



## Development of Observing Quantitative Assessment Capabilities for Ocean Applications at NOAA

The NOAA Quantitative Observing System Assessment Program (QOSAP) was established in 2014 to address NOAA's capability gap for conducting quantitative assessments for proposed changes to the global observing system. Since then, QOSAP has coordinated NOAA assessments of the impact of current and new observing technologies for Earth systems. In order to support sustainable development, blue economy and societal awareness, QOSAP is developing a global ocean quantitative assessment capability for ocean applications. These efforts will expand to enable coastal and regional modeling evaluations, as well as to incorporate the biochemistry and ecosystems components. This ocean capability includes observing system experiments (OSEs) for impact assessment and optimization of existing observations, and observing system simulation experiments (OSSEs) for evaluating the potential benefits of non-yet existing observations. Digital twin development that would help accelerate and improve OSSEs are being investigated. Results from OSEs and OSSEs help NOAA management prioritize mission designs and configurations in a cost-effective way by investigating data assimilation strategies and analyzing tradeoffs of proposed observing configurations. An update on NOAA QOSAP ongoing work towards developing an ocean OSE/OSSE capability with national and international partnership, including SynObs, will be discussed.

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