On the Effect of Tidal Flats on the Hydrodynamics of the Tagus Estuary

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Summary

The effects of tidal flats on the hydrodynamics of the Tagus estuary are analysed using an accurate high-resolution shallow water model, supported by field data. Tidal flats act mainly as filters, rather than sinks, transferring energy from astronomic to non-linear frequencies. Tidal flats also play a major role in determining the strong resonance mode that amplifies semi-diurnal constituents.

We show that the upper estuary, with extensive tidal flats, has an increasing accretion rate. This "filling-up" results from a positive feedback between sediment deposition and the hydrodynamics: accretion in the upper estuary increases the duration of ebbs, decreasing sediment flushing, and further increasing accretion.

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