**JCOMM’s capability to coordinate the provision of Marine Meteorological and Oceanographic Observations**

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| **Strengths** | **Weaknesses** |
| * Most GCOS observational user requirements well taken into account * NWP observational user requirements relatively well taken into account * Implementation targets defined and accepted (although being revised) * Efficient implementation strategies and mechanisms for data buoys and ship-based observations with DBCP and SOT * Near real-time data reporting of most marine data * Good level of engagement of international partners in the implementation of the marine observing networks, including on the ocean research side * Cost effective observing technology used (e.g. drifters) * Monitoring of how well the implementation targets are met is in place at JCOMMOPS * Most technical Regulations up to date * Best practices documented and available * JCOMMOPS providing technical and monitoring support on day to day basis * Robust collaborations established over the years, and strong partnerships with ocean community, and good cooperation with the IOC, including for sharing data in real time and delayed mode * Homogeneity of observing technology used * Efficient PANGEA concept for capacity development and partnerships * Good quality monitoring and control procedures in place | * Relatively low level of commitment of NMHSs and non-research sponsors of marine observing towards achieving implementation targets * Difficulty for developing countries to engage in the implementation of marine observing networks * Some observational user requirements not well considered (marine services, waves) * Ocean research community having difficult access to GTS (while they are sharing data with WMO) * Data gaps identified in certain regions (polar regions, southern ocean, Gulf of Guinea, marginal seas …) * Decreasing availability of ship time by major sponsors of global moored buoy arrays * Funding and sustainability of JCOMMOPS * Sustainability of the observing systems being essentially funded by short-term research programs * Difficulty of deployment of observing platforms in EEZs (or drifting into EEZs) * Cost of Satcom in some instances * Data collection latency in some cases or areas * Traceability of observations not always assured * Satellite data requirements for in-situ data not documented in a comprehensive manner, and integration of *in situ* and satellite data not achieving its full potential * Data processing of data for converting to geo-physical units of collected data, quality control, encoding and insertion on GTS done from multiple sources using different procedures * Interactions with coastal observing communities (e.g. GOOS regional alliances) are weak * Challenges integrating like data (e.g. temperature) across multiple observing networks * Poor coordination of CD across networks and with potential external CD activities |
| **Opportunities** | **Threats** |
| * E-learning brings opportunities to promote and develop engagement of more Members/Member States in marine observation activities * Potential synergies between observing communities to address emerging requirements, e.g. bio-Argo * New technologies in sensors and platforms (e.g. underwater and surface gliders) hold promise to increase efficiencies and capabilities and potentially lower the cost threshold for deployment by member states * Employing new data tools to demonstrate integrated data access * Multi-purpose observing stations now deployed in several locations * Barometer drifter upgrade scheme, and multi-purpose stations offer opportunities to share resources and better achieve synergies * Enhancing collaborations with third parties, incl. racing ships, fishing vessels, oil & gas industry, and tourist ships operating in data sparse regions * Regional Marine Instrument Centres (RMICs) playing stronger role to enhance traceability and engagement of more NMHSs including from developing countries * HF Radars providing observations required for marine services (waves, currents). Need to standardize practices in this regard. * Development of low cost wave observing technology on drifters * ITU cables offer opportunities to develop more robust and cost effective Tsunami monitoring system * Automation of ship-based observations to reduce cost, and provide better data * New Satcom Forum offers opportunities to make better use of Satcom (e.g. Iridium provides for higher and more timely data at lower cost than other systems used so far) * Use PANGEA concept to further develop engagement of developing countries in support of implementation of marine observing systems (ship time) and train them on the use of ocean data. * WIGOS, RRR and EGOS-IP encouraging stronger engagement of NMHSs in the implementation of the marine observing systems * Integration of JCOMM quality monitoring and control into the WIGOS Data quality Monitoring System (WDQMS) * Observations from marine animals * Better integration of *in situ* and satellite data and stronger engagement of space agencies in support of implementation of in situ networks * Collaborating with manufacturers for the collection of instrument/platform metadata | * Volatility of ships (changing routes, ownership) makes it difficult to maintain ship recruitment in VOS * Cost of ship time reducing the size of the moored buoy array * Reduced and/or non-increasing budgets of major ocean observing sponsors * Impact of vandalism on data buoys * Piracy in some shipping zones reducing availability of ship data and opportunities to deploy and service data buoys in those regions * Environmental issues (e.g. drifters & floats to be seen as trash or marine debris, use of lithium batteries and chemicals in observing platforms, platforms getting ashore) * Reduction of manual/visual observations threatening record of time series during sufficient period * Reduced funding of JCOMMOPS * Dependency on only one or small number of manufacturers * Manufacturers design and production changes sometimes introduce quality issues * Aging workforce in the ocean observing enterprise |