

Intergovernmental Oceanographic Commission
Reports of Governing and Major Subsidiary Bodies



**Intergovernmental Coordination
Group for the Tsunami Early
Warning and Mitigation System
in the North-Eastern Atlantic,
the Mediterranean and Connected
Seas (ICG/NEAMTWS)**

Sixteenth Session

Cannes, France
2–4 December 2019

UNESCO

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ICG/NEAMTWS-XVI/3
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¹The Executive Summary is available in English, French, Spanish and Russian.

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Executive summary

The Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS) held its 16th session on 2–4 December 2019 in Cannes, France. The ICG took the following decisions and recommendations:

The ICG/NEAMTWS,

Accepted the conclusions and recommendations of the Accreditation Team and **granted** the Instituto Português do Mar e da Atmosfera (IPMA, Portugal) the status of accredited NEAMTWS Tsunami Service Provider (TSP);

Acknowledged the Tsunami Exercises conducted in France, Greece, Israel, Italy and Turkey during this intersessional period;

Noted the framework set by the Working Group on Tsunamis and Other Hazards related to Sea-Level Warning and Mitigation Systems (TOWS-WG) at its 12th session in Paris on 21–22 February 2019, for dissemination of tsunami messages for the maritime community; the ICG/NEAMTWS will closely follow implementation of this service by other ICGs;

Acknowledged and **committed** to follow with interest the EU funded [cost action AGITHAR](#)-Accelerating Global Science in Tsunami Hazard and Risk Analysis;

Decided to:

- (i) continue the convergence of activities of the ICG Working Groups 2 and 3 which were merged in a new working group on Seismic, Geophysical & Sea level Measurements with a new mandate (Annex 1 to Decision [ICG/NEAMTWS-XVI.1](#));
- (ii) continue the Task Team on Documentation according to its revised Terms of Reference (Annex 3 to Decision [ICG/NEAMTWS-XVI.1](#));
- (iii) continue the Task Team on Tsunami Exercises according to its revised Terms of Reference (Annex 2 to Decision [ICG/NEAMTWS-XVI.1](#));
- (iv) continue the Task Team on Operations according to its revised Terms of Reference (Annex 4 to Decision [ICG/NEAMTWS-XVI.1](#));
- (v) continue the activities of the Steering Committee during the intersessional period;
- (vi) request the Steering Committee to further reflect on the structure of ICG/NEAMTWS;
- (vii) conduct the next tsunami exercise NEAMWave20 from 2 to 4 November 2020; and

Based on the recommendations of the Nominations Committee ([Annex II](#)):

- (viii) postpone the elections for Chairperson and Vice-Chairpersons from ICG/NEAMTWS-XVI to an extraordinary session of the ICG or an election via written correspondence with sealed ballot envelopes. The elections should be executed as soon as possible, but no later than prior to the NEAMTWS Steering Committee meeting, planned for April 2020;
- (ix) request the Secretariat to extend the deadline to 28 February 2020 for filing nominations for Chairperson and Vice-Chairpersons. This should be communicated by a circular letter from IOC to NEAM Member States;

- (x) extend the term of the current Chairperson and Vice-Chairpersons for an interim period of four months until 31 March 2020;

Recommended to:

- (i) increase the participation of Member States in the ICG activities, with particular focus on tsunami education, awareness and preparedness, and to continue to explore the adaptation of community preparedness and recognition programmes such as Tsunami Ready for the NEAM region, including Tsunami Hazard and Tsunami Evacuation Maps, Plans, and Procedures (TEMPP);
- (ii) Tsunami Service Providers (TSP), National Tsunami Warning Centres (NTWC), working groups and Member States to provide key documents and reports to the IOC Secretariat at least one month before the start of the next ICG/NEAMTWS session;

Further recommended that:

- (iii) each TSP continues to provide alert level information based on their best practices, including (possibly different) decision matrices, scenario databases or other methods. These methodologies needing to be documented in the NEAMTWS Operational Users Guide;
- (iv) Tsunami Warning Focal Points, in close connection with their NTWCs, if applicable, develop standard operating procedures in order to be able to handle diverging TSP warning messages in line with the guidance document "Guidelines on TSP Messages Uncertainty" prepared by Working Group 1 in 2017;
- (v) Member States encourage the active involvement of their national Civil Protection Authorities (CPAs);

Accepted additional recommendations of working groups and task teams as outlined in [Annex I](#);

Acknowledged the [draft strategic planning document](#) for NEAMTIC redevelopment (version 27 November 2019);

Acknowledged further the support of the European Commission (EC) and the Joint Research Centre (JRC) towards capacity development in support of local tsunami warning, awareness, and mitigation, including infrastructure, research and new sea level instrumentation and provision of measurements, especially for the Last Mile Projects implemented in Kos (Greece) and Bodrum (Turkey);

Welcomed the offer of Germany of hosting ICG/NEAMTWS-XVII;

Thanked France, and particularly the municipality of Cannes, for hosting the 16th session of ICG/NEAMTWS.

Résumé exécutif

Le Groupe intergouvernemental de coordination du Système d'alerte rapide aux tsunamis et de mitigation dans l'Atlantique du Nord-Est, la Méditerranée et les mers adjacentes (GIC/NEAMTWS) a tenu sa 16^e session du 2 au 4 décembre 2019 à Cannes, en France. Le GIC a adopté les décisions et recommandations ci-après :

Le GIC/NEAMTWS,

Accepte les conclusions et recommandations de l'Équipe d'accréditation et **a accordé** à l'Instituto Português do Mar e da Atmosfera (IPMA, Portugal) le statut Prestataire de services relatifs aux tsunamis (TSP) accrédité du NEAMTWS ;

Prend acte des exercices d'alerte aux tsunamis menés en France, en Grèce, en Israël, en Italie et en Turquie pendant la période intersessions ;

Prend note du cadre mis en place par le Groupe de travail sur les systèmes d'alerte aux tsunamis et autres aléas liés au niveau de la mer, et de mitigation (TOWS-WG) à sa 12^e session, tenue à Paris les 21 et 22 février 2019, pour la diffusion de messages relatifs aux tsunamis à l'intention de la communauté maritime ; le GIC/NEAMTWS suivra de près la mise en œuvre de ce service par d'autres GIC ;

Prend en compte et s'engage à suivre avec intérêt l'action COST intitulée [AGITHAR](#) (Accélérer la recherche scientifique mondiale en matière de risques de tsunami et d'analyse des risques), financée par l'Union européenne ;

Décide :

- (i) de maintenir la convergence des activités des groupes de travail 2 et 3 du GIC, qui ont été fusionnés en un nouveau groupe de travail sur les mesures sismiques, géophysiques et du niveau de la mer doté d'un nouveau mandat (annexe 1 à la décision [ICG/NEAMTWS-XVI.1](#)) ;
- (ii) de maintenir l'Équipe spéciale sur la documentation avec un mandat révisé (annexe 3 à la décision [ICG/NEAMTWS-XVI.1](#)) ;
- (iii) de maintenir l'Équipe spéciale sur les exercices d'alerte aux tsunamis avec un mandat révisé (annexe 2 à la décision [ICG/NEAMTWS-XVI.1](#)) ;
- (iv) de maintenir l'Équipe spéciale sur les opérations avec un mandat révisé (annexe 4 à la décision [ICG/NEAMTWS-XVI.1](#)) ;
- (v) de poursuivre les activités du Comité directeur pendant la période intersessions ;
- (vi) de prier le Comité directeur de réfléchir plus avant sur la structure du GIC/NEAMTWS ;
- (vii) de conduire le prochain exercice d'alerte aux tsunamis (NEAMWave20) du 2 au 4 novembre 2020 ;

Et, sur la base des recommandations du Comité des candidatures ([annexe II](#)) :

- (viii) de reporter à une session extraordinaire du GIC les élections aux postes de président et de vice-présidents qui devaient se tenir pendant la 16^e session du GIC/NEAMTWS, ou de procéder à des élections à bulletin secret par correspondance. Les élections doivent avoir lieu dès que possible, avant la réunion du Comité directeur du GIC/NEAMTWS prévue en avril 2020 ;

- (ix) de prier le Secrétariat de proroger jusqu'au 28 février 2020 le délai de dépôt des candidatures aux postes de président et de vice-présidents. Les États membres de la région de l'Atlantique du Nord-Est, de la Méditerranée et des mers adjacentes devront être informés de cette décision par lettre circulaire de la COI ;
- (x) de prolonger le mandat du Président et des Vice-Présidents actuels pour une période intérimaire de quatre mois, jusqu'au 31 mars 2020 ;

Recommande :

- (i) d'accroître la participation des États membres aux activités du GIC, en mettant l'accent sur l'éducation, la sensibilisation et la préparation aux tsunamis, et de continuer d'envisager d'adapter les programmes de préparation des communautés et de reconnaissance tels que Tsunami Ready pour la région de l'Atlantique du Nord-Est, de la Méditerranée et des mers adjacentes, notamment le risque de tsunami et les cartes, plans et procédures d'évacuation en cas de tsunami (TEMPP) ;
- (ii) que les prestataires de services relatifs aux tsunamis (TSP), les centres nationaux d'alerte aux tsunamis (NWTC), les groupes de travail et les États membres transmettent les documents et rapports clés au Secrétariat de la COI au moins un mois avant l'ouverture de la session suivante du GIC/NEAMTWS ;

Recommande également :

- (iii) que chaque TSP continue de fournir des informations sur le niveau de menace fondées sur leurs meilleures pratiques, notamment des matrices de décision (éventuellement différentes), des bases de données sur les scénarios ou d'autres méthodes, ces dernières devant être documentées dans le Guide opérationnel des utilisateurs du NEAMTWS ;
- (iv) que les points focaux pour l'alerte aux tsunamis élaborent, en lien étroit avec leur NTWC, le cas échéant, des procédures opérationnelles normalisées afin d'être en mesure de réagir de façon appropriée en cas de messages d'alerte divergents émis par les TSP, conformément au document d'orientation « *Guidelines on TSP Messages Uncertainty* » (directives en cas d'incertitude sur les messages des TSP) élaboré par le Groupe de travail 1 en 2017 ;
- (v) que les États membres encouragent la participation active de leurs autorités nationales de protection civile ;

Accepte les autres recommandations formulées par les groupes de travail et les équipes spéciales, telles qu'énoncées dans l'[annexe I](#) ;

Prend note du [projet de document de planification stratégique](#) concernant la refonte du Centre d'information sur les tsunamis pour l'Atlantique du Nord-Est, la Méditerranée et les mers adjacentes (NEAMTIC) (version du 27 novembre 2019) ;

Prend note également de l'aide fournie par la Commission européenne (CE) et son Centre commun de recherche (CCR) pour le développement des capacités à l'appui de l'alerte, de la sensibilisation aux tsunamis et de leur mitigation au niveau local, y compris les infrastructures, la recherche, les nouveaux instruments de mesure du niveau de la mer et la fourniture de mesures, notamment pour les projets « dernier kilomètre » mis en œuvre à Kos (Grèce) et à Bodrum (Turquie) ;

Se félicite de la proposition de l'Allemagne d'accueillir la 17^e session du GIC/NEAMTWS ;

Remercie la France, et en particulier la municipalité de Cannes, d'avoir accueilli la 16^e session du GIC/NEAMTWS.

Resumen

El Grupo Intergubernamental de Coordinación del Sistema de Alerta Temprana contra los Tsunamis y Atenuación de sus Efectos en el Atlántico Nororiental y el Mediterráneo y Mares Adyacentes (ICG/NEAMTWS) celebró su 16ª reunión en Cannes (Francia) del 2 al 4 de diciembre de 2019. El ICG aprobó las siguientes decisiones y recomendaciones:

El ICG/NEAMTWS,

Aceptó las conclusiones y recomendaciones del Equipo de Acreditación y **concedió** al Instituto Português do Mar e da Atmosfera (IPMA, Portugal) la acreditación para ser proveedor de servicios sobre tsunamis (TSP) del NEAMTWS;

Reconoció las simulaciones de tsunamis realizadas en Francia, Grecia, Israel, Italia y Turquía durante el período entre reuniones;

Tomó nota del marco establecido por el Grupo de Trabajo sobre sistemas de alerta contra tsunamis y otros peligros relacionados con el nivel del mar y atenuación de sus efectos (TOWS-WG) en su 12ª reunión, celebrada en París los días 21 y 22 de febrero de 2019, para difundir mensajes sobre tsunamis a la comunidad marítima; el ICG/NEAMTWS seguirá de cerca la utilización de este servicio por parte de otros ICG;

Reconoció y se comprometió a seguir con interés la [cost action AGITHAR](#) (Acelerar la ciencia mundial en materia de peligros de tsunami y análisis de riesgos), financiada por la Unión Europea;

Decidió:

- (i) mantener la convergencia de las actividades de los Grupos de Trabajo 2 y 3 del ICG que se fusionaron en un nuevo grupo de trabajo sobre mediciones sísmicas, geofísicas y del nivel del mar con un nuevo mandato (anexo 1 de la decisión [ICG/NEAMTWS-XVI.1](#));
- (ii) mantener el Equipo de Trabajo sobre Documentación de conformidad con su mandato revisado (anexo 3 de la decisión [ICG/NEAMTWS-XVI.1](#));
- (iii) mantener el Equipo de Trabajo sobre Simulaciones de Tsunamis de conformidad con su mandato revisado (anexo 2 de la decisión [ICG/NEAMTWS-XVI.1](#));
- (iv) mantener el Equipo de Trabajo sobre Operaciones de conformidad con su mandato revisado (anexo 4 de la decisión [ICG/NEAMTWS-XVI.1](#));
- (v) proseguir las actividades del Comité de Dirección durante el periodo entre reuniones;
- (vi) pedir al Comité de Dirección que siguiera reflexionando sobre la estructura del ICG/NEAMTWS;
- (vii) llevar a cabo la próxima simulación de tsunamis NEAMWave20 del 2 al 4 de noviembre de 2020; y

sobre la base de las recomendaciones del Comité de Candidaturas ([anexo II](#)):

- (viii) aplazar a una reunión extraordinaria del ICG las elecciones para los puestos de Presidente y vicepresidentes que debían realizarse durante la 16ª reunión del ICG/NEAMTWS, o celebrarlas por votación secreta por correspondencia. Las elecciones deberían tener lugar lo antes posible y, en todo caso, antes de la reunión del Comité de Dirección del ICG/NEAMTWS, prevista en abril de 2020;

- (ix) pedir a la Secretaría que prorrogara hasta el 28 de febrero de 2020 el plazo de presentación de candidaturas a los puestos de Presidente y vicepresidentes. Esta información deberá comunicarse a los Estados Miembros de la región del Atlántico Nororiental y el Mediterráneo mediante una circular de la COI;
- (x) prorrogar el mandato del Presidente y los vicepresidentes actuales por un periodo provisional de cuatro meses, hasta el 31 de marzo de 2020;

Recomendó:

- (i) que se aumentara la participación de los Estados Miembros en las actividades del ICG, prestando especial atención a la educación, la sensibilización y la preparación con respecto a los tsunamis, y que se siguiera estudiando la posibilidad de adaptar los programas comunitarios de preparación y reconocimiento, como “Tsunami Ready” para la región del Atlántico Nororiental y el Mediterráneo, incluidos el riesgo de tsunami y los mapas, planes y procedimientos de evacuación en caso de tsunami (TEMPP);
- (ii) que los proveedores de servicios sobre tsunamis (TSP), los centros nacionales de alerta contra los tsunamis (NTWC), los grupos de trabajo y los Estados Miembros proporcionaran documentos e informes clave a la Secretaría de la COI al menos un mes antes del inicio de la siguiente reunión del ICG/NEAMTWS;

Recomendó también:

- (iii) que cada proveedor de servicios sobre tsunamis siguiera proporcionando información sobre el nivel de alerta basándose en sus mejores prácticas, en particular matrices de decisión (posiblemente diferentes), bases de datos sobre hipótesis u otros métodos, en el entendimiento de que esas metodologías deberían documentarse en la guía operacional para usuarios (Operational Users Guide) del NEAMTWS;
- (iv) que los puntos focales de alerta contra los tsunamis, en estrecha relación con sus NTWC, según proceda, elaboraran procedimientos operativos estándar para poder gestionar los mensajes de alerta divergentes emitidos por los TSP, de conformidad con el documento de orientación “Guidelines on TSP Messages Uncertainty” (directrices en caso de incertidumbre sobre los mensajes de los TSP), elaborado por el Grupo de Trabajo 1 en 2017;
- (v) que los Estados Miembros alentaran la participación activa de sus autoridades nacionales de protección civil (APC);

Aceptó las recomendaciones adicionales de los grupos de trabajo y los equipos de trabajo que figuran en el [anexo I](#);

Tomó nota del [proyecto de documento de planificación estratégica](#) para la remodelación del NEAMTIC (versión del 27 de noviembre de 2019);

Reconoció también la asistencia prestada por la Comisión Europea (CE) y el Centro Común de Investigación (CCI) para el desarrollo de capacidades en apoyo de la alerta contra los tsunamis, la sensibilización al respecto y la atenuación de sus efectos en el plano local, en particular la infraestructura, la investigación, los nuevos instrumentos para la medición del nivel del mar y el suministro de mediciones, especialmente para los proyectos “último kilómetro” ejecutados en Cos (Grecia) y Bodrum (Turquía);

Celebró el ofrecimiento de Alemania de acoger la 17ª reunión del ICG/NEAMTWS;

Expresó su agradecimiento a Francia, y en particular a la municipalidad de Cannes, por haber acogido la 16ª reunión del ICG/NEAMTWS.

Рабочее резюме

Межправительственная координационная группа по системе раннего предупреждения о цунами и смягчения их последствий в Северо-Восточной Атлантике, Средиземном и прилегающих морях (МКГ/СПЦСВАСМ-XVI) провела свою шестнадцатую сессию в Каннах, Франция, 2-4 декабря 2019 г. МКГ утвердила следующие решения и рекомендации:

МКГ/СПЦСВАСМ

одобрила выводы и рекомендации Группы по аттестации и **предоставила** Португальскому институту моря и атмосферы (ПИМА) статус аккредитованного провайдера данных слежения за цунами СПЦСВАСМ;

приветствовала проведение в текущий межсессионный период в Греции, Израиле, Италии, Турции и Франции учений по проверке готовности к цунами;

приняла к сведению разработанные Рабочей группой по системам предупреждения и смягчения последствий цунами и других опасных явлений, связанных с изменением уровня моря (РГ-СПЦО), в ходе ее 12-й сессии (Париж, 21-22 февраля 2019 г.) общие принципы распространения сообщений о цунами в рамках морского сообщества; МКГ/СПЦСВАСМ будет внимательно наблюдать за тем, как оказание аналогичной услуги обеспечивается другими МКГ;

приветствовала усилия и **выразила намерение** внимательно наблюдать за деятельностью в рамках финансируемого по линии Европейской программы сотрудничества в области научно-технических исследований (КОСТ) сетевого проекта «Активизация глобальных научных исследований в области анализа опасных явлений и рисков, связанных с цунами ([АГИТХАР](#));

постановила:

- (i) продолжить согласование деятельности рабочих групп 2 и 3 МКГ, объединенных в новую рабочую группу по сейсмическим, геофизическим и морским измерениям, для которой был определен новый круг полномочий (см. приложение 1 к решению [ICG/NEAMTWS-XVI.1](#));
- (ii) продолжить работу Целевой группы по документации в соответствии с пересмотренным кругом ведения (см. приложение 3 к решению [ICG/NEAMTWS-XVI.1](#));
- (iii) продолжить работу Целевой группы по учениям, связанным с цунами, в соответствии с пересмотренным кругом ведения (см. приложение 2 к решению [ICG/NEAMTWS-XVI.1](#));
- (iv) продолжить работу Целевой группы по осуществлению деятельности в соответствии с пересмотренным кругом ведения (см. приложение 4 к решению [ICG/NEAMTWS-XVI.1](#));
- (v) продолжить работу Руководящего комитета в межсессионный период;
- (vi) просить Руководящий комитет продолжить рассмотрение вопроса о структуре МКГ/СПЦСВАСМ;
- (vii) провести следующие учения по проверке готовности к цунами «СВАСМ/Волна-20» со 2 по 4 ноября 2020 г.; и

В соответствии с рекомендациями Комитета по кандидатурам (см. [Приложение II](#)):

- (viii) перенести проведение запланированных в рамках XVI сессии МКГ/СПЦСВАСМ выборов Председателя и заместителей Председателя на внеочередную сессию МКГ либо организовать эти выборы в формате переписки посредством направления запечатанных конвертов с бюллетенями по почте; выборы должны быть проведены по возможности в короткие сроки, причем до запланированного на апрель 2020 г. совещания Руководящего комитета СПЦСВАСМ;
- (ix) просить Секретариат продлить до 28 февраля 2020 г. крайний срок представления кандидатур на должность Председателя и заместителей Председателя; информацию об этом следует распространить циркулярным письмом МОК в адрес государств-членов в регионе СВАСМ;
- (x) продлить временно срок полномочий нынешнего Председателя и заместителей Председателя на четыре месяца до 31 марта 2020 г.;

рекомендовала:

- (i) принять меры по расширению участия государств-членов в деятельности МКГ, уделяя особое внимание информационно-просветительской работе и усилиям по повышению готовности к цунами, а также изучению возможностей адаптации для региона СВАСМ программ, направленных на повышение готовности населения к цунами и оценку такой готовности, например, посредством выдачи сертификата «К цунами готов», включая разработку карт, планов и порядка проведения связанных с цунами эвакуационных мероприятий (КППМЦ);
- (ii) провайдерам данных слежения за цунами (ПДСЦ), национальным центрам предупреждения о цунами (НЦПЦ), рабочим группам и государствам-членам представить основные документы и доклады в Секретариат МОК не позднее чем за месяц до начала работы следующей сессии МКГ/СПЦСВАСМ;

рекомендовала также:

- (iii) всем ПДСЦ продолжить представление информации об уровне готовности с использованием успешно зарекомендовавших себя методологий, включая (различного рода) матрицы принятия решений, базы данных по возможным сценариям и другие методы, которые необходимо отразить в Оперативном руководстве для пользователей СПЦСВАСМ;
- (iv) координаторам по предупреждению о цунами в тесном взаимодействии со своими НЦПЦ в необходимых случаях разработать стандартные оперативные процедуры, которые позволили бы реагировать на поступающие от ПДСЦ противоречивые предупреждающие сообщения, руководствуясь подготовленными рабочей группой 1 в 2017 г. методическими указаниями «Руководящие принципы в отношении неясных сообщений ПДСЦ»;
- (v) государствам-членам поощрять более активное участие своих национальных органов защиты гражданского населения (ОЗГН);

одобрила дополнительные рекомендации рабочих и целевых групп, изложенные в [Приложении I](#);

приняла к сведению подготовку [проекта документа по стратегическому планированию](#) реорганизации НЕАМТИК (версия документа от 27 ноября 2019 г.);

приняла к сведению также поддержку со стороны Европейской комиссии (ЕК) и Объединенного исследовательского центра (ОИЦ) в деле наращивания потенциала в вопросах предупреждения о цунами местного значения, информирования общественности и смягчения возможных последствий, включая развитие материально-технической базы, оснащение новым оборудованием для проведения исследований и измерения уровня моря, а также предоставление данных о проведенных замерах, в частности, в рамках проектов «Последняя миля», осуществляемых в Косе (Греция) и Бодруме (Турция);

приветствовала предложение Германии провести у себя семнадцатую сессию МКГ/СПЦСВАСМ;

поблагодарила власти Франции и, в особенности, администрацию г. Канны за организацию у себя шестнадцатой сессии МКГ/СПЦСВАСМ.

1. OPENING OF SESSION

1. The Sixteenth session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS-XVI) was opened on Monday 2 December 2019 at 10:00 by Mr Gerasimos Papadopoulos, Chairperson of ICG/NEAMTWS, who welcomed the participants to the meeting.
2. Ms Claire-Anne Reix, the President of the Palais des Festivals et des Congrès, gave an opening presentation. She welcomed all participants to the ICG/NEAMTWS-XVI session in Cannes, France. She informed the meeting that Cannes has taken several steps to mitigate tsunamis. Cannes has adopted the World Tsunami Awareness Day, 5 November as an annual event since 2017. It has carried out two tsunami exercises, installed tsunami evacuation signs and adopted a comprehensive risk information document for its inhabitants, which also includes a section on tsunamis. Lately, a charter has been developed for a set of city employees concerning tsunami risks and inundation.
3. Mr Thorkild Aarup, Head of IOC Tsunami Section, welcomed participants on behalf of Vladimir Ryabinin, Executive Secretary of IOC. He thanked the mayor and the deputy mayor of the city of Cannes, as well as Ms Emilie Crochet, Ministère de l'Intérieur, and Mr François Schindelé, CENALT, CEA (Commissariat à l'Énergie atomique et aux énergies alternatives), for their support in hosting the session in Cannes.
4. Mr Aarup reminded participants about the 15th commemoration of the Indian Ocean Tsunami that killed about 230,000 in December 2004. The event triggered the development of a Global Tsunami Warning System, including the North-Eastern Atlantic, the Mediterranean and Connected Seas. There are now four, and soon five accredited Tsunami Service Providers in the NEAM region that send out alerts to countries that subscribe to them.
5. He stressed that there are several remaining challenges, in particular is awareness of the tsunami threat in the NEAM region still limited and there is still uneven participation among nations and Civil Protection Agencies. He emphasized that NEAMTWS has now reached a major milestone, and it is an opportune time to set its direction for the future by focusing on strengthening awareness and preparedness, in particular through performance based community recognition programmes (i.e. Tsunami Ready).
6. The planned NEAMWave20 Tsunami Exercise in 2020 is important for the NEAMTWS community. It is an opportunity for societal outreach and awareness raising on tsunami threats. He highlighted the need to strengthen resilience of coastal communities due to increasing coastal exposure for example from population growth.
7. In closing, Mr Aarup wished the participants a productive and successful meeting.

2. ORGANIZATION OF THE SESSION

2.1 ADOPTION OF THE AGENDA

8. Mr Gerasimos Papadopoulos, the Chairperson of the ICG/NEAMTWS, introduced the provisional Agenda. The Group adopted the Provisional Agenda with no change, as included in [Annex I](#).

2.2 DESIGNATION OF THE RAPPORTEUR

9. Mr Iordanis Dimitriadis from Cyprus Geological Survey Department agreed to be the rapporteur of the ICG/NEAMTWS-XVI session.

2.3 ESTABLISHMENT OF DRAFTING GROUP ON DRAFT DECISIONS AND RECOMMENDATIONS

10. Ms Anna von Gyldenfeldt and Mr Öcal Necmioğlu agreed to prepare the first draft of the Decisions and Recommendations of the ICG/NEAMTWS-XVI session.

2.4 TIMETABLE AND DOCUMENTATION

11. The ICG reviewed and adopted the timetable for the meeting with only minor adjustment in the session ending, in light of the foreseen French strikes on the 5th December.

2.5 ESTABLISHMENT OF THE NOMINATIONS COMMITTEE AND CHAIR FOR ELECTIONS

12. Mr Alexander Rudloff from Germany was appointed Chairperson of the Nominations Committee for the election of Officers. Ms Marzia Santini from Italy and Mr Ahmet C. Yalciner from Turkey were appointed as members.

2.6 ESTABLISHMENT OF SESSIONAL COMMITTEES AND WORKING / DRAFTING GROUPS

13. The ICG discussed the formation of sessional committees and Working Groups (WGs). There would be two breakout sessions. During the first breakout session individual WGs and Task Teams (TTs) would meet. In the second breakout session there would be joint meetings on cluster topics:

3. REPORT ON ICG/NEAMTWS INTERSESSIONAL ACTIVITIES

3.1 REPORT BY THE CHAIRPERSON

14. Mr Gerasimos Papadopoulos, Chairperson of the ICG/NEAMTWS, reported on the activities undertaken since the last session of the ICG/NEAMTWS-XV in Paris, France, 26–28 November 2018.

15. The Chairperson informed about his participation in various coordination meetings including: (i) the steering committee (SC) meeting in Paris on 21–22 March 2019; (ii) communication and coordination with the other ICG/NEAMTWS Officers; and (iii) WGs/TTs Co-Chairpersons and the Technical Secretariat. He also reported on his participation in other meetings and activities including the 12th session of the Working Group on Tsunamis and other Hazards related to Sea-level Warning and Mitigation Systems (TOWS-WG, 21–22 February 2019, IOC/UNESCO, Paris).

16. The Chairperson participated in the national meetings in Greece, in particular the 2nd Scientific Forum for Disaster Risk Reduction, 11–15 March 2019.

17. The Chairperson also observed the national tsunami exercise in Tel Aviv, Israel, on 12 March 2019 and participated in an earthquake and tsunami field trip in the northern Israel on 13 March 2019. He considered Israel's tsunami exercise as successful.

18. He also delivered a presentation on NEAMTWS at the Municipality of Rhodes on 16 November 2019 and participated in the Rhodes Island, Greece, Tsunami Scenario exercise on 18 November 2019.

19. Mr Gerasimos Papadopoulos highlighted the need to further improve particularly the downstream component of NEAMTWS.

3.2 REPORT BY THE IOC SECRETARIAT

20. Mr Denis Chang Seng, Technical Secretary of the ICG/NEAMTWS, [reported](#) on the IOC Secretariat activities for the intersessional period.
21. The Technical Secretary supported and participated in the TOWS Task Team on Disaster Management & Preparedness, 19–20 February 2019, UNESCO, Paris.
22. The Secretariat organized the ICG/NEAMTWS Steering Committee meeting in Paris, 21–22 March 2019. The meeting focused on the preparations for NEAMWave20, NEAMTIC implementation plan, drafting of a new ICG/NEAMTWS Strategy and Implementation Plan, and preparations for the World Tsunami Awareness Day, 5 Nov. 2019 and the ICG/NEAMTWS-XVI session.
23. The Technical Secretary participated in the [21st Conference of the IHO Mediterranean and Black Seas Hydrographic Commission](#) (MBSHC), 11–13 June 2019 in Cádiz, Spain. Key recommendations to the MBSHC conference included improving bathymetry, sharing of bathymetry data and densifying sea level networks particularly nearby tsunamigenic sources for improved hazard assessments and coastal early warning systems in NEAM region.
24. The Technical Secretary also participated in the planning and organisation of the [Second Multi-Hazard Early Warning Conference](#) (MHEWC-II)-Early Warning and Early Action towards Sustainable, Resilient and Inclusive Societies on 13–14 May 2019 held at the WMO Headquarters, Geneva, Switzerland. He also contributed to an expert panel discussion on '[Making Early Warning System Multi-hazard](#)'.
25. The Technical Secretary contacted remaining countries that have not yet nominated Tsunami National Contacts (TNCs) and Tsunami Warning Focal Points (TWFPs). These countries include Albania, Estonia, Georgia, Montenegro, Mauritania, Algeria and Tunisia. Mauritania and Estonia responded and provided TNC/TWFP.
26. The Technical Secretary organised the Task Team on Exercise and Working Group 4 to discuss about NEAMWave20 preparations and NEAMTIC plans.
27. Other activities carried out included: (i) production of a new ICG/NEAMTWS poster available on [NEAMTIC](#) webpage and in print; (ii) publication of the summary report from the Tsunami Workshop (Rabat, Morocco, September 2018); (iii) development of an online subscription tool for NEAMWave20; and update of the [ICG/NEAMTWS Fact Sheet 2005-2020](#) to be finalized by ICG/NEAMTWS Steering Committee meeting in April 2020.
28. The Technical Secretary also reported on the ongoing preparations of the UN Decade of Ocean Science for Sustainable Development (2021–2030). Participants were encouraged to participate and contribute to the UN Ocean Decade Mediterranean workshop (Venice, Italy, 21–23 January 2020).

3.3 REPORT BY THE WORKING GROUP ON TSUNAMIS AND OTHER HAZARDS RELATED TO SEA-LEVEL WARNING AND MITIGATION SYSTEMS (TOWS-WG)

29. Mr Gerasimos Papadopoulos reported on the 12th Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation System ([TOWS-WG-XII](#)) which was held on 21–22 February 2019 at the IOC/UNESCO Headquarters in Paris.
30. The TOWS-WG-XII session made several recommendations to the IOC Executive Council requesting Member States to:

- increase and sustain technical and financial support of the tsunami and other coastal hazards warning systems in their respective regions;
- emphasize to national civil protection/disaster management agencies the role they play in strengthening the warning chain to ensure optimal community response and stress the importance that the agencies participate in regional tsunami governance and technical forums;
- continue to strengthen tsunami awareness and preparedness in communities and among authorities through communication, evacuation planning, tsunami exercises, training, information, and piloting recognition programmes such as Tsunami Ready;
- densify sea level networks capable of tsunami detection as well as seismic network particularly to nearby tsunamigenic sources;
- extend sharing of real time tsunami source and tsunami detection observations;
- collect high resolution coastal bathymetry and extend the data sharing for improved characterization of tsunami and other coastal hazards and risks, and also advocate this through IHO and regional hydrographic commissions;
- register NTWCs and TWFPs as alerting authorities in the WMO Alerting Authority;
- register via the WMO National Permanent Representative and in follow-up to WMO Circular Letters;
- consider the PTWS [Key Performance Indicator Framework](#) and provide input to a consolidated report for TOWS-XIII,
- continue the Tsunami Ready pilot activities with UNESCO-IOC recognition, including conducting surveys on Member State status, interest and feedback in the implementation of Tsunami Ready.

31. Mr Gerasimos Papadopoulos highlighted that the TOWS-WG also approved the following:

- updates to the [Tsunami Glossary, 2019](#);
- changes to the Area of Service Map (see IOC/[TOWS-WG-XII](#), [Appendix 3 to Annex IV](#));
- the proposal on TSP Messages for the Maritime Community and requested the ICGs to consider the proposal for implementation in their respective basins (see IOC/TOWS-WG-XII, [Appendix 4 to Annex IV](#)).
- produce a compelling high level concept note to the Implementation and Science Plans for the UN Decade of Ocean Science for Sustainable Development and convey it to global and regional Decade planning meetings. (See Angove et al. (2019), [Ocean Observations Required to Minimize Uncertainty in Global Tsunami Forecasts, Warnings, and Emergency Response](#)).

3.4 REPORT BY OTHER ICGs

32. There were no representation from other ICGs. The Chair informed that reports from other ICGs are available at the [30th IOC Assembly webpage](#).

4. IMPLEMENTATION

4.1 REPORTS BY THE NEAMTWS WORKING GROUPS AND TASK TEAMS

33. The Chair invited the Co-Chairs of the working groups (WG) and task teams to report on progress achieved during the past intersessional period with respect to the recommendations adopted at the earlier session of the ICG/NEAMTWS and the tasks assigned to them.

Working Group 1 on Hazard Assessment and Modelling

34. Mr Jörn Behrens reported on the activities of WG 1. Only one work item – provision of data for benchmarking was addressed during the intersessional period.
35. A new COST Action (CA18109 – Accelerating Global Science in Tsunami Hazard and Risk Analysis AGITHAR) has been established. It plans to perform a benchmarking exercise in January 2020. Therefore, it can be expected that corresponding data and results will be available to the community early next year.
36. In regards to the warning messages and uncertainty, he noted that the ICG/NEAMTWS abandoned the unified decision matrix and allowed centres to adopt whatever assessment method they considered to be best practice. This has lead to the current situation, where differing bulletin messages may be received from focal points or national contacts. WG1 proposed a procedure documented in the paper [“*How to handle diverging TSP warning messages and know about the inherent uncertainty*”](#).
37. Mr Öcal Necmioğlu pointed out that the study on warning messages and uncertainty seems to provide a simple solution to what is perceived as a big problem in NEAM region.
38. Ms Marzia Santini (Italy) enquired about the legal implications of the procedure proposed.
39. Mr Jörn Behrens suggested that such a process can be automated. The paper used a real event. He remarked that legally one will be on the safe side if there is a procedure in place, even if Standard Operating Procedure (SOP) fails.
40. Mr Marinos Charalampakis (NOA, Greece) mentioned that it would be interesting to see more tsunami events analysed to better understand inherent uncertainty.
41. In closing, Mr Jörn Behrens informed the session that he will step down as co-chair of WG1 to focus on the COST Action project.
42. The ICG thanked Mr Jörn Behrens for his dedicated contributions to the ICG/NEAMTWS over many years.

Working Group 2 on Seismic and Geophysical Measurements and Working Group 3 on Sea Level Data Collection and Exchange, Including Offshore Tsunami Detection and Instruments

43. Mr Marinos Charalampakis, Co-Chairperson of WG 2 and 3, reported on [seismic and geophysical measurements and Sea Level Data Collection and Exchange, Including Offshore Tsunami Detection and Instruments](#).
44. He briefed the group about WG 2 and WG 3 Plan of Actions; engagements and meetings organized during this intersessional period; the status of seismic and sea level networks in NEAM region; the ongoing projects and experiments, the collaborative GNSS network between INGV and NOA for real-time monitoring of ground motion.
45. Five new GNSS (Global Navigation Satellite System) stations were established by INGV and NOA via the European Multidisciplinary Seafloor and water column Observatory (EMSO) initiative. EMSO ERIC consists of a system of offshore observatories, which are platforms equipped with multiple sensors, placed in the water column and on the seafloor. Efforts have been made to make data available at NOA. However, one of the two branches with instruments (pressure sensor included) of the platform needs to be serviced. INGV is cooperating with the Hellenic Centre for Marine Research to establish a link with the onshore hub of the platform. A Service Level Agreement between TSPs and the managing institutions is necessary to obtain data in real-time.
46. In 2019, the Joint Research Center installed five IDSL sea level stations in Kos Island, Bodrum, Malta, Ireland and Lesvos Island (Plomari). A GNSS buoy has also been installed by JRC.
47. Mr Charalampakis also informed the session that he is stepping down as co-chair for WG 2 and 3.
48. The ICG thanked Mr Charalampakis for his excellent contributions in the last four years.

Working Group 4 on Public Awareness, Preparedness and Mitigation

49. Ms Marzia Santini, Co-Chairperson of the Working Group 4 reported on the progress and development since ICG/NEAMTWS-XV.
50. Key activities of WG 4 for the intersessional period focused on NEAMTIC phase 2 (redevelopment of website); representation of WG 4 in ICG/NEMATWS and the inter-ICG TOWS Task Team on Preparedness and Awareness; effort in improving user participation in NEAMTWS; promoting and supporting the development of the NEAMTWS downstream component; collaborating with WG 1 and TT on Exercise and Documentation.
51. She also informed that the Italian Civil Protection and INGV presently is studying and reviewing the Tsunami Ready initiative for an Italian context and findings will be reported to NEAMTWS.
52. A full report of WG 4 is available at the [event site](#).
53. The Group also discussed national laws and regulations and possible implications for a tsunami community preparedness recognition programme. While there may be issues, it should not be a barrier for trials and pilot implementation.

Task Team on Exercise

54. Ms Ceren Özer Sözdinler Co-Chairperson of TT on Exercise reported on the activities accomplished for the intersessional period. She recalled the decision of the ICG/NEAMTWS-XV session concerning organizing and conducting the fourth tsunami exercise in 2020 (NEAMWave20) and the Terms of Reference of the TT on Exercise. The TT on Exercise was in particular mandated to revise the NEAMWave Exercise Manual, and to support IOC Secretariat develop an online exercise subscription system and online evaluation questionnaire. She updated the session regarding the Plan of Action and the recommendations of the TT on Exercise.
55. Ms Sözdinler gave a comprehensive account of the preparation of NEAMWave20. Further details is available [here](#). She highlighted the progress and challenges regarding implementing the activities according to the timeline developed to prepare for the exercise.
56. She informed the session that the TT on Documentation recommended to reorganize the documentation, developing a generic standard Exercise Manual and a supplement that includes specific details, scenarios, contacts etc. and which can be updated easily each time an exercise is conducted.
57. Ms Sözdinler emphasized the need to prepare the exercise scenarios in early 2020 and to also develop a one-page guiding document to share with and between CPAs describing their experiences in implementing phase B of NEAMWave exercise.
58. The ICG discussed and agreed to maintain Phase C because it is seen as an important exercise element which will improve access to the European Union Emergency Response Coordination Center (ERCC).
59. Mr Alessandro Annunziato, observer (European Commission—Joint Research Centre) highlighted the importance to involve as many Mediterranean countries as possible in the NEAMWave20 exercise.
60. The Secretariat informed the session that the online subscription platform and evaluation questionnaire will be finalized before the next meeting of the ICG /NEAMTWS Steering Committee.

Task Team on Operations

61. Mr François Schindelé and Mr Fernando Carrilho, Co-Chairpersons of TT on Operations, [reported](#) on the activities accomplished for the intersessional period. TT on Operations participated in the [TOWS-WG-XII](#) meeting which was held on 21–22 February 2019 at the IOC/UNESCO Headquarters in Paris, France, and also in the ICG/NEAMTWS-SC on 21–22 March 2019.
62. The TT on Operations continue to assess the Global Service Definition Document (GSDD) and investigate its adaptability in the NEAMTWS community, in particular the team will continue to discuss the issue of Threat Level Adaptation.
63. The Task Team on Operations also recommended to have some diversity in the tsunami exercise messages (e.g. magnitudes, observations) in order to simulate what happens in real situations.
64. An evaluation of the storm surge alert levels in the region was carried out by Mr Knud-Jacob Simonsen (Danemark). Mr Simonsen [reported](#) on this study. The study has examined the storm surge threshold based criteria, the Meteoalarm colour code system and then

compared storm surge and tsunami messages. He concluded that generally, there are no conflict between meteorological and oceanographic community when information is disseminated in text bulletins. However, if visualization of tsunami information with low threat and no impact is yellow it will be in conflict to the standard use of colours in meteorological community.

Task Team on Documentation

65. The Co-Chairpersons Mr Brian McConnell and Mr Alessandro Amato reported on the progress in the development of a new Implementation Plan for NEAMTWS (see also discussion under [agenda item 4.6](#)).

66. The Task Team on Documentation also provided recommendations to the Task Team on Exercise on how to restructure the Exercise Manual into a more generic documents.

4.2 STATUS AND REPORTS FOR ESTABLISHMENT OF NATIONAL TSUNAMI WARNING CENTRES AND TSUNAMI SERVICE PROVIDERS

67. Tsunami Service Providers (TSPs), National Tsunami Warning Centres (NTWCs) and other centres supporting tsunami work provided detailed presentations available at the following links below.

NEAM Tsunami Service Providers (TSPs)

- [France \(CENALT\)](#), Mr François Schindelé
- [Italy \(INGV\)](#), Mr Alessandro Amato
- [Greece \(NOA\)](#), Mr Nikolaos Kalligeris
- [Turkey \(KOERI\)](#), Mr Öcal Necmioğlu

NEAM Candidate Tsunami Service Provider

- [Portugal \(IPMA\)](#), Mr Fernando Carrilho

NEAM National Tsunami Warning Centres /National Efforts

- [Romania \(NIEP\)](#), Mr Constantin Ionescu
- [Spain](#), Ms Elena Tel
- [Morocco](#), Mr Naccer Jabour

4.3 REPORTS BY CIVIL PROTECTION AGENCIES/ORGANIZATIONS

68. The Civil Protection Agency of Italy reported on the recent tsunami related developments in Italy.

- [Italy](#), Mr Luigi D'Angelo

4.4 ACCREDITATION

69. Mr Alexander Rudloff provided a brief report on the accreditation of the Candidate Tsunami Service Provider in Portugal—Instituto Português do Mar e da Atmosfera (IPMA).

70. He noted that IPMA had applied for accreditation as a Tsunami Service Provider (TSP) in NEAMTWS region on 5 February 2019.

71. Following the ICG/NEAMTWS Steering Committee meeting, 21–22 March 2019, the Secretariat informed IPMA on 28 May 2019 that an Accreditation Team (AT) had been appointed to carry out the accreditation evaluation. The AT members and the timeline of the accreditation procedure were provided. The AT members constituted are listed below:
1. Adrienne Moseley, GA, JATWC, Australia
 2. Ahmet Yalciner, METU, Turkey
 3. Alessio Piatanesi, INGV, Italy
 4. Alexander Rudloff, GFZ, Germany
 5. François Schindele, CENALT, France
72. The AT had elected Alexander Rudloff as Chair of the Accreditation Team (AT).
73. IPMA was invited to prepare and submit the necessary documents by email by 14 June 2019 in accordance with the [Procedures for Accreditation of TSP](#).
74. The AT requested a two-week extension in order to carry out its work. A revised time line and road map was issued on 21 June 2019.
75. The actual evaluation was conducted between mid-June and mid-October 2019 by the members of the AT, reviewing the written reports submitted by IPMA. Two additional requests were answered in due time. In-depth discussions were carried out through telephone conferences on 14 June and 23 October 2019. The final statements were harmonized via email communication. The draft report was sent to the Candidate Tsunami Service Provider (CTSP) for consultation before submission to the ICG/NEAMTWS Chair and Secretariat.
76. The AT leader presented the [report of Accreditation Team for CTSP \(IPMA\)](#) first to the Steering Committee on the evening of before the ICG/NEAMTWS-XVI session for discussion and later to the ICG during this session.
77. Mr Alexander Rudloff reported that the AT accreditation was successful and a full upgrade of IPMA from CTSP to TSP was recommended.
78. The Group thanked Dr Alexander Rudloff and the members of the Accreditation Team for their hard work, and accepted the conclusions and recommendations of the AT, and acknowledged that the former CTSP (IPMA, Portugal) henceforth be referred to as NEAMTWS Tsunami Service Provider (TSP).
79. The Secretariat informed that a certificate of accreditation will be provided at the next IOC governing body meeting in Paris in 2020.
- 4.5 UPDATE ON NEAMTIC (IMPLEMENTATION PLAN)
80. Ms Marzia Santini [reported](#) on the NEAM Tsunami Information Centre Implementation Plan. Following the ICG/NEAMTWS-XV session, WG 4 was mandated to further analyze, and elaborate on an action plan for the redevelopment of the NEAMTIC website (phase 2 of the NEAMTIC Plan of Action proposal).
81. WG 4 will propose revised Terms of References for NEAMTIC. The Group is also developing a NEAMTIC vision, mission and strategic objectives. She outlined the strategic objectives, goals, target users, contents, functionalities and maintenance of NEAMTIC. She underlined the need to systematize existing knowledge and leverage available expertise and resources.

4.6 NEAMTWS DOCUMENTATION (STRATEGY AND IMPLEMENTATION PLAN)

82. The Co-Chairpersons Mr Brian McConnell and Mr Alessandro Amato reported on the progress regarding the continued development of a new [Strategy and Implementation Plan for NEAMTWS](#).

83. The draft structure of the Implementation Plan was presented. The document will include a brief NEAMTWS Strategy. Input from WGs and TTs have been sought. However, aside WG 4, other WGs and TTs have not provided the requested input to the draft NEAMTWS Strategy and Implementation Plan.

84. The ICG agreed that the TT on Documentation should prepare a draft NEAMTWS Strategy and Implementation Plan to be presented to the NEAMTWS Steering Committee meeting in April 2020, and final draft to be presented to the ICG/NEAMTWS-XVII session.

4.7 TSUNAMI ALERTS TO THE MARITIME COMMUNITY

85. Mr Thorkild Aarup reported on tsunami alerts to the maritime community. TOWS-WG has in collaboration and consultation with the IHO/IMO World-Wide Navigational Warning Service Sub-Committee (WWNWS-SC) developed a framework for providing tsunami alerts to the maritime community. Several actions were carried out and a final summary report from TOWS WG was prepared.

86. In February 2019, the [TOWS-WG-XII](#) approved the framework (see summary report from TOWS-WG-XII subsequently approved by the 30th IOC Assembly) for TSP Messages for the Maritime Community and requested the ICGs to consider the proposal for implementation in their respective basins (see IOC/TOWS-WG-XII/3 Appendix 4 to Annex IV).

87. He provided an outline of the proposed TSP Messages for the Maritime Community and an example of proposed messages. It is now for each ICG to discuss, decide and coordinate if and how alerts should be sent to respective NAVAREA coordinators in the area of service.

88. The ICG discussed the framework. No TSPs in NEAMTWS are presently ready to issue such alerts to the maritime community. ICG/NEAMTWS will closely follow implementation of the framework in other ICGs before considering starting such a service.

4.8 REPORTS ON PROJECTS RELATED TO NEAMTWS

AGITHAR Project

89. Mr Joern Beherens reported on the [AGITHAR COST Action Project](#).

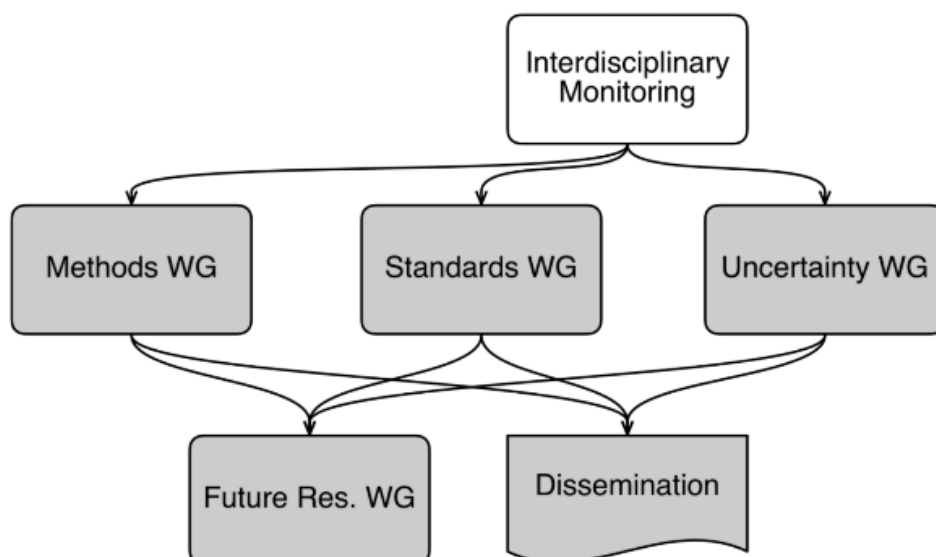
90. There is a need to gather scientific community around tsunami risk analysis in order to improve understanding of global, regional, and local tsunami hazard and risk. He highlighted that there is no clear strategy for evacuation, and preparedness. In particular there is a need to:

- assess, benchmark, improve and document methods to analyse tsunami hazard and risk;
- understand and communicate the uncertainty involved;
- interact with stakeholders to understand the societal needs;
- contribute to stakeholder's efforts to minimize losses.

91. The project will help in the following ways:
- understanding tsunami hazard and risk, as well as the processes that drive them;
 - facilitating compatibility and improving probabilistic tsunami hazard and risk analysis; methods via the development of standards, guidelines, methods, tools;
 - identification of key research questions;
 - developing regional and global reference probabilistic tsunami hazard and risk maps;
 - developing standardized processes for developing local hazard and risk analyses;
 - establishing reference pools of experts for completing and reviewing tsunami hazard; and risk assessments from stakeholders;
 - providing input and contribution to multi-hazard risk assessment with organizations covering other natural hazards;
 - facilitating interaction with stakeholders to ensure dissemination of results and uncertainty communication to non-scientists.

92. The key objectives of the project are to: produce an inventory of Probabilistic Tsunami Hazard Assessment (PTHA) and Probabilistic Tsunami Risk Analysis (PTRA) approaches; create performance metrics and test cases (benchmarks) for individual components of PTHA and PTRA workflow; structure for standardize PTHA and PTRA workflows; provide quality assurance for PTHA and PTRA; benchmark the interdisciplinary quality assessment; provide open access data repositories; implement at and disseminate PTHA and PTRA methods to stakeholders and end users.

93. Thirty-four partners from 20 countries have signed the Letter of Interest, and more partners are interested. Five Working Groups have been established as shown in the figure below:



94. Mr Joern Beherens informed the ICG that the next [AGITHAR meeting](#) is planned from 14 to 17 January 2020 in Rome at two different locations: Società Geografica Italiana (SGI) and National Institute of Geophysics and Volcanology (INGV).

Deep Globe Ocean-One Wave

95. Mr Mario Castro de Lera from the Deep Globe Ocean-One Wave [reported](#) on a new project initiative regarding tsunami confirmation using space technologies. OneWave project is aiming to complement and contribute to the improvement of the tsunami monitoring from space based **assets** for the confirmation of the position and amplitude of the tsunami waves. [OneWave](#) is using Satellite Altimetry data and advanced data analytics tools to monitor the Sea Surface Height and detect the signature of tsunamis generated by earthquakes and, potentially, by landslides and other similar events.

4.9 UPDATE ON THE EUROPEAN PLATE OBSERVING SYSTEM (EPOS)

96. Mr Alexander Rudloff, GFZ, [reported](#) on the key activities of [EPOS](#) in 2019. EPOS, the European Plate Observing System, is a long-term plan to facilitate integrated use of data, data products, and facilities from distributed research infrastructures for solid Earth science in Europe.

97. A Thematic Core Service (TCS) for Tsunami is under development and will be strongly connected to the TCS Seismology, TCS Volcano Observations, TCS GNSS Data and Products, TCS Near Fault Observatories, TCS Satellite Data. The EPOS platform will act as a test bed to foster development of new methods and technologies for NEAMTWS.

98. EPOS will liaise with IOC/UNESCO about possible sea level data integration.

99. For 2020 and beyond, EPOS will work on obtaining formal commitments (Letter of Interest) and feedbacks from institutions (e.g. CEA, GFZ etc.), as well as defining relationship between the AGITHAR COST Action and the EPOS/TCS TSUNAMI.

For the [EGU 2020](#), EPOS is drafting a Tsunami Community Position Paper with respect to EPOS-(ERIC) and is updating the mailing list.

100. The ICG highlighted the need for partners of EPOS to discuss and clarify what services and community activities the Thematic Core Service (TCS) for Tsunami is expecting to come up with. There is a need to establish a list of data and products required and then decide what could be made available to EPOS.

101. Mr Rudloff stressed that EPOS will not offer any real-time early warning services and has no intentions of replacing ICG/NEAMTWS.

4.10 REPORT BY OTHER INTERGOVERNMENTAL ORGANIZATIONS AND OBSERVERS

102. Mr Alessandro Annunziato reported on the activities of the Joint Research Center (JRC)/European Commission for the intersessional period.

103. He reported on the IDSL survey carried out in 2019 from the IDSL users in 20 countries. JRC received 17 survey replies. According to the survey, 87% of countries were satisfied to very satisfied with the IDSL devices. Ten Member States (62%) indicated that they will continue to operate and maintain IDSL at their own cost, however most countries (81%) indicated that the IDSL should be maintained and managed through a combination of national and external support.

104. JRC installed and is testing a floating GPS buoys in collaboration with I.S.P.R.A in the Ligurian Sea. It is measuring the sea level as the other IDSLs and providing 1 data point every 5 s (as the other IDSL devices). The data are collected in the TAD server:

https://webcritech.jrc.ec.europa.eu/TAD_server/Device/143

105. Mr Annunziato pointed out that it was both an opportunity and a challenge to install and operate such a large network of sea level devices. He thanked various countries who contributed to develop the IDSL network. JRC considers the activity on IDSL concluded, but will continue to maintain the latest installations for another year. JRC will continue hosting the data collection and dissemination. JRC will consider installing further devices only in subsequent phases of the Last Mile Project.
106. He informed that JRC is developing a new type of sea level measuring device, based on differential GPS receiver installed on a floating oceanographic buoy. The advantage, in regards to a traditional coastal tide gauge, is to have the measurement further from the coast allowing to monitor any sudden sea level changes before they reach the coast. The cost of the device is around € 45-50 K (€ 30 K for the cost of buoy, € 1 K for the instrumentation and € 10 K for the installation). He enquired if Member States would consider installing one of these devices at their own expenses.
107. He then [reported](#) on the Last Mile Projects implemented in Bodrum (Turkey) and Kos (Greece).
108. The project helped to develop procedures for local Tsunami Risk Assessment and Preparedness in Kos and Bodrum. A table-top exercise and a field exercise was carried out in Bodrum and Kos respectively on the 5 and 19 November 2019.
109. JRC invited all to a final Last Mile Phase 1 event to be held in Bruxelles in February 2020.
110. Mr Öcal Necmioğlu (KOERI, Turkey) expressed support towards development of a floating GPS buoy. However, he stressed that it has to be carried out under the framework of a project and with due consideration to maintenance of such devices.

5. PROGRAMME FOR 2020

5.1 ACTIVITIES AND ACTIONS FOR 2020

111. Actions and activities follow from adopted decisions and recommendations ([Annex II](#)).

5.2 NEAMWave20 Exercise

112. Based on the recommendations of TT on Exercise, the ICG decided to organise and conduct the fourth tsunami exercise on 2–4 November 2020.

5.3 ESTABLISHMENT OF INTERSSIONAL WORKING GROUPS AND TASK TEAMS

113. The ICG established the following Working Groups and Task Teams with Chairpersons/Co-Chairpersons as given below.
- **Working Group 1** - Hazard Assessment and Modelling - Co-chairs: [Mauricio González](#) (University of Cantabria, Spain) and [Audrey Gailler](#) (Commissariat à l'Énergie Atomique et aux Énergies Alternatives, France)
 - **Working Group 2 and 3** - Seismic, Geophysical and Sea Level Measurements - Co-chairs: [Anna von Gyldenfeldt](#) (Federal Maritime and Hydrographic Agency, Germany) and [Didem Cambaz](#) (Bogazici University Kandilli Observatory and Earthquake Research Institute, Turkey)

- **Working Group 4** - Public Awareness, Preparedness and Mitigation - Co-chairs: [Areti Plessa](#) (Institute of Geodynamics, National Observatory of Athens) and [Marzia Santini](#) (Department for Civil Protection, Italy)
- **Task Team on Tsunami Exercises** - Co-chairs: [Ceren Ozer Sözdinler](#) (Kandilli Observatory and Earthquake Research Institute, Turkey) and [Marinos Charalampakis](#) (Institute of Geodynamics, National Observatory of Athens, Greece)
- **Task Team on Operations** - Co-chairs: [Alessio Piatanesi](#) (Istituto Nazionale di Geofisica e Vulcanologia, Italy) and [Fernando Carrilho](#) (Instituto Português do Mar e da Atmosfera, Portugal)
- **Task Team on Documentation** - Co-chairs: [Brian McConnel](#) (Geological Survey Ireland, Ireland) and [Alessandro Amato](#) (Istituto Nazionale di Geofisica e Vulcanologia Roma, Italy)

6. ELECTIONS

114. Dr Alexander Rudloff, Chair of the Nominations Committee, provided a report to the ICG (see Decisions and Recommendations, Annex II, Annex 2).

115. In light of the report and recommendations, the ICG decided to postpone the elections of Chairperson and Vice-Chairperson to an extraordinary session of the ICG or via correspondence. The ICG further decided to extend the deadline for nominations till 28 February 2020.

7. DATE AND PLACE FOR ICG/NEAMTWS-XVI

116. Germany offered to host ICG/NEAMTWS-XVII session in Hamburg in 2020.

8. ANY OTHER BUSINESS

117. No other business was raised to be considered by the session.

9. ADOPTION OF DECISIONS AND RECOMMENDATIONS

118. The meeting reviewed the draft decisions and recommendations from the plenary and adopted them as in [Annex II](#).

10. CLOSING

119. The meeting was closed on Wednesday 4 December at 13:00.

ANNEX I

AGENDA

- 1. OPENING**
- 2. ORGANIZATION OF THE SESSION**
 - 2.1 ADOPTION OF THE AGENDA
 - 2.2 ESTABLISHMENT OF DRAFTING GROUP ON DRAFT DECISIONS AND RECOMMENDATIONS
 - 2.3 ESTABLISHMENT OF THE NOMINATIONS COMMITTEE AND CHAIR FOR ELECTIONS
 - 2.4 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION
 - 2.5 ESTABLISHMENT OF SESSIONAL COMMITTEES AND WORKING GROUPS
 - 2.6 ESTABLISHMENT OF SESSIONAL COMMITTEES AND WORKING/DRAFTING GROUPS
- 3. REPORTS ON ICG/NEAMTWS INTERSESSIONAL ACTIVITIES**
 - 3.1 REPORT BY THE CHAIRPERSON
 - 3.2 REPORT BY THE IOC SECRETARIAT ON ICG/NEAMTWS AND OCEAN DECADE
 - 3.3 REPORT BY THE WORKING GROUP ON TSUNAMIS AND OTHER HAZARD RELATED TO SEA-LEVEL WARNING AND MITIGATION SYSTEMS (TOWS-WG)
 - 3.4 REPORT BY OTHER ICGs
- 4. IMPLEMENTATION**
 - 4.1 REPORT BY THE WORKING GROUPS AND TASK TEAMS
 - 4.2 STATUS OF ESTABLISHMENT OF NATIONAL TSUNAMI WARNING CENTRES AND REPORTS BY (CANDIDATE) TSUNAMI SERVICE PROVIDERS (CTSP)
 - 4.3 REPORT BY CIVIL PROTECTION AGENCIES/ORGANIZATIONS
 - 4.4 CANDIDATE TSUNAMI SERVICE PROVIDER ACCREDITATION (IPMA)
 - 4.5 UPDATE ON NEAM TSUNAMI INFORMATION CENTRE (IMPLEMENTATION PLAN)
 - 4.6 NEAMTWS DOCUMENTATION (STRATEGY AND IMPLEMENTATION PLAN)
 - 4.7 TSUNAMI ALERTS TO THE MARITIME COMMUNITY
 - 4.8 REPORTS ON PROJECTS RELATED TO NEAMTWS (AGITHAR COST ACTION)
 - 4.9 UPDATE ON THE EUROPEAN PLATE OBSERVING SYSTEM (EPOS) TSUNAMI PLANS
 - 4.10 REPORT BY OTHER INTERGOVERNMENTAL ORGANIZATIONS AND OBSERVERS

5. PROGRAMME FOR 2020

5.1 ACTIVITIES SCHEDULED FOR 2020

5.2 NEAMWave 20 EXERCISE

5.3 ESTABLISHMENT OF INTERSESSIONAL WORKING GROUPS AND
TASK TEAMS

6. ELECTIONS

7. DATE AND PLACE FOR ICG/NEAMTWS-XVII

8. ANY OTHER BUSINESS

9. ADOPTION OF DECISIONS AND RECOMMENDATIONS

10. CLOSING

ANNEX II

DECISIONS AND RECOMMENDATIONS

Cannes, France, 2–4 December 2020

Decision ICG/NEAMTWS-XVI.1

The Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS),

Having met for its 16th Session in Cannes, France, 2–4 December 2019;

Having reviewed the progress made in the implementation of the NEAMTWS;

Acknowledges the achievements of the Instituto Português do Mar e da Atmosfera in Portugal to have met the functions and requirements for accreditation as a Tsunami Service Provider;

Expresses its thanks to the Chair of the Accreditation Teams (Dr Alexander Rudloff) and the members of the Accreditation Team for their work;

Recognizes the awareness raising efforts on tsunami hazards and preparedness by Member States during the intersessional period in line and as a contribution to World Tsunami Awareness Day, 5 November 2019;

Notes further the bilateral agreement concerning real time seismic data exchange between INGV (Italy) and KOERI (Turkey) in 2019;

Urges those Member States who have not yet subscribed through the IOC to the services of the TSPs to do so as soon as possible;

Requests the Executive Secretary to contact Member States:

- Who have not nominated or verified both Tsunami Warning Focal Points (TWFPs) and Tsunami National Contacts (TNCs),
- Who have not provided Tsunami Forecast Points (TFPs), and remind them to urgently do so;

Encourages the TSPs to finalize their work to produce a harmonized list of Tsunami Forecast Points (TFPs), including coastal zones of NEAMTWS where no officially communicated TFPs exist;

Takes note of Assembly [Decision IOC-XXX/8.2](#) concerning Tsunami and Other Coastal Hazards Warning Systems;

Acknowledges the Tsunami Exercises conducted in France, Greece, Israel, Italy and Turkey;

Notes the progress in the NEAM Region towards the establishment of a tsunami Thematic Core Service (TCS) within EPOS – The European Plate Observing System, and European Research Infrastructure Consortium (ERIC);

Notes the proposal of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG) in its 12th meeting during 21-22 February 2019 for the format, content, and dissemination of messages with tsunami guidance

specifically for ships on the high seas from the Tsunami Service Providers (TSPs) and will closely follow its implementation by other ICGs;

Acknowledges and will follow with interest the COST Action AGITHAR-Accelerating Global Science in Tsunami Hazard and Risk Analysis;

Requests the Co-Chairs of the Working Groups and of the Task Teams to prepare, in consultation with the members of their respective Working Groups or Task Teams, a plan of action for the intersessional period, and submit it to the IOC Secretariat no later than the end of January 2020;

Decides:

- (i) To continue the merged activities of Working Groups 2 and 3 in accordance to the revised Terms of Reference in Appendix 1;
- (ii) To continue the Task Team on Documentation according to the revised Terms of Reference in Appendix 2;
- (iii) To continue the Task Team on Tsunami Exercises according to the revised Terms of Reference in Appendix 3;
- (iv) To continue the activities of the Task Team on Operations according to the revised Terms of Reference in Appendix 4;
- (v) To continue the activities of the Steering Committee during the intersessional period;
- (vi) To request the Steering Committee to further reflect on the structure of ICG/NEAMTWS;
- (vii) To accept the conclusions and recommendations of the Accreditation Team and acknowledge that the former CTSPs (IPMA, Portugal) henceforth be referred to as NEAMTWS Tsunami Service Provider (TSP);
- (viii) To conduct NEAMWave20 within the first week of November 2020;
- (ix) Based on the recommendations of the Nominations Committee (Annex 2 to this decision) to:
 - postpone the elections for Chairperson and Vice-Chairpersons from ICG/NEAMTWS-XVI to an extraordinary session of the ICG or an election via written correspondence with sealed ballot envelopes. The elections should be executed as soon as possible, but no later than prior to the NEAMTWS Steering Committee meeting, planned for April 2020;
 - request the Secretariat to extend the deadline for filing nominations for chair and Vice-Chairs. This should be communicated by a circular letter from IOC to NEAM Member States;
 - nominations should be sent to the secretariat via diplomatic channels no later than 28 February 2020;
 - extend the term of the current chairperson and Vice-Chairpersons for an interim period of four months until 31 March 2020;

Recommends:

- (i) To increase the participation of Member States in the ICG activities, with particular focus on tsunami education, awareness and preparedness, and to continue to explore the adaptation of community preparedness and recognition programmes such as Tsunami Ready for the NEAM region, including Tsunami Hazard and Tsunami Evacuation Maps, Plans, and Procedures (TEMPP);
- (ii) TSPs, NTWCs, WGs/Member States provide key documents and reports to the IOC Secretariat at least one month before its next session;
- (iii) To make available the reports of TOWS-WG meetings to the TNCs and to the ICG/NEAMTWS Working Groups and Task Teams for review;

Further recommends:

- (i) That each TSP continues to provide alert level information based on their best practices, including (possibly different) decision matrices, scenario databases or other methods, these methodologies needing to be documented in the NEAMTWS Operational Users Guide;
- (ii) That TWFPs, in close connection with their NTWCs, if applicable, to develop SOPs in order to be able to handle diverging TSP warning messages as provided in the guidance document “Guidelines on TSP Messages Uncertainty” by Working Group 1 in 2017;
- (iii) That all sea level data should be made available to the TSPs and NTWCs using bilateral agreements, between NTWCs whenever possible;
- (iv) To increase the number of seismic and sea level stations available in the North of Africa, and for sea level, to increase sampling rate and reduce the latency to 1 minute or less as far as possible;
- (v) That Member States should encourage the active involvement of their national Civil Protection Authorities (CPAs);

Accepts Additional recommendations of Working Groups and Task Teams as outlined in Annex 1 to these decisions;

Acknowledges the draft strategic planning document for NEAMTIC (version 27 November 2019) as a guiding document for NEAMTIC;

Acknowledges the support of the European Commission (EC) and the Joint Research Centre (JRC) in capacity development, including infrastructure and research and new sea level instrumentation and provision of measurements, especially for the Last Mile Projects implemented in Kos (Greece) and Bodrum (Turkey) to address local tsunami warning, awareness, and mitigation;

Welcomes the offer of Germany of hosting ICG/NEAMTWS-XVII;

Thanks France, and particularly the municipality of Cannes, for hosting the Sixteenth Session of ICG/NEAMTWS.

Appendix 1 to Decisions and Recommendations ICG/NEAMTWS-XVI

**Terms of Reference for Working Group 2 and 3
(Seismic and Sea Level Measurements)**

Mandate

The working group will be responsible for:

- (i) Defining, based on existing organizations and functions, detection transnational networks, like seismic, geophysical and sea-level/marine networks as part of early warning tsunami detection instruments;
- (ii) Providing recommendations on the data processing and analysis;
- (iii) Providing a list of possible sea level stations for the NEAMTWS.

Appendix 2 to Decisions and Recommendations ICG/NEAMTWS-XVI

Terms of Reference of the ICG/NEAMTWS Task Team on Documentation

Mandate

The Task Team will:

- (i) Coordinate inputs from Tsunami Service Providers (TSPs), Working Groups and the Task Team on Operations and Technical Secretariat to produce the NEAMTWS Strategy and Implementation Plan;
- (ii) Analyse the NEAMWave20 Exercise Manual and provide comments and suggestions to the Task Team on Tsunami Exercises;
- (iii) Report to ICG/NEAMTWS Steering Committee in April 2020 and subsequent ICG/NEAMTWS-XVII.

Modus operandi

The Task Team will mainly work by correspondence, but will meet by teleconference as required.

Membership

- The ICG/NEAMTWS Officers;
- All TSP representatives;
- Co-Chairpersons of existing NEAMTWS Task Teams and Working Groups;
- Co-Chairpersons of the Task Team will be appointed by the ICG/NEAMTWS Chairperson in consultation with Vice-Chairpersons for a one-year term;
- Reappointed, if needed, on a rotational basis.

Appendix 3 to Decisions and Recommendations ICG/NEAMTWS-XVI

Terms of Reference of the ICG/NEAMTWS Task Team on Tsunami Exercise

Mandate

The Task Team will:

- (i) Work on the preparations of NEAMWave20 in cooperation with the exercise team members and the IOC Secretariat;
- (ii) Prepare the NEAMWave20 Exercise Manual and evaluation questionnaires in collaboration with Task Team on Documentation, Working Group 4, the exercise team and the IOC Secretariat;
- (iii) Support the IOC Secretariat in the preparation of an online systems for exercise subscription and evaluation.

Appendix 4 to Decisions and Recommendations ICG/NEAMTWS-XVI

Terms of Reference of the ICG/NEAMTWS Task Team on Operations

Mandate

The Task Team on Operations will facilitate improvements and harmonization of operational implementation of warning centres/systems through:

- (i) Continue to improve the Performance Monitoring Framework for NEAMTWS upstream components, based on the functions-requirements defined in the approved accreditation procedure and performance indicators developed for Communication Test Exercises;
- (ii) Advice on the modalities of operation, interoperability, methods and standards for the development and issuance of warnings, such as methods and reporting of magnitudes, and requirements in terms of coordination and operation of NEAMTWS;
- (iii) Foster and propose a technical solution for real-time data exchange among TSPs and possible new CTSPs;
- (iv) Evaluate the recommendations made by inter-ICG/TOWS Working Group on Tsunami Operation for possible implementation by ICG/NEAMTWS;
- (v) Advice on arrangements for redundancy and back-up arrangements;
- (vi) Support the Task Team on Documentation;
- (vii) Continue the assessment of the Global Service Definition Document and investigate its adaptability by the NEAMTWS, Report progress to ICG/NEAMTWS-XVII.

Modus operandi

The Task Team will mainly work by correspondence and if required, another one in preparation for the next ICG meeting.

Membership

- The ICG Officers;
- All TSP Representatives;
- NTWC, TWFP and CPA Representatives;
- Co-Chairpersons of existing NEAMTWS Task Teams and Working Groups;
- Co-Chairpersons of the Task Team will be appointed by the ICG/NEAMTWS Officers and will be reappointed on a rotational basis every year.

Annex 1 to Decisions and Recommendations ICG/NEAMTWS-XVI

Recommendations of Working Groups and Task Teams

Recommendations of Working Group 1 on Hazard Assessment and Modelling

- (i) To prepare for possible restructuring of WG 1 in line with recommendations by TT on Documentation;
- (ii) To elaborate in collaboration with TT on Operations on specific SOPs for cancellation of tsunami hazard in relation to different characteristics of local and remote source tsunami events.

Recommendations of Working Group 2 and 3 on Seismic, Geophysical and Sea level Measurements

- (i) Member States should use the online seismic (e.g. EIDA), GNSS network and Sea Level (JRC) repositories as a reference for station availability;
- (ii) Cooperation of the Member States with the JRC, in order to access real time sea level data for tsunami operations or through bilateral agreements between Member States;
- (iii) Member States to explore and support initiatives regarding ocean bottom platforms, as a possible supplementary way for network coverage improvement;
- (iv) Support the IOC Secretariat intention to explore possible high level approaches to data exchange from tsunami detection network in N-African countries, along with active engagement (e.g. workshops, technical visits etc.) in order to encourage their involvement and contribution in the NEAMTWS operations.

Recommendations of Working Group 4 on Public Awareness, Preparedness and Mitigation

- (i) Further elaborate on a plan of action for the redevelopment of the NEAMTIC website, (sections, contents and information);
- (ii) Further analyse and provide feedback on the “Standard Guidelines for the Tsunami Ready Recognition Programme” and suggested logo in view of "Tsunami Ready" Pilot programme meeting (Paris, 17 February 2020);

- (iii) Include on NEAMTIC web-page any public tsunami event reports from the region produced;
- (iv) Plan and support opportunities for implementing training activities back-to-back with IOC information meetings / workshops on NEAMTWS;
- (v) Identify a partner institution/organization for the implementation of NEAMTIC website redevelopment.

Recommendations of the Task Team on Documentation

- (i) Continue coordinating inputs from TSPs, Working Groups and the Task Team on Operations to update the NEAMTWS documentation;
- (ii) Organise at least one video conference with TSPs, WGs and TTs to discuss progress with the documents;
- (iii) Prepare drafts of the NEAMTWS Strategy and Implementation Plan to be presented to the NEAMTWS Steering Committee meeting scheduled in April 2020, and full documents to be presented to ICG/NEAMTWS-XVII.

Recommendations of the Task Team on Tsunami Exercises

- (i) Establish a tsunami exercise team to support the preparations of NEAMWave20;
- (ii) Prepare one single and two joint scenarios in NEAMWave20 that will be implemented during three consecutive days;
- (iii) Request the submission of exercise scenario documents from TSPs by end of January 2020;
- (iv) Prepare the exercise documents (exercise manual, subscription forms, evaluation questionnaires and other related documents) in accordance with the feedback from NEAMWave20 exercise team;
- (v) Conduct NEAMWave20 on the first week of November 2020, before the World Tsunami Awareness Day, preferably on 2nd, 3rd and 4th of November 2020;
- (vi) Organize an online meeting in February 2020 with CPAs representatives;
- (vii) Develop a one-page information document for CPAs describing implementation of Phase B;
- (viii) Secretariat to prepare a concept information paper to inform CPAs about the general concept of NEAMWave20;
- (ix) Invite DG-ECHO to participate in NEAMWave20 exercise team;
- (x) Organise an online meeting with DG-ECHO representatives with the participation of WG 4 co-chairs and the IOC Secretariat to discuss their perspective and how to increase participation of countries in NEAMWave20 Phase C;

- (xi) Consider variation of exercise messages distributed by two different TSPs for a joint scenario in order to simulate the situation in a real tsunami case (“WG 1 Guidelines on TSP Messages Uncertainty” will be provided in the Supplement as an example).

Recommendations of the Task Team on Operations

- (i) Validate TWFPs contact details prior to NEAMWave20;
- (ii) Ensure diversity in the tsunami exercise messages (magnitudes, observations) in order to simulate what happens in a real case;
- (iii) In the announcement of the NEAMWave20, recipients should check their GTS filters (message headers) in order not to discard relevant messages;
- (iv) Provide feedback to the Steering Committee on the global KPI recommendation from PTWS;
- (v) Request TSPs to fill table of existing KPI proposed for the NEAM region;
- (vi) Encourage real-time and reliable exchange of data (e.g. CENALT, IPMA, IGN, and GFZ);
- (vii) Provide support to the NEAMWave20;
- (viii) Provide inputs to the TT on documentation;
- (ix) Report to the Steering Committee and to ICG/NEAMTWS Session.

Annex 2 to Decisions and Recommendations ICG/NEAMTWS-XVI

Report of the Nomination Committee

Chair of Nominations Committee (NC): Dr Alexander Rudloff, Germany.

Members of Nominations Committee: Dr Marzia Santini, Italy; Prof. Ahmet C. Yalciner, Turkey.

Information to the ICG

- The deadline for nominations ended on 2nd December 2019, 1700 CET;
- The NC informs the ICG that two nominations for chair were received via the official and formal channels through the permanent delegations at UNESCO in Paris, for Prof. Costas Synolakis from Greece, seconded by Cyprus and Egypt, and for Prof. Maria Ana Baptista from Portugal, seconded by France and Sweden, and forwarded by the permanent delegations to UNESCO;
- The NC is aware of one nomination for Vice-Chair, which so far has not passed the official channels, for Dr Öcal Necmioglu from Turkey, seconded by France and Germany.

Reflection of the Nominations Committee

The Nominations Committee has reflected the procedure of nominations. At this stage, there are two valid nominations for chair, but none for vice-chair available.

Recommendations of the Nominations Committee to the ICG

Given the current situation, the Nominations Committee,

- Recommends to the ICG to postpone the elections for chair and vice-chairs from ICG/NEAMTWS-XVI to an extraordinary session of the ICG or an election via written correspondence with sealed ballot envelopes. The elections should be executed as soon as possible but no later than prior to the NEAMTWS Steering Committee meeting, planned for March 2020;
- Recommends to the ICG to extend the deadline for filing nominations for chair and Vice-Chairs. Nominations should be sent to the Secretariat no later than 31st January 2020. This should be communicated by a circular letter from IOC to NEAM Member States;
- Recommends to extend the term of the current chair and Vice-Chairs for an interim period of three months until 29th February 2020. The NC stands ready to assist the procedure as described above.

ANNEX III

OPENING ADDRESS

Mr Thorkild Aarup

Head Tsunami Unit, UNESCO/IOC, Paris, France

On behalf of Vladimir Ryabinin, Executive Secretary of IOC I am very happy to welcome you to the 16th session of the Intergovernmental Coordination Group for NEAMTWS.

Avant commencer je souhaite remercier Madame la Député-Maire, la Ville de Cannes, la Gare Maritime, vos collègues, Monsieur Francois Schindelé CENALT, et Madame Emilie Crochet du Ministère de l'Intérieur, pour leur soutien et la subvention accordée à cette réunion.

We are very happy to have the session here in Cannes. Cannes have taken steps to mitigate tsunamis. It has carried out two Tsunami exercises, adopted a comprehensive risk information document for its inhabitants (that also include a section on Tsunami). Lately a charter for a set of city employee concerning Tsunami risks and inundation. Many of these efforts represents a first among municipalities in France and Cannes is a beacon or pilot town in that respect.

We are a few days away from the 15th commemoration of the Indian Ocean Tsunami that killed about 230,000. The event triggered the development of a Global Tsunami Warning System. The IOC had coordinated the Pacific Tsunami Warning System and Member states decided that similar systems be developed in the Indian Ocean, Caribbean, and the NE Atlantic, Mediterranean and connected seas. Member states have responded with national investments and the three regional systems are now operational. In NEAMTWS there are four (and soon be five Tsunami Service Providers) that send out alerts to nations. Tsunamis have been observed in the NEAM region – 4 alone in the last about three years. And many more Tsunami alerts have been sent out following earthquake events.

In NEAMTWS, much focus and investment have gone towards upstream elements of the system.

Challenges remain.

Awareness of the Tsunami threat in the NEAM region is still limited. But the near field events we have observed in the NEAM region (and outside the NEAM regions) highlight the need for awareness, education and self-evacuation. There is still uneven participation among nations, and there is uneven participation from the Civil Protection Agencies.

As NEAMTWS has now reached a major milestone with five TSPs operationally it is an opportune time to set its direction for the future. In that context a medium term strategy and implementation plan is important.

There are other key items on the agenda, including how to strengthen awareness and preparedness. In the Caribbean and Indian Ocean, performance based community recognition programs (Tsunami Ready) have gained traction. Is there scope for this in the NEAM region?

The session will also discuss the plans for the NEAMWave20 Tsunami Exercise wave. Wave exercises are important for the NEAMTWS community, but they also offer major opportunity for societal outreach.

Let me end by drawing attention to a paper published four weeks ago. It is authored by Scott A. Kulp & Benjamin H. Strauss titled "New elevation data triple estimates of global vulnerability to sea-level rise and coastal flooding Exposure".

It was picked up by many newspapers including *Le Figaro*, *Le Monde*, *New York Times*...

The title says it very clearly. While numbers vary between countries in the NEAM region, a quick look at the maps indicate that the triple estimates also appear to hold for NEAM region

The abstract also provides sobering facts quoting:

We estimate one billion people now occupy land less than 10 m above current high tide lines, including 250 M below 1 m.

These sobering numbers underline the need to strengthen resilience of coastal communities.

ANNEX IV

LIST OF DOCUMENTS

Agenda Item	Document Title and Link
2.5	ICG/NEAMTWS-XVI Time Table
3.1	Report by ICGNEAMTWS Chair
3.2	Report by IOC Secretariat
3.3	Chair Report on TOWS-WG 12
4.1	Report on Intersessional Activities of Working Group 1
4.1	Report on Intersessional Activities Working Group 2 and 3
4.1	Report on Intersessional Activities Working Group 4
4.1	Report on Task Team on Exercise
4.1	Report on Task Team on Documentation
4.1	Report on Task Team on Operations
4.2	Status CENALT TSP France
4.2	Status IPMA CTSP Portugal
4.2	Status CAT-INGV TSP Italy
4.2	Status KOERI TSP Turkey
4.2	Status NOA TSP Greece
4.2	Romania (NIEP)
4.2	Morocco
4.2	Storm Surge Study
4.3	CPD Italy
4.3	CP and Tsunami Early Warning in Spain
4.4	Portugal IPMA Accreditation Report

Agenda Item	Document Title and Link
4.5	<u>NEAMTIC Strategic Planning Proposal</u>
4.7	<u>Tsunami Alerts to the Tsunami Community</u>
4.8	<u>COST Action CA18109 AGITHAR Accelerating Global science In Tsunami Hazard And Risk analysis</u>
4.9	<u>Update on EPOS</u>
4.10	<u>Tsunami Confirmation Using Space Technologies</u>
4.10	<u>Joint Research Center Activities</u>

ANNEX V

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ANNEX VI

LIST OF ACRONYMS

AGITHAR	Accelerating Global science In Tsunami Hazard And Risk analysis
ASTARTE	Assessment, STrategy And Risk Reduction for Tsunamis in Europe
CEA	Commissariat à l'énergie atomique et aux énergies alternatives (France)
CENALT	CENtre d'Alerte aux Tsunamis, France
CPA	Civil Protection Authority
CTE	Communication Test Exercise
CTSP	Candidate Tsunami Service Provider
DG-ECHO	Directorate-General of the European Commission's Humanitarian Aid Office
EGU	European Geoscience Union
EMSO	European Multidisciplinary Seafloor and water column Observatory
EPOS	European Plate Observing System
ERCC	Emergency Response and Coordination Center
GFZ	German Research Centre for Geosciences
GNSS	Global Navigation Satellite System
GSDD	Global Service Definition Document
ICG	Intergovernmental Coordination Group
ICG/NEAMTWS	Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas
INGV	Istituto Nazionale di Geofisica e Vulcanologia, Italy
IOC	Intergovernmental Oceanographic Commission (UNESCO)
IPMA	Instituto Português do Mar e da Atmosfera (Portugal)
JRC	Joint Research Centre
KOERI	Kandilli Observatory and Earthquake Research, Turkey
MBSHC	Mediterranean and Black Seas Hydrographic Commission

METU	Middle East Technical University, Turkey
MHEWC	Multi-Hazard Early Warning Conference
NEAM	North-Eastern Atlantic, the Mediterranean and Connected Seas
NEAMTIC	Tsunami Information Centre for the North-Eastern Atlantic, the Mediterranean and Connected Seas
NIEP	National Institute for Earth Physics, Romania
NOA	National Observatory of Athens, Greece
NTWC	National Tsunami Warning Centre
OUG	Operational Users Guide
PTHA	Probability Tsunami Hazard Assessment
PTRA	Probabilistic Tsunami Risk Assessment
SOP	Standard Operating Procedure
TCS	Thematic Core Service
TEMPP	Tsunami Evacuation Maps, Plans, and Procedures
TNC	Tsunami National Contact
ToR	Terms of Reference
TOWS-WG	Working Group on Tsunamis and Other Hazards related to Sea-Level Warning and Mitigation Systems
TSP	Tsunami Service Provider
TT	Task Team
TWFP	Tsunami Warning Focal Point
UNESCO	United Nations Educational, Scientific and Cultural Organization
WG	Working Group

In this Series	Languages
Reports of Governing and Major Subsidiary Bodies , which was initiated at the beginning of 1984, the reports of the following meetings have already been issued:	
1. Eleventh Session of the Working Committee on international Oceanographic Data Exchange	E, F, S, R
2. Seventeenth Session of the Executive Council	E, F, S, R, Ar
3. Fourth Session of the Working Committee for Training, Education and Mutual Assistance	E, F, S, R
4. Fifth Session of the Working Committee for the Global Investigation of Pollution in the Marine Environment	E, F, S, R
5. First Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions	E, F, S
6. Third Session of the <i>ad hoc</i> Task team to Study the Implications, for the Commission, of the UN Convention on the Law of the Sea and the New Ocean Regime	E, F, S, R
7. First Session of the Programme Group on Ocean Processes and Climate	E, F, S, R
8. Eighteenth Session of the Executive Council	E, F, S, R, Ar
9. Thirteenth Session of the Assembly	E, F, S, R, Ar
10. Tenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific	
11. Nineteenth Session of the Executive Council, Paris, 1986	E, F, S, R, Ar
12. Sixth Session of the IOC Scientific Committee for the Global Investigation of Pollution in the Marine Environment	E, F, S
13. Twelfth Session of the IOC Working Committee on International Oceanographic Data Exchange	E, F, S, R
14. Second Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, Havana, 1986	E, F, S
15. First Session of the IOC Regional Committee for the Central Eastern Atlantic, Praia, 1987	E, F, S
16. Second Session of the IOC Programme Group on Ocean Processes and Climate	E, F, S
17. Twentieth Session of the Executive Council, Paris, 1987	E, F, S, R, Ar
18. Fourteenth Session of the Assembly, Paris, 1987	E, F, S, R, Ar
19. Fifth Session of the IOC Regional Committee for the Southern Ocean	E, F, S, R
20. Eleventh Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Beijing, 1987	E, F, S, R
21. Second Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Arusha, 1987	E, F
22. Fourth Session of the IOC Regional Committee for the Western Pacific, Bangkok, 1987	E only
23. Twenty-first Session of the Executive Council, Paris, 1988	E, F, S, R
24. Twenty-second Session of the Executive Council, Paris, 1989	E, F, S, R
25. Fifteenth Session of the Assembly, Paris, 1989	E, F, S, R
26. Third Session of the IOC Committee on Ocean Processes and Climate, Paris, 1989	E, F, S, R
27. Twelfth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Novosibirski, 1989	E, F, S, R
28. Third Session of the Sub-Commission for the Caribbean and Adjacent Regions, Caracas, 1989	E, S
29. First Session of the IOC Sub-Commission for the Western Pacific, Hangzhou, 1990	E only
30. Fifth Session of the IOC Regional Committee for the Western Pacific, Hangzhou, 1990	E only
31. Twenty-third Session of the Executive Council, Paris, 1990	E, F, S, R
32. Thirteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, New York, 1990	E only
33. Seventh Session of the IOC Committee for the Global Investigation of Pollution in the Marine Environment, Paris, 1991	E, F, S, R
34. Fifth Session of the IOC Committee for Training, Education and Mutual Assistance in Marine Sciences, Paris, 1991	E, F, S, R
35. Fourth Session of the IOC Committee on Ocean Processes and Climate, Paris, 1991	E, F, S, R
36. Twenty-fourth Session of the Executive Council, Paris, 1991	E, F, S, R
37. Sixteenth Session of the Assembly, Paris, 1991	E, F, S, R, Ar
38. Thirteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Baja California, 1991	E, F, S, R
39. Second Session of the IOC-WMO Intergovernmental WOCE Panel, Paris, 1992	E only
40. Twenty-fifth Session of the Executive Council, Paris, 1992	E, F, S, R
41. Fifth Session of the IOC Committee on Ocean Processes and Climate, Paris, 1992	E, F, S, R
42. Second Session of the IOC Regional Committee for the Central Eastern Atlantic, Lagos, 1990	E, F
43. First Session of the Joint IOC-UNEP Intergovernmental Panel for the Global Investigation of Pollution in the Marine Environment, Paris, 1992	E, F, S, R
44. First Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms, Paris, 1992	E, F, S
45. Fourteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Paris, 1992	E, F, S, R
46. Third Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Vascoas, 1992	E, F
47. Second Session of the IOC Sub-Commission for the Western Pacific, Bangkok, 1993	E only
48. Fourth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, Veracruz, 1992	E, S
49. Third Session of the IOC Regional Committee for the Central Eastern Atlantic, Dakar, 1993	E, F
50. First Session of the IOC Committee for the Global Ocean Observing System, Paris, 1993	E, F, S, R
51. Twenty-sixth Session of the Executive Council, Paris, 1993	E, F, S, R
52. Seventeenth Session of the Assembly, Paris, 1993	E, F, S, R
53. Fourteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Tokyo, 1993	E, F, S, R
54. Second Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms, Paris, 1993	E, F, S
55. Twenty-seventh Session of the Executive Council, Paris, 1994	E, F, S, R
56. First Planning Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Melbourne, 1994	E, F, S, R
57. Eighth Session of the IOC-UNEP-IMO Committee for the Global Investigation of Pollution in the Marine Environment, San José, Costa Rica, 1994	E, F, S
58. Twenty-eighth Session of the Executive Council, Paris, 1995	E, F, S, R
59. Eighteenth Session of the Assembly, Paris, 1995	E, F, S, R
60. Second Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1995	E, F, S, R

61.	Third Session of the IOC-WMO Intergovernmental WOCE Panel, Paris, 1995	E only
62.	Fifteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Papete, 1995	E, F, S, R
63.	Third Session of the IOC-FAO Intergovernmental Panel on Harmful Algal Blooms, Paris, 1995	E, F, S
64.	Fifteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange	E, F, S, R
65.	Second Planning Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1995	E only
66.	Third Session of the IOC Sub-Commission for the Western Pacific, Tokyo, 1996	E only
67.	Fifth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, Christ Church, 1995	E, S
68.	Intergovernmental Meeting on the IOC Black Sea Regional Programme in Marine Sciences and Services	E, R
69.	Fourth Session of the IOC Regional Committee for the Central Eastern Atlantic, Las Palmas, 1995	E, F, S
70.	Twenty-ninth Session of the Executive Council, Paris, 1996	E, F, S, R
71.	Sixth Session for the IOC Regional Committee for the Southern Ocean and the First Southern Ocean Forum, Bremerhaven, 1996	E, F, S,
72.	IOC Black Sea Regional Committee, First Session, Varna, 1996	E, R
73.	IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Fourth Session, Mombasa, 1997	E, F
74.	Nineteenth Session of the Assembly, Paris, 1997	E, F, S, R
75.	Third Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1997	E, F, S, R
76.	Thirtieth Session of the Executive Council, Paris, 1997	E, F, S, R
77.	Second Session of the IOC Regional Committee for the Central Indian Ocean, Goa, 1996	E only
78.	Sixteenth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific, Lima, 1997	E, F, S, R
79.	Thirty-first Session of the Executive Council, Paris, 1998	E, F, S, R
80.	Thirty-second Session of the Executive Council, Paris, 1999	E, F, S, R
81.	Second Session of the IOC Black Sea Regional Committee, Istanbul, 1999	E only
82.	Twentieth Session of the Assembly, Paris, 1999	E, F, S, R
83.	Fourth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 1999	E, F, S, R
84.	Seventeenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Seoul, 1999	E, F, S, R
85.	Fourth Session of the IOC Sub-Commission for the Western Pacific, Seoul, 1999	E only
86.	Thirty-third Session of the Executive Council, Paris, 2000	E, F, S, R
87.	Thirty-fourth Session of the Executive Council, Paris, 2001	E, F, S, R
88.	Extraordinary Session of the Executive Council, Paris, 2001	E, F, S, R
89.	Sixth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions, San José, 1999	E only
90.	Twenty-first Session of the Assembly, Paris, 2001	E, F, S, R
91.	Thirty-fifth Session of the Executive Council, Paris, 2002	E, F, S, R
92.	Sixteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Lisbon, 2000	E, F, S, R
93.	Eighteenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Cartagena, 2001	E, F, S, R
94.	Fifth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 2001	E, F, S, R
95.	Seventh Session of the IOC Sub-commission for the Caribbean and Adjacent Regions (IOCARIBE), Mexico, 2002	E, S
96.	Fifth Session of the IOC Sub-Commission for the Western Pacific, Australia, 2002	E only
97.	Thirty-sixth Session of the Executive Council, Paris, 2003	E, F, S, R
98.	Twenty-second Session of the Assembly, Paris, 2003	E, F, S, R
99.	Fifth Session of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean, Kenya, 2002 (* Executive Summary available separately in E, F, S & R)	E*
100.	Sixth Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, St. Petersburg (USA), 2002 (* Executive Summary available separately in E, F, S & R)	E*
101.	Seventeenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Paris, 2003 (* Executive Summary available separately in E, F, S & R)	E*
102.	Sixth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 2003 (* Executive Summary available separately in E, F, S & R)	E*
103.	Nineteenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific, Wellington, New Zealand, 2003 (* Executive Summary available separately in E, F, S & R)	E*
104.	Third Session of the IOC Regional Committee for the Central Indian Ocean, Tehran, Islamic Republic of Iran, 21-23 February 2000	E only
105.	Thirty-seventh Session of the Executive Council, Paris, 2004	E, F, S, R
106.	Seventh Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, 2005 (* Executive Summary available separately in E, F, S & R); and Extraordinary Session, Paris, 20 June 2005	E*
107.	First Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), Perth, Australia, 3-5 August 2005	E only
108.	Twentieth Session of the Intergovernmental Coordination Group for the Tsunami Warning System in the Pacific, Viña del Mar, Chile, 3-7 October 2005 (* Executive Summary available separately in E, F, S & R)	E*
109.	Twenty-Third Session of the Assembly, Paris, 21-30 June 2005	E, F, S, R
110.	First Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS), Rome, Italy, 21-22 November 2005	E only
111.	Eighth Session of the IOC Sub-commission for the Caribbean and Adjacent Regions (IOCARIBE), Recife, Brazil, 14-17 April 2004 (* Executive Summary available separately in E, F, S & R)	E*
112.	First Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions (ICG/CARIBE-EWS), Bridgetown, Barbados, 10-12 January 2006	E only
113.	Ninth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE), Cartagena de Indias, Colombia, 19-22 April 2006 (* Executive Summary available separately in E, F, S & R)	E S*

114.	Second Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), Hyderabad, India, 14–16 December 2005	E only
115.	Second Session of the WMO-IOC Joint Technical Commission for Oceanography and Marine Meteorology, Halifax, Canada, 19–27 September 2005 (Abridged final report with resolutions and recommendations)	E, F, R, S
116.	Sixth Session of the IOC Regional Committee for the Western Indian Ocean (IOCWIO), Maputo, Mozambique, 2–4 November 2005 (* Executive Summary available separately in E, F, S & R)	E*
117.	Fourth Session of the IOC Regional Committee for the Central Indian Ocean, Colombo, Sri Lanka 8–10 December 2005 (* Executive Summary available separately in E, F, S & R)	E*
118.	Thirty-eighth Session of the Executive Council, Paris, 20 June 2005 (Electronic copy only)	E, F, R, S
119.	Thirty-ninth Session of the Executive Council, Paris, 21–28 June 2006	E, F, R, S
120.	Third Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), Bali, Indonesia, 31 July–2 August 2006 (*Executive Summary available separately in E,F,S & R)	E*
121.	Second Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS), Nice, France, 22–24 May 2006	E only
122.	Seventh Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, Paris, France, 16–18 March 2005 (* Executive Summary available separately in E, F, S & R)	E*
123.	Fourth Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS-IV), Mombasa, Kenya, 30 February-2 March 2007 (* Executive Summary available separately in E, F, S & R)	E*
124.	Nineteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Trieste, Italy, 12–16 March 2007 (* Executive Summary available separately in E, F, S & R)	E*
125.	Third Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Bonn, Germany, 7–9 February 2007 (* Executive Summary available separately in E, F, S & R)	E*
126.	Second Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Cumaná, Venezuela, 15–19 January 2007 (* Executive Summary available separately in E, F, S & R)	E*
127.	Twenty-first Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Melbourne, Australia, 3–5 May 2006 (* Executive Summary available separately in E, F, S & R)	E*
128.	Twenty-fourth Session of the Assembly, Paris, 19–28 June 2007	E, F, S, R
129.	Fourth Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Lisbon, Portugal, 21–23 November 2007 (* Executive Summary available separately in E, F, S & R)	E*
130.	Twenty-second Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Guayaquil, Ecuador, 17–21 September 2007 (* Executive Summary available in E, F, S & R included)	E*
131.	Forty-first Session of the Executive Council, Paris, 24 June–1 July 2008	E, F, R, S
132.	Third Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Panama City, Panama, 12–14 March 2008 (* Executive Summary available separately in E, F, S & R)	E*
133.	Eighth Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, Paris, France, 17–20 April 2007 (* Executive Summary available separately in E, F, S & R)	E*
134.	Twenty-third Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Apia, Samoa, 16–18 February 2009 (*Executive Summary available separately in E, F, S & R)	E*
135.	Twentieth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Beijing, China, 4–8 May 2009 (*Executive Summary available separately in E, F, S & R)	E*
136.	Tenth Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE), Puerto La Cruz, Bolivarian Republic of Venezuela, 22–25 October 2008 (*Executive Summary available separately in E, F, S & R)	E, S*
137.	Seventh Session of the IOC Sub-Commission for the Western Pacific (WESTPAC-VII), Sabah, Malaysia, 26–29 May 2008 (*Executive Summary available separately in E, F, S & R)	E*
138.	Ninth Session of the IOC-WMO-UNEP Committee for the Global Ocean Observing System, Paris, France, 10–12 June 2009 (* Executive Summary available separately in E, F, S & R);	E*
139.	Fifth Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Athens, Greece, 3–5 November 2008 (* Executive Summary available separately in E, F, S & R)	E*
140.	Fourth Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Fort-de-France, Martinique, France, 2–4 June 2009 (* Executive Summary available separately in E, F, S & R)	E*
141.	Twenty-fifth Session of the Assembly, Paris, 16–25 June 2009	E, F, R, S
142.	Third Session of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology, Marrakesh, Morocco, 4–11 November 2009	E, F, R, S
143.	Ninth Session of the IOC Intergovernmental Panel on Harmful Algal Blooms, Paris, France, 22–24 April 2009 (* Executive Summary available separately in E, F, S & R)	E*
144.	Fifth Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Managua, Nicaragua, 15–17 March 2010 (* Executive Summary available in E, F, S & R)	E*
145.	Sixth Session of the IOC Regional Committee for the Central and Eastern Atlantic Ocean, Accra, Ghana, 28–30 March 2010 (* Executive Summary available in E, F, S & R)	E*
146.	Forty-second Session of the Executive Council; Paris, 15, 19 & 20 June 2009	E, F, R, S
147.	Forty-third Session of the Executive Council; Paris, 8–16 June 2010	E, F, R, S
148.	Sixth Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Istanbul, Turkey, 11–13 November 2009 (* Executive Summary available separately in Ar, E, F, S & R)	E*
149.	Seventh Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, Paris, France, 23–25 November 2010 (* Executive Summary available separately in Ar, E, F, S & R)	E*
150.	Sixth Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Santo Domingo, Dominican Republic, 26–29 April 2011 (* Executive Summary available in E, F, S & R)	E*

151.	Twenty-fourth Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System, Beijing, China, 24–27 May 2011 (*Executive Summary in E, F, S & R included)	E*
152.	Twenty-first Session of the IOC Committee on International Oceanographic Data and Information Exchange, Liège, Belgium, 23–26 March 2011 (*Executive Summary available separately in E, F, S & R)	E*
153.	Eighth Session of the IOC Sub-Commission for the Western Pacific (WESTPAC-VIII), Bali, Indonesia, 10–13 May 2010 (*Executive Summary available separately in E, F, S & R)	E*
154.	Tenth IOC Intergovernmental Panel on Harmful Algal Blooms, Paris, France, 12–14 April 2011 (* Executive Summary available separately in E, F, S & R)	E*
155.	Forty-fifth Session of the Executive Council, Paris, 26–28 June 2012 (* Decisions available in E, F, S & R)	E*
156.	Seventh Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions, Willemstad, Curacao, 2–4 April 2012 (*Executive Summary available in E, F, S & R)	E*
157.	Eleventh Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE), Miami, USA, 17–20 May 2011 (*Executive Summary available separately in E & S)	E, S*
158.	Eight Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS-VIII), Trinidad & Tobago, 29 April–1 May 2013 (*Executive Summary available in E, F, S & R)	E*
159.	Twenty-seventh Session of the Assembly, Paris, 26 June–5 July 2013 and Forty-sixth Session of the Executive Council, Paris, 25 June 2013	E, F, R, S
160.	Twenty-fifth Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS), Vladivostok, Russian Federation, 9–11 September 2013 (*Executive Summary in E, F & R)	E*
161.	Ninth Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions, US Virgin Islands, 13-15 May 2014 (*Executive Summary available in E, F, S & R)	E*
162.	Forty-seventh Session of the Executive Council, Paris, 1–4 July 2014 (* Decisions available in E, F, S & R)	E*
163.	Ninth Session of the IOC Sub-Commission of the Western Pacific (WESTPAC-IX), Busan, Republic of Korea, 9–12 May 2012	E
164.	Eleventh Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and Connected Seas, 12–14 November 2014, Nicosia, Cyprus (*Executive Summary available in E, F, S & R)	E*
165.	Twenty-sixth Session of the Intergovernmental Coordination Group for the for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS-XXVI), Hawaii, USA, 22–24 April 2015 (*Executive Summary available in E, F, S & R)	E*
166.	Tenth Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS), Philipsburg, Sint Maarten, Kingdom of the Netherlands, 19–21 May 2015 (*Executive Summary available in E, F, S & R)	E*
167.	Tenth Session of the IOC Sub-Commission of the Western Pacific (WESTPAC-X), Phuket, Thailand, 12–15 May 2015	E
168.	Twenty-eighth Session of the Assembly, Paris, 18–25 June 2015	
169.	Twelfth 12th Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North-eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS-XII), Dublin, Ireland, 16-18 November 2015 (*Executive Summary available in E, F, S & R)	E*
170.	Eleventh Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS-XI), Cartagena, Colombia, 5-7 April 2016 (*Executive Summary available in E, F, S & R)	E*
171.	Tenth Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS), Muscat, Oman, 24–26 March 2015	E*
172.	Forty-ninth Session of the Executive Council, Paris, 7–10 June 2016 (* Decisions available in E, F, S & R)	E*
173.	Thirteenth Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions, Bucharest, Romania, 26–28 September 2016 (*Executive Summary available in E, F, S & R)	E*
174.	Twenty-seventh Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS-XXVII), Tahiti, France, 28-31 March 2017 (*Executive Summary available in E, F, S & R)	E*
175.	Twelfth Session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS), Puntarenas, Costa Rica, 10–12 May 2017 (*Executive Summary available in E, F, S & R)	E*
176.	Eleventh Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS), Putrajaya, Malaysia, 18–20 April 2017 (*Executive Summary available in E, F, S & R)	E*
177.	Fourteenth Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North-eastern Atlantic, the Mediterranean and connected seas (ICG/NEAMTWS), Lisbon, Portugal, 21–23 November 2017 (*Executive Summary available in E, F, S & R)	E*
178.	Twenty-ninth Session of the Assembly, Paris, 21–29 June 2017 and Fiftieth Session of the Executive Council, Paris, 20 June 2017 (*Executive Summary available in E, F, S & R)	E*
179.	Thirteenth Session of the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS-XIII), Curaçao, 23–27 April 2018 (*Executive Summary available in E, F, S & R)	E*
180.	Twenty-fifth Session of the IOC Committee on International Oceanographic Data and Information Exchange, Tokyo, 2019 (* Executive Summary available separately in E, F, S & R)	E*
181.	Fifteenth Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS), Paris, France, 26–28 November 2018 (*Executive Summary available in E, F, S & R)	E*
182.	Twelfth Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS), Kish, Islamic Republic of Iran, 9–12 March 2019 (*Executive Summary available in E, F, S, R)	E*
183.	Twenty-eighth Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS-XXVIII), Montelimar, Nicaragua, 2–5 April 2019 (*Executive Summary available in E, F, S & R)	E*
184.	Fourteenth session of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS-XIV/3), Punta Leona, Costa Rica, 8–11 April 2019 (*Executive Summary available in E, F, S & R)	E*
185.	Fifth Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS-V/3), Putrajaya, Malaysia, 8–10 April 2008	E

186	Sixth Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS-VI/3), Hyderabad, India, 7–9 April 2009	E
187	Eighth Session of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWS-VIII/3), Melbourne, Australia, 3–6 May 2011	E
188	Thirtieth Session of the IOC Assembly, Paris, 26 June–4 July 2019 and Fifty-second session of the IOC Executive Council, Paris, 25 June 2019 (*Summary report available in E, F, S & R)	E*
189	Executive Summary of the Working Group on Tsunamis and other Hazards related to Sea-level Warning and Mitigation Systems (TOWS-WG), thirteenth meeting , Paris, 20–21 February 2020	E, F, R, S
190	Sixteenth Session of the Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (ICG/NEAMTWS), Cannes, France, 2-4 December 2019 (* Executive Summary available in E, F, S & R)	E*