Electronic Supplementary Information

Measuring metaldehyde in surface waters in the UK using two monitoring approaches

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Figure S1. Map of sampling site locations and details of land use in the lower eastern part of the River Dee catchment. Key to the location of sampling sites: Aldford Brook (D1), Ceiriog (D2), Coddington (D3), Emral Brook (D4), Golborne (D5), Pulford Brook (D6), Shell Brook (D7) and Worthenbury Brook (D8).



Figure S2. Map of sampling site locations and land use within the greater River Thames basin. Key to the location of sampling sites: Cobbins Brook (Swimming Pool (T1)); Galley Hill (T2); Cobbins End (T3); Tillingbourne (River Wey (T4)); Weybridge (Lower Wey (T5)) and the River Enborne in West Berkshire (Shalford Bridge (T6)).



Figure S3: Stainless steel holder and cage used to deploy triplicate Chemcatcher[®] passive samplers in the River Dee catchment field trial (photographs courtesy of the Welsh Dee Trust).



Figure S4. Schematic of rig used to deploy duplicate Chemcatcher® passive samplers in the greater River Thames field trial.



Figure S5. Concentration of metaldehyde (ng L⁻¹) found in spot samples of water (•) and time weighted average (TWA) concentrations found with the Chemcatcher[®] passive sampler (—) estimated using Equation 1 at Alford Brook (D1) during the River Dee catchment field trial (January 2016-Janaury 2017). Daily rainfall (mm) in the area over the same period is also shown (data courtesy of Natural Resources Wales information data base[®] - all rights reserved). The line (……) shows the European Union's Drinking Water Directive limit of 100 ng L⁻¹ for a single pesticide. The grey shaded box indicates the time period in the UK when metaldehyde is applied agriculturally to land. The limit of quantification for spot samples of water was 10 ng L⁻¹ and for extracts obtained from the Chemcatcher[®] passive sampler was 0.45 ng L⁻¹. Only data points above these limits of quantification are shown in the figure.



Figure S6. Concentration of metaldehyde (ng L⁻¹) found in spot samples of water (•) and time weighted average (TWA) concentrations found with the Chemcatcher[®] passive sampler (—) estimated using Equation 1 at Ceiriog (D2) during the River Dee catchment field trial (January 2016-Janaury 2017). Daily rainfall (mm) in the area over the same period is also shown (data courtesy of Natural Resources Wales information data base[®] - all rights reserved). The line (……) shows the European Union's Drinking Water Directive limit of 100 ng L⁻¹ for a single pesticide. The grey shaded box indicates the time period in the UK when metaldehyde is applied agriculturally to land. The limit of quantification for spot samples of water was 10 ng L⁻¹ and for extracts obtained from the Chemcatcher[®] passive sampler was 0.45 ng L⁻¹. Only data points above these limits of quantification are shown in the figure.



Figure S7. Concentration of metaldehyde (ng L⁻¹) found in spot samples of water (•) and time weighted average (TWA) concentrations found with the Chemcatcher[®] passive sampler (—) estimated using Equation 1 at Coddington (D3) during the River Dee catchment field trial (January 2016-Janaury 2017). Daily rainfall (mm) in the area over the same period is also shown (data courtesy of Natural Resources Wales information data base[®] - all rights reserved). The line (……) shows the European Union's Drinking Water Directive limit of 100 ng L⁻¹ for a single pesticide. The grey shaded box indicates the time period in the UK when metaldehyde is applied agriculturally to land. The limit of quantification for spot samples of water was 10 ng L⁻¹ and for extracts obtained from the Chemcatcher[®] passive sampler was 0.45 ng L⁻¹. Only data points above these limits of quantification are shown in the figure.



Figure S8. Concentration of metaldehyde (ng L⁻¹) found in spot samples of water (•) and time weighted average (TWA) concentrations found with the Chemcatcher[®] passive sampler (—) estimated using Equation 1 at Golborne (D5) during the River Dee catchment field trial (January 2016-Janaury 2017). Daily rainfall (mm) in the area over the same period is also shown (data courtesy of Natural Resources Wales information data base[®] - all rights reserved). The line (……) shows the European Union's Drinking Water Directive limit of 100 ng L⁻¹ for a single pesticide. The grey shaded box indicates the time period in the UK when metaldehyde is applied agriculturally to land. The limit of quantification for spot samples of water was 10 ng L⁻¹ and for extracts obtained from the Chemcatcher[®] passive sampler was 0.45 ng L⁻¹. Only data points above these limits of quantification are shown in the figure.



Figure S9. Concentration of metaldehyde (ng L⁻¹) found in spot samples of water (•) and time weighted average (TWA) concentrations found with the Chemcatcher[®] passive sampler (—) estimated using Equation 1 at Pulford Brook (D6) during the River Dee catchment field trial (January 2016-Janaury 2017). Daily rainfall (mm) in the area over the same period is also shown (data courtesy of Natural Resources Wales information data base[®] - all rights reserved). The line (……) shows the European Union's Drinking Water Directive limit of 100 ng L⁻¹ for a single pesticide. The grey shaded box indicates the time period in the UK when metaldehyde is applied agriculturally to land. The limit of quantification for spot samples of water was 10 ng L⁻¹ and for extracts obtained from the Chemcatcher[®] passive sampler was 0.45 ng L⁻¹. Only data points above these limits of quantification are shown in the figure.



Figure S10. Concentration of metaldehyde (ng L⁻¹) found in spot samples of water (•) and time weighted average (TWA) concentrations found with the Chemcatcher[®] passive sampler (—) estimated using Equation 1 at Shell Brook (D7) during the River Dee catchment field trial (January 2016-Janaury 2017). Daily rainfall (mm) in the area over the same period is also shown (data courtesy of Natural Resources Wales information data base[®] - all rights reserved). The line (……) shows the European Union's Drinking Water Directive limit of 100 ng L⁻¹ for a single pesticide. The grey shaded box indicates the time period in the UK when metaldehyde is applied agriculturally to land. The limit of quantification for spot samples of water was 10 ng L⁻¹ and for extracts obtained from the Chemcatcher[®] passive sampler was 0.45 ng L⁻¹. Only data points above these limits of quantification are shown in the figure.



Figure S11. Concentration of metaldehyde (ng L⁻¹) found in spot samples of water (•) and time weighted average (TWA) concentrations found with the Chemcatcher[®] passive sampler (—) estimated using Equation 1 at Worthenbury Brook (D8) during the River Dee catchment field trial (January 2016-Janaury 2017). Daily rainfall (mm) in the area over the same period is also shown (data courtesy of Natural Resources Wales information data base[®] - all rights reserved). The line (……) shows the European Union's Drinking Water Directive limit of 100 ng L⁻¹ for a single pesticide. The grey shaded box indicates the time period in the UK when metaldehyde is applied agriculturally to land. The limit of quantification for spot samples of water was 10 ng L⁻¹ and for extracts obtained from the Chemcatcher[®] passive sampler was 0.45 ng L⁻¹. Only data points above these limits of quantification are shown in the figure.



Figure S12. Concentration of metaldehyde (ng L⁻¹) found in spot samples of water (•) and time weighted average (TWA) concentrations found with the Chemcatcher[®] passive sampler (—) estimated using Equation 1 at Cobbins Brook (Galley Hill (T2)) during the greater River Thames field trial (July 2016-July 2017). Daily rainfall (mm) in the South East England area (HadUKP <u>http://www.metoffice.gov.uk/hadobs/hadukp/</u>) is also shown. The line (……) shows the European Union's Drinking Water Directive limit of 100 ng L⁻¹ for a single pesticide. The grey shaded boxes indicates the time period in the UK when metaldehyde is applied agriculturally to land. The limit of quantification for spot samples of water was 9 ng L⁻¹ and for extracts obtained from the Chemcatcher[®] passive sampler was 0.45 ng L⁻¹. Only data points above these limits of quantification are shown in the figure.



Figure S13. Concentration of metaldehyde (ng L⁻¹) found in spot samples of water (•) and time weighted average (TWA) concentrations found with the Chemcatcher[®] passive sampler (—) estimated using Equation 1 at Cobbins Brook (Cobbins End (T3)) during the greater River Thames field trial (July 2016-July 2017). Daily rainfall (mm) in the South East England area (HadUKP <u>http://www.metoffice.gov.uk/hadobs/hadukp/</u>) is also shown. The line (……) shows the European Union's Drinking Water Directive limit of 100 ng L⁻¹ for a single pesticide. The grey shaded boxes indicates the time period in the UK when metaldehyde is applied agriculturally to land. The limit of quantification for spot samples of water was 9 ng L⁻¹ and for extracts obtained from the Chemcatcher[®] passive sampler was 0.45 ng L⁻¹. Only data points above these limits of quantification are shown in the figure.



Figure S14. Concentration of metaldehyde (ng L⁻¹) found in spot samples of water (•) and time weighted average (TWA) concentrations found with the Chemcatcher[®] passive sampler (—) estimated using Equation 1 at Guilford (River Wey (T4)) during the greater River Thames field trial (July 2016-July 2017). Daily rainfall (mm) in the South East England area (HadUKP <u>http://www.metoffice.gov.uk/hadobs/hadukp/</u>) is also shown. The line (……) shows the European Union's Drinking Water Directive limit of 100 ng L⁻¹ for a single pesticide. The grey shaded box indicates the time period in the UK when metaldehyde is applied agriculturally to land. The limit of quantification for spot samples of water was 9 ng L⁻¹ and for extracts obtained from the Chemcatcher[®] passive sampler was 0.45 ng L⁻¹. Only data points above these limits of quantification are shown in the figure.



Figure S15. Concentration of metaldehyde (ng L⁻¹) found in spot samples of water (•) and time weighted average (TWA) concentrations found with the Chemcatcher[®] passive sampler (—) estimated using Equation 1 at Weybridge (Lower Wey (T5)) during the greater River Thames field trial (July 2016-July 2017). Daily rainfall (mm) in the South East England area (HadUKP <u>http://www.metoffice.gov.uk/hadobs/hadukp/</u>) is also shown. The line (……) shows the European Union's Drinking Water Directive limit of 100 ng L⁻¹ for a single pesticide. The grey shaded box indicates the time period in the UK when metaldehyde is applied agriculturally to land. The limit of quantification for spot samples of water was 9 ng L⁻¹ and for extracts obtained from the Chemcatcher[®] passive sampler was 0.45 ng L⁻¹. Only data points above these limits of quantification are shown in the figure.