



Central Pennsylvania Wetlands

Polar Organic Chemical Integrative Sampler (POCIS)—Pharmaceuticals and Personal Care Products (PPCPs)

Summary

Media:	Surface Water
Study Type:	Side-by-Side
Technology:	Accumulation
Peer Reviewed:	Yes
Publication Date:	September 2021

Study Description

- Results are provided for a side-by-side comparison of POCIS-collected data with grab samples from ephemeral wetlands (vernal pools) potentially affected by wastewater spray irrigation in central Pennsylvania.
- POCIS were deployed across three vernal pools impacted by spray-irrigation and three from an unaffected forest area with vernal pools.
- Grab samples were collected weekly from the pools between May and October 2018 from locations immediately adjacent to deployed POCIS containers. Every 28 days, six POCIS membranes were deployed at each of the six pools at the time grab samples were collected.
- Samples were analyzed for concentrations of 34 emerging contaminants from personal care and pharmaceutical-related substances, including acetaminophen, naproxen, tetracycline, metformin, and others.
- The frequencies of detection from the POCIS and grab samples were compared to data from the irrigation system laterals and data were categorized based on which method most frequently detected the compounds.

Remedial Phase

POCIS samplers were used as part of investigation activities.

Outcome

Data analysis showed that most compounds were detected most frequently in POCIS samples than in grab results. POCIS results may be most appropriate for ecotoxicologically relevant data, while grab samples better capture “impulse” inputs and short-lived compounds.

Case Study Reference

Hayden, K.R.; H.E. Preisendanz; K.R. Elkin; L.B. Saleh; J. Weikel; T.L. Veith; H.A. Elliott; and J.E. Watson. 2022, Comparison of POCIS and grab sampling techniques for monitoring PPCPs in vernal pools in central Pennsylvania. *Science of the Total Environment*. 806: 150607. <https://doi.org/10.1016/j.scitotenv.2021.150607>