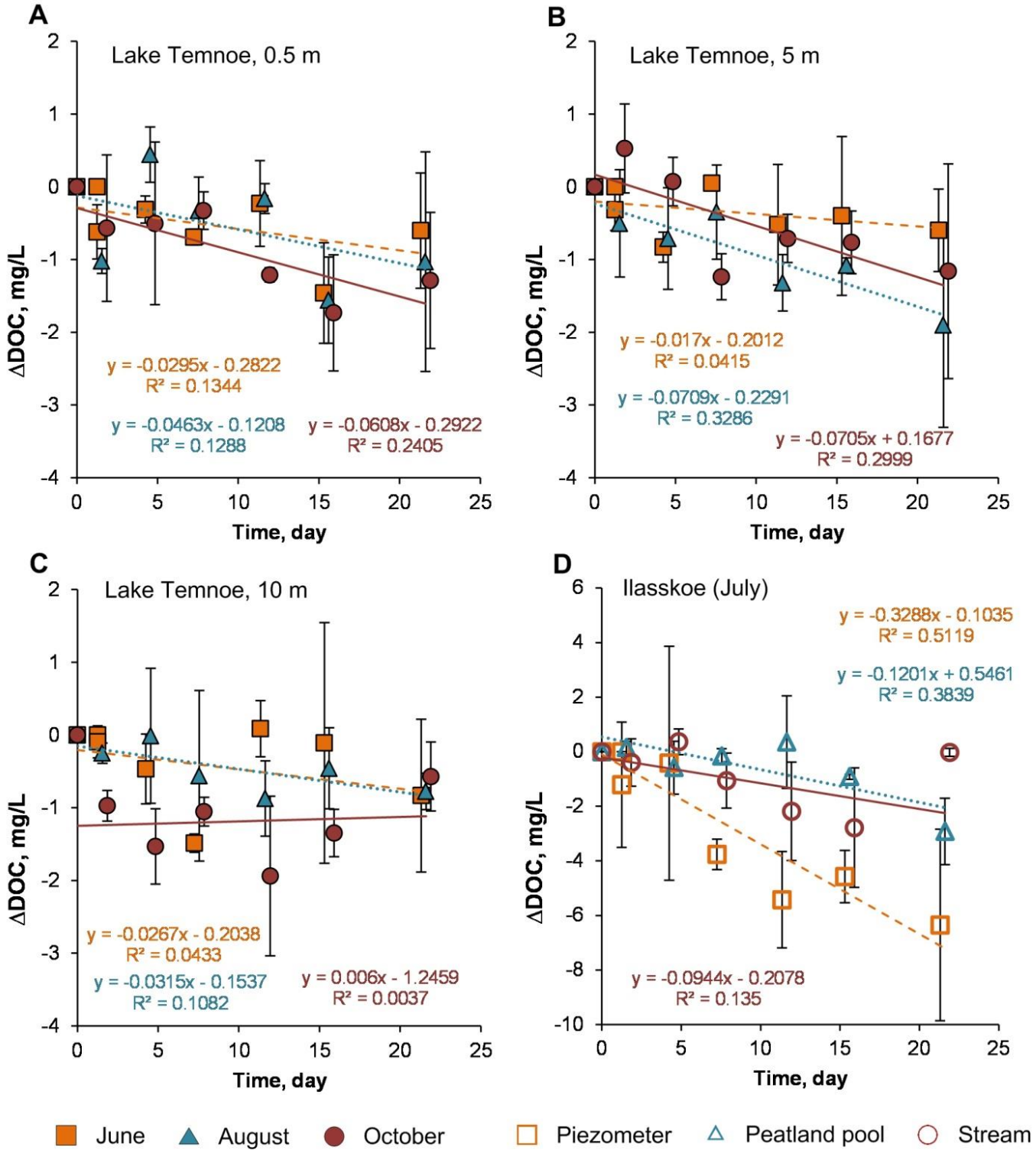

Fig. S1. The change of DOC concentration over time in biodegradation experiments. The error bars represent 1 s.d. of duplicates unless within the symbol size. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (open squares), peatland pool Severnoe (open triangles) and stream Chernyi (open circles)

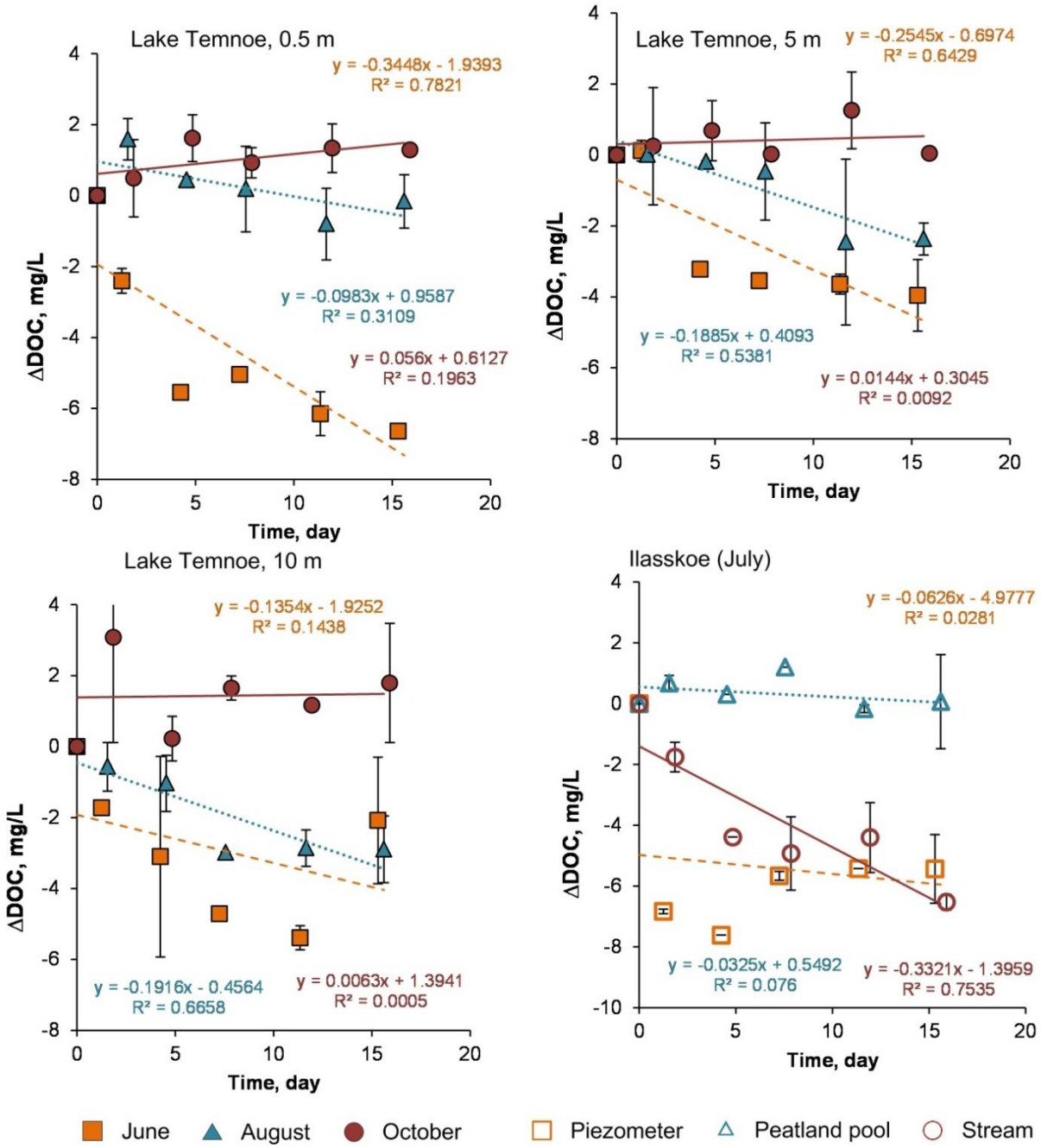

Fig. S2. The change of DOC concentration over time in photodegradation experiments. The error bars represent 1 s.d. of duplicates. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (open squares), peatland pool Severnoe (open triangles) and stream Chernyi (open circles)

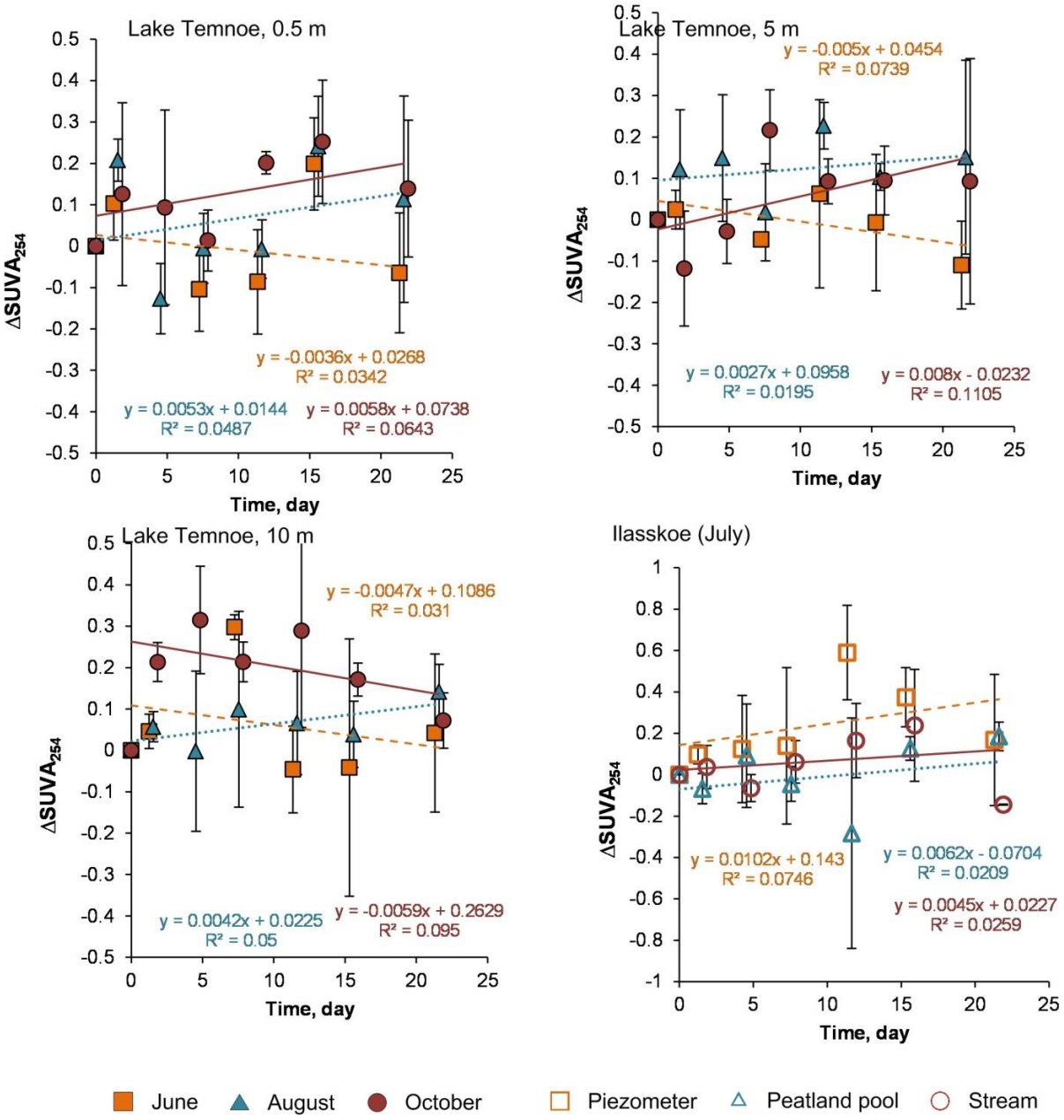

Fig. S3. The change of $SUVA_{254}$ over time in bio-degradation experiments. The error bars represent 1 s.d. of duplicates. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (open squares), peatland pool Severnoe (open triangles) and stream Chernyi (open circles)

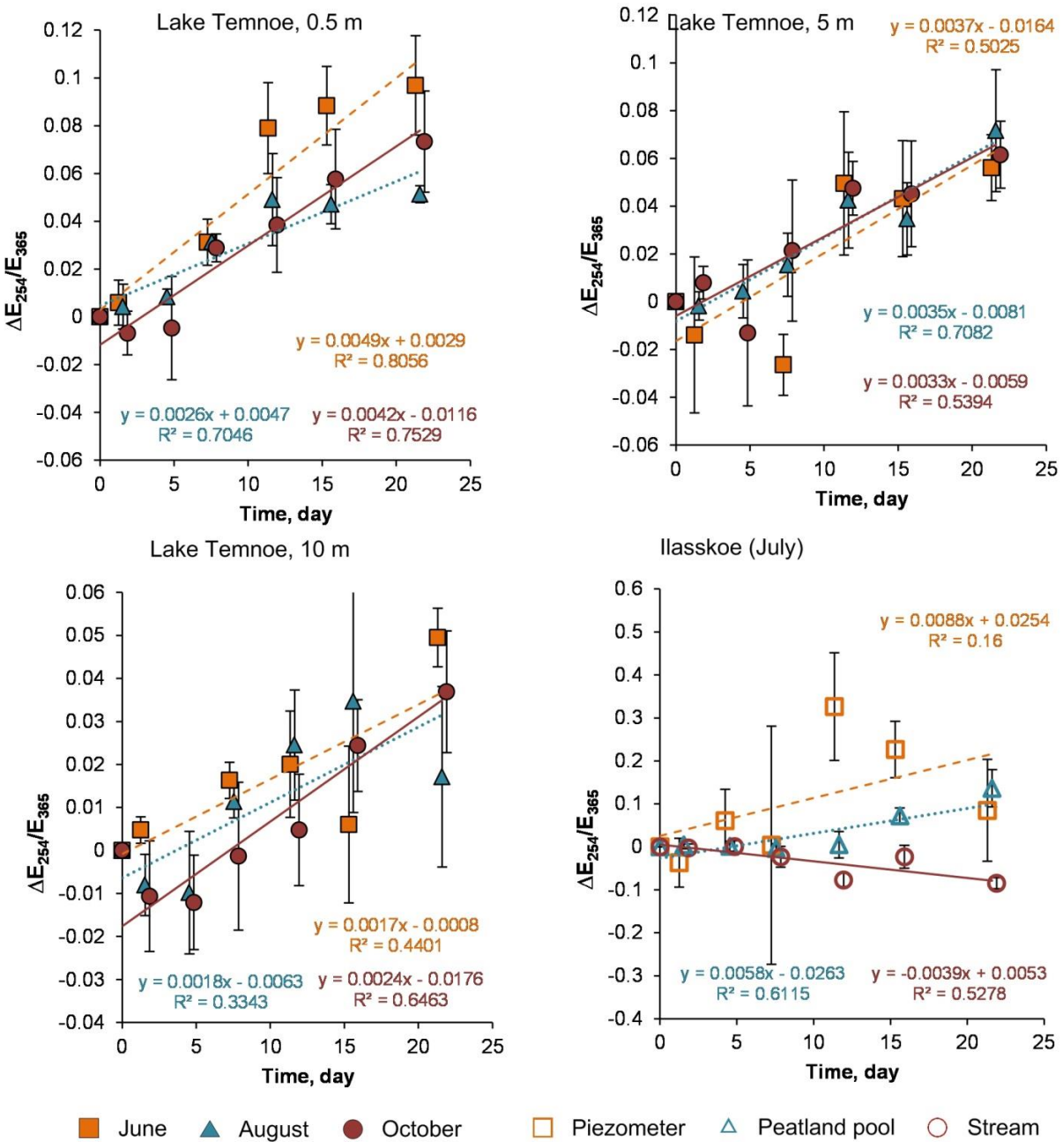

Fig. S4. The change of optical ratios (E_{254}/E_{365}) over time in bio-degradation experiments. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and stream Chernyi (circles)

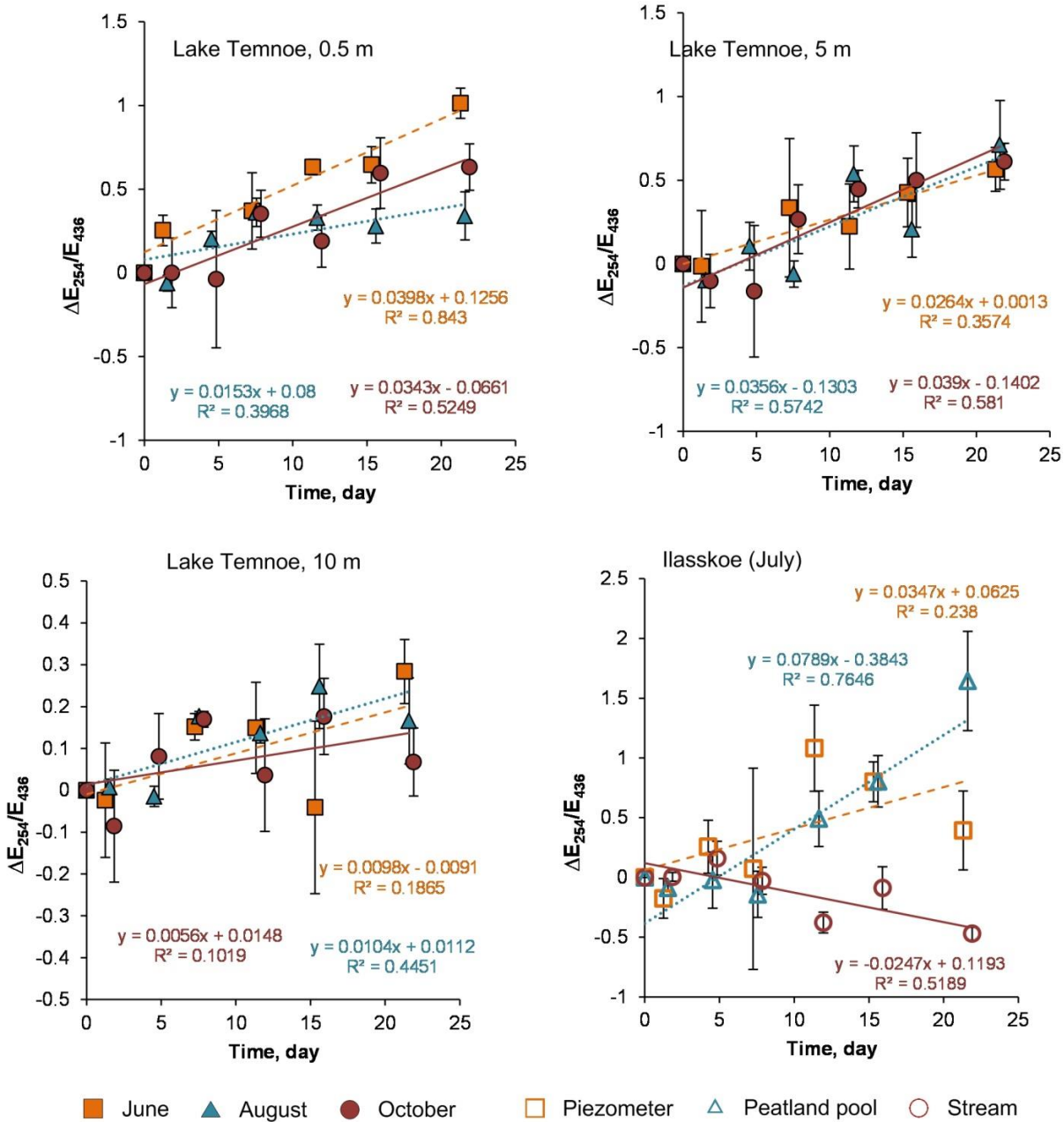

Fig. S4, continued. The change of optical ratios (E_{254}/E_{436}) over time in bio-degradation experiments. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and outlet stream Chernyi (circles)

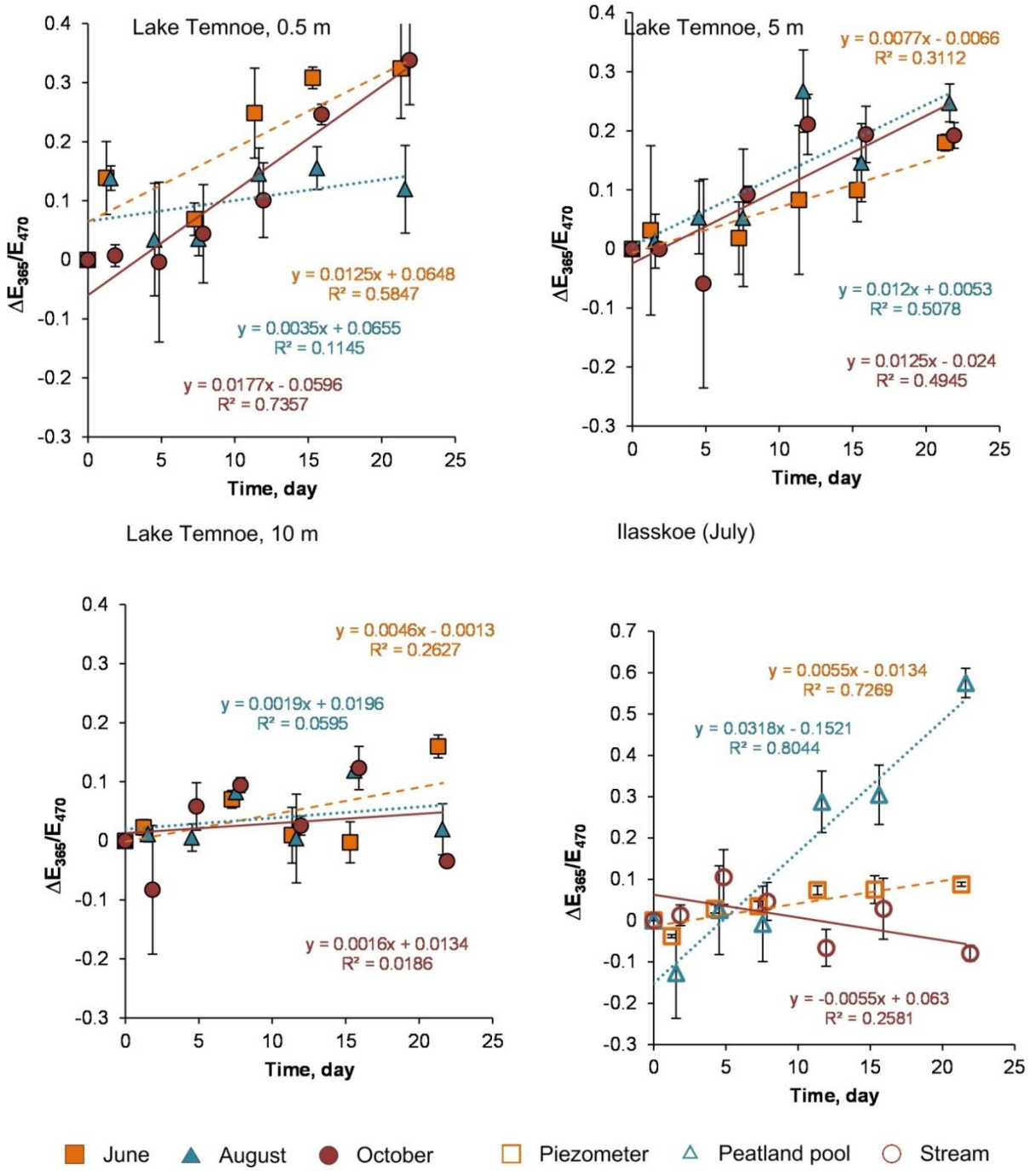

Fig. S4, continued. The change of optical ratios (E_{365}/E_{470}) over time in bio-degradation experiments. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and outlet stream Chernyi (circles)

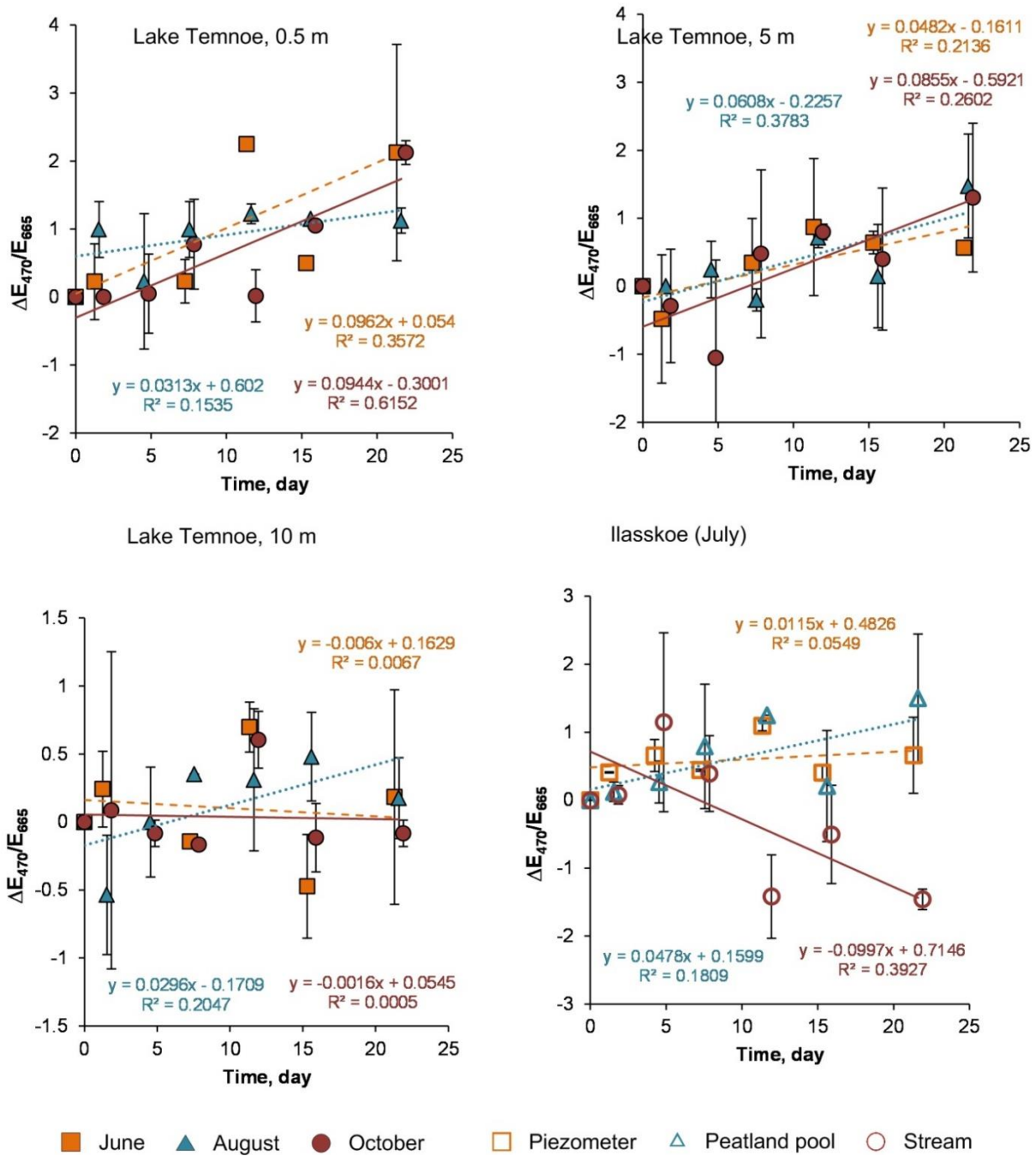

Fig. S4, continued. The change of optical ratios (E_{470}/E_{665}) over time in bio-degradation experiments. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and outlet stream Chernyi (circles)

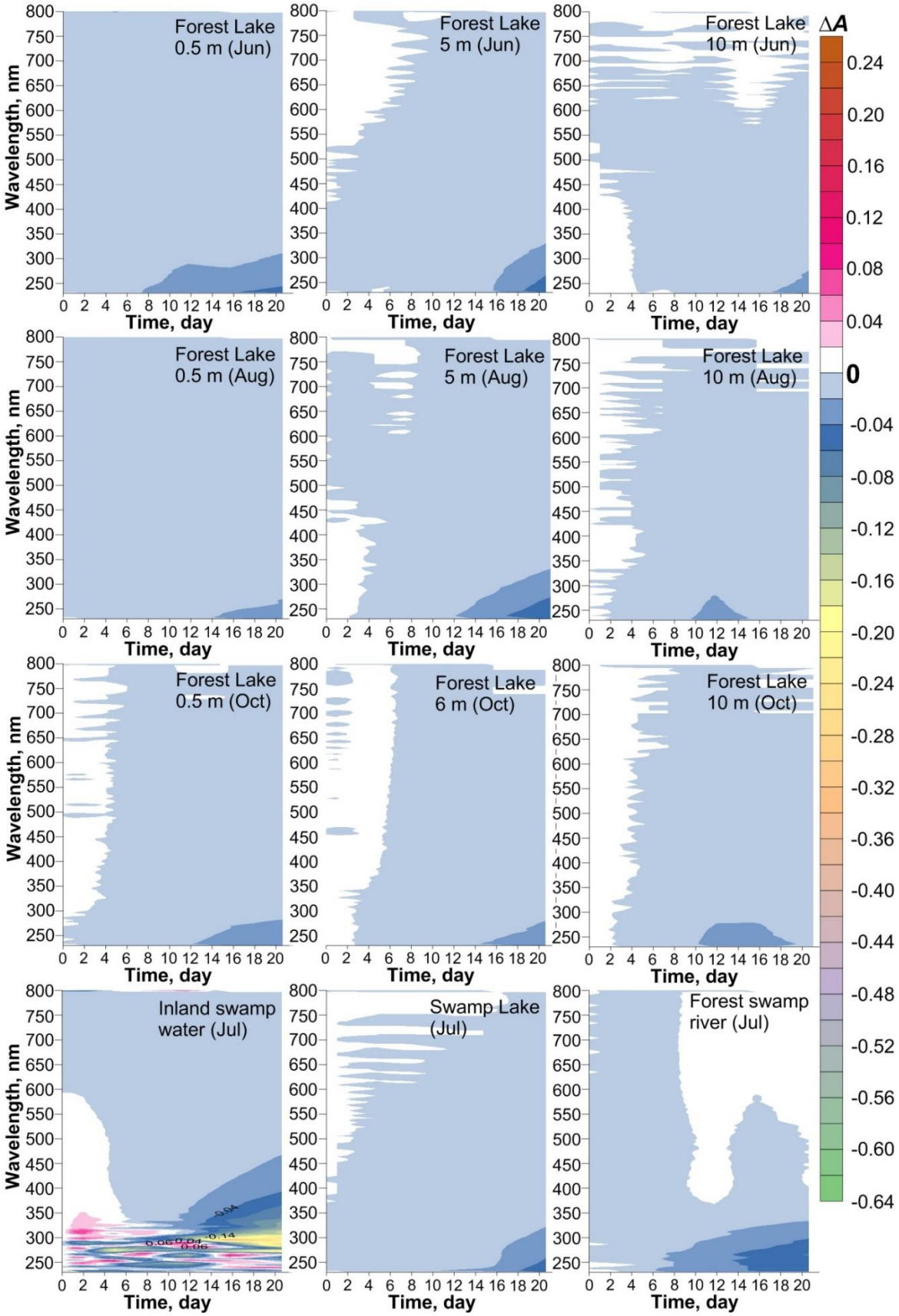

Fig. S5. Continuous optical spectra changes in the course of biodegradation experiments

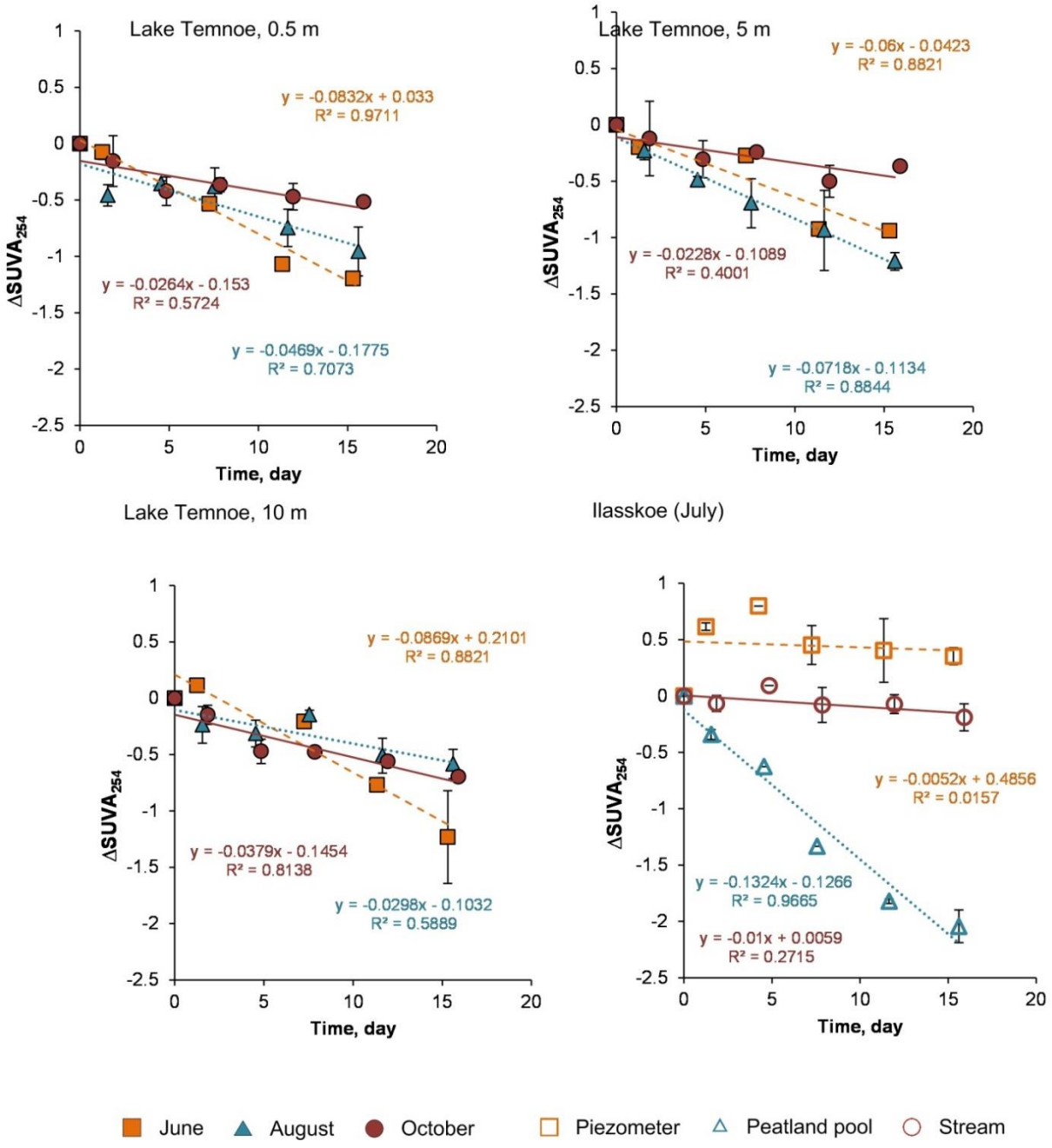

Fig. S6. The change of $SUVA_{254}$ (relative to the control) over time in photodegradation experiments. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and stream Chernyi (circles).

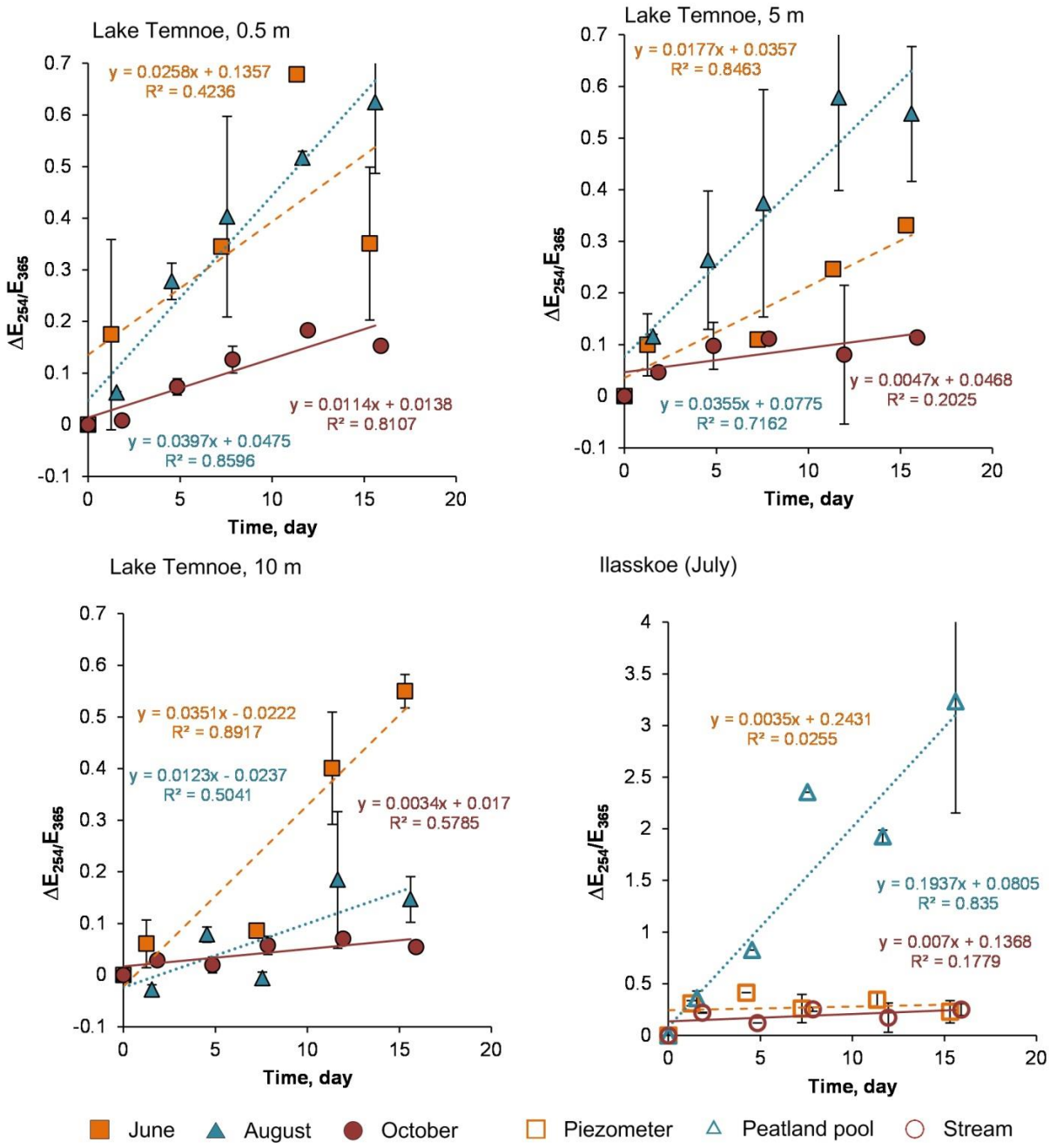

Fig. S7. The change of optical ratios (E_{254}/E_{365}) over time in photodegradation experiments. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and stream Chernyi (circles)

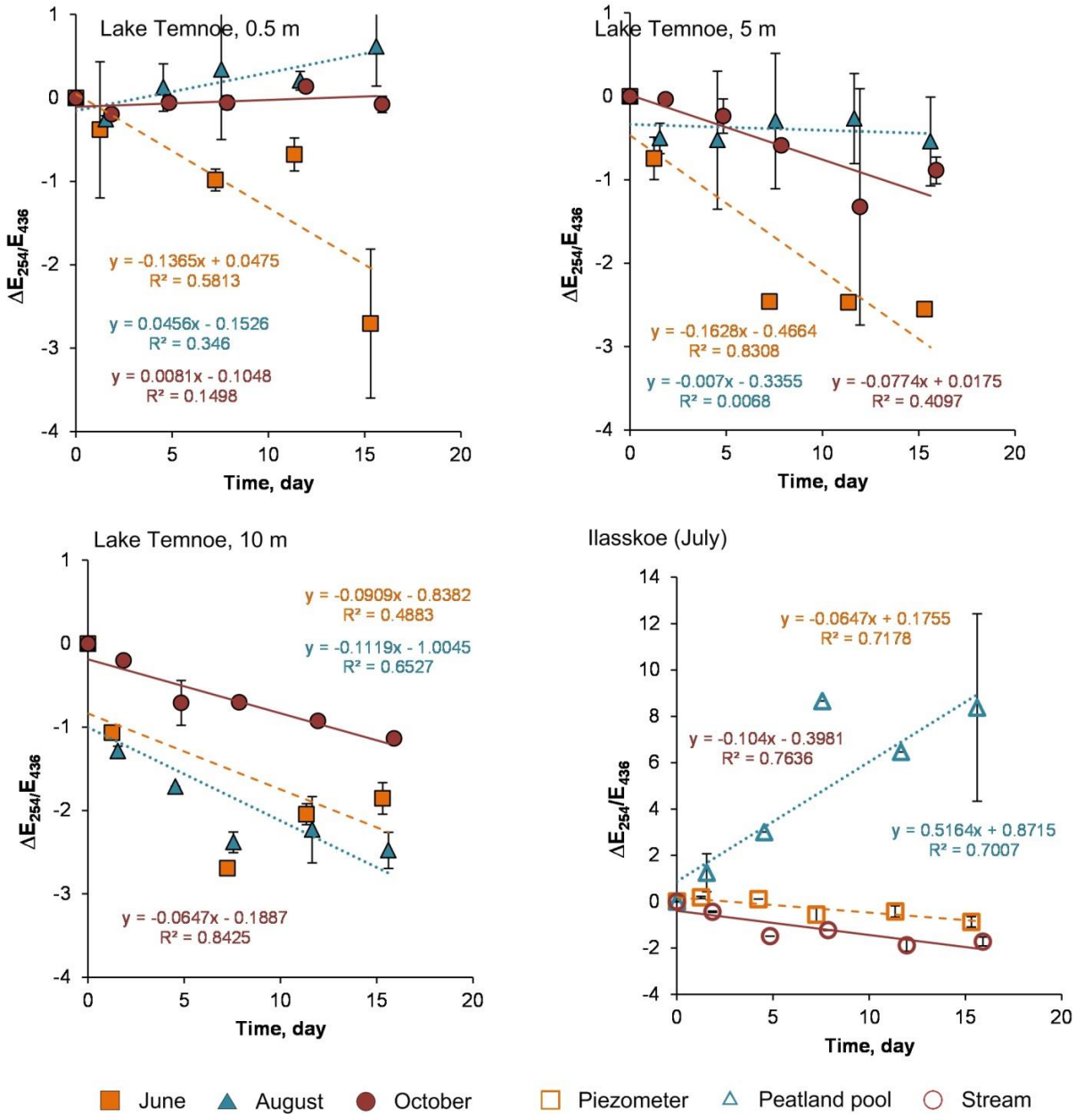

Fig. S7, continued. The change of optical ratios (E_{254}/E_{436}) over time in photodegradation experiments. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and stream Chernyi (circles)

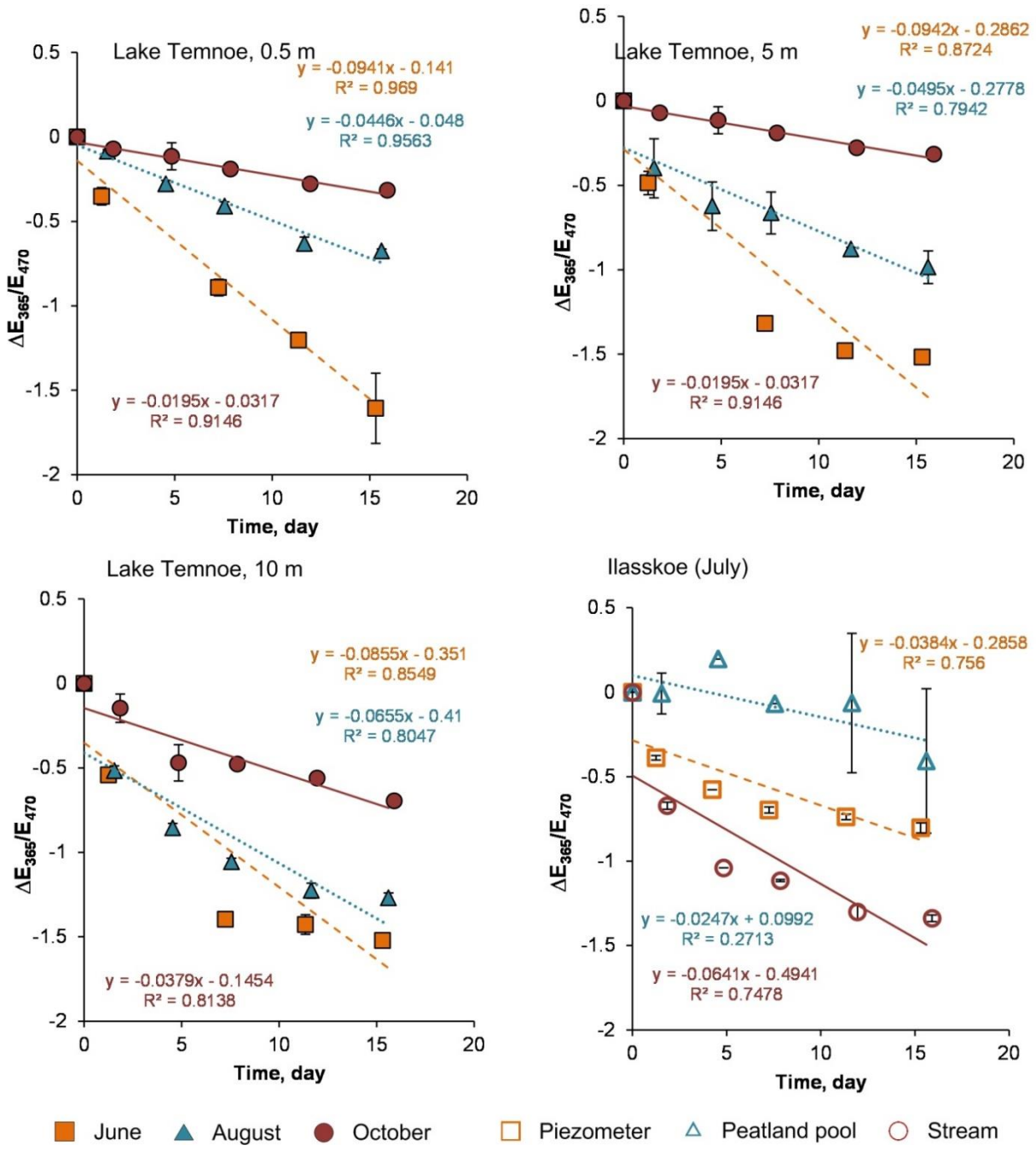

Fig. S7, continued. The change of optical ratios (E_{365}/E_{470}) over time in photodegradation experiments. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and stream Chernyi (circles)

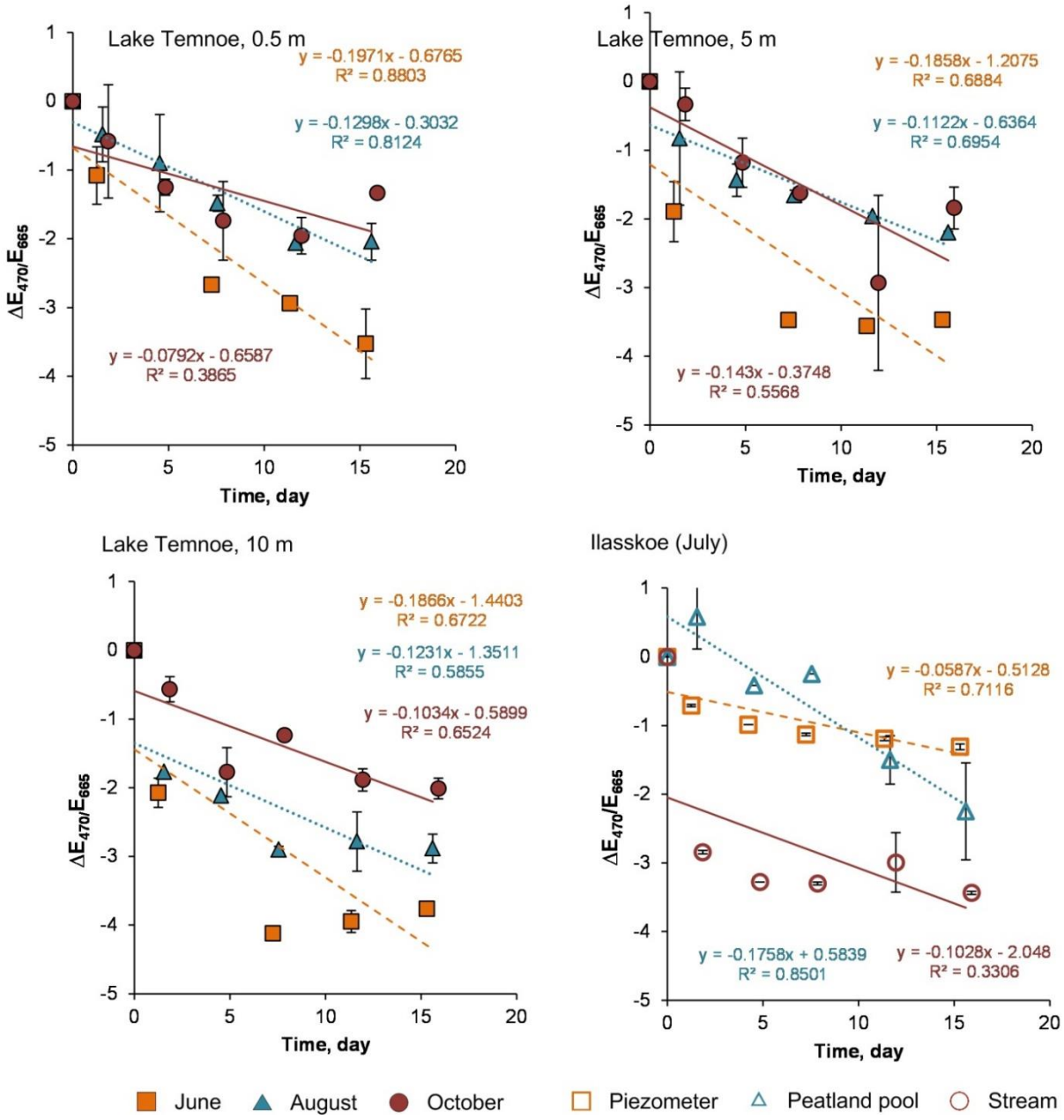

Fig. S7, continued. The change of optical ratios (E_{470}/E_{665}) over time in photodegradation experiments. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and stream Chernyi (circles)

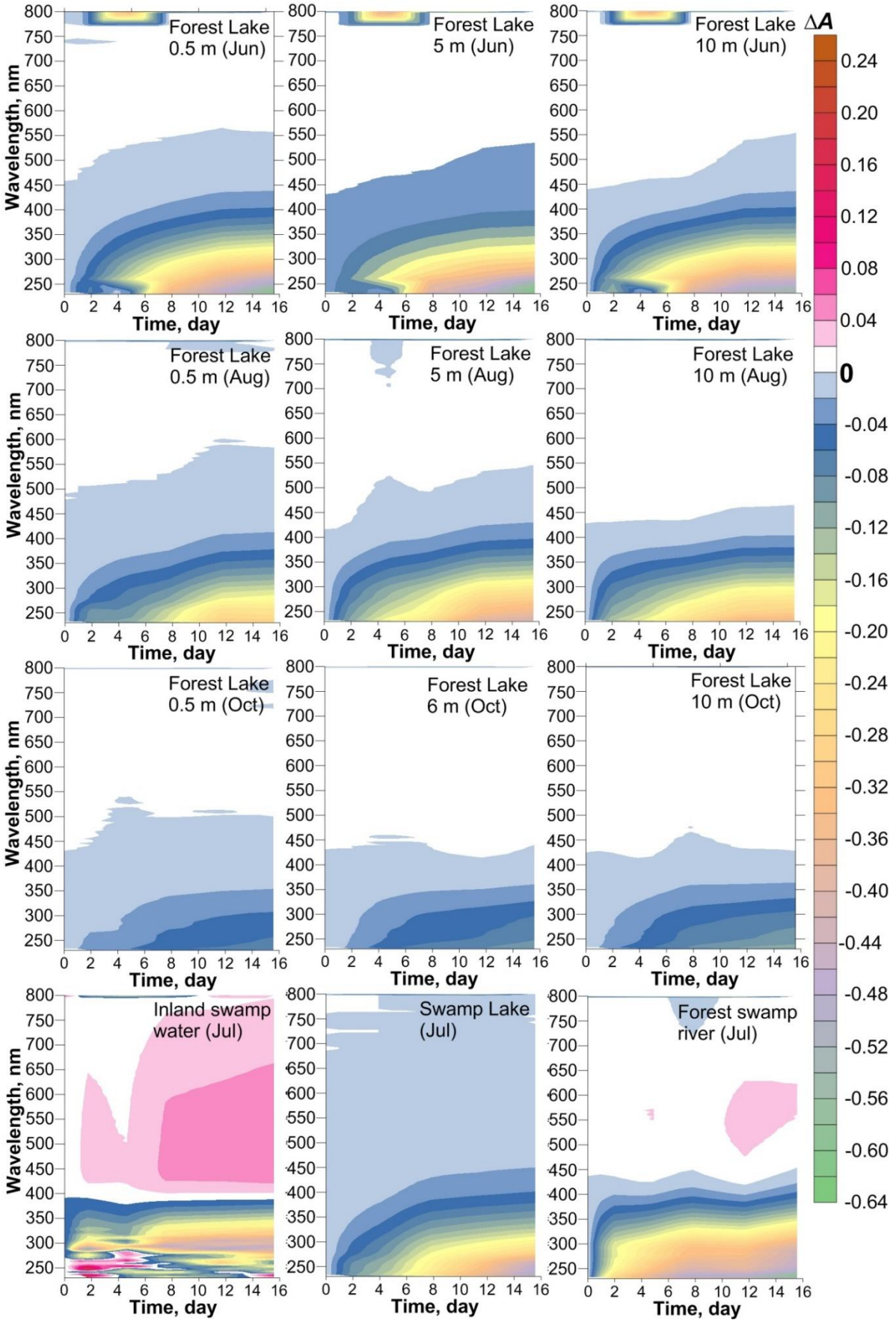

Fig. S8. Continuous optical spectra changes in the course of photodegradation experiments

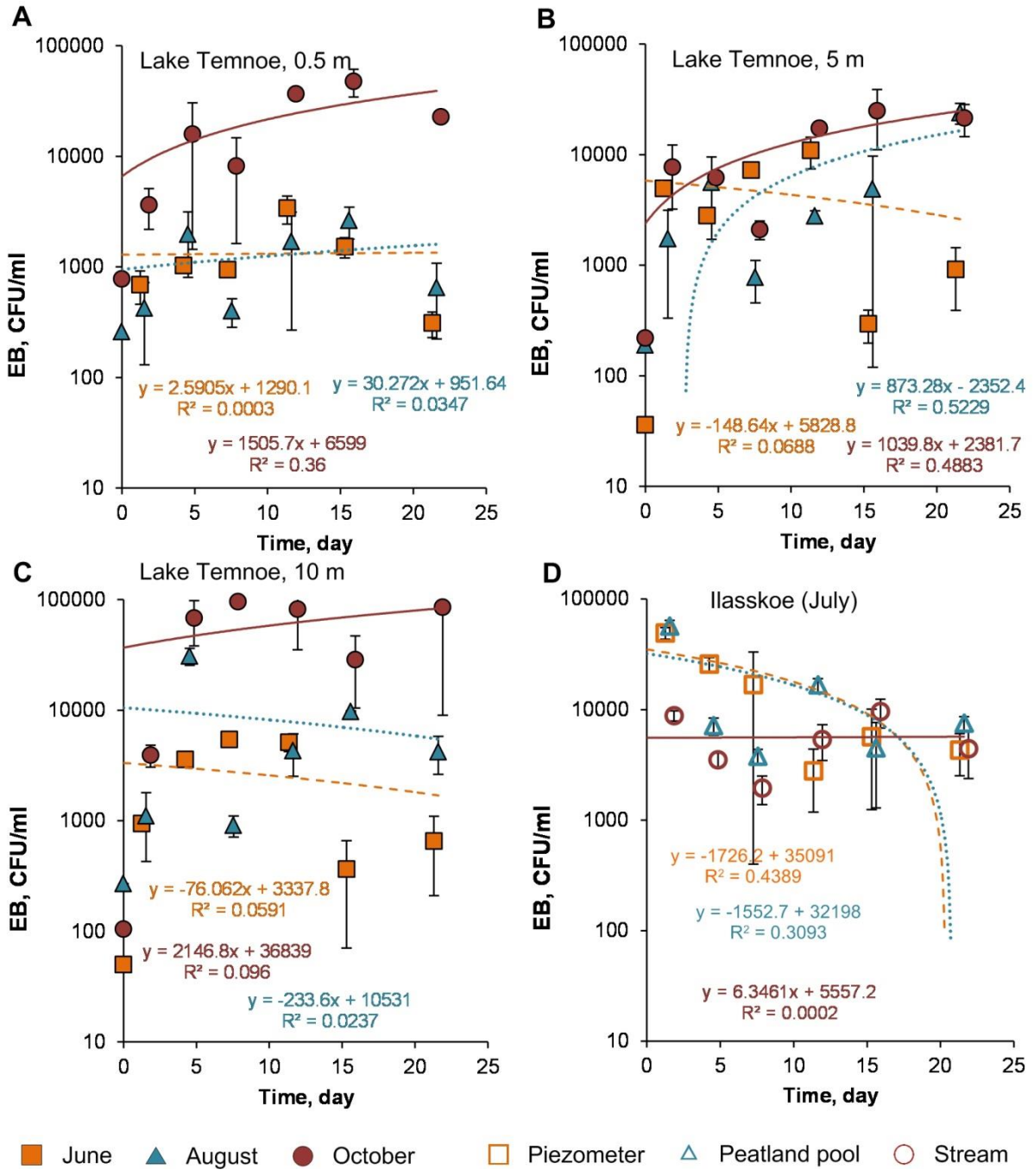

Fig. S9. Results on eutrophic bacterial counts in bio-degradation experiments. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe Bog continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and stream Chernyi (circles).

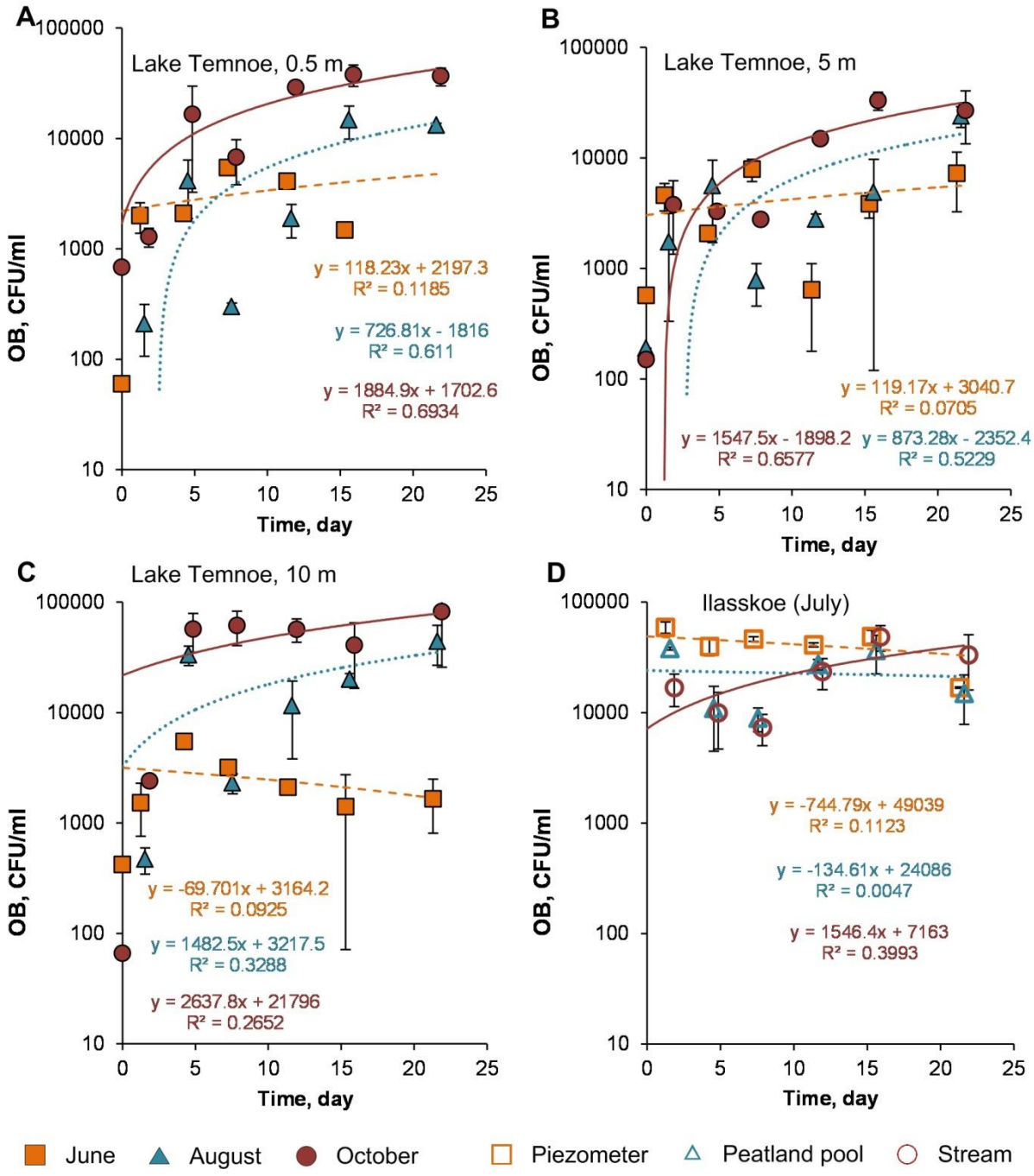

Fig S9, continued. Results on oligotrophic bacterial counts in bio-degradation experiments. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and stream Chernyi (circles).

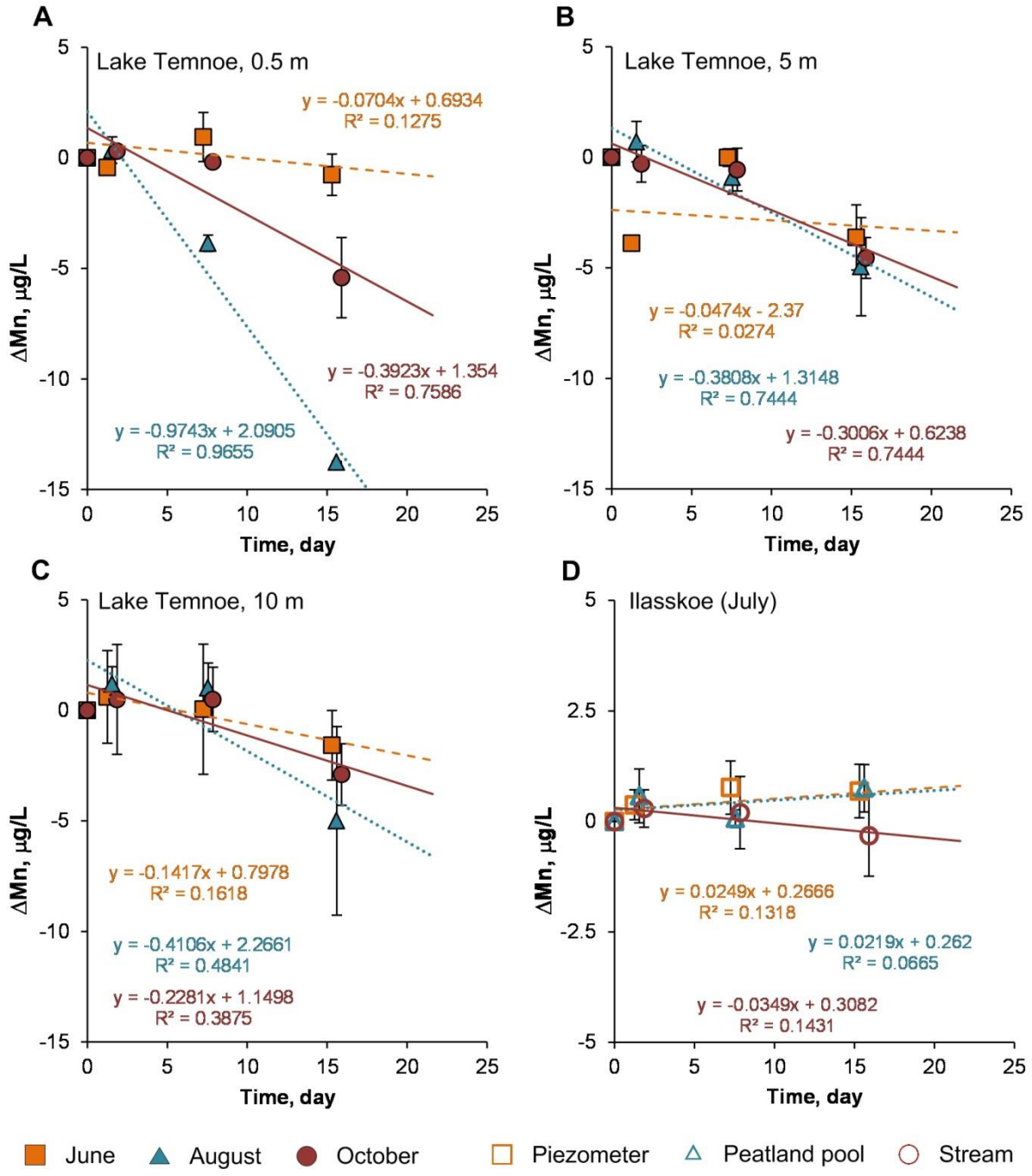

Fig. S10. Change in Mn concentration (relative to the control) over time in bio-degradation experiments. The error bars are 1 s.d. of duplicates. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and stream Chernyi (circles)

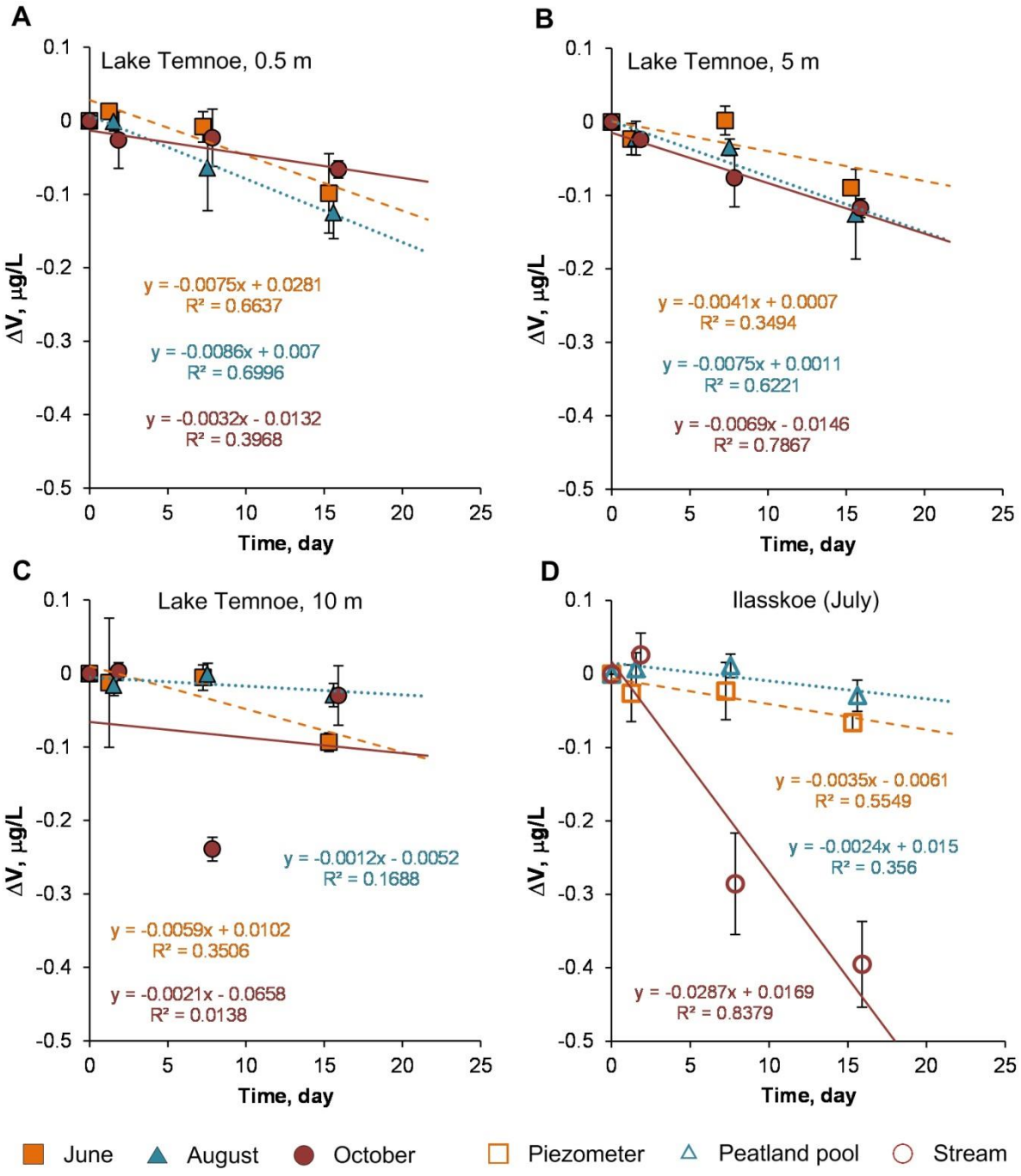

Fig. S11. Change in V concentration (relative to the control) over time in bio-degradation experiments. The error bars are 1 s.d. of duplicates. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and stream Chernyi (circles)

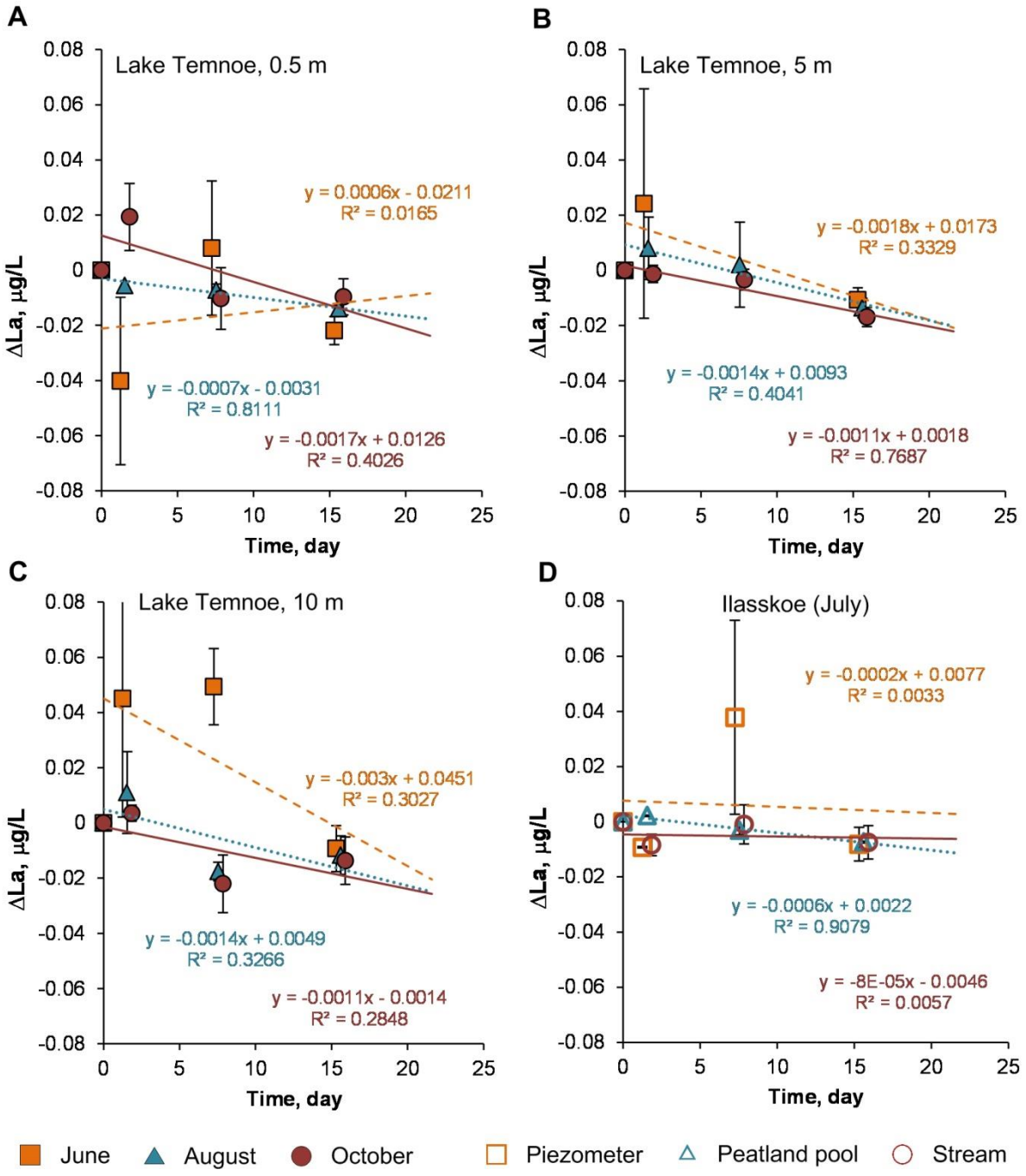

Fig. S12. Change in La concentration (relative to the control) over time in bio-degradation experiments. The error bars are 1 s.d. of duplicates. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and stream Chernyi (circles)

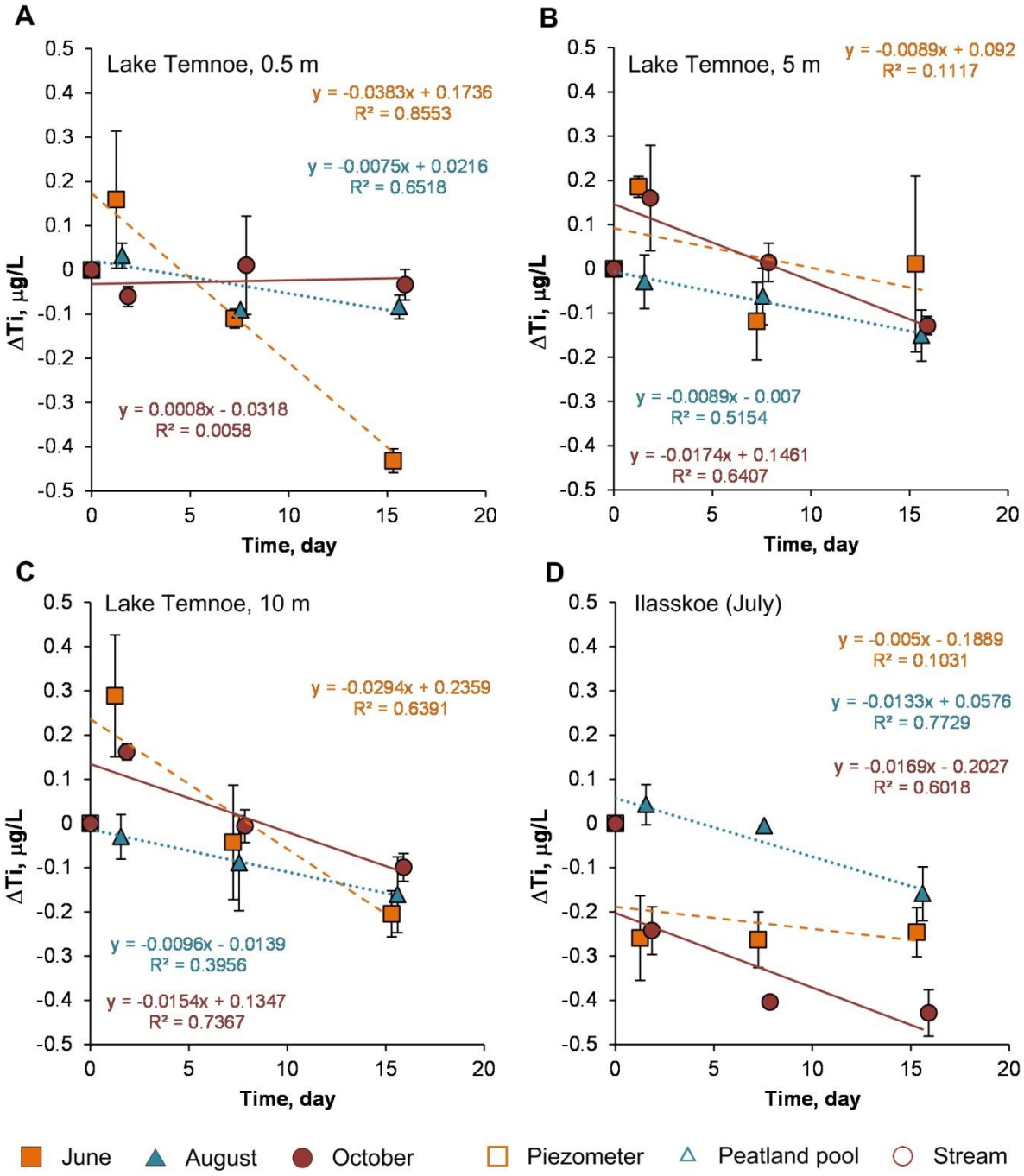

Fig. S13. Change in Ti concentration (relative to the control) over time in photodegradation experiments. The error bars are 1 s.d. of duplicates. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and stream Chernyi (circles)

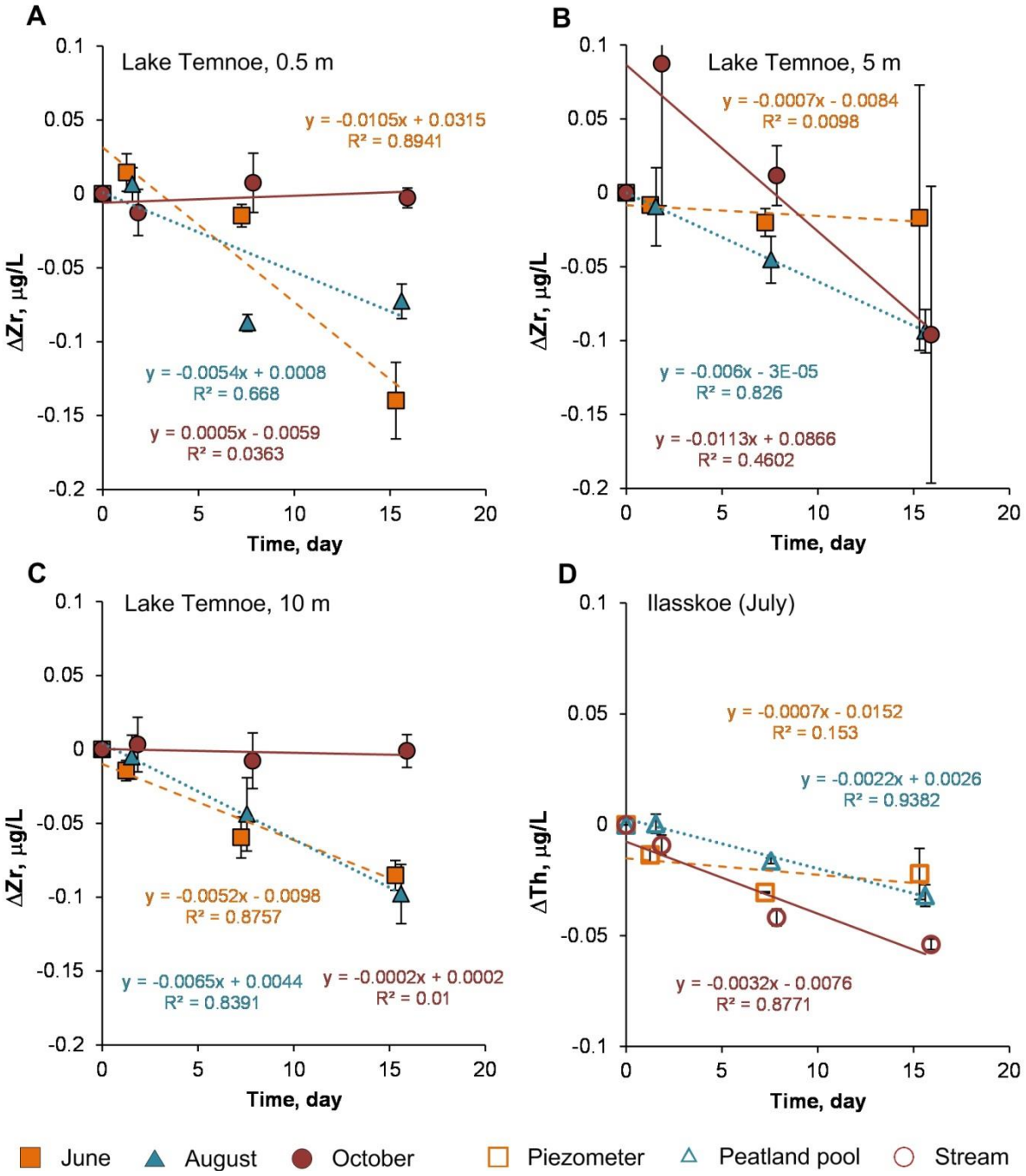

Fig. S14. Change in Zr concentration (relative to the control) over time in photodegradation experiments. The error bars are 1 s.d. of duplicates. Lake Temnoe 0.5 m (A), 5 m (B) and 10 m (C) in June (squares), August (triangles) and October (circles). Ilasskoe continuum in July (D) includes piezometer (squares), peatland pool Severnoe (triangles) and stream Chernyi (circles)