

Tutorial Lectures

Modeling Hurricane Storm Surges

Clint Dawson

Department of Aerospace Engineering and Engineering Mechanics
Institute for Computational Engineering and Sciences
University of Texas at Austin

Monday, January 31, 2011

Lecture 1: Introduction to the shallow water equations.

An overview of the two-dimensional, depth-averaged shallow water equations. I will give underlying assumptions, derivation from the Navier-Stokes equations, and discuss the relevant forcing terms, including tides, wind and atmospheric pressure, gravity, and bottom friction.

Wednesday, February 2, 2011

Lecture 2: The numerical approximation of the shallow water equations.

I will discuss the predominant methods used to approximate solutions to the shallow water equations, including staggered finite difference methods, finite element and finite volume methods. Pros and cons of the different approaches will be discussed.

Friday, February 4, 2011

Lecture 3: Applications of the shallow water equations, including hurricane storm surges.

I will discuss various applications where large-scale shallow water simulators are used, and focus on modeling coastal inundation due to hurricane storm surges.

All lectures will be held at 1:30pm in Room 305 Lind Hall