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Continuous high-frequency ocean data from cabled observatories: A case study from Ocean Networks Canada

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Providing ocean sensors with cabled power and bandwidth connections to shore facilities permits continuous, high-frequency, real-time ocean observing. These systems can be used to monitor the seabed, the water column, and the sea surface, generating time series of ocean data over design lives of 25 years or more. Cabled ocean-observing systems can also include shore-based oceanographic radars, coastal weather stations, and automatic identification system (AIS) receivers that monitor vessel traffic. We use examples from Ocean Networks Canada observatories to illustrate the scientific and operational needs for continuous, real-time, high bandwidth ocean observing, shore-based observatory control, and data acquisition, archiving, and distribution. We then consider the technologies and policies related to accessing observatory data and the development of data products for different user sectors, from ocean scientists to the general public. We conclude by pointing out that data science-oceanography collaborations will be an important and essential area of development for cabled observatories, from the pairing of individual sensors and cameras with artificial intelligences, to predicting future states of complex ocean systems from archived and real-time observations.