Background:
California Department of Pesticide Regulation’s (CDPR) Surface Water Protection Program (SWPP) relies on surface water monitoring to help protect the aquatic environment from the impacts of pesticides and their degradates. Monitoring typically involves the collection of 1-L water grab samples, which are then extracted and analyzed (Figure 1). SWPP has been interested in alternative sampling methods such as the continuous low-level aquatic monitoring (CLAM) sampler (Figure 2). The CLAM is a dynamic sampler that is light weight, easy to use, assembled onsite, and contains a disk that sorbs chemicals via active pumping of water. In collaboration with the California Department of Fish and Wildlife (CDFW), a method was developed to extract commonly detected pesticides in urban runoff from the CLAM (Vasquez et al., 2017).

Methods:
• CLAM deployed at an urban site in Folsom, CA (Figures 3 and 4).
• CLAM deployment lasted for about 24 hours.
• CLAM deployed four different times from 2015–2016 during non-storm events, using field duplicates to measure precision.
• During final deployment, the accuracy of the CLAM sampler was measured by comparing CLAM results to composite water samples collected by autosamplers (ISCO® 6700 portable sampler) and 1-L grab samples.
• Analytical method by CDFW (Vasquez et al., 2017).

Results:
• After deployment, CLAM disks contained sediment but generally had good linear decrease in flow during deployment indicating general decrease of battery life (Figure 5).
• Lower reporting limits (RLs) were observed when using the CLAM sampler than with traditional 1-L grab sample RLs (CDPR, 2013) except for propidaine (Figure 6).
• 7 different pesticides or pesticide degradates were detected during the CLAM deployments (Figure 7).
• Precision among CLAM samples were generally within laboratory-accepted range (<25% RPD) (Figure 8).
• Pesticides were detected more consistently with the CLAM (Table 1) but exhibited lower concentrations than water samples (Figure 9).

Conclusion: CLAM is an alternative environmental assessment tool that can detect low concentrations of pesticides in surface water, which may subsequently warrant additional monitoring and evaluation. This approach has the ability to stretch limited sampling budgets while maximizing the ability to obtain relevant chemistry data.

References:
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