



CAS Ratemaking and Product Management Seminar and Workshops

March 27-29, 2017

Marriott Marquis San Diego Marina

San Diego, CA

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Antitrust Notice

The Casualty Actuarial Society is committed to adhering strictly to the letter and spirit of the antitrust laws.

Seminars conducted under the auspices of the CAS are designed solely to provide a forum for the expression of various points of view on topics described in the programs or agendas for such meetings.

Under no circumstances shall CAS seminars be used as a means for competing companies or firms to reach any understanding—expressed or implied—that restricts competition or in any way impairs the ability of members to exercise independent business judgment regarding matters affecting competition.

It is the responsibility of all seminar participants to be aware of antitrust regulations, to prevent any written or verbal discussions that appear to violate these laws, and to adhere in every respect to the CAS antitrust compliance policy.

For more complete information regarding the CAS antitrust compliance policy, please refer to the CAS website at <http://www.casact.org/professionalism/policiesProc/index.cfm?fa=antitrust>.

**The opinions expressed by speakers at this event are their own words and do not necessarily reflect the positions of the CAS.*

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Registration and attendance at, or participation in, CAS meetings, seminars, and other activities constitutes an agreement by the registrant to CAS's use and distribution (both now and in the future) of the registrant or attendee's image or voice in photographs, videotapes, electronic reproduction, and audiotapes of such events and activities.

CAS Ratemaking and Product Management Seminar and Workshops

March 27-29, 2017

Marriott Marquis San Diego Marina
San Diego, CA

Seminar Overview

The Ratemaking and Product Management (RPM) Seminar provides a forum for presenting and discussing significant issues in ratemaking and product management. This seminar will consider how these two areas influence each other and will include the use of predictive modeling techniques in both. The program includes a range of topics to interest professionals and students in a number of related disciplines. Moreover, the seminar provides an opportunity to meet the continuing education needs of actuaries and other professionals whose responsibilities include ratemaking, underwriting and product management.

This year's RPM Seminar offers more than 70 different concurrent sessions, covering data management and technology, workers' compensation, commercial lines, personal lines, predictive modeling, professionalism, regulation, rate of return and product management topics. The seminar also features optional pre-program workshops on basic and advanced predictive modeling, severe weather, introduction to R, enterprise risk management, product development and data visualization, as well as a special one-day event for the CAS Institute titled, "iCAS Predictive Analytics Community of Practice."

This seminar is recommended for actuaries, underwriters, insurance professionals and others who require an understanding of state-of-the-art developments. The seminar follows a format of panel sessions, many using slides and interactive formatting to augment the presentations. Illustrative numerical examples are used whenever possible. Audience participation is encouraged.

Ratemaking and Product Management Seminar Planning Committee

Amy Juknelis, *Chairperson*
Kevin Donnelly, *Vice Chairperson*
Howard Kunst, *Vice Chairperson*

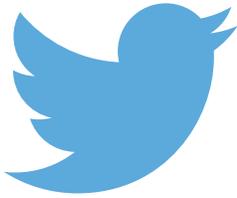
Anusha Anantharaju
Peggy Brinkmann
Sandra Callanan
Dana Chang
Xi Chen
Kelly Cusick
Germain Denoncourt
Brian Fannin
Donald Hendriks
Thomas Hess
Eric Krafcheck
Damon Lay
Xingyun Liao
Jin Liu
Millie Lo

Lili Peng
Brent Petzoldt
Pamela Sealand Reale
Karin Rhoads
Jay Rosen
Lijia Tian
Gary Wang
James Weiss
Robert Wolf
Peter Wu
Lin Xing
Tong Xu
Joshua Youdovin
Xiangfei Zeng
Lijuan Zhang

Accessing WiFi

Wifi Network: LexisNexis Risk Solutions

Wifi Password: AdvancedAnalytics



Tweet from the 2017 RPM Seminar! #CASRPM17

What's happening at the 2017 RPM Seminar? We want to hear from you!
Tweet about the RPM educational sessions and meeting events using the hashtag #CASRPM17.

Follow the CAS on Twitter @CASact

Not using Twitter yet?

Text "CASact" to 40404 to Follow the CAS on Twitter

And Follow the Prompts to Sign Up!

Social Media

The CAS is on Facebook, Twitter and LinkedIn! Stay informed by following CAS on Facebook and Twitter for exclusive updates on CAS activities! The CAS Facebook and Twitter page will feature many different topics including conference updates, online discussions and industry updates! Join and connect with peers and colleagues and discuss issues important to you!

If you cannot access Facebook, Twitter and LinkedIn from your office, please consider signing up to follow us from your personal account at home.



Please visit our website at www.casact.org and click the social media widgets to find our pages!

Download the CAS Meeting App

We're excited to announce that again this year, the Casualty Actuarial Society has worked with Gather Digital to provide a mobile application for the event. You will get up-to-the-minute information such as the latest agenda, updates from the conference planner, speaker information, feedback opportunities, maps, exhibitor and sponsor details, an attendee list and more.

To enable your account, open the app, select "More" or side swipe to the right to view the menu, and select "Login." Please enter the email that you used to register for the conference and select "Request a Password." You will receive an email with a link to create your personal app password. You may create a profile and upload a photo of yourself that other event attendees can view. Once logged into the app, select your email address at the top of the menu. This takes you to the "My Account" screen where you can "Edit" your profile and upload a photo.

To get the Ratemaking & Product Management Seminar 2017 mobile app:

iPhone and iPad users—search "casualty actuarial society" on the Apple App Store.

Android users—search "casualty actuarial society" on the Google Play Store.

Blackberry, Windows, others—go to this address on your smart phones (omit www): cas.gatherdigital.com



Sponsors, Exhibitors and Advertisers

The CAS appreciates the support provided by the 2017 RPM Seminar Sponsors. Attendees are encouraged to spend time visiting the exhibitors to learn about their products and services.

 <p>CARFAX Banking & Insurance Group[®] MORE INFORMATION. BETTER DECISIONS.</p>	<p><i>Carfax Banking and Insurance Group, Gold Partner</i></p> <p>Exhibitor</p>
	<p><i>The CAS Institute</i></p> <p>Exhibitor</p> <p>Tuesday Morning Networking Break Sponsor</p> <p>Wednesday Morning Networking Break Sponsor</p>
	<p><i>Clyde Analytics</i></p> <p>Exhibitor</p> <p>Give-Away Item Sponsor</p> <p>Wednesday Breakfast Sponsor</p>
	<p><i>CoreLogic</i></p> <p>Exhibitor</p>
	<p><i>DataRobot, Gold Partner</i></p> <p>Exhibitor</p> <p>Give-Away Item Sponsor</p>
	<p><i>DW Simpson, Centennial Partner</i></p> <p>Exhibitor</p> <p>Tuesday Reception Sponsor</p>
	<p><i>Earnix, Gold Partner</i></p> <p>Exhibitor</p> <p>Tuesday Afternoon Networking Break Sponsor</p>

Sponsors, Exhibitors and Advertisers

	<p><i>EY, Centennial Partner</i></p> <p>Tuesday Luncheon Sponsor</p> <p>Give-Away Item Sponsor</p>
	<p><i>Ezra Penland Actuarial Recruitment, Centennial Partner</i></p> <p>Exhibitor</p>
	<p><i>Gross Consulting, Gold Partner</i></p> <p>Exhibitor</p> <p>Give-Away Item Sponsor</p>
	<p><i>Guidewire Software</i></p> <p>Exhibitor</p>
	<p><i>The Institutes</i></p> <p>Exhibitor</p>
	<p><i>LexisNexis Risk Solutions, Centennial Partner</i></p> <p>Exhibitor</p> <p>Monday Reception Sponsor</p> <p>Power Tower Sponsor</p> <p>Room Key Sponsor</p> <p>WiFi Sponsor</p> <p>Give-Away Item Sponsor</p>

Sponsors, Exhibitors and Advertisers

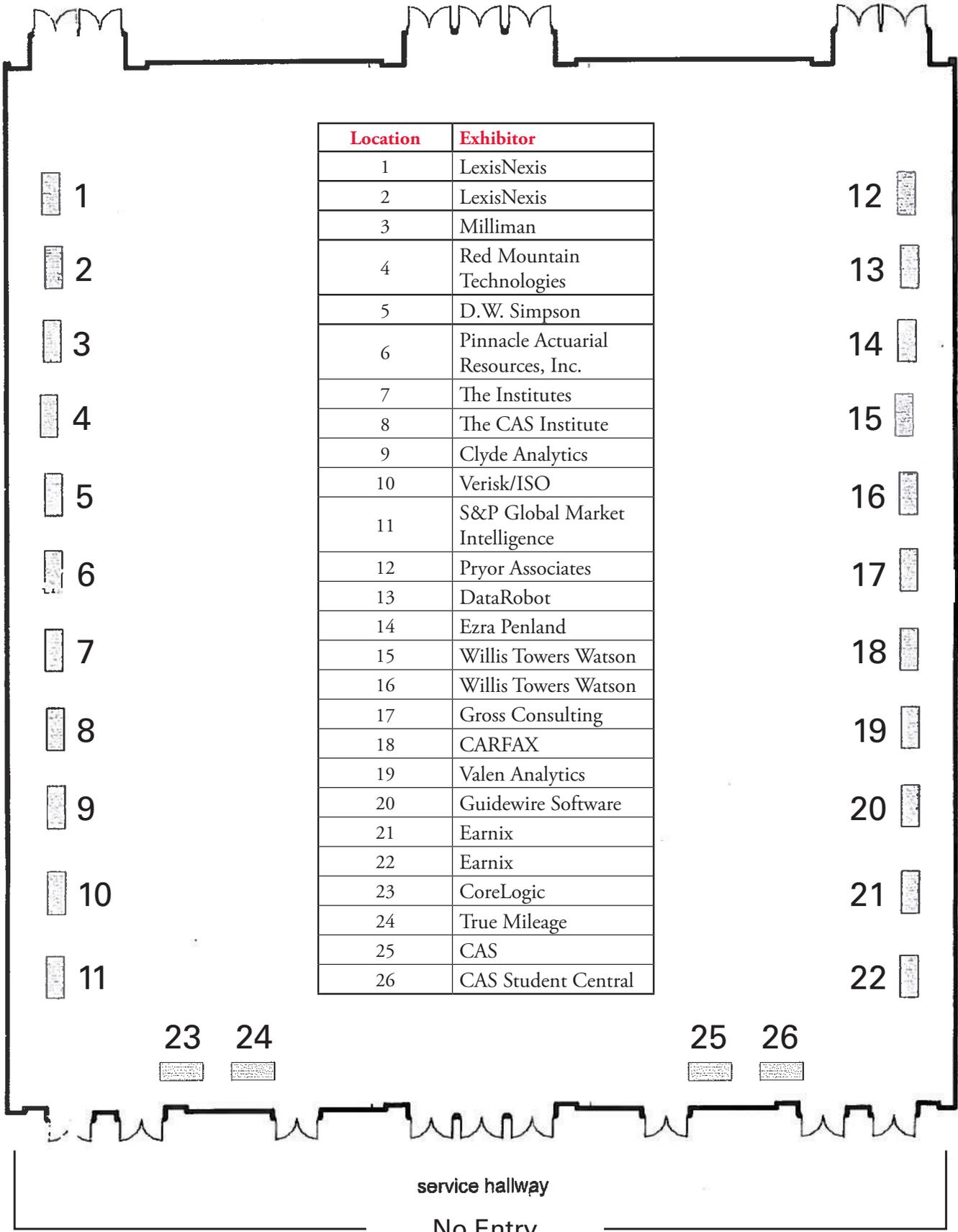
 <p>Liberty Mutual INSURANCE</p>	<p><i>Liberty Mutual, Silver Partner</i> Give-Away Item Sponsor</p>
	<p><i>Milliman, Inc., Centennial Partner</i> Exhibitor</p>
	<p><i>Pinnacle Actuarial Resources, Inc., Gold Partner</i> Exhibitor Tuesday Breakfast Sponsor</p>
	<p><i>Pryor Associates, Centennial Partner</i> Exhibitor Tote Bag Sponsor Give-Away Item Sponsor</p>
	<p><i>Red Mountain Technologies, Platinum Partner</i> Exhibitor</p>
<p>S&P Global Market Intelligence</p>	<p><i>S&P Global Market Intelligence</i> Exhibitor</p>
	<p><i>True Mileage</i> Exhibitor</p>

Sponsors, Exhibitors and Advertisers

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 <p>ISO</p> <hr/> <p>Verisk Insurance Solutions</p>	<p><i>Verisk Insurance Solutions/ISO, Platinum Partner</i></p> <p>Exhibitor Meeting App Sponsor</p>
 <p>Willis Towers Watson</p>	<p><i>Willis Towers Watson, Platinum Partner</i></p> <p>Exhibitor Give-Away Item Sponsor</p>

Exhibit Hall Floor Plan

Main Entrance



Location	Exhibitor
1	LexisNexis
2	LexisNexis
3	Milliman
4	Red Mountain Technologies
5	D.W. Simpson
6	Pinnacle Actuarial Resources, Inc.
7	The Institutes
8	The CAS Institute
9	Clyde Analytics
10	Verisk/ISO
11	S&P Global Market Intelligence
12	Pryor Associates
13	DataRobot
14	Ezra Penland
15	Willis Towers Watson
16	Willis Towers Watson
17	Gross Consulting
18	CARFAX
19	Valen Analytics
20	Guidewire Software
21	Earnix
22	Earnix
23	CoreLogic
24	True Mileage
25	CAS
26	CAS Student Central

General Information

Continuing Education

The CAS Continuing Education Policy applies to all ACAS and FCAS members who provide actuarial services. Actuarial services are defined in the CAS Code of Professional Conduct as “professional services provided to a Principal by an individual acting in the capacity of an actuary. Such services include the rendering of advice, recommendations, findings, or opinions based upon actuarial considerations.”

Members who are or could be subject to the continuing education requirements of a national actuarial organization can meet the requirements of the CAS Continuing Education Policy by satisfying the continuing education requirements established by a national actuarial organization recognized by the Policy.

This activity may qualify for up to 15* CE Credits for the Ratemaking and Product Management Seminar for CAS members. Breakfast Roundtable attendees may add up to .9* CE credit per roundtable. Workshop attendees may add up to a maximum of 7.2* CE credits. Participants should claim credit commensurate with the extent of their participation in the activity. CAS members earn 1 CE Credit per 50 minutes of educational session time not to include breaks or lunch.

**The amount of CE credit that can be earned for participating in this activity must be assessed by the individual attendee. It also may be different for individuals who are subject to the requirements of organizations other than the American Academy of Actuaries.*

Handouts and Evaluations

Session slides are posted on the CAS website so that attendees can download, print and bring handouts as desired. Please note that not every presenter will choose to provide a presentation handout for his or her session.

Attendees are encouraged to view the list of attendees electronically, complete the online evaluation forms and download presentations to a USB flash drive for the sessions they attend.

The CAS appreciates your participation in this effort to reduce the Seminar’s carbon footprint and impact.

Registration Hours

The RPM seminar registration desk (Pacific East Registration Desk) will be open as follows:

Sunday, March 26, 2017	3:00 p.m. - 5:00 p.m. (Workshop Registration ONLY)
Monday, March 27, 2017	8:00 a.m. - 3:00 p.m. (Workshop Registration ONLY)
Monday, March 27, 2017	4:00 p.m. - 6:00 p.m. (Seminar Registration)
Tuesday, March 28, 2017	7:00 a.m. - 6:30 p.m. (Seminar Registration)
Wednesday, March 29, 2017	7:15 a.m. - 2:00 p.m. (Seminar Registration)

General Information

Hotel Information

Marriott Marquis San Diego Marina
333 W Harbor Dr.
San Diego, CA 92101
Phone: (619) 234-1500

Checkout time is 11:00 a.m. Those checking out before the conclusion of the meeting may check their bags at the bell desk of the hotel. The Casualty Actuarial Society is not responsible for lost or stolen items left unattended in public areas of the hotel. CAS staff is unable to accept any bags or other personal items at the registration desk.

Security Note: When leaving the meeting room for an extended period of time, please take valuables and personal belongings with you. Neither the CAS nor the **Marriott Marquis San Diego Marina** can be held responsible for lost or stolen items.

Seminar Attire

Business casual attire is suggested for all sessions as well as the evening receptions on Monday and Tuesday. As meeting room temperatures and personal comfort levels may vary, it is recommended that you bring a sweater or jacket to the sessions. In San Diego, the average high temperature during March is 66 degrees and the average low is 53 degrees.

Interactive Live Streaming at RPM Seminar

Again this year, participants will join a select few of the RPM seminar sessions virtually. Viewers will participate live in a few of the seminar sessions remotely from around the globe. Participants attending virtually will have the opportunity to interact with other virtual attendees as well as pose questions to the panel during the session.

Live Stream Sessions:

Tuesday, March 28, 8:15 a.m. – 9:30 a.m.

Keynote Address: Cybersecurity

Tuesday, March 28, 10:00 a.m. – 11:15 a.m.

PL-5: IoT's Impact on the Distribution, Rating and Underwriting of Personal Auto

Tuesday, March 28, 12:15 p.m. – 1:30 p.m.

CL-1: 3D Printing: Hype or Reality?

Tuesday, March 28, 2:00 p.m. – 3:15 p.m.

BII-1: Evolution in Technology and Demographics: An Impact on the Insurance Industry

Tuesday, March 28, 3:45 p.m. – 5:00 p.m.

REG-4: Rate and Form Regulation — The Latest from the NAIC

Tuesday, March 28, 6:30 p.m. – 7:45 p.m.

INTNL-1: Internet of Things for International P&C Business

General Information

2017 RPM Seminar Prizes

Mobile App Badge Game

We have added something exciting for your mobile app experience. You can earn different badges by completing certain tasks throughout the seminar. Size up the competition by checking the Leaderboard to see your own earned badges and to make sure you're staying ahead of the game! For those who earn that top spot within the game, you will have a chance to win a \$100.00 American Express Gift Card.

To play the badge game, simply download the conference app (see page 2) and sign into your app using your email address and password. Once you have signed in, you will be able to "check-in" at different events and locations. Check how you're doing by viewing the Leaderboard, located behind the MORE or MORE RESOURCES button. Your earned badges will be displayed on the Leaderboard and next to your name under the ATTENDEES button.

Exhibitor Raffle

We are holding a raffle for attendees who visit all of our participating exhibitors. The winner will receive a \$250 American Express gift card.

Two ways to participate:

1. **Mobile App Check-In:** Visit each participating exhibitor and ask a representative for their code word. Check in on the mobile app with the code word. Enter all code words for all exhibitors participating in the Raffle. All code words will need to be entered by 12:00 p.m. on Wednesday, March 29 to be considered for the prize.
2. **Raffle Form:** In your registration bag you received a raffle entry form. Visit each participating exhibitor and ask a representative to initial your form. Once you have initials from all participating exhibitors, submit the form at the Registration Desk by 12:00 p.m. on Wednesday, March 29, to be entered into the drawing.

The winner will be announced on site during the closing session.

Tuesday Night Dinner Groups

Not sure what to do with your free Tuesday evening? Sign up for a dinner group and explore San Diego's culinary scene with other attendees from the conference. This is a great networking opportunity! Dinner groups will meet at the CAS Registration Desk **30 minutes** before the time of the dinner reservation and walk together to the restaurant.

If interested, please sign up at the CAS registration desk. (Limited space available. Participate on a first come, first served basis.)

*Participants are responsible for their own expenses. Please note that that CAS dinner groups are purely for informal networking and not third-party business.

General Sessions

Keynote Address: Cybersecurity

Opening/General Session: Tuesday, March 28, 7:55 a.m. - 9:30 a.m., Grand 5-7

Eric O'Neill will discuss "Cybersecurity in the Age of Breaches and Espionage" (political and corporate). O'Neill will also provide in-depth coverage on how the insurance industry (and actuarial roles) are impacted by cybersecurity policy, practices and some tips for prevention.



In 2001, Eric O'Neill helped capture the most notorious spy in United States history: Robert Hanssen, a 25-year veteran of the FBI. The remarkable true events of his life are the inspiration behind the critically acclaimed dramatic thriller *Breach*, starring Ryan Phillippe as O'Neill. The film set inside the FBI — the gatekeeper of the nation's most sensitive and potentially volatile secrets — is the story of the greatest security breach in U.S. history. Preceding Hanssen's arrest, O'Neill worked with the spy within the information assurance division that protected all classified FBI intelligence. O'Neill gained Hanssen's trust and used that relationship to slowly draw the traitor out of deep cover.

O'Neill began his career in the FBI as a graduate of the FBI's Intelligence Program. He spent the first five years of his career as a special surveillance group field operative tasked to surveil and monitor foreign, national, and domestic terrorists and spies. He transitioned from field operative to direct undercover work focusing on Hanssen. Currently, Eric O'Neill runs The Georgetown Group, a premier investigative and security consultancy, where he specializes in counterintelligence operations, investigations into economic espionage, cybersecurity penetrations, internal investigations, catching the trusted insider and security risk assessment consulting out of Washington, DC.

Eric is also the National Security Strategist for Carbon Black, the leader in next generation endpoint protection, where he provides insight and advice on strategic cybersecurity issues and will work to ensure Carbon Black is an active participant in the conversation about the national strategy for cybersecurity. O'Neill's story is one of patriotism, of decisive action in the face of fear, and of learning to maintain confidence in ability even if it looks like success is impossible. He has told his story in national media, in print, on radio, and on television including *20/20*, *Nightline*, *Hardball with Chris Mathews*, Fox News's *Power Player of the Week with Chris Wallace*, CNN, CSPAN's *Washington Journal*, NPR's *Fresh Air with Terry Gross*, *World News Now* and MTV.

Moderator: Amy Juknelis, Property Product Director, Allstate Insurance Company

Presenter: Eric O'Neill, The Georgetown Group

General Session-1: California Insurance Market - Current Events

General Session/Closing, Wednesday, March 29, 1:15 p.m. - 2:30 p.m., Pacific 23-26

This closing general session will feature a panel of experts who will address various topics surrounding the current state of the insurance market in the state of California. Our panel will cover issues with workers' compensation and various property-related natural hazard issues and will feature a lively Q&A session.

Moderator: Howard Kunst, Chief Actuary, CoreLogic

Panelists: Alex Swedlow, Executive Vice President, California Workers' Compensation Institute
Shawna Ackerman, Chief Actuary, California Earthquake Authority
Howard Botts, Chief Scientist, CoreLogic

Workshops

Pre-registration is required to attend a workshop.

Monday, March 27, 9:00 a.m. – 5:00 p.m.

Workshop 1: Severe Weather

Pacific 14

This workshop provides educational opportunities to learn both about the science and methods used to build weather models, but also provides useful information on how weather can be used within the business of insurance.

Moderator/Facilitator: Howard Kunst, Chief Actuary, CoreLogic
Facilitators: Ed Byrns, Managing Director - Client Calibrated Solutions, Munich Re Trading
Eric Robinson, AIR Worldwide
Thomas Jeffery, CoreLogic
Nancy Watkins, Principal, Milliman, Inc.
Don Windeler, Senior Director - Client Training, RMS

Workshop 2: Basic Predictive Modeling

Pacific 15

This popular, hands-on, interactive predictive modeling workshop has been offered at the RPM seminar now for several years. It will be conducted exclusively in the R statistical computing language, which is widely adopted by statisticians and data scientists.

The course will provide a refresher of regression theory before proceeding to a variety of practical modeling applications and case studies. The focus will be on generalized linear models (GLMs) — their specification, interpretation and validation. A variety of distributions will be covered, including classical, Poisson, logistic, gamma, and Tweedie. Other topics will be discussed and illustrated as time permits. All datasets will be distributed to attendees prior to the seminar.

Important note: Familiarity with R is assumed. An “introduction to R” presentation will be distributed before the seminar that will contain a primer on basic features and statistical functions, as well as installation instructions, that will enable beginners to get up to speed. While R beginners are encouraged to attend, they should make some attempt to become comfortable with the language prior to the workshop. This workshop has been designed for beginning predictive modelers, but more experienced modelers seeking a refresher or a deeper working knowledge of R have attended past workshops and expressed satisfaction with the coverage of topics.

Moderator/Facilitator: Mark Goldburd, Consulting Actuary, Milliman

Workshop 3: Product Development

Pacific 16

This workshop will explore the different stages of product development with hands-on exercises for the attendee. Industry leaders will serve as facilitators to review historical processes and to help guide the attendees throughout the day. Attendees will work in teams to develop fictitious products that will be discussed and integrated into the facilitator’s lesson plans.

Moderator/Facilitator: Kelly Cusick, Senior Manager, Deloitte Consulting, LLP
Facilitators: Thomas Hess, Assistant Actuary, Ohio Department of Insurance
Don Hendricks, Actuary, CARFAX Banking & Insurance Group
Serhat Guven, Director, WillisTowers Watson

Workshops

Workshop 4: Introduction to R

Pacific 17

Are you one of the millions of actuaries around the world who wish they could draw maps showing the progress of hurricanes, fit generalized linear models to predict sporting events, create complex Monte Carlo simulations or fit loss distributions? Or maybe you're the sort of person who wants to fit a stochastic reserving model and have a computer display stacks of pretty pictures for you. Do you want one point of access for all of your Excel, text, database and web-based data? Are you fascinated by programmers whose first names begin with the letter "R?"

If that's the sort of person you are, this is the workshop for you. And if none of those people is you, maybe all you want is to be able to get R to work for your computer. We can take care of that too.

R is the single most important technological advance for actuaries since the invention of the pocket calculator. Come see what all the fuss is about.

Moderator/Facilitator: Gary Wang, Pinnacle Actuarial Resources, Inc.

Facilitators: Emma Li, Data Scientist, Euclid Analytics
Scott Sobel, Principal, Oliver Wyman Actuarial Consulting
Radost Wenman, Consulting Actuary, Pinnacle Actuarial Resources, Inc.

Workshop 5: Capital Allocation and Risk/Reward Decision-Making in an ERM Framework

Pacific 23

This workshop will provide a historical primer on the subject and address past and current research of the practical ways in reflecting the cost of capital for ratemaking and decision-making. This primer will discuss aspects as developed by Merton-Perold, Myers-Read, Mango's asset share model and the RMK procedures. Also considered will be current research as it relates to how actual capital should perhaps be considered in percentile layers and/or tranches, based on the risk metrics considered. We have come a long way in ratemaking since using premium to surplus ratios of 30 years ago. Let's continue the evolution.

A laptop is recommended for participation in this session as we will have hands-on technical sessions where the audience will be charged with an exercise in allocating capital to lines of business considering various methods. Participants will work in groups to make strategic recommendations based on their respective results. Role playing will be involved. Attendees will have access to data in advance.

Moderator/Facilitator: Robert Wolf, Vice President and Chief Actuary, StoneTrust Commercial Insurance Company

Facilitator: Neil Bodoff, Executive Vice President, Willis Towers Watson

Workshops

Workshop 6: Advanced Predictive Modeling

Pacific 24

Although the generalized linear model (GLM) is a natural foundation for much actuarial work, it is best viewed as a starting point, not the last word on the subject. This day-long, hands-on, R-based workshop will discuss a variety of statistical learning methods that either refine or serve as complements to the GLM framework. Generalized additive models (GAM) will be discussed as a means to capture potentially complex nonlinear relationships.

Multilevel/hierarchical models, ridge regression and lasso regression will be discussed as a way of achieving shrinkage (credibility weighting) effects within linear models.

Various forms of tree-based modeling (CART, random forests, boosted trees) will be used to exemplify the use of non-parametric, machine-learning and ensemble methods. Time permitting, other machine-learning methods such as support vector machines (SVM) and artificial neural networks (ANN) will also be discussed. Core themes such as the bias-variance trade-off and cross-validation will be woven throughout the presentation. The workshop will assume a working knowledge of the R statistical computing environment and GLM modeling.

Moderator/Facilitator: Mark Jones, Director, PricewaterhouseCoopers

Facilitators: Kudakwashe Chibanda, Actuarial Manager, PricewaterhouseCoopers
Jean-François Greeff, Senior Associate, PricewaterhouseCoopers
Prashant De, PricewaterhouseCoopers

Workshop 7: Data Visualization: GIS for Actuaries

Pacific 25

This workshop is intended to introduce actuaries to the wonderful world of geographic information science (GIS). GIS can be used to visualize insurance data at a range of scales all the way down to the policy or location level. Additional applications include appending third-party data, enhancing analysis using geographic relationships, and the creation of customized or granular rating territories.

The first part will be a lecture on GIS basics such as data types, geocoding addresses, locating and using third-party data, cartographic representation and simple geoprocessing workflows.

The second half will be a hands-on tutorial taught in ArcGIS for desktop. Instructions on software and data installation will be provided to all participants who pre-register.

Moderator/Facilitator: Garrett Bradford, Milliman, Inc.

The CAS Institute Event

iCAS Predictive Analytics Community of Practice

Pacific 26

The CAS Institute (iCAS) is offering its first Predictive Analytics Community of Practice event in conjunction with the Ratemaking and Product Management (RPM) Seminar. The full-day event is designed for advanced practitioners working in the area of predictive analytics/data science. It will include panels, presentations and roundtable discussions of advanced topics in predictive analytics both within and outside of the insurance fields. Attendance at this event is separate from the RPM Seminar and will require a separate registration. Registration at the RPM Seminar is not a prerequisite of attendance.

Topics for the program include:

- Experimental Design
- Various Modeling Techniques
- Measuring/Communicating Model Performance
- Deploying Models and Designing for Implementation
- Ethics of Predictive Modeling

Facilitator: Amy Brener, Director, The CAS Institute

Roundtable Discussions

RT-1: The CAS Institute

Concurrent Sessions 1, Tuesday, March 28, 10:00 a.m. - 11:15 a.m., Grand 11

Come explore The CAS Institute's Certified Specialist in Predictive Analytics (CSPA) credential and find out about membership in iCAS. Learn how to achieve the credential through the Experienced Practitioner Pathway. Take advantage of the opportunity to ask questions of representatives of the Leadership Advisory Council and Subject Matter Expert groups and to meet The CAS Institute's director.

Facilitator: Amy Brener, Director, The CAS Institute

RT-2: Using Predictive Modeling Beyond Ratemaking

Roundtable Discussions, Tuesday, March 28, 7:00 a.m. - 7:45 a.m., Pacific 15

We will explore some ways insurance companies are using predictive modeling beyond ratemaking. Some examples include in the product management, underwriting and agency/sales management spaces. If you are using predictive modeling in interesting ways beyond ratemaking and would like to talk about it or explore how to do it, please come join us for this engaging discussion.

Facilitator: Peggy Brinkmann, Principal & Consulting Actuary, Milliman

RT-3: Workers' Compensation Game Changers

Roundtable Discussions, Tuesday, March 28, 7:00 a.m. - 7:45 a.m., Pacific 16

Any significant new issue is fair game for this workers' compensation discussion, whether favorable or unfavorable. There are environmental shifts like opt-out provisions and constitutionality challenges, but also potential innovations like the use of drones in claims investigation, medical marijuana for pain management, and prosthetics for amputation injuries. We also expect to hear opinions on current issues that may have intensified recently like the effects of inflation and the ACA. And, if the group is up for it, we will brainstorm on how the new presidential administration might impact the WC market.

Facilitator: Timothy Mosler, Senior Consulting Actuary, Pinnacle Actuarial Resources, Inc.

RT-4: How Will the IoT Impact Auto Insurance?

Concurrent Sessions 1, Tuesday, March 28, 10:00 a.m. - 11:15 a.m., Pacific 16

Connected cars, Internet of Things (IoT) and other new data sources pose challenges and opportunities to make car insurance more precise, personalized and convenient. In this roundtable, we will discuss the data sources available and the path to integration in auto insurance.

Facilitator: Katie DeGraaf, Senior Consultant, Willis Towers Watson

RT-5: Update on Predictive Modeling: Usage and Applications

Roundtable Discussions, Tuesday, March 28, 7:00 a.m. - 7:45 a.m., Pacific 23

Predictive modeling applications have increased significantly in recent years. While continuing to explore ways to improve on the accuracy of rating structures, many carriers are now deploying predictive modeling applications across their organizations. This roundtable will explore the current usage of predictive modeling, including non-pricing applications in areas such as fraud monitoring, claims triage and target marketing. We will also explore topics such as Big Data and usage-based insurance.

Facilitator: Klayton Southwood, Willis Towers Watson

Roundtable Discussions

RT-6: Auto Loss Cost Trends

Roundtable Discussions, Tuesday, March 28, 7:00 a.m. - 7:45 a.m., Pacific 24

Auto losses have been increasing lately due to a variety of likely factors. The CAS, Property Casualty Insurers Association of America and SOA have joined forces to explore and quantify the underlying causes of these changes. Please join us to hear about what variables we are attempting to consider and which data sources we have been able to tap in an effort to find these potential predictors. We also welcome your feedback and suggestions regarding your opinions about loss trend drivers.

Facilitator: Jared Smollik, Director, ISO

RT-7: What Actuaries and Product Managers will be Talking About in 2017

Roundtable Discussions, Tuesday, March 28, 7:00 a.m. - 7:45 a.m., Pacific 25

A scan of *Insurance Journal's* "top 12 insurance trends and news stories of 2016" reveals topics such as climate change, commercial lines disintermediation, cyber, drones and insurance technology.

Facilitator: Jim Weiss, Director-Analytic Solutions, ISO

RT-8: Predicting Modeling Pitfalls: Challenges in Application

Roundtable Discussions, Tuesday, March 28, 7:00 a.m. - 7:45 a.m., Pacific 26

There are many success stories featuring predictive models, but there are also numerous cautionary tales in which the results of well-constructed models were misunderstood, misapplied or not adopted at all. This session will feature several short and entertaining stories illustrating common pitfalls in getting business value from predictive models. Participants will be also be invited to share their own hard-learned lessons.

Facilitator: Kimberly Holmes, Global Head of Strategic Analytics, XL Catlin

RT-9: Implementing Predictive Models: Integration of Rules and Models in Technology

Roundtable Discussions, Tuesday, March 28, 7:00 a.m. - 7:45 a.m., Grand 11

This roundtable discussion will focus on the importance of integrating rules and models into existing technology. Underwriting models and rules need to be aligned and to leverage consistent account data so as to enable straight-through processing.

Facilitators: Gary Ciardiello, Principal, EY
Christine Heiderich, Underwriting Specialist, Pinnacol Assurance

RT-10: Cyber Pricing and Data

Concurrent Sessions 3, Tuesday, March 28, 2:00 p.m. - 3:15 p.m., Pacific 26

This is a roundtable on cyber pricing methodology that will discuss potential solutions to some of the key challenges faced in quantifying the risk.

Facilitator: Nicholas Irwin, Verisk

Roundtable Discussions

RT-11: Automated Vehicles and Their Impact on Vehicle Insurance

Roundtable Discussions, Tuesday, March 28, 7:00 a.m. - 7:45 a.m., Grand 1

Auto manufacturers and technology companies have been working on technology that in the not-too-distant future will permit vehicles to effectively drive themselves. These changes hold out the possibility of revolutionizing vehicular transportation and significantly reducing the number of auto accidents. However, the road to a future populated with automated vehicles raises significant issues about how the insurance market will be structured in such a future and how it will function. This session will discuss the issues and problems raised, and explore their possible implications.

Facilitator: Patrick Woods, Retired

RT-12: Expanding the Toolbox: Technological Tools for Today's and Tomorrow's Markets

Roundtable Discussions, Tuesday, March 28, 7:00 a.m. - 7:45 a.m., Grand 2

As the world becomes increasingly more analytics-driven, the number of resources available to analyze and summarize data has also increased. Further, existing tools frequently relied on by actuaries such as Excel and SAS may no longer be the most suitable analytics options. From Python to Tableau, the Cloud and beyond, from predictive modeling to dashboards used for reporting, this session will allow participants to discuss ways in which new technology can be leveraged to meet the analytics needs of today's and tomorrow's insurance industry.

Facilitator: Eric Krafcheck, Consulting Actuary, Milliman

RT-13: New Car Insurance Challenges and Opportunities from Shared Mobility

Roundtable Discussions, Tuesday, March 28, 7:00 a.m. - 7:45 a.m., Pacific 14

As shared mobility increases in prevalence, insurers are grappling with extending traditional liability coverage to less traditional driver situations. For example, when a person who doesn't own a car uses a car from one of a number of shared-mobility providers, the amount of liability coverage may vary substantially. Expected discussion topics for this roundtable include coverages provided by various shared-mobility companies, international product offerings that could be instructive to U.S. companies, and potential applications of UBI in addressing the insurance-related challenges of shared mobility.

Facilitator: Allen Greenberg, U.S. Department of Transportation

RT-14: The Climate Change Task Force and the Actuaries' Climate Index

Roundtable Discussions, Tuesday, March 28, 7:00 a.m. - 7:45 a.m., Grand 12

What challenges have you faced in using catastrophe models, including flood? How might the Actuaries Climate Index/Actuaries Climate Risk Index help you?

Facilitator: W. James MacGinnitie, American Academy of Actuaries

RT-15: Home Insurance Industry Loss Trends

Roundtable Discussions, Tuesday, March 28, 7:00 a.m. - 7:45 a.m., Pacific 17

This roundtable discussion will focus on the top emerging economic trends in the home insurance industry, across time and geography, as based on peril-specific historical loss information from approximately 470 million house years over six years. The discussion will include the impact to current market conditions, how home insurance industry dynamics are evolving, what the next step of that evolution will likely be, and how to be prepared for it.

Facilitator: Tyson Horn, Lexis Nexis

Concurrent Sessions

2017 RPM Seminar Rating System



No prior knowledge of the subject matter is assumed.
Little or no technical content.



General knowledge of the subject matter is assumed.
Moderate technical content.



Working knowledge of the subject matter is assumed.
Moderate to highly technical content.

BEYOND INSURANCE AND INNOVATION



BII-1: Evolution in Technology and Demographics: An Impact on the Insurance Industry

Concurrent Sessions 1, Tuesday, March 28, 10:00 a.m. - 11:15 a.m., Pacific 23

Live Stream Event, Concurrent Sessions 3, Tuesday, March 28, 2:00 p.m. - 3:15 p.m., Grand 2

Homeowners and auto insurance are evolving in response to technological advancements and demographic changes. We will start with an overview of the evolution of insurance, including how technology impacts the way we capture insurance exposure for homeowners and auto and how it impacts rates. We will then shift to the impact of the autonomous vehicle on insurance, then the latest advancements in connected home products and the potential impacts for insurance companies.

Moderator/Panelist: Sheri Scott, Principal and Consulting Actuary, Milliman

Panelist: Thomas Smith, President, Senteri



BII-2: Wellness Data: The Next UBI?

Concurrent Sessions 2, Tuesday, March 28, 12:15 p.m. - 1:30 p.m., Pacific 23

Sleeping on the job has never been a fast track to success, but sleeping on the way to the job may lead to an early and unscheduled retirement. Research found that more than one-in-five fatal car accidents in the United States involves a drowsy driver.

Property-casualty insurers have long offered discounts to policyholders who attend defensive-driving courses or submit to telemetric examination of their driving habits with usage-based insurance (UBI) devices. Unfortunately, those approaches achieve only limited success because they focus on behaviors surrounding the insured asset and not on a policyholder's larger decisions about wellness. A more effective approach might address how to minimize underlying risk factors that cause or contribute to P&C losses.

This session will bring various perspectives on the relationship between "wellness data" and P&C risk, and illustrate how P&C insurers may take a nod from life insurers and potentially apply modeling to new data sources, such as wearables, to help improve underwriting and marketing.

Moderator/Panelist: Dion Oryzak, Insurance Solutions

Panelist: Chris Stehno, Managing Director, Deloitte Consulting, LLP

Concurrent Sessions



BII-3: UBI Smartphone Apps: What's Hot and What's Not?

Concurrent Sessions 3, Tuesday, March 28, 2:00 p.m. - 3:15 p.m., Pacific 24

We have seen a proliferation of usage-based insurance (UBI) programs in recent years. Many of these use data collected with OBDII devices, but there has been an increase in activity on smartphone apps. Apps bring the promise of rich data at a low cost, however, is this data source the real thing or is it too good to be true?

In this session, we will cover:

- Mobile apps and how they are capturing driving data for UBI purposes.
- Types of data that can be captured and how they differ from OBDII data.
- Mobile telematics apps that complement connected cars to accelerate UBI adoption.
- Trends in smartphone UBI programs.
- A case study of a recent smartphone app implementation.
- What is working and what is not with smartphone UBI.

Moderator/Panelist: Peggy Brinkmann, Principal & Consulting Actuary, Milliman

Panelists: Ryan Morrison, CEO, True Mileage, Inc.
Jim Levendusky, Vice President-Telematics, Verisk Analytics
Jamie Cox, True Mileage, Inc.



BII-4: Evolution in Business Models for Insurance

Concurrent Sessions 2, Tuesday, March 28, 12:15 p.m. - 1:30 p.m., Grand 12

Insurance technology companies are flooding the landscape of the insurance industry. These innovators seek to challenge traditional business models for insurance, leveraging advancements in technology and creative thinking to deliver new products and differentiated levels of service to customers. In this session we will hear from insurance technology companies who are shaking up the insurance landscape, exploring new business models for the sharing economy and peer-to-peer insurance. We will consider the implications of these innovations on the actuarial community.

Moderator: Kelly Cusick, Senior Manager, Deloitte Consulting, LLP

Panelist: Michael Fitzgibbon, Chief Underwriting Officer, Slice Insurance Technologies Inc.
John Peters, Chief Underwriting Officer, Lemonade

Concurrent Sessions



BII-5: Telematics and the Internet of Things

Concurrent Sessions 5, Wednesday, March 29, 8:00 a.m. - 9:15 a.m., Pacific 24

Many insurers want to change the conversation with their customers while increasing engagement and satisfaction. By leveraging sensor data, insurers can take on the burden of worrying about the care and wellbeing of the customer's vehicle or home. Proactive protection services can assist with tasks such as:

- Auto repairs.
- Property loss prevention/maintenance.
- Recommendations for safer driving routes, parking locations.

The Internet of Things is generating the data and the insights for insurers to offer these services and enhance customer satisfaction. During this session, you will learn more about how proactive protection services can help both your customers and your company reduce losses.

Moderator/Panelist: Adam Waldron, CIO, Farm Bureau Insurance of Idaho

Panelist: Dawn Mortimer, AVP IoT/Telematics Claims Product Development, Verisk Insurance Solutions

COMMERCIAL LINES



CL-1: 3D Printing: Hype or Reality?

Live Stream Event, Concurrent Sessions 2, Tuesday, March 28, 12:15 p.m. - 1:30 p.m., Grand 2

There is no doubt that 3D printing is a very exciting technology, but what is it really all about? Is it as revolutionary as people say? We'll talk about what it is and why so many people are excited about it, including 3D applications in various industries. This technology will impact society, business, our personal lives and the insurance industry. Come find out how and get a glimpse of the future.

Moderator/Panelist: Tong Xu, Actuary, The Travelers

Panelist: Robert Weireter, Senior Underwriter, Swiss Re



CL-2: Beyond UBI — Commercial Insured Usage Data as a Customer Added Value

Concurrent Sessions 5, Wednesday, March 29, 8:00 a.m. - 9:15 a.m., Grand 1

This session will explore ways in which data collected from commercial insureds may be used to provide added services, such as expense reduction to the insured, while also allowing insurers to assess risk and pricing and reduce claims. Examples include automobile fleet monitoring as well as water flow and electrical usage monitoring in commercial buildings.

Moderator: Damon Lay, Director, Farmers Insurance

Panelists: Jacob Rothfuss, Head of Commercial Property, Liability, and Auto, Farmers Insurance Group
Daniel Sterling, Founder & CEO, Water Hero, Inc.

Concurrent Sessions



CL-3: Businessowners Policies in the Big Data Era

Concurrent Sessions 7, Wednesday, March 29, 11:15 a.m. - 12:30 p.m., Pacific 16

The era of big data and analytics has fundamentally changed the goals, business models, coverages and premium determination methodologies for small, commercial multiple-peril policies and businessowners policies (BOPs). This session will examine these changing influences and how leading BOP writers are adapting.

Moderator: Lin Xing, ISO
Panelists: Robert Walling, Principal & Consulting Actuary, Pinnacle Actuarial Resources, Inc.
Thomas Kolde, Consulting Actuary, Pinnacle Actuarial Resources, Inc.



CL-4: The Competitive Weapon: Alignment of Analytics and Commercial Underwriting

Concurrent Sessions 3, Tuesday, March 28, 2:00 p.m. - 3:15 p.m., Pacific 15

The interplay of predictive models, rate order calculations (ROC), rules, and risk appetite with field personnel knowledge is critical for a successful deployment of a predictive model to any part of the value chain. This is particularly true for commercial lines underwriting due to the latitude given to underwriters in applying schedule debits and credits and the resulting impact on premium.

In our session we will discuss typical challenges with an emphasis on active field involvement and participation throughout the process. The qualitative side will be illustrated with an industry case study narrative that speaks directly to the advantage of creating alignment of model scores, ROC, firing of rules, and quality of account knowledge as defined by the field. The quantitative side will illustrate the challenges of knowledge engineering and how to blend with data-driven decision making. The discussion will highlight choices made to incorporate field input and achieve “last mile” success.

The session is designed to feature a moderated dialog with the participation of an industry leading executive who is wrestling first-hand with the challenges of commercial lines modernization. Audience participation is encouraged.

Moderator: Pam Sealand Reale, AVP and Actuary, The Hartford
Panelists: Gary Ciardiello, Principal, EY
Christine Heiderich, Underwriting Specialist, Pinnacol Assurance



CL-5: Where Cybersecurity Meets Insurance: Challenges Presented and Opportunities Created

Concurrent Sessions 1, Tuesday, March 28, 10:00 a.m. - 11:15 a.m., Pacific 15

This session features a panel discussion with Eric O’Neill, the RPM Seminar keynote speaker and former FBI agent, and Josh Pyle, senior principal actuary with Symantec. Panelists will discuss the biggest cybersecurity risks in 2017 as well as the most significant challenges to successfully and confidently writing cyber insurance. Please feel free to bring your own questions or just simply come to enjoy the inspiring discussion.

Moderator: Anita Sathe, CoverHound Insurance
Panelists: Joshua Pyle, Senior Principal Actuary, Symantec
Eric O’Neill, The Georgetown Group

Concurrent Sessions



CL-6: Where Will the Drones Take Us?

Concurrent Sessions 4, Tuesday, March 28, 3:45 p.m. - 5:00 p.m., Pacific 26

The skies are not (yet) full of drones but they are certainly becoming much more popular. Recreational and commercial users are growing in number and the technology is really taking off. We even have some regulations intended to provide some law and order. Imagination and enthusiasm are great, but while the insurance industry needs to embrace new opportunities, we also need to be mindful of new challenges. This session will bring us up to speed on the world of drones, with particular emphasis on the insurance impacts.

Moderator/Panelist: Timothy McCarthy, Manager & Assistant Actuary, ISO

Panelist: Robert Weireter, Senior Underwriter, Swiss Re

RATEMAKING CALL PAPER PROGRAM



CP-1: An Alternative Approach to Credibility for Large Account and Excess of Loss Treaty Pricing

Concurrent Sessions 5, Wednesday, March 29, 8:00 a.m. - 9:15 a.m., Pacific 26

This paper was recently approved for *E-Forum* publication by the CAS Ratemaking Committee. It illustrates a comprehensive approach to utilizing and credibility weighting all available information for large account and excess of loss treaty pricing. Excess losses are utilized to modify the severity distribution that is used to calculate the increased limits factors via a simple Bayesian credibility technique not requiring any specialized software to run. Such an approach considers all available information in the same way as analyzing burn costs, but it does not suffer from the same pitfalls.

Moderator: Sandra Callanan, Chief Actuary, Mountain States Insurance Group

Panelist: Uri Korn, Industry Analytics Leader, AIG



CP-2: Removing Bias — The SIMEX Procedure

Concurrent Sessions 1, Tuesday, March 28, 10:00 a.m. - 11:15 a.m., Grand 1

This paper was recently approved for *E-Forum* publication by the CAS Ratemaking Committee. SIMEX (Simulation-Extrapolation) is a very general technique that helps to correct for bias in estimates caused by errors in measurements of predictors. The method is well established in statistical practice, but seems to not be as widely known in actuarial circles. Using ordinary least squares regression as an example, the method is illustrated using some simple R code.

Moderator: Sandra Callanan, Chief Actuary, Mountain States Insurance Group

Panelist: Thomas Struppeck, Instructor, The University of Texas at Austin

Concurrent Sessions

DATA MANAGEMENT



DM-1: Demystifying Data Quality Tools

Concurrent Sessions 2, Tuesday, March 28, 12:15 p.m. - 1:30 p.m., Pacific 24

Data quality is a primary concern when you perform an actuarial analysis or undertake a predictive modeling project. Top among your concerns would be to review the data for accuracy, reasonability, completeness and consistency. A valid question is: When you write programs to perform data quality checks, are you reinventing the wheel? Perhaps your organization has a commercially acquired data quality tool that can aid you, or perhaps acquiring one may be worth considering. This session provides explanations and examples of data quality functions such as data profiling, entity resolution, pattern analysis, etc., that commercially available data quality tools perform. Even if you or your employer choose not to purchase a data quality tool from a vendor, knowing the kinds of tasks these tools perform can increase your awareness of things to look for with regards to data quality.

Moderator/Panelist: Jason Smith, Business Associate Sr., ISO

Panelists: Peter Bothwell, Vice President - Data Science, The Hartford
Tracy Spadola, Vice President - Strategic Data Operations, Verisk Analytics



DM-2: Applying Big Data Analytics in the Insurance Sector

Concurrent Sessions 1, Tuesday, March 28, 10:00 a.m. - 11:15 a.m., Pacific 25

As the hype subsides and expectations begin to settle, leading insurers are now discovering tangible value from their big data analytics projects. During this presentation, we will set out the tools and processes companies should have in place to expedite value discovery and minimize investment cost in their big data analytics capabilities.

Moderator/Panelist: Claudine Modlin, Willis Towers Watson



DM-3: CAS Data and Technology Working Party Report

Concurrent Sessions 4, Tuesday, March 28, 3:45 p.m. - 5:00 p.m., Pacific 24

Members of the CAS Data and Technology Working Party will present findings from their report, which was recently featured in *CAS E-Forum*. The report discusses how, during the ongoing revolution of data and analytics capabilities, information technology (IT) departments and vendors have embraced data & analytics, big data and data science as the new frontier for informed decision-making. In the P&C insurance industry, the CAS actuary is uniquely well-positioned to partner with IT to advance the potential of these disciplines to benefit the industry. In order to be a participant in the conversation, however, the actuary must have knowledge of the language, practices, tools and techniques of the technology supporting this revolution.

Moderator: Jim Weiss, Director-Analytic Solutions, ISO

Panelists: Peter Bothwell, Vice President - Data Science, The Hartford
Dominique Yarnell, Vice President & Pricing Actuary, Aspen Insurance

Concurrent Sessions



DM-4: Effectively Evaluating External Data

Concurrent Sessions 3, Tuesday, March 28, 2:00 p.m. - 3:15 p.m., Grand 12

Data is at the core of the ratemaking process. By effectively leveraging new and innovative data sources, companies can out-segment the competition and gain competitive advantage. However, anyone who has been through a data evaluation process knows that it is not typically as simple as reading the label on the package, tossing it into the cart and heading to checkout. It is not uncommon for data evaluations to take months and ultimately yield results that are difficult to interpret.

In this session, we will share some tips and tricks to make sure you have an efficient and effective data evaluation. There will be a focus on different statistical methods to quantify the business value of adding new data assets. This session will also use live polling so companies can better understand how they compare to their peers on questions like:

- How many new data sources do you typically evaluate in a year?
- How long does the typical evaluation last?
- What business lines benefit the most from the inclusion of external data?

Moderator/Panelist: Jim Weiss, Director - Analytic Solutions, ISO

Panelist: Drew Lawyer, Sr. Professional Services Consultant, Earnix

DATA SCIENCE AND PREDICTIVE ANALYTICS



DSPA-1: Bayesian Analysis of Big Data

Concurrent Sessions 4, Tuesday, March 28, 3:45 p.m. - 5:00 p.m., Pacific 25

While Bayesian methods have attracted considerable interest in actuarial science, they are yet to be embraced in large-scaled predictive modeling applications, due to inefficiencies of Bayesian estimation procedures. This paper develops an efficient Markov chain Monte Carlo algorithm using distributed computing on a cluster of computers. The distributed algorithm dramatically boosts the efficiency of Bayesian estimation and expands the scope of applicability of Bayesian methods. The empirical analysis applies a Bayesian hierarchical Tweedie model to a big data of 13 million insurance claim records. The proposed algorithm achieves as much as 65 times performance gain over existing methods in this application. The analysis demonstrates that Bayesian methods can be of great value to large-scaled insurance predictive modeling.

Moderator: Cheng-Sheng Peter Wu, Managing Director, Deloitte Consulting LLP

Panelist: Yanwei Zhang, Senior Technical Actuary, Uber Technology Inc.



DSPA-2: Easy Tree-sy: Everyday Applications for Decision Trees

Concurrent Sessions 1, Tuesday, March 28, 10:00 a.m. - 11:15 a.m., Pacific 24

Concurrent Sessions 6, Wednesday, March 29, 9:30 a.m. - 10:45 a.m., Pacific 15

This session will cover the background/theory behind decision trees, their benefits and drawbacks, a demonstration of fitting decision trees with free software, and example applications of decision trees for data exploration, GLM residual analysis and underwriting analysis.

Moderator: Linda Brobeck, Senior Consulting Actuary, Pinnacle Actuarial Resources

Panelists: Peggy Brinkmann, Principal and Consulting Actuary, Milliman
Daniel Murphy, President, Trinostics LLC

Concurrent Sessions



DSPA-3: Genetic Algorithms with Applications to Insurance

Concurrent Sessions 7, Wednesday, March 29, 11:15 a.m. - 12:30 p.m., Pacific 15

A genetic algorithm (GA) is a method for solving both constrained and unconstrained optimization problems based on a natural selection process that mimics biological evolution. We give a general overview of GAs and focus on a few specific algorithms with insurance applications: symbolic regression (modeling continuous responses), text mining (looking for higher order n -grams) and differential evolution (used for rating factor optimization, a problem in which the objective function exhibits multiple local minima).

Moderator/Panelist: Eliade Micu, Director-R&D, Clyde Analytics



DSPA-4: Tutorial on Open-Source Text Mining

Concurrent Sessions 2, Tuesday, March 28, 12:15 p.m. - 1:30 p.m., Pacific 15

In 2010 Louise Francis and Matt Flynn wrote a paper, “Text Mining Handbook,” which describes how to do text mining with open-source software. The software used in the paper was R and Perl. As a follow-up to the work described in the paper, we will show how to use the current open source tools of R and Python to do text mining. Applications will include analyzing text field from claim data and analyzing survey data. As with the paper, we intend to provide a data set along with code that can be used by attendees to begin working with text data. This is intended to be a practical session. It will introduce some of the basic concepts of text mining and then move on to how to use the tools.

Moderator/Panelist: Louise Francis, Consulting Principal, Francis Analytics and Actuarial Data Mining, Inc.

Panelist: Matthew Flynn, AIG

ENTERPRISE RISK AND CAPITAL MANAGEMENT



ERCM-1: Business Planning Within a Capital Management Framework

Concurrent Sessions 7, Wednesday, March 29, 11:15 a.m. - 12:30 p.m., Grand 1

As the P&C insurance industry is becoming increasingly more complex and fluid to adapt to the continuous changes in the markets, there is an increasing need for companies to reflect risk within their strategic planning framework. In this session we introduce a capital management framework and explore how a P&C insurance company can leverage this framework to assist management with its business decision-making process, including strategic growth, pricing and portfolio management. By having an integrated risk-based approach towards managing the business, a company is ensured to be better prepared for the future, to remain competitive in the market and, ultimately, to provide value to its customers and shareholders.

Moderator: Robert Wolf, Vice President and Chief Actuary, StoneTrust Commercial Insurance Company

Panelists: Berna Beekman, Manager, Deloitte Consulting, LLP
David Shleifer, Deloitte Consulting, LLP

Concurrent Sessions



ERCM-2: Intro to Profit and Contingency Loading in Ratemaking

Concurrent Sessions 2, Tuesday, March 28, 12:15 p.m. - 1:30 p.m., Grand 1

The Standard Ratemaking Formula is $R=(P+F)/(1-V-Q)$, where:

- R = rate per unit exposure.
- P = Loss cost (or pure premium) per unit exposure.
- F = Fixed expense per unit exposure.
- V = Variable expense costs (% premium).
- Q = Profit and contingency load (as % Premium).

This session is intended to be an introductory session on how to derive your “Q.” There are many methodologies: Some are mandated by regulation; some are subject to the actuary’s discretion and rationale. Multiple answers can occur, given the approaches and considerations in how to best reflect the cost of capital. This session is intended to provide discussions on advantages and disadvantages of alternative approaches.

Moderator/Panelist: Robert Wolf, Vice President and Chief Actuary, StoneTrust Commercial Insurance Company



ERCM-3: Ratemaking, Product Management, Predictive Analytics — How Does It All Fit Within an ERM Framework?

Concurrent Sessions 6, Wednesday, March 29, 9:30 a.m. - 10:45 a.m., Grand 1

The business of insurance operates best under optimal collaboration of marketing/product managers, underwriters, actuaries and data scientists. There is diverse talent on this team and expertise. There is also, of course, a likelihood of significant diversity of opinions on strategy and direction. The predictive models are subject to model risk. The actuary adjusts for bias and credibility of data and considers “change.” Underwriting and marketing may be at odds as regards incentives.

Most of the risks that potentially manifest are based on the decisions of human beings, who are biased with their perspectives within their respective domains and incentives. Within an ERM perspective, how can one best align authority for decision-making with ultimate accountability among this team of experts? These considerations, and more, will be discussed in this session.

Moderator/Panelist: James Guszczka, U.S. Chief Data Scientist, Deloitte Consulting, LLP

Panelists: Kimberly Holmes, Global Head of Strategic Analytics, XL Catlin
Christopher Monsour, Vice President and Actuary-Predictive Business Applications, CNA Insurance Companies



ERCM-4: Introduction to Sustainable ERM

Concurrent Sessions 3, Tuesday, March 28, 2:00 p.m. - 3:15 p.m., Grand 1

This session is intended to provide an update on the work of the CAS Working Party on Sustainable ERM. As global trends, (environmental, social, political, technological) continue to shift the foundations of our current business models, sustainability is becoming embedded in corporate behavior, metrics and strategy. This session will show evidence for a global sustainability meta-trend and summarize business cases and best practices for insurance companies. It will directly serve the risk professionals with more relevant, current, practical and technical information on the new way of doing business and integrating sustainability into ERM.

Moderator: Brian Brown, Principal and Consulting Actuary, Milliman, Inc.

Panelists: Sandra Callanan, Chief Actuary, Mountain States Insurance Group
Fan Yang, AIG

Concurrent Sessions

INTERNATIONAL



INTNL-1: Internet of Things for International P&C Business

Evening Live Stream Event, Tuesday, March 28, 6:30 p.m. - 7:45 p.m., Grand 2

Concurrent Sessions 6, Wednesday, March 29, 9:30 a.m. - 10:45 a.m., Pacific 24

In the last few years, we have seen more and more digital disruption to the global insurance industry. Technology often disrupts mature industries and profoundly changes the business models for those who choose to evolve.

In this session, we will briefly discuss lessons from other industries on how disruptive technologies changes the nature of competition and business models. We will provide an overview of the three core digital technologies (Internet of Things, blockchain and machine learning) and will discuss how these technologies will shake the insurance industry in an unprecedented fashion.

Actual examples will be given showing how these digital technologies have been applied in customer data aggregation (entity resolution), product development and product pricing. Furthermore, we will discuss how actuaries can reinvent themselves to play a key role in the innovation process.

Moderator: Lijuan Zhang, Global Manager of Pricing & Portfolio Management - Individual Personal Insurance, AIG

Panelists: Yuxiang Lei, Ant Financial
James Dodge, Practice Leader, Milliman, Inc.



INTNL-2: Predictive Analytics in Strategy and Decisions — A Tour Around the Globe

Concurrent Sessions 2, Tuesday, March 28, 12:15 p.m. - 1:30 p.m., Pacific 14

Predictive analytics can shape key aspects of insurers' business strategies and thus is gaining popularity worldwide. Regional diversity in practice, market conditions and regulation are influencing the way analytics is being implemented around the globe. The availability of data, analytical sophistication and the maturity level of customer-centric views can also influence many business problems. These problems can be addressed by predictive analytics and the efficiency and precision of actuarial decisions. We can learn from the global differences as well as from the commonalities.

This session will discuss various analytical challenges around pricing, underwriting, retention management, customer life time value, etc., and it will provide real-life examples acquired through numerous projects in over 20 countries around the globe.

Moderator/Panelist: Reuven Shnaps, Chief Analytics Officer, Earnix Ltd.

Concurrent Sessions

MODELS, APPLICATIONS & IMPLEMENTATION ISSUES



MAI-1: Application of Text Mining In Claims Analytics: A Case Study

Concurrent Sessions 5, Wednesday, March 29, 8:00 a.m. - 9:15 a.m., Pacific 25

This presentation will discuss applications of text mining in predictive modeling. Text mining can be a valuable tool to add insights to data based on free text entry and unstructured information. When text data is considered, analyses like marketing and consumer sentiment, claims analytics and even pricing can be enhanced.

We will focus on a case study in claims triaging for workers' compensation and personal auto lines. Traditional claims triaging requires experienced adjusters to predict which claims require the most attention to minimize losses. To facilitate this process, senior adjusters can manually review claim notes and descriptions. By using modern text-mining techniques on claim notes, however, insurers can better triage and see the big picture of their claims.

Text mining is a set of statistical and machine-learning tools in the field of natural language processing. These methods examine a collection of documents and systematically identify important words and patterns. Topic modeling, a newer method in text mining, can also be used to predict which claim types are represented in a given claim. By understanding claim types, this advanced analysis can predict, for example, whether an apparent "fender-bender" is more like a typical single-payment whiplash claim or more like a multi-payment claim with possible nerve damage.

The presentation will focus on applications with intuitive and visual results, with technical info reviewed at a high level.

Moderator: Ben Williams, Senior Consultant, Willis Towers Watson

Panelist: William Frierson, Senior Actuarial Analyst, Willis Towers Watson



MAI-2: Implementing a Predictive Model: Challenges and Considerations for Success

Concurrent Sessions 7, Wednesday, March 29, 11:15 a.m. - 12:30 p.m., Pacific 26

Most of the current focus in data science and analytics is on techniques around data extraction and analysis. While this focus allows for greater depth of insight into companies' customers, internal practices and strategies, the immediate output of the data scientist's work, no matter how valuable, does not initially translate to bottom-line dollars or other measurable impact. The difference between that initial insight and the ultimate impact it might have, is the success or failure of its implementation. In this way, implementation is an equally important partner to data and technique in ensuring successful analytics impact.

What have your experiences been with IT, claims, underwriters and actuaries when trying to build and deploy a model? This discussion looks past the statistics to highlight ways to ensure successful implementation across four important factors: data, technology, people and project management.

Moderator/Panelist: Kate Jordan, Data Science Senior Manager/AVP, Zurich

Panelist: Christopher Zittnan, Associate Data Scientist, Zurich North America

Concurrent Sessions



MAI-3: Modeling and Analytics in a UBI Setting

Concurrent Sessions 1, Tuesday, March 28, 10:00 a.m. - 11:15 a.m., Pacific 26

This session will discuss considerations related to data handling, variable selection, predictive modeling, performance measurement and program implementation in usage-based auto insurance (UBI). The session will include a carrier perspective as well as content from the UBI chapter of the upcoming textbook *Predictive Modeling Applications in Actuarial Science* (Volume 2).

Moderator/Panelist: Jim Weiss, Director - Analytic Solutions, ISO

Panelists: Gregory Hayward, Asst. Vice President and Actuary, State Farm Insurance Companies
Udi Makov, Director - Actuarial Research Center, University of Haifa



MAI-4: Point Estimation Models vs. Ranking Models

Concurrent Sessions 2, Tuesday, March 28, 12:15 p.m. - 1:30 p.m., Pacific 26

Point estimation and ranking modeling are two types of predictive modeling approaches used in many industries. In P&C insurance, class plan rating, territory rating and vehicle symbol rating are typical areas for point estimation; underwriting automation, claim fraud detection, credit scoring and telematics scoring are typical areas for use of ranking models.

The two types of modeling approaches are fundamentally different in many ways. In this presentation, we will discuss the major differences of point estimation and ranking modeling in the following areas:

- Model design — business considerations and technical considerations.
- Predictive variable creation and predictive variable structure.
- Model development and model validation.
- Business implementation and IT implementation.

We will use class plan development and underwriting modeling as examples to demonstrate the differences in details.

In this presentation we will also list and describe many interesting applications of the two types of modeling approaches in life insurance, government affairs and other industries.

Moderator/Panelist: Gary Wang, Consulting Actuary, Pinnacle Actuarial Resources, Inc.

Panelist: Jun Yan, Specialist Leader, Deloitte Consulting, LLP

Concurrent Sessions



MAI-5: Enhancing Pricing Precision for Today's Market — The Path to Customer-Centricity

Concurrent Sessions 4, Tuesday, March 28, 2:00 p.m. - 3:15 p.m., Pacific 23

In response to new market realities, a growing number of North American insurance companies have recognized the need to establish tighter and more engaging relationships with their customers, and are looking into doing so with improved use of analytics.

In the modern age of insurance, financial institutions collect large amounts of customer data. Utilizing a variety of different channels, insurance companies have more information than ever before. However, to improve customer experience, this information needs to be used intelligently. The implementation of customer-centric processes and technology does not happen overnight. In the North American insurance industry, a successful implementation necessitates a robust process and technological solution that can cope with a number of specific challenges. These include effective ways of dealing with big data, the lack of in-house analytical sophistication, limited time-to-market capabilities and the ability to measure the impact of pricing decisions.

This session will review common hurdles to adopting this advanced analytics techniques and propose effective solutions to address some of the challenges along the path to customer-centricity.

Moderator/Panelist: Reuven Shnaps, Chief Analytics Officer, Earnix Ltd.

Panelist: Martin Ellingsworth, President, Salt Creek Analytics

PERSONAL LINES



PL-1: Concierge Claim Service: The Future of Claims with IoT and Telematics

Concurrent Sessions 6, Wednesday, March 29, 9:30 a.m. - 10:45 a.m., Pacific 17

Claims are costly and have a big impact on customer satisfaction, not to mention the insurance company's bottom line. According to InsuranceQuotes.com, even filing one auto insurance claim can cause annual premiums to spike on average 44 percent nationally. Additionally, private passenger auto collision loss ratios have risen to 78.3 percent in 2015. From a customer satisfaction perspective, the dissatisfaction stems from the length of time it takes to be notified of how much the insurer will pay and when the insured actually receives payment. As it relates to property, the impacted customer satisfaction perspective has declined due to the total settlement and service interactions.

IoT data, including telematics, is changing this archetype by offering holistic claim services. With data from the automakers, alarm companies and sensor providers, insurers are able to:

- Offer proactive services to avoid claims.
- Expedite the claim process by getting “black box” data and prefilling the claim system in order to leverage their preferred partners for tow dispatch, body shop and car rental.
- Understand what is happening in the home and reduce loss by mitigating the claim faster, through water sensors, smoke detectors and door sensors.
- Identify fraud.
- Reduce claim cycle time.

Be sure to attend to learn how this concierge approach can help you improve your personal lines claims efficiency and satisfaction by leveraging IoT and telematics data.

Moderator: Jim Weiss, Director - Analytic Solutions, ISO

Panelists: Adam Waldron, CIO, Farm Bureau Insurance of Idaho
Dawn Mortimer, AVP IoT/Telematics Claims Product Development, Verisk Insurance Solutions
Daniel Sterling, Founder & CEO, Water Hero, Inc.

Concurrent Sessions



PL-2: Highway Loss Data Institute — Current Issues in Vehicle Safety

Concurrent Sessions 5, Wednesday, March 29, 8:00 a.m. - 9:15 a.m., Pacific 17

Learn the latest issues in vehicle safety from an HLDI official.

Moderator/Panelist: Kim Hazelbaker, Highway Loss Data Institute



PL-3: The Evolution of Classification Rating

Concurrent Sessions 3, Tuesday, March 28, 2:00 p.m. - 3:15 p.m., Pacific 17

Insurance pricing continues to evolve, becoming more sophisticated and predictive. This session will discuss how personal lines auto class plans have evolved and become more granular over time, as techniques and computing power have improved. This session will also present an approach, using a specific case study, for evaluating a modern rating plan referencing the CAS Statement of Principles on P&C Ratemaking and the Actuarial Standards of Practice. Additionally, we will explore how usage-based insurance mechanisms will transform the ways individual behaviors affect pricing.

Moderator: Claudine Modlin, Willis Towers Watson

Panelists: Jeffrey Kucera, Consultant and Actuary, e2 Value, Inc.
Irene Bass, Consulting Actuary, Bass & Khury, Inc.
Katie DeGraaf, Senior Consultant, Willis Towers Watson



PL-4: Increase Precision in Auto Territory Rating

Concurrent Sessions 4, Tuesday, March 28, 3:45 p.m. - 5:00 p.m., Pacific 15

Concurrent Sessions 7, Wednesday, March 29, 11:15 a.m. - 12:30 p.m., Grand 2

Territorial rating is one of the key elements in auto insurance ratemaking. A territory is defined as a cohort of zip codes or adjacent geographic units with similar loss experience. Auto insurers analyze historical loss experience by garaging location to calculate territorial relativities. Often times, insurers are not allowed to use the indicated relativities due to regulatory constraints governing a territorial plan. This study examines the accident information, and related claim frequency, severity and loss cost by loss location, as well as garaging location, to calculate a score that can potentially be used in conjunction with insurer's existing territorial plan to improve rate adequacy for individual territories.

Moderator: Hicham Elhassani, Vice President of Analytics, LexisNexis Risk Solutions

Panelists: Joy Tang, Statistical Modeler, LexisNexis Risk Solutions
Prince Kohli, Senior Statistical Modeler, LexisNexis Risk Solutions

Concurrent Sessions

PL-5: IoT's Impact on the Distribution, Rating and Underwriting of Personal Auto

Live Stream Event, Concurrent Sessions 1, Tuesday, March 28, 10:00 a.m. - 11:15 a.m., Grand 2

Until recently, insurers have largely determined car insurance premiums based on characteristics that are proxies for actual driving behaviors. For example, the number of vehicles on the policy and territory are proxies for how much and where the vehicle is driven, respectively. Using actual data that answers when, where, how and how much a vehicle is driven is a much better way to calculate premiums.

While telematics data should play a dominant role in rating algorithms, the data is typically only available after the initial UBI policy has been underwritten and the insured installs the required OBDII sensor or app. While insurers may adjust their traditional rating plans to eliminate obvious overlaps, insurers are still relying heavily on traditional factors to calculate a provisional premium that is subsequently adjusted pending a telematics-based driving score. Automakers (original equipment manufacturers), telecommunication companies, mobile handset providers and location-based app providers, etc. (collectively called “data suppliers”) either have or will have this data for their customers. Many of these data suppliers are actively pursuing options of how to best monetize existing data through insurance applications. As these services become available, we expect to see game-changing revisions to how insurers price auto insurance.

This session will focus on the how these data suppliers could fundamentally change the way insurance policies are sold, underwritten and rated. The presenters will highlight some of the benefits as well as the challenges for auto insurers.

Moderator/Panelist: Geoffrey Werner, Global Telematics Leader, Willis Towers Watson

Panelist: Steven Bishop, Co-Founder - Head of Product, Posit Design, Inc.

PL-6: Vehicle History: Insurance Scoring for Your Car

Concurrent Sessions 2, Tuesday, March 28, 12:15 p.m. - 1:30 p.m., Pacific 16

To evaluate the risk associated with personal auto coverage, insurers have traditionally used information about the driver, such as age, gender, marital status and location; the intended use of the vehicle, such as business or pleasure; and the vehicle, when new, such as the original cost of the new car. Insurers then added detail to driver information using sophisticated credit scoring and demographic models. They added detail to vehicle use information with telematics and usage-based insurance pricing. Now, insurers have begun to add detail about the vehicle itself using vehicle history.

This session will discuss how carriers use the specific vehicle history to more accurately price and underwrite risks. We will discuss obvious data elements, such as salvage title brands, verified average annual mileage and severe damage. We will also discuss data that may not be as obvious, but has proven predictive of loss in the past. Finally, we will discuss using vehicle history as an entry point for UBI programs.

Moderator/Panelist: Don Hendriks, Actuary, CARFAX Banking & Insurance Group

Panelist: Michael Chen, Consulting Actuary, Pinnacle Actuarial Resources, Inc.

Concurrent Sessions

PREDICTIVE MODELING – BEYOND GLMS



PM-BG-1: Comparing Machine Learning and Conventional Statistical Techniques In Claims Models

Concurrent Sessions 2, Tuesday, March 28, 12:15 p.m. - 1:30 p.m., Pacific 17

Machine-learning methods are becoming popular in insurance modeling applications. In the session, the panelists will discuss a few machine-learning methods (gradient boosting, random forests, neural network, LASSO, Elastic Net, etc.) and compare them with conventional regression methods (GLM, generalized mixed models, etc.) in the context of claims triage models. A case study will illustrate the pros and cons of those techniques.

Moderator: Cheng-Sheng Peter Wu, Managing Director, Deloitte Consulting LLP

Panelists: Joshua Brady, Actuary I, The Cincinnati Insurance Companies
Luyang Fu, Vice President - Department Head of Predictive Analytics, The Cincinnati Insurance Company
Douglas Noe, Predictive Modeler, The Cincinnati Insurance Companies



PM-BG-2: Ensembles and Combining Models

Concurrent Sessions 3, Tuesday, March 28, 2:00 p.m. - 3:15 p.m., Pacific 23

Ensembles are powerful analytical methods used commonly in the wider predictive analytics community outside of insurance. We'll describe the rationale and explain the effectiveness of ensembles in general, as well as the basic approaches of bagging and boosting ensembles of trees. Advantages of ensembles on insurance data will be shown and the issues surrounding complex models discussed. Finally, strategies for combining linear regression and ensemble models will be explored.

Moderator: Takeshi Yamaguchi, Head of Modeling & Rater Delivery, AIG

Panelist: Christopher Cooksey, Head Actuary, Data & Analytics, Guidewire



PM-BG-3: Overview and Practical Application Machine-Learning Methods in Pricing — Part 1

Concurrent Sessions 6, Wednesday, March 29, 9:30 a.m. - 10:45 a.m., Pacific 25

The term “machine learning” covers a range of methods that can be powerful, with very practical benefits, in pricing and other insurance applications. Such methods can aid in further improving GLM results or more broadly bring valuable insights to complex problems. There can also be a number of practical challenges in using these methods effectively. This is the first of two sessions reviewing a range of commonly used methods and illustrating different ways they are being applied in insurance. These sessions will focus on the high-level mechanics of each method and the benefits/challenges of their application — as opposed to the underlying technical details. Part 1 will focus on approaches such as penalized regression and other approaches more closely related to GLMs. Part 2 will focus on classification-based approaches, including trees, random forests and generalized booster regression models. Each part can be attended without the other.

Moderator/Panelist: Claudine Modlin, Willis Towers Watson

Panelist: Duncan Anderson, Managing Director, Willis Towers Watson

Concurrent Sessions



PM-BG-4: Overview and Practical Application Machine-Learning Methods in Pricing — Part 2

Concurrent Sessions 7, Wednesday, March 29, 11:15 a.m. - 12:30 p.m., Pacific 25

The term “machine learning” covers a range of methods that can be powerful, with very practical benefits, in pricing and other insurance applications. Such methods can aid in further improving GLM results or more broadly bring valuable insights to complex problems. There can also be a number of practical challenges in using these methods effectively. This is the second of two sessions reviewing a range of commonly used methods and illustrating different ways they are being applied in insurance. These sessions will focus on the high-level mechanics of each method and the benefits/challenges of their application — as opposed to the underlying technical details. Part 1 will focus on approaches such as penalized regression and other approaches more closely related to GLMs. Part 2 (this session) will focus on classification-based approaches, including trees, random forests and generalized booster regression models. Each part can be attended without the other.

Moderator/Panelist: Claudine Modlin, Willis Towers Watson

Panelist: Duncan Anderson, Managing Director, Willis Towers Watson



PM-BG-5: 2017 Survey Results: Machine Learning and Advanced Analytics Practices

Concurrent Sessions 4, Tuesday, March 28, 3:45 p.m. - 5:00 p.m., Pacific 16

We live in a world surrounded by analytics. It is everywhere. Sports teams use it to get an edge on the competition. Netflix uses it to predict which shows you are most likely to like. Amazon uses it to introduce you to additional products you didn't even know you wanted. The insurance world is no different. Machine learning and advanced analytics techniques are being used all across the industry for different parts of the pricing process. In this session we will review the interesting findings of a survey conducted around the extent of usage of machine learning and predictive analytics practices among insurance pricing practitioners. Besides learning about the current status of analytics usage, we learned what future insurers are seeing for analytics in the service of pricing. This session will also include live polling to dig deeper into some responses.

Moderator: Dion Oryzak, Insurance Solutions

Panelists: Olivier Tessier, Professional Services Consultant, Earnix
Drew Lawyer, Senior Professional Services Consultant, Earnix Ltd.

PREDICTIVE MODELING – LINEAR MODELS



PM-LM-1: GLM - I

Concurrent Sessions 5, Wednesday, March 29, 8:00 a.m. - 9:15 a.m., Pacific 23

Do terms such as “link function,” “exponential family” and “deviance” leave you puzzled? If so, this session will clarify those terms and demystify generalized linear models (GLMs). The session will provide a basic introduction to linear models and GLMs. Targeted at those who have modest experience with statistics or modeling, the session will start with a brief review of traditional linear models, particularly regression, which has been taught and widely applied for decades. Session leaders will explain how GLMs naturally arise as some of the restrictive assumptions of linear regression are relaxed. GLMs can model a wide range of phenomena, including frequencies and severities as well as the probability that a claim is fraudulent or abusive, to name just a few. The session will emphasize intuition and insight in addition to mathematical calculations. Illustrations will be presented using actual insurance data.

Moderator/Panelist: Ernesto Schirmacher, Senior Managing Actuary, Liberty Mutual Insurance

Concurrent Sessions



PM-LM-2: GLM — II

Concurrent Sessions 6, Wednesday, March 29, 9:30 a.m. - 10:45 a.m., Pacific 23

GLM I provided the case for using GLMs and some basic GLM theory. GLM II will be a practical session outlining basic modeling strategy. The discussion will cover topics such as overall modeling strategy, selecting an appropriate error structure and link function, simplifying the GLM (i.e., excluding variables, grouping levels and fitting curves), complicating the GLM (i.e., adding interactions), and validating the final model. The session will also include a discussion on diagnostics that help test the selections made.

Moderator/Panelist: Ernesto Schirmacher, Senior Managing Actuary, Liberty Mutual Insurance

Panelist: Paul Bailey, Consultant, Willis Towers Watson



PM-LM-3: GLM - III — The Matrix Reloaded

Concurrent Sessions 7, Wednesday, March 29, 11:15 a.m. - 12:30 p.m., Pacific 24

This session will consider new techniques and refinements to the basic GLM that can add material value to the modeling process. It will specifically consider amendments that address some of the purported failings of GLMs in comparison to emerging methods such as machine-learning techniques.

The session will include a discussion of the following:

- An innovative approach to detecting subtle and higher dimensional interactions in an efficient way, potentially eliminating the need to consider alternative, harder-to-implement model forms such as nonlinear models.
- The role of such automated methods in comparison with a more manual construction of composite explanatory variables.
- Ways to mitigate the risk of over-parameterization through the use of modifications that incorporate elements of credibility within the GLM framework.
- Simple practical modeling steps that can be used to remove distortions created by combining models across claim types.
- Innovative ways of modeling bodily injury claims and other miscellaneous refinements.

Moderator/Panelist: Brent Petzoldt, Vice President - Head of Pricing, JLT Re



PM-LM-4: And the Winner Is: How to Pick a Better Model

Concurrent Sessions 4, Tuesday, March 28, 3:45 p.m. - 5:00 p.m., Grand 1

You have just finished running some data through a predictive modeling package. Now all you need to do is summarize the results, send them along and you're done, right? Wrong. At the absolute minimum, the modeler should understand and demonstrate the goodness-of-fit of the model. In most cases, the modeler should also prove that the constructed model provides lift over the existing rating structure. After all, what good is a new model if it cannot outperform the competition? In this session we will explore, in significant detail, three often overlooked components of the modeling process: measuring goodness-of-fit, assessing lift and internally validating a predictive model. Model development is usually a major investment. We should make sure our models are performing well to get the best bang for the buck.

Moderator: Hoi Leung, Director of Predictive Analytics, AIG

Panelists: Dan Tevet, Actuary, Liberty Mutual Insurance
Hernan Medina, Senior Principal Data Scientist, ISO

Concurrent Sessions



PM-LM-5: Nonparametric GLMs

Concurrent Sessions 1, Tuesday, March 28, 10:00 a.m. - 11:15 a.m., Pacific 17

GLMs provide a powerful modeling framework but often their rigid structure does not allow for an optimal model. Learn how to build basic nonparametric models with a limited number of variables and how to apply nonparametric techniques to improve existing GLMs with an unlimited number of variables.

Moderator/Panelist: Ryan Morrison, CEO, True Mileage, Inc.

PRODUCT MANAGEMENT



PMGMT-1: Auto and Home Residual Markets Today: Size, Function and Challenges

Concurrent Sessions 5, Wednesday, March 29, 8:00 a.m. - 9:15 a.m., Pacific 16

The personal lines (auto/home) residual markets look very different today than how they have looked in the past. In private passenger auto, the market is a tiny fraction of what it was in the 1990s and per policy fixed costs to service this market have increased significantly. In homeowners, coastal residual markets have demonstrated elasticity to respond to storm cycles (or lack thereof), with related changes in industry assessment potential. This session will provide an overview of the mechanisms that currently operate to service the U.S. personal lines residual markets, and it will provide insight into how reforms may benefit the industry and the consumer.

Moderator/Panelist: James Rowland, Senior Actuary and Residual Markets Director, Allstate Insurance Company

Panelist: Gina Schwitzgebel, General Manager, NCJUA and NCIUA



PMGMT-2: Competitive Analysis: Know the Data, Know the Market

Concurrent Sessions 3, Tuesday, March 28, 2:00 p.m. - 3:15 p.m., Pacific 16

Competitor data is a powerful ingredient of rating algorithm development, predictive modeling and product performance measurement in the marketplace.

While the use of this data is widespread, the benefit received by insurers depends on the extent and manner in which it is utilized. To utilize the data to its full extent, actuaries should be familiar with the types of data available, the assumptions that underlie them and the strategies to incorporate competitive intelligence into decision-making.

Competitive data is available from different sources, including batch rating companies and agency software companies. In this session, representatives from each of these provider types, plus consultants who specialize in competitive analysis, will illustrate the spectrum of competitive offerings in the marketplace and how each of them can be used. This will include specific ways to evaluate key metrics such as conversion, retention, market penetration and segmentation.

Session attendees will learn the landscape of competitor data and will leave with an in-depth understanding of what is available and specific steps that can be taken to utilize it fully.

Moderator/Panelist: Nancy Watkins, Principal, Milliman, Inc.

Panelists: Cody Webb, Actuary, Milliman

Michael Weitermann, Director Product Management, Analytics, LexisNexis

Joann MacCaul, Senior Product Manager, Vertafore

Concurrent Sessions



PMGMT-3: Multi-Product Optimization: Challenges and Opportunities

Concurrent Sessions 1, Tuesday, March 28, 10:00 a.m. - 11:15 a.m., Grand 12

Concurrent Sessions 6, Wednesday, March 29, 9:30 a.m. - 10:45 a.m., Pacific 26

When trying to understand the customer decision-making process, it is easiest for us to break the customer decisions into independent, discrete choices: for example, whether to renew an auto policy, to add a motorcycle to yearly coverage or to cancel a homeowners policy. These decisions are not made in a vacuum, even though that is the easiest way for us to model them. The real decision-making process is a highly complex one that takes information across multiple products into account.

In this session, we will dive into the complexity of multi-product optimization. We will begin by discussing the advantages of a holistic view for customer decision modeling and then analyze the barriers to adopting a multi-product optimization strategy. Attendees will leave with a practical roadmap of steps they can follow in order to pave the way for multi-term optimization.

Moderator/Panelist: Drew Lawyer, Senior Professional Services Consultant, Earnix

Panelist: Bruno Tremblay, Senior Actuarial R&D Analyst, La Capitale



PMGMT-4: Perspectives on Actuarial vs. Product Management Roles

Concurrent Sessions 6, Wednesday, March 29, 9:30 a.m. - 10:45 a.m., Pacific 16

Have you wondered whether a product management role is for you? In this session, we will hear from panelists who have held both actuarial and product management roles in their careers. The panelists will discuss topics such as contrasting experiences as a product manager versus an actuary, what it takes to be successful in a product management role, and how current marketplace developments are affecting product management.

Moderator: Kelly Cusick, Senior Manager, Deloitte Consulting, LLP

Panelists: Amy Juknelis, Property Product Director, Allstate Insurance Company

Don Hendriks, Actuary, CARFAX Banking & Insurance Group

Scott Drab, AVP/Product Leader - Small Commercial & Farm, Grange Mutual Casualty Group



PMGMT-5: Residential Flood Insurance in Canada and Lessons for the U.S.

Concurrent Sessions 7, Wednesday, March 29, 11:15 a.m. - 12:30 p.m., Pacific 14

In the last two years, at least 15 insurers in Canada have introduced new products to cover overland water. This cause of loss was previously excluded in policy wordings and losses would have been paid by government disaster relief funds. However, after a \$2B fluvial loss in Calgary and a \$1B pluvial loss in Toronto within a few weeks of each other in 2013, an appetite was created for the private market to explore options. This session will explore the current situation in North America, focusing differences in risks and modeling between countries, challenges in product development, implementation and management, market responses to date, and anticipated future developments in both the modeling and product space. This session will be of interest to U.S. practitioners as the collective experiences of panel members will be relevant to the prospect of further privatization of the U.S. flood insurance market.

Moderator/Panelist: Brant Wipperman, Actuary, Peace Hills Insurance

Panelists: Deborah Upton, Director of Actuarial Services, Gore Mutual Insurance Company

Frederick Guillot, Sr. Manager - Research & Innovation, The Co-operators General Insurance Company

Adam Podlaha, CEO, Aon Benfield Impact Forecasting

Concurrent Sessions

PROFESSIONALISM



PRO-1: Discussion of ASOP Exposure Draft: Estimating Future Costs for Prospective Property/Casualty Risk Transfer and Risk Funding

Concurrent Sessions 6, Wednesday, March 29, 9:30 a.m. - 10:45 a.m., Grand 2

The Actuarial Standards Board (ASB) recently released for comment an exposure draft Actuarial Standard of Practice (ASOP) titled, “Estimating Future Costs for Prospective Property/Casualty Risk Transfer and Risk Funding.” This exposure draft follows exposure and comment on two previous exposure drafts related to property-casualty ratemaking.

With this exposure draft, the scope as well as the title has been revised to clarify that the draft ASOP is limited to estimating the future costs for prospective property-casualty risk transfer and does not include the preparation of rate filings and issues related to the interactions between ratemaking, pricing decisions and rate regulation.

The panelists will cover the key components of the current exposure draft. The areas covered in the draft ASOP include all of the items currently listed in the Considerations Section of the Statement of Principles Regarding Property-Casualty Insurance Ratemaking adopted by the Casualty Actuarial Society in 1988.

Attendees will also be encouraged to provide their comments and suggestions directly to the ASB in their formal process for consideration.

Moderator/Panelist: Christopher Carlson, Chief Actuarial Officer, Ohio Bureau of Workers’ Compensation

Panelist: Patrick Woods, Retired



PRO-2: Lights! Camera! Professionalism!

Concurrent Sessions 4, Tuesday, March 28, 3:45 p.m. - 5:00 p.m., Grand 11

Concurrent Sessions 5, Wednesday, March 29, 8:00 a.m. - 9:15 a.m., Grand 2

Come enjoy the acting of some fine fellow actuaries who will perform several skits involving professional dilemmas. The skits are new for 2017 and, as always, they will lead to some lively and educational audience discussions. You will walk away from this session with a better understanding of the ASOPs and the codes of conduct, and you will learn how to apply them when you face your own professional ethical dilemmas. This session may provide attendees with professionalism continuing education credits.

Moderator/Panelist: Michael Chen, Consulting Actuary, Pinnacle Actuarial Resources, Inc.

Panelists: Jennifer Vincent, Director of Pricing and Product Management, Government Employees Insurance Company

Brandon Shain, Associate Actuary, GAINSCO Auto Insurance

Concurrent Sessions



PRO-3: Rogue Actuary: A Professionalism and Predictive Modeling Story

Concurrent Sessions 2, Tuesday, March 28, 12:15 p.m. - 1:30 p.m., Grand 11

Concurrent Sessions 4, Tuesday, March 28, 3:45 p.m. - 5:00 p.m., Pacific 17

During the past decade, predictive modeling has increasingly become part of many actuaries' job descriptions. Whether building predictive models, inserting them as inputs to the pricing decision-making and implementation process with business partners, or supporting them in rate filings, actuaries are often asked for their opinions on issues that relate to the ethics of the profession. This session has been given at several previous RPM seminars and the interactive format will remain the same, although the scenarios have been refreshed. Scenarios that touch on common issues around predictive modeling will be presented, including how those issues relate to the Code of Conduct, Statement of Principles and Standard of Practice. Audience participation is highly encouraged. May the Professionalism be with you.

Moderator: Brent Petzoldt, Vice President - Head of Pricing, JLT Re

Panelist: Nathan Hubbell, 2VP - Analytics & Research, Travelers



PRO-4: Who Wants to Be an Actuary?

Concurrent Sessions 3, Tuesday, March 28, 2:00 p.m. - 3:15 p.m., Grand 11

Come refresh your knowledge of actuarial professionalism in this interactive session! This trivia game will cover a number of topics including a review of the Code of Conduct and ASOPs, helping you determine what you know and what you might want to review. Who said professionalism can't be fun? This session may provide attendees with professionalism continuing education credits.

Moderator/Panelist: Kendall Williams, Manager, Property/Casualty Actuary, COUNTRY Financial

Panelist: Peter Royek, Senior Vice President & Actuary, The Toa Reinsurance Company of America

REGULATION



REG-1: Navigating the Regulatory Environment Around Usage-Based Insurance

Concurrent Sessions 5, Wednesday, March 29, 8:00 a.m. - 9:15 a.m., Pacific 15

Usage-based insurance (UBI) for auto has had a mixed reception among U.S. insurance regulators. While most regulators would support UBI for its potential to promote greater fairness in rating, some would object due to the apparent invasion of driver privacy, among other things. Hear from an actuary and a product manager from Verisk with years of experience filing UBI products.

Moderator: Thomas Hess, Assistant Actuary, Ohio Department of Insurance

Panelists: Isaac Wash, Product Manager-Telematics, Verisk Analytics

Jared Smollik, Director, ISO

Concurrent Sessions



REG-2: Perspectives on Rate Filing Support for Predictive Models

Concurrent Sessions 7, Wednesday, March 29, 11:15 a.m. - 12:30 p.m., Pacific 23

While the use of predictive analytics to develop rate classifications has become a widely accepted technique in the insurance industry, they can create additional challenges during the filing process due to their apparent “black box” nature. While some insurance departments may only require indicated and proposed rating factors, others may require substantially more support, including such items as confidence intervals or lift charts or comparisons to other insurance companies.

This session will provide different points of view on filing support for predictive models, including perspectives from those submitting rate filings (insurance company or consultant) and those reviewing the rate filings (insurance department or independent third-party reviewer). In this session, we will discuss modeling topics as they relate to filing support such as volatile results and thin data, extrapolating and smoothing indicated relativities, and the use of actuarial judgment. We will provide perspectives on how to best submit rate filings that rely on predictive modeling techniques beyond GLMs.

Moderator: Eric Krafcheck, Consulting Actuary, Milliman
Panelists: Paul Anderson, Principal and Consulting Actuary, Milliman
Ryan Purdy, Consulting Actuary, Merlinos & Associates



REG-3: Price Optimization: Regulatory Overview and Permitted Practices

Concurrent Sessions 2, Tuesday, March 28, 12:15 p.m. - 1:30 p.m., Pacific 25

Concurrent Sessions 4, Tuesday, March 28, 3:45 p.m. - 5:00 p.m., Grand 12

This session will provide an overview of the price optimization debate, including how price optimization is defined, the historical development of price optimization in insurance, NAIC and state activity, and other ongoing developments. The presenters will also discuss the development of price optimization ratemaking practices, how the practice has evolved, and some fundamentals of how price optimization works from a non-technical perspective, as well as regulators’ reactions to this modern practice. Understand the current state of the price optimization debate. Know what price optimization is (and is not). Understand the mechanics of price optimization.

Moderator/Panelist: Ryan Purdy, Consulting Actuary, Merlinos & Associates
Panelist: Fred Karlinsky, Shareholder, Greenberg Traurig



REG-4: Rate and Form Regulation — The Latest from the NAIC

Live Stream Event, Concurrent Sessions 4, Tuesday, March 28, 3:45 p.m. - 5:00 p.m., Grand 2

State insurance regulators at the NAIC are discussing big data and other consumer data, generalized linear and other models used in insurers’ rate filings, rate classification issues (capping — what is price optimization and what is not — and causation vs. correlation), private flood insurance, workers’ compensation large deductibles, and other regulation of property-casualty insurance products. Hear about the latest activities and likely impact on actuaries and product managers in ratemaking and product development.

Moderator/Panelist: Kris DeFrain, Director - Research and Actuarial, National Association of Insurance Commissioners
Panelists: Nicole Elliott, Texas Department of Insurance
Charles Angell, Deputy Commissioner and Chief Actuary, Alabama Department of Insurance

Concurrent Sessions



REG-5: What Makes a Good California Filing?

Concurrent Sessions 3, Tuesday, March 28, 2:00 p.m. - 3:15 p.m., Pacific 25

Learn how to improve the quality of your California rate and class plan, form and rule filings. This session will also provide you with some common stumbling blocks that delay the approval of your rate filing.

Moderator: Shawna Ackerman, Chief Actuary, California Earthquake Authority

Panelist: Lynne Wehmueller, Senior Casualty Actuary, California Department of Insurance

WORKERS' COMPENSATION AND HEALTHCARE



WC-HC-1: Workers' Compensation — State of the Market

Concurrent Sessions 1, Tuesday, March 28, 10:00 a.m. - 11:15 a.m., Pacific 14

An overview of the current state of the workers' compensation line will be presented, including a review of financial results, recent trends, and a discussion of where the line might be headed.

Moderator/Panelist: Jay Rosen, Director and Senior Actuary, National Council on Compensation Insurance, Inc.

Panelist: Nancy Treitel-Moore, Director, Liberty Mutual



WC-HC-2: Workers' Compensation — Selected State Issues

Concurrent Sessions 3, Tuesday, March 28, 2:00 p.m. - 3:15 p.m., Pacific 14

The panel will present a summary of the key issues and challenges facing the workers' compensation system in the states of California and Florida.

In Florida, major philosophical shifts in the operation of the workers' compensation system have recently been experienced as a result of the *Castellanos* and *Westphal* decisions, related to attorney fees and temporary total maximum claims duration, respectively. NCCI will present a summary of the associated legislative issues and related cost-impact analyses.

Despite several attempts to reform the system over the last several years, California continues to be a very high cost state with respect to workers' compensation — with a very high frequency of permanent disability claims, a long average claims duration, and exceptionally high benefit delivery costs. WCIRB of California will present a summary of the key factors driving California cost levels as well as a prognosis for future changes in those drivers.

Moderator/Panelist: John Deacon, Director & Actuary, NCCI

Panelist: David Bellusci, Executive Vice President and Chief Actuary, WCIRB of California

Concurrent Sessions

WC-HC-3: Hospital Professional Liability — How Do We Price a Moving Target?

Concurrent Sessions 4, Tuesday, March 28, 3:45 p.m. - 5:00 p.m., Pacific 14

Over the past several years, the medical community has consolidated from private practices into larger groups, with many physicians seeking employment at hospitals. As a result, hospital professional liability business has taken on an increasing share of medical professional liability business. Hospitals are also going through many changes, including major changes to health care delivery, shifts in the judicial environment and a rapidly growing number of mid-level providers. Actuaries' abilities to provide accurate rates is becoming more challenging. In this session, we will summarize the sources of information that actuaries can reference and identify shifts that are likely to impact professional liability costs for hospitals.

Moderator: Joshua Youdovin, Assistant Vice President, New York Compensation Insurance Rating Board

Panelists: Charles Mitchell, Actuary, Mitchell Consulting LLC
Timothy Mosler, Senior Consulting Actuary, Pinnacle Actuarial Resources, Inc.
Robert Allen, President, Pro-Praxis Insurance

WC-HC-4: Impact of PPACA on Workers' Compensation Insurance

Concurrent Sessions 6, Wednesday, March 29, 9:30 a.m. - 10:45 a.m., Pacific 14

Please join Len Herk and Jerry Frye as they discuss the impact of the Patient Protection and Affordable Care Act (PPACA) on workers' compensation insurers and access to care for injured employees.

Len Herk, a senior economist at NCCI, will discuss his recently published study, "Impacts of the Affordable Care Act on Workers' Compensation." In the study, he addresses the frequently asked question, "Has the increase in demand for primary-care services by people newly insured under the ACA crowded out access to the same services by workers' compensation claimants?"

Jerry Frye, president and founder of BSG Analytics, will focus on the reaction of the large health care systems to the PPACA, which has led to many changes in the way care is provided. These changes have many implications to the workers' compensation market, and they may help to explain the findings in Herk's study.

Moderator: Kevin Donnelly, Actuarial Consultant, UnitedHealthcare

Panelists: Gerald Frye, President, The Benefit Services Group, Inc.
Leonard Herk, Director and Senior Economist, NCCI

Concurrent Sessions



WC-HC-5: Using Predictive Analytics to Decompose Workers' Compensation Loss Triangle Anomalies

Concurrent Sessions 5, Wednesday, March 29, 8:00 a.m. - 9:15 a.m., Pacific 14

Loss triangles often produce reserve estimates that are unusual for a particular evaluation. For example, where the previous three years might indicate a 1.25 change in reserves at a particular evaluation, the latest indication is a 1.40 change. Often such an anomaly requires checking with underwriters, claim adjusters, case managers and other operations specialists to understand the unusual adverse loss experience. By contrast, advances in predictive analytics are allowing for much more granular decompositions of claim experience that permit isolating changes in claim frequency and severity for narrow subgroups of claims or claim characteristics. For example, a segmentation analysis might identify an unusually large number of claims for a high-cost segment, an unusually large increase in severity for a moderately severe segment or some combination of both. Segmentation analysis can tease-out changing associations between specific claim characteristics (increasing or decreasing opioid utilization, cumulative trauma and attorney involvement) and their associated outcomes.

The panelists will describe a general framework for the predictive analytics and provide a detailed example of a segmentation analysis, which uses claim characteristics to segment (or to some, cluster) claims into mutually exclusive subgroups, and then they will analyze frequency and severity changes for these subgroups across different evaluations in the loss triangle. The panelists will also describe information the actuary should consult to determine whether the changes to the subgroups is systemic to the book of business or due to external changes. The external changes may include public policy changes, change in adjudication practices or changes in market claim trends.

Moderator: Lori Julga, Principal and Consulting Actuary, Milliman

Panelists: Philip Borba, Senior Consultant, Milliman, Inc.

Alex Swedlow, Executive Vice President, California Workers' Compensation Institute

Personal Attendance Record

This activity may qualify for up to 15 CE credits for the Ratemaking and Product Management Seminar and Workshops for CAS members. Workshop attendees may add a maximum of 7.2 CE credits. Those attendees who participate in a Breakfast Roundtable Discussion can add up to .9 CE Credits. Participants should claim credit commensurate with the extent of their participation in the activity. CAS members earn 1 CE credit per 50 minutes of educational session time not to include breaks or lunch.

Session		Date	Length
General Sessions			
Keynote Address	Cybersecurity	_____	_____
GS-1	California Insurance Market — Current Events	_____	_____
Concurrent Sessions			
Beyond Insurance and Innovation			
BII-1	Evolution in Technology and Demographics: An Impact on the Insurance Industry	_____	_____
BII-2	Wellness Data: The Next UBI?	_____	_____
BII-3	UBI Smartphone Apps: What's Hot and What's Not?	_____	_____
BII-4	Evolution in Business Models for Insurance	_____	_____
BII-5	Telematics and the Internet of Things	_____	_____
Commercial Lines			
CL-1	3D Printing: Hype or Reality?	_____	_____
CL-2	Beyond UBI — Commercial Insured Usage Data as a Customer Added Value	_____	_____
CL-3	Businessowners Policies in the Big Data Era	_____	_____
CL-4	The Competitive Weapon: Alignment of Analytics and Commercial Underwriting	_____	_____
CL-5	Where Cybersecurity Meets Insurance: Challenges Presented and Opportunities Created	_____	_____
CL-6	Where Will the Drones Take Us?	_____	_____
Ratemaking Call Paper Program			
CP-1	An Alternative Approach to Credibility for Large Account and Excess of Loss Treaty Pricing	_____	_____
CP-2	Removing Bias — The SIMEX Procedure	_____	_____
Data Management			
DM-1	Demystifying Data Quality Tools	_____	_____
DM-2	Applying Big Data Analytics in the Insurance Sector	_____	_____
DM-3	CAS Data and Technology Working Party Report	_____	_____
DM-4	Effectively Evaluating External Data	_____	_____
Data Science and Predictive Analytics			
DSPA-1	Bayesian Analysis of Big Data	_____	_____
DSPA-2	Easy Tree-sy: Everyday Applications for Decision Trees	_____	_____
DSPA-3	Genetic Algorithms with Applications to Insurance	_____	_____
DSPA-4	Tutorial on Open-Source Text Mining	_____	_____
Enterprise Risk and Capital Management			
ERCM-1	Business Planning Within a Capital Management Framework	_____	_____
ERCM-2	Intro to Profit and Contingency Loading in Ratemaking	_____	_____
ERCM-3	Ratemaking, Product Management, Predictive Analytics — How Does It All Fit Within an ERM Framework?	_____	_____
ERCM-4	Introduction to Sustainable ERM	_____	_____

Personal Attendance Record

Session		Date	Length
International			
INTNL-1	Internet of Things for International P&C Business	_____	_____
INTNL-2	Predictive Analytics in Strategy and Decisions — A Tour Around the Globe	_____	_____
Models, Applications & Implementation Issues			
MAI-1	Application of Text Mining in Claims Analytics: A Case Study	_____	_____
MAI-2	Implementing a Predictive Model: Challenges and Considerations for Success	_____	_____
MAI-3	Modeling and Analytics in a UBI Setting	_____	_____
MAI-4	Point Estimation Models vs. Ranking Models	_____	_____
MAI-5	Enhancing Pricing Precision for Today's Market — The Path to Customer-Centricity	_____	_____
Personal Lines			
PL-1	Concierge Claim Service: The Future of Claims with IoT and Telematics	_____	_____
PL-2	Highway Loss Data Institute — Current Issues in Vehicle Safety	_____	_____
PL-3	The Evolution of Classification Rating	_____	_____
PL-4	Increase Precision in Auto Territory Rating	_____	_____
PL-5	IoT's Impact on the Distribution, Rating and Underwriting of Personal Auto	_____	_____
PL-6	Vehicle History: Insurance Scoring for Your Car	_____	_____
Predictive Modeling — Beyond GLMs			
PM-BG-1	Comparing Machine Learning and Conventional Statistical Techniques In Claims Models	_____	_____
PM-BG-2	Ensembles and Combining Models	_____	_____
PM-BG-3	Overview and Practical Application Machine-Learning Methods in Pricing — Part 1	_____	_____
PM-BG-4	Overview and Practical Application Machine-Learning Methods in Pricing — Part 2	_____	_____
PM-BG-5	2017 Survey Results — Machine Learning and Advanced Analytics Practices	_____	_____
Predictive Modeling — Linear Models			
PM-LM-1	GLM - I	_____	_____
PM-LM-2	GLM - II	_____	_____
PM-LM-3	GLM - III — The Matrix Reloaded	_____	_____
PM-LM-4	And the Winner Is: How to Pick a Better Model	_____	_____
PM-LM-5	Nonparametric GLMs	_____	_____
Product Management			
PMGMT-1	Auto and Home Residual Markets Today: Size, Function and Challenges	_____	_____
PMGMT-2	Competitive Analysis: Know the Data, Know the Market	_____	_____
PMGMT-3	Multi-Product Optimization: Challenges and Opportunities	_____	_____
PMGMT-4	Perspectives on Actuarial vs. Product Management Roles	_____	_____
PMGMT-5	Residential Flood Insurance in Canada and Lessons for the U.S.	_____	_____
Professionalism			
PRO-1	Discussion of ASOP Exposure Draft: Estimating Future Costs for Prospective Property/Casualty Risk Transfer and Risk Funding	_____	_____
PRO-2	Lights! Camera! Professionalism!	_____	_____
PRO-3	Rogue Actuary: A Professionalism and Predictive Modeling Story	_____	_____
PRO-4	Who Wants to Be an Actuary?	_____	_____

Personal Attendance Record

Session		Date	Length
Regulation			
REG-1	Navigating the Regulatory Environment Around Usage-Based Insurance	_____	_____
REG-2	Perspectives on Rate Filing Support for Predictive Models	_____	_____
REG-3	Price Optimization: Regulatory Overview and Permitted Practices	_____	_____
REG-4	Rate and Form Regulation — The Latest from the NAIC	_____	_____
REG-5	What Makes a Good California Filing?	_____	_____
Workers' Compensation and Health Care			
WC-HC-1	Workers' Compensation — State of the Market	_____	_____
WC-HC-2	Workers' Compensation — Selected State Issues	_____	_____
WC-HC-3	Hospital Professional Liability — How Do We Price a Moving Target?	_____	_____
WC-HC-4	Impact of PPACA on Workers' Compensation Insurance	_____	_____
WC-HC-5	Using Predictive Analytics to Decompose Workers' Compensation Loss Triangle Anomalies	_____	_____
Roundtable Discussions			
RT-1	The CAS Institute	_____	_____
RT-2	Using Predictive Modeling Beyond Ratemaking	_____	_____
RT-3	Workers' Compensation Game Changers	_____	_____
RT-4	How Will the IoT Impact Auto Insurance?	_____	_____
RT-5	Update on Predictive Modeling: Usage and Applications	_____	_____
RT-6	Auto Loss Cost Trends	_____	_____
RT-7	What Actuaries and Product Managers Will Be Talking About in 2017	_____	_____
RT-8	Predicting Modeling Pitfalls: Challenges in Application	_____	_____
RT-9	Implementing Predictive Models: Integration of Rules and Models in Technology	_____	_____
RT-10	Cyber Pricing and Data	_____	_____
RT-11	Automated Vehicles and Their Impact on Vehicle Insurance	_____	_____
RT-12	Expanding the Toolbox: Technological Tools for Today's and Tomorrow's Markets	_____	_____
RT-13	New Car Insurance Challenges and Opportunities from Shared Mobility	_____	_____
RT-14	The Climate Change Task Force and the Actuaries' Climate Index	_____	_____
RT-15	Home Insurance Industry Loss Trends	_____	_____
Workshops			
Workshop 1	Severe Weather	_____	_____
Workshop 2	Basic Predictive Modeling	_____	_____
Workshop 3	Product Development	_____	_____
Workshop 4	Introduction to R	_____	_____
Workshop 5	Capital Allocation and Risk/Reward Decision-Making in an ERM Framework	_____	_____
Workshop 6	Advanced Predictive Modeling	_____	_____
Workshop 7	Data Visualization: GIS for Actuaries	_____	_____
The CAS Institute Event			
	iCAS Predictive Analytics Community of Practice	_____	_____

2017 Ratemaking and Product Management Seminar Schedule

A badge or purchased ticket is required for admittance into ALL RPM workshop and seminar events.

Sunday, March 26, 2017

3:00 p.m. – 5:00 p.m. Workshops/iCAS Event RegistrationPacific East Registration Desk

Monday, March 27, 2017

8:00 a.m. – 3:00 p.m. Workshops/iCAS Event RegistrationPacific East Registration Desk

8:00 a.m. – 9:00 a.m. Workshops/iCAS Event Breakfast..... Pacific Foyer

9:00 a.m. – 5:00 p.m. Full-Day Workshops and iCAS Event

Pacific 14	Pacific 15	Pacific 16	Pacific 17
Workshop 1: Severe Weather	Workshop 2: Predictive Modeling — Basic	Workshop 3: Product Development	Workshop 4: Introduction to R

Pacific 23	Pacific 24	Pacific 25	Pacific 26
Workshop 5: Capital Allocation and Risk/Reward Decision Making	Workshop 6: Predictive Modeling — Advanced	Workshop 7: Data Visualization	iCAS Community of Practice

10:30 a.m. – 11:00 a.m. Workshop Networking and Refreshment Break Pacific Foyer

12:30 p.m. – 1:30 p.m. Workshop Luncheon Grand 10-13

3:00 p.m. – 3:30 p.m. Workshop Networking and Refreshment Break Pacific Foyer

4:00 p.m. – 6:00 p.m. Seminar RegistrationPacific East Registration Desk

Speaker Tech Support Room Torrey Pines I

4:30 p.m. – 6:00 p.m. Welcome Reception and Exhibits, Sponsored by LexisNexis Risk Solutions..... Pacific 18-22

Tuesday, March 28, 2017

7:00 a.m. – 6:00 p.m. Seminar RegistrationPacific East Registration Desk

7:00 a.m. – 8:00 a.m. Continental Breakfast and Exhibits, Sponsored by Pinnacle Actuarial Resources, Inc. Pacific 18-22

7:00 a.m. – 7:45 a.m. Roundtable Discussions

Pacific 14	Pacific 15	Pacific 16	Pacific 17	Pacific 23	Pacific 24
RT-13: New Car Insurance Challenges and Opportunities from Shared Mobility	RT-2: Using Predictive Modeling Beyond Ratemaking	RT-3: Workers' Compensation Game Changers	RT-15: Home Insurance Industry Loss Trends	RT-5: Update on Predictive Modeling: Usage and Applications	RT-6: Auto Loss Cost Trends

Pacific 25	Pacific 26	Grand 1	Grand 2	Grand 11	Grand 12
RT-7: What Actuaries and Product Managers Will Be Talking About in 2017	RT-8: Predicting Modeling Pitfalls: Challenges in Application	RT-11: Automated Vehicles and Their Impact on Vehicle Insurance	RT-12: Expanding the Toolbox: Technological Tools for Today's and Tomorrow's Markets	RT-9: Implementing Predictive Models: Integration of Rules and Models in Technology	RT-14: The Climate Change Task Force & ACI

7:55 a.m. – 9:30 a.m. **Opening Session/iCAS Recognition Ceremony/Keynote Address: Cybersecurity (Live Streaming)** Grand 5-7

8:00 a.m. – 4:00 p.m. Student Central Program..... Grand 3-4

9:30 a.m. – 10:00 a.m. Networking and Refreshment Break, Sponsored by The CAS Institute..... Pacific 18-22

10:00 a.m. – 11:15 a.m. Concurrent Sessions 1 and Roundtable Discussions

Pacific 14	Pacific 15	Pacific 16	Pacific 17	Pacific 23	Pacific 24
WC-HC-1: Workers' Compensation — State of the Market	CL-5: Where Cybersecurity Meets Insurance: Challenges Presented and Opportunities Created	RT-4: How Will the IoT Impact Auto Insurance?	PM-LM-5: Nonparametric GLMs	BII-1: Evolution in Technology and Demographics: An Impact on the Insurance Industry	DSPA-2: Easy Tree-sy: Everyday Applications for Decision Trees

Pacific 25	Pacific 26	Grand 1	Grand 2 (Live Streaming)	Grand 11	Grand 12
DM-2: Applying Big Data Analytics in the Insurance Sector	MAI-3: Modeling and Analytics in a UBI Setting	CP-2: Removing Bias — The SIMEX Procedure	PL-5: IoT's Impact on the Distribution, Rating and Underwriting of Personal Auto	RT-1: The CAS Institute	PMGMT-3: Multi-Product Optimization: Challenges and Opportunities

2017 Ratemaking and Product Management Seminar Schedule

11:15 a.m. – 12:15 p.m. Luncheon, Sponsored by EY..... Pacific 18-22

12:15 p.m. – 1:30 p.m. **Concurrent Sessions 2**

Pacific 14	Pacific 15	Pacific 16	Pacific 17	Pacific 23	Pacific 24
INTNL-2: Predictive Analytics in Strategy and Decisions — A Tour Around the Globe	DSPA-4: Tutorial on Open-Source Text Mining	PL-6: Vehicle History: Insurance Scoring for Your Car	PM-BG-1: Comparing Machine Learning and Conventional Statistical Techniques In Claims Models	BII-2: Wellness Data: The Next UBI?	DM-1: Demystifying Data Quality Tools

Pacific 25	Pacific 26	Grand 1	Grand 2 (Live Streaming)	Grand 11	Grand 12
REG-3: Price Optimization: Regulatory Overview and Permitted Practices	MAI-4: Point Estimation Models vs. Ranking Models	ERCM-2: Intro to Profit and Contingency Loading in Ratemaking	CL-1: 3D Printing: Hype or Reality?	PRO-3: Rogue Actuary: A Professionalism and Predictive Modeling Story	BII-4: Evolution in Business Models for Insurance

1:30 p.m. – 2:00 p.m. Networking and Refreshment Break with Exhibits, Sponsored by Earnix Pacific 18-22

2:00 p.m. – 3:15 p.m. **Concurrent Sessions 3**

Pacific 14	Pacific 15	Pacific 16	Pacific 17	Pacific 23	Pacific 24
WC-HC-2: Workers' Compensation — Selected State Issues	CL-4: The Competitive Weapon: Alignment of Analytics and Commercial Underwriting	PMGMT-2: Competitive Analysis: Know the Data, Know the Market	PL-3: The Evolution of Classification Rating	PM-BG-2: Ensembles and Combining Models	BII-3: UBI Smartphone Apps: What's Hot and What's Not?

Pacific 25	Pacific 26	Grand 1	Grand 2 (Live Streaming)	Grand 11	Grand 12
REG-5: What Makes a Good California Filing?	RT-10: Cyber Pricing and Data	ERCM-4: Intro to Sustainable ERM	BII-1: Evolution in Technology and Demographics: An Impact on the Insurance Industry	PRO-4: Who Wants to Be an Actuary?	DM-4: Effectively Evaluating External Data

3:15 p.m. – 3:45 p.m. Networking Break with Exhibits..... Pacific 18-22

3:45 p.m. – 5:00 p.m. **Concurrent Sessions 4**

Pacific 14	Pacific 15	Pacific 16	Pacific 17	Pacific 23	Pacific 24
WC-HC-3: Hospital Professional Liability — How Do We Price a Moving Target?	PL-4: Increase Precision in Auto Territory Rating	PM-BG-5: 2017 Survey Results — Machine Learning and Advanced Analytics Practices	PRO-3: Rogue Actuary: A Professionalism and Predictive Modeling Story	MAI-5: Enhancing Pricing Precision for Today's Market — The Path to Customer-Centricity	DM-3: CAS Data and Technology Working Party Report

Pacific 25	Pacific 26	Grand 1	Grand 2 (Live Streaming)	Grand 11	Grand 12
DSPA-1: Bayesian Analysis of Big Data	CL-6: Where Will the Drones Take Us?	PM-LM-4: And the Winner Is: How to Pick a Better Model	REG-4: Rate and Form Regulation — The Latest from the NAIC	PRO-2: Lights! Camera! Professionalism!	REG-3: Price Optimization: Regulatory Overview and Permitted Practices

5:00 p.m. – 6:30 p.m. Reception with Exhibits, Sponsored by D.W. Simpson..... Pacific 18-22

6:30 p.m. – 7:45 p.m. Evening Live Stream Event: INTNL-1: Internet of Things for International P&C BusinessGrand 2

Wednesday, March 29, 2017

7:00 a.m. – 1:30 p.m. Seminar RegistrationPacific East Registration Desk

7:00 a.m. – 8:00 a.m. Continental Breakfast with Exhibits, Sponsored by Clyde Analytics..... Pacific 18-22

8:00 a.m. – 9:15 a.m. **Concurrent Sessions 5**

Pacific 14	Pacific 15	Pacific 16	Pacific 17	Pacific 23
WC-HC-5: Using Predictive Analytics to Decompose Workers' Compensation Loss Triangle Anomalies	REG-1: Navigating the Regulatory Environment Around Usage-Based Insurance	PMGMT-1: Auto and Home Residual Markets Today: Size, Function and Challenges	PL-2: Highway Loss Data Institute — Current Issues in Vehicle Safety	PM-LM-1: GLM - I

Pacific 24	Pacific 25	Pacific 26	Grand 1	Grand 2
BII-5: Telematics and the Internet of Things	MAI-1: Application of Text Mining in Claims Analytics: A Case Study	CP-1: An Alternative Approach to Credibility for Large Account and Excess of Loss Treaty Pricing	CL-2: Beyond UBI — Commercial Insured Usage Data as a Customer Added Value	PRO-2: Lights! Camera! Professionalism!

2017 Ratemaking and Product Management Seminar Schedule

9:15 a.m. – 9:30 a.m. Networking Break with Exhibits, Sponsored by The CAS Institute..... Pacific 18-22

9:30 a.m. – 10:45 a.m. **Concurrent Sessions 6**

Pacific 14	Pacific 15	Pacific 16	Pacific 17	Pacific 23
WC-HC-4: Impact of PPACA on Workers' Compensation Insurance	DSPA-2: Easy Tree-sy: Everyday Applications for Decision Trees	PMGMT-4: Perspectives on Actuarial vs. Product Management Roles	PL-1: Concierge Claim Service: The Future of Claims with IoT and Telematics	PM-LM-2: GLM - II

Pacific 24	Pacific 25	Pacific 26	Grand 1	Grand 2
INTNL-1: Internet of Things for International P&C Business	PM-BG-3: Overview and Practical Application Machine-Learning Methods in Pricing — Part 1	PMGMT-3: Multi-Product Optimization: Challenges and Opportunities	ERCM-3: Ratemaking, Product Management, Predictive Analytics — How Does It All Fit Within an ERM Framework?	PRO-1: Discussion of ASOP Exposure Draft: Estimating Future Costs for Prospective Property/Casualty Risk Transfer and Risk Funding

10:45 a.m. – 11:15 a.m. Networking and Refreshment Break with Exhibits Pacific 18-22

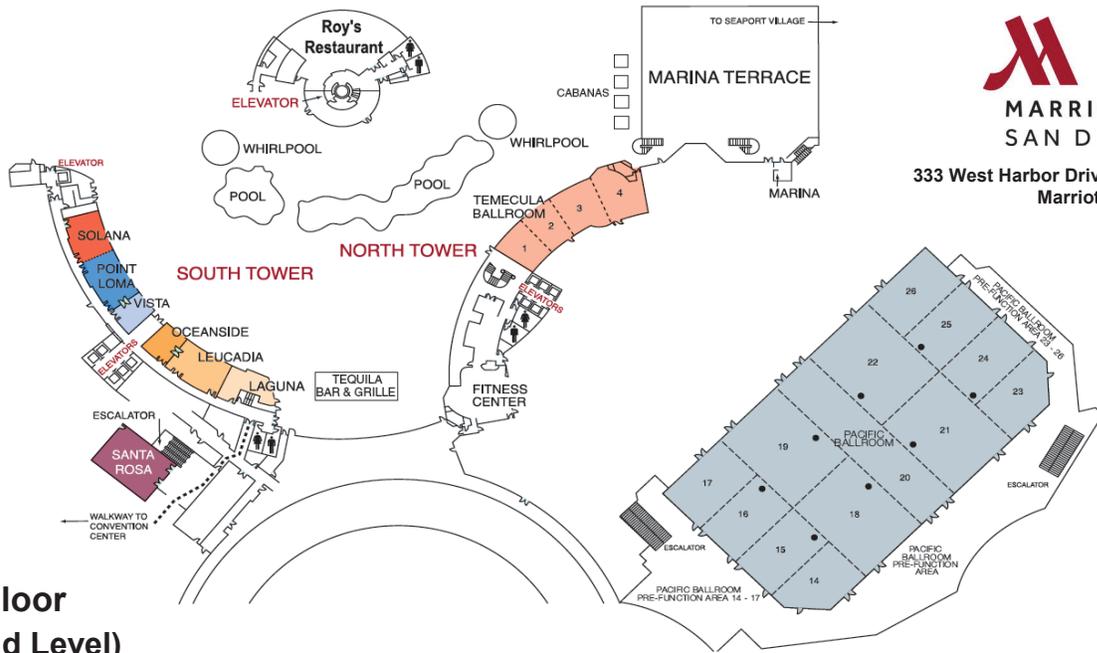
11:15 a.m. – 12:30 p.m. **Concurrent Sessions 7**

Pacific 14	Pacific 15	Pacific 16	Pacific 23
PMGMT-5: Residential Flood Insurance in Canada and Lessons for the U.S.	DSPA-3: Genetic Algorithms with Applications to Insurance	CL-3: Businessowners Policies in the Big Data Era	REG-2: Perspectives on Rate Filing Support for Predictive Models

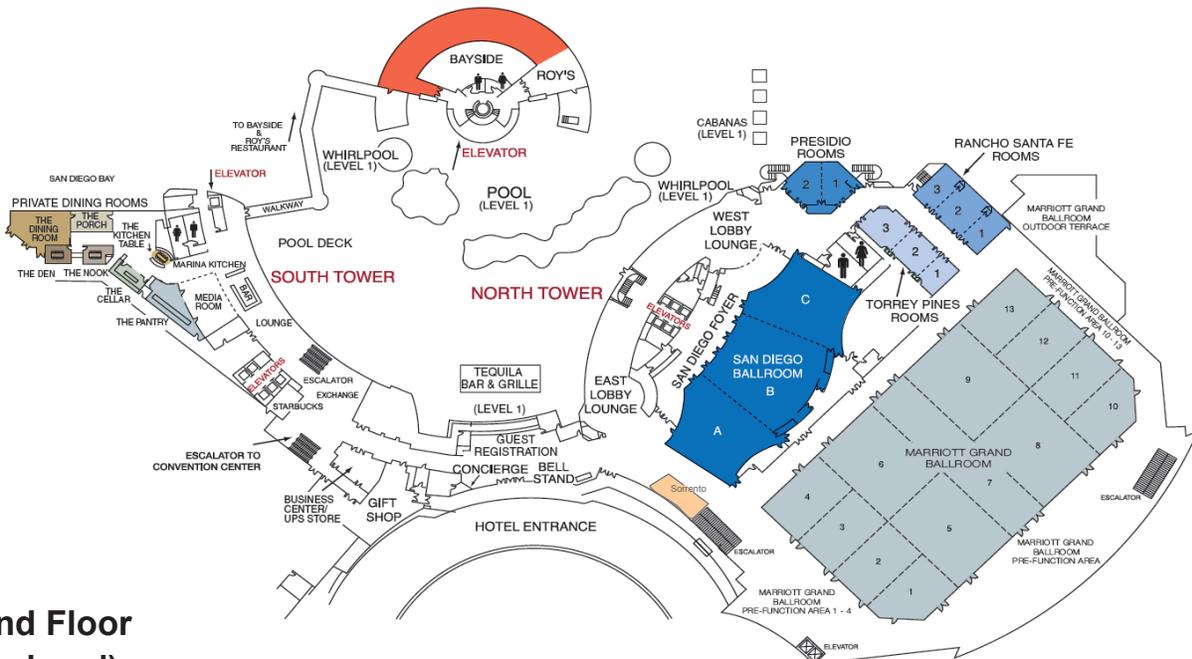
Pacific 24	Pacific 25	Pacific 26	Grand 1	Grand 2
PM-LM-3: GLM - III - The Matrix Reloaded	PM-BG-4: Overview and Practical Application Machine-Learning Methods in Pricing — Part 2	MAI-2: Implementing a Predictive Model: Challenges and Considerations for Success	ERCM-1: Business Planning Within a Capital Management Framework	PL-4: Increase Precision in Auto Territory Rating

12:30 p.m. – 1:15 p.m. Box Lunch Pacific 18-22

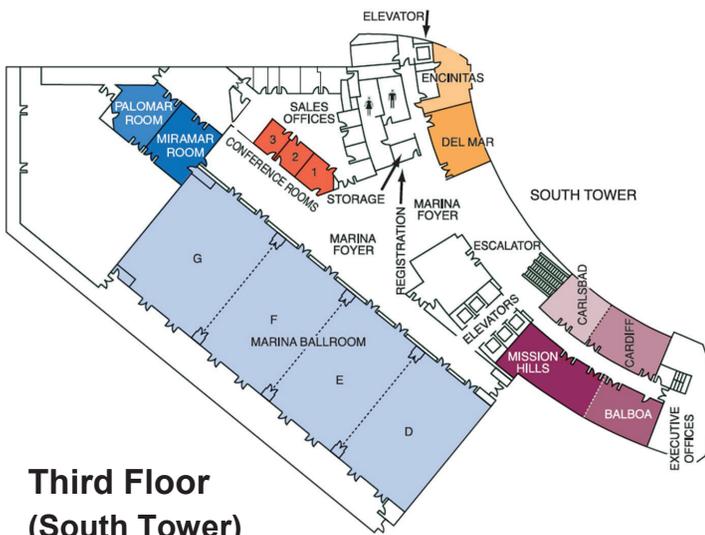
1:15 p.m. – 2:30 p.m. **General Session/Closing**..... Pacific 23-26



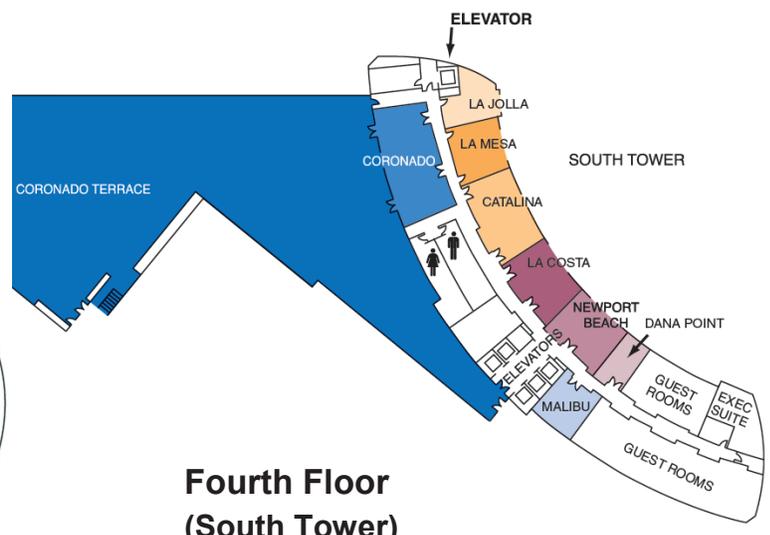
First Floor
(Ground Level)



Second Floor
(Lobby Level)



Third Floor
(South Tower)



Fourth Floor
(South Tower)



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