

Silicate Weathering in the Corumbataí River Basin (São Paulo – Brazil)

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The hydrochemical characterization of the Corumbataí river is used to evaluate the chemical erosion processes and the balance of silicate and carbonate rock weathering in the drainage basin. The main characteristics of the riverine dissolved loads were investigated in terms of discharge/concentration relationships compared with the theoretical dilution curves and by ternary diagrams.

The influence of total atmospheric inputs on the dissolved loads of the drainage basin was 57 and 13 % for SO_4^{2-} and Cl^- ; 37 and 11 % for Ca^{2+} and Mg^{2+} ; 4 and 20 % for Na^+ and K^+ , and 38 and 3 % for NO_3^- and SiO_2 , respectively.

The geochemical model used in this paper was based on the dissolution stoichiometry and hydrolysis of different minerals. The contribution of the CO_2 atmospheric/soil consumed by the rock weathering in the basin was 89 %, which represents a specific flux of about $233 \cdot 10^3 \text{ moles.km}^{-2}.\text{yr}^{-1}$. For the silicate weathering the value observed was $204 \cdot 10^3 \text{ moles.km}^{-2}.\text{yr}^{-1}$, whereas for the carbonate the result was around $29 \cdot 10^3 \text{ moles.km}^{-2}.\text{yr}^{-1}$. The alteration rate of silicates estimated for the total silicated area (96 % of the basin) was 8.9 m/Myr, while for carbonates it was 14.5 m/Myr in only 4 % of the basin.

The results presented in this study revealed the importance of silicate weathering in the Corumbataí River basin, and are comparable to estimates of other Tropical or equatorial river basins.