IHO Input to Part I of the Report of the UN Secretary General on Oceans and Law of the Sea

This contribution is provided in response to letter LOS/SGR/2017 dated 16 December 2016 and the input from the International Hydrographic Organization to Part I of the report of the UN Secretary ´¥¼µ ±« •½¡W¾±´Üë½°-å«0—2³æ'' ´¥±:˜n ³åáX0±è µþÂá¿7 ³Ò²Ñ °ì<_$T~B•›Æ6? !ù”&|êò°¢ 5BÚ`â °sÎx….
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atmosphere. The longest instrumental time series of sea level observations come from tide gauges. The data have been used to study a wide range of processes, such as storm surges and tsunamis. The long time series of mean sea level data collected at permanent tide gauges provided the primary evidence of globally averaged sea level rise during the twentieth century. Altimetry data from satellite missions have provided a near global coverage of sea surface trends since the early 1990s. However, satellite observations need to be corrected for a variety of factors, including sea state bias and wet tropospheric delay. An important final check that errors in the corrections do not introduce biases into the long-term trends is to compare the altimeter time series with those from tide gauges distributed throughout the world. Therefore, it is essential to maintain such a network of tide gauges. The IHO contributes to this objective by encouraging its Member States to collect and make available long series quality-controlled tidal observations. In liaison with the Global Sea Level Observing System (GLOSS) operated under the auspices of the IOC, the IHO Tides, Water Level and Currents Working Group maintains an inventory of tide gauges and current meters operated by IHO Member States. This inventory is available at:
www.iho.int/mtg_docs/com_wg/IHOTC/IHOTC_Misc/TideGaugeInventory.pdf

7. Coastal storms, tsunamis, flooding, coastal erosion and land subsidence, exacerbated by climate change, may severely affect coastal communities through the widespread loss of life and the extensive destruction of most facilities. The number of displaced persons may immediately suffer from shortages of food, water and fuel while the destruction of port facilities and the creation of new navigational obstacles may impede adequate emergency response. In such circumstances support by sea transport is vital and depends upon the immediate restoration of appropriate hydrographic and charting services. Based on the experience of the 2004 tsunami in the Indian Ocean, the IHO identified the need to ensure that appropriate procedures and guidelines are in place so as to enable an immediate and appropriate response when a disaster affects any coastal area of the world. Such a framework has been established through an IHO Resolution adopted in 2005 on IHO Response to Disasters. The framework defines the respective roles of the IHO Secretariat, the fifteen Regional Hydrographic Commissions covering the different ocean and sea basins and the IHO Member States in order to:

- ensure the immediate assessment of damage and its effect on the safety of navigation of national and international shipping,
- immediately inform mariners and other interested parties of relevant damage and any dangers particularly with respect to navigational hazards,
- re-establish the basic key maritime transportation routes, and
- ensure that charts and other hydrographic information of affected areas are updated as soon as possible.

The framework has been progressively improved based on the feedback from more recent disasters such as the 2011 tsunami in Japan, the 2016 tropical cyclone "Winston" in the South West Pacific and the 2016 hurricane "Matthew" in the Caribbean.

8. The IHO Capacity Building Programme assists IHO Member States and other coastal States in developing capacities to address the effect of climate change on the oceans. Related activities include in particular workshops and training courses on establishing Maritime Spatial Data Infrastructures (MSDI), tidal observations and tsunami inundation mapping.

Suggestions for further action

9. The oceans, covering seventy percent of the Earth's surface, are fundamental not only to controlling the climate but also to sustaining life and accessing a vast source of resources and economic wealth. Yet our understanding of ocean and seafloor processes is quite limited due to the difficulties in operating in this environment. Foremost amongst the challenges of understanding and depicting the oceans and the seafloor is the fact that electromagnetic waves such as light and radar are highly attenuated in ocean water and thus the suite of optical and electromagnetic sensors that have been developed to map, observe, and better understand the Earth cannot penetrate more than a few

meters in typical ocean waters. This has left most of the seafloor virtually unmapped, unobserved, and unexplored. No more than 15% of ocean depths greater than 200 metres have been directly measured the ship tracks along which depth measurements are available may be hundreds of miles apart and this means that in many instances the shape of the seafloor is inferred, relying on educated guess and indirect measurement such as satellite altimetry, which do not provide the detail required to understand critical ocean processes and to manage ocean resources. The situation in coastal waters is less dramatic but nothing to be proud of