



## California Department of Insurance

# Catastrophe Model Form

### For Property Lines

All insurers submitting a catastrophe model as support for their Prior Approval Rate Application must include a completed Catastrophe Model Form ("Form") with that application. This form applies to rate, rule, new program or transferred program applications for all property lines of insurance and perils where catastrophe models are permitted to be used by CCR §§2644.4(d) and 2644.4.5.

Submit *one form for each modeled peril* included in the application. If multiple models are used for a particular peril, include information regarding each model in this Form. For wildfire catastrophe models that have not received a PRID (pre-application required information determination), and that are used in the development of either the catastrophe adjustment ("CAT Adj") or the net cost of reinsurance ("NCOR"), or both, submit the [Wildfire Catastrophe Model Checklist](#) in addition to this Form.

Model Name (Model #1):

PRID Issued: Yes / No

Model Name (Model #2):

PRID Issued: Yes / No

Model Name (Model #3):

PRID Issued: Yes / No

Version:

Determination Date (if Yes):

Version:

Determination Date (if Yes):

Version:

Determination Date (if Yes):

Peril (select one):

Wildfire \_\_\_\_

Terrorism \_\_\_\_

Fire Following Earthquake \_\_\_\_

Earthquake \_\_\_\_

Flood \_\_\_\_

Line Type (select one):

Personal \_\_\_\_

Commercial \_\_\_\_

Line of Insurance (select one):

Allied Lines \_\_\_\_ Fire \_\_\_\_ Homeowners \_\_\_\_  
Multiple Peril \_\_\_\_ Earthquake \_\_\_\_ Flood \_\_\_\_

Coverage/Form/Program (identify all that apply): \_\_\_\_\_

Use Case(s) (select all that apply):

Model #1

CAT Adj \_\_\_\_ NCOR \_\_\_\_ Rate Segmentation \_\_\_\_  
Projected Loss (EQ, Flood) \_\_\_\_ Underwriting/Eligibility \_\_\_\_  
Other \_\_\_\_ (specify in Filing Memorandum)

Model #2

CAT Adj \_\_\_\_ NCOR \_\_\_\_ Rate Segmentation \_\_\_\_  
Projected Loss (EQ, Flood) \_\_\_\_ Underwriting/Eligibility \_\_\_\_  
Other \_\_\_\_ (specify in Filing Memorandum)

Model #3

CAT Adj \_\_\_\_ NCOR \_\_\_\_ Rate Segmentation \_\_\_\_  
Projected Loss (EQ, Flood) \_\_\_\_ Underwriting/Eligibility \_\_\_\_  
Other \_\_\_\_ (specify in Filing Memorandum)

#### A. General Information

1. For the Use Case specified, provide a brief overview of how the model improves the insurer's rating plan, and promotes growth, financial stability, and efficiency of the insurer. If multiple models are used, further discuss how those models interact to achieve these goals.
2. If models other than those submitted were considered, how did the insurer initially evaluate the submitted model(s) for appropriateness and applicability to the Use Cases identified (e.g., comparison between models of results at various geographical segments, comparison of model estimates against historical data, etc.)? Provide the rationale for selecting the model(s) submitted over others considered.
3. If the submitted model is not the most recent version available from the vendor, explain why the most recent version is not being used.
4. Is the submitted model replacing a different model that was previously used for a similar Use Case (e.g., change in vendor model, change in the version of the same vendor model)? If so,

provide the CDI file number for the rate application in which the prior model was used, as well as the prior vendor, and model version number, and discuss the rationale for the change. If the submitted model has not received a PRID review, discuss the differences between the prior and submitted models with regard to model input data, methodology, modeling assumptions, and model output.

5. For all model settings that allow a user selection (e.g., demand surge (on/off), smoke damage (with/without), secondary modifiers (yes/no), etc.), provide a description of each model setting, a comparison of the output between available user options, and the rationale for the user selection.

## **B. Model Input**

6. Provide a list of all data elements in the model input data and their associated definitions (e.g., primary/secondary characteristics).
7. Identify all model input data elements obtained from external data sources and the source (e.g., broker data) of each such element.
8. For models used in the development of the CAT Adj and the NCOR, confirm that the model was run on the insurer's in-force business as of the end of the most recent year in the recorded period of the application, pursuant to CCR §2644.4.5(e), or explain any deviation from that regulation. Include a discussion of Variance 10 (refer to CCR §2644.27(f)(10), as applicable).
9. Provide the percentage exposure distribution for each data element in the input data including, but not limited to, geocoding quality, year built, roof type, and individual mitigation feature. Include the "unknown" category in the distribution for each data element.
10. If the model allows user modifications at the location level (e.g., loss modifications, hazard modifications, custom damage functions, etc.) that diverge from the model vendor's default settings, describe any modifications implemented, and the justification for such modifications.
11. For each input data element, identify the percentage of records with missing values. Explain how missing values are treated (e.g., imputation of missing values in the data element, elimination of data element from the model input). If missing values are imputed, explain how that imputation is performed.
12. Describe the process by which the raw data is adjusted to accommodate model input requirements. How does the insurer identify inaccuracies and mismatches between the raw input data and the criteria required by the model (e.g., the model requires a more granular breakdown of risk classes than exists in the raw input data, or the model has a risk class for which there is no direct match to the raw input data), and how are these inaccuracies and mismatches treated prior to the model run?

13. Discuss and support any major data processing steps or any modifications made to the input data that are not addressed in questions 5 through 7.

### **C. Model Output**

14. Provide a sample of the model output and a description of that output. If an event table is used for the Use Case specified, provide the event table (aggregate basis) of the model output. For location-level output, a sample of the top five locations is sufficient. Remove all confidential or sensitive personal information prior to submission.
15. Has the output been adjusted, smoothed, or transformed in any way? If so, provide a description and rationale for these adjustments, and include a numerical example of each adjustment (e.g., demand surge factor different from the original model setting that has been manually applied post-model run).
16. To the extent that the final selected result differs from the model output, provide an explanation for the selection methodology and any judgment employed in the selection process (e.g., smoothing of model output, application of weights to the model output if multiple models are used, etc.). Provide the support in working Excel format (with formulas intact).

### **D. Impact and Application**

17. Demonstrate how the model output was evaluated for reasonableness. If response is formulaic in any way, provide any support in working Excel format (with formulas intact).
18. If the model used in this submission has changed since the prior filing, provide (1) a comparison of the model output based solely on the model change and (2) a comparison of the model output based solely on the change in input data. In each case, explain the results.
19. Is the submitted model used for any purpose other than the Use Case(s) identified (e.g., internal risk management, catastrophe reinsurance placement or other risk transfer placements)? If so, provide the rationale when the model assumptions for these ancillary purposes deviate in any way from those of the submitted model underlying the rate application.