Geophysical Research Abstracts
Vol. 18, EGU2016-9393, 2016
EGU General Assembly 2016


# Dispersion in alluvial convergent estuaries

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The Van der Burgh's equation for longitudinal effective dispersion is a purely empirical method with practical implications. Its application to the effective tidal average dispersion under equilibrium conditions appears to have excellent performance in a wide range of alluvial estuaries. In this research, we try to find out the physical meaning of Van der Burgh's coefficient. Researchers like MacCready, Fischer, Kuijper, Hansen and Rattray have tried to split up dispersion into its constituents which did not do much to explain overall behaviour. In addition, traditional literature on dispersion is mostly related to flumes with constant cross-section. This research is about understanding the Van der Burgh's coefficient facing the fact that natural estuaries have exponentially varying cross-section.

The objective is to derive a simple 1-D model considering both longitudinal and lateral mixing processes based on field observations (theoretical derivation). To that effect, we connect dispersion with salinity using the salt balance equation. Then we calculate the salinity along the longitudinal direction and compare it to the observed salinity. Calibrated dispersion coefficients in a range of estuaries are then compared with new expressions for the Van der Burgh's coefficient K and it is analysed if K varies from estuary to estuary.

The set of reliable data used will be from estuaries: Kurau, Perak, Bernam, Selangor, Muar, Endau, Maputo, Thames, Corantijn, Sinnamary, Mae Klong, Lalang, Limpopo, Tha Chin, Chao Phraya, Edisto and Elbe.