

## **Assessment of the tidal stream resource in the Ria de Muros (Spain)**

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### **Abstract**

The coastline of NW Iberia presents many rias, or drowned valleys, subject to a large tidal range (with maxima in the order of 4 m). The resulting tidal prisms combine with the geography of the rias to produce substantial tidal currents—in excess of 2 m/s in certain areas. The determination of these areas and the assessment of the tidal stream resource in them is best carried out by implementing a numerical model of the ria in question; this is no easy task—in addition to the tidal forcing, the ria hydrodynamics are influenced by river discharges, winds and baroclinic effects. The application of numerical modelling to the assessment of the tidal stream resource will be exemplified in the talk with a study case: the Ria de Muros, a large coastal embayment (125 km<sup>2</sup>) in the Rias Baixas region. A finite-difference numerical model solving the vertically-integrated Navier-Stokes hydrodynamics and transport equations is implemented on a Cartesian grid with variable resolution. After validation based on sea level and velocity measurements, the model is applied to compute the flow throughout the ria at different tidal stages. The largest current values are found in a narrow section of the inner ria; two study sites in this section are selected for a more detailed assessment. The model is run again to compute the tidal stream at the sites during a 14-day period, so as to cover the spring-neap cycle. Based on the velocity values thus obtained, the annual energy output that can be obtained at each site is assessed.

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### **References**

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