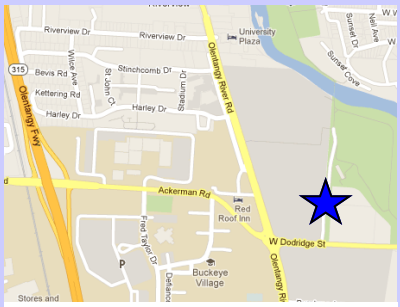
A Water Luncheon Seminar

- Presented by:
  The Water Management Association of Ohio
  and
  The Ohio Water Resources Center

April 13, 2016; 11:30 a.m. - 1:00 p.m.

Wilma H. Schiermeier Olentangy River Wetland Research Park,
The Heffner Building, 352 Dodridge St. Columbus, OH 43202



From St. Rt. 315, exit east onto Ackerman Rd, continue past Olentangy River Rd onto W. Dodridge St, then left into Park driveway.

Can Sunlight Attenuate Pharmaceutical Compounds Downstream of Wastewater Treatment Plants?

Allison MacKay, Professor, Civil, Envir & Geod Eng, The Ohio State University;
https://ceg.osu.edu/people/mackay.49

Pharmaceuticals and other compounds of wastewater origin have received attention in aquatic systems because they are known to be bioactive molecules. Assessments of the risk posed by these compounds must consider both downstream exposure concentrations, as well as organism responses. The purpose of this work was to examine the role of sunlight in attenuating downstream pharmaceutical compound concentrations. We found that organic matter remaining in the treated effluent shielded sunlight penetration to a lesser extent than organic matter naturally occurring in river water. We also found effluent organic matter to show a higher efficiency than natural organic matter for producing short-lived excited chemical species that react to degrade pharmaceutical compounds. Thus, sunlight is more effective in degrading pharmaceutical compounds in treated effluent than typical river waters. However, under realistic discharge scenarios when effluent organic matter is mixed with natural organic matter, the net reactivity of effluent organic matter is quenched to some extent by the natural organic matter. We found for mixtures of effluent and natural organic matter that the production efficiency of short-lived excited chemical species, and degradation rates of pharmaceutical compounds, could be described using simple optical properties of the water. We used an idealized river model to examine the importance of sunlight degradation pathways for pharmaceutical compounds under several seasonal discharge scenarios. Dilution plays an important role in attenuating pharmaceutical compound concentrations during springtime and pharmaceutical compound reactions with short-lived excited chemical species can be important during summertime.

Please register by April 8, 2016. Late or on-site registrations cost $5 extra and are not guaranteed a meal. For registered engineers who need Professional Development Hours (PDHs), this presentation offers 1 PDH.

[ ] WMAO Member ($15) [ ] Nonmember ($18) [ ] Student ($7) Special meal?_____

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Please send form and check to: WMAO-Luncheon, 8584 E. Washington St. #206, Chagrin Falls OH 44023.

OR, register online with a credit card at: www.wmao.org.

Proceeds from the luncheon benefit the continued operation of WMAO and our scholarships. Sponsorship opportunities are available for those interested in providing extra support. More information on sponsorship is available at www.wmao.org.