Several studies show that groundwater flow through coastal aquifer complex plays a vital role on maritime environment and it is now generally recognized as an important medium of nutrient transport. However, quantification of such flow is not straightforward as the land-sea interface is influenced by terrestrial hydraulic gradients and tidal fluctuation occurring over the ambient permeable/impermeable strata and offshore bathymetry. And the magnitude of total discharges along extensive coastal stretches is highly uncertain. The present study aims to add new insights to such coastal flux in the light of fresh water discharges as well as estimating its spatial variability along coasts on continental scale. A new modeling methodology has been developed to quantify terrestrial origin of surface and subsurface water flux, assuming topography and hydro-climatology as the dominant controlling factors for driving continental-scale hydrological systems. The modeling approach is tightly coupled with Geographic Information Systems environment, enabling large scale hydrological modeling with relative ease. While the presented modeling approach alone does not resolve the recirculation of total groundwater discharges, i.e., mixed flow of fresh and sea origin groundwater, it does quantify the upper bound of terrestrial fresh groundwater contributing to its total. Preliminary results show that surface/subsurface water flux along continental coast has high spatial variability and it also indicates that, while such coastal total flux may be typically ungauged or not well considered, their total contribution to the hydrological cycle may not be negligible.