# Kelly et al. Figures

Different Incubation Assay Metrics Describe Different Aspects of Carbon Degradation

## Contents



## Main manuscript

### Figure 1

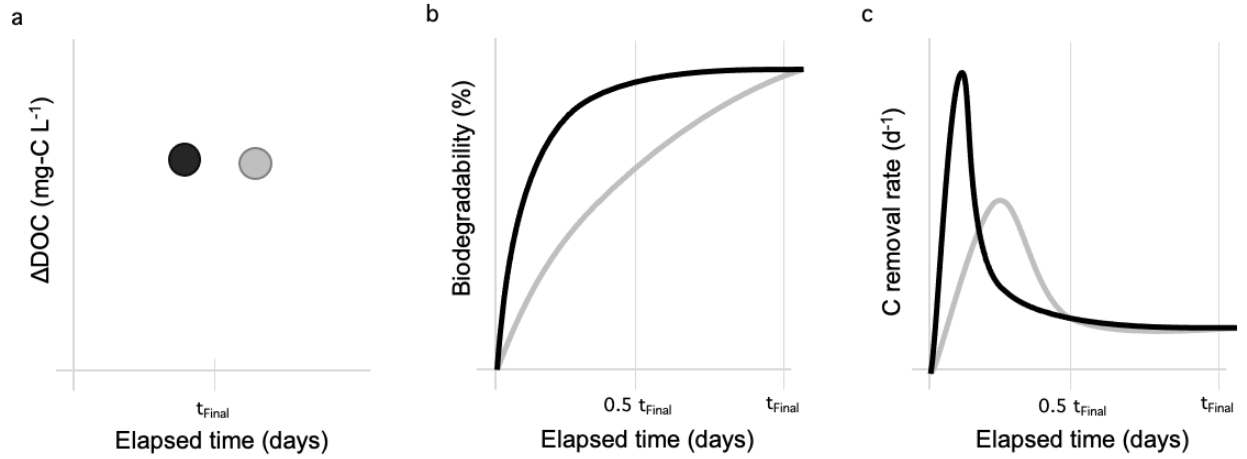


**Figure 2**

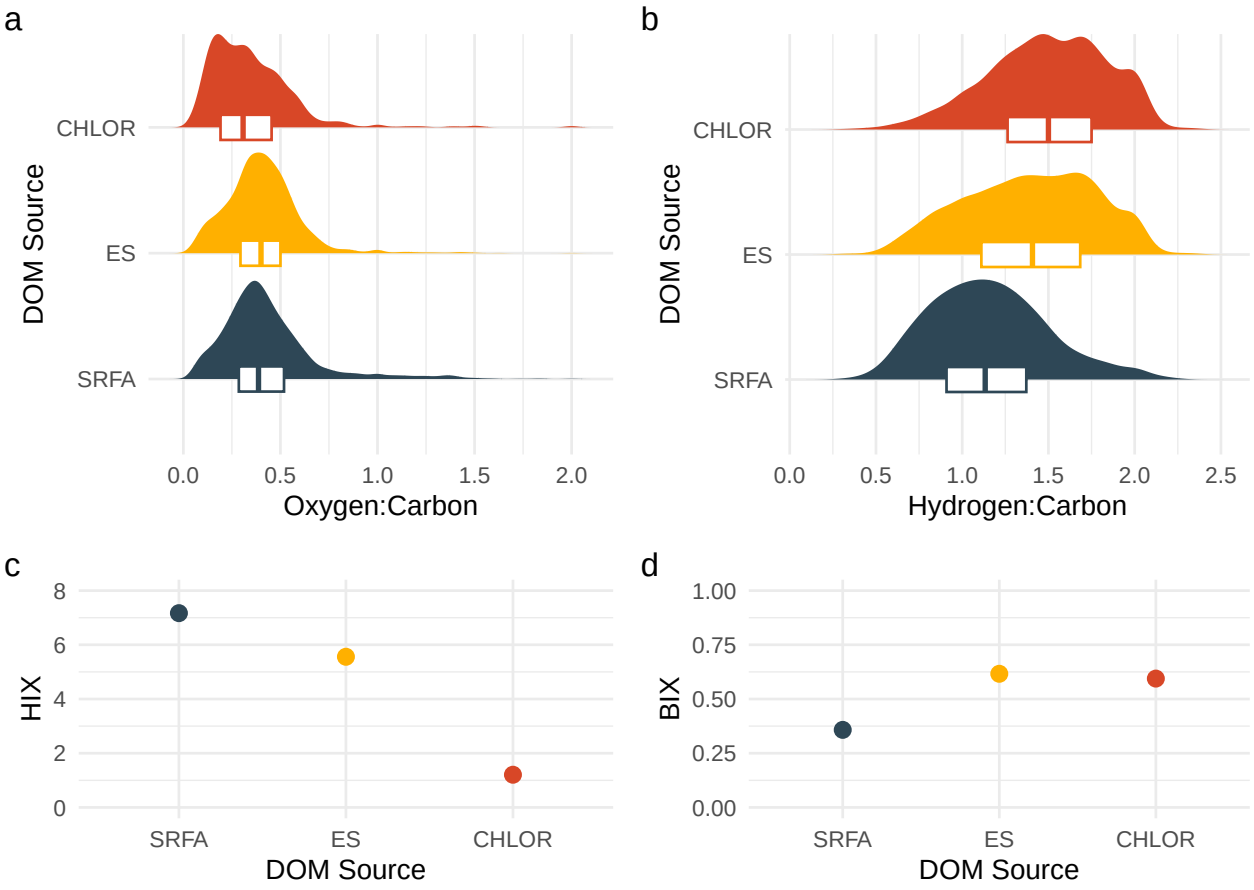

a
CHLOR
ES
SRFA
DOM Source
0.0
0.5
1.0
1.5
2.0
Oxygen:Carbon
b
CHLOR
ES
SRFA
DOM Source
0.0
0.5
1.0
1.5
2.0
2.5
Hydrogen:Carbon
c
HIX
8
6
4
2
0
SRFA
ES
CHLOR
DOM Source
d
BIX
1.00
0.75
0.50
0.25
0.00
SRFA
ES
CHLOR
DOM Source

**Figure 3**

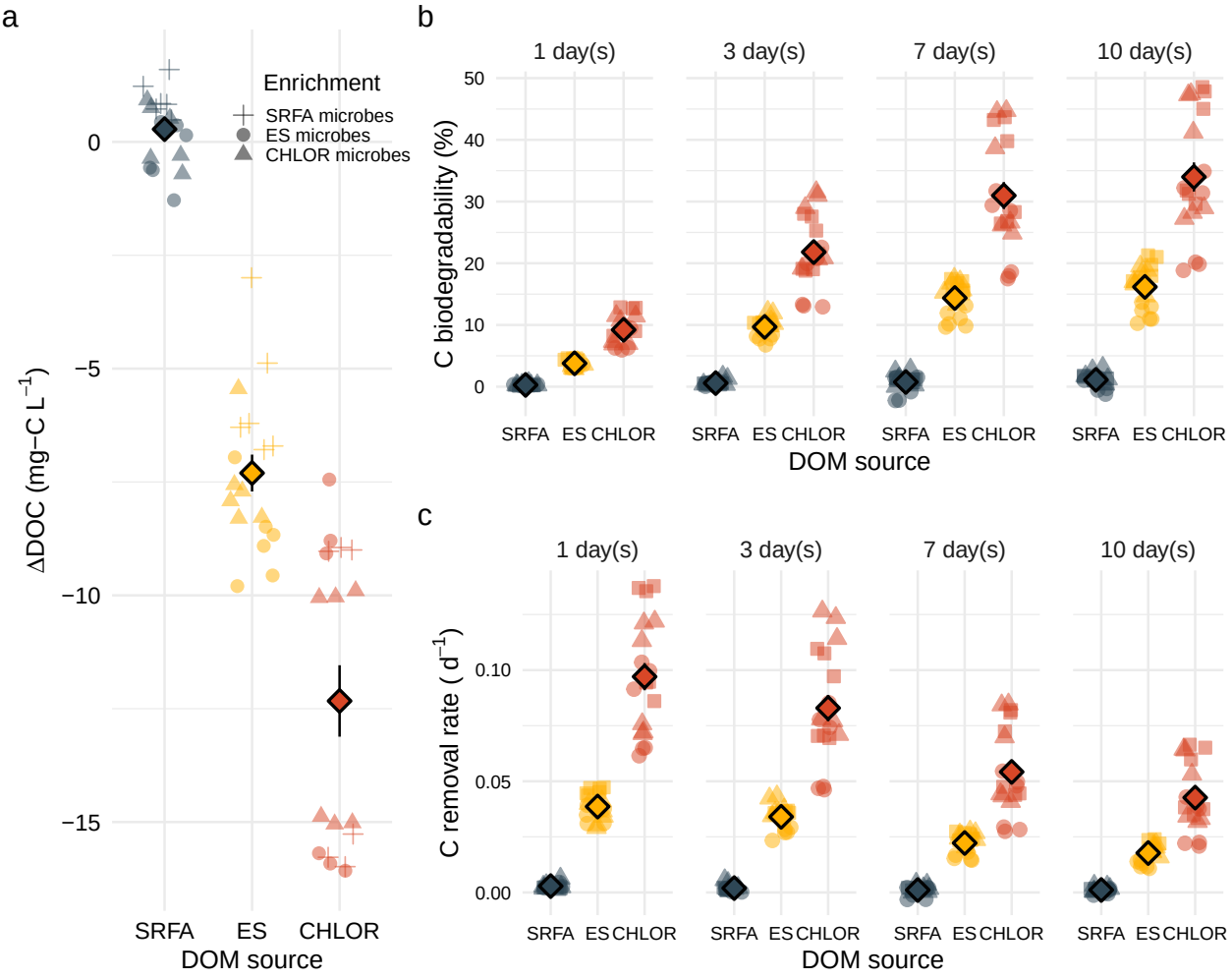
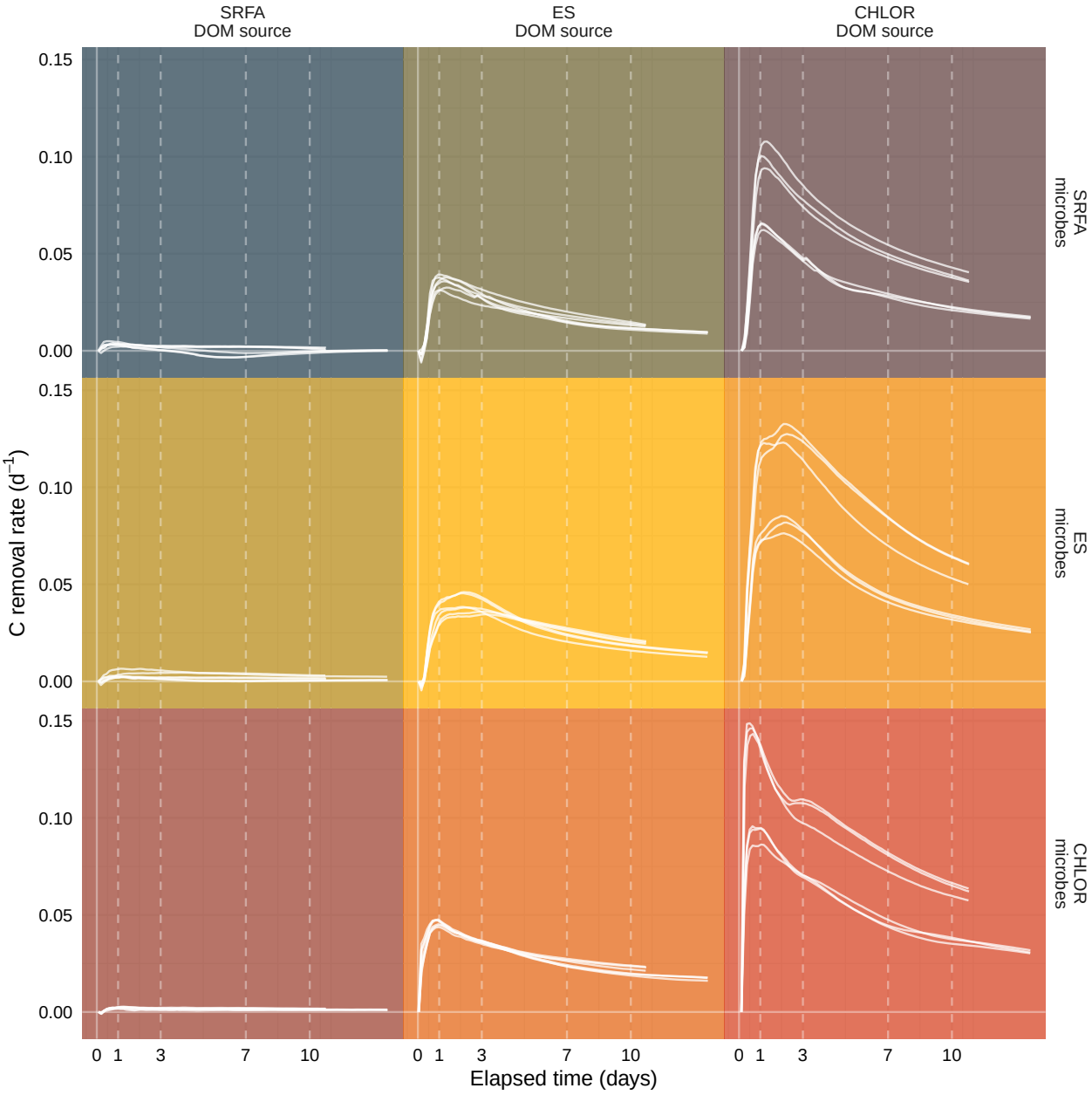
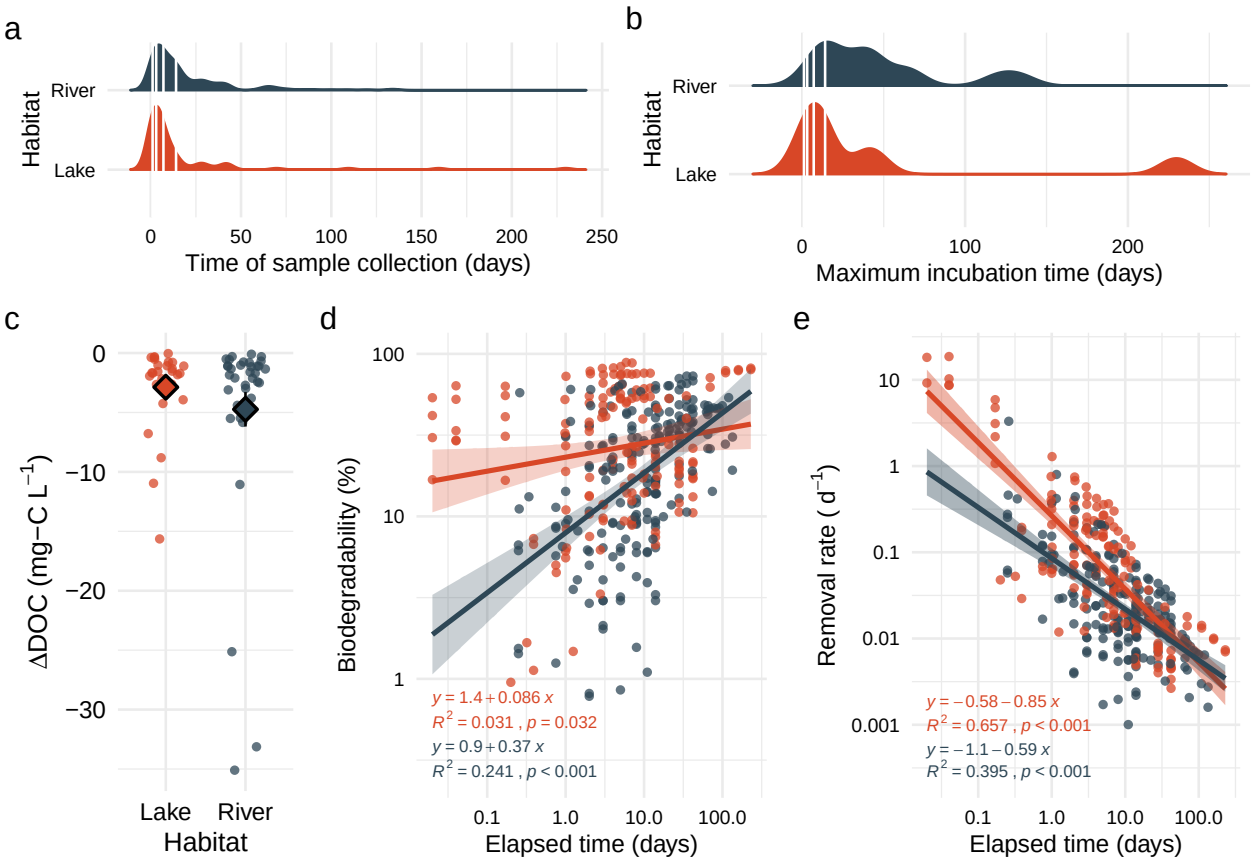

a
Enrichment
SRFA microbes
ES microbes
CHLOR microbes
ΔDOC (mg−C L−1)
0
−5
−10
−15
SRFA
ES
CHLOR
DOM source
b
1 day(s)
3 day(s)
7 day(s)
10 day(s)
C biodegradability (%)
50
40
30
20
10
0
SRFA ES CHLOR
DOM source
c
1 day(s)
3 day(s)
7 day(s)
10 day(s)
C removal rate ( d−1)
0.10
0.05
0.00
SRFA ES CHLOR
DOM source

**Figure 4**


SRFA
DOM source
ES
DOM source
CHLOR
DOM source
SRFA
microbes
ES
microbes
CHLOR
microbes
C removal rate (d$^{-1}$)
0.15
0.10
0.05
0.00
0 1 3 7 10
Elapsed time (days)

## Figure 5




## Figure 6

| | | | C bioavailability |
|---|---|---|---|
| Study objective | Total degradation | Relative degradation | Microbial activity |
| Degradation metric | ΔDOC<br>$\Delta DOC = DOC_F - DOC_0$ | Biodegradability<br>$BDOC_t = \frac{DOC_0 - DOC_t}{DOC_0} \times 100$ | C removal rate<br>$k_t = -\frac{1}{t} \ln \frac{DOC_t}{DOC_0}$ |
| Sampling strategy | Balanced sampling<br>$t_0$ $t_1$ $t_2$ $t_3$ $t_4$ $t_{Final}$ | | Front-loaded sampling<br>$t_0$ $t_1$ $t_2$ $t_3$ $t_4$ $t_{Final}$ |

## Supplemental

### Figure S1

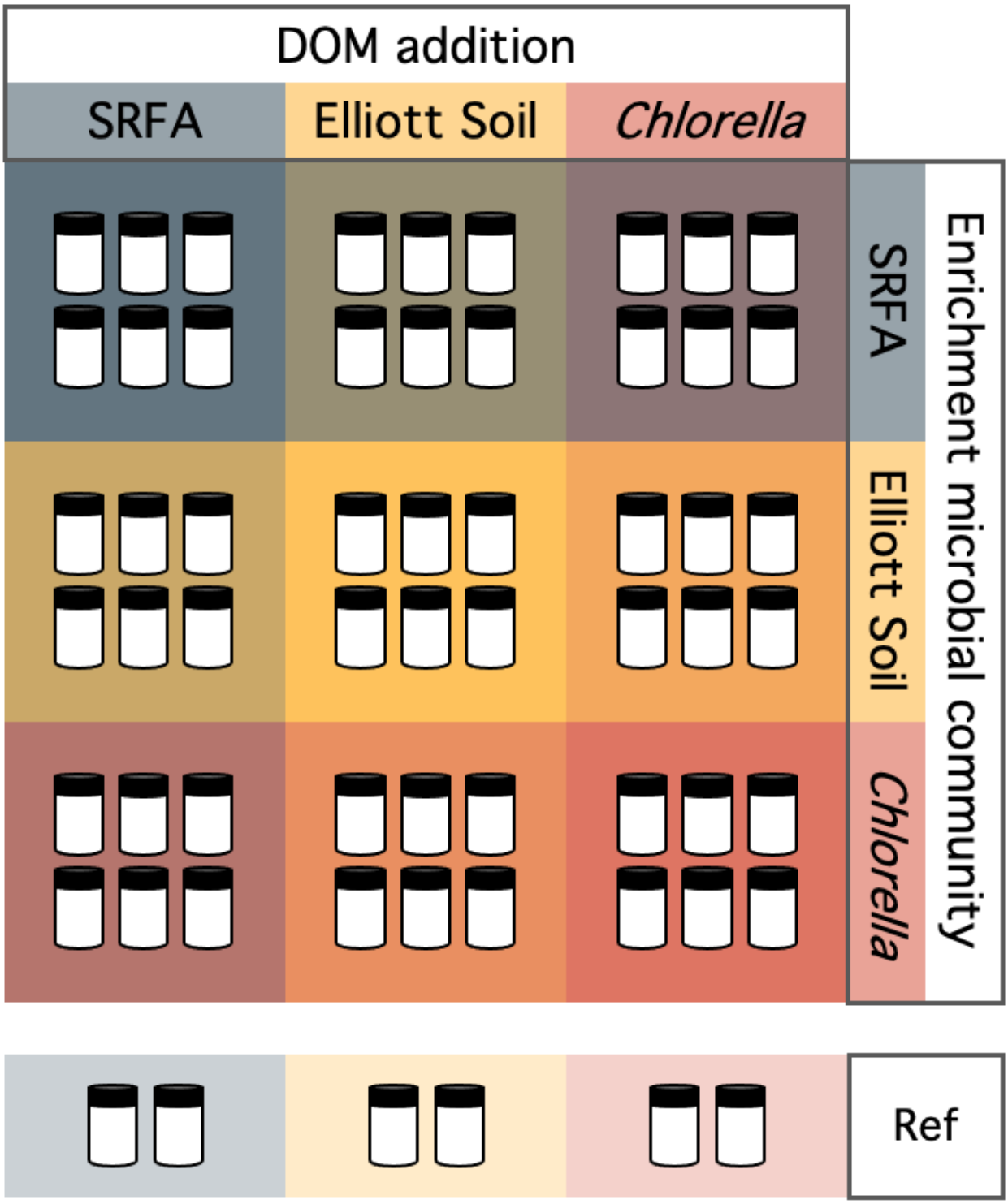


**Figure S2**

a

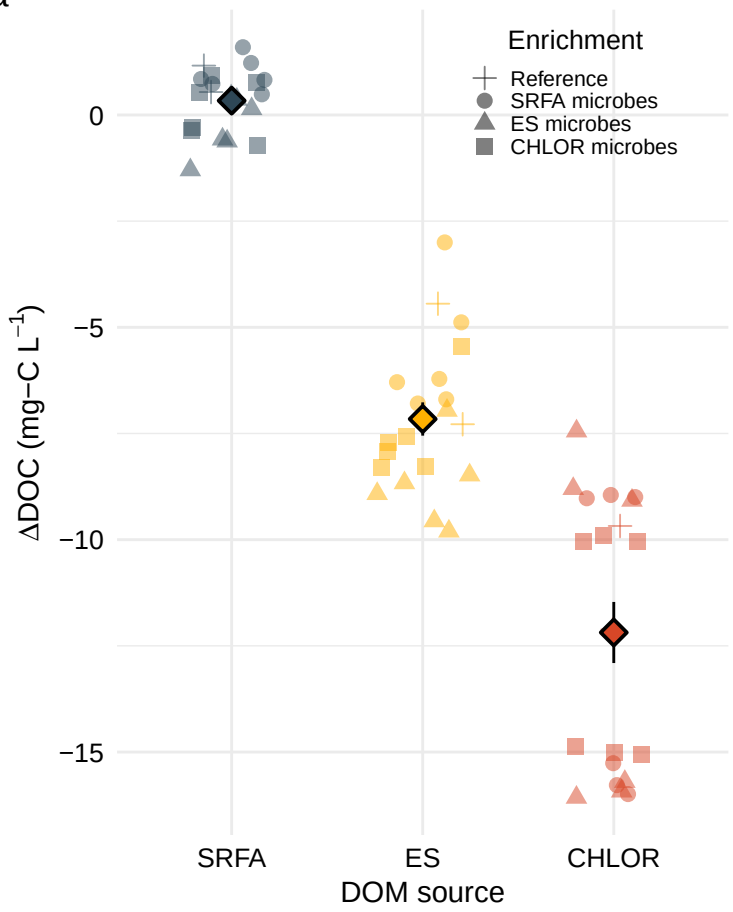

Enrichment
Reference
SRFA microbes
ES microbes
CHLOR microbes
0
−5
−10
−15
ΔDOC (mg−C L−1)
SRFA
ES
CHLOR
DOM source

**Figure S3**

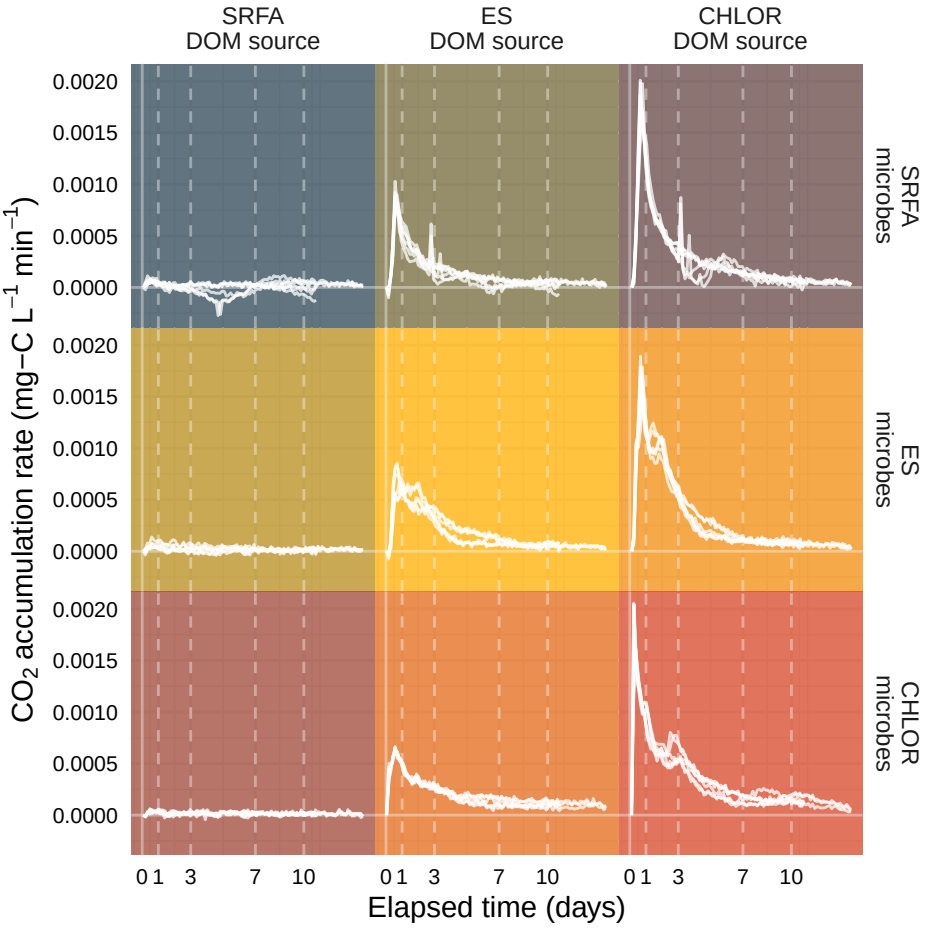

SRFA
DOM source
ES
DOM source
CHLOR
DOM source
SRFA
microbes
ES
microbes
CHLOR
microbes
0.0020
0.0015
0.0010
0.0005
0.0000
CO2 accumulation rate (mg−C L−1 min−1)
0 1 3 7 10
Elapsed time (days)

**Figure S4**

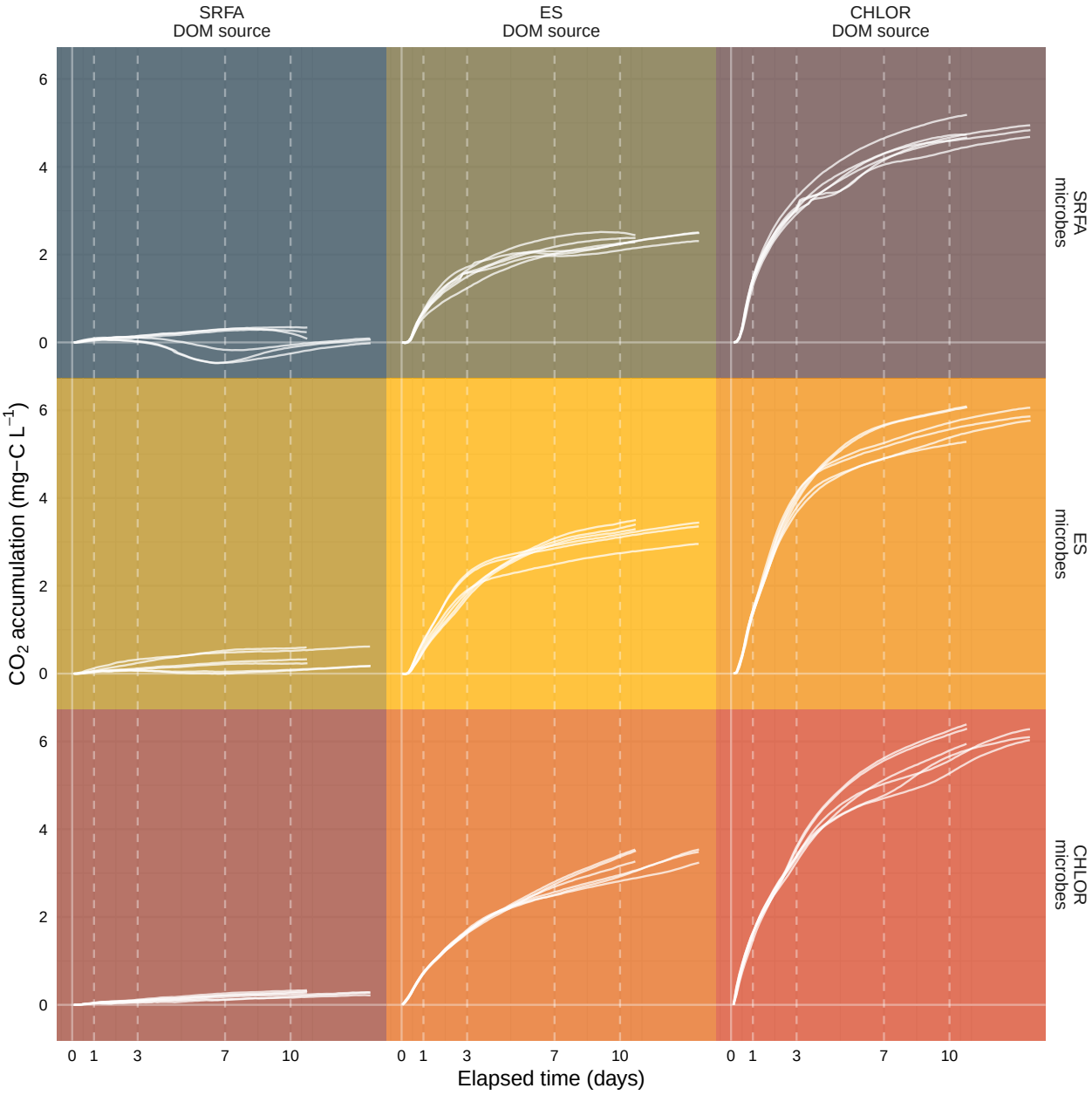
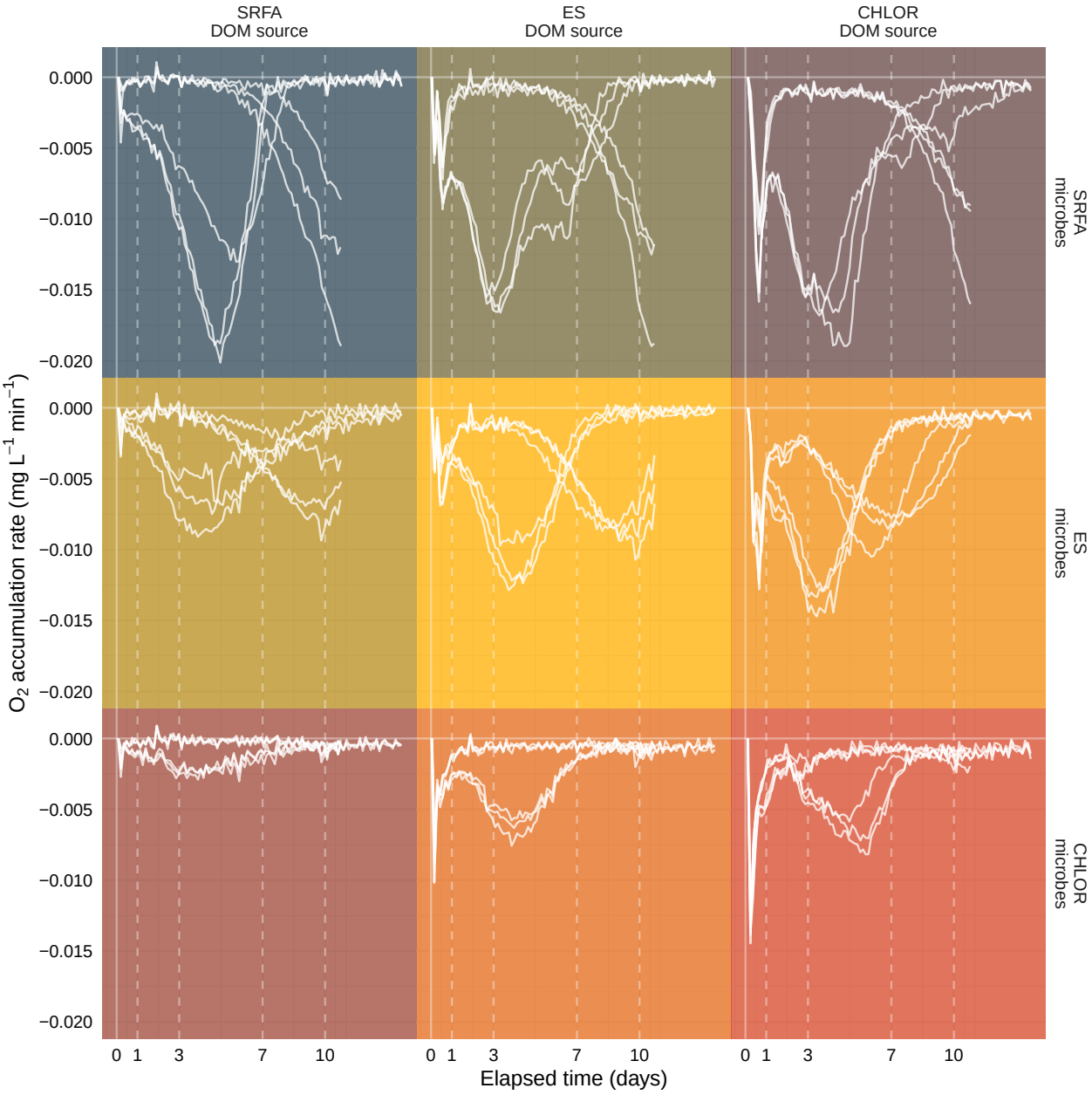
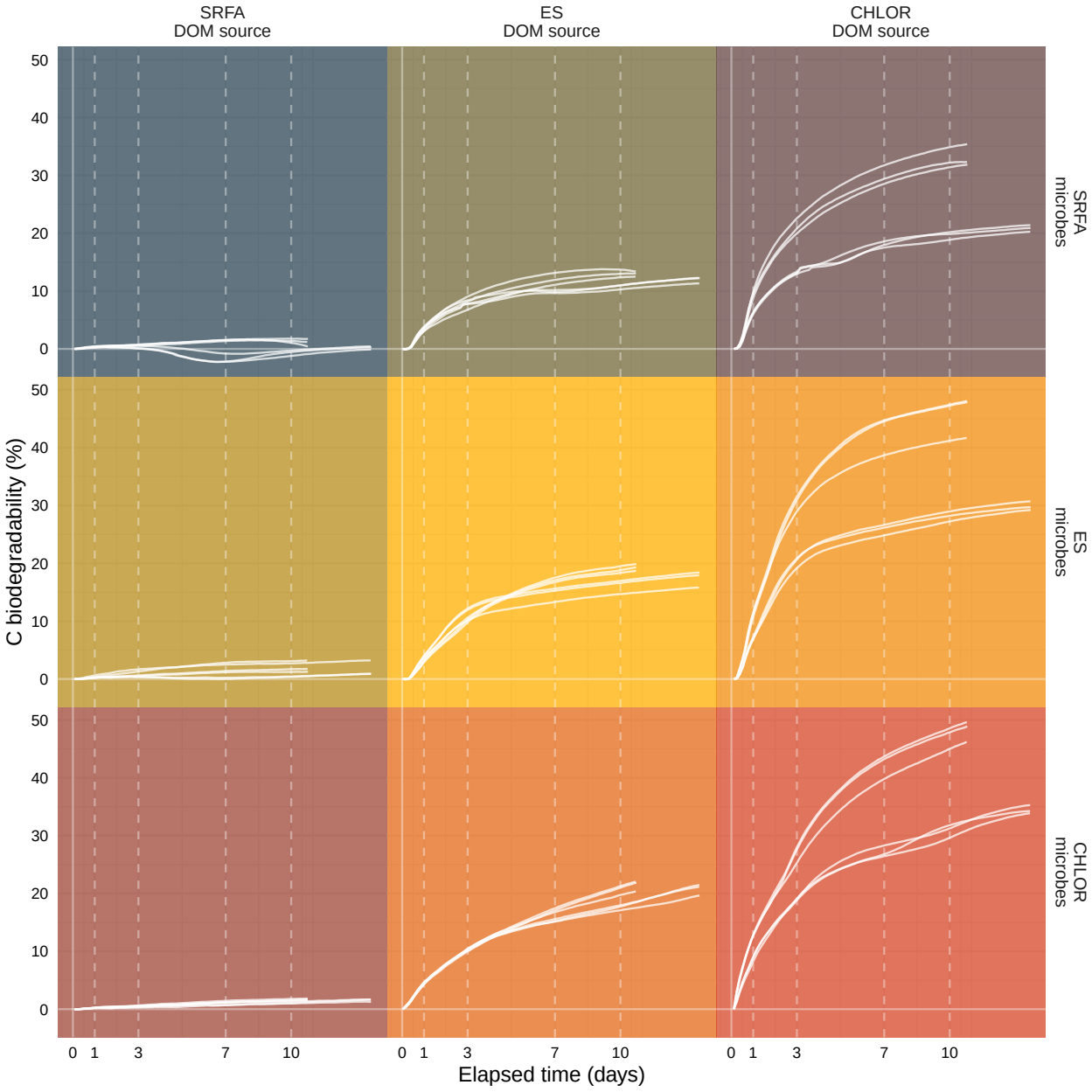

SRFA
DOM source
ES
DOM source
CHLOR
DOM source
SRFA
microbes
ES
microbes
CHLOR
microbes
$CO_2$ accumulation (mg–C $L^{-1}$)
0
2
4
6
0 1 3 7 10
Elapsed time (days)

**Figure S5**


SRFA
DOM source
ES
DOM source
CHLOR
DOM source
SRFA
microbes
ES
microbes
CHLOR
microbes
0.000
−0.005
−0.010
−0.015
−0.020
O2 accumulation rate (mg L−1 min−1)
0 1 3 7 10
Elapsed time (days)

## Figure S6




## Table S1

| | Df | Sum Sq | Mean Sq | F value | Pr(>F) |
|---|---|---|---|---|---|
| DOMSource | 2 | 1588.662 | 794.331 | 170.421 | 0.000 |
| Enrichment | 3 | 25.021 | 8.340 | 1.789 | 0.162 |
| DOMSource:Enrichment | 6 | 16.949 | 2.825 | 0.606 | 0.724 |
| Residuals | 48 | 223.727 | 4.661 | NA | NA |

## Table S2

| DOMSource | Enrichment | initialDOC | finalDOC | 1 | 3 | 7 | 10 |
|---|---|---|---|---|---|---|---|
| SRFA | CTRL | 20.38 (1.33) | 21.23 (0.89) | 0.02 (0.01) | 0.01 (0.04) | 0.06 (0.13) | 0.08 (0.16) |
| SRFA | SRFA | 20.23 (0.88) | 21.18 (0.63) | 0.07 (0.02) | 0.09 (0.06) | -0.04 (0.37) | 0.07 (0.24) |
| SRFA | ES | 18.9 (0.42) | 18.65 (0.64) | 0.06 (0.03) | 0.15 (0.1) | 0.26 (0.22) | 0.3 (0.21) |
| SRFA | CHLOR | 17.56 (0.74) | 17.7 (0.21) | 0.04 (0.01) | 0.09 (0.03) | 0.18 (0.06) | 0.24 (0.06) |
| ES | CTRL | 19.36 (0.89) | 13.5 (1.12) | 0.09 (0.24) | 0.48 (0.61) | 1.16 (0.45) | 1.39 (0.43) |
| ES | SRFA | 19.32 (1.52) | 13.68 (2.1) | 0.66 (0.06) | 1.55 (0.17) | 2.11 (0.16) | 2.28 (0.14) |
| ES | ES | 18.13 (0.77) | 9.4 (1.15) | 0.63 (0.1) | 1.96 (0.23) | 2.88 (0.21) | 3.16 (0.24) |
| ES | CHLOR | 16.26 (0.31) | 8.73 (1.14) | 0.73 (0.01) | 1.67 (0.03) | 2.63 (0.13) | 3.11 (0.25) |
| CHLOR | CTRL | 17.7 (3.85) | 6.81 (2.13) | 0.37 (0.58) | 2.06 (0.79) | 3.13 (1.25) | 3.36 (1.43) |
| CHLOR | SRFA | 18.89 (5.99) | 6.55 (1.01) | 1.4 (0.07) | 3.06 (0.13) | 4.27 (0.21) | 4.67 (0.25) |
| CHLOR | ES | 16.2 (4.99) | 4.03 (0.6) | 1.4 (0.05) | 3.93 (0.17) | 5.25 (0.34) | 5.64 (0.32) |
| CHLOR | CHLOR | 15.34 (3.49) | 2.85 (0.08) | 1.6 (0.07) | 3.42 (0.13) | 5.14 (0.39) | 5.78 (0.37) |

## Table S3

Log accumulation rate

| | Df | Sum Sq | Mean Sq | F value | Pr(>F) |
|---|---|---|---|---|---|
| DOMSource | 2 | 15.381 | 7.691 | 342.127 | 0.000 |
| Enrichment | 2 | 0.532 | 0.266 | 11.824 | 0.000 |
| Time_d | 1 | 10.185 | 10.185 | 453.078 | 0.000 |
| DOMSource:Enrichment | 4 | 0.093 | 0.023 | 1.032 | 0.392 |
| DOMSource:Time_d | 2 | 2.633 | 1.316 | 58.556 | 0.000 |
| Enrichment:Time_d | 2 | 0.250 | 0.125 | 5.558 | 0.004 |
| DOMSource:Enrichment:Time_d | 4 | 0.031 | 0.008 | 0.350 | 0.844 |
| Residuals | 198 | 4.451 | 0.022 | NA | NA |

Log total CO2 accumulation

| | Df | Sum Sq | Mean Sq | F value | Pr(>F) |
|---|---|---|---|---|---|
| DOMSource | 2 | 485.775 | 242.888 | 1593.015 | 0.000 |
| Enrichment | 2 | 8.384 | 4.192 | 27.493 | 0.000 |
| Time_d | 1 | 125.709 | 125.709 | 824.483 | 0.000 |
| DOMSource:Enrichment | 4 | 2.498 | 0.624 | 4.095 | 0.003 |
| DOMSource:Time_d | 2 | 68.780 | 34.390 | 225.551 | 0.000 |
| Enrichment:Time_d | 2 | 3.131 | 1.565 | 10.267 | 0.000 |
| DOMSource:Enrichment:Time_d | 4 | 0.610 | 0.153 | 1.000 | 0.408 |
| Residuals | 198 | 30.189 | 0.152 | NA | NA |

## Table S4

Log biodegradability

| | Df | Sum Sq | Mean Sq | F value | Pr(>F) |
|---|---|---|---|---|---|
| DOMSource | 2 | 31.044 | 15.522 | 737.092 | 0.000 |
| Enrichment | 2 | 0.816 | 0.408 | 19.365 | 0.000 |
| Time_d | 1 | 3.085 | 3.085 | 146.493 | 0.000 |
| DOMSource:Enrichment | 4 | 0.031 | 0.008 | 0.368 | 0.831 |
| DOMSource:Time_d | 2 | 1.052 | 0.526 | 24.980 | 0.000 |

| | Df | Sum Sq | Mean Sq | F value | Pr(>F) |
|---|---|---|---|---|---|
| Enrichment:Time_d | 2 | 0.174 | 0.087 | 4.132 | 0.017 |
| DOMSource:Enrichment:Time_d | 4 | 0.069 | 0.017 | 0.821 | 0.513 |
| Residuals | 198 | 4.170 | 0.021 | NA | NA |

Log C removal

| | Df | Sum Sq | Mean Sq | F value | Pr(>F) |
|---|---|---|---|---|---|
| DOMSource | 2 | 49.072 | 24.536 | 1296.460 | 0.000 |
| Enrichment | 2 | 0.935 | 0.467 | 24.701 | 0.000 |
| Time_d | 1 | 2.587 | 2.587 | 136.682 | 0.000 |
| DOMSource:Enrichment | 4 | 0.047 | 0.012 | 0.618 | 0.650 |
| DOMSource:Time_d | 2 | 0.200 | 0.100 | 5.277 | 0.006 |
| Enrichment:Time_d | 2 | 0.151 | 0.075 | 3.977 | 0.020 |
| DOMSource:Enrichment:Time_d | 4 | 0.062 | 0.016 | 0.824 | 0.511 |
| Residuals | 198 | 3.747 | 0.019 | NA | NA |