropogenic nitrogen in the area of the Northern Indian Ocean (Arabian Sea, Bay of Bengal) and the South China Sea - the areas that are expected to show the greatest increase of anthropogenic nitrogen deposition over the next few decades.

WG 39: Global trends in pollution of coastal ecosystems: retrospective ecosystem assessment

Lead Agency: IAEA

Co-sponsors: UNIDO

Chairpersons: Ana Carolina Ruiz-Fernandez (Mexico)

Members: Ms. Roberta Delfanti (Italy), Mr. José Marcus Godoy (Brazil), Mr. Elvis Nyarko (Ghana), Mr. Joan-Albert Sanchez-Cabeza (Mexico), Mr. José L. Sericano (USA), Ms. Elvira Sombrito (Philippines), Mr. Norbert Theobald (Germany)

Planning: Complete the digitization of core profile figures from the papers in the data base (currently 560 documents); and continue with the data analysis as they are available. Report to GESAMP 42

Terms of Reference for WG 39

ToR Task 1: Bibliographic Review, definitions, methodologies

ToR Task 2: Critical review of existing methodologies on suitable environmental archives, dating methods, pollution indicators, analytical techniques and trend analysis. Review existing data, including data quality

ToR Task 3: Database of global trends of pollution

ToR Task 4: Global assessment and evaluation of global trends of pollution

ToR Task 5: Dissemination activities: Website, press releases, preparation of educational materials, presentation at stakeholder meetings

WG 40: Sources, fate and effects of microplastics in the marine environment: a global assessment

Lead Agency: UNESCO-IOC

Co-sponsors: IMO, UNEP, UNIDO, IAEA, Plastics Europe, American Chemistry Council, NOAA

Co-chair: P. Kershaw (U.K.), H. Leslie (ToR 5) (Netherlands),

Members: T. Andrady (ToR 3) (USA), J. Baker (USA), V. Garcia Rios (Mexico), A. Koehler (Germany), K. Lavender Law (USA), N. Maximenko (USA), O. Osibanjo (Nigeria), S. Sheavely (USA), W. Joon Shim (Korea), H. Takada (Japan), R. Thompson (ToR 1) (UK), A. Turra (Brazil), R. Venkatesan (India), C. Arthur (USA)

Products: Final report under current ToR by November 2014

Terms of reference for WG 40

1 To assess the main sources and categories of plastics and microplastics entering the ocean.

2 To assess and utilize a range of physical and chemical models to simulate the behaviour of plastics and microplastics in the ocean in order to improve current assessment technologies.

3 To assess the occurrence and effects of microplastics in commercial fish and shellfish species, including associated additive chemicals and contaminants in the edible fractions.

4 To assess local, regional and global scales of accumulation of plastics and associated chemicals (additives and absorbed contaminants), including SIDS and regional hotspots.

5 To assess the effects of nano-sized plastics on marine organisms

6 To assess the risk of physical and chemical effects of ingested microplastics on marine organisms.

7 To assess the significance of plastics and microplastics as a vector for organisms, facilitating the spread of non-indigenous (alien) species.

8 To develop guideline covering terminology and methodologies: i) size and shape definitions of particles; ii) sampling protocols for the whole spectrum of particle sizes in surface and sub-surface seawater, seabed sediments, shorelines and biota; and, iii) methodologies for physical and chemical identification and analysis of polymers and associated chemicals.

9 To assess social and economic aspects influencing both the entry of plastics/microplastics into the

ocean and the potential consequences from the resulting contamination.

10 To develop and utilize effective mechanisms for communicating the progress and conclusions of the Working Group to a wide audience (public and private sector).

TASK TEAMS AND CORRESPONDENCE GROUPS

Task Team on the assessment of open ocean pollution

Lead Agency: IOC

Chair: R. Boelens

Members: P. Kershaw, I. Hedgecock, D. Bakker, P. Tyack, A. Baker, G. Gold-Bouchot, T. Bowmer, M. Angelidis

Products: Report to the TWAP and publication in GESAMP Reports & Studies for publication late 2014/early 2015

Correspondence Groups

The following activities will continue during the inter-sessional period:

Correspondence Group on the impacts of mine tailings in the marine environment

The Correspondence Group would prepare a scoping paper as a starting point for further discussion, and will, if possible convene a workshop in the intersessional period.

Lead: M. Huber (Australia)

Members: R. Delfanti (Italy), E. Ajao (Nigeria), A.C. Ruiz Fernandez (Mexico)

Correspondence Group on the biomagnification of contaminants in marine top predators and its ecological and health implications

The Correspondence Group will continue, on the basis of the scoping paper provided (see GESAMP 38, Annex VIII), to: a) develop ToR and a programme for an international workshop on the ecological consequences of bioconcentration; b) prepare with CIESM a high level meeting with stakeholders on the human health issues of biomagnification; and c) establish contacts with FAO/WHO.

Lead: P. Kershaw

Correspondence Group on disinfection by-products

The Correspondence Group has prepared a scoping document, and the interest to pursue the issue through

a working group will be discussed intersessionally. The issue is that based on the disinfection systems for ballast water to avoid bio-invasion of organisms, an additional amount of disinfection by-products will be discharged into the marine environment compared to the amounts discharged by cooling systems using disinfection as well.

Lead: J. Linders (Netherlands), A. Baker (UK)

Members: M. Huber (Australia), C. T. Bowmer (Netherlands), P. Kershaw (UK)

ANNEX VI – TEMPLATE FOR NEW GESAMP WORKING GROUPS

BACKGROUND & CONTEXT

- The subject: Brief general background on subject of the study
- The issue/problem: Why the subject is of concern or interest to the international community from the perspective of marine environmental protection
- The need: Why a GESAMP study is 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 the TOR should focus on the specific task being proposed
- Identify expertise required for the WG

WORK PLAN

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

ADMINISTRATIVE ARRANGEMENTS

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

ANNEX VII – GESAMP REPORTS AND STUDIES

The following reports and studies have been published so far. They are available from the GESAMP website: <http://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. (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 (2009), Rep. Stud. GESAMP, (78):73 p.
79. Pollution in the open oceans: a review of assessments and related studies (2009). Rep. Stud. GESAMP, (79):64 p.
80. Report of the thirty-sixth session, Geneva, 28 April - 1 May 2009 (2011), Rep. Stud. GESAMP, (80):83 p.
81. Report of the thirty-seventh session, Bangkok, 15 - 19 February 2010 (2010), Rep. Stud. GESAMP, (81):74 p.
82. Proceedings of the GESAMP International Workshop on Micro-plastic Particles as a Vector in Transporting Persistent, Bio-accumulating and Toxic Substances in the Oceans (2010). Rep. Stud. GESAMP, (82):36 p.
83. Establishing Equivalency in the Performance Testing and Compliance Monitoring of Emerging Alternative Ballast Water Management Systems (EABWMS). A Technical Review. Rep. Stud. GESAMP, (83):63 p, GloBallast Monographs No. 20.
84. The Atmospheric Input of Chemicals to the Ocean (2012). Rep. Stud. GESAMP, (84) GAW Report No. 203.
85. Report of the 38th Session, Monaco, 9 to 13 May 2011 (pre-publication copy), Rep. Stud. GESAMP, (85): 118 p.
86. Report of the Working Group 37: Mercury in the Marine Environment (in prep.). Rep. Stud. GESAMP, (86).
87. Report of the 39th Session, New York, 15 to 20 April 2012 (pre-publication copy), Rep. Stud. GESAMP, (87):92 p.
88. Report of the 40th Session, Vienna, 9 to 13 September 2013, Rep. Stud. GESAMP, (88):86p.
89. Report of the 41th Session, Malmö, Sweden 1 to 4 September 2014, Rep. Stud. GESAMP, (89):90p.