

State of Nevada  
Department of Business & Industry


Protect Consumers  
Ensure Solvency

## Division of Insurance

### Developments in Regulatory Review of Predictive Models

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*Presentation for the  
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 Discussion Panel on U.S. Regulatory Landscape for P&C Actuaries  
 November 12, 2018*




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### NAIC Paper on Regulatory Review of Complex Predictive Models

- **“Best practices”** for review of complex predictive models
- **Guidance:** Neither binding nor exhaustive
- **State-specific requirements** may supplement or supersede.
- Currently focused on **GLMs for personal automobile and home insurance.**

**Key Regulatory Principles**

1. State insurance regulators will maintain their current rate regulatory authority.
2. State insurance regulators will be able to share information to aid companies in getting insurance products to market more quickly.
3. State insurance regulators will share expertise and discuss technical issues regarding complex predictive models.
4. State insurance regulators will maintain confidentiality where appropriate regarding complex predictive models.




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### NAIC Paper on Regulatory Review of Complex Predictive Models – Areas of Consideration

- I. **Selecting Model Input**
  - ✦ Available Data Sources, Sub-Models, Adjustments and Scrubbing, Data Organization
- II. **Building the Model and Scrutinizing the Data**
  - ✦ Narratives (High- and Medium-Level) for Building the Model
  - ✦ Predictor Variables, Massaging Data, Model Validation, Goodness-of-Fit Measures
  - ✦ “Old Model” versus “New Model”
  - ✦ Modeler/Software
- III. **The Filed Rating Plan**
  - ✦ General Impact of Model on Rating Algorithm
  - ✦ ★ Relevance of Variables / Relationship to Risk of Loss
  - ✦ Comparison of Model Outputs to Current and Selected Factors
  - ✦ Responses to Data, Credibility, and Granularity Issues
  - ✦ Definitions of Rating Variables
  - ✦ Supporting Data
  - ✦ ★ ★ Consumer Impacts
  - ✦ Accurate Translation of Model into a Rating Plan




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### Emerging Issues on Predictive Models in Nevada

- **Transitions from Older to Newer Generations of Credit-Based Insurance Scoring (CBIS) Models:**  
More rate disruption than expected or reasonable
- **Stand-Alone Models Considering Utility / Telecommunication Information (NCTUE Data):**  
Models proposed to be adopted alongside credit-based insurance scoring models, instead of information incorporated into CBIS models
- **Decision Trees / Gradient-Boosting Models:**  
Selection of number of trees, "stumps", order of variables, characterization of overall impact.
  - **Missing the forest for the trees?**



Angular Fractal Trees (2010)  
by Gennady Stolyarov II



View of Carson City from the Kings Canyon Trail – July 8, 2018 – Gennady Stolyarov II –

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