Added Value of Combining Multiple Optical and Acoustic Instruments When Characterizing Fine-Grained Estuarine Suspensions

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Various optical and acoustic instruments have specific advantages and limitations for characterizing suspensions, and when used together more information can be obtained than with one instrument alone. The LISST 100X, for example, is a powerful tool for estimating particle size distribution, but because of the inversion method used to determine the size distribution, it is difficult to distinguish two dominate populations that peak close to one another, especially among larger grain sizes. In the York River estuary, VA, additional information obtained through the deployment of a RIPScam camera system and an ADV along with the LISST 100X allowed differentiation between populations of resilient pellets and flocs in suspension close to the bed and how the populations varied over a tidal cycle. A second example of instrument pairing providing additional information was the use of a PICS video imaging system in the York River to verify the conditions under which use of the ADV Reynolds flux method was valid for estimating settling velocity of suspended particle populations.