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INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of UNESCO)

INFORMATION DOCUMENT

Strategic Framework
for Implementation of the Second International Indian Ocean Expedition
(Report of the IOC Second International Indian Ocean Expedition (IIOE-2)
Interim Planning Committee)

Summary. This document provides the latest development of the Strategic Framework for Implementation of the second International Indian Ocean Expedition since the mention of the IIOE-2 as a concept. It is the result of the various meetings of the IIOE-2 Interim Planning Committee until May 2015. The IPC recommends that the SCOR's Science Plan to be adopted as the basis for implementing science and research for IIOE-2 over a period from 2015 to 2020. The IPC also provides direction for a well-resourced governance framework.

* An executive summary in English, French, Russian and Spanish is included in the document.

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Executive Summary

IPC establishment

Following the 2013 IOC Assembly Decision IOC-XXVII/Dec.5.1.2 on the Second International Indian Ocean Expedition (IIOE-2), in 2014 IOC decided to establish, through Resolution EC-XLVII.1, the IOC IIOE-2 Interim Planning Committee (Group of Experts) [IPC] to “...*undertake initial planning work, based on the research plan, and to report on this work to the Assembly at its 28th Session in 2015...*”. Membership specifications and Terms of Reference for the IPC were given in the Resolution. IPC Membership comprises:

- (i) through nominations from the Scientific Committee on Oceanic Research (SCOR): Peter Burkill, Raleigh Hood;
- (ii) through nominations from the Indian Ocean Global Ocean Observing System Regional Alliance (IOGOOS): Andreas Schiller, Satheesh Shenoi (IPC Chair), Nasser Zaker;
- (iii) through Member State nominations to the IOC Executive Secretary: Rana Fine, Birgit Gaye, Karen Heywood, Ashley Johnson, Somkiat Khokiattiwong, Kenneth Lee, Charles Majori, Yukio Masumoto, S.W.A Naqvi, Jerome Vialard, Haiwen Zhang (alternate Weidong Yu).

The IPC met by teleconference on 9 February and 30 March, in person on 20–21 April 2015 and through a series of inter-sessional interactions, coordinated by the IOC Secretariat. The IPC delivers its report to the 28th Assembly of IOC (IOC28), as per the Resolution.

Planning reviewed

IPC reviewed the full spectrum of IIOE-2 related planning activities that have occurred since the initial mentions of an IIOE-2 as a concept. These comprised numerous workshops, meetings, correspondences, formal and informal, and all largely voluntary but with some levels of support through various sponsoring Member States and related IOC constituents. The planning comprised representations at governmental, institutional and community levels deriving from most all of the Indian Ocean and neighbouring rim countries, as well IOC constituents from well outside the region, including from Europe, Africa, Asia and the Americas. For example, three key regional planning meetings were conducted during: 2013 in India and China (Hood and D’Adamo, 2013 and 2014); and 2014 in Mauritius (D’Adamo, 2014). The IOC constituency *per se* has been regularly and explicitly engaged via Executive Council and Assembly meeting deliberations and associated outputs, and formal communiques to all IOC Member States via the IOC Secretariat. IOC HQ, IOC Perth Programme Office and SCOR websites contain information and products generated from the past four years of planning.

IPC commends the progress being made by various countries in developing coherent national approaches to engaging in IIOE-2, such as through India’s National Organising Committee for IIOE-2, established in 2013. Through these ‘national committees’, plans are emerging for material engagement through research projects and associated cruises by a growing number of countries, as being developed through science alliances, for example such as the Indian Ocean Panel under IOGOOS/CLIVAR (IOP), Sustained Indian Ocean Biogeochemistry and Ecosystem Research under IOGOOS/IMBER (SIBER) and with support from constituents in the Indian Ocean Observing System Resources Forum under IOGOOS (IRF). This also includes efforts now materialising under the auspices of IOC bodies such as Regional Subsidiary Bodies, Committees and Decentralised Offices, including IOCAFRICA, WESTPAC, IODE, JCOMMOPS, as well as from IOC stakeholder alliances and supporting organisations.

SCOR IIOE-2 Science Plan Development Committee

IPC noted that SCOR’s Science Plan for IIOE-2 had been produced by an international committee and following extensive consultation over the period 2013–2015. IPC recommends that the

Science Plan (Hood et al., 2015) be adopted as the basis for implementing of science and research for IIOE-2.

IIOE-2 duration

IPC recommends that IIOE-2 should run to 2020, with it then being assessed and reviewed in terms of its successes, achievements and challenges, and examined for its legacy, relevancy to IOC constituents and merits of considering complementary forward actions. IPC further recommends that IIOE-2 should be led under the auspices of IOC, SCOR and IOGOOS, in alignment with their joint role in the history of its development during the formative planning phase of IIOE-2, their collective coverage and linkages to governmental, institutional, scientific and societal stakeholders, and their commitments to ongoing collaborative support and sponsorship of IIOE-2.

IIOE-2 launch

IPC recommends that IIOE-2 would be ideally suited to be launched in Goa, India, on 4 December 2015, at the end of the International Symposium on the Indian Ocean, which will celebrate 50 years of Indian Ocean science stemming from the original IIOE of 1959–1965 and the 50th anniversary of the Indian National Institute of Oceanography (itself a legacy of IIOE). The symposium will be hosted by the Government of India, supported by IOC and SCOR, and on 4 December 2015 an Indian research vessel will be launched from Goa, en-route to Mauritius, under the spirit of IIOE-2 and symbolising the IIOE-2's first international scientific research cruise.

IIOE-2 governance

IPC believes that IIOE-2 requires a clear and well-resourced governance framework, with steerage that oversees and derives input from a divisional structure comprising, respectively:

- (a) Science and Research;
- (b) Data and Information Management;
- (c) Capacity Building;
- (d) Operational Coordination;
- (e) Outreach and Communication;
- (f) Translating Science for Society; and
- (g) Resources and Sponsorship.

The IPC recommends that an IIOE-2 Steering Committee (SC) be established, under the formative Chairing of the current sponsors of the IIOE-2 planning process (IOC, SCOR and IOGOOS). The mechanism of chairing will be decided by the Sponsors at the first meeting of the IIOE-2 SC. The three sponsors may co-chair or the chairing may rotate among the three co-sponsors, with the other two sponsors being vice-chairs.

The SC would include a strategic 'executive' level group with one representative for each of the six over-arching science themes derived from the SCOR Science Plan Development Committee's (SPDC) [IIOE-2 Science Plan \(Version 1\)](#), as recommended to IOC for adoption as the essential underpinning science framework for IIOE-2. The six theme headings are: Human impacts; Boundary current dynamics, upwelling variability and ecosystem impacts; Monsoon variability and ecosystem response; Circulation, climate variability and change; Extreme events and their impacts on ecosystems and human populations; and unique geological, physical, biogeochemical, and ecological features of the Indian Ocean. These over-arching themes provide scientific areas for interested parties that wish to engage in IIOE-2 to be able to identify and select scientific relevancies for their respective interests. The executive level of the SC would also include one member from each of the operational divisions (a to g, above), as well as *ex-officio* members as appropriate. Furthermore, key Indian Ocean-related IOC regional bodies and committees may be represented on the SC at this level through their respective focal points.

Additionally, within the SC structure, two supporting groups of IIOE-2 Members would derive respectively from: (i) representatives of IIOE-2 ‘national committees’, with each country that has an effective IIOE-2 national committee involved in the delivery of IIOE-2 providing a single member of the SC; and (ii) leading Principal Investigators of major science programmes established and implemented under the IIOE-2’s science framework.

Support to the SC is recommended via an International Project Office Framework.

Concept structure recommended by IPC for an IIOE-2 Steering Committee

Co-Chairs (IOC, SCOR, IOGOOS)	International Project Office Framework Leading personnel represented on Steering Committee as ex-officio
Strategic Executive level: One representative per each of the six science themes from the SCOR SPDC IIOE-2 Science Plan + One representative per each of the seven operational divisions to be established as IIOE-2 Working Groups + One representative per each major IOC regional body/committee (e.g. IOCAFRICA, WESTPAC, IOCINDIO)	
Regional Coordination level One representative per each IIOE-2 ‘national committee’	
Science Delivery level One representative (i.e. Principal Investigator) per each ‘major’ IIOE-2 scientific research initiative, including a representative of the Early Career Scientists Network from the Capacity Building Working Group	

Each of the seven recommended IIOE-2 Divisions (a to g, above) should be established as IIOE-2 Working Groups, with their own leadership and participatory membership structures, formed under the oversight of the SC. IPC believes the IIOE-2’s steerage ‘community’, as described by this proposed structure, should work collaboratively and through annual IIOE-2 wide symposia which would constitute essential sessions at which assessment, exchange of information, review and forward planning takes place. The Working Groups could also allow for their own inter-sessional gatherings to address issues specific to individual Working Groups or that cut across two or more Working Groups, as might be required and as feasible.

The role of the IIOE-2 Steering Committee (SC) is to set the high-level policies and take responsibility for the delivery of IIOE-2 over the 2015–2020 period. The IIOE-2 SC must be international and is modelled on well tried-and-tested procedures used in large-scale science programmes. The SC would have a role which constitutes a transition in function from the current IPC and the transition process will be as seamless as possible.

IIOE-2 guiding frameworks

The seven recommended IIOE-2 operational divisions (i.e. a to g, above) require respective strategic guiding frameworks complemented by associated implementation plans. IPC recommends that the [SCOR IIOE-2 Science Plan \(Version 1\)](#) be complemented by a science implementation plan, also to be developed under the auspices of SCOR.

IPC notes that the development of completed strategic guiding frameworks and complementary implementation plans for the other divisional elements of IIOE-2 was not possible under the resourcing limitations inherent during the recent period of IIOE-2 genesis. Notwithstanding the circumstances, IPC does note and acknowledge with appreciation the range of IOC constituents and stakeholders that have not only supported formative work and progressed those plans

(including IODE, JCOMMOPS, Global Oceans and various Member States and associated constituents) but that have also committed to ongoing support for the development and completion of plans over the coming months.

IPC tenure

Accordingly, IPC believes it can continue to play a role in overseeing the development of those plans in collaboration with stakeholders that are committed to assisting in this regard. To that end, IPC offers its services to the IOC Assembly under an extended tenure that is suggested to run to the recommended launch date of 4 December 2015.

IIOE-2 resourcing / project management

Furthermore, IPC recommends as essential that IIOE-2, in the context of the IPC's recommended implementation framework, be supported by an appropriately structured and resourced project management network, complementing India's and Australia's respective related commitments in this regard at the IOC's 47th Executive Council meeting in 2014.

IPC emphasises that any overall IIOE-2 project management network should be underpinned by central core support provided through a new and dedicated IOC IIOE-2 budget line. This should be complemented by resources and support contributed by IOC Member States and related constituents. Essential elements of such a secretariat framework should include an IOC IIOE-2 Coordinator with adequate support (human resources and operational) to service the IOC's own responsibilities and roles in the implementation of the IIOE-2 and to provide the essential linkages to facilitate coordination of IOC's role across its respective in-region network (including IOC Regional Subsidiary Bodies, Centres, Committees and Decentralised Offices) and centralised HQ sphere. Member States should be called upon to support project management needs for IIOE-2, such as through national support nodes and/or direct in-kind and/or cash contributions to IOC to underpin, for example, the IOC Secretariat's function and also those of the recommended divisional Working Groups. The resourcing framework developed by the IPC contains discrete identifiable line items such as capacity building, outreach/communication, symposia and workshop hosting/support, and operational coordination. These provide opportunities for Member States to select and align supporting resources. Overall, the consolidated de-centralised support model proposed by IPC becomes, in essence, an International Project Office 'Framework' (IPO).

Résumé exécutif

Cadre stratégique pour la mise en œuvre de la deuxième Expédition internationale de l'océan Indien

Création du Comité intérimaire de planification (CIP)

Faisant suite à la résolution IOC-XXVII/5.1.2 de l'Assemblée de la Commission océanographique intergouvernementale (COI, 2013) concernant la deuxième Expédition internationale de l'océan Indien (EIOI-2), la COI a décidé, en 2014, de créer par sa décision EC-XLVII.1 un Comité intérimaire de planification pour l'EIOI-2 (groupe d'experts) [CIP] « chargé d'entreprendre les travaux initiaux de planification en se fondant sur le plan de recherche et de rendre compte de ses travaux à l'Assemblée à sa 28^e session en 2015 ». La composition et le mandat du CIP sont exposés dans la décision. Les membres du CIP sont les suivants :

- (i) Peter Burkill et Raleigh Hood, désignés par le Comité scientifique de la recherche océanique (SCOR) ;
- (ii) Andreas Schiller, Satheesh Shenoi (Président du CIP) et Nasser Zaker, désignés par le Système mondial d'observation de l'océan pour l'océan Indien (IO-GOOS) ;
- (iii) Rana Fine, Birgit Gaye, Karen Heywood, Ashley Johnson, Somkiat Khokiattiwong, Kenneth Lee, Charles Majori, Yukio Masumoto, S.W.A Naqvi, Jérôme Vialard et Haiwen Zhang (suppléant Weidong Yu), dont les candidatures ont été présentées par les États membres à la Secrétaire exécutive de la COI.

Le CIP s'est réuni par visioconférence le 9 février et le 30 mars 2015, lors d'une réunion physique les 20 et 21 avril 2015, ainsi que dans le cadre d'échanges intersessions coordonnés par le Secrétariat de la Commission. Il fait rapport à la 28^e session de l'Assemblée de la COI, comme prévu dans la décision susmentionnée.

Examen de la planification

Le CIP a passé en revue l'ensemble des activités de planification liées à l'EIOI-2 qui ont été menées depuis qu'il est question de ce projet. Elles comprennent de nombreux ateliers, réunions et correspondances formels et informels, en grande partie volontaires, bien que bénéficiant de niveaux de soutien différents de la part de divers États membres et parties prenantes de la COI parrainants. Cette planification prévoyait des représentations aux niveaux gouvernemental, institutionnel et communautaire pour la plupart des pays riverains de l'océan Indien et des pays voisins, ainsi que pour les parties prenantes de la COI d'autres régions, notamment l'Europe, l'Afrique, l'Asie et les Amériques. Ainsi, trois importantes réunions régionales de planification ont été organisées en Inde et en Chine en 2013 (Hood et d'Adamo, 2013 et 2014), et à Maurice en 2014 (d'Adamo, 2014). Les parties prenantes de la COI participent régulièrement et explicitement au processus par le biais des débats tenus lors des réunions du Conseil exécutif et de l'Assemblée et des résultats qui en découlent, ainsi que des communiqués officiels transmis à tous les États membres de la COI par l'intermédiaire du Secrétariat. Les sites Web du Siège de la Commission, du Bureau régional de programme de Perth et du SCOR contiennent des informations et des produits générés au cours des quatre dernières années de planification.

Le CIP se félicite des progrès accomplis par plusieurs pays dans la définition d'approches nationales cohérentes de la participation à la deuxième Expédition internationale, par exemple la création en 2013 du Comité national indien d'organisation pour l'EIOI-2. Grâce à ces « comités nationaux », un nombre croissant de pays mettent au point des plans relatifs à leur participation matérielle à l'Expédition, sous la forme de projets de recherche et de campagnes de recherche en mer connexes, élaborés dans le cadre de partenariats scientifiques (par exemple le Panel de l'océan Indien (IOP) d'IO-GOOS/CLIVAR ou la Recherche continue sur la biogéochimie et les écosystèmes de l'océan Indien (SIBER) d'IO-GOOS/IMBER), avec le soutien des parties prenantes du Forum sur les ressources du système d'observation de l'océan Indien de l'IO-GOOS. Cela inclut en outre des efforts qui se concrétisent à présent sous les auspices d'organes de la

COI tels que les organes subsidiaires régionaux, les comités et les bureaux décentralisés, notamment la Sous-Commission de la COI pour l’Afrique et les États insulaires adjacents (IOCAFRICA), la Sous-Commission de la COI pour le Pacifique occidental (WESTPAC), l’Échange international des données et de l’information océanographiques (IODE), le Centre JCOMM de soutien aux programmes d’observation *in situ* (JCOMMOPS), ainsi que des activités menées par des groupements de parties prenantes de la COI et des organisations de soutien.

Comité chargé de l’élaboration d’un plan scientifique du SCOR pour l’EIOI-2

Le CIP a noté qu’un comité international avait élaboré un Plan scientifique du SCOR pour l’EIOI-2, à l’issue d’une large concertation menée en 2013-2015. Le CIP recommande que le Plan scientifique (Hood et al., 2015) soit adopté pour servir de base à la mise en œuvre des activités scientifiques et de recherche de la deuxième Expédition internationale.

Durée de l’EIOI-2

Le CIP recommande de poursuivre l’EIOI-2 jusqu’en 2020, d’en évaluer et examiner les succès, résultats et difficultés, et d’étudier son héritage, sa pertinence pour les parties prenantes de la COI et le bien-fondé d’éventuelles actions complémentaires. Le CIP recommande également de conduire l’EIOI-2 sous les auspices de la COI, du SCOR et de l’IO-GOOS, eu égard au rôle joué par ces organismes dans la mise en œuvre du projet au cours de la phase de planification initiale, aux domaines de compétence similaires qui sont les leurs, à leurs liens communs avec des acteurs gouvernementaux, institutionnels, scientifiques et sociétaux, et à leur engagement à soutenir et parrainer la deuxième Expédition internationale de façon continue.

Lancement de l’EIOI-2

Le CIP estime qu’il serait idéal de lancer l’EIOI-2 le 4 décembre 2015 à Goa (Inde), à l’issue du colloque international sur l’océan Indien qui célébrera les 50 années de recherche sur cet océan initiées par la première Expédition de 1959-1965, ainsi que le 50^e anniversaire de l’Institut national indien d’océanographie, également un héritage de l’EIOI. Le colloque sera organisé par le Gouvernement indien avec le soutien de la COI et du SCOR. Le 4 décembre 2015, dans l’esprit de l’EIOI-2, un navire de recherche indien partira de Goa en direction de Maurice pour symboliser la première campagne de recherche scientifique en mer de la deuxième Expédition internationale.

Gouvernance de l’EIOI-2

Le CIP considère que l’EIOI-2 doit être dotée d’un cadre de gouvernance clair qui prévoit des ressources suffisantes, ainsi qu’une entité de direction chargée de la supervision et s’appuyant sur une structure composée des divisions suivantes :

- (a) Science et recherche ;
- (b) Gestion des données et de l’information ;
- (c) Renforcement des capacités ;
- (d) Coordination opérationnelle ;
- (e) Sensibilisation et communication ;
- (f) La science au service de la société ;
- (g) Ressources et parrainage.

Le CIP recommande d’établir un comité directeur de l’EIOI-2 (SC), initialement présidé par les trois organismes parrainant actuellement le processus de planification du projet, à savoir la COI, le SCOR et l’IO-GOOS. Les organismes de parrainage choisiront le système de présidence lors de la première réunion de l’EIOI-2 SC. La présidence sera assurée par les trois organismes soit conjointement, soit à tour de rôle, les deux autres organismes occupant dans ce cas les fonctions de vice-présidents.

Le SC comprendra un groupe stratégique de niveau « exécutif » composé d'un représentant de chacune des six thématiques scientifiques prioritaires du [Plan scientifique pour l'EIOI-2 \(version 1\)](#), préparé par le Comité pour l'élaboration d'un plan scientifique du SCOR (SPDC) et recommandé pour adoption par la COI en tant que principal cadre scientifique pour l'EIOI-2. Les six thématiques sont les suivantes : impact des activités humaines ; dynamique des courants de frontière, variabilité des remontées d'eaux froides et impact sur les écosystèmes ; variabilité des moussons et réaction des écosystèmes ; circulation et variabilité et changement climatiques ; phénomènes extrêmes et conséquences pour les écosystèmes et les populations humaines ; particularités géologiques, physiques, biogéochimiques et écologiques de l'océan Indien. Ces thématiques prioritaires proposent des domaines de recherche aux parties intéressées qui souhaitent participer à la deuxième Expédition internationale, et leur permettent de repérer et sélectionner des sujets de recherche en rapport avec leurs intérêts respectifs. Le SC inclura également, au niveau exécutif, un membre des divisions opérationnelles susmentionnées – (a) à (g) –, ainsi que des membres d'office, s'il y a lieu. De plus, les principaux organes régionaux et comités de la COI relatifs à l'océan Indien pourront être représentés au niveau exécutif du SC par l'intermédiaire de leurs points focaux respectifs.

Le SC comprendra en outre deux groupes d'appui composés de membres de l'EIOI-2, à savoir : (i) des représentants des « comités nationaux » pour l'EIOI-2, à raison d'un représentant par pays doté d'un comité effectif participant à l'exécution du projet au sein du SC ; et (ii) les principaux responsables de recherche de programmes scientifiques majeurs établis et mis en œuvre dans le cadre scientifique de l'EIOI-2.

Il est recommandé de soutenir le SC par le biais d'un cadre pour un bureau international du projet.

Structure recommandée par le CIP pour un comité directeur de l'EIOI-2

Coprésidents (COI, SCOR, IO-GOOS)	
<p>Niveau stratégique exécutif :</p> <p>Un représentant de chacune des six thématiques scientifiques du Plan scientifique du SPDC pour l'EIOI-2</p> <p style="text-align: center;">+</p> <p>Un représentant de chacune des sept divisions opérationnelles à établir en tant que groupes de travail de l'EIOI-2</p> <p style="text-align: center;">+</p> <p>Un représentant des organes régionaux/comités importants de la COI (par ex. IOCAFRICA, WESTPAC, Comité régional de la COI pour l'océan Indien central – IOCINDIO)</p>	<p>Cadre pour un bureau international du projet</p> <p>Personnel dirigeant, représenté au Comité directeur en tant que membres d'office</p>
<p>Niveau de coordination régionale</p> <p>Un représentant de chaque « comité national » de l'EIOI-2</p>	
<p>Niveau des prestations scientifiques</p> <p>Un représentant (responsable de recherche) des initiatives de recherche « majeures » de l'EIOI-2, y compris le Réseau des scientifiques en début de carrière du Groupe de travail sur le renforcement des capacités</p>	

Les sept divisions de l'EIOI-2 recommandées – (a) à (g) ci-dessus – seront établies en tant que groupes de travail de l'EIOI-2 et dotées d'une instance de direction et d'une structure d'adhésion participative formées sous la supervision du SC. Le CIP estime que la « communauté » de direction de la structure proposée doit travailler de manière collaborative, en organisant de grands colloques annuels de l'EIOI-2, lesquels constitueront des réunions d'importance capitale comprenant des évaluations, des échanges d'information, des examens et des travaux de planification. Les groupes de travail pourraient aussi se réunir pendant l'intersession de façon indépendante, pour aborder des questions les concernant spécifiquement ou intéressant deux groupes de travail ou plus, s'il y a lieu et dans la mesure du possible.

Le Comité directeur de l'EIOI-2 est chargé de la définition des politiques de haut niveau et de l'exécution de l'EIOI-2 pour la période 2015-2020. Sa composition doit être internationale, et ses règles de fonctionnement inspirées de procédures largement éprouvées dans le cadre de programmes scientifiques d'envergure. Le rôle du SC constitue une transition par rapport au CIP actuel, qui sera la plus douce possible.

Cadres directeurs de l'EIOI-2

Les sept divisions opérationnelles de l'EIOI-2 recommandées – (a) à (g) ci-dessus – doivent être dotées de cadres directeurs stratégiques et des plans de mise en œuvre correspondants. Le CIP recommande que le [Plan scientifique du SCOR pour l'EIOI-2 \(version 1\)](#) soit complété par un plan de mise en œuvre scientifique, également à élaborer sous les auspices du SCOR.

Le CIP prend acte qu'il n'a pas été possible d'élaborer des cadres directeurs stratégiques complets et des plans de mise en œuvre complémentaires pour les autres divisions de l'EIOI-2, en raison des restrictions de ressources ayant marqué la période récente au cours de laquelle l'EIOI-2 a été conçue. Malgré ce contexte, le CIP note avec satisfaction que plusieurs parties prenantes de la COI et acteurs ont non seulement soutenu le processus initial et fait avancer ces plans (y compris IODE, le JCOMMOPS, Global Oceans, divers États membres et parties prenantes associées), mais se sont en outre engagés à en appuyer de façon continue l'élaboration et la mise en œuvre au cours des prochains mois.

Mandat du CIP

En conséquence, le CIP estime qu'il peut continuer d'assurer la supervision de l'élaboration des plans susmentionnés, en collaboration avec les acteurs résolus à l'aider dans cette tâche. À cette fin, le CIP offre ses services à l'Assemblée de la COI, en vertu d'un mandat qu'il est proposé de prolonger jusqu'à la date de lancement du projet, le 4 décembre 2015.

Ressources de l'EIOI-2/gestion de projet

En outre, le CIP estime que dans le contexte du cadre de mise en œuvre qu'il recommande d'adopter, il est essentiel que l'EIOI-2 soit soutenue par un réseau de gestion de projet convenablement structuré et doté de ressources suffisantes, venant compléter les engagements respectivement pris à cet égard par l'Inde et l'Australie lors de la 47^e session du Conseil exécutif de la COI en 2014.

Le CIP souligne que ce réseau de gestion de projet global pour l'EIOI-2 doit reposer sur un financement de base assuré au titre d'une nouvelle ligne budgétaire de la COI consacrée à l'EIOI-2. Ceci doit s'accompagner d'un soutien et de ressources fournis par les États membres de la COI et les parties prenantes associées. Les éléments essentiels de ce cadre de secrétariat comprennent un coordinateur de l'EIOI-2 de la COI, qui doit bénéficier du soutien nécessaire (ressources humaines et opérationnelles) pour assumer les responsabilités et rôles incombant à la Commission concernant la mise en œuvre de l'EIOI-2 et établir les liens indispensables afin de faciliter la coordination des fonctions de la COI dans son réseau régional (y compris les organes subsidiaires régionaux, centres, comités et bureaux décentralisés de la COI) et le domaine centralisé du Siège. Il convient d'appeler les États membres à répondre aux besoins de l'EIOI-2 en matière de gestion de projet, par exemple en mettant en place des axes d'appui nationaux et/ou par le biais de contributions directes financières et/ou en nature à la COI pour soutenir, par exemple, l'accomplissement des tâches du Secrétariat de la COI ainsi que des groupes de travail ou divisions recommandés. Le cadre de ressources élaboré par le CIP prévoit des postes identifiables distincts, comme le renforcement des capacités, la sensibilisation/communication, l'organisation/le financement de colloques et d'ateliers, et la coordination opérationnelle. Ces différents postes permettent aux États membres de choisir et d'harmoniser les ressources de soutien à fournir. En définitive, le modèle de soutien décentralisé consolidé proposé par le CIP devient un « cadre » pour un bureau international du projet (IPO).

Resumen dispositivo

Marco estratégico de ejecución para la Segunda Expedición Internacional al Océano Índico

Creación del Comité provisional de planificación (IPC)

En cumplimiento de la decisión IOC-XXVII/5.1.2 relativa a la Segunda Expedición Internacional al Océano Índico (IIOE-2), adoptada por la Asamblea de la COI en 2013, en el año 2014 la COI decidió crear, en virtud de la resolución EC-XLVII.1, el Comité provisional de planificación (Grupo de expertos) de la COI para la IIOE-2 (IPC), encargado de “[...] emprender la labor inicial de planificación, [sobre la base del plan de investigación,] y de informar al respecto a la Asamblea en su 28ª reunión, en 2015 [...]”. La resolución precisaba también la composición y el mandato del IPC. La composición del IPC es la siguiente:

- (i) a propuesta del Comité Científico de Investigaciones Oceánicas (SCOR): Peter Burkill, Raleigh Hood;
- (ii) a propuesta del Sistema Mundial de Observación de los Océanos - Océano Índico (IO-GOOS): Andreas Schiller, Satheesh Shenoi (Presidente del Comité), Nasser Zaker;
- (iii) a propuesta de los Estados Miembros por conducto del Secretario Ejecutivo de la COI: Rana Fine, Birgit Gaye, Karen Heywood, Ashley Johnson, Somkiat Khokiattiwong, Kenneth Lee, Charles Majori, Yukio Masumoto, S. W. A. Naqvi, Jerome Vialard, Haiwen Zhang (suplente: Weidong Yu).

El IPC celebró reuniones por teleconferencia el 9 de febrero y el 30 de marzo y presencialmente los días 20 y 21 de abril de 2015, y mantuvo una serie de contactos entre las reuniones, bajo la coordinación de la Secretaría de la COI. De conformidad con la resolución, el IPC presenta su informe a la Asamblea de la COI en su 28ª reunión.

Examen de la planificación

El IPC examinó todas las actividades de planificación relacionadas con la IIOE-2 que se han llevado a cabo desde las primeras referencias a la idea de organizar la IIOE-2. Entre ellas se encuentran un gran número de talleres, reuniones y cartas oficiales y oficiosas, en gran medida de carácter voluntario pero con cierto grado de apoyo por parte de varios Estados Miembros patrocinadores y otros participantes en la COI. En las actividades de planificación participaron representantes gubernamentales, institucionales y comunitarios de prácticamente todos los países ribereños del océano Índico y otros países adyacentes, así como otros interesados en la COI de fuera de la región, procedentes de Europa, África, Asia o las Américas. Así, por ejemplo, se celebraron tres reuniones regionales de planificación importantes, dos en 2013, en la India y en China (Hood y D’Adamo, 2013 y 2014), y una en 2014, en Mauricio (D’Adamo, 2014). De manera periódica y explícita se hizo partícipes a los interesados en la COI, por medio de las deliberaciones mantenidas en las reuniones del Consejo Ejecutivo y la Asamblea y sus correspondientes resultados y con el envío de comunicados oficiales a todos los Estados Miembros de la COI por conducto de la Secretaría de la COI. Los sitios web de la Sede de la COI, de la Oficina de Programas de Perth y del SCOR contienen información y productos generados a lo largo de los cuatro años de planificación.

El IPC encomia los progresos alcanzados por diversos países en la definición de unos planteamientos nacionales coherentes para su participación en la IIOE-2, como es el caso del Comité Organizador Nacional para la IIOE-2 creado por la India en 2013. Por medio de estos comités nacionales, en un creciente número de países están surgiendo planes para su participación material, a través de proyectos de investigación y cruceros conexos que se están llevando a cabo en el marco de alianzas científicas, como el Panel sobre Estudios Climáticos del Océano Índico (IOP) (en el marco de IO-GOOS/CLIVAR), el Programa de investigación biogeoquímica y ecosistémica continuada del océano Índico (SIBER) (en el marco de IO-GOOS/IMBER) y el apoyo de

participantes en el Foro de recursos para el sistema de observación del océano Índico (IRF) (en el marco de IO-GOOS). Entre estas iniciativas se incluyen también las que actualmente se están materializando bajo los auspicios de órganos de la COI como sus comités, oficinas descentralizadas y órganos subsidiarios regionales, entre ellos IOCAFRICA, WESTPAC, IODE y JCOMMOPS, así como las que llevan a cabo diversas alianzas de interesados en la COI y organizaciones de apoyo.

Comité encargado de la elaboración del plan científico del SCOR para la IIOE-2

El IPC tomó nota de que el plan científico del SCOR para la IIOE-2 había sido elaborado por un comité internacional tras una amplia consulta realizada entre 2013 y 2015. El IPC recomienda que se adopte el plan científico (Hood *et al.*, 2015) como base científica y de investigación para la ejecución de la IIOE-2.

Duración de la IIOE-2

El IPC recomienda que la IIOE-2 dure hasta 2020, momento en que se evaluarían sus éxitos, logros y dificultades y se examinarían su legado, su pertinencia para los participantes en la COI y la conveniencia de plantear medidas ulteriores complementarias. El IPC recomienda además que la IIOE-2 se ejecute bajo los auspicios de la COI, el SCOR y el IO-GOOS, teniendo en cuenta la función conjunta que han desempeñado a lo largo de la fase de preparación y planificación de la IIOE-2, su cobertura colectiva y sus vínculos con interesados gubernamentales, institucionales, científicos y sociales, así como su compromiso de seguir apoyando y patrocinando la IIOE-2 de modo cooperativo.

Inicio de la IIOE-2

El IPC recomienda que la IIOE-2 se ponga en marcha idealmente en Goa (India) el 4 de diciembre de 2015, al término del simposio internacional sobre el océano Índico, en el que se conmemorarán los 50 años de la investigación científica sobre el océano Índico, iniciada a raíz de la primera IIOE de 1959-1965, así como el 50º aniversario del Instituto Nacional de Oceanografía de la India (que también forma parte del legado de la IIOE). El simposio será albergado por el Gobierno de la India, con el apoyo de la COI y el SCOR, y el 4 de diciembre de 2015 zarpará de Goa rumbo a Mauricio un buque de investigación indio, con el espíritu de la IIOE-2 y como símbolo del primer crucero de investigación científica internacional de la IIOE-2.

Gobernanza de la IIOE-2

El IPC considera que la IIOE-2 requiere un marco de gobernanza claro y dotado de recursos suficientes, cuya dirección se encargue de supervisar y recibir aportaciones de una estructura compuesta por las siguientes divisiones:

- a) ciencia e investigación;
- b) gestión de datos e información;
- c) fortalecimiento de capacidades;
- d) coordinación operacional;
- e) divulgación y comunicación;
- f) transmisión de la ciencia a la sociedad; y
- g) recursos y patrocinio.

El IPC recomienda que se cree un Comité de Dirección de la IIOE-2, presidido por los actuales patrocinadores del proceso de planificación de la IIOE-2 (la COI, el SCOR y el IO-GOOS). Los patrocinadores decidirán el modo de funcionamiento de la presidencia en la primera reunión del Comité de Dirección de la IIOE-2. Podría tratarse de una presidencia conjunta de los tres patrocinadores o de una presidencia rotatoria, en cuyo caso los otros dos patrocinadores asumirían la vicepresidencia.

El Comité de Dirección incluiría un grupo estratégico de carácter ejecutivo constituido por un representante de cada uno de los seis temas científicos generales que se determinan en el [plan científico para la IIOE-2 \(versión 1\)](#), elaborado por el comité del SCOR constituido a tal efecto y que se presenta a la COI para su aprobación como marco científico fundamental para la IIOE-2. Esos seis temas son los siguientes: efectos de las actividades humanas; dinámica de las corrientes fronterizas, variabilidad de las surgencias y efectos en los ecosistemas; variabilidad de los monzones y respuesta de los ecosistemas; circulación y variabilidad y cambio climáticos; fenómenos extremos y efectos en los ecosistemas y las poblaciones humanas; y singularidades geológicas, físicas, biogeoquímicas y ecológicas del océano Índico. Estos temas generales ofrecen un marco en el que las partes interesadas en participar en la IIOE-2 podrán determinar los ámbitos científicos pertinentes para sus intereses. El nivel ejecutivo del Comité de Dirección incluiría también un miembro de cada una de las divisiones operacionales (los puntos a) a g) indicados anteriormente), así como los miembros de oficio que se consideren oportunos. Asimismo, los principales comités y órganos regionales de la COI relacionados con el océano Índico podrán estar representados en este nivel del Comité de Dirección a través de sus coordinadores respectivos.

Además, la estructura del Comité de Dirección constaría de dos grupos de apoyo, constituidos respectivamente por los siguientes miembros de la IIOE-2: i) representantes de los comités nacionales de la IIOE-2 (cada país donde exista efectivamente un comité nacional de la IIOE-2 que participe en la ejecución de la expedición aportará un único miembro al Comité de Dirección); y ii) investigadores principales de los grandes programas científicos que se creen y se ejecuten dentro del marco científico de la IIOE-2.

Se recomienda que el Comité de Dirección cuente con el apoyo de una oficina internacional de proyectos.

**Esquema de la estructura recomendada por el IPC para el
Comité de Dirección de la IIOE-2**

Copresidencia (COI, SCOR, IO-GOOS)	
<p>Nivel estratégico-ejecutivo</p> <p>Un representante por cada uno de los seis temas científicos determinados en el plan científico de la IIOE-2 elaborado por el comité especial del SCOR</p> <p style="text-align: center;">+</p> <p>Un representante por cada una de las siete divisiones operacionales que se constituyan como grupos de trabajo de la IIOE-2</p> <p style="text-align: center;">+</p> <p>Un representante por cada uno de los principales comités y órganos regionales de la COI (p. ej., IOCAFRICA, WESTPAC, IOCINDIO)</p>	<p>Oficina internacional de proyectos</p> <p>Sus principales miembros están representados de oficio en el Comité de Dirección</p>
<p>Nivel de coordinación regional</p> <p>Un representante por cada uno de los comités nacionales de la IIOE-2</p>	
<p>Nivel de producción científica</p> <p>Un representante (investigador principal) por cada una de las principales iniciativas de investigación científica de la IIOE-2, entre ellos un representante de la red de científicos <i>Early Career Scientists Network</i> del grupo de trabajo sobre el fortalecimiento de capacidades</p>	

Cada una de las siete divisiones que se recomiendan en los puntos a) a g) deberían constituirse como grupos de trabajo de la IIOE-2, cada cual con su propia estructura de dirección y participación, bajo la supervisión del Comité de Dirección. El IPC considera que los distintos componentes de la estructura de dirección de la IIOE-2 que aquí se propone deberían

desempeñar su labor en colaboración y por medio de amplios simposios anuales de la IIOE-2, que deberían constituir los espacios de reunión básicos para la evaluación, el intercambio de información, el examen y la planificación. Por otra parte, los grupos de trabajo podrían celebrar sus propios encuentros, dentro del periodo comprendido entre estas reuniones, para tratar cuestiones específicas de determinados grupos de trabajo o transversales a dos o más grupos, según sea necesario y factible.

La función del Comité de Dirección de la IIOE-2 consiste en definir las políticas generales y asumir la responsabilidad de la ejecución de la IIOE-2 durante el periodo 2015-2020. El Comité de Dirección de la IIOE-2 debe ser de carácter internacional y regirse por procedimientos debidamente acreditados en programas científicos de gran escala. El Comité de Dirección tendrá también la función de velar por el desarrollo de un proceso de transición óptimo con respecto al IPC actual.

Marcos de orientación de la IIOE-2

Cada una de las siete divisiones operacionales recomendadas para la IIOE-2 (los puntos a) a g) mencionados anteriormente) requiere un marco de orientación estratégica y su correspondiente plan de ejecución. El IPC recomienda que el [plan científico del SCOR para la IIOE-2 \(versión 1\)](#) se complemente con un plan científico de ejecución, elaborado también bajo los auspicios del SCOR.

El IPC toma nota de la imposibilidad de finalizar los marcos de orientación estratégica y los planes de ejecución complementarios para las demás divisiones de la IIOE-2 debido a la limitación de recursos propia del reciente periodo de concepción de la IIOE-2. A pesar de las circunstancias, el IPC toma en consideración y agradece el apoyo de las diversas partes interesadas en la COI (entre ellas el IODE, el JCOMMOPS, Global Oceans, varios Estados Miembros y otras entidades participantes) que no solo han respaldado la labor preparatoria y el avance de esos planes, sino que, además, se han comprometido a seguir respaldando la elaboración y la finalización de los planes en los próximos meses.

Mandato del IPC

Por consiguiente, el IPC considera que puede seguir cumpliendo una función en la supervisión de la elaboración de esos planes, en colaboración con los interesados que se han comprometido a contribuir a ello. Para tal fin, el IPC sugiere a la Asamblea de la COI seguir prestando sus servicios durante un mandato prorrogado hasta la fecha recomendada para el inicio de la IIOE-2, el 4 de diciembre de 2015.

Recursos y gestión de proyectos de la IIOE-2

Asimismo, el IPC recomienda como una medida fundamental que, dentro del marco de ejecución recomendado por el IPC, la IIOE-2 cuente con el apoyo de una red de gestión de proyectos que disponga de la estructura y los recursos adecuados, como complemento de los compromisos adquiridos al respecto por la India y Australia en la 47ª reunión del Consejo Ejecutivo de la COI, celebrada en 2014.

El IPC recalca que esta red general de gestión de proyectos de la IIOE-2 debería contar con el apoyo fundamental de una nueva partida presupuestaria de la COI específica para la IIOE-2. Ello debería complementarse con los recursos y el apoyo de los Estados Miembros de la COI y otras entidades participantes. Entre los componentes básicos de este marco de secretaría debería incluirse un coordinador de la COI para la IIOE-2 que contase con el apoyo necesario (operacional y de recursos humanos) para contribuir al desempeño de las responsabilidades y funciones propias de la COI en la ejecución de la IIOE-2 y para proporcionar los vínculos necesarios para facilitar la coordinación de la labor de la COI tanto en su red regional (en particular sus órganos subsidiarios, centros, comités y oficinas descentralizadas regionales) como en su Sede central. Debería instarse a los Estados Miembros a prestar el apoyo necesario para la gestión de proyectos de la IIOE-2 —por medio de centros nacionales de apoyo, contribuciones directas en especie y/o contribuciones financieras a la COI— con objeto de respaldar, por ejemplo, la labor de

la Secretaría de la COI y la de los grupos de trabajo que se recomienda crear para las distintas divisiones. En el marco de recursos elaborado por el IPC figuran partidas específicas y determinadas, como fortalecimiento de capacidades, divulgación y comunicación, organización y apoyo para simposios y talleres y coordinación operacional. Este marco ofrece a los Estados Miembros la posibilidad de seleccionar y asignar los recursos correspondientes. De manera general, el modelo integral de apoyo descentralizado que propone el IPC constituye en definitiva el marco para una oficina internacional de proyectos.

Краткий Рабочий Доклад

Стратегические рамки проведения второй Международной экспедиции в Индийском океане

Учреждение ВКП

В соответствии с принятым Ассамблеей МОК в 2013 г. решением IOС-XXVII/Реш.5.1.2 относительно второй Международной экспедиции в Индийском океане (МЭИО-2) в 2014 г. МОК в резолюции ЕС-XLVII.1 постановила учредить временный комитет по планированию (группа экспертов) (ВКП) МЭИО-2 *«в целях первоначального планирования работы на основе плана научных исследований и представить Ассамблее МОК на ее 28-й сессии в 2015 г. доклад о проведенной работе»*. Членский состав и круг ведения ВКП приводятся в резолюции. В состав ВКП входят:

- (i) назначенные Научным комитетом по океаническим исследованиям (СКОР): Петер Беркилл, Роли Худ;
- (ii) назначенные Региональным альянсом для Индийского океана Глобальной системы наблюдений за океаном (ГСНО-ИО): Андреас Шиллер, Сатеш Шенои (председатель ВКП), Нассер Закер;
- (iii) назначенные из числа кандидатов, предложенных Исполнительному секретарю МОК государствами-членами: Рана Файн, Биргит Гайе, Карен Хейвуд, Эшли Джонсон, Сомкиат Хокиаттивонг, Кеннет Ли, Чарльз Майори, Юкио Мацумото, С.У.А. Накви, Жером Виалар, Хайвэнь Чжан (поочередно с Вэйдуном Юйем).

ВКП провел телеконференции 9 февраля и 30 марта и совещание 20-21 апреля 2015 г., а также ряд межсессионных консультаций, координируемых Секретариатом МОК. В соответствии с резолюцией ВКП представляет свой доклад 28-й Ассамблее МОК (МОК-28).

Обзор планирования

ВКП провел обзор всех мероприятий по планированию МЭИО-2, осуществленных с начала разработки концепции МЭИО-2. В число таких мероприятий вошли многочисленные семинары, совещания, переписка, носившие как официальный, так и неофициальный характер и проводившиеся преимущественно на добровольной основе, хотя выступившие спонсорами различные государства-члены и соответствующие структуры МОК обеспечили определенный уровень поддержки. Процесс планирования включал проведение соответствующих мероприятий на правительственном, институциональном и общинном уровнях в большинстве стран акватории Индийского океана, а также на уровне структур МОК из других регионов, в том числе Европы, Африки, Азии и Северной и Южной Америки. Например, три основных региональных совещания по планированию состоялись в 2013 г. в Индии и Китае (Худ и Д'Адамо, 2013 г. и 2014 г.) и в 2014 г. на Маврикии (Д'Адамо, 2014 г.). Структуры МОК как таковые на регулярной основе принимали конкретное участие в дискуссиях на сессиях Исполнительного совета и Ассамблеи и подготовке материалов по их итогам. Кроме того, через Секретариат МОК всем государствам – членам МОК направлялись официальные коммюнике. На веб-сайтах Штаб-квартиры МОК, бюро по программам МОК в Перте и СКОР содержится информация и документы, подготовленные за последние четыре года планирования.

ВКП высоко оценивает прогресс, достигнутый различными странами в разработке согласованных национальных подходов для участия в МЭИО-2, например, работу индийского национального организационного комитета МЭИО-2, учрежденного в 2013 г. Благодаря этим национальным комитетам появляются планы, позволяющие принять непосредственное участие в научно-исследовательских проектах и соответствующих рейсах все большему числу стран, поскольку они разрабатываются в рамках научных альянсов, таких, как Группа по Индийскому океану (ГИО) при ГСНО-ИО/КЛИВАР, Устойчивое биохимическое и экосистемное исследование Индийского океана (SIBER) под эгидой ГСНО-

ИО/ИМБЕР, а также при поддержке структур Форума ресурсов системы наблюдений за Индийским океаном (ФРИО) под эгидой ГСНО-ИО. Прогресс также обусловлен усилиями, предпринимаемыми в настоящее время под эгидой органов МОК, таких, как региональные вспомогательные органы, комитеты и децентрализованные бюро, в том числе МОКАФРИКА, ВЕСТПАК, МООД, СКОММОПС, а также альянсами заинтересованных сторон МОК и сотрудничающими организациями.

Комитет СКОР по разработке плана научных исследований МЭИО-2

ВКП отметил, что план научных исследований МЭИО-2 СКОР был подготовлен международным комитетом по итогам всесторонних консультаций, прошедших в 2013-2015 гг. ВКП рекомендует принять этот план научных исследований (Худ и др., 2015 г.) за основу научно-исследовательской деятельности в рамках МЭИО-2.

Продолжительность МЭИО-2

ВКП рекомендует установить срок проведения МЭИО-2 до 2020 г., после чего провести оценку и обзор экспедиции на предмет определения ее положительных результатов, достижений и трудностей, а также изучить ее итоги, актуальность для структур МОК и преимущества проведения дополнительных мероприятий. ВКП далее рекомендует проводить МЭИО-2 под эгидой МОК, СКОР и ГСНО-ИО, учитывая совместную роль, которую они играли на первоначальном этапе планирования МЭИО-2, их общий охват и связи с правительственными, институциональными, научными и общественными заинтересованными сторонами, а также их обязательства по оказанию постоянного содействия и спонсорской поддержки МЭИО-2.

Начало МЭИО-2

ВКП рекомендует в качестве наиболее подходящего варианта дать старт МЭИО-2 на Гоа, Индия, 4 декабря 2015 г. по окончании Международного симпозиума по Индийскому океану, приуроченного к 50-летию научно-исследовательской деятельности в Индийском океане, начало которой положила первая МЭИО (1959-1965 гг.), и 50-летию индийского Национального института океанографии, который является непосредственным наследием МЭИО. Симпозиум будет организован правительством Индии при поддержке МОК и СКОР, и 4 декабря 2015 г. индийское научно-исследовательское судно отправится из порта Гоа на Маврикий, олицетворяя дух МЭИО-2 и символизируя первый международный научно-исследовательский рейс в рамках МЭИО-2.

Управление МЭИО-2

ВКП считает, что МЭИО-2 требует четких и хорошо обеспеченных ресурсами рамок управления с руководящей структурой, контролирующей и централизующей результаты работы подразделений в следующих областях:

- (a) научно-исследовательская деятельность;
- (b) управление данными и информацией;
- (c) создание потенциала;
- (d) координация оперативной деятельности;
- (e) информационно-разъяснительная деятельность и коммуникация;
- (f) использование результатов научных исследований на благо общества;
- (g) ресурсы и спонсорская поддержка.

ВКП рекомендует учредить Руководящий комитет (РК) МЭИО-2 под председательством нынешних участников процесса планирования МЭИО-2 (МОК, СКОР и ГСНО-ИО). Механизм председательства будет определен участниками в ходе первого заседания РК МЭИО-2. Три

организации-спонсора могут обеспечивать председательство совместно или поочередно, в последнем случае две другие организации могут выполнять функции заместителей председателя.

РК будет включать с себя стратегическую исполнительную группу с одним представителем от каждой из шести основных научных тем, обозначенных в Плане научных исследований МЭИО-2 (1-й вариант) Комитета СКОР по разработке плана научных исследований, который МОК рекомендовано положить в основу научно-исследовательской деятельности в рамках МЭИО-2. Шесть тематических направлений включают в себя: антропогенное воздействие; динамику пограничных течений, изменчивость подъема глубинных вод и воздействие на экосистему; муссонную изменчивость и реакцию экосистемы; циркуляцию, изменчивость и изменение климата; экстремальные явления и их воздействие на экосистемы и население; уникальные геологические, физические, биогеохимические и экологические характеристики Индийского океана. Эти основные темы намечают направления научных исследований, которые заинтересованные стороны, желающие участвовать в МЭИО-2, могут определить и выбрать как наиболее актуальные в соответствии с их приоритетами. В исполнительную группу РК также войдет один представитель от каждого оперативного подразделения (см. выше с (а) по (g)) и в соответствующих случаях члены *ex-officio*. Кроме того, основные органы и комитеты МОК в регионе Индийского океана могут быть представлены на этом уровне РК через их соответствующие координационные центры.

В структуру РК также войдут две вспомогательные группы участников МЭИО-2, состоящие соответственно из: (i) представителей национальных комитетов МЭИО-2 (по одному члену от каждой страны, где национальные комитеты МЭИО-2 принимают активное участие в осуществлении МЭИО-2) и (ii) старших научных сотрудников основных научных программ, разработанных и осуществляемых в рамках научно-исследовательской деятельности МЭИО-2.

Поддержку РК рекомендуется обеспечивать через Международное бюро по проекту.

Концепция структуры Руководящего комитета МЭИО-2, рекомендуемая ВКП

Сопредседатели (МОК, СКОР, ГСНО-ИО)	Международное бюро по проекту Руководители, входящие в состав Руководящего комитета <i>ex-officio</i>
<p style="text-align: center;">Стратегический исполнительный уровень:</p> <p>Один представитель от каждой из шести научных тем, обозначенных в Плане научных исследований МЭИО-2 Комитета СКОР по разработке плана научных исследований</p> <p style="text-align: center;">+</p> <p>Один представитель от каждого из семи оперативных подразделений, которые будут созданы в качестве рабочих групп МЭИО-2</p> <p style="text-align: center;">+</p> <p>Один представитель от каждого основного регионального органа/комитета МОК (например, МОКАФРИКА, ВЕСТПАК, ИОСИНДИО)</p>	
Региональный координационный уровень	
<p style="text-align: center;">Научно-исследовательский уровень</p> <p>Один представитель (а именно, старший научный сотрудник) от каждой крупной научно-исследовательской инициативы в рамках МЭИО-2, включая представителя сети начинающих ученых Рабочей группы по развитию потенциала</p>	

Каждое из семи рекомендуемых подразделений МЭИО-2 (см. выше с (а) по (g)) должно создаваться в качестве рабочей группы МЭИО-2 с собственным руководством и обеспечивающими широкое участие структурами членства, сформированными под контролем РК. ВКП считает, что в соответствии с предлагаемой структурой руководящее «сообщество» МЭИО-2 должно работать в тесном сотрудничестве и посредством ежегодных крупных симпозиумов, посвященных МЭИО-2, в ходе которых будет проводиться оценка, обмен информацией, обзор и перспективное планирование. Рабочие группы смогут также в случае необходимости и по мере возможности проводить межсессионные совещания для решения вопросов, непосредственно касающихся одной рабочей группы или двух и более рабочих групп.

Роль Руководящего комитета (РК) МЭИО-2 будет заключаться в разработке политики высокого уровня и обеспечении осуществления МЭИО-2 в период с 2015 г. по 2020 г. РК МЭИО-2 должен иметь международный характер и работать на основе отлаженных процедур, используемых в крупных научных программах. РК возьмет на себя роль действующего ВКП, и переходный процесс будет протекать как можно более плавно.

Руководящие рамки МЭИО-2

Семь рекомендуемых оперативных подразделений МЭИО-2 (см. выше с (а) по (g)) требуют соответствующих стратегических руководящих рамок, подкрепленных связанными с ними планами осуществления. ВКП рекомендует дополнить подготовленный СКОР План научных исследований МЭИО-2 (1-й вариант) планом осуществления научных исследований, который также следует разработать под эгидой СКОР.

ВКП отмечает, что в условиях ограничения ресурсов, в которых в последнее время протекает процесс подготовки МЭИО-2, разработать расширенные стратегические руководящие рамки и дополнительные планы осуществления для других структурных подразделений МЭИО-2 оказалось невозможным. Несмотря на сложившиеся обстоятельства, ВКП принимает к сведению и с удовлетворением отмечает, что многочисленные структуры МОК и заинтересованные стороны не только оказывали поддержку в ходе подготовительного процесса и способствовали разработке этих планов (включая МООД, СКОММОПС, Глобальную систему наблюдений за океаном и различные государства-члены и ассоциированные структуры), но также взяли на себя обязательства в ближайшие месяцы оказывать постоянное содействие процессу разработки и окончательной доработки планов.

Срок полномочий ВКП

В связи с этим ВКП считает, что может продолжать выполнять функции надзора за разработкой этих планов в сотрудничестве с заинтересованными сторонами, которые обязались оказывать поддержку в этом процессе. С этой целью ВКП предлагает Ассамблее МОК продолжить свою работу до рекомендованной даты начала МЭИО-2 4 декабря 2015 г.

Обеспечение ресурсами/управление проектами МЭИО-2

Кроме того, в контексте рекомендуемых ВКП рамок осуществления комитет настоятельно призывает оказать МЭИО-2 поддержку посредством сети управления проектом с соответствующей структурой и необходимыми ресурсами в дополнение к обязательствам, которые приняли на себя Индия и Австралия на 47-й сессии Исполнительного совета МОК в 2014 г.

ВКП подчеркивает, что сеть управления проектом МЭИО-2 должна опираться на поддержку, обеспечиваемую за счет выделения новой отдельной статьи для МЭИО-2 в бюджете МОК. Она должна дополняться ресурсами и поддержкой со стороны государств – членом МОК и ассоциированных структур. Центральную роль в таком механизме с функциями секретариата должен играть координатор МОК по МЭИО-2, обеспеченный соответствующей кадровой и оперативной поддержкой, в целях выполнения обязательств и функций МОК в

ходе осуществления МЭИО-2 и обеспечения необходимого взаимодействия, способствующего координации функций МОК на уровне ее региональной сети (включая региональные вспомогательные органы, центры, комитеты и децентрализованные бюро МОК) и централизованной работы Штаб-квартиры. Следует призывать государства-члены оказывать поддержку в управлении проектами МЭИО-2, например, посредством национальных вспомогательных структур и/или прямых взносов в натуральной и/или финансовой форме в МОК, в частности, для укрепления функций Секретариата МОК, а также рекомендуемых рабочих групп. Система обеспечения ресурсами, разработанная ВКП, содержит отдельные конкретные элементы такие, как создание потенциала, информационно-разъяснительная деятельность и коммуникация, организация симпозиумов и семинаров и поддержка в их проведении и координация оперативной деятельности. Это предоставляет государствам-членам возможность выбрать и согласовать форму предоставления вспомогательных ресурсов. В целом, предложенная ВКП модель децентрализованной поддержки фактически находит свое воплощение в механизме Международного бюро по проектам.

1. Planning Background

During 2011 at the UNESCO IOC 26th Assembly session, a number of awards to distinguished servants of oceanography were given under the celebratory spirit of IOC's 50th anniversary, and in some cases reference was made to respective recipients' roles in the original IIOE. The same year, at IMBER's annual meeting, Drs Ed Urban (SCOR) and Raleigh Hood (SIBER) formally introduced the concept of celebrating IIOE's 50th anniversary through a renewed ocean-wide scientific research effort, with IMBER agreeing to support planning for such. The motivation was not only to extend the good work of IIOE and equally laudable subsequent programmes implemented in the Indian Ocean (e.g. JGOFS, TOGA, GLOBEC, IMBER, SOLAS, GEOHAB, GEOTRACES, WOCE), but also in recognition that the Indian Ocean remains arguably the least studied and understood of the world's oceans. This is despite its critical role in global ocean-climate cycles and its specific and profound oceanic and coupled climatic influence on its rim and neighbouring constituents of over 3 billion people, cutting across social, economic and ecological relevancies.

IOGOOS at its 2011 meeting also decided to champion the IIOE-2 concept, which led to an IIOE-2 Prospectus (Hood and D'Adamo 2012). This was followed with the emergence of a growing supportive regional and emerging global sentiment for an IIOE-2 with the beginnings of specific research programmes being developed under the IIOE-2 spirit. In 2013, India hosted the formative first IIOE-2 Reference Group meeting, which brought together a largely voluntary community of senior scientists, managers and stakeholders to explore the IIOE-2 concept in technical detail and to begin developing the scientific and societal motivation and related framework for a prospective IIOE-2 project. IOC through its central HQ Secretariat and supporting Perth Programme Office (PPO) in collaboration with SCOR, IOGOOS, SIBER and associated scientific alliances (e.g. under CLIVAR and IMBER), provided integrating support and limited available sponsorship. The first Reference Group meeting became catalytic, and was characterised by what continued to be a common and underpinning spirit of engagement under limited support by a wide spectrum of participants at all subsequent IIOE-2 events leading to 2015. The first gathering also exemplified the positive bottom-up interest for the IIOE-2 matching with that from the top-down at institutional levels. The broadcast for engagement in the first and all subsequent meetings was wide and broad and met with great response and interest.

Then followed the IIOE-2 deliberations (and resultant Decision) at IOC Assembly 27 (2013), IIOE-2 Reference Group Meetings 2 and 3, in China and Mauritius respectively, complemented by many other national meetings and IIOE-2 related advocacy discussions at alliance meetings, such as under the auspices of SCOR, IMOS, IOGOOS, WIOMSA, WAGOOS, IMarEST, POGO, ASCLME, BOBLME, IOCAFRICA and IOC/WESTPAC. India was the first to establish an IIOE-2 National Organizing Committee in 2013. Australia recently followed suit and a number of other Member States are in the process of doing the same. In 2013, the IIOE-2 was also brought to the attention of the Indian Ocean Rim Association (IORA), which in its Communique of the IORA 1 November 2013 meeting in Perth, Western Australia, referred to the IIOE-2 in explicitly supportive terms (underscored by the endorsement of its 20-Member IORA Council of Ministers, 6 Dialogue Partner Members and two Observer Members). The Executive Council of IOC deliberated on and formalised a Resolution for IIOE-2 in 2014, including parameters for establishing the IPC. The IPC was formed, as required, by the IOC Executive Secretary, comprising members nominated through SCOR, IOGOOS and IOC Member States. IPC met three times, leading to its Report to the IOC's 28th Assembly. In parallel, the planning process, involving workshops, meetings etc., continued in earnest, including a number of important national and regional workshops (for example, regionally and globally under the auspices of IOC Africa, BOBLME and the SCOR). These added significantly to the overall planning set for IIOE-2. In 2014, SCOR established and sponsored the IIOE-2 Science Plan Development Committee that has now finalised (Hood et al, 2015) an IIOE-2 Science Plan (Version 1), adopted by IPC and recommended to IOC by IPC as the underpinning science framework for IIOE-2. That science planning process also led to the beginnings of a consolidation of confirmed current and planned research programmes and related research cruises relevant to IIOE-2, with the data gathering and curation process for such initialised by SCOR. Not-for-profit organizations also expressed intent to support IIOE-2, including the World Ocean Council and

Global Oceans (GO). Recently in March 2015, the Bay of Bengal Large Marine Ecosystem (BOBLME) programme collaborated with the IOC Perth Programme Office, SIBER and IOP to fund a dedicated advocacy workshop for IIOE-2, bringing together key BOBLME constituents to develop awareness and engagement in IIOE-2. IOCAFRICA followed suit through an IIOE-2 dedicated science planning workshop in April 2015. Throughout 2011–2015 IIOE-2 received added exposure through major national and international conferences (e.g. AGU, EGU, IUGG, AOGS, IODE and AMSA) and associated publications. All key stages of IIOE-2 planning since 2011 have been widely and openly advertised, including for key events and via IOC Executive Secretary Circular Letter communiques to all Member States calling for Member State engagement and support of the IIOE-2 in its planning phase. The IOC has also been directly engaged in liaison via IOC Vice-Chair Prof. A Blivi (Togo). The overall constituency kept abreast of and encouraged to engage in the IIOE-2 planning phase has included science leaders from the region and globe generally, their institutions, managers, governments and their representatives, decision-makers, scientific alliances, societal user representatives, marine and climate science/applications organisational focal points, NGOs and private industry representatives.

In all, the planning phase has brought to the various meetings, workshops, symposia and related events representatives directly from at least 50 countries, at least 50 institutions and over 20 groups in ocean science related alliances (of the nature of SCOR, WIOMSA, AMSA). Directly or indirectly, all 147 Member States of the IOC have been a part of the advocacy effort for IIOE-2.

All IIOE-2 related materials and planning outputs (2011 onwards) are available via www.iocperth.org.

2. Status of planning of individual component parts of the IIOE-2

2.1 IPC formation and Terms of Reference

The IPC was established through IOC Resolution EC-XLVII.1 (2014), which requested the IPC to:

- Propose to the IIOE-2 sponsoring organizations (IOC, SCOR and IOGOOS) the establishment of committees to oversee the planning and implementation of IIOE-2 (such as a Scientific Steering Committee, an Implementation Committee, and possible sub-committees on key elements such as data and information management, cruise coordination and capacity development and outreach), including terms of reference and membership;
- Arrange for and coordinate the development of implementation, data and information management, and capacity development plans for the IIOE-2;
- Engage other interested organizations in the planning of the IIOE-2, in particular IOC partner organizations and space agencies;
- Develop a draft budget for planning and implementation of the IIOE-2, and identify and secure the resources required for this planning and implementation, including for secretariat support, in both IOC Paris and the proposed regional secretariat;
- Propose and oversee a mechanism for the formal launch of the IIOE-2 in 2015;
- Work largely by electronic correspondence, but with a minimum of two face-to-face meetings, depending on the availability of funds, to establish the IPC work programme and prepare the final report to the sponsoring organizations; and
- Report in detail on these activities to the IOC Assembly at its 28th session in 2015.

The IOC Executive Secretary coordinated the establishment of the IPC, through a call via [IOC Circular Letter No. 2541](#), dated 24 September 2014. The resultant IPC membership is listed in Appendix 1, showing members as selected by SCOR, IOGOOS and the IOC Executive Secretary. The IPC met two times by teleconference (9 February and 30 March 2015) and once in person (20-21 April 2015) to develop its report to the IOC Assembly at its 28th Session.

2.2 Governance and Coordination

Principles

IPC believes that IIOE-2 requires a clear and well-resourced governance framework, with steerage that oversees and derives input from a divisional structure comprising, respectively: (a) Science and Research; (b) Data and Information Management; (c) Capacity Building; (d) Operational Coordination; (e) Outreach and Communication; (f) Translating Science for Society; and (g) Resources and Sponsorship.

IPC recommends that principles of the Governance and Coordination structure for IIOE-2 incorporate the following: Consistency, Cohesivity, Fairness, Inclusivity and Transparency.

The structure should be as simple as possible while remaining fit-for-purpose for generating the policies and processes for IIOE-2.

As IIOE-2 will depend on public resources, the structure must ensure there is proper oversight and accountability.

The IIOE-2 structures must place high priority on both achieving excellence and contemporary relevance in the science and in the matching of the science to key societal needs and applications. All those involved in the delivery of IIOE-2 will need to have a voice in the structure.

IIOE-2 Steering Committee

An IIOE-2 Steering Committee (SC) will be chaired by the Sponsors of IIOE-2. The mechanism of chairing will be decided by the Sponsors at the first meeting of the IIOE-2 SC. The three sponsors may co-chair or the chairing may rotate among the three co-sponsors, with the other two sponsors being vice-chairs.

The IPC recommends a SC that would include a strategic 'executive' level group with one representative for each of the six over-arching science themes derived from the SCOR Science Plan Development Committee's (SPDC) IIOE-2 Science Plan (Version 1) (Hood et al., 2015), and as recommended to IOC for adoption as the essential underpinning science framework for IIOE-2. The six theme headings are: Human impacts; Boundary current dynamics, upwelling variability and ecosystem impacts; Monsoon variability and ecosystem response; Circulation, climate variability and change; Extreme events and their impacts on ecosystems and human populations; and Unique geological, physical, biogeochemical, and ecological features of the Indian Ocean. These over-arching themes provide scientific areas for interested parties that wish to engage in IIOE-2 to be able identify and select scientific relevancies for their respective interests. The executive level of the SC would also include one member from each of the operational divisions (a to g, above), as well as *ex-officio* members as appropriate. Furthermore, key Indian Ocean related IOC regional bodies and committees may be represented on the SC at this level through their respective focal points.

Additionally, within the SC structure, two supporting groups of IIOE-2 Members would derive respectively from: (i) representatives of IIOE-2 'national committees', with each country that has an effective IIOE-2 national committee involved in the delivery of IIOE-2 providing a single member of the SC; and (ii) leading Principle Investigators of major science programs established and implemented under the IIOE-2's science framework.

Support to the SC is recommended via an International Project Office Framework.

Each of the seven recommended IIOE-2 Divisions (a to g, above) should be established as IIOE-2 Working Groups, with their own leadership and participatory membership structures, formed under the oversight of the SC. IPC believes the IIOE-2's steerage 'community', as described by this proposed structure, should work collaboratively and through annual IIOE-2 wide symposia which would constitute essential sessions at which assessment, exchange of information, review and

forward planning takes place. The Working Groups could also allow for their own inter-sessional gatherings to address issues specific to individual Working Groups or that cut across two or more Working Groups, as might be required and as feasible.

Concept structure recommended by IPC for an IIOE-2 Steering Committee

Co-Chairs (IOC, SCOR, IOGOOS)	International Project Office Framework Leading personnel represented on Steering Committee as ex- officio
Strategic Executive level: One representative per each of the six science themes from the SCOR SPDC IIOE-2 Science Plan + One representative per each of the seven operational divisions to be established as IIOE-2 Working Groups + One representative per each major IOC regional body/committee (eg IOC AFRICA, IOC WESTPAC, IOCINDIO)	
Regional Coordination level	
One representative per each IIOE-2 'national committee'	
Science Delivery level One representative (ie Principal Investigator) per each 'major' IIOE-2 scientific research initiative, , including a representative of the Early Career Scientists Network from the Capacity Building Working Group	

The role of the IIOE-2 Steering Committee (SC) is to set the high-level policies and take responsibility for the delivery of IIOE-2 over the 2015–2020 period. The IIOE-2 SC must be international and is modelled on well tried-and-tested procedures used in large-scale science programmes.

The Sponsors will approve the initial membership of the IIOE-2 SC. Each year, the IIOE-2 SC will propose to the sponsors any adjustments to the membership if initial members are inactive or wish to rotate off the SC. It is recommended that some members are from a younger age range to ensure inclusivity, and the SC will include a specific representative of the Early Career Scientists Network from the Capacity Building Working Group.

An IOC Officer, designated as IOC IIOE-2 Coordinator and the full time appointee at the International Programme Office hosted by a Member State in the Indian Ocean region will be *ex-officio* members of the SC. The IOC Coordinator together with the appointee at the International Programme Office will represent the issues that cut across the over-arching project management structure for the IIOE-2 as well as the issues of specific relevancy to IOC's role and interests in IIOE-2.

The SC will meet annually after the IIOE-2 Symposium, subject to provision of funding from the Sponsors or some other source. The SC chair(s) and 'executive' level members will comprise an Executive Committee that has responsibility for making decisions about issues as they arise between annual meetings. They will meet with the IOC and Programme Office *ex-officio* members. The Executive Committee will also work by email and by phone.

The SC would have a role which constitutes a transition in function from the current IPC and the transition process will be as seamless as possible.

SC members will rotate every two years but members may be returned for a second two-year term.

Sponsors

Sponsors are the main international organizations (IOC, SCOR and IOGOOS) that are globally recognized. Individuals that represent their sponsors cannot have a direct vested interest in the science. Sponsors take responsibility for facilitating the funding of IIOE-2 and direct responsibility for ensuring that the overall project management needs for IIOE-2 are resourced via a call to volunteer countries to host the IPOs (see below).

Sponsors will have equal rights in the joint initial appointment of the SC and under the SC Chair(s) for the running of IIOE-2. This implies that the number of sponsors will be small to facilitate decision-making. Sponsorship will be required to devote significant financial and/or in-kind resources to facilitate IIOE-2. There will be no honorary sponsors. Addition of new sponsors depends on agreement of existing sponsors and new sponsorship must demonstrate a significant improvement in the delivery of IIOE-2.

International Project Office Framework

The International Project Office (IPO) Framework defines the nodal point network for IIOE-2 delivery and will have day-to-day responsibility for the co-ordination and implementation of IIOE-2. It should comprise IOC central and regional support, with nodes located in the IO region, hence this being a model based on a single or multiple locations. Based on commitments made so far in support of the functions of the required IPO Framework, the emerging model noted by IPC is a decentralised one (multiple locations), involving the IOC at central secretariat and regional levels, along with national support at specific locations by some Member States. It will facilitate all aspects of IIOE-2, particularly the science and associated infrastructure, and facilitate aspects such as capacity building, operational coordination, outreach/communication, data/information management, sponsorship facilitation and knowledge transfer for societal benefit.

The IPO framework will need to be supported by IOC, with as much collaborative support as possible from established Member State institutions providing supporting infrastructure and resources. Countries that provide sponsorship and/or hosting of IPO functions will be requested to commit adequate funding for a reasonable duration. The Resources and Sponsorship section, below, refers to a list of key functions suggested to be required for overall IIOE-2 project management. There will need to be at least one salaried full time FTE who provides IOC IIOE-2 Coordination, with required administrative and hosting support, and that person will be line managed by their parent employing host (i.e. IOC) but with responsibilities in terms of their IIOE-2 support function to the Chair (or co-chairs) of the SC under an agreed job description and associated terms of reference between the host (i.e. IOC) and SC (i.e. through the Chairs). Any complementary additional IIOE-2 support staff, either under sponsorship or secondment to IOC or operating as national employees within supporting Member States, will have their normal institutional line-management respected, with due notice taken of input from the SC Chair over staff tasking and performance. There will need to be a formal agreement (such as a MoU) between the host institute and the sponsors and, if necessary, with the normal institute of the staff member. A significant proportion of the functions of the IPO are likely to be undertaken by volunteers or those on secondment.

Science and infrastructure themes

The science themes will be as per the Science Plan and its required complementary Implementation Strategy. This applies similarly for the divisional infrastructure/operational themes. This is the heart of the delivery of IIOE-2 and the governance structure is intended to facilitate their effective delivery. Each theme will have its own respective committee comprising the main scientists/representatives involved in the theme. Members of each committee are volunteers as they are fuelled by self-interest. They will work mainly by conference calls and email but are encouraged to meet in conjunction with the IIOE-2 annual symposium. There will be a strong link between each project and the IPO Framework (IPO). The working of the Themes will be left to those involved in each Theme and this will be discussed and agreed on the first occasion that they meet.

National committees

As the funding for science delivery and societal applications will be generated within each country, the preferred model is for each country to have an IIOE-2 National Committee with a Chairperson who is the point of contact for IIOE-2 SC and the IPO Framework. Note that in most countries there are already national committees for SCOR and for IOC; so there is already infrastructure to allow this. These committees would be self-sustaining but would need to adhere to principles set by the Sponsors (which are almost certainly in place).

Principal Investigators (PIs)

Principal Investigators (PIs) are the people who deliver the science of IIOE-2, obtain their funding via national channels, publish their findings in the open scientific literature and submit their data in a timely way to an approved database. The IPO Framework exists to facilitate the work of PIs and to aid international coordination of science. Endorsement of a PI's research as contributing to IIOE-2 will be done by their National Committee and/or the SC.

IO regional and international committees

Representatives of regional organizations and other international programmes (e.g. SAARC, ROPME, PERSGA, BOBLME) and Chairs of IOC WESTPAC, IOCAFRICA, IOCINDIO involved in the delivery of IIOE-2 will be members of the SC.

Annual meetings

The IIOE-2 community will meet annually around an open Symposium to review results. Working Groups will be encouraged to attend. The SC will meet at the end of the Symposium. Symposia will be self-funded and overseen by the IPO in conjunction with the hosting nation.

2.3 Science and Research

2.3.1 IPC adoption and recommendation of an IIOE-2 science framework

At its meeting of 20–21 April 2015, IPC received a final draft of the SCOR IIOE-2 Science Plan Development Committee's Science Plan (referred hereafter as the IIOE-2 Science Plan). IPC welcomed the plan as an excellent and appropriate science underpinning framework for IIOE-2. IPC recently received the final IIOE-2 Science Plan (Version 1, 13 May 2015) (Hood et al., 2015) and recommends the plan to IOC for adoption as the science plan for IIOE-2. The following is a précis of the IPC's examination of the science plan and related issues.

2.3.2 Summary of the IIOE-2 Science Plan

Motivation

Although there have been significant advances in our ability to describe and model the Earth System, our understanding of geologic, oceanic and atmospheric processes in the Indian Ocean is still rudimentary in many respects. This is largely because the Indian Ocean remains under-sampled in both space and time, especially compared with the Atlantic and Pacific. The situation is compounded by the Indian Ocean being a dynamically complex and highly variable system under monsoonal influence. Many uncertainties remain in terms of how geological, oceanic and atmospheric processes affect climate, extreme events, marine biogeochemical cycles, ecosystems and human populations in and around the Indian Ocean. There are also growing concerns about food security in the context of global warming and of anthropogenic impacts on coastal environments and fisheries sustainability. These impacts include sea level rise, which leads to coastal erosion, loss of mangroves and loss of biodiversity. There is a pressing need for ecosystem preservation in the Indian Ocean for both tourism and fisheries.

In the 50 years since the original IIOE, fundamental changes have taken place in geological, ocean and atmospheric science. These have revolutionized our ability to measure, model, and understand the Earth System. Thanks to these technological developments we can now study how the ocean changes across a wide range of spatial and temporal scales, and how these fluctuations are coupled to the atmosphere and topography. Moreover, compared with the IIOE era, which relied almost exclusively on ship-based observations, new measurement technologies, in combination with targeted and well-coordinated field programs provide the capacity for a much more integrated picture of Indian Ocean variability. In addition, improved communication through the World Wide Web allows much broader engagement of the global scientific community.

SCOR, IOC and IOGOOS are coordinating a new phase of international research focused on the Indian Ocean beginning in late 2015 and continuing through 2020. The goal is to assist ongoing research and stimulate new initiatives in this time frame as part of the second International Indian Ocean Expedition (IIOE-2).

Overarching Goal

The overarching goal of IIOE-2 is to:

Advance our understanding of interactions between geologic, oceanic and atmospheric processes that give rise to the complex physical dynamics of the Indian Ocean region, and to determine how those dynamics affect climate, extreme events, marine biogeochemical cycles, ecosystems and human populations.

This understanding is required to predict the impacts of climate change, pollution, and increased fish harvesting on the Indian Ocean and its nations, as well as the influence of the Indian Ocean on other components of the Earth System.

New understanding is also fundamental to policy-makers for the development of sustainable coastal zone, ecosystem, and fisheries management strategies for the Indian Ocean.

Other goals of IIOE-2 include helping to build research capacity and improving availability and accessibility of oceanographic data from the region.

Core Science Themes

The IIOE-2 Science Plan is structured around six scientific themes. Each of these include a set of questions that need to be addressed in order to improve our understanding of the physical forcing that drives variability in marine biogeochemical cycles, ecosystems and fisheries in the Indian Ocean and develop the capacity to predict how this variability will impact human populations in the future. It is also important to emphasize that most of these questions are relevant to open ocean, coastal and marginal sea environments.

- **Theme 1: Human Impacts** (*How are human-induced ocean stressors impacting the biogeochemistry and ecology of the Indian Ocean? How, in turn, are these impacts affecting human populations?*)
- **Theme 2: Boundary current dynamics, upwelling variability and ecosystem impacts** (*How are marine biogeochemical cycles, ecosystem processes and fisheries in the Indian Ocean influenced by boundary currents, eddies and upwelling? How does the interaction between local and remote forcing influence these currents and upwelling variability in the Indian Ocean? How have these processes and their influence on local weather and climate changed in the past and how will they change in the future?*)
- **Theme 3: Monsoon Variability and Ecosystem Response** (*What factors control present, past and future monsoon variability? How does this variability impact ocean physics, chemistry and biogeochemistry in the Indian Ocean? What are the effects on ecosystem response, fisheries and human populations?*)

- **Theme 4: Circulation, climate variability and change** (*How has the atmospheric and oceanic circulation of the Indian Ocean changed in the past and how will it change in the future? How do these changes relate to topography and connectivity with the Pacific, Atlantic and Southern oceans? What impact does this have on biological productivity and fisheries?*)
- **Theme 5: Extreme events and their impacts on ecosystems and human populations** (*How do extreme events in the Indian Ocean impact coastal and open ocean ecosystems? How will climate change impact the frequency and/or severity of extreme weather and oceanic events, such as tropical cyclones and tsunamis in the Indian Ocean? What are the threats of extreme weather events, volcanic eruptions, tsunamis, combined with sea level rise, to human populations in low-lying coastal zones and small island nations of the Indian Ocean region?*)
- **Theme 6: Unique geological, physical, biogeochemical, and ecological features of the Indian Ocean** (*What processes control the present, past, and future oxygen dynamics of the Indian Ocean and how do they impact biogeochemical cycles and ecosystem dynamics? How do the physical characteristics of the southern Indian Ocean gyre system influence the biogeochemistry and ecology of the Indian Ocean? How do the complex tectonic and geologic processes, and topography of the Indian Ocean influence circulation, mixing and chemistry and therefore also biogeochemical and ecological processes?*)

IIOE-2 Research Initiatives

In addition to organizing ongoing research, the IIOE-2 will work to initiate new geologic, oceanic and atmospheric research projects and programmes that are designed to address the core science themes articulated above. These will include both national and international efforts. For example, international planning is underway to initiate upwelling research initiatives in both the eastern and western Indian Ocean: the Eastern Indian Ocean Upwelling Research Initiative (EIOURI); and the Western Indian Ocean Upwelling Research Initiative (WIOURI). These new initiatives, which are aligned with CLIVAR's interdisciplinary upwelling research theme, will be focused on understanding the interacting forces that drive upwelling variability in the Indian Ocean and the resulting biogeochemical and ecological responses.

It is important to emphasize that EIOURI and WIOURI are just examples of two research initiatives that are already emerging under IIOE-2. Indeed, the scope of the Expedition is much broader than upwelling and embraces many other aspects of physical, chemical and biological oceanography and also geology and atmospheric science. Efforts will be undertaken to promote additional interdisciplinary initiatives under IIOE-2.

In addition to research initiatives, the IIOE-2 will coincide with and embrace the Year of the Maritime Continent (YMC) as a major IIOE-2 field campaign in 2017–2018.

Programmatic Linkages

The IIOE-2 Science Plan has been developed with the sponsorship of the Scientific Committee on Oceanic Research (SCOR). The plan relies significantly on regional input from the IIOE-2 Reference Group meetings sponsored by the Intergovernmental Oceanographic Commission (IOC) of UNESCO and others. The IIOE-2 will coordinate with international research efforts such as the Integrated Marine Biogeochemistry and Ecosystem Research (IMBER) programme, the Sustained Indian Ocean Biogeochemistry and Ecosystem Research (SIBER) programme, the Surface Ocean–Lower Atmosphere Study (SOLAS), the Indian Ocean Panel of IOGOOS/CLIVAR, GEOTRACES (a programme to improve the understanding of biogeochemical cycles and large-scale distribution of trace elements and their isotopes in the marine environment), the Global Ocean Ship-Based Hydrographic Investigations Programme (GO-SHIP), the International Ocean Discovery Programme (IODP), InterRidge (an international project that promotes interdisciplinary, international studies of oceanic spreading centres), the Year of the Maritime Continent (YMC) research initiative, and others. IIOE-2 will also leverage several coastal and open-ocean monitoring programmes in the Indian Ocean. These include the CLIVAR and GOOS-sponsored Indian Ocean Observing System (IndOOS), Australia's Integrated Marine Observing System (IMOS), the Southern Ocean Observing System (SOOS) and several regional GOOS programmes. To develop

a broader understanding of the Indian Ocean ecosystem, IIOE-2 will coordinate its efforts with the Western Indian Ocean Marine Science Association (WIOMSA), the South African Network for Coastal and Oceanic Research (SANCOR), the Strategic Action Programme Policy Harmonization and Institutional Reforms (SAPPHIRE) project, the Bay of Bengal Large Marine Ecosystem (BOBLME) project, and the EAF-Nansen project (Strengthening the Knowledge Base for and Implementing an Ecosystem Approach to Marine Fisheries in Developing Countries). As the IIOE-2 develops, it is envisaged that the number of participants, institutes and programmes involved will increase. IIOE-2 will provide the innovation, direction and coordination required to build a critical mass of multidisciplinary science and scientists to mount this ambitious and globally important expedition.

Legacy

The motivation, coordination and integration of Indian Ocean research through IIOE-2 will advance knowledge, increase scientific capacity, and enable international collaboration in an under-sampled, poorly understood, yet important region. IIOE-2 will promote awareness of the significance of Indian Ocean processes and enable a major contribution to their understanding, including the impact of Indian Ocean variability and change on regional ecosystems, human populations, and global climate. The legacy of IIOE-2 will be to establish a firmer foundation of knowledge on which future research can build and on which policy makers can make better informed decisions for sustainable management of Indian Ocean ecosystems and mitigation of risk to Indian Ocean rim populations. IIOE-2 will leverage and strengthen SCOR and IOC by promoting coordinated international, multidisciplinary research among both developed and developing nations, hence increasing scientific capacity and infrastructure within the Indian Ocean rim and neighboring nations.

The success of IIOE-2 will be gauged not just by how much it advances our understanding of the complex and dynamic Indian Ocean system, but also by how it contributes to sustainable development of marine resources, environmental stewardship, ocean and climate forecasting, and training of the next generation of ocean scientists from the region. If this vision of success is realized, IIOE-2 will leave a legacy at least as rich as the original expedition.

Development of national plans, priorities and funding

The IIOE-2 will advocate development of national science plans and national science priorities and also efforts to secure funding for national participation. Indeed, all of the research carried out under IIOE-2 will be supported through national funding.

It is anticipated that many countries participating in the IIOE-2 will establish planning committees and/or project offices. For example, India has an active IIOE-2 'National Organizing Committee' and other countries are in the process of forming committees and/or IIOE-2 project/programme offices (e.g., India, Australia and the USA). The activities of these committees and offices will variously include, for example, the development of national science and implementation plans, the motivation and coordination of national research efforts, communication with national funding agencies and communication with the international IIOE-2 research community and elements of the IPO Framework.

The IIOE-2 will encourage national participation and it will endeavour to motivate scientists to seek funding to participate in IIOE-2 whether or not national planning/organization/funding resources are available. It is anticipated that many developing Indian Ocean rim countries will want to participate in the IIOE-2 but will not have the resources to support a national planning effort or project office. One of the important tasks of the IIOE-2 International Project Office Framework (IPO) will be to engage these developing countries and seek research and travel support (e.g., from SCOR) for their scientists so that they can participate in IIOE-2 cruises, conferences and meetings. Countries with planned cruises will be encouraged to make berths available for scientists from smaller developing nations to facilitate engagement, cooperation and scientific exchange.

Structure for delivering science

It will be important to communicate the science that is being undertaken and the results that are emerging from IIOE-2. This will facilitate the advancement of scientific discovery and it will foster collaborative efforts. It will also help to engage less involved countries around the world.

The IIOE-2 IPO will maintain a directory of scientific activities and it should try to coordinate these where possible. This directory will be a living document that will be continuously updated as the expedition progresses, and it will be available via the World Wide Web to all scientists who are interested in participating in the IIOE-2. Efforts have already been undertaken by SCOR to develop a database along these lines (documenting, for example, the scientific focus, duration and location of planned research activities during the IIOE-2 time frame and providing contact information for the scientists involved, and for those wishing to piggyback or collaborate). Efforts have also been initiated to develop web-based software for visually tracking IIOE-2 research with interactive maps. The development and maintenance of this database, which will be one of the core functions of the IPO, will be essential for enabling communication and coordination of research efforts in IIOE-2.

In addition, scientific conferences will provide an important venue for developing, sharing and communicating IIOE-2 science. Large international symposia, similar to the planned Goa Symposium in late 2015, will be convened at the mid-point and at the end of the IIOE-2 field campaign (e.g., in 2017 and 2020). In addition, a final conference should be convened after the field campaign has been completed during the synthesis stage of IIOE-2 (e.g., in 2022). National and/or project-focused meetings will be held more frequently. It has been proposed that the IPO should also convene smaller annual symposia in association with annual IIOE-2 Steering Committee meetings, though the feasibility of convening annual international symposia needs to be determined. Early career scientist conferences will be convened to help build an active community like the Association of Polar Early Career Scientists (APECS) that emerged from the International Polar Year (IPY) but for Indian Ocean science. The IPO should also encourage special sessions on the IIOE-2 at major national and international conferences, such as that organised for the 2015 IUGG / IAPSO Symposium, Prague, 26 June–1 July 2015: IIOE to IIOE2 – Five Decades of Indian Ocean Oceanography: Challenges in physics and biogeochemistry of Indian Ocean.

The IPO should promote the use of electronic communications for meetings (e.g., Skype and GoToMeeting) to minimize the carbon footprint of IIOE-2 and also to make the meetings accessible to IIOE-2 participants who cannot attend. Webinars (such as those that are successfully used by APECS) will provide a good means to convey IIOE-2 science results to all nations around the world. The IPO should maintain a set of archived seminars online for download.

The IPO should also promote science communication via a wide range of written articles, i.e., through publication of peer-reviewed papers in scientific journals and also via articles in publications that are aimed at a broader scientific audience. The former should include special issues on the IIOE-2. The latter should include, for example, publications in the American Geophysical Union's *EOS* magazine, *Oceanography Magazine*, the *Bulletin of the American Meteorological Society* (BAMS) and *CLIVAR Exchanges*. The excellent IIOE-2 newsletter "Indian Ocean Bubble 2" will continue to provide an important vehicle for promoting general scientific exchange and for building and maintaining the science community throughout IIOE-2.

Finally, in order to ensure the legacy of the expedition, the IPO should encourage the development of synthetic products of compiled data after IIOE-2 finishes (e.g., web-based maps of physical properties, oxygen and nutrient concentrations).

2.4 Data and Information Management

The success of any oceanographic research of a scale such as anticipated for IIOE-2 will depend in large part on the volume, quality, curation, accessibility and utility of collected data and associated information, including: effective management and archival of such; its temporal, spatial and scientific compatibility; and on an appropriate level of metadata description and documentation.

IPC notes the important contribution made through the SCOR SPDC IIOE2-2 Science Plan, in respect to data and information that will stem from the scientific research of IIOE-2. That Plan states that: a data and information management plan will be developed under the guidance of IOC and SCOR; this will be refined and published in due course on the IIOE-2 website; and such a plan would facilitate the full exploitation of data resources available to the programme, while respecting the intellectual property rights of contributors and reducing duplication of fieldwork and research effort.

The IPC further notes the IOC's International Oceanographic Data and Information Exchange programme (IODE) as a logical framework and infrastructure to support the over-arching IIOE-2 data and information management requirements.

IPC notes that it has not been possible to fully develop a data and information management strategy and associated implementation plan, but that the 23rd Session of the IOC Committee on International Oceanographic Data and Information Exchange (IODE) (Report IOC/IODE-XXIII/3, Ostend, 31 March 2015) resulted in an offer by IODE to assist the IPC and IOC in developing these required documents for IIOE-2 data and information management. Appendix 2 provides a salient extract from IOC/IODE-XXIII/3 on this offer. Accordingly, IPC recommends that IODE's offer be accepted, bearing in mind the IPC's own guiding views on data and information management, as follows:

- Due reference, note and utilisation of existing data and information management frameworks to be reviewed in context and with respect to examination of existing best practices for the discovery, management, exchange of, and access to marine data and information, including international standards, quality control and appropriate information technology (eg, with reference to IOC, IODE, OBIS, GODAR, ICSU, WMO, EU data and other relevant information management frameworks);
- That in response to the proposed governance structure for IIOE-2 (above) an IIOE-2 Data and Information Management Working Group be established, and that Dr Cyndy Chandler (IODE Co-Chair) be invited to take on the role of Interim Chair of the Working Group; and
- Pending IOC's response to IPC's offer to continue its tenure to oversee the development of yet to be completed plans for IIOE-2, IPC recommends that the IOC Secretariat work with the IIOE-2 Data and Information Management Working Group, through proposed Interim Chair Dr Cyndy Chandler, to develop an over-arching IIOE-2 Data and Information Management Plan by the proposed 4 Dec 2015 IIOE-2 launch date;
- That this process be undertaken in integrative collaboration with SCOR, cognisant of SCOR's commitment to oversee a science data and information management planning process; and
- That the following additional points of reference, as regarded by IPC to be important in developing the IIOE-2 Data and Information Management Plan, be taken into consideration during the development process;
 - IOC Oceanographic Data Exchange Policy (2003, www.iode.org/policy);
 - *IOC Manuals and Guides, 66, IOC Strategic Plan for Oceanographic Data and Information Management* (2013–2016), dated 03/09/13;
 - Due attention be given to the issue of data and information legacy for IIOE-2, through the development of long-living synthetic products representing compiled data, such as web-based maps of key technical variables and synthesised parameters;
 - IIOE-2 national committees should include representation in regards to data and information management, with that representation also present on the IIOE-2 Data and Information Management Working Group;

- Due attention be given to examining and developing a mechanism to facilitate data and information management under scenarios where nationally based sovereignty and rights to ownership need to be considered and resolved (especially EEZ-related issues);
- Due attention be given to the issue of developing collaborative protocols to facilitate bi- to multi-national to regionally applicable relationships in the spheres of data sharing, joint publication, data release horizons for open access to data etc.;
- Due attention be given to consideration of data quality control issues;
- Due attention be given to developing IIOE-2 wide protocols/agreements in respect to journal preferences for publications based on IIOE-2 data, to when the publications become open access and to where publications are to be curated/hosted for longevity of access, and finally on access to underpinning data sets used in publications; and
- All publications generated by IIOE-2 should be included in IOC OceanDocs.

2.5 Capacity Building

Enhancing capacity for ocean science in the Indian Ocean region was a major aspect of the first International Indian Ocean Expedition (IIOE). The IIOE left a very important legacy, entraining many practicing and prospective scientists into the sphere of Indian Ocean science and even leading to the birth of a major institution for such, namely the National Institute of Oceanography in India, now an important plank of Indian Ocean research. The SCOR website and underpinning curation of material outputs and links referring to publications from the IIOE adds testament to the important legacy of the IIOE.

Today capacity building is arguably even more vital than in the time of IIOE. Industrially developed countries that will be involved in IIOE-2 have relatively well advanced skills, infrastructure and general capacities for scientific research, related technologies in ocean and associated climate observations, processing techniques (including numerical) for processing data thereof, and knowledge and methods to apply the benefits for societal well-being. However, unfortunately and in contrast, many countries from the Indian Ocean rim have yet to achieve adequate levels of competencies and capacities in this realm. But the IIOE-2 offers an opportunity to help redress this divergence.

In this context, capacity building that connects the science to its downstream societal applicability forms a major generic priority for many IIOE-2 stakeholders, and hence is a major cross-cutting objective of IIOE-2. This has been repeatedly expressed and emphasised by IIOE-2 constituents at IIOE-2 planning meetings. The essential messages from representatives from countries aspiring to acquire greater capacity in marine and coupled climate science and applications are that they wish to;

- Be involved with PIs and related operational stakeholders/institutions/networks at the earliest practicable stages of research planning (including for cruises, characterisation studies, modelling, etc.) and then integrally throughout the conduct of such research related activities, up to and including reporting and publication;
- Be better enabled to participate through effective modes in these facets of IIOE-2;
- Be better enabled to apply the knowledge acquired for the purposes of underpinning improved sustainable usage of their own marine environs, so as to facilitate improvements in human well-being, but under a sustainable ecological regime of usage of their 'blue economies';
- Be better empowered through opportunities to not only participate through collegial collaborations in the research and applications, but also in the processing of data and related publication of results.

An IIOE-2 capacity building strategy and associated implementation plan is important for IIOE-2 but not yet fully developed. IPC appreciates the earlier contributions through the IIOE-2 planning phase and subsequent interest from the IOC Secretariat (through IOC Capacity Development Coordinator Peter Pissierssens of the UNESCO/IOC Project Office for IODE, Ostend, Belgium) to further facilitate development of the plan. Accordingly, IPC recommends that the IOC Secretariat be requested to assist IPC in this matter and lead the development of an IIOE-2 Capacity Building Strategy and Implementation Plan, bearing in mind a number of the IPC's own guiding views on IIOE-2 capacity building, as follows:

- Take note of existing relevant capacity building frameworks;
- That in response to the proposed governance structure for IIOE-2 (above) an IIOE-2 Capacity Building Working Group be established, and that IOC's focal point for Capacity Building be invited to take on the role of Interim Chair of the Working Group; and
- Pending IOC's response to IPC's offer to continue its tenure to oversee the development of yet to be completed plans for IIOE-2, IPC recommends that the IOC Secretariat work with the IIOE-2 Capacity Building Working Group, through the proposed Interim Chair, to develop an over-arching IIOE-2 Capacity Building Plan by the proposed 4 Dec 2015 IIOE-2 launch date;
- That this process be undertaken in collaboration with SCOR, cognisant of SCOR's integration of capacity building into its science plan; and
- That the following additional points of reference, as regarded by IPC to be important in developing the IIOE-2 Capacity Building Plan, be taken into consideration during the development process:
 - The essential need, early in the IIOE-2 process, for a survey of Indian Ocean constituents' key needs in capacity building, so that activities and allocation of resources for the capacity building programme are targeted for maximal relevancy and effectiveness;
 - Due reference be given to the IOC Capacity Development Strategy 2015–2021, version: 4 March 2015;
 - Focus be given to strengthening and using national and regional institutional capacity building structures for IIOE-2, including those under IOC's auspices (e.g. IOCAFRICA and IOC/WESTPAC initiatives) and/or endorsed through UNESCO/IOC;
 - Promote capacity building amongst young emerging scientists, marine managers etc., drawing on the excellent example of the International Polar Year 'Association of Polar Early Career Scientists' (APECS) initiative;
 - Identify and engage countries with the political will and resources to create new / strengthen existing oceanographic research (e.g. IMS in Zanzibar) or training centres (e.g. Dhaka University in Bangladesh, INCOIS ITCOceans training centre in India, SOTO in South Africa);
 - Promote actions under the capacity building programme that facilitate provision of equipment, training and essential materials and operational support to countries wishing to contribute to IIOE-2 and having limited resources;
 - Ensure that IIOE-2 activities benefit from existing capacity building programmes in oceanography, as detailed in the IOC capacity building development strategy for 2015–2021 and SCOR programme for capacity building;
 - Further ensure that those capacity building activities also refer to existing sub-regional and regional mechanisms, intergovernmental and non-governmental, such as IOC and WMO regional offices (RSBs, Decentralised Offices) and bodies such as ITCOceans, IOCINDIO, UNESCO Category II centres, the IODE OceanTeacher Global Academy Regional Training Centres and other networks such those of IOC or the International Ocean Institute (IOI);
 - Generally promote investment in personnel and institutions of which they are a part, enhancing their access to contemporary scientific tools and methodologies, reinforcing the capabilities of their regional institutions to provide services to Member States, enhancing the communication between scientific, mass media and policy maker communities, expanding ocean literacy in civil society and mobilizing resources to accomplish the IIOE-2 goals; and
 - Focus be given on building capacity in young people through sustained mentorships, scholarship programs, internships, training at sea etc., through the IIOE-2 and as may be facilitated by links, networks and programs under the auspices of IIOE-2 stakeholders (eg through SCOR, POGO, national training centres, etc.)
- **Early Career Scientists Network**
 - IPC places specific importance on developing an early career scientist element under the capacity building theme. IPC proposes the establishment of a dedicated theme within the Capacity Building Working Group, taking the lead from the International Polar Year 'Association of Polar Early Career Scientists' (APECS). In this context, IPC recommends that an *Early Career Scientists Network* (ECSN) be developed as a specific entity within the Capacity Building Working Group, with a constituency and associated leadership. The

leadership will have its focal point represented explicitly on the IIOE-2 SC, as introduced earlier in the Governance and Coordination section.

2.6 Operational Coordination

A central overarching goal of the IIOE-2 will be to coordinate an international, research effort in the Indian Ocean. This will include field-based process studies, sustained monitoring efforts, and also remote sensing and modelling research. A well-coordinated programme, managed through a central office facility, will avoid redundancies and repetitions of previous investigations but will also allow investigators to build upon previously obtained knowledge and pursue major research questions in an integrated way using modern methodologies. Along these lines, a responsive capacity within the operational coordination role should be established to:

- a) Coordinate utilization of ships and other observational platforms;
- b) Facilitate joint and coordinated operation and servicing of long-term observation systems;
- c) Support sound and inter-calibrated sampling and experimental methodologies across IIOE-2 studies;
- d) Support remote sensing and modelling efforts; and
- e) Integrate and coordinate existing and planned studies and promote inter- and trans-disciplinary research.

Therefore, one of the first and most important undertakings of the IIOE-2, through the IPC's formative work for IOC and through the supporting project management framework for IIOE-2 (see the governance section, above), will be to develop the means to compile, keep track of and coordinate ongoing and planned research activities during the expedition, focusing, in particular, on ship-based field work.

Toward this goal, JCOMMOPS (the WMO-IOC Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM) *in-situ* Observations Programme Support Centre) and Global Oceans (a US-based 501c3 non-profit organization focused on expanding at-sea research capacity through the deployment of Modular Adaptive Research Vessels (MARVs)) have offered to collaboratively assist the IIOE-2 IPC and IPO in the development of an IIOE-2 Operational Coordination Strategy and Implementation Plan, and the complementary development for and formation of an IIOE-2 Operational Coordination Working Group. IPC notes with appreciation this offer and requests the IOC Secretariat and related IPO network for IIOE-2 to liaise with JCOMMOPS and Global Oceans to progress these objectives for IIOE-2, with a view to finalising them by the recommended IIOE-2 launch date of 4 December 2015.

Initial efforts have already been made by SCOR to compile proposed IIOE-2 studies to date in the form of an Excel spreadsheet, including: information on the scientific focus of each study; project contact and status (i.e., ongoing, funded, planned); geographic region and timeframe of study; and alignment with the scientific themes of the IIOE-2 Science Plan. The current project spreadsheet can be downloaded from the SCOR website (<http://scor-int.org/IIOE-2/IIOE2.htm>).

In order to aggregate, organize and coordinate the operational and logistical requirements of proposed IIOE-2 studies in a way that facilitates expeditions that are efficient, inclusive and collaborative (from both a scientific and resource-sharing standpoint), Global Oceans and JCOMMOPS have offered to integrate Global Oceans' interactive, GIS-enabled expedition management system called GOCEPT (in development; built on the SeaSketch GIS platform by the Marine Science Institute at the University of California, Santa Barbara, USA), with the GIS-enabled system currently used by JCOMMOPS to manage its core ocean observations programmes. User-defined forums and project modules within GOCEPT will host and archive map-enabled discussion forums on planned research activities, methodologies and resource needs, as an additional mechanism for enabling coordination and collaboration.

JCOMMOPS and Global Oceans have agreed to establish a data exchange capacity to support ongoing IIOE-2 activity needs, including provision of GIS map files and other geospatial metadata on scheduled and planned JCOMMOPS programme deployments in the Indian Ocean to assess

the potential for hosting IIOE-2 scientists. Lines of communication with ship scheduling organizations within IIOE-2 participating countries (e.g., University-National Oceanographic Laboratory System (UNOLS) in the United States) should also be established. Consolidation and useable access to information about scheduled, planned and adaptive vessel capacity will therefore help to ensure that resource and ship-time gaps can be filled.

Study data from the SCOR spreadsheet will be migrated to the new system and can be augmented with additional details including: interactive maps with graphical representation of proposed cruise tracks, sampling protocols and instrument deployments; assigned vessels; port calls; resource needs; proposal abstracts; collaborating science teams, etc. Capacity building and related activities should also be tracked and made available in a similar way, although it is anticipated that most capacity building will be via land-based training courses organized by SCOR and/or IOC.

An IIOE-2 dedicated, web-based portal is proposed to seamlessly link these resources for easy access and visibility to IIOE-2 activities. Supporting documents hosted through the IIOE-2 web portal will be curated with an appropriate content management system (CMS). The CMS will enable documents posted to the web portal to be searched, modified, organized and presented in a useable format and, when integrated with the GIS-enabled systems mentioned above, will also support the creation and management of:

- A searchable technical information database of resources and research platforms available to the IIOE-2 community, including for charter from the private-sector, such as ROVs, AUVs, UAVs, HOVs, surface gliders, and analytical instrumentation; and
- An archived database of completed studies and annotated cruise track data that allow visualization of completed IIOE-2 field campaigns for planning purposes.

The IIOE-2 Operational Coordination Working Group should establish multiple lines of communication with the IIOE-2 scientific community to ensure that national research activities under IIOE-2 are tracked and shared, including national representatives/contacts for all countries participating in the IIOE-2 that can help collect and report information on national research activities. These contacts might include, for example, the chairs of IIOE-2 national committees in countries where these committees have been formed.

To promote the IIOE-2 more broadly within the science community at large, the IIOE-2 Operational Coordination Working Group should also convene town hall meetings about the IIOE-2 at major national and international meetings in order to establish lines of communication with PIs and programme managers from national funding agencies.

On the basis of the foregoing strategies and plans, a proposed framework for facilitating the five capacity focal points “a through e” above, by the Operational Coordination Working Group, may be envisioned as follows:

a) Utilization of ships and other observational platforms:

The proposed framework acknowledges the primary collaborative role for JCOMMOPS and Global Oceans in assisting the IIOE-2 IPO and participating national, intergovernmental and institutional bodies with coordination of community-wide platforms and other infrastructure resources in the Indian Ocean over the IIOE-2 timeframe.

b) Joint and coordinated operation and servicing of long-term observation systems:

JCOMMOPS has primary responsibility for management of multiple global ocean observation systems. For JCOMMOPS programme assets in the Indian Ocean, the Operational Coordination Working Group will explore opportunities to leverage the increased level of regional vessel activity during the IIOE-2 period to support JCOMMOPS programme needs for maintenance, deployment and retrieval of buoys, moorings, floats and other programme assets.

c) Support sound and inter-calibrated sampling and experimental methodologies across IIOE-2 studies:

The Operational Coordination Working Group proposes to liaise with the science elements of the IIOE-2 SC Executive level to define the operational implications and resource needs stemming from

recommended sampling and analytical methodologies, which the Operational Coordination Working Group would then seek to implement and/or support operationally. For example:

- Facilitation of IIOE-2-wide inter-calibration standards, as recommended by the IIOE-2 Science Plan, could include the development and/or sourcing of: Certified Reference Materials (CRMs); documentation of standard methodologies and calibration protocols; training materials, etc., organized and made available through the IIOE-2 web portal;
- Assessing the potential value of obtaining regional or site-specific baseline data (e.g. bathymetry, regional environmental data, etc.) not included within the scope of individual study proposals, in order to provide analytical context across multiple IIOE-2 study data or planning efforts. The Operational Coordination Working Group could organize resources and funding to generate such data on behalf of the wider IIOE-2 community.

d) Support remote sensing and modeling efforts:

The Operational Coordination Working Group proposes to liaise with both the science elements of the IIOE-2 SC Executive level and the Data and Information Management Working Group to define *in situ* operational needs potentially beneficial to remote sensing and modeling. For example:

- Defining and scoping potential sampling and observation data for ground-truthing remote sensing, to be coordinated with scheduled IIOE-2 cruises by the Operational Coordination Working Group.
- Defining where IIOE-2 studies are generating data that would benefit from near-real time integration with large-scale models, such as climate models. The Operational Coordination Working Group could engage with the relevant PIs and institutions to coordinate data transfer and formatting for such efforts.

e) Integrate and coordinate existing and planned studies and promote inter- and trans-disciplinary research:

Opportunities for inter- and trans-disciplinary IIOE-2 research among PIs that emerge from workshops, conferences and other collaborative processes will be more effectively enabled operationally with community-wide access to consolidated, interactive information and planning tools. Aggregation and organization of IIOE-2 research activities, operational needs and available supporting infrastructure, together with interactive forums, project modules and mapping tools provided through GOCEPT, will help facilitate inter- and trans-disciplinary research planning and the ability of the Operational Coordination Working Group to align and coordinate the resources needed to support integrated research.

Finally, it is important to emphasize that the IIOE-2 Operational Coordination Working Group will require sufficient human and financial resources to undertake these efforts.

2.7 Outreach and Communication

A well-organized outreach and promotional campaign during IIOE-2 will have the benefit of providing IIOE-2 programme visibility and a lasting, measurable and explicit awareness of its importance and value. It will emphasize the paramount role that the Indian Ocean plays in the everyday life of the coastal communities of the Indian Ocean.

It will be able to bring scientists in closer association with concerned stakeholders and the public. It will assist in bridging the gap between knowledge and everyday life, facilitate discussion about existing problems during IIOE-2 planning and implementation, and will help identify ways to overcome them.

It is desirable from the very beginning of the IIOE-2 to capture the world's attention and garner its interest in the IIOE-2. Artists, students, journalists, media officers and book publishers may help to overcome the barriers of language, level of education and culture. As a result it will help encourage world-wide actions at all levels in support of IIOE-2 and empower people to concrete actions.

Outreach will be achieved through dedicated proactive actions orchestrated at local, national, regional and global levels through the use of existing and newly established networks. It is

desirable that the general public should comprehend the IIOE-2's objectives and benefits not only within the Indian Ocean region but also globally.

Examples of outreach activities may include field trips, museum exhibits, organization of exhibitions (including through the use of multimedia), visits on board of research vessels taking part in the IIOE-2 ("open door days"), lecture series, school competitions, Indian Ocean related films and photo contests, publication of children art books dedicated to the beauty and wealth of the ocean, involvement of prominent public figures in promotion campaigns, essay writing and many others. Experiences derived from earlier initiatives of this scale demonstrate the importance of the development of promotional materials, such as designing and disseminating an IIOE-2 logo and using it through flash-drives, clothing accessories, calendars, stamps, posters, pins, pencils. Activities such as these will give IIOE-2 a high profile and impact.

To attract world-wide attention and build a public constituency for IIOE-2 there is a need to establish international cooperation and partnerships not only within the science community but with all other sectors of society. There will be a need to engage new groups of stakeholders such as from the private sector (e.g. marine industries and tourism) for long-term commitments.

As emphasised in the IIOE-2 Science Plan, effective communication will be fundamental to the success of IIOE-2 and should be an important component in the implementation phase of IIOE-2.

As for the other operational components of IIOE-2 (above), IPC recommends the establishment of an IIOE-2 Outreach and Communication Working Group. As for the other operational components recommended herein, it has not been possible to fully develop an IIOE-2 Outreach and Communication Strategy and Plan. In the absence of an external facilitator for this purpose, IPC requests the IOC Secretariat to facilitate the development of such a strategy and plan. Again, as for other operational components for IIOE-2, this aspect will also require adequate resourcing.

2.8 Translating Science for Society

The IPC felt strongly that specific focus should be afforded to the imperative of translating science for societal benefit, in line with the sentiment that underscored many of the discussions by stakeholders at the various IIOE-2 planning workshops held, as emphasised in the SCOR SPDC Science Plan and as generally prevalent as societally relevant themes in many national, international and regional ocean-based public policies.

Therefore an IIOE-2 Translating Science for Society Working Group is recommended. This theme, and the activities and objectives of the Working Group would align closely with most other of the working groups, especially Data and Information Management, Outreach and Communication, and Capacity Building.

Key tasks identified for this Working Group concern:

- Conducting base line assessments of scientific information availability and demand as required and as useful for societal applications;
- Identification and development of tools for conducting these assessments (in respect to being able to demonstrate the benefits of the science);
- Identification of existing and additional value propositions provided by IIOE-2;
- Identification of easy to implement examples of how the science of IIOE-2 can apply to assist with societally relevant issues (ie early examples that act as instructive and help build an advocacy for the relevance of the science in IIOE-2 for societal benefit);
- Leaving an IIOE-2 'legacy': developing a plan for sustained observations, tools and methods for identifying societal/economic benefits.

The pathway of relevancy in this theme of 'translating science for society' can be visualised as follows:

Science planning and execution → Scientific analysis → Development of tools for identifying societal benefits → Tangible benefits for society

As with other Working Group strategies and implementation plans that are yet to be completed, and for which no identifiable external facilitator exists, IPC requests IOC Secretariat to facilitate the development of this theme's plans. Adequate resources to facilitate this working group's function will be needed.

2.9 Resources and Sponsorship

Approach to structuring a resources framework and budget

The IPC was requested to "...develop a draft budget for planning and implementation of the IIOE-2, and identify and secure the resources required for this planning and implementation, including for secretariat support, in both IOC Paris and the proposed regional secretariat."

IPC examined what would constitute the required operational structure for the IIOE-2, taking into consideration the governance requirements and also the essential component parts for an IIOE-2. IPC believes that IIOE-2 requires a clear and well-resourced governance framework, with steerage that oversees and also derives input from elements including IIOE-2 divisional Working Groups comprising: (a) Science and Research; (b) Data and Information Management; (c) Capacity Building; (d) Operational Coordination; (e) Outreach and Communication; (f) Translating Science for Society; and (g) Resources and Sponsorship.

In the ideal world, a project such as IIOE-2 would perhaps have a centralised supporting Secretariat with a sufficient number of secretariat staff (professional and administrative) based centrally (for example either at IOC Headquarters or at some other hosted International Project Office or a combination of both) and also with some staff based within nodal offices regionally in order to connect most closely with regional IIOE-2 constituents. All secretariat facets would be accorded sufficient supporting operational funds to undertake all required tasks in support of the Steering Committee and in support of the divisional components of IIOE-2. Member States would ideally provide resourcing support to the Secretariat, to both its centralised and regionally decentralised nodes. A relatively recent example of such a set-up would be that which evolved post 2004 to establish and support the Indian Ocean Tsunami Warning and Mitigation System, its Secretariat, its Intergovernmental Coordination Group and its Regional Tsunami Warning Centres based within hosting Member States. Another is the Indian Ocean Global Ocean Observing System, which has had (since 2002) a fully resourced Secretariat hosted and supported by India (INCOIS, Hyderabad) working with IOC regional coordination support out of the IOC Perth Programme Office, together coordinating and facilitating all facets of IOGOOS, including formal annual and inter-sessional alliance meetings, scientific project group meetings, relationships with collaboration organizations, and associated capacity building programmes under the IOGOOS structure.

The IPC was therefore faced with the decision of whether to specify the parameters of what might be considered as the ideal set-up or rather to work with its knowledge of the realities facing the programme (financially) along with known early committed resources for secretariat support and advise on a more pragmatic resourcing structure.

IPC chose to follow the latter pragmatic option, by outlining herewith the required resourcing structure according to a listing of line items, with associated specified functions, and associated specified recommendations on how they should or could be resourced, allowing for Member States to then examine each line item as a potential aspect of the IIOE-2 secretariat structure that they may be able to support in some manner. In doing this, note is given to known commitments applying to the line items.

Framework and budget

The IPC concludes that the IIOE-2 requires, as a minimum, the following framework of overall ‘secretariat’ type support, with associated estimates given for complementary operational funds.

For the line items listed below, apart from any known support already offered by prospective donors each lends itself to be supportable by willing donors (e.g. Member States, global funding bodies, organizations, institutions, alliances etc.)

It is hoped that IOC Member States and other potential donors for IIOE-2 may examine this budget structure and find specific areas that they may support through cash or in-kind resources, and to convey those intentions either to the IOC Secretariat directly or via announcements at official IIOE-2 related forums, beginning with the 28th Session of the IOC Assembly, 18–25 June 2015.

IOC Secretariat support

IOC IIOE-2 Coordinator

- The IOC IIOE-2 Coordinator, employed as an IOC Officer, will be line managed by the IOC Executive Secretary, and have Terms of Reference agreed between IOC and IIOE-2 SC Co-Chairs that include support Terms relevant to the IIOE-2 Steering Committee. The IOC IIOE-2 Coordinator will represent issues that cut across the over-arching project management structure for the IIOE-2 (i.e. supporting the Steering Committee and the IIOE-2 Working Groups) as well as the issues of specific relevancy to IOC’s role and interests in IIOE-2.
 - Australia has indicated that it will continue its support of IOC programmes via the IOC Perth Programme Office, to include IIOE-2 through underpinning staff and administrative hosting and operational support for an IOC IIOE-2 Coordinator.

Support staff for the IOC IIOE-2 Coordinator

- IPC believes the IOC IIOE-2 Coordinator would ideally require a supporting IIOE-2 Programme Specialist and an IIOE-2 Administrative Officer, either as IOC staff or otherwise.
 - Australia has indicated it will provide support for a minor proportion of an IIOE-2 Programme Specialist FTE.

Operational resources underpinning IOC IIOE-2 staff

- Administrative hosting (office requirements for staff and associated office infrastructure and financial administration etc.)
 - Australia has committed to providing ‘administrative hosting’ for the IOC IIOE-2 Coordinator and up to two additional associated or support staff within its hosted Perth Programme Office.
- The mission funding for staff is estimated at approximately ~\$100K per year, to support regular missions for advocacy, liaison across IOC and between IOC and its constituency, liaison with sponsors and the oceanographic community both regionally and globally, management of Steering Committee and associated Working Group activities and events, sponsorship tasking, oversight of other elements of IIOE-2 programmes, and other activities.

It is recommended that an appropriate operational budget for mission support under this item be in the order of \$100k per annum.

Nationally based Programme Office support

IIOE-2 Programme Office

- IPC believes the in-region Programme Office concept to be an essentially desirable support mode for IIOE-2, to provide nationally based, but over-achingly relevant support to IIOE-2, working in harmony and collaboratively with the IOC Secretariat based support structure.
 - India has offered to establish an “IIOE-2 Programme Office” at INCOIS, Hyderabad, fully accorded with staff and underpinning resources and to work in close coordination with IOC and IIOE-2 sponsors to coordinate and execute the activities of IIOE-2.

IPC notes the collective facility offered through India and Australia, above, in support of IIOE-2.

IPC recommends that the IOC Secretariat work with both hosts to coordinate and optimise their national facilities as a joint collaborative foundation for an IIOE-2 International Project Office Framework structure (IPO).

Support for annual IIOE-2 symposia

The IPC recommends in its Governance and Coordination section that: "...The IIOE-2 community will meet annually around an open Symposium to review results. Working Groups will be encouraged to attend. The SSC will meet at the end of the Symposium. Symposia will be self-funded and overseen by the IPO in conjunction with the hosting nation."

In this context, IPC recommends that Member States be requested to host the annual meetings, similarly to the manner in which, for example, IOGOOS and IOC/WESTPAC Member States volunteer to host key annual meetings.

Each annual symposium might ideally comprise specific meetings/workshops of the IIOE-2 Steering Committee and the Working Groups and then a plenary component involving all groups addressing cross-cutting aspects of IIOE-2.

The IPO would manage the coordination of such annual symposia, including managing negotiations for hosting the meetings and for their logistical support, as required.

The IPO will require sufficient underpinning resourcing to enable this to be managed as part of its portfolio of responsibilities.

It is recommended that an appropriate operational budget for this item be in the order of \$60k per annum.

Delegate costs and local hosting costs are not included in this estimate, and would be the respective responsibility of delegates and the local host per se.

Support for IIOE-2 Working Group meetings

It is envisaged that the IPO would also provide similar coordination/management to enable Working Groups to meet either back-to-back with annual IIOE-2 symposia or inter-sessionally (say, up to once per year) as might be required for compelling operational reasons.

It is recommended that an appropriate operational budget for this item be in the order of \$40k per annum.

Delegate costs and local hosting costs are not included in this estimate, and would be the respective responsibility of delegates and the local host per se.

IIOE-2 seed funding for Capacity Building

General

- The IPO should be tasked with both: (i) helping the Capacity Building Working Group to find resources for its function (such as catalytic funding to support sponsorship drives, strategic meetings for such etc.); and (ii) itself have a basal level for seed funding and the capacity to acquire additional funds from donors to support essential capacity building activities for IIOE-2, especially for constituents from developing countries. Activities in this area could involve: seed funds to help IPO and stakeholders develop funding applications to prospective donor agencies and organisations; IODE related training workshops; special support for G77 countries to engage in IIOE-2 projects under the capacity building theme; seed funding for mentorships; seed funding for participations (related to capacity building) of developing country constituents in research cruises; and national training centre capacity building activities, such as participation in training programmes offered by the International Training Centre for Operational Oceanography in Hyderabad, etc.

It is recommended that an appropriate operational budget for this over-arching Capacity Building function be in the order of \$200k per annum.

Early Career Scientists Network

- The IPO should be tasked with both: (i) helping the Early Career Scientists Network to find resources for its function (such as catalytic funding to support sponsorship drives, strategic meetings for such, etc.) and (ii) itself have a basal level for seed funding and the capacity to acquire additional funds from donors to support essential early career scientist activities for IIOE-2. This follows the example of the Association of Polar Early Career Scientists (APECS), which was fostered so successfully by the International Polar Year (IPY) and remains its most tangible and demonstrable legacy. Early career scientists both in the Indian Ocean regions and in the global community will benefit from open and shared networking events, webinars, workshops, career development and training, typically organised by and for the Early Career Scientists Network.

It is recommended that an appropriate operational budget specifically for the Early Career Scientists Network be in the order of \$100k per annum.

- As for other component parts of the IIOE-2, a Resources and Sponsorship Working Group is recommended to be established, complemented by a Resources and Sponsorship Strategy and Implementation Plan. As with other Working Group strategies and implementation plans that are yet to be completed, and for which no identifiable external facilitator exists, IPC requests IOC Secretariat to facilitate the development of this theme's plans. Adequate resources to facilitate this working group's function will be needed.

3. Conclusions and recommendations

This report provides a suggested framework, for IOC to adopt at its 28th Assembly, in respect to strategic direction and implementation guidelines for the IIOE-2.

The SCOR IIOE-2 Science Plan Development Committee Science Plan (Version 1, 13 May 2015) is recommended for adoption by IOC as the essential underpinning science framework for IIOE-2.

IPC recommends a governance structure, based on co-chairs deriving from co-sponsors (initially IOC, SCOR and IOGOOS), overseeing a Steering Committee with: an 'executive level group' (which includes six science leaders respectively representing the six Science Plan themes, and IIOE-2 Working Group leaders and key representatives of relevant IOC regional bodies); a conjoining membership level deriving from IIOE-2 'national committees'; and a final level of 'Principal Investigators' representing the respective major research projects in IIOE-2. All of this, supported by an International Project Office Framework (IPO), noting the initial committed support for such from the IOC Secretariat, India and Australia, and urging other potential donors to supplement the IPO with additional support and resources.

The IPO also recommends the establishment of explicit Working Groups to work in harmony with the Steering Committee, and with their representative leaders being members of the Steering Committee 'executive level group'. These WGs are defined to address what IPC believes to be key thematic and operational components of an essential IIOE-2 framework: (a) Science and Research; (b) Data and Information Management; (c) Capacity Building; (d) Operational Coordination; (e) Outreach and Communication; (f) Translating Science for Society; and (g) Resources and Sponsorship. The IPO should support the Working Groups, as it should the Steering Committee.

IPC recommends that IIOE-2 be launched in Goa, India, on 4 December 2015, at the end of the International Symposium on the Indian Ocean, which will celebrate 50 years of Indian Ocean science stemming from the original IIOE of 1959–1965 and the 50th anniversary of the Indian National Institute of Oceanography (itself a legacy of IIOE). The symposium will be hosted by the Government of India, supported by IOC and SCOR, and on 4 December there will also be the launch of an Indian Research vessel from Goa, en-route to Mauritius, under the spirit of IIOE-2 and symbolising the IIOE-2's first scientific research cruise.

It has not been possible, in planning for a programme of the magnitude and scope covered by IIOE-2, and in the time available to IPC under its tenure, to have been able to harness the necessary energies to deliver a full set of IIOE-2 component strategies and implementation plans, notwithstanding the successful finalisation of the Science Plan through SCOR.

Accordingly, IPC invites IOC to extend its tenure to the date of the proposed launch (4 December 2015), in order for IPC to oversee and facilitate the development of strategies/implementation plans for the component facets of IIOE-2 (a to g, above).

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Appendix – 1 IPC Member List

Member	Country	Appointed through
Peter Burkill	UK	SCOR
Nasser Zaker (replaced Vahid Chegini)	Iran	IOGOOS
Rana Fine	USA	IOC
Birgit Gaye	Germany	IOC
Karen Heywood	UK	IOC
Raleigh Hood	USA	SCOR
Ashley Johnson	South Africa	IOC
Somkiat Khokiattiwong	Thailand	IOC
Kenneth Lee	Australia	IOC
Yukio Masumoto	Japan	IOC
S.W.A Naqvi	India	IOC
Andreas Schiller	Australia	IOGOOS
Satheesh Shenoi	India	IOGOOS
Jerome Vialard	France	IOC
Charles Majori (replaced Enock Wakwabi)	Kenya	IOC
Haiwen Zhang (alternate Weidong Yu)	China	IOC

Appendix 2 – Extract referring to IIOE-2 from the 23rd Session of the IOC Committee on International Oceanographic Data and Information Exchange (IODE) (Report IOC/IODE-XXIII/3, Ostend, Belgium, 31 March 2015)

From Pages 33-34 (in quote)

6.3.3.11 Second International Indian Ocean Expedition (IIOE-2)

- Mr Greg Reed made the following statement: “*The Second International Indian Ocean Expedition (IIOE-2) is a joint IOC-SCOR-IOGOOS initiative to celebrate the 50th anniversary of the International Indian Ocean Expedition (IIOE) of the 1960s.*”
- *IIOE-2 will advance understanding of geologic, oceanic and atmospheric processes and their interactions in the Indian Ocean, and to determine how these dynamics affect climate, marine biogeochemical cycles, ecosystems, and fisheries both within the region and globally. Planning for IIOE-2 has been underway since 2011. An Interim Planning Committee (IPC) has been formed and a draft Science Plan has been released. Final arrangements for the commencement of IIOE-2 are proposed to be adopted by the IOC Assembly in June 2015. IIOE-2 is a major international initiative that will collect vast amounts of data and IODE should take the lead for the Data and Information management component. Activities where IODE can provide leadership includes (i) sponsor a Data Management Plan to outline the types of data to be collected, data and metadata standards, data access and sharing, and data archiving and preservation, (ii) promote data citation, (iii) ensure IIOE-2 data are cited in publications, (iv) provide a repository for all IIOE-2 data (ODP/OBIS), and (v) provide data and information management training through OTGA.”*
- The Committee was informed that the IIOE-2 draft science plan specifically referred to IODE: “*At the international level, the IOC’s International Oceanographic Data and Information Exchange (IODE) provides a logical framework and infrastructure that can support IIOE-2 data and information management”.*”
- **The Committee agreed** that IODE provides the essential framework and infrastructure to support IIOE-2 data and information management and that IODE can provide leadership and make a valuable contribution to the IIOE-2 objectives to build capacity and improve availability and accessibility of oceanographic data.
- **The Committee recommended** that all publications generated by IIOE-2 should be included in OceanDocs and **instructed** the IODE Secretariat to inform the Interim Planning Committee (IPC) of its recommendation.
- **The Committee instructed** the Secretariat to inform IIOE-2 IPC of IODE’s readiness to support IIOE-2, and specifically to prepare draft text for a Data Management Plan.
- **The Committee proposed** to establish a working group on the development of a draft text for an IIOE-2 data management plan, noting that such text could also be adapted for use by other programmes and projects.
- The delegate from India informed the Committee that the national committee on IIOE-2 instructed INCOIS to collate the data of IIOE-1 and publish it on the IIOE-2 web site at the NODC at INCOIS.
- The Committee expressed its appreciation to all partner programmes and organizations for their reporting to, and participation in the Session.

From Page 40 (in quote)

- In this regard reference was made to agenda item 6.3 (IIOE2) where it was recommended to prepare a data and information management plan for IIOE2. This should be discussed with the staff member of the IOC Secretariat responsible for IIOE2. Mr Somkiat Khokiattiwong informed the Committee that Dr S. Sheno (INCOIS, India) had been designated to chair the committee on IIOE2. Mr Calvin Gerry volunteered to ensure that the suggestion to develop a data management plan for the IIOE2 would be considered by IIOE2.
- More generally NODCs should assist, where required, with the development of data and information management plans when new national or regional projects are planned.
- Ms Cyndy Chandler volunteered to prepare a draft data and information management plan that could be used for various purposes.

Glossary

AGU	American Geophysical Union
AMSA	Australian Marine Sciences Association
AOGS	Asia Oceania Geosciences Society
ASCLME	Agulhas and Somali Current Large Marine Ecosystems Project
BOBLME	Bay of Bengal Large Marine Ecosystem Project
CLIVAR	Climate Variability and Predictability program of the World Climate Research Program
EGU	European Geosciences Union
GEOHAB	Global Ecology and Oceanography of Harmful Algal Blooms
GEOTRACES	International Study of Marine Biogeochemical Cycles of Trace Elements and their Isotopes
GLOBEC	Global Ocean Ecosystem Dynamics International Programme
GO	Global Oceans (www.global-oceans.org)
GOOS	Global Ocean Observing System
GRA	GOOS Regional Alliance
IAPSO	International Association for the Physical Sciences of the Oceans
IIOE	International Indian Ocean Expedition
IIOE-2	Second International Indian Ocean Expedition
IMarEST	Institute of Marine Engineering, Science & Technology
IMBER	Integrated Marine Biogeochemistry and Ecosystem Research
IMOS	Australian Integrated Marine Observing System
IOCAFRICA	IOC Sub-Commission for Africa and the Adjacent Island States
IOC/WESTPAC	IOC Sub-Commission for the Western Pacific
IOC	Intergovernmental Oceanographic Commission of UNESCO
IOC HQ	The Secretariat for the IOC, Paris, France
IOCINDIO	IOC Regional Committee for the Central Indian Ocean
IOC28	Twenty-eighth session of the IOC Assembly
IODE	International Oceanographic Data and Information Exchange programme of the IOC
IOGOOS	Indian Ocean Global Ocean Observing System Regional Alliance
IOP	Indian Ocean Panel under IOGOOS/CLIVAR
IORA	Indian Ocean Rim Association
IPC	IOC IIOE-2 Interim Planning Committee (Group of Experts)
IPO	International Project Office
IRF	Indian Ocean Observing System Resources Forum under IOGOOS
IUGG	International Union of Geodesy and Geophysics
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
JCOMMOPS	JCOMM <i>in-situ</i> Observations Programme Support Centre
JGOFS	Joint Global Ocean Flux Study
NGO	Non-governmental Organization
NIO	Indian National Institute of Oceanography
POGO	Partnership for Observation of the Global Oceans
PPO	Perth Program Office in support of the IOC of UNESCO
SC	IIOE-2 Steering Committee
SCOR	Scientific Committee on Oceanic Research
SIBER	Sustained Indian Ocean Biogeochemistry and Ecosystem Research under IOGOOS/IMBER
SOLAS	International Convention for the Safety of Life at Sea
SPDC	SCOR Science Plan Development Committee
TOGA	Tropical Ocean Global Atmosphere programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation (www.unesco.org)
WAGOOS	Western Australian Global Ocean Observing System Regional Alliance
WIOMSA	Western Indian Ocean Marine Science Association
WOCE	World Ocean Circulation Experiment
WMO	World Meteorological Organization

Intergovernmental Oceanographic Commission (IOC)

United Nations Educational, Scientific and Cultural Organization
 7 Place de Fontenoy
 75 352 Paris Cedex 07, France
 Tel.: +33 1 45 68 39 83/84
 Fax: +33 1 45 68 58 12
<http://loc.unesco.org>