

## **ANUGA – Open Source Hydrodynamic Modelling**

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Geoscience Australia and the Australian National University are developing a hydrodynamic inundation modelling tool called ANUGA to help simulate the impact of hydrological hazards.

ANUGA is a software package which allows 2D water flow to be simulated across a study area represented by a mesh of triangular cells. By solving a mathematical equation within each cell, water depth and horizontal momentum are tracked over time and will simulate realistic water flows in complex geometries.

A major capability of ANUGA is that it can model the process of wetting and drying as water enters and leaves an area. This means that it is suitable for simulating water flow onto a beach or dry land and around structures such as buildings. ANUGA is also capable of modelling difficult flows involving shock waves and rapidly changing flow speeds (transitions from sub critical to super critical flows).

Although the use of ANUGA requires some familiarity with programming it is not difficult to set up a flow model which is defined as a short script using the programming language Python.

Each script consists of a specification of the study area, the digital elevation model, the initial water level, boundary conditions such as tide or an incoming wave, and any other forces that may drive the system such as rainfall.

ANUGA is written in the object-oriented programming language Python and has been released as Open Source software at <http://sourceforge.net/projects/anuga> where more information is available.