

PROFESSIONAL TEAM REPORT
ISSUES FOR COMMISSION MEETING – 2005 Report of Activities
JULY 2005

I. Multiple hurricanes at the same location in the same hurricane season

A. The Issue:

The Professional Team reviewed the methods used to account for multiple landfalls at a single location. In addition, discussions were held with each modeler relative to the passage of HB9A in a 2004 Special Session of the Florida Legislature relating to “seasonal deductibles”.

Models generally assume that the structure is undamaged prior to the impacts of damaging winds from a hurricane in the stochastic storm set. The Professional Team informed the modelers that they should be prepared to develop methods to incorporate the effects of the “seasonal deductible” in the submissions made to the Commission in future years.

The impact on loss cost levels of the revision from “per occurrence” to “seasonal deductibles” is expected to be very small; caused by the following:

- 1) Damage to a property caused by a second event in a single season will be less than the damage caused by the same storm initially striking the property. This is due to lesser damages due to damage already having been caused and considered following the first event. This will cause the zero deductible loss costs to decrease, since the first event has left the property damaged and of lesser value when the second event occurs.
- 2) The loss costs associated with deductibles will increase due to the fact that the losses that would have been eliminated under the full deductible will now be less (or zero) for the second event.
- 3) The impacts of each of the above offsetting cost implications will be very small due to the very low frequency of multiple damaging hurricanes at the same property location.

B. Professional Team Recommendation:

The Professional Team recommends that the Commission revise the Actuarial Standard relating to “Deductibles” to ensure that models approved for rate filings in Florida conform to the new “seasonal deductible” legislation.

The Professional Team recommends adding a sentence to Standard A-6 (Deductibles) as follows:

Deductible loss costs produced by the model shall be calculated on an annual deductible basis.

(627.701 Florida Statute reads, “The hurricane deductible shall apply on an annual basis to all covered hurricane losses that occur during the calendar year for losses that are covered under one or more policies issued by the same insurer or an insurer in the same insurer group.”)

II. Event Definition in the Stochastic Storm Sets

A. The Issue:

The Commission requested that the Professional Team investigate whether modelers are defining stochastic hurricanes in a manner that is consistent with property insurance policy hurricane definitions. The Commission also expressed the desire to determine whether modelers are defining hurricanes in a similar manner.

While there are currently subtle differences in the way currently accepted models define a hurricane event, these differences appear to be very minor, relating almost entirely to the way by-passing storms are treated in the creation of loss costs. The mandates currently included in the Commission’s Standard A-1 provide an adequate means to ensure that models are appropriately defining landfalling hurricanes relative to the definition contained in Florida property insurance policies. The current Standard, however, is not as specific relative to by-passing hurricanes, causing the subtle differences in the treatment of by-passing storms described earlier.

B. Professional Team Recommendation:

The Professional Team recommends that Standard A-1 be modified as follows:

Modeled loss costs shall reflect all damage caused by the peril of windstorm during a modeled hurricane, as defined in Florida Statute 627.0425(2).

III. Commercial Residential

A. The Issue:

The Professional Team once again discussed the possibility of the inclusion of commercial residential standards in its future reviews. This has been discussed in previous years. During the current discussions, modelers provided the following.

Models currently produce loss costs for commercial residential properties. Standards would have to be expanded to account for additional criteria relative to additional roof cover types, meteorological and vulnerability differences due to building heights, building classification anomalies or shortcomings in insurance company data, and other criteria for which the personal residential Standards may not currently provide sufficient detail to be applied directly to commercial residential properties.

There is a concern among modelers relative to a possible lack of commercial residential property insurance claim data, but this concern may be ameliorated with a possible influx of commercial residential data from the 2004 storm season.

Modelers also expressed a concern relative to the possibility that the Commission would opt for an “all or nothing” approach, causing current models to be found “unacceptable” if they fail to pass or do not apply for acceptance under the Commission’s commercial residential standards.

B. Professional Team Recommendations:

The Professional Team recommends that the Commission direct the Professional Team through the audit process to determine the availability of commercial residential data and the science currently used by the modelers relative to producing commercial residential loss costs. Audit language would reside under Standard G-1 with the commercial residential components of the model reviewed on-site.

Audit item added to G-1:

Justify the vertical variation of the wind speed conversion factor with respect to gradient to damage level.

The following is quoted from the Professional Team’s 2002 report to the Commission relating to commercial residential. While modelers discussed some different issues with the Professional Team this year, this previous report is provided as additional information relative to this subject.

“The Professional Team has been asked to provide the Commission with its latest recommendations relative to commercial residential standards following a polling of interested parties. Prior research has determined the following:

- 1) There is no universally accepted industry definition of commercial residential.***
- 2) The currently available insurance data relative to commercial lines of insurance (including commercial residential) is extremely sparse.***
- 3) In order to review loss costs produced for condominium and apartment dwellers, some additional information is needed relative to the height of the structure due to the effect of elevation on wind speeds and pressures.***
- 4) There is a far greater number of possible construction types in commercial construction than in single family dwelling structures.***

Subsequent research has determined that there is not a great need for commercial residential standards, and that the creation of such standards might cause problems with the current market for these coverages.

Given the significant difficulties involved with the collection of the data necessary to produce and to verify commercial residential standards, and given the low levels of need for such standards, the Professional Team recommends that the Commission postpone any decisions relative to the creation of commercial

residential standards until such time as the necessary criteria is more readily available. The Professional Team also recommends that the Commission request that the Insurance Department notify the Commission if their needs relative to the creation of commercial residential standards changes.”

IV. Gradient to Surface Wind Conversions

A. The Issue:

Models currently use somewhat varying methods to convert from gradient wind speeds to surface wind speeds. Although each of the methods used by the modelers has been determined to be acceptable, there is a substantial amount of meteorological work being performed with the desired result of improving upon the statistical forecasting of gradient to surface wind conversions.

B. Professional Team Recommendations:

A growing body of atmospheric science literature, predominantly from the researchers at NOAA’s Hurricane Research Division and their collaborators, has shown variation in the wind speed reduction around a hurricane dependent upon (1) the intensity of the hurricane and (2) the location of the site relative to the radius of maximum wind. The Professional Team recommends that the Commission introduce Franklin et al. (2003) as a potential normative reference and include the following modification to Disclosure 3 in Standard M-2:

- 3. Describe the process for converting gradient winds to surface winds including the treatment of the inherent uncertainties in the conversion factor with respect to location of the site compared to the radius of maximum winds. Justify the variation of the gradient to surface winds conversion factor relative to hurricane intensity.*

Potential New normative reference J. L. Franklin, M. L. Black, and K. Valde, 2003: GPS dropwindsonde wind profiles in hurricanes and their operational implications. *Weather and Forecasting*, **18**, 32-44.

V. Transition of Hurricanes From Over Water to Over Land

A. The Issue:

Transition from over water to over land results in substantial changes to the hurricane windfield due to storm weakening and friction. As was evident from the 2004 hurricanes affecting Florida, transition to land also results in generation of tornadoes, another source of substantial damage. The historical use by the Commission of the Kaplan DeMaria normative reference may have had the unintended result that the modelers over-emphasized this approach.

B. Professional Team Recommendations:

The Professional Team believes that the current methods used by accepted models are adequate to capture the transition effects of hurricane weakening and friction. However, substantial data for hurricane wind fields over land are being collected and published in the atmospheric science and engineering literature. Thus, the Professional Team recommends that the Commission encourage the modelers to continually validate their wind field models over land through modification of the disclosure language in Standard M-5 as follows:

4. *Provide a graphical representation of the modeled degradation rates for Florida hurricanes over time compared to published wind observations. The model generated winds should be demonstrated to be consistent with the observed winds. Reference to the Kaplan-DeMaria decay rates alone is not acceptable. (Potential storms to request are Andrew, Erin, Opal, Charley)*
5. *Document any differences between the treatment in the model of decay rates for stochastic hurricanes compared to historical hurricanes affecting Florida.*

Further, the Professional Team recommends that Kaplan and DeMaria (1995) be removed as a normative reference.

VI. HURDAT Data Revisions

A. The Issue:

Models currently use the historical database as an aid in calibrating stochastic storm sets. The National Hurricane Center's Best Track Committee has identified deficiencies in the existing HURDAT from which the Commission's Official Hurricane Set is drawn. To ameliorate this problem, the NHC has set in place a reanalysis of the entire HURDAT database of storms.

B. Professional Team Recommendations:

The Professional Team recommends that the Commission consider implementing the revisions to the HURDAT database once it is completed and approved through to 1960 (since there were only 2 center fixes per day through to 1960). These updates should be incorporated following an active year, since substantial changes to the historical database will be required in updating that prior, active season. Reanalysis through to 1914 has already been completed and accepted by the National Hurricane Center's Best Track Change Committee. According to Dr Chris Landsea, the lead scientist for the HURDAT reanalysis project, NHC approval of the reanalysis through to 1940 is likely by Spring 2006, with NHC approval of the reanalysis through 1970 to be expected a year later.

The modelers express reservations about including a partial revision of the dataset and express a preference for waiting until the entire HURDAT reanalysis has been completed and approved. This position is unchanged from 2003 (see below).

The following is quoted from the Professional Team’s 2003 report to the Commission relating to HURDAT revisions:

“Modelers were unanimous that they would rather wait until all the revisions are made before the Commission’s Official Storm Set is amended. Modelers question the validity of the data being used to add older storms as well as the decision to revise Hurricane Andrew characteristics. They expressed that this revision is a work in progress and not ready for inclusion in the process, and that there are issues about its (HURDAT revised data) quality, especially for Cat 2 storms. There are many concerns and reservations about the conclusions from that group of storms. One modeler suggested that an independent committee review the revision committee’s recommendations.”

The Professional Team notes that the HURDAT revisions are reviewed and accepted by National Hurricane Center’s Best Track Change Committee prior to inclusion in NHC HURDAT. The HURDAT revisions are being undertaken at NOAA’s Hurricane Research Division, in collaboration with a number of university researchers. Further, the Commission created its own Official Storm Set in 1995 due to dissatisfaction with the quality of the NHC HURDAT. The Professional Team notes that the HURDAT revisions provide additional information with which to reconstruct the historical storms and so are very unlikely to degrade the quality of the HURDAT database.

Finally, recent work by Johnson and Watson suggests that using the full NHC HURDAT (with the updates through 1914) is far superior to using even the most relevant subset of storms when simulating loss costs. Thus, should the choice be made to revert to the NHC HURDAT, the Professional Team recommends that the full NHC HURDAT be the reference database.

It remains the sentiment of the Professional Team to use the best available data in constructing the Official Hurricane Set.

VII. Radius of Hurricane Force Winds

A. The Issue:

The Commission does not currently include a standard that relates directly to the model’s inclusion of a factor for “the radius of hurricane force winds”. Modelers described a serious lack of data and studies that could be used to produce the radius of hurricane force winds in a scientifically accepted manner. In addition, models currently develop radii of hurricane force winds that are consistent with historical data as is evident in the numerous model validations and verifications performed using historical hurricanes.

B. Professional Team Recommendations:

The Professional Team notes the publication of Kimball and Mulekar (2004) which documents the acceptability of the extended best track dataset, a freely available dataset of size parameters measurements for all Atlantic tropical systems for the fifteen year period 1988-2002. The Professional Team believes that validation of other size

parameters for historical storms may be enlightening. Thus, the Professional Team recommends that the findings from this paper be given consideration and that this remain an active issue.

Reference: Kimball, S. K., and Mulekar, M. S., 2004: A 15-year climatology of North Atlantic tropical cyclones. Part I: Size parameters. *J. Climate*, **17**, 3555-3575.

VIII. ALE - Storm Surge Damage to the Infrastructure

A. The Issue:

The Commission requested the Professional Team to review the methods used by the modelers to account for insurer claim payments that result from storm surge damage to the infrastructure regardless of whether the insured property suffered a covered loss.

Modelers generally agree that insurance companies pay claims for additional living expenses when the infrastructure is damaged by storm surge (which is not a covered peril under the insurance contract). Individual claims were reviewed where there was no coverage A, B or C losses, but there were payments made for ALE. It is believed that this is often caused by damage to the infrastructure that caused the property to become uninhabitable. It is also believed that insurers generally do not investigate to determine whether the infrastructure damage is due to wind or storm surge.

B. Professional Team Recommendations:

The Professional Team recommends that language removed in a previous Commission meeting (relating to the model's capability of including ALE losses from storm surge damage to the infrastructure) be added to the current Standard A-8.

ALE loss costs produced by the model shall incorporate a provision for ALE claims arising from damage to the infrastructure.