

# Welcome to the Office of Insurance Regulation

## Overview of Florida's Public Hurricane Model

One of the most important components for determining residential insurance rates are to estimate losses --- or the predicted damage caused to insured property. Although there are other risks such as sinkhole, flood, wind damage, and fire, in the State of Florida the primary risk for insurers is the risk of a catastrophic hurricane. (To view the magnitude of hurricane losses for the 2004-2005 hurricane seasons, please see the Office's [Summary of the 2004-2005 Hurricane Seasons](#).)

To calculate these potential losses (which are ultimately a component of consumer's overall insurance premium) large insurance companies have developed complex computer models --- potentially costing in the \$8 to \$15 million range. From a regulatory standpoint, this has created several problems:

- The inputs, functions, and even outputs of these models are often proprietary
- Regulators often do not have resources to effectively evaluate these models
- The models' projections of hurricane losses can vary significantly

Beginning in 2001, the Florida Department of Insurance (later to become the Florida Office of Insurance Regulation) embarked on a new strategy to address this important issue: develop a Public Hurricane Model.

The hurricane model is predictive and has two main predictive features:

***Pre-Hurricane Prediction.*** This type of prediction can be used during insurer rate filings to determine premiums. The model can incorporate different factors about a specific book of business (policy limits, policy type, geographic location) to predict future hurricane losses specific to a company.

***Post-Hurricane Prediction.*** Given a specific wind speed, impact locations, and duration of a storm, the model can quickly estimate actual damage following a hurricane. Subsequent to Hurricane Wilma, the Public Hurricane Model estimated the potential impact of the storm to be \$7 billion. This proved to be within 2% of the losses calculated to be \$6.9 billion. The OIR issued a [press release](#) reporting this finding on July 11, 2006.

### **History of the Public Hurricane Model**

The Hurricane Model was approved by the Florida Legislature in the General Appropriates Act for fiscal year 2000-2001, and was directed to contract with the Florida University System. While there were several participating institutions including Florida State University, Florida Institute of Technology, the University of Florida, the University of Miami, and the Hurricane Research Division of NOAA --- ultimately OIR with the approval of the Financial Services Commission decided to have [Florida International University](#) be the lead institution under the direction of Dr. Shahid Hamid, Ph.D.

Nearly \$2.7 million in public funds was appropriated by the Florida Legislature to complete the project.

## **Certification**

Over the course of several years, which included complex data reporting requirements of the insurance industry, the research team at FIU and associated universities and institutions tested and verified the accuracy of various elements of the model.

Mark Powell of the U.S. Department of Commerce certified the accuracy of the Atmospheric Science Component in a memo dated May 27, 2005 based on 2004 standards adopted by the Florida Commission on Hurricane Loss Projection Methodology. Jean-Paul Pinelli, Ph.D. of Florida Institute of Technology certified the engineering section pertaining to vulnerability standards in a memo dated May 24, 2005. Finally, the statistical components of the Public Model were certified by Sneha Gulati, Ph.D. of FIU in a memo dated June 7, 2005.

## **Approved for Use**

On August 9, 2005, the Florida Insurance Commissioner commissioned five teams of professionals to visit the FIU campus in Miami to review the efficacy of the Public Hurricane Model. The five teams included: 1) a Meteorological Team; 2) an Engineering Team; 3) an Insured Loss Team; 4) a Computer Science Team; and 5) a Statistical Team.

Although the team did have some recommendations and pledged to continue to work in the development and refinement of the model, based on the team's findings, Commissioner Kevin McCarty recommended to the Governor that the Public Hurricane Model was ready for public use in a [letter dated August 31, 2005](#).

The Public Model has been a dynamic project that continues to evolve and incorporate new loss data as it becomes available. The International Hurricane Research Center at Florida International University issued a status report of the project to the Office of Insurance Regulation in April, 2006.

## **Future Updates**

One limitation of the current system is that it only analyzes hurricane loss damage for single-family homes, including mobile homes. In 2006, the Florida Legislature approved \$1.1 million to expand the system to incorporate commercial structures including condominiums and apartment buildings.

## **Using the Model – the Practical Application**

Not only is the computer model complex, but it involves several hours of programming, often performed by FIU graduate students prior to beginning the calculation. For these reasons, the OIR is allowed, per contract basis, a limited number of computer runs during the fiscal year.

The initial contract signed between the Florida Office of Insurance Regulation and FIU on December 14, 2005 allowed the OIR 100 computer runs. A subsequent contract with the same limitation was signed to cover the period following June 30, 2006.

As of March 2007, the Office of Insurance Regulation has requested 116 computer runs of the Public Model, which have taken an average of 9.9 days to complete. Although the specific detail associated with Model outputs do not become part of the rate filings, the actuaries' interpretation of these findings can be found on the Office's website – Forms and Rates Search Page at <http://www.fldfs.com/edms/> and select "Public Hurricane Model."