

CATASTROPHE MODELING 101
Short Course Organizers Joe Cleveland and Peter Sousounis
SUNDAY JANUARY 12, 2020

Time	Topic	Summary
8:00 am	Hurricane Andrew Spawns the Industry	Joe Cleveland (Director, AIR Consulting and Client Services)
8:30 am	Components of a Cat Model	Peter Sousounis, PhD (Vice President, AIR Research)
9:00 am	Building a Stochastic Catalog of Events	Anna Trevino, PhD (Senior Scientist, AIR Research)
9:40 am	Modeling Storm Intensity	Anna Trevino
10:20 am	Break	
10:50 am	Converting Intensity to Loss	Sarah Bobby, PhD (Senior Engineer, AIR Research)
11:30 am	How to Validate What You've Built	Sarah Bobby
12:00 pm	Real World Applications	Joe Cleveland
12:45 pm	Course ends	

Hurricane Andrew Spawns the Industry

Catastrophe modeling was a brand new industry in 1992, when Hurricane Andrew struck Florida. This event transformed the insurance industry in a number of ways, primarily its perspective on the potential impact of extreme hurricane risk. In this session, we will use this landmark event, as a lens through which to understand what catastrophe modeling is and its value to society.

Components of a Cat Model

We will breakdown the various components required to build a catastrophe model at a high level. Examples will be given across multiple perils and provide an introduction to the data, methods, and challenges associated with building said models. These model components will be studied further in the following sessions.

Building a Stochastic Catalog of Events

Simulation of a set of theoretically feasible events allows users of the model to get a full view of the potential range and impact of their risk. This session will cover how a simulated catalog of events is created for tropical cyclones, as well as discuss how this process might differ for other types of weather risk.

Modeling Event Intensity

Key to understanding the damage and loss potential of a tropical cyclone, whether real or simulated, is understanding the intensity of the hazard experienced by each risk. This session will discuss the methods used to model intensity of tropical cyclones and other atmospheric perils within a catastrophe model.

Converting Intensity to Loss

This session will cover the methods and approach involved in estimating damage to buildings and other types of risks within a catastrophe modeling framework. Methods for incorporating uncertainty into this calculation will also be discussed. Tropical cyclone related perils will be the focus, but insight will be provided on other atmospheric perils as well.

How to Validate What You've Built

Catastrophe models are complex tools which are used to manage trillions of dollars worth of risk globally. In order to create a robust and useful model, extensive validation exercises are required to make sure the model output is reasonable across many classes of risks. This session will give an overview of the scope of peer review and validation which are required in catastrophe modeling.

Real World Applications

How are catastrophe models used within various industries? How have governments and international agencies leveraged the models to help understand their risk? We will conclude our catastrophe modeling crash course with a review of the wide-ranging practical applications of the models.