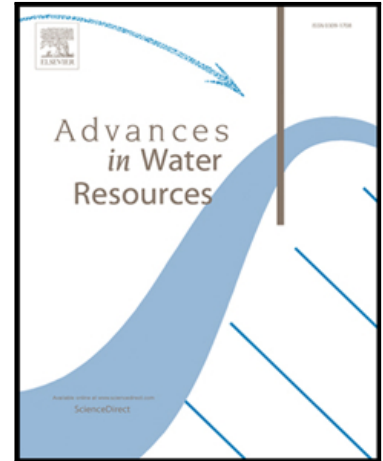


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Experimental investigation on dispersion mechanisms in rigid and flexible vegetated beds

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Highlights

- The processes of transport and dispersion of turbulence and tracers were investigated for two different experimental data sets, assessed in laboratory channels with flexible dense vegetation and rigid sparse vegetation.
- In the case of sparse vegetation, the anisotropy of turbulence spreading was proved, with integral length scales and dispersion coefficients characterized by a heterogenous behavior, locally variable and dependent on the position relative to the stems, which is a novel aspect as compared to previous researches. In the dense canopy, turbulence was characterized by isotropy.
- The analysis revealed that the density of the canopy is the key parameter in the advective processes. For high values of vegetation density, the transport and dispersion of a tracer was obstructed along all directions. In the case of sparse vegetation, turbulent eddies and tracer transport have a favorite transversal path, while in the longitudinal direction the advective transport depended on the relative prevalence of channel velocity or turbulence.

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