



A Proposal to Establish a Catastrophe (CAT) Modeling “Center of Excellence” (COE) within the NAIC’s Center for Insurance Policy & Research (CIPR)

September 20, 2021

Introduction

The leadership and members of the NAIC have determined natural CAT risks and resiliency to be a top priority and organized several workstreams to pursue objectives intended to help ensure homes and businesses are protected from insured perils arising from natural CATs, while keeping markets stable through financially strong insurers and reinsurers. For example, the Catastrophe Risk (E) Subgroup has spent many years working to develop risk-based capital (RBC) factors for hurricane and earthquake exposures and, more recently, grappling with how best to address wildfire, flood, and convection storm perils. Separately, the Catastrophe Insurance (C) Working Group is charged with maintaining the NAIC *State Disaster Response Plan*, the *Disaster Assistance Program*, and the *Catastrophe Computer Modeling Handbook*. The Working Group has also commenced work to determine ways in which the private flood market can be facilitated and monitored by the state insurance regulators. The Climate and Resiliency (EX) Task Force has taken on significant work, which will require a deeper understanding of all aspects of climate and natural CAT risks. Further, many state insurance regulators are taking on new roles in working to create risk resilient communities within their jurisdictions.

Given these increased pressures and new roles, state insurance regulators need to improve their understanding of the CAT modeling technologies used by insurers and reinsurers. This means having access to the same knowledge, insights, and tools used by insurers. In doing so, state insurance regulators can more effectively engage with insurers and state and federal policymakers when discussing how best to maintain critical insurance coverages for their states’ economies and developing new regulatory policy. The NAIC can play an instrumental role fulfilling these needs.

In this regard, the Technology Workstream of the Climate and Resiliency (EX) Task Force was assigned the task of considering the potential application of technology, such as early warning systems and predictive modeling tools, to better understand and thereby evaluate insurers’ climate and natural CAT



risk exposures. In particular, the Technology Workstream was tasked with determining whether technical support services were needed by state insurance departments regarding the industry's use of CAT models.

To help facilitate the members' consideration of such a need, NAIC/CIPR staff conducted two presentations on June 7 and Aug. 6, 2021, wherein staff laid out a range of support services for state insurance departments when encountering the use of commercial CAT models by insurers in rate making processes, solvency functions, and/or other insurance business decisions (e.g., strategic, reinsurance, claims management). NAIC/CIPR staff addressed potential support services in the areas of: 1) facilitating access to CAT modeling documentation; 2) providing technical education and training; and 3) conducting applied research to proactively address regulatory climate risk and resilience priorities. Finally, an additional related benefit highlighted is the ability to provide future support services for other modeled CAT risk beyond climate and natural CATs, including casualty/liability, cyber, terrorism, and infectious diseases such as pandemics. This additional support work could potentially influence other NAIC related committee activities, as appropriate.

Proposal

As outlined in the introduction above, the time has arrived for the NAIC to establish a permanent support group—i.e., the NAIC CAT Modeling COE—to provide the NAIC and state system of insurance regulation with the necessary technical expertise, tools, and information to effectively regulate the insurers and reinsurers exposed to catastrophic events for a secure and stable insurance marketplace. We believe this COE would be best positioned within the NAIC's CIPR given CIPR's: 1) existing knowledge, expertise, and recent NAIC applied research track record in this field; and 2) its ability to effectively work with modelers and state insurance regulators from a neutral perspective within the NAIC. Below is a complementary and integrated series of technical support services envisioned by the COE:

- 1) Facilitating insurance department access to CAT modeling documentation and assistance in the distilling of this information.
- 2) Providing general technical education/training materials on the mechanics of commercial models and treatment of perils and risk exposures.
- 3) Conducting applied research analysis utilizing various model platforms to proactively answer the regulatory "so what" questions that may need to be addressed for regulatory resilience priorities.

The first element from above provides for the CAT Modeling COE to facilitate insurance department access to CAT modeling documentation and other information, as well as centralizing accumulated knowledge and expertise to aid in the deciphering and distillation of CAT models. The COE would assist



with managing both CAT model vendor relationships and insurance department needs. As such, the COE would be briefed on the modeling technologies and inputs in a similar fashion as insurers and reinsurers are and have access to the same modeling documentation to develop internal expertise. This knowledge and expertise would then be actively shared with state insurance regulators for use in regulatory processes and other considerations. Critically, this information would be collected and stored on an NAIC regulator-only technological platform with proper CAT modeling vendor Data Use Agreements (DUAs) in place to allow for proprietary model information sharing, part of which has been a stumbling block to regulatory access to date.

The second element from above provides for technical education/training materials on the mechanics of commercial models and treatment of perils and risk exposures for state insurance regulators. Importantly, this technical training would be utilized to enhance regulatory operational activities, thereby bringing the science to operations. For example, it would allow for state insurance departments and the NAIC to reimagine the NAIC [Catastrophe Computer Modeling Handbook](#), which could become the foundational authoritative literature on state insurance regulator use of CAT models. As state insurance regulators gain more practice with these models, the NAIC is also well-positioned to develop best practices on industry use, as well as state insurance regulator use. Consequently, the NAIC [Financial Condition Examiners Handbook](#) and the [NAIC Own Risk and Solvency Assessment \(ORSA\) Guidance Manual](#) could be improved to account for the latest developments and best practices in CAT risk assessment. Further from a solvency perspective, both the development of related RBC CAT charges and climate stress testing would benefit greatly from such a technical foundation.

The third element from above provides for conducting applied research analysis to utilize various model platforms to proactively answer the regulatory “so what” questions that may need to be addressed. CAT models are not limited to use by the insurance industry; they are tools for CAT risk assessment. State insurance regulators can apply these tools in much the same way as the industry, albeit for regulatory resilience priorities (e.g., how to increase the uptake and proliferation of home hardening activities related to hurricane and wildfire risk). Such mitigation activities are critical to reduce expected losses and improve the availability and affordability of coverage currently and in a future warming climate. Applied research utilizing CAT models can demonstrate the economic value of such mitigation activities, laying the proper foundation for policy discussions to address increasing property owner mitigation implementation.

Lastly, it is important to note that these identified support services will not be taking the place of individual state department of insurance (DOI) activities involving CAT models, such as model and rate filing reviews, nor will the CAT Modeling COE be approving vendor models. Rather, the support services will allow the COE to engage with state insurance regulators as a trusted partner with a sufficient level



of CAT modeling expertise to enable the conduction of ongoing CAT modeling regulatory activities more effectively.

Plan of Action

In the past year, many of the above support services have already transpired and/or are currently underway. These include: 1) regulator-only technological platform infrastructure development and DUA executions; 2) NAIC Insurance Summit and CIPR events focused on CAT modeling education concerning wildfire and flood models, CAT model climate change incorporation and climate risk assessment, and casualty CAT modeling; 3) successful completion of a California, Colorado, and Oregon DOI [wildfire mitigation report](#) and wildfire CAT model technical documentation done in conjunction with the Insurance Institute for Business & Home Safety (IBHS) and Risk Management Solutions (RMS), which was further leveraged by the Catastrophe Risk (E) Subgroup for wildfire RBC factor development and the Catastrophe Insurance (C) Working Group *Catastrophe Computer Modeling Handbook* updates. Therefore, this proposal will not be to start such CAT modeling COE support service activities, but rather to build upon and leverage these activities for further enhancement and formalization at the NAIC.

Following the meeting of the Technology Workstream on Aug. 6, 2021, the proposal was released to the member states for further comments and questions. Comments were considered, and a revised proposal was approved for public exposure by the Technology, Solvency, and Pre-Disaster Mitigation Workstreams on Sept. 20, 2021.

Following the Sept. 20 regulator-only meeting, the proposal was released to interested parties for further comment and questions for 30 days. Comments will be considered by the Technology Workstream following this feedback and revisions may be made to the proposal, as agreed upon.

If the proposal advances through the above process steps, it will be prepared for recommendation to the Climate Risk and Resiliency (EX) Task Force at the NAIC 2021 Fall National Meeting in San Diego, CA.

We anticipate there would be no new charges associated with creation of the COE; i.e., the expenses associated with the COE resources would be effectively absorbed by the NAIC budget and have no special assessments, fee for services, etc. These resources may include: 1) recruiting a vendor/insurance department CAT modeling relationship manager and a CAT model research analyst; 2) funding for education/training development and implementation and the licensing and/or running of models for applied research to support and/or enhance regulatory operational activities; and 3) addressing regulatory resilience priorities.



Conclusion

In the face of extreme weather and the future climate significantly affecting property insurance markets, state insurance regulators need to have access to the same knowledge, insights, and CAT modeling tools used by insurers and reinsurers to assess and address climate risk and resiliency; i.e., knowledge and tools that are available for state insurance regulators to access, understand, and utilize. To accomplish this, we propose that the NAIC establish a permanent support group—i.e., the NAIC CAT Modeling COE—housed within the NAIC’s research unit; i.e., CIPR. We have laid out a proposal and plan of action that would build upon the work that the NAIC/CIPR has already been conducting around climate and CAT risks and allows the NAIC/CIPR to bring science to the operation of the DOIs in a way that is additive to the existing regulatory system, easy to access, and tailored to the needs of the state insurance regulators.

[CATModelCOE Proposal](#)



NAIC/Center for Insurance Policy and Research (CIPR) Catastrophe Model

Center of Excellence (COE) Frequently Asked Questions (FAQ) November 16, 2021

Governance & Oversight

Topic: Vendor and Insurer Continued Engagement with Departments of Insurance (DOIs)

Is the intent for the COE to become the primary point of contact between state insurance regulators and modelers?

No. As stated in the proposal, “identified support services will not be taking the place of state DOI activities involving CAT models, such as model and rate filing reviews, nor will the CAT Modeling COE be approving vendor models.” However, we do envision the COE providing access to CAT modeling expertise to support state insurance regulator understanding, training, etc.

Will state insurance regulators continue to be open to discussions with modelers (and insurers) about models?

Yes. In fact, the COE will seek to improve communication between state insurance regulators and modelers/insurers, supplying state insurance regulators with expertise and information to help facilitate such discussions.

Topic: Transparency and Potential Bias of Modeled Results/Usage

How will the COE engage with interested stakeholders to remain transparent?

Most NAIC support resources interact with a committee for reporting and oversight. In this instance, at least for now, we propose that the catastrophe resource center will report to the Technology Workstream under the Climate and Resiliency (EX) Task Force, as well as coordinate with the Property and Casualty Insurance (C) Committee.

How will the COE work to ensure impartiality of vendor models?



The COE will make every effort to engage with all vendors willing to participate for all perils with available technical documentation. Furthermore, the COE will establish a governance structure to ensure that partiality is not provided to any model or vendor.

Would the COE be engaging to connect learnings from the CAT model to specific insurer rate-making, solvency, and/or business—i.e., strategic, reinsurance, claims management—decisions?

The COE support services will not take the place of state DOI activities involving CAT models, such as model and rate filing reviews, nor will the CAT Modeling COE be approving vendor models. The COE will work to understand models objectively from a general sense, not for individual rate filings or solvency assessments. We acknowledge that each insurer has their own risk profile that would need to be considered on an individual basis, which is outside the scope of the COE.

Topic: Objective Science

Would the kind of information the COE conveys be facts-based or would it include opinions or analysis?

The information provided to the state DOIs would be fact-based with relevant objective analysis, as requested. Providing this type of information to states highlights the importance of the placement of the COE within the NAIC's independent research center, the CIPR.

Topic: Addressing Regulatory “So What” Questions Through Applied Research

What are regulatory “so what” questions in support service #3 of the proposal conducting applied research analysis?

State insurance regulators are responsible for maintaining well-functioning competitive insurance markets. Forward-looking models can be utilized to help analyze market performance, especially regarding the need for improved resilience. As stated in the proposal, CAT models are tools for catastrophe risk assessment. State insurance regulators can apply these tools in much the same way as the industry, albeit for regulatory resilience priorities. For example, models can be used to identify high-risk areas and where proliferation of home hardening activities can improve resilience to natural hazards, including hurricane, flood, severe convective storm, tornado, wildfire, and earthquake. Such mitigation activities are critical to reduce probable losses. Lower losses over time can improve the availability and affordability of coverage in the future. Applied research utilizing CAT models can demonstrate the economic value of mitigation activities. One



description provided via public comments that we considered useful is, “conducting applied research analysis that utilizes or analyzes the potential to utilize CAT models to further public and private risk mitigation and resiliency efforts; benefits and opportunities at the individual consumer or business; or public agency at the community, regional, state, or national level.”

Regarding conducting applied research analyses utilizing CAT models, we would like to understand the research and support expectations from the COE on modelers.

We envision working with modelers on applied research activities as applicable. We are requesting funding to allow for modeler engagement.

Depending on the expected level of granularity for COE work, additional questions may be relevant, such as whether the COE (NAIC/CIPR) would need to be prepared to go to a hearing to testify or respond to discovery?

It is not anticipated that the COE would maintain granular information about individual insurer use of CAT models. The level of detail would be around the actual CAT model to provide education and training to state DOIs.

Will the COE be used to conduct research and analysis into the markets for CAT models. Will conflicts of interest or market failures distort the use of CAT models?

No. It is not envisioned that the COE would set out to conduct this type of research and analysis.

Implementation Considerations

Topic: COE Communication of Various Results, Information, and Observations to DOIs

Given the complexity of models and breadth of expertise required to build and maintain them, there is a risk that any third party cannot adequately communicate the nuances and justification of models. Will the COE plan to coordinate model presentations from the modelers, rather than only relaying this information second-hand?

Yes. The COE would plan to coordinate model presentations from modelers.

How will information, observations, and/or questions about models be conveyed to state insurance departments? What kind of output will be generated?

We plan to hire a relationship manager responsible for communicating with the CAT model vendors and state insurance regulators. A regulator-only technology platform will help facilitate information sharing with state insurance regulators.



Research output could take multiple forms depending upon the nature of the analysis undertaken.

What kinds of data fields will be included? Will others provide input into the design?

The data fields selected would be contingent on the models being used and the research project under consideration. Data fields would follow from model inputs and outputs.

Will the COE reviews and/or output be designed to be geography-specific?

Yes. That is possible.

Once a model has been reviewed, what renewal process is envisioned?

Models will not be reviewed, nor would they be posted on the state insurance regulator-only website. However, model technical documentation and information will be updated as new versions of the models are released.

Topic: Model Vendor Intellectual Property (IP) Protection

How will the COE safe-guard intellectual property of the participating CAT model vendors?

All modeling documentation, access, and usage will be centralized and monitored through the COE via legally binding data use agreements. The NAIC has an extensive track record of experience in collecting and protecting proprietary information. The actual models will not be posted on the state insurance regulator website, only the model documentation will be posted.

Topic: Interaction with Modelers and Other External Experts

Will modelers engage in discussions with the COE about specific models? Do you expect insurers would be involved in model-related discussions?

Yes. The COE would be engaged with modelers on the modeling technologies and inputs in a similar fashion as insurers and reinsurers and have access to the same modeling documentation to develop internal expertise. It is possible that insurers could be involved in model-related discussions with the COE, but the COE will not review individual insurer's use of models.

Is the CIPR planning to license and use modeler software or engage in paid consulting studies for their research and development of processes?



Yes, depending on COE resources and the specific research use case. The CIPR would be willing to either license modeler software and/or engage in paid consulting studies for research and educational/training purposes, as directed by the appropriate NAIC authorities.

How will results and underlying assumptions from licensed models be communicated to state insurance regulators?

Any use of a licensed model, including distribution of modeled results, would be subject to the model license agreement and/or model vendor negotiated research consulting contract. Underlying assumptions from the various models utilized would be collected via the model technical documentation as part of the model vendor data use agreement. Note that it is possible that the model technical documentation, including underlying model assumptions, could be collected through a COE data use agreement without an associated model-based research project. If we were to license a model, the actual model would not be posted on the state insurance regulator-only website.

Will modelers be involved in establishing workflows, best practices, agendas, and expectations of the COE, including timing?

We anticipate that modelers will be actively engaged with the COE staff, advising on these items as appropriate.

How many vendors is the COE considering supporting?

The COE will not be “supporting” vendors, but rather the COE will collect model documentation and engage with model vendors. The COE will engage with any model vendor serving insurance markets where the information is relevant to state insurance regulators.

Does the COE anticipate looking to external experts for some of the implementation or ongoing work?

Yes. External collaboration would be welcome, whether that be with industry experts, public agencies, or the academic community.

Topic: Resources - Staffing and Funding

How many states do you expect to be interfacing with the COE?

The COE will be a resource of the NAIC potentially interfacing with all 56 jurisdictions.



Beyond recruiting for the identified new roles of CAT modeling relationship manager and CAT model research analyst, how many people at the NAIC/CIPR will be contributing to COE activities? Do you expect that to change over time?

The CIPR director, the NAIC solvency enterprise risk management (ERM) advisor, and potentially Property and Casualty Insurance (C) Committee staff support will have a role in supporting the work of the COE. We anticipate that additional technical and administrative support resources may be necessary as the workload and demand for services evolve with demonstrated success.

Will the staffing level proposed by the NAIC be able to provide meaningful analysis in the broad category of catastrophe modeling?

Prior to the creation of the COE, CIPR and NAIC staff have provided meaningful analysis on wildfire CAT modeling and applied wildfire resilience research. We aim to build off this success and need to start somewhere. Every little bit helps for the states, as stated by one industry commenter, “[t]he staffing issues mentioned above regarding experts at the NAIC are even larger for state insurance departments. Most states are not going to have enough or the right staff to review these models. They will have to rely on others to evaluate catastrophe model validity, and most likely will have to rely heavily on the decisions and evaluations made by others.”

Have long-term plans been prepared? Are there budget implications?

No long-term plan has been developed for the COE. The expenses associated with the COE would be subject to the NAIC budget process and have no special assessments or fees for service.

[CIPR COE FAQ](#)