**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
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| **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
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