Fig. S1 Photos of examples of above- and below-tree-line lakes
Fig. S2. Examples of EEMs for sample from (a) above-tree-line lake Zihai and (b) below-tree-line lake Tiancai.
Table S1. Spectral characteristics $\text{Ex}_{\text{max}}$ and $\text{Em}_{\text{max}}$ of 4 components compared with fluorescence peaks identified in previous work.

<table>
<thead>
<tr>
<th>Component No.</th>
<th>$\text{Ex}_{\text{max}}$ (nm) $^*$</th>
<th>$\text{Em}_{\text{max}}$ (nm)</th>
<th>Peaks in other previous work $^*$</th>
<th>Property and probable source</th>
</tr>
</thead>
</table>
| S1            | 230-245                           | 285-295 (310-375)        | $\text{Ex}_{\text{max}}$: < 240  
$\text{Em}_{\text{max}}$: 330-370 $^{a-d}$  
(300) $^e$                      | (T, A, M) $^{**}$  
Tryptophan-like fluorescence |
| S2            | 210-220                           | 265-270 (285-295)        | $\text{Ex}_{\text{max}}$: < 240  
$\text{Em}_{\text{max}}$: 300-312 $^{a,e}$                      | (T, A, M)  
Tyrosine-like fluorescence |
| S3            | 230 (300)                         | 338                      | $\text{Ex}_{\text{max}}$: 240 (300)  
$\text{Em}_{\text{max}}$: 338 $^f$  
$\text{Ex}_{\text{max}}$: 280, $\text{Em}_{\text{max}}$: 325 $^g$;                      | (T, A, M)  
Tryptophan-like or phenolic fluorescence |
| S4            | 300-340                           | 400-450                  | $\text{Ex}_{\text{max}}$: 320-360  
$\text{Em}_{\text{max}}$: 420-480 $^{a,b,h,i}$                      | (T)  
UV humic-like fluorescence |

$^*$ Secondary excitation band is listed in brackets.

$^{**}$ T: Terrestrial source; A: Autochthonous source; M: Microbial source.

$^a$ Stedmon et al. (2003).

$^b$ Stedmon and Markager (2005a).

$^c$ Stedmon and Markager (2005b).

$^d$ Cory and McKnight (2005).

$^e$ Zhu et al. (2005).

$^f$ Murphy et al. (2006).

$^g$ Maie et al. (2007).

$^h$ Coble (1996).

$^i$ Coble et al. (1998).