Supplementary Information for

Comparing non-targeted chemical persistence assessed using an unspiked OECD 309 test to field measurements

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Figure S1. Map of the study site and sampling locations.
Text S1. HRMS data post-processing workflow parameters in CompoundDiscoverer

Step I – Peak Picking

- RT range: 0.2 – 10 min
- m/z range: 80 – 1000 Da
- S/N threshold: 5
- Minimum scan number: 5
- Minimum intensity: 5000

Step II – Retention Time Alignment

- Alignment model: adaptive curve
- Maximum shift: 0.5 min
- Mass tolerance: 5 ppm

Step III – Compound Detection

- Considered elements: C50, H100, Br5, Cl6, F10, I5, N10, O15, P5, S5
- Isotope grouping:
  - mass tolerance: 5 ppm
  - intensity tolerance: 40%
  - minimum isotopes: 2
- Considered adducts:
  - Positive mode: [M+ACN+H]^{1+}, [M+H]^{1+}, [M+K]^{1+}, [M+Na]^{1+}
  - Negative mode: [2M+FA-H]^{1-}; [2M-H]^{1-}; [M-2H+K]^{1-}; [M-H]^{1-}; [M-H-H_2O]^{1-}
- Adduct grouping:
  - Mass tolerance: 5 ppm
  - intensity tolerance: 30%

Step IV – Background Subtraction

- Maximum sample/blank ratio: 3
- Mass tolerance: 5 ppm

Step V – Database (mzCloud) Searching

- Compound classes: all
- Match ion activation type: true
- Match ion activation energy: match tolerance
- Ion activation energy tolerance: 30
- Apply intensity threshold: true
- Identity search: HighChem HighRes
- Similarity search: none
- Mass tolerance: 5 ppm
- Match score threshold: 75
Text S2. Model assumptions for estimating half-life in the field

Equation 1 in the paper is based on a simple mass balance model of the lake. The following assumptions were made:

- The volume of the lake was constant
- The only sources of contaminant to the lake were the Sundet WWTP and inflowing water from the lake Södra Bergundasjön
- The only sinks of contaminant in the lake were outflow via the stream and degradation
- The lake was well-mixed
- The contaminant concentration in the lake was equal to the contaminant concentration in the water in the outflowing stream
- The amount of chemical stored in the bottom sediment was negligible
- The contaminant concentration in the weekly grab samples of inflowing water and outflowing water equaled the average concentration during the previous 7 days
- Chemical degradation was first order
- The rate constant for chemical degradation was constant
- The rate constant could be approximated by dividing the rate of loss of contaminant (mol d⁻¹) by the average inventory of chemical in the lake during the study (this approximation is exact when the inventory is constant over time).

Steady state was not assumed. The change in chemical inventory during the study period was considered in the mass balance calculation (Equation 1 in the paper).
Figure S2. Discharge rate (m³/s) of Sundet WWTP effluent and flow rate (m³/s) of Norra Bergundasjön during the sampling period. The data were provided by Andreas Hedrén from Växjö Municipality.

Figure S3. Air temperature (°C) at the Växjö meteorological station during the sampling period. The data were obtained from the Swedish Meteorological and Hydrological Institute.
**Figure S4.** Precipitation (mm) in the study area during the sampling period. The data were obtained from the Swedish Meteorological and Hydrological Institute.

**Figure S5.** Global irradiation (W/m²) at the Växjö meteorological station during the sampling period. The data were obtained from the Swedish Meteorological and Hydrological Institute.
Table S1. Matrix effect of the isotopic-labeled chemicals during the sampling period, presented as peak area (outflow)/peak area (effluent).

| isotopic-labeled standard | sampling week number |
|--------------------------|----------------------|
|                          | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 |
| metformin-d6             | 1.3| 1.3| 1.3| 1.2| 1.1| 1.1| 1.3| 1.3| 1.2| 1.2| 1.3| 1.3|
| sotalol-d6               | 1.5| 1.4| 1.4| 1.4| 1.3| 1.3| 1.5| 1.4| 1.3| 1.4| 1.5| 1.4|
| acetaminophen-d4         | 1.4| 1.4| 1.3| 1.3| 1.2| 1.2| 1.4| 1.3| 1.2| 1.2| 1.2| 1.2|
| atenolol-d7              | 1.4| 1.3| 1.3| 1.4| 1.2| 1.2| 1.4| 1.3| 1.3| 1.3| 1.3| 1.4|
| ranitidine-d6            | 1.3| 1.2| 1.2| 1.2| 1.2| 1.1| 1.3| 1.2| 1.1| 1.1| 1.2| 1.1|
| gabapentin-d6            | 1.7| 1.6| 1.6| 1.6| 1.5| 1.5| 1.8| 1.7| 1.5| 1.6| 1.8| 1.7|
| metoprolol acid-d5       | 1.4| 1.4| 1.4| 1.4| 1.3| 1.3| 1.5| 1.3| 1.3| 1.4| 1.6| 1.5|
| caffeine-d9              | 1.6| 1.5| 1.4| 1.4| 1.4| 1.5| 1.6| 1.5| 1.4| 1.3| 1.4| 1.4|
| methotrexate-d3          | 1.6| 1.4| 1.5| 1.5| 1.3| 1.3| 1.6| 1.6| 1.3| 1.6| 1.6| 1.6|
| 1H-benzotriazole-d4      | 1.9| 1.7| 1.7| 1.6| 1.7| 1.8| 1.8| 2.0| 1.7| 1.7| 1.8| 1.7|
| fluconazole-d4           | 1.7| 1.5| 1.5| 1.6| 1.4| 1.4| 1.7| 1.5| 1.5| 1.6| 1.7| 1.6|
| metoprolol-d7            | 1.4| 1.2| 1.3| 1.2| 1.1| 1.1| 1.4| 1.3| 1.2| 1.3| 1.3| 1.3|
| tramadol-d6              | 1.4| 1.3| 1.3| 1.2| 1.2| 1.1| 1.4| 1.3| 1.2| 1.2| 1.4| 1.3|
| sulfamethoxazole-d4      | 1.6| 1.4| 1.4| 1.4| 1.3| 1.2| 1.5| 1.4| 1.4| 1.4| 1.5| 1.3|
| venlafaxine-d6           | 1.4| 1.2| 1.2| 1.2| 1.1| 1.2| 1.3| 1.3| 1.3| 1.3| 1.4| 1.3|
| carbamazepine-d8         | 1.3| 1.3| 1.3| 1.2| 1.2| 1.2| 1.4| 1.3| 1.3| 1.4| 1.5| 1.4|
| proranolol-d7            | 1.3| 1.2| 1.2| 1.2| 1.1| 1.1| 1.2| 1.2| 1.2| 1.2| 1.3| 1.2|
| anastrozole-d12          | 1.4| 1.4| 1.4| 1.3| 1.3| 1.4| 1.6| 1.4| 1.4| 1.6| 1.6| 1.4|
| oxazepam-d5              | 1.9| 1.7| 1.7| 1.6| 1.6| 1.7| 2.0| 1.8| 1.8| 2.0| 2.0| 1.8|
| irbesartan-d6            | 2.0| 1.9| 1.7| 1.6| 1.6| 1.7| 1.9| 1.7| 1.6| 1.9| 2.1| 1.7|
| climbazole-d4            | 1.4| 1.3| 1.3| 1.3| 1.3| 1.3| 1.4| 1.3| 1.4| 1.3| 1.3| 1.4|
| ketoprofen-13C-d3        | 1.8| 1.8| 1.9| 1.7| 1.5| 1.7| 1.9| 1.8| 1.7| 2.0| 2.0| 1.9|
| atorvastatin-d5          | 1.1| 1.2| 1.3| 1.5| 1.5| 1.6| 1.1| 1.0| 1.9| 1.3| 1.2| 1.3|
| glimepiride-d5           | 1.1| 1.1| 1.2| 1.4| 1.7| 1.5| 0.9| 1.0| 2.0| 1.1| 1.0| 1.2|
| acesulfame-d4            | 1.3| 1.3| 1.3| 1.3| 1.2| 1.4| 1.5| 1.4| 1.2| 1.3| 1.3| 1.1|
| hydrochlorothiazide-13C-d2| 1.6| 1.2| 1.4| 1.4| 1.4| 1.6| 1.6| 1.5| 1.5| 1.2| 1.4| 1.3|
| furosemide-d5            | 1.6| 1.4| 1.4| 1.4| 1.3| 1.4| 1.6| 1.4| 1.4| 1.3| 1.5| 1.3|
| clofibric acid-d4        | 1.5| 1.4| 1.4| 1.3| 1.4| 1.4| 1.5| 1.5| 1.4| 1.4| 1.4| 1.3|
| bezafibrate-d4           | 1.5| 1.3| 1.4| 1.3| 1.4| 1.4| 1.6| 1.4| 1.3| 1.2| 1.3| 1.2|
| valsartan-d3             | 1.6| 1.4| 1.5| 1.5| 1.4| 1.4| 1.6| 1.5| 1.4| 1.3| 1.4| 1.3|
| bicalutamide-d4          | 1.0| 1.0| 1.2| 1.2| 1.4| 1.3| 1.1| 1.0| 1.9| 0.9| 0.9| 1.1|
| diclofenac-13C6          | 1.7| 1.5| 1.5| 1.5| 1.4| 1.5| 1.6| 1.5| 1.5| 1.4| 1.5| 1.4|
**Table S2.** List of chemicals identified in the field.

| chemical                  | formula                          | molecular weight | RT (min) |
|---------------------------|----------------------------------|------------------|----------|
| acesulfame                | C4 H5 N O4 S                     | 162.9932         | 1.30     |
| acetonophene              | C8 H8 O                          | 120.0574         | 6.11     |
| acetylarginine            | C8 H16 N4 O3                     | 216.1225         | 1.11     |
| acridine                  | C13 H9 N                         | 179.0734         | 3.00     |
| adenosine                 | C10 H13 N5 O4                    | 267.0970         | 1.21     |
| amphetamine               | C9 H13 N                         | 135.1048         | 1.81     |
| atenolol                  | C14 H22 N2 O3                    | 266.1631         | 1.88     |
| benzophenone              | C13 H10 O                        | 182.0731         | 6.58     |
| benzotriazole             | C6 H5 N3                         | 119.0484         | 2.70     |
| benzoylecgonine           | C16 H19 N O4                     | 289.1314         | 3.01     |
| bicalutamide              | C18 H14 F4 N2 O4 S               | 430.0613         | 6.18     |
| bis(2-butoxyethyl) ether  | C12 H26 O3                       | 218.1882         | 7.08     |
| bis(4-ethylbenzylidene)sorbitol | C24 H30 O6                | 414.2042         | 6.72     |
| candesartan               | C24 H20 N6 O3                    | 440.1598         | 5.41     |
| carbamazepine             | C15 H12 N2 O                     | 236.0949         | 4.88     |
| choline                   | C5 H13 N O                       | 103.0997         | 0.96     |
| citric acid               | C6 H8 O7                         | 192.0266         | 0.72     |
| climbazole                | C15 H17 Cl N2 O2                 | 292.0977         | 5.38     |
| codeine                   | C18 H21 N O3                     | 299.1520         | 2.24     |
| conine                    | C8 H17 N                         | 127.1361         | 2.19     |
| cytidine                  | C9 H13 N3 O5                     | 243.0859         | 1.11     |
| cytosine                  | C4 H5 N3 O                       | 111.0434         | 1.12     |
| d-panthenol               | C9 H19 N O4                      | 205.1315         | 1.68     |
| decanamide                | C10 H21 N O                      | 171.1622         | 6.56     |
| DEET                      | C12 H17 N O                      | 191.1310         | 5.54     |
| DL-tryptophan             | C11 H12 N2 O2                    | 204.0900         | 2.09     |
| dodecamethylocyclohexasiloxane | C12 H36 O6 Si6                  | 444.1126         | 9.20     |
| ecgonine                  | C9 H15 N O3                      | 185.1052         | 3.08     |
| escitalopram              | C20 H21 F N2 O                   | 324.1638         | 4.78     |
| fexofenadine              | C32 H39 N O4                     | 501.2881         | 5.42     |
| fluconazole               | C13 H12 F2 N6 O                  | 306.1042         | 3.25     |
| furosemide                | C12 H11 Cl N2 O5 S               | 330.0081         | 4.69     |
| gabapentint               | C9 H17 N O2                      | 171.1258         | 2.22     |
| galaxolidone              | C18 H24 O2                       | 272.1783         | 2.42     |
| guanine                   | C5 H5 N5 O                       | 151.0496         | 1.11     |
| guanosine                 | C10 H13 N5 O5                    | 283.0921         | 1.22     |
| hexamethylenetetramine    | C6 H12 N4                        | 140.1062         | 0.97     |
| hydrochlorothiazide       | C7 H8 Cl N3 O4 S2                | 296.9649         | 2.22     |
| hypoxanthine              | C5 H4 N4 O                       | 136.0387         | 1.12     |
| irbesartan                | C25 H28 N6 O                     | 428.2324         | 5.35     |
| isoamylamine              | C5 H13 N                         | 87.1049          | 1.61     |
| isoleucine                | C6 H13 N O2                      | 131.0947         | 1.22     |
| Chemical Name          | Molecular Formula | MW   | Log P |
|------------------------|-------------------|------|-------|
| kinetin                | C10 H9 N5 O       | 215.0807 | 1.88  |
| L-alanyl-L-proline     | C8 H14 N2 O3      | 186.1006 | 1.09  |
| L-phenylalanine        | C9 H11 N O2       | 165.0791 | 1.60  |
| L-tyrosine             | C9 H11 N O3       | 181.0742 | 1.17  |
| lamotrigine            | C9 H7 Cl N5       | 255.0078 | 3.24  |
| leucylproline          | C11 H20 N2 O3     | 228.1473 | 2.08  |
| lidocaine              | C14 H22 N2 O      | 234.1733 | 2.95  |
| losartan               | C22 H23 Cl N6 O   | 422.1622 | 5.32  |
| melamine               | C3 H6 N6          | 126.0655 | 1.00  |
| metformin              | C4 H11 N5         | 129.1015 | 0.95  |
| metoprolol             | C15 H25 N O3      | 267.1833 | 3.36  |
| mirtazapine            | C17 H19 N3        | 265.1579 | 3.17  |
| monobutyl phthalate    | C12 H14 O4        | 222.0890 | 5.41  |
| oxazepam               | C15 H11 Cl N2 O2  | 286.0508 | 5.10  |
| paracetamol            | C8 H9 N O2        | 151.0633 | 1.86  |
| PEG n5                 | C10 H22 O6        | 238.1415 | 1.94  |
| PEG n6                 | C12 H26 O7        | 282.1678 | 2.19  |
| PEG n7                 | C14 H30 O8        | 326.1939 | 2.41  |
| PEG n8                 | C16 H34 O9        | 370.2203 | 2.61  |
| perillartine           | C10 H15 N O       | 165.1154 | 2.60  |
| phenethylamine         | C8 H11 N          | 121.0893 | 1.98  |
| PPG n4                 | C12 H26 O5        | 250.1778 | 3.35  |
| PPG n5                 | C15 H32 O6        | 308.2197 | 3.98  |
| pregabalin             | C8 H17 N O2       | 159.1259 | 2.22  |
| propranolol            | C16 H21 N O2      | 259.1571 | 4.39  |
| pyridostigmine         | C9 H12 N2 O2      | 180.0899 | 1.21  |
| ranitidine             | C13 H22 N4 O3 S   | 314.1411 | 1.96  |
| sedanolide             | C12 H18 O2        | 194.1307 | 5.83  |
| sitagliptin            | C16 H15 F6 N5 O   | 407.1183 | 3.74  |
| sotalol                | C12 H20 N2 O3 S   | 272.1194 | 1.84  |
| sulfaacetazone         | C10 H11 N3 O3 S   | 253.0522 | 3.49  |
| sulfapyridine          | C11 H11 N3 O2 S   | 249.0573 | 2.38  |
| thymine                | C5 H6 N2 O2       | 126.0430 | 1.56  |
| tolcyaine              | C15 H22 N2 O3     | 278.1629 | 2.99  |
| tramadol               | C16 H25 N O2      | 263.1884 | 3.37  |
| triethyl phosphate     | C6 H15 O4 P       | 182.0708 | 3.94  |
| triisopropylamine      | C9 H21 N O3       | 191.1525 | 1.12  |
| tris(2-butoxyethyl) phosphate | C18 H39 O7 P   | 398.2433 | 8.07  |
| tropine                | C8 H15 N O        | 141.1153 | 4.42  |
| uracil                 | C4 H4 N2 O2       | 112.0274 | 1.12  |
| valine                 | C5 H11 N O2       | 117.0790 | 0.97  |
| valsartan              | C24 H29 N5 O3     | 435.2274 | 6.14  |
| venlafaxine            | C17 H27 N O2      | 277.2040 | 4.04  |
| xanthine               | C5 H4 N4 O2       | 152.0327 | 1.17  |
| xylene sulfonate       | C8 H10 O3 S       | 186.0346 | 2.49  |
| zolpidem               | C19 H21 N3 O      | 307.1683 | 3.89  |
| δ-valerolactam         | C5 H9 N O         | 99.0684  | 1.72  |
Table S3. Relative mass flow during the sampling period of the chemicals with a degradation half-life of <100 d in the field.

| chemical         | mass flow from inflow (d⁻¹) | mass flow from effluent (d⁻¹) | mass flow from outflow (d⁻¹) | contribution of the inflow to Σ(inflow+effluent) (%) |
|------------------|-------------------------------|-------------------------------|-------------------------------|------------------------------------------------------|
| acesulfame       | 4.04E+10                      | 2.27E+11                      | 4.01E+11                      | 15                                                   |
| amphetamine      | 1.8E+09                       | 4.45E+09                      | 4.24E+09                      | 29                                                   |
| atenolol         | 3.61E+09                      | 3.54E+11                      | 1.07E+10                      | 1                                                    |
| benzophenone     | 5.39E+10                      | 7.47E+10                      | 2.47E+11                      | 42                                                   |
| benztotriazole   | 1.44E+10                      | 1.09E+12                      | 4.42E+11                      | 1                                                    |
| benzoylecgonine  | 4.97E+08                      | 1.45E+10                      | 9.46E+08                      | 3                                                    |
| choline          | 1.08E+12                      | 2.21E+11                      | 2.44E+12                      | 83                                                   |
| climbazole       | 1.64E+09                      | 1.76E+10                      | 2.99E+09                      | 9                                                    |
| codeine          | 1.34E+09                      | 7.05E+10                      | 4.2E+09                       | 2                                                    |
| coniine          | 7.69E+08                      | 3.07E+10                      | 2.65E+09                      | 2                                                    |
| D-panthenol      | 2.71E+10                      | 7.11E+10                      | 7.22E+10                      | 28                                                   |
| ecgonine         | 2.48E+09                      | 2.35E+11                      | 2.39E+10                      | 1                                                    |
| escitalopram     | 5.13E+08                      | 1.18E+11                      | 2.56E+09                      | 0                                                    |
| fexofenadine     | 1.33E+09                      | 8.27E+10                      | 2.19E+10                      | 2                                                    |
| furosemide       | 3.12E+09                      | 1.74E+11                      | 7.3E+09                       | 2                                                    |
| hexamethylenetetramine | 1.02E+10               | 4.48E+11                      | 1.08E+11                      | 2                                                    |
| hydrochlorothiazide | 1.3E+09                    | 8.6E+10                       | 2.23E+09                      | 1                                                    |
| irbesartan       | 7.74E+08                      | 4.47E+10                      | 1.58E+09                      | 2                                                    |
| kinetin          | 1.44E+09                      | 1.77E+11                      | 3.07E+10                      | 1                                                    |
| lamotrigine      | 3.46E+09                      | 1.53E+12                      | 4.24E+11                      | 0                                                    |
| lidocaine        | 1.89E+09                      | 3.93E+11                      | 8.19E+10                      | 0                                                    |
| losartan         | 1.27E+09                      | 8.38E+10                      | 1.46E+10                      | 1                                                    |
| melamine         | 2.97E+10                      | 5.54E+11                      | 1.97E+11                      | 5                                                    |
| metformin        | 1.6E+09                       | 4.34E+11                      | 9.37E+10                      | 0                                                    |
| metoprolol       | 1.83E+09                      | 9.7E+11                       | 1.81E+10                      | 0                                                    |
| oxazepam         | 1.96E+09                      | 1.15E+11                      | 3E+10                         | 2                                                    |
| paracetamol      | 7.39E+09                      | 1.72E+10                      | 1.55E+10                      | 30                                                   |
| PEG n5           | 1.17E+11                      | 2.51E+11                      | 1.28E+11                      | 32                                                   |
| PEG n6           | 3.44E+10                      | 2.75E+10                      | 4.43E+10                      | 56                                                   |
| perillartine     | 2.59E+09                      | 6.65E+10                      | 2.31E+10                      | 4                                                    |
| PPG n4           | 3.3E+10                       | 3.69E+11                      | 1.18E+11                      | 8                                                    |
| PPG n5           | 2.25E+10                      | 2.16E+11                      | 8.06E+10                      | 9                                                    |
| pregabalain      | 5.3E+09                       | 3.21E+11                      | 2.25E+11                      | 2                                                    |
| propranolol      | 1.86E+09                      | 9.35E+10                      | 5.41E+09                      | 2                                                    |
| ranitidine       | 3.08E+09                      | 4.49E+10                      | 5.61E+09                      | 6                                                    |
| Chemical          | Unitless peak area | peak area | concentration | ratio |
|-------------------|--------------------|-----------|---------------|-------|
| sitagliptin       | 4.73E+08           | 4.89E+10  | 6.15E+09      | 1     |
| sotalol           | 1.95E+09           | 1.52E+10  | 3.62E+09      | 11    |
| sulfapyridine     | 2.43E+09           | 1.43E+11  | 5.37E+09      | 2     |
| tramadol          | 1.23E+09           | 4.6E+11   | 5.63E+10      | 0     |
| triisopropanolamine | 4.91E+10          | 2.44E+11  | 1.07E+11      | 17    |
| tropine           | 1.55E+10           | 8.02E+11  | 4.49E+11      | 2     |
| valsartan         | 1.23E+09           | 2.01E+10  | 2.22E+09      | 6     |
| venlafaxine       | 6.83E+08           | 5.02E+11  | 1.8E+10       | 0     |

*a Unitless peak areas were used as surrogates of chemical concentration, hence the units are not mass per time and can only be evaluated on a relative basis for a given chemical.*
Table S4. Comparison of chemical half-life (d) in the lab test and the field test.

| chemical         | lab measurements (mixture lake water / natural lake water) | field measurements | mean | 95% confidence interval | mean | rel. std. dev. (RSD) |
|------------------|-----------------------------------------------------------|--------------------|------|-------------------------|------|---------------------|
| acesulfame*      | 30 / 24                                                   | 51                 | 0.53 | [26, 36] / [21, 28]     |      |                     |
| amphetamine*     | 46 /                                                      | 58                 | 0.56 | [41, 54] /              |      |                     |
| atenolol*        | 6.5 /                                                     | 3.9                | 0.049| [6.2, 6.8] /            |      |                     |
| benzoetriazole   | -- /                                                     | 68                 | 0.16 | -- / [-, -] / [-, -]    |      |                     |
| codeine          | 101 / 150                                                 | <6.5 b             | 0.21 | [78, 142] / [98, 202]   |      |                     |
| conine           | -- /                                                     | <13                | 0.24 | -- / [-, -] /           |      |                     |
| ecgonine*        | 5.1 / 4.9                                                 | 10                 | 0.21 | [4.7, 5.5] / [2.9, 15]  |      |                     |
| escitalopram     | -- /                                                     | 3.9                | 0.17 | -- / [-, -] /           |      |                     |
| furosemide*      | 11 /                                                     | 5.9                | 0.041| [9.1, 13] /             |      |                     |
| hexamethylenetetramine | -- / --                  | 45                | 0.24 | [1347, --] / [--, --]   |      |                     |
| hydrochlorothiazide* | 36 / --                           | <3.6 b            | 0.043| [31, 41] /              |      |                     |
| irbesartan*      | 10 /                                                     | <5.7 b             | 0.062| [9.3, 11] /             |      |                     |
| kinetin          | 92 / 135                                                  | 25                 | 0.17 | [66, 152] / [83, 354]   |      |                     |
| lamotrigine      | -- /                                                     | 74                 | 0.33 | -- / [-, -] / [-, -]    |      |                     |
| lidocaine        | 200 / 162                                                 | 28                 | 0.23 | [149, 306] / [133, 208] |      |                     |
| losartan*        | 18 / 33                                                   | 21                 | 0.23 | [15, 21] / [11, 79]     |      |                     |
| melamine         | -- /                                                     | 39                 | 0.28 | -- / [-, -] / [-, -]    |      |                     |
| metformin        | -- /                                                     | 15                 | 0.38 | [1934, --] / [--, --]   |      |                     |
| metoprolol*      | 14 / 12                                                   | 3.1                | 0.043| [13, 15] / [11, 14]     |      |                     |
| oxazepam*        | 105 / 119                                                  | 37                 | 0.18 | [81, 148] / [79, 239]   |      |                     |
| perillartine     | 73 / --                                                   | 71                 | 0.31 | [38, 1282] / [--]       |      |                     |
| PPG n4*          | 5.1 / 19                                                  | 32                 | 0.28 | [4.8, 5.4] / [17, 22]   |      |                     |
| PPG n5*          | 3.7 / 24                                                  | 34                 | 0.31 | [3.5, 4.0] / [21, 28]   |      |                     |
| pregabalin*      | 11 / 7.2                                                  | 81                 | 0.43 | [8.9, 12] / [6.7, 8.7]  |      |                     |
| propranolol*     | 13 / --                                                   | <6.8 b             | 0.083| [11, 14] /              |      |                     |
| ranitidine*      | 4.6 /                                                     | <17                | 0.055| [3.7, 6.2] /            |      |                     |
| sitagliptin      | 71 /                                                      | 20                 | 0.47 | [55, 100] /             |      |                     |
| sulfapyridine*   | 2.7 /                                                     | <5.5 b             | 0.14 | [2.4, 3-0] /            |      |                     |
| tramadol         | 401 / 731                                                 | 16                 | 0.19 | [261, --] / [419, --]   |      |                     |
| tropine*         | 33 / 18                                                   | 52                 | 0.41 | [29, 36] / [12, 25]     |      |                     |
| valsartan*       | 6.3 /                                                     | <14                | 0.096| [4.1, 14] /             |      |                     |
| venlafaxine      | 3818 / --                                                 | 5.6                | 0.099| [608, --] / [--]        |      |                     |

* These chemicals followed first-order dissipation kinetics in the laboratory test.

a -- indicates a positive slope of the dissipation curve. If the upper bound has this designation, then the dissipation half-life was not different from ∞. If the lower bound also has this designation, then there was net formation of the chemical during the incubation. If the space after the / is empty then dissipation could not be measured in the incubation with natural lake water.

b -- < indicates that mean represents an upper limit; in this case the RSD applies to the upper limit.
Figure S6. Field and lab half-lives ($t_{1/2}$, d) for the 18 chemicals that degraded according to first-order kinetics in the lab test. The area between the two dashed lines represents agreement between the two half-lives within a factor of 3. The * symbol next to a chemical indicates a good agreement between field and lab half-lives (central estimates differ by a factor of <3). The † symbol next to a chemical indicates the lab half-lives are from incubations of natural lake water; those for the other compounds are from incubations in mixture lake water. The error bars show the standard deviation for the field measurements and the 95% confidence interval for the lab measurements. The extended line with an arrow is used if the concentration was <LOD in outflow, in which case the calculated $t_{1/2}$ represents a maximum value.
Figure S7. Concentration time trends in the lab test with mixture lake water for the 14 chemicals for which either the half-life had a high uncertainty or the 95% confidence interval of the half-life intersected infinity. All graphs share the same x and y axis. Plots are based on normalized peak areas at each time point relative to the initial peak area in each sample. Linear regressions are shown as solid lines.