Earth System
Science
Data

Supplement of

A consistent ocean oxygen profile dataset with new quality control and bias assessment

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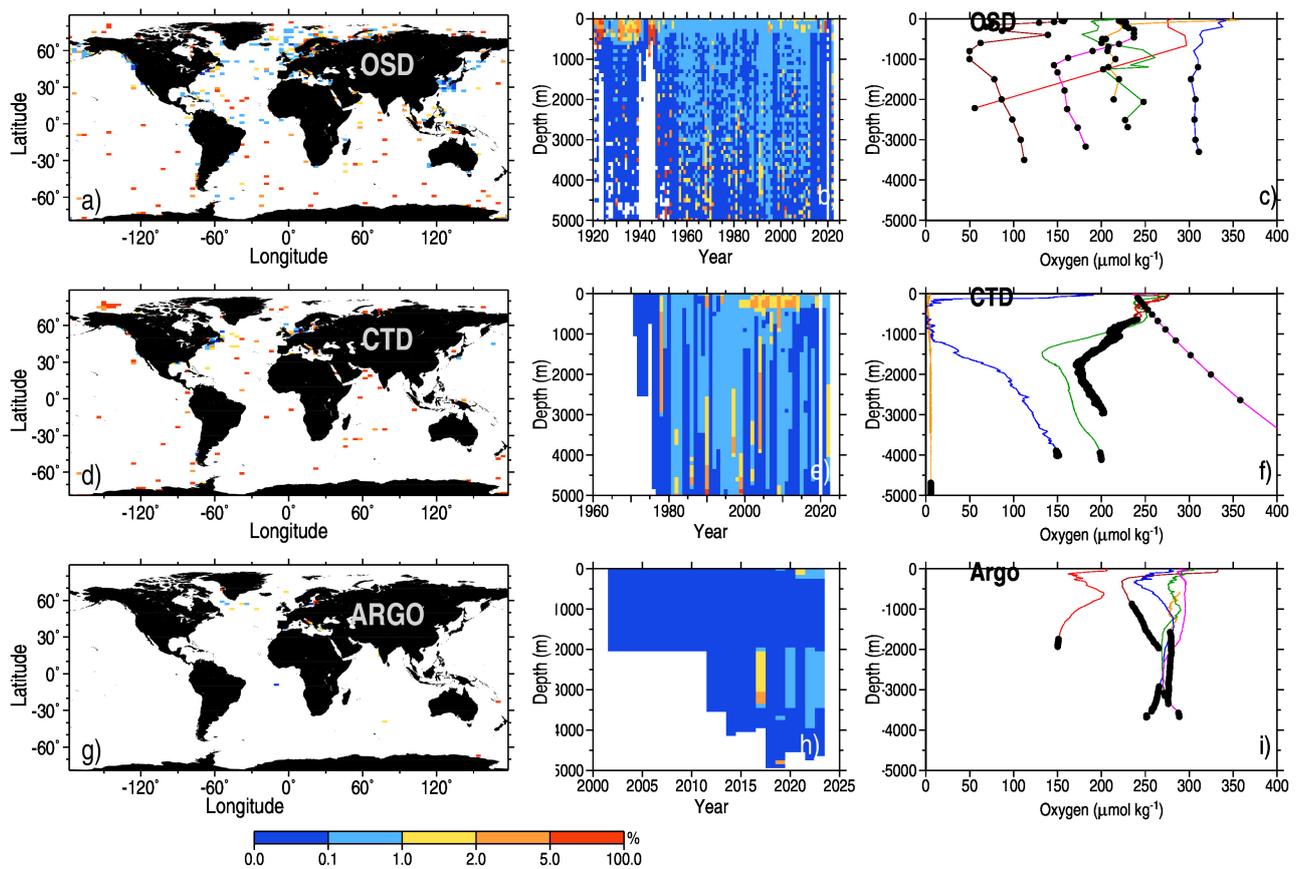**Fig. S1.** Outlier statistics for the location check: a, d, g) percentage of outliers in 2°×4° latitude/longitude geographical boxes; b, e, h) percentage of outliers versus time and depth (bin size is 1 year × 100 m); c, f, i) examples of randomly selected oxygen profiles failing the check (black dots show observations below the local bottom depth.

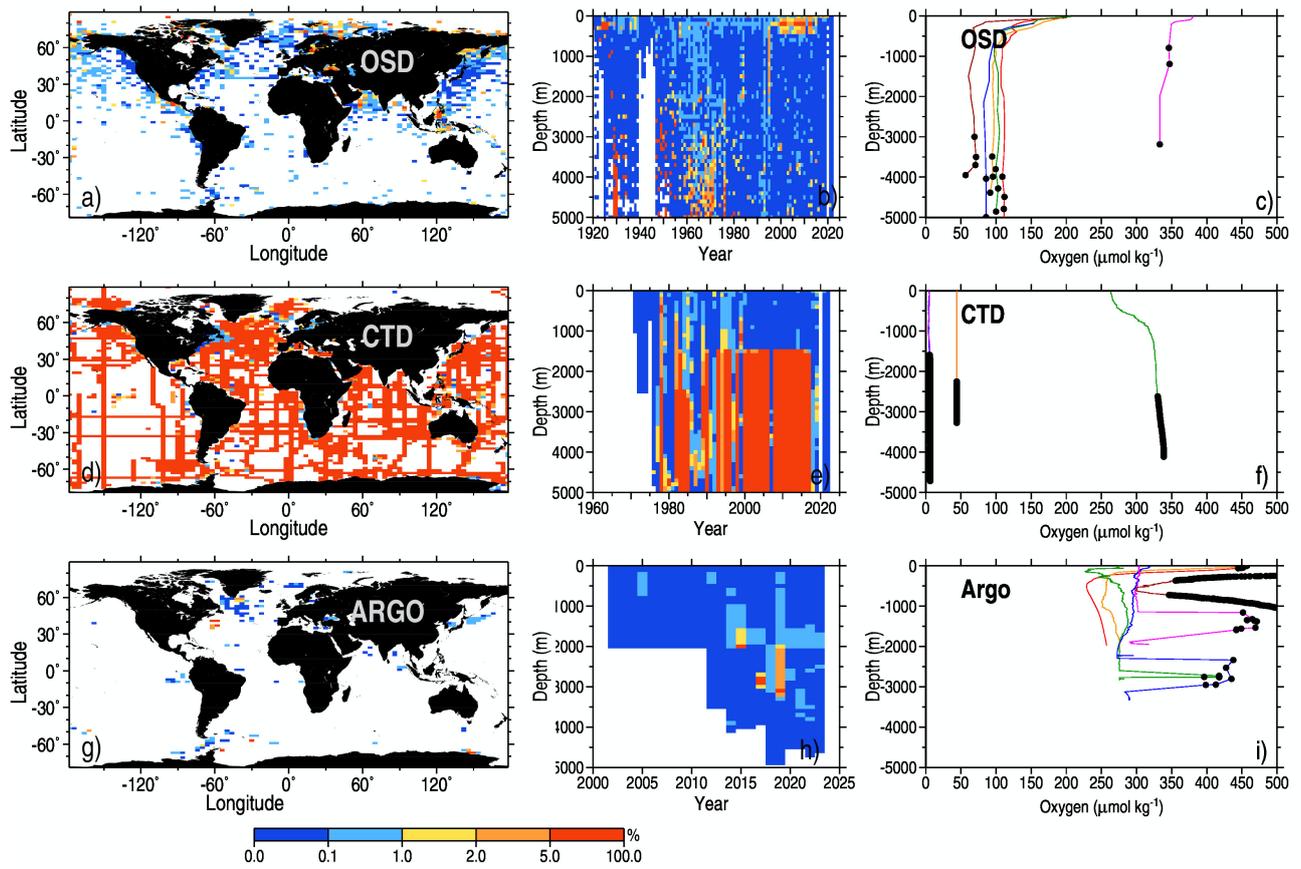**Fig. S2.** Outlier statistics for the global oxygen range check at depth levels: a, d, g) percentage of outliers in 2°×4° latitude/longitude geographical boxes; b, e, h) percentage of outliers versus time and depth (bin size is 1 year × 100 m); c, f, i) examples of randomly selected oxygen profiles with outliers shown as black dots.
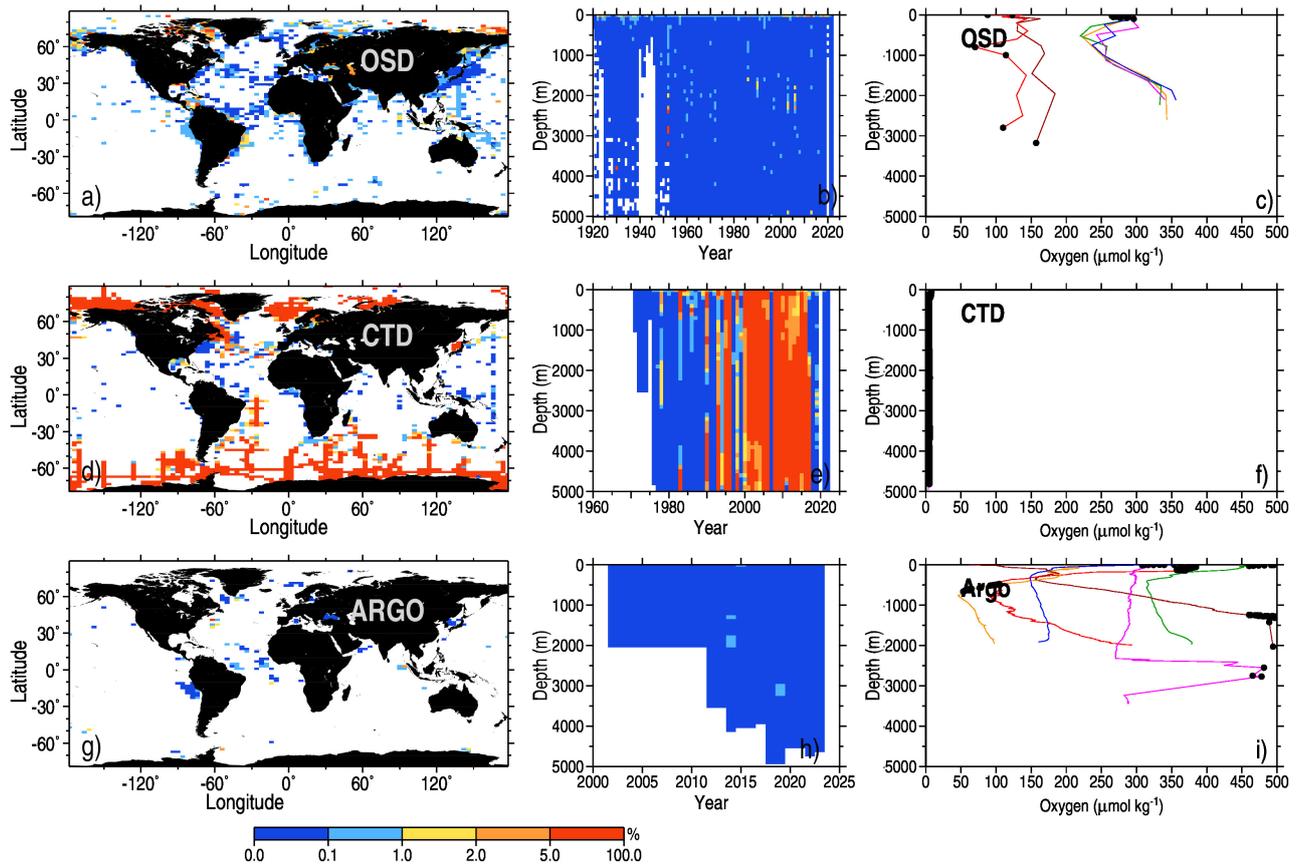
Fig. S3. Outlier statistics for the global oxygen range check on temperature surfaces: a, d, g) percentage of outliers in 2°×4° latitude/longitude geographical boxes; b, e, h) percentage of outliers versus time and depth (bin size is 1 year × 100 m); c, f, i) examples of randomly selected oxygen profiles with outliers shown as black dots.

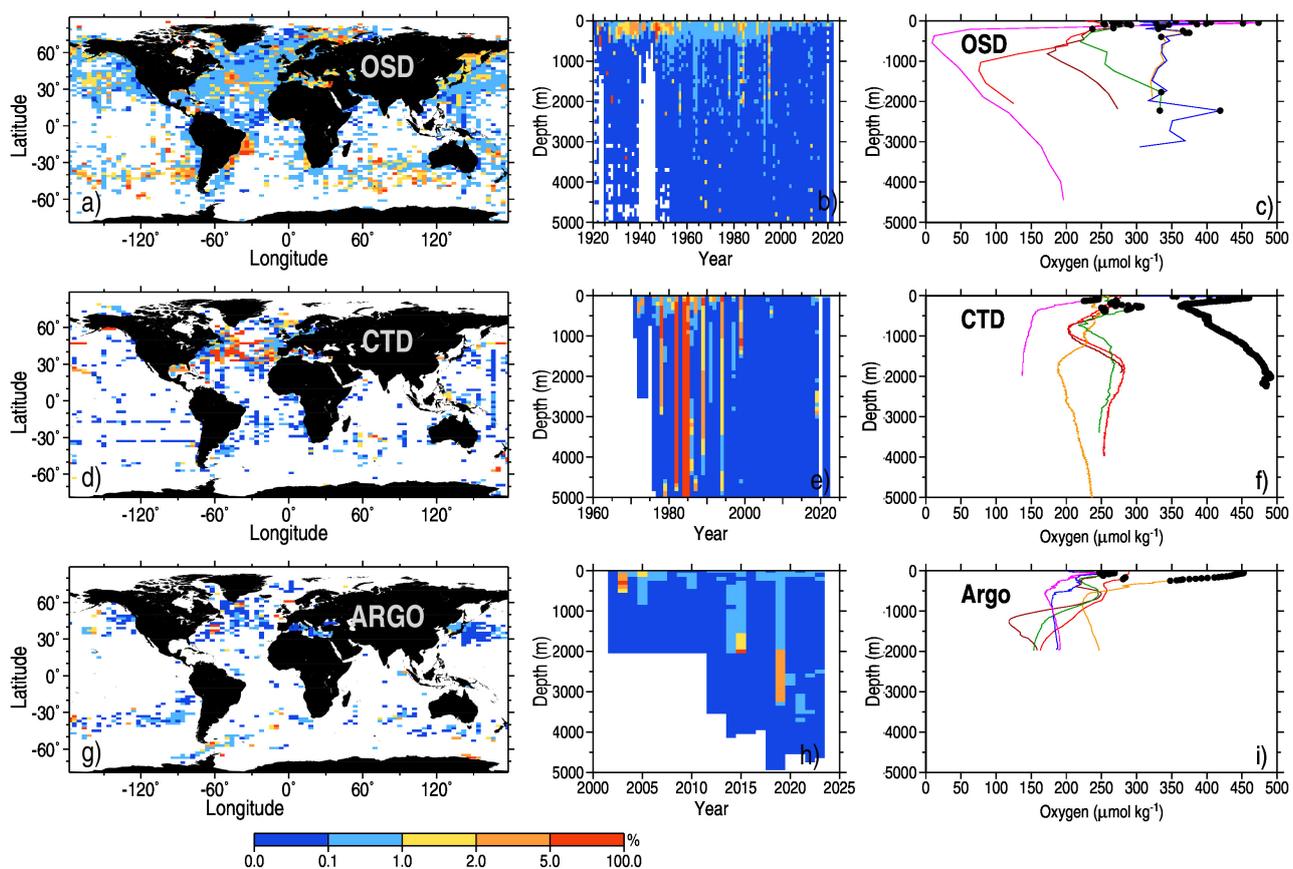**Fig. S4.** Outlier statistics for the maximum oxygen solubility check: a, d, g) percentage of outliers in 2°×4° latitude/longitude geographical boxes; b, e, h) percentage of outliers versus time and depth (bin size is 1 year × 100 m); c, f, i) examples of randomly selected oxygen profiles with outliers shown as black dots.

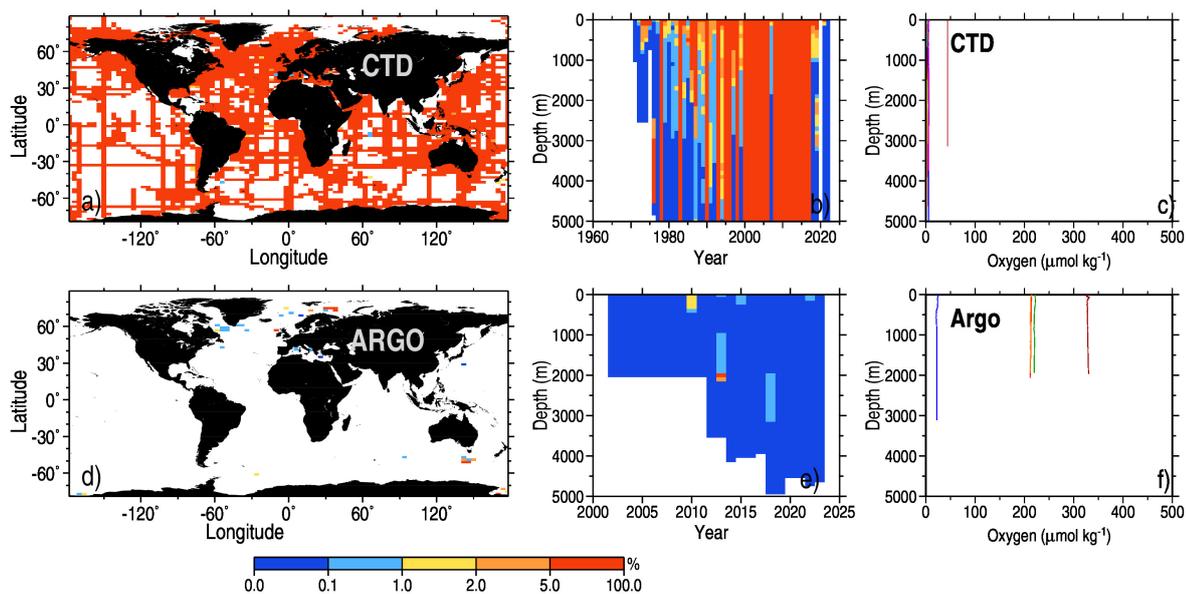**Fig. S5.** Outlier statistics for the stuck value check: a, d) percentage of outliers in 2°×4° latitude/longitude geographical boxes; b, e) percentage of outliers versus time and depth; c, f) examples of randomly selected oxygen profiles with outliers shown as black dots. This check is applied only to the CTD and Argo sensor data.
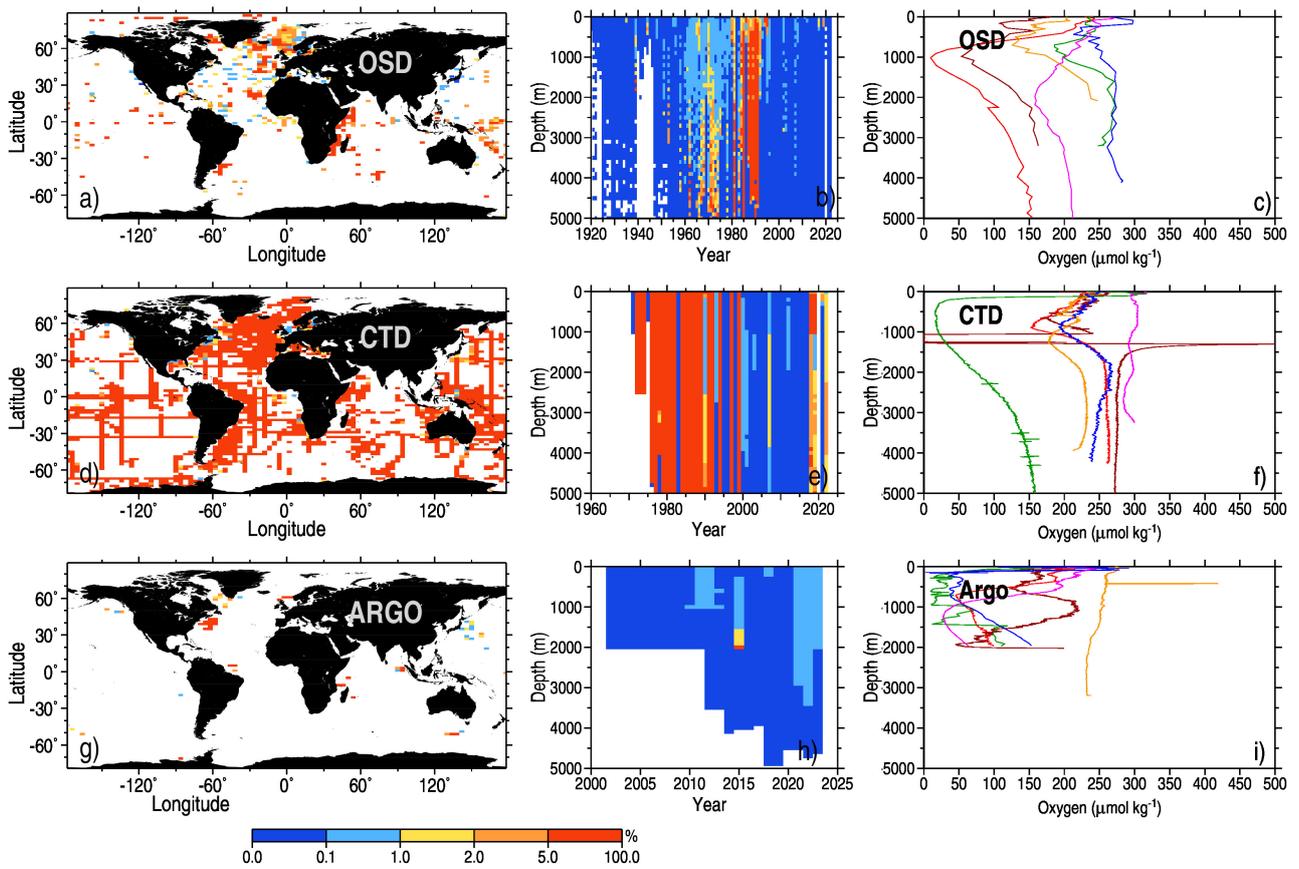
Fig. S6. Outlier statistics for the multiple extrema check: a, d, g) percentage of outliers in 2°×4° latitude/longitude geographical boxes; b, e, h) percentage of outliers versus time and depth (bin size is 1 year × 100 m); c, f, i) examples of randomly selected oxygen profiles with outliers shown as black dots.

Fig. S7. Outlier statistics for the spike check: a, d, g) percentage of outliers in 2°×4° latitude/longitude geographical boxes; b, e, h) percentage of outliers versus time and depth (bin size is 1 year × 100 m); c, f, i) examples of randomly selected oxygen profiles with outliers shown as black dots.
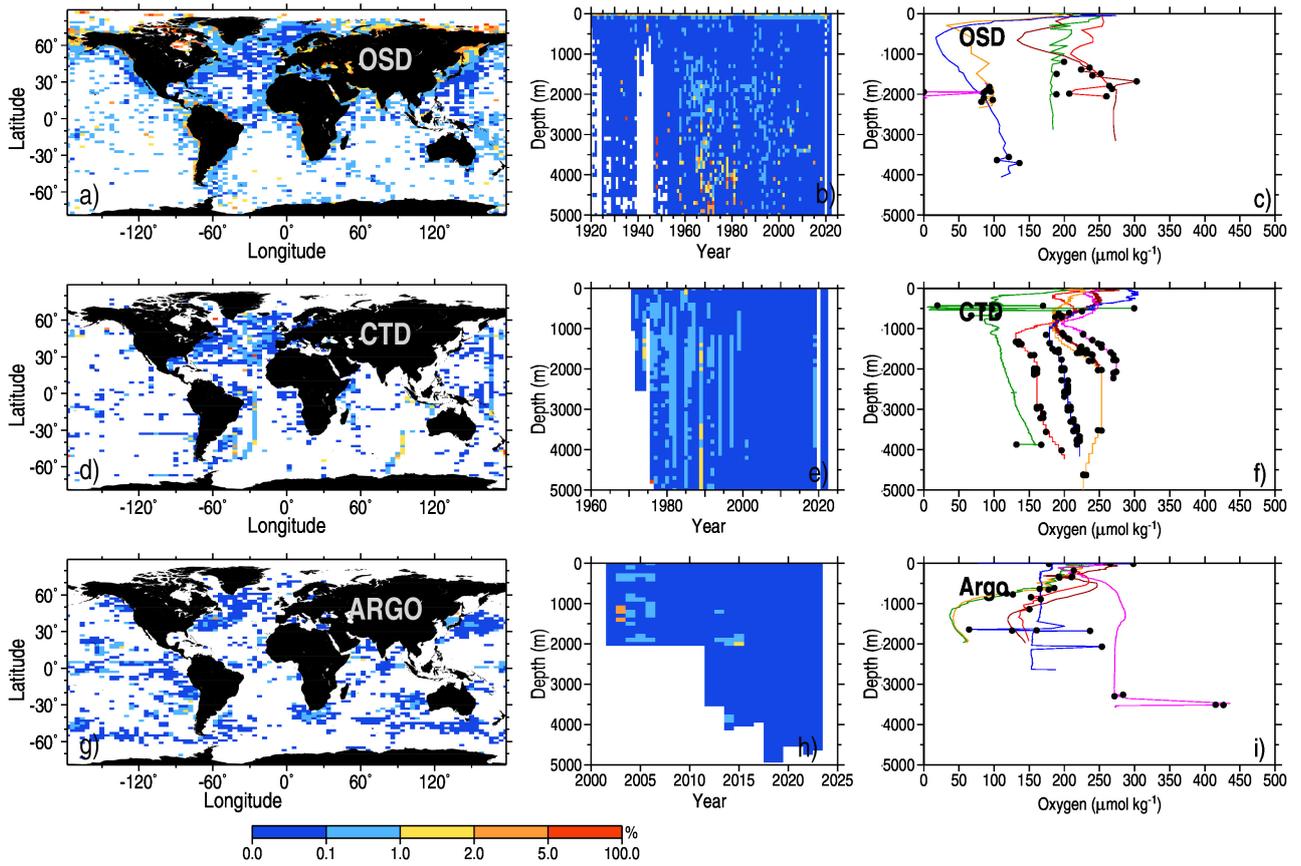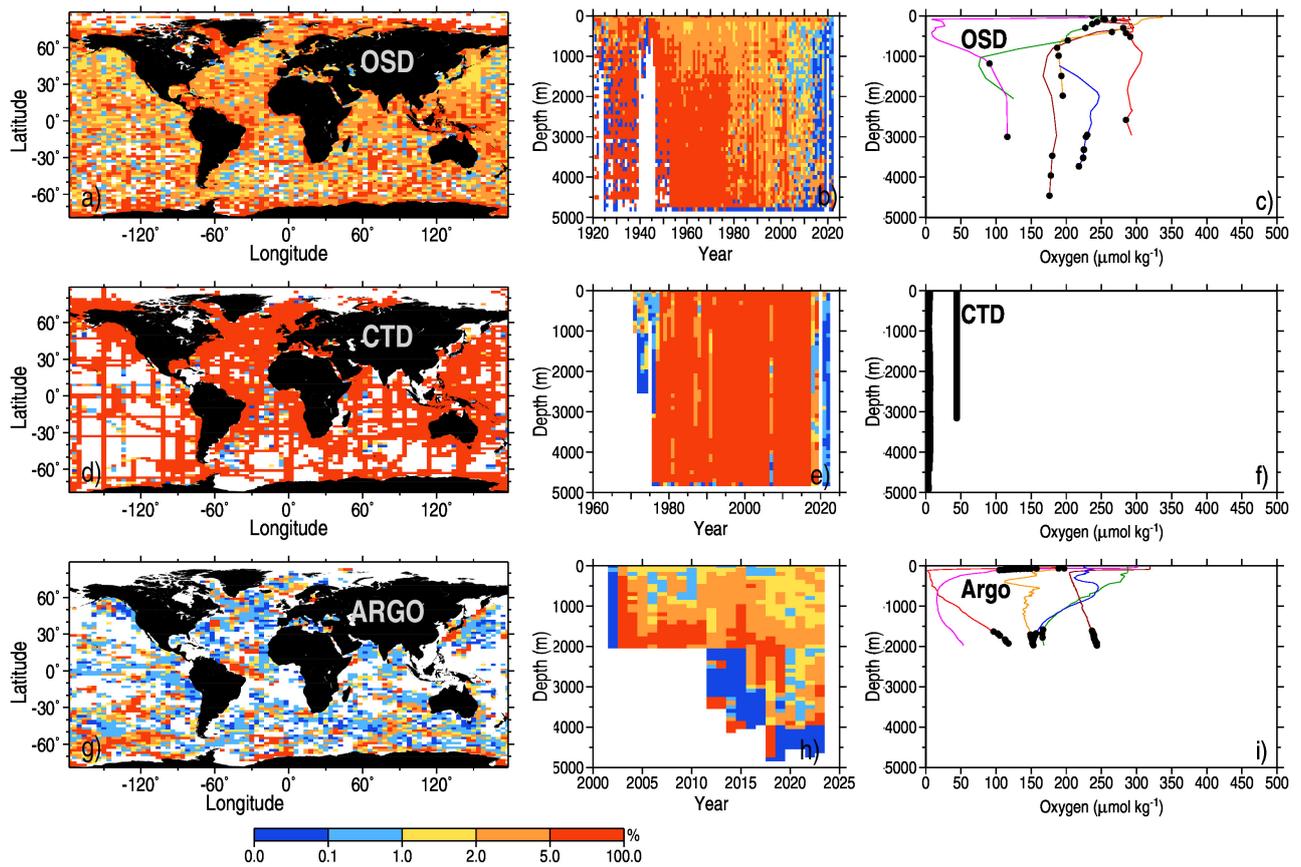
Fig. S8. Outlier statistics for the oxygen local climatological range check: a, d, g) percentage of outliers in 2°×4° latitude/longitude geographical boxes; b, e, h) percentage of outliers versus time and depth (bin size is 1 year × 100 m); c, f, i) examples of randomly selected oxygen profiles with outliers shown as black dots.

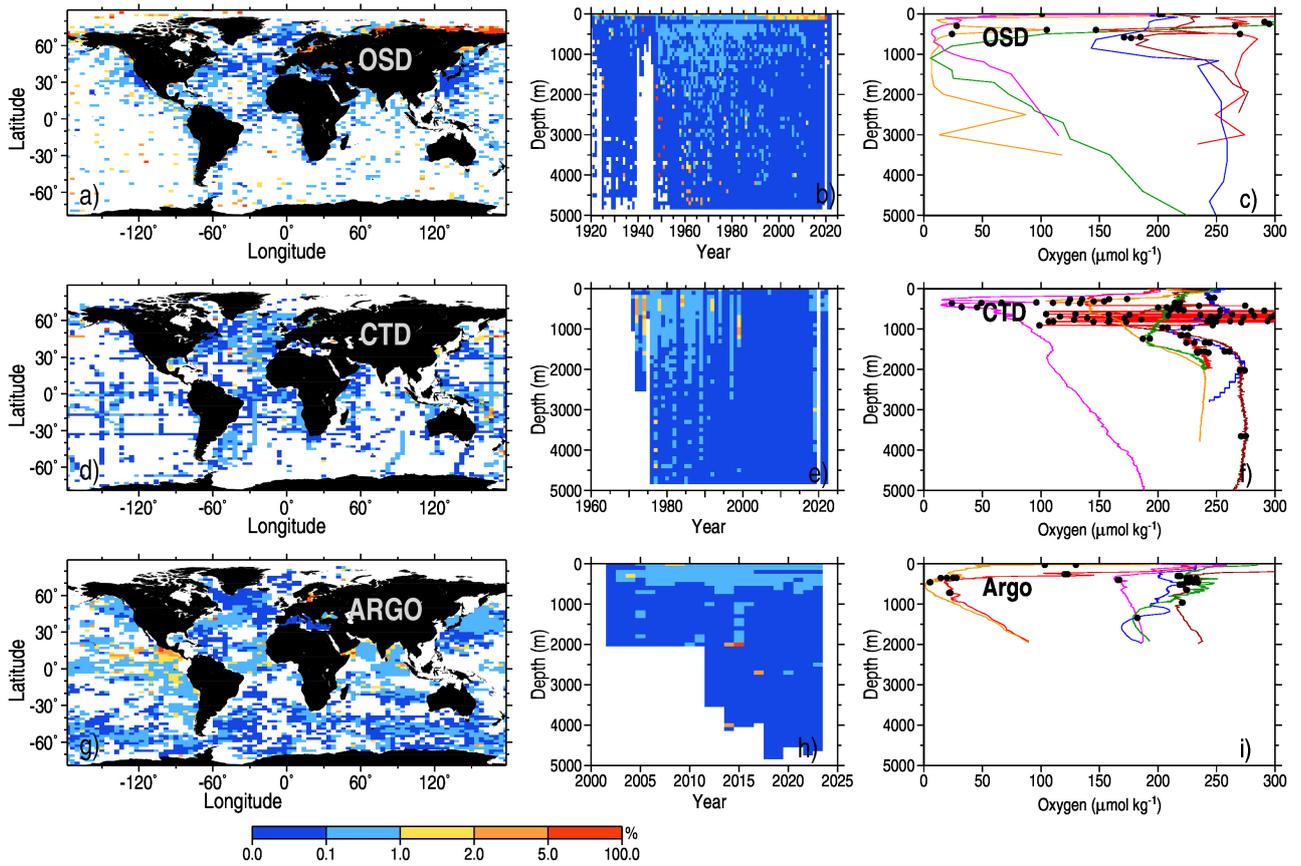**Fig. S9.** Outlier statistics for the local oxygen gradient climatological range check: a, d, g) percentage of outliers in 2°×4° latitude/longitude geographical boxes; b, e, h) percentage of outliers versus time and depth (bin size is 1 year × 100 m); c, f, i) examples of randomly selected oxygen profiles with outliers shown as black dots.

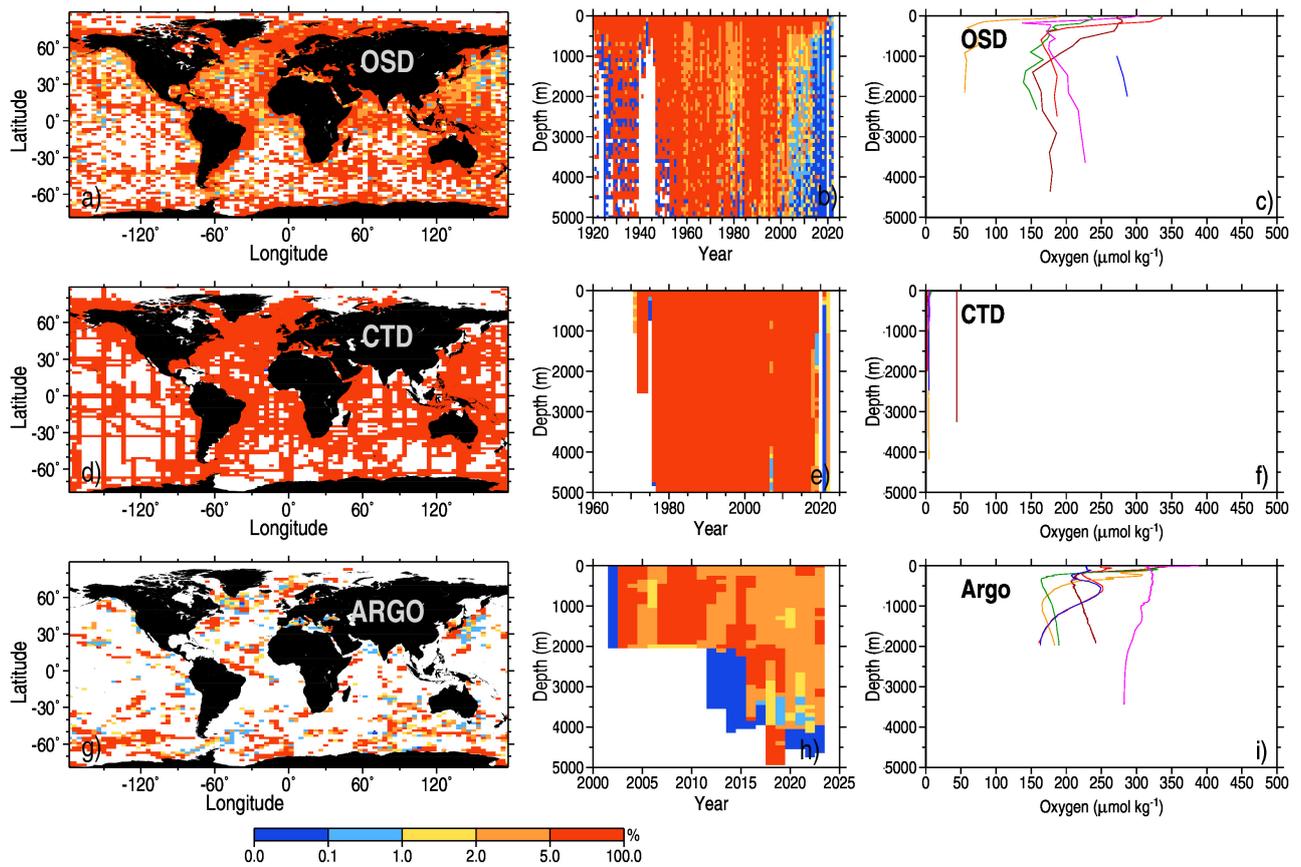**Fig. S10.** Outlier statistics for the excessive flagged level percentage check: a, d, g) percentage of outliers in 2°×4° latitude/longitude geographical boxes; b, e, h) percentage of outliers versus time and depth (bin size is 1 year × 100 m); c, f, i) examples of randomly selected oxygen profiles with outliers shown as black dots.