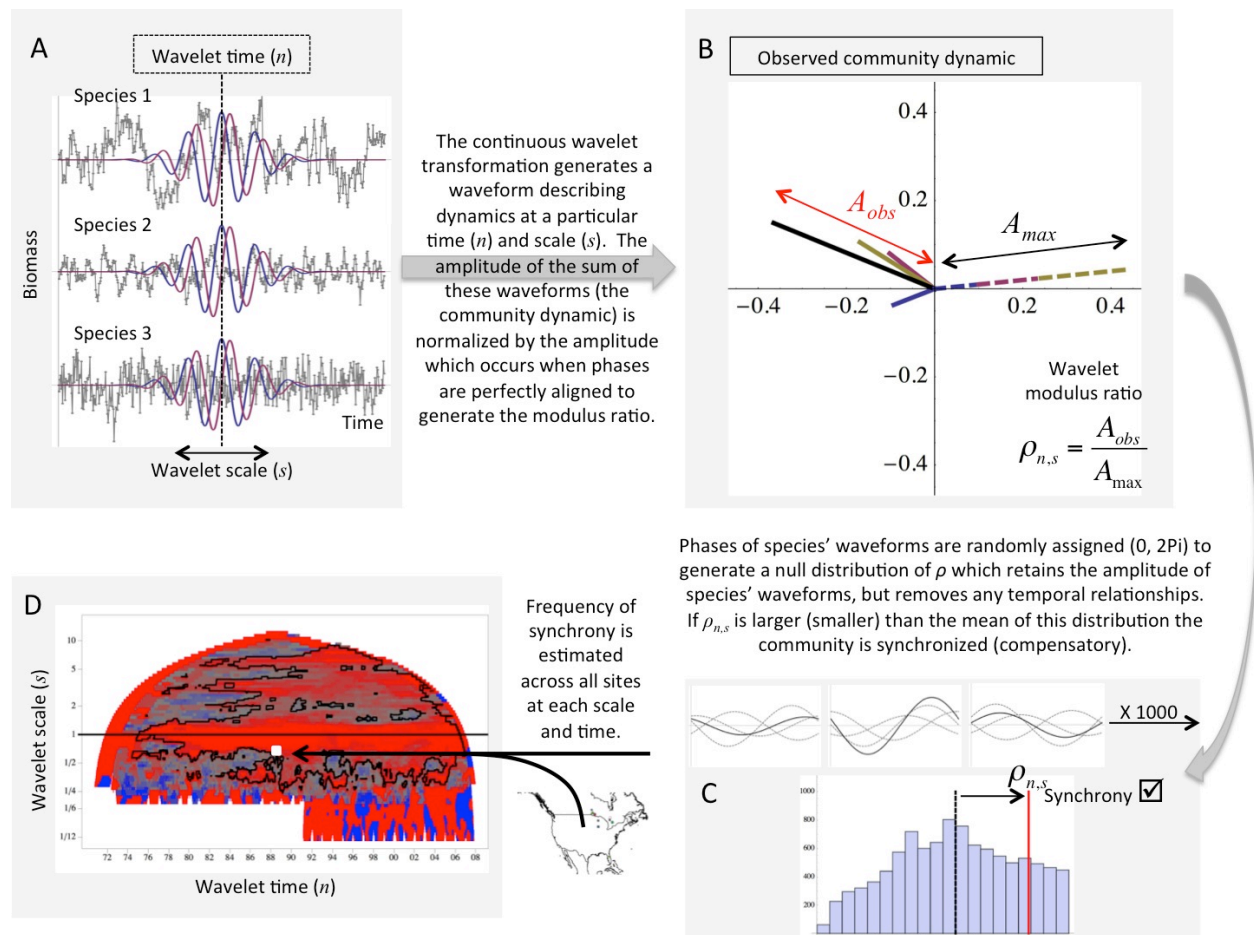
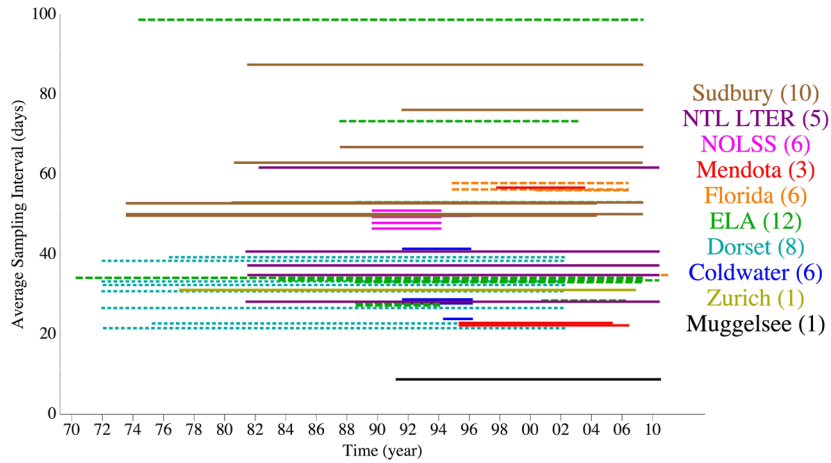


## Supplementary Materials

**Supplementary Figure S1.** Schematic of the analytical scheme used to generate figures 2 and 3. A: the continuous wavelet transform is applied to the time-series of each zooplankton species in a particular lake at a particular time and scale; blue and violet lines represent the real and imaginary components of the Morlet wavelet. B: the local wavelet modulus ratio is calculated at each scale and time for which the wavelet transforms were estimated in (A). C: A set of 1000 phase-permutations is applied to determine the null-distribution (under the assumption of uncorrelated species' dynamics) of the local wavelet modulus ratio. Observed values greater than the mean of the null-distribution are assigned 'synchronous', those below 'compensatory'. Information from each study site are aggregated to produce a single point on the plot in (D). We used a binomial test to determine if the observed fractions of synchronous lakes were different from a random distribution. The procedure is repeated for all combinations of scale and time.



**Supplementary Figure S2.** Sampling range (years) and mean sampling periodicity (days) for the 58 study sites used herein. Different colors denote the sampling regions shown in figure 1.



**Supplementary Figure S3.** Histogram showing the distribution of median values of the wavelet modulus ratios generated by the null model for all scales, times, and lakes. The median is sensitive to the species richness in the community (e.g. Fig. 4) and also to unevenness in the community.

