

**SOURCE TERM AND INFILTRATION EXTENSION OF THE SHALLOW
WATER EQUATIONS DERIVED FROM INCOMPRESSIBLE
NAVIER-STOKES**

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The flow of water in rivers and oceans can, under certain assumptions, be efficiently modelled using the shallow water equations, which can be derived from a starting point of incompressible Navier-Stokes. Accuracy in this system is paramount in flood modelling, as an inaccurate model can potentially lead to loss of life, greater structural damage, or greater loss to business; it is key therefore if we wish to model flooding in a location that our equations should account, in some way, for the causes of flooding. We present here an extension of the standard shallow water system which incorporates an additional rain term on the surface of the water and infiltration of the water into the ground below, and show how this system can be modelled numerically.

Keywords. Computational model, Infiltration, Navier-Stokes, Precipitation, Shallow Water